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FORENSIC ACCOUNTING: FIGHTING FRAUD, AND MUCH MORE!

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While Forensic Accounting has been recognized as a legitimate branch of accounting for over thirty years, appeal for it has compounded in recent years, especially following the accounting scandals of several major U.S. corporations in the past decade. Significant contributions to literature are being made by analysis of accounting and audit failures, errors in assessing risk, and aspects of ethical breakdowns, fraud, and other illicit activity. In addition to fighting fraud, there are other characteristics of forensic accounting.

This paper provides an overview of forensic and investigative accounting, including providing an understanding of the nature and development of forensic accounting, an understanding of fraudulent financial reporting and employee fraud and how to detect and prevent these accounting crimes, courtroom procedures and litigation management and support, cybercrime management, and business valuations. Included in the paper are discussions of indirect methods of reconstructing income, money laundering, computation of economic damages, and forensic accounting in action.

The paper includes discussion of the following:

- Nature and development of fraud and forensic accounting, the means, sources, motivation and contributing factors of fraudulent financial reporting, and how to detect fraud in financial statements
- Financial reporting frauds including at Enron, WorldCom, Adelphia Communications, Tyco, Global Crossing, Health South, Waste Management, Qwest Communications, Xerox Corporation, Fannie Mae and others.
- Employee fraud, fraud schemes, types of misappropriations, and fraud prevention techniques.
- Indirect methods of reconstructing income and money laundering, litigation management and support, and related issues.
- Cybercrime management and related issues.
- Business valuation and computation of economic damages techniques

The paper demonstrates the advantages of extensive study in this branch of accounting. In addition to showing how forensic accounting can be used in fraud investigations, the paper provides examples of services accountants may provide “forensically” that are value-added to commercial enterprise and independent of regulatory issues. The paper concludes with recommendations for teaching topics and approaches for covering them in the undergraduate forensic accounting course.

THE CLARITY PROJECT: IMPROVED GUIDANCE FOR ACCOUNTING PRACTITIONERS

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INTRODUCTION

The American Institute of CPAs (AICPA) launched the Clarity Project in an attempt to deal with increased complexities of the standard setting for attest practices, particularly for audits of closely-held companies. The experiences of the Financial Accounting Standards Board (FASB) and its Codification Project are precedents for overhaul. The success of the Accounting Standards Codification (ASC) has strong implications for the methodology of the way that existing auditing standards may be archived, and the manner in which new standards will be written. This paper illustrates the key features of “clarified” standards, and the relative advantages of its structure to the practicing accountant. Issues involving big firms v. smaller firms, and international v. local standard setting are explored. The paper concludes with recommendations for firm training programs and continuing professional education (CPE) to disseminate knowledge among a firm’s staff in applying the Statements on Auditing Standards as reorganized for clarity.

DEVELOPMENT OF CLARIFICATION

The 2002 passage of the Sarbanes-Oxley Act was a significant world-wide turn in professional and public perspectives of the auditing profession. Among the pre-emptive concerns for precluding audit failures was the idea that better organized standards, both for financial reporting and external auditing, would be key components. The preliminary work was put forth by the International Auditing and Assurance Standards Board (IAASB) in 2003. The next year the Auditing Standards Board (ASB) of the AICPA aligned its agenda with the international organization in a plan for convergence. In 2006, the IAASB established conventions for drafting clarified standards and developed an infrastructure for a “redrafting” process. In 2007 and 2008, the ASB issued a Clarity Project discussion paper and an exposure draft. In 2008 and 2009 the IAASB finishes its version of the Clarity Project and puts ISAs into effect. The ASB expects to have full finalization for periods ending or after December 15, 2012.

GOALS AND RATIONALE FOR THE CLARITY PROJECT

Generally accepted auditing standards (GAAS) have been a source of disagreement among practitioners as to application differences between public and nonpublic companies. The convergence project between the US Financial Accounting Standards Board and the UK-based International Accounting Standards Board has been met with severe criticism by multiple users, auditors, analysts, preparers, and issuers. On the other hand, the clarity project efforts between the ASB and IAASB have not had to deal with this rift extensively, due primarily to the nature of the underlying objectives of audits for privately held enterprises.

The critics would probably speak louder had there not been a Public Company Accounting Oversight Board (PCAOB) created as a result of the Sarbanes-Oxley 2002 Act, where that organization provided rules for regulation of public companies and the reporting structure of external auditors in the line between the SEC and the public companies' management. Accordingly, serendipity arose from the ashes of the fraud and irregular activities of the 1990s and first decade of the 21st century: auditing standards and procedures must be greatly improved, a necessary bifurcation between Big GAAS and Little GAAS has already been established with the PCAOB on the one hand, and the ASB on the other, and the timing for reassessment, reorganization, and refinement of the necessary auditing standards is extremely evident.

STRUCTURE OF OLD AND NEW SASs

As the FASB had done with its Codification of standards through a complete reshaping of outstanding Accounting Research Bulletins, Accounting Principles Board Opinions, and FASB Statements on Standards, the ASB embarked on the project to revise, and re-codify, all existing auditing (AU) sections of the AICPA *Professional Standards*. Accordingly, with an improved organization of AU sections around more logical topical areas, new SASs can continue to be issued, but just like Accounting Standards Updates for the financial reporting Codification, the new SASs will fit into a more logical scheme.

The formats of clarified SAS will be uniform and will exhibit the following major categories: Introduction, Objective, Definitions, Requirements, and Application and other Explanatory Material. The traditional ten generally accepted auditing standards previously found at AU 150, will now be re-clarified and appear in various positions in the clarified documents. An outgrowth of the clarity efforts has also led to improvements in the standard, unmodified, unqualified auditor's report. An advantage of the ASB leading the charge in advance of the PCAOB in the arena of clarity is that the auditor of private companies will not likely incur the problematic issues that continuously surface relative to having centralized oversight over all practices by one direct body, as it is with FASB over both public and nonpublic company financial reporting.

IMPROVED GUIDANCE FOR PRACTITIONERS

The remainder of this paper illustrates how practitioners will gain through this improved methodology of standard-setting and structure. Specifically, three clarified sections are examined to demonstrate the advantages of the new structure and its language: AU-C Section 550 Related Parties, AU-C Section 560 Subsequent Events, and AU-C Section 570 Going Concern. The authors compare each of these three newly clarified sections with their respective original un-clarified counterpart, and defend the new structure and language. Benefits will accrue as well to non-practitioners, especially students, who must carry an increasingly large toolkit of knowledge each day.

Privacy Disposition, Website Reputation, and Familiarity: Their Impacts on Privacy Concerns

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Abstract

In information privacy literature, limited attention was paid to the studies on the effects of a person's privacy disposition on his/her privacy concerns. This relationship is of critical importance to privacy research, as privacy disposition is believed to be an important antecedent of privacy perceptions. In this study, a research model is developed to examine the impacts of a person's privacy disposition, reputation of an e-commerce website and personal familiarity with the website on the person's privacy concerns about the website and the subsequent behavior. A survey is administered for the empirical test of the model. The results confirm the impacts of the three antecedents.

Keywords: Information privacy concerns, privacy disposition, website reputation, familiarity with a website

Introduction

Studies on online information privacy have achieved significant progress over the last decade, with a number of factors that influence a person's privacy concerns recognized (Belanger and Crossler 2011; Li 2011; Smith, Dinev and Xu 2011). Of these factors, a person's privacy disposition, also known as the psychological need for privacy, play important roles in determining the person's privacy beliefs (Li 2011). It refers to a person's inclination to desire more or less privacy in various social situations, such as in e-commerce environment. Studies show that this factor has a direct impact on a person's privacy concerns (Yao, Rice and Wallis

2007), and its impact may also be mediated by other factors such as intrusion perception (Xu, Dinev, Smith and Hart 2008).

Despite the theoretical and practical importance of the construct, privacy disposition has not received sufficient attention in literature. Only a few empirical studies tested its impact. For example, Yao et al. (Yao et al. 2007) tested the impact of privacy disposition on a person's privacy perceptions regarding the general internet use, but failed to examine its impact on privacy concerns regarding a specific website. Xu et al. (Xu et al. 2008) then incorporated institutional factors in their study and tested the privacy concerns regarding specific websites, but the direct impact of privacy disposition on privacy concerns was not examined. Another study by Rensel et al. (Rensel, Abbas and Rao 2006) tested the moderating roles of need for privacy in website use, but a direct measure of privacy concerns or other privacy perceptions was not attempted. More efforts are needed to investigate the direct relationship between these constructs with regard to specific websites.

In this study, we develop a research model to test the direct impact of a person's privacy disposition, reputation of a website, and familiarity with a website on the person's privacy concerns about the website and the subsequent behavioral intention to use that site. A survey is administered to test the model with multiple sources of respondents and multiple websites. The results show that all three antecedents have a significant impact on a person's privacy concerns about a website, which in turn exert a significant impact on the behavioral intention to use that website.

The study adds values to online information privacy research in a couple of ways. First, it provides additional evidence of the direct impact of privacy disposition on privacy perceptions. In particular, the data involve various types of internet users, including educators, businesspersons, and residents, and the websites in the study cover several industries, including online auction, online travel agencies, and online investment brokers. The results are therefore generalizable to various e-commerce contexts. Second, the study examines the impacts of both individual factors and institutional factors on privacy concerns, showing that they are independent antecedents. This has important implications for further research on individual as well as organizational antecedents of privacy concerns. The implications for practice are also discussed.

The structure of the paper is as follows. First, the research model is developed from the

literature review, and the corresponding hypotheses are proposed. Next, the research method for empirically testing the model is described, followed by the analysis of data. Then, the results of the analysis are discussed along with their implications for research and practice.

Literature Review and Research Model

Privacy concerns about a specific website

Online information privacy is an important area of research in today's ubiquitous e-commerce environment. It deals with online customers' rights and abilities to keep their personal information from unwanted outcomes. Studies have investigated factors that influence the formation of online customers' privacy concerns. These studies examine the privacy concerns about the general e-commerce environment, and also the privacy concerns about specific e-commerce websites (Li 2011). The second approach has the advantage of gaining deep insights into how online firms may improve their privacy practices to better protect customers' information and reduce their privacy concerns (Pavlou, Liang and Xue 2007). This approach is adopted in the study.

To date, several factors were found to have impacts on individuals' concerns for information privacy regarding specific websites, including the reputation of a website (Eastlick, Lotz and Warrington 2006); privacy policy and rewards (Andrade, Kaltcheva and Weitz 2002); privacy assurance (Lee and Cranage In press); information sensitivity or relevance (Lwin, Wirtz and Williams 2007); and trust, website informativeness, and social presence of the website (Pavlou et al. 2007). Most of the factors reside at the organizational level, which can be interpreted by the agency theory since websites are the agents that collect and use customers' information for services and transactions. Of these factors, we focus on the reputation of a website, as it was shown to have a direct impact on website-specific privacy concerns and also influence other organizational factors (Andrade et al. 2002; Eastlick et al. 2006).

Little is known about the impact of individual-level factors on website-specific privacy concerns, as most of the individual factors are linked to privacy concerns regarding the general e-commerce environment (Li 2011). Nevertheless, as we mentioned earlier, disposition to privacy may play an important role in determining a person's site-specific privacy concerns. Privacy disposition is the outcome of personal interaction with family and social environments (Xu et al. 2008; Yao et al. 2007); it is a psychological basis of self (Buss 2001). Its impact on website-

specific privacy concerns can be interpreted by the theory of reasoned action (Ajzen and Fishbein 1980), suggesting that a person’s underlying beliefs directly influence his/her attitude toward a certain object. In terms of information privacy, it implies that a person’s underlying beliefs of privacy may have an impact on the person’s privacy perception regarding a particular website. For example, Hann et al. (Hann, Hui, Lee and Png 2007) show that people can be categorized by three types of privacy preferences: privacy guardians, information sellers, and convenience seekers. Compared to the latter two, privacy guardians are more sensitive to online information privacy and prefer more protections of privacy. It is necessary to extend previous research on privacy disposition and investigate its impact on privacy concerns about specific websites.

Another important antecedent that we examine is personal familiarity with a website (Gefen 2000). It refers to the overall understanding of a website based on a person’s previous interactions, experiences, and learning of what the website does with users’ private information (Awad and Krishnan 2006). It deals with the socio-relations between a person and a website, which gives the person first-hand information of the privacy practices of a website. Although the moderating effect of website familiarity was tested (Van Slyke, Shim, Johnson and Jiang 2006), we argue that it may also exert a direct impact on privacy concerns.

Finally, we conceptualize that website-specific privacy concerns have a direct impact on the behavioral intention to use the website. The research model and the hypotheses are illustrated in Figure 1. In the next section, we describe the development of the hypotheses.

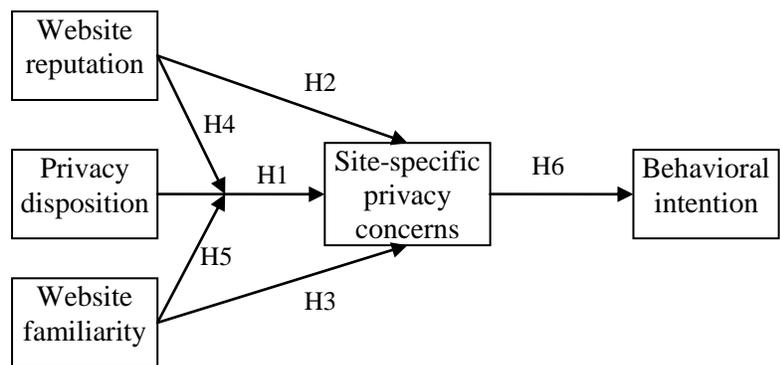


Figure 1. Research model

The impact of privacy disposition on privacy concerns

Several social psychological theories explain the enduring human need for privacy (Yao

et al. 2007). For example, Halmos (Halmos 1953) argues that the desire for solitude is natural to both primitive and postprimitive societies and functions to regenerate social life for more harmonious living. Klopfer and Rubenstein (Klopfer and Rubenstein 1977) then argue that having some level of privacy is essential to one's survival. Laufer and Wolfe (Laufer and Wolfe 1977) point out that individual conception of privacy is developed through a social environment and the interactions with others within the environment, and total disclosure is impossible. Such a developmental process leads to individuation or personal dignity, which is a basis of "self" (Buss 2001).

The online environment presents additional challenges to the conservation of individual privacy, as technologies are available to collect information about a person without his/her explicit consent (Stafford and Urbaczewski 2004). Online firms that collect the information may also use it for secondary purposes and may treat the information unfairly (Milberg, Smith and Burke 2000). Individuals with basic knowledge of such online privacy risks would express concerns about how their information is collected and used by a company (Bansal, Zahedi and Gefen 2010; Zviran 2008). This is especially true if the person has limited knowledge of the information practices of a particular website, so that the disposition to privacy becomes a major basis to gauge privacy perceptions about the website, based on which self-protective behaviors are taken (Chai, Bagchi-Sen, Morrell, Rao and Upadhyaya 2009). Therefore, we hypothesize:

H1: A person's privacy disposition has a positive impact on the person's privacy concerns regarding a specific website.

The impact of website reputation on privacy concerns

The reputation of a website has a potential impact on the trust beliefs on the website (Andrade et al. 2002; Eastlick et al. 2006). This is because information exchange is necessary for the fulfillment of online transactions (Hoffman, Novak and Peralta 1999), and information exchange involves both an economic contract (i.e., purchasing products or services from a website) and a social transaction (i.e., providing personal information that can be stored for future use). Especially in countries without omnibus protection of online privacy, the opportunistic behavior of online firms may do harm to customers' private information, causing privacy concerns (Bellman, Johnson, Kobrin and Lohse 2004). While online firms can take a number of approaches to addressing privacy concerns, such as developing complete privacy statements or using third party privacy assurance (Hui, Teo and Lee 2007; Kim, Steinfield and

Lai 2008), a direct and effective approach to addressing privacy concerns would be to build the image or reputation of the firm.

A firm's reputation is an overall assessment of the firm's product/service expertise and social character, consumers' prior experiences, and credible communications about the firm's abilities (Riahi-Belkaoui and Pavlik 1992). It provides customers important reference of how the firm may handle their private information. Reputable websites are believed to handle customers' information with competence and respect due to their established privacy policies and other practices, while disreputable websites may handle the information without much competence or respect. It is therefore hypothesized:

H2: The reputation of a web site has a negative impact on a person's privacy concerns regarding the web site.

The impact of website familiarity on privacy concerns

Although personal familiarity with a website is not widely studied in privacy literature, it was found to have a significant impact on consumer behavior in a broader e-commerce context (Gefen 2000). Familiarity is a social-relational factor that assesses the overall experiences of a person in interacting with a website. On personally familiar websites, a customer gains knowledge and experience about what information is collected by the websites, how that information is used, and what to do to control the information and its use, as compared to unfamiliar websites. All these comply with the core requirements of the fair information practice (such as informed consent, control, and exit) and deal directly with the privacy concerns (Milberg et al. 2000). Therefore, we hypothesize:

H3: Personal familiarity with a website has a negative impact on a person's privacy concerns regarding the web site.

Potential moderating effects

Interactions between the antecedent factors may exist. Van Slyke et al. (Van Slyke et al. 2006), for example, tested the moderating effects of familiarity on the relationship between privacy concerns and trust beliefs, and also between privacy concerns and risk beliefs. The empirical results, though, did not support the expectations. Nevertheless, we argue that given the main effect of privacy disposition on website-specific privacy concerns, the other two antecedents, reputation and familiarity, may influence the strength of the main effect. First, the reputation of a website may influence how significant the privacy disposition is in determining

the privacy concerns: good reputation of a website may attenuate the impact of privacy disposition on privacy concerns, as it helps to address some of the concerns a person may have about the information practice; on the other hand, bad reputation of a website may magnify that impact, as the person may feel more worried if the information practice of the website is less known. In other words, the reputation of a website may help to deal with some uncertainties in interacting with a website, especially at the beginning of the interaction when the individual has limited knowledge of the website. Similarly, more familiarity with a website is able to attenuate the impact of privacy disposition on privacy concerns, as compared to less familiarity with a website. This would be the case when the individual is accumulating knowledge about the website, and is therefore more relaxed and less concerned. It is therefore hypothesized:

H4: For a more reputable website, the relationship between a person's privacy disposition and privacy concerns is weaker, as compared to a less reputable website.

H5: For a more familiar website, the relationship between a person's privacy disposition and privacy concerns is weaker, as compared to a less familiar website.

Finally, we expect a direct impact of site-specific privacy concerns on a person's behavioral intention to use the website for information inquiry purposes. As this relationship was well studied in literature (Li 2011), the rationale is not belabored. We hypothesize:

H6: A person's privacy concerns about a specific website have a negative impact on the person's behavioral intention to use that website.

Research Method

We conducted a survey to empirically test the model. We measured individuals' self-reported privacy perceptions about a particular website and their assessment of other antecedent and consequence factors. To reduce and verify the common method bias (Podsakoff, MacKenzie, Lee and Podsakoff 2003) in the study, we applied several techniques. First, we included multiple websites in the study, following the advice of other scholars (Bansal, Zahedi and Gefen 2008; Xu et al. 2008), in order to reduce the impact of a single research site. The websites selected for the study include two online auction sites, two online travel agencies, and two online investment brokers. For each type of websites, we chose one that is of relatively higher reputation and one that is of relatively lower reputation. We judge their reputations based on appearance on TV

commercials, market dominance, and word-of-mouth. Second, we reversely worded several measurement items on the survey to deal with the social desirability bias (Podsakoff et al. 2003). Third, we use statistical methods to verify the existence of the common method bias.

Measurement items

All the items that measure the latent constructs were adopted from existing literature. For disposition of privacy, three items were adopted from (Xu et al. 2008). For reputation, four items were adopted from (Casalo, Flavian and Miguel 2007). For website familiarity, four items were adopted from (Gefen 2000). For privacy concerns, six items were adopted from (Pavlou et al. 2007). And finally, four items were adopted from (Bansal et al. 2010) and (Gefen and Straub 2000) to measure behavioral intention.

Survey procedure and results

The survey proceeded as follows. First, the participants filled in the portion of the survey that measures their privacy disposition. Then, each participant was asked to visit a website listed on the survey questionnaire, which is randomly assigned to him/her. After that, the participant filled in the rest of the survey to capture their assessment of the reputation of the website, personal familiarity with the website, privacy concerns, and behavioral intention. Finally, demographic information was collected for description purposes. Each participant was also provided a cover letter and a consent form in front of the survey to introduce the purpose of the study and privacy policies.

The survey was conducted between April and September in 2011. The participants included faculty and staff from a private college in the southeast region of the United States, businesspersons from a local business association, and resident from a local community. A total of 264 questionnaires were sent to the faculty and staff via campus mail, and 30 questionnaires were handed to the businesspersons and residents directly. Two rounds of email reminders were sent to the faculty and staff, but no formal reminder was given to the other subjects. A total of 70 responses were received, yielding a 23.8% response rate. Descriptive information of the responses is listed in Table 1.

A possible reason of the relatively low response rate is the fact that each participant was required to visit a website to finish the survey. To test the potential non-response bias, we compare early respondents (before the first email reminder) and late respondents (after the first email reminder) based on their genders ($F=.19$, $p=.67$), age groups ($F=2.81$, $p=.10$), education

($F=1.36$, $p=.25$), years of internet use ($F=.64$, $p=.42$), daily internet use ($F=1.63$, $p=.21$), and the websites (high reputation websites versus low reputation websites) ($F=.60$, $p=.44$). None of these factors show significant differences, suggesting the lack of significant non-response bias in the data.

Table 1. Descriptive information of the survey responses

Demographic factors	Frequency
Gender	
Female	50
Male	19
Unspecified	1
Age	
25 or under	5
26-35	13
36-45	13
46-55	19
56 or older	19
Unspecified	1
Education	
College degree and below	21
Master's degree	26
Doctoral degree	22
Unspecified	1
Years of Internet use	1
Less than 1 year	0
1-3 years	2
4-6 years	66
7 years or more	1
Unspecified	
Daily internet use	5
Less than 1 hour	28
1-2 hours	22
3-4 hours	10
5-6 hours	4
7 hours or more	1
Unspecified	

Data Analysis and Results

We apply the Partial Least Squares (PLS) method to test the research model (Chin 1998), and use SmartPLS (Ringle, Wende and Will 2005) to analyze the data. SmartPLS tests the psychometric properties of the variables directly, and performs the bootstrapping process to

examine the significance of the path coefficients. Table 2 reports the reliabilities of the constructs (i.e., Cronbach's alpha), their Composite Reliabilities (CR), and the Average Variances Extracted (AVE). It also shows the correlations between the constructs and compares to the square roots of the AVE (on the diagonal of the correlation matrix). The results show sufficient reliabilities of the constructs. The square roots of the AVE are all greater than the correlations between the constructs. Although the AVE of the privacy concerns construct (.45) is relatively low, it may be caused by the use of reversed wording (two out of six items), and it is close to the recommended threshold value of .5 (Chin 1998). Therefore, we conclude that the constructs exhibit acceptable convergent validity. The discriminant validity is examined by the factors loadings, and all exceed the cutoff value of .50 (ranging from .60 to .94) with no significant cross-loadings (greater than the loadings on the anticipated construct) observed, showing sufficient discriminant validity.

Table 2. Psychometric properties and correlation matrix of the constructs

Constructs	Cronbach's α	CR	AVE	1.	2.	3.	4.	5.
1. Disposition	.91	.94	.84	.92 ^a				
2. Reputation	.89	.92	.75	.03 ^b	.87 ^a			
3. Familiarity	.93	.95	.83	.06 ^b	.53 ^b	.91 ^a		
4. Privacy concerns	.76	.83	.45	.23 ^b	-.44 ^b	-.37 ^b	.67 ^a	
5. Intention	.93	.95	.83	-.19 ^b	.55 ^b	.59 ^b	-.63 ^b	.91 ^a

Note: CR – Composite Reliability; AVE – Average Variance Extracted; a – square roots of the AVE; b – correlations between the constructs.

As moderating effects exist in the research model, we follow the common approach to testing the main effects first, and then the main effects plus the moderating effects. Bootstrapping procedures with 200 resamples were performed to test both, and the results are reported in Table 3. The results show that the moderating effects, although in their expected directions, did not reach significance, rejecting H4 and H5. The main effects model show support of the other hypotheses (i.e., H1, H2, H3, and H6), indicating that privacy disposition, website reputation and website familiarity are all direct antecedents of privacy concerns, and privacy concerns have a negative impact on behavioral intention to use a website.

Due to the concerns of common method bias, we analyzed the data using Harman's single-factor method (Podsakoff et al. 2003). An exploratory factor analysis on all the variables

without any rotations using SAS software package yielded a five-factor structure with the first factor explaining 49.5% variances in the data. Although this factor explain a large portion of the variances, it does not exceeding the 50% cutoff level, indicating the lack of critical common method bias.

Table 3. Test of the hypotheses

Variables	Main effects	Main effects + Moderating effects
DV: Privacy concerns		
IV:		
Disposition to privacy (H1)	$\beta = .25$ (t = 2.42 [*])	$\beta = .52$ (t = 2.10 [*])
Website reputation (H2)	$\beta = -.37$ (t = 3.02 ^{**})	$\beta = -.21$ (t = 1.00 ^{ns})
Website familiarity (H3)	$\beta = -.20$ (t = 2.21 [*])	$\beta = .10$ (t = .38 ^{ns})
Disposition * Reputation (H4)	N/A	$\beta = -.19$ (t = .52 ^{ns})
Disposition * Familiarity (H5)	N/A	$\beta = -.36$ (t = 1.22 ^{ns})
R ² of privacy concerns	R ² = .28	R ² = .30
DV: Behavioral intentions		
IV: Privacy concerns (H6)	$\beta = -.63$ (t = 10.31 ^{**})	$\beta = -.63$ (t = 12.37 ^{**})
R ² of intentions	R ² = .40	R ² = .40

Note: * - significant at .05 level; ** - significant at .01 level; ns – non-significant.

Discussion and Conclusions

In this study, we tested the direct impact of a person’s privacy disposition, the reputation of a website, and the personal familiarity with a website on the person’s privacy concerns about the website and the corresponding behavioral intention to use the website for information inquiry. The results show that all the three antecedents had significant impacts on website-specific privacy concerns, although the anticipated interactions among the antecedents were not supported by the data. Interestingly, the path coefficient between privacy concerns and behavioral intention is within the normal range of the estimates in literature (Li 2011).

This study has a number of implications for research and practice. For research, it extends the existing literature by incorporating privacy disposition in a study on website-specific privacy concerns and testing its direct impact on the latter. Such a study barely exists in literature. The findings therefore provide the first evidence of the direct relationship between the two. Secondly, the use of multiple websites in the empirical study enhances the generalizability of the research model. Not many studies on website-specific privacy concerns have employed multiple websites in the same study, except for a few (Pavlou et al. 2007; Xu et al. 2008). The results therefore

provide strong evidence to the research model in terms of various e-commerce contexts. Third, the insignificance of the moderating effects suggests that both the individual-level factor and the organization-level factors are direct antecedents of website-specific privacy concerns, suggesting that researcher should be cautious in examining the interaction effects between the antecedents in the further.

For practice, the study illustrates the significant roles of privacy disposition in the formation of website-specific privacy concerns. It implies that for online firms to effectively address privacy concerns, they need to better understand their customers, especially their privacy disposition. Although the moderating effects of reputation and familiarity do not exist, other organizational mechanisms such as monetary incentives (Hann et al. 2007) may be considered to alter customers' privacy attitudes.

In sum, studies on information privacy regarding specific websites should receive more attentions from the academia, and the focus could be put on the understanding of the formation of website-specific privacy concerns and the investigation of corresponding antecedents, including both individual factors and organizational factors.

References

- Ajzen, I., and Fishbein, M. 1980. *Understanding Attitudes and Predicting Social Behavior*. Englewood-Cliffs, NJ: Prentice-Hall.
- Andrade, E.B., Kaltcheva, V., and Weitz, B. 2002. "Self-Disclosure on the Web: The Impact of Privacy Policy, Reward, and Company Reputation," *Advances in Consumer Research* (29:1), pp 350-353.
- Awad, N.F., and Krishnan, M.S. 2006. "The Personalization Privacy Paradox: An Empirical Evaluation of Information Transparency and the Willingness to Be Profiled Online for Personalization," *MIS Quarterly* (30:1), pp 13-28.
- Bansal, G., Zahedi, F.M., and Gefen, D. 2008. "The Moderating Influence of Privacy Concern on the Efficacy of Privacy Assurance Mechanisms for Building Trust: A Multiple-Context Investigation," *Proceedings of the Twenty Ninth International Conference on Information Systems*).
- Bansal, G., Zahedi, F.M., and Gefen, D. 2010. "The Impact of Personal Dispositions on Information Sensitivity, Privacy Concern and Trust in Disclosing Health Information Online," *Decision Support Systems* (49:2), pp 138-150.
- Belanger, F., and Crossler, R.E. 2011. "Privacy in the Digital Age: A Review of Information Privacy Research in Information Systems," *MIS Quarterly* (35:4), pp 1017-1041.
- Bellman, S., Johnson, E., Kobrin, S., and Lohse, G. 2004. "International Differences in Information Privacy Concerns: A Global Survey of Consumers," *Information Society* (20:5), pp 313-324.
- Buss, A. 2001. *Psychological Dimensions of the Self*. Thousand Oaks, CA: Sage.

- Casalo, L.V., Flavian, C., and Miguel, G. 2007. "The Role of Security, Privacy, Usability and Reputation in the Development of Online Banking," *Online Information Review* (31:5), pp 583-603.
- Chai, S., Bagchi-Sen, S., Morrell, C., Rao, H.R., and Upadhyaya, S.J. 2009. "Internet and Online Information Privacy: An Exploratory Study of Preteens and Early Teens," *IEEE Transactions on Professional Communication* (52:2), pp 167-182.
- Chin, W.W. 1998. "Issues and Opinion on Structural Equation Modeling," *Management Information Systems Quarterly* (22:1), pp 7-16.
- Eastlick, M.A., Lotz, S.L., and Warrington, P. 2006. "Understanding Online B-to-C Relationships: An Integrated Model of Privacy Concerns, Trust, and Commitment," *Journal of Business Research* (59:8), pp 877-886.
- Gefen, D. 2000. "E-Commerce: The Role of Familiarity and Trust," *Omega* (28), pp 725-737.
- Gefen, D., and Straub, D. 2000. "The Relative Importance of Perceived Ease of Use in Is Adoption: A Study of E-Commerce Adoption," *Journal of the Association for Information Systems* (1:8), pp 1-28.
- Halmos, P. 1953. *Solitude and Privacy: A Study of Social Isolation, Its Causes and Therapy*. New York: Philosophical Library.
- Hann, I., Hui, K., Lee, S.T., and Png, I.P.L. 2007. "Overcoming Online Information Privacy Concerns: An Information-Processing Theory Approach," *Journal of Management Information Systems* (24:2), pp 13-42.
- Hoffman, D.L., Novak, T.P., and Peralta, M.A. 1999. "Information Privacy in the Marketplace: Implications for the Commercial Uses of Anonymity on the Web," *Information Society* (15:2), pp 129-139.
- Hui, K.-L., Teo, H.H., and Lee, S.-Y.T. 2007. "The Value of Privacy Assurance: An Exploratory Field Experiment," *MIS Quarterly* (31:1), pp 19-33.
- Kim, D.J., Steinfield, C., and Lai, Y.-J. 2008. "Revisiting the Role of Web Assurance Seals in Business-to-Consumer Electronic Commerce," *Decision Support Systems* (44:4), pp 1000-1015.
- Klopper, P., and Rubenstein, D. 1977. "The Concept of Privacy and Its Biological Basis," *Journal of Social Issues* (33), pp 52-65.
- Laufer, R.S., and Wolfe, M. 1977. "Privacy as a Concept and a Social Issue: A Multidimensional Development Theory," *Journal of Social Issues* (33:3), pp 23-42.
- Lee, C.H., and Cranage, D.A. In press. "Personalisation-Privacy Paradox: The Effects of Personalisation and Privacy Assurance on Customer Responses to Travel Web Sites," *Tourism Management*.
- Li, Y. 2011. "Empirical Studies on Online Information Privacy Concerns: Literature Review and an Integrative Framework," *Communications of the Association for Information Systems* (28:28), pp 453-496.
- Lwin, M., Wirtz, J., and Williams, J.D. 2007. "Consumer Online Privacy Concerns and Responses: A Power-Responsibility Equilibrium Perspective," *Journal of the Academy of Marketing Science* (35:4), Winter2007, pp 572-585.
- Milberg, S.J., Smith, H.J., and Burke, S.J. 2000. "Information Privacy: Corporate Management and National Regulation," *Organization Science* (11:1), pp 35-57.
- Pavlou, P.A., Liang, H., and Xue, Y. 2007. "Understanding and Mitigating Uncertainty in Online Exchange Relationships: A Principal-Agent Perspective," *MIS Quarterly* (31:1), pp 105-136.

- Podsakoff, P.M., MacKenzie, S.B., Lee, J.-Y., and Podsakoff, N.P. 2003. "Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies," *Journal of Applied Psychology* (88:5), pp 879–903.
- Rensel, A.D., Abbas, J.M., and Rao, H.R. 2006. "Private Transactions in Public Places: An Exploration of the Impact of the Computer Environment on Public Transactional Web Site Use," *Journal of the Association for Information Systems* (7:1), pp 19-51.
- Riahi-Belkaoui, A., and Pavlik, E. 1992. *Accounting for Corporate Reputation*. Westport, CT: Quorum Books.
- Ringle, C.M., Wende, S., and Will, S. 2005. *Smartpls 2.0 (M3) Beta*. Hamburg: <http://www.smartpls.de>.
- Smith, H.J., Dinev, T., and Xu, H. 2011. "Information Privacy Research: An Interdisciplinary Review," *MIS Quarterly* (35:4), pp 989-1015.
- Stafford, T.F., and Urbaczewski, A. 2004. "Spyware: The Ghost in the Machine," *Communications of the Association for Information Systems* (14:15), pp 291-306.
- Van Slyke, C., Shim, J.T., Johnson, R., and Jiang, J. 2006. "Concern for Information Privacy and Online Consumer Purchasing," *Journal of the Association for Information Systems* (7:6), pp 415-443.
- Xu, H., Dinev, T., Smith, H.J., and Hart, P. 2008. "Examining the Formation of Individual's Privacy Concerns: Toward an Integrative View," *Proceedings of the Twenty Ninth International Conference on Information Systems*.
- Yao, M.Z., Rice, R.E., and Wallis, K. 2007. "Predicting User Concerns About Online Privacy," *Journal of the American Society for Information Science & Technology* (58:5), pp 710-722.
- Zviran, M. 2008. "User's Perspectives on Privacy in Web-Based Applications," *Journal of Computer Information Systems* (48:4), pp 97-105.

FRAUD TRIANGLE ANALYTICS: AN AUDITING TECHNIQUE FOR
UNSTRUCTURED ENTERPRISE DATA

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ABSTRACT

Current economic and employment (unemployment?) conditions have contributed to an environment that is very conducive to fraudulent activity. Many companies are being asked to do “more with less”---less marketing, less R&D, less internal auditing staff and so on. These circumstances also contribute to an employee’s ability to rationalize his/her behavior---even if that employee realizes that the behavior he/she is about to engage in is unethical, illegal or fraudulent. Motivation/Pressure plus Opportunity plus Rationalization = Dr. Donald Cressey’s “Fraud Triangle”. “Fraud Triangle Analytics” (FTA) involves data-mining key employee’s electronic communications in an effort to reveal key words and phrases that may identify planned or ongoing fraudulent activity. FTA presents a new approach to proactive, rather than “after the fact (forensic) auditing for fraudulent behavior. This paper discusses the history of the “Fraud Triangle”, and auditing of both structured and unstructured enterprise data. A brief comparison of the two auditing areas is also presented.

INTRODUCTION

Current economic and employment (unemployment?) conditions have contributed to an environment that is very conducive to fraudulent activity, whether it be asset misappropriation (embezzlement), corruption (using one's position to benefit one's self in violation of one's fiduciary duty to his/her employer), or fraudulent financial reporting. Financial pressures on individuals and/or pressure for a firm to hit specific numerical targets, in conjunction with cutbacks that have weakened internal control, have created both motivation and opportunity to engage in unethical behavior. When combined with increased workloads and lower bonuses and/or compensation, some employees may consider unethical behavior.

Many companies are being asked to do "more with less"---less marketing, less R&D, less internal auditing staff and so on. These circumstances also contribute to an employee's ability to rationalize his/her behavior---even if that employee realizes that the behavior he/she is about to engage in is unethical, illegal or fraudulent. Motivation/Pressure plus Opportunity plus Rationalization = Dr. Donald Cressey's "Fraud Triangle", which describes the conditions that, if they exist, encourage and enable fraud. (1) Albrecht, *et al*, (2) made an interesting comparison to the "fire triangle" where fire exists if you have fuel, oxygen & heat. In both triangles, where all three conditions exist simultaneously, the outcome is nearly inevitable.

The Association of Certified Fraud Examiners (ACFE)(3) estimates that 5% of business revenues are lost to fraud, and that fraudulent behavior lasts a median of 18 months before being discovered. Applying this percentage to the global economy, fraud costs about 2.9 *trillion* dollars per year! Furthermore, most discoveries occur more by luck than design. Fully 48.5% of fraudulent activity is discovered by either employee tips or by accident.

"Fraud Triangle Analytics" presents a new approach to proactive (rather than forensic) auditing for fraudulent behavior.

ANALYZING STRUCTURED ENTERPRISE DATA

Torpey, Walden and Sherrod (4) report that “Eighty percent of ‘enterprise data’ (for example, company documents, presentations, Web, e-mail, etc) is unstructured in nature...”. However, auditing software, such as ACL or spreadsheet analysis, focuses almost exclusively on analyzing structured data (journal entries, spreadsheets, schedules etc.)

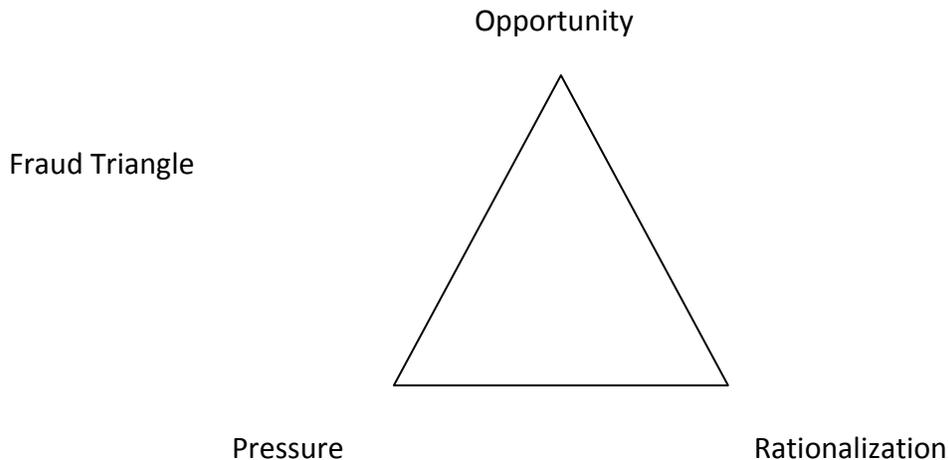
Evaluating, analyzing and questioning works fairly well for discovering fraud, especially if the auditor’s suspicions have already been raised regarding a specific transaction or potential violator. Unfortunately, auditing an enterprise’s structured data almost always entails a reactive approach, rather than a proactive approach. Per Crumbley, *et al*, (5) many standards and articles have been published detailing what an auditor should be aware of and look for regarding the existence of fraud.

But should the auditing process concentrate primarily on databases, transactions, accounting systems, reporting and presentation criteria, and representational faithfulness? This is an entirely reactive “after the fact” approach. This approach ignores the value of proactive methods for preventing fraud.

Fraud Triangle Analytics (FTA) is a process where auditors attempt to discover plans for fraud---before the fraud actually takes place (or at least discover and halt the activity very early)---rather than finally uncover the fraud a year or two (or even longer) after it begins.

DR. DONALD CRESSEY'S "FRAUD TRIANGLE": A BRIEF HISTORY

Before continuing, a brief review of Cressey's "Fraud Triangle" may be helpful.



Cressey's research on white-collar criminals convinced him that if all three factors were present, then fraudulent behavior was nearly inevitable. (1) Fraud could also occur if only two or even one factor existed, but was not as likely to occur.

The Fraud Triangle has been modified and enhanced over the ensuing four decades. Cressey's research was concentrated on individuals, and he identified an "...unshareable financial pressure". This component has been expanded to include management's incentives to commit fraud ("Hit the numbers!").

Albrecht, *et al*, (6) introduced their "Fraud Scale" and stated that identifying perpetrators of fraud was difficult and that substituting "Integrity" for "Rationalization" was helpful when trying to anticipate fraud. Rezaee and Riley (7) expanded on the topic of deterrence, agreeing that "Integrity" was critical for reliance upon personal decision making and responsibility.

Earlier, Rezaee (8) postulated the "3-C" model for explaining how the Fraud Triangle can be used to predict a corporation's unethical behavior. "Conditions"---a business downturn increases the likelihood of fraud. "Corporate structure"---irresponsible or ineffective corporate governance also increases the likelihood of fraud. "Choice"---between legal/ethical and illegal/unethical behavior.

Wolfe and Hermanson (9) proposed the "Fraud Diamond" where a fourth side was added. This new factor is "Capability" and addresses the reality that some people won't commit fraud

even if all three original factors are strongly present. An individual's personal traits are the deciding factor. They play a major role in whether or not the person will actually go ahead and commit a fraudulent act.

Kranacher, *et al*, (10) discussed their "**MICE**" concept for elaborating on motivation (pressure). "**M**oney, **I**deology, **C**oercion, and **E**go/Entitlement" are the primary motivating factors for committing fraud. They also illustrated a conjoined triangle (yes---it looks like a diamond) for fraud factors. The original fraud triangle is retained. Now, however, it shares a side ("Opportunity") with a new triangle. The two new sides on this attached triangle are "Criminal Mindset" and "Arrogance". Essentially, the authors distinguish between those individuals whom they deem "Accidental Fraudsters" and those that they deem to be "Predators". This is an interesting theory in that it makes a distinction between those hapless souls who are caught up in fraud vs. those "career criminal" types who are always on the lookout for easy prey.

ANALYZING UNSTRUCTURED ENTERPRISE DATA: USING FRAUD TRIANGLE ANALYTICS TO MINE ELECTRONIC COMMUNICATIONS

The “unstructured data” that FTA is most concerned with includes emails and text (“instant”) messages---especially those communications that are saved on a firm’s central server. By accessing the server, auditors avoid the complicating factors and logistics attached to collecting electronic devices from all of those employees that are in sensitive and/or critical positions within a firm (i.e. those employees most likely to be investigated).

Although standard internal auditing procedures for structured data discovered almost 14% of occupational fraud (3), that is a woefully small percentage when one considers internal auditing’s primary focus. We can further criticize this lackluster performance when we point-out that all of these frauds are discovered *after* the perpetrators have been engaging in them for awhile!

Torpey, *et al*, (11) have attempted to link prior behavior with subsequent fraudulent acts. Their research indicates that certain language contained in email communications can signal information about the fraud factors that may be present for specific individuals within a company. They refer to certain terms and phrases as “keywords”, and they have accumulated, organized and tested a proprietary library list exceeding 3,000 keywords. These keywords help auditors analyze the language in employee’s email communications.

Keyword examples for “Pressure” include “Meet the deadline”, “Make sales quota”, and “Under the gun”. For “Opportunity”, “Override”, “Write-off” and “Recognize revenue” represent red flags. Finally, “I think it’s OK”, “Sounds reasonable”, and “I deserve...” are suspicious key words regarding the “Rationalization” element. Add 3,000 more keywords and then let the software analyze and report on the content of literally millions of emails. We all know how quick and simple it is to apply the “Search” function to a MSWord document. FTA software does much the same thing, only on a much grander scale!

Each keyword is associated with specific element in the fraud triangle. Each person whose emails are analyzed (unbeknownst to him or her---be aware of the jurisdiction that you are operating in and be careful not to break any laws or regulations related to privacy and/or warrantless searches) receives an individual score for each fraud triangle element.

FTA attempts to answer questions. *Who* is involved? *What* are they up to? *When* did they start? The researchers started with fraudulent situations where they already knew who the perpetrators were, the time line, and the outcome. Corruption/bribery and fraudulent financial reporting problems had already been discovered via standard auditing methods. The

researchers ran the guilty executives emails through the FTA software and made an interesting discovery. For *every* executive involved, there was a sharp spike in the frequency of keywords in their emails prior to and during the fraudulent behavior! (11) They also submitted the emails from many more executives from the same company and for the same period. Emails from executives not entangled in the fraud did not spike regarding keywords.

There are some basic steps to implementing FTA. After conducting a basic fraud-risk assessment, identify any major risks and key employees in those high-risk operations. With IT's help, copy the key employee's emails & submit them to the appropriate analysis search engine. Depending upon who you use, you may also have to submit a keyword library. You will be rewarded with a chronological keyword analysis, which you can then use to "zero-in" on specific individuals. Remember to follow any applicable laws and to also apply the rules of due process.

CONCLUSIONS

Fraud Triangle Analytics can save more than just dollars lost to embezzlement or the necessity to restate financial statements. Investigative and litigation expenses will be minimized if fraud can be discovered and stopped in its earliest stages (preferably during the planning stage). Painstaking and time-consuming document-by-document evaluations are no longer necessary to try and pinpoint high-risk areas/individuals.

The big advantage for FTA is that the procedures can be applied proactively. No matter how strong of a case you can build after discovering fraud, it is always better to prevent the fraud from occurring in the first place.

FTA, when contracted out, currently costs about \$1,500 per gigabyte of information analyzed. That price will decrease as more and more competitors enter the market and begin offering FTA services. FTA is still new---but more and more firms are discovering how efficient and effective it can be.

Per Torpey, *et al*, (12)FTA, though still in its infancy, is a powerful weapon against fraud. They mention seven observations:

1. The Fraud Triangle still works
2. Use FTA for high-risk operations
3. Know the regulations and laws
4. Anti-bribery and corruption keywords are particularly effective
5. FTA works well for early assessment of fraud
6. FTA complements internal auditing tests of structured data
7. FTA can be customized to a company, for an industry, and for a certain region or country

As companies try to cut costs without cutting internal control effectiveness, they will discover that FTA is an efficient way to economically achieve their goals.

SUGGESTIONS FOR FURTHER RESEARCH

Dorminey, et al, (13) suggest that since “Pressure” and “Rationalization” cannot be observed, the fraud triangle is inadequate for deterring and detecting fraud. Some fraudster’s behavior is very inconsistent with the elements described in Cressey’s Fraud Triangle. How important is “Capability”? And does adding this element, creating a “Fraud Diamond”, essentially make the old model obsolete?

Recently, we have seen many pathological fraudsters---white-collar sociopaths who also don’t neatly fit the old model. How will fraud detection need to adapt in order to maintain its credibility?

These are all valid questions. As FTA methods and software mature, it will be interesting to see if these evaluation weapons can keep pace.

REFERENCES

- (1) Cressey, Dr. 1973 *Other People's Money-A Study in the Social Psychology of Embezzlement* Paterson Smith Publishing Company NJ
- (2) Albrecht, Wernz & Williams 1995 *Fraud: Bringing Light to the Dark Side of Business* XXXX
- (3) ACFE 2010 *Report to the Nations on Occupational Fraud and Abuse* Austin, TX
- (4) Torpey, D., Walden, V., and Sherrod, M. 2009 Exposing the Iceberg Part 1 Fraud Magazine May/June
- (5) Crumbley, Heitger & Smith 2003 *Forensic and Investigative Accounting* Chicago, IL CCH Publishing, Inc. AICPA SAS #82 Consideration of Fraud in a Financial Statement Audit (Superseded by SAS 99)
- (6) Albrecht, Howe & Romney 1984 *Deterring Fraud: The Internal Auditor's Perspective* IIA Research Foundation
- (7) Razaee and Riley 2010 *Financial Statement Fraud: Prevention and Detection* Wiley & Sons
- (8) Razaee 2002 *Financial Statement Fraud* John Wiley and Sons
- (9) Wolfe and Hermanson 2004 The Fraud Diamond: Considering the Four Elements of Fraud
The CPA Journal December
- (10) Kranacher, Riley and Wells 2010 *Forensic Accounting and Fraud Examination* Wiley & Sons
- (11) Torpey, D., Walden, V., and Sherrod, M. 2009 Exposing the Iceberg Part 2 Fraud Magazine July/August
- (12) Torpey, D., Walden, V., and Sherrod, M. 2010 XXXXXXXX Fraud Magazine May/June
- (13) Dorminey, J., Fleming, A., Kranacher, M., & Riley, R. 2010 Beyond the Fraud Triangle The CPA Journal July

Price Elasticities and Supply Flexibilities of Fresh Produce, and How They Affect “Buy-Local”

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Abstract

The specialty crop market is being bolstered by positive media press, from the new MyPlate dietary guidelines, and the “buy local” movement. Fresh fruit and vegetable retailers see a win-win for their produce departments from participating in the buy local phenomenon – increased revenues and profits from loyal customers seeking and buying produce from markets that support the local growers, and lower costs of sourcing the produce due to reduced transportation and storage costs as well as lower prices paid (price ratios the increased local supply of fresh produce) to growers, as experienced and observed in demand or price elasticities and supply or price flexibilities, respectively. Are these marketing tools and measurements quantifiable at the local level and what are the implications of the calculations for growers, marketers and consumers? Price and quantity data at the retail and grower levels were collected for the 2009, 2010 and 2011 marketing seasons for seven fresh specialty crops produced and marketed in Georgia. Demand elasticities at retail-level and supply flexibilities at farm-level were calculated for each of the fruit or vegetable crops, with the results evaluated as to pricing implications for grower, marketer, and consumer.

The “Buy-Local” movement.

The specialty crop market for fresh fruits and vegetables is being bolstered by positive media press, from the new ‘MyPlate’ dietary guidelines which replace the old food pyramid with a plate that is comprised of half fruits and vegetables, and the “buy local” movement. The “Buy Local” phenomenon has gained momentum with consumers seeking local produce at many retail venues – local direct markets (i.e., pick-your-own markets, grower roadside stands, community-supported-agriculture (CSA), community- or county- or state-sponsored farmers’ markets) and local grocery stores and supermarkets.

Retailers who embrace the buy-local movement have found that highlighting their relationships with local growers and producers of fresh fruits and vegetables can build customer loyalty, which increases the sales and profits in their produce departments. Consumers also are looking for more local produce, especially at local farmers’ markets which have experienced a 17-percent one-year increase in numbers nationwide to 7,175 in 2011, according to USDA.

The ‘buy-local’ attention has spurred demand for locally-grown specialty produce from nearby sources so that retailers can promote locally grown and consumers can buy locally grown fruits and vegetables. A question remains as to how “local” should be defined. Growers of the produce will argue that an hour’s drive or the same county as the retail venue is “local,” while state departments’ of agriculture contend that produce crops grown and harvested in the same state as they are marketed are “local” (as this supports their statewide promotions, like “Georgia Grown). Retail supermarket chains having extensive transportation and distribution networks extend the “local” boundaries to a ten – twelve hour or 500-mile radius drive. In

Texas, Rio Grande citrus is marketed as local produce in Amarillo – a 700 mile drive north of South Texas; in Atlanta, Georgia, Indian River citrus from South Florida could be promoted as local – a ten-hour drive. In either case, the citrus is not indigenous to the specified market, but qualifies as local, depending on who is defining “local.”

Regardless of the definition of local, the buy-local phenomenon persists. And with the movement comes opportunities for growers of specialty crops to expand production of a variety of fresh produce, often with the encouragement of retail produce market or department managers. Buy local is a double-edged sword, with the marketers of fresh fruits and vegetables viewing the price elasticities as well as the supply flexibilities for local produce with economic attentiveness.

Demand elasticity, supply elasticity and the price trap.

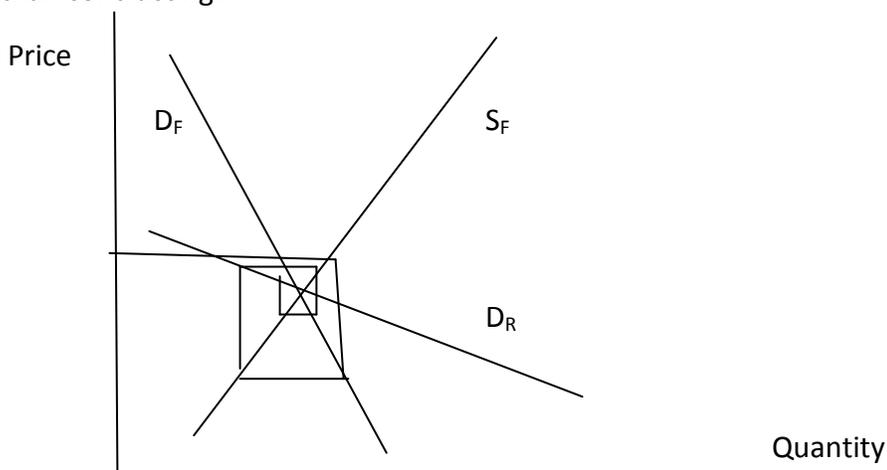
Demand or price elasticity is a measurement of the consumers’ purchase behavior (quantity purchased) when a perceived price change occurs. For a normal good and a rational consumer, when a price increase is observed, the purchase is of a lesser quantity, and vice-versa. Depending on the magnitude of the price change, the purchase quantity will also vary; however, each fruit or vegetable price change elicits a quantifiable change in quantity purchased. In formula, demand elasticity is calculated as the percentage change in quantity purchased or demanded divided by the percentage change in price, $\Sigma_D = \% \Delta Q \div \% \Delta P$. Demand elasticity is measured at the retail level.

Supply or price flexibility is a measurement of the price change observed at the grower level when supply or production quantities change. Price rations supply with price decreasing when an abundant supply exists; after all, if you don’t sell it, you smell it, so price must clear the inventory. With a supply shortage, price is raised to ration the limited supply. The formula for supply elasticity is the percentage change in price divided by the percentage change in supply, $\Sigma_S = \% \Delta P \div \% \Delta S$. Supply elasticity is measured at the grower level. In theory, the price elasticities and the price flexibilities should be approximate reciprocals of each other, and both carry negative signs reflecting the inverse relationship between price and quantity.

The marketer is the intermediary between the grower and the consumer. Consequently, as growers are enticed into producing more and more specialty produce, supply increases; as supply increases, prices paid by the marketer to the grower decline in order to clear the harvested supply. At the other end of the marketing channel, the marketer monitors consumers’ reactions to price changes via the quantities the consumers purchase. At retail, the goal of price changes is to increase the produce department’s revenues (price multiplied by quantity), so knowing the typical purchase response to an observed price change gives guidance to the retailer as to the magnitude of a price change to implement and the expected sales response in sales dollars (revenue). Hence, the double-edged sword of buying local is observed – the demand elasticity at retail and the supply flexibility at the farm.

The interaction of the supply and demand response to price changes can be validated with the “cobweb theory” for the expansion and contraction of the production of fresh produce. In response to an increase in demand for local produce (the buy local concept), the

supply at the farm gate increases, and the price paid by the buyer falls at the farm. Growers react to the falling prices and limit future production (decreasing the farm level supply at harvest) with no apparent change in demand at retail. With the decrease in supply at the farm level, the prices at both the farm gate and the retail outlet increase; with the increase in price, the incentive to increase production (and hence supply) occurs. Over time, the cobweb is woven. Among marketers, this is often called the “price trap,” because of the movement toward a stable, unchanging price. If a shock occurs, such as a hurricane or hail storm or immigration legislation or food recall, either of the demand curves or the supply curve may alter slope or elasticity resulting in a “new” cobweb to be developed – perhaps expanding rather than contracting.



Methodology and results.

Price and quantity activity was tracked within the Georgia marketing season at both the farm level (prices paid for specified quantities, paying particular attention to sequential changes in supply and the resulting prices paid) and the retail level (quantities purchased by consumers resulting from observed or perceived price changes) for five fruit and eleven vegetable specialty crops. The retail venues monitored for calculating demand elasticities included three grocery stores, two state-sponsored farmers’ markets and three community- or county-sponsored farmers’ markets, and four family-owned farm site markets, whereby price and per customer purchase data were acquired. Nine growing operations that each produced at least three of the sixteen produce crops cooperated in providing production (supply) data and prices received data for supply flexibility computations. The primary data was supplemented with secondary data provided by the individual retailer vendors and buyers.

The following table summarizes the observations taken from primary data and combined with any appropriate secondary data to arrive at the price or demand elasticity at the retail level and the price or supply flexibility at the farm level, if determinable. Interpreting the first entry in the table for fresh market apples, if the price of locally grown apples were to decrease 10-percent (from \$0.50/lb to \$0.45/lb, as an example), the quantity purchased would likely increase 22.6-percent. Evaluating the second entry, if the supply of locally grown apples were to increase 10-percent, the price paid would generally decrease 7.3-percent [price and quantity are in opposite directions, hence the minus sign].

<u>Item</u>	<u>Measurement</u>	<u>Demand Elasticity</u>	<u>Supply Flexibility</u>
<u>Georgia Fruits:</u>			
Apples, fresh market	Price	- 2.26	
Apples, fresh market	Production		- 0.73
Apples, in-season, fresh	Price	- 2.34	
Apples, in-season, fresh	Production		- 0.85
Apples, in-season, fresh	Consumption	- 1.80	
Apples, Georgia u-pick	Price	- 5.71	
Blueberries, u-pick	Price	-2.84	
Grapes, in-season	Price	- 1.37	
Peaches, in-season, fresh	Production		- 0.46
Peaches, in-season, fresh	Price	- 1.19	
Strawberries, u-pick	Price	- 3.01	
Strawberries, u-pick	Production		- 0.89
<u>Georgia Vegetables:</u>			
Asparagus, fresh cut	Consumption	- 0.15	
Green Beans, fresh, cut	Consumption	- 0.18	
Cabbage, head, in-season	Price	- 0.45	
Carrots, fresh, whole	Consumption	- 0.76	
Corn, sweet, ear	Price	-2.00	
Cucumbers, whole, slicer	Consumption	- 1.40	
Onions, Vidalia	Consumption	- 1.74	
Peas, shelled, fresh	Consumption	- 0.68	
Peppers, bell	Production		- 1.03
Tomatoes, whole	Consumption	- 1.80	
Watermelons, each	Production		- 0.93

Conclusions and implications.

Application of the quantified measurements of price flexibility can be used to a marketer's advantage if a desired contribution margin is to be maintained. Contribution is selling price minus variable costs, with contribution divided by selling price to arrive at the contribution margin percentage. In essence, the selling price per unit is equated to 100-percent and the desired contribution margin might be 30-percent, leaving the variable costs to be 70-percent of the selling price. Knowing what the purchase price of a particular produce is to be (this becomes the variable cost in the contribution margin format) and the desired margin to be maintained, a new selling price can be determined. For instance, if a produce buyer for a retail market buys bell peppers at 10-cents each and sells them for 25-cents each, the contribution of 15-cents is a contribution margin of 60-percent. If, due to a reduction in farm level supply, the price to be paid by the marketer rises to 15-cents each (the new variable cost from the price flexibility computation) and the marketer desires to maintain the 60-percent contribution margin, the new selling price should become 37½¢ each. Demand elasticity and supply flexibility combined with the cost-volume-profit or contribution margin analysis tool provide mechanisms for answering a lot of "what-if...?" questions by the retail marketer.

Considering the table of values for strawberries (above), marketers understand that if the demand elasticity is elastic (elasticity > - 1.0), to increase revenue the marketer must lower price. If the produce marketer has been selling fresh strawberries at \$3.49/quart and decides to lower the price 10% to increase revenues, with a strawberry price elasticity of - 3.01, lowering the price from \$3.49 to \$3.14/quart (a 10% decrease) will generate 30% more quarts sold. If the marketer has been buying strawberries from a local grower for \$2.00/quart and selling them for \$3.49/quart, this results in \$1.49 contribution (a 44% contribution margin). Concerned that the marketer will have enough strawberries to meet the increased demand resulting from lowering the retail price, the marketer encourages local strawberry growers to raise the total production by 20%. The supply elasticity of - 0.89 suggests that an increase in strawberry output by 20% will result in produce buyers paying 18% less in price to meet the expected rise in demand. Instead of the earlier \$2.00/quart price the marketer was paying the grower, a lower price to be paid of \$1.64/quart is anticipated (price rations supply). With the new retail price of \$3.14 and the new price paid to the grower of \$1.64, the marketer realizes a new contribution of \$1.50/quart, which is a 47% contribution margin. The marketer has been able to lower the retail price to the consumer while paying less for the strawberries from the grower and still increase the marketing margins and the revenues. The arithmetic of pricing favors the intermediary (the marketer).

For the grower, realizing that unless his/her products are highly differentiable from other growers raising the same fruit or vegetable, as the aggregate supply increases due to the demand encouragement of the buy local movement, the price received from the produce buyer (the retail marketer) will decline by the calculated supply flexibility. What appeared to be a "good thing" initially for the grower in terms of sales revenues from producing and harvesting a specialty crop may be dampened by the reduced price received from the produce buyer if the total or aggregate production supply increases.

Selected References.

Best, R.J. 2009. *Market-Based Management: Strategies for Growing Customer Value and Profitability*. Pearson Prentice Hall

Purcell, J.C., J.C. Elrod and Robert Rauniker. *Consumption and Expenditure Analysis for Fruits and Vegetables in Atlanta, Georgia*. USDA/ERS.

Western Extension Marketing Committee's Task Force on Price and Demand Analysis. *A Handbook on the Elasticity of Demand for Agricultural Products in the United States*. USDA/AMS.

GROWTH AND CONVERGENCE IN VIRGINIA: AN UPDATE FROM THE 2010 CENSUS

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ABSTRACT

This paper applies the empirical methodology for testing for convergence of incomes across all the counties and independent cities in Virginia (Virginia is unusual among states in that some cities are not considered part of the surrounding counties). Decennial data from the Bureau of the Census on real personal income per capita for all the geographic areas within the Commonwealth of Virginia are used to test for two types of income convergences over 1959-2009 periods. The results indicate that both beta and sigma measures of convergence occurred across the regions in Virginia for the full period, but not during the decade of the 1980s nor that of the 2000s.

INTRODUCTION

It is an empirical fact that there are some regions, (here measured by counties or cities), that are poorer than others in the Commonwealth of Virginia. It is also clear that different counties and cities experience different rates of economic growth. These facts lead to at least two important questions. First, are regions that are initially poorer than others somehow destined to remain poorer than richer areas? Or, are initial poorer counties and cities likely to catch up with richer ones in their state? A second related question that we are interested in is whether the degree of income inequality across counties decreases or increases over time—that is, do we find the gaps in per capita incomes between richer and poorer counties in the same state increasing, remaining the same, or diminishing over time? In this paper, we attempt to provide answers for these two questions by analyzing growth rates of counties and cities of the Commonwealth over a 50 year period.

LITERATURE REVIEW

The neoclassical models introduced by Ramsey [6], Solow [8], and Swan [9] provide the basis for empirical estimations that frequently confirm the convergence in per capita incomes predicted by the models. The type of convergence that the Solow-Swan neoclassical models suggest is conditional beta (β) convergence. The convergence is conditional because the models assume the same technology, the same population growth rate, and the same savings rate for all of the economies in the sample. Convergence is absolute if poorer regions grow more rapidly than richer ones regardless of their initial conditions (other than lower incomes). The model implies that per capita income will have a tendency to converge across nations and regions within nations. The lower the initial level of real per capita income relative to the long run or steady state level, the faster will be the growth rate. That result suggests that regions with lower initial income per capita will eventually close the gap between themselves and those regions with greater initial income per capita. The convergence is ultimately a product of diminishing returns to capital, as economies with less initial capital per worker relative to their steady state equilibrium will have greater returns and higher growth rates.

In original formulations these growth models assume that the level of capital (and labor) productivity was constant over time and that economies would reach a steady-state in which

per capita income would remain constant. However modifications by Hicks, Harrod, and Solow allow for technology to improve over time, so that diminishing returns do not result in constant per capita incomes in the steady-state. Hicks defined technological innovation as neutral if the ratio of marginal products remained unchanged for a given capital/output ratio. Harrod and Solow [8] define technological innovation as neutral if the relative input shares of capital and labor remain constant for a given labor/output ratio. As long as the technological innovation is neutral, the assumptions of the Solow-Swan neoclassical models are not violated.

Previous research by Pfitzner and Lang [5] confirmed the Solow-Swan neoclassical model's predictions for regions in Virginia. They found that per capita incomes converged over time across counties in Virginia for the 1959-1999 period. The initially poorer counties grew faster (β convergence) than the initial richer counties in their research. The gaps of per capita income between counties and cities in Virginia also decreased over time. This latter measure is called sigma (σ) convergence.

Research by Dan Ben-Davi [1] suggests that groups of economies that engage in substantial intra-regional trade will experience greater convergence than groups of economies that do not trade substantially. Counties and independent cities in the same state are likely to be substantial trading partners. As a result, greater convergence might be anticipated among counties and independent cities in the same states than between different states or countries.

Barro, Sala-i-Martin, Blanchard, and Hall [4] apply β and σ convergence to study the rate of convergence and the reduction of dispersion in per capita incomes. The research applies conditional convergence to control for migration and government investment. However, the control factors seem to have little effect because the states seem to have similar characteristics.

In his research, Sala-i-Martin [7, p. 1326] concludes that "Economies converge at a speed of about two percent per year." This conclusion was offered as the "mnemonic rule" of economic growth empirics. Results in line with this rule were first reported by Barro and Sala-i-Martin [3] and by Mankiw, Romer, and Weil.

METHODOLOGY

Econometric Method and Beta Convergence

Beta convergence considers per capita income between two points in time to be related to some initial level of income. That form may be represented as:

$$\log(y_{it} / y_{i,t-1}) = a - (1 - e^{-\beta}) \cdot \log(y_{i,t-1}) + \mu_{i,t} \quad (1)$$

where y represents per capita real GDP, t represents the time (year), i represents the nation or region and μ is the stochastic error term. The coefficients, a and β , are estimated by non-linear least squares techniques.

Equation 1 is a solution of the neoclassical model of growth that can be utilized to test empirically the transitional dynamics implied by the model. The left side of the equation simply represents the growth rate of, say, per capita income over the period from $t-1$ to t . The only variable on the right-hand side is initial level of income in time period $t-1$ (the earlier time period). Then for a group of counties, a positive statistical estimate of β implies that the initially poorer counties grow on average at a faster rate than do the richer ones. A

negative β implies greater growth for the initially richer counties. Further, β represents the *speed* of convergence (or divergence) among the counties. Assuming convergence, it will allow us to estimate how long it will take for incomes to close some proportion of the gap between the rich and poor counties across Virginia.

For time separated by years, equation (1) is modified as

$$(1/T) \cdot \log(y_{it} / y_{i,t-T}) = a - [(1 - e^{-\beta T}) / T] \cdot \log(y_{i,t-T}) + \mu_{i,t-T}, \quad (2)$$

where T = the length of the interval in years between initial income and its level at the end of the period, so that the left-hand side of (2) becomes an annualized growth rate. The estimate of β in this form is independent of the interval T . Equation 2 is estimated by non-linear least squares techniques in this paper.

Sigma convergence

Sigma convergence is a simpler idea. The standard deviation of the log of per capita income is computed for each year across the regions. This is a simple measure of dispersion, or income inequality for the sample data. If this standard deviation declines over time, per capita incomes are less dispersed and σ convergence is implied. This provides a measure of the extent of income inequality and how that inequality changes over time.

THE DATA SET

The data were drawn mainly from the U.S. census and consist of the per capita income by county in Virginia from 1959 to 2009 at the census 10 year intervals. For 1959 to 1989 the data were extracted directly from a single table from the U.S. census. That census table presents data in 1989 (real) dollars. However, the data for 1999 and 2009 were acquired separately, and were converted into 1989 dollars using the CPI-U version of the consumer price index.

The U.S. census does not as of this writing provide per capita income by county for 2009 for Virginia. We were able to obtain the per capita incomes of different districts within each county. Then, from these data, we generated per capita income for each county by dividing total income of the county by its population after proper weighting techniques.

There are some counties in Virginia that do not report incomes for the entire period from 1959 to 2009, so we do not include these counties in the samples. After collecting all the data from counties that report incomes for the full 1959 to 2009 time frame, we have 123 observations for Virginia.

Some Descriptive Statistics

Table I provides the reader with the list of ten counties that grew most slowly in Virginia over the full period. These growth rates range from Harrisonburg City with a rate of 32.18% to Hopewell city with a rate of 72.61%. In addition, Table II gives lists the 10 counties growing at the fastest rates in Virginia. These faster growth rates range from Dinwiddie County with a rate of 348.35% to Goochland County with a growth rate of 589.03%.

Table I: Ten areas that grew slowest in Virginia, 1959-2009

Area	Per Capita Income 1959	Per Capita Income 2009	Percentage growth
Harrisonburg city, VA	\$6,981	\$9,228	32.18
Martinsville city, VA	\$7,420	\$10,286	38.63
Williamsburg city, VA	\$7,809	\$11,501	47.28
Radford city, VA	\$5,996	\$8,935	49.02
Waynesboro city, VA	\$8,617	\$13,101	52.03
Covington city, VA	\$6,934	\$11,114	60.28
Galax city, VA	\$6,537	\$10,823	65.57
Danville city, VA	\$6,439	\$11,025	71.22
Lynchburg city, VA	\$7,252	\$12,455	71.74
Hopewell city, VA	\$6,455	\$11,142	72.62

Table II: Ten areas that grew fastest in Virginia, 1959-2009

Area	Per Capita Income 1959	Per Capita Income 2009	Percentage growth
Dinwiddie County, VA	\$3,339	\$14,970	348.35
Surry County, VA	\$3,092	\$13,905	349.71
Charles City County, VA	\$3,328	\$15,038	351.85
Cumberland County, VA	\$2,594	\$11,807	355.18
Buckingham County, VA	\$2,868	\$13,113	357.23
Greene County, VA	\$3,076	\$14,204	361.78
Highland County, VA	\$2,853	\$13,862	385.86
Craig County, VA	\$3,642	\$18,260	401.37
Rappahannock County, VA	\$3,477	\$19,569	462.80
Goochland County, VA	\$3,716	\$25,604	589.03

It is interesting to note that all of the geographic areas in Table I were initially richer than any of the areas in Table II. Put simply, the slowest growing ten areas were initially richer than any of the fastest growing ten regions. Also note that all of the slower growing areas are *cities*, and all of the faster growing areas are *counties*.

SIGMA CONVERGENCE

Figure 1 represents the sigma (σ) computation for 123 counties available in Virginia. Sigma is computed as the standard deviation in the natural logarithm of per capital income across counties and independent cities in Virginia. If sigma declines over time, then by this measure

incomes are converging. Most of the sigma convergence for Virginia took place in 1960s and 1970s. The measure of sigma was 0.3186 in 1959, and decreased to 0.2264 in 1999. However, sigma increased slightly from 0.195 in 1979 to 0.2398 in 1980, and then decreased again to 0.2264 in 1999. In the most recent decade, sigma increased again to 0.2620 in 2009. In summary, the dispersion in per capita income reached a low in 1979 and has increased over the last thirty years

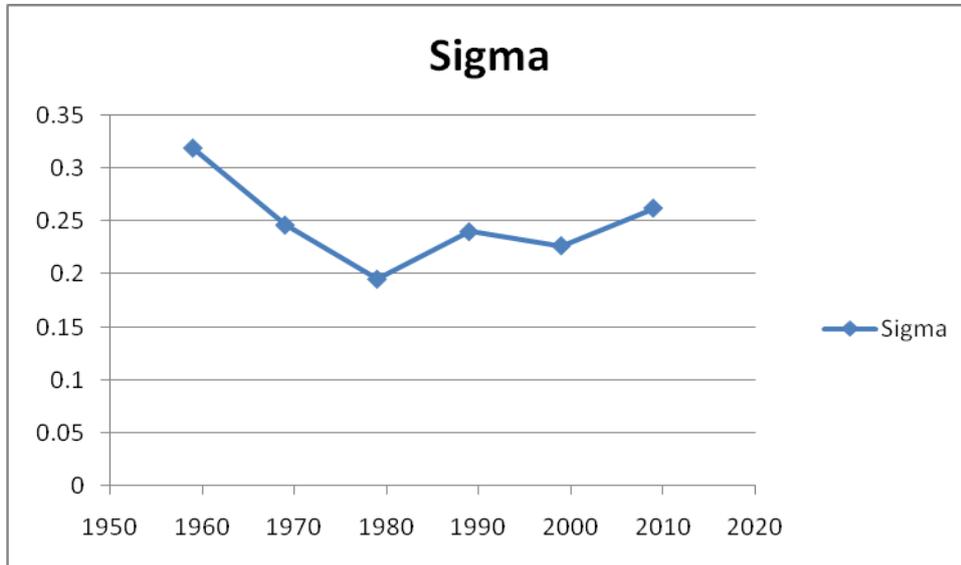


Figure 1: Dispersion of personal per capita income across Virginia counties

Figure 1 is very similar to the pattern of income dispersion described by Sala-i-Martin [7 p. 1030]. In addition, Sala-i-Martin also mentioned that sigma convergence stopped for all *countries* in his data set, including the U.S., so that the lack of convergence was world-wide during 1980s. The same pattern seems to apply to Virginia. Sala-i-Martin argues that “something strange” happened during the 1980s. Income also diverged in the decade of the 2000s for Virginia.

BETA CONVERGENCE

Table III contains the estimates of the regressions based on equation (2). Of crucial importance is the estimate of β , the last row of results in the table shows the estimates for the full sample, 1959-2009. The estimate of β is correctly signed and statistically significant, indicating beta convergence for the full sample period. The overall explanatory power of the regression is reasonably impressive ($\bar{R}^2 = 0.43101$). We also provide evidence for five 10-year sub-periods in the first five rows of the table. The results for the sub-periods from 1959-69 and 1969-79 indicate positive signs of β (meaning *convergence*). However, from 1979 to 1989, the sign of the β is negative (indicating *divergence*), but not significantly different from zero. Later, in the 1990s, the estimate of β once more has the correct sign (for beta convergence) and is statistically significant. Last, in the period from 1999-2009, β is negatively signed which indicates *divergence*, but that estimate of β is not significantly different from zero. All of these results are consistent with the earlier evidence on sigma convergence.

To summarize the results for beta convergence in Virginia for this sample, we find that initially poorer areas (in 1959) grew faster over the succeeding fifty year period than those

areas that were initially richer in terms of per capita income. The economic meaning of this result is that the poorer areas were catching up to those counties/cities that were initially richer, a result consistent with the predictions of the Solow-Swan neo-classical growth models. Congruent with the results on sigma convergence, there was a break in the 1980s when convergence was not evident, and then resumed in the 1990s. However, there was again a break in the 2000s.

Table III: Regressions for personal incomes across Virginia Counties

Period	$\hat{\beta}$	\bar{R}^2	See
Sub-period 1959 – 1969	0.03345* (0.0037)	0.4876	0.00925
Sub-period 1969 – 1979	0.03613* (0.00493)	0.3863	0.00934
Sub-period 1979 – 1989	-0.00891 (0.00468)	0.0187	0.01102
Sub-period 1989 – 1999	0.01172* (0.0032)	0.1010	0.00765
Sub-period 1999-2009	-0.00706 (0.00366)	0.0197	0.00983
Full-Period 1959-2009	0.021360* (0.00391)	0.4310	0.00477

(standard errors in parentheses, see = standard error of the estimate, n = 123, all regressions include an unreported constant term.)

*indicates statistical significance at $\alpha < .01$

Considering the results for the full sample, the degree of convergence suggested is similar to that found in other studies. Sala-i-Martin [7, p. 1024] finds convergence for US states (from 1880 to 1990) to be on the order of 2% per year; these results presented here suggest convergence of approximately 2.13% per year for counties in Virginia over the period 1959 to 2009.

Figure 2 depicts the visual evidence for Virginia of the convergence suggested by the regression for the full sample period. The downward slope of the fitted regression line (and the scatterplot as well) indicates the negative relationship between initial per capita income in 1959 and the rate of growth in per capita income for the following fifty year interval. The evidence for beta convergence for Virginia is clear for the full sample period.

To give a practical interpretation of the rate of beta convergence, the half-life (the time it takes for one-half of the gap between per capita incomes to be closed) can be computed. The rate of convergence is governed by the equation:

$$e^{-\beta t} = p, \tag{3}$$

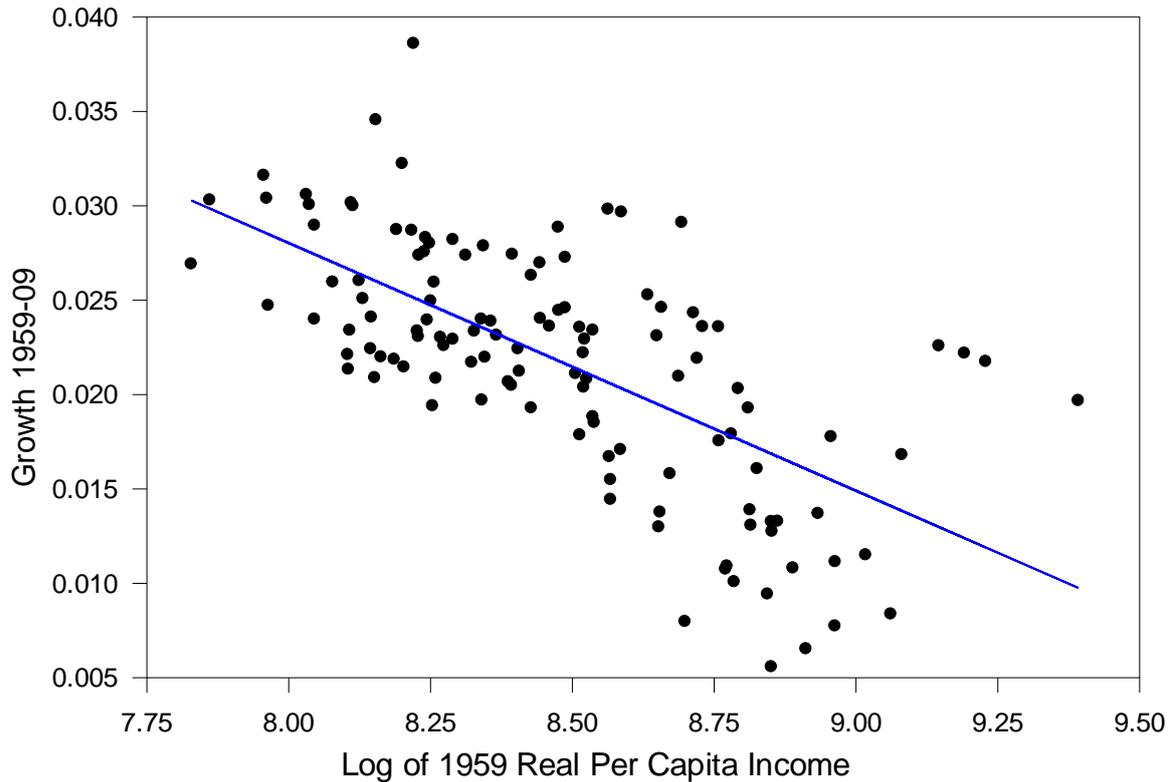


Figure 2: Beta convergence for Virginia

where e , β , and t , are as defined above and p is the proportion of the gap between incomes to be eliminated. Setting $p = 1/2$ and solving for t , the half-life can be computed as:

$$t = \frac{\ln(2)}{\beta} \quad (4)$$

So that the implied half-life based on the estimate of β for the full period is approximately 31.5 years. That is, it would take 31.5 years for one-half of the gap in incomes to be eliminated if per capita incomes were to converge at 2.13% (the estimate for the full sample) per year. If beta convergence had continued for the full period at the pace of the 1970s (3.6%), half of the gap in incomes would have been eliminated in approximately 19.25 years.

DISCUSSION OF THE RESULTS

Two of the sub-period results presented above contradict the predictions of the neo-classical growth models. There is no evidence of convergence in per capita in the decades of the 1980s or the 2000s for Virginia. Numerous hypotheses have been offered to explain the lack of convergence in the 1980s. Empirical work has incorporated the level of farm population, energy resources, technology, education, and local price levels to explain the absence of convergence in the 1980s. None of these hypotheses alone, or in combination, can explain fully the lack of convergence. Sala-i-Martin thus concludes that "... something strange occurred in the mid-1970s." [7, p. 1034] He also suggested that perhaps most of the convergence that would take place had occurred prior to 1990.

The absence of convergence in the first decade of the 2000s is less surprising. The *great recession* of the latter half of that decade is generally agreed to have had greater negative effects on those with lower incomes and we would expect that the same would be true for poorer regions.

CONCLUSIONS

The results of this research suggest that counties in Virginia with lower real per capita incomes in 1959 grew faster on average through 2009 than those with higher initial real per capita incomes. That result confirms beta convergence as suggested by the neo-classical models of economic growth. The dispersion of real per capita income also decreased over the same period, but increased in the decade of the 1980s and in the 2000s. Overall the data support both beta and sigma versions of convergence for the full period, and the evidence for the sub-periods are consistent with respect to the two criteria of convergence.

REFERENCES

- [1] Ben-Davi, Dan. "Trade and Convergence Among Countries," *Journal of International Economics*. < <http://www.tau.ac.il/~danib/trade-growth/tradconv.pdf>>
- [2] Barro, R.T. 1991. "Economic Growth in a Cross Section of Countries." *The Quarterly Journal of Economics*. 106 (May). 407-443.
- [3] Barro, R.T., and X. Sala-i-Martin. 1991. "Convergence Across States and Regions." *Brooking Papers on Economic Activity*. 1. 107-182(a).
- [4] Barro, Robert, Xavier Sala-I-Martin, Olivier Jean Blanchard, and Robert E Hall, "Convergence Across States and Regions." brookings institution. (1991): < <http://www.jstor.org/stable/pdfplus/2534639.pdf?acceptTC=true>>
- [5] Pfitzner, C. Barry and Steven D. Lang. "Economic Convergence: Evidence from Counties in Virginia." *Virginia Social Sciences Journal*, Volume 41, 2006, pp. 44-56
- [6] Ramsey, F.P. 1928. "A Mathematical Theory of Saving." *Economic Journal*. 38 (December). 543-59.
- [7] Sala-i-Martin, X. 1996. "The Classical Approach to Convergence." *The Economic Journal*. 106(July). 1019-1036.
- [8] Solow, R.M. 1956. "A Contribution to the Theory of Economic Growth." *Quarterly Journal of Economics*. LXX. 65-94.
- [9] Swan, T.W. 1956. "Economic Growth and Capital Accumulation," *Economic Record*. 32(2). 334-61.

DIGITALIZED HOSPITAL – MYTH OR REALITY: AN EXPLORATORY STUDY

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ABSTRACT

To meet the increasing demand of quality health care, health care service providers need to provide higher quality service at a relatively lower cost if they are to be the preferred choice of patients/consumers. This study explores the factors that influence the adoption of administrative information technological innovation. Rogers' diffusion of innovation theory and the Tornatzky and Fleischer framework are used as the guiding theoretical lenses to identify the technological, environmental, and organizational factors that facilitates healthcare organizations' adoption of the administrative information technology.

INTRODUCTION

Over the past decades, there has been a consumerism in health care. Recent reports predict that in the next 25 years, the demand for acute care beds will increase by 46% and patients over age 65 will account for 51% of the admission and require 59% of the beds [1]. These changes will put not only a financial strain on the Medicare and Medicaid programs, but also emphasize the need to provide quality care to the aging population. One possible way to address these issues is to adopt innovative administrative information technology (AIT) [2]. AITs will reduce operational and administrative costs, while maintaining high quality by creating and modifying the rules, roles, procedures, and structures that are related to the communication and exchange of information among healthcare staff [3]. For example, Electronic Medical Records (EMR) reduce manual data entry, the Computerized Provider Order Entry (CPOE) system improves data accuracy, and the Radio Frequency Interactive Device (RFID) tracks assets - wheel chairs, defibrulators, and incubators, all of which allows the healthcare staff to spend more quality time with their patients. These changes brought about by the administrative IT innovations provide new ways to either allocate resources or structure tasks in the organization resulting in improved operational performance.

As the importance of AIT does continue to grow it is essential to understand how to successfully implement these systems. In other words, what factors inhibit or facilitate successful implementation of AIT in healthcare organizations. This study investigates the relationship between environmental uncertainty, organizational factors, technological perceptions and adoption of AIT. In addition, this study examines the impact of level of adoption of AIT and organizational performance.

LITERATURE REVIEW, RESEARCH MODEL AND HYPOTHESES

The primary focus of this study is to explore what factors affect the adoption of AIT and how the level of AIT adoption influences the organizational performance. The proposed research model, shown in Figure 1, is adapted from [4]. According to this model, three factors - environmental, technological, and organizational influence the level of AIT adoption in health care organizations.

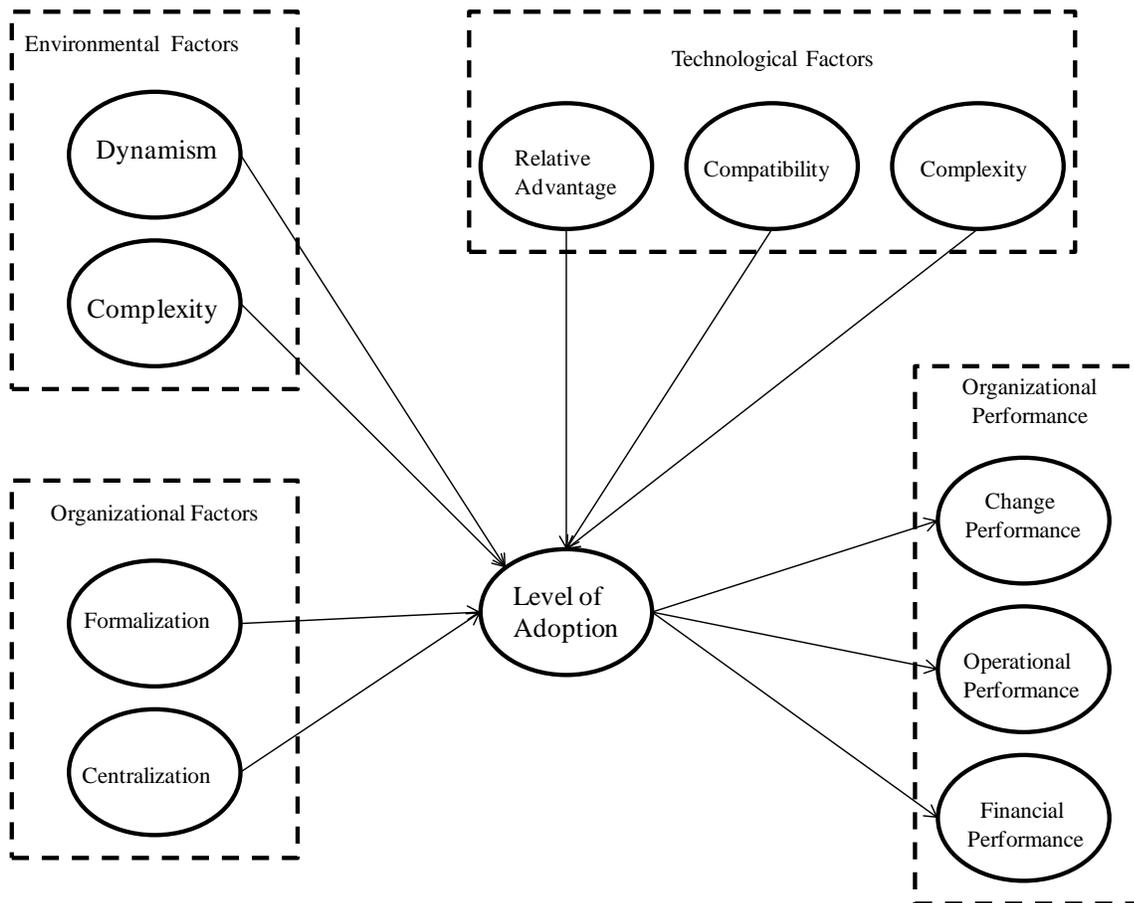


Figure 1 A model of administrative IT adoption

Environmental uncertainty

Environmental uncertainty is defined as the inability of the organization to accurately predict the consequences of an action or the future state of the organization and its environment [5]. It is generally captured along two dimensions - complexity and dynamism [6, 7]. Complexity

refers to the number of elements and the nature of dissimilarity and the interconnectedness of those elements [7]. The *number of elements* is a combination of external and internal entities or associations that health care organizations interact with. External elements are comprised of suppliers, competitors, customers, financial capital markets, government regulatory agencies, and educational institutions. Internal elements include professional associations, labor unions, health care professionals, and insurance payers.

Dynamism is defined as the frequency and the predictability of changes in the environment [8]. The frequency of changes in the healthcare environment refers to changes in the aspects of complexity. The predictability of change in the healthcare environment is based on examination of healthcare indicators (i.e. national health expenditures, hospital admissions, outpatient visits, supply of nurses and physicians, number of hospitals, and hospital revenues) and their trends over time [6].

Prior research offers evidence that intense market competition, complex and rapidly changing environment enforce organizations to adopt innovative IT [9, 10]. Previous studies reveal a significant relationship between environmental uncertainty and usage of technology [11]. Environmental uncertainty cannot be controlled by organizations, yet it affects the way in which they conduct their business. Thus we posit:

H1a: Higher level of dynamism will positively affect the level of adoption of AIT.

H1b: Higher level of complexity will positively affect the level of adoption of AIT.

Organizational Structure

Organizational structure refers to an organization's internal pattern of relationships, authority, and communication. Prior research suggests that the adoption of innovations in IT can be facilitated or hindered by organizations' structural design [12-14]. Some organizational

structures produce radical innovations, while others generate more routine or incremental innovations [13]. In particular, different degrees of centralization and formalization are required during different phases of innovation - initiation and implementation. Organizational structure is commonly represented by two dimensions - centralization and formalization. Centralization refers to the degree to which the authority to make decisions and evaluate activities is concentrated at the higher levels in the organization [14]. Formalization measures the extent to which an organization uses rules and procedures to prescribe behavior [15].

Radical innovations occur frequently in organizations that have a relatively powerful centralized coalition of authority which has the potential to overcome opposition and initiate the process of innovation adoption [12, 16]. Accordingly, we argue that initiation of AIT adoption will require a centralized coalition of authority in order to re-allocate resources, to cut off opposition, and to dismiss personnel who stand as barriers to change. Furthermore, initiation of radical innovations requires high information gathering and processing needs [17]. On the other hand, a high level of formalization not only eliminates role ambiguity, but also limits members' decision making discretion. A less formalized decision making profile is more effective for gathering and processing the increased information [14]. In other words, less formalization is necessary to allow experimentation and significant departure from the existing state which is critical for adopting radical innovations [12]. Therefore we hypothesize that -

H2a: Centralized structure will have a positive effect on the level of innovative administrative IT adoption

H2b: Formalized structures will have a negative effect on the level of innovative administrative IT adoption

Technological factors

Technological factors include characteristics of the technology and perceived consequences of its usage in an organization. Prior research has noted that characteristics of IT

play a considerable part in its adoption [18]. Studies on diffusion of innovation acknowledge that relative advantage, along with compatibility and complexity, have a significant impact on relationship between the level of technology adoption and the attributes of that technology [17-19]. Relative advantage is defined as the degree to which a particular innovation is perceived as providing greater organizational benefit than either the status quo or any other innovation [20]. Compatibility is defined as the extent to which an innovation is consistent with the values, experiences, and needs of potential adopters [21]. Complexity refers to the degree of difficulty users experience in understanding or using an innovation [20, 21].

Prior studies note that adoption of innovative IT in healthcare organizations promises to provide potential advantages such as improved labor productivity, higher inventory reductions, increased asset visibility, better patient safety, and pharmaceutical material tracking [3, 5]. Similarly, positive correlations have been found between compatibility and adoption behaviors [12]. Since significant physical and environmental programming issues are involved in the adoption of innovative AIT, the perceptions of health care administrators' in terms of the compatibility of new IT system will influence the decisions to adopt the innovative administrative IT [22] . Finally, technological innovations are generally considered to be complex products that expose adopting organizations to unfamiliar features. The degree to which technical skills are required to use an innovation may tend to inhibit/or facilitate its adoption [23]. Innovative AIT adoption in health care organizations presents certain challenges as it requires training to understand and use the technology [22]. Based on the above arguments, we posit that -

H3a: Higher relative advantage will have a positive effect on the level of innovative administrative IT adoption.

H3b: Higher levels of perceived compatibility will have a positive effect on the level of innovative administrative IT adoption.

H3c: Higher levels of perceived complexity will have a negative effect on the level of innovative administrative IT adoption

Performance

The relationship between the level of IT adoption and organizational performance has been researched to a great extent by both academicians and practitioners. However, the results do not always add up to a compelling business case in favor of a strong relationship between the level of IT adoption and organizational performance improvements [24]. IT adoption facilitates accurate information availability, which in turn helps in reducing waste during the service delivery process [25]. This reduction in waste leads to superior operational performance, which results in improving financial performance. Moreover, IT adoption improves employee satisfaction[18]. Hence it is posited:

H4: Higher levels of innovative administrative IT adoption will have a positive effect on the organizational performance

Control Variable

The decision to adopt a comprehensive IT capability requires extensive organizational resources in order to purchase, implement, and maintain the technology. For this reason, size of the organization plays a significant role in the adoption of new technology [26]. Previous studies has observed that innovation adoption is positively related to organizational size, and a positive relationship is consistently found at the empirical level [16, 21]. Based on these arguments size is treated as a control variable.

MOVING FORWARD

Data collection will be done using a survey based design. The unit of analysis is acute care hospitals that are not controlled by the federal government. A survey instrument will be

developed and deployed to desired sample which include - chief information officer, vice president of operations/support services from hospitals that meet the American Hospital Association's (AHA) criteria for registration as a hospital facility. We believe that the variety of sample hospitals will facilitate a comprehensive evaluation of the technological, organizational and environmental antecedents to AIT adoption in health care organizations. Six hundred questionnaires will be mailed to hospitals using a stratified random sampling approach from a list of AHA-registered hospitals. Most of the variables are adapted from earlier empirical work on innovation (see table 1), the items are measured with a five point Likert scale (1- strongly disagree, 5 - strongly agree).

Table 1. Summary of Construct Measures			
Construct	Dimensions	# Items	Source
Environmental Uncertainty	Complexity	2 items	[27]
	Dynamism	2 items	[16, 28]
Organizational factors	Centralization	3 items	[29]
	Formalization	4 items	[11]
Technology factors	Relative advantage	8 items	[20]
	Compatibility	3 items	[12]
	Complexity	3 items	[30]
Organizational performance	Innovation and change, financial, and operational	7 items	[31]
Organizational size		3 items	[18]

REFERENCES

1. Coile, R., *Futurescan: Healthcare trends and implications 2004-2008*. 2004.
2. Hanson, W., *Healthcare informatics*2006: McGraw-Hill Professional.
3. Glandon, G., H.D. Smaltz, and J.D. Slovensky, *Information Systems For Healthcare Management*2010: BookComp Inc.
4. Tornatzky, L. and M. Fleischer, *The processes of technological innovation*. Vol. 273. 1990: Lexington books.
5. Shortell, S. and A. Kaluzny *Healthcare Management: Organizational design and behavior*.2000: Thomson Delmar Learning.
6. Begun, J. and A. Kaissi, *Uncertainty in healthcare environments: Myth or reality*. Health care management review, 2004. **29**(1).
7. Duncan, R., *Characteristics of organizational environments and perceived environmental uncertainty*. Administrative Science quarterly, 1972. **17**(3).
8. Kumar, K., R. Subramanian, and K. Strandholm, *Market and efficient based strategic responses to environmental changes in healthcare industry*. Healthcare management review, 2003. **27**(3).
9. Mansfield, E., et al., *The production and application of new industrial technology*1977: W W Norton & Co Inc.
10. Pfeffer, J. and H. Leblebici, *Information technology and organizational structure*. Pacific sociological review, 1977. **20**(2).
11. Grover, V. and M. Goslar, *The initiation, adoption and implementation of telecommunications technologies in US organizations*. . Journal of Management Information Systems, 1993. **10**(1).
12. Ettlie, J., W. Bridges, and R. O'Keefe, *Organizational strategy and structural differences for radical versus incremental innovation*. . Management Science, 1984. **30**(2).
13. Koufteros, X. and M. Vonderembse, *The impact of organizational structure on the level of JIT attainment: Towards theory development*. International Journal of Production Research, 1998. **36**(10).
14. Zaltman, G. and R. Duncan, *Strategies for planned changed*1977: John Wiley & Sons Inc.
15. Hage, J. and M. Aiken, *Routing technology, social structure, and organizational goals*. Administrative science quarterly, 1969. **14**(2).
16. Dewar, R. and J. Dutton, *The adoption of radical and incremental innovations: An empirical analysis*. Management science, 1986. **32**(11).
17. Tornatzky, L. and K. Klein, *Innovation characteristics and innovation adoption-implementation: A meta-analysis of findings*. IEEE transaction on Engineering Management, 1996. **29**(1).
18. Kimberly, J. and M. Evanisko, *Organization Innovation: The influence of individual, organizational, and contextual factors on hospital adoption of technological and administrative innovations*. Academy of management journal, 1981. **24**(4).
19. Iacovou, C., I. Benbasat, and A. Dexter, *Electronic data interchange and small organizations: adoption and impact of technology*. MIS Quarterly, 1985. **19**(4).
20. Kwon, T. and R. Zmud, *Unifying the fragmented models of information systems implementation: Critical issues in information systems research*1987: John Wiley & Sons.
21. Rogers, E., *Diffusion of innovation*1995: Free Press.
22. Mandviwalla, A., *Piloting RFID Along the Supply Chain: A Case Analysis*. Communications of the AIS, 2004. **15**(24).
23. Cooper, R. and R. Zmud, *Information technology implementation research: A technological diffusion approach*. Management Science, 1990. **36**(2).
24. Devraj, S. and R. Kohli, *Performance impacts of information technology: Is actual usage the missing link*. Management Science, 2003. **49**(3).
25. Spear, S., *Fixing healthcare from the inside*. Harvard Business Review, 2005. **83**(9).
26. Globerman, S., *Technological diffusion in the Canadian carpet industry*. Research Policy, 1975. **4**(1).
27. Duncan, R., *Characteristics of organizational environments and perceived environmental uncertainty*. Administrative Science quarterly, 1972. **17**(3).
28. Miller, D. and P. Friensen, *Innovation in conservative and Entrepreneurial firms: Two models of strategic momentum*. Strategic management journal, 1982. **3**(1).
29. Grover, V., *An Empirically derived model for the adoption of customer based inter-organizational systems*. Decision Science, 1993. **24**(3).

30. Chau, P. and K. Tam, *Factors affecting the adoption of open systems: An exploratory study*. MIS Quarterly, 1997. **21**(1).
31. Li, S., et al., *The impact of supply chain management practices on competitive advantage and organizational performance*. Omega, 2006. **34**(2).

ACHIEVING SUCCESSFUL IMPLEMENTATION OF ENTERPRISE RESOURCE
PLANNING SYSTEMS - A STUDY OF POSITIVE CORRELATION TO
SUCCESSFUL IMPLEMENTATION FROM THE USE OF BEST PRACTICES
COMBINED WITH CHANGE MANAGEMENT AND CHANGE IN TECHNOLOGY

by

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Abstract

Technology is a tool that, when used properly, can make dramatic improvements in the productivity of operations and the work of support employees. As organizations strive to become more competitive in their product or service offering, they find themselves at the mercy of unanswered questions, excellence as achieved by their competitor's best practices, and ever changing technology. As changes in technology rapidly advanced in the 1990's, a new competitive element was born that enabled organizations to compete on multiple competitive priorities, making them more competitive and driving competitors far behind. The new technological offering, initially introduced as an answer to antiquated systems and year 2000 issues, was called Enterprise Resource Planning. This new mammoth technology enabled organizations to connect vendors, the organization, and customers in an almost seamless manner with real-time accurate communication and information.

Enterprise Resource Planning comes with a high price, complex system of database and modules, and plethora of changes in the way support staff do their job. Organizations striving for the benefits Enterprise Resource Planning have to offer, often find themselves in self destruct modes and eventual bankruptcy. In order to insure success in Enterprise Resource Planning adoption, successfully completing the implementation process is a critical undertaking. Critical success factors and attention to the change in technology being adopted lead to the achievement of success in the adoption of these systems. This research studies the effects of critical success factors focused on the adoption of best practices in an effort to test for a significant link between

adoptions of best practices during implementations, to successful Enterprise Resource Planning adoptions in hopes that future adoptions find increased success. In addition, the study includes results from tests of correlation of positive impact from a combination of focus on best practices, culture change / change management, and change in technology. The summary of all findings will provide practitioners with future knowledge to lead to more successful implementations of Enterprise Resource Planning adoptions in the future.

Keywords: Enterprise Resource Planning, Change to Best Practices, Change in Technology, Culture Change, Critical Success Factors, ERP, Implementation of ERP, Technological Change, Enterprise Systems, SAP, Management Information Systems, MIS

Background of the Study

This research study deals with the implementation of information technology, namely ERP. It focuses on the presence or lack of documented and proven critical success factors further grouped into elements of adoption and deployment of new best business practices, as well as for change management, change in technology, and deployment of best business practices as combined. The concept of ERP methodology is entity comprehensive for the "enterprise" employing ERP, as well as the customer and supplier enterprises integrated into the service or goods provider who is employing ERP in their organization. This marriage of once dissimilar information systems and the required change of business processes with the goal of "optimization enabled through integration" make the implementation of ERP an extremely immense and complicated task (Buckland, 1991; Debons et al., 1988; Debons & Larson, 1983).

The benefits of ERP systems are immense and in some instances necessary for competitive survival in today's global business climate. Along with the potential for huge benefits comes a huge price tag accompanied with well documented failures driving some large organizations into bankruptcy. Many executives believe ERP implementation provides at least a moderate chance of damaging their organization because of possible problems encountered during the implementation of this vast system (Honig, 1999).

While the ERP methodology is an attractive and desirable tool for most twenty-first century corporations, successful implementation of ERP is difficult, challenging, expensive, and as a result frequently detrimental to organizations. Organizations that have implemented ERP have followed various approaches for successful implementation.

Many attempt to implement ERP as they would any other type of change in information technology. Others follow a more intensive time consuming approach in pursuit of best business practices. Numerous other approaches are documented. After approximately 10 years of heightened use of ERP systems, successful ERP implementation is still somewhat of a mystery (Honig, 1999).

Statement of the Problem

There have been many theories and approaches to ERP implementation which have proven both success and unsuccessful results. Identification of the many critical success factors that underlie these approaches have been the objective of other scholars research efforts. The intent of this study was to identify correlation between successful implementation of ERP and the presence and/or absence of a change in business practices or combination in change in best business practices with focus on change management or focus on change in technology.

Purpose of the Study

While ERP positions firms to compete using multiple competitive priorities, the complexity and vastness of ERP systems often leads to implementation failure as well as subsequent business loss and/or failure (Davis & Heineke, 2005). Many documented research efforts have been conducted on the topic of ERP's required technological change, as well as ERP imposed people and culture related issues. However, research lacks in the study of the possible root cause of failure from the perspective of ERP requiring the implementing organization to change to the selected ERP best practices.

The purpose of this research was to explore ERP implementations and determine whether successful implementations result from a focus on ERP as a change in best business practices and a combination of focus on change management, change in technology, and deployment of best business practices. The results from this research can be used to assist other companies implementing ERP in the future to plan implementation with a higher confidence level for success.

Rationale

Due to the vast degree of change necessary to integrate all functional areas and responsibilities through a single database, ERP involves vast change management. Implementation of ERP is a process aimed at "producing a radical logistical" innovation for the organization (Kraemmerand et al., 2003).

ERP systems can be complex and difficult to implement. A strong structured and disciplined approach can greatly facilitate a successful implementation (Umble et al., 2003). While several schools of thought exist in developing implementation plans, those that focus more on people and business related issues, rather than plan exclusively for technological related issues prove to be more successful (Davenport, 1998). Accordingly, implementation strategies should incorporate a blend of business, people, and technological steps (Somers & Nelson, 2004; Yusuf et al., 2004).

Critical success factors can be traced to people, business, and technological related origins. While many failed ERP efforts have focused on technological change, organizations that focus on business and people issues and problems find more success in implementing ERP as these areas are the more common causes of failure (Davenport, 1998). Organizations that adopt a solid ERP implementation plan, placing primary

emphasis on business and people related critical success factors, are more likely to find success in their implementation efforts (Somers & Nelson, 2004).

Research Questions

ERP is a costly, complex, comprehensive system when successfully implemented, can yield desirable results for many organizations. Benefits including heightened competitiveness, better communication, higher accuracy of information, and more timely information are all positive attributes gained by organizations with successfully implemented ERP systems. These attributes lead to better decision making, better vendor and customer relationships, and stronger customer loyalty.

Considering the high risk for failure observed through many non-successful ERP implementations, the need exists for knowledge supporting successful ERP implementations. With this in mind, the following question is raised:

- 1) Is a focus on change to best business practices with which adoption of ERP systems promotes present in successful ERP implementations?

As previously mentioned, previous research concludes a positive correlation between success in ERP implementation and a focus in change management, while no positive correlation was observed for success in ERP implementation and a focus on change in technology. Considering these findings as well as the findings of the previous research question posed, can a combination of foci generate a stronger positive correlation to success in implementing ERP. With this in mind, the following question is raised:

- 2) To what degree does the combined presence of focus on: a) the change in technology, b) change management, and c) change to best business practices, correlate to successful ERP implementations?

These questions form the basis for this study, and are thus fundamental to the following research. The selection of instrument and collection of data supported the researcher with analyzing the achievement of success gained by adoption of ERP systems as correlated to the presence of focus in ERP implementation on change to best business practices.

Significance of the Study

This study is significant for a number of reasons. To the manufacturer of goods or provider of services, ERP provides the infrastructure to compete on multiple competitive priorities without experiencing loss due to tradeoffs. To illustrate, consider the competitive priorities as identified by the works of Roth & van der Velde (Roth & van der Velde, 1991) and Michael Porter (Porter, 1980, 1985; Porter & Millar, 1985). The five competitive priorities organizations historically have had the capability of focusing on are cost, quality, flexibility (lean competitor), speed of delivery, and service (Davis & Heineke, 2005). Traditionally, organizations have found themselves limited to the use of only one (sometimes two) competitive priorities with which to compete, as focus and trade-offs have prohibited organizations from basing their strategy on more than one (Skinner, 1969). For example, if an organization wanted to focus on speed of delivery, it could not be flexible in terms of its ability to offer a wide range of products. McDonald's, for example, provides fast service but does so with a limited menu of highly standardized fast food offerings. The advantage given by information technology as

observed by the improvement of communication between customers, suppliers and providers of goods and services (through ERP) gives the firm the ability to compete on multiple competitive priorities (O'Brien, 2005). This advantage has taken organizations to a new heightened level of competitive strategy. Considering the high rate of ERP failures due to problems and delays in implementation, the study and correlation of factors / methods contributing to the successful implementation of ERP proves valuable to organizations who wish to implement ERP in the future.

In addition to organizations, the software and consulting industries that have been created as a result of ERP account for nearly \$25 billion and \$17 billion of our annual world economy, respectively. Considering the positive impact that can be gained from successful implementations to the future organizations using ERP, as well as the positive impact to the industries providing ERP software and consulting, the study proves to be significant.

Finally, by publishing the results of correlation research between ERP people, business practice, and technology change, the study has the potential to make a contribution to the theory and ERP literature that exists today.

Assumptions and Limitations

The following assumptions and limitations apply to this research:

- 1) The areas represented in the survey instrument were extracted from critical success factors and grouped into for best business practices (of which change from a currently employed practice to a new best business practice is focused).

- 2) The assumption was made that a successful ERP implementation can be determined by identifying minimum goals of an ERP system which are identified in the literature review.
- 3) The respondents honestly answered the survey.
- 4) Data to corroborate the existence of a correlation between ERP success and successful ERP implementation attribute groups can be gathered through the survey instrument.
- 5) Respondents of the survey had responsibility, as well as the appropriate proficiency for making decisions regarding ERP implementation, for their respective companies implementing ERP.
- 6) The survey instrument was structured for the purpose of finding comprehensive factual unbiased information was appropriate for the assessment of such information, and the statistical procedures applied were appropriate to measure the significance of a measured correlation between success and the existence of the focus areas previously mentioned.
- 7) The survey instrument was dependent upon self-reported data as well as subjective opinions.

Nature of the Study

This research is conducted in a quantitative methodology approach. The nature of a quantitative approach is to research many observations, and quantitatively determine facts and other information from the results of survey or questionnaire instruments. In contrast to a qualitative approach which focuses on few instances, the researcher felt a

more conclusive and representative study could be conducted using the quantitative methodology.

Five hundred organizations who have implemented SAP within the past 5 years preliminarily represent the sample studied in this research. A comprehensive survey/questionnaire is used to derive statistical information about the nature and approach of each organizations ERP implementation, as well as measure the success of the ERP system one year after implementation. A study of the correlation between those organizations achieving success through ERP and the presence (or lack thereof) of focus on change in technology, change management, and best business practices, was conducted using this data.

LITERATURE REVIEW

Introduction

As organizations search for new ways to improve productivity, increase their competitive advantage, and satisfy customer demands, information technology promises to provide answers and solutions. A contemporary concept and approach to the use of information technology in the production of goods and services is enterprise resource planning, commonly known as ERP. According to contemporary thought, enterprise resource planning (ERP) is the foundation of today's business management and strategic positioning (Stevens, 1999). Most major corporations have transformed their operations to organizations led by ERP systems since the mid 1990's (Oliver & Romm, 2002). ERP is an integrated information system that manages all aspects of a business entity (Scalle & Cotteleer, 1999). Utilizing a single data base approach integrating all functional areas, it

streamlines data flows throughout the organization allowing managers access to real-time information. By virtue of data integration, counter-productive processes and cross-functional coordination problems are reduced or eliminated within the organization (Somers & Nelson, 2004).

While ERP has been widely accepted, its complexity, vastness, and degree of required change make its successful implementation and use an ominous task. Poorly planned and managed ERP implementations have brought organizations to their knees and in many cases, caused bankruptcy.

The Nature of Enterprise Resource Planning - ERP

ERP systems integrate all functional areas of an organization into a single data base approach. ERP systems offer companies three major benefits, 1) business process automation, timely access to management information, and improvement in the supply chain via the use of E-communication and E-commerce (Yusuf et al., 2004). Information technology proves to be a vital tool by providing "end-to-end" connectivity in an organization through implementation of ERP systems (Rajagopal, 2002).

The intent and value of ERP comes from its ability, when successfully implemented, to link all areas of an organization including order management, manufacturing, human resources, financial systems, and distribution with external suppliers and customers into a tightly integrated system with shared data and visibility (Chen, 2001). This concept streamlines data flows allowing managers access to real-time information (Scalle & Cotteleer, 1999). Counter-productive processes and cross-functional coordination problems are reduced or eliminated within the organization by virtue of ERP's data integration efforts (Somers & Nelson, 2004). The benefits of a

successful ERP system can be significant. Average firms experience improvements of 25 - 30% in inventory cost, 15% in raw material, up to 95% of planning cycle time, 10 – 40% of delivery times, 10 – 50% of production times, and 20 – 25 % of late deliveries (Adam & O'Doherty, 2000; Ragowsky & Somers, 2002).

The benefits of a well selected and successfully implemented ERP system are accompanied by substantial investment and risks. Implementation can range from \$200,000 - \$800,000 for small to medium sized companies with approximately \$10 to \$70 million in sales, to millions for larger organizations (Ragowsky & Somers, 2002). From a risk perspective, studies show an estimated 50-75% of United States firms experience failure in some manner, while 90% of ERP implementations end up late or over budget (Umble et al., 2003).

Companies have spent billions of dollars and numerous man hours implementing sophisticated ERP systems (Yusuf et al., 2004). A study of 63 companies varying from \$12 million to \$43 billion in corporate revenue, reported average ERP implementation time of 23 months, an average implementation cost of \$10.6 million, plus an additional average \$2.1 million spent on maintenance over a two year period (Stein, 1999).

ERP has become a "must have" system for almost every firm to improve competitiveness. As of the year 2000, over 60% of companies have installed or plan to install a packaged ERP system (Hsiuju & Chwen, 2004). The rapid trend toward ERP has created a new software and consulting industry which is projected to reach [have reached] \$79 billion in 2004 (Ragowsky & Somers, 2002).

The Use of Enterprise Resource Planning Systems in Today's Business World

Enterprise Resource Planning (ERP) has been the most popular means of overall business process improvement since the North American adoption of the Japanese led concept of Just-in-time management. The majority of Fortune 500 companies have adopted ERP systems. Most major corporations have transformed their operations to ERP system led organizations since the mid 1990's. As a result, as the high end of the market has become saturated, ERP systems have gained popular reception and are now filtering down to medium-sized organizations throughout Europe and North America (Oliver & Romm, 2002).

What's so special about ERP? "ERP Systems represent the implementation of the old managerial dream of unifying and centralizing all the information systems required by the firm in one single system..." (Rowe, 1999). This single database system potentially places all elements of the organization in a position to work from one source of interrelated data – not multiple departments driven by islands of information.

When used appropriately, ERP software integrates information used by the major (if not all) areas of an organization – accounting, manufacturing, distribution, and human resources – into a seamless computing system. This provides a more effective and efficient environment working from one database of information instead of relying on islands of information originated previously from each independent area of the organization. Successful ERP systems can be the backbone of business intelligence for an organization. This gives management a unified view of its processes and better

enables control over those processes. ERP systems have a reputation for being very costly and often providing scanty results (Gale, 2002).

Contemporary thinking today is that ERP is the foundation of today's business management and strategic positioning (Stevens, 1999).

Reports of many reasons why ERP systems have been adopted exist. Many of the reasons are based on informed opinion rather than extracted by research study. A significant portion of the justification for adopting ERP systems is founded upon technology issues such as integration, and dissatisfaction with existing administrative systems, procedural issues such as information access, process improvement, and standardization, organizational issues such as business vision, service and quality, and people issues (Oliver & Romm, 2002). Regardless of the reason, the issue of cost versus benefits is ever-present mandating management to justify the high cost of ERP with theoretical justification promising increased productivity and market share, while reducing costs.

Moving to ERP is often justified more by political reasons than by sound managerial reasoning (Adam & O'Doherty, 2000). While popular, political reasons are often costly and least understood. Many organizations feel unjust pressure to implement ERP to provide upper management a standard framework by which to operate multiple business instances. While justifiable from the upper management standpoint, this is often not understood from the instance or individual business subsidiary standpoint.

To generate return on investment, companies are adding strategic applications on top of ERP to find value. These value-added applications, or "bolt-ons", include solutions in customer-relationship management (CRM), supply-chain management

(SCM), advanced planning and scheduling, strategic procurement, e-Commerce, and business intelligence (Stevens, 1999). Business integration in dealing with organization wide ERP is the ultimate proof for companies as they move into the post-implementation phases of their ERP initiatives ("Enterprise resource implementation still tough", 2001). Many organizations have found merit in expanding ERP efforts throughout their organizations. Demonstrated results of ERP implementations include:

- 1) Reduction of planning cycle (95%)
- 2) Reduction of delivery times (10 – 40%)
- 3) Reduction of production times (10 – 50%)
- 4) Lower stock levels (10 – 25%)
- 5) Reduction of later deliveries (25 – 50%)
- 6) Increase in productivity (2 – 5%)

The above results exemplify the effects of synergy in including (and / or combining) the supply chain management function within the ERP environment (Adam & O'Doherty, 2000). These improvements show the significant potential of ERP implementation when properly planned, and orchestrated.

ERP Implementation Considerations

Many organizations consider the implementation of ERP to be a transition from one technological platform to another. While many organizations plan for the technological impact of an ERP implementation, they fail to consider the people and culture related impact. Due to the vastness of ERP systems, and the associated degree of change management involved, many of the risk issues involved in implementation of ERP are more people and culture related than technological related (Ragowsky &

Somers, 2002). ERP systems often fail due to lack of top management commitment, lack of proper training, and lack of communication – all of which are people and cultural related issues (Davis & Heineke, 2005). Consequently, a significant amount of focus in the change management process of ERP implementations should be devoted to people and culture related issues.

The aforementioned evidence promotes questions as to whether ERP implementation should be considered as a transition from one technology or system to another, or whether ERP implementation should be approached as a culture change, or paradigm shift for the organization to embrace. A transition is a change from one state to another, while a paradigm shift is much more complex and comprehensive than a mere change. A paradigm shift is a change from one set of interrelated assumptions to another. These interrelated assumptions form a philosophical and conceptual framework for which an environment exists (Kuhn, 1962). Considering the importance and correlation of this issue to the success of ERP implementations, a study of the change management approach of ERP as a transition of technology versus culture change or paradigm shift, is in order. The appropriate selection of research method to such a study is imperative in order to effectively discover and communicate new knowledge for future ERP system use.

ERP Implementation – Technology Challenge versus Business Problems

As documented evidence illustrates, many ERP implementations result in failure. Often times, the approach to which the organization takes in planning implementation is faulty. While many anticipate the technical challenges to be the focal point of

implementation efforts, they are often times not the main reason enterprise systems fail. ERP implementations focusing exclusively on information technology aspects, and not on the overall implementation of a system, are structured for failure. (Hsiuju & Chwen, 2004). The companies that have the kind of problems that lead to disaster are those that install ERP without thinking through its full business implications (Davenport, 1998).

"The companies deriving the greatest benefits from their systems are those that, from the start, viewed them primarily in strategic and organizational terms. They stressed the enterprise, not the system..." (Davenport, 1998). The leading problems are business problems. Companies fail to reconcile the technological imperatives of the enterprise system with the business needs of the enterprise itself (Davenport, 1998).

Adapting an approach to ERP implementation which focuses on the business issues of the organization includes several specific considerations. The people and culture of the organization should be included. People are change adverse in nature, while "IT projects are complex undertakings with a lot of human factors, and that means they're inherently fraught with danger." (Wilder & Davis, 1998).

Considerations for effective communication should be considered to avoid unnecessary results from human factor related problems. One issue of communication, which impacts all personnel of the organization, especially upper management, is when the ERP implementation is invisible with regards to the new system and new technology. Invisible introductions are a major cause of implementation failure. Creating an understanding of the linkages among implementation funding, support, and technology success can be one of the most difficult perceptions for project managers to construct. Executives must understand that money, time, and attention are vital to the successful use

of the technology. Executives typically must see success before they will support implementation (Griffith et al., 1999).

Creating a context that supports implementation is project manager's first responsibility in the implementation process. Without the support that visibility generates, there is little opportunity to use the tools and techniques provided by the implementation literature. And without those tools and techniques, successful implementation is a long shot (Griffith et al., 1999).

ERP Implementation Activities

All implementation include a standard set of activities. These activities include 1) market research and acquisition of hardware, software, and services, 2) software development (if necessary), 3) data conversion, 4) end user training, and 5) conversion from old to new system (O'Brien, 2005). The following sections detail the steps taken in an ERP implementation process. While most implementation processes take on a more technical focus, as detailed by the steps above, ERP implementations require focus on people and business issues as well (Davenport, 1998).

ERP Implementation Strategies

While ERP systems are intricate and complicated systems to implement, a planned and closely controlled approach can greatly aid the implementation process (Robey et al., 2002). ERP implementation strategies can take on many different approaches – some proving to be successful, while others are labeled for failure. While some approaches provide more specific criteria, others include general phases or stages for adoption of stage specific steps. For example, (Rajagopal, 2002) proposes a six-stage

model for ERP implementation which consists of initiation, adoption, adaptation, acceptance, routinization, and infusion. The first four stages of this model represent pre-"go live" stages, while the last two represent post-adoption behaviors (Rajagopal, 2002). Somers and Nelson (Somers & Nelson, 2004) incorporate this approach using the Markus and Tanis (Markus & Tanis, 2000) key players and key activities framework (critical success factors) into each stage. These critical success factors consist of key players which include top management, a project champion, a steering committee, implementation consultants, a project team, vendor-customer relationships, vendors' tools, and vendor support. In addition, fourteen key activities compose additional critical success factors and more specific steps in the implementation process. These key activities include: 1) user training and education, 2) management of expectations, 3) careful selection of the appropriate package, 4) project management, 5) customization, 6) data analysis and conversion, 7) business process reengineering, 8) defining the architecture, 9) dedicating resources, 10) change management, 11) establishing clear goals and objectives, 12) education on new business processes, 13) interdepartmental communication, and 14) interdepartmental cooperation (Somers & Nelson, 2004). These critical players and activities interface with the six ERP project life cycle stages to establish the implementation plan. The advantage of this approach is the controlled, yet flexible structure to implementations incorporating both pre- and post-implementation behavior (Umble et al., 2003).

Umble et al. (2003) use input from the works of Langenwalter (2000), Oden et al. (Oden et al., 1993), Ptak (Ptak, 1999), and Ptak and Schragenheim (Ptak & Schragenheim, 2000) to derive an eleven step specific implementation approach as an

alternative method to implementing ERP. The steps within this process include 1) a review of the pre-implementation process to date, 2) install and test any new hardware, 3) install the software and perform the computer room pilot, 4) attend system training, 5) train on the conference room pilot 6) establish security and necessary permissions, 7) ensure that all data bridges are sufficiently robust and the data are sufficiently accurate, 8) document policies and procedures, 9) bring the entire organization on-line, either in a total cutover or in a phased approach, 10) celebrate, and 11) improve continually (Langenwalter, 2000; Oden et al., 1993; Ptak, 1999; Ptak & Schragenheim, 2000; Umble et al., 2003). This specific implementation strategy focuses on post ERP system selection steps which represents an ominous task within the implementation process and thus must be considered prior. The downside to this approach is that it lacks the communication, accountability, and responsibility associated with the individuals who selected the system to be implemented. Umble et al. (2003) study of Huck International, Inc., and their related ERP implementation, justify support for the use of the eleven step process. Following these steps, the organization found success in their ERP implementation efforts.

The ERP Metamorphosis

Implementing ERP involves automating standard transactions and thus developing new business processes. When a company optimizes operations, account management, or management information, they are creating new business processes (Stevens, 1999). Recognizing such when launching an ERP project is important due to the necessary communication required to alert system users of new processes and procedures that will arise. Even the slightest failure to acknowledge user responsibility

could result in one required element of the single database to not be updated thus creating corrupt data and resultant disaster for other users and decision makers.

In association with required new processes, reengineering of the organization is often both a desirable and necessary step of ERP projects. Because ERP represents a new way of managing an organization, employees are often required to do additional functions or functions outside their previous scope of performance. Thus, an evaluation of the appropriateness of business re-engineering is a major first step in the ERP implementation process. It is rare that some kind of re-engineering is not required (O'Leary, 2002).

Business re-engineering requires observance and documentation of current processes and procedures in an effort to map future ERP required processes and procedures. Consultants are often used to perform such studies as organizations do not typically have existing resources to conduct such.

Risk and Implementation of ERP – The Price of ERP

Cost of ERP is a concern for many companies. Implementation costs, on average, are 25 percent over budget. Considering the high price tag for ERP implementations, this overrun is of significant concern and can (has) put large organizations in a going concern questionable state. In addition to implementation cost, support costs are often underestimated by 20 percent for the year following implementation. A comparison of previous system costs to post ERP implementation system costs finds most companies with an increase in support cost as a whole on an ongoing basis ("Enterprise Resource", 2001). Efficiency, productivity, market share, and other gains, as a result of ERP, are expected to offset this increase in support cost.

The financial impact of ERP to both the software provider and knowledge consultant industry is significant. By 2000 the ERP revolution generated over \$20 billion in revenues annually for suppliers and an additional \$20 billion for consulting firms (Willcocks, 2000).

Risk and Implementation of ERP – Risk Factors

In a search for common factors associated with risk and implementation of ERP projects, Mary Sumner studied seven ERP project implementations representing seven diverse industries implementing implementations of three major ERP providers: SAP, PeopleSoft, and Oracle. Her findings represent the most common risk factors mentioned in the seven implementations and are illustrated in Table 1 below.

Table 1. Common Risk Factors of ERP Implementations

<u>Risk Factor</u>	<u>Category of Risk Factor</u>
1 Failure to redesign business processes to fit the software	Management
2 Lack of senior management support	Management
3 Insufficient training and reskilling	People Skills
4 Lack of ability to recruit and retain qualified ERP system developers	Technical
5 Insufficient training of end-users	People Skills
6 Inability to obtain full-time commitment of 'customers' to project activities and management	Customer
7 Lack of integration	Technical
8 Lack of a proper management structure	Management
9 Insufficient internal expertise	People Skills
10 Lack of a champion	People Skills
11 Lack of "business" analysts	People Skills
12 Failure to mix internal and external personnel	Management
13 Failure to emphasize reporting, including custom report development	Management
14 Insufficient discipline and standardization	People Skills
15 Ineffective communications	Management

Risk and Implementation of ERP – The Price for Failure

The high level of risk associated with such projects correlates to the beneficial effects of implementing ERP. Enterprise resource planning projects are complex. Re-engineering of key business processes prior to their implementation, and the required culture change create a need for change management within the organization. In addition, ERP projects require reliance on many different types of expertise outside the firm's traditional internal means. Consultants, software vendors, and trainers are often an integral part of the ERP project team. The complexity of ERP, vast amount of radical change and introduction of new players to the environment all add to the dangers inherent in such vast projects. Some large organizations have incurred bankruptcy after years of unsuccessful implementation efforts of ERP systems. In the case of Foxmeyer, who incurred bankruptcy in 1996 after years of unsuccessful ERP implementation, software vendor SAP and the consulting branch of Arthur Anderson were sued as a result of problems associated with Foxmeyer's attempts at implementing ERP. Failure of large companies and legal action against implementation support players is illustrative of what can happen when implementations go wrong (Adam & O'Doherty, 2000).

Attributes for Failure

"ERP Trends," a survey conducted by The Conference Board (an independent research organization), reported 40 percent of study ERP study participants failed to achieve their business case one year after implementation of their enterprise resource planning. When benefits of the ERP project were achieved, it took six months longer

than expected or planned. The lag in achieving benefits, as documented by the study, was primarily due to pressure to "go live" before the organization was ready to cutover to their new system. This resulted in substantial post-implementation efforts to identify and measure shortcomings and deficiencies associated with problems in the cutover ("Enterprise Resource", 2001).

Problems relating to ERP implementation are vast, sudden, and expensive. The most frequent and devastating problems include: 1) approaching ERP implementations from an excessively functional perspective, 2) inappropriately cutting project scope, 3) cutting end-user training, 4) inadequate testing, particularly of interfaces, modifications integrations and exceptions, 5) not first improving business processes where this needs to be done, 6) underestimating data quality problems and reporting needs, 7) unknown business results, 8) disappointing business results, 9) fragile human capital, and 10) migration problems (Markus et al., 2000).

Another study conducted by O'Leary analyzes problems by identifying ERP stages and associated problems within each stage. The ERP life cycle includes six stages: 1) deciding to go ERP (business case state), 2) choosing an ERP system, 3) designing an ERP system, 4) implementing an ERP system, 5) after going live, and 6) training.

According to a study conducted by Daniel O'Leary, 27.3 percent of the time, the main problem with ERP implementations is a lack of participation by the users. However, this measure is questionable due to the question as to whether users were adequately trained or not. Other problems could possibly underlie training and user involvement such as insufficient buy-in regarding personnel as well as insufficient support of management (O'Leary, 2002).

Other studies have revealed factors that affect risk inherent in major information system projects to include organizational fit, personnel skill mix, management strategy and structure, software systems design, user involvement and training, technology planning, project management, and social commitment (Sumner, 2000).

Middle management within production departments is often the source for most resistance to ERP projects. Their main objections to changes of ERP nature are typically that they are fundamentally unnecessary and that the organization can remain competitive through focus on development and production of technically innovative products (Hislop, 2000).

In addition to personnel issues, the change in adopting new technology has been noted to play a role. "Faulty technology is often blamed, but eight out of nine times, ERP problems are performance-related..." according to Pat Begley, senior vice president of educational services at SAP, a major ERP software provider (Gale, 2002).

One of the biggest mistakes that companies make when they launch new ERP applications is assuming that they are going to be like any other piece of software... Microsoft Word is a productivity tool – whether you use it doesn't impact anyone else in the company. But ERP is a totally new environment. Everything you do in an ERP environment affects the success of the company (Gale, 2002).

One area where many companies implementing ERP all too often first look to cut expense due to project overruns in training of ERP users. This is a very dangerous expense to minimize. Training is often last minute and weak. It typically covers, on a minimal basis, how to do specific job-related tasks, with no explanation of the effects of those actions (or lack thereof) within the business cycle. Training should cover why each

task is important and how every transaction is part of a larger process. If this is not done properly, end-users are less likely to use the application correctly or consistently. ERP training should not be limited to teach end-users how to fill in fields and click buttons. End-users should know how their actions impact their colleagues as well as the entire new ERP management environment (Gale, 2002).

According to another study conducted by Daniel O'Leary, when companies discuss problems with ERP system implementations, it generally involves one of the following problems: 1) budget over-run, 2) time over-run, 3) lack of benefit, 4) meets or does not meet business plan criteria (O'Leary, 2002). The O'Leary study was the only one to exclude specifically people issues from its recognition of problem areas.

Attributes for Success

How does an organization determine if it is successful in its ERP implementation efforts? Quantitative operational objectives that are often sought for and met from ERP adoptions are: 1) experienced reduction in scheduling and planning cycle greater than 50%, 2) experienced reduction in delivery times by at least 10%, 3) realized reduction in production time by at least 10%, 4) reduced inventory stock by at least 10%, 5) reduced late deliveries by at least 25%, and increased productivity by at least 2% (KPMG, 1997). A survey of 62 Fortune 500 companies shows these success measures to be on the low end of the demonstrated scale (Fryer, 1999). Successful ERP adoptions also show evidence of improved operating margins of 1.5%, reduced operating cost by 5%, and increases in on time delivery rates to 99% (Sweat, 1998). For a project of the size and investment of ERP, organizations often look at return on investment as a benchmark for

success. Organizations often set a ROI goal for their ERP oftentimes as much as 5% or greater (Bradford, 2001) with ROI results reported as high as 33% (Fryer, 1999). ROI is of particular interest to upper management personnel, such as controllers and CFO's who are responsible for monitoring the return on the ERP investment to measure whether proper quantitative success is achieved (Lutchen, 2004). With greater emphasis on ROI, organizations can find increased financial success via there ERP investment dollars (Scherpenseel, 2003).

A quantified business need is a prerequisite for a high level of satisfaction with enterprise resource planning initiatives ("Enterprise Resource", 2001). "... Companies that differ substantially in how they defined success in the project phase because they differed in their definitions of the project itself... The larger organizations tended to define the ERP experience in much more expansive terms than smaller ones. They often demanded business results from "IT" projects. In many cases, these organizations were planning for multiple of ERP installations and realized the importance of learning how to implement and upgrade ERP systems better each time. They were more likely than smaller organizations to start planning for the onward and upward phase during the project phase" (M. L. Markus & Tanis, 2000).

Developing a cross-functional project team representing all departments impacted by the ERP project is an important step to successfully managing change and implementing ERP. Allowing individual groups to accept or resist ERP can result in problems for the implementation. For example, Pharm-Co, a UK based provider of nuclear medicines, underwent resistance to ERP from their production middle management. This group felt the existing system fit their company goals and no

alteration was necessary for increased productivity, improved efficiencies, or increased competitive strategy to capture additional market share. Anticipating this reaction, Pharm-Co organized their ERP project team around the production middle managers including members of all other affected departments. The production middle managers held their ground firmly throughout the entire ERP implementation, but succumbed to political pressure as well as their inability to influence other middle managers in outlying support departments. Their inability to form a cross-functional resistance (especially to include the senior management level) led to their loss of power in affecting the issue (Hislop, 2000).

While the Pharm-Co case worked, it is not the preferred form of building cross-functional ERP implementation team. Meeting the potential resistance head on gaining buy-in to the project early on in the ERP pre-implementation phase, could have resulted in a much more efficient and productive implementation.

The design of ERP program management can contribute to the success of ERP's complex software implementation. In their study of 15 ERP cases, Pieter M. Ribbers, PhD, and Klaus-Clemens Schoo identified five implications for practice of complex ERP program management. The first of these implications for practice deals with coordination. Deemed to be of critical importance, coordination with suppliers and employees across individual projects is necessary to achieve process efficiency. The second implication was a strict adherence to a "no change policy" during the rollout phase of enterprise-wide ERP implementations. The third implication deals with ERP implementations with high integration complexity. The need for complete alignment mechanisms (such as steering committees, reviews, and release controls) is of critical

importance. In particular, steering committees should be primarily focused for adherence to planned changes (those involving integration complexities) and place less emphasis on unplanned disruptions (i.e. "fire fighting"). The fourth implication cited by Ribbers and Schoo involves implementation approaches. According to Ribbers and Schoo, "Successful programs (ERP implementations) differentiate their implementation approaches according to the extent of the different complexities they encounter..." These changes involve decisions such as the number of parallel rollout activities and the changes during the parallel activities. In environments of high integration complexity, organizational changes may also be required to be implemented together with technical changes. The final implication deals with attention from management to complex ERP implementations. As cited by Ribbers and Schoo, complexity further complicated with high variety (i.e. multiple locations) demands greater general management attention. Greater general management attention requires communication and sponsorship in order to be effective (Ribbers, 2002).

In another study of success achieved from adopters' experiences with ERP, Markus, Axline, Petrie, and Tanis study ERP implementation experiences through the sponsorship of an ERP vendor interested in helping customers be more successful in ERP implementation. Markus et al. identify three distinct phases in the "ERP experience cycle" to group successes attributes within: 1) the project phase (where ERP software is configured and rolled out to the organization), 2) the "shakedown phase" (where the organization makes the transition from "go live" to "normal operations), and 3) the "onward and upward" phase (where the organization experiences the majority of business

benefits from ERP and plans their next steps for business improvement) (M. Markus, Axline, S., Petrie, D. & Tanis, C., 2000).

Success in the project phase, according to Markus et al., is characterized by: 1) project cost relative to budget as controlled by people, 2) project completion time relative to schedule as controlled by people, and 3) completed and installed system functionality relative to original project scope as controlled by people.

Success in the "shakedown phase" is characterized by: 1) short-term changes occurring after system "go-live" in key business performance indicators such as operating labor costs, 2) length of time before key performance indicators achieve "normal" or expected levels, and 3) short-term impacts on the organization's adopters, suppliers and customers such as average time on hold when placing a telephone order all of which are controlled by people.

Success in the "onward and upward phase" is characterized by: 1) achievement of business results expected for the ERP project, such as reduced IT operating costs and reduced inventory carrying costs, 2) ongoing improvements in business results after the expected results have been achieved, and 3) ease in adopting new ERP releases, other net Its, improved business practices, improved decision making, etc., after the ERP system has achieved stable operations (Markus et al., 2000). Once again, these are all controlled by people.

As stated earlier, measurables in the ERP process are important. In general, companies that do not deliberately set out to achieve measurable business results do not obtain them. These same companies never realize that they have obtained the optimal levels not measured as well (Markus et al., 2000).

ERP implementations are socially complex activities. Up to 12 or more external parties (including the ERP vendor, vendors of ERP product “bolt-ons”, vendors of hardware, software consultants, telecommunications specialists, implementation consultants, etc.) may be involved in different aspects of an organization's ERP implementation. Dealing with numerous parties can be difficult to manage. (Markus et al., 2000)

Because of its vastness, complexity, high risk for failure, and significant price tag, the ERP project manager has a huge responsibility. Few (if any) information technology products and services firms are willing to take end-to-end responsibility for coordinating all parties. While true they also generally seem to take exception to accepting secondary roles to other such firms as well. In addition, product and service firms demonstrate widespread lack of knowledge about the details of ERP products in the sales cycle especially when integration and interface questions are posed (Markus et al., 2000).

One of the greatest challenges in effectively implementing ERP environments is recruiting and retaining highly sought information technology professionals with the specialized technical and application-specific skills (Sumner, 2000).

"At the start of an ERP project the organization is really not aware of the scope of the implementation, the impact it will have. Due to fixed deadlines there is no time to train the end users, or they only have a couple of days... what you see then is a lot of end users struggling to use the system making all kinds of errors. Companies want to do more with less. They are not going to cut designing a business process, if an organization is going to cut something it will be security and controls, and that all hinges on the control philosophy..." (Wright, 2002 Spring Supplement).

Training should include information about their new roles and responsibilities, the business objectives of the ERP initiative, and the projected benefit to the company and to users. People will embrace a new system if you give them the skills and support (training and other tools) to use it (Gale, 2002).

ERP Related Failures

While ERP can provide significant competitive advantage and improve organizational efficiency and productivity, the growing number of horror stories regarding failed or out-of-control projects gives organizations reason to evaluate a move to ERP. FoxMeyer Drug argues that its system helped drive it into bankruptcy. Mobil Europe spent hundreds of millions of dollars on its system only to abandon it when its merger partner objected. Applied Materials gave up on its system when it found itself overwhelmed by the organizational changes involved. Dow Chemical spent seven years and close to half a billion dollars implementing a mainframe-based enterprise system and later decided to start over again on a client-server version (Wilder & Davis, 1998).

Critical Areas of ERP Implementations

The issues and challenges of ERP implementations can be summarized into three areas: 1) people, 2) technology, and 3) business. These areas are derived from the study of Critical Success Factors (CSFs) from past ERP implementations as researched by four scholarly efforts – Nah et al. (2003), Somers and Nelson (2004), Laughlin (1999), and Krammeeraard et al. (2003) and are summarized in Table 1 – CSFs by Scholar. CSFs often have common characteristics and can overlap from one area into another.

People and business related CSFs outnumber technological factors. Studies of ERP implementation failure support this emphasis on people and business related CSFs. In a survey of information technology managers, Information Week found the top three reason ERP projects failed were attributed to poor management (people / business), change in business goals (business), and lack of business management support (people / business) (Umble et al., 2003). Thus, ERP implementations often find failure not because of the technology, but because of business and people issues (Somers & Nelson, 2004). Further, a study conducted of Fortune 1000 chief financial officers, CFO's ranked the five top CSFs of ERP implementations as top management support (people), project champion (people), ERP teamwork and composition (people / business), project management (business / technology), and change management (people) (Nah et al., 2003). In addition, Rolls-Royce found in their ERP implementation cultural (people), business, and technical difficulty were the primary areas of concern during their successful ERP implementation (Yusuf et al., 2004). Accordingly, CSFs should be grouped and viewed within these areas.

People, Business, and Technology Related ERP Critical Success Factors

The results in table 2 show the study of ERP implementation CSFs emphasizes factors that affect people, business, and technology issues.

Table 2. Critical Success Factors of ERP Implementations by Scholar

Group	Critical Success Factor	Scholar			
		Nah et al. (2003)	Somers & Nelson (2004)	Laughlin (1999)	Kraemmeraard et al. (2003)
Technology	Appropriate Business & IT Legacy System	X			
Business	Business Plan & Vision	X	X	X	X
Business	Business Process Reengineering	X	X		X
People	Change And Expectation Management	X	X	X	
People	Communication	X	X	X	
People	ERP Teamwork & Composition	X	X	X	X
Business	Monitoring & Evaluation of Performance	X			
People	Project Champion	X	X		
Business	Project Management	X	X	X	
Technology	Software Development, Testing, & Troubleshooting	X			
People	Top Management Support & Involvement	X	X	X	X
People	Steering Committee		X		
People	Implementation Consultants		X		
People	Vendor-Customer Partnership, Tools, and Support		X		
People	User Training and Education		X		X
Business	Appropriate Software Selection		X		
Business	Minimize Customization		X		
Technology	Data Analysis and Conversion		X		
Technology	Defining the System Architecture		X		
Business	Dedicating Resources		X		
Business	Aggressive Schedule and Timelines			X	
Business	Focused Issue Resolution			X	
Business	Limited Scope			X	
Business	Early Success			X	
Business	Justification				X

The majority of organizations realize their employees (people) are their greatest asset. People represent any organization's defining asset. Excellence in people management can add massively to shareholder value in every aspect of their performance, including their reception and acceptance to change (Somers & Nelson,

2004). Employee costs exceed 40% of many companies' total expenditures. These employees represent the internal users of ERP and have a major role in ERP and business success. "A company is nothing without its people..."(Kingsmill et al., 2005). CSFs impacted by people include, 1) change and expectation management (including user education and training), 2) communication, 3) cross functional ERP team composition and teamwork, 4) evaluation of business performance, 5) appropriate project champion, 6) support of upper management, 7) support of steering committee, 8) knowledgeable implementation consultants, and 9) establishing vendor / customer relationships. (Kraemmerand et al., 2003; Laughlin, 1999; Nah et al., 2003; Somers & Nelson, 2004).

Critical to implementation, ERP requires enterprise wide culture and structure change management (Rosario, 2000). Important to the change management process necessary for ERP implementation is recognizing the need for change, culture and structure management, user education, and training (Nah et al., 2003). Recognizing the need for change through all levels of the organization is critical to the acceptance of ERP. The integrated single data base theory and structure of ERP, as compared to the traditional management process practiced in pre-1990 management, require a vast amount of change from many aspects of the organization implementing ERP (Somers & Nelson, 2004). Once identified, managing the subsequent cultural and structural change resultant as a consequence of ERP, becomes an ongoing task that the organization should not take lightly as vast change in procedure, responsibility and accountability prevail (Somers & Nelson, 2004). User education and training are extremely important and often subject to non-existence as ERP projects finding budget overruns often look to this area for cost cuts. Sadly enough, organizations guilty of this implementation offense often

find failure – the organization invests millions in a system in which employees have no idea how to run (Somers & Nelson, 2004).

In addition to managing people from a cultural change management aspect, communicating with employees is another critical people success factor for ERP implementation success. Successful implementations are related to successful management of user expectations (Somers & Nelson, 2004). Goals and expectations of ERP should be communicated at every level of the organization in order to create an expectation of change and create an environment for success (Falkowski et al., 1998). The aspect of successful communication efforts, as a critical successful factor, include identifying what information needs to be communicated to which employees, communicating in a timely and effective manner, communicating ERP information to stakeholders (i.e. suppliers, customers, etc.), communicating expectations of all levels of the organization, and communicating the progress of the ERP project. In addition to these unilateral communication efforts, bilateral communication involving users to provide input and make choices when appropriate is necessary for successful ERP implementation (Falkowski et al., 1998; Holland et al., 1999; Rosario, 2000).

Another CSF for ERP implementations which focuses upon the area of people is the aspect of ERP teamwork as well as the composition of the team. The joint effort of implementer, vendor, consultants, and the ERP internal implementation team are critical to the success of the ERP implementation (Nah et al., 2003). The team should consist of a cross-functional workgroup of full-time employees empowered to make and carryout decisions. Superior technical and business knowledge should be characteristics of which team members, as a group, should possess (Somers & Nelson, 2004). The best

people in the organization should be recruited into the ERP team (Falkowski et al., 1998). The ability for the cross-functional team to support each other, as well as support and promote the ERP implementation is critical. This team of business experts is a very powerful group and plays an important role in the success of the ERP project. Their ability to work together as a team is a determinant factor in the success of the implementation (Nah et al., 2003). Incentives and risk-sharing agreements are encouraged for motivation for the ERP team to reach desired goals (Umble et al., 2003).

One of the most important aspects of people related CSFs is the project champion. This individual shoulders the success of the organization. This individual should have the endorsement of a high-level executive sponsor willing to provide the project champion with the power to set goals and the authority to implement change within the organization (Somers & Nelson, 2004). The project champion should be self motivated and capable of enduring long hours, stress, and the ability to boost the moral of others impacted by the ERP implementation (Rosario, 2000).

The final critical factor relating to people could dually suffice for a business critical factor – the support of upper management. Continual support from upper management is cited as the most relevant factor in many studies to ERP implementation success. According to Somers and Nelson (2003), "... no single factor is as predictive to ERP project success." Public and explicit support for the ERP project should be a top priority of upper management (Laughlin, 1999). Should this support and endorsement not be present from upper management and employees resist to the change brought about by ERP, their support will alienate the project (Shanks et al., 2000).

Somers and Nelson (2003) consider the use of a steering committee to be an effective means of ensuring appropriate involvement and making ERP succeed. An effective steering committee should consist of members of senior management, senior project management representatives, and ERP end users. Steering committees often are charged with the ominous task of ERP system selection in addition to as well as provide support during implementation (Somers & Nelson, 2004).

Somers and Nelson's (2003) comprehensive list of CSFs includes the importance of knowledgeable consultants. The role of consultants is critical for setup, installation, and customization of ERP software systems (Somers & Nelson, 2004). Success of the ERP project is impacted by their experience with previous implementations and the software application, as well as their comprehensive knowledge of system components and modules. Their ability to interface effectively with the ERP project team is imperative (Nah et al., 2003).

The final people related ERP CSF deals with the relationship established between the vendor and the organization implementing ERP and the tools and support offered by the vendor. Just as selection of the ERP software is critical, a positive correlation exists between the "fit" of the software vendor and user organization (Somers & Nelson, 2004). As a result, this relationship is strategic in nature and critical to early stages of implementation.

Vendor tools provided by the software vendor can provide a more efficient implementation in adopting and adapting to an ERP system. Vendor tools are important for gaining knowledge regarding the use of the software, as well as understanding the

business processes and best practices of the software system. As a result, they can significantly reduce costs and time of deployment (Somers & Nelson, 2004).

As ERP systems require substantial investment and strain on business efforts, their successful adoption should employ a substantial period of use. Continual investment in new modules and upgrades are necessary for additional functionality and problem resolution. Vendor support is critical to long term success of ERP use. Technical assistance, emergency maintenance, updates, and training are important factors required of continual vendor support (Somers & Nelson, 2004).

METHODOLOGY

Introduction

The purpose of this study is to determine if organizations who adopt ERP systems achieve greater success when implementations focus on deployment of best business practices, or some combination of deployment of best business practices, focus on change management, or focus on change in technology.

This study was conducted by grouping ERP critical success factors during implementation. The instrument tests for the presence of these factors as well as the success before the implementation of ERP and at least one year after the completion of ERP implementation.

The results from this research identified success as correlated to the presence of the success factor group and/or combination of groups. This research can be used to

assist organizations achieve operational success in future implementations of ERP systems.

Description of Methodology

To effectively study these questions, the researcher utilized a quantitative method approach. Quantitative research has been used historically to inquire into causes and effects and to verify the validity of theoretical constructs. By gathering statistical data and analyzing data with SPSS, identified variables are examined to gather information about how they impact the theoretical claim (Creswell, 2003). In this research, the theoretical claim is that organizations that focus ERP implementations on a change in technology, change management in people (i.e. culture change), and/or the adoption of best business practices required, or some combination of any or all of these three foci, are more successful one year or more after implementation, than organizations that focus only on the required change in technology or other foci. This study tested this assumption for validity using an instrument previously used to test for similar critical success factors in ERP systems implemented in educational and governmental environments.

Design of Study

A survey of 500 SAP implementations was conducted. Examples of the survey questionnaire and cover letter are in Appendix A. The main objectives of the survey were to first determine if success was achieved after one year of ERP implementation, and if so what correlation exists between success and ERP focus.

Population and Sample

Participants in this study came from North and South American organizations that completed their implementation of ERP in their organization more than one year prior to the date of the survey. The ERP systems implemented were developed and marketed by SAP, the world's leading provider of ERP systems holding a 24% market share; some 6 points higher than the nearest single competitor Oracle (Panorama Consulting, 2011).

The population was selected because of SAP's leadership in the ERP industry and the demographic diversity in composition of SAP's user population. The population consists of over 3500 SAP users. A sample of 500 random SAP user organizations having completed implementation of ERP more than one year ago will be surveyed.

Data Collection and Instrumentation

Quantitative research often relies on survey instruments for data collection. Questions designed to research data specific to individual observations and then analyzed collectively form the basis for this research. The survey to be used in this research was previously developed and used in two prior publications (Al-Sehali, 2000; Harrison, 2004). The two instruments used in these dissertations were combined and modified to accommodate the combination of tools and prevent redundant questions.

The instrument contains four sections which include demographic information, expected results and benefits, implementation critical factors for success, modules implemented, and implementation concerns.

Data Collection

The survey instrument was made available via the Internet, to the sample under study via surveymonkey.com - an independent online survey organization. Five hundred randomly selected SAP implementations which have occurred in the past 3 years formed the base of the sample under research in this study. All participants were selected and contacted by an independent SAP user's association to inform members of the population of the survey. Two follow-ups were also sent by the organization to encourage participation in the survey. The initial contact from the organization to the sample was made approximately one week prior to the organization's first contact instructing the user group sample on how to take the survey. Approximately one week later, the organization sent a final request for participation in the survey.

Data Analysis

Data from the survey was coded and cleaned after downloading the data into Microsoft Excel. The data was loaded into the Statistical Package for the Social Sciences (SPSS) for Windows, version 14.0, and analyzed.

Method of Data Analysis

The analysis of variance (ANOVA) along with the mean and standard deviation was used to compare the observed data for all variables. Responses were grouped initially by response to success attribute questions. These groups were next tested for correlation to critical success factors indicating a focus on change in technology, focus on change management (with people affected by the change or culture change), and focus on

adaptation to best business practices. This data analysis formed the foundation for conclusions from this research.

DATA COLLECTION AND ANALYSIS

The initial email from the organization to the 500 members and subsequent follow-up email which included the 500 initial recipients plus another 100 randomly selected recipients (subsequently added to the population), resulted in a total of 239 responses, or 39.8% response rate (see Table 3). Sixty-six of these responses were not used because their implementations had occurred within the past year. An additional forty-seven responses were not used due to incomplete survey responses. The number of valid responses that were used totaled 126 representing a response rate of 21%. Table 3 illustrates the distribution of the respondents to the questionnaire.

The first section of this section describes the demographic information from the respondents based on their responses to the survey. Characteristics include the location of where the respondent company is based, annual sales of the company, responsibility of the respondent, industry in which the company participates, implementation status of ERP in the company, and ERP modules implemented. This section also addresses how respondents were segregated into successful versus unsuccessful categories.

The remaining sections discuss the statistical analysis of the each research question as restated below:

1. Is a focus on change to best business practices with which adoption of ERP systems promotes present in successful ERP implementations?

2. To what degree does the combined presence of focus on; a) the change in technology, b) change management, and c) change to best business practices, correlate to successful ERP implementations?

Table 3. Survey Response Rate

	<i>N/n</i>	% sample	% valid
Total Sample Size	600	100.0%	n/a
Total Responses	239	39.8%	n/a
Incomplete Responses	47	7.8%	n/a
Valid Responses to Survey*	126	21.0%	100.0%
Met At Least One Success Factor	64	10.7%	50.8%
Met No Success Factors	62	10.3%	49.2%
Met ROI Objective	41	6.8%	32.5%
Met All Objectives**	18	3.0%	14.3%

*Responses in which ERP was implemented more than 1 year prior to survey

**Met ROI and All Success Objectives

Respondent Demographic Information

The data for this research was collected from March to April 2007. The user organization members in the 600 member sample (all of which were located in North and South America) were randomly selected by the member organization and were contacted via email directly from the organization. The researcher used surveymonkey.com as the independent medium to survey, collect, and report the respondent's responses. Responses were grouped into two categories, successful (those responses in which the respondent indicated at least one success factor was present), versus unsuccessful (those responses in which the respondent indicated no success criteria had been met). The information from these two categories will be analyzed and compared to evaluate the research questions.

Information on the location of the company, organization type, annual sales of the company, position of the survey respondent, current implementation status of ERP within the company, size of the implementation team, management position making the decision to implement, other ERP vendors considered, implementation style, and ERP modules implemented, is presented in tables 4 – 13.

Location of the Companies

The location of the responding companies is presented in Table 4. Over 88% of the respondent organizations were based in the United States with the remaining 10% evenly distributed over Mexico, Canada, and outside North America. Successful versus non-successful organizations were nearly identical to these percentages with neither section significantly over or under the total response splits.

Organization Type

The type of organization in which ERP was implemented is presented in Table 5. The majority of the respondents were manufacturing companies (38.9% of the total) while government, food and beverage, and computer software and services ranked second, third, and fourth with 12.7%, 8.7% and 7.1% of the sample total, respectively. The percentages of success versus no success categories showed similar representation to the total sample, however, 13% fewer organizations were from the manufacturing area, and 10% more were from the government in the no success category versus the success category.

Table 4. Country Where Respondent's Company is Based

Country Based	Success		No Success		Total Responses	
	<i>n</i>	%	<i>n</i>	%	<i>N</i>	%
1 = United States	56	87.5	56	90.3%	112	88.9%
2 = Canada	3	4.7	2	3.2%	5	4.0%
3 = Mexico	1	1.6	1	1.6%	2	1.6%
4 = Other (Open Ended)	4	6.3	3	4.8%	7	5.6%

Table 5. Organization Type Where ERP Was Implemented

Organization Type	Success		No Success		Total Responses	
	<i>n</i>	%	<i>n</i>	%	<i>N</i>	%
1 = Banking & Finance	0	0.0%	0	0.0%	0	0.0%
2 = Computer Software & Service	4	6.3%	5	8.1%	9	7.1%
3 = Education	3	4.7%	1	1.6%	4	3.2%
4 = Food & Beverage	7	10.9%	4	6.5%	11	8.7%
5 = Government	5	7.8%	11	17.7%	16	12.7%
6 = Manufacturing	29	45.3%	20	32.3%	49	38.9%
7 = Retail	0	0.0%	1	1.6%	1	0.8%
8 = Telecommunications	0	0.0%	2	3.2%	2	1.6%
9 = Transportation	0	0.0%	0	0.0%	0	0.0%
10 = Utilities	4	6.3%	4	6.5%	8	6.3%
11 = Wholesale / Distribution	3	4.7%	3	4.8%	6	4.8%
12 = Other (open ended)	9	14.1%	11	17.7%	20	15.9%

Annual Sales

The annual sales of the respondent organizations are presented in Table 6. The largest number of organizations represented in the survey (31%) had annual sales between \$1 and \$5 billion dollars. The second (27%) and third (17.5%) largest categories of annual sales representing surveyed organizations reported sales of over \$5 billion and \$500 million to \$1 Billion, respectively. The responses for success and no success

categories were similar in rank and percent to the total response statistics with no significant deviation.

Table 6. Annual Sales of Respondent Organizations

Annual Sales	Success		No Success		Total Responses	
	<i>n</i>	%	<i>n</i>	%	<i>N</i>	%
1 = 0 to 10 Million	0	0.0%	1	1.6%	1	0.8%
2 = 10 Million to 100 million	3	4.7%	3	4.8%	6	4.8%
3 = 100 million to 250 million	5	7.8%	5	8.1%	10	7.9%
4 = 250 million to 500 million	5	7.8%	3	4.8%	8	6.3%
5 = 500 Million to 1 billion	11	17.2%	11	17.7%	22	17.5%
6 = 1 billion to 5 billion	17	26.6%	22	35.5%	39	31.0%
7 = over 5 billion	18	28.1%	16	25.8%	34	27.0%
Other	5	7.8%	1	1.6%	6	4.8%

Survey Respondent Position

The position of the respondent filling out the survey is presented in Table 7. The majority of the survey respondents are from the information technology discipline (79%). The majority of respondents appear to be in higher level positions with no significant difference in the number of respondents in success versus no success responses.

Table 7. Survey Respondent Position

	<u>Success</u>		<u>No Success</u>		<u>Total</u>	
	<i>n</i>	%	<i>n</i>	%	<i>N</i>	%
Information Technology						
Manager	34	53.1%	32	51.6%	66	52.4%
System Analyst	16	25.0%	16	25.8%	32	25.4%
Senior Manager	8	12.5%	7	11.3%	15	11.9%
Chief Finance Officer	0	0.0%	1	1.6%	1	0.8%
Internet Specialist	0	0.0%	1	1.6%	1	0.8%
Other	6	9.4%	5	8.1%	11	8.7%
Total	64	100.0%	62	100.0%	126	100.0%

Implementation Status

The implementation status of the respondent organizations is presented in Table 8. As mentioned earlier, organizations that indicated their implementation had taken place less than one year from the time of the survey were removed from valid responses in the sample. The reason for their removal is due to the fact that organizations need at least one year of ERP operation results in order to reasonably determine if ROI and success objectives have been met.

Over 48% of the respondent organizations reported implementing ERP more than 5 years prior to the survey, while 25.4% implemented ERP within 1 to 2 years prior to the survey. A significant difference was observed in the success versus no success categories with more than twice as many no success 1 to 2 years implementation were reported for no success (22 or 35.5%) than were in the success 1 to 2 years implementation category (10 or 15.6%). In addition, more than twice as many in the success category that implemented over 5 years prior were observed (41 or 64.1%) than in the no success category (20 or 32.3%).

Table 8. ERP Implementation Status of Respondent Organization

Implementation Status	Success		No Success		Total Responses	
	<i>n</i>	%	<i>n</i>	%	<i>N</i>	%
1 = Implemented 1 year of less	0	0.0%	0	0.0%	0	0.0%
2 = Implemented 1 to 2 years	10	15.6%	22	35.5%	32	25.4%
3 = Implemented 2 - 3 years	4	6.3%	6	9.7%	10	7.9%
4 = Implemented 3 - 4 years	7	10.9%	4	6.5%	11	8.7%

5 = Implemented 4 - 5 years	2	3.1%	10	16.1%	12	9.5%
6 = Implemented over 5 years	41	64.1%	20	32.3%	61	48.4%

Size of Implementation Team

The respondent's ERP implementation team size for each surveyed organization is presented in Table 9. The highest frequency of implementation teams were over 20 members large which also held true for success (73.4%) versus no success (79%) categories. Implementation teams with 10 to 20 members were the second highest frequency for both success (20.3%) and no success (14.5%) categories.

Table 9. Implementation Team Size

Size of Implementation Team	Success		No Success		Total Responses	
	<i>n</i>	%	<i>n</i>	%	<i>N</i>	%
1 = Less than 10	4	6.3%	3	4.8%	7	5.6%
2 = 10 to 20	13	20.3%	9	14.5%	22	17.5%
3 = More than 20	47	73.4%	49	79.0%	96	76.2%
Other	0	0.0%	1	1.6%	1	0.8%

Decision To Implement

The level of management within the respondent organization responsible for the decision to implement is presented in Table 10. Top Management was responsible for the decision to employ ERP in 54% of the sample followed Business Process Leaders / Business Unit Managers with 23% of the sample. The results of the success and no success categories were very similar to the overall sample results.

Table 10. Level of Management Making Decision to Implement

Decision to Implement	Success		No Success		Total Responses	
	<i>n</i>	%	<i>n</i>	%	<i>N</i>	%
1 = IT Dept	11	17.2%	9	14.5%	20	15.9%
2 = Business Process Leaders / Unit Managers	17	26.6%	12	19.4%	29	23.0%
3 = Top Management	32	50.0%	36	58.1%	68	54.0%
4 = Outside Consultants	3	4.7%	2	3.2%	5	4.0%
5 = Other	1	1.6%	3	4.8%	4	3.2%

Other ERP Vendors Considered

The number of organizations that considered other ERP vendors is shown in Table 11. A total of 27.8% (35) of the total 126 responses considered valid for the study did not consider any other ERP vendor for their implementation (25% or 16 of the success responses, 30.6% or 19 of the no success responses). Over 40% of all respondents looked at Oracle (SAP's top competition) and 33% looked at PeopleSoft (now a part of Oracle). In further analysis of the success versus no success category, the success respondent organizations looked at more ERP options 23.6% more of the time than the no success category.

Table 11. ERP Vendors Considered In Addition to SAP

Consider ERP Other than SAP	Success		No Success		Total Responses	
	<i>n</i>	%	<i>n</i>	%	<i>N</i>	%
No	16	25.0%	19	30.6%	35	27.8%
Yes, Oracle	27	42.2%	29	46.8%	56	44.4%
Yes, PeopleSoft	26	40.6%	16	25.8%	42	33.3%
Yes, JD Edwards	21	32.8%	10	16.1%	31	24.6%
Yes, Baan	13	20.3%	8	12.9%	21	16.7%
Yes, Other	10	15.6%	13	21.0%	23	18.3%

Implementation Style

The implementation style of the sample organizations used to implement ERP is shown in Table 12. Sample organizations chose the Phased Implementation Style 51.6% of the time while the Plunge Implementation Style was used 31% of the time. Success versus no success organizations were very similar in implementation style used. There was less than a 3% overall deviation for each category to the total sample.

Table 12. ERP Implementation Style Used By Sample Organizations

Implementation Style	Success		No Success		Total Responses	
	<i>n</i>	%	<i>n</i>	%	<i>N</i>	%
1 = Phased	32	50.0%	33	53.2%	65	51.6%
2 = Pilot	5	7.8%	7	11.3%	12	9.5%
3 = Parallel	5	7.8%	0	0.0%	5	4.0%
4 = Plunge	21	32.8%	18	29.0%	39	31.0%
5 = Don't Know	1	1.6%	4	6.5%	5	4.0%

Modules Implemented

The modules implemented by the respondent companies are shown in Table 13. Of the 24 module types questioned, over 90% of all organizations sampled implemented the general ledger, accounts payable, and finance module. The success category companies implemented the general ledger, accounts payable, and finance modules 98.4%, 98.4%, and 96.9% of the time, respectively, while the no success category companies showed 88.7%, 87.1%, and 87.1% implementation of the aforementioned modules, respectively. Of the entire 24 modules questioned, the success category

implemented all modules with the exception of 3, more of the time than did the no success organizations. The three categories in which no success outweighed success were Employee Self Service, Industry Solution, and Training and Events (no success weights 50%, 61.6%, and 48.4%, respectively, while success weights were 42.2%, 34.4%, and 35.9%, respectively).

Respondent Demographic Information Summary

The previous tables and study of the demographic information for all valid responses included in the survey show no bias in the valid responses from an overall standpoint and from a success versus no success standpoint. Notable demographic observations include:

1. The majority of organization types in the survey were manufacturing organizations.
2. The annual sales of the majority of the organizations were over \$1 Billion.
3. While 40% of the overall organizations with valid responses implemented greater than 1 but less than 4 years, 36% of the success responses indicated over 1 and less than 4 years of implementation (and 64% over 4 years) versus 52% of the no success responses indicating over 1 and less than 4 years of implementation (and 48% over years).
4. Twenty out of 24 ERP modules were implemented in more instances in responses indicating success versus no success.

Table 13. ERP Modules Implemented By Sample Organizations

	Success	No Success	Total
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	<i>n</i>	%	<i>n</i>	%	<i>N</i>	%
General Ledger	63	98.4%	55	88.7%	118	93.7%
Accounts Payable	63	98.4%	54	87.1%	117	92.9%
Finance	62	96.9%	54	87.1%	116	92.1%
Materials Management	59	92.2%	53	85.5%	112	88.9%
Accounts Receivable	59	92.2%	50	80.6%	109	86.5%
Cost Control	52	81.3%	50	80.6%	102	81.0%
Inventory Management	54	84.4%	46	74.2%	100	79.4%
Fixed Assets	49	76.6%	45	72.6%	94	74.6%
Budgeting	48	75.0%	45	72.6%	93	73.8%
Sales and Distribution	50	78.1%	41	66.1%	91	72.2%
Manufacturing and Logistics	50	78.1%	38	61.3%	88	69.8%
Human Resources	42	65.6%	40	64.5%	82	65.1%
Personnel	42	65.6%	39	62.9%	81	64.3%
Payroll	39	60.9%	37	59.7%	76	60.3%
Production Planning	44	68.8%	27	43.5%	71	56.3%
Warehouse Management	40	62.5%	31	50.0%	71	56.3%
Plant Maintenance	33	51.6%	32	51.6%	65	51.6%
Treasury Management	37	57.8%	27	43.5%	64	50.8%
Customer Service Management	36	56.3%	24	38.7%	60	47.6%
Project Management	32	50.0%	28	45.2%	60	47.6%
Employee Self Service	27	42.2%	31	50.0%	58	46.0%
Industry Solution (i.e. healthcare, utility, etc.)	22	34.4%	32	51.6%	54	42.9%
Training and Events	23	35.9%	30	48.4%	53	42.1%
Quality Management	27	42.2%	22	35.5%	49	38.9%

Success Versus No Success

As previously shown in Table 3, of the 239 total responses, 126 responses were usable for this research purpose. The 126 valid responses were examined for ERP operations which were deemed successful by their respondent's responses, versus those deemed not successful. In the survey, there are nine criteria in which achieving success in ERP systems were measured. Respondents indicating the presence of one of more of

these factors were considered to have achieved success in adoption of their ERP system.

The nine criteria measured as a part of the survey are:

1. Realized expected Return on investment
2. Realized ROI > 5%
3. Increased productivity => 2%
4. Reduced operational cost by 5%
5. Experienced reduction in scheduling and planning cycle > 50%
6. Experienced reduction in delivery times => 10%
7. Realized reduction in production time => 10%
8. Reduced inventory stock =>10%
9. Reduced late deliveries => 25%

These nine criteria were derived from the quantitative success factors cited in the “Attributes For Success” section of the Literature Review.

As shown in Table 3 previously, 64 of the 173 valid responses met at least one or more of the ERP surveyed success factors, leaving the remaining 62 of which responses indicated that no success factor was achieved.

Analysis of Research Question

Research questions were analyzed based on the data received from the surveys. Each observation in the survey contained a response to attribute questions, as well as a coded indication of whether the respondent indicated his/her organization’s implementation was a success (one or more success variables present) or not a success (no success in which no success variables were present), as determined from prior analysis described earlier. The data from these attribute responses was examined and summarized. Analysis of the data was conducted using the Statistical Package for the Social Sciences (SPSS) for Windows and included the following tests: the frequency of attributes for success versus no success implementations, correlation of attributes to

success and no success, and significance of difference for each attribute as it relates to success versus no success observations.

In an effort to determine the tests most suitable for use, the data was first tested to evaluate the normality assumption. A visual observation of data graphed in a histogram, and the Kolmogorov-Smirnov test was conducted to evaluate the normality assumption. Based on these two tests, the normality assumption failed for all attributes in all categories. As a result, three non-parametric tests were selected; – the Spearman Rank Correlation for correlation testing purposes, the Kruskal-Wallis test, and the Mann Whitley test for test of significant differences.

The first research question:

Is a focus on change to best business practices with which adoption of ERP systems promotes present in successful ERP implementations?

is formulated into the following null hypothesis and alternate hypothesis for study purposes:

Ho: Focus on change to best business practices required by an ERP adoption is not necessary for a successful ERP implementation.

Ha: Focus on change to best business practices required by an ERP adoption is necessary for a successful ERP implementation

The survey questions used to analyze research question 3 are as follows:

Please indicate the extent to which the statements below are true for your organization's implementation.

- b. The project team was knowledgeable about ERP and business processes.
- l. Our organization mapped and reengineered our business processes to match the ERP processes.
- q. Our organization adopted best business practices during the ERP implementation.

Because of implementing ERP software, my organization has:

- i. redesigned business processes to mirror best business practices.
- j. improved customer relationship or supply chain management.

Table 14. Frequency of Best Business Practices Focus Attributes

	Frequency of Non-Successful Implementations Focusing on Best Business Practices							
	Yes		Somewhat		No			
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%		
Project Team Knowledgeable RE ERP & Bus Process	23	37.1%	29	46.8%	10	16.1%		
Org mapped and reengineered business processes to ERP	13	21.0%	37	59.7%	12	19.4%		
Organization adopted best business practices	18	29.0%	28	45.2%	16	25.8%		
	Expected		Expected		Not Expected		Not Expected	
	Realized		Not Realized		Realized		Not Realized	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Redesigned business process to mirror best business practices	16	25.8%	41	66.1%	0	0.0%	5	8.1%
Software easily adaptable to business changes	8	12.9%	43	69.4%	1	1.6%	10	
	Frequency of Successful Implementations Focusing on Best Business Practices							
	Yes		Somewhat		No			
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%		
Project Team Knowledgeable RE ERP & Bus Process	27	42.2%	31	48.4%	6	9.4%		
Org mapped and reengineered business processes to ERP	26	40.6%	26	40.6%	12	18.8%		
Organization adopted best business practices	35	54.7%	28	43.8%	1	1.6%		
	Expected		Expected		Not Expected		Not Expected	
	Realized		Not Realized		Realized		Not Realized	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Redesigned business process to mirror best business practices	41	64.1%	17	26.6%	3	4.7%	3	4.7%
Software easily adaptable to business	33	51.6%	21	32.8%	2	3.1%	8	

changes

Table 14 shows the frequency of focus on best business practices attributes for success versus no success implementations. All five attributes showed higher frequency in observations where success was observed as opposed to observations where success was not observed.

A non-parametric test – the Spearman Rank Correlation, was used to analyze the best business practices focus attributes for correlation by attribute to success in ERP implementation. Table 15 shows the results of the Spearman Rank Correlation.

Table 15. Spearman’s Correlation Rank for Focus on Best business practices

	<u>Spearman's</u> <u>Correlation</u> <u>Coefficient</u>	<u>Sig. (2-</u> <u>tailed)</u>
Project Team Knowledgeable RE ERP & Bus Process	0.081	0.367
Org mapped and reengineered business processes to ERP	0.148	0.101
Organization adopted best business practices	0.081	0.370
Software easily adaptable to business changes	0.072	0.451
redesigned business process to mirror best business practices	0.047	0.622

Sig. (2-tailed) p test < .05 indicates a significant correlation

The Spearman Correlation shows insufficient evidence exists for any of the five attributes to indicate a correlation exist between the attribute and a successful ERP implementation.

The Mann Whitley test was conducted to determine if a significant difference in the distribution of observations indication success in ERP as correlated to the focus attributes. The Mann Whitley test for significance shows that none of the 5 attributes

have Asymp. Sig. (2-tailed) values less than .05, which indicate a significant difference in the distribution of best business practices attributes for success versus no success observations.

Based on the results of the Spearman Correlation Rank and the Mann Whitley test for best business practices focus attributes, there is insufficient evidence to conclude best business practices focus attributes are necessary for a successful ERP implementation. Therefore, the null hypothesis is not rejected. While the frequency of these attributes is evident in more successful implementations than non-successful, this conclusion is supported by the results of the Spearman Correlation Rank and Whitney Mann tests.

The second research question:

To what degree does the combined presence of focus on: a) the change in technology, b) change management, and c) change to best business practices, correlate to successful ERP implementations?

is formulated into the following null hypothesis and alternate hypothesis for the purpose of this study:

Ho: Focus on a combined change of best business practices, change management, and technology change required by an ERP adoption is not necessary for a successful ERP implementation.

Ha: Focus on a combined change of best business practices, change management, and technology change required by an ERP adoption is necessary for a successful ERP implementation.

Previous research has observed when implementing ERP, a focus on change management within the organizations as well as outside of the organization, is significantly related to a successful ERP implementation. Emphasis on how the new ERP system impacts employees, suppliers, and customers, as well as emphasis on transitioning

the old system to the new are critical to the success of the project (Thomas, 2007). In addition, previous research has concluded that SAP ERP implementations in North and South America show little to no correlation to focus on change in technology (Thomas, 2007). The final research question and hypothesis focus on the success of combined foci in these two areas as well as deployment of best business practices.

The frequency of combined categorical attribute factors is shown in Table 16. Factors were tested for conditions where all technology change attributes were present, all change management attributes were present, all best business practice attributes were present, a combination of all three categories, and three combinations of two categories is shown for all observances, those observances where success was indicated, and those observances where no success was indicated.

Table 16. Frequency of Combined Categorical Attribute Factors

	All		Success		No	
	Observations		Success		Success	
	<i>N</i>	%	<i>n</i>	%	<i>n</i>	%
All Change Management Factors Present	52	41%	34	53%	18	29%
All Technology Change Factors Present	49	39%	25	39%	24	39%
All Best Business Practices Factors Present	50	40%	32	50%	18	29%
All Change Management and All Technology Change Factors	28	22%	16	25%	12	19%
All Change Management and All Best Business Practices	27	21%	21	33%	6	10%
All Technology Change and All Best Business Practices	26	21%	16	25%	10	16%
All Factors Present	15	12%	10	16%	5	8%

For each condition cited above, success observances outweighed no success observances. The stronger observances were for all factors present and for all observances where all conditions other than a change in technology were present.

The Spearman Correlation Rank and the Mann-Whitney test were conducted for further substantiation of the frequency results of combined categorical attribute factors. These tests are shown in Tables 24 and 25, respectively.

Table 17. Spearman Correlation Rank Test on Combined Attribute Factors

	<u>Spearman Correlation Rank</u>	<u>Correlation Coefficient</u>
	<u>Sig. (2-tailed)</u>	
All Change Management Factors Present	0.006	0.245
All Technology Change Factors Present	0.968	0.004
All Best Business Practices Factors Present	0.016	0.214
All Change Management and All Technology Change Factors	0.193	0.117
All Change Management and All Best Business Practices	0.001	0.068
All Technology Change and All Best Business Practices	0.450	0.282
All Factors Present	0.222	0.110

Sig. (2-tailed) *p* test < .05 indicates a significant correlation

The Spearman Correlation Rank showed significance for all change management attributes, all best practices attributes, and the combined all change management and all best practices attributes. In addition, the Mann-Whitney test showed significance for the same groups. The mean ranks for all change management factors of 70.97 and 55.79 for success versus no success, respectively, for all best business practices factors of 70.00 and 56.79 for success versus no success, respectively, and for all change management and

all best business practices combined of 70.67 and 56.10 for success versus no success, respectively, indicated in each case as more of the combined two attributes are present, the greater the chances for success in ERP implementation.

Table 18. Mann-Whitney Test on Combined Attribute Factors

	<u>Sig. (2-tailed)</u>	<u>Mann Whitley Test</u>	
		<u>Success</u>	<u>No Success</u>
All Change Management Factors Present	0.006	70.97	55.79
All Technology Change Factors Present	0.968	63.61	63.39
All Best Business Practices Factors Present	0.017	70.00	56.79
All Change Management and All Technology Change Factors	0.448	65.84	61.08
All Change Management and All Best Business Practices	0.002	61.69	65.25
All Technology Change and All Best Business Practices	0.220	70.67	56.10
All Factors Present	0.192	66.25	60.66

Sig. (2-tailed) *p* test < .05 indicates a significant correlation

An analysis of the qualitative questions regarding problems encountered with ERP implementations shows 15 of the 126 valid observations made comments regarding problems experienced with change management. Of the 15 comments, 9 came from ERP implementations which indicated no success attributes. In addition, the qualitative question regarding recommendations of the respondent if they had to implement ERP over again indicated 9 respondents recommending better change management. Six of the

9 qualitative questions regarding recommendations for future ERP implementations indicated no success attributes.

Considering the results of the frequency, Spearman Correlation Rank, and Mann-Whitely test, there is insufficient evidence to conclude a combination of all three focus factors leads to more successful ERP implementations. However, there is sufficient evidence to conclude a combination of two focus factors (change management and best business practices) leads to more successful ERP implementations. Therefore, a modified null and alternate hypothesis is created:

Ho: Focus on a combined change of best business practices, and change management required by an ERP adoption is not necessary for a successful ERP implementation.

Ha: Focus on a combined change of best business practices, and change management required by an ERP adoption is necessary for a successful ERP implementation.

Considering the significant evidence to support a combined focus on change in best business practices and change management in ERP implementations do lead to more successful ERP adoptions, the original and modified null hypotheses are rejected and the modified alternate hypothesis is accepted.

RESULTS, CONCLUSIONS, AND RECOMMENDATIONS

Summary of the Findings

A summary of the findings of the research in response to the first research questions follows.

The first research question:

Is a focus on change to best business practices with which adoption of ERP systems promotes present in successful ERP implementations?

demonstrated the following observations:

In analyzing the descriptive statistics analysis of frequencies, the study of this research question shows all five attributes tested showed a higher frequency in observations where success was observed in ERP implementations. This suggests that the presence of focus on best business practices occurs more often in successful ERP implementations than in no success ERP implementations.

The Spearman Correlations Rank and the Mann Whitley test were both used to further analyze the data for any correlation that would exist between the 5 attributes and successful ERP implementations. Both the Spearman Correlation Rank and the Mann Whitley test showed no correlation to be present in any of the 5 attributes as tested for correlation to successful ERP implementation.

Due to the conflict in results of the analysis of frequency versus the Spearman Correlation Rank and the Mann Whitley test, it can be concluded a lack of evidence exists to show correlation of best practice attributes to successful ERP implementations.

The second research question:

To what degree does the combined presence of focus on: a) the change in technology, b) change management, and c) change to best business practices, correlate to successful ERP implementations?

demonstrated the following observations:

In analyzing data for conclusions to this research question, the descriptive statistics analysis of frequencies for presence of all attribute factors in each category (focus on change management, focus on change in technology, and focus on best business practices), as well as the presence of attribute factors in combined categories (focus on change management and change in technology, focus on change management and best business practices, and focus on change in technology and best business practices) were analyzed for success ERP implementations versus no success ERP implementations. For each category and the combined categories, the presence of all attribute factors was observed in successful ERP implementations versus no success ERP implementations.

To confirm these results and test for correlation of success ERP implementations, the Spearman Correlation Rank and the Mann-Whitney test were used to further analyze the data. The Spearman Correlation Rank showed significance for tests on observances in which all change management attributes were present, all best practices attributes were present, and the combination of all change management and all best business practice attributes were present. The Mann-Whitney test showed identical results to the results of the Spearman Correlation Rank for all instances where successful ERP implementations were observed.

Examination of responses to qualitative questions in the survey show in 15 (of 126) valid observations report problems experienced with change management. Nine of the 15 observations were from no success ERP implementations.

While insufficient evidence exists to confirm a correlation between the combined existence of all attribute factors in all three categories under study (focus on change in

technology, focus on change management, and focus on best business practices) exists with successful ERP implementations, there is sufficient evidence to conclude a correlation exists between successful ERP implementations and combined focus on change in best business practices and change management in ERP implementations.

Conclusions

Based on the findings of this research, the following conclusions were formulated in regard to ERP implementations using SAP in North and South America:

The first conclusion of the research is while correlations did not exist for 2 of 3 individual focus attribute groups (focus on technology and focus on best business practices), nor for 3 of 4 combinations of focus attribute groups (technology and best business practices, technology and change management, and technology, best business practices, and change management), all but one attribute was present in more successful ERP implementation observations, than in no success ERP implementations. This conclusion supports the creditability of the critical success factors of which each focus group was comprised, as well as the fact that presences of these critical success factors and/or focus attributes makes an organization implementing ERP more likely to succeed than to not succeed.

When SAP ERP systems are implemented, 50.8% of implementations show successful results when success is measured in terms of achieving at least one success attribute which include realizing target return on investment, realizing return on investment greater than 5%, increasing productivity by at least 2%, reducing operational cost by at least 5%, reduce scheduling and planning of more than 50%, reduction in

delivery time by at least 10%, reduction in production time by at least 10%, reduction in inventory by at least 10%, or reduction in late deliveries by at least 25%. The research also shows that ERP implementations using SAP meet their return on investment objective 32.5% of the time, and reach all previously mentioned success attributes 14.3% of the time.

While successful ERP implementations show no significant relationship to a focus on best business practices to success, and while a focus on change management shows a significant, yet marginal correlation to successful ERP implementation, the combination of a focus on change management and best business practices creates a synergistic significant relationship to successful ERP implementations. This conclusion suggests that while most ERP implementations will succeed with a focus on change management and a lack of focus on best business practices, the presence of a focus on both change management and best business practices yields significant success compared to a simple focus on change management.

Recommendations for Practice

The intent of this research was to identify correlation between successful implementation of ERP and the presence and/or absence of target areas of implementation focus – a change to best business practices, a change in technology, and /or focus on change management. Based on the conclusions and findings, the researcher suggests the following recommendations to organizations implementing SAP ERP in North and South America:

- 1) It is recommended that organizations considering ERP system implementations consider the success versus no success rate of success as

gained from employing ERP before they commit to the ERP initiative. It is recommended that they consider the demonstrated rate of success strongly as the commitment, attention, discipline, and change required for successful implementations is significant.

- 2) It is recommended that all organizations implementing ERP consider all critical success factors, success attributes, and groups of success attributes when planning for ERP implementations.
- 3) It is recommended that top management be informed of the commitment to an ERP implementation (including the amount of resources necessary for successful ERP implementations, the critical success factors necessary for ERP implementations, and the demonstrated results of failures (i.e. running over budget) in order to prepare and make contingency plans for the possible impact of ERP implementations.
- 4) It is recommended that organizations educate users, management, suppliers, and customers that while ERP does incorporate an adoption of new technology and focuses to some degree on an information system based approach, a focus on change management and best business practices is much more critical to success, than focusing on the change in technology.

Recommendations for Future Research

While this study provides comprehensive research to the presence of significant focus for successful ERP implementations, it raises additional questions for further research. Recommendations for further research include the following:

Conduct a study of Oracle and other ERP implementations to compare to the SAP results. Test for similar findings noting the similarities and differences between different ERP vendor offerings as correlated to successful ERP implementations.

- 1) Conduct a study focusing on support of top management identifying top management support attributes, and correlated each to ERP success. Strive to validate and further understand why no correlation in support of top management existed for successful ERP implementations.
- 2) Conduct a study to understand and validate why a focus in change in technology showed no significance. Compare the various ERP vendors to test for differences in the focus on technology attribute for organizations favoring particular vendors from a technology standpoint.
- 3) Conduct a qualitative study of various organizations adopting ERP interviewing front line employees, middle managers, and upper managers, to understand their goals (success measures) for ERP in their respective organizations. Include a correlation of critical success factors to those goals, and contrast measurement of success at upper, middle, and front line positions.
- 4) Conduct a study to validate and further understand the success measures specific to organizations measuring ERP success.
- 5) Conduct a study to further define best business practices of organizations within different industry types for both service and manufacturing organizations.
- 6) Conduct a study of correlation of individual ERP modules and the combination of ERP modules to ERP success measures.

REFERENCES

- Adam, F., & O'Doherty, P. (2000). Lessons from enterprise resource planning implementations in Ireland - towards smaller and shorter ERP projects. *Journal of Information Technology*, 15(4), 305 - 316.
- Al-Sehali, S. (2000). The factors that affect the implementation of enterprise resource planning (ERP) software in the International Arab Gulf States and United States Companies with special emphasis on SAP software. Dissertation Abstracts International, (UMI No. 9992042).
- Anderegg, T. (2000). *ERP: A-z implementer's guide for success*. Eau Claire, WI: Resource Publishing.
- Bradford, M., Roberts, D. (2001). Does your ERP measure up? *Strategic Finance*, 83(3), 30-34.
- Buckland, M. K. (1991). *Information and information systems*. New York: Greenwood Press.
- Chen, I. J. (2001). Planning for ERP systems: Analysis and future trend. *Business Process Management Journal*, 374 - 386.
- Creswell, J. W. (2003). *Research design: Qualitative, quantitative and mixed methods approaches* (2nd ed.). Thousand Oaks, CA: Sage.
- Davenport, T. H. (1998). Putting the enterprise into the enterprise system. *Harvard Business Review*, 76(4), 121 - 131.
- Davis, M. M., & Heineke, J. (2005). *Operations management - integrating manufacturing and services* (5th ed.). New York: McGraw-Hill Irwin.
- Debons, A., Horne, E. E., & Cronenweth, S. (1988). *Information science: An integrated view*. Boston: G.K. Hall.
- Debons, A., & Larson, A. G. (1983). *Information science in action: System design*. The Hague; Boston: M. Nijhoff; Distributors for the U.S. and Canada.
- Enterprise resource implementation still tough. (2001). *IIE Solutions*, 33(8), 19.
- Falkowski, G., Pedigo, P., Smith, B., & Swanson, D. (1998). A recipe for ERP success. *Beyond Computing*, 44 - 45.
- Fryer. (1999). The ROI challenge. *CFO*, 15(9), 85-89.
- Gale, S. (2002). For ERP success, create a culture change. *Workforce*, 81, 88-91.

- Griffith, T. L., Zammuto, R. F., & Aiman-Smith, L. (1999). Why new technologies fail. *Industrial Management*, 41(3), 29 - 34.
- Hammer, M. (1993). *Reengineering the corporation: A manifesto for business revolution*. New York: HarperCollins.
- Harrison, J. L. (2004). *Motivations for enterprise resource planning (ERP) system implementation in public versus private sector organizations*. Unpublished Dissertation, University of Central Florida, Orlando, Florida.
- Hislop, D., Newel, S., Scarbrough, H., & Swan, J. (2000). Networks, knowledge and power: Decision making, politics and the process of innovation. *Technology Analysis & Strategic Management*, 12, 399-412.
- Holland, C. P., Light, B., & Gibson, N. (1999). A critical success factors model for enterprise resource planning implementation. *Proceedings of the 7th European Conference on Information Systems*, 1, 273 - 297.
- Honig, S. (1999). The changing landscape of computerized accounting systems. *The CPA Journal*, 69(5), 14 - 19.
- Hsiuju, R. Y., & Chwen, S. (2004). Aligning ERP implementation with competitive priorities of manufacturing firms: An exploratory study. *International Journal of Production Economics*, 92(3), 207 - 220.
- John Wiley and Sons, L. (2003). *Dictionary of e-business*.
- Kingsmill, D., Bishop, D., Smith, J., Brown, D., Kearns, P., Phelps, R., et al. (2005). 'a company is nothing without its people. What are you afraid of?' *Personnel Today*, 16 - 17.
- Klynveld Main Goerdeler Peat Marwick International (KPMG). (1997). *Profit-focused software package implementation*. London: KPMG Consulting Group.
- Kraemmerand, P., Møller, C., & Boer, H. (2003). ERP implementation: An integrated process of radical change and continuous learning. *Production Planning & Control*, 14(4), 338 - 348.
- Kuhn, T. (1962). *The structure of scientific revolutions*. Chicago, IL: University of Chicago Press.
- Lutchen, M. D. (2004). Managing it as a business. *Financial Executive*, 20(5), 50-52.
- Markus, M., Axline, S., Petrie, D. & Tanis, C. (2000). Learning from adopters' experiences with ERP: Problems encountered and success achieved. *Journal of Information Technology*, 15, 245-265.

- Markus, M. L., & Tanis, C. (2000). The enterprise systems experience from adoption to success. In *Framing the domains of it management: Projecting the future through the past*. Ohio: Pinnaflex Educational Resources.
- O'Brien, J. A. (2005). *Introduction to information systems* (12th ed.). New York: McGraw-Hill Irwin.
- O'Leary, D. (2002). Discussion of information system assurance for enterprise resource planning systems: Unique risk considerations. *Journal of Information Systems*, 16, 115-126.
- Oden, H., Langenwalter, G., & Lucier, R. (1993). *Handbook of material and capacity requirements planning*. New York: McGraw-Hill.
- Oliver, D., & Romm, C. (2002). Justifying enterprise resource planning adoption. *Journal of Information Technology*, 17(4), 199 - 214.
- Panorama Consulting Group (2011). *2011 ERP Vendor Analysis*, Copyright 2011 Panorama Consulting Group, 2.
- Porter, M. E. (1980). *Competitive strategy - techniques for analyzing industries and competitors*. New York: The Free Press.
- Porter, M. E. (1985). Competitive advantage - creating and sustaining superior performance.
- Porter, M. E. (2001). Strategy and the internet. *Harvard Business Review*, 79(3), 62 - 78.
- Porter, M. E., & Millar, V. E. (1985). How information gives you competitive advantage. *Harvard Business Review*, 63(4), 149 - 160.
- Ptak, C. (1999). ERP implementation - surefire steps to success (Vol. 1999): ERP World Proceedings.
- Ptak, C., & Schragenheim, E. (2000). *ERP: Tools, techniques, and applications for integrating the supply chain*. Boca Raton, FL: St. Lucie Press.
- Ragowsky, A., & Somers, T. M. (2002). Special section: Enterprise resource planning. *Journal of Management Information Systems*, 19(1), 11 - 15.
- Rajagopal, P. (2002). An innovation—diffusion view of implementation of enterprise resource planning (ERP) systems and development of a research model. *Information & Management*, 40(2), 87 - 114.
- Ribbers, P., Schoo, K.C. (2002). Program management and complexity of ERP implementations. *Engineering Management Journal*, 14, 45-52.

- Robey, D., Ross, J. W., & Boudreau, M.-C. (2002). Learning to implement enterprise systems: An exploratory study of the dialectics of change. *Journal of Management Information Systems*, 19(1), 17 - 46.
- Rosario, J. G. (2000). On the leading edge: Critical success factors in ERP implementation projects. *Business World*, 27.
- Roth, A. V., & van der Velde, M. (1991). Operations as marketing: A competitive service strategy. *Journal of Operations Management*, 10(3), 303 - 328.
- Rowe, F. (1999). Coherence, integration informationnelle et chagement: Esquisse d'un programme de recherché a partir des progiciels integres de gestion. *Systemes d'Information et Management*, 4, 3-20.
- Scalle, C. X., & Cotteleer, M. J. (1999). *Enterprise resource planning (ERP)*. Boston: Harvard Business School Publishing.
- Scherpenseel, C. (2003). Getting more from an ERP investment. *Financial Executive*, 19(5), 52-54.
- Shanks, G., Parr, A., Hu, B., Corbitt, B., Thanasankit, T., & Seddon, P. (2000). *Differences in critical success factors in ERP systems implementation in australia and china: A cultural analysis*. Paper presented at the Proceedings of the 8th European Conference on Information Systems, Vienna, Austria.
- Skinner, W. (1969). Manufacturing--missing link in corporate strategy. *Harvard Business Review*, 47(3), 136.
- Somers, T. M. t., & Nelson, K. G. (2004). A taxonomy of players and activities across the ERP project life cycle. *Information & Management*, 41(3), 257- 278.
- Stein, T. (1999). Making ERP add up - companies that implemented enterprise resource planning systems with little regard to the return on investment are starting to look for quatifiable results. *Information Week*, 24, 59.
- Stevens, T. (1999). Consulting's new era. *Industry Week/IW*, 248(15), 24 - 27.
- Sumner, M. (2000). Risk factors in enterprise-wide ERP projects. *Journal of Information Technology*, 15, 317-327.
- Sweat, J. (1998). ERP-enterprise application suites are becoming a focal point of business and technology planning. *InformationWeek*, 26.
- Umble, E. J., Haft, R. R., & Umble, M. M. m. (2003). Enterprise resource planning: Implementation procedures and critical success factors. *European Journal of Operational Research*, 146(2), 241 - 257.

- Wikipedia. (2006). Wikipedia - the free encyclopedia. Retrieved November 17, 2006, 2006, from http://en.wikipedia.org/wiki/Change_management
- Wilder, C., & Davis, B. (1998, November 30). False starts strong finishes. *InformationWeek*, 41 - 46.
- Willcocks, L. P., & Sykes, R. (2000). The role of the CIO and it function in ERP. *Communications of the ACM*, 43, 32-38.
- Wright, S., & Wright, A. (2002 Spring Supplement). Reply to discussion of information system assurance for enterprise resource planning systems: Unique risk considerations. *Journal of Information Systems*, 16, 127 - 130.
- Yusuf, Y., Gunasekaran, A., & Abthorpe, M. S. (2004). Enterprise information systems project implementation: A case study of ERP in rolls-royce. *International Journal of Production Economics*, 87(3), 251 - 266.

PLANNING FOR SUCCESS WITH CUSTOMER RELATIONSHIP MANAGEMENT SYSTEM (CRM) IMPLEMENTATIONS

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Abstract

According to the IT research group, Gartner Group, Customer Relationship Management (CRM) is emerging as a top priority for today’s businesses. Building and maintaining a solid working relationship with customers is essential to long-term business survival. Today’s businesses implement CRM initiatives within strategic plans to fully understand, satisfy and maintain customers. Companies failing to implement CRM initiatives could face declining market shares. Today’s competitive businesses protect customer data as a valuable asset and develop information systems to manage and share customer data throughout all levels of the organization; ensuring customer focus is prevalent everywhere. Because customer data is vital to all organizations, taking the time to properly plan CRM implementations is critical. This research paper examines best practices and strategies for project teams in designing and implementing CRM systems for today’s businesses.

INTRODUCTION

Customer based decisions are at the center of business survival and evaluation in all competitive consumer markets. Focusing attention on the details associated with attraction and retention of customers is more important now than ever. Rosenbert & Czepiel (1984) estimated that the cost of winning a new customer is five times higher than that of maintaining an existing customer. We must assume this statistic has increased over the last 25 years due to the explosion on ecommerce and online purchases and the international market place. Reichhel & Sasser (1990) estimate the retention of an additional 5% of customers can increase profit by nearly 100%. Research proves spending dollars on maintaining customer relationships is cost effective and should become a key aspect of business strategies, prompting Customer Relationship Management implementations (Morgan & Hung, 1994; Kim, 2003).

CRM systems attempt to maximize customer value and loyalty in the long term, by focusing business processes, marketing and customer service on client relationship maintenance within an information technology system. CRM implementations are not cure-all solutions capable of transforming production-oriented organizations into customer-oriented organizations (Chen & Popovich, 2003). Interest in CRM started to boom in the 1990s (Ling & Yen 2001) when firms began to recognize the value of establishing information systems that support a two way exchange between customers so that firms could address intimate knowledge of their needs, wants, and study buying habits. Enhancing customer relationships can lead to greater loyalty, retention, and profits for organizations.

AN OVERVIEW OF CUSTOMER RELATIONSHIP MANAGEMENT

From the 1950s and 1960s business were consumed with producing goods and services to satisfy growing demand and using marketing techniques to capture customers entering the market place (Brooks & Palmer, 2004). In today's market place, businesses are competing in a very different manner. Marketing (product, price, place, and promotion) alone is no longer sufficient to maintain customer loyalty (Denison & McDonald, 1995). Relationship marketing was established to assist in building unique

relationships with customers and assist in adding more value to goods and services than traditional product, price, place, promotion marketing would allow. Relationship marketing is about building long-term relationships, reflecting a transaction-relationship continuum (Webster, 1992).

There are various definitions for Customer Relationship Management. One author defines it as “a set of business processes and overall policies designed to capture, retain and provide service to customers” (Scott, 2001). Another author defines CRM as “a coherent and complete set of processes and technologies for managing relationships with current and potential customers and associates of the company, using the marketing, sales and service departments, regardless of the channel of communication” (Chen and Popovich, 2003). Research shows CRM definitions could be defined into two categories, strategic or operational.

In general, CRM is a broad term for managing a business’ interactions with its customers. Effective CRM is about acquiring, analyzing and sharing knowledge about customers. Total CRM covers one’s direct business contracts with customers, channels partners’ indirect contacts with customers and customers’ contract management in the supply chain. More importantly, it allows a business to focus and target on the customer directly. CRM is a highly fragmented environment and has to come to mean different things to different people (McKie, 2000). For some organizations, CRM means direct emails with customers, for others, it is mass customization or developing products that fit individual customer’s needs. For IT consultants, CRM typically translates into IT terminology related to databases and concepts like on-line analytical processing and customer interaction centers.

One concept of CRM is the utilization of customer related information or knowledge to deliver relevant products or services (Levine, 2000). While CRM definitions are wide ranged, they tend to offer a narrow insight into the goals, basic characteristics and the overall intent for a CRM system. As CRM continues to evolve, its definitions will continue to evolve along with it. Light (2001) believes that CRM evolves from business processes such as relationship marketing and then increases emphasis on improved customer retention through the effective management.

This remainder of this research paper defines CRM as a strategic approach that integrates processes, people, and technology to understand an organization’s customers,

improve stakeholder value, and deliver profitable and long-term relationships with customers.

Components to CRM Systems

CRM consists of three major components: Technology, People, and Business Processes. Technology refers to computing capabilities that allow organizations to collect, analyze, trend, organize, save, and process data about its customers. Information technology based systems enable CRM systems to achieve their objectives of collecting, classifying, saving and processing valuable data on customers. Integrating information based technology systems allows organizations to develop better relationships with customers by providing a wider view of the customer behavior (Thompson 2006); ultimately increasing the quality of customer service organizations provide. Effective CRM systems demand organizations to integrate IT resources to improve the capabilities of understanding customer behavior, develop predictive models about the customer, build effective communications with customers and respond to those customers with real time and accurate information (Chen and Popovich 2003).

Employees and customers are a key factor for successful CRM projects. CRM is built around customers to manage beneficial relationships through acquiring information on different aspects of customers. The primary objective of CRM is to translate the customer information into customized products and services that meet the changing needs of customers in order to achieve their loyalty. A full commitment of the organization's staff and management is critical for an effective CRM implementation to best serve customers and satisfy their needs.

CRM is a business strategy that has its philosophical basis in relationship marketing (Chen and Popovich 2003). CRM success requires tailoring business processes around the customer. All business processes that involve both direct and indirect interaction with customers should be analyzed and assessed (Mendoza 2007). An effective CRM system has an organization-wide impact and requires processes that directly interact with customers be dealt with as a priority when integrating and automating business processes. The main business processes that should be addressed in CRM implementation are marketing, sales, and services.

WHY CRM IMPLEMENTATIONS FAIL

CRM systems fail to meet their business objectives for several reasons. Some reasons are inevitable, however many can be avoided (Payne, 2004). On average, CRM failure is caused by the complexity of technical and organizational issues that are associated with CRM implementation (Goodue 2002).

Research indicates the primary reasons CRM implementations fail are for the following: lack of senior management support, failure to align internal customer processes, failure to link CRM initiatives to the organization's higher-level strategies, failure to focus on CRM ROI. Chalmeta (2006) has identified the following factors for CRM failure:

- Thinking of CRM as a pure technology
- Lack of upper management support
- Lack of customer-centric vision
- Lack of readiness process
- Poor quality data
- Lack of change management
- Lack of vision and strategy
- Lack of involving the end user in designing the CRM system
- Failing to re-engineer business processes
- Underestimating difficulties with data mining and data integration

Forsyth (2001) argues the primary causes of CRM implementation failures are related to the following:

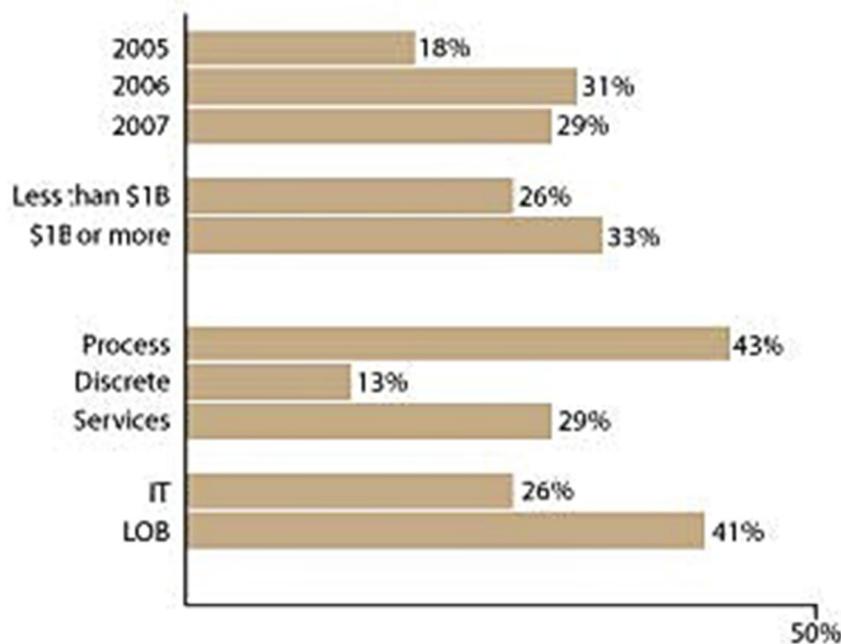
- Organizational Change (29%)
- Company polices/inertia (22%)
- Little understanding of CRM (20%)
- Poor CRM Skills (6%)

Research indicts the overwhelming reason why CRM implementations fail is due to lack of senior management support and failure to develop a CRM strategic plan. Rigby (2002) highlights four objectives for CRM implementations that must be overcome: Implementing CRM prior to developing a customer strategy, rolling out CRM before

changing an organization to align with the new or existing business processes, assuming that more CRM technology is better. However, other factors such as lack of focus on human/social dynamics (employee and customers) were the main problems behind CRM implementations researched by King and Burgess (2007). Additional key misconceptions made by organizations that have been identified to lead to CRM implementation failures are the assuming CRM is equal to customer acquisition / customer satisfaction is equal to customer loyalty and focusing only on profitable customers.

Figure (1) displays a graph from ARM Research that details percentages of CRM implementations that failed to go live from 2005 – 2007.

Figure 1: Customer management software implementation failures



% Respondent: that have experienced any implementation failures that kept them from "going live" in any of these areas

Source: AMR Research, 2007

Figure 1: CRM Implementation Failures

PLANNING FOR SUCCESS

Much research has been conducted to identify critical factors leading to CRM implementation success. Table (1) lists key factors leading to CRM success from various researchers.

TABLE 1: CRM Success Factors

Kings & Burgess (2007)	Chalmeta (2005)	Mendoza (2005)	Chen &Chen (2004)	Siebel (2004)
Top Management Support	Awareness among management	Senior management commitment	Champion Leadership and internal marketing	Clear communication of Strategy
Communication of CRM Strategy	Defining vision and objectives	Clearly defined objectives	Business-It alignment	Back office integration
KM Capabilities	Creation of committee	Interdepartmental Integration	System Integration	Software Customization
Willingness to Change Processes	Official appointment of coordinators	Communication of CRM strategy to the staff	Ease of Culture / structure change	NA
Willingness to share data	Development and approval of the project plan	Staff Commitment	KM Capabilities	NA
Technological Readiness	Monitoring to control time slippage	Customer Service	NA	NA
Cultural change customer orientation	Prevent resistance to change	Sales Automation	NA	NA
Systems integration capabilities	Motivate Staff	Marketing Automation	NA	NA

A successful implementation begins with senior executives supporting the CRM project. Employees are most likely not going to support CRM initiatives if senior executives and upper management echelons are not pushing them. Many times the success of a CRM implementation is the result of a senior manager who realizes the value of the project, understands the problems it will solve and is willing to dedicate time and energy to its success (Beasty, 2005).

A second key to ensuring CRM implementation success and ensuring organizations obtain the most value from a CRM system is to align departmental strategies with CRM objectives. Each department within the organization has its own requirements and goals. However, all departments should communicate a consistent message highlighting customer touch-points. Customer touch-points within each departmental section should be identified, reviewed and integrated into CRM initiatives to ensure the organization, enterprise system and customer are aligned and in sync. CRM requires a customer-centric attitude (Lipka 2006). “Unless you are selling a cheap commodity to a nameless customer, the quality of your relationship with the customer will do more to improve or destroy your business than anything else you do” (Lipka p. 95).

Along with aligning customer touch-points it is also critical customer data be scrubbed for accuracy. Behavioral data is the lifeblood of CRM systems (Beasty, 2005). Beasty, 2005 explains how many organizations overspend on CRM technology implementations without ever gaining an accurate view of their current customer data maintained within the organization first. Customer data must first be consolidated into a centralized data repository and cleansed of duplicates and anomalies. Organizations must then ensure data is accurate and distributed across all customer touch-points. Best practice CRM implementations standardize all organizational databases to ensure customer data is presented accurately and formalized throughout the entire organization. Running multiple independent databases containing customer data leads to a lack of data integrity and increased data duplication; resulting in data anomalies.

A final key to CRM implementation success is to plan for training during the early stages of a CRM initiative. Training is often considered the last component of a CRM implementation and typically receives the least amount of funding for a CRM project (Beasty, 2005). The earlier users are trained on the new CRM system and business processes, the faster they adapt to new business processes and the quicker they realize the benefits of the application. It is also considered a best practice to develop training curriculums that mirror the business processes of each department.

CONCLUSION

In today's competitive market, organizations must focus on maintaining customs and increasing quality of customer service and care more than ever. Customer Relationship Management information systems focus on technology, people, and processes to assist organizations in increasing their quality of customer service. CRM systems are not plug and play software packages that organizations purchase commercial off the shelf. A successful CRM implementation begins with a strategic plan that aligns organizations goals and objectives with CRM initiatives. Senior management within the organization must be involved in planning and supporting CRM implementations to ensure success. Organizations must create a customer centric work environment first, align customer details within each department second, and map customer related business processes to CRM initiatives to ensure implementations add the most value for the organization. It is critical organizations scrub all customer data within the organization prior to implementing a CRM system. Taking the time to plan, design, and implement a customer relationship management system is believed to increase customer loyalty, retention, and profits for organizations.

REFERENCES

- Beasty, C. (2005), "11 Ways to Ensure CRM Success", *CRM Magazine*, December 2005.
- Brooks, R. and Palmer, R. A. (2004), *The new global marketing reality*, Basingstoke' Palgrave.
- Chalmeta R. (2006), "Methodology for customer relationship management", *The Journal for Systems and Software*, 79: 1015-1024.
- Chen, J. S. & Popovich, K (2003), Understanding CRM: people, process, technology, *Business Process Management Journal*, 9(5), pp. 672-688.
- Denison, T. and McDonald, M. (1995), 'The role of marketing: Past, present and future', *Journal of Marketing Practice*, 1(1), pp. 54-76.
- Goodhue, D (2002), Realizing business benefits through CRM: "Hitting the right target in the right way". *MIS quarterly Executive* 1(2): 79-94.
- King, S. & Burgess T. (2007), "Understanding success and failure in customer relationship management", *Industrial Marketing Management*, 2007.
- Levine, S. (2000), *The Rise of CRM*, America's Network, 104(6), p. 34.
- Light, B (2003), 'CRM packages software: A study of organizational experiences', *Business Process Management Journal*, 9(5) pp. 603-616.

- Ling, R. and Yen, D.C. (2001), 'Customer relationship management: an analysis framework and implementation strategies', *Journal of Computer Information Systems*, 41(3), pp. 82-97.
- Lipka, S. (2006), "Twelve steps to CRM without eating an elephant", *Handbook of Business Strategy, 2006* pp. 95-100.
- McKie, S. (2000), *Customer role management*, Planet IT, 13 April.
- Mendoza, L (2007), Critical success factors for a customer strategy, *Information Software Technology*, 49: 913-945.
- Payne A. (2005), A Strategic Framework for Customer Relationship Management", *Journal of Marketing Management*, 22: 135-168.
- Reichhel, F. F. & Sasser, W. E. (1990), Quality comes to services, *Harvard Business Review*, 68, pp. 105-111.
- Rigby, D. (2002), "Avoid the Four Perils of CRM". *Harvard Business Review*, February, 2002.
- Rosenberg, L. J. & Czepiel, J. A. (1984), *A marketing approach to customer retention*, *Journal of Customer Marketing* pp. 45-51.
- Scott, D. (2001), Understanding Organizational Evolution: *Its impacts on management and performance*, Quorum Books.
- Siebel Systems (2004), "Critical Success Factors for Phased CRM Implementations". *Siebel white papers*, 2004.
- Thompson S.H. Teo, Paul Devadoss, Shan L. Pan (2006) Towards a holistic perspective of customer relationship management implementation, *Decision Support Systems*, 42: 1613-1627.
- Webster Jr. F. E. (1992), 'The changing role of marketing in the corporation', *Journal of Marketing*, 56(4) pp. 1-17.

CLOUD COMPUTING IN THE CONTEXT OF OFF-SHORING OF TECHNOLOGY

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ABSTRACT

Business firms continue to offshore computer systems and technologies and can benefit economically by cloud computing. Countries not considered in the literature as off-shoring leaders in technologies can also benefit from furnishing cloud computing as a service to business firms in the United States. The authors of this exploratory paper analyze the feasibility of cloud computing as a method for off-shoring systems to countries not considered frequently as leaders in the off-shoring of technologies – Indonesia, Philippines and Singapore. Elements of infrastructure-as-a-service (IaaS), platform-as-a-service (PaaS) and software-as-a-service (SaaS) are examined in each of the countries, in order to evaluate the plausibility of firms in the United States investing prudently in cloud computing technology in these countries. This paper can benefit managers considering investment in cloud computing services and systems offered by technology firms hosting technologies in other countries and will furnish a foundation for further research study of the cloud and the off-shoring of technologies.

KEYWORDS: Cloud, Cloud Computing, Indonesia, Infrastructure-as-a-Service (IaaS), Off-Shoring of Technology, Outsourcing, Philippines, Platform-as-a-Service (PaaS), Singapore, Software-as-a-Service (SaaS)

BACKGROUND AND DEFINITION

Cloud Computing

Cloud computing is defined as “a model for enabling convenient, on-demand network access [by business firms] to a shared pool of configurable computing resources ... that can be provisioned rapidly and released with minimal management effort or [cloud] service provider [CSP] [or technology firm] interaction” [21].

Cloud computing is delivered in the following models:

- Infrastructure-as-a-Service (IaaS), employed as on-demand services, such as networks, processors and storage;
- Platform-as-a-Service (PaaS), employed as services, such as languages, operating systems, optimized middleware and tools; or
- Software-as-a-Service (SaaS), employed as paying-as-you-go services, such as applications, data and processes [12].

Benefits of the models are in business agility [6], as deployment of new products or services is enabled by a faster on-demand infrastructure, not rigid infrastructures of information systems departments of business firms [2]. Elasticity is enabling optimized pay-as-you-go scalability of services in minutes, if not seconds, at a lower investment in over-or-under provisioning of systems [9]. The benefits of the cloud are cited frequently in the literature [10] and are evident in forecasts that cloud computing may not be an evolution but a revolution [22] – potentially the most profound revolution since the Internet [8]. Estimates from the Forrester Group indicate that the global market for cloud computing will grow from \$40.7 billion in 2011 to \$241 billion in 2020, of which SaaS and PaaS will have the highest potential through 2020 [32].

Cloud computing as hyped in the literature may be for business firms the new mainstream platform [17] or strategic inflection point [4] of technology in 2011 – 2014.

Off-Shoring of Systems and Technology

Off-Shoring of Systems and Technology is defined as “transferring of responsibility of information services, systems and technologies to a [domestic or foreign technology firm] third party [that is] hosting the services, systems and technologies in an [external] foreign country” [11].

Business firms in the United States may benefit from the economics and efficiencies from the off-shoring of technologies on to cloud computing platforms if the platforms are hosted in countries evaluated as off-shoring leaders in technologies. However, countries not evaluated frequently as off-shoring leaders in technologies may be candidates for off-shoring of technologies due to the generic hosting of the technologies on the cloud [25] – “instant outsourcing” [33].

In brief, countries not evaluated as off-shoring leaders may compete with the off-shoring leaders of technologies and may be feasible for business firms in the United States considering investment in outsourcing of technologies through the cloud.

INTRODUCTION TO PAPER

In this paper the authors explore countries not evaluated as off-shoring leaders that may have a feasible foundation to be participants through cloud computing platforms. Given exponential growth in the Asia and Pacific market – a \$55.9 billion market in information technology in 2011 [24], the analysis is currently explored from a choice of countries from the Asia Pacific Information Technology Series Market and Forecast 2006 – 2011 of the Springboard Research Group [24]. Indonesia, Philippines and Singapore are explored in this paper, and Korea, Malaysia and Vietnam may be explored in a later analysis.

From earlier findings of the secondary author of the paper [11] evaluated for 2011, the off-shoring leaders of China and India have benefited from factors fundamental in off-shoring of technologies:

Table 1: Leaders in Off-Shoring of Technologies

Factors	China	India
Competency – Programming and Project Management	High	High
Culture – Cultural Affinity, Innovation and Language Compatibility	Low	High
Economy – Currency Fluctuation and Industry Growth	Intermediate	Intermediate
Education – Educational Labor Pool	High	High
Geography – Geographic Disturbances	Intermediate	Intermediate
Government – Corruption, Geopolitics and Stability	Intermediate	Low
Law – Intellectual Property, Legislation and Tax	Low	Intermediate
Security – Information and Infrastructure	Low	Intermediate
Technology – Investment in Infrastructure and Telecommunications	High	High
Volatility – Turnover of Information Technologies	Low	Intermediate

Legend: High – High Factor Level (from Literature), Intermediate – Intermediate Factor Level and Low – Low Factor Level

Source: [11, Revised]

Nevertheless, the off-shoring non-leaders of Indonesia, Philippines and Singapore have also benefited from the factors at high, intermediate and low levels in the earlier findings [11] enhanced for 2011, as noted below:

Table 2: Non-Leaders in Off-Shoring of Technologies

Factors	Indonesia	Philippines	Singapore
Competency	Intermediate	Intermediate	High
Culture	Intermediate	High	High
Economy	Intermediate	Intermediate	High
Education	High	Intermediate	High
Geography	Intermediate	Intermediate	Intermediate
Government	Low	Intermediate	High
Law	Low	Intermediate	High
Security	Intermediate	Intermediate	Intermediate
Technology	Intermediate	Intermediate	Intermediate
Volatility	High	Intermediate	Low

Source: [11, Revised]

For factors in general, and in feasible foundations for cloud platforms, it is clear that the non-leaders in the off-shoring of technologies – infrastructure-as-a-service (IaaS), platform-as-a-service (PaaS) and software-as-a-service (SaaS) – may be beneficiaries of a demand for off-shoring of technologies that might be enhanced by the differentiation of cloud computing platforms, especially as the leaders in the technologies experience growth issues [35]. Literature is clear that countries are confronting an environment in which all of them may compete in an era of globalization [19], justifying the focus of the paper on the non-leaders in the off-shoring of technologies.

FOCUS

The paper explores the feasibility for the cloud as a method for the off-shoring of technologies to Indonesia, Philippines and Singapore. Elements of infrastructure-as-a-service (IaaS), platform-as-a-service (PaaS) and software-as-a-service (SaaS) are explored for investment plausibility in these countries. Emphasis of this exploratory paper is on the features of cloud computing that may enable a foundation for off-shoring of technologies to these countries. This paper expands frequent literature on cloud computing to the niche of off-shoring to countries not considered leaders in technologies. The findings of this initial paper form a framework for further research study.

METHODOLOGY

The methodology of this paper consisted of a four credit Independent Project Study in Cloud Computing and Off-Shoring of Technology, conducted by an experienced graduate student in the Seidenberg School of Computer Science and Information Systems of Pace University, in the period of December 2010 – July 2011. The student analyzed industry literature and attended practitioner conferences on cloud computing and outsourcing in the period of study. The analysis was done in five iterative stages and was focused from a literature survey:

- Cloud computing concepts, models and practices;
- Off-shoring methods of business firms in United States;
- Off-shoring methods of domestic and foreign technology firms;
- Off-shoring practices of leading technology firms in Asia Pacific Region; and
- Potential of cloud computing processes and technologies in Indonesia, Philippines and Singapore of Asia Pacific Region.

The foundation for this survey was an earlier Off-Shore Outsourcing Study [11] at the Seidenberg School conducted by the secondary author of this current study. Throughout the period of this current study, the student, who is the primary author, was supervised by the secondary author of this Study, an instructor in Cloud Computing, who synthesized the findings of the student.

PRELIMINARY ANALYSIS – COUNTRY SNAPSHOTS

The bulk of the preliminary analysis was done on the cloud computing potential of off-shoring practices of technologies of the non-leaders in the off-shoring of technologies of the study: Indonesia, Philippines and Singapore.

Indonesia

As a competitor to China and India, in essentially PaaS, Indonesia appears to be feasible for a cloud computing low level opportunity in PaaS (i.e. developmental projects in software and tools). Firms in Australia including Mitrais [15], and firms including Oracle and VM Ware in the United States, have invested in developmental projects that may enable a foundation for limited PaaS. The demand driver for the country is engineering skills of graduates from specialized Indonesian institutions that benefit off-shoring projects [15]. Indonesia benefits further from compensation efficiencies on projects of software [18]. Though PaaS may be a feasible opportunity for business firms considering investing in Indonesia, data center hosting is not frequent and Internet intensity is not high in Indonesia [36] for IaaS (i.e. networks, processors and servers). Firms installing data center operations for outsourcing services may be impacted by governmental intrusions on the services [5] [31]. SaaS (i.e. applications and processes) may not be a feasible opportunity for firms investing in Indonesia, given less compatibility in culture and language to the United States [26]. There are factors moreover of murky politics and regulations that are intrusions to investments [20] in not only SaaS but also PaaS and IaaS. Indonesia appears to be a country for limited PaaS outsourcing of projects of software. Indonesia is positioned to be a feasible but low level proposition for cloud computing constrained in the future to PaaS.

Philippines

Philippines appear to be feasible fundamentally for cloud computing intermediate level opportunity. The country has exceeded India in call centers [28]. AT&T, Cisco, Expedia, IBM and Microsoft have invested in call centers in the Philippines that may enable a foundation for SaaS (i.e. applications and processes). Tata Consulting Services of India has even invested in operations in the Philippines [3] [5] [29]. The demand drivers in the country are cost efficiencies from lower costs of higher skilled staff and higher incentives in taxation than in India. Philippines benefits further than India from more compatibility in culture to the United States. Though less favorable than in India, the infrastructure in telecommunications is feasible moderately in the Philippines [28] that it furnishes a foundation for SaaS if not in the future IaaS (i.e. networks of processes) or PaaS (i.e. optimized software and tools) from the skilled staff. The benefits however may be diluted by engineering and science skills that are higher in India than in the Philippines, though staff turnover is higher in India than in the Philippines. Philippines appear to be an evolutionary hub for investment in limited outsourcing of technologies. Philippines are positioned to be a feasible but intermediate proposition for cloud computing opportunity.

Singapore

Of the non-leaders in technologies in the study, Singapore appears to be the most feasible country for a cloud computing high level opportunity. The country has more data centers than other countries in the Asia Pacific region exclusive of Hong Kong and Japan. HP and IBM have invested in data centers and laboratories in Singapore [1] [7] [13] [16] that may facilitate a foundation for IaaS (i.e. processors and servers). Google and Microsoft have invested in hubs of networks and network partners in Singapore [27] that may also furnish a foundation for IaaS (i.e. networks). The demand driver in the country is cost efficiency in the existing infrastructure of technologies in Singapore in contrast to that of the United States. Singapore benefits further from engineering and scientific skills of staff and standards equitable increasingly to those of Japan and the United State [23]. This contributes however to higher costs of outsourcing to Singapore than to India or China. Though costs may be a concern for business firms considering investment in the country, Singapore is considered to be ideally positioned to be the hub for investment in strategic technologies [30]. The country is implementing a broadband iN2015 next-generation network of 1gbps for technology and business firms in Singapore [14]. Singapore is positioned to be a feasible high level optimal proposition for cloud computing opportunity.

PRELIMINARY SUMMARY ANALYSIS

Indonesia, Philippines and Singapore

Indonesia, Philippines and Singapore appear to enable feasible cloud opportunities. Singapore affords immediate opportunity in infrastructure-as-a-service (IaaS) [i.e. networks, processors and servers]; Philippines affords opportunities in software-as-a-service (SaaS) [i.e. applications and processes] and further possibilities in IaaS and platform-as-a-service (PaaS) [i.e. software and tools]; and Indonesia affords limited opportunities in PaaS though the foundations extend from high to low levels.

Any one of the models of IaaS, PaaS and SaaS affords a foundation for cloud computing potential in these countries.

**Table 3: Non-Leaders in Off-Shoring of Technologies
- Cloud Computing Foundations**

Cloud Computing Potential

Foundations	Indonesia	Philippines	Singapore
Infrastructure-as-a-Service (IaaS)	-	Low	High
Platform-as-a-Service (PaaS)	Intermediate	Low	-
Software-as-a-Service (SaaS)	-	Intermediate	-
Overall Potential	Low	Intermediate	High

Legend: High – High Potential, Intermediate – Intermediate Potential, and Low – Low Potential of Technologies

Singapore and Philippines afford more competencies than Indonesia for enabling cloud computing opportunities. None of the countries appear to have matured infrastructures and methodologies for ensuring fulfilling services to business firms in the United States. The preliminary analysis discloses that business firms in the United States investing in these countries for cloud computing opportunities have to approach investment with a caution higher than in the countries considered leaders in the outsourcing of technologies.

PRELIMINARY IMPLICATIONS

From the preliminary findings, cloud computing is a feasible proposition in the off-shoring of technologies to the countries in the paper. Countries not considered as off-shoring leaders in technologies may be an alternative to business firms evaluating partnership with technology firms hosting systems and technologies in these countries. Countries evaluated as off-shoring leaders in technologies may not have a control of the field of off-shoring of technologies due to cloud computing.

Cloud computing is also and may be even an immediate proposition for countries evaluated in the literature as off-shoring leaders in technologies. Technology firms hosting technologies in these countries may be more established in competencies for taking advantage of the cloud. Such firms may have higher budgets to invest in cloud computing sooner than firms in countries not off-shoring leaders, impacting the competitiveness of propositions presented by technology firms in the countries not off-shoring leaders in technologies.

Business firms in the United States may consider a balanced country portfolio mix of technology firms hosting technologies in countries that are off-shoring leaders and countries that are not leaders in technologies. The strategy may enable business firms in the United States to choose the best of core competencies in cloud computing and off-shoring of technologies in different technology firms in different countries. This strategy may mitigate moreover the investing risks in one country, especially in a developed or emerging country.

Business firms in the United States may have to be cautious of investment in technology firms hosting technologies in countries not evaluated as off-shoring leaders in technologies. These technology firms may not have matured methodologies for servicing business firms in the United States. This is a further factor impacting the competitiveness of propositions presented by these technology firms, in contrast to technology firms evaluated as off-shoring leaders in technologies.

Finally, firms in the United States may have to demand evidence of methodologies from foreign or domestic technology firms in countries not evaluated as off-shoring leaders in technologies. These technology firms may not have proven processes and standards for integrating existing technologies with new technologies, such as cloud computing, as envisioned in this paper. In short, managers in the United States may have to exercise greater inquiry in propositions presented by technology firms in countries analyzed in this paper.

LIMITATIONS AND OPPORTUNITIES

The paper is constrained in contribution to the field, as it is an exploratory study. Emphasis of the paper on the features of cloud computing without expanded explanation of issues of cloud management, and liabilities and risks of security [34], is limiting in impact on investment. Information on business firms in the United States that have expanded off-shoring practices of private and public cloud models of technologies is needed in a new paper. However, this paper furnishes opportunities for further in-depth research of countries developing, emerging and higher-tier in the Asia Pacific region as impacted by the cloud computing and off-shoring of technologies theme. This research will be initiated in 2012.

CONCLUSION

This paper can benefit practitioners considering cloud computing in the off-shoring of technologies to other countries. The exploratory findings of this paper disclose cloud computing as a feasible initial proposition in the off-shoring of technologies to Indonesia, Philippines and Singapore, the focus of the study. Business firms in the United States may consider cloud computing methodology and technology in the off-shoring of technologies to these countries not evaluated as off-shoring leaders and concurrently to those countries noted to be off-shoring leaders in technologies, in a balanced country portfolio strategy. Firms however must inquire of methodological practices and standards and learn of risks in any of these countries for a plausible proposition. The findings of this paper form an initial framework for further study in 2012.

REFERENCES

- [1] Babcock, C. HP launches cloud lab in Singapore. *InformationWeek*, 2010, February 24, 1-2.
- [2] Betts, M. Report: Cloud information technology (it) ideal for testing innovative ideas. *Computerworld*, 2010, August 23, 5.
- [3] Chickowski, E. Outsourcing slideshow: 9 alternatives to Indian outsourcing. *CIO Insight*, 2009, March 23, 1. Retrieved from: <http://www.cioinsight.com/c/a/Outsourcing/9-Alternatives-to-Indian-Outsourcing-411423/>.
- [4] Chorafas, D.N. *Cloud computing strategies*. Boca Raton, Florida: Taylor & Francis Group, 57, 2011.
- [5] Darmawan, I. & Farida, A. RIM asked to build data center in Indonesia. *VIVAnews*, 2010, August 5, 1. Retrieved from: <http://us.en.vivanews.com/news/read/169233-rim-asked-to-build-data-center-in-indonesia>.
- [6] Fogarty. Which applications should you move to the cloud?: 5 guidelines. *CIO*, 2010, August 18, 2.
- [7] Gwendolyn, R. IBM opens cloud computing laboratory in Singapore. *sgentrepreneurs*, 2010, May 7, 1. Retrieved from: <http://sgentrepreneurs.com/news-stop/2010/05/07/ibm-opens-cloud-computing-laboratory-in-singapore/>.
- [8] Hugos, M. & Hultzky. *Business in the cloud: What every business needs to know about cloud computing*. Hoboken, New Jersey: John Wiley & Sons, Inc., 38, 2011.
- [9] Klems, M. Twenty-One experts define cloud computing. *Cloud Computing Journal*, 2010, November, 1.
- [10] Kontzer, T. Your cloud checklist for 2015. *CIO Insight*, 2011, January, 1-4.

- [11] Lawler, J.P. & Palmer, L-A. G. Agile methodology in offshore outsourcing. *Journal of Business Case Studies*, 2005, 1(1), 35-46.
- [12] Lawler, J., Howell-Barber, H., Yalamanchi, R. & Joseph, A. Determinants of an effective cloud computing strategy. *Proceedings of the Information Systems Education Conference (ISECON)*, Wilmington, North Carolina, 2011, November 3-6.
- [13] Lee, J. IBM to open \$38M cloud computing data center in Singapore. *Web Host Industry Review*, 2011, March 7, 1. Retrieved from: http://www.thewhir.com/web-hosting-news/030711_IBM_to_Open_38M_Cloud_Computing_Data_Center_in_Singapore.
- [14] Lemon, S. Broadband for everyone – in Singapore. *CIO*, 2006, May 15, 22.
- [15] Magson, D. Quality of information technology (it) graduates elevates Indonesia as a software development outsourcing destination. *Computerworld*, 2009, July 29, 1.
- [16] Proffitt, A. IBM announces cloud computing center in Singapore. *Bio.IT World.com*, 2011, March, 11, 1. Retrieved from: <http://www.bio-itworld.com/2011/03/11/ibm-cloud-computing-center-singapore.html>.
- [17] Reisinger, D. Information technology slideshow: The cloud, mobility, social media – The new mainstream?. *CIO Insight*, 2010, December 20, 1-2.
- [18] Sharma, M. Bali an outsourcing attraction. *The Australian*, 2007, June 12, 1.
- [19] Sirkin, H. New world disorder: Countries and companies are facing an economic environment that is not only borderless but also rule-less. *Time*, 2008, October 27, Global 2.
- [20] Strukhoff, R. Cloud computing in Philippines, Asia presents major challenge. *Cloud Computing Journal*, 2010, September 25, 1. Retrieved from: <http://cloudcomputing.systems.com/node/1546630>.
- [21] Walz, J. & Grier, D.A. Time to push the cloud. *IEEE IT Pro*, September / 2010, October, 14.
- [22] West, D.M. Saving money through cloud computing. *Governance Studies at Brookings*, 2010, April 7, 1.
- [23] Wong, B. Singapore's credibility makes it an attractive destination for forming an offshore company. *ContentKing*, 2011, March 7, 1. Retrieved from: <http://www.contentking.eu/business/business-tools/singaporea%80%99s-credibility-makes-it-an-attractive-destination-for-forming-an-offshore-company.html>.
- [24] _____. Indonesia and Vietnam emerge as strong information technology (it) – services markets in APEJ. *Global Services*, 2008, March 26, 1-2.
- [25] _____. Cloud computing: The next classic disruptive technology. *Global Services*, 2009, March 16, 1-4.
- [26] _____. India loses its charm on global outsourcing landscape. *Global Services*, 2010, March 30, 1.
- [27] _____. Singapore emerging as the cloud computing hub in Asia-Pacific. *Korea IT Times*, 2010, September 10, 1. Retrieved from: <http://www.koreaitimes.com/story/10397/singapore-emerging-cloud-computing-hub-asia-pacific>.
- [28] _____. Philippines and India compete for outsource dollars. *Global Services*, 2010, November 19, 1-2.
- [29] _____. Philippines is world's business outsourcing capital. *Newasianist*, 2010, December 7, 1. Retrieved from: <http://www.newasianist.com/philippines-is-worlds-business-outsourcing-capital/>.
- [30] _____. Singapore: Growing into trusted business processing outsourcing (bpo) of the region. *Global Services*, 2010, December 20, 1.

- [31] _____. RIM must set up data center in Indonesia: Tifatul. *The Jakarta Post*, 2011, January 11, 1. Retrieved from: <http://www.thejakartapost.com/news/2011/01/11/rim-must-set-data-center-indonesia-tifatul.html>.
- [32] _____. Forrester: Public cloud growth to surge, especially saas. *Global Services*, 2011, April 28, 1-2.
- [33] _____. Cloud Computing: Is it a threat to Indian outsourcers?. *Global Services*, 2011, April 29, 1-2.
- [34] _____. On-Line reputations in the dirt: Serious glitches at Sony and Amazon have revived worries about the risks of handling data on-line. *The Economist*, 2011, April 30, 65.
- [35] _____. Service issues reported for Indian outsourcers. *Computer*, 2011, June 10, 1-2.
- [36] _____. Going local: The internet is not that global at all. *The Economist*, 2011, July 16, 65.

SOCIAL NETWORKING: PRIVACY CONTROL TOOL AVAILABILITY AND USER CHARACTERISTICS

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ABSTRACT

The appearance of social networking sites has changed the manner in which people share information. The protection of this shared information is a major challenge for social networking sites. This study investigates privacy control tools availability and its affect on social networking web site choice by users depending upon their user characteristics. Findings report that availability of privacy tools does have an influence on user choice of web site for sharing of information depending on age, education level, and gender of the user.

INTRODUCTION

Social networking has changed the way people share information [1]. Individuals share different types of information such as personal interests, special hobbies, and several other facets of their lives in an effort to develop intimate and personal connections with other users [2]. In addition, a lot of personally identifiable information is collected during the account sign-up process [3]. Thus one of the major challenges for social networking sites is to ensure all the shared information is protected [4]. Past trends have shown that the information shared on social networking websites has been targeted and misused by many sources including law enforcement agencies, identity thieves, sexual predators [5], prospective and current employers [6], educational institutions, and other third-party websites [7]. Such incidents can have damaging consequences for both social networking sites as well as their users [8]. From a user standpoint, it is imperative to understand the various privacy controls available to protect the various pieces of information they share on the social networking site.

The main objective of this study is to address the different aspects of privacy issues in social networking sites as related to privacy control tools availability and its influences on social networking web site choice depending on user characteristics. Towards that end, we identify the privacy controls available to protect the different types of information – personal, social and professional. Following this, we analyze whether there is any relationship between privacy tool availability and user characteristics such as age, gender and education levels. The findings provide implications for both users and social networking sites. From a user standpoint, we provide suggestions on the different types of information that can be shared safely on social networking sites and report the demographic differences among users regarding privacy controls.

From a social networking provider perspective, we provide implications on what is being expected with respect to privacy tools and how to meet those expectations.

BACKGROUND LITERATURE

Research on issues related to social networking sites is continually emerging. In general, past research has addressed a variety of issues related to social networking. Most of this research has largely focused on examining the factors that motivate individuals to participate in social networking [1, 9]. Another stream has explored user attitudes towards social networks with an emphasis on information sharing and disclosure [4, 10]. Similarly some recent works have analyzed the relationship between cultural affiliation and social networking [2, 11].

Research related specifically to privacy issues in social networking is still in its infancy. Some studies have examined the content of privacy policies [3], others analyzed the potential threats and risks of using social networking [12, 13]. A slightly different but related research takes a technical approach to examine the security flaws [14] and/or the network architectures [15] to propose new privacy preserving front ends for existing social networks. A common agreement among most of the studies is that privacy in social networks is dysfunctional and requires remodeling. Most interestingly, prior findings note a “privacy paradox” with respect to social networking; that is, users show high concern for privacy but at the same time share a large amount of data [16]. Thus it is suggested that future researchers take a more refined approach to resolve the privacy paradox [12]. Accordingly, this study reports the availability of privacy controls to protect the different pieces of user information shared on the social networking site. In addition, we evaluate the influence of privacy tool availability on social networking web site choice for usage depending on user characteristics - gender, age and level of education.

METHOD

A list of major social networking sites collected as a part of a larger project were used to capture the availability of privacy controls and user characteristics. Demographic information about the users and the social networking site statistics were collected from Alexa (www.Alexa.org), a web information company. The sites chosen in this study are consistent with prior research [e.g., 3] examining user privacy in social networking sites.

On selected sites a generic user account was created to gain access into the social networking site and to examine the privacy control tools available to protect different types of user information. The user characteristics were recorded from the respective Alexa website and coded using a five point Likert scale (1-Very Low, 2 – Low, 3- Moderate, 4-High, 5-Very High). The Alexa website displays a multi-colored bar graph showing the demographic information of the users. For example, under represented categories are displayed with a long red bar while the mostly

represented ones are shown in long bar green. The length of the graph varies based on the magnitude of representation. To illustrate, on Alexa for Facebook, gender - Male had a short red bar; Female had a short green bar. This is coded as a two indicating low representation for male and four indicating high representation for female. A score of five (very high) and one (very low) were assigned only when the bar was close to either extremes. A similar approach was used for coding age and level of education where each group was independently coded with the five point Likert scale.

RESULTS & DISCUSSION

Overall the social networking sites allowed users to share multiple types of information. The types of information were categorized into personal, social and professional groups. Personal information consists of data that is not publicly shared or only shared with highly trusted persons. For instance, date of birth, personal photos, and relationship status would be listed in this category. Social information refers to data that helps the individual to socialize with similar people. For example, group affiliations, network interests, and tags on preferred videos are in this grouping. Professional information relates to the posting data about one’s expertise, credentials, and experience. This includes information such as degrees, educational levels, certificates, and place of employment. We identified a total of 69 privacy tools that were available to protect user information. All the details are listed in Table 1.

Table 1: Top Social Networking Sites and Privacy Tool Availability			
	Social Networking Site	Web Site Description	Tool Availability Percentage
1.	Facebook	General-Purpose	39%
2.	MySpace	Gaming	19%
3.	Twitter	Micro-blogging	10%
4.	Bebo	General-Purpose	4%
5.	Habbo	General-Purpose	4%
6.	Tagged	General-Purpose	13%
7.	Okrut	General-Purpose	25%
8.	Friendster	General-Purpose	5%
9.	Badoo	General-Purpose	5.56%
10.	LinkedIn	Business-Networking	4%
11.	Hi5	General-Purpose	4.17%
12.	NetLog	General-Purpose	14%
13.	Flixster	Media recommendation	5.91%
14.	MyLife	Reunion	1.2%
15.	Classmates.com	Reunion	6.4%
16.	Last.fm	Media recommendation	4%
17.	Viadeo	Business-Networking	5.4%
18.	WeeWorld	Gaming	3.67%

19.	Xanga	General-Purpose	5.7%
20.	GaiaOnline	Gaming	5.5%
21.	SkyRock	General-Purpose	7%
22.	MyYearbook	General-Purpose	4%
23.	BlackPlanet	General-Purpose	6.11%
24.	Fotolog	Photo-blogging	5.25%
25.	FriendsReunited	Reunion	5.46%
26.	LiveJournal	General-Purpose	14%
27.	meinVZ	General-Purpose	4.5%
28.	Sonico	General-Purpose	5.5%
29.	Plaxo	General-Purpose	5.25%
30.	StumbleUpon	Media recommendation	7%
31.	Multiply	General-Purpose	2.22%
32.	Hyves	General-Purpose	1.4%
33.	BuzzNet	Media recommendation	6.25%
34.	WAYN	Travel	5.6%
35.	Care2	General-Purpose	3%
36.	DeviantART	Media recommendation	6.66%
37.	XING	Business-Networking	6%
38.	MyOpera	Blogging	4.5%
39.	OpenDiary	Blogging	2.5%
40.	Livemocha	Language Learning	1.2%
41.	weRead	Media recommendation	7%
42.	ibibo	General-Purpose	4.5%
43.	MocoSpace	General-Purpose	1.4%
44.	CouchSurfing	Travel	5.4%
45.	Nexopia	General-Purpose	2.65%
46.	PerfSpot	General-Purpose	6%
47.	Yonja	General-Purpose	5.4%
48.	Bahu	General-Purpose	1.1%
49.	Eons	General-Purpose	4%
50.	ExperienceProject	Privacy-Specific	6.66%

A total of sixty-nine privacy controls pertaining to profile, personal information, social information and professional information were identified. However, the availability of tools was not consistent across social networking sites (see Table 1). More interestingly, the percentage of availability of privacy tools on some of the popular social networking sites was less than ten percent.

The number of privacy tools available for protecting either the user's profile or personal information was greater than those available to protect either their social or professional information (see Table 2). This was consistent with the current market and research trends

which have primarily emphasized the need for protecting profile and personal information [3]. Privacy controls for social and professional information are still at their infancy. However, established sites such as Facebook had more privacy controls for social and professional information. Given that recruiters are increasingly using social networking to search and hire potential candidates [17], it is important to protect users' social and professional information. The findings indicate that social networking sites are catering to the emerging demands; however it is still in the developing mode. From the standpoint of users, it is important to pay close attention to the type of information they post on the social networking, failing which can lead to dire consequences. At this junction it is vital to reiterate the privacy paradox, which we think is waning; it is time that users bore some responsibility for their actions. Further examination showed the availability of fine-grained privacy controls; that is, users have more options to manipulate their visibility rather than simply opt-in or opt-out. While this is important for protecting user privacy, micro-managing of privacy controls can become very stressful and confusing for novice users.

Type of Information	Privacy Tools Available
Profile Information	22
Personal Information	24
Social Information	13
Professional Information	10

The privacy tool availability had some degree of influence on social networking choice for usage depending on user characteristics. Three factors were taken into consideration – gender, age and level of education. Each factor was independently examined to determine any possible relationship with privacy tool availability. The top five sites with highest and lowest privacy tool availability were considered for analysis. The results are displayed in Tables 3, 4 and 5 respectively. The relationship between gender and privacy tool availability depicts a mixed result (see Table 3). However, overall the results indicate that female representation continues to decline in sites with lower privacy tool availability. This finding is consistent with prior research which notes that online intruders disproportionately or entirely target women[18].

Site Name	Privacy Tool Availability	Gender Representation	
		Male	Female
Top 5 Sites with Highest Privacy Tools Availability			
Facebook	39 %	Low	High
Orkut	25 %	Very High	Very Low
MySpace	19 %	High	Moderate
NetLog	14 %	Moderate	Low
LiveJournal	14%	Very Low	High

Top 5 Sites with Lowest Privacy Tool Availability			
Livemocha	1.2 %	Low	Moderate
MyLife	1.2 %	Low	Moderate
Mocopace	1.4 %	Moderate	Low
Hyves	1.4 %	High	Low
Multiply	2.22 %	Very Low	Moderate

The results in Table 4 show the relationship between privacy tool availability and the user's age. The findings reveal that most of the social networking users are teenagers and young adults. This is consistent with recent reports which reveal teenagers as leaders in adopting online tools [19]. However, the representation of mature adults was considerably low in sites with lowest privacy tool availability. This implies that mature adults are aware of consequences due to breach of privacy which makes them less participative in sites with poor privacy tools.

Table 4: Privacy Tool Availability and Age							
Site Name	Privacy Tool Availability	Age (years)					
		18-24	25-34	35-44	45-54	55-65	65+
Top 5 Sites with Highest Privacy Tools Availability							
Facebook	39 %	Very High	High	Moderate	Low	Low	Very Low
Orkut	25 %	Very High	Moderate	Very Low	Very Low	Very Low	Very Low
MySpace	19 %	Very High	High	Low	Low	Very Low	Very Low
NetLog	14 %	Low	Very Low	High	Very High	Low	Very Low
LiveJournal	14%	Very High	High	Low	Low	Very Low	Very Low
Top 5 Sites with Lowest Privacy Tools Availability							
Livemocha	1.2 %	Very High	High	Very Low	Very Low	Very Low	Low
MyLife	1.2 %	Very Low	Low	Low	High	Very High	Very High
Mocopace	1.4 %	Very High	High	Low	Low	Very Low	Very Low
Hyves	1.4 %	Moderate	Moderate	High	Very Low	Very Low	Very Low
Multiply	2.22 %	Moderate	Moderate	Low	Very Low	Very Low	low

The relationship between privacy tool availability and the user's level of education are displayed in Table 5. The results show that the users in the sites with highest privacy tool availability held college and grad school degrees. On the other hand, representation of college and grad school holders in sites with lowest privacy tool availability was low. This finding suggests that more knowledgeable individuals prefer to share information only on sites which provide protection. As noted by prior research education acts on a social agent in influencing individuals attitude towards information sharing behavior [20].

Table 5. Privacy Tool Availability and Level of Education					
Site Name	Privacy Tool Availability	Level of Education			
		No College	Some College	College	Grad School
Top 5 Sites with Highest Privacy Tools Availability					
Facebook	39 %	Very Low	Low	High	Moderate
Orkut	25 %	Very Low	High	High	Moderate
MySpace	19 %	Low	Very High	High	Very Low
NetLog	14 %	Moderate	Low	Low	High
LiveJournal	14%	Very Low	Low	Moderate	Moderate
Top 5 Sites with Privacy Lowest Tools Availability					
Livemocha	1.2 %	Low	Moderate	Moderate	Low
MyLife	1.2 %	Low	High	Moderate	Very Low
Mocospace	1.4 %	High	Very High	Moderate	Very Low
Hyves	1.4 %	Very Low	Low	Low	Moderate
Multiply	2.22 %	Low	Very Low	Moderate	Very Low

In summary, while the social networking sites allow users to share different types of information, it is important for users to exercise or employ their judgment to determine which information is safe on the social networking site. The privacy tools availability varied widely across the social networking sites. Most of the sites focused on offering tools to protect profile and personal information compared to social and professional information. Most interestingly, the overall privacy tool availability was less than fifty percent for any given web site. These findings can help not only users understand the degree of protection available on social networking sites but also help them determine the possibility of privacy breach. With users sharing more information on social networking sites, these sites become an attractive target for both legal and illegal bodies [21]. As a result it is vital for social networking providers to take proactive measures to protect user information. Privacy tool availability especially influenced user choice for web site usage based upon characteristics such as gender, age and level of education. Thus, in order to attract a sophisticated clientele, social networking site developers needs to offer more privacy tools to protect user information.

CONCLUSION

Privacy in social networking is still at its infancy which urges the need for more research in identifying new issues and providing options or solutions to protect user information. While the social networking sites are introducing new tools to protect user information, the proportions of privacy controls were not balanced. In other words, there were more privacy controls for protecting profile and personal information than social and professional information. More interestingly, the availability of privacy tools influenced user choice of social networking web site depending upon user characteristics. It is important to note that sites which offered more privacy tools attracted a rich clientele base which emphasizes the need for introducing more tools to protect user information. Future research can extend the findings presented in this study to explore how privacy tool availability affects the quality of information shared on the social

networking sites. This research hopes that the ideas presented here, along with the user characteristics findings, will be an important starting point towards resolving the privacy paradox.

REFERENCES

- [1] Boyd, D.M., and Ellison, N.B. Social Networking Sites: Definition, History, and Scholarship. *Journal of Computer-Mediated Communication*, 13 (2008), 210-230.
- [2] Vasalou, A., Joinson, A., and Courvoisier, D. Cultural differences, experience with social networks and the nature of "true commitment" in Facebook. *International Journal of Human Computer Studies*, 68, 10 (2010), 719-728.
- [3] Bonneau, J., and Preibusch, S. The Privacy Jungle: On the Market for Data Protection in Social Networks. *WEIS 2009 The Eighth Workshop on the Economics of Information Security* (2009), 1-45.
- [4] Livingstone, S. Taking risky opportunities in youthful content creation: teenagers' use of social networking sites for intimacy, privacy, and self-expression. *New media & society*, 10, 3 (2008), 393-411.
- [5] Pilkington, E. Blackmail claim stirs fears over Facebook., *The Guardian.*, 2007, pp. 16 July 2007.
- [6] Finder, A. For Some, Online Persona Undermines a Resume. *The New York Times*, 2006, pp. June 2006.
- [7] Fogel, J., and Nehmad, E. Internet Social Network Communities: Risk taking, trust, and privacy concerns. *Computers in Human Behavior*, 25, 1 (2009), 153-160.
- [8] Rosenblum, D. What Anyone Can Know: The Privacy Risks of Social Networking Sites. *IEEE Security & Privacy Magazine*, 5, 3 (2007), 40.
- [9] Tufekci, Z. Grooming, gossip, facebook and myspace: What can we learn about these sites from those who won't assimilate? *Information, Communication, and Society*, 11, 4 (2008), 544-564.
- [10] Constant, D., Kiesler, S., and Sproull, L. What's mine is ours, is it? A study of attitudes about information sharing. *Information System Research*, 5, 4 (1994), 400-423.
- [11] Fogg, B.J., and Iizawa, D. Online persuasion in facebook and mixi: A cross-cultural comparison., *Persuasive*, 2008, pp. 35-46.
- [12] Dwyer, C., Hiltz, S.R., and Passerini, K. Trust and Privacy Concern within Social Networking Sites: A Comparison of Facebook and MySpace. *Thirteenth Americas Conference on Information Systems*, 2007.
- [13] Frankowski, D., Cosley, D., Sen, S., Terveen, L., and Riedl, J. You Are What You say: Privacy Risks Of Public Mentions. . *29th annual international ACM SIGIR conference on Research and development in information retrieval*, New York: ACM, 2006, pp. 565-572.
- [14] Bonneau, J., Anderson, J., and Danezis, G. Prying Data out of a Social Network. *Advances in Social Networks Analysis and Mining*, 2009.
- [15] Anderson, J., Diaz, C., Bonneau, J., and Stajano, F. Privacy Preserving Social Networking Over Untrusted Networks. *2nd ACM SIGCOMM Workshop on Online Social Networks*, 2009.

- [16] Poindexter, J.C., Earp, J.B., and Baumer, D.L. An Experimental Economics Approach Toward Quantifying Online Privacy Choices. *Information Systems Frontiers*, 8, 5 (2006), 363-374.
17. Albrechtslund, A. Online Social Networking as Participatory Surveillance. *First Monday*, 13, 3 (2008).
- [18] Bartow, A. Woman as Targets: The Gender-Based Implications of Online Consumer Profiling. *Federal Trade Commission Online Profiling Workshop*, FTC, 1999.
- [19] Madden. Teens, Privacy & Online Social Networks. Pew Internet & American Life Project. . *Pew Internet & American Life Project.*, 2007.
- [20] Grant, I.C. Young Peoples' Relationships with Online Marketing Practices: An Intrusion Too Far? *Journal of Marketing Management*,, 21 (2005), 607-623.
- [21] Boyd, D.M., and Crawford, K. Six Provocations of Big Data. *A Decade in Internet Time: Symposium on the Dynamics of the Internet and Society*: Oxford Internet Institute, 2011.

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Influence of Trust, Security, and Privacy on IS Continuance Intention: A Theoretical Model

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ABSTRACT

The proliferation of e-services has initiated several concerns for consumers regarding trust, security, and privacy that make consumers hesitant to use e-services. Although the influence of trust, security, and privacy on the continuance of e-services use is highlighted in literature, there is scarcity in research that investigates the influence of the accumulation of these three dimensions on the continuance use of IS. The purpose of this research-in-progress paper is to propose a model that can examine the role of trust, privacy, and security in the post adoption context by augmenting these three variables to the post-acceptance model of IS continuance [3].

Keywords:

Information systems continuance intention, trust, security, privacy

INTRODUCTION

The growth of the internet improves the ability of the providers of e-services to retain their customers by hoping that consumers continue using the provided electronic services. Acquiring new customers may cost five times more than keeping current customers [3]. In insurance industry, for instance, 5% raise in customer retention can be equivalent to 18% savings in operating costs [9]. Encouraging customers to continue using e-services has many benefits. Conducting electronic financial transactions online, for example, has reduced the providers' costs and raised their revenues by offering self-services to consumers [27]. IS research suggests that IS continuance intention is essential to organizational success [21]. In addition, research suggests that IS continuance intention, which is a form of post acceptance behaviors, is an outcome of customer retention [37].

On the other hand, the proliferation of e-services has initiated several concerns for consumers regarding trust, security, and privacy that make consumers hesitant to use e-services. For instance, many consumers face difficulties in trusting the providers' abilities in delivering the promised commitment [36]. Un-confidence in electronic applications of e-services can occur because of insufficient security and privacy protection [14]. Consumers also worry about threatening their financial information by hackers or another third party [38]. Furthermore, several researchers argue that privacy is not protected in many firms [4,11] even though customers provide sensitive information while accomplishing e-services online.

Trust and IS continuance have been discussed in IS literature [29,30,31,15,20]. IS literature shows that the association between privacy and IS continuance have been proposed [10], and security and IS continuance have also been studied [45,6]. Although the influence of trust, security, and privacy on the continuance of e-services use is highlighted in literature, there is scarcity in research that empirically investigates the influence of the accumulation of these three dimensions on continuance use of IS. We argue that it is important to study the IS continuance intention in a holistic way by considering the influence of trust, security, and privacy. Therefore, the purpose of this research-in-progress paper is to propose a model that can examine the role of trust, privacy, and security in the post adoption context by augmenting these three variables to the post-acceptance model of IS continuance [3].

Since continuance intention to use information systems can be influenced not only by users' satisfaction, perceived usefulness, and confirmation, but also affected by users' perception regarding trust, security, and privacy, the key theoretical contribution of this paper is developing an integrative model of IS continuance intention by augmenting trust, security, and privacy to the post-acceptance model of IS continuance [3]. To the best of our knowledge, developing such model is a novel idea that is not discussed before.

The rest of the paper is organized in three sections. In section 2, we review the related literature, and present the suggested model. In section 3, we briefly describe the methodology that we plan to use in our future research to validate the proposed model. Finally, we conclude in section 4.

THEORETICAL BACKGROUND AND PROPOSED MODEL

In this section we present the original post acceptance model, and we review the related literature of trust, security, and privacy.

Post-acceptance Model of IS Continuance

Since continuance use is considered one of the appropriate measures of system success, it is important to understand the factors that affect the continuance use of IS. Users' post adoption behavior can be explained by the Expectation Confirmation Theory (ECT), which is originally proposed in consumer behavior literature to explore consumers' satisfaction and their re-purchasing decision. Bhattacharjee [3] has introduced ECT to IS context and proposed an IS continuance model based on ECT as shown in figure 1. In order to explain the IS continuance intention, Bhattacharjee integrates user satisfaction and perceived usefulness to the original ECT model. The author concludes that IS confirmation of expectation from prior IS usage has positive impact on perceived usefulness of IS. Also, he concludes confirmation of expectation and perceived usefulness are the determinants of user satisfaction.

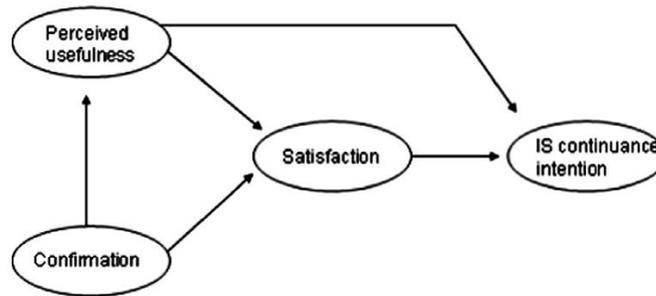


Figure 1: Post-acceptance model of IS continuance [3]

Related literature of Trust, Privacy & Security

Trust, security, and privacy concerns have become a major impediment for the continuance use of IS such as e-commerce [40]. Malhotra et al. [32] and Mayer et al. [33] argue that trust, which consists of ability, integrity, and benevolence as the key factors, is the major player of the adoption of e-commerce system.

From various trust research [33,35,12,25], trust description embraces two key concepts. First, the trusting party has uncertainty about a future or current relationship that may lead to a perception of risk. Second, the potential perception of risk is based on three characteristics: ability, integrity, and benevolence. Ability is related to the skills and competences that the trustee has. Integrity means that the trustee should follow ethical and moral rules that are

adequate for the trusting party. Benevolence implies that the trustee should have kindness to the trusting party. The combination of these three features may lead to the desirousness of the trusting party to depend upon the trustee in a certain beneficial task. In this paper, we adopt the desirousness of the trusting party as the definition of trust, and this definition is coherent with trust definition in previous research [16,19,23].

Liao et al. [30] include habit, perceived usefulness, and trust to predict consumers' continued behavior of using B2C websites. All three key variables determine consumers' behavioral intentions to continue using a B2C web site. Lin and Shih [31] argue that users' satisfaction with their values, and mobile technology trusting expectations are important determinant in the continued m-commerce usage. Floh and Treiblmaier [15] explore the importance of trust, quality of the website, quality of the service and overall satisfaction to the loyalty of online banking. They found that trust and satisfaction are important determinants of online loyalty.

Horst et al. [22] argue that trust of users of e-government is the main determinant of the perceived usefulness of e-government services. Gefen [17] argues that trust is one of the perceived usefulness determinants in cyberspace environment because the received usefulness from the website, for example, depends on the unseen staff behind the website. Chircu et al. [8] and Pavlou [39] purport that trust affects perceived usefulness since trust permits customers to be vulnerable to the internet to guarantee that customers receive the expected usefulness. In research that examines electronic commerce participation and attitudes, McCloskey [34] finds that trust has a positive effect on perceived usefulness.

Confirmation can be perceived as users' confidence that systems will function as expected. Confirmation can be also expressed as the user's perception of the analogy between user expectations and the actual performance of e-services [3]. In the context of e-commerce, Kim et al. [27] report a positive and significant association between consumers' trust and expectation. Therefore, we propose the following:

P1: Trust will positively affect IS continuance intention

P2: Users' trust is positively associated with perceived usefulness

P3: Users' trust is positively associated with their extent of confirmation

Information security and privacy are considered two of the most important issues in today's internet environment [26]. Security threat can be defined as "circumstance, condition, or event with the potential to cause economic hardship to data in the form of destruction, disclosure, modification of data, and/or fraud, waste, and abuse" [24]. Udo [43] shows that privacy protection is the most important concern of internet purchasers. Privacy can be defined as "the claim of individuals or institutions to determine for themselves when, how, and to what extent information about them is communicated to others" [46].

Security protocols (i.e. authorization, encryption) and privacy protocols (i.e. privacy seals) enhance perceived security and privacy which in turn strengthen the trust of using e-services [2]. Chellappa [5] argue that the perception of security and privacy affects the customers' trust in e-commerce transactions. Vatanasombut et al. [45] integrate ECT, Commitment-Trust, and Technology Acceptance theories to explore the IS continuance intention of web-based customers. They find that IS continuance intention is determined by relationship commitment and trust. Also, they conclude that perceived trust is affected by perceived security, and relationship commitment is influenced by perceived empowerment. Based on the above review, we propose the following:

P4: Users' security is positively associated with their trust

P5: Users' privacy is positively associated with their trust

Dai et al. [10] propose a positive association between privacy and customer satisfaction. Eid [13] found that security and privacy are positively associated with users' satisfaction. Therefore, we propose:

P6: Users' security is positively associated with their satisfaction

P7: Users' privacy is positively associated with their satisfaction

We also plan to test the following propositions that are hypothesized in the original post-acceptance model of IS continuance:

P8: Users' level of satisfaction with initial IS use is positively associated with their IS continuance intention

P9: Users' extent of confirmation is positively associated with their satisfaction with IS use

P10: Users' perceived usefulness of IS use is positively associated with their satisfaction with IS use

P11: Users' IS continuance intention is positively associated with their perceived usefulness of IS use

P12: Users' extent of confirmation is positively associated with their perceived usefulness of IS use

The proposed model is shown in figure 2.

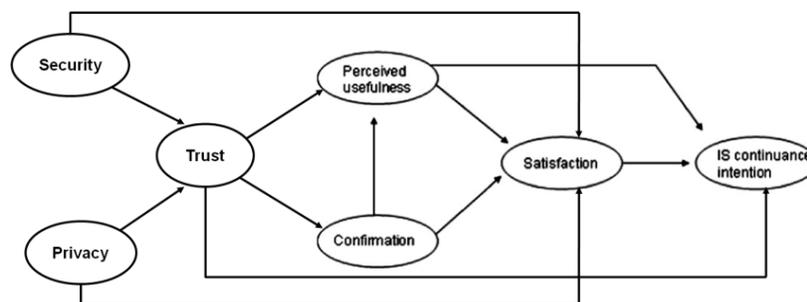


Figure 2: The proposed model

METHODOLOGY

Appendix 1 depicts the constructs used in the web survey that we plan to design. The constructs related literature, from which they were chosen, is also shown in appendix 1. To validate the proposed model, we plan to conduct a web survey with the users of Bahrain's e-government national portal (www.bahrain.bh). According to the United Nations E-government Survey [44], Bahrain has achieved a high rank in the United Nations e-government readiness index as follows: 13th at the world level, 3rd at the Asia level, and 1st at the Arab level. The proposed research model will be analyzed using PLS structure equation modeling tool, which evaluates the psychometric properties of measurement model, and estimate the parameters of structural model. Specifically, SmartPLS software will be used to analyze the dataset. In addition for being prediction-oriented [7], PLS, rather than covariance-based and parameter-oriented structural equation modeling, is used because PLS is preferred to handle large number of variables and relationships [18].

CONCLUSION

The increase using of e-services has initiated several concerns for consumers regarding trust, security, and privacy that make consumers hesitant to use e-services. Literature shows that there is scarcity in research that investigates the influence of the accumulation of trust, security, and privacy on continuance use of IS. In this research-in-progress paper, we have proposed a model that can examine the role of trust, privacy, and security in the post adoption context by augmenting these three variables to the post-acceptance model of IS continuance [3]. We have already defined the constructs based on literature, and we plan to conduct a web survey with the users of Bahrain's e-government national portal to validate the proposed model.

References

- [1] Armstrong, J. S. and Overton, T. S. (1977) Estimating Nonresponse Bias in Mail Surveys, *Journal of Marketing Research*, 14 (3), 396-402
- [2] Benlian, A. Hoehne, E. and Hess, T. (2010) The Contribution of IT Features to Increase Trust and Participation in Online Communities: An Empirical Analysis, *Proceedings of the European Conference on Information Systems*
- [3] Bhattacharjee, A. (2001) Understanding information systems continuance: An expectation confirmation Model. *MIS Quarterly*, 25(3), 351-370
- [4] Brunk, B.D. (2002), Understanding the privacy space, *First Monday*, 7(10)
Chellappa, R. and Pavlou, P.A. (2002) Perceived Information Security, Financial Liability, and Consumer Trust in Electronic Commerce Transactions, *Journal of Logistics Information Management*, (15), 2002
- [5] Chellappa, RK (2002). Consumers' trust in electronic commerce transactions: the role of perceived privacy and perceived security, available from <http://asura.usc.edu/~ram/rcf-papers/sec-priv.pdf>
- [6] Chen SC, Chen HH, Chen MF (2009), Determinants of satisfaction and Continuance Intention towards Self-service Technologies, *Industrial Management Data Systems*, 109 (9), 1248-1263
- [7] Chin, W. W. (1998) *The partial least squares approach for structural equation modelling*, In Modern Methods for Business Research (Ed, Marcoulides, G. A.) Lawrence Erlbaum Associates, Hillsdale, 295-336.
- [8] Chircu, A.M. Davis, G.B. and Kauffman, R.J. (2000) Trust, expertise and e-commerce intermediary adoption, *Proceedings of the Sixth Americas Conference on Information Systems*, Long Beach, CA, August 3–5, 2000
- [9] Crego, E. T. J. and Schiffrin P. D. (1995) *Customer-Centered Reengineering: Remapping for Total Customer Value*, Burr Ridge, IL, Irwin
- [10] Dai, L. Huang, L. and Yi, Y. (2005) How B2C service quality influences website continuance, *Proceedings of the Pacific Asia Conference on Information Systems*
- [11] Deniv, T. and Hart, P. (2006) Internet privacy concerns and social awareness as determinants of intention to transact, *International Journal of Electronic Commerce*, 10(2), 7-29
- [12] Doney, P.M. Cannon, J.P. (1997) An examination of the nature of trust in buyer–seller relationships, *Journal of Marketing*, 61, 35–51
- [13] Eid, M. I. (2011) Determinants of E-Commerce Customer Satisfaction, Trust, and Loyalty in Saudi Arabia, *Journal of Electronic Commerce Research*, 12(1), 78-93

- [14] Eynon, R. (2007) *Breaking Barriers to eGovernment: Overcoming Obstacles to Improving European Public Services*, European Commission, Brussels
- [15] Floh, A., and Treiblmaier, H. (2006) What keeps the e-banking customer loyal? A multigroup analysis of the moderating role of consumer characteristics on e-loyalty in the financial service industry, *Journal of Electronic Commerce Research*, 7(2), 97-110
- [16] Ganesan, S. (1994) Determinants of long-term orientation in buyer–seller relationships, *Journal of Marketing*, 58, 1–19.
- [17] Gefen, D. (1997) Building users' trust in freeware providers and the effects of this trust on users' perceptions of usefulness, ease of use and intended use of freeware, Ph.D. dissertation, Georgia State University
- [18] Gefen, D. (2000) E-Commerce: The Role of Familiarity and Trust, *Omega*, 28 (6), 725-737
- [19] Gefen, D. (2002) Customer loyalty in E-commerce, *Journal of the Association for Information Systems*, 3 (1), 27–51.
- [20] He, W. Fang Y. and Wei, K. (2009) The role of trust in promoting organizational knowledge seeking using knowledge management systems: An empirical investigation, *Journal of the American Society for Information Science and Technology*, 60(3), 526–537
- [21] Hongxiu, L. and Yong, L. (2011) Post adoption behaviour of e-service users: an empirical study on Chinese online travel service users, *Proceedings of the European Conference on Information Systems*, Paper 56
- [22] Horst, M. Kuttuschreuter, M. Gutteling, J.M. (2007) Perceived usefulness, personal experiences, risk perception and trust as determinants of adoption of e-government services in The Netherlands, *Computers in Human Behavior*, 23(4), 1838-52
- [23] Jarvenpaa, S.L. Tractinsky, N. Vitale, M. (2002) Consumer trust in an internet store, *Information Technology and Management*, 1 (1/2), 45–71.
- [24] Kalakota, R. and Whinston, A. B. (1996) *Frontiers of Electronic Commerce*, Addison-Wesley, Reading
- [25] Kee, H. Knox, R. (1970) Conceptual and methodological considerations in the study of trust, *Journal of Conflict Resolution*, 14, 357–366
- [26] Kelly, E.P. and Erickson, E.G. (2005) RFID tags: commercial applications v. privacy rights", *Industrial Management & Data Systems*, 105(6), 703-13.
- [27] Kim, D.J. Ferrin, D.L. and Rao, H.R. (2003) A Study of the Effect of Consumer Trust on Consumer Expectations and Satisfaction: The Korean Experience, *Proceedings of the Proceedings of the 5th international conference on Electronic commerce*, Pittsburgh, Pennsylvania, 2003
- [28] Kim, G. Shin, B.S. and Lee, H.G. (2009) Understanding dynamics between initial trust and usage intentions of mobile banking, *Information Systems Journal*, 19(3), 283-311
- [29] Koppius, O. Speelman, W. Stulp, O. Verhoef, B. and van Heck, E. (2005) Why are customers coming back to buy their airline tickets online? Theoretical explanations and empirical evidence, *Proceedings of the 7th international conference on Electronic commerce*, Xi'an, China, 319 – 326
- [30] Liao, C. Palvia, P. and Lin, H.N. (2006) The Roles of Habit and Web Site Quality in E-Commerce, *International Journal of Information Management*, 26(6), 469-483

- [31] Lin Y.M. and Shih, D.H. (2008) Deconstructing mobile commerce service with continuance intention, *International Journal of Mobile Communications*, 6, 67-87
- [32] Malhotra, N., Kim, S., and Agrwal, J. (2004) Internet users' information privacy concerns (IUIPC): The construct, the scale, and a causal model, *Information Systems Research*, 15(4), 336-355
- [33] Mayer, R. Davis, J. Schooreman, F. (1995) An integrative model of organizational trust, *Academy of Management Review*, 20 (3), 709– 734
- [34] McCloskey, D.W. (2006) The importance of ease of use, usefulness and trust to online consumers: an examination the technology acceptance model with older consumers, *Journal of Organizational and End User Computing*, 18(3), 47–65
- [35] McKnight, D.H. Chervany, N.L. (2002) What trust means in E-commerce customer relationships: an interdisciplinary conceptual typology, *International Journal of Electronic Commerce*, 6 (2), 35–59.
- [36] Mcknight, D.H. Choudhury, V. and Kacmar, C. (2002).The impact of initial consumer trust on intentions to transact with a web site: A trust building model, *Journal of Strategic Information Systems*, 11, 297-323
- [37] Ng, E.H. and Kwahk, K.Y. (2010) Examining the determinants of mobile internet service continuance: a customer relationship development perspective, *International Journal of Mobile Communications*, 8(2), 210-29.
- [38] Pavlou, P. A. (2003) Consumer acceptance of electronic commerce: Integrating trust and risk with the technology acceptance model, *International Journal of Electronic Commerce*, 7(3), 101–134.
- [39] Pavlou, P.A. (2002) Consumer Acceptance of electronic commerce integrating trust and risk with the technology acceptance model, *International Journal of Electronic Commerce*, 7(2)
- [40] Ranganathan, C. and Ganapathy, S. (2002) Key dimensions of business-to-consumer web sites. *Information & Management*, 39(6), 457–465
- [41] Salisbury, W.D. Pearson, R.A. Harrison A.W. (1993) Who's Afraid of the World Wide Web? An Initial Investigation into the Relative Impact of Two Salient Beliefs on Web Shopping Intent, *Proceedings of the Fourth Americas Conference on Information Systems*, Baltimore, MD
- [42] Smith, H. J., Milberg, S. J., and Burke, S. J. (1996) Information privacy: Measuring individuals' concerns about organizational practices, *MIS Quarterly*, 20(2), 167-196.
- [43] Udo, G. (2001), Privacy and security concerns as major barriers for e-commerce: a survey study, *Information Management & Computer Security*, 9(4), 165-74
- [44] United Nations E - Government Survey, (2010) Chapter 4, world e-government ranking, available from: kz.mofcom.gov.cn/accessory/201009/1284225105383.pdf
- [45] Vatanasombut, B. Igbaria, M. Stylianou, A.S. and Rodgers, W. (2008) Information systems continuance intention of web-based applications customers: The case of online banking, *Information & Management*, 45, 419-428
- [46] Westin, A.F. (1967), *Privacy and Freedom*, Atheneum, New York, NY

Appendix: The constructs and their related literature

Latent variable	Construct	Measurement	Related literature
Continuance Intention	CIN1	I intend to continue using the national portal rather than discontinue its use.	Bhattacharjee (2001)
	CIN2	My intentions are to continue using the national portal than use any alternative means.	
	CIN3	If I could, I would like to continue using the national portal as much as possible.	
Confirmation	CO1	My experience with using the national portal was better than what I expected.	
	CO2	The service level provided by the national portal was better than what I expected.	
	CO3	Overall, most of my expectations from using the national portal were confirmed	
Satisfaction	SAT1	My overall experience of the national portal use was: very satisfied	
	SAT2	My overall experience of the national portal use was: very pleased	
	SAT3	My overall experience of the national portal use was: very contented	
	SAT4	My overall experience of the national portal use was: very delighted	
Perceived usefulness	PU1	Using the national portal improves my performance in managing personal electronic services	
	PU2	Using the national portal increases my productivity in managing personal electronic services.	
	PU3	Using the national portal enhances my effectiveness in managing personal electronic services	
	PU4	Overall, the national portal is useful in managing personal electronic services.	
Trust	TRUST1	The national portal that I use keeps its promises	Stewart (2003) & Pennington et al. (2003)
	TRUST2	The national portal services meet my needs	
	TRUST3	The national portal is trustworthy	
	TRUST4	I think the national portal is concerned with the present and future interests of users	
	TRUST5	Overall, I trust the national portal	
Security	SEC1	I feel secure sending sensitive information using the national portal	Salisbury et al. (1998)
	SEC2	The national portal is a secure means through which to send sensitive information	
	SEC3	I would feel totally safe providing sensitive information about myself using the national portal	
	SEC4	Overall, the national portal is a safe means to transmit sensitive information	
Privacy	PRV1	It usually bothers me when I am asked for personal information.	Smith et al. (1996)
	PRV2	When I am asked for personal information, I sometimes think twice before providing it.	
	PRV3	It bothers me to give personal information to so many people.	
	PRV4	I am concerned that the national portal is collecting too much personal information about me.	

ATTITUDES ON PLAGIARISM IN PROGRAMMING COURSES: RESULTS FROM A SURVEY OF STUDENT PERCEPTIONS

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INTRODUCTION

There have been many studies conducted on plagiarism in academic institutions. Studies include investigation of plagiarism in different groups of students as well as using different methods to plagiarize. Sheard, Dick, Markham, et al. (2002) studied plagiarism of first year IT students while McCabe, Butterfield & Trevino (2006) investigated academic dishonesty in graduate business programs. Cosma & Joy and Daly & Horgan discussed detecting plagiarism of source code in programming classes. Given that many assignments in academic institutions are submitted electronically and the availability of information in digital format, plagiarism is, arguably, easier today than it has been in the past.

This research seeks to add to the current body of literature by investigating whether college students apply the same standards of acceptability for graded programming assignments versus other types of graded assignments. The rationale for this research objective is that the authors of this study are faculty who teach programming and have done so for years; anecdotally, we have noticed that cheating on programming assignments is common. This observation provided the initial impetus for this study. In addition, we have discovered that students do not typically think of code they produce like they would an essay. They seem to think copying a portion of code is not unethical while copying a portion of an essay is a clear violation of the university academic integrity policy. There have been a number of studies citing similar observations with respect to programming assignments and other computer based work (Ross 2005; Buchanan 2006; Cosma and Joy 2008; Marsan 2010). However, there have been few researchers that have compared cheating on IT based assignments to cheating on traditional assignments; furthermore, the findings from the few studies that have looked at this issue are not consistent. Molnar et al (2008) found that undergraduate students rated cheating with IT as more acceptable than cheating without the use of IT. Stephens et al. (2007), on the other hand, found that students did not express different perceptions about the seriousness of cheating in a digital context versus a standard context.

To accomplish the research goal, a survey was conducted on student perceptions of the acceptability of a number of behaviors when working on various types of graded individual assignments. The types of assignments investigated are: (1) programming, (2) mathematics, and (3) essay. The behaviors included in the survey are based upon the following categories previously identified by Sheard et al. (2002), Broeckelman-Post (2008) and Jian et al. (2008): (1) seeking help from approved sources, (2) unauthorized collaboration, (3) copying portions of others' work, and (4) copying all of others' work.

BACKGROUND AND LITERATURE REVIEW

Cheating and plagiarism by college students is an area of concern to academics both in their capacity as teachers and as researchers. Academic research in this area has a long tradition with some of the earliest works dating back to the early years of the 20th century (e.g., Barnes 1904; Campbell 1933; Drake 1941). As might be expected, the body of literature on this topic is extensive and a full review is beyond the scope of the current paper. However, we present an overview of research on cheating with special attention to the work most relevant to the current study. We divide this literature review into two broad areas. In the first area, we group those articles that explore the prevalence of cheating and that attempt to determine the extent to which personal and environmental factors influence cheating. In the second area, we group articles assessing the impact of technology and the internet on cheating.

Studies exploring the prevalence of cheating have found wide ranging results. The percentage of students who admit to some form of academic dishonesty range from a low of 3% (Karlins, Michaels et al. 1988) to a high of 95% (McCabe and Trevino 1997). The disparities in cheating rates found in these studies can be attributed a variety of factors. They encompass different definitions of cheating and plagiarism, different methods of measurement, and different types of student work. While much of the work in this area depends on self-report measures to determine the rate of cheating (McCabe, Trevino et al. 2001), other studies using measures of actual cheating behavior have also identified a broad range in rates of cheating. One of the early studies attempting to determine actual cheating behavior found the low 3% rate mentioned previously (Karlins, Michaels et al. 1988). West, Ravenscroft, and Schrader (2004) used an incident of widespread, blatant cheating (74% of a class cheated on a take-home exam) to conduct a natural experiment comparing cheating to measures of moral judgment. The advent of widely available text matching software tools such as Turnitin has increased the number of studies reporting rates of actual cheating behavior detected through use of the tools: these studies have reported rates ranging from 21% to 61% (Warn 2006; Ledwith and Riskey 2008; Martin, Rao et al. 2009; Walker 2010). Despite the attention given academic dishonesty, the rate of occurrence does not appear to be declining and may be increasing (Haines, Diekhoff et al. 1986; Park 2003; Eastman, Iyer et al. 2006).

Technology has had a profound impact on the academic environment providing greater access to students in widespread locations and improving the ease of communicating and disseminating information (Mayfield and Ali 1996). However, technology has also increased the opportunity and ease of student cheating. The extant literature contains numerous examples of students using technology to gain easy access to other's work or solicit unauthorized assistance. The most egregious forms of student cheating are the outright purchase of assignments such as term papers (Campbell, Swift et al. 2000) or completed assignments (Ross 2005). Other forms of cheating include copying and pasting unattributed material from online sources. Today's college students have grown up using the Internet as a primary source of information (Marsan 2010); we should not be surprised when they turn to it when working on assignments.

Despite the recognition of how technology and the Internet have enabled increased cheating (Renard 1999/2000; Ercegovac and Richardson 2004), there has been relatively little academic literature offering

empirical examinations of the phenomenon. Lester and Diekhoff (2002) conducted one of the earliest studies comparing demographic and other factors of traditional and Internet cheaters. The study found that where traditional cheaters tended to be women (65.2%), Internet cheaters were more likely to be men (54.1%). Internet cheaters were also more likely to be involved with both varsity and intramural sports than traditional cheaters but no significant differences were found in other demographic factors. This study found that both traditional and Internet cheaters tended to justify their behaviors and that this justification was more prevalent in Internet cheaters. Finally, the study found that Internet cheaters were less likely to resent cheating behavior in others than were traditional cheaters.

METHODOLOGY

This study combines and builds on the results of two previous studies conducted by the authors (Aasheim, Li, Rutner and Williams, 2010; Aasheim, Li and Rutner, 2011). The results of the first study (Aasheim et al., 2010) were based on a preliminary investigation of data and indicated that education about academically dishonest behavior related to programming did seem to make a difference on student perceptions. In the second study (Aasheim et al., 2011) the authors conducted a factor analysis to determine if the underlying dimensions for the three types of assignments were different, which would provide initial support for the hypothesis that students do view the types of assignments differently. The results indicated that students did seem to have different perceptions about how they view ethical behaviors as they relate to the different types of assignments. This study is to develop and test hypotheses related to how students view the different types of assignments differently. To this end the following hypothesis is developed and tested:

Students have different perceptions on what constitutes academically dishonest behavior depending on the type of graded assignment (programming, math or English).

As programming assignments are the primary concern, the authors wish to determine whether perceptions on programming assignments differ from those of essay or math assignments.

H1: Students have different perceptions on what constitutes academically dishonest behavior for programming assignments than math assignments.

H2: Students have different perceptions on what constitutes academically dishonest behavior for programming assignments than English assignments.

After examining current literature (Sheard, Markham et al. 2002; Broeckelman-Post 2008; Jian, Sandnes et al. 2008) on categories of academic behavior related to graded class assignments, three sets of 12 questions for programming, mathematical and essay assignments were designed in the survey (see Appendix 1). The mapping of the categories according to literature and the questions on the survey is provided in Table 1.

Table 1: Mapping of categories of academic behavior to survey questions

Categories of Academic Behavior	Survey Questions
Seeking help from approved sources	1 - 3
Unauthorized collaboration	4 - 6
Copying portions of others' work	7 - 9
Copying all of others' work	10 - 12

The survey instrument was administered to undergraduate students in programming courses at the authors' institution. For a graded programming, math and essay assignment that were to be completed individually, the respondents were asked to indicate (on a Likert scale of *1=Very Acceptable Behavior* to *5=Very Unacceptable Behavior*) how acceptable they felt the behaviors specified in the survey questions were. The survey was a retrospective pre-test/post-test instrument in that it was given two points in time: (1) at the beginning of enrolling in the programming course and (2) after class discussion about academic dishonesty. In addition, several demographic questions were added to the survey to gather information about the respondents.

The survey was administered to students in four different undergraduate programming courses: a first course in Java for information technology (IT) and information systems (IS) majors, a first course in Java programming for computer science (CS) majors, an introductory web page development course (HTML, CSS and JavaScript) for IT and IS majors as well as non-majors and a second course in Java for IS and IT majors. The survey was administered in class by a third party and was anonymous in that there was no identifying information on the survey. There were 155 respondents. All but five response was complete enough to use for analysis (n=150).

DATA ANALYSIS

Demographics of Respondents

The students that responded to the survey were mostly from three computing majors: Information Technology (46.7%), Information Systems (18.7%) and Computer Sciences (14.0%). The remainder of the respondents were from the College of Liberal Arts and Social Sciences or College of Science and Technology (19.3%), or undeclared or left their major blank (1.3%). Females accounted for 26.0% of the respondents, males 68.0% and the remainder did not identify their gender. Ninety-two percent (92%) of the respondents were age 24 or younger. Forty-seven point three percent (47.3%) of the respondents identified themselves as having a GPA of 3.0 or above.

Confirmatory Factor Analysis

To identify the underlying structure of the data and to reduce the number of variables in the analysis, a confirmatory factor analysis (CFA) was conducted on the 12 items on the survey corresponding to the programming, math, and English assignments for the survey items corresponding to perceptions on behaviors prior to education and after education confirming the category structure proposed in Table 1. Based on the initial fit of the CFA model, question 9 (making minor changes to an assignment submitted for a previous course and submitting it for the current course) was removed and question 6 (working together and submitting similar work) was moved from the category of unauthorized collaboration to copying part of an assignment. The rationale for removing question 9 was that it did not apply to the courses taught as they are primarily introductory in nature and also have vastly different assignments. The rationale for moving question 6 was a matter of fit. The statistics measuring fit for the CFA model improved when question 6 was moved from unauthorized collaboration and to copying part of an assignment. As the question can logically go in either category, the authors decided to include it in the copying part of an assignment category.

A summary of the final factors in the CFA are provided in Table 2. A summary of the statistics related to overall fit of the final model are provided in Table 3. The level of significance is greater than the recommended 0.05 for the programming assignments, chi-square divided by the degrees of freedom (chi-square/DF) is less than the recommended 3 in all cases, the normed fit index (NFI) is greater than the recommended 0.90 in all cases, the Tucker-Lewis index (TLI) is greater than the recommended 0.90 in all cases, the comparative fit index (CFI) is greater than the recommended 0.90 in all cases, the root mean

square error of approximation (RMSEA) is less than the recommended 0.80 indicating a close or reasonable fit for all but the math assignments and the standardized root mean squared residual is less than the recommended 0.10 for all but the math assignments (Kline 2005). Overall, based on the combined statistics, the model has an acceptable to good fit for all three types of assignments for the four factors identified in Table 3. Finally, reliability of each measure was assessed using Cronbach's alpha (Cronbach, 1951) and the values are provided in Table 4. In all cases, Cronbach's alpha is below the recommended level of 0.70 (Hair et al., 1998).

Table 2: Final four factor solution from CFA

Category	Survey Questions Corresponding to CFA
Authorized Help	1 - 3
Unauthorized Discussion	4 - 5
Copying Part of an Assignment	6 - 8
Copying All of an Assignment	10 - 12

Hypothesis Testing

To determine whether or not students have different perceptions about what constitutes academically dishonest behavior for different types of assignments, a comparison of student perceptions for each category of behavior is made across the different types of assignments. More specifically, a comparison of programming assignment perceptions will be made to those of math and essay assignments. The results of the individual paired t-tests related to the hypothesis are presented in Table 5 and Table 6. Table 5 provides the results of tests conducted for the hypothesis comparing perceptions on the factors related to perceptions on programming assignments to those on essay assignments using a paired t-test (H1). Table 6 provides the results of tests conducted for the hypothesis comparing perceptions on the factors related to perceptions on programming assignments to those on math assignments using a paired t-test (H2).

Table 3: Fit statistics for final four factor solution from CFA

	Programming	Essay	Math
Chi-square	47.603	68.846	96.373
Significance	0.137*	0.002	< 0.000
Chi-square/DF	1.253*	1.812*	2.536*
NFI	0.959*	0.934*	0.925*
TLI	0.987*	0.955*	0.931*
CFI	0.991*	0.969*	0.952*
RMSEA	0.041*	0.074**	0.102***
SRMR	0.0481*	0.0618*	0.793***
Fit Assessment	Good	Acceptable	Acceptable

*a good fit, **a reasonable fit, ***a poor fit according to statistic

Table 4: Cronbach's alpha for final four factor solution from CFA

Factor	Programming	Essay	Math
Authorized Help	0.884	0.836	0.878
Unauthorized Discussion	0.826	0.747	0.875
Copy Part	0.859	0.787	0.871
Copy All	0.920	0.936	0.927

Table 5: Results of t-tests for H1 (programming assignments compared to essay assignments)

Category	Questions	Difference in means	Standard Deviation	t-test statistic	p-value
Authorized help	1, 2, 3	-0.40959	0.70865	-7.149	***0.000
Unauthorized discussion	4, 5	-0.26316	0.81774	-3.968	***0.000
Copy part	6, 7, 8	-0.50658	0.84916	-7.355	***0.000
Copy all	10, 11, 12	-0.05298	0.54173	-1.202	0.231

***significant at 1%, **significant at 5%, *significant at 10%

Table 6: Results of t-tests for H2 (programming assignments compared to math assignments)

Category	Questions	Difference in means	Standard Deviation	t-test statistic	p-value
Authorized help	1, 2, 3	0.02908	0.52122	0.681	0.497
Unauthorized discussion	4, 5	0.05369	0.83654	0.783	0.435
Copy part	6, 7, 8	0.13199	0.77578	2.077	**0.040
Copy all	10, 11, 12	0.01333	0.62137	0.263	0.793

***significant at 1%, **significant at 5%, *significant at 10%

The only significant difference in perceptions for programming versus math assignments is in copying part of the assignment (Table 6). It seems that students perceive copying part of a programming assignment as more unacceptable than one in math. There are differences in perceptions related to seeking authorized help, engaging in unauthorized discussion and copying part of an essay assignment as compared to a programming one (Table 5). Specifically, seeking authorized help for a programming assignment is more acceptable than for an essay; having unauthorized discussions is more acceptable for a programming assignment than for an essay; and copying part of a programming assignment is more acceptable than for an essay. The fact that students perceptions prior to taking the course are that copying part of a programming assignment and engaging in unauthorized discussions as more acceptable than for an essay assignment is problematic. The next logical question would be can we address this issue with education about what constitutes cheating as it specifically relates to programming and are there any changes in perceptions on graded essay and math assignments based on this education campaign.

DISCUSSION AND CONCLUSION

In an article in NetworkWorld (Marsan 2010) stated that 50% of the academic dishonesty cases at the University of Washington involved computer science students and 23% at Stanford. The article cites that reasons for cheating on programming assignments include (1) the availability of past solutions due to faculty not creating "new" assignments every semester as this is a difficult thing to do because of debugging requirements and (2) students thinking that there is only 1 correct solution so they do not realize solutions to the same problem have so much variation (so if a friend found the "right" answer and

there can only be one, how can I be caught?). This article highlights the fact that cheating in classes where programming is required is prevalent and needs to be addressed.

This study finds that students view programming assignments differently than other types of assignments which may be part of the reason cheating is so prevalent on programming assignments as found in the Marsan (2010) article. Students do have different perceptions regarding academic behavior for different types of assignments. They think that seeking authorized help is more acceptable on a graded programming assignment than on an essay. Of greater concern is that they view copying part of and participating in unauthorized discussions for a programming assignment as more acceptable behaviors than for an essay assignment.

To deal with the issue of unauthorized collaboration, Georgia Tech allows students to collaborate on programming assignments. When collaborating students have to sign a collaboration agreement and all collaborators on a project must be listed on the project. To ensure that each student learns the material, students must demonstrate their understanding of the program through an oral presentation of the code to a teaching assistant. In addition more of the grade come from the test and less from the homework (where students typically cheat more) (Marsan 2010). The attitude at Tech is that computing is best learned in a group and as long as students learn from another student's code, collaboration is OK.

Another way to address this issue of cheating in programming courses is for faculty to take the time to discuss issues related to academic dishonesty as it relates to programming as it makes a difference in perceptions. In a future paper, the authors plan to examine whether or not education can make a difference in perceptions.

REFERENCES

- Aasheim, C., L. Li, and P. Rutner. (2011). "Exploring Student Attitudes Towards Plagiarism: Does the Type of Work Matter." Paper presented at the 2011 Annual Meeting of the Southeast Decision Sciences Institute, Savannah, GA.
- Aasheim, C., L. Li, P. Rutner, and S. Williams. (2010). "A Survey of Student Attitudes on Plagiarism in Programming Courses." Paper presented at the 2010 Annual Meeting of the Southeast Institute for Operations Research and the Management Sciences, Myrtle Beach, SC.
- Barnes, E. (1904). "Student Honor: A Study in Cheating." International Journal of Ethics 14(4): 481-488.
- Broeckelman-Post, M. A. (2008). "Faculty and student classroom influences on academic dishonesty." IEEE Transactions on Education 51(2): 206-211.
- Buchanan, W. (2006). "Correlation between academic and skills-based tests in computer networks." British Journal of Educational Technology 37(1): 69-78.
- Campbell, C., C. O. Swift, and L. Denton. (2000). "Cheating goes hi-tech: Online term paper mills." Journal of Management Education 24(6): 726-739.
- Campbell, W. G. (1933). "Measurement in Determining the Personality and Behavior of the College Cribber." Education 53(7): 403-408.
- Cosma, G. and M. Joy (2008). "Towards a definition of source-code plagiarism." IEEE Transactions on Education 51(2): 195-200.

- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16,297-334.
- Drake, C. A. (1941). "Why Students Cheat." *Journal of Higher Education* 12(8): 418-420.
- Eastman, J. K., R. Iyer, and K. L. Eastman. (2006). "Addressing academic dishonesty: The implications for business schools, professors, and students." *Journal for Advancement of Marketing Education* 9: 1-8.
- Ercegovac, Z. and J. V. Richardson (2004). "Academic dishonesty, plagiarism included, in the digital age: A literature review." *College & Research Libraries* 65(4): 301-318.
- Haines, V. J., G. M. Diekhoff, E. E. LaBeff and R. E. Clark. (1986). "College cheating: Immaturity, lack of commitment, and the neutralizing attitude." *Research in Higher Education* 25(4): 342-354.
- Hair, J. E., Anderson, R. E., Tatham, R. L. and W. C. Black. (1998). *Multivariate Data Analysis*. New Jersey: Prentice-Hall.
- Jian, H. L., F. E. Sandnes, Y. Huang, L. Cai and K. M. Y. Law. (2008). "On students' strategy-preferences for managing difficult course work." *Ieee Transactions on Education* 51(2): 157-165.
- Karlins, M., C. Michaels, and S. Podlogar. (1988). "An Empirical-Investigation of Actual Cheating in a Large Sample of Undergraduates." *Research in Higher Education* 29(4): 359-364.
- Kline, R. B. (2005). *Principles and Practices of Structural Equation Modeling*. New York, NY, The Guilford Press.
- Ledwith, A. and A. Risquez (2008). "Using anti-plagiarism software to promote academic honesty in the context of peer reviewed assignments." *Studies in Higher Education* 33(4): 371-384.
- Lester, M. C. and G. M. Diekhoff (2002). "A comparison of traditional and Internet cheaters." *Journal of College Student Development* 43(6): 906-911.
- Marsan, C. D. (2010) "Why computer science students cheat." *NetworkWorld*.
- Martin, D. E., A. Rao, and S. Lloyd. (2009). "Plagiarism, Integrity, and Workplace Deviance: A Criterion Study." *Ethics & Behavior* 19(1): 36-50.
- Mayfield, J. and K. S. Ali (1996). "The Internet as an educational tool." *Computers & Industrial Engineering* 31(1-2): 21-24.
- McCabe, D. L., K. D. Butterfield, and L. K. Trevino. (2006). "Academic dishonesty in graduate business programs: Prevalence, causes, and proposed action." *Academy of Management Learning & Education* 5(3): 294-305.
- McCabe, D. L. and L. K. Trevino (1997). "Individual and contextual influences on academic dishonesty: A multicampus investigation." *Research in Higher Education* 38(3): 379-396.
- McCabe, D. L., L. K. Trevino, and K. D. Butterfield. (2001). "Cheating in academic institutions: A decade of research." *Ethics & Behavior* 11(3): 219-232.

- Molnar, K., M. Kletke, and J. Chongwatpol. (2008). "Ethics vs. IT Ethics: Do Undergraduate Students Perceive a Difference?" Journal of Business Ethics 83(4): 657-671.
- Renard, L. (1999/2000). "Cut and Paste 101: Plagiarism and the Net." Educational Leadership 57(4): 38-42.
- Ross, K. A. (2005). "Academic dishonesty and the Internet." Communications of the ACM 48(10): 29-31.
- Sheard, J., M. Dick, S. Markham, I. MacDonald, and M. Walsh. (2002). Cheating and plagiarism: Perceptions and practices of first year IT students. Proc. Innovations and Technology in Computer Science Education, Aarhus, U.K.
- Stephens, J. M., M. F. Young, and T. Calabrese. (2007). "Does moral judgment go offline when students are online? A comparative analysis of undergraduates' beliefs and behaviors related to conventional and digital cheating." Ethics & Behavior 17(3): 233-254.
- Walker, J. (2010). "Measuring plagiarism: researching what students do, not what they say they do." Studies in Higher Education 35(1): 41-59.
- Warn, J. (2006). "Plagiarism Software: No Magic Bullet!" Higher Education Research & Development 25(2): 195-208.
- West, T., S. P. Ravenscroft, and S. Shrader. (2004). "Cheating and moral judgment in the college classroom: A natural experiment." Journal of Business Ethics 54(2): 173-183.

APPENDIX – SURVEY INSTRUMENT

You are working on a graded written essay for a class; your professor has told you this is an individual assignment. How acceptable are the following behaviors?

1. Asking the professor for help on the essay.
2. Asking a university provided tutor for help on the essay.
3. Reviewing similar essays in your textbook for ideas on how to write your essay.
4. Discussing ideas about the essay with a fellow student but writing the essays independently of each other.
5. Discussing ideas about the essay on an Internet news group, social networking site or blog.
6. Working together on the essay with a fellow student and submitting similar essays.
7. Copying a few sentences of another student's essay while adding a significant portion of your own work.
8. Copying a few sentences from the Internet or a written source while adding a significant portion of your own work.
9. Making minor changes to an essay you had previously written for another class and submitting it for this class.
10. Posting the assignment on an Internet news group, social networking site or blog asking someone to write the essay for you.
11. Hiring someone or asking a tutor to write the essay for you.
12. Copying another student's essay, making minor changes, and submitting it as your own work.

You are working on a graded programming assignment for a class; your instructor has told you that this is an individual assignment. How acceptable are the following behaviors?

1. Asking the professor for help on the program.
2. Asking a university provided tutor for help on the program.
3. Reviewing similar programs in your textbook for ideas on how to write your program.
4. Discussing ideas about the program with a fellow student but implementing the ideas independently.
5. Discussing ideas about the program on an Internet news group, social networking site or blog.
6. Working together on the program with a fellow student and submitting similar programs.
7. Copying a few lines of another student's program while adding a significant portion of your own work.
8. Copying a few lines of the program from the Internet or a textbook while adding a significant portion of your own work.
9. Making minor changes to a program you had previously written for another class and submitting it for this class.
10. Posting the assignment on an Internet news group, social networking site or blog and asking someone to write the program for you.
11. Hiring someone or asking a tutor to write the program for you.
12. Copying another student's program, making minor changes, and submitting it as your own.

You are working on a graded math assignment for a class; your professor has told you this is an individual assignment. How acceptable are the following behaviors?

1. Asking the professor for help on the assignment.
2. Asking a university provided tutor for help on the assignment.
3. Reviewing similar problems in your textbook for ideas on how to complete your assignment.
4. Discussing ideas about the assignment with a fellow student but implementing the ideas independently.
5. Discussing ideas about the assignment on an Internet news group, social networking site or blog.
6. Working together on the assignment with a fellow student and submitting similar work.

7. Copying a small part of another student's assignment while adding a significant portion of your own work.
8. Copying a small part of the assignment from the Internet or a textbook while adding a significant portion of your own work.
9. Making minor changes to an assignment you had previously completed for another class and submitting it for this class.
10. Posting the assignment on an Internet news group, social networking site or blog and asking someone to complete the work for you.
11. Hiring someone or asking a tutor to complete the assignment for you.
12. Copying another student's work, making minor changes, and submitting it as your own.

ADOPTING THE IS 2010 MODEL CURRICULUM: A SURVEY OF TOP MIS PROGRAMS

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ABSTRACT

The new IS 2010 Model Curriculum reflects a number of significant changes, one of which is to no longer require application development, or program coding, as a core course in the curriculum. Additionally, new courses have been added to the set of core courses that reflect a more management perspective of information systems. The degree in which information systems programs have adopted the new model curriculum is the focus of this study, with the sample IS programs surveyed consisting of the leading IS programs recognized nationally as exhibiting exemplary curricula. This paper reports the findings of this study and offers an analysis of the findings, with concluding recommendations for further studies.

KEY WORDS

IS 2010 model curriculum, ACM, AIS, Implementation challenges, core courses, elective courses, faculty, students, business community, infrastructure resources, curriculum design, IS program.

INTRODUCTION

The evolution of the model IS curriculum development shares a common goal: to provide guidelines for educational institutions to assure their graduates have necessary competencies, skills, and attitudes for success in the workplace and life-long learning as an IS professional (Davis et al. 1997). The availability of curriculum models not only provides a mechanism to keep the currency of contents for the body of IS knowledge taught, but also provides local academic units with rationale to justify resources to support the IS programs (Gorgone et al. 2003).

The systematic approach of model IS curriculum design has several advantages (Davis et al. 1997):

- 1) It was based on replicable methodology as the knowledge base evolves;
- 2) It provides functional rather than topical guidelines for course content;
- 3) the body of knowledge of learning objectives is progressively covered in an integrated fashion;
- 4) It provides unified and measurable educational learning objectives, which allows competent learning of the body of knowledge and continuous assessment and feedbacks (Argyris 1976); and
- 5) It provides for small learning units and allows both coherent of overall learning outcomes and flexibility for individual academic units to ensure the quality of their graduates.

Both IS'97 and IS 2002 extension have been widely adopted by many IS department as the baseline for their own curriculum design, and have been the basis for IS undergraduate program accreditation (Topi

et al. 2010). Despite the rapid contextual and technological changes in information technology in the past 10 years, there have been no major updates of model curriculum and many of the technologies in model curriculum elements haven't been quite antiquated. The major changes in technology and industry practices include:

- 1) A movement towards globally distributed information systems development;
- 2) Web technologies and development as a core part of IS development;
- 3) Emergence of service-oriented architecture;
- 4) Focus on configuration on large-scale enterprise systems; and
- 5) Ubiquitous mobile computing; 6) standardization of IT control and infrastructure frameworks (Topi et al. 2010).

Besides the need to reflect technology changes in the curriculum, the enrollment crisis in computer science and IS majors also calls for an update in the curriculum design. Since the "dot-com bubble" burst in 2001, IS enrollment decreased as much as 70-80 percent throughout the world (Granger et al. 2007). Even though there are many other factors affecting the IS enrollments, curriculum changes have been recommended by many (George, Valachich, and Valor 2005; Bullen, Abraham, and Gallup 2007; Granger et al. 2007; Kuechler, McLeod, and Simkin 2009) as one of the opportunities to increase enrollment.

Beginning in March 2009, a much anticipated draft version of the new curriculum was posted for discussion as a joint effort of the ACM and AIS. This third collaborative effort by ACM and AIS is considered as a major revision of the existing model curriculum with several significant characteristics (Topi et al. 2010) to address aforementioned issues, including:

- Reaching beyond the schools of management and business to provide expertise in other domains such as law, biology, healthcare, and so on;
- The outcome expectations has been articulated in high-level IS capabilities to provide students with skills and knowledge levels in three categories: IS specific, foundation, and domain fundamentals;
- The curriculum core is separated from electives to support different career tracks; and
- Involving the global IS community to reflect the global perspective IS discipline.

The finalized version of the new curriculum was published by the Joint IS 2010 Curriculum Task Force in early spring of 2010. Compared to previous version, IS 2010 has clearly moved towards a less technical, more managerial focus. It assumes that most organizational systems are built based on packaged systems or out-sourced development. Students are expected to engage in effective communication with both business stakeholders and developers in order to accurately specify both business and system requirements. However, they are not required to understand design and/or implementation of the technical structure of the system. A change in core data management concepts has reduced the focus on physical data modeling and DBA level requirements and application development (IS2002.5 programming, Data, File, and Object Structures and IS 2002.9 Physical Design and Implementation in Emerging Environment). Programming is completely removed from the core set of courses. The other major change in IS 2010 is the infusion of both enterprise architecture and IT infrastructure in core courses, focusing on organizational level issues related to planning, architecting, designing and implementing IT solutions with infrastructure as a foundation.

The proposed new IS 2010 model curriculum has the potential for many challenges to the major stakeholders, including faculty, students, administration, business community, infrastructure resources, and accreditation boards. Before making the transition from the existing IS Model Curriculum to the new IS 2010 Curriculum, many factors (Tatnall and Burgess 2009) need to be taken into consideration, which include:

- 1) organizational factors such as organizational constraints and administrative support;
- 2) resources such as hardware, software and textbooks;
- 3) social factors such as community expectations and competition with other course providers; and
- 4) perceptions of faculty members and students towards of the change. Among those diverse challenges, faculty acceptance level towards the curriculum change may be the most critical because faculty members are vital to the strength of an IS program (Topi, et al. 2010) and an effective faculty is the first required resource (Firth, Lawrence, and Looney 2008).

List 1 describes the 1997 IS Model Curriculum by categorizing the curriculum courses in five core content-focused areas: (A) Information Systems Fundamentals; (B) Information Systems Theory and Practice; (C) Information Technology; (D) Information Systems Development; and (E) Information Systems Development and Management Processes. With the surging advent of microcomputers as the primary infrastructure architecture for the development of web-based applications in response to a push for new business models, a software toolkit of personal productivity tools became a prerequisite to the program curriculum.

Prerequisite

IS'97.P0 Knowledge Work Software Tool Kit (a prerequisite to the program)

A. Information Systems Fundamentals

- Ⓜ IS'97.1 Fundamentals of IS
- Ⓜ IS'97.2 Personal Productivity with IS Technology

B. Information Systems Theory and Practice

- Ⓜ IS'97.3 Information Systems Theory and Practice

C. Information Technology

- Ⓜ IS'97.4 Information Technology Hardware and Software
- Ⓜ IS'97.5 Programming, Data and Object Structures
- Ⓜ IS'97.6 Networks and Telecommunications

D. Information Systems Development

- Ⓜ IS'97.7 Analysis and Logical Design of an IS
- Ⓜ IS'97.8 Physical Design and Implementation with DBMS
- Ⓜ IS'97.9 Physical Design and Implementation with a Programming Environment

E. Information Systems Deployment and Management Processes

- Ⓜ IS'97.10 Project Management and Practice

List 1: Details of IS'97 core curricula (Topi, et.al. 2010)

Table 1 illustrates the changes to and departure from the IS'97 Model Curriculum to the IS 2010 Model Curriculum. The primary changes can be seen as the elimination of application development with an emphasis in program coding as a core requirement. Instead, it has been retained as a suggested elective. In addition, there is less emphasis on information technology and physical architecture content areas. Two new courses, (1) Enterprise Architecture; and (2) IS Strategy, Management, and Acquisitions, have been added as required courses.

Changes in IS 2010	IS'97	IS 2010
Foundation topics are changed to more current issues.	IS'97.1: Fundamentals of IS and IS'97.2: Personal Productivity with IS Technology and IS'97.3: Information Systems Theory & Practice	IS 2010.1: Foundations of Information Systems
From system design and implementation in a DBMS environment to conceptual data modeling, logic models, and SQL, plus basic database administration tasks. However, physical data model and DBA level requirements have been reduced.	IS'97.8: Physical Design & Implementation with DBMS	IS 2010.2: Data and Information Management
Focus is on the level required for effective work as business system analysis. It is considered as foundation for further study in more technical issues in computer architecture and communication networks.	IS'97.4: Information Technology Hardware & Software and IS'97.6: Networks & Telecommunications	IS 2010.5: IT Infrastructure
Focus has changed from object-oriented analysis and logic design to business and systems requirements and high-level design specifications. Assumes that most solutions are based on packaged systems or implemented by using outsourced capabilities (on or off-shore).	IS'97.7: Analysis and Logical Design of an Information System	IS 2010.6: Systems Analysis & Design
Instead of system development management or enhancement projects alone, most IS activity is considered to be project-based. Team activities are emphasized. It also acknowledges that project management involves not only internal resources, but also external resources (contracted from outside organization	IS'97.10: Project Management & Practice	IS 2010 4: IS Project Management
Removed as a requirement.	IS'97.5: Programming, Data and Object Structures and IS'97.9: Physical Design & Implementation with a Programming DBMS	Gone
New course	None	IS 2010 3: Enterprise Architecture
New course.	None	IS 2010 7: IS Strategy, Management, and Acquisitions

Table 1.

IS'97 Model Curriculum Courses vs. IS 2010 Model Curriculum Courses. (Topi, et.al. 2010)

RESEARCH QUESTION AND PURPOSE OF STUDY

With the 2010 IS model curriculum now published in its final version, how well do existing programs conform to the curriculum? Major curriculum changes often take time to evolve since “older” curricula must be supported for four years or more as students move through their programs. This is especially true with urban institutions with large evening programs. However, there has been time for the academic community to make some initial modifications in adapting to the new model curriculum where deemed appropriate. To determine to what extent information systems programs have changed their curricula to align with the IS 2010 Model Curriculum, a survey was conducted to examine the curricula of a sample set of programs report how well the current set of courses match the IS2010 Model Curriculum. The purpose of the study is to ascertain to what degree the leading current information systems programs reflect the changes in the IS 2010 Model Curriculum. The value of the survey is allow information systems departments a benchmark for assessing their compliance to the new curriculum, and determining the degree of lag in making the transition.

METHODOLOGY

To compile information about current curricula, a group of academic institutions was chosen from the Top 10 college programs for Management Information Systems according to US News and World Report (<http://colleges.usnews.rankingsandreviews.com/best-colleges/rankings/business-management-information-systems>). As recognized leaders in the field, these institutions were chosen because they should be at the forefront in offering up-to-date curricula. The following university/college information systems programs comprise the sample population:

1. MIT
2. Carnegie Mellon
3. University of Arizona (Eller)
4. University of Texas-Austin (McCombs)
5. University of Minnesota-Twin Cities (Carlson)
6. University of Pennsylvania (Wharton)
7. University of Maryland-College Park (Smith)
8. Georgia State University (Robinson)
9. University of Michigan-Dearborn
10. Indiana University-Bloomington

MIT was omitted from the analysis because upon inspection of their web portal, no specific information systems program could be identified from the set of major undergraduate school program offerings. It is highly unusual and rather curious that a major publication report cannot be properly validated. The authors have not contacted US News and World Report for an explanation, but will have that information by conference time.

The most current curricula were retrieved from the websites of each of the remaining programs. Where historical curricula were included, the one identified as effective in the 2011-2012 academic year was used. Where only one curriculum was available, it was assumed to be current for this same academic period.

Using these criteria, a course-by-course examination was made to identify required and/or elective courses that matched courses in the IS2010 Model curriculum. This determination was made based on the course titles and descriptions that are available online. In some cases, the course description mentioned coverage of topics from multiple areas in the IS2010 curriculum. Since the IS 2010 Model curriculum recommends a set of courses, rather than just topics, this was handled by categorizing the course based on its *primary* topic focus. It was assumed that “some” coverage of a content area within a course was not equivalent to offering an entire course in the content area as recommended by the IS2010 Model Curriculum.

The examination also categorized each course based on whether it was a graduation requirement, or a course that could be used as a major elective. Required courses for “tracks” or “concentrations” were classified as electives since students in other tracks would not be required to take them. The number of credit hours dedicated to each category was recorded rather than the number of courses. Most universities used the 3 credit hour convention, but there were some who had a different mix of offerings. One university (Carnegie Mellon) used a “unit” system rather than the more typical “credit hour” system, so these were converted to credit hours assuming that 9 “units” is equivalent to 3 “credit hours”. All universities in the study used the semester system, so there was no need to make course length adjustments.

SURVEY FINDINGS AND ANALYSIS

Typically, academic programs that are recognized nationally are used to benchmark the progress of curriculum development. Hence, the rationale for using the top information systems programs to determine the new model curriculum’s level of acceptance. It was expected that the analysis would show a strong correlation to the recommended core and elective courses.

Recognizing that most curriculum changes take at least an academic year to be implemented in college bulletins/catalogs, an immediate adoption of the new model curriculum would not be expected; rather a slower transition would be more typical. However, the development of the new model has been evolving since the publication of the 1997 curriculum model and drafts of the new model have been available for distribution since 2009. A priori, one would expect a much quicker transition since the cycle duration included extensions of the 1997 model curriculum in 2002. The purpose of the survey was to test this hypothesis.

The survey results are summarized in Table 2 and they provide a number of interesting observations concerning how well nationally recognized leading information systems programs are adopting this new model.

		IS 2010 Recommended Core Courses (p. 35 Topi, et. al. 2010)						
		IS 2010.1	IS 2010.2	IS 2010.3	IS 2010.4	IS 2010.5	IS 2010.6	IS 2010.7
Ranking		Foundations of Information Systems	Data & Information Management	Enterprise Architecture	IS Project Management	IT Infrastructure	Systems Analysis & Design	IS Strategy, Management & Acquisition
	Institution							
1	Massachusetts Institute of Technology (Sloan)							
2	Carnegie Mellon University (Tepper)	3 (R)	3 (R)	6 (E)	3 (R)	6 (E)	7 (R)	5 (E)
3	University of Arizona (Eller)	6 (R)	3 (R)		3 (E)	3 (R)	3 (R)	
4	University of Texas--Austin (McCombs)	3 (E)	3 (R)	3 (R) & 3 (E)		3 (R)	3 (R)	3 (R)
5	University of Minnesota--Twin Cities (Carlson)	3 (R)	2 (R); 2 (E)			2 (R)	4 (R)	4 (R)
6	University of Pennsylvania (Wharton)	3 (R)	6 (E)		3 (E)	1 (E)	3 (E)	3 (E)
7	University of Maryland--College Park (Smith)	3 (R)	3 (R)		3 (E)	3 (E)	3 (R)	3 (E)
8	Georgia State University (Robinson)	3 (R)	3 (R)		3 (R); 9 (E)	3 (E)	3 (E)	3 (E)
9	University of Michigan--Dearborn	3 (R)	6 (R)		3 (R)	3 (R)	3 (R)	
10	Indiana University--Bloomington	3 (R)	3 (R)	3 (E)		3 (R)	3 (E)	3 (E)
		IS 2010 Selected Electives (p. 35, Topi, et.al. 2010)						
		Application Development	Business Process Management	Enterprise Systems	Introduction to Human-Computer Interaction	IT Audit & Controls	IS Innovation & New Technologies	IT Security & Risk Management
	Institution							
1	Massachusetts Institute of Technology (Sloan)							
2	Carnegie Mellon University (Tepper)	11 (R)	6 (E)		8 (E)		6 (E)	6 (E)
3	University of Arizona (Eller)	3 (R); 3 (E)	3 (R); 9 (E)				3 (E)	
4	University of Texas--Austin (McCombs)	6 (R)	3 (R)				3 (E)	
5	University of Minnesota--Twin Cities (Carlson)	4 (R)				2 (E)		2 (E)
6	University of Pennsylvania (Wharton)	3 (R)	9 (E)				3 (E)	3 (E)
7	University of Maryland--College Park (Smith)	3 (R); 3 (E)	6 (E)			3 (E)		
8	Georgia State University (Robinson)	6 (E)	12 (E)	3 (E)				6 (E)
9	University of Michigan--Dearborn	3 (R); 6 (E)						3 (E)
10	Indiana University--Bloomington	3 (R); 3 (E)	3 (R)					3 (E)

Table 2

Mapping of Nationally Ranked Information Systems Programs To 2010 IS Model Curriculum

I. Core Courses Findings:

Foundations of Information System (2010.1). As expected, most institutions have this as a program requirement. Only one program appeared to offer this as an elective only.

Data and Information Management (2010.2) This course was almost universally accepted as a required course. Only one program did not require a course in data management, but even in this program (Wharton) there was a strong emphasis for this field in elective offerings.

Enterprise Architecture (2010.3). As a curriculum requirement, this course has not yet garnered widespread support. It is listed as a requirement in only one program. Two others offer this topic as elective courses. That leaves six programs with no offerings in a subject that the IS2010 Model suggests to be sufficiently important to be a stand-alone required course.

IS Project Management (2010.4) This course is included in six of the programs included in this study. However, it is required in only three of them. In the other three it is offered as an elective only.

IT Infrastructure (2010.5). Some form of this course has universal presence in the curricula. More than half of the programs (5) have a course focused on data communications, telecommunications, systems administration or hardware operations as a requirement. The remaining programs offer at least one elective course in this area.

Systems Analysis and Design (2010.6). This course also had universal presence in the curricula that were examined. Only the Foundation course (IS2010.1) had stronger support as a required course. Six programs required a course in systems analysis and the remaining three offered elective courses. .

IS Strategy, Management & Acquisition (2010.7) While only two programs had a required course in this area, all of them offered at least 3 credits in IS strategy.

Summary Analysis of Core Courses.

Five of the seven courses were not substantially changed from IS97 to IS2010. As expected, most of these relatively unchanged courses are well supported by the programs in the survey. Courses which have been emphasized for a longer period of time have had a chance to become better supported by textbook publishers, and to be more familiar to faculty. Anecdotally, much of the IS research has focused on these ‘topical’ areas, providing a stronger basis for academic staying power for the courses.

However, being in the Model Curriculum (even older, more “established” ones) does not guarantee widespread acceptance as a course requirement. One course (Project Management) appears to have only partial acceptance. It is required in only three programs, even though it was included in both the older 1997 and extended 2002 model curricula and the new recommended 2010 model. It is elective in three other programs, but is still not offered in three others. This finding was not expected because of the pressure from businesses for more and better trained project managers. The response by information systems programs appears to not coincide with the need by industry.

Two additions were made to the new Model curriculum: Enterprise Architecture and IS Strategy. The first has little support in the programs studied. It is a required course in only one program, while two others offer it as an elective only. This leaves six programs with no course offerings in this subject area. IS strategy, on the other hand, has much better support. It appears in all but one of the programs, although only 2 of programs have this as a requirement.

Overall, it appears that the programs are in a good position to adopt at least one of the suggested curriculum changes. IS strategy could be moved from elective to required status at all of the institutions where it is not already a required course. On the other hand, it does not appear that Enterprise Architecture has the same potential. It is also interesting to note the lack of universal support for Project Management even though this has been included on Model curricula for a longer period of time.

II. Elective Course Findings:

Applications Development was deleted from the Model as a required course, but added as one of the suggested electives. While this was de-emphasized in the new model, there is still heavy emphasis on it. In programs where programming is required there are at least three and as many as eleven required credit hours. The lone exception to this trend is Georgia State, which does not have a programming requirement. Yet even here there are six elective hours in this area.

Business Process Management has support as both a required and an elective course. Three programs list a course in this field as a requirement. The remaining programs have some form of elective course.

Enterprise Systems is offered in only one program, and this is an elective course. The remaining programs may cover this topic in other courses, but they did not appear to have any stand-alone courses with *Enterprise Systems* as the primary focus.

Similarly, *Human Computer Interaction* is emphasized as an elective in only one program (Carnegie Mellon). It should be noted that the undergraduate elective offerings are broad (8 credit hours) and that HCI is offered as a second major through the university's Human-Computer Interaction Institute.

IT Audit & Controls has minimal support as it is offered in only two programs.

IS Innovation & New Technologies has better support, with offerings in four programs.

IT Security and Risk Management, on the other hand, shows good support. Six programs offer an elective course in this area. In two cases, multiple courses are available.

Summary Analysis of Elective Courses:

Overall, only two of the seven suggested electives identified in the IS2010 Model curriculum show reasonable widespread adoption of the electives *Business Process Management*, and *IT Security*. As noted previously, another suggested elective, *Applications Development*, continues to be treated as a core requirement by the majority of the sampled programs. The remaining four suggested electives are not, so far, garnering much interest as stand-alone courses.

As previously suggested, one of the reasons for not adopting a new subject area in a curriculum is the lack of textbook support for teaching the course. Other reasons are the lack of in-depth understanding and confidence in teaching the subject material because of a lack of available research in the topic, or the lack of support for bringing faculty up to a level of competency in teaching the material.

The gap between the curriculum recommended in IS2010 and what is seen in this analysis may well lessen over time as faculty become more familiar with the new model and curriculum committees comply with the administrative processes for officially changing program curricula. The lead time for curriculum changes is long and there are

some institutions that may be working on making changes that have not yet surfaced in the published curricula. On the other hand, each of these programs has unique strengths and strategies. When curriculum decisions are made, they are more likely to consciously support these unique strengths and strategies rather than an external “standard”.

CONCLUSION

Perhaps it is too early to assess the degree of acceptance by information systems programs of the new 2010 IS Model Curriculum; primarily because of the lack of innate agility with college and university processes for changing existing curricula. Although this assessment may be harsh, the reality is that traditional methods for change are not complementary of the fast-paced requirements for adapting to the needs of the ‘customer’ in the marketplace.

Another rationale for the lack of adoption support for the new model curriculum is the commitment to the existing IS majors who are currently under an older curriculum. Until these students are through the pipeline and graduate, or, substitutions are acceptable to program advisors, official program curricula changes will take place slowly.

The survey conducted in this study highlights much of the resistance to change and the mirroring of the process for curricula change exhibited by most academic institutions. It shows that the nationally recognized leading IS programs do not show strong evidence in their published programs for the new requirements. If other IS programs look to the recognized leaders for guidance, there may be some disappointment in not seeing significant changes in these programs. It might be expected that these leaders would be shaping, rather than following, a recommended curriculum such as IS2010. Yet there is no evidence of this shown in this analysis.

This study suggests that more work needs to be done in determining if the content areas depicted in the required and elective courses of the 2010 IS Model Curriculum reflect the real trends in creating curricula that mirror the skills and knowledge that are more urgently needed and expected by potential employers. A logical next step is an extensive survey of industry leaders whose corporations are shaping the way business is conducted in today’s global marketplace to determine if the model reflects what is needed in today’s marketplace. In addition, it would be beneficial to extend the study over a longer timeframe to so that curriculum changes that are still “in process” will emerge to provide more support for the IS2010 Model Curriculum.

REFERENCES

- Argyris, Chris. (1976). Single Loop and Double Loop Models in Research Design on Decision Making. *Administrative Science Quarterly* 21 (3):363-375.
- Bullen, C. , T. Abraham, and S Gallup. (2007). IT Workforce Trends: Implications for Curriculum and Hiring. In *Panel presentation at the 13th Annual Americas Conference on Information System*. Keystone, Colorado.
- Davis, G.B., John T. Gorgone, J. Daniel Couger, David L. Feinstein, and Herbert E. Longenecker Jr. (1997). IS '97: Model Curriculum and Guidelines for Undergraduate Degree Programs in Information Systems. *ACM SIGMIS Database* 28 (1).
- Firth, David, Cameron Lawrence, and Clayton Arlen Looney. (2008). Addressing the IS Enrollment Crisis: A 12-step Program to Bring about Change through the Introductory IS Course. *Communications of AIS* 2008 (23):17-36.
- George, J., J. Valachich, and J. Valor. (2005). Does Information Systems Still Matter? Lessons for a Maturing Discipline. *Communications of the Association for Information Systems* 16:219-232.
- Gorgone, J.T., J.S. Valacich, D.L. Feinstein, G.B. Davis, H. Topi, and H.E. Longenecker. (2003). IS 2002 Model Curriculum and Guidelines for Undergraduate Degree Programs in Information Systems. *Communications of the Association for Information Systems* 11 (1).
- Granger, Mary J., Geoff Dick, Jerry Luftman, Craig Van Slyke, and Richard Watson. (2007). Information Systems Enrollments: Can They be Increased? *Communications of AIS* 2007 (20):649-659.
- Kuechler, William L., Alexander McLeod, and Mark G. Simkin. (2009). Why Don't More Students Major in IS? *Decision Sciences Journal of Innovative Education* 7 (2):463-488.
- Tatnall, Arthur, and Stephen Burgess. (2009). Evolution of Information Systems Curriculum in an Australian University over the Last Twenty-Five Years. In *Proceedings of 9th WCCE 2009*. Brazil
- Topi, H., Joseph S. Valacich, K Kaiser, J. H. Jr. Nunamaker, Janice C. Sipior, GJ de Vreede, and R Wright, T. (2010). IS 2010 Curriculum Guidelines for Undergraduate Degree Programs in Information Systems. *Draft for Review*.
- (2010). Carnegie Mellon, College of Humanities and Social Sciences, Information Systems Department Curriculum. Retrieved from <http://www.cmu.edu/information-systems/curriculum/index.html>
- (2010) Georgia State University, Department of Computer Information Systems. Retrieved from: <http://www2.cis.gsu.edu/>

(2010) University of Arizona, Management Information Systems, Undergraduate Programs. Retrieved from <http://mis.eller.arizona.edu/undergraduate/programs.asp#mismajor> .

(2010) University of Maryland, Information Systems specialization in Business, Retrieved from <http://www.rhsmith.umd.edu/undergrad/majors/is.aspx>

(2010) University of Michigan, College of Business, Information Technology management. Retrieved from : <http://cob.umd.umich.edu/691067/>

(2010) University of Minnesota, Carlson School of Management, Management Information Systems. Retrieved from: <http://www.csom.umn.edu/undergraduate/academics/majors-minors/management-information-systems.html>

(2010) University of Indiana, Kelley School of Business, Undergraduate Program. Retrieved from : <http://kelley.iu.edu/ugrad/academics/curriculum/ipm.cfm>

(2010) University of Pennsylvania, Wharton Undergraduate Program. Retrieved from : <http://www.wharton.upenn.edu/undergrad/>

(2010) University of Texas at Austin, McCombs School of Business, Management Information Systems Degree Information Retrieved from <http://www.mcombs.utexas.edu/Departments/IROM/Academic-Information/BBA/MIS.aspx>

(2011) US News and World Report. Management Information Systems Rankings. Retrieved from <http://colleges.usnews.rankingsandreviews.com/best-colleges/rankings/business-management-information-systems>

MIS & CS -WORKING TOGETHER TO DEVELOP MOBILE APPS

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ABSTRACT

Management Information Systems (MIS) and Computer Science (CS) courses have been designed to provide the training the students need to make them marketable when they graduate. MIS students take core business courses to learn how businesses work and how to use information systems to improve organizations. In contrast, mathematics is very crucial for computer science theory. CS students are trained to take on challenging programming jobs and are concerned with problem solving and algorithm analysis. A growing area for software development is focused on mobile application development. This paper describes how MIS and CS students worked together to develop mobile apps for our university.

INTRODUCTION

Management Information Systems (MIS) and Computer Science (CS) are two majors available in the College of Business at our university. MIS students take core business courses, including marketing, management, accounting and finance. Understanding the organizational and behavioral aspects of information systems enable professionals to serve as a bridge between the technical and management levels within an organization. MIS professionals may often employ off-the-self products to solve organizational problems and improve the way an organization works.

Computer Science students learn how to design and build software and create efficient solutions for real-world problems. Mathematics is very crucial for Computer Science theory. CS students are trained to take on challenging programming jobs and focus on developing problem solving and algorithm analysis skills. They must determine the best way to solve a problem in the most efficient manner possible. CS students often work in a laboratory and invent new software to be used in various fields including health, education, robotics and digital forensics.

As more and more software development focuses on development for mobile devices, business are finding ways to integrate mobile devices into their organization. Mobile apps can be used to help people stay connected with customers and employees, stay informed, and stay productive. There are apps available to meet nearly every business need, from *word processing* to *remote access*, so employees can continue doing the job at hand.

Mobile and web-based distributed technologies provide the infrastructure for many organizations. The CS curriculum should reflect today's reality and cover mobile and web-based

application development [2]. Business schools can foster innovation and provide an integration between the school and the community [3]. MIS & CS students at our university worked together to develop mobile apps for our university's career center and campus police department. This paper will highlight some of the courses MIS & CS students take that helped them to work together to develop mobile apps.

PROJECTS

GC Career is a mobile app developed for our university's Career Center. It provides Bobcat Tracks, a checklist of tasks students need to complete in order to stay on the right path to graduate (Figure 1a). There are tasks for all students –from freshmen to seniors. This app is designed to keep students up-to-date and connected with the Career Center and even syncs career related events with user's Gmail calendar. *GC Career* is available in both Apple and Android app stores. In addition, an administration module was developed to allow an administrator to post updates to the checklist.

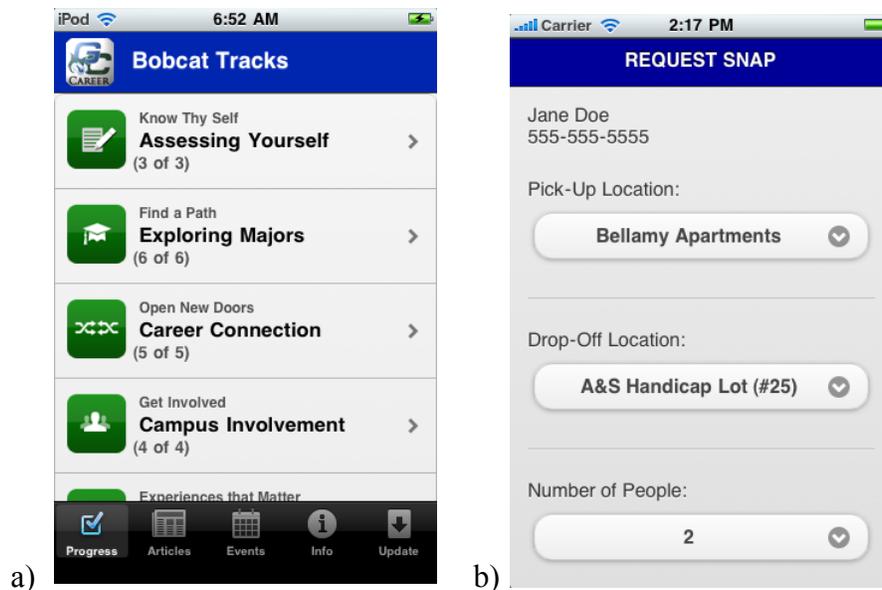


Figure 1: a) *GC Career* includes a checklist of tasks, links to articles and calendar of events.
b) *GC SNAP* is used to request a Student Night Auxiliary Patrol (SNAP) safety escort

GC SNAP is a software suite developed for our university's campus police safety escort service. On nights and weekends, students can contact campus police to request a Student Night Auxiliary Patrol (SNAP) officer to escort them to locations on campus. *GC SNAP* was developed to enable seamless communication between students, the dispatcher and officers.

Five modules were developed and work as one:

- The ***GC SNAP* app** (Figure 1b) is the module visible by student users; it was designed as a web app to allow students with various phones including Android, Blackberry and iPhone to connect using their web browser.

- The **Dispatcher** module (Figure 2) receives requests from student using the app and allows manual entry of requests that are phoned-in.
- The **Officer** module enables officers to process all SNAP requests from their vehicles. They are able to filter requests to show their active requests and shift history.
- The **Administration** module is needed to produce reports, add officers and locations to the system, and update emergency numbers stored in the student's app.
- The **Map** module is visible to the dispatcher and officers and shows the location on a map of all active requests.

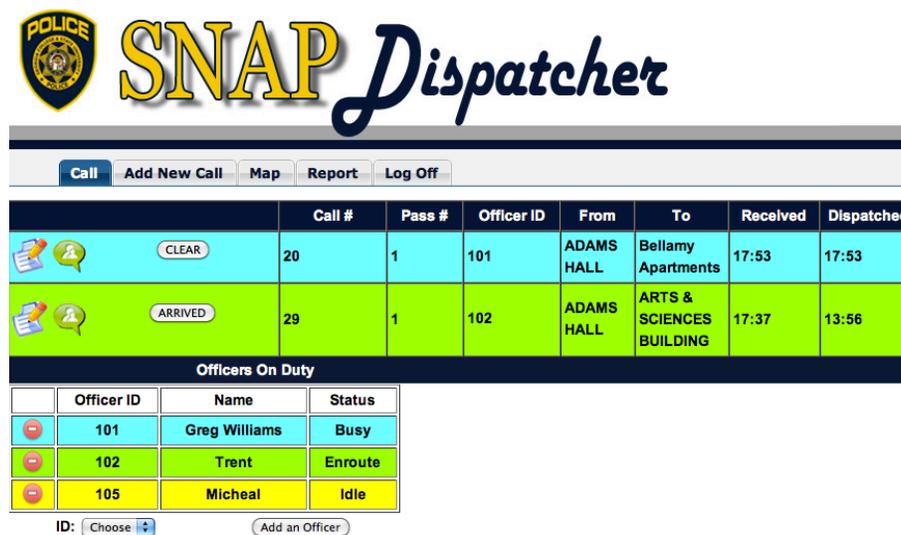


Figure 2: The Dispatcher module of the SNAP suite allows the police dispatcher to see status of all requests and officers.

MANAGEMENT INFORMATION SYSTEMS

Management Information Systems specialists help people when selecting products to fit their organization and managing deployment of the products. There were two MIS students working on this project. One student was responsible for graphic design and documentation, and the other student was responsible for setting up the initial development environment.

In CBIS 3219 Web Development, topics include HTML, CSS and how to use Dreamweaver and Fireworks. During the initial phase of gathering the client's requirements, Dreamweaver was used to draw a rough draft of screen layouts. These layouts were modified and adjusted as the requirements were gathered. The final version was given to the CS developers and used as a starting point for the code.

Developing mobile apps is image intensive. Icons, splash pages, marketing images, and graphics in the app need to be custom creations. iPhone, iPad and Android devices have different image standards. In fact, there should be three versions of each graphic for android devices alone.

There were images needed for the home pages, users' guides, and specification documentation. The MIS student's knowledge of Photoshop was invaluable.

MIS courses provide experience needed to create professional user guides for training when the application was deployed. In addition to BCOM 2285 Business Communication & Reports required for the MIS major, our student also minored in Marketing and completed MKTG 3162 Consumer Behavior and MKTG 4166 Advertising & Promotion. These courses emphasized that well written content paired with impeccable presentation is very important and is a good way to set your project apart from others.

An MIS student also takes CBIS 3212 Introduction to Programming & CBIS 4210 Advanced Programming. Even though the programming languages used for developing *GC Career* and *GC SNAP* are not covered in these classes, students learn about the process of development and how to test and try to "break" applications. Our development team was small so everyone was required to work together to test the code.

The second MIS student on the team was our IT person. He used the knowledge gained in CBIS 4225 System Administration to create users on the department's web server and establish a test environment for the CS developers. When the applications were deployed, MIS and CS faculty worked with the clients. We walked the *GC SNAP* administrators through the process of establishing a secure Yahoo webhosted service. For the *GC Career App*, the requirements of the webserver and database were given to the university's technical support and they established the required campus accounts.

COMPUTER SCIENCE

Computer Scientists may develop all types of software from operating systems, communication programs to web browsers and search engines. There were three (3) CS undergraduate developers for these projects. The students were chosen for their skills in Android, IOS and Internet programming. Our school recognizes the growing need for mobile and web-based programming courses and offers electives to fit this need.

Computer Science students often take an elective course, CSCI 4950 Internet Programming to learn how to develop web applications using HTML, CSS, JavaScript, PHP as well as creating and accessing online databases. In this course, students are exposed to a variety of web authoring tools such as Dreamweaver and content management software such as Drupal. For the *GC Career* and *GC SNAP* software, websites were created using PHP and JSON for server-side programming and JavaScript and JQuery for client-side programming.

In CSCI 4710 Databases, students master SQL and learn how to develop new database software. Some CS graduates use their knowledge of database software design to work as a database administrator for a company. For these projects, CS students were able to create and query the databases stored both online and in local storage on the smart phones.

CSCI 4320 Software Engineering provides an overview of the software development life cycle. Students gain experience working on a programming team, meet with clients to gather

requirements and develop software for a client. The requirements often change during the design phase and implementation phase either due to the client requests or technical difficulty. *GC Career* grew from providing a checklist for graduation to incorporating facebook, twitter and WordPress blogs. Students learn ways to deal with change and stay organized. They learn their goal is to develop software that meets the client's needs, is fault-free, delivered on time, delivered within budget and is easy to modify.

CS students take a variety of programming courses which enable them to easily learn new languages. All of the CS students completed an elective, CSCI 3950 iPhone Application Development and learned how to develop native iPhone apps using Objective-C. Their exposure to IOS programming was beneficial when configuring and uploading the app to the app store. However, for this project, an Android version was also needed. The CS student in charge of Android development was responsible for learning Android development on his own.

CONCLUSION

The students were given 3 months to complete the projects. The software was developed on time; however, Apple took over a month to add the *GC Career* app to the Apple App store. The apps the students developed can be accessed by all of the students on campus. Within the first month of installing the software, over 1,700 requests were processed using the *GC SNAP* software suite.

This paper lists just a few of the courses MIS and CS students took that helped them to work together to develop the mobile apps. Computer scientists may develop all types of software from system infrastructure to application technologies. Management Information Systems specialists help people when selecting products to fit their organization and managing deployment of the products. There are potentially rich opportunities for cooperation between MIS and CS majors.

REFERENCES

- [1] Joint Task Force for Computing Curricula 2005. "Computing Curricula 2005: The Overview Report Covering Undergraduate Degree Programs In Computer Engineering, Computer Science, Information Systems, Information Technology And Software Engineering" September 2005. (http://www.acm.org/education/curric_vols/CC2005-March06Final.pdf)
- [2] Mahmoud, Q. H., "Integrating Mobile Devices into the Computer Science Curriculum." Proceedings of the Frontiers in Education Conference (FIE 2008), Saratoga Springs, NY, USA, pp. S3E-17- S3E-22. (<http://fie-conference.org/fie2008/papers/1895.pdf>)
- [3] AACSB International Task Force on Business Schools and Innovation "Business Schools on an Innovation Mission" 2010. (<http://www.aacsb.edu/publications/researchreports/currentreports/business-schools-on-an-innovation-mission.pdf>)

DESIGNING AN ACADEMIC COMPUTER CAMP

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ABSTRACT

As the need for computer science professionals increases, the number of undergraduate students studying computer science is not keeping pace. Studies have shown that middle school is a key age in which students develop an interest in the sciences. A fun way to introduce students to computer science is through a summer academic computer camp. The authors share their investigation of available instruments and activities and those they considered for such a camp. The authors also share an outline of the goals developed for the camp, how the instruments and activities relate to the goals, and provide their draft schedule.

INTRODUCTION

As the need for computer science professionals increases, the number of undergraduate students studying computer science is not keeping pace. The U.S. Bureau of Labor Statistics Office of Occupational Statistics and Employment (OOSE) projects employment in computer related fields to grow much faster than average for the next few years [28]. The OOSE projects a 20 to 30% increase in new jobs for Computer Network, Systems, Database Administrators and Computer Scientists [28]. However, enrollment trends may not meet this demand. According to the Computing Research Association (CRA), while the enrollment in computer science has increased slightly over the past two years, it is still not sufficient to meet the projected need [13].

One way to increase interest in computer science is to ‘prime the pipeline’ by engaging and exposing students to computer science earlier in their education. Rodgers found that students start forming opinions about possible careers in middle school [32]. That is also about the time students begin to form opinions of science and mathematics. These opinions influence their interest in pursuing a career in those subjects [25]. While many middle school students have an understanding of careers in professions such as medicine, education, or business, and learn about others (ex. forensic science and law) through the media, they do not have a good idea of what a career in computer science involves [32].

To address this problem, universities and colleges have developed summer computer camps directed at middle school students [15] [5] [16] [25] [1] [29] [38]. In summer 2011, the authors conducted a computer camp for middle school students, grades 7-8 (12-14yrs). The approach we took in designing the academic camp was to expose students to computer science concepts through games and 'hands on' exercises. This paper presents the steps we took in designing the weeklong computer science day camp. We present the process of developing the camp proposal, and relate the selected activities to the camp goals.

BACKGROUND

Summer computer camps for middle school age students have become popular in recent years. Research has shown that these camps can increase awareness and interest in computer science [30]. Many camps have targeted a specific demographic to increase interest in populations underrepresented in the computer science field, such as females [15] [38] [31] or Latina/os [20]. These camps were designed around the general interests or cultural diversity of specific populations.

Camp designs have focused on a broad spectrum of subjects such as cryptography [35] and web-authoring [31] or introductory computer teaching tools such as Alice [38] [3] or Scratch [1]. The idea of using games to stimulate computing interest in middle school students has been well received [15] [25]. Middle school students' interest of games spans culture and gender. A computer camp using games as the main motivation for teaching computer science to girls was successfully received by the attendants [6] [24].

The need for computational thinking is well documented. Wing proposed the idea of computational thinking and of incorporating it across academic fields in 2006 [39]. Wing now defines computational thinking as "the thought processes involved in formulating problems and their solutions so that the solutions are represented in a form that can be effectively carried out by an information-processing agent" [40]. The National Science Foundation established the Innovative Technology Experiences for Students and Teachers (ITEST) in response to the projected shortage of professionals in Science, Technology, Engineering and Mathematics (STEM) [26]. The ITEST Computational Thinking Working Group states that computational thinking involves defining, understanding, solving problems and abstraction. The working group postulated that computational thinking has benefit for youth both in and out of school. The authors review computational thinking in game design and robotics, areas that may be of particular interest to youth [3]. Qualls and Sherrell [32] state that computational thinking activities must start in the primary grades and continue through the secondary grades and beyond, if computational thinking is to become as common as reading, writing and arithmetic. The importance placed on computational thinking by the National Science Foundation (NSF) is evidenced by the many grants that require or promote computational thinking, www.nsf.gov. Barr and Stephenson present computing concepts that can be applied across disciplines in an effort to help develop computational thinking in K-12 [4].

PROGRAM OVERVIEW

During the Fall 2010 semester, a task force at our institution sent out a request for academic summer camp proposals. The university sought to pilot four camps that would benefit both the students and the university. The camps would benefit the students by increasing their knowledge or interest in the camps' academic area. The camps could benefit the university by positively exposing potential students and their parents/guardians to the university. The camps could benefit the faculty by providing a new venue to test pedagogies, develop new interests and provide potential research material.

The camps would be one-week, Monday through Friday, from 9:00am to 4:00pm. Each camp was limited to twenty-four students and one college-age assistant. Interdisciplinary/departmental proposals with multiple faculty were encouraged. The camps would be taught in either week of a specified two-week period. The camp could be focused on one of five age groups, grades 3- 4 (8-9yrs), grades 5 - 6 (10-11yrs), grades 7 - 8 (12-14yrs), grades 9 - 10 (15-16yrs) and grades 11-12 (17-18yrs).

INVESTIGATION

Two computer science faculty joined forces to develop a proposal for an academic computer camp. We started the process by searching the web and reviewing the descriptions of advertised summer computer camps. In addition, we reviewed research material related to computational thinking and role models.

Computer Games

A common element in most camps was the use a software tool to develop a computer game. Multiple camps used Alice, a free educational software tool provided by Carnegie Mellon University. The Alice website notes that it introduces the user to object-oriented and fundamental programming concepts in a 3D environment [2]. Based on its name and icon, Alice specifically targets girls. Educators can gain access to free instructor resources that accompany the book, *Learning to Program with Alice*. The book is available for \$83 from the publisher, Prentice Hall.

Other camps used Multimedia Fusion 2 by Click Team. Multimedia Fusion 2 is a commercial product that allows the developer to create video games. Two options are available for site licenses, \$50 per computer the first year with a \$25 renewal fee, or \$83 per computer. Individual licenses are \$119 [7].

A 2D game creation tool used at some camps was Stagecast Creator 2. The Stagecast Creator website describes it as bridging creativity and developing thinking skills [36]. An evaluation copy that allows the user to create a limited number of characters for 120 days is free to download. After the 120 days, users can play existing games but cannot create new games. Stagecast Creator offers an education edition; the 25-user package costs \$775. Additional licenses, if less than 50, are \$31 each (e-mail correspondence). Individual standard licenses cost \$49.95.

Unreal Development Kit (UDK) by Unreal Engine 3 allows the user to create 3D applications and games. UDK includes an editor for importing and creating content, a frontend for launching and packaging applications, and tools for importing animation from other creation applications. Programmers can develop code using the object-oriented, UnrealScript, programming language [17] [18] [19].

GameMaker Lite by YoyoGames provides the user with the ability to design and create computer games containing backgrounds, animated graphics, music and sound effects. GameMaker Standard includes 3D graphics, sound and hardware acceleration [41]. For educators, 10 licenses of the standard version cost \$175 (e-mail correspondence); GameMaker Lite is free. A built-in GameMaker Language (GML) gives the experienced user additional flexibility in creating games. Educational resources created by users of GameMaker are available on the YoyoGames wiki. Table 1 presents a comparison of the game creation software.

	Cost for 24 students, 2 teachers	Educational Resources available?	Targeted/Suitable for Beginners
Alice	Free	Y	Y
Multimedia Fusion	\$50*26 = \$1300 (1 yr)	Y	Y
Stagecast Creator	\$775+\$31 = \$806	Y	Y
Unreal Development Kit	Free	N	N
GameMaker Lite	Free	Y	Y

Web Resources

Multiple websites provide resources for educators in the computing field; many are directed toward K-12 students. The authors reviewed various websites seeking activities designed to develop computational thinking.

Computer Science for High School (CS4HS) is a Google sponsored grant opportunity for universities to develop 2 to 3 day workshops that promote computer science and computational thinking to middle and high school teachers [21]. The website provides a Curriculum Guide that contains modules used in previous workshops [22]. A review of the site provided information for use in the workshop and directed us to other sites. The material available varied and included links or references to other websites, slides, module descriptions and speaker notes. Examples of potential relevant information and tools gained from this site:

- A format for delivering information quickly to a group called Pecha Kucha by Christopher Starr, PhD at College of Charleston [8]. We considered this method of delivery for topics we might convey that did not involve an activity.
- Videos by the University of Washington on the subject Why Choose Computer Science [23] [37]. The videos showcase students presenting topics such as reasons why they chose computer science, examples of projects they had developed and a typical day in the life of a software professional.
- A reference by one or more authors led to an examination of the following websites: Computer Science (CS) Unplugged, <http://csunplugged.org>; Computer Science for Fun

(CS4Fn), <http://www.cs4fn.org/>; and Computer Science Teacher's Association (CSTA) <http://www.csta.acm.org>. The authors reviewed these and other websites to locate age appropriate computational thinking exercises and activities that promote computer science.

Computer Science Unplugged [11] provides free activities that teach computer science through games and puzzles. The activities introduce such topics as binary numbers, algorithms, programming, and cryptography.

Computer Science for Fun (CS4Fn) [12] based in the United Kingdom provides resources to help share a passion for Computer Science. They provide resources for teachers, and focus on presenting the concepts of computer science while having fun. Topics include algorithms, animation, binary, careers, computational thinking, fundamentals of computing, computer history, math, and programming. The site contains a booklet of magic tricks that can be used to introduce many computing concepts.

The Computer Science Teachers Association [9] provides resources for K-12 teachers and students to support and promote computing disciplines. CSTA computational thinking materials include an operational definition, vocabulary, activities, and classroom scenarios [10].

A review of the CS4Fn site lead to MATHmaniaCS. MATHmaniaCS, [27] provides educational activities that focus on discrete mathematics and computer science and has resources that they loan to teachers.

CAMP PROPOSAL

The authors elected to conduct the camp for middle school students, grades 7-8 (12-14yrs). The university advertised the camp through an open call to the community. Therefore, the camp was not designed for a specific population or demographic other than middle school students.

The camp proposal included activities and goals aimed at promoting computer science. The proposed goals were:

- Encourage students to consider computer science as a career
- Promote an understanding of computers that goes beyond using them
- Help students recognize the underlying purpose and capability of technology
- Break the stereotype of what/who is a computer scientist
- Inspire an interest in learning, creativity and inventiveness.

The authors proposed the following general activities for the camp:

- Development of computer games to introduce the concept of software development.
- Perform puzzles and games that inspire computer science.
- Students will look inside a computer, identify parts of a computer, and install/uninstall memory.

Relating Goals to Activities

The proposed activities directly relate to the camp goals.

- Development of computer games to introduce the concept of software development.
To introduce the concept of software development we proposed that students develop computer games. The camp proposal included both GameMaker and Alice as possible choices for the software development tool. We ultimately decided to use GameMaker Lite because it was already on the campus computers and one instructor had previously used the software. This activity addressed the goals to inspire interest and encourage a career in computer science. Many middle age students are interested in playing computer games and those that would participate in a computer camp might have a greater pre-disposition to enjoy computer games.
- Perform puzzles and games that inspire computer science.
An example idea was included in the proposal. The puzzle game, first independently invented by Gardner and Fulves [14], is to have a blindfolded magician flip 3 coins into a desired configuration using only three moves. The three moves work because of the binary nature of the coins. Because binary is the language of computers, multiple sites that address computational thinking include activities to introduce the concept of binary numbers. By challenging the students to think through puzzles and connecting puzzle solutions to how computers function, the students would be encouraged to develop an understanding of computers beyond just using them. Furthermore, asking students to consider how computers could be used to help solve puzzles would encourage them to consider the capability of technology.
- Students will look inside a computer, identify parts of a computer, and install/uninstall memory.
To help demystify computers, students would be guided in looking inside a computer's system unit and identifying such parts as the motherboard, memory, expansion cards and drives. This activity could be accomplished using obsolete or broken computers from the university's IT department. Allowing students to uninstall and install memory would assist students in realizing that some maintenance and upgrade activities can be performed by a non-professional. Looking "inside" promotes a richer understanding and appreciation of the computer, beyond using the software.
- General.
The goal, "Break the stereotype of what/who is a computer scientist" was to be addressed through example. The camp presenters would be females of different races. The camp assistant would be a college student. By providing role models of different ages, interests and backgrounds, the stereotypical view of the computer scientist would be challenged.

The authors found the following quote instructive and included it in the proposal as additional comments: "When human beings acquired language, we learned not just how to listen but how to speak. When we gained literacy, we learned not just how to read but how to write. And as we

move into an increasingly digital reality, we must learn not just how to use programs but how to make them.” Douglas Rushkoff [34].

DRAFT SCHEDULE

Once the camp was approved, a schedule was developed. The camp would be conducted in both a classroom and lab setting. Table 2 shows the program schedule drafted for the 5 day academic computer camp.

TABLE 2 – Draft Schedule for the week		
Weekday	Morning CLASSROOM	Afternoon LAB
Monday	Registration, Survey Team Building Exercises Videos of emerging technology	Intro to software development Intro to Gamemaker Blogging Activity
Tuesday	Math Games Lego Mindstorm Activity	Intro to Gamemaker (cont) Blogging Activity
Wednesday	Computational Thinking Games Inside a computer Bits and Bytes Soundbyte	Students start building their own games with Gamemaker Blogging Activity
Thursday	Security SW pilferage and illegal downloading Computational Thinking Games	Students continue with their own game Blogging Activity
Friday	Points about networking Requirements Elicitation using Legos Create executable of student games Final Blogging Activity	Survey, Workshop evaluation Students play with each other’s games Students present games for parents Dismissal and thanks Present parents blogs & student games

CONCLUSION

Many resources exist to assist with developing an academic computer camp. Free software is available that can be used in an academic setting. Some software has associated resources to assist educators. Software that is also free to the individual allows a student to continue independent learning. This will further promote computational thinking skills. Some organizations that provide grants to help promote computer science and computational thinking, such as Computer Science for High School, make grant proposals publically available. Organizations such as CS Unplugged, CS for Fun, and CSTA provide a wealth of information and activities. Some activities include not only instructions but also speaker’s notes. As researchers and teachers continue to share what works, it may be easier to increase the number of educators that intentionally include activities that help promote computational thinking and increase the number of students that have an opportunity to attend a computer camp that helps to promote computer science.

REFERENCES

- [1] Adams, Joel C... Scratching middle schoolers' creative itch. In *Proceedings of the 41st ACM technical symposium on Computer science education (SIGCSE '10)*. ACM, New York, NY, USA, 356-360, 2010.
- [2] Alice, What is Alice?, 1999-2011, http://alice.org/index.php?page=what_is_alice/what_is_alice.
- [3] Allan, Walt, Bob Coulter, Jill Denner, Jeri Erickson, Irene Lee, Joyce Malyn-Smith, Fred Martin, Computational Thinking for Youth, The ITEST Small Group on Computational Thinking White Paper Working Group, 2010, http://itestlrc.edc.org/sites/itestlrc.edc.org/files/Computational_Thinking_paper.pdf
- [4] Barr, Valerie, Chris Stephenson, Bringing computational thinking to K-12: what is involved and what is the role of the computer science education community? *ACM Inroads*, Volume 2, Number 1 (2011), Pages 48-54.
- [5] Bruckman, Amy , Maureen Biggers, Barbara Ericson, Tom McKlin, Jill Dimond, Betsy DiSalvo, Mike Hewner, Lijun Ni, and Sarita Yardi. \,"Georgia computes!": improving the computing education pipeline. In *Proceedings of the 40th ACM technical symposium on Computer science education (SIGCSE '09)*. ACM, New York, NY, USA, 86-90, 2009.
- [6] Carmichael, Gail, Girls, computer science, and games. *SIGCSE Bull.* 40, 4 (November 2008), 107-110, 2008.
- [7] Click Team, Multimedia Fusion 2, <http://www.clickteam.com/website/usa/multimedia-fusion-2.html>
- [8] Computer Science Department at College of Charleston, Delivering a Module to Teachers: Pecha Kucha
<https://docs.google.com/document/d/1UUIHAN-nAdoEoVZ8qL7R-0N8Gmnsd0EnP2HTtI-Gz5OI/edit?hl=en&pli=1#>
- [9] Computer Science Teachers Association, <http://www.csta.acm.org/index.html>
- [10] Computer Science Teachers Association, <http://www.csta.acm.org/Curriculum/sub/CompThinking.html>
- [11] Computer Science Unplugged, <http://csunplugged.org>
- [12] Computer Science for Fun, <http://www.cs4fn.org/>
- [13] Computing Research Association (CRA), CRA Taulbee Report: CS Enrollments, New Majors Up again for the 2nd Year, March 2010.
<http://www.cra.org/govaffairs/blog/2010/03/cra-taulbee-report-cs-enrollments-new-majors-up-for-2nd-straight-year/>
- [14] Demaine, Erik, Recreational Computing Puzzles and tricks from Martin Gardner inspire math and science, *American Scientist*, November-December 2010, Volume 98, Number 6, Page: 452, DOI: [10.1511/2010.87.452](https://doi.org/10.1511/2010.87.452).
<http://www.americanscientist.org/issues/num2/2010/6/recreational-computing/4>
- [15] Doerschukm Peggy, Jiangjiang Liu, and Mann, Judith. Pilot summer camps in computing for middle school girls: from organization through assessment. In *Proceedings of the 12th annual SIGCSE conference on Innovation and technology in computer science education (ITiCSE '07)*. ACM, New York, NY, USA, 4-8, 2007. DOI=10.1145/1268784.1268789.
- [16] Dunn, Deborah L. ,Robert G. Strader, and Michael M. Pickard, Camps on a shoestring: how we survived a summer. In *Proceedings of the 42nd ACM technical symposium on Computer science education (SIGCSE '11)*. ACM, New York, NY, USA, 383-388, 2011.

- [17] Epic Games, 2001-2010, UDK Frequently Asked Questions, <http://udn.epicgames.com/Three/DevelopmentKitFAQ.html>
- [18] Epic Games, 2001-2010, Getting Started <http://udn.epicgames.com/Three/DevelopmentKitGettingStarted.html>
- [19] Epic Games, 2001-2010, Getting Started Programming on the Unreal Development Kit <http://udn.epicgames.com/Three/DevelopmentKitProgramming.html>
- [20] Franklin, Diana, Phillip Conrad, Gerardo Aldana, and Sarah Hough, Animal tlatoque: attracting middle school students to computing through culturally-relevant themes. In Proceedings of the 42nd ACM technical symposium on Computer science education (SIGCSE '11). ACM, New York, NY, USA, 453-458, 2011.
- [21] Google, Computer Science for High Schools, nd, <http://cs4hs.com/index.html>
- [22] Google, Curriculum Guide, nd, <http://cs4hs.com/curriculum.html>
- [23] Google, Why Choose Computer Science, <http://cs4hs.com/curriculum.html>
- [24] Gorriz, Cecilia M. and Claudia Medina, Engaging girls with computers through software games. Commun. ACM 43, 1 (January 2000), 42-49, 2000.
- [25] Hardnett, C, Gaming for Middle School Students: Building Virtual Worlds, GDSCE 08, Miami FL, USA, February 2008.
- [26] ITEST, About ITEST and the Learning Resource Center, <http://itestlrc.edc.org/about-itest-and-learning-resource-center>
- [27] MATHmaniaCS <http://www.mathmaniacs.org>
- [28] Occupational Outlook Handbook, 2010-2011 Edition; U.S. Bureau of Labor Statistics, Office of Occupational Statistics and Employment Projection, PBS Suite 2135, 2 Massachusetts Ave. NE Washington DC 20212-0001, <http://www.bls.gov/oco/>
- [29] Ouyang, Youwen and Katherine Hayden. A technology infused science summer camp to prepare student leaders in 8th grade classrooms. In Proceedings of the 41st ACM technical symposium on Computer science education (SIGCSE '10). ACM, New York, NY, USA, 229-233, 2010.
- [30] Pivkina, Inna, Enrico Pontelli, Rachel Jensen, and Jessica Haebe, Young women in computing: lessons learned from an educational & outreach program. In Proceedings of the 40th ACM technical symposium on Computer science education (SIGCSE '09). ACM, New York, NY, USA, 509-513, 2009.
- [31] Pollock, Lori, Kathleen McCoy, Sandra Carberry, Namratha Hundigopal, and Xiaoxin You, Increasing high school girls' self confidence and awareness of CS through a positive summer experience. SIGCSE Bull. 36, 1 (March 2004), 185-189, 2004.
- [32] Qualls, Jake A. , Linda B. Sherrell, Why computational thinking should be integrated into the curriculum May 2010, Journal of Computing Sciences in Colleges, Volume 25 Issue 5.
- [33] Rodger, S. et. al., Engaging Middle School Teachers and Students with Alice in a Diverse Set of Subjects, Fourtieth SIGCSE Technical Symposium on Computer Science Education, p.271-275, 2009.
- [34] Rushkoff, Douglas, [Program or be Programmed: Ten Commands for a Digital Age](#), 2010, Introduction, OR Books, New York.
- [35] Saliga, Linda, Lance Nelson, and Kathy Liszka, What's the secret?: an encrypted treasure hunt. J. Comput. Small Coll. 24, 1 (October 2008), 55-61, 2008.
- [36] Stagecast Creato, About Stagecast Creator, 1997-2011, <http://stagecast.com/creator.html>
- [37] University of Washington, Why Choose CSE? <http://www.cs.washington.edu/whyhsc>

- [38] Webb, Heidi C. and Mary Beth Rosson. Exploring careers while learning Alice 3D: a summer camp for middle school girls. In Proceedings of the 42nd ACM technical symposium on Computer science education (SIGCSE '11). ACM, New York, NY, USA, 377-382, 2011.
- [39] Wing, Jeannette. M., Computational Thinking, Communications of the ACM, 49, (3), 33-35, 2006
- [40] Wing, Jeannette, Research Notebook: Computational Thinking—What and Why? , 2011, <http://link.cs.cmu.edu/article.php?a=600>
- [41] YoYoGames, 2007-2011, GameMaker 8.1, <http://www.yoyogames.com/gamemaker/windows>

Using Experiential Methods to Teach Business Students about Sustainability

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Abstract

As sustainable practices in businesses and organizations become more and more prevalent, it is time to include these topics in our business courses. This does not make it a straight forward process. First of all, there are plenty of old school professors and department chairs still around who see sustainability as not worthy of class time. Secondly, many business students are not open to learning about these practices as they've been trained in other business classes that the financial bottom line is the only one that deserves attention. This paper first defines sustainability and its place in the business school curriculum. Two courses that have already been taught and one I will be teaching during the Spring 2012 term will be presented and the challenges of teaching sustainability to business students will be outlined and discussed.

Background

During my sabbatical in 2005 I came to the realization that teaching sustainability in business schools and departments was a logical step. With further investigation I discovered that I wasn't the only academic with this idea. In fact, I discovered the website www.beyondgreypinstripes.com which ranked over a hundred institutions of higher education that were already shining a light on sustainability in their business programs. Noting that the MBA program at UNC Chapel Hill had a concentration in Sustainable Enterprise, I became inspired to pursue a goal of incorporating sustainability into my courses and even create courses that focus on the practices of sustainable businesses and organizations.

Over the course of the several years I developed and taught a couple of specialized courses relating to sustainable businesses and organizations. While this helped to a small degree to

satisfy my passion to get business students on board with thinking about sustainability, I have been frustrated with some of the challenges. These will be further outlined below.

Definition of Sustainability

Our Common Future (1987) by the World Commission on Environment and Development defined sustainable development as “meeting the needs of the present without compromising the ability of future generations to meet their own needs.” Willard (2002) suggests that in economic language this means living of the Earth’s interest and not its capital. In business, that’s sustaining nature’s resources while sustaining the business. He and others (Savitz and Weber 2011, Henriques and Richardson 2004 and Esty and Winston 2009) outline a more practical definition. That is that a business doesn’t have just one bottom line of financial profitability; it has three bottom lines that include 1) financial profitability, 2)environmental preservation and 3) social justice.

The Courses

Intensive Learning Courses

In our General Education curriculum we have included Intensive Learning Courses. One of these is required by all Roanoke College students in order to graduate. Each faculty member is expected to teach an Intensive Learning course once every three years. There are some conditions that have to be met in order for it to be classified as a course in the Intensive Learning Curriculum. The Intensive Learning course is unique in that it:

1. Immerses students and faculty in the subject under consideration, by providing a concentrated period of study on a full-time basis.
2. Is the only one course being taken by students and taught by faculty during this time, so that it can be a full-time activity for both, with as few distractions as possible.
3. Reinforces a present strength of the College, namely student/faculty interaction and student access to faculty.
4. Considers a topic of circumscribed dimensions, clearly focused and well defined, for which it is possible to reach a conclusion and attain closure during the period of study.

5. Allows for students and faculty together to experience teaching strategies, learning opportunities and activities that are difficult to use extensively during a regular term and can be emphasized here because of the unique features of the new term.
6. Makes it possible to consider assessment and evaluation of student work in ways that are impractical during the regular year.

Sustainable Business: The Next Industrial Revolution

In May of 2010 I taught “Sustainable Business: The Next Industrial Revolution” as an Intensive Learning course. The course topics and activities included:

1. Coverage of the early part of the first Industrial Revolution and the unsustainable business practices that had dramatically negative consequences on the environment and society. Readings included Dickens’ *Hard Times*, Rachel Carson’s *Silent Spring*, Ralph Nadar’s *Unsafe at Any Speed* among several other articles and cases. Various videos were viewed and discussed including one on Union Carbide created tragedy in Bhopal, India, another on Monsanto’s Genetically Modified Seeds and associated pesticides, and the Exxon Valdez tragedy. We were witnessing live the BP oil spill in the Gulf. Students did research on unsustainable business practices, wrote papers on them and made presentations.
2. Coverage of Climate Change and the students debated whether it was man made and if some actions on the part of government and businesses are warranted.
3. Coverage of what businesses and organizations can do to operate more sustainably.
4. Students conducted primary research to assess the public’s awareness and perception of the need for sustainable practices by governments and businesses. Students wrote summaries of the their interpretation of the research results.
5. We visited several sustainable businesses and organizations in Roanoke, Salem and Washington DC. Students wrote reflection paper about these visits.
6. Students produced proposals for projects that would help either 1) promote awareness of the need for sustainable practices or 2) provide direction to businesses and

organizations who are interested in operating more sustainably or 3) mini business plans for sustainable businesses and/or organizations. These plans were then presented to the class.

Reflection on the “Sustainable Business: The Next Industrial Revolution” course

The students who took this course came from a variety of backgrounds. The majority were business students. Very few know what a sustainable business was. Many took the course because they wanted to go to Washington DC. There were students who were already aware of the environmental and social problems that some businesses have created. Others had no idea. One student said “When I realized this course was about the environment, I thought ‘Oh, Crap,’”. I am passionate about making students aware of the triple bottom line so I had energy and enthusiasm for the course. The students didn’t seem to mind the topic, but most did not share my enthusiasm. The completed assignments ranged from just being completed assignments while others were outstanding and creative. Overall, I was pleased that all the students did learn about this other way of conceptualizing business, saw some great examples of sustainable businesses and organization, and did a decent job of proposing ideas for sustainable businesses.

The Greener Way of Life in Germany

In 2011 I had the opportunity to take over a course that had been planned by another professor that took students to Berlin, Germany to examine their focus on sustainable living, sustainable business practices and governmental sustainable policies and activities. This course was entitled “The Greener Way of Life in Germany”. It was originally created as an Economics course and many Economics students were enrolled and had paid for the course. For this reason I assigned a book that was a critical assessment of capitalism in the United States and how it is leading us into very dangerous environmental and social situations. Another book focused on the need for changes in lifestyle and business practice and offered up many good

examples of how some basic changes could turn around some of the detrimental effects of business as usual.

The course topics included:

1. A consideration of whether economies based on capitalism are able to become sufficiently engaged in sustainability to make the adjustments necessary to ensure that the planet and the people on it could survive into the future.
2. Limited vs. Unlimited Growth was a topic for a class debate.
3. The way German lifestyles embraced sustainability.
4. The way German businesses incorporated sustainability practices.
5. The creative sustainability movement in Berlin.
6. Governmental policies and activities that foster sustainability.
7. The students completed an exam that required them to contemplate, state and argue their position on the topics covered in the course.
8. The students wrote proposals for sustainable businesses or organizations.

Reflection on the Greening of Germany Course

This became my course through some very unusual circumstances and so there were some challenges inherent in it which I will explain more thoroughly in the paper. Again, the student group was mixed in terms of how open they were to ideas of limited growth and sustainability. A great component of it was the part that consisted of site visits and tours. Some of these were to: 1) Prenslauer Berg which in the formerly eastern section of Berlin where many young and progressive Germans sustainably remodeled the run down apartments that were there after the reunification 2) the Bundestag which is the capital building of Germany that was built after 2000 to house the government as it relocated to Berlin from Bonn – it is a fascinating sustainable building 3) the Freire University where we visited a graduate level environmental studies class and spoke with German students who are passionately planning for careers in sustainability 4) Community urban gardens that are in a variety of locations throughout Berlin 5) Cooperatives 6) Many sustainable businesses and organizations that are common in Berlin.

Intellectual Inquiry 300 (INQ 300): Contemporary Issues

At the time of this writing I have proposed a course that will serve as one of the capstone courses for our General Education curriculum. All Roanoke College students must take an INQ 300 and its intent is to allow them to use the skills and knowledge they've gained in their majors and in the General Education Curriculum to thoroughly analyze a contemporary issue and provide viable solutions to it. There are several of these offered every semester and I will be teaching two sections of it in the Spring 2012 term.

Common learning objectives for all INQ 300 courses are that students will be able to:

1. apply their research findings to a formal project addressing the course topic question and will successfully present this proposal in an oral defense.
2. write well-organized and clearly reasoned papers both individually and with a group. Papers will have clear theses, effective organization, and a minimum of sentence-level errors.
3. contribute to meaningful, effective discussion and collaborative work that includes expressing, listening to, and debating ideas.
4. be able to apply critical thinking and quantitative reasoning skills in a meaningful way.
5. make explicit, meaningful connections between past course work (both in the core and in their majors) and contemporary issues.
6. demonstrate understanding of a contemporary issue or problem, an awareness of the types of inquiry needed to understand it, and the resources required for addressing it.

The course I developed is entitled "The American Dream: Where do we go from here?" The course has been accepted by the General Education Group and the Curriculum Committee. Soon it will officially part of the General Education Curriculum when it is voted in by the faculty. The specific learning objectives for the course are that the students will be able to:

1. Examine and evaluate their own vision of the American Dream
2. Evaluate the vision of the American Dream as portrayed by the marketers and the media

3. Research the limits of consumption and consider what a sustainable American Dream could be
4. Analyze and articulate the characteristics of a sustainable lifestyle
5. Analyze and articulate the characteristics of successful sustainable program and projects.
6. Design a program and/or project that fosters a sustainable American Dream
7. Synthesize all of the above and predict outcomes of various scenarios

Other activities will include site visits to sustainable businesses and organizations in and near Roanoke. Guest speakers will also be invited to share their expertise in related fields. The students will present their programs/projects formally to the class and other local experts and faculty from the Environmental Science programs.

Conclusion

No course is perfect, especially if it's only taught one time. There are certainly things I would do differently if given a chance to reteach the IL courses. The INQ course will be in session at the time of my SE DSI presentation. It is my hope to not only share my experiences but also gain some insight from the SE DSI participants with respect to what sorts of things have worked for them and what suggestions they might have for me. Specific issues I have at this point are 1) Many students don't take sustainability seriously because it isn't being reinforced in many other business classes. 2) Other professors dismiss sustainability and that isn't helpful. 3) The level of awareness is so mixed that for some students this is like preaching to the choir and for some students it is a whole new and seemingly incomprehensible concept. 4) How many of the

problems I have are due to the nature of the IL courses? Will the INQ course be different? 5)

What else can I do to motivate students to care about sustainability?

Select Bibliography

Beyond Grey Pinstripes 2003. In partnership with the Aspen Institute and the World Resources Institute. www.BeyondGreyPinstripes.org

Brown, Lester R. (2001) *Eco-Economy: Building an Economy for the Earth*. Norton: New York.

Carson, Rachel (1962) *Silent Spring*

Dickens, Charles (1854) *Hard Times*

Esty, Daniel C. and Andrew Winston (2009) *Green to Gold: How Smart Companies Use Environmental Strategy to Innovate, Create Value, and Build Competitive Advantage*. Wiley.

Gogoi, Pallavi (2005) "Welcome to the Generation Y Workplace" in *BusinessWeek*.

Hawken, Paul (1993) *The Ecology of Commerce: A Declaration of Sustainability*. Harper Collins: New York

Hawken, Paul, A. Lovins and L.H. Lovins (1999) *Natural Capitalism*. Little Brown: Boston.

Heeks, Alan (2001) *The Natural Advantage: An Organic Way to Grow Your Business: Seven Principles for High Performance*. Rodale: Emmaus PA.

Henriques, Andrian and Julie Richardson (2004) *The Triple Bottom Line, Does It All Add Up?: Assessing the Sustainability of Business and CSR*. Routledge.

"Innovations in Sustainable Enterprise" UNC Kenan-Flagler Business School's Center for Sustainable Enterprise website. www.kenan-flagler.unc.edu/ki/cse/newcourses.cfm

Little, Amand Griscom (2005) "Maathai on the Prize: An Interview with Nobel Peace Prize Winner Wangari Maathai" *Grist Magazine: Environmental News and Commentary*

Millennium Ecosystems Assessment Synthesis Report (2005)
www.millenniumecosystemsreport.org

Nadar, Ralph (1965) *Unsafe at Any Speed*

Salzmann , Oliver, Aileen Ionescusomers and Ulrich Steger (2005) "The Business Case for Corporate Sustainability: Literature Review and Research Options" *European Management Journal*

Savitz, Andrew and Karl Weber (2006) *The Triple Bottom Line: How Today's Best-Run Companies Are Achieving Economic, Social and Environmental Success -- and How You Can Too*. Jossey-Bass.

Shellenberger, Michael and Ted Nordhaus (2004) "Is Environmentalism Dead". Transcript of speech given at the Commonwealth Club of San Francisco on Dec 8, 2004.

Thomsen, Mark (2005) "Climate Change Offers Opportunities: An Interview with Tim Wirth, Executive Director of the UN" , www.socialfunds.com

Willard, Bob (2002) *The Sustainability Advantage: Seven Case Benefits of a Triple Bottom Line*. The New Society Publishers: Gabriola Island, Canada.

World Commission on Environment and Development (1987) *Our Common Future*. OUP: Oxford.

A Look at the Liberal Arts Core and Business Administration Courses: How the New University Requirement's have Facilitated Changes

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Southeast Decision Science Institute 42nd Annual Meeting

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Abstract

Due to recent changes in the liberal arts core and business administration core at Marymount University, these classes have had to adjust to meet these new requirements. After many discussions with employers, alumnae and the advisory board, it was clear that we needed to update our courses to meet the current trends in the workplace and around the globe. These requirements will be discussed in detail in the paper, but the main focus was on Critical Thinking, A Global Perspective and an Ethics component. To meet these needs, Marymount has also created a Center for Teaching Excellence and the DISCOVER Program, both will be discussed later.

These skills are essential for our students to be successful in the Business Environment of today. Many of the courses were self-contained and there wasn't much discussion about cross curriculum skills and why they were important. Now we are seeing a shift from isolated courses to an integration of both the liberal arts core and business administration core.

We examine and analyze a smaller set of courses, to show that there has indeed been a shift from the Marymount Catalogue of 2006 and 2011. We still have some students finishing up their degree plans under the old requirements, but in a few years, we hope that all students will be responsible for all of these requirements. As educators, our goal is to prepare our students for the 21st Century and we are adjusting to meet those changes.

Introduction

Although we would like to include a comprehensive comparison of the course catalogue descriptions, we have chosen only a few from both the liberal arts and business administration core. Our selection was to explicate that we are indeed making the shift towards the new University Requirements. First, there is a list of the specific University requirements, as well as those in the liberal arts and business core. A sample of these were selected to show the shifts at both the School and University levels. There is also a table that does include all of the requirements without the descriptions to synthesize the changes over time.

University Requirements:

Global Perspective

GP — One designated course, study abroad, or foreign language course is required.

Writing Across the Curriculum

WI — Three designated writing-intensive courses are required, in addition to the Liberal Arts Core requirement of the written communication sequence.

Ethics Across the Curriculum

ETH — One designated course is required, in addition to the Liberal Arts Core requirement of a moral principles course.

Experiential Learning

EXP — An internship or research experience is required. Most students meet this requirement through the internship in their majors.

Inquiry Learning

INQ — Three courses in the major are designated as inquiry-guided learning courses. In addition, DSC 101 DISCOVER First-Year Seminar is an inquiry course.

(<http://www.marymount.edu/academics/core/requirements.aspx>)

Core Requirements:

Written Communication

6 credits

WR — EN 101 Composition I and EN 102 Composition II are required, with a minimum grade of C- in each class.

Humanities

12 credits

Introductory college-level courses are required in History and Literature.

HI-1 Introductory History

LT-1 Introductory Literature

Students also select two courses in two different fields, from designated Fine Arts, advanced History, or advanced Literature courses:

FNA Fine Arts

HI-2 Advanced History with a prerequisite

LT-2 Advanced Literature with a prerequisite

Mathematics and Sciences

19 credits

Mathematics

MT — One designated college-level Mathematics course is required. Credits for MA 019W, MA 094, and MA 095 may not be applied toward any degree.

Natural Science

NS — At least one designated college-level Natural Science course with laboratory is required. Students complete one designated course from Astronomy (ASTR), Biology (BIO), Chemistry (CHM), Geology (GEOL), Physics (PHYS), or Physical Science (PSC) offerings. Some students have the option of completing a second Natural Science course, as outlined under Social Science.

Social Science

Four fields — Economics, Politics, Psychology, and Sociology — constitute the social sciences, and requirements vary depending upon the degree being sought.

The following requirements apply to all students except those completing a Bachelor of Business Administration degree:

Two designated introductory Social Science courses are required in two different fields:

SS-1 Introductory Economics, Politics, Psychology, or Sociology

One designated Social Science course at the advanced level is required:

SS-2 Advanced Social Science with a prerequisite

Students also select between another introductory Social Science course and a second Natural Science course (lab optional):

SS-1 Introductory Social Science (in a third field)

NS Natural Science (lab optional)

The following requirements apply to those students who are completing a Bachelor of Business Administration degree:

Three designated introductory Social Science courses are required, two in Economics and one in another Social Science field:

SS-1 ECO 210 Principles of Microeconomics

SS-1 ECO 211 Principles of Macroeconomics

SS-1 Introductory Politics, Psychology, or Sociology

Students also select between an advanced Social Science course and a second Natural Science course (lab optional):

SS-2 Advanced Social Science with a prerequisite

NS Natural Science (lab optional)

Philosophy, Theology, and Religious Studies

12 credits

Introductory college-level courses in Philosophy and in Theology/Religious Studies are required. Students also take an advanced course in each area. One of the advanced courses must be a designated moral principles course:

PH-1 PH 200 Introduction to Philosophy

PH-2 Advanced Philosophy with a prerequisite*

TRS-1 TRS 100 Theological Inquiry

TRS-2 Advanced Theology or Religious Studies with a prerequisite*

*One of these must be a designated moral principles course:

PH-E or TRS-E.

DISCOVER Seminar

3 credits (in addition to the Liberal Arts Core credits)

Freshmen are required to enroll in DSC 101 DISCOVER First-Year Seminar, offered each year in the fall. DSC 101 focuses on learning and life skills required for academic success as well as the process of inquiry-guided learning.

(<http://www.marymount.edu/academics/core/requirements.aspx>)

BBA Core Requirements:

All B.B.A. majors take coursework that builds on the foundation provided by the Liberal Arts Core and B.B.A. core. The specialty allows student to tailor their degree to fit their individual interests and goals. Specialty Requirements are outlined following the Major Requirements.

Major Requirements

To fulfill the requirements of the major, all students in this program will take the following coursework in a sequence determined in collaboration with a faculty advisor. All students also must fulfill Liberal Arts Core and University requirements, and some of the following courses may also satisfy those requirements.

- ACT 201 Introduction to Financial Accounting
- ACT 202 Introduction to Managerial Accounting
- ECO 210 Principles of Microeconomics
- ECO 211 Principles of Macroeconomics
- FIN 301 Financial Management
- IT 110 Information Technology in the Global Age
- LA 248 Business Law I
- LA 249 Business Law II
- MA 155 Finite Mathematics
- MGT 123 The Business Experience
- MGT 223 Sophomore Business Experience
- MGT 291 Business Communication
- MGT 304 Organizational Management
- MGT 323 Junior Business Experience
- MGT 423 Senior Business Experience
- MGT 451 Strategic Management
- MGT/LA 490 Internship
- MSC 300 Business Statistics
- MSC 337 Operations Management
- MKT 301 Principles of Marketing
- PH 305 Business Ethics

<http://www.marymount.edu/academics/programs/businessAdmin/programReq.aspx>

Selected Course Descriptions from 2006 & 2011

Core Business Course Descriptions 2006-07 Catalogue:

ACT 201 Introduction to Financial Accounting (3)

An introduction to the basic concepts of financial analysis and recording. Introduction to the entire accounting cycle through preparation of worksheets and financial statements, special journals, and subsidiary ledgers. Prerequisite: ISY 096 or equivalent.

ACT 202 Introduction to Managerial Accounting (3)

A continuation of the concepts and practices introduced in ACT 201. Introduction to partnership and corporate accounting and financial statement analysis. Prerequisite: ACT 201.

ECO 199 Principles of Macroeconomics (3)

Measurement and determination of aggregate levels of income and output, employment, and prices. The role of the central bank and the impact of government spending and taxation are examined as well.

ECO 210 Principles of Microeconomics (3)

The market mechanism, with a detailed examination of supply and demand and applications to monopoly power, externalities, resource markets, and instruments of social action.

Note: ECO 199 has changed numbers in the 2011 catalogue to ECO 211.

FIN 301 Financial Management (3)

The fundamentals of business finance, including financial analysis, planning, and control; management of working capital; analysis of long-term investment opportunities; and examination of internal and external sources of financing. Prerequisites: MGT 123 and ACT 201.

ISY 301 Information Systems (3)

Explores information systems as a means of information management. To accomplish this, the course looks first at the nature of organizations and their need for information, then at the nature of information technology, and finally combines the two for a look at information systems. Prerequisites: ISY 095-098. This course is not open to IS majors. This course contains a significant component in the use of computers.

Note: This course number has changed to IT 110 in the 2011 Catalogue.

LA 248 Business Law I (3)

A study of the rights and relationships involved in the laws of contracts, sales and agency, including the Uniform Commercial Code. Offered fall semester only. Prerequisite: MGT 123.

LA 249 **Business Law II (3)**
A study of the law relating to the development and operations of partnerships, limited liability companies, and corporations, and of the government agencies that regulate business. Offered spring semester only. Prerequisite: LA 248.

MA 155 **Finite Mathematics (3)**
Introduces common problems that can be modeled and solved using techniques of finite mathematics. Among the techniques are the uses of matrices and systems of linear equations applied to elementary linear programming, probability, and stochastic processes. Prerequisite: self-placement or a grade of C- or better in MA 100B.

MGT 123 **The Business Experience (3)**
A survey of American business with an experiential focus on the business resources of the Washington, DC, area. The student is given an overview of business formation; management origins; and the functional relationships of marketing, finance, personnel, and production.

Note: MGT 223 has been added to the 2011 BBA core requirements.

MGT 391 **Business Writing and Speaking (3)**
The primary emphasis of this course is on writing — helping students learn how to write clearly and correctly for busy people at work. A small part of the course will cover fundamentals of business speaking; specifically, students will work together to prepare and present a computer presentation, an extraordinarily useful skill for today's business environment. Prerequisites: EN 102, ISY 095 or equivalent, and ISY 097 or equivalent. This course contains a significant amount of speech and oral presentations.

Note: MGT 391 had been changed to MGT 291-Business Experience.

MGT 304 **Organizational Management (3)**
A study of behavior in organizations and influences of individual, group, and organizational processes on performance. Among the topics that will be introduced are interpersonal perception, motivation, group and team dynamics, decision making, influence and conflict, interpersonal communication, and organizational cultures. Prerequisite: MGT 123 or EN 102.

Note: MGT 323 and 423 and been added to the course BBA Requirements in the 2011 Catalogue.

MGT 451 **Strategic Management (3)**
An analysis of major business policy decisions using case studies, simulations, and class discussion. Development of the understanding of the interrelationship of economic, marketing, financial, and management functions through integrating cases. Prerequisites: FIN 301, MGT 304, MGT 391, MKT 301, and senior status.

- MGT 490 Internship (3-6)**
Senior students register for field experience with cooperating business firms in the Washington metropolitan area. The internship is monitored by a supervising professor and a representative of the cooperating company. Application should be made 3 to 6 months prior to registration to permit exploration of internship opportunities. Prerequisites: permission of director of internships for the School of Business Administration, senior status, minimum of 90 credit hours with a cumulative GPA of 2.0 or better, and a cumulative GPA of 2.0 or better in all Business courses.
- MSC 300 Business Statistics (3)**
Introduces students to the basic descriptive and inferential statistical procedures used in the analysis of data and testing of hypotheses in a business environment. Commonly available spreadsheet software will be used. Prerequisites: ISY 096 or equivalent, and MSC 202 or MSC 205 or equivalent. This course contains a significant component in the use of computers.
- MSC 337 Production and Operations Management (3)**
A study of the concepts, issues, and decisions facing production and operations managers through the identification and analysis of a variety of operational problems. Emphasis on quantitative analysis techniques used by managers to solve these problems. Extensive use of microcomputer models. Prerequisites: ISY 096 and ISY 098 or equivalents, and MSC 300. This course contains a significant component in the use of computers.
- MKT 301 Principles of Marketing (3)**
A study of the system of interacting business activities that deliver goods and services to present and potential customers. Analysis of the problems of planning, research, and logistics that confront the modern marketing manager. Prerequisite: EN 102 or MGT 123.
- PH 305 Business Ethics (3)**
Examines the ethical foundations of business and the role of ethical judgment in business decisions. The course reviews theoretical foundations and examines case study applications. Prerequisite: EN 102.

Core Business Course Descriptions 2011 Catalogue

ACT 201 Introduction to Financial Accounting

An introduction to the basic concepts of financial analysis and recording. Introduction to the entire accounting cycle through preparation of worksheets and financial statements, special journals, and subsidiary ledgers. (3)

ACT 202 Introduction to Managerial Accounting

A continuation of the concepts and practices introduced in ACT 201. Introduction to partnership and corporate accounting and financial statement analysis. Prerequisite: ACT 201 with a grade of C or better. (3)

ECO 210 Principles of Microeconomics

The market mechanism, with a detailed examination of supply and demand and applications to monopoly power, externalities, resource markets, and instruments of social action. Prerequisite: MGT 123 or any 100-level or higher Mathematics course. *Liberal Arts Core/University Requirements Designation: SS-1.* (3)

ECO 211 Principles of Macroeconomics

Measurement and determination of aggregate levels of income and output, employment, and prices. The role of the central bank and the impact of government spending and taxation are examined as well. Prerequisite: MGT 123 or any 100-level or higher Mathematics course. *Liberal Arts Core/University Requirements Designation: SS-1.* (3)

FIN 301 Financial Management

The fundamentals of business finance, including financial analysis, planning, and control; management of working capital; analysis of long-term investment opportunities; and examination of internal and external sources of financing. Prerequisites: MGT 123 and ACT 202. (3)

IT 110 Information Technology Applications

Introduces students to the role of information technology in today's business and government agency environments, and in society in general. The course studies hardware and software, networks, the Internet, software development processes, databases, and information security and privacy. It examines how tools such as spreadsheets and databases are used in business and government. (3)

LA 248 Business Law I

A study of the rights and relationships involved in the laws of contracts, sales and agency, including the Uniform Commercial Code. Prerequisite: MGT 123. (3)

LA 249 Business Law II

A study of the law relating to the development and operations of partnerships, limited liability companies, and corporations, and of the government agencies that regulate business. Prerequisite: LA 248. (3)

MA 155 Finite Mathematics

Introduces common problems that can be modeled and solved using techniques of finite mathematics. Applies concepts from the study of functions, probability, counting techniques, and basic finance to business applications. Prerequisite: complete University's Directed Self-Placement process, or a grade of C or better in MA 095. *Liberal Arts Core/University Requirements Designation: MT.* (3)

MGT 123 The Business Experience

A survey of American business with an experiential focus on the business resources of the Washington, DC, area. The student is given an overview of business formation; management origins; and the functional relationships of marketing, finance, personnel, and production. Offered fall and spring semesters only. (3)

MGT 223 Sophomore Business Experience

Provides additional interaction with sophomore students as a group. Activities will be designed to help students identify or confirm their areas of specialization, continue to build critical thinking and information literacy skills, and understand the applicability of freshman- and sophomore-level foundational business courses to real-world business problems. Sample activities will include research about and discussions of current business topics and identification of career opportunities through guest speakers and site visits. Students will plan and give several short presentations, individually and in groups. Offered spring semester only. Prerequisites: EN 102, MGT 123, ACT 201, and ECO 210 or ECO 211. (1)

MGT 291 Business Communication

Focuses on the skills and approaches people in the business environment must have to communicate effectively at work. Emphasizes writing in a variety of formats, preparing and delivering business presentations, writing in teams, negotiating and interpersonal communication skills, and spending 40 percent of one's time with every writing/speaking assignment engaged in editing and revision. Requires successful demonstration in the use of today's technology to communicate with a variety of business audiences. Prerequisite: EN 102. (3)

MGT 304 Organizational Management

A study of behavior in organizations and influences of individual, group, and organizational processes on performance. Among the topics that will be introduced are interpersonal perception, motivation, group and team dynamics, decision making, influence and conflict, interpersonal communication, and organizational cultures. Offered fall and spring semesters only. Prerequisite: MGT 123 or EN 102. (3)

MGT 323 Junior Business Experience

Provides additional interaction with junior students in a group. Activities will be designed to help students identify and prepare for their internships, further develop interpersonal skills necessary for successful individual and group performance in a modern business setting, integrate knowledge and skills acquired through B.B.A. core courses in solving business problems, and continue to build information literacy and critical thinking skills. Sample activities include discussion of current business topics, continued identification of career opportunities through guest speakers and site visits, use of simulation packages to allow students to make business decisions in a competitive environment while working with classmates. Offered spring semester only. Prerequisites: MGT 223, MGT 291, and LA 249. Prerequisites/corequisites: FIN 301 and MKT 301. (1)

MGT 433 Research

A student in this course will conduct collaborative research (scholarly work leading to new knowledge) under the direction of a faculty member. Prerequisite: application and approval of department chair. (1-6)

MGT 451 Strategic Management

An analysis of major business policy decisions using case studies, simulations, and class discussion. Development of

the understanding of the interrelationship of economic, marketing, financial, and management functions through integrating cases. Prerequisites: FIN 301, MGT 291, MGT 304, MKT 301, and senior status. (3)

Note: There are changes being made to the Management courses, 1 credit courses at the freshman, sophomore, junior and senior level are the MGT 23. There is a shift to take these courses in lieu of the MGT 451.

MGT 490 Internship

Senior students register for field experience with cooperating business firms in the Washington metropolitan area. The internship is monitored by the director of internships for the School of Business Administration and a representative of the cooperating company. Application should be made 3 to 6 months prior to registration to permit exploration of internship opportunities. Prerequisites: permission of director of internships for the School of Business Administration, senior status, minimum of 90 credit hours with a cumulative GPA of 2.0 or better, and a cumulative GPA of 2.0 or better in all Business courses. (3-6)

MSC 300 Business Statistics

Introduces students to the basic descriptive and inferential statistical procedures used in the analysis of data and testing of hypotheses in a business environment. Commonly available spreadsheet software will be used. Prerequisite: MA 155 or equivalent. (3)

MSC 337 Operations Management

A study of the concepts, issues, and decisions facing production and operations managers through the identification and analysis of a variety of operational problems. Emphasis on quantitative analysis techniques used by managers to solve these problems. Extensive use of microcomputer models. Prerequisites MSC 300. (3)

MKT 301 Principles of Marketing

A study of the system of interacting business activities that deliver goods and services to present and potential customers. Analysis of the problems of planning, research, and logistics that confront the modern marketing manager. Prerequisite: EN 102. (3)

PH 305 Business Ethics

Examines the ethical foundations of business and the role of ethical judgment in business decisions. The course reviews theoretical foundations and examines case study applications. Prerequisite: EN 102. (3)

Challenges

Although Marymount University is very forward thinking, there has been resistance to change. Teaching using the traditional model of covering core course content in isolation, no

longer works. This requires a new focus for faculty about their teaching strategies, assignments and assessments.

Conclusions and Future Research

Since starting this process, we have had many successes. The creation of the Center for Teaching Excellence and the development of the DISCOVER program, both of which foster all of the new requirements that we have discussed throughout this paper. The process began with the examination of the University's Mission and Strategy's to meet that. It has now been fulfilled in many of our courses. We have received positive feedback from students. In this new era of social networks, texting, blogging and tweeting, we are striving to reach our students on these new platforms.

In the future we would like to expand the meta analysis to include all liberal arts and business core courses. Hopefully, all syllabi will reflect this shift toward the new University requirements. This is essential for not only Marymount as a University staying competitive, but also the students that we are educating to go off in this new environment. This new environment includes; critical thinking, inquiry learning, a global perspective and an ethical component. As we move forward with these changes we are excited about what the future brings and how we, as educators, can meet the needs of that future.

References

<http://www.marymount.edu/academics/core/requirements.aspx>

<http://www.marymount.edu/academics/programs/businessAdmin/programReq.aspx>

**A QUALITY FUNCTION DEPLOYMENT APPROACH TO DEVELOPING
ELECTRONIC MEDICAL RECORD COURSE CONTENT, DESIGN AND DELIVERY
FOR HEALTHCARE EMPLOYEES**

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ABSTRACT

The healthcare industry faces the challenge of incorporating electronic medical record (EMR) systems, principles and practices into day-to-day work life for healthcare employees. The primary concern is to ensure newly-trained healthcare program graduates are proficient on EMR systems and related IT subjects. In response to the growing challenge, Virginia Highlands Community College applied for and received a 4.7 million dollar federal grant for community-based job training called Health Information Technology Education. With this funding and based on previous research, we used Quality Function Deployment to develop curricula to meet the needs of our healthcare industry partners. Our study resulted in a taxonomy composed of nine subject areas. Each area had twelve topics, tracking information from modules to chapters down to the page.

INTRODUCTION

The healthcare industry faces the challenge of incorporating electronic medical record (EMR) systems, principles and practices into day-to-day work life for all healthcare employees. New and existing healthcare employees experience frustrations with the EMR interface by not understanding or mastering the EMR system. In addition, many healthcare employees are not proficient at basic computer skills which limits the ability to use and troubleshoot EMR systems.

In response to these needs, Virginia Highlands Community College applied for and received a 4.7 million dollar federal grant for community-based job training called Health Information Technology Education (HITE). Quoting the grant application, "The HITE initiative's primary goal is the recruitment, training, placement, and retention of 'EMR Savvy Healthcare

Professionals’ for healthcare employers such as ambulatory healthcare service, hospitals, and nursing and residential care.” [1, 1-20]

The HITE initiative concentrated training and employment services for five target healthcare occupations:

- (1) Medical Records/Health Information Technicians
- (2) Medical Assistants
- (3) Pharmacy Technicians
- (4) Licensed Practical Nurses
- (5) Registered Nurses

The HITE initiative has three committees: the Project Management Committee (PMC), the Advisory Committee (AC) and the Curriculum Modification Committee (CMC). The PMC was responsible for the oversight of the entire HITE initiative including activities like monitoring partner performance and submitting reports to the Department of Labor. The AC was composed of industry and academic partners. The AC provided input on the modification and implementation of EMR training activities (See Table 1). The CMC was composed of faculty members from Virginia Polytechnic Institute and State University, University of Virginia’s College at Wise and the five participating community colleges (See Table 1). The purpose of the CMC was to provide research, consulting and curriculum modification services to enhance the five community college programs. The authors of this paper served as members of the CMC.

Table 1: HITE Participants

<u>Academic Partners</u>	<u>Additional Partners</u>
Virginia Highlands Community College (VHCC)	Southwestern Virginia Workforce Investment Board
New River Community College (NRCC)	New River/Mount Rogers Workforce Investment Board
Virginia Western Community College (VWCC)	Western Virginia Workforce Investment Board
Southwest Virginia Community College (SVCC)	Virginia Polytechnic Institute and State University (VT)
Mountain Empire Community College (MECC)	University of Virginia’s College at Wise (UVa-Wise)
<u>Industry Partners</u>	
Hospital Corporation of America (HCA): 1. Montgomery Regional Hospital 2. Pulaski Community Hospital	Mountain States Health Alliance including:
Carilion Clinic	1. Dickenson Community Hospital
Clinch Valley Medical Center (Lifepoint)	2. Johnson Memorial Hospital
Holston Medical Group	3. Russell County Medical Center
Buchanan General Hospital	4. Smyth County Community Hospital
Wellmont Health Systems	5. Francis Marion Manor

The CMC met monthly and worked to achieve the following three goals:

- (1) Develop a new or modified curriculum to create EMR training programs tailored to the five targeted occupations.
- (2) Identify additions to existing community college staff, curriculum and/or equipment to upgrade existing health information technology programs.
- (3) Develop an online curriculum modification portal. The portal is under development and will be covered in future papers.

Quality Function Deployment (QFD) is a product design method typically used in operations management. QFD “translates the voice of the customer into technical design requirements.”[5] We wanted to conduct a thorough evaluation of the needs, wants and requirements of EMR training and convert the information into technical training items for academia. In addition, we wanted to map those technical items to actual course delivery and course management elements. In the HITE application, we customized the QFD approach from a manufacturing venue to an education venue.

The first matrix of QFD, known as the house of quality (HOQ), maps customer requirements to product-design characteristics.[5] In the HITE application, we collected detailed student/employee characteristics and skills from the community colleges, industry partners, and federal regulations. We used these to outline the design through a series of QFD matrices converting the information into course characteristics, design and delivery.

LITERATURE REVIEW

In 1998, Franceschini and Terzago used QFD to describe all activities needed to develop a theoretical yet practical industrial training course. The QFD model outlined the prioritized customer requirements (student needs), the service characteristics (technical design) and the relationship between the requirements and characteristics. The authors suggested collecting customer requirements information from students and training agencies. The data was organized by grouping the information into categories based on similarity. This process was challenging due to intersecting and/or overlapping customer requirements which fell into two or more categories. Franceschini and Terzago stressed that the construction of a “perfect” hierarchy is not the most important element of the process. Incorporating all information from the data collection stage was the most important element [3, 753-768]. In the HITE application, we used a similar process in the organization of healthcare customer requirements and design characteristics.

In 2003, Duffuaa, Al-Turki and Hawsawi customized QFD to design a basic statistics course at King Fahd University of Petroleum and Minerals. The customer requirements were collected from external customers (companies) and internal customers (students and faculty). Students and companies were given a survey to identify prioritized customer requirements. The design characteristics were obtained from faculty via surveys to identify the most important elements of design and delivery of the course. Each design characteristic had subsections allowing for detailed information for the logistics of the course. For example, the design characteristic “prerequisite” included subsections “calculus” and “college algebra” [4, 740-750]. In the HITE application, we used the same approach to the design characteristics by creating a hierarchy of subsections. In addition, Duffuaa, Al-Turki and Hawsawi concentrated on the logistics

development of a course. We concentrated on the course design and delivery but included the development of course content as the primary objective.

In 2005, Denton, Kleist and Surendra used the HOQ to overcome resource constraints while delivering a comprehensive curriculum within a well-designed course in Management Information Systems (MIS). They converted customer requirements into expected abilities of the program graduates. The product was the graduate and the customer was the future employer [2, 111]. Denton, Kleist and Surendra used curriculum guidelines provided by a university to build the customer requirements. In the HITE application, we recognized the concern that newly-trained healthcare graduates lacked proficiency in EMR systems and related IT subjects. Therefore, we used not only curriculum guidelines but college and industry feedback as well.

In addition, Denton, Kleist and Surendra used the trade-off matrix, the competitive assessment section and the target value section of the HOQ. In the HITE application, we removed the trade-off matrix and the competitive assessment in its entirety. Also, we did not incorporate the target value section until the fourth matrix. Moreover, Denton, Kleist and Surendra used an extension of the HOQ application which moves from the HOQ straight to the logistics of course design and delivery. We extended the detailed levels of design characteristics into five matrices. This enabled academia and industry to understand how each subject area, topic, module, chapter and page fit into the course design and delivery.

RESEARCH DESIGN

Stage I: Fact Finding Process

The CMC conducted roundtables with academic and industry partners to study the potential needs and/or improvement to the five targeted healthcare occupation academic programs. The off-site meetings consisted of open-ended discussions to ensure a wide range of information was gathered without the participants feeling limited by a specific list of questions.

These requirements were sorted and grouped based on commonality. The information was cleared of redundancy. We also labeled the design characteristics with a primary subject area along with subsections called topics. We used QFD matrices to continue organizing the information to ensure an efficient application of course content development, design and delivery. This drove the development of the HITE taxonomy hierarchy of information (See Figure 1).

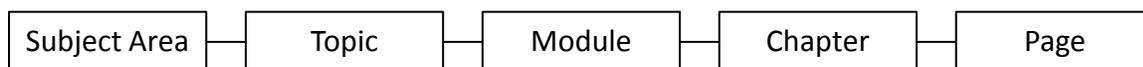


Figure 1: HITE Taxonomy Design

Stage II: QFD Application

The QFD matrices map customer requirements to product characteristics to part characteristics to process characteristics and, finally, to operations (See Figure 2).

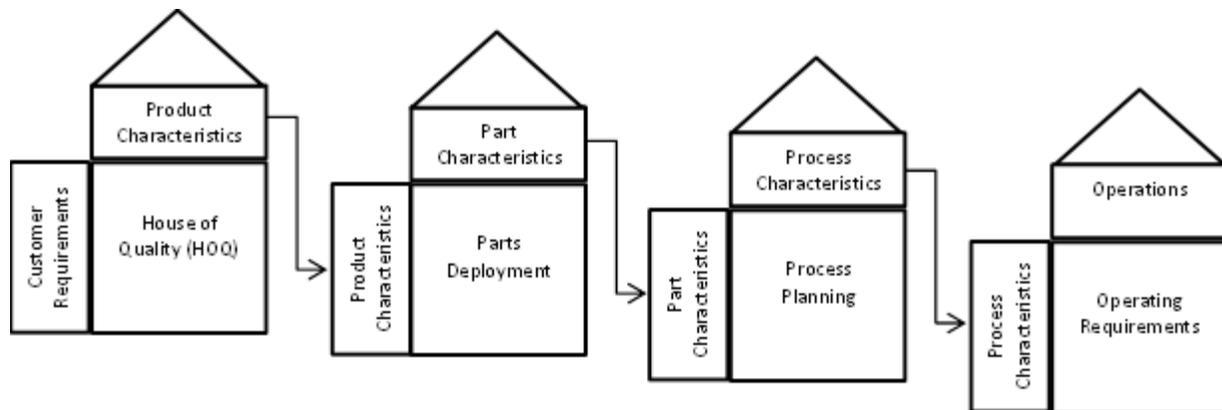


Figure 2: Series of Connected QFD Houses in a Manufacturing Environment [5]

The initial house or HOQ, where customer requirements are converted into product-design characteristics, is the most commonly used matrix.[5] The HOQ has six sections: customer requirements, competitive assessment, design characteristics, relationship matrix, trade-off matrix, and target values section (See Figure 3). In the HITE application, we used four of the six sections: customer requirements, design characteristics, relationship matrix and target values section. The remaining sections are more relevant to a manufacturing environment and thus were not used in the academic application.

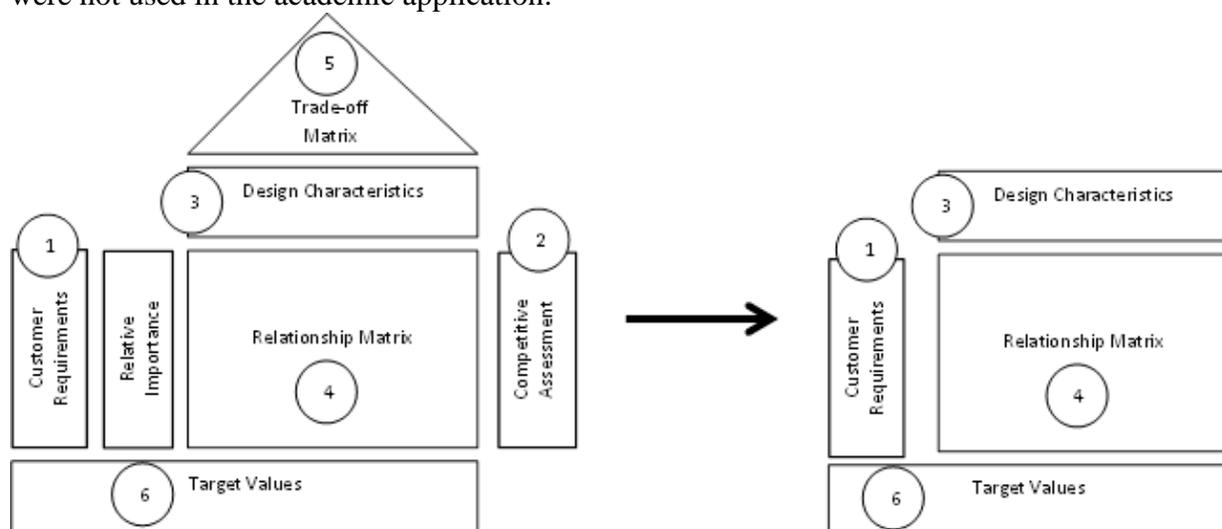


Figure 3: House of Quality versus customized HITE House of Quality

Customer requirements (1) generally identify the needs, wants or requirements of internal and external customers. In the HITE application, the internal customers are the community college partners and the external customers are the industry partners. The information identified from the roundtable meetings was listed in this section.

Design characteristics (3) are the technical terms that are linked to the customer requirements. We identified these terms through current course syllabi, current course design and healthcare requirements, specifically the American Health Information Management Association (AHIMA).

The relationship matrix (4) is the crucial connection between customer requirements and design characteristics. In the event, a customer requirement is not covered in a design characteristic the relationship matrix will detect this gap. In the event a customer requirement is covered in multiple design characteristics the matrix will show the redundancy.

The target value section (6) generally adds quantitative values through a technical assessment of the design characteristics. In the HITE application, we do not incorporate the target value section until the fourth matrix for course delivery. This helps quantify classroom time for the specific logistics of course design.

The competitive assessment section (2) evaluates the current company against the competitors based on the customer requirements. The trade-off matrix (5) identifies trade-offs between the design characteristics. The relative importance section is a tool to rate or order the customer requirements based on importance. In the HITE application, all customer requirements need to be incorporated in the course; therefore, all of the customer requirements are equally important. Sections (2), (5) and relative importance were not used in the academic application.

RESULTS

Stage I: Fact Finding Process

During our meetings with academic and industry partners, we identified nine primary design characteristics which we called subject areas (See Table 2). We also identified twelve secondary design characteristics or subsections of each subject area called topics (See Table 3). Each subject area had the potential of having twelve topics.

Table 2: Subject Area

<i>Subject Areas</i>
Basic Protocols
Communication
Computer Skills
Critical Thinking
EMR
Health Informatics Skills
Health Information Literacy
Privacy and Confidentiality
Work-Related Issues

Table 3: Topics

<i>Topics</i>
Continuing Education
General Communication
Electronic Medical Records
Ethical & Quality Practices
Legal Environment
Medical Industry

Meaningful Use
Computers & Related Devices
Patient-Nurse Relationship/Patient Care
Pharmacy Practice
Security & Protection
Work Practices

We continued organizing the information to ensure an efficient application of QFD and developed the HITE taxonomy hierarchy of information. Each topic consisted of modules; each module consisted of chapters; each chapter consisted of pages (See Figure 1).

As the organization of information continued, a customer requirement could be mapped from a subject area to a topic to a module to a chapter to a page to ensure coverage in the course design and delivery. An example of the HITE taxonomy of information is shown in Figure 4.



Figure 4: Example of the HITE Taxonomy for Computer Skills

The hierarchy of information was much more complicated than a simple linear organization of information: subject areas had multiple topics; topics had multiple modules, modules had multiple chapters; and chapters had multiple pages (See Figure 5).

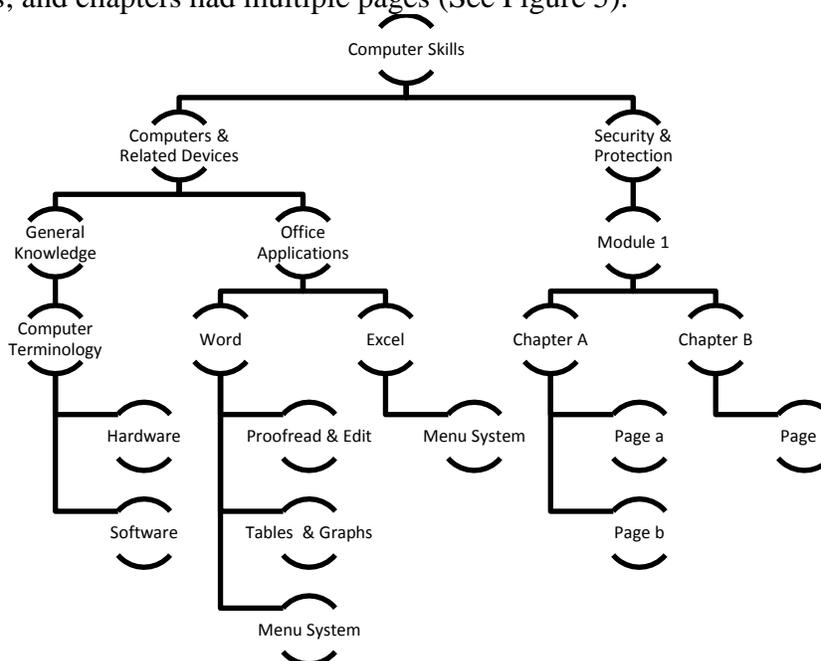


Figure 5: A detailed example of the HITE taxonomy for Computer Skills.

Stage II: QFD Application

The initial HITE QFD matrix mapped customer requirements to the design characteristics labeled subject areas and topics. The following two matrices mapped the design characteristics

to the page level: subject area and topic to module and chapter to page (See Figure 6). The remaining two matrices map the page characteristics to module delivery and management.

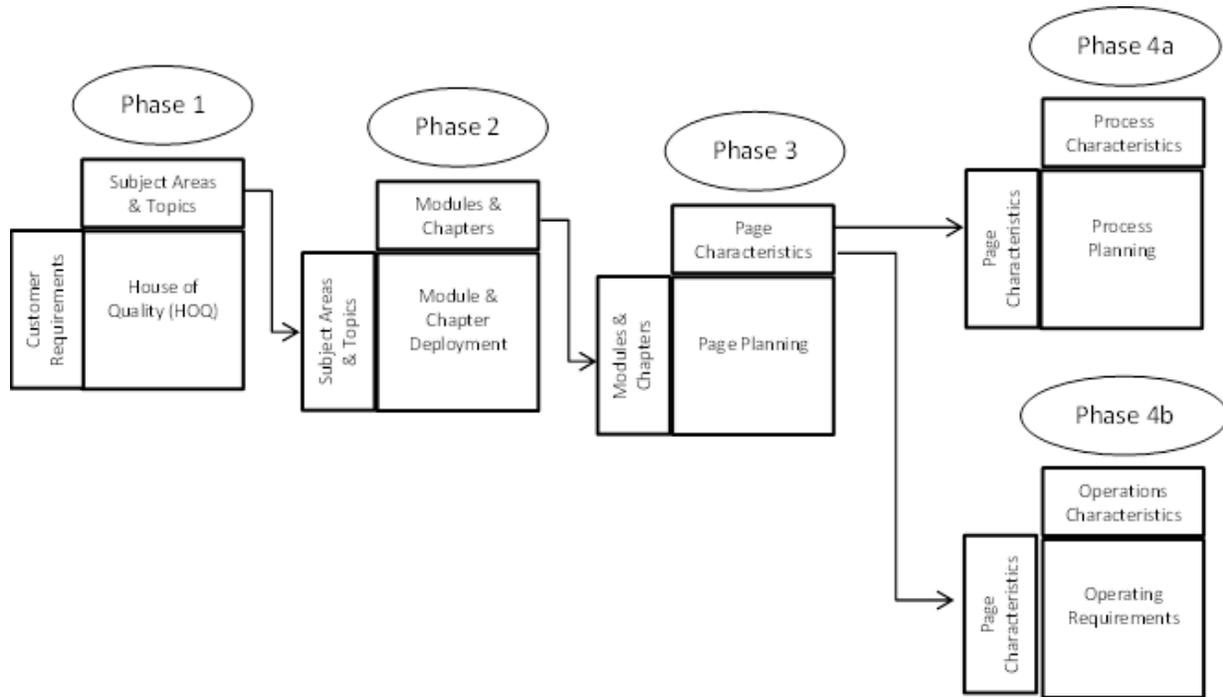


Figure 6: Series of Connected QFD Matrices in the HITE Environment

The customized QFD matrices were broken down into a four-phase process of converting customer requirements to content development, design and delivery (See Table 4).

Table 4: HITE QFD Matrices

<i>Phase</i>	<i>Label</i>	<i>Appendix</i>
1	Customer Needs-Subject Area-Topic	I
2	Topic-Module-Chapter Breakdown	II
3	Chapter-Page Breakdown	III
4a	Module Delivery	IV
4b	Module Management	V

CONCLUSION AND FUTURE RESEARCH

As stated in the introduction, the CMC worked to achieve three objectives for the HITE initiative. We described the tool for developing a new or modified curriculum for EMR training programs. This was done for the five targeted occupations specified in the grant. Also, we identified additions to existing community college staff, curriculum and equipment to upgrade existing health information technology programs. We will develop an online curriculum modification portal to make this process more efficient. The portal will foster communication and collaboration between academia and industry in regards to course content, design and delivery. The new curriculum will be introduced in the 2011-2012 academic year.

APPENDIX

Appendix I: Phase 1: Customer Needs-Subject Area-Topic Breakdown

Phase 1: Customer Needs-Subject Area-Topic Breakdown																								
SUBJECT AREA & THEIR TOPICS: Identify topics within each subject area.																								
	COMPUTER SKILLS			Communication			Critical Thinking			Subject Area				Subject Area										
	Computers & Related Devices	Security & Protection	Topic A	General Communication	Patient-Nurse Relationship/Patient Care	Topic B	Topic C	EMR	Ethical & Quality Practices	Meaningful Use	Medical Industry	Topic B	Topic C	Topic D	Topic E	Topic F	Topic G	Topic H	Topic I	Topic J	Topic K	Topic L	Topic M	
CUSTOMER REQUIREMENTS (college & industry): Insert abilities/skills the customer would like the healthcare employee to possess.																								
College																								
Keyboarding	x																							
Need A																								
Need B																								
Need C																								
Industry																								
Emailing/Attachments	x																							
Search	x	x																						
Research	x	x																						
Navigation in Word																								
Both																								
Written/Verbal Communication Skills	x			x	x																			
Troubleshooting Hardware Issues	x																							
Need D																								

Appendix II: Phase 2: Topic-Module-Chapter Breakdown

Phase 2: Topic-Module-Chapter Breakdown																
MODULES & THEIR CHAPTERS: Identify modules with their chapters within each module																
	Office Application			General Knowledge				Module C		Module D		Module E		Module F		
	Word	Excel	PowerPoint	Chapter C	Chapter D	Chapter E	Chapter F	Chapter G	Chapter H	Chapter I	Chapter J	Chapter K	Chapter L	Chapter M	Chapter N	Chapter O
SUBJECT AREA & THEIR TOPICS																
Computer Skills	Computers & Related Devices															
	Topic A															
	Topic B															
Subject Area A	Topic C															
	Topic D															
Subject Area B	Topic E															
	Topic F															
	Topic G															
	Topic H															

Appendix III: Phase 3: Chapter-Page Breakdown

Phase 3: Chapter-Page Breakdown				PAGE CHARACTERISTICS: Identify page characteristics within each chapter.																	
SUBJECT AREA	TOPIC	MODULE	MODULES & THEIR CHAPTERS	Proofread & Edit Contents	Tables & Graphs	Menu System	Page C	Page D	Page E	Page F	Page G	Page H	Page I	Page J	Page K	Page L	Page M	Page N	Page O	Page P	
																					Computer Skills
Subject Area A	Topic A	Module A	Chapter C																		
			Chapter D																		

Appendix IV: Phase 4a: Module Delivery

Phase 4a-Module Delivery				PROCESS CHARACTERISTICS: Identify items needed to deliver each page within each chapter						
SUBJECT AREA	TOPIC	MODULE	CHAPTER	PAGE CHARACTERISTICS	Speakers	LECTURES/PPT	Homework	Interactive Media	Exams	Project
					Subject Area A	Topic A	Module A	Chapter A	Proofread and Edit Contents	Mr. X
Chapter A	Tables & Graphs	Mrs. Y								
Subject Area A	Topic A	Module A	Chapter A	Menu System	Dr. Z					
			Chapter A	Page C	1					
Subject Area A	Topic A	Module A	Chapter A	Page D	2					
			Chapter A	Page E	3					
Subject Area B	Topic B	Module B	Chapter B	Page F	4					
			Chapter B	Page G	HW1					
Subject Area B	Topic B	Module B	Chapter B	Page H	HW2					
			Chapter B	Projected Classroom Hours	HW3					
					ABC					
					DEF					
					XYZ					
					Exam 1					
					Exam 2					
					Exam 3					
					Project A					

Appendix V: Phase 4b: Module Management

Phase 4b-Module Management																				
SUBJECT AREA	TOPIC	MODULE	CHAPTER	OPERATIONS CHARACTERISTICS: Identify each item needed to manage/operate each topic within each module.																
				Student Registration			Pre-requisites				Location			Class Size			Faculty			
Computer Skills	Computers & Related Devices	Office Applications	Word	How	When	Who	Module 1	Module 2	Module 3	Other	Site A	Site B	Site C	0-25	25-50	50-75	RN	3-5 years experience in healthcare	3-5 years experience with teaching	
				Proofread & Edit Contents																
				Tables & Graphs																
				Menu System																
Subject Area A	Topic A	Module A	Chapter A	Page C																
				Page D																
Subject Area B	Topic B	Module B	Chapter B	Page E																
				Page F																
				Page G																
				Page H																

REFERENCES

1. Bonham, W., *Technical Proposal-SGA/DFA PY 09-07*, 2009: Blacksburg, VA. p. 1-20.
2. Denton, J.W., V.F. Kleist, and N. Surendra, *Curriculum and Course Design: A New Approach Using Quality Function Deployment*. Journal of education for business, 2005. 81(2), p. 111.
3. Franceschini, F. and M. Terzago, *An application of quality function deployment to industrial training courses*. The International journal of quality & reliability management, 1998. 15(7), p. 753-768.
4. Hawsawi, M.M., U.M. Al-Turki, and S.O. Duffuaa, *Quality function deployment for designing a basic statistics course*. The International journal of quality & reliability management, 2003. 20(6), p. 740-750.
5. Russell, R.S. and B.W.T. III, *Operations Management: Creating Value Along The Supply Chain*. 7th ed2011: John Wiley & Sons, Inc.

An Empirical Test of a Measurement Model for Online Quality Learner

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Abstract

The purpose of this study is to examine the underlying structure of a measurement, called Profile of a Quality Learner (PQL), which was originally developed to provide feedback to students about their learning skills and quality. In our study, PQL is tested and validated in an online class setting. Academic and demographic data of 151 students who took undergraduate marketing courses offered through online at a small engineering school during a four-year period extending from 2007 to 2010 are examined using confirmatory factor analysis (CFA) as well as regression models. The results of this study indicate that the PQL measure, which consists of six dimensions - namely, information processing, values, learning skills, interpersonal skills, intrapersonal skills, and thinking skills - exhibited desirable psychometric properties in the context of online learning. Overall, empirical results suggest that digital natives are not all quality online learners and that there are some salient factors which distinguish quality online learners from mere digital native students. We hope this research could provide a useful feedback for both online class providers and students to improve our online classes.

Keywords: Online Learner, Quality and Skill Sets, Measure Validation, Confirmatory Factor Analysis, Profile of a Quality Learner

Introduction

Due to rising costs in education, enrollment management issues, and an evolution in the use of distance learning there is a major shift toward online offerings in higher education (Eastman & Swift 2001). Schools can offer a course or program without a geographical limit at a marginal cost. From the perspective of students, online classes are much more convenient than traditional classes. Unlike traditional classes, online courses usually don't have regular class meetings, giving students greater flexibility in terms of their schoolwork and study schedule. This obviously has huge advantages for non-traditional students who have jobs and a family which require their care and attention. In addition, online courses are well suited to the student lifestyle. After all, what's not to like about "attending" class in your PJ's? So it's clear that both parties - schools and students alike - generally like online courses and want to increase the number and scope of such offerings.

One of the ideas that favor online courses is that the majority of current students are digital native students, who are much more comfortable and predisposed to online learning rather than traditional settings (Prensky 2001). In contrast to digital immigrants, digital natives are technology users, whose natural ease around technology readily reveals their digital roots (Herther 2009). Researchers in this area argue that today's students (i.e., digital natives) think and process information fundamentally different from their predecessors (i.e., digital immigrants). Digital native students prefer 1) receiving information quickly and from several multimedia sources, 2) parallel processing and multitasking, 3) processing pictures, sounds and video before text, and finally, 4) prefer instant gratification and instant rewards.

However, quality online learners are different from the digital native in that every digital native student is not necessarily a good student in an online class. Contrary to common belief,

digital native students might not, in fact, be able to learn better in online learning environments than in traditional settings. For example, Huh et al. (2010) empirically suggested that there is no significant difference between online and offline learners. So who might be the best candidates for online learning? And how can we help a digital native student become a quality online learner? Beyerlein, Holmes, and Apple (2007) described characteristics of quality learners as 1) they are intrinsically motivated, 2) learning for them is not limited to external structures such as classes, and 3) they show learning behaviors in their personal life. Beyerlein et al. (2007) also argued that learning behavior involves choosing and using appropriate combinations of learning skills across domains, aligning cognitive skills with values and attitude.

Recent literature on student learning indicates that student learning behavior has a large impact on student learning outcomes (Marsh and Scalas 2010, Schaefer and McDermott 1999, Yen et al. 2004). The most effective way to create quality online learners is to identify characteristics of online learner behavioral quality, measure those characteristics and provide feedback that promotes student development. Valid and reliable outcomes from instruments that are based on effective learning standards are needed to provide feedback to students. The Profile of a Quality Learner (PQL) is an evaluation tool designed specifically to provide feedback for students (Beyerlein et al. 2007). The purpose of this study was to examine the underlying structure of the PQL using confirmatory factor analysis (CFA).

The remainder of the paper is organized as follows: first, we discuss the development of PQL, followed by discussions of sample data descriptions, along with data analyses and their results. Concluding remarks are made in the final section.

The Development of PQL

A measure that describes quality learners, namely, Profile of a Quality Learner (PQL) was developed by Pacific Crest from more than ten years of observations and communication with faculty and students (Krumsieg and Baehr 2000). Based upon Bandura's cognitive theory of learning, PQL provide a comprehensive diagnostic measure, which can be used by student as a self-regulated learning assessment tool. Bandura (1999) argued that people can and do control their own motivation and thought processes, using observation and self-assessment to change their behaviors to accomplish their own goals. So, successful learners should have accurate beliefs about their learning skill and about their ability to influence external factors that caused failure in their planning, performance, and assessment of phases of a learning process. Without accurate self-assessment, no one can be a successful learner.

Beyerlein et al. (2007) argued that recognizing the ideal qualities of learners helps students to move toward the ideal and that providing the current levels of qualities that are already present in learners helps students to maximize learning. Faculty also can use an assessment tool for improving learning environments to facilitate student's quality learning behaviors so they will continue to grow in taking on responsibility for their own growth as learners. Consequently, developing a self-assessment tool has two crucial implications: 1) as a diagnostic tool for quality learners who can consciously embed self-regulation process to produce significant learning and growth in these essential behaviors, and 2) as an assessment for faculty to measure the student's beliefs about learning and their self-efficacy to help them realize their greatest potential as lifelong learners. These implications led to the birth of PQL.

PQL consists of six dimensions that include Information Processing, Values, Learning Skills, Interpersonal Skills, Intrapersonal Skills, and Thinking Skills. Appendix 1 shows the six dimensions, along with sub-points.

Sample Description

Sample data was collected from students who took undergraduate marketing courses offered through online at a small, private engineering-focused university in Michigan, during the three years from 2007 to 2010. All marketing classes over the period were taught by the same instructor who used Blackboard as a web-based learning assistance tool. The same textbook was used and the same lecture notes for each chapter developed by the instructor were provided to students in all classes. Student performance data such as WAG, GPA, and class test scores were collected from the course instructor or the university database, while student demographic data such as gender, age, course standing, and major was from survey questionnaires given to the student sample. After deleting students with insufficient data, the final data of 151 students (34% female and 66% male) were analyzed in this study. The frequency of the subject's major is presented in Figure 1. There are no significant differences in major compositions as the 75% of students at the school were mechanical engineering majors. Table 1 shows other descriptive statistics for our sample. As tests indicate, there are no significant differences in WAG, GPA, and performance (test scores) between the subjects and the school population.

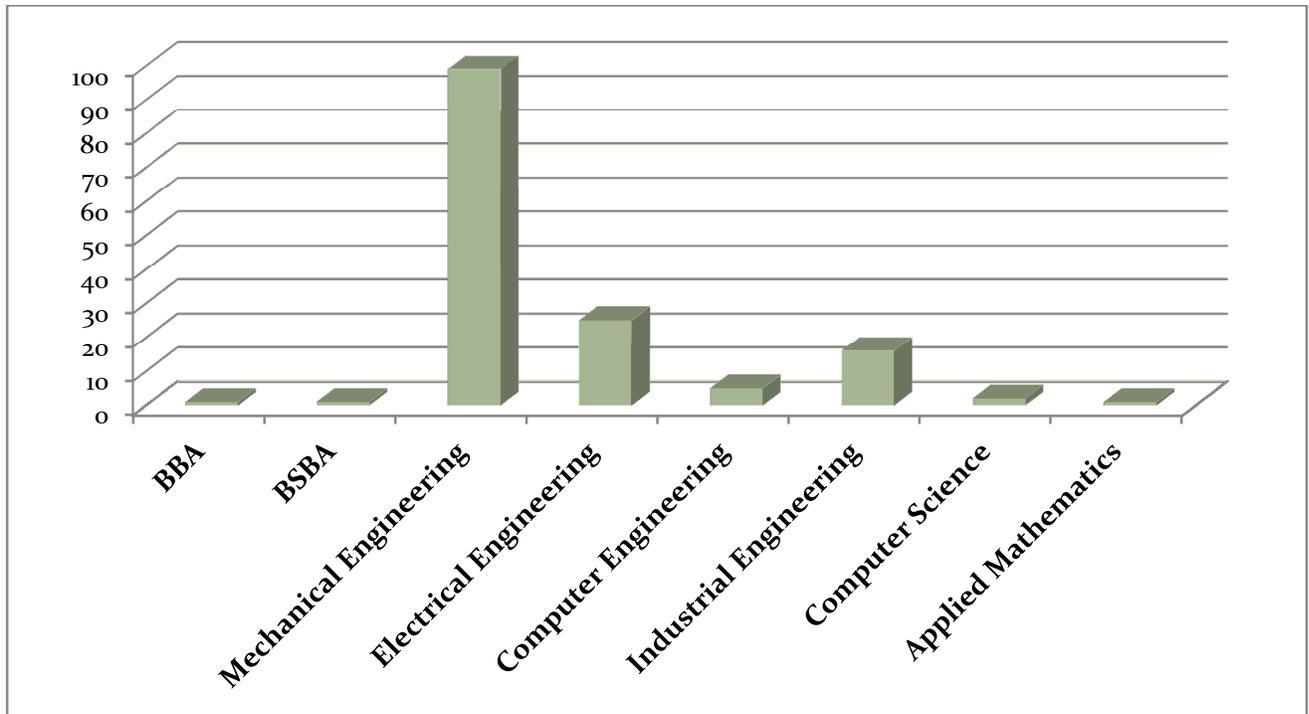


Figure 1 - Major of Students

Table 1 - Descriptive Statistics for GPA

	Mean	Std. Dev	Median
WAG	84.26	14.14	84.32
GPA	3.45	0.31	3.48
Test scores	82.31	15.47	82.43
Degree Standing	3.64	3.00	1.21

➔ Analysis, Results, and Conclusions Sections will be available and presented at the Conference

References

- Bandura, A. (1999). The cognitive theory of personality. In D. Cervone and Y. Shoda, (Eds.) *The coherence of personality: Social-cognitive bases of consistency, variability, and organization*. New York: Guilford Press.
- Eastman, J. K., and Swift, C. O. (2001) New horizons in distant education: the online learner-centered marketing class. *Journal of Marketing Education*, 23 (1), 25-35.
- Gratton-Lavove, C. and Stanley, D. (2009) Teaching and learning principles of microeconomics online: an empirical assessment. *Journal of Economic Education*, 40 (1), 3 - 26.
- Ho, L.-A. (2009). The antecedents of e-learning outcomes: an examination of system quality, technology readiness, and learning behavior. *Adolescence*, 44 (175), 581-600.
- Huh, S., Jongdea, J., Lee, K. J., and Yoo, S. (2010). Differential effects of student characteristics on performance: online vis-a-vis offline accounting courses. *Academy of Educational Leadership Journal*, 14 (4), 81-90.
- Krumsieg, K. and Baehr, M. (2000) *Foundations of learning* (3rd ed.). Lisle, IL: Pacific Crest.
- Marsh, H.W. and Scalas, L.F (2010) Self-Concept in Learning: Reciprocal effects model between academic self-concept and academic achievement *International Encyclopedia of Education* (3rd Edition), 660-667
- Ogunleye, A. (Jan 2010). Evaluating an online learning program from a student perspective. *Journal of College Teaching and Learning*, 7 (1), pg. 79 - 90.
- Schaefer, B. A, and McDermott, P. A. (1999). Learning behavior and intelligence as explanations for children's scholastic achievement. *Journal of School Psychology*, 37(3), 299-313
- Yen, C.-J., Konold, T. R., and McDermott, P. A. (2004) Does learning behavior augment cognitive ability as an indicator of academic achievement? *Journal of School Psychology*, 42 (2), 157-169

Appendix 1

Information Processing

- Accesses information quickly.
- Distinguishes relevant from irrelevant information.
- Engages all senses to access information.
- Uses appropriate tools and technology.
- Learns new tools and technologies to facilitate learning.

Values

- Creates a vision for life and articulates goals and objectives with measurable outcomes.
- Uses learning to clarify personal value system.
- Responds ethically to strong challenges.
- Respects and values the difficulty and importance of learning.
- Approaches tasks with confidence in his or her ability to master new learning.

Learning skills

- Takes responsibility for his or her own learning process.
- Demonstrates interest, motivation, and desire to seek out new information, concepts, and challenges.
- Validates his or her own growth and understanding, without the need for outside affirmation.
- Actively seeks out ways to improve his or her learning skills.
- Integrates new concepts within a general systems perspective and grasps instructions as part of a logical structure.
- Develops stronger learning skills by modeling the learning process itself.

Interpersonal skills

- Interacts easily with other people on productive teams.
- Seeks models and mentors to enhance learning.
- Understands and appreciates the values of others.

Intrapersonal skills

- Focuses energy on the task at hand.
- Perseveres through difficult tasks, making good decisions about when to seek help.
- Judiciously takes risks to advance personal growth.
- Uses failure as a frequent and productive road to success.
- Prioritizes tasks to effectively live a balanced life.

Thinking skills

- Uses inquiry, questioning, and critical thinking to gain new insights.
- Clarifies, validates, and assesses understanding of concepts.
- Applies concepts to new contexts.
- Transfers and synthesizes concepts to solve problems.
- Continually assesses his or her own performance.
- Takes corrective actions to get “on track” when the planned path is blocked or ineffective.

ENGAGING HIGH SCHOOL STUDENTS AND YOUNG ADULTS WITH DISABILITIES FOR COLLEGE INCLUSION IN INFORMATION SYSTEMS PROGRAMS

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ABSTRACT

This session for a tutorial describes a program that is engaging high school students and young adults with developmental and intellectual disabilities to be included in the campus life of a university. The program is designed to lead the higher-functioning or less impaired of these students into information systems programs of local universities. Participants of this tutorial will learn critical features in the implementation of the program that might be customized into programs in their own universities.

DESCRIPTION OF TUTORIAL

The session describes a program that is engaging high school students and young adults with developmental and intellectual disabilities to be eventually included in the campus life of a metropolitan university.

The presenter introduces a mentoring program in which computer science and information systems students of the university have been helping higher-functioning or less impaired high school students and young adults with disabilities in the city. The students have been helping the high school students in learning advanced computer skills, but even more important, they have been helping the students in learning life planning, personal productivity and self-expression and improvement skills, for eventual inclusion of the high school students in a metropolitan university. The session discusses the features of the program that have been expanding a foundation for the high school students and young adults with disabilities to grow into the setting of a university upon graduation from the high schools.

The focus of the program has been on the information systems discipline, on which the computer science and information systems students of the university have been mentoring the high school students and young adults with developmental and intellectual disabilities since 2010. Each of the students of the university has been engaging as a ‘one-on-one’ partner to a high school student and young adult on pursuing information systems projects, from which the high school students have been learning new skills of technology. Engagements have been at the facilities and laboratories of the university 3 –

5 hours once a week throughout the fall, spring and summer semesters of 14 weeks per semester. However, the high school students, the young adults and the students of the university have been concurrently engaging with the high school instructors in pursuing person-centered planning projects on the dreams and hopes of the high school students and young adults. Following the semesters of 14 weeks, the high school students and young adults with developmental and intellectual disabilities have been presenting the planning projects in multimedia portfolios of personal and potential professional skills to their parents and others, so that these portfolios might facilitate partial justification for them to be included later as official students of the university upon graduation from the high schools or other institutions.

These projects have been leading the high school students and young adults with developmental and intellectual disabilities to be potentially productive students of the university. Several of them have even been joining computer science and information systems courses of the university twice a week as unofficial students of the university. In order to further help the high school students and young adults, the computer science and information systems students of the university have been furnishing assistive communication devices – i-pad mobile systems and speech recognition and text-to-speech tools – customized to several of the students impaired in speech, so that they might interact effectively with the students of the university. However, the bulk of the high school students and young adults have been functioning in the program at low support. Throughout the period of the program, the higher-functioning high school students and young adults with developmental and intellectual disabilities have been engaged by their partnered students of the university in events of recreation and socialization with other students of the university, in order to include the high school students and young adults in the life of the university, even if only as unofficial students.

The process of the program has been facilitated by the excitement and great interest of the high school students and young adults to be partnered with fellow computer savvy students at a leading university of computer science and information systems in the city. The program has also been facilitated by the passion in service of the students. The tutorial explains the impact of increased perceptions of pride of the higher functioning high school students and young adults with developmental and intellectual disabilities to be included in the program with the university – in fellowship and learning that they would never have had if they were not in the program.

BENEFITS OF TUTORIAL

Though the impact of the partnership on the high school students and young adults has been lauded by the administrators of the high schools and by others, the program has been enabled by factors that are important to know in implementing the program in the setting of a university. The presenters examine factors of collaboration, pedagogy, project management, strategy and technology instrumental in the program of the university. They explain methods for including higher functioning high school students and young adults with developmental and intellectual disabilities and computer science and information systems students of a university interested in joining the program. The

presenter is frank on issues that might impede innovative programs in other universities, but they furnish practical remedies. The session highlights the importance of the involvement of the organizational staff of the university, not only Office of Disability staff but peripheral staff throughout the university, in the initial program stages.

Overall, this tutorial will benefit instructors in information systems at universities considering initiating if not expanding inclusive education programs in information systems for high school students and young adults with developmental and intellectual disabilities.

Instructors will learn of grant opportunities and partnerships for funding inclusive education projects involving programs of technology. The presenter will include informative and interesting simulations on the person-centered planning projects of several teams as though the participants of the session are actually at the program of the university. In summary, this tutorial on *Engaging High School Students and Young Adults with Disabilities for College Inclusion in Information Systems Programs* will benefit participants in learning practices in inclusive education in the field of information systems that are fruitfully transforming the lives of high school students and young adults with developmental and intellectual disabilities in the setting of a university.

Assessing Transitions: President Barack Obama's First Year

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Assessing Transitions: President Barack Obama's First Year

ABSTRACT

Successful presidents have highly effective transitions, transitions that last their first year in office. In the end their success should be measured in democratic and political terms in this most disaggregated, intransigent, and nearly ungovernable political system.

Such transitions involve an entrepreneurial approach that is predicated on nimble governance, shrewd implementation, and effectiveness as a national leader. The term "entrepreneurial" concisely fits the necessity for newly elected presidents to make choices and take risks for later "profit" or success in the ongoing negotiations of the presidential enterprise. An entrepreneurial approach requires cold-blooded politics and eschews inordinate concern for specific individuals, issues, and policies which might become an impediment to the incoming government. That is, presidents must protect their reputation for effectiveness and freedom to maneuver.

Nimble governance means choosing among alternative priorities and avoiding blunders. Shrewd implementation means that new policies and programs are announced early, lobbied energetically, enacted swiftly, and executed boldly.

The most effective presidents have the reputation of highly creative leaders. That is, they are a blend of nimble lions and shrewd foxes, both carefully coated with a benign, puppy-dog-like exteriors. That is, presidents as lions frighten off those who would prey on their administration, as foxes recognize traps, and as puppy dogs are adroit and lovable so as to sustain the necessary elite and mass support to achieve their ends.

Introduction

A favorite preoccupation of all who are interested in organizational leadership is assessing presidential performance. Such an endeavor is enormously complicated by a range of factors. First, each president faces his own unique challenges that grow out of the era and issues confronting the nation. As Karl Marx (1852) observed 150 years ago:

Men make their own history, but they do not make it as they please; they do not make it under self-selected circumstances, but under circumstances existing already, given and transmitted from the past. The tradition of all dead generations weighs like a nightmare on the brains of the living.

Not only do presidents face unique circumstances, they also are confronted by a host of other constraints. These include decisions by their predecessors; precedents in law and tradition; the actions and preferences of other governmental institutions, such as the Congress, the Supreme Court, the Washington bureaucracy and state and local governments; and the ever-intrusive press (Walker and Reopel, 1986; Cronin, 1980; and Neustadt, 1980).

A number of scholars and presidents have observed that the transition period is not only crucial to the success of the president, but also sets the tone for the Washington establishment as well as national elites, whose vantage points and opinions influence his success. The issue of course is the length of the transition period. Some have argued that the first hundred days is an appropriate period. But the challenge for the 100-day model is that current political appointments take many weeks for congressional review, and the extensive agenda of modern presidents requires months to implement. (Lovvorn and Walker, 2010; Walker, 1993; and Neustadt, 1960).

Some might argue that the length of the transition is the so-called honeymoon, in which the administration is held in high esteem by national elites and mass publics. Quite often this honeymoon is measured by presidential approval scores in opinion polls and indicates that the president still dominates his election coalition and is thus able to promote his priorities. As Richard Neustadt has observed, approval ratings are important in the Washington community in gauging a president's prospects for success. When those ratings are above 55% or even 50%, the administration can expect its programs to receive serious attention from Congress and national elites (Neustadt, 1980).

For example, President Jimmy Carter's honeymoon is said to have lasted until September or October of his first year; Ronald Reagan's lasted until January or February of his second year; and, George H.W. Bush's also appeared to last until early in his second year (Walker, 1993 and Jones, 2009). As a result we see the transition as a president's post-election period and his first full year in office. Thus a presidential transition lasts from election day until January 31st of his second year. By then, most presidents find their popularity has begun to wane, Washington and national elites have become critical, and Congress becomes preoccupied with the upcoming midterm elections (Haider, 1981). As President Lyndon Johnson observed: "You have to give it all you can that first year. Doesn't matter what kind of majority you came in with. You've got just one year when they treat you right and before they start to worry about themselves (As quoted in Hess, 1976, 22)."

There is much to be done in the transition period. Not only must the president and his team recover from an exhausting campaign, they must shift gears from campaigning to governing. And governing includes many weighty challenges to include: healing wounds within the winning party;

reaching out to the Washington community; deciding on priorities, policies, and appointees; and writing the inaugural address.

Some presidents have begun the transition period even before the election. The Reagan administration's efforts began years before the transition as conservative think tanks generated ideas for a supportive administration. Many of these ideas were codified into specific policy recommendations by the Heritage Foundation's 1980 book *Mandate for Leadership* (Bonifede, 1982). Even before Reagan was nominated in the Spring of 1980, advisors were assembled to propose initiatives for the first 100 days of the administration and an executive search group was established (Kirschten, 1980).

Judging Transitions

Criteria to assess transitions are also complicated and multiple. That is, no single measure is sufficient. To be specific, some argue that the measure of a successful transition is efficient machinery for decision making. Others argue that the prompt appointment of political executives is the correct measure. Still others measure success by the administration's adherence to its platform, or if the national interest has been served by their actions (Clinton and Lang, 1990).

Unfortunately although these measures are much to be desired, they are inconsistent with the realities of the presidency and the fractured American political system with its checks and balances and federalist structure. American politics is not about efficiency, but rather liberty and access of all citizens to the government. And capable executives are increasingly hard to find as the confirmation process grinds many appointees to exhaustion. The national interest is impossible to operationalize. Holding an administration to its platform presupposes that there are no changes in the political system during and after the election and that the incoming administration fully understands the many policy systems it will confront.

Another impossible expectation for any administration is satisfying all the interested political claimants in the extended government community. Thus, presidents cannot be expected to reconcile the many interests that extend from federal appointees, to career public servants, the legions of interest groups and lobbyists, and extending still further into diplomatic missions and to state and local governments.

So we assert that the only way to measure the success is in democratic and political terms. That is, incoming presidents should be **entrepreneurial**, **nimble** in governance, shrewd at **implementation** of their priorities, and effective as a **creative national leaders**.

Their approach should be **entrepreneurial** in character (Doig and Hargrove, 1987). The term "entrepreneurial" concisely fits the necessity for newly elected presidents to make choices and take risks for later "profit" or success in the ongoing negotiations of the presidential enterprise. An entrepreneurial approach eschews inordinate concern for specific individuals, issues, and policies which might become an impediment to the incoming government. That is, presidents must protect their reputation for effectiveness and freedom to maneuver (Neustadt, 1980).

Entrepreneurial presidents look to the future of the administration as a marathon to be endured and completed rather than a sprint to be won. Consequently, they must not squander their transition period in any of the following ways: protecting supporters, friends and contributors; advocating for issues not yet ready or

ripe for action; or blindly promoting policies advocated by electoral allies. Thus, an entrepreneurial approach requires cold-blooded politics.

During the transition, administrations should be **nimble**. Nimble leadership means choosing among alternative priorities and avoiding blunders. That is, effective presidents will select three or four dominant issues for their attention (Heineman and Hessler, 1980). These issues must be sorted out from the many campaign promises made over the course of lengthy campaigns. Presidents may delegate to their cabinets six or seven more to be championed and shepherded through Congress with little more than the president's blessing. Presidents also recognize that the actual details of new policies and programs will be modified by domestic and international realities, so they avoid immersion in details and claim credit when policies and programs resemble their promises.

Blunders must be assiduously avoided. Public comments, the background of newly appointed political executives, and a new Congress may all ignite firestorms which detract from the administration's message. All too often presidents misunderstand and underestimate their opponents and the power centers on Capitol Hill and in Washington. Such fumbling costs political capital.

Shrewd implementation means that new policies and programs are announced early, lobbied energetically, enacted swiftly, and executed boldly. These many challenges entail internal White House requirements to hammer out new policies, the details of programs, and the administrative machinery to insure these policies are implemented. Thereafter, these policies, programs, and machinery must be codified into bills, and supportive members of the legislature must introduce them.

Once introduced the administration begins the coaxing, cajoling, and logrolling that characterize presidential-congressional negotiations. These activities demand considerable presidential attention in meeting with members of Congress from both houses, public speeches, and visits to key constituencies. Such activities drain any president and administration of valuable political capital and attention. To neglect them is to lose the initiative in the crucial first year of any administration, when other political elites would prefer to turn to their own agendas. (Light, 1983).

Since the president and his advisers have campaigned throughout the nation during the preceding months, domestic affairs are more intelligible to incoming presidents and their staff. But new administrations must also attend to national security affairs that involve foreign, military and intelligence issues. Here the number of actors, as well as the subtleties and nuances of diplomacy are much less well understood by most presidential candidates. Additional challenges include the precedents of relationships with other nations and extensive U.S. alliances. Thus, activity in this realm must be approached with caution and care.

The most effective presidents are also **creative national leaders**. In essence they should be mongrels. That is, they are a blend of nimble lions and shrewd foxes, both carefully coated with a benign, puppy-dog-like exteriors (Burns, 1956). That is, presidents as lions frighten off those who would prey on their administration, as foxes recognize traps, and as puppy dogs are adroit and lovable so as to sustain the necessary elite and mass support to achieve their ends. As Niccolo Machiavelli (1910) noted:

A Prince should know how to use the beast's nature wisely; he ought of beasts to choose both the lion and the fox; for the lion cannot guard himself from the toils, nor the fox from wolves. He must therefore be a fox to discern toils, and a lion to drive off wolves.

To rely wholly on the lion is unwise; and for this reason a prudent Prince neither can nor ought to keep his word when to keep it is hurtful to him and the causes which led him to pledge it are removed (60).

We are also indebted to former cabinet member and Washington insider Elliott Richardson for our understanding of national leaders as puppy dogs. As Richardson (1987) noted, effective American politicians are not attack dogs. Rather they are puppy dogs who everybody loves and therefore are highly effective in building coalitions.

Thus, the hard-boiled politics of the entrepreneurial presidency are wrapped in a genial shell for easy digestion by both national elites and mass publics. A non-threatening public style is crucial to success in the Byzantine maneuvering that characterizes workaday Washington, in creating supportive coalitions, and in disarming opponents. The opposition party, especially those in Congress, also should be acknowledged, consulted for their concerns, and soothed. Once charmed, members of his own party, the opposition, and powerful outsiders can then be enticed into coalitions that later must be constantly recast and then recreated issue-by-issue.

Thus effective presidents successfully maneuver in the face of overwhelming opposition, woo supporters and mollify opponents in Congress, the Washington community at large, and the nation. They are agile in creating an environment of order and congeniality with both the old and new centers of power within the government. For example, as some of his opponents said of President Ronald Reagan, they did not agree with him on much, but he sure did like him (Brody and Page, 1975 and D'Souza, 1999).

This charm, grace and style are also crucial in communicating beyond the legislature. Recognizing that political missteps will occur in every administration, and especially during the transitional period, the most successful presidents are adept at graceful exits from ill-considered judgments and are proficient at redirecting attention to new issues (Nathan, 1983). Finally, the president's communication skills must channel the nation's mood by national speeches, visits throughout the nation, and interaction with the press.

To illustrate our model of the entrepreneurial president, we will apply it to the Obama administration's first year in office. To summarize our criteria, we consider whether Barack Obama has been entrepreneurial, nimble, shrewd at implementation and a creative national leader. Thereafter, we will consider the utility of this model for other chief executives.

The Obama Transition

Were President Barack Obama and his administration **entrepreneurial**? That is, have they practiced cold-blooded politics and eschewed inordinate concern for specific individuals, issues, and policies which might become an impediment to them?

The administration's performance here was uneven. On the positive side, Obama engineered the financial rescue early, something that many observers feel was essential to stabilize an economy in free-fall. The TARP and stimulus bills were crucial actions in his first few months to stabilize the economy (Alter, 2011).

Obama created a fine cabinet by wooing Senator Hillary Clinton, his principal adversary for the Democratic nomination, to be Secretary of State. In the midst of the Iraq and Afghanistan wars, he held over

the widely-admired Robert Gates as Secretary of Defense. For Treasury Secretary, he appointed Tim Geithner, who had helped President George W. Bush engineer the early rescue efforts of large financial firms. Other appointees included David Chu to be Secretary of Energy and Army General Richard Shinseki, himself a wounded veteran, to be Secretary of Veterans Affairs (Watkins, 2009 and CQ, 2009).

Obama also added a number of advisors, called by outsiders as "Czars" to oversee major initiatives from the White House. The record of these appointees was less effective. Many were named, but most seemed to disappear in the White House.

The nomination of Sonia Sotomayor to the United States Supreme Court was inspired. As the first Hispanic to ever be nominated for the Supreme Court, administration opponents could not easily object, especially given the rising prominence of Hispanic voters. She was easily confirmed (Alter, 2011).

Other issues that the new President took on early were consumer credit card reform and the huge bonuses earned by executives in the financial sector. All voters could easily support credit card reform; after all credit card use is high among both the middle and upper-class economic sectors. And who could possibly object to taking on the credit card companies, who were widely seen as whimsical in what appeared their unending alteration and increase of fees (Alter, 2011). Most observers and columnists had also complained about the very large bonuses earned by financial executives, executives that were seen as having engaged in questionable financial practices and risky loans. Thus, as these same executives appeared to be lined up at the Department of Treasury for bailout funds for their investment and commercial banks, the news was rife with stories of excess and apparent skullduggery (Solomon, 2009).

The administration's performance was more mixed in the General Motors and Chrysler loans. To be sure the President made a strong case that such loans were necessary given the economic prominence of these firms, but other economic sectors, particularly mid-sized and smaller firms, were also heavily impacted by what has come to be called the Great Recession (Clinton, David and Lang, Daniel, 2010). And these firms were often the local firms that were in the aggregate the principal employers in the nation.

Turning to what must be cited as errors in entrepreneurial governance, a number come to mind. First, many Republicans and others who were politically unaligned complained loudly about the huge bloat of the financial rescue package. In fact, it appears that the new President was much too reliant on House Speaker Nancy Pelosi and Senate Majority Leader Harry Reid for the details of this rescue package. Pelosi and Reid were seen as larding the package with huge numbers of additions that suited Congressmen and Senators' home district needs and not the nation as a whole (Barnes, 2009 and Gerson, 2009).

The same charge can be made in the area of health care reform. The President's agenda recognized the huge inequities and inefficiencies in the health care system, but seeking to learn from the mistakes of the Carter Administration, he left the details to Speaker Pelosi and Majority Leader Reid. The scope and perceived intrusiveness of the early reform bills met huge resistance in the Senate, resistance that almost killed the planned health care reforms (Adamy, 2009). Only when the President intervened was a law passed.

Another major error for the President was over-reliance on what many called the "Chicago crowd," that is, the major advisors the president brought in with his administration (Draper, 2009). This group of advisors tended to idolize him and cut him off from advisors outside his immediate circle. Many criticized his close-relationship with White House Chief of Staff Rahm Emmanuel, whose style was caustic and unrelenting (Alter, 2011 and Weisman, J., King, N., and Adamy, 2009). Some said that Emmanuel himself

was to blame for the extended debated on the health care reform bills in the Congress. Another example was Social Secretary Desiree' Rogers's apparent lack of attention to the details of a White House event, in which a couple not on the cleared list met the President. Many were surprised at how long Rogers lasted after the affair (Alter, 2011).

To summarize, President Obama's entrepreneurship – that is, his willingness to practice cold-blooded politics and eschew concern for individuals, issues and policies – has to be considered mixed and at best a B-. Although he was effective in the financial rescue efforts, the constitution of his Cabinet, and the successful nomination of Supreme Court Justice Sonia Sotomayor, the bloat of the financial stimulus bills, the arduous effort to pass health care reform, and his heavy reliance on the “Chicago crowd” were substantial missteps.

Was the Obama Administration **nimble**? Did Obama and his team choose among alternative priorities, avoid blunders, successfully maneuver in the face of overwhelming opposition, and woo supporters and mollify opponents in Congress, the Washington community at large, and the nation?

During the transition, there were a number of very positive initiatives on his announced priorities. He announced early four key priorities: rescue the economy, reform health care, increase America's reliance on renewable sources of energy and improve education. During the Great Recession, not only did he play a prominent role in stabilizing the economy, but he also worked effectively with congressional leaders to provide funding for state and local governments that were hard-pressed by reduced tax revenues. Although critics could point to the high unemployment rates into January 2010, most thoughtful observers found that the federal government had done about all it could do given the deficit and the fact that economic indicators lag large infusions of federal money (Wilson, 2009).

In the area of education, Obama and his Secretary of Education Arne Duncan campaigned for a huge increase in federal funding for education, in fact more funding than any Education Secretary had ever had at his disposal. Obama and Duncan were often photographed visiting elementary schools and emphasized the importance of charter schools. Indeed this emphasis on charter schools was contrary to the view of most teacher associations, who had been very supportive of Obama during his campaign (Alter, 90-2).

In the area of national security affairs, Obama moved quickly to insure the phased withdrawal of American troops from Iraq, an initiative that was popular with his party and most Americans. After some initial fumbling around the Christmas, 2009 airline bomber attack, the administration recovered quickly with the president prominently taking responsibility and demanding accountability from his national security team (Broder, 2010).

Yet, overall in spite of these positive developments, there were a number of prominent mistakes that detracted from the effectiveness of the new administration. First, his vision was not clear (Pfeffer, 2010). Second he was not effective in winning over the Congressional Republicans or independent voters. Third to name but a few policy realms, his efforts in domestic legislative arenas, national security and foreign affairs policies, and various domestic stumbles have not been successful.

First in terms of vision, the White House seemed to announce a new initiative almost daily. In spite of his four priorities, new matters seemed to crop up almost daily that detracted from his efforts. For example, within ten days, he discussed health care, “then he's lobbying for a cap and trade plan to reduce carbon emissions, and then he's out there trying to re-regulate the financial world or sell a new treaty to the

Russians (Bai, 2009. Also see Van Dyk, 2009 and Sherman, 2010.).” One must conclude that in spite of what President Obama saw as many areas needing urgent attention, an administration about everything ends up being an administration that is fumbling and jumping from issue to issue. Such issue-jumping damages the president's reputation and thus his power.

Throughout his first year and in spite of efforts to bring the Congressional Republicans along, that party voted almost unanimously against his initiatives in most economic and domestic realms. His support ratings, especially among independents – the very voters who had given him so much support during the campaign, declined such that by July or August, it was clear that whatever honeymoon he had enjoyed ended (Weisman, July 2009). And the rise of the so-called Tea Party Movement reinforced the sense that the administration had lost the support of those who had been very critical of the actions of the George W. Bush Administration (Johnson and Sidoti, 2010). To ice the cake, although the Obama Administration held several highly-publicized meetings with the leaders of large business firms, it was not able to translate this outreach to much support from the business community.

In domestic legislative areas – and especially in the areas where the Obama Administration had indicated its highest priorities – new legislative initiatives bogged down. Health care was an especially volatile area. Obama was not able to persuade Republican legislators that his proposals to reform the health care system were appropriate, and he was able eventually to carry none of the opposition along with him, in spite of a number of high-profile efforts to woo a few Republican senators (Schulz, 2009).

His administration was also not nimble in energy reform. Although the administration did issue several executive decrees in energy reform, no legislation was forthcoming in his first year. Finally what perhaps inflamed independents and the Tea Party movement the most was the lack of any serious reform of the financial sector after the dramatic failure of many banks and financial institutions. Small business leaders (what many call Main Street) were very unhappy that government lending was almost wholly dedicated to large financial institutions (what is often called Wall Street). Thus the Administration's efforts in domestic reform were seen as stunted.

There were other apparent errors. Obama relieved the commander in Afghanistan, replaced him with General Stanley McChrystal, and declared that he would completely support his new commander's strategy for operations in Afghanistan. Within several months after his initial assessment, McChrystal asked the Administration for more troops to achieve the nation's goals there. This request seemed to take the Administration by surprise, and it fumbled for what seemed weeks trying to make up its mind on how to respond. Though it eventually did respond, the request was not fully supported; indeed the build-up was slow and relied on new NATO troops, troops that in some cases such as the Germans could not be fully used in every contingency (Whitaker, 2009).

Even though Obama won the Nobel Peace Prize for his pre-Inauguration vision for the United States and was widely recognized for a thoughtful speech to accept the prize, there were other apparent missteps that detracted from the administration's reputation (Klein, 2010). For example, efforts to win peace between the Israelis and Palestinians and to reconcile Afghanistan and Pakistan appeared to be going nowhere by the end of the first year. In addition, Obama was much criticized for bowing to the Japanese Emperor, a display that suggested somehow among these two heads of states, one was inferior to the other (Noonan, November 2009, A15). Furthermore his deference to Chinese leaders was seen as suggesting that the United States was somehow a beggar state to the Inner Kingdom.

Finally, there were several widely reported gaffes in the first year. First, on April 27, 2009 a decision by the Director of the White House Military Office to fly an Air Force One look-alike over New York City to take pictures high above the harbor caused local uproar. As there had been no announcement of the flight, it caused momentary panic in some quarters and led to the evacuation of several buildings in Lower Manhattan and Jersey City. By the afternoon, the situation had turned into a political fuse box, with Mayor Michael R. Bloomberg saying that he was "furious" that he had not been told in advance about the flyover. The White House apologized for the error, and the director resigned (Weisman, July 2009).

A second gaffe on July 16, 2009 was Obama's offhand remarks at a press conference about the arrest on July 16, 2009 of Harvard scholar Louis Gates by Cambridge, Massachusetts Police Sergeant James Crowley. In essence, Obama jumped off-message on this matter and immersed himself in a purely local dispute that appeared to have racial overtones. His remarks spawned wide-spread press coverage and endless editorials (Williamson, 2009). Both of these gaffes interfered with the Administration's efforts to dominate press attention about the administration's legislative agenda during the crucial first few months of Obama's honeymoon year.

What then are we to conclude about the Obama Administration's ability to be nimble? To be sure, there a number of successes on the economy and education, but errors outweighed these achievements. That is, the lack of a clear vision, the frequent jumping from issue to issue, the fumbling around in dealing with Afghanistan, and the lack of movement on financial reform indicate that the administration has not been supple. Indeed Obama was not nimble in many areas to include wooing independents and other of his supporters and mollifying opponents in Congress, the Washington community at large, and the nation.

Was the Obama Administration **shrewd implementers** of new policies and programs? That is, were these policies and programs announced early, lobbied energetically, enacted swiftly, and executed boldly?

In the area of administration, Obama has been more effective. To be sure, there were areas where the president and his team did not perform well. Although he promised to close the prison at Guantanamo, the challenges proved to be too large. Among the many issues surrounding this military prison in Cuba were the handing of the cases of terrorists held there as well as finding an alternative site to locate them in the continental United States. The apparent differences among the White House staff and Attorney General Holder and his aides caused considerable fumbling. And the efforts to locate a military prison in several states invariable ended up with senators and governors loudly objecting to placing the prisoners in their regions. By January, 2010 the issue had not been resolved (Manel, 2010).

Another implementation challenge was the spending of stimulus funds. Although Vice President Joe Biden made it clear that the administration would only accept "shovel-ready" projects, the reality was that most of the projects were months away from ground-breaking (Factor). As a result the hoped-for financial stimulus from the huge outlay of money was very slow in coming and the economy remained in the doldrums with unemployment at 10.6% in January, 2010 (Radnovsky, 2010).

Two other implementation challenges were in foreign affairs and the domestic housing market. Although the administration had made substantial promises to engage Iran and North Korea, nothing came of these promises in the administration's first year (Boot, 2009). In addition, the efforts to help with huge number of foreclosures did not have much of an impact. The unemployed simply did not have the funds or the employment prospects to be helped by the Obama administration's program.

Yet, the Obama administration's successes were impressive in implementing its agenda. In the area of health care, Obama and his team quickly removed restrictions on stem cell research imposed by the George W. Bush Administration (Watkins, 2009). Obama also was able to expand the children's health insurance program as well as move more forcefully on tobacco regulation. Finally, the EPA declared carbon dioxide a threat to human health (Meckler, 2009).

Obama's list of achievements in implementing a number of foreign policy initiatives was striking. Obama's performance in persuading foreign leaders at the G-20 summit in April and again at the December climate change conference in Copenhagen resulted in considerable success. He successfully wooed the Pakistani government to work with the United States to engage Al Qaeda and the Taliban who were using Pakistan as a sanctuary from the fighting in neighboring Afghanistan (Alter, 2011).

Obama was also very effective in approving force. After persuading the Pakistanis to cooperate on finding and killing terrorists in Waziristan and other of its Federally Administered Tribal Areas, he ramped up the use of the Predator unmanned aerial drone. He also approved using Navy Seals to save an American cargo-ship captain who was held hostage in the Indian Ocean off the coast of Somalia. The SEALs successfully rescued the captain, killed three of his captors, captured the rest, and put pirates on notice about boarding American-flagged vessels.

Obama and Secretary of State Clinton were very effective in improving the nation's image abroad with their speeches and travel (Boot). Obama's June, 2009 speech in Cairo, Egypt as well as his Nobel acceptance speech in December were widely lauded both domestically and abroad. Clinton traveled extensively in the administration's first year. For example, she was in Asia in February, in the Middle East, Europe, and Mexico in March alone; her travel schedule for the rest of Obama's first year was equally impressive.

Two other policy areas where the Obama administration was successful in implementation were in civil rights and the domestic auto industry. In January, 2009, Obama signed the first bill of his administration with a ceremony for the Lilly Ledbetter Act, which makes it easier for people who believe they've been discriminated against to sue employers. In June, he signed an executive order that expanded federal benefits to same-sex partners of Foreign Service and executive branch government employees.

The so-called bailout for the automotive industry was more controversial, but highly effective in resuscitating it from bankruptcy. Both General Motors and Chrysler were loaned money from the Troubled Assets Recovery Program and saved from possible disintegration. Although the Bush administration had passed the program, it was up to Obama to implement it, and he did so with energy and enthusiasm.

Overall, Obama and his administration have been effective in implementation of their policies. As with all circumstances that presidents face, there have been some failures, but the successes have much outweighed the shortfalls. His willingness to work assiduously on health care and civil rights, to make inroads in foreign policy and to use force needed to keep America safe from terrorist attacks have all given him a good reputation for implementation.

Was Barack Obama a **creative national leader** at the end of his first year in office? Was he a blend of the nimble lion, the shrewd fox, and a lovable puppy dog?

Barack Obama and his administration came to office facing huge challenges, and challenges more perplexing than many incoming presidents. As Karl Marx noted above, the circumstances that each president faces are unique and laden with precedents by former presidents as well as other institutional actors.

Obama faced a financial meltdown with growing unemployment, which had been only partially confronted by the exhausted, outgoing administration of George W. Bush, two ongoing wars, and an electorate aroused to believe that hope and change would be the hallmarks of the new administration. In addition, Obama was convinced that the outgoing administration had failed to address such issues as the apparent fall of world approval for America, the lack of health care for a huge proportion of the population, education reform, the decline of civil rights actions for women and minorities, and inattention to a well-defined energy plan.

Given these challenges, The Rasmussen poll gave the new administration a 65% approval rating. By the end of January 2010 this number had fallen to 47%. To be sure such falls are large, but this administration fell faster than most in its first year. And clearly the ongoing financial meltdown and rising unemployment contributed substantially to this decline (Rasmussen and Brooks, 2009 and Rasmussen and Schoen, 2009).

In fact by late July, 2009, the warmth and hope that Obama had engendered seemed to be broken. In fact the decline in his approval rating began in June and continued well into November (Gerson, 2009 and Krauthammer, 2009). Yet, Obama had managed to extend his honeymoon for about nine months from his election on November 4, 2008 to July, 2009. And a honeymoon of nine months seems about normal for most presidents (Jones, 2009).

There were a number of reasons that Obama lost public support. First, his public persona was not one that endeared him to the Washington establishment or to mass publics. Clear to all was that Barack Obama was extremely bright and well-educated. But too many found him passionless, too rational and aloof, and not really lovable (Noonan, November 2009).

At times Obama even appeared to be a bit petulant as he was with the large banks that had to depend on the federal government for loans to stanch their huge losses on mortgage bets. In addition, he was not the self-effacing leader that many long for. Instead he appeared egocentric and failed like many successful presidents before him to put his appointees out in front to deflect some of the dissatisfaction with his decisions and directions. Only Hillary Clinton as Secretary of State seemed to be a highly public figure, and even she was hemmed in by presidential decisions on the larger questions (Elliott and Wagner, 2010).

Second the administration had overexposed Obama. He seemed to be on television and in the newspapers daily with a speech, a new program initiative, or another announcement. His promises struck many as too big, too ad hoc, and too ambitious for a government and economy reeling from a sea of troubles. All this exposure made the administration appear a bit amateurish by Washington standards (Henninger, 2009). Furthermore, for all the communicating that Obama was doing, he appeared "tone deaf" to the challenges of many citizens who were facing bankruptcies and layoffs. Many thought he was not really aware of the burdens everyday Americans were facing.

Third, Obama was not able to carry the opposition in support of his many initiatives. Indeed the Congressional Republicans found the administration and its allies on Capitol Hill steamrolling and bullying its way to the passage of legislation (Barnes, 2009). Even his Democratic allies were tired of the lack of

civility, generosity, and dignity in partisan politics. All this was punctuated by the Democratic leadership in the House and Senate. Speaker Pelosi was often dismissive of the opposition, and some of her supporters called protestors and some Republican legislators as industry-funded, right-wing operatives.

Finally, a large segment of the public was clearly unhappy with the Obama administration and its policies as evidenced by the rise of the Tea Party movement and the ongoing celebrity of former vice-presidential nominee Sarah Palin. In February, 2010 she seemed to capture the feelings of many when she asked in front of the first Tea Party Convention in Nashville, "How is that hopey-changey thing working out?" (Gonyea, 2010)

What then is the bottom line on the Obama persona, a reputation crucial for governance in any administration? Obama in his first year was too much the lion with his ongoing roars on a wide range of issues, not enough the fox in leading his own party and the opposition, and clearly not the puppy dog who could endear himself and his administration to the nation.

Conclusion

Our model of successful presidential transitions concludes that they can best be judged in the administration's first full year in office. Four criteria provide a framework for assessing presidential success. These criteria are predicated in political and democratic terms and are needed for leadership in this highly disaggregated and nearly ungovernable political system.

First, a new president must be entrepreneurial and cold-blooded; that is, he must make choices and take risks for later "profit" or success in the ongoing negotiations of the presidential enterprise. Presidents cannot show excessive concern for specific individuals, issues, and policies which were crucial to their elections, but might become an impediment to the incoming government. Presidents must also protect their reputation for effectiveness and freedom to maneuver.

Second incoming presidents must be nimble. They do so by choosing carefully a few initiatives for immediate attention and recognize that these may be substantially modified as they wend their way along the routes to enactment and implementation. New presidents must avoid blunders by carefully controlling their messages as well as the messages of their appointees.

Third, presidents must also be shrewd in implementing new policies and programs. New administrations must insure that new initiatives they are announced early, lobbied energetically, enacted swiftly, and executed boldly.

Finally the most effective presidents recognize that their national leadership must be creative and a blend of nimble lions and shrewd foxes, both carefully coated with benign, puppy-dog-like exteriors. That is, presidents as lions frighten off those who would prey on their administration, as foxes recognize traps, and as puppy dogs are adroit and lovable so as to sustain the necessary elite and mass support to achieve their ends.

The Obama Administration was not very effective in its first year in office. To be sure, the administration faced huge challenges in the economy and national security affairs (CQ, 2009). But at the same time, Obama and his administration made many mistakes. First, Obama was not highly entrepreneurial as evidenced by the bloat of his financial stimulus, the initial stumbling on health care reform, and over reliance on the "Chicago crowd."

Second, the administration was not very nimble. Obama's lack of a clear vision, frequent leaps from issue to issue, fumbling on Afghanistan, and lassitude in dealing with financial reform impeded the administration. However, the Obama administration was successful in implementation. He quickly removed restrictions on stem cell research, expanded the children's health care program, wooed foreign leaders in Copenhagen and Pakistan, intervened with drone attacks and the rescue of an American hostage, improved civil rights, and resuscitated the automotive industry. Finally, as a creative national leader, Obama was not very successful. He was too much the lion, too little the fox, and clearly not a puppy dog who endeared himself to the nation.

Judging United States presidents in these political terms would also seem to work for any chief executive officer. Too often, CEOs are judged in other terms, terms such as their ability to raise their organizations' stock price, open new markets, or innovate with new products. All these measures are useful, but in the end all senior executives must be political animals who must be entrepreneurial, nimble, effective implementers, and creative leaders, whose influence should spread well beyond their immediate organization.

We seldom read of CEOs being judged in political terms, but students of leadership have recognizing this reality. For example, Lee Bolman and Terrence Deal (2003) have found the political frame an effective tool for assessing leaders. Their frame or model sees power, conflict, bargaining, and building coalitions central to organizational analysis and thus to leadership. These insights are imbedded in our model to assess effective presidential transitions.

Max DePree in his classic book *Leadership is an Art* (1989), sees artful leaders as engaged in tribal exercises that are based on defining reality, weaving relationships, leaving a legacy, maintaining momentum, and establishing effective administration (3-22). All these ideas are used in our conception of entrepreneurial, nimble, and creative presidents who are also effective implementers.

Another book that captures these ideas is Warren Bennis and Burt Nanus *Leaders: Strategies for Taking Charge* (1995). Bennis and Nanus use four strategies for effective leaders. That is, such leaders create a vision, communicate effectively, position themselves to build trust, and deploy themselves with confidence and energy. Although we designed our model of effective presidents from other resources, we are struck by the similarities with all these authors.

Some may find fault with our model. For example, one observer asked, "What is magic about one year for the transition?" Well our answer is that as Lyndon Johnson noted in the quote above, the Washington community has a limited attention span. After the first year of any presidency, the Congress begins gearing up for the mid-term elections. The government bureaucracy and interest groups have also learned in the transition year. By then, they have taken the measure of the new president and have decided how to proceed in finding support within the new administration.

Another fault may be the lack of clear specificity of our model which calls for scholars to measure a president or any CEO as entrepreneurial, nimble, effective as an administrator and a creative leader all at once. Such demands may well be beyond the capacity of any leader. But we are convinced that an ideal for presidential leadership needs to be established, and in the end all leaders must be political animals. And although these measures may overlap on any one presidential initiative, one can still apply them effectively.

Thus for President Barack Obama, we found that in national security affairs, he may have been entrepreneurial, but not always nimble or creative as a leader.

Finally, the model does not easily recognize that agendas, crises, and new issues come at a president all at the same time. There is not one matter at once, but many cascading upon a leader each day. And he cannot decide to be use all four measures on each issue. Thus President Obama found himself confronting the Great Recession, and he could not decide to apply all four of our criteria at once. In most cases all leaders find matters dogging them in rapid order, and careful consideration of how to react to each using our criteria is impossible. Still, leaders can decide to approach the daily questions and issues by using our criteria serially or in combination, thereby deflecting their many critics inside their organizations and in the environment that envelops them.

Despite these criticisms, we are convinced that measuring leaders in political terms recognizes the reality of politics, power and pressures for all organizational leaders. It is well beyond the scope of this short article to apply these criteria to corporate, not-for-profit, and military leaders. But we are delighted with this model as an agenda for further work and invite our readers to join us.

Bibliography

Adamy, Janet (August 2009) "Support slips for health overhaul." *CQ*.

Alfonso-Zaldivar, Ricardo (March, 2010) "All sides playing hardball on health." Retrieved March 16, 2010 from news.yahoo.com/ap/20100317/ap_on_bi_ge/us_health_care.

Alter, Jonathon (2011) *The promise: president Obama, year one*. New York: Simon and Schuster.

Anderson, Martin (1988) *Revolution*. San Diego: Harcourt Brace.

Altman, Roger (December, 2009) "Dems need a midcourse correction." *The Wall Street Journal*.

Bai, Matt (July, 2009) "The shuffle president: Barack Obama's complicated, even eclectic, agenda suits our multitasking digital age." *New York Times Magazine*.

Balz, Dan (August, 2009) "After July's turmoil, Obama needs a 'new chapter' in August." *The Washington Post*.

Barnes, Fred (July, 2009) "The Obama agenda bogs down." *The Wall Street Journal*.

Barger, Harold (1984) *The impossible presidency: issues and illusions of presidential power*. Glenview, IL: Scott Foresman.

Bendavid, Naftali and Weisman, Jonathon (September, 2009) "Democrats show strain of heated battles." *The Wall Street Journal*.

Bennis, Warren and Nanus, Burt (1995). *Leaders: strategies for taking charge*, 2nd Ed. New York: Harper.

Benson, Fred (January, 2010) "The hope of audacity." Email document received January 17, 2010.

Bolman, Lee G. and Deal, Terrence E. (2003) *Reframing organizations: artistry, choice, and leadership*, 3rd ed. San Francisco: Jossey-Bass.

Bonifede, Dom (March 1982) "Issue oriented Heritage Foundation hitches its wagon to Reagan's star." *The National Journal*.

Boot, Max (December, 2009) "The best available defence of Obama's foreign policy." Email document entitled "Recent contributions by Max Boot to CommentaryMagazine.com's contentions."

Broder, David (January, 2010) "Obama's 9/11 challenge came on focus-transforming 12/25." *The Washington Post*.

Brody, R. and Page, B. I. (1975). "The impact of events on presidential popularity." In A. Wildavsky (ed.) *Perspectives on the Presidency*. Boston: Little, Brown.

Brooks, David (September, 2009) "Left tilt causes Obama's slide." *The Charleston Post and Courier*.

Assessing Transitions: President Barack Obama's First Year

Burke, John P. (2001). "Lessons from past presidential transitions: organization, management, and decision making." *Presidential Studies Quarterly*.

Burke, John P. (2000). *Presidential transitions: from politics to practice*. Boulder, CO: Lynne Rienner Publishers.

Burns, James McGregor (1956) *Roosevelt: the lion and the fox*. NY: Harcourt Brace and World.

Businessweek (August, 2010) "Obama: the Businessweek interview." *Businessweek*.

Clinton, David and Lang, Daniel (December 1990) "What makes a successful transition? The case of foreign affairs." *White Burkette Miller Center of Public Affairs, the University of Virginia*.

"Congress' Job Approval Rating Worst in Gallup History." Retrieved December 17, 2010 from <http://www.gallup.com/poll/145238/Congress-Job-Approval-Rating-Worst-Gallup-History.aspx>.

CQ, (January, 2009) "The Obama Presidency: Can Barrack Obama deliver the change he promises?" *CQ Researcher*.

Cronin, Tom (1980) *The state of the presidency, 2nd ed*. Boston: Little Brown.

DePree, Max (1989), *Leadership is an art*. New York: Dell.

Doig, Jameson and Hargrove, Erwin (1987) "'Leadership' and political analysis" in their *Leadership and innovation: a biographical perspective on entrepreneurs in government*. Baltimore: Johns Hopkins University Press.

Draper, Robert (July, 2009) "Obama's BFF: Valerie Jarrett is one of the president's most influential advisors. So what exactly does she do?" *New York Times Magazine*.

D'Souza, Dinesh (1999) *Ronald Reagan: how an ordinary man became an extraordinary leader*. New York: Touchstone.

Dwyer, Paula (March, 2010) "How gridlock may end." *Bloomberg Businessweek*.

Easton, Nina (August, 2009) "Obama's stimulus killers: his two big legislative goals for the fall could put new burdens on a weak economy." *Fortune*.

Edwards, Mickey (January, 2010) "Limits of a silver tongue." *The Washington Post*.

Elliott, Philip and Wagner, Daniel (January, 2010) "Obama seeks to limit big banks." *The Charleston Post and Courier*.

Factor, Mallory (January, 2010) "The two promises Obama managed to keep." *FoxNews.com*..

Gerson, Michael (August, 2009) "After the thrill is gone." *The Washington Post*.

Goleman, Daniel et. al. (2002). *Primal leadership: realizing the power of emotional intelligence*. Boston: Harvard.

Gonyea, Don (February 2010) “:How’s that hopey-changeey stuff?’ Palin asks.” *NPR*. Retrieved June 16, 2011 from <http://www.npr.org/templates/story/story.php?storyId=123462728>.

Gorton, Slade (January, 2010) “Take the congressional lead.” *The Washington Post*.

Gupta, Yash (January, 2010) “A poor communicator.” *The Washington Post*.

Haider, Don (1981) “Presidential transitions: critical if not decisive.” *Public Administration Review*.

Heifetz, Ronald A. and Laurie, Donald J. (December, 2001) “The work of leadership.” *Harvard Business Review*. 5-14.

Heineman, Benjamin and Hessler, Curtis (1980) *Memorandum for the president: a strategic approach to domestic affairs in the 1980s*. New York: Random House.

Henninger, Daniel (December, 2009) “Obama wow!” *The Wall Street Journal*.

Henry, Loren (1960) *Presidential transitions*. Washington: The Brookings Institution.

Henry, Loren (1983) The transition from nomination to inauguration.” In *The presidential transition, 1980-1981*. Edwardsville, IL: Southern Illinois University Press.

Hess, Steven (1976) *Organizing the presidency*. Washington: The Brookings Institution.

Hitt, Greg and Adamy, Janet (March, 2010) “Health showdown is set.” *The Wall Street Journal*.

Johnson, Glen and Sidoti, Liz (January, 2010) “Brown upsets Coakley: voter resentment gives GOP edge in pivotal race.” *The Charleston Post and Courier*.

Jones, J. M. (July, 2009) “Obama honeymoon continues: 7 months is recent average.” Retrieved August 10, 2011 from <http://gallup.com/poll/12139/Obama-honeymoon-continues-months-recent-average.aspx>.

Kirschten, Dick (1980) “Wanted: 275 Reagan team players, empire builders need not apply.” *National Journal*.

Klein, Joe (February, 2010) “Starting over. One year in Obama’s agenda is on life support. What he must do to retrieve it.” *Time*.

Kotter, John. P. (1996). *Leading change*. Boston: Harvard.

Krauthammer, Charles (September, 2009) “Obama now must lead as mere mortal.” *The Charleston Post and Courier*.

Assessing Transitions: President Barack Obama's First Year

- Kumar, Martha J. (2008) "Hubris or wise policy? Early planning for a presidential transition." *IBM Center for The Business of Government*.
- Light, Paul. (1983) *The President's Agenda: Domestic Policy Choice from Kennedy to Carter*. Baltimore, MD: Johns Hopkins University Press.
- Lovvorn, Al and Walker, Earl (2010). "Assessing Presidential Transitions: Bill Clinton's Inaugural Year In Office" *Southeast Decision Sciences Institute Proceedings*.
- Machiavelli, Niccolo (1910). *The prince*. Translated by N.H. Thomson. NY: P. F. Collier & Son.
- Manal, Jon (2010). "Why Guantanamo Bay closure deadline was missed." Retrieved August 10, 2011 from <http://news.bbc.co.uk/2/hi/8460183.stm>.
- Marx, Karl (1852) "The Eighteenth Brumaire of Louis Bonaparte." Retrieved June 7, 2011 from <http://www.marxists.org/archive/marx/works/1852/18th-brumaire/index.htm>.
- McGinnis, Patricia (January, 2010) "Beat the drum louder." *The Washington Post*.
- Meckler, Laura et. al (August, 2009) "Obama's agenda: a midyear briefing." *The Wall Street Journal*.
- Nathan, Richard (1983) *The administrative presidency*. New York: John Wiley.
- Neustadt, Richard (September, 1960) "Memorandum on organizing the transition." The Kennedy Library: Boston, MA.
- Neustadt, Richard (1980) *Presidential power: the politics of leadership from FDR to Carter*. New York: Wiley.
- Neustadt, Richard. (2001). "The contemporary presidency: the presidential 'hundred days,' an overview." *Presidential Studies Quarterly*, 31(1): 121-125.
- Noonan, Peggy (January, 2010) "Slug the Obama story 'disconnect.'" *The Wall Street Journal*.
- Noonan, Peggy (November, 2009) "He can't take another bow." *The Wall Street Journal*.
- Pfeffer, Jeffrey (January, 2010) "A failure to communicate." *The Washington Post*. Retrieved on January 19, 2010 from <http://views.washingtonpost.com/leadership/panelists>.
- Pfiffner, James (1988) *The strategic presidency: hitting the ground running*. Chicago: Dorsey Press.
- Post and Courier Editorial (January, 2010) "Obama must correct course." *The Charleston Post and Courier*.
- Power, Stephan (August, 2009) "Energy fight heats up." *The Wall Street Journal*.
- Radnovsky, Louise (August 2009) "Stimulus: one down, one to go?" *The Wall Street Journal*.

- Rasmussen, Scott (2011) "Daily presidential tracking poll." Retrieved June 7, 2011 from www.rasmussenreports.com/public_content/politics/obama_administration/daily_presidential_tracking_poll.
- Rasmussen, Scott and Schoen, Douglas (November, 2009) "Obama is losing independent voters." *The Wall Street Journal*.
- Richardson, Elliott (1987) Personal conversation with Wallace E. Walker. West Point, New York.
- Rove, Karl (December, 2009) "The president is no B+." *The Wall Street Journal*.
- Schmitz, Paul (January, 2010) "Presidential 360 review." *The Washington Post*.
- Schulz, Max (August 2009) "A town-hall protest in Maryland." *The Wall Street Journal*.
- Scott, Katherine Tyler (January, 2010) "Delivering us from anxiety." *The Washington Post*.
- Seib, Gerald (December, 2009) "Obama abroad mirrors Bush senior." *The Wall Street Journal*.
- Seib, Gerald ed. (January, 2010) "How's it going? A one-year report card." *The Wall Street Journal*.
- Sherman, Elizabeth (January, 2010) "Over-exposed, under-communicating." *The Washington Post*. *The Washington Post*. Retrieved on January 19, 2010 from <http://views.washingtonpost.com/leadership/panelists>.
- Shore, Bill (January, 2010) "Cucumber man." *The Washington Post*.
- Solomon, Deborah (August, 2009) "Wall street sees sign of relief." *The Wall Street Journal*.
- Van Dyk, Ted (July, 2009) "Obama needs to 'reset' his presidency." *The Wall Street Journal*.
- Walker, Earl (August 26, 2002), "Leaders should take time to rebuild employee trust." *The Charleston Post and Courier*.
- Walker, Wallace Earl (1987). "Elmer Staats and strategic leadership in the legislative branch." *Leadership and innovation*. Jameson W. Doug and Erwin Hargrove, eds. Baltimore: Johns Hopkins.
- Walker, Wallace Earl (1993), "Presidential Transitions and the Entrepreneurial Presidency: Of Lions, Foxes and Puppy Dogs," *Presidential Studies Quarterly*. Winter.
- Walker, Wallace Earl and Reopel, Michael R. (1986). "Strategies for governance: domestic policymaking in the Reagan administration." *Presidential Studies Quarterly*.
- Wallsten, Peter (December, 2009) "Democrat's blues grow deeper in new poll." Retrieved December 17, 2009 from online.wsj.com/article/SB1261003469026949.html.
- Watkins, Michael (June, 2009) "Obama's first 90 days." *Harvard Business Review*.
- Weisman, Jonathon (July, 2009) "Post-partisan promise fizzles." *The Wall Street Journal*.

Assessing Transitions: President Barack Obama's First Year

Weisman, Jonathon (September, 2009) "Doubts rise about course of war." *The Wall Street Journal*.

Weisman, Jonathon and King, Neil (September, 2009) "Obama relaunches health bid." *The Wall Street Journal*.

Weisman, J., King, N., and Adamy, J. (September, 2009) "Wrong turns: how Obama's health-care push went astray." *The Wall Street Journal*.

Whitaker, Mark (December, 2009) "Lessons from the White House." *The Washington Post*.

Williamson, Elizabeth (July, 2009) "Teachable moment observed with beer." *The Wall Street Journal*.

Wilson, Scott (December, 2009) "Obama defends first-year record." *The Washington Post*.

Wallsten, Peter and Spencer, Jean (March, 2010) "Opinions harden on health." Retrieved March 16, 2010 from online.wsj.com/article/SB10001424052748704688604575125.

Weisman, Jonathon and Perez, Evan (March, 2010) "Deal near on Gitmo, trials for detainees." *The Wall Street Journal*.

Assessing Leadership Transitions: Characterizing the First Year of Three U.S. Presidents

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Abstract

Successful presidents have highly effective transitions that impact their first year in office. In the end, their success should be measured in democratic and political terms in this most disaggregated, intransigent, and nearly ungovernable political system. Such transitions involve an entrepreneurial approach that is predicated on nimble governance, shrewd implementation, and creativity. The term "entrepreneurial" fits the necessity for newly elected presidents to make choices and take risks for later "profit" or success in the ongoing negotiations of the presidential enterprise. Nimble governance means choosing among alternative priorities and avoiding blunders. Shrewd implementation means that new policies and programs are announced early, lobbied energetically, enacted swiftly, and executed boldly. Finally, the most effective presidents have the reputation of being highly creative leaders. We conclude that this four-point scheme can be extrapolated to business and non-profit CEOs.

Keywords: leadership, transition, change, president, CEO

Introduction

A favorite preoccupation of all who are interested in organizational leadership is assessing presidential performance. Such an endeavor is enormously complicated by a range of factors. First, each president faces his own unique challenges that grow out of the era and issues confronting the nation. As Karl Marx observed 150 years ago:

Men make their own history, but they do not make it as they please; they do not make it under self-selected circumstances, but under circumstances existing already, given and transmitted from the past. The tradition of all dead generations weighs like a nightmare on the brains of the living (Marx).

Not only do presidents face unique circumstances, they also are confronted by a host of other constraints. These include decisions by their predecessors; precedents in law and tradition; the actions and preferences of other governmental institutions, such as the Congress, the Supreme Court, the Washington bureaucracy and state and local governments; and the ever-intrusive press (cf. Walker & Reopel, 1986, pp. 735-8; Cronin, 1980, pp. 1-10; Neustadt, 1980, p. 29).

A number of scholars and presidents have observed that the transition period is not only crucial to the success of the president, but also sets the tone for the Washington establishment as well as

national elites, whose vantage points and opinions influence his success. The issue of course is the length of the transition period. Some have argued that the first hundred days is an appropriate period. But the challenge for the 100-day model is that current political appointments take many weeks for congressional review, and the extensive agenda of modern presidents requires months to implement (Lovvorn & Walker, 2010; Walker, 1993; Neustadt, 1960).

Some might argue that the length of the transition is the so-called honeymoon, in which the administration is held in high esteem by national elites and mass publics. Quite often this honeymoon is measured by presidential approval scores in opinion polls and indicates that the president still dominates his election coalition and is thus able to promote his priorities. As Richard Neustadt (1980) has observed, approval ratings are important in the Washington community in gauging a president's prospects for success. When those ratings are above 55% or even 50%, the administration can expect its programs to receive serious attention from Congress and national elites (Neustadt, 1980).

For example, President Jimmy Carter's honeymoon is said to have lasted until September or October of his first year; Ronald Reagan's lasted until January or February of his second year; and, George H.W. Bush's also appeared to last until early in his second year (Walker, 1993). As a result we see the transition as a president's post-election period and his first full year in office. Thus a presidential transition lasts from election day until January 31st of his second year. By then, most presidents find their popularity has begun to wane, Washington and national elites have become critical, and Congress becomes preoccupied with the upcoming midterm elections (Haider, 1981). As President Lyndon Johnson observed: "You have to give it all you can that first year. Doesn't matter what kind of majority you came in with. You've got just one year when they treat you right and before they start to worry about themselves" (Hess, 1976, p. 22).

There is much to be done in the transition period. Not only must the president and his team recover from an exhausting campaign, they must shift gears from campaigning to governing. And governing includes many weighty challenges to include: healing wounds within the winning party; reaching out to the Washington community; deciding on priorities, policies, and appointees; and writing the inaugural address.

Some presidents have begun the transition period even before the election. The Reagan administration's efforts began years before the transition as conservative think tanks generated ideas for a supportive administration. Many of these ideas were codified into specific policy recommendations by the Heritage Foundation's 1980 book *Mandate for Leadership* (Bonifede, 1982). Even before Reagan was nominated in the Spring of 1980, advisors were assembled to propose initiatives for the first 100 days of the administration and an executive search group was established (Kirschten, 1980).

Judging Transitions

Criteria to assess transitions are also complicated and multiple. That is, no single measure is sufficient. To be specific, some argue that the measure of a successful transition is efficient machinery for decision making. Others argue that the prompt appointment of political executives

is the correct measure. Still others measure success by the administration's adherence to its platform, or if the national interest has been served by their actions (Clinton & Lang, 1990).

Unfortunately although these measures are much to be desired, they are inconsistent with the realities of the presidency and the fractured American political system with its checks and balances and federalist structure. American politics is not about efficiency, but rather liberty and access of all citizens to the government. And capable executives are increasingly hard to find as the confirmation process grinds many appointees to exhaustion. The national interest is impossible to operationalize. Holding an administration to its platform presupposes that there are no changes in the political system during and after the election and that the incoming administration fully understands the many policy systems it will confront.

Another impossible expectation for any administration is satisfying all the interested political claimants in the extended government community. Thus, presidents cannot be expected to reconcile the many interests that extend from federal appointees, to career public servants, the legions of interest groups and lobbyists, and extending still further into diplomatic missions and to state and local governments.

So we assert that the only way to measure the success is in democratic and political terms. That is, incoming presidents should be entrepreneurial, nimble in governance, shrewd at implementation of their priorities, and effective as creative national leaders.

Entrepreneurial

Their approach should be entrepreneurial in character (Doig & Hargrove, 1987). The term "entrepreneurial" nicely fits the necessity for newly elected presidents to make choices and take risks for later "profit" or success in the ongoing negotiations of the presidential enterprise. An entrepreneurial approach eschews inordinate concern for specific individuals, issues, and policies which might become an impediment to the incoming government. That is, presidents must protect their reputation for effectiveness and freedom to maneuver (Neustadt, 1980).

Entrepreneurial presidents look to the future of the administration as a marathon to be endured and completed rather than a sprint to be won. Consequently, they must not squander their transition period in any of the following ways: protecting supporters, favoring friends and contributors; advocating for issues not yet ready or ripe for action; or blindly promoting policies advocated by electoral allies. Thus, an entrepreneurial approach requires cold-blooded politics.

Nimble

During the transition, administrations should be nimble. Nimble leadership means choosing among alternative priorities and avoiding blunders. That is, effective presidents will select three or four dominant issues for their attention (Heineman & Hessler, 1980). These issues must be sorted out from the many campaign promises made over the course of lengthy campaigns. Presidents may delegate to their cabinets six or seven more to be championed and shepherded through Congress with little more than the president's blessing. Presidents also recognize that the actual details of new policies and programs will be modified by domestic and international

realities, so they avoid immersion in details and claim credit when policies and programs resemble their promises.

Blunders must be assiduously avoided. Public comments, the background of newly appointed political executives, and a new Congress may all ignite firestorms which detract from the administration's message. All too often presidents misunderstand and underestimate their opponents and the power centers on Capitol Hill and in Washington. Such fumbling costs political capital.

Shrewd Implementation

Shrewd implementation means that new policies and programs are announced early, lobbied energetically, enacted swiftly, and executed boldly. These many challenges entail internal White House requirements to hammer out new policies, the details of programs, and the administrative machinery to insure these policies are implemented. Thereafter, these policies, programs, and machinery must be codified into bills, and supportive members of the legislature must introduce them.

Once introduced the administration begins the coaxing, cajoling, and logrolling that characterize presidential-congressional negotiations. These activities demand considerable presidential attention in meeting with members of Congress from both houses, public speeches, and visits to key constituencies. Such activities drain any president and administration of valuable political capital and attention. To neglect them is to lose the initiative in the crucial first year of any administration, when other political elites would prefer to turn to their own agendas. (Light, 1983).

Since the president and his advisers have been campaigning throughout the nation during the preceding months, domestic affairs are more intelligible to incoming presidents and their staff. But new administrations must also attend to national security affairs that involve foreign, military and intelligence issues. Here the number of actors, as well as the subtleties and nuances of diplomacy are much less well understood by most presidential candidates. Additional challenges include the precedents of relationships with other nations and extensive U.S. alliances. Thus, activity in this realm must be approached with caution and care.

Creative

The most effective presidents are also creative national leaders. In essence they should be mongrels. That is, they are a blend of nimble lions and shrewd foxes, both carefully coated with a benign, puppy-dog-like exteriors (Burns, 1956). That is, presidents as lions frighten off those who would prey on their administration, as foxes recognize traps, and as puppy dogs are adroit and lovable so as to sustain the necessary elite and mass support to achieve their ends. As Niccolo Machiavelli (1910) noted:

A Prince should know how to use the beast's nature wisely; he ought of beasts to choose both the lion and the fox; for the lion cannot guard himself from the toils, nor

the fox from wolves. He must therefore be a fox to discern toils, and a lion to drive off wolves.

To rely wholly on the lion is unwise; and for this reason a prudent Prince neither can nor ought to keep his word when to keep it is hurtful to him and the causes which led him to pledge it are removed. p. 60

We are also indebted to former cabinet member and Washington insider Elliott Richardson for our understanding of national leaders as puppy dogs. As Richardson once told Walker, effective American politicians are not attack dogs. Rather they are puppy dogs who everybody loves and therefore are highly effective in building coalitions.

Thus, the hard-boiled politics of the entrepreneurial presidency are wrapped in a genial shell for easy digestion by both national elites and mass publics. A non-threatening public style is crucial to success in the Byzantine maneuvering that characterizes workaday Washington, in creating supportive coalitions, and in disarming opponents. The opposition party, especially those in Congress, also should be acknowledged, consulted for their concerns, and soothed. Once charmed, members of his own party, the opposition, and powerful outsiders can then be enticed into coalitions that later must be constantly created, recast, and then recreated issue-by-issue.

Thus effective presidents successfully maneuver in the face of overwhelming opposition, woo supporters and mollify opponents in Congress, the Washington community at large, and the nation. They are agile in creating an environment of order and congeniality with both the old and new centers of power within the government. For example, as some of his opponents said of President Ronald Reagan, they did not agree with him on much, but he sure did like him (Brody & Page, 1975; D'Souza, 1999).

This charm, grace and style are also crucial in communicating beyond the legislature. Recognizing that political missteps will occur in every administration, and especially during the transitional period, the most successful presidents are adept at graceful exits from ill-considered misjudgments and are proficient at redirecting attention to new issues (Nathan, 1983). Finally, the president's communication skills must channel the nation's mood by national speeches, visits throughout the nation, and interaction with the press.

To illustrate our model of the entrepreneurial president, we will apply it to the Clinton, Bush, and Obama administrations' first year in office. To summarize our criteria, we consider whether Clinton, Bush, and Obama have been entrepreneurial, nimble, shrewd at implementation, and creative national leaders. Thereafter, we will consider the utility of this model for other chief executives.

The Clinton Transition

Having established these criteria, we will illustrate some insights we were able to draw by briefly applying them to the Clinton transition. This recent Democratic Party presidential transition exemplified interparty change as Clinton's administration succeeded twelve years of Republican Party control of the executive branch. We will seek to assess this transition in terms of nimble

governance and shrewd implementation. We will also consider whether we found a leader who managed to be both a lion and a fox.

Bill Clinton assumed the mantle of president-elect in November 1992 after defeating the soon-to-be one term President George H.W. Bush. The election had been a hard fought contest between three major contenders (H. Ross Perot was the first credible national third party candidate in decades) and had revolved around issues of the economy and jobs. The United States was beginning to emerge, unknown and unfelt at the time, from a recession and there was a national debate over the wisdom of entering into a free trade agreement with Canada and Mexico. Unlike most previous presidents, Clinton could claim little mandate to establish a different course for the nation as he had won only 43% of the popular vote; and, yet, he was well positioned to be able to implement the policies on which he had campaigned since the Democratic Party controlled both the House of Representatives and the Senate. As noted by historian John Burke, Clinton had “an obvious skill in ‘campaigning for policy’” (Burke, 2000, p. 6). Thus, the Democrats were eager for Clinton to set the agenda for the nation since their political party had been out of the Executive Mansion for the previous twelve years, and he appeared ready for the challenge of directing legislative victories after having run such a disciplined and focused campaign.

The promise of a new direction being orchestrated by a Democratic president was quickly tempered by the numerous missteps of the president-elect. The missteps were so frequent and so public that his transition is generally viewed as undisciplined and unfocused (Burke, 2000, 2001; Kumar, 2008b; Maranto, 2004). In examining presidential transitions, Burke noted that the “Clinton presidency did not hit the ground running; it stumbled out of the blocks in worse shape than any modern presidency. Even Jimmy Carter looks accomplished by comparison—no small feat” (Burke, 2000, p. 6). The evident chaos of the transition lacked both political nimbleness and shrewdness and was saved only by the grace of the honeymoon period all new chief executives are fortunate to experience. Table 1 highlights Clinton’s political management skill (i.e. nimble governance and shrewd implementation) of the inaugural year as his administration faced the issues it defined and that defined it.

Determined to have a cabinet that reflected the diversity of America, Clinton and his small inner circle concentrated on the selection of his team. The extreme focus on his cabinet officers detracted from any deep thinking about the players and processes that he would employ within his own White House staff to achieve his legislative priorities. Clinton even acknowledged in his own autobiography that he hardly spent any time on White House staff member selection (Clinton, 2004) and the *New York Times* observed that the “skeletal transition board has only met twice and is still trying to work out a time-table to present to Mr. Clinton for his most important transition decisions” (Friedman, 1992). The lack of engagement with the organization of his staff was most obvious with the procrastination in naming a chief of staff. With the election decided November 3, it was not until mid-December that he announced that Mack McLarty would serve in the position (Wellford, 2008). A childhood friend of unquestionable loyalty, McLarty would prove to be ill-equipped to handle the complexities of operating within the political sphere of Washington, D.C. His inexperience as a staff member (he was a *Fortune 500* company CEO), combined with his lack of political insight, and desire to play the role of honest

Table 1. Assessing Clinton’s political management of his inaugural year (Nov 1992 – Nov 1993)

	Successes	Failures
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Nimble governance

1. <i>Prioritize</i> policies/ programs	Creation of National Economic Council in December 1992	Numerous first year priorities: 1. Economic stimulus program 2. Deficit Reduction program 3. Healthcare overhaul 4. Welfare overhaul 5. New college loan program 6. AmeriCorps program 7. Reinventing government program 8. New community develop banks and enterprise zones
2. <i>Avoid</i> mistakes	December 1992 conference focused on US economy	➤ Naming Personnel Director and Transition Directors to Cabinet posts ➤ Homosexuals in military controversy ➤ Air Force One haircut at Los Angeles Airport controversy
3. <i>Maneuver</i> in face of opposition	FMLA passage	➤ Zoe Baird nomination for Attorney General ➤ Lani Guinier nomination for Head, Civil Rights Division, Department of Justice
4. <i>Persuade/appease</i> supporters/ opponents	NAFTA passage with Republican support	➤ Homosexuals in military controversy alienated supporters and antagonized opponents ➤ North American Free Trade Agreement (NAFTA) passage without major Democratic support

Shrewd implementation

1. <i>Announce</i> early	Personnel Director and Transition Director selections	➤ Delay in naming president’s Chief of Staff ➤ Naming of Personnel and Transition Directors to cabinet roles ➤ Delay in White House staff selection
2. <i>Lobby</i> energetically	FMLA and NAFTA passage	➤ Zoe Baird nomination for Attorney General ➤ Kimba Wood nomination for Attorney General ➤ Liaison with Senate over desired Stimulus Program
3. <i>Enact</i> swiftly	Annual Budget passed Congress in August 1993	➤ Early leadership for Department of Justice ➤ Healthcare overhaul legislation ➤ Welfare reform legislation
4. <i>Execute</i> boldly	Brady Handgun Violence Prevention Act passage	Jobs training and education priorities limited to \$1 billion

broker impeded his ability to effectively control and direct the White House staff and serve Clinton. The selection of such a poor choice as chief of staff reflected directly on the president-elect's haphazard decision-making style. Even with his chief of staff in place, Clinton procrastinated further on selecting members of his White House staff. It was not until five days prior to the inauguration that Clinton named his senior staff members, which resulted in no one being familiar with their new positions or having the opportunity to ask their outgoing predecessors questions (Kumar, 2008b). The Presidential Records Act of 1978 requires the outgoing presidential records depart with the exiting administration (with the exception of the White House Counsel's office and the National Security Council); thus, there was no institutional memory waiting for the incoming Clinton administration to assist his staff in understanding their roles, responsibilities, and issues facing the jejune administration (Kumar, 2008a). The late selection of White House staff severely disrupted early coordination of policy initiatives that Clinton desired to pursue (Wellford, 2008).

Though he did overlook the value that his own staff would bring to the success of his legislative agenda, Clinton's intense focus on building the best cabinet possible did not materialize as expected. The goal of having 500 to 600 appointees in place by the end of the first 100 days (Bruce, 1993) was unrealistic and Clinton's team succeeded in having only 42 confirmed at that desired point in time (Kumar, 2008a). Early successful decisions quickly morphed into bad choices. Richard Riley, the former governor of South Carolina was placed in charge of personnel operations and Warren Christopher, a trade negotiator for Kennedy and State Department official for Carter, was selected as the transition director. By naming his personnel director as secretary of education, he may have made a shrewd decision for the cabinet position; however, the choice hampered the nascent administration's ability to prepare itself to govern (Kumar, 2008a; Maranto, 2004; Wellford, 2008). Burke quotes one transition staff member stating, "The personnel process was a complete disaster. They put Dick Riley in charge of it and then named him secretary of education. And he immediately moved out of it, and that deteriorated into a complete mess; it was just chaos . . . there were no real people with experience running it" (Burke, 2000, p. 295). The problem of preparing to govern was exacerbated when Warren Christopher was named to fill the secretary of state position. Both men removed themselves from their transition jobs while the administration was still in transition in order to prepare themselves for their Senate confirmation proceedings. Wellford (2008), White House transition advisor to President-Elect Clinton, stated the transition was "crippled" by the departure of the two key transition leaders.

Clinton wanted a cabinet that reflected the diversity of the United States, from both a gender and a racial perspective; and, it was in his next cabinet selections that he experienced the first true scandal of his administration (starting even before being sworn into office). Women's rights groups agitated for a woman to be selected for one of the big four cabinet positions (i.e., State, Defense, Justice, and Treasury). Clinton announced his cabinet secretaries along with appropriate counterparts in various councils (e.g., Secretary of Defense with members of the National Security Council). As he named his state department team, defense department team, and economic team with men all taking the secretary positions, the pressure was increased on Clinton to name a female to be Attorney General. In regards to selecting an individual to serve as his Attorney General, Clinton was neither shrewd nor nimble.

When his first choice, Zoe Baird, was named as Attorney General-designate, many perceived that Clinton was a weak executive who could be pressured into making particular decisions (Burke, 2000; Drew, 1994). The supposed weakness, however, paled as Baird's nomination ran into a political firestorm over her employing an illegal childcare worker and family driver. Not only were the two employees illegal immigrants, but the Baird's had failed to pay social security taxes on the individuals' salaries. Clinton's team did not appreciate the political sensitivities that would arise with the revelation (Kumar, 2008a). The political tide was turning against his nominee, yet he refused to withdraw her name and only relented the day after his inauguration when Senate Democratic leaders informed him that she could not be confirmed (Drew, 1994). George Stephanopoulos recognized the callow administration's lack of political sensitivity as he commented on the Baird nomination, "We should have never let Baird's nomination get as far as it did, but our systems failed us at every crucial step" (Stephanopoulos, 1999, p. 118). Unfortunately, the systems proved little better when in early February, Clinton's team leaked to the press that Kimba Wood, a federal district court judge, was the new nominee for Attorney General. Realizing that Wood's similar problem with an illegal immigrant as a childcare worker would generate a new firestorm, President Clinton withdrew her nomination. Regrettably, the administration had again demonstrated a lack of political sophistication and management skills evidenced by a successful president. Reviewing Clinton's first hundred days in office, a *New York Times* editorial likened the search for an attorney general to being "snakebit" (*New York Times*, 1993). The President did not have his attorney general sworn in until March 12, 1993 when Florida State Attorney General Janet Reno finally took the oath of office.

The search for a confirmable attorney general was not Clinton's only evidence of political blindness in the Justice Department. A holdover from President George H.W. Bush's administration was directing the department since Webb Hubble, a former law partner of Hillary Clinton and slated to be the number two official in Justice was slow in getting confirmed. He noted that, "the media began focusing on what they called a leadership vacuum at Justice" (Hubbell, 1997, p. 185). A few months into the administration, another appointment political crisis erupted. Lani Guinier was nominated to be head of the Civil Rights Division of the Justice Department. A law professor, she had written academic articles concerning racial discrimination. The articles proved to be controversial and she was dubbed a "Quota Queen" by *The Wall Street Journal* (Bolick, 1993). After the controversy erupted Clinton read the controversial articles for himself, felt he could no longer support her nomination, and withdrew it. Senator Joe Lieberman, a Democrat from Connecticut, reflected on the haphazard vetting of Clinton's nominees by his White House staff and stated, "If they didn't know [about her academic articles], they did a bum job of review. If they did know and didn't stop the nomination, their judgment is off" (Drew, 1994, p. 206).

Though he stumbled badly during his transition period, Clinton had reassured the nation that he would remain focused on the agenda on which he campaigned. He created the National Economic Council and announced it at a December press conference. Shortly afterward, in mid-December, he held a two day economic conference that demonstrated his attention to the U.S. economy. Citizens wanted the new president to succeed and shortly after assuming the office his poll numbers revealed 58% approved of his job performance (Kumar, 2008b).

Clinton's agenda was broad. Reviving the economy was his primary focus with both a stimulus and deficit reduction program to be proposed. He intended to comprehensively reform health care—a plan would be before Congress within the first hundred days. Welfare would be overhauled. He would present to the legislature college-loan and the AmeriCorps community-service proposals. Vice-President Gore would have his reinventing government program presented to Congress. He proposed community development banks and enterprise zones. Clinton failed to understand that he needed to focus on a few major projects at a time and not try to do everything in his first year. During the transition period Bruce Lindsey, a Clinton advisor, noted that, “We had no time line before we came in. No one sat down and said, ‘if you do A, B, C is your plate too full?’” (Drew, 1994, p. 36). At the hundred day mark, some in Clinton's administration were questioning whether far too much had been heaped onto the legislative plate (*New York Times*, 1993).

Besides lacking the shrewdness to ensure that nominees were picked early and were confirmable, Clinton early on in his administration lacked the nimbleness to not be hoisted on his own petard. A speech where he had advocated allowing homosexuals to serve in the military to a gay and lesbian group during the campaign had drawn little interest. That changed when a reporter asked Clinton if he intended to work on changing Defense policy now that he was president (Kumar, 2008a). Clinton was not well briefed on the issue and his not deeply considered comments alienated vital constituencies (Mathews, 1993). Not sufficiently appraised on the complexity of the issue, Clinton and his administration were not prepared for the weeks of negative political coverage. The controversy became so heated that the Chairman of the Joint Chiefs of Staff, during a speech at the Naval Academy, advised that if military officers found the plan morally unconscionable they should resign. Congressional ire increased and it became apparent that Congress was nearing the point where there would be sufficient votes to pass legislation to override any executive order Clinton might issue. His poorly staffed comments, in the first month of his administration, generated a crisis in civil-military relations. To defuse the situation, Clinton referred the issue to his Secretary of Defense, Les Aspin, to study for six months. The new policy of “Don't ask. Don't tell.” quieted the furor but no one was satisfied, and Clinton had once again demonstrated that he was ill attuned to political sensitivities. William Waybourn, director of Victory Fund, a political action committee raising funds for gay and lesbian political candidates, commented on the ill-timed and needless distraction of the subject, “The whole issue was very costly. Basically, it took a new administration and dropped it on its head for three months . . . And what did we have? Nothing” (Yeager, 1993, p. 205). Clinton lost 20 points in his favorability rating in the first two weeks of his presidency (Drew, 1994).

The new President did demonstrate some adroitness in his actions. Having campaigned on reviving the economy, he wanted his budget to set a new path. Clinton sought to accomplish three things with his first budget: (1) a stimulus program, (2) human capital investment, and (3) a deficit reduction program. Poor legislative liaison with the Senate resulted in the stimulus dying as the White House felt no need to accept a moderate compromise with Republican Senators especially after the plan had passed the house (Stephanopoulos, 1999). Jobs training and education essentially met the same fate when Clinton learned that a 1990 legislative budget agreement had established spending caps through 1995 so he was limited to less than a paltry \$1 billion (Reich, 1997). Yet, he was able to steer his \$1.5 trillion budget outline through in record

time, and it passed in August though it required Vice-President Gore's tie-breaking vote in the Senate after squeaking through the House 218-216.

A notable legislative accomplishment that his team was able to steer through the House and Senate was the Family Medical Leave Act (FMLA). Unfortunately, the Kimba Wood nomination had cratered and Wood's statement to the press was released the same day as Clinton was to sign the FMLA into law. Clinton's successes were too frequently, in his inaugural year, overshadowed by his stumbles. His administration demonstrated little of the adroitness of his campaign when faced with a challenge.

Clinton's political judgment continued to be questionable through his first year in office in both small and great matters. A \$200 haircut onboard Air Force One as the aircraft sat on the Los Angeles International tarmac reportedly delayed other planes and generated another firestorm that had nothing to do with Clinton's ability to govern. The campaign promise to reduce the White House staff by 25% became an embarrassment as Clinton's team was unable to accurately determine how many people worked on the staff and then indicated that it might not be achievable at all. The reductions that were attempted had the appearance of ham-handed political firings such as the 20 person reduction in the White House correspondence unit and wholesale firing of the White House travel staff. A success for Clinton that he achieved in spite of his party was the passage of the North American Free Trade Agreement (NAFTA). Opposed by a majority of Democrats, Clinton only succeeded in getting the bill passed with Republican support. Though he had campaigned as a "New Democrat," questions arose about how successful a president could be who worked against his party.

The minor embarrassments paled in comparison to the political missteps on one of his signature campaign efforts—comprehensive health care reform. Originally, the proposed legislation was to be presented to Congress by May. The complexity of the health care reform led to the date slipping to July, and then it slipped again to September. The decision to place his wife, Hillary Clinton, in charge of the reform effort was not well received by all legislators and perceived poor efforts to keep Congress informed further alienated the members. Eventually, the health care reform effort was put off until 1994. Like healthcare, welfare reform, which was on the agenda for 1993, had to be shifted to a later date. Clinton's inaugural year closed with a signature event; on November 30, 1993 he signed into law the Brady Handgun Violence Prevention Act, which instituted for the first time the requirement for background checks prior to firearm purchases.

Conclusion: Clinton

This study applied the preceding criteria to the inaugural year of the Clinton Presidency. Clinton did not display a deft political management style in his first year in office. Even though he had some significant legislative victories his first year in office (e.g., NAFTA, FMLA, and the Brady Bill), Clinton stumbled more than most of his predecessors. He was neither nimble in extricating himself from untenable positions nor shrewd in positioning himself to successfully sell his agenda to Congress or the American people. His unfocused and undisciplined decision-style, commencing with the indecision in naming his chief of staff during the transition, would reverberate throughout his first year in office to his detriment. Clinton would gain a successful executive footing only with the naming of a new chief of staff in 1994 and the takeover of both

the House and Senate by the Republican Party during mid-term elections that year, which forced the Clinton White House to find both discipline and focus; however, the transition year was a year marked and marred by avoidable missteps. Though the inaugural year was rocky, at the end of Clinton's full first term Americans elected him to another term (the first Democrat to serve two full, elected terms since Franklin D. Roosevelt (1932-1945). During Clinton's full first term the economy began what would turn out to be the strongest period of growth in United States history. Unemployment declined from 7.4 percent when he was elected in November 1992 to 5.4 percent when he was re-elected in 1996 (St. Louis Federal Reserve, 2011). Unable to push through his policy initiatives in the second half of his first term (welfare reform was the last major policy initiative win of his first term), he increased his presidential stature as he successfully countered the Republican legislative initiatives. In a budget battle with the Republican-controlled Congress during the winter of 1995/1996, the Republicans were perceived by the electorate as the instigators of the federal government shutdown, which rebounded to Clinton's increasing popularity. Interestingly, a stumbling inaugural year with noted legislative accomplishments was followed by three years of deft political management and only limited further political accomplishments (Burns and Sorenson (2000) criticized Clinton for not advocating for significant policy changes after the debacle of Hillary Clinton's health care plan in 1994). Had Clinton employed more nimble governance and shrewd implementation during his inaugural year and not attempted to put health care reform into a too long list of first year priorities, he might have been able to build the political coalitions necessary to pass health care reform. Yet, with the debacle of health care reform behind him, the economic rebound that continued to grow throughout his presidency significantly contributed to Clinton's re-election and public perception of a successful presidency (notwithstanding the mistakes and missteps of the inaugural year). With the ever strengthening economy, the voters of 1996 decided that Clinton had indeed remained focused on the right issue as he promised with his 1992 campaign slogan, "It's the Economy, Stupid."

The Bush Transition

The Bush presidential transition of 2000 to 2001 is arguably the most unique of modern times. Losing nearly half of the transition time to a contested election, the administration had only five official weeks in which to effect the changeover. While some authors suggest that the short transition yielded a problematic Bush administration (Eksterowicz & Hastedt, 2005), others laud the outcome especially given the brief time period (Burke, 2004). The extant literature suggests that partisan politics is alive in modern academia, as well as in Washington.

Regardless of one's conclusions about the policy outcomes of the Bush administration, some consider the changeover to be as smooth as Reagan's in 1980 with no particular faults contributing to any early mistakes by the administration (Burke, 2004; Purdum, 2004). This is also noteworthy given the antagonism that existed between staff members of the outgoing and incoming administrations (Ashbee, 2009).

Certainly, if the transition is considered successful, that success is attributable to prior preparation. Effective early groundwork includes planning transition activities before the election, organizing a postelection transition process, creating policy planning and presidential agenda teams, establishing groups to gather agency and department information, and attending to

cabinet, subcabinet, and White House staff appointments (Burke, 2001). In Bush's case the transition could not have succeeded without effective pre-election planning (Light, 2008).

In addition to the general concept of planning, the Bush team executed a variety of successful efforts including information gathering from various think tanks (Kamensky, 2008). The following chronology is largely excerpted from Burke's (2004) thorough report on the Bush transition. Transition efforts started as early as 1999 when longtime Bush friend Clay Johnson became involved in the process. He quickly educated himself on various transition issues including organization and personnel. By mid-2000 Johnson had a plan in place, as well as lists of names for cabinet posts and a potential Chief of Staff. After Election Day, the lack of official results precluded the General Services Administration from funding a transition. Bush used private funds in order to continue the process until December 14, 2000. By that time all key White House staff positions were filled and within weeks Bush had an entire cabinet announced, followed by the selection of subcabinet positions. Policy position papers prepared for the campaign were used by the staff during the transition to generate policy proposals for release early in the administration. The White House staff held a clear agenda that helped them to stay focused. The president's team was considered to be unified; although key positions in various agencies were being filled more slowly than past administrations (Burke, 2004).

The administration executed an effective transition into office through the inauguration. The following sections assess the effective use of that initial platform. As argued by Bridges (2003), change is situational, but transition is psychological. The extent to which the Bush administration established itself as entrepreneurial, nimble, shrewd, and creative was critical to its capability to engage in effective policy execution. These four factors are examined in the context of personnel decisions, organization structure, and the administration's following major policy initiatives: tax cuts, education reform, changes in Medicare, faith-based initiatives, defense modernization, and Social Security reform. The other monumental factor to consider in Bush's first year was September 11, 2001. The following statements of events rely almost exclusively on Burke's (2004) historical report of the Bush administration from 2000 to 2003.

The Entrepreneurial Bush

In an effort to run a tight, well managed White House President Bush demanded discipline and loyalty. Chief of Staff Andrew Card would ensure that a loyal and disciplined culture was established accordingly through various training sessions as well as in day-to-day operations. Although Card would ensure that people were treated well and felt part of a team, the Bush approach was one of cool calculation and determination to structure and organize the White House to generate predictable outcomes. In addition to loyalty and discipline, nominees had to have experience and arrive with a clear set of policy goals; otherwise they understood that their goals would be set for them (Burke, 2004).

This entrepreneurial approach served President Bush well on September 11, 2001. He took charge of the situation in a cool calculating way and had the staff to support him in doing so. There is some speculation that the disciplined structure which led to initial successes after 9/11 might have hampered the later war efforts, which were deemed failures. Nonetheless, Bush took a cold-blooded approach toward the terrorist attacks and became the architect of the war on

terror. As characterized by Burke (2004), President Bush adopted the view that “when fortune fails, use other presidential powers” (p. 224).

Bush eliminated any issues surrounding the legitimacy of his presidency after the election was official by immediately pursuing an ambitious political agenda. He sought to build political capital by focusing upon policy and governing as opposed to the election. The basis for choosing cabinet and staff members emphasized the qualities necessary for the position, as opposed to the characteristics of particular individuals. Experience was considered one of those qualities, and in order to get Washington experience the administration hired many people from inside the Beltway. Depending upon the estimate, 38-50% had previously served in the Bush-Senior White House (Barnes, 2001).

In order to protect his reputation for effectiveness and establish the freedom to maneuver, he issued an executive order to block access to materials at the Reagan Library that were to be made public. This act would ensure that the means to do things in a nonlegislative way would be available to him during his presidency (Burke, 2004), just as they were to others in the past. Although 9/11 would cause an abrupt alteration in the presidential situation, his control over a tightly structured White House sustained itself. Inside the White House he decided that he would take over as Chair of the National Security Council meetings and outside the White House his wartime presidency made congressional compliance nearly assured, at least in the short term.

President Bush can be judged to have done well in the entrepreneurial arena. A great deal of advance planning and preparation contributed to his effectiveness in this area. He showed that he was ready to take charge and that he had implemented a well-organized process do so (Burke, 2004). Bush was able to be decisive because the support structure allowed him to be so. This would not necessarily be an asset in the long-term, as over reliance on an effective structure led to a sometimes insular operation (Kellerman, 2008).

The Nimble Bush

The campaign and pre-election preparation process was established over 18 months through the diligent efforts of Clay Johnson. His work enabled the administration to move exceedingly quickly through the truncated transition period. After December 13, 2000 the transition team quickly announced key appointments at points earlier than the previous administration. Key White House staff members at the highest levels were in place and cabinet members were awaiting confirmation before the end of December. Regardless of whether some Bush cabinet nominees were chosen earlier or later than his predecessors, these picks were accomplished only three weeks from the time of his official transition, as opposed to the 8 to 10 weeks that other presidents had to do the same. A 20-day, 100-day, and 180-day preliminary schedule were established before the president took office. Whether or not the administration was truly this nimble, the existence of these outcomes made it look so.

Through Clay Johnson’s transition research, Bush and his staff knew the importance of establishing only a few initiatives for immediate attention. Like Reagan, Bush wanted a limited set of proposals which eventually resulted in the following list: tax cuts, education reform, changes in Medicare, faith-based initiatives, defense modernization, and Social Security reform,

all of which had been the centerpiece of the campaign. The goal of the administration was to do a few things, but do them very well (Burke, 2004). Karen Hughes remarked that one of the hallmarks of the administration was its focus on big substantive important things (Kornblut, 2001). The tax-cut plan would succeed in short order, but even though other policies were pursued vigorously, 9/11 would mark a shift in emphasis even though many fall plans had been in place to lobby for education reform.

Early on, President Bush showed that he was willing to modify his initiatives to garner support. Especially in the area of vouchers, he soon learned that he had to modify his education plan significantly. September 11 would interrupt the education reform process, but in 2002 Bush signed the bill amidst many compromises. In general, Bush would be willing to account for legislative circumstances and would compromise when he did not have adequate support. In cases where he thought the stakes were more significant, such as in the case of tax reform, he would wait upon the legislature to come closer to his position prior to engaging in the negotiation of a deal (Burke, 2004).

The administration made significant efforts to establish an institutional structure that would avoid public blunders by carefully controlling appointees and public communications. Cabinet nominees were briefed on policies, issues and campaign promises related to their areas. They were directed to establish clear policy goals, or risk having them established elsewhere. Despite their efforts, the issue of public blunders was an area where the administration appeared to lack complete control.

The EPA issued statements about the environment and arsenic levels in water, which were inconsistent with the administration's position. The Kyoto treaty process was also misrepresented relative to the administration's position. Treasury Secretary Paul O'Neill made numerous public comments that were at odds with the administration, including estimates which cast the tax-cut bill in an unfavorable light. Eventually O'Neill would be among the first to be asked to leave the administration. A rift existed between Donald Rumsfeld and Colin Powell, which got publicized through sensitive comments made by Secretary Rumsfeld. The secretary of education did not necessarily make public blunders, but was clearly omitted from the loop when it came to the education reform initiative. The Department of Agriculture did not inform the White House about changes in Salmonella regulations and Attorney General Ashcroft made firearms remarks that were at odds with the court's standing on the bearing of firearms as a collective and not individual right (Burke, 2004).

In terms of policy and nimbleness, Bush's record of success is mixed. By June 7, 2001 Bush had signed the tax cut bill into law. This garnered him some political capital. Although introduced early, the faith-based initiatives would be achieved much later, but only by executive order and not legislation. The prescription drug benefits for seniors would also be delayed beyond his first year and were subject to compromise. Education reform would come within the first year, but was reached through compromise and somewhat overshadowed by the events of 9/11. In the case of education, Bush showed significant willingness to modify his plan in order to ensure enactment. In one case he invited members of the Kennedy family to the White House in order to view the recently released movie *Thirteen Days*, which focused on the decisions of President John F. Kennedy during the Cuban missile crisis of 1962. Social Security reform was not

pursued in term one, and later failed early in term two. The failure to be nimble in terms of immediate attention on Social Security might have been the inception of its demise. The events of 9/11 posed a confounding factor relative to what might have been a better-than-mixed review of Bush's nimbleness.

The Shrewd Bush

George Bush was shrewd in his efforts to establish political legitimacy early by continuing with the transition efforts prior to December 13, 2000. The shrewdness came in the form of showing his leadership, but attempting to do it without appearing too presumptuous. One of the strategies was to ensure that future Vice President Cheney had regular visibility during this period. In contrast, Bush would maintain a low profile in order to avoid any damage regarding presumption before the election results were confirmed.

In addition to other unique organizational structures in the White House, Bush implemented a very unique structure employing Karl Rove as political strategist on the staff and having Karen Hughes handle communications and media relations. For the first time, these positions worked at the top levels of the White House. As an example, speechwriter Michael Gerson was given an office in the West Wing, while his predecessors had been in the Executive Office Building. Both press and politics maintained a close relationship to this administration and its president.

When it came to announcing initiatives early, this administration also understood the importance of taking the lead. The transition team began discussing education reform even before the December 13th election decision. Bush's early legislative agenda was noteworthy, even if all parts of the agenda were not as relevant later in the administration (Burke, 2004).

President Bush lobbied energetically, broadly, and continually. He built strong working relationships with Congress and reached out in a variety of ways to congressional constituency groups. Johnson's background research taught the administration about the importance of Congress and career government workers, regarding their attention to how a new administration reaches out to them. Bush held an unprecedented number of meetings with members of both parties and especially with those who held important committee positions relevant to the Bush agenda. Republicans were brought on board to ensure they understood his agenda, and the Democratic members of Congress showed admiration for his mode of operation. In particular, Zell Miller of Georgia publicly praised Bush on his approach (Burke, 2004).

More specific initiatives included a public relations effort aimed at education which included personal visits with educators and school officials. To emphasize his faith-based initiative, Bush met with religious leaders. To promote tax cuts, he met with business executives. Public support for policy initiatives was garnered through more appearances, such as having Mrs. Bush attend meetings with educators and principals. In foreign affairs, he traveled to Mexico and had Great Britain's Tony Blair come to the White House. The president visited military installations to promote defense initiatives. He conducted three-day tours in groups of states represented by Democratic Senators who might be persuaded to support his tax cut proposal. He met with citizens who would most benefit from his tax cut proposal. From his transition through his first week as president, Bush met with 90 legislators and 29 of those were Democrats; his efforts at

courting individual members of Congress would later be known as the “charm offensive” (Burke, 2004). Well after his first year, in 2003, Bush also would court and win the support of the AARP for the prescription drug act.

President Bush behaved boldly as plans unfolded and opportunities presented themselves. Karl Rove tightened the strategic plan during the transition period and produced a detailed operating plan for the first 180 days. These plans are aimed at turning the campaign agenda into legislation. Bush also demand a plan of conduct aimed at the first six weeks of his administration. The basis for this plan was to execute the promises of the campaign. Although none of the major policy initiatives were enacted in the first 100 days, all of them had been made public (Burke, 2004). The tax cut bill was signed on June 7, 2000 and showed promise for fast action elsewhere, but the events of 9/11 would interrupt that tack. Those same events would also enable bold and quick action in the case of the Transportation Safety Bill, the Patriot Act, and other measures taken in the war on terror.

George Bush proved to be shrewd in legitimizing his presidency, implementing a unique organizational structure to manage perceptions of the White House, being prepared to announce initiatives early, and conducting extensive Congressional and public lobbying efforts for his policies. Much of his capability to be shrewd and subsequently bold is once again attributed to a disciplined organizational structure and effective planning by a savvy staff. Although 9/11 interrupted the planned flow of policy-related activities, the tragic events still provided the opportunity for new policies and programs, which were enacted and executed quickly.

The Creative Bush

Some of the more creative components of the Bush administration include the unique division of labor between Card, Rove, and Hughes (Milbank, 2001). Daily operations, political strategy, and communications plans were addressed at the highest levels. Bush himself referred to this as the legs of the triangle (Allen, 2001). He also tried to make the Cabinet smaller and more productive. Although he risked alienation, Bush restructured the workings of the National Economic Council and relegated the functions of the Office for Women's Initiatives and Outreach to the Public Liaison Unit (Burke, 2004). During the campaign he built a strong advisory network in order to develop policy along the campaign trail.

As a lion, he fended off those who might otherwise prey on the administration. Cabinet appointments were based upon loyalty to him and his agenda, as well as prior experience and expertise. He communicated that he had an experienced, cohesive team that was aggressively preparing to govern and operated without pride or partisanship (Burke, 2004).

As a fox, he recognized the potential for traps. He did not want to get caught as his father did in the early days of his administration when Bush Senior was left asking the following question: what do we do now? (Burke, 2004). The recruitment of Clay Johnson to do the early research on the components of an effective transition was the key to laying a good foundation for what was to come. He had a strong Chief of Staff whom he directed to facilitate, and not impede upward communication. Although the administration's planning efforts ensured they were able to control the legislative landscape regarding policy initiatives, they could not specifically account for

unplanned events. The outgoing administration's last-minute executive orders and a variety of regulatory measures, such as the ban on logging and road building operations on national forest land were traps that the new administration had to address in a more spontaneous fashion. Although discipline, loyalty, and experience helped in some cases, various public blunders by appointees could not always be controlled.

If puppy dogs manage to sustain the support of both the elite and the masses in order to achieve their ends, then George Bush managed to simultaneously attain the status of shrewd gunslinger and nimble puppy dog. He mounted the “charm offensive” on Congress and wooed the public through personal appearances by him and the First Lady. His cabinet had a high degree of prior executive experience to be admired by legislators, while also pleasing his public political base. The president also pleased his staff by including everyone in the decision-making process; although, he made it clear that in the final analysis the decisions were his to be made.

Conclusion: Bush

At the risk of alienating non-Bush supporters, we do not wish to paint an undeservingly rosy picture of the Bush administration. But, regardless of the substantive nature of his policies, the processes of his administration over the course of his first year were effective. His first hundred days are generally lauded because he stuck to his conservative political agenda and sought to build bridges to Democrats in Congress (Burke, 2004). The Bush administration proved itself entrepreneurial, nimble, shrewd, and creative in a variety of ways. These measures do not necessarily indicate an effective or successful administration, because ultimately that judgment is based upon outcomes over time and beyond the scope of this paper.

The Obama Transition

Entrepreneurial

Were President Barack Obama and his administration entrepreneurial? That is, have they practiced cold-blooded politics and eschewed inordinate concern for specific individuals, issues, and policies which might become an impediment to them?

The administration's performance here was uneven. On the positive side, Obama engineered the financial rescue early, something that many observers feel was essential to stabilize an economy in free-fall. The TARP and stimulus bills were crucial actions in his first few months to stabilize the economy (Alter, 2011).

Obama created a fine cabinet by wooing Senator Hillary Clinton, his principal adversary for the Democratic nomination, to be Secretary of State. In the midst of the Iraq and Afghanistan wars, he held over the widely-admired Robert Gates as Secretary of Defense. For Treasury Secretary, he appointed Tim Geithner, who had helped President George W. Bush engineer the early rescue efforts of large financial firms. Other appointees such as David Chu to be Secretary of Energy and Army General Richard Shinseki, himself a wounded veteran, to be Secretary of Veterans Affairs (Watkins, 2009; CQ, 2009).

The nomination of Sonia Sotomayor to the United States Supreme Court was inspired. As the first Hispanic to ever be nominated for the Supreme Court, administration opponents could not easily object, especially given the rising prominence of Hispanic voters. She was easily confirmed (Alter, 2011).

Other issues that the new President took on early were consumer credit card reform and the huge bonuses earned by executives in the financial sector. All voters could easily support credit card reform; after all credit card use is high among both the middle and upper-class economic sectors. And who could possibly object to taking on the credit card companies, who were widely seen as whimsical in what appeared their unending alteration and increase of fees (Alter, 2011). Most observers and columnists had also complained about the very large bonuses earned by financial executives, executives that were seen as having engaged in questionable financial practices and risky loans. Thus, as these same executives appeared to be lined up at the Department of Treasury for bailout funds for their investment and commercial banks, the news was rife with stories of excess and apparent skullduggery (Solomon, 2009).

The administration's performance was more mixed in the General Motors and Chrysler loans. To be sure the President made a strong case that such loans were necessary given the economic prominence of these firms, but other economic sectors, particularly mid-sized and smaller firms, were also heavily impacted by what has come to be called the Great Recession (Businessweek, 2010). And these firms were often the local firms that were in the aggregate the principal employers in the nation.

Turning to what must be cited as errors in entrepreneurial governance, a number come to mind. First, many Republicans and others who were politically unaligned complained loudly about the huge bloat of the financial rescue package. In fact, it appears that the new President was much too reliant on House Speaker Nancy Pelosi and Senate Majority Leader Harry Reid for the details of this rescue package. Pelosi and Reid were seen as larding the package with huge numbers of additions that suited Congressmen and Senators' home district needs and not the nation as a whole (Barnes, 2009; Gerson, 2009).

The same charge can be made in the area of health care reform. The President's agenda recognized the huge inequities and inefficiencies in the health care system, but seeking to learn from the mistakes of the Carter Administration, he left the details to Speaker Pelosi and Majority Leader Reid. The scope and perceived intrusiveness of the early reform bills met huge resistance in the Senate, resistance that almost killed the planned health care reforms (Adams, A21). Only when the President intervened was a law passed.

Another major error for the President was over-reliance on what many called the "Chicago crowd," that is, the major advisors the president brought in with his administration (Draper, 2009). This group of advisors tended to idolize him and cut him off from advisors outside his immediate circle. Many criticized his close-relationship with White House Chief of Staff Rahm Emmanuel, whose style was caustic and unrelenting (Alter, 2011; Weisman et.al., 2009). Some said that Emmanuel himself was to blame for the extended debated on the health care reform bills in the Congress. Another example was Social Secretary Desiree' Rogers's apparent lack of

attention to the details of a White House event, in which a couple not on the cleared list met the President. Many were surprised at how long Rogers lasted after the affair (Alter, 2011).

To summarize, President Obama's entrepreneurship, i.e., his willingness to practice cold-blooded politics and eschew concern for individuals, issues and policies has to be considered mixed and at best graded a B-. Although he was effective in the financial rescue efforts, the constitution of his Cabinet, and the successful nomination of Supreme Court Justice Sonia Sotomayor, the bloat of the financial stimulus bills, the arduous effort to pass health care reform, and his heavy reliance on the "Chicago crowd" were substantial missteps.

Nimble

Was the Obama Administration nimble? That is has Obama and his team chosen among alternative priorities, avoided blunders, successfully maneuvered in the face of overwhelming opposition, and wooed supporters and mollified opponents in Congress, the Washington community at large, and the nation?

During the transition, there were a number of very positive initiatives on his announced priorities. He announced early four key priorities: rescue the economy, reform health care, increase America's reliance on renewable sources of energy and improve education. During the Great Recession, not only did he play a prominent role in stabilizing the economy, but he also worked effectively with congressional leaders to provide funding for state and local governments that were hard-pressed by reduced tax revenues. Although critics could point to the high unemployment rates into January 2010, most thoughtful observers found that the federal government had done about all it could do given the deficit and the fact that economic indicators lag large infusions of federal money (Wilson, 2009).

In the area of education, Obama and his Secretary of Education Arne Duncan campaigned for a huge increase in federal funding for education, in fact more funding than any Education Secretary had ever had at his disposal. Obama and Duncan were often photographed visiting elementary schools and emphasized the importance of charter schools. Indeed this emphasis on charter schools was contrary to the view of most teacher associations, who had been very supportive of Obama during his campaign (Alter, 2011).

In the area of national security affairs, Obama moved quickly to insure the phased withdrawal of American troops from Iraq, an initiative that was popular with his party and most Americans. After some initial fumbling around the Christmas 2009 airline bomber attack, the administration recovered quickly with the president prominently taking responsibility and demanding accountability from his national security team (Broder, 2010).

Yet, overall in spite of these positive developments, there were a number of prominent mistakes that detracted from the effectiveness of the new administration. First, his vision was not clear (Pfeffer, 2010). Second he was not effective in winning over the Congressional Republicans or independent voters. Third to name but a few policy realms, his efforts in domestic legislative arenas, national security and foreign affairs policies, and various domestic stumbles have not been successful.

First in terms of vision, the White House seemed to announce a new initiative almost daily. In spite of his four priorities, new matters seemed to crop up almost daily that detracted from his efforts. For example, within ten days, he discussed health care, “then he’s lobbying for a cap and trade plan to reduce carbon emissions, and then he’s out there trying to re-regulate the financial world or sell a new treaty to the Russians” (Bai, 2009, p. 12; cf. Van Dyk, 2009 & Sherman, 2010). One must conclude that in spite of what President Obama saw as many areas needing urgent attention, an administration about everything ends up being an administration that is fumbling and jumping from issue to issue. Such issue-jumping deters the president’s reputation and thus his power.

Throughout his first year and in spite of efforts to bring the Congressional Republicans along, that party voted almost unanimously against his initiatives in most economic and domestic realms. His support ratings, especially among independents – the very voters who had given him so much support during the campaign, declined such that by July or August, it was clear that whatever honeymoon he had enjoyed ended (Weisman, July 2009). And the rise of the so-called Tea Party Movement reinforced the sense that the administration had lost the support of those who had been very critical of the actions of the George W. Bush Administration (Johnson & Sidoti, 2010). To ice the cake, although the Obama Administration held several highly-publicized meetings with the leaders of large business firms, it was not able to translate this outreach to much support from the business community.

In domestic legislative areas, and especially in the areas where the Obama Administration had indicated its highest priorities, new legislative initiatives bogged down. Health care was an especially volatile area. Obama was not able to persuade Republican legislators that his proposals to reform the health care system were appropriate, and he was able eventually to carry none of the opposition along with him, in spite of a number of high-profile efforts to woo a few Republican senators (Schulz, 2009).

His administration was also not nimble in energy reform. Although the administration did issue several executive decrees in energy reform, no legislation was forthcoming in his first year. Finally what perhaps inflamed independents and the Tea Party movement the most was the lack of any serious reform of the financial sector after the dramatic failure of many banks and financial institutions. Small business leaders (what many call Main Street) were very unhappy that government lending was almost wholly dedicated to large financial institutions (what is often called Wall Street). Thus the Administration’s efforts in domestic reform were seen as stunted.

There were other apparent errors. Obama relieved the commander in Afghanistan, replaced him with General Stanley McChrystal, and declared that he would completely support his new commander’s strategy for operations in Afghanistan. Within several months after his initial assessment, McChrystal asked the Administration for more troops to achieve the nation’s goals there. This request seemed to take the Administration by surprise, and it fumbled for what seemed weeks trying to make up its mind on how to respond. Though it eventually did respond, the request was not fully supported; indeed the build-up was slow and relied on new NATO

troops, troops that in some cases such as the Germans could not be fully used in every contingency (Whitaker, 2009).

Even though Obama won the Nobel Peace Prize for his pre-Inauguration vision for the United States and was widely recognized for a thoughtful speech to accept the prize, there were other apparent missteps that detracted from the administration's reputation (Klein, 2010). For example, efforts to win peace between the Israelis and Palestinians and to reconcile Afghanistan and Pakistan appeared to be going nowhere by the end of the first year. In addition, Obama was much criticized for bowing to the Japanese Emperor, a display that suggested somehow among these two heads of states, one was inferior to the other (Noonan, November 2009). Furthermore his deference to Chinese leaders was seen as suggesting that the United States was somehow a beggar state to the Inner Kingdom.

Finally, there were several widely reported gaffes in the first year. First, on April 27, 2009 a decision by the Director of the White House Military Office to fly an Air Force One look-alike over New York City to take pictures high above the harbor caused local uproar. As there had been no announcement of the flight, it caused momentary panic in some quarters and led to the evacuation of several buildings in Lower Manhattan and Jersey City. By the afternoon, the situation had turned into a political fuse box, with Mayor Michael R. Bloomberg saying that he was "furious" that he had not been told in advance about the flyover. The White House apologized for the error, and the director resigned (Weisman, July 2009).

A second gaffe on July 16, 2009 was Obama's offhand remarks at a press conference about the arrest on July 16, 2009 of Harvard scholar Louis Gates by Cambridge, Massachusetts Police Sergeant James Crowley. In essence, Obama jumped off-message on this matter and immersed himself in a purely local dispute that appeared at first to have racial overtones. His remarks spawned wide-spread press coverage and endless editorials (Williamson, 2009). Both of these gaffes interfered with the Administration's efforts to dominate press attention about the administration's legislative agenda during the crucial first few months of Obama's honeymoon year.

What then are we to conclude about the Obama Administration's ability to be nimble? To be sure, there a number of successes on the economy and education, but errors outweighed these achievements. That is, the lack of a clear vision, the frequent jumping from issue to issue, the fumbling around in dealing with Afghanistan, and the lack of movement on financial reform indicate that the administration has not been supple. Indeed Obama was not nimble in many areas to include wooing independents and other of his supporters and mollifying opponents in Congress, the Washington community at large, and the nation.

Shrewd

Was the Obama Administration a shrewd implementer of new policies and programs? That is, were these policies and programs announced early, lobbied energetically, enacted swiftly, and executed boldly?

In the area of administration, Obama has been more effective. To be sure, there were areas where the president and his team did not perform well. Although he promised to close the prison at Guantanamo, the challenges proved to be too large. Among the many issues surrounding this military prison in Cuba were the handing of the cases of terrorists held there as well as finding an alternative site to locate them in the continental United States. The apparent differences among the White House staff and Attorney General Holder and his aides caused considerable fumbling. And the efforts to locate a military prison in several states invariably ended up with senators and governors loudly objecting to placing the prisoners in their regions. By January, 2010 the issue had not been resolved (Williamson & Perez, A1).

Another implementation challenge was the spending of stimulus funds. Although Vice President Joe Biden made it clear that the administration would only accept “shovel-ready” projects, the reality was that most of the projects were months away from ground-breaking (Factor, 2010). As a result the hoped-for financial stimulus from the huge outlay of money was very slow in coming and the economy remained in the doldrums with unemployment at 10.6% in January, 2010 (Radnovsky, 2009).

Two other implementation challenges were in foreign affairs and the domestic housing market. Although the administration had made substantial promises to engage Iran and North Korea, nothing came of these promises in the administration’s first year (Boot, 2009). In addition, the efforts to help with huge number of foreclosures did not have much of an impact. The unemployed simply did not have the funds or the employment prospects to be helped by the Obama administration’s program.

Yet, the Obama administration’s successes were impressive in implementing its agenda. In the area of health care, Obama and his team quickly removed restrictions on stem cell research imposed by the George W. Bush Administration (Watkins, 2009). Obama also was able to expand the children’s’ health insurance program as well as move more forcefully on tobacco regulation. Finally, the EPA declared carbon dioxide a threat to human health (Meckler, 2009).

Obama’s list of achievements in implementing a number of foreign policy initiatives was striking. Obama’s performance in persuading foreign leaders at the G-20 summit in April and again at the December climate change conference in Copenhagen resulted in considerable success. He successfully wooed the Pakistani government to work with the United States to engage Al Qaeda and the Taliban who were using Pakistan as a sanctuary from the fighting in neighboring Afghanistan (Alter, 2011).

Obama was also very effective in approving force. After persuading the Pakistanis to cooperate on finding and killing terrorists in Waziristan and other of its Federally Administered Tribal Areas, he ramped up the use of the Predator unmanned aerial drone. He also approved using Navy Seals to save an American cargo-ship captain who was held hostage in the Indian Ocean off the coast of Somalia. The SEALs successfully rescued the captain, killed three of his captors, captured the rest, and put pirates on notice about boarding American-flagged vessels.

Obama and Secretary of State Clinton were very effective in improving the nation’s image abroad with their speeches and travel (Boot, 2009). Obama’s June, 2009 speech in Cairo, Egypt

as well as his Nobel acceptance speech in December were widely lauded both domestically and abroad. Clinton traveled extensively in the administration's first year. For example, she was in Asia in February, in the Middle East, Europe, and Mexico in March alone; her travel schedule for the rest of Obama's first year was equally impressive.

Two other policy areas where the Obama administration was successful in implementation were in civil rights and the domestic auto industry. In January, 2009, Obama signed the first bill of his administration with a ceremony for the Lilly Ledbetter Act, which makes it easier for people who believe they've been discriminated against to sue employers. In June, he signed an executive order that expanded federal benefits to same-sex partners of Foreign Service and executive branch government employees.

The so-called bailout for the automotive industry was more controversial, but highly effective in resuscitating it from bankruptcy. Both General Motors and Chrysler were loaned money from the Troubled Assets Recovery Program and saved from possible disintegration. Although the Bush administration had passed the program, it was up to Obama to implement it, and he did so with energy and enthusiasm.

Overall, Obama and his administration have been effective in implementation of their policies. As with all circumstances that presidents face, there have been some failures, but the successes have much outweighed the shortfalls. His willingness to work assiduously on health care and civil rights, to make inroads in foreign policy and to use force needed to keep America safe from terrorist attacks have all given him a good reputation for implementation.

Creative

Was Barack Obama a creative national leader at the end of his first year in office? Was he a blend of the nimble lion, the shrewd fox, and a lovable puppy dog?

Barack Obama and his administration came to office facing huge challenges, and challenges more perplexing than many incoming presidents. As Karl Marx noted above, the circumstances that each president faces are unique and laden with precedents by former presidents as well as other institutional actors.

Obama faced a financial meltdown with growing unemployment, which had been only partially confronted by the exhausted, outgoing administration of George W. Bush, two ongoing wars, and an electorate aroused to believe that hope and change would be the hallmarks of the new administration. In addition, Obama was convinced that the outgoing administration had failed to address such issues as the apparent fall of world approval for America, the lack of health care for a huge proportion of the population, education reform, the decline of civil rights actions for women and minorities, and inattention to a well-defined energy plan.

Given these challenges, The Rasmussen poll gave the new administration a 65% approval rating. By the end of January 2010 this number had fallen to 47%. To be sure such falls are large, but this administration seemed to fall faster than most in its first year. And clearly the ongoing

financial meltdown and rising unemployment contributed substantially to this decline (Rasmussen & Brooks, 2009; Rasmussen & Schoen, 2009).

In fact by late July, 2009, the warmth and hope that the apparently charismatic Obama had engendered seemed to be broken. In fact the decline in his approval rating began in June and continued well into November (Gerson, 2009; Krauthammer, 2009). Yet, Obama had managed to extend his honeymoon for about nine months from his election on November 4, 2008 to July, 2009. And a honeymoon of nine months seems about normal for most presidents.

There were a number of reasons that Obama lost public support. First, his public persona was not one that endeared him to the Washington establishment or to mass publics. Clear to all was that Barack Obama was extremely bright and well-educated. But too many found him passionless, too rational and aloof, and not really lovable (Noonan, November 2009).

At times Obama even appeared to be a bit petulant as he was with the large banks that had to depend on the federal government for loans to stanch their huge losses on mortgage bets. In addition, he was not the self-effacing leader that many long for. Instead he appeared egocentric and failed like many successful presidents before him to put his appointees out in front to deflect some of the dissatisfaction with his decisions and directions. Only Hillary Clinton as Secretary of State seemed to be a highly public figure, and even she was hemmed in by presidential decisions on the larger questions (Elliott & Wagner, 2010).

Second the administration had overexposed Obama. He seemed to be on television and in the newspapers daily with a speech, a new program initiative, or another announcement. His promises struck many as too big, too ad hoc, and too ambitious for a government and economy reeling from a sea of troubles. All this exposure made the administration appear a bit amateurish by Washington standards (Henninger, 2009). Furthermore, for all the communicating that Obama was doing, he appeared “tone deaf” to the challenges of many citizens who were facing bankruptcies and layoffs. Many thought he was not really aware of the burdens everyday Americans were facing.

Third, Obama was not able to carry the opposition in support of his many initiatives. Indeed the Congressional Republicans found the administration and its allies on Capitol Hill steamrolling and bullying its way to the passage of legislation (Barnes, 2009). Even his Democratic allies were tired of the lack of civility, generosity, and dignity in partisan politics. All this was punctuated by the Democratic leadership in the House and Senate. Speaker Pelosi was often dismissive of the opposition, and some of her supporter called protestors and some Republican legislators as industry-funded, right-wing operatives.

Finally, a large segment of the public was clearly unhappy with the Obama administration and its policies as evidenced by the rise of the Tea Party movement and the ongoing celebrity of former vice-presidential nominee Sarah Palin. In February, 2010 she seemed to capture the feelings of many when she asked in front of the first Tea Party Convention in Nashville, “How is that hopey-changey thing working out?” (Gonyea, 2010).

What then is the bottom line on the Obama persona, a reputation crucial for governance in any administration? Obama in his first year was too much the lion with his ongoing roars on a wide range of issues, not enough the fox in leading his own party and the opposition, and clearly not the puppy dog who could endear himself and his administration to the nation.

Conclusion: Obama

The Obama Administration was not very effective in its first year in office. To be sure, the administration faced huge challenges in the economy and national security affairs (CQ, 2009). But at the same time, Obama and his administration made many mistakes. First, Obama was not highly entrepreneurial as evidenced by the bloat of his financial stimulus, the initial stumbling on health care reform, and over reliance on the “Chicago crowd.”

Second, the administration was not very nimble. Obama’s lack of a clear vision, frequent leaps from issue to issue, fumbling on Afghanistan, and lassitude in dealing with financial reform impeded the administration. However, the Obama administration was successful in implementation. He quickly removed restrictions on stem cell research, expanded the children’s health care program, wooed foreign leaders in Copenhagen and Pakistan, intervened with drone attacks and the rescue of an American hostage, improved civil rights, and resuscitated the automotive industry. Finally, as a creative national leader, Obama was not very successful. He was too much the lion, too little the fox, and clearly not a puppy dog who endeared himself to the nation.

Conclusion

Our model of successful presidential transitions concludes that they can best be judged in the administration’s first full year in office. Four criteria provide a framework for assessing presidential success. These criteria are predicated in political and democratic terms and are needed for leadership in this highly disaggregated and nearly ungovernable political system.

First, a new president must be entrepreneurial and cold-blooded; that is, he must make choices and take risks for later “profit” or success in the ongoing negotiations of the presidential enterprise. Presidents cannot show excessive concern for specific individuals, issues, and policies which were crucial to their elections, but might become an impediment to the incoming government. Presidents must also protect their reputation for effectiveness and freedom to maneuver.

Second incoming presidents must be nimble. They do so by choosing carefully a few initiatives for immediate attention and recognize that these may be substantially modified as they wend their way along the routes to enactment and implementation. New presidents must avoid blunders by carefully controlling their messages as well as the messages of their appointees.

Third, presidents must also be shrewd in implementing new policies and programs. New administrations must insure that new initiatives they are announced early, lobbied energetically, enacted swiftly, and executed boldly.

Finally the most effective presidents recognize that their national leadership must be creative and a blend of nimble lions and shrewd foxes, both carefully coated with benign, puppy-dog-like exteriors. That is, presidents as lions frighten off those who would prey on their administration, as foxes recognize traps, and as puppy dogs are adroit and lovable so as to sustain the necessary elite and mass support to achieve their ends.

Judging United States presidents in these political terms would also seem to work for any chief executive officer. Too often, CEOs are judged in other terms, such as their ability to raise their organizations' stock price, open new markets, or innovate with new products. All these measures are useful, but in the end all senior executives must be political animals who must be entrepreneurial, nimble, effective implementers, and creative leaders, whose influence should spread well beyond their immediate organization.

We seldom read of CEOs being judged in political terms, but some students of leadership have recognizing this reality. For example, Lee Bolman and Terrence Deal (2003) have found the political frame an effective tool for assessing leaders. Their frame or model sees power, conflict, bargaining, and building coalitions central to organizational analysis and thus to leadership. These insights are imbedded in our model to assess effective presidential transitions.

Max DePree (1989) in his classic book *Leadership is an Art*, sees artful leaders as engaged in tribal exercises that are based on defining reality, weaving relationships, leaving a legacy, maintaining momentum, and establishing effective administration. All these ideas are used in our conception of entrepreneurial, nimble, and creative presidents who are also effective implementers.

Another book that captures these ideas is Warren Bennis and Burt Nanus (1995) *Leaders: Strategies for Taking Charge*. Bennis and Nanus use four strategies for effective leaders. That is, such leaders create a vision, communicate effectively, position themselves to build trust, and deploy themselves with confidence and energy. Although we designed our model of effective presidents from other resources, we are struck by the similarities with all these authors.

Some may find fault with our model. For example, one observer asked, "What is magic about one year for the transition?" Well our answer is that as Lyndon Johnson noted in the quote above, that the Washington community has a limited attention span. After the first year of any presidency, the Congress begins gearing up for the mid-term elections. The government bureaucracy and interest groups have also learned in the transition year. By then, they have taken the measure of the new president and have decided how to proceed in finding support within the new administration.

Another fault may be the lack of clear specificity of our model which calls for scholars to measure a president or any CEO as entrepreneurial, nimble, effective as an administrator and a creative leader all at once. Such demands may well be beyond the capacity of any leader. But we are convinced that an ideal for presidential leadership needs to be established, and in the end all leaders must be political animals. And although these measures may overlap on any one presidential initiative, one can still apply them effectively. Thus for President Barack Obama, we

found that in national security affairs, he may have been entrepreneurial, but not always nimble or creative as a leader.

Finally, the model does not easily recognize that agendas, crises, and new issues come at a president all at the same time. There is not one matter at once, but many cascading upon a leader each day. And he or she cannot decide to be use all four measures on each issue. Thus, President Obama found himself confronting the Great Recession, and he could not decide to apply all four of our criteria at once. In most cases all leaders find matters dogging them in rapid order, and careful consideration of how to react to each using our criteria is impossible. Still, leaders can decide to approach the daily questions and issues by using our criteria serially or in combination, thereby deflecting their many critics inside their organizations and in the environment that envelops them.

Despite these criticisms, we are convinced that measuring leaders in political terms recognizes the reality of politics, power and pressures for all organizational leaders. It is well beyond the scope of this short article to apply these criteria to corporate, not-for-profit, and military leaders, but we propose this model as an agenda for further work and invite our readers to join us.

References

- Adamy, J. (August 2009) "Support slips for health overhaul." *CQ*.
- Alfonso-Zaldivar, Ricardo (March, 2010) "All sides playing hardball on health." Retrieved March 16, 2010 from news.yahoo.com/ap/20100317/ap_on_bi_ge/us_health_care.
- Allen, M. (2001, January 4). Bush appoints Allbaugh, Rove. *Washington Post*.
- Alter, Jonathon (2011) *The promise: president Obama, year one*. New York: Simon and Schuster.
- Altman, Roger (December, 2009) "Dems need a midcourse correction." *The Wall Street Journal*.
- Anderson, Martin (1988) *Revolution*. San Diego: Harcourt Brace.
- Ashbee, E. (April 2009). US update: Edward Ashbee explains presidential transitions. *Politics Review* Apr. 2009: 32. *General OneFile*.
- Bai, Matt (July, 2009) "The shuffle president: Barack Obama's complicated, even eclectic, agenda suits our multitasking digital age." *New York Times Magazine*.
- Balz, Dan (August, 2009) "After July's turmoil, Obama needs a 'new chapter' in August." *The Washington Post*.
- Barger, Harold (1984) *The impossible presidency: issues and illusions of presidential power*. Glenview, IL: Scott Foresman.
- Barnes, Fred (July, 2009) "The Obama agenda bogs down." *The Wall Street Journal*.
- Barnes, J.A. (2001, June 23). Bush's insider's. *National Journal*. 1869.
- Bendavid, Naftali and Weisman, Jonathon (September, 2009) "Democrats show strain of heated battles." *The Wall Street Journal*.
- Bennis, Warren and Nanus, Burt (1995). *Leaders: strategies for taking charge*, 2nd Ed. New York: Harper.
- Benson, Fred (January, 2010) "The hope of audacity." Email document received January 17, 2010.
- Bolick, C. (1993, April 30), "Clinton's Quota Queens", *The Wall Street Journal*, p. A1.

- Bolman, Lee G. and Deal, Terrence E. (2003) *Reframing organizations: artistry, choice, and leadership*, 3rd ed. San Francisco: Jossey-Bass.
- Bonifede, Dom (March 1982) "Issue oriented Heritage Foundation hitches its wagon to Reagan's star." *The National Journal*.
- Boot, Max (December, 2009) "The best available defence of Obama's foreign policy." Email document entitled "Recent contributions by Max Boot to CommentaryMagazine.com's contentions."
- Bridges, W. (2003). *Managing transitions: Making the most of change* (2 ed.). Cambridge, Massachusetts: Da Capo Press/Perseus pubs.
- Broder, David (January, 2010) "Obama's 9/11 challenge came on focus-transforming 12/25." *The Washington Post*.
- Brody, R. and Page, B. I. (1975). "The impact of events on presidential popularity." In A. Wildavsky (ed.) *Perspectives on the Presidency*. Boston: Little, Brown.
- Bronfman, C., Lehn, K., and Schwartz, R.A. (1994), "The SEC's Market 2000 Report", *Journal of Corporation Law*, 19(3): 523-551.
- Brooks, David (September, 2009) "Left tilt causes Obama's slide." *The Charleston Post and Courier*.
- Bruce, R.R. (1996), "The succession of the President and the Vice-President: Managing the change", *Public Administration Quarterly*, 20(1): 26-51.
- Burke, John P. (2000). *Presidential transitions: from politics to practice*. Boulder, CO: Lynne Rienner Publishers.
- Burke, J. P. (2001), "Lessons from past presidential transitions: Organization, management, and decision making", *Presidential Studies Quarterly*, Vol. 31 No. 1, pp. 5-24.
- Burke, J.P. (2004). *Becoming president: The Bush transition, 2000-2003*. Boulder, Colorado: Lynne Rienner Pubs.
- Burns, J. M. (1956), *Roosevelt: The Lion and the Fox*, Harcourt Brace and World, New York, NY.
- Burns, J.M., and Sorenson, G.J. (2000), *Dead Center: Clinton-Gore Leadership and the Perils of Moderation*, Scribner, New York, NY.
- Burns, James McGregor (1956) *Roosevelt: the lion and the fox*. NY: Harcourt Brace and World.
- Businessweek (August, 2010) "Obama: the Businessweek interview." *Businessweek*.
- Chernoff, J. (2003), "Institutions seek better returns with less long-term risk", *Pensions and Investments*, 31(5): 14.
- Clinton, B. (2004), *My Life*, Hutchinson, London.
- Clinton, David and Lang, Daniel (December 1990)
- CQ, (January, 2009) "The Obama Presidency: Can Barrack Obama deliver the change he promises?" *CQ Researcher*.
- "Congress' Job Approval Rating Worst in Gallup History." Retrieved December 17, 2010 from <http://www.gallup.com/poll/145238/Congress-Job-Approval-Rating-Worst-Gallup-History.aspx>.
- Cronin, T. (1980) *The state of the presidency*, 2nd ed. Boston: Little Brown.
- D'Souza, Dinesh (1999) *Ronald Reagan: how an ordinary man became an extraordinary leader*. New York: Touchstone.
- Deluga, R.J. (2001), "American presidential Machiavellianism implications for charismatic leadership and rated performance", *The Leadership Quarterly*, 12(3): 339-363.

- DePree, Max (1989), *Leadership is an art*. New York: Dell.
- Doig, Jameson and Hargrove, Erwin (1987) "Leadership' and political analysis" in their *Leadership and innovation: a biographical perspective on entrepreneurs in government*. Baltimore: Johns Hopkins University Press.
- Draper, Robert (July, 2009) "Obama's BFF: Valerie Jarrett is one of the president's most influential advisors. So what exactly does she do?" *New York Times Magazine*
- Drew, E. (1994), *On the Edge: The Clinton Presidency*, Simon & Schuster, New York, NY.
- Dwyer, Paula (March, 2010) "How gridlock may end." *Bloomberg Businessweek*.
- Easton, Nina (August, 2009) "Obama's stimulus killers: his two big legislative goals for the fall could put new burdens on a weak economy." *Fortune*.
- Edwards, Mickey (January, 2010) "Limits of a silver tongue." *The Washington Post*.
- Eksterowicz, A.J., & Hastedt, G.P. (2005, Winter). The George W. Bush presidential transition: the disconnect between politics and policy. *White House Studies*, (15).
- Elliott, Philip and Wagner, Daniel (January, 2010) "Obama seeks to limit big banks." *The Charleston Post and Courier*.
- Factor, Mallory (January, 2010) "The two promises Obama managed to keep." *FoxNews.com*..
- Freshwater, R. (2007), "ProComp: The birth, implementation, and evolution of teacher pay-for-performance in Denver, CO", Retrieved from <http://dev.policy2.org/servlet/JiveServlet/download/16711407/ProComp%20Policy%20Paper.d>
- Friedman, T. (1992), "Change of tone for Clinton: High energy to low profile", *New York Times*, November 11, 1992.
- Gerson, Michael (August, 2009) "After the thrill is gone." *The Washington Post*.
- Goleman, Daniel et. al. (2002). *Primal leadership: realizing the power of emotional intelligence*. Boston: Harvard.
- Gonyea, Don (February 2010) "How's that hopey-changey stuff? Palin asks." *NPR*. Retrieved June 16, 2011 from <http://www.npr.org/templates/story/story.php?storyId=123462728>.
- Gorton, Slade (January, 2010) "Take the congressional lead." *The Washington Post*.
- Gupta, Yash (January, 2010) "A poor communicator." *The Washington Post*.
- Haider, Don (1981) "Presidential transitions: critical if not decisive." *Public Administration Review*.
- Heifetz, Ronald A. and Laurie, Donald J. (December, 2001) "The work of leadership." *Harvard Business Review*. 5-14.
- Heineman, Benjamin and Hessler, Curtis (1980) *Memorandum for the president: a strategic approach to domestic affairs in the 1980s*. New York: Random House.
- Henninger, Daniel (December, 2009) "Obama wow!" *The Wall Street Journal*.
- Henry, Loren (1960) *Presidential transitions*. Washington: The Brookings Institution.
- Henry, Loren (1983) The transition from nomination to inauguration." In *The presidential transition, 1980-1981*. Edwardsville, IL: Southern Illinois University Press.
- Hess, Steven (1976) *Organizing the presidency*. Washington: The Brookings Institution.
- Hitt, Greg and Adamy, Janet (March, 2010) "Health showdown is set." *The Wall Street Journal*.
- Hubbell, W. (1999), *Friends in High Places*, Morrow, New York, NY.
- Johnson, Glen and Sidoti, Liz (January, 2010) "Brown upsets Coakley: voter resentment gives GOP edge in pivotal race." *The Charleston Post and Courier*..

- Jones, J. M. (2009, July 3), "Obama Honeymoon Continues: 7 Months is Recent Average", Gallup. Retrieved from <http://www.gallup.com/poll/121391/obama-honeymoon-continues-months-recent-average.aspx>
- Kamensky, J. (2008). Transition 2000: George W. Bush. *A weblog by the IBM Center for the Business of Government*. <http://transition2008.wordpress.com/2008/03/17/transition-2000-george-w-bush/>
- Kellerman, B. (2008). Bad leadership and ways to avoid it. In J.V. Gallos, (ed.) *Business Leadership*, San Francisco, California: Jossey Bass.
- Kirschten, Dick (1980) "Wanted: 275 Reagan team players, empire builders need not apply." *National Journal*.
- Klein, Joe (February, 2010) "Starting over. One year in Obama's agenda is on life support. What he must do to retrieve it." *Time*.
- Kornblut, A. (2001, April 29), The First 100 days: A low profile for Bush. *Boston Globe*.
- Kotter, John. P. (1996). *Leading change*. Boston: Harvard.
- Krauthammer, Charles (September, 2009) "Obama now must lead as mere mortal." *The Charleston Post and Courier*.
- Kumar, P. (2006), *Shrewd Marketing: Marketing Artifices of the 21st Century*, New Delhi, India: Anmol Publications Pvt. Ltd.
- Kumar, M.J. (2008a), "Getting ready for Day One: Taking advantage of the opportunities and minimizing the hazards of a presidential transition", *Public Administration Review*, 68(4): 603-617.
- Kumar, M.J. (2008b), "Hubris or wise policy? Early planning for a presidential transition", *IBM Center for The Business of Government*, Fall/Winter 2008, pp. 61-65.
- Lehn, K.M., Patro, S., and Zhao, M. (2009), "Determinants of the size and composition of US corporate boards: 1935-2000", *Financial Management*, 38(4): 747-780.
- Light, P. (1983), *The President's Agenda: Domestic Policy Choice from Kennedy to Carter*, Johns Hopkins University Press, Baltimore, MD.
- Light, P.C. (2008). McCain's Presidential Transition Gaffe. http://www.huffingtonpost.com/paul-c-light/mccains-presidential-tran_b_114842.html
- Lovvorn, Al and Walker, Earl (2010). "Assessing Presidential Transitions: Bill Clinton's Inaugural Year In Office" *Southeast Decision Sciences Institute Proceedings*.
- Machiavelli, N. (1910), *The Prince*, Translated by N.H. Thomson, P. F. Collier & Son, New York, NY.
- Maranto, R. (2004), "Bureaus in motion: Civil servants compare the Clinton, G.H.W. Bush, and Reagan presidential transitions", *White House Studies*, Vol. 4 No. 4, pp. 435-452.
- Marx, Karl (1852) "The Eighteenth Brumaire of Louis Bonaparte." Retrieved June 7, 2011 from <http://www.marxists.org/archive/marx/works/1852/18th-brumaire/index.htm>.
- Mathews, T. (1993), "Clinton's growing pains", *Newsweek*, May 3.
- McGinnis, Patricia (January, 2010) "Beat the drum louder." *The Washington Post*.
- Meckler, Laura et. al (August, 2009) "Obama's agenda: a midyear briefing." *The Wall Street Journal*.
- Milbank, D. (2001, January 5). Bush names Rove political strategist. *Washington Post*.
- Nathan, Richard (1983) *The administrative presidency*. New York: John Wiley.
- Neustadt, Richard (1980) *Presidential power: the politics of leadership from FDR to Carter*. New York: Wiley.

- Neustadt, Richard (September, 1960) "Memorandum on organizing the transition." The Kennedy Library: Boston, MA.
- Neustadt, R. (2001), The contemporary presidency: The presidential 'hundred days': An overview, *Presidential Studies Quarterly*, Vol. 31 No. 1, pp. 121-125.
- New York Times* (1993), "Bill Clinton's Hundred Days", 29 April, p. A22.
- Noonan, Peggy (January, 2010) "Slug the Obama story 'disconnect.'" *The Wall Street Journal*.
- Noonan, Peggy (November, 2009) "He can't take another bow." *The Wall Street Journal*.
- Patrick, S. (2010), "Global governance reform", Retrieved from <http://stanleyfdn.org/publications/pab/PatrickPAB210.pdf>
- Pfeffer, Jeffrey (January, 2010) "A failure to communicate." *The Washington Post*. Retrieved on January 19, 2010 from <http://views.washingtonpost.com/leadership/panelists>.
- Pfiffner, James (1988) *The strategic presidency: hitting the ground running*. Chicago: Dorsey Press.
- Post and Courier Editorial (January, 2010) "Obama must correct course." *The Charleston Post and Courier*.
- Power, Stephan (August, 2009) "Energy fight heats up." *The Wall Street Journal*.
- Pratt, G. (2008), "New South Wales", *Australian Journal of Public Administration*, 51(3), pp. 259-269.
- Purdum, T.S. (2004, April 3). Threats and responses: White House memo; the Clinton-Bush transition seemed to be tidy. Was it? *New York Times*, page 10.
- Radnovsky, Louise (August 2009) "Stimulus: one down, one to go?" *The Wall Street Journal*.
- Rasmussen, Scott (2011) "Daily presidential tracking poll." Retrieved June 7, 2011 from www.rasmussenreports.com/public_content/politics/obama_administration/daily_presidential_tracking_poll.
- Rasmussen, Scott and Schoen, Douglas (November, 2009) "Obama is losing independent voters." *The Wall Street Journal*.
- Reich, R. L. (1997), *Locked in the Cabinet*, Knopf, New York, NY.
- Robinson, M. (2005), "Managing successful governance reforms: Lessons of design and implementation", Retrieved from <http://www1.worldbank.org/publicsector/PRMWWK2005/poleconomy/RobinsonSynthesisPaper.doc>
- Rove, Karl (December, 2009) "The president is no B+." *The Wall Street Journal*.
- Santiso, C. (2003), "Insulated economic policymaking and democratic governance: The paradox of second generation reforms in Argentina and Brazil" Retrieved from <http://ojs.acadiau.ca/index.php/ASAC/article/viewFile/667/576>
- Santiso, C. (2004), "The contentious Washington Consensus: Reforming the reforms in emerging markets", *Review of International Political Economy*, 11(4): 828-844.
- Schmitz, Paul (January, 2010) "Presidential 360 review." *The Washington Post*.
- Schulz, Max (August 2009) "A town-hall protest in Maryland." *The Wall Street Journal*.
- Scott, Katherine Tyler (January, 2010) "Delivering us from anxiety." *The Washington Post*.
- Seib, Gerald (December, 2009) "Obama abroad mirrors Bush senior." *The Wall Street Journal*.
- Seib, Gerald ed. (January, 2010) "How's it going? A one-year report card." *The Wall Street Journal*.
- Sherman, Elizabeth (January, 2010) "Over-exposed, under-communicating." *The Washington Post*. Retrieved on January 19, 2010 from <http://views.washingtonpost.com/leadership/panelists>.
- Shore, Bill (January, 2010) "Cucumber man." *The Washington Post*.

- Solomon, Deborah (August, 2009) "Wall street sees sign of relief." *The Wall Street Journal*.
- St Louis Federal Reserve (2011), Unemployment rate. Retrieved from <http://research.stlouisfed.org/fred2/data/UNRATE.txt>
- Stephanopoulos, G. (1999), *All Too Human: A Political Education*, Little, Brown & Company, New York, NY.
- Sun, J., Lan, G., and Ma, Z. (2009), "Does SOX make economic sense?-The impact of corporate governance and investment opportunity sets", Retrieved from <http://ojs.acadiau.ca/index.php/ASAC/article/viewFile/667/576>
- Thornbury, J. (2003), "Creating a living culture: The challenges for business leaders", *Corporate Governance*, 3(2): 68-79.
- Van Dyk, Ted (July, 2009) "Obama needs to 'reset' his presidency." *The Wall Street Journal*.
- Walker, Earl (August 26, 2002), "Leaders should take time to rebuild employee trust." *The Charleston Post and Courier*.
- Walker, W. E. (1993), "Presidential transitions and the entrepreneurial presidency: Of lions, foxes, and puppy dogs", *Presidential Studies Quarterly*, Vol. 23, pp. 57-75.
- Walker, W. E. and Roepel, M. R. (1986), "Strategies for governance: Domestic policymaking in the Reagan administration", *Presidential Studies Quarterly*, Vol. 16, pp. 734-760.
- Walker, Wallace Earl (1987). "Elmer Staats and strategic leadership in the legislative branch." *Leadership and innovation*. Jameson W. Doug and Erwin Hargrove, eds. Baltimore: Johns Hopkins.
- Walker, Wallace Earl (1993), "Presidential Transitions and the Entrepreneurial Presidency: Of Lions, Foxes and Puppy Dogs," *Presidential Studies Quarterly*. Winter.
- Walker, Wallace Earl and Reopel, Michael R. (1986). "Strategies for governance: domestic policymaking in the Reagan administration." *Presidential Studies Quarterly*.
- Wallsten, Peter (December, 2009) "Democrat's blues grow deeper in new poll." Retrieved December 17, 2009 from online.wsj.com/article/SB1261003469026949.html.
- Wallsten, Peter and Spencer, Jean (March, 2010) "Opinions harden on health." Retrieved March 16, 2010 from online.wsj.com/article/SB10001424052748704688604575125.
- Watkins, Michael (June, 2009) "Obama's first 90 days." *Harvard Business Review*.
- Weisman, Jonathon (July, 2009) "Post-partisan promise fizzles." *The Wall Street Journal*.
- Weisman, Jonathon (September, 2009) "Doubts rise about course of war." *The Wall Street Journal*.
- Weisman, Jonathon and King, Neil (September, 2009) "Obama relaunches health bid." *The Wall Street Journal*.
- Weisman, Jonathon and Perez, Evan (March, 2010) "Deal near on Gitmo, trials for detainees." *The Wall Street Journal*.
- Weisman, Jonathon et. al. (September, 2009) "Wrong turns: how Obama's health-care push went astray." *The Wall Street Journal*.
- Wellford, H. (2008), "Preparing to be President on Day One", *Public Administration Quarterly*, 68(4): 618-623.
- "What makes a successful transition? The case of foreign affairs." *White Burkette Miller Center of Public Affairs, the University of Virginia*.
- Whitaker, Mark (December, 2009) "Lessons from the White House." *The Washington Post*.
- Williamson, Elizabeth (July, 2009) "Teachable moment observed with beer." *The Wall Street Journal*.
- Wilson, Scott (December, 2009) "Obama defends first-year record." *The Washington Post*.

Yeager, K. (1998), *Trailblazers: Profiles of America's Gay and Lesbian Elected Officials*, Haworth Press, Binghamton, NY.

Behind this door...

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Abstract

Prior research offers conflicting results on the impact of office furniture arrangements, particularly when faculty offices are examined. This study utilizes a simple rubric to collect office furniture orientation across a variety of academic disciplines represented at several public and private schools of higher education. Of initial interest is the extent to which the faculty member could be perceived as “approachable” by a visitor as they enter the office space. Controlling for the structural and policy limitations imposed by the institutions, differences across disciplines and across institution types will be examined and reported.

Introduction

Folklore and fact challenge the impact of office furniture arrangement on perceptions about those who occupy the spaces. Notions of power display, insecurities, openness, and the like find little empirical support, and when studied, often focus on office elements other than the basic orientation of the furniture. For example, clutter and decoration dominated student perceptions of faculty offices with little import given to arrangement (Campbell, 1979). Darby and Judson (1987) reported that students perceived less control in the faculty-arranged (and decorated) offices. Elsbach (2004) explores relatively permanent office décor (but not arrangement) and the interpretations made about the office’s occupant. Sitton (1984) related the neatness of the desk top to the characteristics of the owner.

Although not common for full-time faculty in collegiate settings, many part-time faculty share office space. Referred to as “non-territorial office environments” or more commonly, “hoteling” or “hot desking” in corporate settings, there is some evidence the occupant’s workplace identity is threatened by the lack of physical markers/referents. (Elsbach, 2003.) If office furniture arrangement preference is driven by the personality of the occupant and the occupant has the freedom to execute the arrangements, then student perceptions about the faculty member’s personality are influenced by the arrangement. Lacking the ability to arrange the furniture could lead to misinterpretations by students.

In this study, the orientation of the faculty member’s desk and chair used for primary activities serves as the proxy for “arrangement”. Recognizing the fact that most faculty are engaged in a variety of activities in their offices from counseling and advising to grading and research, those activities which dominate the time spent in the office are deemed to be their “primary activity”.

This study seeks to determine the extent to which office furniture orientation correlates with academic disciplines in public and private colleges/universities in one geographic region.

Method

Using a "Furniture Arrangement Rubric", all accessible offices will be noted, along with building and room identifiers, then cross-indexed to report the sex, age (bracketed), and academic discipline of the principle faculty occupant. Assessing the furniture orientation is done from the perspective of the visitor upon first entry into the space (i.e. what the visitor first sees from the doorway). In the case of shared spaces or non-traditional environments (where the space is not defined by a door), the perspective remains the same: what the visitor sees upon first entry into the space. To control for structural (there's only one way to set the furniture) and policy limitations (where faculty have little or no voice in how office furniture is arranged), each department or building or school will be queried about such limitations. The primary activity of each faculty member can be deduced by a combination of inquiries and deduction based upon the academic discipline.

Results

TBA

References

- Campbell, David E. (December 1979). Interior office design and visitor response. *Journal of Applied Psychology*. Vol 64(6), 648-653.
- Darby, Bruce W. and Judson, Nia. (October 1987). Students' perceptions of faculty's office arrangements. *Perceptual and Motor Skills*. Vol 65(2), 507-514.
- Elsbach, Kimberly D. (February 2004). Interpreting workplace identities: the role of office décor. *Journal of Organizational Behavior*. Vol 25(1), 99-128.
- Elsbach, Kimberly D. (2003). Relating physical environment to self-categorizations: Identity threat and affirmation in a non-territorial office space. *Administrative Science Quarterly*. Vol 48, 622-654.
- Elsbach, Kimberly D. and Pratt, Michael G. (2007). The physical environment in organizations. *The Academy of Management Annals*. Vol 1(1), 181-224.
- Sitton, Sarah. (1984). The messy desk effect: How tidiness affects the perception of others. *Journal of Psychology: Interdisciplinary and Applied*. Vol 117(2), 263-267.

Predictive Power of Personal Factors in Studying Students' Perception of Sales Profession in China

By

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Abstract

The purpose of this study is investigate students' perceptions of personal selling as a career in the developing nations – Case of China. Studies in United States highlighting the negative perception of sales profession by people are numerous, especially when it comes to issues of ethics and honesty (Futrell 2007). Lee et al (2007) argued that students generally try to avoid salespeople as best as they can; in the addition, the lack of information about the profession perpetrates the negative image in their minds. Logistic regression and Z test are used in this research. The results do confirm the results of preceding studies; personal factors play a significant role in predicting students' perception of sales profession as a career. Research output showed that Chinese students have a biased perception about sales as career; however, interestingly few dimensions showed significant effect.

Introduction

Most people view sales people as pushy, dishonest, aggressive and annoying. In fact, according to a study done by Gallup (as cited by Futrell 2007), it was found that insurance salespeople, advertising practitioners and used car salespeople ranked among the lowest in terms of ethics and honesty, with car salespeople placed at the lowest rung. The roots of this 'negative' attitude towards salespeople can perhaps be traced back to the Industrial Revolution, when factories developed tremendous manufacturing capabilities, leading to a huge surplus of inventories that posed problems to manufacturers (Lamb et al. 2007). As a consequence, salespeople were hired to sell as much of the products as possible as well as quickly as possible. To achieve their sales 'target' these salespeople had to adopt an extremely aggressive approach, which is often referred to as 'sales (as opposed to 'market') orientation in marketing theory (Bristow et al. 2006). It is this contradictory attitude towards the sales profession in general and the salesperson that motivated our current research. Specifically, what we are interested in finding out is whether students brought up and educated in vastly different cultures and education systems also harbor different feelings towards the salespersons and choosing the sales profession as a career. The following section provides a review of the relevant literature. In the next section, we develop the conceptual framework for our analysis, which is based on the Marketing Lens Model (MLM henceforth) (Bristow 1998, Bristow et al. 2006, Licatta et al. 1995). The penultimate section of this study describes the implications for the study. At a minimum, the findings can be used by sales managers, salespersons and marketing educators to make a conscious effort in eliminating the misguided notions that students have about the role of salespersons in our society. The concluding section acknowledges the limitations and provides suggestions for advancing the current line of research.

CONCLUSIONS, LIMITATIONS, AND RECOMMENDATIONS

Results showed significant evidence that Chinese students' perception of the sales job and sales people is not neutral, which is consistent with the findings of other studies. However, their perception is driven by ideas / concepts that are different from what have been documented. Gender, major, and class were not significant. In the same direction of other research, our analysis supports the hypothesized relationships pertaining to cultural and sociological differences. From this perspective, the current study not only vindicates and strengthens existing research in this field but also provides substantial contribution to the literature, because China is one of the leading nations in the global economy, and culture and social values play a major role in its peoples' lives.

There are three practical problems associated with this study. 1- Data is a primary type, which is taken from a survey, which is subject to sample collection and related errors. 2- Sample size: cost and time were the primary factor for using sample of 271 observations. 3- The external validity of the model was not tested and need to be addressed.

Accordingly, it is recommended to use this model in studying students' perception in other countries.

Building Social Capital through Social Entrepreneurship

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ABSTRACT

The purpose of this paper is to develop a conceptualization of social entrepreneurship that builds on the cumulative management theories of social capital. By considering the work of one social entrepreneurship organization – Fonkoze – this paper develops the concept of social capital as a unique management theory that will bridge some conceptual gaps between sociology, management and social entrepreneurship. The foundations of social capital theory can be traced back to sociology and a thorough review of social capital research in the field of sociology shows that the lens has been used to look at individuals, nations, firms, and organizations (for profit and non-profit). Social capital research in the management field has stemmed in large part from the work of Kogut and Zander (1992) who have proposed that a firm be viewed as a “social community specializing in the speed and efficiency in the creation and transfer of knowledge.” The specific term and concept of social capital was brought into mainstream management research by the theoretical work of Nahapiet and Ghoshal (1998) who suggested that social capital, as defined by three dimensions, can lead to intellectual capital creation and to performance improvements. Nahapiet and Ghoshal (1998) used sociological research, such as Jacobs (1965), and the foundations laid by Kogut, Zander and Burt in formalizing and developing social capital as consisting of three dimensions: 1) structural dimensions; 2) cognitive dimensions; and 3) relational dimensions. This paper supports the idea that social entrepreneurship can be viewed as a tool for social capital development.

INTRODUCTION

The purpose of this paper is to develop a conceptualization of social entrepreneurship that builds on the cumulative management theories of social capital. Universities and colleges throughout the US are developing programs and courses in social entrepreneurship at an astounding rate. The concept of social entrepreneurship has resonated well with students, academicians and practitioners alike as it facilitates the bringing together of business minded principles – innovation, measurement, sustainability and financial accountability – with the passion that is so uniquely present with missions that are aimed at addressing social problem such as ending poverty and hunger, providing gender equality, universal education, and making health care available. As Dees (2001) stresses: “The time is certainly ripe for entrepreneurial approaches to social problems. Many governmental and philanthropic efforts have fallen far short of our expectations. Major social sector institutions are often viewed as inefficient, ineffective, and unresponsive. Social entrepreneurs are needed to develop new models for a new century.”

Many of the most well-established and well-respected poverty alleviation non-governmental organizations use microfinance as a uniquely effective tool in poverty alleviation and in the empowerment of the poorest of the poor. Microfinance has many definitions and conceptualizations but consistent with most of these definitions are the ideas that through access to reliable business partners and trust-worthy financial services – such as credit, savings, insurance and fund transfers – poor people are better equipped to climb out of the cycle of poverty.

Specially, this paper considers Fonkoze – a microfinance institution seeking sustainability with the mission to: 1) Provide Haiti's poor with the financial and educational services they need to make their way out of poverty; 2) Eliminate the kind of poverty that leaves people without hope, motivation, and courage, and; 3) Reverse the decline in Haiti's economy by empowering and motivating families to engage in sustainable economic development (<http://fonkoze.org/>). Microfinance is a uniquely important tool in social entrepreneurship.

Dees (2001) suggests that social entrepreneurs have a unique role in developing communities' efforts to develop out of poverty. Dees (2001) states:

- “Social entrepreneurs play the role of change agents in the social sector, by:
- Adopting a mission to create and sustain social value (not just private value),
 - Recognizing and relentlessly pursuing new opportunities to serve that mission,
 - Engaging in a process of continuous innovation, adaptation, and learning,
 - Acting boldly without being limited by resources currently in hand, and
 - Exhibiting heightened accountability to the constituencies served and for the outcomes created.”

A central challenge for management researchers and practitioners is to understand how and why some individuals/firms/communities are able to establish sustainable performance through relationships across the supply chain and community. Social capital theory has been presented as a valuable lens through which to view how organizations and people interact effectively and efficiently to develop knowledge, to sustain competitive advantage, and to increase access to valuable resources.

In linking social entrepreneurship to social capital it is important to clearly identify what social capital is and is not. Nahapiet (2008) suggests the following three points in an effort to clarify not only the *definition* of social capital but, perhaps just as important, the *theoretical domain* of social capital:

First, social capital is a resource-based perspective. The actual connections, interactions and access to resources that occur between parties represent the resource of interest. Many alternative perspectives are taken in network and trust research conducted outside the “social capital” lens. For example, other network and social capital literature considers concepts such as “structural holes” (Burt 1992) to be the focus of study—where the actual

hole between social networks is the unit of analysis. In structural hole analysis, for example, there is typically a correlation between number of contacts or numbers of holes and annual compensation of an individual in a social network. In other studies of networks and interorganizational relationships, there are a number of perspectives used, but implicit is our view of social capital is that it is both a *resource* and *source of access* to resources.

Secondly, performance outcomes are a central point of emphasis of social capital research—and this includes both positive and negative consequences of social capital. Negative effects of social capital exist, for example, when social networks begin to create inertia between partners due to a “locking in” of past expectations (Maurer and Ebers 2006). It is only by considering performance outcomes that the social capital lens can deliver much needed insight to both researchers and practitioners alike.

Finally, social capital—unlike much of existing network research—considers the interplay of all its three dimensions. The interaction of the structural connections, relational, and cognitive dimensions is what separates social capital from most network research. True social capital research must consider each of the structural, relational, and cognitive dimensions and how they interact.

Nahapiet (2008) suggests that by outlining these theoretical boundaries to social capital, social capital becomes a more robust, well-defined, theoretical lens with greater applicability for developing meaningful and applicable insights for management researchers. We use these three theoretical boundaries throughout this paper in our view and consideration of social capital.

Over the last decade much research has been conducted in an effort to better nail down what social capital is (and isn't) and to avoid ambiguity with the term “social capital.” Various uses of the term have left the theory broad in its potential scope and generalizability but, simultaneously, weak as theoretical lens. In this paper we use Nahapiet's and Ghoshal's (1998) well-cited definition of social capital (while alternative definitions are offered in Table 2.1) for two primary reasons. First, these authors' definition is consistent with the conceptualization of social capital suggested by the social capital theoretical domain we have outlined and, secondly, because this definition has been frequently cited by leading management authors (Nahapiet 2008, Lawson et al. 2008, Krause et al. 2007, Cousins et al. 2006):

“The sum of actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit. Social capital thus comprises both the network and the assets that may be mobilized through that network” Nahapiet's and Ghoshal's (1998 p. 243).

As Wacker (2004) cautions, developing and refining theory begins with clearly defining formal conceptual definitions. This definition of social capital builds on the cumulative management tradition and lays a foundation for effective research in this dissertation.

DIMENSIONS OF SOCIAL CAPITAL

Social capital consists of the relational, cognitive and structural dimensions. Each dimension of social capital serves as a separate construct and, while the characteristics used to describe the three dimensions of social capital are highly inter-related, each has a set of unique qualities. From social capital's sociological roots we can gather some insight from previous conceptualizations of the concept of social capital as well as gain an appreciation for the real and genuine challenge of moving social capital research in the sociological field into a single, unified view for the management and social entrepreneurship fields.

Relational Dimension

The relational dimension concerns “the kind of personal relationships people have developed with each other through a history of interactions” (Nahapiet and Ghoshal 1998 p. 244). This dimension encompasses the characteristics and qualities of individual relationships. Therefore, issues such as shared history, trust, respect, and friendship are important. The relational dimension is associated with the *qualities*—good or bad—of ongoing relationships. The relational dimension encompasses the character and qualities of the connection between individuals. This is often characterized through trust and cooperation and the identification that a particular individual has within a network of relationships.

An example of how the relational dimension may come into play can be seen when comparing the interactions between separate individuals that may have the same positions in a network of relationships (say a buyer and a supplier). Depending on the history of bonds and trustworthiness between the two individuals, the action and dynamics of the interactions will be very different than between the same two people without the relational ties. The interaction between the individual actors is highly influenced by the relationship and history of exchanges between the particular individuals. This dissertation views the relational dimension concept as the assets created and leveraged through *distinct* (specific person-to-person) relationships that have their own unique relational history.

In the example of Fonkoze, the “poorest of the poor” typically lack all access to value-adding relationships. Specifically, when seeking to identify and help the poorest members of a village, community leaders will typically under-represent the poorest of the poor instead seeking to link the resources of Fonkoze with people with whom community leaders already have relationships.

Structural Dimension

The structural dimension concerns the “properties of the social system and of the network of relations as a whole” (Nahapiet and Ghoshal 1998 p. 244). This dimension has been explored in depth and strongly influenced by the work of Burt (1992, 1995, 2000, 2002,

2004 and 2007) and deals with who you reach and how you reach them. The structural dimension encompasses network components and facets such as the presence or absence of ties between parties, the configuration of a network (such as the hierarchy within an organization), and concepts such as denseness of relationships, structural holes in networks, the presence or absence of network ties between different people, formal and/or informal (such as appropriable networks) network configuration, and the density and connectivity of a network. According to Burt, actors on opposite sides of structural holes operate in different information circles, and thus, there is value in spanning these separate information circles. Combining information from these separate, non-redundant information flows, then, offers the potential for innovation and the generation of new intellectual capital. We suggest here that these “properties” in and of themselves cannot generate social capital; rather these ties facilitate social capital only when they work in conjunction with the relational and cognitive dimensions. Structural ties alone cannot bridge separate information flows effectively, for, as Burt asserts, closure between two networks requires more than just structural ties, bridging also requires attributes such as facilitating trust, collaborative alignment, and shared interpretations (Burt 1995).

In the example of Fonkoze, the “poorest of the poor” are unable to articulate who in the community “gets things done” or who can help them in “a time of crisis.” More specifically for example, the poorest of the poor do not know how to access publically available resources such as cholera clinics because they lack the structural links to instead seeking to link the resources of Fonkoze with people with whom community leaders already have relationships.

Cognitive Dimension

The cognitive dimension refers to “those resources providing shared representations, interpretations, and systems of meaning among parties” (Nahapiet and Ghoshal 1998 p. 244). This dimension, the least studied of the three (Nahapiet 2008, Krause et al. 2007), encompasses the shared meanings and shared interpretations between parties in a relationship. The cognitive dimension captures the concepts of shared norms, systems of meanings and values, and, as such, we can expect the cognitive dimension to directly impact the development of social capital and the development of relationships. Tsai and Ghoshal (1998) suggest that cognitive capital is embodied in the shared visions and collective goals of organizational partners and is encapsulated by shared perceptions, expectations and interpretations. Relationships developed with shared norms and values can be expected to be stronger (Moran 2005, Burt 1992). Weick et al. (1995) asserts that when there is congruence on goals and values and when interpretations are shared by and across organizational partners this cognitive capital becomes on-going, cumulatively supportive, and self-reinforcing. The cognitive dimension reflects the concept that separate networks or communities develop unique terms, acronyms, interpretations of numbers and concepts. For example (Liker 2004), one of the key challenges in a firm’s adopting best practice from Toyota’s Production System into their supply chain is appreciating what is *actually* meant by terms such as zero-inventory, kanban, just-in-time, and kaizen. Using a *term* is quite different from understanding the *concept* the term

describes and when the concepts have different meanings to different supply chain partners there are sub-optimal results. Similarly, ERP system set-up failures are often linked to supply chain partners, managers and operators having separate interpretations of the meaning of specific input terms such as lead-times, safety stock levels and resource requirements (Chapman 2005). The cognitive dimension captures the essence of the importance of truly sharing rich information with shared meanings across network actors and not just passing along data or bandying about fancy terms.

In the example of Fonkoze, the “poorest of the poor” typically lack understanding of basic exchange policy – i.e. how to get one’s goods to market, how to make change for money, how to sign up for credit at a micro-finance organization. Specifically, the poorest members of a village typically lack the ability to functionally dialogue about even the most basic concepts dealing with money or development.

Sociological Foundations

The foundations of social capital theory can be traced back to sociology. A review of social capital research in the field of sociology shows that the lens has been used to look at individuals, nations, firms, and organizations (for profit and non-profit). Social capital has been used in the sociological field to investigate a wide range of outcomes. For example, sociologists have researched the impact of social capital on gross domestic product and labor markets (Aldridge et al. 2002), crime levels (Halpern 2001), governmental effectiveness (Kawachi et al. 1999; Putnam et al. 1993), educational attainment (Aldridge et al. 2002; Israel et al. 2001) and the quality of public health (Coulthard et al. 2001; Subramanian et al. 2003).

One of the early uses of the social capital concept is seen in the research by Jacobs (1965) who used the concept to investigate the importance of relationships and networks to the survival and functioning of neighborhoods. Jacobs (1965) studied how inclusion in a neighborhood social network had strong impacts on the outcomes of individuals from that community. Subsequently, social capital has been used in the sociological field to cover such research topics as school, region and national productivity and performance. Since these early beginnings, social capital has been used to investigate numerous other social phenomena. Boix and Posner (1998) have suggested, for example, that social capital creation can be used strategically to help combat social problems and ills such as urban poverty, high-crime areas, economic underdevelopment and government inefficiency.

Coleman (1988) represented an important shift in social capital research as he helped shift attention from social capital applied at the individual level towards social capital research being applied towards outcomes for groups, organizations, and institutions. Putnam’s (1995) work investigating the relationship between social capital and participation in voluntary organizations also influenced early management social capital researchers. Putnam’s and Coleman’s work served as evidence that the social capital lens offered insights for management researchers willing to apply the lens to the management arena.

Sociologists have shown social capital to be a valuable lens. A key challenge for management researchers has been in moving the lens from sociology for useful study in the management field.

Social Capital Research in the Management Field

Social capital research in management has stemmed in large part from the work of Kogut and Zander (1992) who have proposed that a firm be viewed as a “social community specializing in the speed and efficiency in the creation and transfer of knowledge” p. 503. The specific term and concept of social capital was brought into mainstream management research by the theoretical work of Nahapiet and Ghoshal (1998) who suggested that social capital, as defined by three dimensions, can lead to intellectual capital creation and to performance improvements. Nahapiet and Ghoshal (1998) used sociological research, such as Jacobs (1965), and the foundations laid by Kogut, Zander and Burt in formalizing and developing social capital as consisting of three dimensions: 1) structural dimensions; 2) cognitive dimensions; and 3) relational dimensions.

More recently, management researchers have attempted to build on this theoretical foundation to build a more cohesive conceptualization of social capital. Adler and Kwon (2002) and Inkpen and Tsang (2005), for example, have sought to integrate various research streams into a single cohesive OM-suitable social capital theory. Both papers result in the conclusions that, at present, it is difficult to present a cohesive unified theory that links all previous research themes. Because the social capital model proposed by Nahapiet and Ghoshal (1998) is consistent with existing relationship theory, network research, the knowledge-based view of the firm and the resource-based view of the firm, while still offering distinct and unique advantages, we believe the social capital lens is well-suited for management research and application.

Burt (1992, 1995, 2000, 2002, 2004 and 2007), a sociologist whose work has spanned into mainstream management research, has done much work on the structural aspects of social capital looking at the overall pattern and configuration of relationships, ties, and networks between individuals. Burt has largely pioneered the concept of structural holes – the gap between separate and distinct social networks – finding that people who are able to span across structural holes often obtain higher positions in organizations and receive greater remuneration than their counterparts. In Diagrams 1 and 2, which are representative of much of Burt’s work, Burt illustrates a network where a specific “banker” fills a unique position in bridging a network of contacts. In Diagram 1 Burt illustrates a network of direct contacts for an individual banker where dark dots are direct contacts. In this diagram the banker stands to benefit by being able to broker information between the top four interconnected contacts and the unconnected colleagues at the bottom of Diagram 1. In Diagram 2, however, we see how other indirect contacts (indirect contacts are indicated by white dots) negate much of the brokerage potential of the banker as indirect contacts between his social network leaves few “true” structural holes. Accordingly, the banker in this example was below average among peers in salary due in large part to his weak network position.

By *uniquely* connecting separate networks, a person can create value for him or herself by being able to bridge otherwise unconnected sets of knowledge and resources. Burt (1992, 1995, 2000, 2002, 2004 and 2007) has developed an entire portfolio of work based on identifying and quantifying the value of establishing relationships that span otherwise separate networks. However, as Burt (1995) asserts, structural ties alone cannot bridge separate information flows effectively. Rather, closure between two networks also requires relational and cognitive elements such as facilitating trust, collaborative alignment, and shared interpretations (Burt 1995).

Several management papers have contributed to the strong theoretical development of social capital. Inkpen and Tsang (2005) sought in their paper to theoretically develop how the dimensions of social capital might come in to play with different network types—specifically intracorporate networks, strategic alliances, and industrial districts. Inkpen and Tsang (2005), in attempting to use social capital as a lens for studying interorganizational relationships, stress that “the introduction of social capital variables into the analysis of networks and knowledge transfer adds a level of complexity that has not yet been examined empirically” (p.160) but stress that effective empirical analysis will “lead to a more comprehensive view of the strategic behavior of firms” (p. 161).

Moran’s (2005) work on social capital focused on researching structural social capital and relational embeddedness social capital. Moran’s “structural” element focuses primarily on the network structure and deals with the ‘whom one knows’ issue. Relational embeddedness, on the other hand, addresses the notion of ‘how well one knows them’ (Moran 2005). Along this line Moran suggests that research issues concerning the quality of relationships may be more important than research considering the number of relationships. Moran’s work serves to reinforce the multi-faceted nature of social capital while emphasizing the need for further research to better understand the dimensions and facets of this complex lens.

Several researchers have suggested that social capital be viewed either as bridging (dealing with relationships external a group) or bonding (dealing with relationships internal a group). However, as Adler and Kwon (2002) suggest, “external ties at a given level of analysis become internal ties at the higher levels of analysis, and, conversely, internal ties become external at the lower levels, thus rendering this stream of research, in our opinion to not be the most pressing.”

Social Capital Research in the Social Entrepreneurship

This paper has developed the concept of social capital as a unique management theory that will bridge some conceptual gaps between sociology, management and social entrepreneurship. It is the author’s hope that this paper can stimulate the use of existing social capital research to better inform our understanding and application of social entrepreneurship.

REFERENCES

- Adler, P.S., Kwon, S. W. 2002. Social capital: prospects for a new concept. *Academy of Management Review*, 27(1), 17-40
- Burt, R. S. 2007., Secondhand Brokerage: Evidence on the Importance of Local Structure for Managers, Bankers, and Analysts. *Academy of Management Journal*, 2007, 50(1), pp. 119-48.
- Burt, R. S. 2004., Structural Holes and Good Ideas. *American Journal of Sociology*, 2004, 110 (2), pp. 349-99.
- Burt, R. S., 2002 **The** Social Capital of Structural Holes. in M. F. Guillén: *The New Economic Sociology : Developments in an Emerging Field*. New York: Russell Sage Foundation, 2002, pp. 148-90
- Burt, R.S., 2000. The contingent value of social capital. In E. L. Lesser (Ed.), *Knowledge and social capital: foundations and applications*. (pp. 255-285). Boston: Butterworth Heinemann.
- Burt, R.S., 1995. The Network Structure of Social Capital. *Research in Organizational Behavior*. Amsterdam; London and New York: Elsevier Science JAI, 2000. pp. 345-423
- Burt; R. 1992., *Structural Holes: The Social Structure of Competition*. Cambridge, Mass.: Harvard University Press, 1992
- Chapman, S., *Fundamentals of Production Planning and Control*. Prentice Hall (March 11, 2005).
- Coleman, J., 1988. Social capital in the creation of human capital. *American journal of sociology*, 94(supplement), 95-120.
- Dees, J. G. . The Meaning of .Social Entrepreneurship. Reformatted and revised: May 30, 2001. http://www.caseatduke.org/documents/dees_sedef.pdf
- Inkpen, A.C., Tsang, E.W.K., 2005. Social capital, networks and knowledge transfer. *Academy of Management Review* 30 (1), 146–165.
- Koka, B.R., Prescott, J.E., 2002. Strategic alliances as social capital: a multidimensional view. *Strategic Management Journal* 23 (9), 795–816.

Kogut, B., Zander, U., 1992. Knowledge of the firm, combinative capabilities, and the replication of technology. *Organization Science* 3, 383–397.

Kostova, T., Roth, K., 2003. Social capital in multinational corporations and a micro-macro model of its formation. *Academy of Management Review*, 28: 297–317.

Lawson, B., Tyler, B. and Cousins, P., 2008. Antecedents and consequences of social capital on buyer performance improvement. *Journal of Operations Management* 26 (2008) 446–460.

Leana, C.R., Van Buren, H.J., 1999. Organizational social capital and employment practices. *Academy of Management Review*, 24(3), 538-555.

Liebesskind, J. P., 1996. Knowledge, Strategy, and the Theory of the Firm. *Strategic Management Journal* 17 (Winter Special Issue):93-107.

Maurer, I., Ebers, M., 2006. Dynamics of Social Capital and Their Performance Implications: Lessons from Biotechnology Start-ups. *Administrative Science Quarterly*, 51 (2006) 262;292.

Moran, P., 2005. Structural vs. relational embeddedness: social capital and managerial performance. *Strategic Management Journal* 26 (12), 1129–1151.

Nahapiet, J., Ghoshal, S., 1998. Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review* 23 (2), 242–266.

Teece, D.J., Pisano, D., Shuen, A., 1997. Dynamic capabilities and strategic management. *Strategic Management Journal*, 18: 509-33.

Tsai,W., Ghoshal, S., 1998. Social capital and value creation: the role of intrafirm networks. *Academy of Management Journal* 41 (4), 464–476.

Uzzi, B., 2007. Embeddedness in the Making of Financial Capital: How Social Relations and Networks Benefit Firms Seeking Capital. *Empirical Studies in the Sociology of Organizations*.

Wacker, J. G., 2004. [A theory of formal conceptual definitions: developing theory-building measurement instruments](#). *Journal of Operations Management*, Volume 22, Issue 6, December 2004, Pages 629-650.

Walker, G., Kogut, B., Shan, W., 1997. Social capital, structural holes and the formation of an industry network. *Organization Science* 8 (2), 109–125.

Prepare for Crises: It's Part of Doing Business

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Prepare for Crisis: It's Part of Doing Business

INTRODUCTION

Regardless of the best efforts to prevent a crisis, the odds are that eventually every organization will experience a crisis at some time during its existence. The terrorist attacks of September 11th and the anthrax incidents that followed were totally unexpected. Even with all the intelligence, safeguards, and precautions that were in place, the U.S. Government was unable to prevent these crises from occurring. We expect that the U.S. Government, with its enormous resources, would be able to methodically respond to just about any disaster. Yet, as we have seen, the government was not prepared for dealing with the anthrax scare. As a result, all types of organizations have been seriously disrupted. Fear has taken over where organization is lacking. Other examples reinforce the seriousness of crisis management decision making. In 1999, Ebay lost \$4 billion dollars in market value and 500,000 customers in a single day because of a computer crash (Barton, 2001). During the same year, Coca Cola, one of the world's principal soft drink companies mismanaged its product recall crisis even though it had the time, resources and public relations capabilities to successfully resolve the situation. All of these incidents have accentuated the need to assess vulnerabilities and prepare for crises in all sectors of the economy. Preparing for crisis is a major part of business management activity.

Too frequently managers believe that the chances of a crisis occurring are so slim that the extra effort to plan for them is unnecessary. The truth is that crisis management has always been a critical activity in organizations, one that is often ignored. In our complex world, organizations will continue to confront a variety of threats and crises stemming from many separate internal and external sources. As the environment grows more technologically complex, the crises

confronting organizations will also occur more frequently. In effect, the coping ability of managers is of vital importance. Crises are a way of life in business, and no industry is immune. Historically, business crises were usually thought of as important but isolated events affecting primarily large organizations. However, experience has demonstrated that, eventually, all organizations will in some way be affected by a crisis situation, and no-one is excluded.

Lessons learned from experience have demonstrated that a crisis can occur with little or no warning, anywhere, and at anytime. An organization's geographical location or size does not exempt it from potential crises. A crisis looms on the horizon of every organization. One wrong decision, even the smallest one, by a manager can be the cause of a serious organizational crisis. If managers accept the inevitability of a crisis as a reality, then they can plan not only to respond to the crisis, but also to find the opportunities that are contained in the crisis.

Surveys indicate that 80% of companies failing to develop a crisis management plan, go out of business within two years of experiencing a major disaster. Although businesses deal with crises and disasters daily, fewer than 60% of the Fortune 500 industrial companies have established operational crisis management plans (Brown, 1993). Some managers of this group believe the issue of preparing for a crisis event is not a priority. These managers present the following arguments:

- They believe that, in their business/industry, a crisis won't happen.
- They believe that, if a crisis does happen, they can manage their way through the difficulty without a plan because they have a well-managed business.
- They reason that because they have insurance for their businesses they are worry free.
- They assert that they do not have sufficient resources to meet the proper readiness requirements.

- They state that current problems associated with their business are so difficult and time-consuming that they have no time to plan for tomorrow's uncertainties.

While these are understandable points of view, they are ill advised. An organization may lose important business deals if a crisis interrupts its operations. As such, managers should be more realistic and establish a crisis management plan to help preserve the organization today and then focus on the deals that will come tomorrow.

PERSPECTIVES ON CRISIS

The term crisis has different meanings to people in management. Understanding the makeup of a crisis is crucial to the development of any proper and timely response. In business, as in life, there are many varieties of crises. Some of them present opportunities for the business to change directions and achieve new goals. Other crises present very ugly and difficult circumstances that require quick responses. Such crises can be viewed from two perspectives: the "festering" view and the "abrupt" view.

The festering crisis may be best described as an evolving episode arising from incremental decisions, neglect, or denial. An unresolved disagreement or a decision causing anger or protest often inflames this type of crisis. Managers can often anticipate these incidents, but are presumptuous about their possible occurrence. For example, a Texaco's racial discrimination case, settled in 1996, involved taped conversations of top management's views of minority workers. When the transcripts were released to the public, there was clear evidence of racial bias. This exposure aroused not only the aggrieved employees, but also the entire business community. This festering crisis consequently cost Texaco money, time, and reputation.

The abrupt crisis can be best described as an event or events that takes management by total surprise. One example of an abrupt crisis are workplace violence episodes. These crises

seem to come out of nowhere. Another recent example is an act such as the September 11th attack on the World Trade Center. This was an abrupt and unanticipated crisis event. This sudden incident stunned the world not only emotionally, but also structurally with the immediate implementation of major security changes in just about every area of life.

CRISIS IDENTIFICATION

Organizational crisis management is a process by which managers try to identify, assess and predict potential crises in order to prevent or minimize the effects of their occurrence.

Businesses are confronted with many types of crises. Major crisis events can be classified into five categories – organizational, internal threats, external threats, natural disasters, and technological. All of them incorporate festering and abrupt characteristics. Managers need to appreciate the potential for a crisis and therefore prepare their organization for a possible occurrence. Table #1 summarizes the crisis types, definitions, and the possible events.

-insert Table # 1 about here -

Table #1 is not all-inclusive. Nevertheless, the perspective it provides can guide decision-making. Contained in each of these categories are more complex problems that managers may fail to recognize even though they may see the crisis itself. Probing the content of the definitions in Table #1 reveals four fundamental problems that form the foundation for each of the five categories. Before any crisis planning can be completed, managers must understand how these problems influence the crisis management planning and execution process. Figure # 1 illustrates the interrelationships among the four problems facing managers.

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This understanding provides a framework for developing better alternatives and solutions to the crisis. The four fundamental problems include political, organizational, communication, and

business. Each one of these problems has a systemic impact on the development and implementation of crisis management planning. Understanding the characteristics of the four and how they interface with the planning process are essential. The following discussion provides this understanding:

- Political problems: These refer to large differences in the ideological understanding among employees regarding what is a significant crisis threat and how it can alter business operations. These differences also involve winning acceptance of those affected by the crisis planning itself and management decisions that negatively affect their available resources as a result of the commitment to crisis preparation. Political problems force managers to persuade, negotiate, and influence different groups in the organization regarding the need to identify crisis problems and establish appropriate plans to respond if a crisis occurs. Many administrators still deny the possibility of crisis by saying, “We’ve never done crisis management before, and we have managed to be very successful without it.” Managers with this belief are thinking only of the past and deny the vulnerabilities of the present and the future when assessing the impact of a crisis on their business. The recent changes in the global economy and electronic commerce have introduced completely new vulnerabilities that can destroy a business. Many are still reluctant to invest resources into plans or management structures that will help prevent and manage crises. It is necessary for business people to be politically astute in their efforts to continue raising the awareness of the importance of crisis management.
- Organizational problems: This refers to the ability of an organization to respond quickly in a crisis as a function of its culture, configuration, and communication strategies. Organizing the management structure so that it can respond to a crisis is not an easy task.

The structural flexibility of an organization provides opportunities to fashion crisis management planning strategies that are in its best interest. It involves identifying the possible vulnerabilities and developing appropriate management structures that can quickly address the impending or existing crisis. Establishing a planning and communication structure that gives managers a blueprint and the tools to deal with potential crises is essential. This requires allocating the proper resources, such as people, materials, money, and logistical support, to meet the potential needs of a crisis. Building systems that identify potential and an impending crisis or crises is a defensive maneuver that will also help managers deal with other organizational issues. This is often exemplified in the establishment of internal control systems that address financial and information control issues. The internal control system should be structured so that it will automatically notify managers of vulnerabilities. For example, festering crises can be identified by the appearance of accounting irregularities. Early detection can lead to intervention and resolution, avoiding a full crisis.

- Communication problems: Dealing with various audiences such as employees, customers, suppliers, and other publics is important to sustaining any organization. However, in many cases, the immediacy of a crisis event has been either lost or misrepresented by many managers. Careful analysis and construction of the proper messages to the various publics are crucially important to the successful management of a crisis. When communicating, timing is everything. It has been proven that communication about a crisis ultimately determines the organization's future success or failure. An organization must create a communication strategy for information and designate appropriate staff. Those charged with handling the crisis communication tasks

need to be knowledgeable about the various methods that are available to best convey timely messages to the appropriate publics. For example, employees and customers are special audiences that must be notified at the very first opportunity. The approach must be honest and candid, yet not careless with classified or confidential information. Proper timely information allows publics to remain loyal to the organization. The time to begin crisis communication is when there is no crisis. This will allow organizational managers to establish the proper connection frameworks and procedures. Furthermore, this helps to create a reservoir of goodwill -- just like having lifeboats on an ocean liner. Managers must have appropriate communication systems to respond quickly, truthfully, and to make it right.

- Business problems: All efforts in an organization should be focused on realizing a continuous program or strategy to satisfy customers, even if a crisis occurs. Organizations that become paralyzed due to a crisis face serious management problems. Managers must develop viable business strategies to prevent, manage, or turn a crisis into an opportunity. For example, when Chrysler minivan tailgate latches came under scrutiny, the automaker offered a latch replacement to existing owners at the same time as it introduced a new generation of minivans. Many owners took the opportunity not only to have new latch installed on their old models, but also to upgrade to a new Chrysler minivan. Management took a product recall crisis and turned into a profitable marketing opportunity. The business of an organization is continuity in its operations. Therefore, managers must establish continuity planning as part of their normal management process. The business continuity planning designates key people to function in critical roles. It also determines both financial and human resources necessary to carry out the plans

authorized by the key crisis management leaders. During many crisis situations many activities, such as bill paying, resources acquisition and day-to-day business operations, must continue in order to sustain the survival of the business. This is just one component of crisis management, which itself is part of the organization's strategic management process.

These four problems require managers to adopt a coordinated and integrated effort that harnesses all the necessary resources and appropriate competencies to develop a plan of action. The resulting crisis management portfolio will help prepare the organization for potential incidents.

CRISIS PREPARATION AND MANAGEMENT FUNCTIONS

There are two major ways for managers to view the resolution of a crisis. They can 1.) ignore the warning signs and react to the crisis or 2.) they can prepare themselves to prevent or manage a crisis. The decision path of the first choice has undefined outcomes while the second decision path provides many more opportunities to manage the crisis. Taking the second, or a pro-active approach, may even avert the crisis completely. Figure # 2 illustrates and compares the stages that exist in crisis management process.

- insert Figure # 2 about here -

Figure # 2 shows the decision path managers can take when dealing with crises. The first path is a reactive model where the decisions about planning occur during and after the event(s) have already occurred. The second path traces the pro-active model where managers have already anticipated some form of crises events. Under this scenario, they have completed a risk assessment that helped them develop a plan and contingencies to deal with the crises. The consequences of choosing one of these paths are significant. Managers have to weigh the

difference between the investments in planning for a crisis versus the potential costs that result from failure to plan. This choice is integrally linked to an understanding of the types of crisis that exist.

Crisis Management Functions

Crisis management encompasses four functions: team formation, assessment, strategy making, and evaluation. This is a cyclical process that considers the four problems mentioned above. Figure # 3 illustrates the interface of the problems with the planning and strategy functions. To accomplish an effective crisis management plan, managers must recognize and manage this interfacing process. Understanding how the four problems interface and affect the business operation provides the knowledge base for proper direction and leadership.

Crisis management requires managers to engage in active leadership that gives employees the proper direction and resources to complete their jobs.

- insert Figure # 3 about here -

Figure # 3 illustrates two ideas. First, it shows the interacting components that influence the crisis planning process. Second, it exhibits the functions the manager must control to solve the four problems that have an impact on the organization. Figure # 3 stresses the importance of all of these problems affecting the organization simultaneously.

Scanning the internal and external environments assists the manager in developing ideas, strategies, and plans of action that can prepare the organization to solve crisis problems. Managers need to continuously assess the problem/function interface and take necessary steps to assure preparedness. Such decisions regarding team formation, vulnerability analysis, strategy making and evaluation are essential in the crisis management preparation process. A discussion of these functions highlights the importance of these functions.

- The first function requires the formation of a team that assumes the responsibility for making sure the organization is prepared for a crisis. The members of this team should be from different parts of the organization, with active participation by top management. As a leadership group, this team takes charge, making sure the resources and structures are in place to respond to a crisis that may occur. While this team may, or may not, take on the specific activities involved in developing the crisis strategies, as a unit, it establishes the goals, helps identify vulnerabilities as well as approve the final plan of action. As a management unit the team's role focuses on the overall coordinating mechanism, it sets the direction and concentrates on minimizing the risk to all stakeholders.
- Assessment involves vulnerability analysis. This is the information gathering activity that provides information needed to construct crisis action plans. This should be just like any other business planning activity that has an assessment, cost analysis, implementation, and evaluation stages. This assessment process develops the crisis strategies and should be completed on a recurring basis. It is important that it is done competently so that any crises can be effectively managed.
- Strategy making deals with the development of alternatives and appropriate decisions for dealing with crisis situations. Given the available information, decision-makers craft suitable responses to potential events. Crisis strategy development must be a very fluid management process as external and internal environments constantly change.
- The evaluation function is not a final activity, as it needs to be continuously updated. A plan is only as good as the plan's content and the people implementing it. It may be helpful to review two plans at the same time. This process should help make managing more consistent. Similarly, the identification of different or new vulnerabilities, such as

learning from a competitor's crisis experience or the impact of new technologies, obligates managers to update crisis plans to reflect these threats. Being prepared means forecasting what might occur in the future. Evaluation is a perpetual process.

An effective crisis management plan establishes protocols for addressing the logistics needed to deal with a crisis. Typically these are the elements and resources that are commonly needed in all situations. Examples include supplies and emergency back up equipment. Having these resources in place leaves managers better able to supervise the content aspect of the crisis.

The four functions discussed above operate within each of the systemic problems faced by an organization. The four problems that were discussed earlier affect all levels of the organization. To address their impact, managers should have a perspective on when, how, and to what extent the problems alter the organization. Figure #3 summarizes the relationships that exist among the four problems and the planning process.

DEVELOPING A SPECIFIC PLAN

Although it is almost impossible to achieve full readiness, it is necessary to create guidelines that focus on the three major time phases of a crisis. This time frame approach involves decisions and activities that precede, exist during, and happen after a crisis. All decisions are contingent upon one another, and the failure to complete one has a direct impact on subsequent actions. Table # 2 presents guidelines for decisions and activities needed for successful implementation of crisis management plans.

- insert Table # 2 about here -

We live in a very dynamic and turbulent global environment, and the potential for crises has increased dramatically as a result of the recent events. Unfortunately, too many organizations wait for a crisis to occur before developing a crisis management plan. These organizations are

reactive, rather than pro-active. This approach to crisis management ignores the symptoms or warning signals. Then, when a crisis occurs, an organization is not prepared for the potential confusion and chaos. This situation can cause added conflict and problems. Classic examples include the Valdez Exxon oil spill, Dow Chemical's mishandling of publicity about silicone breast implants, as well as the Firestone and Ford fiasco. These crisis management problems illustrate the importance of planning, communication, and training. The poor decision-making that took place in these cases has had long-term impact on each firm's reputation and has had disastrous consequences on profitability. When managers understand what constitutes a crisis and how its symptoms are manifested in a vulnerability analysis, they can move quickly to develop plans and strategies for managing a crisis.

Crisis management, in many respects, resembles strategic management. It requires managers to read and reread the internal and external environments. They must complete a SWOT analysis (strengths, weaknesses, opportunities, and threats) of potential crisis events confronting their business. As managers evaluate the results of this analysis, proper crisis plans can be developed to meet the needs of the organization. This is key to business continuity and mitigating the effects of a crisis.

An organization can have all the resources, plans, and contingency arrangements; however, if it does not promote a crisis management culture and attitude, all the efforts to prevent and manage a potential crisis are wasted. Management must continuously deal with the politics of crisis management. It is a continuous process of persuading stakeholders to recognize the vulnerabilities that exist and identify alternatives that will best resolve the issues. Additionally, management must address the politics of denial or partial remission through insurance policies or other quick fix remedies. An organization should plan on how to use

limited resources to achieve multiple goals. For example, efficient planning and coordination of human and physical resources contribute significantly to producing the desired results, instead of blindly following the “reactive path,” as shown in Figure # 2.

IMPLICATIONS FOR MANAGEMENT

While there is no absolute panacea for crisis prevention, concentrating on the following areas will go a long way in helping prevent crises before they emerge: 1) forming a crisis management team, 2) knowing how to detect pre-crisis symptoms and conduct vulnerability analysis, 3) developing a very good communication mechanism within the organization, 4) training everyone to be vigilant, prepared, and responsive, 5) remaining flexible to meet the changing environments, as well as 6) having a continuous evaluation process.

1. The first recommendation is for an organization to form a crisis management team. No matter how small or large the business, an appropriate team can be established. The purpose of the crisis management team is to plan for potential crisis events and to manage those events should they occur. The team should consist of key representatives of the organization, such as operations, marketing, and accounting. In addition, the top executive or business owner should be a part of this team. If the team is new, it is may be worthwhile to consult with experts who can provide the team with a framework for operation. This planning may be done through consultants who can schedule training sessions for the core members of the team. While the size of the team depends on the particular type of organization, any more than ten members can become onerous. The crisis management team should meet at least twice a year. This schedule will help them work on developing a crisis management plan. This plan outlines how the organization will respond to crisis events and who will be in charge of managing various aspects of the crisis.

2. The second recommendation centers on a vulnerability analysis. This analysis is one of the most important steps in developing the crisis management plan. It is a process of identifying the most significant vulnerabilities in the business and prioritizing them to ensure that management is addressing their potentiality. For example, all commercial watercraft and airlines are prepared and equipped to respond to emergencies. A business that plans for crisis unique to its industry becomes better prepared to manage the crisis should it occur. Crisis preparation and planning should be an ongoing activity requiring management and employees always be vigilant.

3. The third recommendation centers on making the communication system as effective as possible. Communicating during and after a crisis is crucial to successful crisis management. Regardless of the efforts that an organization makes to prevent a crisis, eventually it will have to face a crisis. When this happens, a good communication system is very important. The strategy on how to communicate during and after a crisis is an extremely important decision each manager must effect. Setting and agreeing on a strategy for communication is essential to successful management of the crisis. An indispensable element of the communication process is the selection of a proper spokesperson. This person is well trained in communicating the correct message at the correct time and to the correct audience. In some cases, hiring a consultant to assist in developing a proper responsive communication system may be necessary.

4. The fourth recommendation suggests ongoing training of employees. Offering both formal and informal training to management and employees is an important ingredient in the crisis management. The more knowledge an employee has about the warning signs of a potential crisis, the easier it will be to identify the crisis and deal with it immediately. Therefore, creating a corporate culture that is sensitive to the crisis management concept is so important. It must be remembered that it is much less costly to deal with a problem before it occurs than to have to

address a full-blown crisis and its aftermath. Appropriate training is part of proper planning and preparedness.

5. The fifth recommendation requires that not only the crisis management team, but also all other employees, understand the importance of being able to accommodate and respond to abrupt changes. In managing a crisis, the decision-makers must not be locked into rigid plans.

Responding to a crisis requires managers to be flexible and capable of making competent impromptu decisions as events emerge.

6. The final recommendation proposes that managers establish an evaluation mechanism to assess the organization's ability to implement the crisis plan. Crises are not enjoyable situations; thus, everything possible needs to be done to prevent their recurrence or the occurrence of another type of crisis. Questions in the pre-crisis stage include what could happen and how can it be prevented? If the organization has already experienced a crisis, then there is an opportunity to assess what occurred and compare it to what was planned for in the crisis management portfolio. This evaluation is a learning process and should be incorporated into the crisis management plans. On the other hand, if a crisis has not yet occurred, then it is imperative that specific evaluative criteria be included in the crisis management plan. Feedback from proper analysis is essential. During a crisis, managers must have a plan of action that methodically outlines the decisions and actions that need to occur and when they need to occur. Along with activating the crisis management team, accurate and timely communication is critical. Questions in the post-crisis stage include what happened, why it happened, and what could have been done to prevent it? The recovery stage consists of getting operations back to normal, as well as preparing for the next crisis. If the crisis management team or plan operated properly, then the debriefings and the assessment process are much easier. It is necessary that, in all circumstances, managers step

back, look at what happened and complete a comprehensive assessment of what was successful and what failed. Efforts should be devoted to reexamine vulnerabilities or threats and to repeat a SWOT analysis. It is a process of continual improvement. This strategy does not guarantee prevention of future crisis, but it presents management alternatives and incremental improvements in dealing with crises. Not all crises can be prevented, but all crises can be managed better.

CONCLUSION

A crisis becomes a very visible turning point in an organization's life. The manner in which the crisis is managed can make or break a positive image, as well as affect the bottom line. The political, organizational, communication, and business problems that confront an organization before, during, and after a crisis all pose major challenges for the managers. How they analyze and respond to these issues may determine the outcome of the crisis. Having a well thought out crisis management plan with trained staff that knows how to implement it will be one major step towards bringing crisis situations to a successful conclusion. Every organization may encounter a problem that can turn into a crisis. Unfortunately, many organizations do not perceive the need to plan for a crisis.

The best-prepared managers will survive and may even prosper during a crisis. Managers must change their thinking about crises. Having a crisis management plan in place that involves every function and every employee of the organization will pay major dividends when the inevitable crisis hits. While all crises cannot be prevented, they can certainly be managed better.

REFERENCES

- Brown, B. (1993). The Disaster Business, *Management Today*, October 1993, pp.42-48.
- Crandall, William, R. & Menefee, M. (1996). Crisis management in the midst of labor strife: preparing for the worst. *SAM Advancement Management*, 61 (10), n 1, 11-15.
- Caponigro, J. (2000). *The Crisis Counselor: A Step-by-Step Guide to Managing a Business Crisis*, Chicago, IL: Contemporary Books.
- Darling, J.R. (1994). Crisis management in international business: Keys to effective decision-making. *Leadership & Organization Development Journal*, 15(8), p. 3-8.
- Hickman, J., & Crandall, W. (1997). Before disaster hits: A multifaceted approach to crisis management. *Business Horizons*, 40 (2), 75-79.
- Muller, R. (1985). Corporate Crisis Management. *Long Range Planning*, 18(5), p.38-48.
- Meyers, G., & Holusha, J. (1986). *When it hits the fan: Managing the nine crises of business*. Boston: Houghton Mifflin.
- Spillan, J. & Crandall, W. (2001). What? Me worry? Crisis concerns and management in small businesses, Proceedings of the Decision Science Institute Conference James Madison University, February 21, 2001.
- Tiller, M. (1994). Is Your Disaster Plan Effective? *Management Review*, April 1994.p.57.
- Wilson, B.G. (1992). 'Crisis Management: A Case Study of Three American Universities.' Unpublished dissertation, University of Pittsburg, PA.
- Henry, R.A. (2000). *You'd better have a hose if you want to put out the fire*. Gollywobbler: Windsor, California.
- Fink, S. (2000). *Crisis management: Planning for the inevitable*. An authors Guild Backinprint.com edition: Lincoln, Ne.

Internet Sources:

<http://www.krisennavigator.de/crisisnavigator.org/atcm5-e.htm>

Table # 1 – Crisis classification and definition framework summary

Categories	Definitions	Crisis Events
1. Organizational	These types of events have the potential to disrupt an organization’s day-to-day operations.	Serious industrial accidents, product malfunctions, loss of key records due to fire, systems breakdowns, or terrorist attacks
2. Internal Threats	These crises often originate from operational crises and can result in negative public perceptions.	These consist of corporate espionage, management corruption, embezzlement, and theft. Some examples are employee or consumer lawsuits, government investigations, and product recalls, and employee violence in the work place.
3. External Threats	These events refer to wrongful acts committed by an individual or organization	Serious industrial accident resulting in injuries or fatalities is an example. Miscommunication can create other problems. Poor publicity about events such as boycotts, product sabotage, and negative media coverage can affect a company’s profitability
4. Natural Disasters	These are caused by an act of God.	They include floods, tornadoes and earthquakes.
5. Technology	These are events that have potential impact on the company’s technology system and operations.	Computer systems breakdowns, invasion by hacker, Virus or computer systems invasion by intruder

Figure # 1 – Organizational Problems Influencing Crisis Management

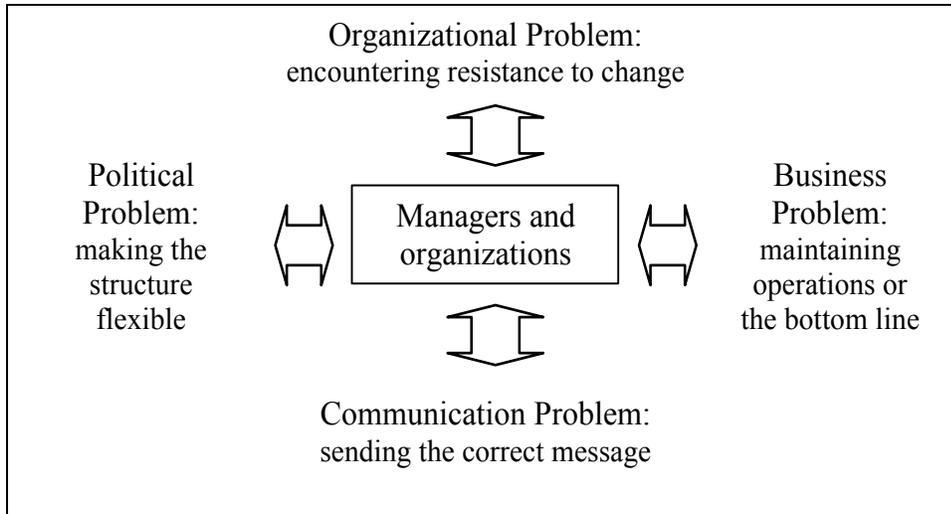


Figure # 2 - Crisis Management Process – Two Possible Paths

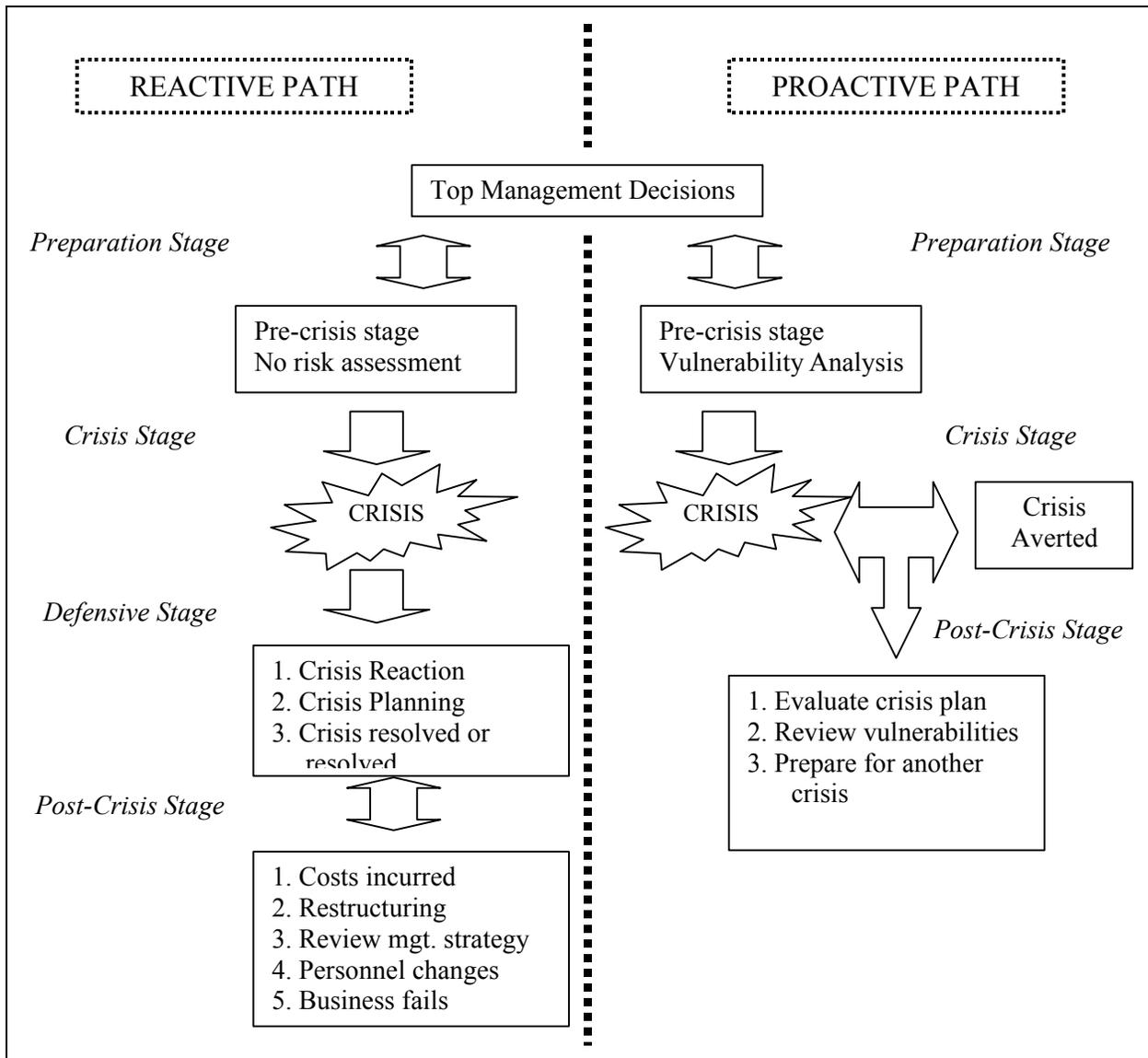


Table # 2 – Crisis Management Decision and Action Guidelines

Time frame	Problems addressed	Action/decision	Comments
I.) Before the Crisis	Political, Publics, Business, and Organizational	<ol style="list-style-type: none"> 1.) Persuade staff and management that crisis management plans are an absolute necessity 2.) Form the crisis management team 3.) Assess vulnerabilities 4.) Establish standard operating procedures 5.) Create strategies that will address the problems 6.) Complete cost analysis and budget allocations necessary 	<p>The crisis management team should be operating before any crisis actually occurs.</p> <p>A vulnerability assessment prepares management create appropriate strategies and action plans to resolve the crisis.</p> <p>Standard operating procedures should be created before any potential crisis event occurs.</p> <p>Cost analysis allows manager(s) to determine the resource allocations needed</p>
II.) During the Crisis	Political, Publics, Business, and Organizational	<ol style="list-style-type: none"> 1.) Activate the crisis management plans 2.) Direct attention to the public's desire for information 3.) Develop effective communication plan & structure 4.) Appoint an official spokesperson 5.) Carry out Business Plan and Crisis management Plan simultaneously 	<p>Being prepared can be confirmed with systematic use of the strategies & action plans.</p> <p>How management addresses the Publics can have an impact on how effectively the crisis is resolved and concluded. Making sure that accurate and timely information is conveyed is critical to successful resolution to a crisis.</p> <p>If possible, it is important to carry out business as usual servicing customers even while crisis is occurring. Trying to sustain the normal business is critical.</p>
III.) After the Crisis	Political, Publics, Business, and Organizational	<ol style="list-style-type: none"> 1.) Discover the cause of the crisis 2.) Communicate to staff and stakeholders (Publics) 3.) Recover and continue to operate the business if possible 4.) Evaluate the crisis plan to determine its effectiveness. Develop corrective actions that need to be implemented 5.) Assess vulnerabilities 	<p>Analysis of what went wrong and what symptoms were not recognized is an important part of the post crisis thought process. Were vulnerabilities not correctly assessed?</p> <p>Management must regain its momentum and get back to business as usual as quickly as possible. Evaluation is imperative.</p> <p>Management must determine what worked and what did not work. Corrective action is essential.</p> <p>Repeat the cycle of assessment, plan and evaluate.</p>

Figure # 3 – Crisis Management Planning and Response Process



An Explorative Study of Students' Perception of International Business Curriculum: – Case of Lebanon

ABSTRACT

Economic development depends on business education for a thriving and secure society. A skilled work force that can create, innovate and increase business opportunities fosters an environment of prosperity that provides jobs and enhances the quality of life among its citizens. This paper examines the elements of curriculum, the students opinions and the delivery of business education in Lebanon. This paper focuses on students' perceptions of the value and applicability of the curriculum. Additionally, the study investigates the shift in importance on an international perspective in curricula as opposed to just a domestic understanding. This shift is important to academicians as well as practitioners in order for them to understand the methods, techniques and activities that are being used to prepare the future business work force. This study presents ideas and perspectives about how Lebanese students perceive the business and international curricula in a important Lebanese University. Data for this paper was collected in Lebanon and reflects the students' perspective on its international business curriculum.

Key Words: Lebanon, economic development, business education, international business curriculum, economic and social benefits, developing nation

INTRODUCTION

There is a direct relationship between economic growth potential and education. This relationship is both obvious and contentious because one can argue that it is difficult to determine which one comes first. Storm and Feiok's (1999) study has become a foundation for our discussion in this paper. The connection between successful economic development and people having a university education is clear. The benefits of a highly educated citizenry include improving a countries economy while simultaneously meeting future workforce needs. This eventually creates an environment, which improves the country's quality of life. Higher education is frequently valued as a benefit for the individual; however, it can be strongly argued that an educated citizenry significantly benefits the entire country.

Globalization has created a dynamic business environment. As technology has been rapidly introduced, business has had to adopt new methods of business operation and adapt to a new business environment. The speed of communication has caused changes that now require workers acquire many more sophisticated skills than before. Workers are flexible, agile and capable of changing directions at a moments notice. While the technology has increased the intensity of competition, it has also leveled the playing field for many companies and developing countries. Emerging markets can now communicate as rapidly with sophisticated developed countries as they can with any other country in the world. This situation creates business opportunities that never existed

before. When a country has an educated, alert and trained work force produced from its higher education system it can compete, profit and expand its economic development activities.

Understanding the impact of globalization, one can easily see the importance of having managers that are well trained and ready to address the many complex challenges of international trade. This is especially true from a marketing and general management perspective. Providing students with the proper international business credentials is a very important for the relevance of higher education. Pursuing this goal is even more complicated and challenging in developing countries. Since many developing countries lack resources and expertise in academia, it is essential that they develop curricula that are efficient, effective and focused on the economic development of their country.

The purpose of this paper is to present a perspective on the methods and techniques that are being used in teaching future Lebanese business leaders. The paper also seeks to find out which subjects are considered more important for international business/marketing majors and the preferred learning methods.

CONCLUSIONS

We can conclude that Lebanese respondents had opinions across all three broad survey categories. The results of the analysis indicate that the students have a clear idea about international business and its implications among global markets. Most of the respondents indicated an awareness of the fact that Lebanese businesses will be directly or indirectly affected by socio-economic, cultural and political developments in international markets. As such, managers will have to have knowledge and training in order to understand and anticipate the consequences of their decisions. Based on the data analysis we believe that the respondents are interested in studying this area and are well aware of the career opportunities that await those familiar with international business and trade.

With regard to an ideal international marketing and management curriculum, the responses indicated an interest in learning a wide variety of subjects that are related to international business. Special interest was also shown in marketing decision making as a useful subject when developing curriculum.

This study has provided an opportunity to see that the development of international business and curriculum deserves attention and is of much interest to the students in Lebanon. Since Lebanon is a developed but politically unstable country that is increasingly embracing globalization, much talent is needed by way of new graduates who are familiar with international business and related areas. This presents both a challenge and an opportunity for universities to develop courses and programs that equip graduates with these vital skills.

IMPLICATIONS

The students have made their views clear by way of this study. They are very interested in learning more about international business in their curriculum. They are well aware of the trends in these areas and how it affects the relationship of their own nation with other developed countries. They are also aware of how important this subject matter is to their job prospects and future growth. In addition, the study provides inputs about what

specific subjects should be included by way the different levels of interest that were shown in various areas. Furthermore, the students have also indicated their preference to learn these subjects by way of non-traditional methods.

The Impact of Religion and Social Structure on Leading and Organizing in Saudi Arabia

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Abstract

The impact of cultural differences on the success of multinational corporations cannot be overstated. Consequently, it is very important for managers to understand the culture of the society where their subsidiaries operate. The higher the cultural distance between home and host cultures, the more significant the potential for operational failure based on cultural differences. Culture influences management styles, decisions, and behaviors. Culture also affects how employees expect to be managed. The cultural distance between the United States and the countries in the Middle East is such that religion and social structure impact how effectively a subsidiary can be successfully managed. In particular, Saudi Arabians are heavily influenced by the religion of Islam including the business environment. Saudis adhere to strict divisions between members of society based on several factors such as tribal affiliations, age, and gender. This paper is a discussion of the impact of religion and social structure on the management functions of leading and organizing in Saudi Arabia.

The Impact of Religion and Social Structure on Leading and Organizing in Saudi Arabia

Saudi Arabia is the largest country in the Middle East with an area of approximately 830 thousand square miles. Saudi Arabia shares its borders with Jordan, Iraq, Kuwait, Qatar, United Arab Emirates, Yemen, Oman and Bahrain. The Red Sea lies to the west and the Persian Gulf to the northeast. The geography of the country varies from the humid western coastal region to sandy lowlands in the east. In the southwestern region there are mountains as high as ten thousand feet. The “Empty Quarter” is Saudi Arabia’s largest desert and is located at the southernmost border. Saudi Arabia has climates that enable growth of large varieties of plant and animal life; it also has climates that contain little to no life. Riyadh is the capital and largest city. The official language of the country is Arabic. The government is an Islamic absolute monarchy and is currently ruled by the son and grandsons of the first king, Abd Al Aziz Al Saud. Saudi Arabia has a population of roughly 28 million. The estimated gross domestic product for 2010 was 623 billion dollars with forty five percent coming from its vast petroleum reserves (Al-Rasheed, 2008; www.state.gov/r/pa/ei/bgn/3584.htm). The per capita gross domestic product was US\$2400 for 2010.

Saudi Arabia is a major political ally of the United States in the Middle East. The diplomatic relations between the two nations have been forged over the past 75 plus years with various highs and lows. The vast petroleum reserve in Saudi Arabia is critical to the relationship between the two nations. In fact, the ‘business of petroleum’ is a critical element to the furthering of the relationship between the two nations.

Culture and Saudi Arabia

Culture in its basic form can be defined as a system of values and norms that are collectively shared between individual groups of people. These shared ideas form a foundation for the way of life of a particular group. For multinational corporations, two cultures come into focus, national and organizational. The focus of this paper is on national culture and its impact on successfully managing a business in Saudi Arabia. Culture influences all aspects of a manager's job including managerial styles and management decisions. Culture also affects the nature of negotiations. In general, managerial behavior is influenced by culture (Hill, 2009).

The functions of managers to the extent that they are people-oriented are influenced by culture. For example, if a culture places an emphasis on people being unequal in physical and intellectual capabilities, then according to Hofstede (1980), there is high power distance. In essence, one can expect a wide gap in power between superiors and their subordinates in Saudi Arabia. Another important aspect of how culture affects business management is the degree to which individuals have collective ties with one another. Business in Saudi Arabia is affected by collectivist thinking and therefore dictates that relationships are more important than business dealings (Lundgren, 1998).

For multinational corporations, it is generally understood that national culture can be a major obstacle to improving overall organizational performance. Making organizational improvements often require internal cultural change. In Saudi Arabia where religion influences most, if not all, areas of life, it is difficult for managers to change certain aspects of the organizational culture. This is due to the influence on managers of the tribal traditions which dictates that they place more of an emphasis on continuity over competitiveness. The Saudi's

preference for managerial positions is motivated by status and position (within the dictates of national culture). For example, most Saudis find it embarrassing to accept positions in labor (Currey & Kadash, 2002). While there are many facets of culture that impact management effectiveness in Saudi Arabia, religion and social structure perhaps have the most influence.

Religion

Religion plays a significant role and is all encompassing in defining the culture of Saudi Arabia. Saudi Arabia is the birthplace of Islam, the second largest religion in the world. Saudi Arabia is home to the Islamic religion's two most sacred shrines in Mecca and Medina. The majority of Saudi Arabia's population is Sunni Muslim. Since Islam is the 'established religion' of the country, the government provides financial and political support to its institutions (Esposito, 2003).

Islam was established in Mecca by Muhammad in the early seventh century. Muhammad stressed that his fellow tribesmen be monotheistic rather than polytheistic as was the case historically. Muhammad began teaching his revelations from Allah to Muslims in the region. The teachings supposedly were received directly through the angel Gabriel. After his death, Muhammad's followers placed his teachings into the holy scripture of Islam, the Qur'an. Islam, through Muhammad, is responsible for defining the way of life and establishing the culture for both individuals and the society as a whole. Islam does not distinguish between religious and political life nor does it make distinctions between secular and religious life (Menoret, 1985).

The five pillars of Islam include: five daily prayers, affirmation of faith, at least one pilgrimage to Mecca, fasting during the month of Ramadan, and almsgiving which is the act of

giving to the poor. Another important aspect of the Islamic faith is the conversion of the infidel, though Muhammad gave special status to the Jews and Christians because the two religions contributed to the Islamic faith. By the time of Muhammad's death in 632, the majority of the tribal communities in Saudi Arabia had declared loyalty to him as a political leader and recognized Islam as the true religion. The process of religious conversion was completed under the leadership of Islam's first caliph, Abu Bakr. The religion propagated throughout the Middle East and North Africa (Lacey, 1981).

The religion of Islam in modern day Saudi Arabian society is interpreted based on the Wahhabi ideology, which was established in the early eighteenth century. The ideology is thought to purify Islam from any new innovations, modifications or practices that deviate from the seventh-century teachings of the Prophet Muhammad. The monarchy of Saudi Arabia is made legitimate through the alliance of the religious council, The Ulama, and the royal family. The council's main function is to make sure that government policies are constructed within the religious guidelines of Islam. The council also oversees the religious police who enforce the morality rules that are established by the council (Esposito, 2003).

The most influential symbols in Saudi culture are those linked to the religion of Islam. The ritual celebrations that have the greatest impact on Saudi culture are the holy month of Ramadan, the holy pilgrimage to Mecca, and the Muslim feasts of *Id al-Fitr* and *Id al-Adha*, which occur after the end of Ramadan and in combination with the annual pilgrimage. Islam also impacts the culture through various social celebrations such as: weddings, other joyous and sad occasions, extended family reunions and kin-based socialization (Al-Yassini, 1985).

Since the 1960s, many Saudis have welcomed a progressive and westernized consumer culture especially in their business dealings. However, in 1979 there was an attack on the Grand Mosque in Mecca, which led to a shift back to traditional conservatism. This has divided much of the country; those who favor the liberal approach of the West versus others who prefer traditional conservatism. The latter are interested further institutionalizing Islam into the life and government of Saudi Arabia (Fisher, 1990).

Social Structure

The Saudi social structure places an emphasis on the group rather than the individual. The family or tribe is the center of social life. Saudis tend to have large immediate families and are expected to stay in close proximity to their extended families, often living with them or next to them. Saudis believe it is important to develop strong social networks. The networks can provide help for families if it is needed. Saudis are very aware of their heritage and family backgrounds. In business, it is commonplace and even encouraged for employers to hire their friends. Saudis place a high level of importance on hiring those who they know and trust (Fischer & Manstead, 2000).

Social stratification is based on tribal bloodlines. Family descent is passed through the males. Even though families are patrilineal, relatives of the mother still play important roles as support systems for the extended family. Children are considered to belong to the father and not the mother. Marriage is considered a civil contract rather than a sacrament, and must be signed by witnesses. The husband has to pay a predetermined amount of money to the wife once the contract is signed. Additional monies are to be paid to the wife in the event of a divorce. Children will remain in the custody of the father if a divorce were to occur (Bell, 1986).

The collectivist attitude of Saudi society has an enormous impact on the way families measure their success. If a family member can live up to his or her socially accepted morals, then increased esteem will be brought on the entire family. Several of the morals that are most socially valued include: generosity, selflessness, support of family members, removal of dependence on others, and hospitality, just to name a few (Metz, 1992).

Another important aspect of social structure is sexual modesty. This concept is applied mostly to women. In Saudi culture there are strong divisions in both importance and power between women and men. This helps in the prevention of sexual transgressions. Another tool that the Saudi culture uses to increase sexual modesty is the veiling of women. However, in recent times many families have taken a more liberal stance on the issue. Women can remove the veil and instead cover just the top of the head or even wear gloves to cover their hands (Fischer & Manstead, 2000).

Traditionally, Saudis have been patriarchal. The father is the head of the family and the sole provider. The mother's role is that of raising the children and taking care of the home. Sons and daughters are raised to follow these hereditary traditions and are assigned age specific duties. The sons are to protect the daughters while the daughters are to be a source of emotional support for the family. This structure has recently changed. It is now commonplace for the father and the mother to provide for the family, with servants or children of age taking care of the home. This change has been brought on by educational mandates for both men and women set forth by the Saudi Arabian government (Metz, 1992).

Men still have more rights than women. Women are still mostly dependent on the male figures within the family to conduct much of their private and public business. Women are not

allowed to leave the country without a male escort nor can they drive. The limited rights of women in Saudi Arabia have not prevented them from becoming successful in business and academia. This can be attributed to women's ability to own property and invest personal money in business ventures. Many women have acquired considerable wealth through their investment dealings (Al-Rasheed, 2008).

Managers and Management Functions

By definition, managers are individuals within an organization who oversee the work of others. Managers also direct the work of people who are subordinate to them. Management is what managers do or the process involved in effectively and efficiently accomplishing the goals and objectives of the organization (Robins, DeCenzo, & Coulter, 2011). Management functions include planning, leading or directing, staffing, organizing, and controlling (Hill, 2009). These management functions are universal to the extent that their presence in organizations is not dictated differences in culture or type of organization. For example, in for-profit organizations the role of the manager is generally to satisfy stakeholders by creating value while in not-for-profit organizations, managers/administrators place more importance on stewardship (i.e., maintain the confidence of donors).

It is difficult to determine precisely the advent of management thought. Some believe that the ancient Sumerian traders and the ancient Egyptians used management techniques. Some of the accounts of these early managers were lost because most businesses were on such a small scale that a systematic approach to management was not warranted. The wide spread use of Arabic numerals in the fifth century, and the later double-entry book keeping techniques in the fifteenth century, started the development of modern day management. Early

management tools provided managers with the tools to aid in planning and control. The emergence of management theories and the utilization of management functions became widespread after the industrial revolution, with the introduction of large scale businesses (Robbins & Coulter, 1999).

The universality of management functions has made it possible for various cultures to contribute to management thought. A Chinese general, Sun Tzu, wrote *The Art of War* in the sixth century which dealt with managers' need to focus on the strengths and weaknesses of the organization. The Italian, Niccolo Machiavelli, wrote *The Prince* in the sixteenth century and focused on management's need to use fear, not hatred, to control the organization. (Robbins & Coulter, 1999).

Leading

The leading function of a manager involves supervising, controlling and motivating the behaviors of employees to assist in accomplishing corporate goals. This function of management also involves helping employees to accomplish their own personal and career goals through motivation, communication, workplace dynamics, and departmental leadership. Effective managers have the ability to excite employees and increase the level of effort they are willing to put forth toward accomplishing corporate goals (Hofstede, 1980b).

One important aspect of the leadership function is the managers' ability to motivate. To motivate it is important for the manager to understand employees' values, attitudes, behaviors, and personalities. Employees that are motivated generally have better job performance results. Those who are motivated play a greater role in accomplishing organizational goals. Managers can use a variety of tools to motivate employees including

prizes, accomplishment recognition, increased responsibilities and financial incentive programs based on employee specific performance (Ali & Schaupp, 1992).

Another important aspect of leadership is the manager's ability to maintain a productive working environment. This includes helping employees build positive interpersonal relations and group dynamics, problem solving, and improving efficacy through effective communication between the manager and the employees. Effective communication also helps the manager in directing his or her plans (Balkin & Cardy, 2008).

Organizing

The organizing function of management involves the development of the organizational structure and the use of human resources to accomplish organizational goals. Organizing often involves the design of individual jobs, duties, and responsibilities within the organization. Similar jobs and activities are then grouped together in departments which become functional units or parts of the organizational whole (Carroll & Gillen, 1980).

After departments have been established, the manager will determine and classify the extent of power that management will have over subordinates and lower-level managers. This determination of power rankings within the organization is referred to as hierarchy. The division of power defines manager responsibility, increases efficiency and helps to maintain continuity when resolving problems (Robbins & Coulter, 1999).

Organizing involves establishing and maintaining a structure that fits with other organizational processes and factors. It is especially important that the structure facilitate relationship building between the various groups within the organization while creating an efficient flow of information. The establishment of a clear organizational structure allows for

each individual within the organization to understand his or her authority base (if any). It also makes clear the individuals under the manager's supervisory scope and therefore from whom employees are to take orders (Robbins & Coulter, 1999).

Impact of Religion and Social Structure on Leading and Organizing

Given the significance of Islam within Saudi Arabian society and the social structure dictated by the same, the potential minefield for any expatriate manager lies in 'human relations' when managing in this Middle Eastern nation. Therefore, any manager in Saudi Arabia must be willing and able to modify their leadership strategies, styles and behaviors to fit the traditions and customs within that society.

Impact of Religion on Leading

The status conscious nature of Saudi Arabian life means that the leadership function of management, which consist of modifying and supervising the behaviors of employees to accomplish corporate goals, must be implemented with care. Managers must be able to establish a motivational atmosphere by setting a positive example while staying within the strict confines of Islam (Esposito, 2003).

It is expected that the manager of a Saudi Arabian business will value his/her subordinates. The manager must avoid causing a loss of dignity to subordinates. Furthermore, managers must find ways to minimize undue pressure on subordinates to accomplish goals. Saving face is more important than imposing pressure to meet deadlines or improving productivity. It is important for management to show recognition and appreciation to subordinates for their contributions. It is disrespectful for managers to fail to express their

appreciation on a continual basis to subordinates. Employees that feel valued will likely remain with the organization for longer periods of time (Ali, 1986).

Effective leadership in business can be accomplished in many different ways. Saudi managers are expected to spend most of their time outside of their offices. Managers assist subordinates in performing their jobs. This mirrors the importance of strong social bonds in the Islamic faith. Religion also impacts leadership through the use of incentives and rewards. Successful managers in Saudi Arabia reward productive behaviors. A popular reward scheme is through flexible schedules, allowing for time away from work to attend religious ceremonies and social gatherings (Ali, 1986). The hierarchical nature of Islam also means there must be clear lines of power and authority between superiors and their subordinates.

Impact of Social Structure on Leading

The importance of family and personal relationships that are common in Saudi Arabia are also felt in the business environment. It is common and accepted for managers to display favoritism to subordinates with whom they have developed close relationships. Favors that are based on mutual benefit and trust enhance these social values. Family takes precedence over other governing factors in the business environment. Managerial decisions are often determined by the desires of the family (Atiyah, 1993).

The social structure dictates the amount of obedience toward superiors. Saudis are motivated by status and position. It is of great importance for subordinates to show respect to managers and to not question their authority. Saudi managers are authoritarian leaders. They provide clear expectations about what needs to be done and how to do it. This can be problematic for the organization because it stifles creative thinking and dictates that employees

wait to be told what to do rather than making decisions on their own. This impacts the challenges managers face when trying to improve productive behaviors. Another impact that social structure has on leadership is the hiring and firing of friends or family. It is common for managers to hire friends and family. However, this can be problematic when employees are not productive (Ali & Schaupp, 1992).

Honor and reputation also play a big role in the business environment. It is important for managers who are collaborating in group settings to follow certain guidelines. To promote team participation, it is important that managers first establish a non-threatening environment. Managers should then honor the oldest subordinate by allowing them to start the collaboration. Honoring employees can also include the giving of gifts and the recognition of individual employee's anniversary of their hire date (Bell, 1986).

Impact of Religion on Organizing

Islam teaches the importance of family relationships, loyalty and the need to show respect to the elders. Religion forms the basis of the organizational structure. The power is established at the top and dramatically decreases down the chain of command. Introducing flatter systems to the organizational structure with promotions based on verifiable talent, accomplishments and productivity rather than social connections would be seen as a disgrace to the culture, history and religion. Islam is so prevalent in the business environment that decisions made along the chain of command will not be questioned because nothing happens if it is not the will of Allah. It is important for managers to be aware of relationship building both up and down the chain of command. It is not uncommon for subordinates to be promoted to higher managerial positions, replacing their current manager, due to close relationships with

upper management. This type of business practice has some negative and positive aspects. It can serve as a catalyst for building strong relationships with employees up and down the chain of command. However, it can also diminish the value of performance. Employees in this type of environment may believe that achieving personal goals will require organizational politics rather than working harder. This decreases the efficiency of the organization and can cause employee dissatisfaction (Atiyah, 1991).

Impact of Social Structure on Organizing

The organizational structure in Saudi Arabian firms is set up along strong hierarchical lines. This structure emphasizes the Saudi view that it is the manager's job to make decisions and communicate them down the chain of command for implementation. This can be problematic for the manager who does not specifically request certain jobs to be performed. In the strict Saudi hierarchical approach, employees are to follow and managers are to lead. Jobs do not get accomplished if employees are not told to complete them. Functional units are established in this approach to help prevent miscommunication of duties (Ali, 1986).

Social structure also impacts who receives positions of power within the organization. There are strong divisions of power between managers and subordinates within organizations in Saudi Arabia. It is important to respect a manager's position. It is not uncommon for managers to receive their position of power due to family status, class connections or age. It is also very difficult for women to obtain managerial positions within the organization due to their low levels of social status (Bell, 1986).

Conclusion

The discovery of oil reserves in 1953 transformed Saudi Arabia from a trade-based economy to the world's largest exporter of oil. This has opened the door for Saudi Arabia to become a major player in the international business environment. For managers who wish to do business in Saudi Arabia, an understanding of the culture, which is dominated by the religion of Islam, is essential to their success.

To understand the culture of Saudi Arabia, managers must first comprehend the influence that Islam has in all aspects of society and everyday life. Religion governs every part of Arab life and permeates into every aspect of business. The majority of the population adheres to the Wahhabi sect of Islam. The results are a business environment that is very detail oriented, placing an emphasis on expected social behaviors, ethics, and the organizational structure. Managers must be able to motivate employee behaviors without causing a loss of dignity or respect. This forbids placing undue pressure on employees to meet strict timelines, improved performance, or other productivity measures.

Managers in Saudi Arabia must be able to communicate with employees in a highly contextual environment. This includes using body language and eye contact. It is vital that managers understand these nonverbal cues in order to prevent misunderstandings. Managers must also be aware of the use of changing tones in order to show their authority and to gain the respect of their subordinates. To be successful in Saudi Arabian business, managers must value close personal relationships with employees in order to establish trust. This is an essential part of Muslim life. The value of family and relationships is more important than immediate business concerns.

Managers must establish an organizational structure that resembles the strict dichotomy between groups that exists in Saudi Arabian society. To do this, managers need to establish an organizational structure with strong hierarchical lines. This places the power at the top with each subsequent step down the chain of command having a drastic decline in authority. Positions of power can be heavily influenced by familial ties, gender and age. This is in keeping with the need for managers to develop and maintain close personal relationships which are central to success when managing in Saudi Arabia.

References

- Ahlan, Ahmed Hassan, ed. (1990). *Politics, Administration, and Development in Saudi Arabia*.
- Al-Rasheed, Madawi. (2008). *A History of Saudi Arabia*. Cambridge University Press.
- Al-Yassini, Ayman. (1985). *Religion and State in the Kingdom of Saudi Arabia*.
- Ali, A. (1986). Public Managers: Are They Different? A Study of Managerial Belief Systems in Saudi Arabia. *International Review of Administrative Science*, 52: 67-79.
- Ali, Abbas J. and Schaupp, Dietrich L. (1992). Value Systems as Predictors of Managerial Decision Styles. *International Journal of Manpower*, 13: 19-26.
- Atiyah, Hamid S. (1991). Effectiveness of Management Training in Arabic Countries. *Journal of Management Development*, 10: 22-29.
- Atiyah, Hamid S. (1993). Management Development in Arabic Countries: The Challenges of the 1990s. *Journal of Management Development*, 12: 3-12.
- Balkin, David and Robert L. Cardy. (2008). *Management: People, Performance, Change*, 3rd edition, 19-25. New York, New York USA: McGraw-Hill.

- Bell, D. (1986). Production and Distribution within Hierarchically Structured Groups. *Journal of the Steward Anthropological Society*, 16: 96-124.
- Carroll, Stephen J. and Dennis J. Gillen. (1980). Are the Classical Management Functions Useful in Describing Managerial Work? *Academy of Management Review* 12: 38–51.
- Curry, A., and Kadash, N. (2002). Focusing on key elements of TQM- Evaluation for sustainability. *The TQM Magazine*, 14:207-216.
- Esposito, John. (2003). Islam in Saudi Arabia. *Oxford Dictionary of Islam*. Oxford University Press Inc.
- Fischer, A and Anthony Manstead. (2000). *The relation between gender and emotions in different cultures*. 71 – 94. A. H. Fischer (ed.): Cambridge University Press.
- Fisher, Sidney Nettleton. (1990). *The Middle East*. New York, NY: McGraw Hill.
- Hill, Charles. (2009). *International Business: Competing in the Global Marketplace*. New York, NY: McGraw Hill.
- Hofstede, G. (1980). *Culture's Consequences: International Differences in Work-Related Values*. Beverly Hills: Sage Publications.
- Hofstede, G. (1980b). Motivation, Leadership, and Organization: Do American Theories Apply Abroad? *Organizational Dynamics*, 8: 42-63.

Lacey, Robert. (1981). *THE KINGDOM: Arabia & The House of Sa'ud*, Harcourt Brace Jovanovich, Inc.

Lundgren, L. (1998). The technical communicator's role in bridging the gap between Arab and American business environments. *Journal of Technical Writing and Communication*, 28(4): 335-348.

Ménoret, Pascal. (1985). *The Saudi Enigma: A History*. Zed Books.

Metz, Helen Chapin, ed. (1992). *Saudi Arabia: A Country Study*.

Nyrop, R. (1985). *Saudi Arabia: A Country Study*. Washington, DC: U.S. Government Printing Office.

Robbins, Stephen P. and Mary Coulter. (1999). *Management*. Upper Saddle River, NJ: Prentice Hall.

Robins, Stephen P, DeCenzo, David A., and Coulter, Mary. (2011). *Fundamentals of Management*. Upper Saddle River, NJ: Prentice Hall.

A Cross-Cultural Study of Consumer Attitudes Toward Genetically Modified Food in the Philippines and the United States

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ABSTRACT

Foods derived from genetically modified (GM) crops have been a part of the food chain in the United States and the Philippines for more than a decade while incurring little of the controversy exhibited in European countries. GM crops include fruits, vegetables and grains and are the result of a process by which foreign genes are spliced into a related or non-related species resulting in a genetically modified organism. This pilot study examines whether Filipino and American consumers hold different attitudes toward GM food from crops. Surveys of the literature regarding consumer attitudes toward GM foods in developing economies are presented together with an analysis of the political economy and cultural characteristics of the Philippines. The results of this initial study strongly suggest that Filipinos perceive food derived from GM crops to be more useful, more morally acceptable, less personally risky, more economically necessary, and should be more politically encouraged than their American counterparts. This study concludes with a discussion of the ways by which marketers may reduce consumer resistance to food derived from GM food.

INTRODUCTION

Genetically modified (GM) food is food produced from any plant or animal that has been genetically altered during its production using the modern techniques of gene technology. The first wave of GM food possessed enhanced input properties and is producer and environmentally friendly. For example, genes for herbicide resistance have been transplanted from bacterial cells into tobacco plants, demonstrating that these transgenic plants better tolerate the herbicides used for weed control. The second wave of GM foods has enhanced output properties and is designed to be more consumer-friendly. Some examples are fruits and vegetables with higher antioxidant contents to reduce the risk of heart disease, diabetes and cancer as well as rice with higher levels of iron. Other examples of second wave GM foods include milk and other animal products with

healthier fat content and lower levels of allergens and horticultural produce with enhanced flavor, texture, and shelf-life. On the horizon are bananas that produce human vaccines against infectious diseases such as hepatitis B, fish that mature more quickly, cows that are resistant to bovine spongiform encephalopathy (mad cow disease), fruit and nut trees that yield years earlier, and plants that produce new plastics with unique properties .

GM foods provide another market choice alongside conventional foods and organic products. In this current study, attitude and belief dimensions of university students in two different societies are examined from the context of second-generation, value-enhanced GM foods from crops. Specifically, this study attempts to assess the conjecture that Filipino and American consumers harbor different attitudes towards the willingness to purchase GM food.

LITERATURE REVIEW

Consumer Attitudes toward GM Foods

Speaking at the 2006 Agricultural Biotechnology International Conference in Melbourne, Craig Cormick, Manager of Public Awareness for Biotechnology Australia, said "consumer attitudes relating to GM foods are complex and studies that simply ask if people would or wouldn't eat GM foods don't do justice to the complexities of public attitudes." Some literature suggests that cultural determinants play an important role in the consumer's approval of a specific technology, and those beliefs about its benefits and risks are rooted in more general knowledge and attitudes toward nature and technology and are therefore difficult to change. Because these views are also culturally constrained, it is possible that international differences in opinion toward GM food are embedded in these cultural attitudes.

Many studies have focused on consumer attitudes in the United States (Ganiere, Wen, Chern & Hahn, 2006). Surveys by the Pew Initiative on Food and Biotechnology (2005) show American consumers are surprised and even outraged when they learn how pervasive GM foods are. On a scale of 1 to 10 with 10 indicating "very well informed on biotechnology", fifty-three percent rated their awareness at 3 points or below, indicating that they were relatively not well informed regarding biotechnology issues.

Several studies have compared consumer attitudes toward GM foods among developing countries. The University of Washington's IMPACT Center released the preliminary results of a consumer survey done in Mexico, Chile, and India focusing on attitudes toward GM crops (Curtis, McCluskey, & Wahl, 2004). The survey was conducted at grocery stores and in markets, and included both poor and more affluent demographics. In Chile and Mexico, 70% of respondents said they were willing to purchase GM food if it had more vitamins or other nutrients, or used fewer pesticides. In India, approximately 88% of consumers stated that they would buy GM foods. Although the majority of surveyed consumers in China reported that they had little or no knowledge of biotechnology, their attitudes toward (GM) foods were generally positive, especially for GM foods with product-enhancing attributes (Li, Curtis, McCluskey, & Wahi, 2002). These results imply that, unlike Europe and Japan, there is a potential market for GM foods in China and other developing economies. Korean consumers, who have proven to be strongly resistant to

GM products, do show signs of changing attitudes toward GM foods when the promise of its benefits is communicated (Hallman, Jang, Hebden, & Shin, 2005).

Studies that have focused on the consumer acceptance of GM food in less developed countries indicate that technology has a role to play in addressing food insecurity in these nations (Nielsen, Robinson, & Thierfelder, 2001). Consumer surveys in supermarkets, kiosks, and maize mills in Kenya reported that 68% of respondents would purchase GM maize meal at the same price as their favorite brands, although many were concerned with the potential environmental and health risks as well as ethical and equity issues (Kimenju, De Groote, Karugia, Mbogoh & Poland, 2005). Curtis, McCluskey, and Wahl (2004) studied GM food acceptance among developing nations including the Columbia and China. These studies concluded that the generally positive perception towards GM foods in developing nations stems from more urgent needs in terms of food availability and nutritional content. Additionally, perceived levels of risk may be smaller due to somewhat greater trust in government, positive perceptions of science, and positive media influences.

Economic Differences

With a current estimated population of 97.9 million, the Philippines is the twelfth largest country in the world. The 7107 islands that make up the Philippines approximate the land mass of Arizona. The vast majority of the population live on the islands of Luzon, Cebu, Mindanao, Leyte, and Negros. The history of the Philippines is largely characterized by their nearly 400 years of as a Spanish colony and their relationship with the United States. The Philippines were ceded to the United States in 1898 upon the conclusion of the Spanish-American War and became a self-governing commonwealth in 1935. Upon the conclusion of the Second World War, the Philippines became an independent Republic. It is unique in Asia in its religious composition: the predominate religion is Roman Catholic. For both imports and exports, the largest trading partner of the Philippines is the United States. Although the official language of the Philippines is Tagalog, English is widely spoken, especially among the college educated. The educational system is largely modeled on the American system and the literacy rate was recently estimated at 92.7%. Its University system is highly competitive on a global basis. The Philippines is characterized as a developing economy and the most recent estimates of its per capita income is \$3300 on a purchasing power parity basis. By way of comparison, per capita income in the United States is \$46,400. The GINI Index attempts to measure the distribution of income within a country and both the United States and the Philippines would be considered countries in which income and wealth is relatively concentrated. The GINI Index for the Philippines is 45.8 and for the United States it is 45.0 (CIA World Factbook, 2011).

Hofstede's Dimensions of National Character

Geert Hofstede's framework of the cultural dimensions of national character has been a mainstay of research in international marketing since its inception. As developed in his seminal work in the field: *Culture's Consequences, Comparing Values, Behaviors, Institutions, and Organizations Across Nations* (Hofstede, 2001), the five dimensions of national character include Power Distance Index (PDI), Individualism (IDV), Masculinity (MAS), Uncertainty Avoidance Index (UA), and Long-Term Orientation (LTO). Hofstede's framework allows research in international marketing to compare and contrast country markets based upon their underlying cultural dimensions.

With regard to the introduction and assimilation of new products and new technologies such as GM foods, the two dimensions of Hofstede's framework that might be of most interest for the study at hand are the Uncertainty Avoidance Index (UA) and the Power Distance Index (PDI). The Uncertainty Avoidance Index attempts to measure the degree of uncertainty and ambiguity that a society feels comfortable with and has often been employed as a proxy for the diffusion of innovation within a culture. Those cultures which are uncertainty avoiding attempt to minimize the possibility of such situations by strict laws and rules as well as safety and security measures while cultures that are uncertainty accepting cultures are more tolerant of opinions different from what they are used to and typically have as few rules as possible. Both the United States (UA = 41) and the Philippines (UA = 40) have UA scores which would seem to indicate an openness to the possibility of GM foods. Previous research (Curtis, McCluskey, & Wahl, 2004) has noted the possibility of somewhat greater trust in government, positive perceptions of science, and positive media influences as playing a role in more positive perceptions of GM food. Such constructs may well be captured in Hofstede's Power Distance Index. Formally defined, the Power Distance Index (PDI) holds that the extent to which the less powerful members of organizations and institutions accept and expect that power is distributed unequally. The PDI ratings for the Philippines – 95- and the United States – 38 – are vastly different.

Table 1: Hofstede's Dimensions of National Character

	Philippines	United States
Power Distance	95	38
Individualism	35	88
Masculinity	70	68
Uncertainty Avoidance	40	41
Long-Term Orientation	25	32

OBJECTIVES AND HYPOTHESES OF THE STUDY

The central focus of this study is whether Filipino consumers view GM foods more positively than their American counterparts. Paralleling the research of Le Marre et

al., (2007) on American and French attitudes toward GM foods, this study incorporates the constructs of usefulness, moral acceptability, personal risk, economic necessity, and social imperative to examine attitudes toward GM crops and GM livestock. Consequently, the primary research objective can be expressed in the form of the following five hypotheses:

H1: Filipinos will have a more favorable attitude regarding the usefulness of GM food than Americans.

H2: Filipinos will have a more favorable attitude regarding the moral acceptability of GM food than Americans.

H3: Filipinos will have more positive perceptions of the personal riskiness of GM food than Americans.

H4: Filipinos will have a more favorable attitude regarding the economic necessity of GM food than Americans

H5: Filipino perceptions that social and scientific policy toward GM foods should be more encouraged will be more positive than Americans.

METHODOLOGY

The research setting of our study focused on upper-level undergraduate students from the United States and the Philippines majoring in Biology. Students enrolled in Microbiology, Biotechnology and Genetics courses were offered a modest extra-credit incentive to participate in the study and participation was virtually 100%. This research setting was chosen because potential respondents would have been exposed to significant course material regarding genetic theory and bio-engineering issues. Of the 172 respondents, 94 were from the United States and 78 were from the Philippines. Our survey utilized a password-protected website in order to increase efficient data collection and control multiple submission issues. The survey questionnaire was largely based upon measures utilized in a cross-cultural analysis of French and American attitudes towards first and second-generation GM food published by Le Marre et al. (2007). These Likert measures were modified to reflect the purpose of our study comparing Filipino and American attitudes toward foods from GM crops (*ex: Food derived from GM crops is useful*). Respondents utilized a 5 point scale where 1 = strongly agree, 2 = mostly agree, 3 = neither agree nor disagree, 4 = mostly disagree, and 5 = strongly disagree. The survey as it appeared in both the American and Filipino versions is reproduced in the Appendix. The Filipino version of the survey was in English as all students were fluent in English. The data was analyzed using SPSS 14.0 for Windows.

RESULTS

Descriptive statistics from the study are presented in Table 2 and include the mean, sample size, standard deviation, and standard error of the mean.

Table 2: Group Statistics Regarding GM Foods

Variables	Mean	N	Std. Dev.	Std. Error Mean
American Belief in Usefulness	2.14	94	0.833	0.089
Filipino Belief in Usefulness	1.43	78	0.499	0.061
American Belief in Moral Acceptability	2.56	94	0.882	0.094
Filipino Belief in Moral Acceptability	1.69	78	0.656	0.080
American Belief in Riskiness	2.68	94	0.977	0.104
Filipino Belief in Riskiness	3.45	78	1.063	0.130
American Belief in Necessity	2.62	94	0.951	0.101
Filipino Belief in Necessity	1.87	78	0.919	0.112
American Belief in Encouragement	2.63	94	0.938	0.100
Filipino Belief in Encouragement	1.72	78	0.714	0.087

Further analysis of the data was performed utilizing paired t-tests to measure the differences between Filipino and American attitudes toward food derived from GM crops. These results are presented in Table 3. Statistically significant differences were reported across all five variables: Usefulness, Moral Acceptability, Risk, Necessity, and Encouragement. As can be seen, all 5 sub-hypotheses were confirmed at the 95% confidence level. For H1, Filipinos were found to perceive food from GM crops to be more useful than Americans ($t = -6.124$, $p = 0.000$). For H2, food derived from GM crops was found to be more morally acceptable for Filipinos than Americans ($t = -6.771$, $p = 0.000$). For H3, Filipinos perceived food derived from GM crops to pose less risk than did Americans ($t = 4.654$, $p = 0.000$). For H4, food derived from GM crops was found to be more necessary by Filipinos over Americans ($t = -4.996$, $p = 0.000$). For H5, Filipinos believed food derived

from GM crops should be more socially and scientifically encouraged than did their American counterparts ($t = -6.602$, $p = 0.000$). Based upon the findings from our set of five hypotheses, we can accept our central hypothesis that Filipino undergraduate biology students possess a more positive attitude than American undergraduate biology students toward food derived from GM crops.

Table 3: Paired Samples t-tests of American Attitudes toward Foods vs. Filipino Attitudes toward GM Foods

Variables	Mean Difference	t-value	Significance
Usefulness	-0.704	-6.124	0.000
Moral Acceptability	-0.870	-6.771	0.000
Riskiness	0.766	4.654	0.000
Necessity	-0.759	-4.996	0.000
Encouragement	-0.909	-6.602	0.000

LIMITATIONS OF THE STUDY

The limitations to this study mirror those of survey-based studies in general. The first of these limitations is that the data is based upon the self-reported responses of survey participants. While the reporting of attitudes toward GM food is not as controversial as some topics, there remains an element of social bias that cannot be discounted. Nevertheless, the research methodology and the instructions in the survey offered the promise of confidentiality as well as anonymity to respondents thus helping to minimize the social bias problem. A second area of limitations to our study lies in the choice of our sample frame. The conclusions offered in this study are limited to undergraduate Biology majors who have been exposed to a significant amount of training in microbiology, genetic theory and biotechnology issues and may not apply to the general population. As was discussed earlier, this population was specifically targeted in

order to minimize the problem encountered in earlier studies of surveying respondents who had little or no educational background in genetics or biotechnology.

CONCLUSIONS

The diffusion of GM food technology has been underway for the better part of two decades. This study confirms and extends the research stream which demonstrates that developing economies have more positive attitudes toward GM foods. In this study, consumers in the Philippines have been shown to have more positive attitudes to these foods based upon the grounds of moral acceptability, risk to human health, and the usefulness and necessity of the innovation.

RECOMMENDATIONS FOR FUTURE RESEARCH

The diffusion of innovations is an area of research whose boundaries are constantly expanding. This is particularly the case regarding GM foods in cross-cultural studies in general and from developing countries in particular. Directions for further research in this area include studies on the attitudes of the general public rather than the sample of biology majors utilized in this study. Other potential research in this area might be directed at cross-cultural consumer attitudes toward food derived from GM livestock. The definition of GM livestock includes livestock which have been fed with GM feed, livestock which have been injected with GM additives, and livestock which have been genetically modified themselves. Future research projects might attempt to determine if public attitudes towards these three categories of GM livestock differ. In addition, further international marketing research utilizing the Philippines as a research setting is highly recommended given the substantial population, strategic location, and historical ties with the United States.

REFERENCES

- Baker, G. A., & T. A. Burnham (2001), Consumer response to genetically modified foods: Market segment analysis and implications for producers and policy makers. *Journal of Agricultural and Resource Economics*, 26, 2:387-403.
- Brookes, G. & P. Bartoot (2005), GM crops: the global economic and environmental impact. *AgBioForum*, 8(2&3), 187-189.
- Chern, W.S. & K. Rickertsen (2001), Consumer acceptance of GMO: Survey results from Japan, Norway, Taiwan and the United States. *Taiwanese Agricultural Economic Review*, 7, 1-28.
- CIA World Factbook (2011), Retrieved on February 5, 2011 from <https://www.cia.gov/library/publications/the-world-factbook/geos/rp.html>
- Curtis, K.R., J.J. McCluskey, & T.I. Wahl (2004), Consumer acceptance of genetically modified food products in the developing world. *AgBioForum*, 7(1&2), 70-75.

- Ganiere, P., S. Wen, K. Chern & D. Hanh (2006), A continuum of consumer attitudes toward genetically modified foods in the United States. *Journal of Agricultural and Resource Economics*, 31(1), 129-149.
- Hallman, W.K., A.O. Adelaja, B.J. Schilling, & J.T. Lang (2002), Consumer beliefs, attitudes, and preferences regarding agricultural biotechnology. *Food Policy Institute Report*, Rutgers University, New Brunswick, NJ.
- Hallman, W.K., H.M. Jang., C.W. Hebden & H.K. Shin (2005), Consumer acceptance of GM food: A cross cultural comparison of Korea and the United States. *Food Policy Institute Report*, Rutgers University, New Brunswick, NJ.
- Hofstede, Geert (2001), *Culture's Consequences, Comparing Values, Behaviors, Institutions, and Organizations Across Nations*, Thousand Oaks CA: Sage Publications.
- Kimenju, Simon Chege , Hugo De Groote, Joseph Karugia, Stephen Mbogoh, & David Poland (2005), Consumer awareness and attitudes toward GM foods in Kenya. *African Journal of Biotechnology*, 4(10), 1066-1075
- Le Marre, K.N., Wine, C.L., Burkink, T.J., M.Grunhagen, & G.J. Wells (2007), A second generation of genetically modified food: American vs. French perspectives. *Journal of Food Products Marketing*, 13(1), 81-100.
- Li, Q., K.R. Curtis, J.J. McCluskey, & T.I. Wahi (2002), Consumer attitudes toward genetically modified foods in Beijing, China. *AgBioForum*, 5(4), 145-152.
- Nielsen, C.P., Robinson, S., & Thierfelder, K. (2001). Genetic engineering and trade: panacea or dilemma for developing countries. *World Development*, 29(8), 1307-1324.
- Pew Initiative on Food and Biotechnology (2005), Public sentiment about genetically modified food. Retrieved on July 15, 2011 from <http://pewagriotech.org/research/2005update/2005summary.pdf>

**BROADENING OUR UNDERSTANDING OF THE PHILOSOPHICAL
UNDERPINNINGS IN THE CHANNEL OPERATIONS AREA**

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ABSTRACT:

In the area of channels operations the focus has been naturally enough mainly on logistical issues. This is a stream of research that focuses on the power issues that develop between organizations or more precisely buyers and sellers in organizations (the dyad).

In a series of papers of which this is one, the author is suggesting that there are Sociological mechanisms at work in dyadic interchange from which power issues are the result not the main mechanism. By viewing the main function of management as the handling of environmental uncertainty as suggested by Achrol and others, these drivers of environmental uncertainty could serve as the starting point for examining channel dyad functioning. This is not to relegate power issues to the scrap heap. They are still the main result of the interaction and change in lockstep with each interaction, but they do not remain the central mechanism.

Then the Sociological mechanisms will be examined through expectations and disconfirmation. The result of these phenomenon include Performance and Sentiment, part of which is the resulting power issues

BROADENING OUR UNDERSTANDING OF THE PHILOSOPHICAL UNDERPINNINGS IN THE CHANNEL OPERATIONS AREA

In the area of channels operations and interaction the phenomenon of social power has been the primary focus of our understanding. This stream of several articles has been referred to as the channels power area. This stream proceeds through a consideration of power, the use or withholding of power and the sources of power employed by the seller in the buyer/seller dyad. This suggests that power in its various social forms is the sole influence channel operations and interaction. The purpose of the present paper is to suggest sociological interaction is at center stage while recognizing power as one of the results from this interaction along with channel performance. In the power stream of literature the starting point is a questionnaire for which the domain of items includes the types of social power employed and their effect on channel performance and sentiment, including power. This gives direction to the seller in the dyadic interaction concerning which types of power to use, which to avoid and how to employ those employed. But the dyad is a sociological phenomenon and as such works through sociological mechanisms.

To address this issue the writer has planned a research stream with three separate sections to result in a final manuscript. The first of these three sections is an attempt to use work from the organizational literature (Thompson, 1967) [4] and extended by Achrol (1986b) [1]. Thompson and others state that the central role of management is dealing with uncertainty. The uncertainty dealt with in this work includes two of the three types of uncertainty from organizational theory and narrowed down to uncertainty pertaining to Diversity among Consumers , Dynamism, Concentration and Capacity by Achrol (1988) [2] This would replace power with uncertainty as the starting point of channels operations.

The channel dyad represented by the buyer/seller interface is the sociological setting to be examined in this research. This is the second section of this conceptualization, an examination of the two sociological mechanisms suggested to exist in the channel dyad (buyer-seller interface). This second section of the three is where most work has been done on this research to date. Two sociological mechanisms have been proposed, the questionnaires have been distributed and are being returned currently. After the hopeful establishment of the two mechanisms, the measurement of the relationship of uncertainty with these mechanisms will be investigated.

Then the third section will investigate the results of uncertainty working through the sociological mechanisms resulting in matching, exceeding or failing to reach performance expectations.

In summation, the overall process for the three sections amounts to employing Achrol's scales of uncertainty in the first part of the research (Measuring Uncertainty). Next these will be related to the internal workings of the sociological mechanisms in the channel dyad. Finally, these two sociological mechanisms will be related to the buyer's

perspective of channel operations as measured by his expectations being unaltered, enhanced or set at a lower standard in the third part of the research (Expectations, the Result of Channel Operations).

The first section sets the stage for Thompson's asserting that uncertainty and handling it are management's main function. Thompson outlined three main sources of organizational uncertainty. The first of these is Generalized Uncertainty which is external to the organization and concerns decision-makers facing this environmental uncertainty including our channel dyad decision-makers. Researchers have developed a list of the dimensions of organizational uncertainty from the political-economy and channels literature. Achrol (1986b) [1] produced a list of these dimensions from the organizational behavior literature: Capacity, Diversity, Interdependence, Concentration, Dynamism, dimensions while employing a two-tier linkage. Their paper resulted in the rejection of a two-tier linkage and the suggestion that four dimensions be used in future work, Diversity among Consumers, Dynamism, Concentration and Capacity.

A questionnaire will be developed to measure uncertainty faced by buyers in the channel dyad using Achrol and Stern's (1988) [2] four dimensions (Uncertainty in the Dyad). These will be related to the two sociological mechanisms in the second section of the overall research (Sociological Mechanisms in the Dyad). Finally, the results will be related to the expectations of the organizational buyer (Expectations, the Sociopolitical Result of Dyadic Interaction).

UNCERTAINTY IN THE DYAD

In the conceptualization of channel influence which is here suggested it is expectations that are viewed as the philosophical underpinnings of dyadic interaction. Power is viewed as a derived and related phenomenon to the two sociological mechanisms and expectations.

SOCIOLOGICAL MECHANISMS IN THE DYAD

It is suggested that there are two sociological mechanisms at work in the channel dyad to influence the buyer's behavior. The first is the overall image of the firm supplying goods through the dyad. This would include such things as the firm's expertise in this business area, special knowledge of the product, market and distribution and its size and reputation in the business area. This is termed, "Persuasion by Reference." These characteristics of the selling firm enhance the buying firm's desire to be associated with it and are the factors of the selling firm's image and influence.

The second sociological mechanism at work to assert influence on buyer behavior is termed, "Coping Tactics." It includes resorting to any promotional activity or to the terms of the contract to gain compliance. These would be less commonly used and then only when it is felt necessary to gain compliance and the sales levels projected. The chance of negative sentiment is much more likely to be carried over with this mechanism.

The second major departure of this conceptualization from the power stream of literature is the collection of data to measure channel operations. Instead of using the various

forms of social power, it is proposed to use measures of environmental uncertainty faced by decision-maker within channel dyads.

EXPECTATIONS, THE SOCIOLOGICAL RESULT OF DYADIC INTERACTION

Expectations will be measured by a questionnaire yet to be developed. Some research in this area demands data collection both before and after. Should this be found to be absolutely necessary, this third part of the research will not be attempted. The development of this questionnaire will follow the item development suggested by Oliver (1980) [3]. There had been further work done in this area of questionnaire development.

REFERENCES

- [1] Achrol, R. S. (1986b), "Dimensionalizing Marketing Channel Environments: Concept Based Measures and Their Psychometric Properties," working paper, University of Notre Dame.
- [2] Achrol, R. S. and L. W. Stern (1988), "Environmental Determinants of Decision-Making Uncertainty in Marketing Channels," Journal of Marketing Research, Vol. 47 (February), (p. 36-50)
- [3] Oliver, Richard, (1980), "A Cognitive Model of the Antecedents and Consequences of Satisfaction Decisions," Journal of Marketing Research, Vol. XVII (November, 1980) (p. 460-9)
- [4] Thompson, J. D. (1967), Organizations in Action, New York: McGraw-Hill

HEALTHCARE AND HIGHER EDUCATION: SHARED LESSONS IN LEAN

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ABSTRACT

Healthcare and higher education share similar challenges: increasing demand for services, a cost structure growing faster than the rest of the economy, lack of transparent pricing, and highly educated labor-intensive workforce. Since both fields are experiencing pressure to reduce costs, are there lessons they can learn from each other about best practices in applying Lean principles? This paper examines some of the Lean tools employed by both healthcare and higher education. The distinctive characteristics of these industries make sharing Lean tools difficult, but each industry can glean new ideas and approaches from sharing tools and reporting processes.

INTRODUCTION

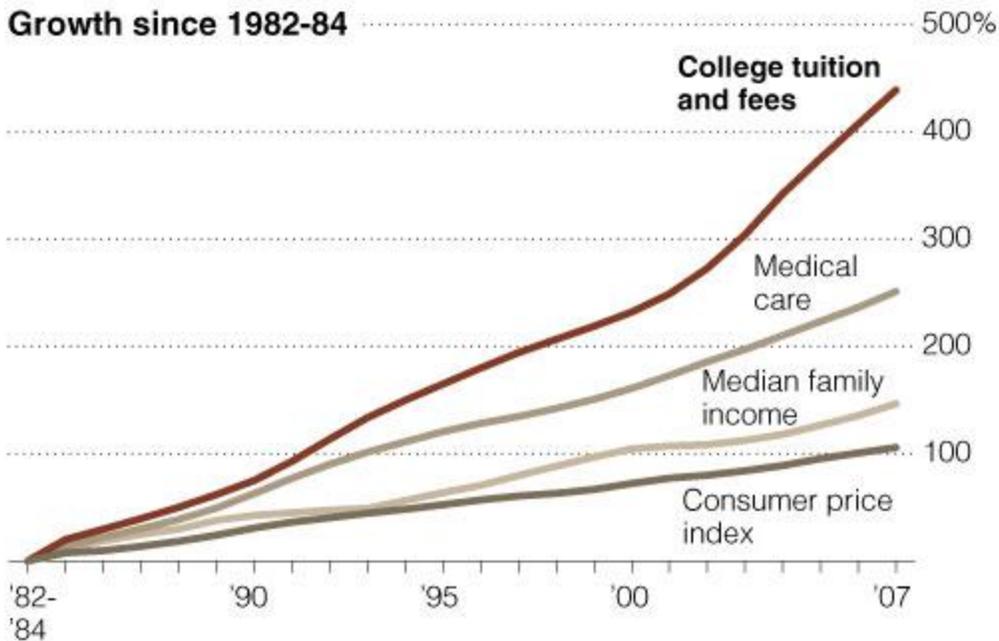
Inarguably, two of the greatest supporting pillars of American society are higher education and healthcare. Costs in these industries are growing at rates higher than the underlying economy. One estimate based on S&P Healthcare Economic Indices shows that the average per capita cost of healthcare services covered by commercial insurance and Medicare grew 5.71% over the 12 months ending in July 2011. [1]

One website reported that from 1980 through 2010, the top 5% of households saw their real incomes increase by 71.5%. During this period, inflation-adjusted medical costs grew by 241%, while the real costs of college tuition and fees rose 596%. [14] The 2008 New York Times graphic, Figure 1, shows the similar story over a slightly different period.

In today's uncertain economic climate, both fields are suffering greatly and face danger of self-implosion. Healthcare organizations and universities must adopt measures which serve the dual function of leveling the economic playing field for the institution while providing greater value to the consumer. Both systems have struggled internally in the last decade, with varying results, to rise above a system originally designed for an earlier, less complex America. Both are now reeling from the effects of comprehensive, consumer- and government-driven reform initiatives. With the current state of the American economy and the less-than-positive outlook for the foreseeable future, both healthcare and institutions of higher learning must develop a sense of urgency for revolutionary, dramatic change.

Soaring College Tuitions

College tuition continues to outpace median family income and the cost of medical care, food and housing.



Net college costs as a percentage of median family income*

INCOME CATEGORY	FOUR-YEAR PUBLIC		TWO-YEAR PUBLIC	
	1999-2000	2007-8	1999-2000	2007-8
Lowest	39 %	55 %	40 %	49 %
Lower-middle	23	33	22	29
Middle	18	25	15	20
Upper-middle	12	16	10	13
Highest	7	9	6	7

Note: Net college costs are tuition and room and board minus financial aid.

Source: "Measuring Up 2008," the National Center for Public Policy and Higher Education

THE NEW YORK TIMES

Figure 1. [11]

The nature and scope of the problem facing healthcare and higher education was a topic of discussion at the Milken Institute's Global Conference on "Shaping the Future" (April 26-28, 2010), a conference which gathered leading thinkers and "doers" from various nations to discuss global issues and attempt to suggest solutions. During this conference, the following test was administered to participants in the discussions: [7]

- Success requires that _____ empower consumers and become much more personal. (Answer: Education)
- Success in _____ requires a greater focus on outcomes and access and new collaborations for improvement. (Answer: Healthcare)
- In _____ learning from failure is as important as learning from success. (Answer: Healthcare)
- To improve _____ we must aggregate, absorb, and act on information. (Answer: Healthcare)
- Americans are accustomed to being number one in _____. We are too fat, dumb, and happy to recognize that we have fallen behind. (Answer: Education)

Participants were in good company if they missed a few items. The lines between policy issues and conversations that concern healthcare and education are becoming more and more blurred as consumers demand higher quality and improved outcomes from both, and governmental policy making seeks to meet these demands. Far from being two totally separate and distinct entities without much in common, the two actually share many similarities – not the least of which are unwieldy and complicated organizational structures, lack of effective communication or transparency across a variety of service providers, and crushing and unsustainable cost increases in most cases outstripping the annual rate of inflation.

In order to understand the underlying issues, one must first understand the similarities. A close examination reveals the following: [5], [7]

Higher Education	Healthcare
“Student Centered” – services revolve around and designed for improvement for the end consumer; BUT - organized and structured for convenience of institution, offering courses at times and places that are not the most convenient for student access	“Patient Centered” – services revolve around and designed for improvement of health for the end consumer; BUT - organized and structured in “silos” which require long waiting periods for services and providing the same information multiple times, services not offered at times and places most convenient to patients
Professors/instructors for allied health professions are in many cases healthcare practitioners; train nurses and non-physician providers in schools that are part of university or college systems	Healthcare practitioners “moonlight” in educational institutions as professors/instructors for allied health and medical academic programs
Service provider; success and increased enrollment, revenue generation depend on strong reputation and customer satisfaction with quality of instruction provided	Service provider; volumes and revenue strongly dependent on reputation for quality and customer satisfaction with services provided
Quality determined through consumer feedback and success rates rather than sales-oriented or product-driven	Quality determined through success rates (good patient outcomes) and patient feedback on satisfaction with services provided

High level of competition for customers requires constant reinvestment in resources to drive innovation, develop new curricula, attain high customer satisfaction, and maintain cost-effectiveness	High level of competition for consumers requires constant reinvestment in technology and resources that drive customer satisfaction and innovation (but are not always cost-effective)
Attracts individuals who are interested in social causes and societal improvement	Societal causes and improvement are intrinsic qualities for the majority of those individuals who choose healthcare as a profession
Labor-intensive, largest investment is in the human resource; salary and benefits often represent more than 50% of the operating budget	Labor-intensive, dependent on the human resource for customer satisfaction and quality outcomes; salary and benefits often represent more than 50% of the operating budget
Employ a diverse population in terms of ethnicity, job function, and level of education; spectrum ranges from professors to custodial, maintenance, clerical staff	Employ a diverse population in terms of ethnicity, job function, and level of education; spectrum ranges from physicians to custodial, maintenance, clerical staff
Hierarchical; professors receive respect and deference as highly-educated individuals. Departments divided along department lines (e.g., business and humanities) with a department chair of each.	Hierarchical; physicians receive respect and deference as highly-educated individuals. Departments divided along clinical lines (e.g., oncology and neurosurgery) with a chief at the head of each department
Lack of pricing transparency; aid package formulas not available to consumer; students and parents unable to accurately predict true out-of-pocket cost for education	Lack of pricing transparency; multiple pay sources and pricing structures, hospital staff and patients unable to accurately predict true out-of-pocket cost for healthcare services
More prestigious institutions generally accept only the highest performing academic students; would not consistently accept high-risk students for enrollment	Highly prestigious transplant centers strive to accept only those patients whose risk of mortality and/or morbidity is lower so that publicly-reported data reflects "quality outcomes"
"Decision by committee"; input sought from faculty members for decision-making, which results in slow rate of change	"Decision by committee"; input must be sought from physicians who are often reluctant to embrace changes required to respond to an ever-changing consumer and regulatory marketplace, resulting in slow rate of change
Generate huge amounts of data on students, services, outcomes for competitive purposes, but data not widely shared, which may contribute to inability of the consumer to determine true value of the services provided	Generate huge amounts of data which is "benchmarked" against other organizations for competitive purposes, but data not widely shared outside organization; leads to inability of consumer to determine value for healthcare dollar expended

A number of initiatives have arisen in recent years which seek to change the status quo in both arenas. Healthcare is moving from a fee-for-service model, where reimbursement for services is driven by the number of treatments or tests provided to the patient, to an outcomes-driven model, where providers receive reimbursement predicated on the *efficiency* and the *effectiveness* of the care provided. Similarly, in higher education there are pilots emerging which examine the effectiveness of early enrollment of high school students in college-level courses in decreasing the need for postsecondary remedial education courses and increasing graduation rates among enrolled students. [12]

Recognizing the differences between healthcare and higher education reveals several important places where each industry faces unique challenges:

Higher Education	Healthcare
Colleges and universities can have selective policies based on admissions criteria.	Hospital emergency departments are required by law to see all patients.
Service delivery is predictable as classes start and end at scheduled times.	Service delivery is scheduled at approximate times, with expected waits of an hour or more.
Most service delivery is in groups (classes) with 20-30 or more students.	Most service delivery is one patient at a time.
Government regulations are present to a moderate extent. There is a lack of clear, reliable data on success of higher education institutions.	Government regulations are present to a high degree. Healthcare organizations must make readmission, mortality, and other relevant data publicly available.
A college education is optional.	Healthcare is not usually optional.
Prices vary widely depending on the type of school and degree.	Price variation is smaller as government and insurance companies control reimbursement.
Higher education involves a mental, social, and psychological transformation.	Healthcare involves a physiological and/or psychological transformation.

LEAN HEALTHCARE

In healthcare, the issue of consumer-driven change is one of immediate urgency. In the past fee-for-service model, the volume of services provided drove the ultimate financial success of the institution. Passage of the Affordable Care Act in 2010 has completely redefined the reimbursement climate for healthcare in the United States; the Act seeks to slow the unsustainable increase in healthcare spending by placing emphasis on “value-based purchasing” initiatives and ferreting out fraud, abuse, and waste. Decreasing reimbursement combined with increasing regulatory requirements (mostly unfunded) has produced an environment where the elimination of waste is a paramount objective.

Consumers and payors are demanding higher value for the healthcare dollar, and are highly aware that in spite of being number one in healthcare spending per capita globally, the United States is ranked thirty-seventh among all developed nations for healthcare outcomes. [15] The Inspector General of the U.S. Department of Health and Human

Services (HHSIG) released an audit in July 1997 that suggested that fraud and abuse in the Medicare program totals as much as \$23 billion a year, or 14% of the traditional Medicare program expenditures. A 2010 report by accounting giant Price Waterhouse Cooper estimated wasteful spending in the health system consumes up to \$1.2 trillion of the \$2.2 trillion expended annually for healthcare services – or more than half of all health spending. [13] Healthcare operations are rife with duplication of services, inefficiency and accompanying higher cost for consumers and payors; shifting of this cost to commercial payors and healthcare consumers, an option practiced by healthcare institutions and individual providers for many years, is no longer a viable long-term option.

To combat decreasing revenues and a rise in the number of uninsured patients due to current economic factors, healthcare must develop key initiatives to seek out and eliminate waste and inefficiency in healthcare services. To this end, the initiation of Lean principles, long embraced by manufacturing, is a viable, if not ideal, option for healthcare providers (particularly hospitals). The five-step thought process for guiding the implementation of Lean techniques provides a solid outline for decreasing waste and increasing value to the ultimate healthcare customer – the patient. This process includes the following steps:

- (1) Specify value *from the standpoint of the patient* for each healthcare process or service.
- (2) Identify all the steps in the value stream for each process or service, eliminating whenever possible those steps which do not add value in the eyes of the patient.
- (3) Make the value-creating steps occur in tight sequence so the product flows smoothly *toward* the customer.
- (4) As flow is introduced, let patients *pull* value from the next upstream activity.
- (5) As value is specified, value streams are identified, wasted steps are removed, and *flow* and *pull* are introduced, begin the process again and continue it until a state of *perfection* is reached in which perfect value is created with no waste. [10]

A visual representation of these five principles is shown as follows:



Figure 2. Steps in the Value Stream

The cycle as presented is one of continuous improvement and patient-driven value. For healthcare implementations in particular, a key component of Lean that must be implemented and consistently performed is observation (or “going to the Gemba” in Lean parlance) of the work in process to identify and *quantify* areas of waste and inefficiency. This is a paramount step in the success of Lean initiatives in healthcare since few healthcare processes are “standardized” across individual institutions or even across individual professional practice.

Another paramount step in a healthcare implementation is the empowerment of the front-line healthcare workforce to initiate improvement and change *immediately*, wherever and whenever they are identified. To truly implement Lean successfully in the healthcare environment, traditional hierarchical structures and “decision by committee” must be minimized or eliminated in some instances so that effective change may occur. Along with this, organizational culture must shift toward a “Just Culture”, where learning from errors, lapses and mistakes is emphasized over punishment of those individuals involved. Traditional behaviors and “class barriers” between professions (e.g., nurse-physician relationships and communications) must be modified so that barriers to effective communication are removed. Interdisciplinary collaboration and cross-channel communication in an atmosphere of cooperative teamwork must be the norm.

A 90-bed general acute-care hospital located in a small southeastern city, is one such hospital that has recently undergone a Lean implementation, driven from the ground up by employees empowered to drive improvements without the necessity of involving numerous committees or individuals in the decision-making process. Implementation of Lean was generated through the hospital’s Service Excellence program, in which a select group of outstanding employees are identified annually to serve as “Service Excellence Advisors” (SEAs) for the organization. The hospital sponsored a certification in Lean methodology and team facilitation for the Director of Quality, who then developed and taught a curriculum to the SEAs to roll out to all hospital employees.

Once their education was completed, the SEAs were then utilized as peer instructors to roll out the Lean curriculum. Hospital administration assisted the effort by designating these classes as mandatory education for all staff members. Employees are empowered by hospital administration to seek out and identify waste and promote and facilitate Lean initiatives for its elimination. Lean projects and their results are reported up through the hospital’s quality committees to the hospital’s Board of Trustees and medical staff. While in its early stages of implementation, the unique approach to implementation demonstrated by this hospital shows promising early results.

LEAN HIGHER EDUCATION

Many leaders in Higher Education consciously reject applications of trendy business ideas to the hallowed halls of intellectual ideals. But the current growth rate of costs in higher education is not sustainable. Educational leaders must recognize that they need tools to make institutions do more with fewer resources.

Kaizen, the lean term representing continuous improvement, suggests that all organizations have opportunities to dig deeper in eliminating waste. Higher education in particular might utilize one Lean technique called the 5 Whys to identify root cause for the sake of improvement. In this technique, you ask why over and over until you get to the root cause. A big “Why” that higher education should be asking is “Why are college costs rising so fast?”; the answers to this question could drive the initiation of value-driven solutions and initiatives for the elimination of identified waste so that the higher education consumer receives the most value for their educational dollar.

Waste in higher education may take the form of excessive or redundant programs and services. Robert Dickeson authored an effective resource to identify which programs to cut in his book, *Prioritizing Academic Programs and Services: Reallocating Resources to Achieve Strategic Balance*. [3]

In his book and website, Dickeson identifies several key sources of soaring college costs, many of which parallel the identified cost drivers in healthcare:

1. **Labor intensive.** Over 75% of college costs go to pay salaries for faculty and staff. There is little room to achieve efficiency by higher student/faculty ratios without compromising the nature of service delivery.
 2. **Tenure.** Tenure has evolved from a system designed to protect academic freedom to a system designed to create job security. Once tenured, some faculty members lapse into less productive practices. In a corporate environment, these underperformers would be cut.
 3. **Highly Regulated.** Public schools are subject to a variety of federal and state governmental requirements, many of which are unfunded. These regulations require regular reports, thus increasing the need for additional staff.
 4. **Slow change processes.** The systems inherent in higher education require faculty participation, oversight, and approval in order for change to take place. As faculty seek to guard their own disciplines, they are resistant to any change which shrinks their domain.
 5. **Internal subsidization.** There is no relationship between the costs of a program and the revenue it generates.
 6. **Pressure to improve amenities.** As colleges compete with each other for top scholars, students expect quality dorms and apartments on campus, convenient food courts, and expanded facilities for athletics and entertainment.
 7. **Accreditation.** Government mandated accreditation (e.g., AACSB, NCATE) increases costs without comparable increases in funding.
 8. **Expensive pursuit of top students.** To play the ratings game, colleges and universities court top students with full scholarships in hopes of seeing their average SAT rise. All schools aggressively pursue the same small pool of high performers.
- [3], [4]

In response to these cost drivers, schools are looking to reduce costs without reducing value for the student’s academic experience. Those tradeoffs are difficult to measure, especially on the front end of the transaction. Resources such as the National Survey for

Student Engagement (NSSE), retention rates, and other success measures can help institutions recognize and correct student dissatisfaction.

Program Cuts

Dickeson identified a system of evaluating all academic and administrative programs by requiring reports from each subunit or department with parallel statistics and qualitative justification for their program. A committee made up of administrators and faculty would then review these reports in order to sort programs into five tiers based on program quality, necessity, efficiency, and resource generation.

Top tier programs should be recognized, celebrated, and perhaps receive additional resources. Bottom tier programs would receive serious scrutiny, and some would be consolidated or phased out. [3]

The process of generating reports and sorting out these programs into tiers is labor intensive, subjective, and subject to the personalities on the committee. Therefore, selecting members for the committee is a crucial step; in line with the Lean philosophy, institutions may be wise to consider forming focus groups of their consumers (students, parents) to provide the value-based focus and feedback that is currently lacking in the present structure. Faculty elections may be another way to help faculty members feel that the process was somewhat democratically driven and fair. Colleges and universities across the country have experienced program cuts in one form or another, whether top down or committee led, as Dickeson describes. [3]

***Muda* (Waste) Elimination Everywhere**

Since higher education is less process-driven than healthcare, the same approach to Lean implementation may not be the best for driving true change. Many of the underlying principles of Lean would not be applicable to such an environment; however, one principle that both share in common is that there is waste inherent and identifiable in both institutions. The elimination of *muda* (waste) is the key commonality between both. One systematic way to look for excess waste or *muda* is to look for the eight wastes in the Toyota Processing System, developed by Taiichi Ohno. These wastes include overproduction, waiting, transporting, processing, inventory, movement, defects, and intelligence. Although all these wastes are difficult to apply to higher education, there are ways that some of them can be relevant to both higher education and healthcare.

To apply overproduction to higher education, one must think in terms of intellectual property rather than multiple diagnostic tests or procedures. Multiple classes of similar nature with small class sizes, application of tenure where underperformers are protected and value to the student is sacrificed to the emphasis on seniority, the lack of consideration of student input in course offerings and scheduling, and even perhaps the flow of coursework through the student's chosen curriculum may all be areas that institutions of higher learning may want to explore to affect change.

Cost Cutting 101

Organizations everywhere are looking for quick ways to trim costs. Departments can make incremental changes and cut costs by 10%. These can include consolidating holiday parties

and special celebrations to a single event, firing underperformers (including supervisors), and taking a hard look at other miscellaneous spending. [2]

Savings of 20% require removing lowest-value structural elements. Coyne recommends combining fractional full-time-equivalents in multiple departments into a single employee where feasible. At the 20% savings level, most organizations will need to see processes redesigned. Achieving 30% cost savings will require cutting into the meat of the organization, requiring the elimination of programs. While Coyne gave examples, there were not directly applicable templates for success across industries. [2]

Many colleges and universities have experienced over ten years of tight budgets, and at some point, telling colleagues to continue cutting costs another 10% this year is not feasible. Growing out of a financial crisis requires increases on the revenue sides or major restructuring, not just incremental decreases in costs.

The Value Stream

To view processes through the eyes of the customer, value stream mapping is another valuable tool. Value stream mapping works best, however, in environments where there is a process to map. As such, healthcare has enjoyed great success in examining consumer-focused processes through the eyes of the patient, such as the reduction of patient wait times and improvement in patient flow. In contrast, few, if any, universities employ value stream maps to improve processes, since processes in higher education tend to be less rigid; where healthcare is driven by protocol and process, higher education is driven by and prizes intellectual individuality and expression.

CONCLUSIONS

The many similarities identified between healthcare and higher education suggest that these two critically important components of our economy can learn from each other, but also that there is no “cookie cutter” solution to the current and future problems faced by both institutions. Arguably, health care is a few years ahead of higher education in applying Lean principles, and therefore those in higher education stand to learn more from pioneering colleagues in healthcare.

The process-driven environment of healthcare organizations lends itself handily to the more “pure” application of Lean principles; since higher education is less process-driven, it may better be served by adapting Lean strategies where they make sense, rather than fully adopting the full Lean philosophy.

Perhaps the ultimate lesson for higher education is to apply these Lean strategies within a Service Excellence framework throughout the organization. Focusing on the value to the consumer (whether student or patient), obtaining input and feedback, and involving key players in the redesign of curricula or processes to meet 21st century needs may be key to moving both institutions toward a more streamlined, less cumbersome, and ultimately, higher value service delivery for both institutions.

REFERENCES

- [1] Commins, John. (September 16, 2011). "Healthcare Costs Accelerate Slightly." Retrieved October 14, 2011 from <http://www.healthleadersmedia.com/print/HOM-270977/Healthcare-Costs-Accelerate-Slightly>
- [2] Coyne, K.P., Coyne, S.T., and Coyne, E.J. (May 2010). "When you've Got to Cut Costs Now." *Harvard Business Review*, 88(5), 74-82.
- [3] Dickeson, Robert C. (2010). *Prioritizing Academic Programs and Services: Reallocating Resources to Achieve Strategic Balance*. Jossey-Bass.
- [4] Dickeson, Robert C. (2011). "Frequently Asked Questions about College Costs." Sixth in a Series of Issue Papers from The Secretary of Education's Commission on the Future of Higher Education, Retrieved October 14, 2011. <http://www2.ed.gov/about/bdscomm/list/hiedfuture/reports/dickeson2.pdf>
- [5] DiPisa, R. (January 30, 2007). Articlesbase Free Online Articles Directory. Retrieved October 10, 2010, from Articlesbase: <http://www.articlesbase.com/careers-articles/health-care-higher-education-different-industries-similar-profiles-98859.html>
- [6] Finney, J. E. (2010). A Reset for Higher Education. *Chronicle of Higher Education*, 57(1), 6. Retrieved from EBSCOhost.
- [7] Halaska, F. M. (June 4, 2010). *Health Care or Education: A High-stakes Blindfolded Taste Test*. Retrieved October 10, 2011, from Huffington Post Politics: http://www.huffingtonpost.com/terrell-halaska/health-care-or-education_b_600771.html
- [8] Halaska, T. and Manganiello, M. (December 16, 2008). "Higher Education: Take a Lesson From Health Care." Retrieved October 7, 2011, http://www.huffingtonpost.com/terrell-halaska-and-michael-manganiello/higher-education-take-a-l_b_151558.html
- [9] Kirch, D. G. (2011). Higher Education and Health Care at a Crossroads. *Trusteeship*, 19(2), 8-13. Retrieved from EBSCOhost.
- [10] *Lean Enterprise Institute*. (2009). Retrieved October 10, 2010, from Lean Enterprise Institute: <http://www.lean.org/whatslean/principles.cfm>
- [11] Lewin, Tamar (December 3, 2008). "College May Become Unaffordable for Most in U.S." *The New York Times*, Retrieved October 14, 2011. <http://www.nytimes.com/2008/12/03/education/03college.html>
- [12] NEA Policy Brief. (2010). *And They're Off! How States Are Re-examining Students' Early Graduation from High School*. http://www.nea.org/assets/docs/PB31_EarlyGraduation10.pdf.

[13] PricewaterhouseCooper's Research Institute. (2010). The Price of Excess: Identifying Waste in Healthcare Spending. <http://pwchealth.com/cgi-local/hregister.cgi?link=reg/waste.pdf>: PricewaterhouseCooper .

[14] Short, Doug (March 9, 2011). "A Depressing Look At Income Growth Compared To Health Care And College Cost." http://articles.businessinsider.com/2011-03-09/news/30078492_1_medical-costs-household-incomes-real-growth

[15] World Health Organization. (2000). *World Health Report 2000: Health Systems: Improving Performance*. World Health Organization.

An Innovative Approach for Software Pricing

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ABSTRACT

The issue of software pricing continues to elude academic researchers. While the literature is replete with models for hardware pricing, most software pricing papers have dealt with the issue qualitatively. The authors have attempted to model software pricing using backward propagation neural networks in conjunction with traditional statistical approaches. Their model features 26 software attributes and uses data from the 2009 Statistical Software Survey published in ORMS Today. The paper presents the model features and discusses some preliminary results.

Keywords: statistical software, software pricing, artificial intelligence, neural network

INTRODUCTION

Software prices are determined by two elements - intrinsic software features and extrinsic variables. The intrinsic software features refer to the specific attributes of the software created by software developers. For instance, features such as RAM needed, operating system that can run the software, input-output options, et cetera have to be considered during the software development. On the other hand, extrinsic variables deal with marketing tools available to the vendors to assist their sales efforts. For instance, licensing options, licensing terms, installation types, payment methods, terms and compliance issues, and product flexibility are routinely used to generate sales (Cusmano).

Some firms may price the software to recoup its cost. However, this approach is quite problematic since the demand is unknown, and the software is generally differentially priced. For instance, corporations and individuals may pay vastly different rates for the same software. In addition, the levels of service desired – installation, with or without testing, with or without conversion, et cetera may influence total pricing (Scott).

Competition in the market place may impact software prices, especially if two or more firms are producing near-identical software. In addition, some firms lock-in prices for a certain time frame via service contracts that assures consumers of updated versions at no additional charge. Some firms routinely upgrade the price to reflect the cost of living adjustment, while others gain consumer loyalty by adding additional functionality without price increases (Davis).

In the field of computer hardware, some authors have estimated prices by essentially accumulating the contributions made by the different components to the overall cost. Regression-based approaches by

Sircar and Dave (1986a, 1986b) and Harris and Dave (1994) provide useful methodologies for computer hardware; however, their application for computer software pricing may be limited. The reason for this is that computer software is generally not designed by piecing together several components. It is an integral whole. In fact, because of this, computer software is described in terms of its attributes rather than components.

The difficulty in estimating software prices has been underscored by several authors in the literature, and many have offered suggestions to attempt to deal with the issue. However, there is lack of a comprehensive model that produces meaningful, quantitative output that can be meaningfully interpret and used by software makers and vendors. Lederer and Prasad (1993), Bontis and Chung (2000), Niccolai (2003), and Anonymous (1998), and Sullivan and Ephraim (2001) offer ideas like using software development costs, attributes perceived to be valuable by buyers, number of processors running, and fee per usage as basis for pricing.

The authors of this paper have attempted to utilize artificial intelligence techniques in conjunction with traditional statistical approaches to quantify the impact of various attributes on the prices of specific software. The approach is tested on several academic and commercial versions of statistical software, using 26 attributes.

MODEL DEVELOPMENT

The ORMS Today publication has been reporting prices of statistical software every couple of years based on its survey. The survey provides both academic and commercial prices for each software in its listing. Additionally, the reports rate the presence or absence of 26 attributes in the software. For some attributes, like RAM needed to operate the software, the exact values are provided. The 2009 survey reported data on several statistical software packages. Due to incompleteness of data, only 34 of the listed software were selected for analysis.

Three modeling approaches, artificial intelligence (AI), traditional statistical, and hybrid were attempted on the data.

The AI approach used backward propagation neural networks for modeling. Taking the 26 attribute values as input, it mapped them against the software price as output. The academic and commercial software had models that were identically structured, varying only in the output price.

The traditional statistical approach used multiple regression models with 26 software attributes as independent variables and the software price as the dependent variable. Different models were constructed for the academic and commercial software.

The hybrid approach combined traditional statistical and AI techniques. It used factor analysis to extract 7 factors from the data. Taking these 7 factors and the top contributing variables from the earlier AI approach as input, it mapped them against the software price as output. Different models were constructed, once again, for academic and commercial software.

Several studies in the literature, most notably Rumelhart et al (1994), Sharda (1994), Subramaniam et al (1993) and Markham and Ragsdale (1995) offered evidence of success of artificial intelligence approaches employed alone or in conjunction with the conventional statistical approaches.

THE ARTIFICIAL INTELLIGENCE APPROACH

The 26 input variables are shown in table 1. The tool used for AI analysis was Predict, made by NeuralWare (2003). Working as an add-in in Excel, Predict offers convenient menus for creating, training, and testing the model. It withholds 30% of the original data for testing purposes. The end model produced has the ability to forecast output for changing input values.

Variable	Description	Variable	Description
RAM	Memory Needed	COSTING	Cost allocation
OS-MAC	Operating System1	MIX-DIS-CONT	Discrete & Cont. Mix
OS-LINUX	Operating System2	ANIMATION	Animation
ICON-DROP	Icon Drag and Drop	REALTIME	Real-time viewing
MODULES	Access to Modules	EXP-ANIM	Export Animation
RUNTIME-BUG	Run time debug	ANIM-SOFT	animation software
INPUT-FIT	Fit Input Distribution	3D-ANIM	3D Animation
SOLN-HELP	Output Analysis Support	IMPORT-CAD	Import CAD drawings
BATCH	Batch run/expt. design	HOTLINE	Hotline
OPTIMAL	Optimization	USER-GRP	Users discussion area
CODEREUSE	Reuse of Code	TRAIN-COURSE	Training Courses
MODELPACK	Model Packaging	TRAIN-SITE	On-site Training
EXTRACOST	Extra cost model packaging	CONSULT	Consulting Available

Table 1: Model Development Variables

Table 2 shows the results of the AI approach. The model-mapping for academic software pricing demonstrated a 96.86% training phase and 88.24% testing phase accuracy. The commercial software pricing showed corresponding accuracy of 95.65% and 97.06%. The linear correlation between the actual and model output was 0.7859 for the academic pricing model and 0.7869 for the commercial pricing model in the testing phase. The value for the root mean square error was 239.76 for the academic pricing model and 7169.99 for the commercial pricing model. The starting disparity in these two can be explained by the significant difference in the pricing of the software. For instance, the price

	R	Net-R	Avg.Abs.	Max.Abs.	RMS	Accuracy	95% CI	Records
Academic Pricing Model								
Train	0.7583	0.5933	95.89	980.26	272.99	0.8696	566.10	23
Test	0.7859	0.6066	84.28	980.26	239.76	0.8824	486.77	34
Commercial Pricing Model								
Train	0.8895	0.7125	3154.51	36740.01	8191.46	0.9565	16986.46	23
Test	0.7869	0.6675	3000.73	36740.01	7167.99	0.9706	14552.94	34

R = Linear correlation between the actual and model output

AbvAbs = Average absolute error between the actual and model output

MaxAbs = Maximum absolute error between the actual and model output

RMS = Root mean square error between the actual and model output

Accuracy = Fraction of real world outputs within specified tolerance of the output model

95%CI = Model values are within this distance of target values with 95% confidence

Table 2: Neural Network Training and Testing Results

range for commercial software is \$55,000 compared to \$1,750 for academic software. The model accuracy, which assesses the percentage of output that was within the user-stated tolerance was 88% for academic and 97% for the commercial model during the testing phase.

A very useful output provided by the Predict software in its sensitivity analysis is the contribution made by different variables on a scale of 100. A larger value indicates greater contribution and vice versa. For the academic and commercial pricing models, this data is shown in tables 3 and 4. For instance, both are impacted by Compatible Animation Software, availability of Batch Run/Experimental Design, amount of Extra Cost for Model Packaging, and compatibility with LINUX and MAC Operating Systems.

Variable	Description	Contribution Indicator
ANIM-SOFT	Compatible Animation Software	38
OS-LINUX	LINUX Operating System	25
MODULES	Access to Modules	14
INPUT-FIT	Input Distribution Fitting	11
EXTRACOST	Extra Cost for Model Packaging	10
RAM	Memory Needed	9
TRAIN-COURSE	Training Courses	7
REALTIME	Real-time Viewing	6
OS-MAC	MAC Operating System	4
BATCH	Batch Run / Experimental Design	3
USER-GRP	User Group or Discussion Area	3
COSTING	Cost Allocation	2

Table 3: Contribution Analysis: Academic Software Prices

Variable	Description	Contribution Indicator
IMPORT-CAD	Import CAD Drawings	40
OS-LINUX	LINUX Operating System	29
3D-ANIM	3D Animation	23
BATCH	Batch run / Experimental Design	15
MODELPACK	Model Packaging	11
ANIMATION	Animation Availability	5
CODEREUSE	Reuse of Code	5
OPTIMAL	Optimization Techniques	3
OS-MAC	MAC Operating System	2
ANIM-SOFT	Compatible Animation Software	1
RAM	Memory Needed	1

Table 4: Contribution Analysis: Commercial Software Prices

TRADITIONAL STATISTICAL APPROACH

Motivated by the hardware approaches of Sircar and Dave (1986a, 1986b) and Harris and Dave (1994), the prospect of using regression to map the 26 software attribute as independent variables against software price as dependent variable was examined. The correlation between some independent variables was quite high, suggesting that some variables could be left out with minimal impact on the model output. As a result, a stepwise, multiple regression analysis was conducted using SPSS version 18. The P_{in} and P_{out} values were set at 0.05 and 0.10 respectively. The results for the commercial and academic pricing models are shown in tables 5 and 6 respectively.

The models output paled in comparison to the AI approach. The standard errors for the commercial and academic pricing models were 6722.597 and 278.98 respectively; with adjusted- R^2 values of 0.5872 and 0.4726 respectively. Both the models resulted in 5 significant variables.

The academic model had EXTRACOST, BATCH, IMPORT-CAD, USER-GRP, and MIX-DIS-CONT as the significant variables. 3D-ANIM, SOLN-HELP, MIX-DIS-CONT, EXTRACOST, and REALTIME were the significant variables for the commercial model. The variables that were in common for both models were EXTRACOST and MIX-DIS-CONT. It was found that the significant variables identified in the two models bore little resemblance to the variables identified as the major contributors in the AI approach.

Step	Variable	Coefficient	Std. Error	t	p-value
1	(Constant)	2519.70	2002	1.26	.2173
	3D-ANIM	11281.87	3120	3.62	.0010
2	(Constant)	-6810.24	4837	-1.41	.1691
	3D-ANIM	12895.32	3064	4.21	.0002
	SOLN-HELP	9820.99	4680	2.10	.0441
3	(Constant)	-7282.11	4472	-1.63	.1139
	3D-ANIM	13524.48	2842	4.76	.0000
	SOLN-HELP	16630.69	5102	3.26	.0028
	MIX -DIS-CONT	-8567.63	3407	-2.51	.0175
4	(Constant)	-17116.88	5550	-3.08	.0045
	3D-ANIM	15333.25	2689	5.70	.0000
	SOLN-HELP	24737.50	5598	4.42	.0001
	MIX -DIS-CONT	-9759.16	3149	-3.10	.0043
	EXTRACOST	8478.20	3234	2.62	.0138
5	(Constant)	-23732.63	5947	-3.99	.0004
	3D-ANIM	10663.23	3245	3.29	.0027
	SOLN-HELP	28552.40	5495	5.20	.0000
	MIX -DIS-CONT	-11590.57	3052	-3.80	.0007
	EXTRACOST	12320.56	3463	3.56	.0014
	REALTIME	8367.86	3676	2.28	.0307

Table 5: Stepwise Regression for Commercial Software Prices ($P_{in}=0.05$, $P_{out}=0.10$)

Step	Variable	Coefficient	Std. Error	t	p-value
1	(Constant)	79.35	76	1.04	.3061
	EXTRACOST	280.56	134	2.09	.0445

2	(Constant)	-170.03	120	-1.42	.1659
	EXTRACOST	437.92	138	3.17	.0034
	BATCH	337.39	131	2.57	.0151
3	(Constant)	-110.19	113	-.97	.3390
	EXTRACOST	447.38	128	3.50	.0015
	BATCH	489.26	136	3.60	.0011
	IMPORT-CAD	-304.47	122	-2.50	.0183
4	(Constant)	-372.16	167	-2.23	.0335
	EXTRACOST	518.95	126	4.11	.0003
	BATCH	419.18	133	3.14	.0038
	IMPORT-CAD	-366.04	120	-3.06	.0047
	USER-GRP	364.42	177	2.06	.0485
5	(Constant)	-538.57	174	-3.09	.0045
	EXTRACOST	554.62	120	4.63	.0001
	BATCH	383.93	127	3.03	.0052
	IMPORT-CAD	-363.12	113	-3.23	.0032
	USER-GRP	386.34	167	2.32	.0281
	MIX -DIS-CONT	229.78	105	2.18	.0375

Table 6: Stepwise Regression for Academic Software Prices ($P_{in}=0.05$, $P_{out}=0.10$)

THE HYBRID APPROACH

In an attempt to boost the AI approaches results, the authors decided to add valuable information as input into the model. Since the input variables in the AI were highly correlated, it was conjectured that feeding factors derived from the input variables as input, along with the top contributing variables identified by the stepwise regression approach could hold the promise of a promising model.

<i>Regression Statistics</i>					
Multiple R	0.7794				
R Square	0.6074				
Adjusted R Square	0.2248				
Standard Error	325.9				
Observations	34				
<i>ANOVA</i>					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	16	2958250	184891	1.8569	0.1081
Residual	18	1911751	106208		
Total	34	4870002			
<i>Variable</i>	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	
Intercept	-1013.6	403.4	-2.51	0.0217	
EXTRACOST	638.0	297.5	2.14	0.0459	
ANIM-SOFT	-960.9	455.5	-2.11	0.0492	

factor4	656.2	321.0	2.04	0.0558
factor5	959.9	543.0	1.77	0.0941
REALTIME	-669.8	390.0	-1.72	0.1031

Table 7: Results of Hybrid Model (7 Factors and High Contributors) – Academic Price

The Varimax rotation of SPSS factor analysis produced 7 factors. Feeding these along with the significant variables from the stepwise regression as input and using software prices for commercial and academic prices as output produced the results shown in tables 7 and 8. The academic pricing model produced results that were better than the traditional statistical approach but inferior to the AI approach. The commercial pricing model was found to be overall insignificant, leaving the AI approach as the clear winner overall.

<i>Regression Statistics</i>					
Multiple R	0.7455				
R Square	0.5557				
Adjusted R Square	0.1300				
Standard Error	9443				
Observations	34				
<i>ANOVA</i>					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	16	2007875345	125492209	1.5012	0.2072
Residual	18	1605062844	89170158		
Total	34	3612938189			
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	
Intercept	-377	14374	-0.03	0.98	
BATCH	18111	15318	1.18	0.25	
factor2	7715	6798	1.13	0.27	

Table 8: Results of Hybrid Model (7 Factors & High Contributors) – Commercial Prices

CONCLUSION

Attempting to construct a reliable model with a dataset featuring 26 attributes in just 34 observations has been a challenging task. Based on the models' results, the traditional statistical and the hybrid approaches took a back seat to the AI approach. The resulting AI model is capable of predicting the software price for any set of attributes. This would offer significant help to a software maker who wants

to determine the viability of adding a particular attribute to statistical software. By comparing the software prices with and without the attribute and performing the cost-benefit analysis, the software maker can make a definitive Go/No Go decision. In addition, the model can help a software maker determine the financial viability of undertaking a software manufacturing project.

REFERENCES

- Anonymous (1998) 'IBM Revamps S/390 Software Pricing Models', *Computing Canada*, Vol. 24, No. 41, p.27.
- Bontis, N. and Chung, H. (2000) 'The Evolution of Software Prices from Box Licenses to Application Service Providers Models', *Internal Research*, Vol. 10, No. 43, pp. 10, 246.
- Cusmano, M. (2007) 'The Changing Labyrinth of Software Pricing' *Communications of the ACM*, Vol. 50, Issue 7, p19-22, 4p.
- Davis, R.A. (2005) 'The Price of Software These Days,' *Accounting Technology*, Vol. 21, No. 10, p26-30, 5p.
- Harris, A.L. and Dave, D.S. (1994) 'Effects of Computer System Components on the Price of Notebook Computers', *Information and Management*, Vol. 27, pp. 151-160.
- Lederer, A.L. and Prasad, J. (1993) "Information Systems Software Cost Estimating: A Current Estimating", *Journal of Information Technology*, Vol. 8, pp. 22-33.
- Markham, I.S. and Ragsdale, C.T. (1995) 'Combining Neural Networks and Statistical Predictions to Solve the Classification Problem in Discriminant Analysis', *Decision Sciences*, Vol. 26, No. 2, pp. 229-242.
- Neural Ware (2003) *User Guide: Neural Networks Predict*, Product Release 3.1, February, Printed in the USA.
- Niccolai, J. (2003) 'Microsoft to Change Server Pricing', *Computerworld*, Vol. 37, No. 11, p.7.
- Rumelhart, D.E., Widrow, B., and Lehr, M.A. (1994) 'The Basic Idea in Neural Networks', *Communications of the ACM*, Vol. 37, No.3, pp.87-92.
- Scott, R.W. (2006) 'The Price of Everything Software,' *Accounting Technology*, Vol. 22, No. 7, pp44-48, 5p
- Sharda, R. (1994) 'Neural Networks for the MS/OR Analyst: An Application Bibliography', *Interfaces*, Vol. 24, No. 2, pp. 116-130.
- Sircar, S. and Dave, D. (1986b) 'The Relationship between Benchmark Tests and Microcomputer Price', *Information and Management*, Vol. 29, No. 3, pp. 212-217.

Sircar, S. and Dave, D.S. (1986a) 'Effect of Computer Characteristics on Price in the US Computer Industry', *Information and Management*, Vol. 11, pp.77-85.

Subramaniam, V., Hung, M.S., and Hu, M.Y. (1993) 'An Experimental Evaluation of Neural Networks for Classification', *Computers and Operations Research*, Vol. 20, No. 7, pp. 769-782.

Sullivan, T. and Ephraim, S. (2001) 'Retooling Software Pricing', *InfoWorld*, Vol. 23, No.2, pp.1, 2.

Swain, J.J. (2009) Statistical Analysis Software Survey, <http://www.lionhrtpub.com/orms/surveys/sa/sa-survey.html>

**What is the Sweetest Suite?
Microsoft 2010 with Apps vs. Google Apps vs. Open Office etc.**

Session Organizers and Moderators

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Abstract

This session will look at the rise of Google Apps and how it is impacting the educational use of Microsoft Office and other online productivity suites. The pros/cons of cloud computing using the different options will be explored with input from attendees encouraged.

Think You Know Office 2010?

Session Organizers and Moderators

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Abstract

Come explore new features and how to customize Word, Excel and PowerPoint. This session will also include time for attendees to share tips/tricks of using Office 2010.

SERVICE DESIGN FOR BUSINESS

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ABSTRACT

This paper is a conspectus of the emerging discipline of service design. Historically, science has been concerned with the discovery and study of natural and socially developed phenomena and the role of design to create new artifacts and processes and to improve existing ones. Service has been an important part of the fabric of societal culture from ancient times, so the notion of service as the co-creation of value by provider and client is well established. It necessarily follows that the objective of service design is to add value by enhancing the efficiency, effectiveness, and efficacy of older service systems and to create newer ones with requisite attributes. The necessary elements of service design are introduced and important concepts are identified.

KEYWORDS: Service, service systems, service design.

OVERVIEW OF SERVICE DESIGN

A service is an interaction between entities that co-creates value, where the entities involved may be persons or nonpersons, such as government offices, educational institutions, and possibly some form of automation. (Katzan [7]) A service interaction is a process consisting of several steps organized to achieve an identifiable purpose. All products are essentially services, so that service design has assumed an expanded role in the development of cultural artifacts in the modern global economy. (Vargo [16]) More specifically, service design is a process that specifically takes an abstract idea and turns it into a pragmatic reality.

In a naive view of service, such as in business and personal affairs, the number of participants is relatively few, and the time span is relatively short, so that the total experience can be conceptualized as a single service event. In substantial service projects, such as a complicated medical procedure, the construction of a large building, or a military operation, where the number of interactions is high and the time span is relatively long, a unifying methodology, called *service design*, is necessary. (Saco [13]) The discipline of service design is based on the tacit knowledge that when we build a service or a product, we, implicitly or explicitly, adhere to a well-defined set of steps or techniques for scoping the problem, analyzing the design parameters, generation of feasible solutions, and implementation of the selected option.

It is important to recognize that there is a reasonable limit to what can be achieved through service design. How an architect arrives at the characteristics of a structure or a physician deals with patients is in some respect a matter of personality and style as manifested in the cultural environment. To apply design principles to a problem, one basic condition must be present. A designed service should be synthesized from a coherent and interacting set of service components and should have a stated purpose so that it can be readily identified. Some authors have referred to a behavior pattern that involves several independent services, such as going to work, as a service system and, thereby, construed it to be a comprehensive service. In this instance, the various constituent services exist as discrete areas of functionality connected by independent access points. Even though they support the contention that “services are everywhere,” the various facilities are not necessarily connected in any requisite manner. It is something a person plans but does not synthesize in a coherent way. The service components in designed service should possess a necessary and sufficient relationship and not exist as a disparate collection of service events. A service system is a collection of service components intended to achieve a predetermined function, when called upon, such as a missile system or an educational system. Service design is primarily concerned with

service systems of this genre. Formally, a service system is a collection of resources, economic entities, and service processes capable of engaging and supporting one or more service engagements. Service processes may interact or be linked in a service value chain. The conceptual model is that the designer and the client collaborate to construct a service system that eventually will be used by many customers.

GENERIC SERVICE DESIGN AND OPERATION ENVIRONMENT

In its most basic form, a service system is a value producing interaction between a service provider and a service client, consisting of a process conceptualized as a layered set of activities. (Ferrario and Guardino [3], Katzan [7]) The layers provide an operational environment for the service procedure, consisting of sponsorship, infrastructure development, service delivery, and system analysis. We are going to refer to the environment as a service framework consisting of four elements: service commitment, service production, service delivery, and service analysis. In some sense, designing a service is similar to producing a TV show. *Service commitment* refers to the formal agreement to provide a class of services to a service audience by a principal or trustee with the proper administrative control over the service environment. *Service production* pertains to service provisioning, infrastructure, availability, quality management, and back-office processing. *Service delivery* is the class of actions usually regarded as the service and is the layer where the service client comes into the picture. *Service analysis* refers to measurement activities and the determination of the value proposition needed to sustain service operations.

In order for a service provider and a client to co-create a service event, there must be some degree of locality to the situation, in the sense that the client travels to the provider, the provider travels to the client, the client and provider execute the service event in a third-party location, or they communicate via some form of interactive device and its corresponding media. Location is basic to service provisioning. When the client travels to the provider site, the location is termed a *service factory* and the client or the service object remain in the service factory for the duration of the service transaction. A service factory can be organized as a job shop or an assembly line. When the service object is left in the provider's facilities, the location is known as a *service shop*. The provider may also travel to client facilities, as in the cases of consulting or nursing home care. With information service, the provider may reside in a remote facility and provide access through a *service portal*.

FOUNDATIONS OF SERVICE DESIGN

There are three parts to service design. The first is to develop a context for the service and then delineate precisely what it is that needs to be designed. It is necessary to solve the right problem – to make it exceedingly simple – in the correct context, so you don't solve the wrong problem at the right time or the right problem at the wrong time. This is as much a cultural endeavor as it is a procedural problem. Each service process takes place – it executes, so to speak – in an environment of people and organizational entities that is unique. Something that works for one client probably isn't going to work in another.

The second part is determining how the designer team is going to work with the client team to design the service. Clearly, designing a service system for a major organization is totally different than designing for a small local group. For a variety of reasons, there is a higher degree of specialization in large organizations and careful attention must be given to the makeup of both teams. It is frequently the case that it is absolutely necessary for a design team to develop a strategy for working with the client in order to design the service that is needed in the first place.

The last part is not so obvious. Some service design teams must be better at their craft than others, because some service design projects turn out to be more successful than others. Here are some relevant questions in this regard: What mindset do good service designers have that not-as-successful designers don't have? What do successful designers know in order to do their job better? What service design tools are needed? What knowledge and training is needed to be a proficient service designer and how is this information imparted to prospective service designers? The questions are answered in two major sections: design thinking and design methods.

DESIGN THINKING

Design thinking involves people and culture. When a service design involves a person-to-person interaction, for example, the efficacy of that interaction involves more than the exchange of acts or symbols. The point-of-view of the participants is basic to how the service interaction is perceived as an important component of the total service experience. The client or customer's expectations will determine if a highly predictable or a highly variable interaction should take place.

Design thinking is a discipline that combines the designer's knowledge, sensitivity, and design perspective with technical feasibility and design methods to assist a client in resolving a perceived need so as to provide value for the client and the designer. (Brown [2]) Recall that the designer will be working with the client to design services and products that the client will put into place when dealing with its customers.¹ The prevailing mindset is that the designer is given a project, does the work, and then simply hands it over to the client for use in a predetermined operational environment. (Morelli [10]) Nothing can be farther from the truth. In the modern view of things, the designer team will be working with the client team using the prescribed design tools to collectively produce a process that is experientially sound from the client's perspective for use with its customers.

In the past, most designers interpreted their role as being complementary to business and organizational strategies. Through globalization, much of production is currently being commoditized and outsourced, so that global companies have turned their attention to local contexts. Thus, competitive advantage is achieved through service innovation at the local level, so that the customer is no longer a passive receiver, but rather an active participant in the service process.

Design thinking has turned the process of design completely on its head. Instead of expecting a designer to take an existing idea or product and then make it more useful and usable to a customer, modern design companies – especially in the area of service – are expecting designers to create ideas that are more appropriate to customer needs, and in the process, make the service experience an important component of the design goal. Collaboration and prototyping are key elements of the service design process, as well as a variety of conceptualization techniques.

In the quest for client solutions, a design project should go through three phases: inspiration, ideation, and implementation. During the inspiration phase, the designers and their counterparts on the client side confer, looking for new ways of thinking about the problem, spending time with the eventual customer through observational research or various forms of content analysis. During the ideation phase, the design participants look for inspiration outside of the customer base for insights into how the project may be scoped into new directions and new forms. Ethnography is a key element of ideation, since the eventual outcome of the design will have to reside in context of people and their culture. During the implementation phase, designers use a combination of prototyping and testing, through customer participation, to get the service (or product) right, relying on feedback and tweaking to resolve issues that

¹ The design team works with its client team to produce a product or service for the client's customers.

surface. “What goes around comes around.” So, implementation frequently returns to inspiration for a new round of research and development.

The key question is, “What mode of operation should the service designer bring to the table?” In doing ideation, for example, how does the service designer think about a design problem? The answer is quite simple, but doing it is not. Here are the modes on thinking that the design community has in mind: empathy, integrative thinking, optimism, experimentalism, and collaboration. (Brown [2])

Successful service designers use *empathy*, which in this instance refers to looking at the design universe from different points of view. What are those points of view? In a design situation, they are the viewpoints of clients, customers, end users, and colleagues. (Brown, op cit.) For example, a certain auto maker was asked why its cars didn’t have adjustable seats and cruise control. The answer: The seats are just where they should be, and a good driver doesn’t need cruise control. Times have changed, of course, but the point has been made that a good designer’s thinking should reflect different perspectives, and not only those of the designer.

Integrative thinking means that a productive attitude should go beyond analytical thinking and look for novel solutions, perhaps from other domains. Tim Brown, President of the design firm IDEO, gives the example of a design done for a client’s debit card service that models the prevailing practice of putting loose change in a container, such as a bottle, at the end of the day. The banking client rounds up a transaction to the nearest dollar and puts the difference in a separate account to promote saving. (Brown, op cit.)

Optimism refers to the underlying thought that an innovative solution exists to every design problem; all the designer has to do is look for it. The key element is innovation of which there is always room for a new twist or turn. Most innovation is not of the light-bulb type, but rather, it is the tweaking of an existing design. Innovation is cultural in nature, where implementation can be a major component of the design.

Lastly, *collaboration*, is required as part of each of the three aspects of design thinking. Clearly, it starts with brainstorming and ideation, but is part of the iterative component of the design process. Collaboration helps to identify requirements and supports differing roles among participant. Service designers, client, and customers collaborate to achieve service differentiation and competitive advantage.

Creation of a well-thought out customer experience through a combination of approaches, related by a common denominator of a perceived problem statement, including holistic design, cross-disciplinary synthesis, a useful and usable delivery system, and an effective and efficient service process, is the result of five fundamental principles of good service design. (Stickdorn and Schneider [15])

User-centered – The objective of service, by definition, is to satisfy customer needs.

Co-creative – The focus of service design involves the considerations of the stakeholders who should cooperate in the process of service design. (There are two processes: the design process and the service process.)

Sequencing – Any service design, other than trivial service endeavors, should have a timeline reflecting the service design process, and the state of the participants at that point in time.

Evidencing – A well-designed service should have a foot-print of front stage and back stage processes (covered later). The value of both tangible and intangible services should be clearly evidenced, as part of the service design experience.

Holistic – Service, of any type, resides in a culture. In many instances, the service designer collaborates with the client in its culture to establish service for customers, who may have a unique a culture. Thus, a good service designer should be culturally ambidextrous.

In the application of the five principles, we are going to focus on five stakeholders from the service environment. They are the client/customer, the service provider, the principal, and the designer, supporting the contention that service design is not a job description but a process.

DESIGN METHODS

Since service design is by definition a creative process², one would expect a wide variety of approaches to the subject. Six “tools” of service design are presented here, and from then on, the designer is on his or her own to develop an individual approach. When collaborating with a client in this regard, there seems to be no “right or wrong.” We are going to cover the following six subjects: service view, narrative, process diagram, service blueprinting, touchpoints, and interaction design.

Service View

The *service view* represents the problem statement. Initially, the designer is faced with the possibility that the client does not really know what it wants and has not thought the situation through. Several techniques can be employed for needs research: brainstorming, crowdsourcing, customer shadowing, contextual interviews, fictitious customer profiles – known as *personas*, and customer sequencing through a nominal service process.

Narratives

A *narrative* is a verbal or written description of a hypothetical run-through of a service process from which the designer and client can establish component services, touchpoints – events wherein the client server and customer interact, and operational conditions that should be met – sometimes known as *evidence* items. The idea behind evidence is to inform the customer what is being done and how well things are going.

From a design narrative, the collection of service components are identified that must be orchestrated in a real life scenario. The instances in which the patient interacts with the service providers are established – that is, touchpoints – and the various roles are determined. Methods for providing evidence that processes are progressing, as expected, are selected so that the customer’s service experience is designed into the service process.

Process Design Model

Process design model reflects the interaction between service entities. Unlike product design, the components of a service are a combination of integrated processes, people, skills, and materials that must be planned in advance. (Goldstein [6]) One means of describing a service process is through the use of a “bubble” diagram, often used in investigation to unravel a complex sequence of events. The degree of interaction between service components is clearly evident from a process diagram but the precise nature of each interaction is not specified. An interaction design is needed for that. This process model applies to people processing, possession processing, and information service.

² See *Service Design: Practical Access to an Evolving Field* by Stefan Moritz (KISD, 2005) for a comprehensive view of the creative aspects of service design.

Service Blueprinting

A *service blueprint* is a flow chart used to describe the design of a service process. It is a tool for delineating the steps through which the designer or customer will go; it operates at two levels:

The manner in which the designer and client collaborate to establish the design objective
The steps that the customer will be engaged in to receive the service under consideration

We are going to focus on the second category, because it has attracted the most attention in the service design community. There are several uses of the design blueprint, the most common of which is to identify the constituent service events that are visible to the customer, such as the process flow, the provider interactions, and service bottlenecks. In so doing, five parts of a service process are identified: physical evidence, customer actions, front-stage service provider actions, back-stage provider actions, and support processes. (Bitner [1], Shostack [14], Zeithaml [17], Norman [12]) This design approach gives the opportunity to establish three lines of separation: line of interaction, line of visibility, and the line of internal interaction.

In designing, there are usually three main things the designer has to think about: what the customer does and experiences, what the service provider does in conjunction with the customer to gather information and execute service events, and what goes on behind the scenes to support the service provider. A *service blueprint* is a description of a service, and without that description, success will be a never-ending process of trial and error. *It is important to recognize that the customer and the service provider both go through a series of steps and the blueprint shows where they interact.*

The category of *physical evidence* is a catch all for the supplementary activities usually performed by the customer; they are necessary for getting a service going and sustaining the service. This is the acquisition phase and part of the invocation phase. Prototypical examples are making a reservation or appointment, driving to the service facility, finding a parking spot, and so forth. It is important to include “physical evidence “ in a blueprint, because it identifies activities that could be assisted by the service provider to enhance the service experience, such as shuttle service or valet parking.

The category of *customer actions* refers to what the customer does upon entering the service factory, shop, or information portal, and the activities performed during the service process, as well. They might include finding a table and reading the menu in a restaurant, for example, or checking in and going to one’s room during a hotel stay or buying a ticket and going to one’s seat in a form of public transportation.

The *front stage* refers to the actions performed by the service provider that are seen by the customer, either physically or logically, such as taking an order, selling a ticket, or ignoring a customer. The customer actions and the *front-stage service provider actions* are like two sequences, running in parallel, with a hypothetical dividing line between them known as the *line of interaction*.

The category of *back stage provider actions* denotes service activities performed by the service facility on behalf of a customer but not ordinarily seen by the customer. During a hotel check-in, it is the computer operations behind the counter that supply assistance to the employee in assigning a room and providing supplementary services that are expected but not requested by the hotel guest. In a restaurant, it is food preparation by the kitchen staff. The separation between the front stage and the back stage is known as the *line of visibility*. More specifically, of course, it is the separation between the front-stage provider actions and the back-stage provider actions.

Practically, all forms of service require support activities, such as the reservations computer in the hotel business and the infrastructure, operational and supplier functions in a restaurant. This form of service is known as *support processes* that are separated from the back-stage functions by a *line of internal interaction*.

Figure 1 gives a generic form of a service blueprint, and Figure 2 gives an example of a service blueprint of a conference registration process. Generally, there are a lot of “boxes” to be arranged and rearranged when constructing a service blueprint, so that the diagram is developed on a wallboard with appropriate sticky notes. (Stickdorn and Schneider [15]) Another name for a service blueprint is a “story board.”

Touchpoints

A *touchpoint* is a contact point between the service provider and a customer; it is sometimes known as a “service interface.” Usually, the purpose of a touchpoint is to exchange information, and clearly, that can take several forms, the most prominent of which are person-to-person and person-to-technology, often regarded in the latter case as a computer and regarded as “self service.” Touchpoint can be conceptualized as two processes, the customer process and the service provider process, running in parallel and exchanging information on a needs basis. Two associated metrics are of interest: the intensity and the duration.

Intensity is the number of touchpoints in a service process. *Duration* is the length of the various touchpoints measured on a time basis. Although the actual number of touchpoints in a particular service process and the length of time of each touchpoint are admittedly nebulous, the notion is positively correlated with a rewarding customer experience.

The notion of a touchpoint is basic to the concept of service. In fact, some service designers regard service as a sequence of interactions between the customer and service provider, such that the subject of interaction design is essential to service design.

Interaction Design

Interaction design involves the dialog between a person and a production or service, based on a series of touchpoints supporting the instantiation of a service. (Stickdorn and Schneider [15], Kolko [8]) The idea behind interaction design is to assist in making useful products and services usable. (Norman [12]) *Utility* (i.e., the notion of usefulness) is concerned with functional benefits of a service object, while *usability* involves an assessment of how well the interaction components are sequenced and how adjacent elements are interrelated. Interaction design shapes the behavior of the user of a product or service. (Kolko op cit.)

The design of a series of interactions effectively creates a user experience that determines whether the experience is successful or not. “The user experience is the totality of end users’ perception as they interact with a product or service.” (Kuniavsky [9], p.14) The perceptions include effectiveness, efficiency, and affective satisfaction. Collectively, the three aspects of perception contribute to the nebulous concept of service quality.

An interaction is a bridge between the front stage and the back stage that normally assumes either of the following forms: person-to-person services, technology-enhanced person-to-person services, self-service, and multichannel services. (Glushko, and Tabas [5])

Person-to-person service refers to a face-to-face encounter that provides tangible evidence that a service is being delivered. (Glushko [4]) *Technology-enhanced person-to-person service* refers to the case wherein the provider or the customer uses technology in creating an information-intensive service

encounter. *Self-service* uses technology for enhancing the service provider's viewpoint in supplying service – as in self-service hotel or baggage check-in or online purchasing. *Multichannel service* refers to the case where a service provider supplies online and in-store services, as in well-known instances of book and apparel marketing.

CONCLUSION

It is difficult to draw a conclusion to service design, since it is a continuously evolving human-centered collection of diverse and creative activities aimed at an ever-changing goal. Service design is both art and science. Service design is innovative and global. Service design is personal and collaborative (Moritz [11])

We are experiencing a service revolution. The service economy is booming. Pure service companies are emerging, and product companies are becoming “solution” companies, as complementary services accompany products. Why is this the case? The product market has been commoditized, and as a result, enhanced services are used to secure a competitive advantage. Technology enables service, so that the relationship between providers and clients has changed. Technology offers choices for delivering service to more fully satisfy human needs.

REFERENCES

1. Bitner, M., Ostrom, A., and F. Morgan. 2007. Service Blueprinting: A Practical Technique for Service Innovation. *Center for Service Leadership, Arizona State University*.
2. Brown, T. 2008. Design Thinking. *Harvard Business Review*, (June 2008), p. 1-10.
3. Ferrario, R. and N. Guardino. 2008. Towards an Ontological Foundation for Services Science. *Proceedings of the Future Internet Symposium*, Vienna Austria, 28-30 September 2008.
4. Glushko, R. 2010. Seven Contexts for Service System Design. (ischool.berkeley.edu/glushko)
5. Glushko, R. and L. Tabas. 2010. Designing Services by Bridging the “Front Stage” and “Back Stage.” (ischool.berkeley.edu/glushko)
6. Goldstein, S., Johnston, R., Duffy, J., and J. Rao. 2002. The service concept: the missing link in service design research? *Journal of Operations Management* 20:121-13.
7. Katzan, H. 2008. *Service Science: Concepts, Technology, Management*. New York: iUniverse, Inc.
8. Kolko, J. 2011. *Thoughts on Interaction Design*. New York: Elsevier.
9. Kuniavsky, M. 2010. *Smart Things: Ubiquitous Computing User Experience Design*. New York: Elsevier/Morgan Kaufmann.
10. Morelli, N. 2007. Social Innovation and New Industrial Contexts: Can Designers “Industrialize” Socially Responsible Solutions? *Design Issues*, 23(4): 3-21.
11. Moritz, S. 2005. *Service Design: Practical Access to an Evolving Field*. KISD (Germany).
12. Norman, D. 2011. *Living with Complexity*. Cambridge, MA: The MIT Press.
13. Saco, R. and A. Goncalves. 2008. Service Design: An Appraisal. *Design Management*, 19(1):10-19.
14. Shostack, G. 1984. Designing Services that Deliver. *Harvard Business Review*, 62(1): 133-139.
15. Stickdorn, M. and J. Schneider. 2010. *This is Design Thinking*. Amsterdam: BIS Publishers.
16. Vargo, S. and M. Akaka. 2009. Service-Dominant Logic as a Foundation for Service Science. *Service Science*, 1(1): 32-41.
17. Zeithaml, V. and M. Bitner. 2000. *Services Marketing: Integrating Customer Focus Across the Firm* (2e). New York: Irwin McGraw Hill.

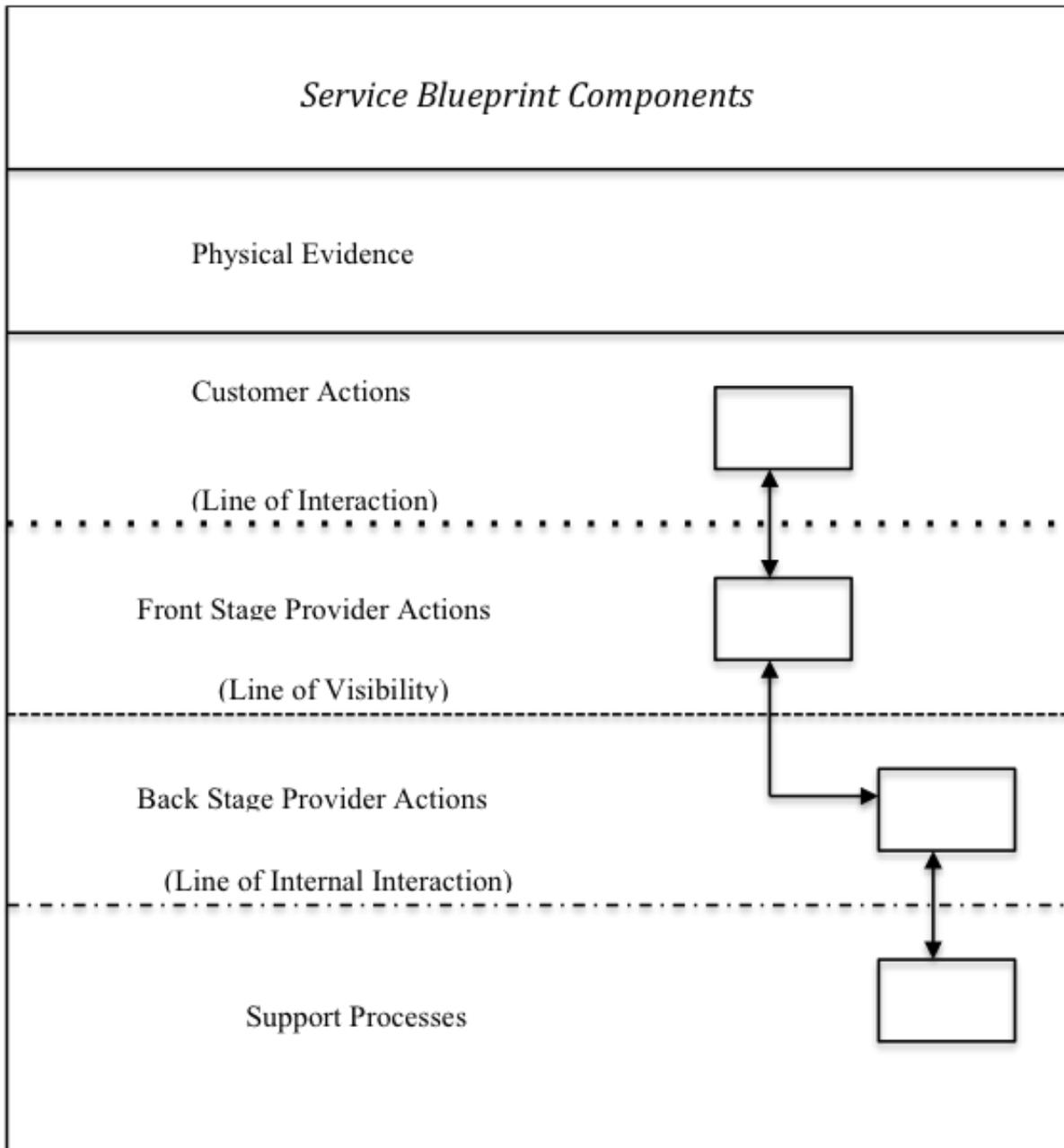


Figure 1. Generic Form of the Service Blueprint.

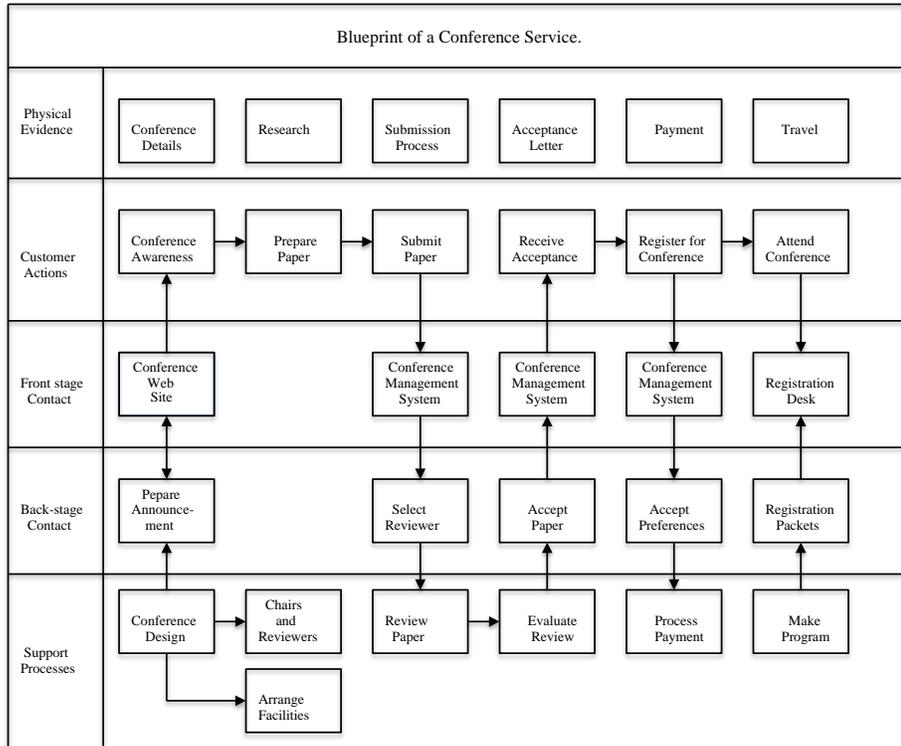


Figure 2. Blueprint of a Conference Service

DESIGN FOR SERVICE INNOVATION

Harry Katzan, Jr., Webster University, USA

ABSTRACT

This paper covers service innovation for service scientists. The subject has not been accorded the attention it deserves, because of inadequate professional and academic attention to services, in general, and service design, in particular. The changing of one's perception of the human landscape from products to services is indeed cumbersome and entails a lot of effort on the part of the service establishment and the service entrepreneur. However, a new view of an age-old agenda in light of the ongoing move to globalization can be enlightening and rewarding. If Thomas Edison were engaged in services, he would have put it this way, "Service innovation is 90% perspiration and 10% inspiration." Heretofore, innovation has been unfortunately aligned with the business community that has been distracted by an outdated and simplistic view of competitive advantage based on comparative economics. Effective service innovation is based on differential economics through service delivery that supplies better services as seen by the customer. Service innovation applies equally well, if not more so, to the other human endeavors of engineering, government, education, social services, political science, and a wide-range of unclassified interpersonal relations. The paper gives a modern view of service, innovation, service innovation, and how to unearth services innovation in a practical sense. Also, the point is made herein that service innovation is basic to the constituency of the human condition.

KEYWORDS: service, service thinking, service design, innovation, service innovation.

SERVICE

A *service* is an interaction between two entities that co-create value, as long as the constituent roles are complementary.¹ The receiver of the service may be a distinct service object. A service is a process resulting in tangible value when the associated sequence of steps is instantiated. (Katzan [9]) The term "service" is an overloaded word. The constituent steps of a service process may be service components arranged in a hierarchical or possibly a recursive fashion. All products are essentially services – a statement that must dismay economists and accountants – and some products and services may have an intangible value that exceeds their tangible value. For example, if a person drives a Porsche Panamera to his or her place of business, there is considerably more to the automobile product than the element of transportation. Once we recognize intangible service, it opens the door for an enhanced role for service in the domain of everyday life.

One's persona is a service signaling education, position, and leisure or social status. Form of dress, table manners, quality of speech, and even patterns of activity can also be construed as services. In fact, one's occupation can be viewed as a service indicating the social position of an individual.

Clearly, the scope of service innovation is enormous, and this paper applies functional analysis to uncover a wide range of applicable phenomena. In many instances, it is not entirely clear exactly who the provider is and precisely clear who is the client. A prototypical example is the common photo of an experienced physician, a trainee doctor, and a patient with the caption, "who's the client and who's the service provider?"

¹ This means that one role is the service provider and the other role is the service client.

INNOVATION

Innovation generally refers to the creation of new or improved products, services, or technologies that are recognized by individuals, groups, organizations, governments, or society in general. Innovation usually reflects positive change, by making products or services more efficient, effective, more useful, and more usable. The operant question is, “for whom?” The provisioning of multichannel access to government services, in some jurisdictions, for example, is usually regarded as an instance of innovation. The client, on the other hand, has to make an “up front” commitment to that form of activity, so who really benefits? The client has to go out of his or her way to benefit from the innovation, while the government employee is free to engage in other activity, not necessarily productive in nature. Another familiar example is the ending of a news segment by referring the viewer to the station’s web site with the familiar phrase, “You can find more about this story on our web site at www.xyz.com.” This is clearly innovation, but its value proposition for the client is questionable.

There is an ethical component to innovation. Is the innovation of online shopping to entice people into purchasing something they didn’t need in the first place ethical? This is an interesting question when considering society’s inability to resist temptation.

Innovation is synonymous with change, for which there is always a reason. However, an operational adjustment resulting from a societal, organizational or governmental change is not innovation. Innovation is a change in a service – yes, all products are services – that results in a positive change to the value proposition for the provider and for the client. (Vargo [21])

Most product and service innovation – to revert to the older conception of products and services for a moment – is effectively hidden to the general public and to the consumer and occurs at the science and technology level to increase reliability and functionality. Engineering and design usually supply the following:

- Products that are more reliable to reduce warranty costs
- Products that perform better
- Products that provide functionality not previously available
- Products that look better

On the other hand, there is another side to the coin. At the service level, we are looking for services that supply the following:

- Services that are more useful
- Services that are more usable
- Services that provide a better user experience

The latter category concerns elements that are human centered and give rise to discipline sometimes known as “service innovation.” If there were an innovation cycle, it would cycle through the following activities:

- Improve the process
- Improve the result/experience
- Improve the economics (value proposition for provider and client)
- Improve the number of customers
- Return to the first entry

The sources of innovation are generally regarded as *manufacturing innovation* and *end-user innovation*. It is customarily achieved by formal research and development or by on-the-job modification of design, commonly regarded as “learning by doing.” There is a bias toward the former and many forms of diffusion have been developed to support that bias. (Rogers [17])

The economist Joseph Schumpeter [19] associated innovation with “creative destruction,” whereby previously created productive forces are periodically destroyed to make room for new ideas, resulting in instability of the business cycle. Layoffs of workers with obsolete skills and downsizing to free-up capital for creation are normally associated with intense periods of innovation.

DESIGN THINKING

Design thinking involves people and culture. When a service design involves a person-to-person interaction, for example, the efficacy of that interaction involves more than the exchange of acts or symbols. The point-of-view of the participants is basic to how the service interaction is perceived as an important component of the total service experience. The client or customer’s expectations will determine if a highly predictable or a highly variable interaction should take place. Design thinking is a discipline that combines the designer’s knowledge, sensitivity, and design perspective with technical feasibility and design methods to assist a client in resolving a perceived need so as to provide value for the client and the designer. (Brown [3])

Creation of a well-thought out customer experience through a combination of approaches, related by a common denominator of a perceived problem statement, including holistic design, cross-disciplinary synthesis, a useful and usable delivery system, and an effective and efficient service process, is the result of five fundamental principles of good service design. (Stickdorn and Schneider [20])

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Holistic – Service, of any type, resides in a culture. In many instances, the service designer collaborates with the client in its culture to establish service for customers, who may have a unique a culture. Thus, a good service designer should be culturally ambidextrous.

In the application of the five principles, it is important to focus on four stakeholders from the service environment. They are the client/customer, the service provider, the principal, and the designer, supporting the contention that service design is not a job description but a process.

DESIGN METHODS

Since service design is a creative process, one would naturally expect a wide variety of approaches to the subject. Six “tools” of service design are presented here, and from then on, the designer is on his or her

own to develop an individual approach. When collaborating with a client in this regard, there seems to be no “right or wrong.” We are going to cover the following six subjects: service view, narrative, process diagram, service blueprinting, touchpoints, and interaction design.

The *service view* represents the problem statement. Initially, the designer is faced with the possibility that the client does not really know what it wants and has not thought the situation through. Several techniques can be employed for needs research: brainstorming, crowdsourcing, customer shadowing, contextual interviews, fictitious customer profiles – known as *personas*, and customer sequencing through a nominal service process.

A *narrative* is a verbal or written description of a hypothetical run-through of a service process from which the designer and client can establish component services, touchpoints, events wherein the client server and customer interact, and operational conditions that should be met, known as *evidence* items. The idea behind evidence is to inform the customer what is being done and how well things are going.

Process design model reflects the interaction between service entities. Unlike product design, the components of a service are a combination of integrated processes, people, skills, and materials that must be planned in advance. (Goldstein [8]) One means of describing a service process is through the use of a “bubble” diagram, often used in investigation to unravel a complex sequence of events. The degree of interaction between service components is clearly evident from a process diagram but the precise nature of each interaction is not specified.

A *service blueprint* is a flow chart used to describe the design of a service process. It is a tool for delineating the steps through which the designer or customer will go to establish the design objective. There are several uses of the design blueprint, the most common of which is to identify the constituent service events that are visible to the customer, such as the process flow, the provider interactions, and service bottlenecks. In so doing, five parts of a service process are identified: physical evidence, customer actions, front-stage service provider actions, back-stage provider actions, and support processes. (Bitner [1], Shostack [18], Zeithaml [25], Norman [15]) In designing, there are usually three main things the designer has to think about: what the customer does and experiences, what the service provider does in conjunction with the customer to gather information and execute service events, and what goes on behind the scenes to support the service provider. *It is important to recognize that the customer and the service provider both go through a series of steps and the blueprint shows where they interact.*

The category of *physical evidence* is a catch all for the supplementary activities usually performed by the customer; they are necessary for getting a service going and sustaining the service. This is the acquisition phase and part of the invocation phase. Prototypical examples are making a reservation or appointment, driving to the service facility, finding a parking spot, and so forth.

The category of *customer actions* refers to what the customer does upon entering the service factory, shop, or information portal, and the activities performed during the service process, as well. They might include finding a table and reading the menu in a restaurant, for example, or checking in and going to one’s room during a hotel stay or buying a ticket and going to one’s seat in a form of public transportation.

The *front stage* refers to the actions performed by the service provider that are seen by the customer, either physically or logically, such as taking an order, selling a ticket, or ignoring a customer. The customer actions and the *front-stage service provider actions* are like two sequences, running in parallel, with a hypothetical dividing line between them known as the *line of interaction*.

The category of *back stage provider actions* denotes service activities performed by the service facility on behalf of a customer but not ordinarily seen by the customer. During a hotel check-in, it is the computer operations behind the counter that supply assistance to the employee in assigning a room and providing supplementary services that are expected but not requested by the hotel guest. In a restaurant, it is food preparation by the kitchen staff. The separation between the front stage and the back stage is known as the *line of visibility*. More specifically, of course, it is the separation between the front-stage provider actions and the back-stage provider actions.

Practically, all forms of service require support activities, such as the reservations computer in the hotel business and the infrastructure, operational and supplier functions in a restaurant. This form of service is known as *support processes* that are separated from the back-stage functions by a *line of internal interaction*.

Interaction design involves the dialog between a person and a production or service, based on a series of touchpoints supporting the instantiation of a service. (Stickdorn and Schneider [20], Kolko [10]) The idea behind interaction design is to assist in making useful products and services usable. (Norman [15]) *Utility* (i.e., the notion of usefulness) is concerned with functional benefits of a service object, while *usability* involves an assessment of how well the interaction components are sequenced and how adjacent elements are interrelated. Interaction design shapes the behavior of the user of a product or service. (Kolko op cit.) The design of a series of interactions effectively creates a user experience that determines whether the experience is successful or not. “The user experience is the totality of end users’ perception as they interact with a product or service.” (Kuniavsky [11], p.14) The perceptions include effectiveness, efficiency, and affective satisfaction. Collectively, the three aspects of perception contribute to the nebulous concept of service quality. An interaction is a bridge between the front stage and the back stage that normally assumes either of the following forms: person-to-person services, technology-enhanced person-to-person services, self-service, and multichannel services. (Glushko, and Tabas [7]) *Person-to-person service* refers to a face-to-face encounter that provides tangible evidence that a service is being delivered. (Glushko [6]) *Technology-enhanced person-to-person service* refers to the case wherein the provider or the customer uses technology in creating an information-intensive service encounter. *Self-service* uses technology for enhancing the service provider’s viewpoint in supplying service – as in self-service hotel or baggage check-in or online purchasing. *Multichannel service* refers to the case where a service provider supplies online and in-store services, as in well-known instances of book and apparel marketing.

SERVICE INNOVATION

Service innovation is the introduction of new or significantly improved services. (OECD [16]) Innovative services can be stepwise improvements, termed incremental innovation, or be radical innovations that are disruptive to the market or industry. In the former case, the innovation may be incremental but new to the firm. (Mohapatra [12]) Innovation incorporates inventions and insight that generates economic and social value. (NII [14]) In general, the source of innovation can be internal to a firm or result from a variety of external sources, termed *open innovation*. (Chesbrough [4]) In general, service innovation benefits both the provider and the client.

Through service innovation, something changes in the service domain, and a useful model of those changes is reflected in the den Hertog model that includes four dimensions of service innovation: the service concept, the client interface, the service delivery system, and the technology options. (den Hertog [5])

The *service concept* includes the manner in which the service is delivered, the customer's service experience, the service result, and the value of the service to both the provider and the customer. The *client interface* is descriptive of the roles played by the provider and the client, and is a prime determinant of the client experience. The *service delivery system* describes the packaging, delivery, and the mode of delivery, whether it be person-to-person or technology enhanced. *Technology options* suggest the use of computer and information technology to support and encapsulate the support the delivery of services. Clearly, the den Hertog model is a general framework that suggests the myriad of points in the service design cycle that are sources of service innovation. In actual practice, most service innovations will incorporate a combination of the four dimensions. (Wiki [24])

Miles [13] covers a set of four service attributes, each of which is associated with a certain type of innovation, normally resulting from a problem in service design, service delivery, or client experience. The general categories are: (1) Features of services associated with service production; (2) Features of services associated with service product; (3) Features of services associated with services consumption; and (4) Features of services associated with services markets. We are going to concentrate on features (2) and (3) under the title of "experiential services."

EXPERIENTIAL SERVICES

Clearly, service innovation is achieved through service design and is the reason that service design was summarized in an earlier section. Each touchpoint presents an opportunity for service innovation. With experiential services, the customer experience can be viewed as a "customer journey," built up over a period of time. As such the journey will consist of multiple touchpoint and multiple components. This approach will emphasize the role of the customer in service design. (Voss [22])

"Experiential services are services where the focus is on the experience of the customer when interacting with the organization, rather than just the functional benefits following from products and services delivered." (Voss [23]) We are going to use the Walt Disney World experience cycle of Departure, Savoring, Anticipating, Arrival, and Experience as a conceptual model for this presentation. The corresponding areas for innovation are the physical environment, service employees, service delivery process, fellow customers, and back office support.

The *physical environment* is the setting in which the service is delivered and is concerned with navigation within a service facility. (Bitner [2]) The category of *service employees* refers to customer engagement and includes the behavior of employees as well as auxiliary services. The *service delivery process* refers to the actions required to present the expected service. The behavior of *fellow customers* is instrumental in experiential design and can result from crowded facilities and unruly people. On the other hand, socializing can make a service experience more enjoyable, so that the subject of fellow customers is a particularly sensitive item in service innovation. Lastly, *back office support* indirectly supports the customer experience, even though the back office may not directly interact with customers. Back office training is important in this regard.

SUMMARY

Service innovation is a general subject related to either or all of three areas of study: the service product, the service process, and the service organization. Service innovation is designed into the total service offering through the traditional design methodology, as long as it results from design thinking.

REFERENCES

1. Bitner, M., Ostrom, A., and F. Morgan. 2007. Service Blueprinting: A Practical Technique for Service Innovation. *Center for Service Leadership, Arizona State University*.
2. Bitner, M. 1992. Servicescapes: The Impact of Physical Surroundings on Customers and Employees. *Journal of Marketing*, 56(2):57-71.
3. Brown, T. 2008. Design Thinking. *Harvard Business Review*, (June 2008), p. 1-10.
4. Chesbrough, H. 2003. *Open Innovation*. Cambridge, MA: Harvard Business School Press.
5. den Hertog, P. 2000. Knowledge-intensive business services as co-producers of innovation. *International Journal of Management*, (http://www.centrim.bus.bton.ac.uk/research/Rise/theme_denhertog.pdf).
6. Glushko, R. 2010. Seven Contexts for Service System Design. (ischool.berkeley.edu/glushko)
7. Glushko, R. and L. Tabas. 2010. Designing Services by Bridging the “Front Stage” and “Back Stage.” (ischool.berkeley.edu/glushko)
8. Goldstein, S., Johnston, R., Duffy, J., and J. Rao. 2002. The service concept: the missing link in service design research? *Journal of Operations Management* 20:121-13.
9. Katzan, H. 2008. *Service Science: Concepts, Technology, Management*. New York: iUniverse, Inc.
10. Kolko, J. 2011. *Thoughts on Interaction Design*. New York: Elsevier.
11. Kuniavsky, M. 2010. *Smart Things: Ubiquitous Computing User Experience Design*. New York: Elsevier/Morgan Kaufmann.
12. Mohapatra, S., Cheney, D., Shapira, P., Youtie, J., Lamos, E., and A. Bhaskarabhatia. 2006. *Product and Service Innovation*, NIST, SRI International, and Georgia Tech Program in Science, Technology, and Innovation Policy.
13. Miles, I. 1993. Services in the New Industrial Economy. *Futures*, 25(6):653-672.
14. NII. 2004. *Innovate America*, Council on Competitiveness, Washington, DC.
15. Norman, D. 2011. *Living with Complexity*. Cambridge, MA: The MIT Press.
16. OECD. 2006. *Innovation and Knowledge-intensive Service Activities*, (https://www.oecd.org/document/56/0,3343,en_2649_34273_362743360_1_1_1_1,00.html).
17. Rogers, E. 1962. *Diffusion of Innovation*, New York: The Free Press.
18. Shostack, G. 1984. Designing Services that Deliver. *Harvard Business Review*, 62(1): 133-139.
19. Shumpeter, J. 2008. *Capitalism, Socialism, and Democracy* (3e). New York: Harper Perennial.
20. Stickdorn, M. and J. Schneider. 2010. *This is Design Thinking*. Amsterdam: BIS Publishers.
21. Vargo, S. and M. Akaka. 2009. Service-Dominant Logic as a Foundation for Service Science. *Service Science*, 1(1): 32-41.
22. Voss, C., Tsikriktsis, N., and M Frohlich. 2002, Case research in operations management. *International Journal of Operations & Production Management*, 22(2):195-219.
23. Voss, C. and L. Zomerdijk. 2007. Innovation in Experiential Services – An Empirical View. Published in *Innovation in Services*, DTI Occasional Paper No. 9, (<http://www.dti.gov.uk/innovation/technology>).
24. Wiki. 2010. *Service Innovation*. (http://en.wikipedia.org/wiki/Service_innovation).
25. Zeithaml, V. and M. Bitner. 2000. *Services Marketing: Integrating Customer Focus Across the Firm* (2e). New York: Irwin McGraw Hill.

SERVICE AND INNOVATION DESIGN WORKSHOP

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The purpose of this workshop is to familiarize the participants with design methods as they apply to service innovation. This is an important subject that has been essentially overlooked in the service science literature.

The methods apply to business, education, government, and personal relations.

During the conduct of the workshop, the participants will be asked to select one of several case studies in service design and prepare a design script of that problem using methods of service design and service innovation, as presented in preceding papers on the subject.

The workshop will be interactive in the sense of participant and coordinator interactions.

Duration: 20-30 minutes.

The workshop will follow presentations on service design and service innovation.

SEDSI Panel Proposal

Meet the Journal Editors of the South East Decision Sciences Institute

Health Systems

Fay Cobb Payton, North Carolina State University

IEEE Engineering Management Review

Paul K. Bergey, North Carolina State University

The Small Business Institute® Journal

Shanan G. Gibson, East Carolina University

Virginia Economic Journal

Barry Pfitzner, Randolph-Macon College

Members of the Southeast DSI, please come out and meet the journal editors that are active in your regional organization! In this panel, the journal editors of the SEDSI will give their perspectives on the many challenges of managing the publication process. Topics to be discussed will include:

- An introduction of each journal by the respective editor outlining the mission of the journal
- Specific challenges that they face in building the infrastructure to support a new journal
- Transition and continuity planning for assuming the leadership role of existing journals
- Communication challenges and protocol with potential authors and reviewers
- Relevance of interdisciplinary research
- Time management in an editorial context
- Respecting the production schedule
- University and Departmental support issues
- Topics of interest for upcoming special issues
- Key dates over the coming year

Managing Rental Car Businesses Using a Multivariate Decision Model

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Abstract

An out-of-control national debt, rising inflation rates, and highly-erratic climbing fuel prices are prime ingredients prolonging the American recession. They have adversely affected all segments of the economy. Personal bankruptcies and business closures are excessive, and a growing concern among our foreign investors. Rental car companies offer prime examples of businesses suffering in an economic downturn.

Critical factors created a negative impact on revenue in this industry during the period late 2007 through summer 2011. They included rising fuel prices, decreases to business and leisure travel, decreases to resale of rental units and increases to maintenance costs.

A multivariate decision-making model is developed in this paper to help managers better understand which specific variables are likely to impact rental car revenues. It is the authors' expectation that the information derived from this model, together with in-house performance indicators, will greatly assist them in optimizing their decisions to make the best use of available assets.

1.0 INTRODUCTION

Excessive debt, cost inflation, and fluctuating high fuel prices adversely affect all segments of the nation's economy. There is an alarming rise in business closures, personal bankruptcies and growing concern among investors. Rental car ventures are not immune from the negative results. For years, these businesses prospered by forging relationships with the big three automotive manufacturers, where they enjoyed deep factory discounts. This relationship allowed them to renew their fleet with new vehicles and sell the used ones at high profits. Unfortunately, this is where the story ends, or perhaps where the problems begin.

Hoover, a private think tank states "The auto rental and leasing industry in the US includes about 5,000 companies with combined annual revenue of about \$40 billion. Major companies include Avis Budget Group, Enterprise Holdings, Hertz Global Holdings, Ryder, and U-Haul

International (a subsidiary of AMERCO). The industry is highly concentrated: the 50 largest companies generate more than 80 percent of revenue.

Several key factors had negative impacts on revenue in this industry segment during the period from late 2007 through summer 2011, including rising fuel prices, decreases to business and leisure travel, reduced resale of rental units and increased maintenance costs.

According to *Gas Buddy.com*, the national average for a gallon of gasoline climbed steadily from mid-2007 through the third quarter of 2008. A steady climb from January 2009 brought current prices 30% above 2007 pricing. Unfortunately, the car rental industry was not the only one affected by rising fuel costs. Airline and hotel industries share similar increases.

Airlines' cash flow dropped from 2007 through 2010, reflecting passenger statistics. Total U.S. passengers during 2007 were 769.4 billion, 2008 saw an increase to 812.3 billion but 2009 was devastated by fuel prices and total passengers dropped to 769.6, 2010 showed an increase to 786.7 which is only slightly above 2007 levels. (source: *BTS.Gov*)

Fluctuation in fuel costs also affected the hotel industry negatively. The median occupancy rate from 2000-2007 was 74%. In 2008 the occupancy rate dropped to 72 %, in 2009 66% and rebounded in 2010 to 71%. Travel agents and hotel executives are warning analysts to expect no growth in 2011, and perhaps a decline in 2012 based on current economic conditions and uncertainty in the market (source: *Hotel Occupancy Rates 2007-2011*).

U.S. Travel Association states that business travel declined for three years in a row beginning in 2007, showed a slight rebound in 2010, and no growth for 2011 based on current figures. Leisure travel follows the same trend, although not as large a percentage as business travel.

According to *Auto Rental News.com*, the overall inventory for rental car companies decreased from a high of 1.861 million units in 2007 to the current low of 1.629 million in 2010. A potential impact on revenue is scheduled to occur in 2012 when the bonus depreciation is discontinued. The Federal government attempted to ease losses with the bonus depreciation program which began in September of 2010 and will run until the end of 2011. This program allows rental car companies to write off the entire cost of a new rental unit in year one resulting with little or no tax liability. Once this ends, the depreciation decreases to 50% in 2012 and 0% in 2013.

The decrease in numbers of rentals per year forced rental car companies to hold on to inventory longer than usual. This forced an increase in maintenance costs. For example, overall cost per mile increased from .0256 in 2008 to .0296 in 2011 or 14%. Average repair costs per month increased from \$24.67 in 2008 to \$31.28 in 2010, or 27%, and average cost for tire replacement increased from \$96 to \$105. (source: Antich).

The authors of this paper propose to develop a multivariate decision making model, which will help management better understand which critical variables are likely to impact rental car revenues. It is our expectation that the information derived from this model, together with management's in-house performance indicators, will greatly assist them in optimizing decision-making to fully maximize use of their assets.

2.0 LITERATURE REVIEW

The research literature identifies a number of deterministic models, which are designed to address revenue management in varying industries. More specifically, the authors focused on those which centered their attention on the rental car industry. Some of the issues which these models attempt to address are highlighted below followed by a brief commentary about their shortcomings.

Twenty years ago United States automobile manufacturers purchased the majority of major car rental companies and flooded them with their vehicles. As the economy improved, changes in the price structure forced the rental car business to follow the airline paradigm of applying revenue management. Revenue management, the practice of using booking policies, together with data information systems, aims to increase revenues by intelligently matching capacity with demand (Belobaba, 1987; Weatherford and Bodily, 1992; Gallego and Van Ryzin, 1997). Unfortunately, this approach presented difficulties within the car rental industry. It failed to address specific issues surrounding asset management for businesses operating in a downturn economy. Rental car companies found themselves holding on to their assets (i.e. rental units) longer than usual. As a result, this practice gave rise to increased maintenance and liability issues, which many of the deterministic models failed to address or explain when discussing revenue management. Most of these models are static in nature, and thus cannot fully account for dynamic changes.

Researchers agree that all rental car companies face an uphill battle in their dynamic pricing practices, because there are an increasing number of variables to take into account. Altman and Helms (1995) noted that competitive pricing is one of the most critical attributes that a rental car company must possess in order to attract customers. In addition to pricing, there are other factors to consider, such as different car classes, arrival dates, rates which can change daily and time of rental. Most deterministic models simply identify these variables, but fail to fully explain their interaction, or significance in explaining variation in revenue.

A common theme in the revenue management literature is to focus on profit maximization by matching capacity with demand. One particular method in dealing with this complexity involves risk pooling, where rental locations can be grouped in pools to gain access to each other's vehicles. In the rental car industry, revenue management models can be designed to allocate resources to the products, allocate resources to the customer, set prices, and allocate resources to the market.

Predictive models typically developed for this industry include unit pricing, allocating resources to markets and dynamic reallocation. The unit pricing model is used consistently in the rental car industry; it includes data such as location, car type, anticipated demand, duration of rental, and competitor pricing. Once bookings begin, demand forecasts are updated. Then demand is considered relative to available resources, given customer preference of car type. The model which allocates resources to markets considers production capacity, which can be optimized across and within markets. A variation of the preceding model involves dynamic reallocation, which targets short-term adjustments in the allocation of resources across markets.

3.0 METHODOLOGY

A typical rental car company collects its data monthly. We were provided with a subset covering the period 2009 to 2011 for four of its rental centers, which are within 50 miles of one another. The two largest centers are within 25 miles of each other, which allows for access to their fleet to meet specific customer needs. During this same period, they recognized that their revenues were plummeting, as demand fluctuated affecting both fleet capacity and utilization. They observed that during this period, recessionary conditions brought about radical changes to their existing business plan. These changes necessitated managing the businesses assets much more efficiently to survive.

A close-up look into the rental car data define (1) fields capturing revenue, (2) number of rentals, (3) number of rental days, (5) fleet size, (6) revenue per day, revenue per rental unit, and (7) utilization for all four regions. After engaging in a few interviews, it was determined that interest in additional predictor variables needed further investigation outside of the ones they had already collected to determine potential impact on revenues. An expanded database now included (a) nationwide monthly gasoline prices, (b) consumer price index (CPI), (c) regional population data, (d) regional monthly unemployment data, and (e) seasonal and/or quarterly effects.

A discussion ensued about developing a multivariate predictive model, which can be used in conjunction with their in-house performance indicators to assist them make decisions that will maximize rental car fleet revenues.

We define the general linear regression model with multiple explanatory variables commonly referred to as a multiple regression model (Rousseeuw, p. j., 1984), which is defined by

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_k X_k + \varepsilon$$

and will now adapt it to the more specific case where Y is defined as *Revenue* (the response variable) and can depend on several factors. Several endogenous variables are identified to help explain variation in revenue. Intuitively, some variables were identified based on their ability to globally impact the economy such as gasoline, Consumer Price Index (CPI), and unemployment rate, which influences spending. As fuel prices increase, both consumers and businesses tend alter their consumption level. Exogenous variables would help to capture this effect; naturally, this type of information is difficult to accurately quantify. For instance, businesses ask their employees to use public transportation or taxis, rather than incur the cost of a rental car. Rental car companies have no way to counteract such practices, except to offer further rate reduction, which serves to diminish revenue. As the general price levels for goods and services rise, both consumers and business will adjust consumptions levels to meet existing and future demand. Families are likely to put off traveling, while businesses enact policies whereby employees are compensated for the use of their own vehicle. Rental car companies can do little to alter consumer and business practices. Instead, they are motivated to seek cost reduction through

efficient allocation and by maintaining an optimal mix of units and size (cook, r. d. & weisberg, s. 1982).

We define several potential explanatory variables in Table 1. Our expectation is that we can identify a sufficient number of explanatory variables, which will provide an excellent fit to our deterministic model.

Table 1. Definition of Predictor Variables

<i>Definition of Variable</i>	<i>Short Variable Name</i>
Y = Monthly Rental Car Revenue (thousands of dollars)	<i>Rev</i>
X_1 = Seasonal Segmentation (fall, winter, spring and summer) ~ Dummy Variable	<i>Fal, Win, Spr, Sum</i>
X_2 = Quarterly Segmentation ($Q_1, Q_2, Q_3,$ and Q_4) ~ Dummy Variable	<i>Quar1, Quar2, Quar3, Quar4</i>
X_3 = Regional Location (four locations within a 50 mile radius) ~ Dummy Variable	<i>Region1, Region2, Region3, Region4</i>
X_4 = Regional Population Data (thousands of people)	<i>PopDat</i>
X_5 = Regional Monthly Unemployment Data (%)	<i>UnEmp</i>
X_6 = Nationwide Monthly Price for Regular Gasoline (\$ per gallon)	<i>Gasol</i>
X_7 = Number of Rentals per month (expressed in hundreds)	<i>NumRen</i>
X_8 = Total Number of Days Cars were Rented Monthly	<i>RenDay</i>
X_9 = Average Number of Rentals per Month (days)	<i>AveRen</i>
X_{10} = Revenue per Unit (\$ per unit)	<i>RevDay</i>
X_{11} = Fleet Size (number of units) per month at each location	<i>FltSize</i>
X_{12} = Fleet Utilization (%)	<i>Util</i>
X_{13} = Average Number of Days per Rental Unit ('000)	<i>RevUnit</i>
X_{14} = Advertising Expense ('000)	<i>AdvExp</i>
X_{15} = Consumer Price Index (CPI) ('00)	

4.0 RESULTS

In order to find a useful number of predictor variables, we pursued a variable reduction technique called “stepwise regression”. However, the outcome from this technique produced a model with erroneous and highly unstable coefficients, which may be partly attributed to multicollinearity. A subsequent approach was to employ a correlation matrix to identify a potential subset to use in the regression model. *Variance Inflation Factors* (VIF) from the Minitab output was examined for each predictor variable to determine its sensitivity within the model (Lin, F., 2008). Upon examining the VIFs, some variables exhibited mild variation inflation, while others leaned towards strong variance inflation. These results are shown in Table 2. Some of the variables exhibiting strong variance inflation directly impact rental car revenues, and removing them will yield potentially misconstrued results. Hence, care must be exercised when using VIFs alone when deciding to either keep, or remove, predictor variables in the model (O'brien, R.,M., 2007).

The fitted multiple regression equation is given by

$$REV = -13.7 + 2.50 \text{ Quar2} - 0.06 \text{ Region1} + 1.62 \text{ Region3} + 0.674 \text{ UnEmp} \\ + 4.11 \text{ NumRen} + 3.32 \text{ RenDay} + 0.0541 \text{ FltSize} - 0.489 \text{ Gasol}$$

Table 2. Multiple Regression Output from Minitab

Predictor	Coef	SE Coef	T	P	VIF
Constant	-13.744	5.766	-2.38	0.019	
QUAR2	2.5008	0.7052	3.55	0.001	1.341
Region1	-0.061	1.419	-0.04	0.966	5.432
Region3	1.618	2.000	0.81	0.420	10.779
UNEMP	0.6735	0.5969	1.13	0.261	6.832
NUMREN	4.1080	0.8404	4.89	0.000	11.560
RENDAY	3.3152	0.2326	14.25	0.000	17.991
FLTSIZE	0.05410	0.06672	0.81	0.419	29.679
GASOL	-0.4888	0.5677	-0.86	0.391	1.464

S = 3.16474 R-Sq = 98.1% R-Sq(adj) = 98.0%

Examining the output from Minitab revealed both promising and encouraging results. Overall, the fitted model is highly significant because only two percent of the total variation in monthly revenues cannot be explained by its subset of explanatory variables. Both R^2 and the adjusted R^2 show no departure from each other, while the standard error of the model reveals a good fit. The signs of each predictor variable were logical, except for one, UnEmp. A discussion of each predictor follows below (Rousseeuw, p. j. & Van Zomeren, b. c.,1990).

The dummy variable *Quar2*, which includes the months April, May and June would collectively add \$2,500 in total revenue across locations during this period. Businesses and individuals seem to take advantage of planned budgeted trips. For instance, families with tax refunds may use refunds to travel on vacation trips during spring break, or at the end of the school year.

Region1, which is located in a military town, has a population of about 67,000. It would only adversely impact revenue by producing a monthly decrease of only 60 dollars, which is negligible. It is highly unlikely that the rental car company would not benefit from having a presence in that location. With added marketing to military families and to the military base, they could likely boost revenues. *Region 3*, on the other hand, which has a population of about 91,000, serves a much larger business community. It generates a monthly increase of \$1,620 in revenue. Alternatively, locations would see a drop of \$489 in monthly revenues every time the price of a gallon of regular gasoline increases.

The unemployment data *UnEmp* appears to be parsimonious. It was expected to adversely impact revenue; this was not the case. In fact, the variable is not statistically significant in the model ($p=0.261$). The variable *NumRen* (*number of rentals*), which is statistically significant in the model ($p=0.00$) increases monthly revenue by \$4,110 across locations. For each added day of rental, according to the variable *RenDay* ($p=0.00$), revenue would increase by \$3,320 across locations. The variable *FltSize* suggests that monthly revenue across locations would increase by \$54 dollars for each additional unit added to service. This seems to provide a minimal benefit given the acquisition and operational cost of a unit.

5.0 LIMITATIONS, RECOMMENDATIONS AND FUTURE WORK

This study would have benefited from a larger data set encompassing more than three years to establish a stronger foundation for building a deterministic model, where, for example, recognizable trends could have been identified. In addition, the authors felt that rental car revenues are not only impacted by fleet size, but also by their mix of vehicles. The data did not distinguish revenue streams between compact, midsize, full size vehicles and so forth. Some rental car companies are acquiring “green” vehicles, which may be attractive to some markets. It is not known, however, if this option was provided by this company. A profile of clients would certainly be useful to include in the data set, except this information is generally not collected. Having knowledge of clients could help them appeal to those who are likely to impact revenue in their marketing campaign. A brief text to their past and present clients is a simple, and yet effective marketing tool to announce upcoming specials. If they alter their database to capture some of the information mentioned above, it is conceivable that a modified regression model would explain further variation in revenues by its predictor variables.

6.0 CONCLUSION

As the recession continues to strengthen its grip on the US economy, rental car companies, along with others in similar positions, such as hotels and airlines, have seen a significant decline in revenues over the last two years. The regression model developed in this paper is intended to assist decision-makers of individual rental car companies address revenue shortfalls. With this model, they are able to perform what-if scenarios with predictor variables, which were deemed significant to their monthly revenue streams. There are factors which cannot be quantified, such as policies adopted by businesses to promote public transportation or taxis in lieu of renting a vehicle.

REFERENCES

- Altman R. and Helms M. (1995) 'Quantifying service quality: Case study of a rental car agency', *Production and Inventory Management Journal: the Journal of the American Production and Inventory Control Society Inc* , 36 , 2, 45-50.
- Arcelus F.J. and Srinivasan G. Ordering policies under one time only discount and price sensitive demand', *IIE Transactions* , 30 , 11, 1057-1064.
- Belobaba P. (1987) 'Airline yield management an overview of seat inventory control', *Transportation Science* , 21 , 2, 63-73.
- Cook, R. D. & Weisberg, S. (1982) *Residuals and Influence in Regression* (New York, Chapman and Hall). Filliben, J. J. (1975) The probability plot correlation coefficient test for normality, *Technometrics*, 17, pp. 111-117; correction, 17, p. 520.
- Gallego G. and Van Ryzin G. (1997) 'A multiproduct dynamic pricing problem and its applications to network yield management', *Operations Research* , 45 , 1, 24-41.
- Lin, F. (2008). Solving multicollinearity in the process of fitting regression model using the nested estimate procedure. *Quality and Quantity*, 42(3), 417-417-426. doi:10.1007/s11135-006-9055-1
- O'brien, R.,M. (2007). A caution regarding rules of thumb for variance inflation factors. *Quality and Quantity*, 41(5), 673-673-690. doi:10.1007/s11135-006-9018-6
- Rousseeuw, P. J. (1984) Least median of squares regression. *Journal of the American Statistical Association*, 79, pp. 871-880.
- Rousseeuw, P. J. & Van Zomeren, B. C. (1990) Unmasking multivariate outliers and leverage points
(<http://www.hoovers.com/industry/automobile-rental-leasing/1211-1.html>)

AN IMPROVED ALGORITHM FOR THE FIXED CHARGE PROBLEM

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ABSTRACT

In this paper we present a method for determining a lower bound for the global solution of a fixed charge transportation problem (FCTP). The method uses quadratic approximations to converge to the optimal solution. These procedures can be extended to a general fixed charge problem and may be incorporated in any branch-and-bound or approximation method to enhance the convergence to the optimal solution. We present numerical examples to illustrate applications of the proposed method.

INTRODUCTION

In Fixed Charge Transportation Problems (FCTP) the cost of transportation is directly proportional to the number of units transported and a fixed cost is also incurred when a distribution variable assumes a nonzero value. Since the effort required to solve an FCTP using these methods grows exponentially with the size of the problem, several authors [2, 3, 4, 6, 7] have turned to efficient heuristic algorithms for solving FCTPs because the above-mentioned methods are constrained by limits on computer time. Adlakha *et al* [1] develop an analytical iterative method that starts with a linear formulation of the problem and converges to an optimal solution by sequentially separating the fixed costs and finding a direction to improve the value of the linear formulation while continually tightening the lower and upper bounds.

In this paper we present a method for solving an FCTP by using quadratic approximations to determine the solution's lower bound. Using quadratic approximations of an FCTP's objective function, we develop superior lower and upper bounds. The bounds developed here can be used in tandem with any established algorithm to obtain superior initial or starting conditions.

FIXED CHARGE TRANSPORTATION PROBLEM

Assume that there are m ($i = 1, 2, \dots, m$) suppliers a_i units and n ($j = 1, 2, \dots, n$) customers with demand of b_j units. Let x_{ij} be the number of units shipped by supplier i to customer j at a shipping cost per unit c_{ij} plus a fixed cost f_{ij} , assumed for opening this route. The objective is to minimize the total cost of meeting all demand, using all given supply constraints. The fixed charge transportation problem (FCTP) is formulated as follows:

$$\mathbf{P:} \text{ Minimize} \quad Z = \sum_{i=1}^m \sum_{j=1}^n (c_{ij} x_{ij} + f_{ij} y_{ij}) \quad (1)$$

$$\text{Subject to} \quad \sum_{j=1}^n x_{ij} = a_i \quad \text{for } i = 1, 2, \dots, m, \quad (2)$$

$$\sum_{i=1}^m x_{ij} = b_j \quad \text{for } j = 1, 2, \dots, n, \quad (3)$$

and

$$\sum_{i=1}^m a_i = \sum_{j=1}^n b_j$$

$$a_i, b_j, c_{ij}, f_{ij} \geq 0; \quad x_{ij} \geq 0 \quad \text{for all } (i, j)$$

$$y_{ij} = 0 \quad \text{if } x_{ij} = 0$$

$$y_{ij} = 1 \quad \text{if } x_{ij} > 0.$$

Geometrically, the total transportation cost along route (i, j) can be represented by Figure 1. The cost of Shipping no units is zero, but the cost of Shipping x_{ij} units is f_{ij} plus amount $c_{ij} x_{ij}$.

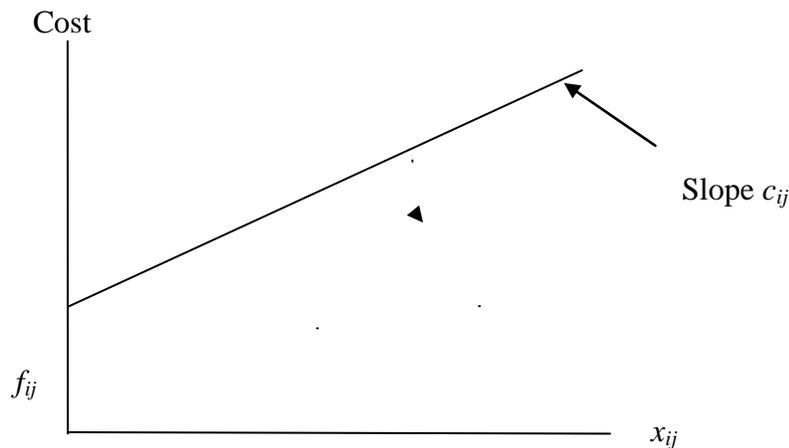


Figure 1: Shipping Cost in FCTP

Linear Formulation of the FCTP

Balinski [5] provided a linear approximation of FCTP by relaxing the integer restriction on y_{ij} , with the property that

$$y_{ij} = x_{ij}/m_{ij} \quad (4)$$

where

$$m_{ij} = \min (a_i, b_j). \quad (5)$$

So, the relaxed transportation problem of an FCTP would simply be a classical TP with unit transportation costs $C_{ij} = c_{ij} + f_{ij}/m_{ij}$. We refer to this problem as **PB**. The optimal solution $\{x_{ij}^B\}$ to problem **PB** can be easily modified into a feasible solution of $\{x_{ij}^B, y_{ij}^B\}$ of **P** by setting $y_{ij}^B = 1$ if x_{ij}^B is positive and 0 otherwise. Balinski shows that the optimal value, $Z(\mathbf{PB})$, provides a lower bound on the optimal value $Z^*(\mathbf{P})$ of FCTP, i.e., $Z(\mathbf{PB}) = \sum \sum C_{ij} x_{ij}^B \leq Z^*(\mathbf{P})$. Geometrically, the Balinski linear approximation can be represented as in Figure 2.

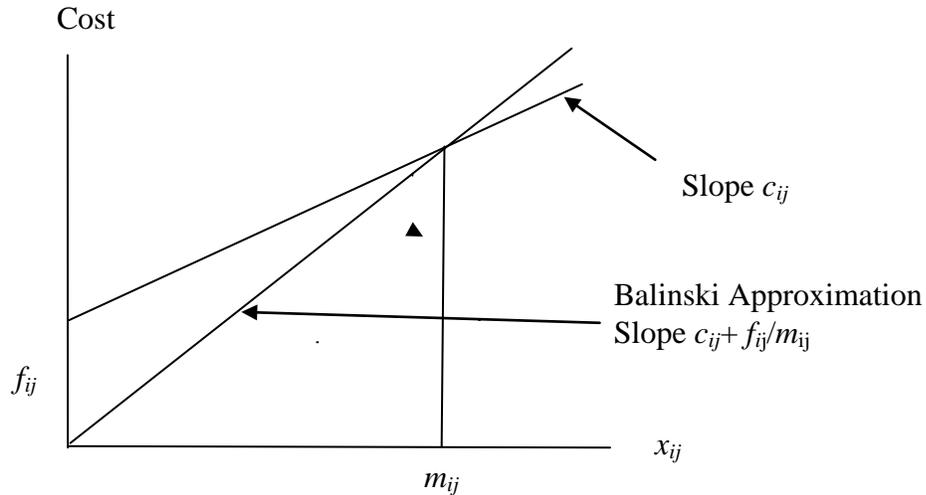


Figure 2: Balinski Linear Approximation

A QUADRATIC APPROXIMATION TO LOWER BOUND

In this section we develop a quadratic approximation, Q_L , for FCTP costs as proposed in Figure 3. The objective here is to estimate FCTP costs more closely than the linear approximation used by Balinski, in order to improve the solution estimate for the FCTP.

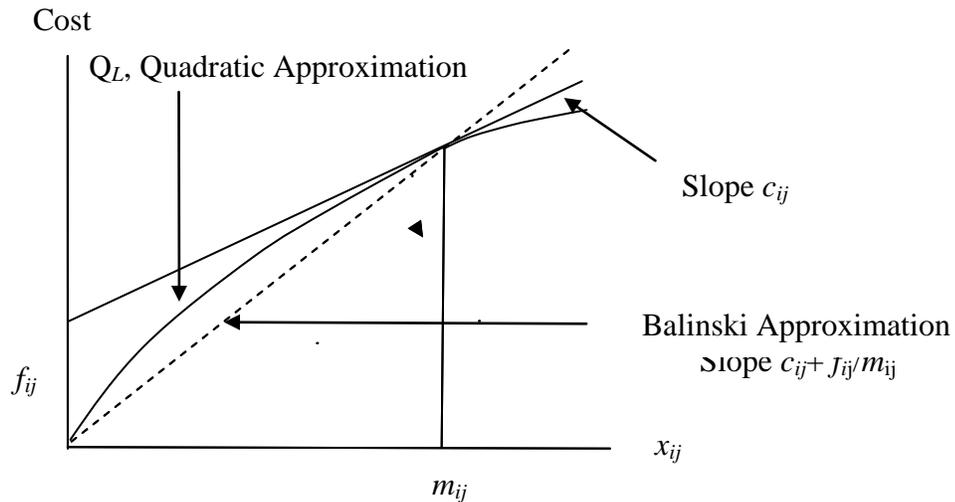


Figure 3: Quadratic Approximation to FCTP

Define

$$Q_L(x_{ij}) = a(x_{ij})^2 + b(x_{ij}) + c, \quad (6)$$

where

$$Q_L(0) = 0, \quad (7)$$

$$Q_L(m_{ij}) = f_{ij} + c_{ij} m_{ij}, \quad (8)$$

$$Q'_L(m_{ij}) = c_{ij}. \quad (9)$$

Equations (7) and (8) ensure that the proposed quadratic curve, $Q_L(x_{ij})$ starts at the origin and equals the FCTP cost at m_{ij} . Equation (9), where Q'_L denotes the derivative of Q_L , ensures that $Q_L(x_{ij})$ is tangential to FCTP at m_{ij} . We use these equations to determine coefficients in $Q_L(x_{ij})$.

$$Q_L(0) = 0 \Rightarrow c = 0.$$

Equations (8) and (9) yield

$$a(m_{ij})^2 + b(m_{ij}) = f_{ij} + m_{ij} c_{ij}$$

and
$$2a(m_{ij}) + b = c_{ij}$$

Solving these two above equations, we get

$$a = -f_{ij}/(m_{ij})^2 \text{ and } b = 2f_{ij}/m_{ij} + c_{ij}$$

Therefore
$$Q_L(x_{ij}) = -\{f_{ij}/(m_{ij})^2\}(x_{ij})^2 + \{(2f_{ij}/m_{ij}) + c_{ij}\}(x_{ij}).$$

Theorem 1: The quadratic curve, $Q_L(x_{ij})$, lies entirely above the Balinski approximation [14] and entirely below the FCTP cost line.

Consider the following quadratic problem

PQ_L: Minimize
$$Z = \sum_{i=1}^m \sum_{j=1}^n -\{f_{ij}/(m_{ij})^2\}(x_{ij})^2 + \{(2f_{ij}/m_{ij}) + c_{ij}\}x_{ij} \tag{10}$$

Subject to
$$\sum_{j=1}^n x_{ij} = a_i \quad \text{for } i = 1, 2, \dots, m,$$

$$\sum_{i=1}^m x_{ij} = b_j \quad \text{for } j = 1, 2, \dots, n,$$

$$x_{ij} \geq 0 \text{ for all } (i, j),$$

The optimal solution $\{x'_{ij}\}$ to problem **PQ_L** can be easily modified into a feasible solution of $\{x'_{ij}, y'_{ij}\}$ of **P** as follows:

and
$$y'_{ij} = 0 \quad \text{if } x'_{ij} = 0,$$

$$y'_{ij} = 1 \quad \text{if } x'_{ij} > 0.$$

Remark 1: Since Theorem 1 holds for all $0 \leq i \leq m$ and $0 \leq j \leq n$, it immediately follows that

$$Z(\mathbf{PB}) \leq Z(\mathbf{PQ}_L) \leq Z^*(\mathbf{P}) \leq \sum \sum (c_{ij} x'_{ij} + f_{ij} y'_{ij}). \tag{11}$$

Thus we have found a superior lower bound to $Z^*(\mathbf{P})$. Since the objective function of an FCTP is discrete, the lower bound $Z(\mathbf{PQ}_L)$ can be rounded up to the nearest interval.

QUADRATIC APPROXIMATION METHOD

Adlakha *et al* [1] present a branching method for solving the FCTP. Starting with a linear formulation of the problem, they develop a method based on the computation of a lower bound and an upper bound embedded within a branching process. Their method is based on obtaining lower bounds using linear approximations [5]. We modify their method so that the proposed quadratic approximations for lower and upper bounds are used in conjunction with the method. For the sake of completeness, we reiterate detailed steps of the proposed algorithm:

The Quadratic Approximation Method

Step 1: Formulate the quadratic problems PQ_L using the given FCTP.

Step 2: Solve as quadratic problems and identify the load as x_{Lij} .

Step 3: Check for the terminating conditions for a specific branch as follows:

- a. If $\sum \sum -\{f_{ij}/(m_{ij})^2\}(x_{ij})^2 + \{(2f_{ij}/m_{ij}) + c_{ij}\}x_{ij} = \sum \sum (c_{ij}x_{Lij} + f_{ij}y_{Lij})$;
- b. If $\sum \sum -\{f_{ij}/(m_{ij})^2\}(x_{Lij})^2 + \{(2f_{ij}/m_{ij})+c_{ij}\}x_{Lij} \geq$ lowest recorded Z thus far, STOP and terminate this branch. Otherwise continue.

Step 4: Pick out partially loaded cells, i.e., cells with $0 < x_{Lij} < m_{ij}$.

Step 5: For each cell identified in Step 4, calculate $\delta = f_{ij} - (f_{ij}/m_{ij})x_{Lij} = f_{ij} (1 - x_{Lij}/m_{ij})$.

Step 6: Pick out the cell (s, t) with the highest δ among those identified in Step 5.

Branch Y(s,t): load cell (s, t)

Step 7: Note $Z_{Ycost} = f_{st}$, where Z_{Ycost} represents the extracted fixed charges along branch Y(s,t).
Set $f_{st} = 0$ in the FCTP.

Step 8: Repeat Steps 1 through 6 with the adjusted FCTP.

Branch N(s,t): exclude cell (s, t)

Step 9: Set $c_{st} = M$ (a very large number) in the FCTP.

Step 10: Repeat Steps 1 through 6 with the adjusted FCTP.

Remark 2: In Step 5, the δ value, $f_{ij} (1 - x_{Lij}/m_{ij})$, represents the fixed cost differential between the PB_L and the FCTP for load x_{Lij} at cell (i, j) . This is the reason for selecting the largest δ value for branching further.

The branches are labeled as Y, N in the first iteration; YY, YN, NY, NN in the second iteration, etc., by dividing and extending each branch into two branches and affixing Y or N with the previous branches, where Y represents the branch where the selected cell is loaded and N represents the branch where the selected cell is excluded. The Quadratic Approximation Method sequentially searches for the fixed costs f_{ij} of the given FCTP that can be extracted, in order to induce linear properties into the problem and to search for an optimal solution by sequentially increasing the lower and upper bounds obtained by the quadratic formulation. The procedure terminates when all possible branches are terminated.

Theorem 2: The Quadratic Approximation Method provides an improved lower bound of an FCTP at each iterative step along a branch.

CONCLUSION

We have proposed a novel quadratic approximation method to solve an FCTP. The method starts with a quadratic formulation of the FCTP objective function to converge to an optimal solution of the FCTP by sequentially separating the fixed costs and finding a direction to improve the value of the quadratic problem. The method is based on computations of lower and upper bounds embedded within a branching process. When the two bounds are equal the solution is optimal. While the proposed method uses branching for convergence on the optimum, unlike the branch-and-bound method the optimum is not obtained through comparison with the previous results but through tightening the lower and upper bounds. Note that the number of branching stages doesn't depend on the size of the problem but on the number of partially loaded cells, i.e., cells with $x'_{ij} \neq m_{ij}$, which in turn depends on the difference $m-n$ ($n-m$).

To reduce the number of iterations as the size of FCTP increases, one can set a tolerance level between the upper and lower limits equal to, for example, a percentage of the initial value of the Z function and terminate the search after reaching that tolerance [1]. However, in this case the Quadratic Approximation method becomes a heuristic. The proposed quadratic approximation method starts with a good initial solution and converges quickly to an optimal solution. The proposed method can be easily programmed and implemented for much larger fixed-charge problems using the simple tools of an Excel spreadsheet or any software for solving quadratic problems. Future work should seek the development of an efficient code to implement this approach for computational and comparative studies.

REFERENCES

- [1] Adlakha, V., Kowalski, K. and Lev, B. (2010), A Branching Method for the Fixed Charge Transportation Problem. *OMEGA-Int J Manage S* **38**, 393–397.
- [2] Adlakha, V., Kowalski, K. and Vemuganti, R.R. (2006), Heuristic Algorithms for the Fixed-Charge Transportation Problem. *Opsearch* **43**, 88-108.
- [3] Adlakha, V., and Kowalski, K. (2003), A Simple Heuristic for Solving Small Fixed-charge Transportation Problems. *OMEGA-Int J Manage S* **31**, 205-211.
- [4] Aguado, J.S. (2009), Fixed Charge Transportation Problems: a New Heuristic Approach Based on Lagrangean Relaxation and the Solving of Core Problems. *Ann Oper Res* **172**, 45-69.
- [5] Balinski, M.L. (1961), Fixed Cost Transportation Problems. *Naval Research Logistics Quarterly* **8**, 41-54.
- [6] Glover, F., Amini, M. and Kochenberger, G. (2005). Parametric Ghost Image Processes for Fixed Charge Problems: A study of Transportation Networks. *J Heuristics* **11**, 307-336.
- [7] Sun, M., Aronson, J.E., McKeown, P.G. and Drinka, D. (1998). A Tabu Search Heuristic Procedure for the Fixed Charge Transportation Problem. *Eur J Oper Res* **106**, 441-456.

ESSAYS IN MANAGEMENT SCIENCE

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ABSTRACT

Frequently in Management Science courses, the focus lies primarily on teaching students the mathematics of linear programming. However, the ability to discuss mathematical expressions in business terms is an important skill for students to learn in preparation for a career. In this paper, analysis of student abilities to discuss management science concepts through memo homework assignments as well as a memo on the midterm and an essay on the final exam is presented.

Keywords: Management Science, Memos, Business Education, Assessment

INTRODUCTION

Management Science helps students learn how to describe the complexities and logic of real world business problems to improve decision-making. In an introductory undergraduate course in management science, students learn first how to identify decisions and translate them into a legend with variable symbols. Using their legend, students learn how to translate the word description for the objective in to an objective function. Likewise, they learn how to translate the word description for the constraints into mathematical expressions (Anderson, Sweeney, Williams, Camm, & Martin, 2011). When an assumption of linearity is appropriate, students are taught to use these mathematical constructs to develop a linear program. For a two-decision linear program, students learn to use the graphical solution procedure and interpret the solution and the relationships between the solution and the constraints. For larger problems with three or more decisions, students learn to use computer software to solve and interpret the relationship between the optimal solution and the constraints. Students also learn to answer follow-up questions about changes in resource constraints, minimum requirements, new requirements, or changes to decision contributions to the objective.

Most pedagogy related to linear programming focuses on teaching students the mathematics of linear programming (Liberatore & Nydick, 1999; Stevens & Palocsay, 2004). Research in the pedagogy of mathematics describes the strategies students must learn to use to translate word problems into mathematical expressions (Barnes, Perry, & Stigler 1989; Grinde & Kammermeyer, 2003; Koedinger & Nathan, 2004; Rittle-Johnson & Koedinger, 2005, Williams and Reid, 2010). An important learning goal is that students will be able to transfer their skills and apply management science procedures to problems they encounter in actual business practice. We ask the question, how should we design assignments and examinations that will help students imagine the uses of management science in new situations and apply these to novel business problems? We discuss the development of student writing through practice with memo homework assignments and exam essays that encouraged students to write about how management science procedures might be used in practice. We present data on the qualitative elements of management science and student performance on such an essay on a final exam in an undergraduate management science course.

As part of AACSB Standard 15, Management of Curricula, it is recommended that all undergraduate and graduate business students develop knowledge and skills in the management science area. This course is required of all Management and Management Information Systems majors at the University of West Florida. The instructors in a management science course implemented a series of cumulative memo homework assignments and exam essays to promote students' ability to discuss and apply principles and procedures from management science to business problems. This paper summarizes student performance on these sequential and cumulative assessments of learning on this outcome in a management science class taught in the fall 2010 semester.

METHOD

Participants in the study ($n = 29$) were students enrolled in the fall 2010 undergraduate Management Science course at the University of West Florida. The Institutional Review Board of the authors' employer approved data collection and analysis. The total course enrollment was 30 students, one of which chose not to participate in the study. The characteristics of the data pool are summarized in Table 1 in terms of the year in college, major, and gender. Recruitment activities were to invite students to participate voluntarily at the first and second class lectures, where letters of invitation and informed consent forms were passed out and collected. Twenty-nine subjects ($n = 29$) consented to participation in this education research for a 96.6% participation.

Table 1 Course Demographics

	Enrollment (%)	Subjects (%)
Number of juniors	3 (10%)	3 (10.3%)
Number of seniors	27 (90%)	26 (89.7%)
Number of Management majors	21 (70%)	20 (68.9%)
Number of MIS majors	5 (16.7%)	5 (17.3%)
Number of other majors	4 (13.3%)	4 (13.8%)
Number of women	6 (20%)	6 (20.7%)
Number of men	24 (80%)	23 (79.3%)
Total	30	29

During the first week of the semester, students were introduced to memo formatted homework assignments in class discussions and a course packet that included complete examples of past memo homework assignments and memo homework keys. Student performance data was collected throughout the semester on new memo homework assignments. Homework assignment performance was evaluated with a rubric, which evaluated student performance on several essay components, including the memo, legend, objective function, and identification of constraints. The memo section of the rubric included the student's description of the decisions, the objective, the constraints, their recommendation, their response to sensitivity analysis questions, their professionalism, and the attachment of an appendix with supporting documentation. Other sections of the rubric evaluated the mathematical aspects of linear programming such as the formal legend, the mathematical expression of the objective function and the constraints, and if applicable, graphical methods (such as a graphical solution for a two-decision model or a network flow graph for a transportation model).

In addition, student performance data was also collected on a memo question on the midterm and an essay question included on the final exam. The midterm exam memo question was evaluated such that 40% of the grade was based on the problem statement and description of the two new constraints, 40% was based on the mathematics of the two new constraints, and the remaining 20% was based on grammar and professional writing. The final exam memo

question was evaluated such that 79% was based on the description of the decisions, objective, constraints, and sensitivity analysis while 21% was based on grammar and professional writing.

The homework (HW) assignment and test assessment tools are summarized in Table 2. Each homework assignment had two problems. If the decisions or objective were different for the two homework problems, then two are listed in the rubric, separated by an “or.” The number of decisions ranged from 2 to 9 in the assignments. The objectives were not always financial. For example, in homework assignment 2, one of the problems required students to maximize the product produced as a small business prepared to sell their product at a local festival. The types of constraints considered are summarized in Table 2 to demonstrate the variety of limits or requirements imposed by the business scenarios. The expected procedure for all homework assignments was that students would use computer software to discover an optimal solution. In addition, for the first homework assignment, students were required to include an application of the graphical solution method to the problem in their response.

Table 2 Summary of homework assignment and test assessment tools

Tool	Decisions	Objective	Constraints
HW 1	2-decision product mixes	Max profit	Labor and material supplies, production capacity, marketing forecasts, contracts
HW 2	4- or 5- decision production plans	Max quantity produced or profit	Labor and material supplies, forecasts, production budget, management preferences
Mid-term	6-decision ad mix	Max # of customers	Add new management preference constraints to existing model
HW 3	3- decision service mix or 6-decision ad mix	Min total costs or max # customers	Labor available, marketing requirements, management preferences
HW 4	8-decision transportation or 6-decision assignment	Min shipping costs or max profit	Inventory supply, retailer demands, contracts, management preferences
HW 5	9-decision transshipment or 6-decision production plan	Min shipping costs or max net revenue	Factory supply, distributor inventory balance, forecasts, machine capacity and setups
Exam essay	Student described	Student described	Student described

The homework memo solution response keys are given in Table A1 in the Appendix. Table A1 includes the summary statement of the decisions, the objective, the constraints, the recommendation, and the objective function value for the recommended solution. The sensitivity analysis question responses are not included due to space constraints. The appendices referenced in the Table A1 solution key memos contained mathematical models and software output that is not included since the focus of this paper is the student memo writing. Table A1 includes an example of a solution that demonstrates the quality expected for student writing in the assignments. Solution keys for homework assignments were distributed to the students in class on the day the assignment was due. The solution key then became the focus of the lecture discussion that day. Students were also asked follow-up sensitivity analysis questions in class as an additional opportunity to demonstrate their understanding of the managerial decision tool.

For the midterm discussion question, students were given a model and a memo that asked them to explain how they would modify the model to adapt it to new management preferences. Students had to explain how to develop the new constraints and how the revised model might impact their recommendations and the value of the objective.

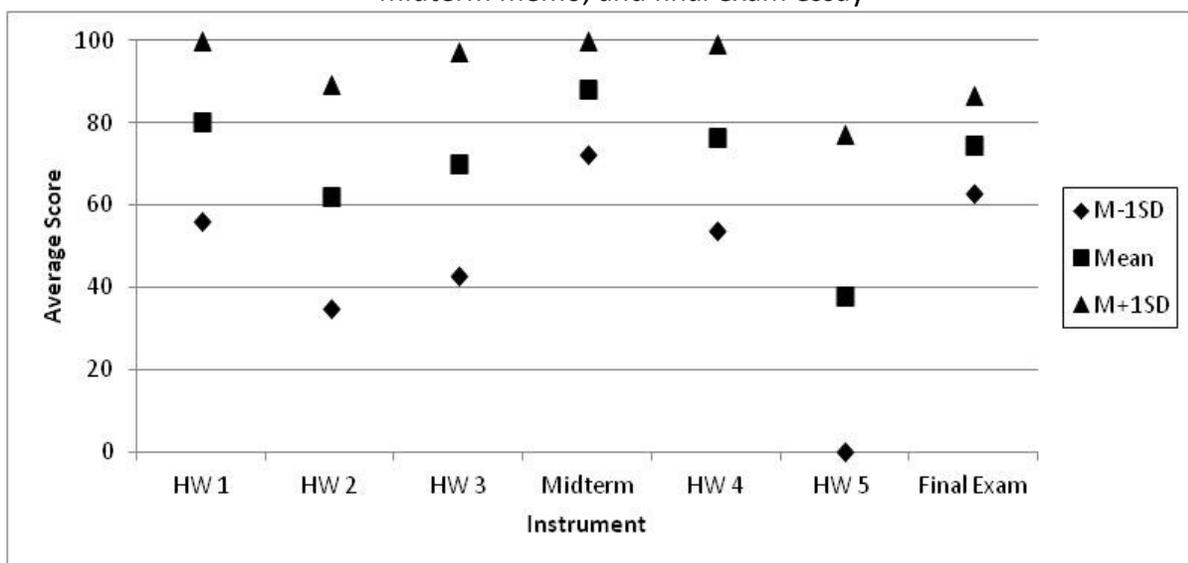
The exam essay question asked students to describe the use of management science for a particular organization. Examples using organizations such as UPS were discussed in an exam review in class. Expectations were discussed such as articulating the decisions, an objective, constraints, and sensitivity analysis questions. The exam essay question is repeated below.

Explain how a linear program, integer program, or mixed integer linear program from management science can help the US Army with a specific example. Your explanation should demonstrate learning the concepts covered in class over the semester. Write legibly, with correct spelling and grammar.

RESULTS

Student performance for the memos in each of the five homework assignments, the memo question in the midterm, and the final exam essay were tracked over time as shown in Figure 1. Each homework assignment had two problems with two memos, which are aggregated in Figure 1. Each homework assignment was worth 4% (16% of the total grade since the lowest homework grade is dropped), while the midterm and final exams were each worth 30% of the course grade. Therefore, the effect of earning a score of zero on one or more homework assignments greatly impacted the standard deviations in Figure 1. Another source of variability is that the homework assignments became more challenging as the course progressed.

Figure 1 Assessment of student performance for homework memos including scores of zero, midterm memo, and final exam essay



Excluding the zero homework scores, Pearson's correlation coefficients were calculated first using the average of the students' homework memo 1 and 2 as the independent variable and the midterm memo score as the dependent variable. Because the homework assignments varied in difficulty, we correlated the combined homework memo grade with the midterm grade. These early homework memos did not have a strong correlation with the midterm memo. Next, Pearson's correlation coefficients were calculated for the dependent variable final exam essay and two independent variables: the average of the students' homework memo 1, 2, 3, 4, and 5 excluding zero scores and the midterm memo score. The average score of the five homework memos was strongly correlated with the final essay question. The midterm memo was also correlated with the final essay question. These results are summarized in Tables 3 and 4. Table 4 should be interpreted with caution however, since the small sample size may be subject to sampling error and grading bias from only one instructor performing the grading with student names present. Since grading consistency was not tested and the sample size was small, we interpret Table 4 as indicating a potential trend.

Table 3: Descriptive statistics (excluding zero homework scores)

	Mean	Standard deviation	Coefficient of variance
Average of homework memos 1 and 2	0.78	.11	7
Average of homework memos 1, 2, 3, 4, and 5	0.78	.09	8.7

Table 4: Correlation coefficients

	Midterm – memo	Final – essay
Average of homework memos 1 and 2	0.26	0.37*
Average of homework memos 1, 2, 3, 4, and 5	-	0.55**
Midterm-memo question	-	0.49**

* Correlation is significant at the 0.05 level (2-tailed)

** Correlation is significant at the 0.01 level (2-tailed)

CONCLUSIONS AND FUTURE RESEARCH

In conclusion, initial average homework memo performance was not strongly correlated to midterm memo performance. However, a potential trend was indicated for correlation between average homework memo performances for the semester as well as midterm memo with the final exam essay performance. Since the final exam essay required students to write about the use of management science in practice, the preparation trend is encouraging. However, the actual final exam essay averages show an opportunity for further innovation to improve student performance.

Further research is needed to determine what factors influence student preparation and learning with respect to imagining the use of management science to solve real business

problems. We plan to conduct further research to determine how to improve student learning on the discussion of the use of management science.

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REFERENCES

- Anderson, D. R., Sweeney, D. J., Williams, T. A., Camm, J. D., & Martin, K. (2011). *An Introduction to Management Science: Quantitative Approaches to Decision Making*. Mason, OH: South-Western Cengage Learning.
- Barnes, R., Perry, M., & Stigler, J. W. (1989). Activation of real-world knowledge in the solution of word problems. *Cognition and Learning*, 6(4), 287-318.
- Business Accreditation Standards. *Standard 15*. AACSB International. Retrieved on October, 7, 2011 from <http://www.aacsb.edu/accreditation/business/standards/aol/standard15.asp>
- Grinde, R. B., & Kammermeyer, J. A. (2003). Experiences using thematic assignments in an undergraduate management science course. *INFORMS Transactions on Education*, 4(1), 23-36.
- Koedinger, K. R., & Nathan, M. J. (2004). The real story behind story problems: Effects of representations on quantitative reasoning. *The Journal of the Learning Sciences*, 13(2), 129-164.
- Liberatore, M.J., & Nydick, R.L. (1999, July/August). The teachers' forum: Breaking the mold- A new approach to teaching the first MBA course in management science. *Interfaces*, 29(4), 99-116.
- Rittle-Johnson, B., & Koedinger, K. R. (2005). Designing knowledge scaffolds to support mathematical problem solving. *Cognition and Instruction*, 23(3), 313-349.
- Stevens, S.P., & Palocsay, S.W. (2004, May). A translation approach to teaching linear program formulation. *Informations Transactions on Education*, 4(3), 38-54.
- Williams, J.A.S., & Reid, R. (2010). Developing problem solving and communication skills through memo assignments in a management science course. *Journal of Education for Business*. 85(6), 323-329.

APPENDIX

Table A1: Homework Assignment Memo Keys

Assignment	Memo
Homework 1 Problem 1	<p>In response to your query to determine the number of containers of Organic Garlic Hummus and Organic Red Pepper Hummus to produce and sell next week, I assumed that all of the Organic Hummus produced is sold, the available labor for ingredient preparation, mixing, and packaging are 14,400, 9600, and 7200 minutes respectively, the projected demands for Garlic versus Red Pepper Organic Hummus are 3000 and 1000 respectively, and the sales cannot exceed projected demand. Also, a contract for 800 Red Pepper Hummus containers must be honored. After talking with procurement, I learned that all the ingredient supplies are available. To calculate the expected profit per container of Organic Garlic Hummus and Organic Red Pepper Hummus, I considered the retail price, overhead cost, labor cost, and materials cost. I developed a linear programming model that is detailed in the attached appendix 1. Also included in appendix 1 is the Management Scientist software output for my model. Based on my model with an objective to maximize profit, I recommend the following product mix:</p> <p style="padding-left: 40px;">Produce and sell 2800 containers of Organic Garlic Hummus Produce and sell 800 containers of Organic Red Pepper Hummus</p> <p>The total profit from producing and selling this optimal combination is \$1240.</p>
Homework 1 Problem 2	<p>In response to your request to determine the number of medium and large CFL packs to manufacture and sell each day in order to maximize profit, I investigated the accounting profits, supplier minimum use contracts for foil, and marketing forecasts. Assuming that each CFL pack manufactured is sold, I recommend the following product mix:</p> <p style="padding-left: 40px;">6000 medium CFL packs 4800 large CFL packs</p> <p>Selling this mix of products each day will generate \$10,896.80 in profit. I based my recommendation on a linear programming model that is defined in the attached appendix 2. I solved my model using the graphical solution method as well as by using the solver in Management Scientist software, as shown in the attached appendix 2. If you have any questions, please contact me.</p>
Homework 2 Problem 1	<p>In response to your memo requesting the quantities of five types of soap to produce in preparation for booth sales at a large local festival next week, I created a linear programming decision model that maximizes the bars of soap produced while considering constraints for the beeswax and avocado supplies, the labor time available, the management preferences, and the production budget. The linear programming model I used to develop my recommendation is given in the attached Appendix 1. I recommend the following production plan (approximated by rounding down from the optimal solution for honey and unscented):</p> <p style="padding-left: 40px;">Produce 2907 bars of honey soap Produce 300 bars of citrus soap Produce 600 bars of green tea soap Produce 400 bars of avocado soap Produce 3061 bars of unscented soap</p> <p>The total number of bars of soap from this production plan is 7268 bars of soap.</p>

<p>Homework 2 Problem 2</p>	<p>In response to your memo requesting the quantities of each type of vaccine to maximize profit, I created a linear programming decision model that considers contracts for seasonal flu and chicken pox vaccines, the labor requirements, the advertising budget, the requirement that the number of MMR vaccines be twice the total number of H1N1 and chicken pox vaccines, and the profit of each type of vaccine. The model I used to develop my recommendation is given in the attached Appendix 2. I recommend the following product mix and note their financial implications (approximated by rounding down from the optimal solution for MMR and H1N1):</p> <ul style="list-style-type: none"> Number of MMR vaccines to produce and sell: 3405 vaccines (profit \$12,189.90) Number of H1N1 vaccines to produce and sell: 902 vaccines (profit \$1,957.34) Number of Seasonal flu vaccines to produce and sell: 800 vaccines (profit \$2000) Number of Chicken pox vaccines to produce and sell: 800 vaccines (profit \$2200) <p>The total profit from this product mix is projected to be: \$18,347.24</p>																																																	
<p>Homework 3 Problem 1</p>	<p>In response to your memo to determine the minimum cost service mix for Charters, Inc. such that at least 300 total trips are scheduled which includes at least 50 three-hour trips, I considered the captain and tour guide service times and availability and the cost per trip. I also considered that the number of two-hour trips be at least 25% of the sum of one- and three-hour trips. I developed a linear programming model that is shown in the attached Appendix 1.1. I recommend the following service mix:</p> <ul style="list-style-type: none"> 190 One-hour trips 60 Two-hour trips 50 Three-hour trips <p>The total cost from this service mix will be \$31,900</p>																																																	
<p>Homework 3 Problem 2</p>	<p>In response to your September 23rd memo to determine the number of Online and Radio Ads for Mobile, Pensacola, and FWB to increase the number of customers subject to the advertising budget of \$301,800, I considered the requirements to use at least at least 30 online ads in FWB but at most 20 radio ads in Mobile. I developed a linear programming model that also considered that the number of radio ads in Mobile and Pensacola must be equal and that the number of online ads in Pensacola must be at least 50% of the total number of online ads selected for the 3 markets. Based on the model to maximize the number of customers added and its Management Scientist software output in the attached appendix 2.1, I developed the following recommendations. The optimal solution is to use the following advertising mix to add 31,800 new customers:</p> <table border="1"> <thead> <tr> <th rowspan="2">Ad</th> <th colspan="3">Mobile</th> <th colspan="3">Pensacola</th> <th colspan="3">FWB</th> </tr> <tr> <th># of Ads</th> <th>customers added</th> <th>Cost</th> <th># of Ads</th> <th>customers added</th> <th>Cost</th> <th># of Ads</th> <th>customers added</th> <th>Cost</th> </tr> </thead> <tbody> <tr> <td>Online</td> <td>0</td> <td>0</td> <td>0</td> <td>30</td> <td>7,500</td> <td>\$75,000</td> <td>30</td> <td>6,000</td> <td>\$66,000</td> </tr> <tr> <td>Radio</td> <td>20</td> <td>7,000</td> <td>\$60,000</td> <td>20</td> <td>8,000</td> <td>\$70,000</td> <td>11</td> <td>3,300</td> <td>\$30,800</td> </tr> <tr> <td>TOTAL</td> <td>20</td> <td>7,000</td> <td>\$60,000</td> <td>50</td> <td>15,500</td> <td>\$145,000</td> <td>41</td> <td>9,300</td> <td>\$96,800</td> </tr> </tbody> </table>	Ad	Mobile			Pensacola			FWB			# of Ads	customers added	Cost	# of Ads	customers added	Cost	# of Ads	customers added	Cost	Online	0	0	0	30	7,500	\$75,000	30	6,000	\$66,000	Radio	20	7,000	\$60,000	20	8,000	\$70,000	11	3,300	\$30,800	TOTAL	20	7,000	\$60,000	50	15,500	\$145,000	41	9,300	\$96,800
Ad	Mobile			Pensacola			FWB																																											
	# of Ads	customers added	Cost	# of Ads	customers added	Cost	# of Ads	customers added	Cost																																									
Online	0	0	0	30	7,500	\$75,000	30	6,000	\$66,000																																									
Radio	20	7,000	\$60,000	20	8,000	\$70,000	11	3,300	\$30,800																																									
TOTAL	20	7,000	\$60,000	50	15,500	\$145,000	41	9,300	\$96,800																																									
<p>Homework 4 Problem 1</p>	<p>In response to your query to determine the transportation mix for American flags, I considered the transportation costs from the warehouse to each of 4 retailers. I also considered the contract between the warehouse and Ace Hardware to ship at least 5000 units. I developed a network model and a linear programming model which is detailed in the attached appendix. Please note that because our current inventory is only 20,000 flags and the total demand forecasts for the 4 retailers is 21,000 flags, we are 1000 flags short. The optimal solution below minimizes shipping costs but allocates the 1000-unit shortage to Home Depot. The total shipping cost from this optimal mix is \$18,340. Thus, I recommend the following transportation mix for next week.</p> <table border="1"> <thead> <tr> <th rowspan="2">Source</th> <th colspan="4">Optimal shipment quantities</th> <th rowspan="2">Total Shipped</th> </tr> <tr> <th>Ace Hardware</th> <th>Home Depot</th> <th>Lowe's</th> <th>Reynolds Hardware</th> </tr> </thead> <tbody> <tr> <td>Warehouse</td> <td>5000 flags</td> <td>5000 flags</td> <td>7000 flags</td> <td>3000 flags</td> <td>20,000 flags</td> </tr> <tr> <td>Shortage</td> <td></td> <td>1000 flags*</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>*Home Depot's forecast is 6000 flags, but only 5000 flags are shipped (a 1000 – flag shortage)</p>	Source	Optimal shipment quantities				Total Shipped	Ace Hardware	Home Depot	Lowe's	Reynolds Hardware	Warehouse	5000 flags	5000 flags	7000 flags	3000 flags	20,000 flags	Shortage		1000 flags*																														
Source	Optimal shipment quantities				Total Shipped																																													
	Ace Hardware	Home Depot	Lowe's	Reynolds Hardware																																														
Warehouse	5000 flags	5000 flags	7000 flags	3000 flags	20,000 flags																																													
Shortage		1000 flags*																																																

<p>Homework 4 Problem 2</p>	<p>In response to your query to determine the assignments for the two sales representatives to the three patients, I developed a network model and a linear programming model shown in the attached appendix 2.1. I considered management preferences to determine the optimal assignment that maximizes profit.</p> <table border="1"> <thead> <tr> <th>Sales Rep</th> <th>Patient</th> <th>Profit</th> </tr> </thead> <tbody> <tr> <td>Bill</td> <td>2</td> <td>\$600</td> </tr> <tr> <td>Nancy</td> <td>1</td> <td>\$800</td> </tr> <tr> <td>Nancy</td> <td>3</td> <td>\$500</td> </tr> <tr> <td colspan="2">Total Profit Estimate (\$)</td> <td>\$1900</td> </tr> </tbody> </table>	Sales Rep	Patient	Profit	Bill	2	\$600	Nancy	1	\$800	Nancy	3	\$500	Total Profit Estimate (\$)		\$1900
Sales Rep	Patient	Profit														
Bill	2	\$600														
Nancy	1	\$800														
Nancy	3	\$500														
Total Profit Estimate (\$)		\$1900														
<p>Homework 5 Problem 1</p>	<p>In response to your memo requesting the shipment schedule for pairs of snow skis that minimizes shipment costs, I considered several important factors. The Fort Collins and Park City weekly factory capacities are 1400 pairs and 1600 pairs of snow skis respectively. The weekly demand forecasts for customers in Park City and Vail are 1800 pairs and 1200 pairs of snow skis respectively. I also considered the shipping costs for each route and the limitation of only 800 pairs that can be direct shipped from the Park City factory to regional Park City customers. I developed a network diagram and a linear programming model as shown in Appendix 1. I recommend the following shipment schedule:</p> <ul style="list-style-type: none"> Ship 1400 pairs of snow skis from the Fort Collins factory to the Denver distributor Ship 800 pairs of snow skis from the Park City factory to the Salt Lake City distributor Ship 800 pairs of snow skis from the Park City factory directly to the Park City customers Ship 200 pairs of snow skis from the Denver distributor to the Park City customers Ship 1200 pairs of snow skis from the Denver distributor to the Vail customers Ship 800 pairs of snow skis from the Salt Lake City distributor to the Park City customers <p>The total shipping cost for this optimal schedule is \$37,200.</p>															
<p>Homework 5 Problem 2</p>	<p>In response to your request regarding the snow skis setup and production schedule, I considered data for each of the three types of snow skis: Expert, Flier, and Novice. The data for each type of snow ski included the snow ski demand forecasts, the sales price per pair of snow skis, the setup and production machine time for per pair of snow skis. I assumed \$15/minute for either machine setup or production time. I also considered that if SS produces Flier skis, then they must produce Novice skis. I also avoided selection of both Expert and Flier skis from setup and production next week. I developed a model to maximize net revenue subject to these constraints, which is detailed in appendix 2. I recommend setting up Flier skis and making 533 pairs and then setting up Novice skis and making 400 pairs. The total net revenue from this setup and production schedule is \$453,360.</p>															

Password Protection: Perceptions and Practice

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Abstract

Increasing concerns about security and privacy have raised the bar for interest in ways to protect information. Although newer approaches include face recognition, the use of passwords is commonly used today as the best approach for protecting data. Web sites, software programs, financial institutions universities, and many commercial stores are requiring that a password include the following attributes: consist of a fixed number of characters, include numbers and letters, special characters and lower and upper case letters. In addition, repetition of a password is not allowed, i.e. the updated password must be original to the user. These circumstances are just a few of the requirements that have made generating a password somewhat of a challenge. Many institutions also require changing a password on a regular schedule. The growth of the use of password coupled with the frequency of changing these codes have made the creation and use of passwords a challenging necessity.

This paper explores how students view and use password protection. One of the questions addressed in this research is: Do student attitudes toward password protection impact how passwords are used? Another inquiry discussed in this paper is perception of the importance of the use of passwords. Interest in using an automated tool to facilitate use of password protection is also explored. Evidence connecting the use of passwords and the habits developed by undergraduates in protecting their information are also explored in this paper. Some of the questions addressed in this research include the following:

- How many web sites do you visit that require a password?
- Given the following classifications: personal banking, social networking, shopping, and gaming, how many websites of each type do you use that require passwords?

- How do you view the importance of password security?
- How many passwords do you use?
- How often do you change your password(s) voluntarily?
- How often do you change your password(s) because you are required to?
- Do you find it challenging to change your passwords, given many sites requirements, to include a capital letter, symbol or other character?
- Are you familiar with any software that aids in creation and/or saving of your personal passwords? If so, which software?
- Would you be interested in such a tool, if you aren't familiar with one?
- Of the following devices: desktop, iPad, laptop, and cell phone, how would you rate the importance of securing them with password protection?

The findings of the survey help to understand the perspective of today's students and how to address the critical need to secure their passwords. The consequence of misapplying a password can lead to frustration, loss of information, and delays in accessing data. The practice of employing an automated password tool is seen as a solution to the complexities of creating and applying passwords.

This research contributes to understanding some of the attitudes and habits of students in their use of passwords. Approximately 94% of the respondents to the survey felt that password protection was important. The perception of the degree of trouble of changing password was almost evenly divided between a high level of difficult and a low level of difficulty among the students surveyed. The majority of students in the study (57%) are interested in learning about a software tool to automate password management.

In terms of the relationships between the perceptions and the behaviors reported in the survey, it was found that there is significant relationship between the number of sites requiring passwords and the use of passwords. There was also a significant relationship between the difficulty in changing passwords and interest in an automated tool.

Passwords may be words or strings of characters that are used to verify identity to gain access to a resource. Passwords have been used in ancient times especially as guard words for sentries and other military applications (About.com, 2011). In modern times, passwords have been associated with computers since their early days and used to verify identity for logging into the system (Morris & Thompson, 1979). Remembering a few passwords is generally not a difficult task; however, as more computers, networks and web sites are used the more challenging the effort. In addition to the number of devices expanding that require passwords the range of uses has also increase the need for more passwords. Ideally every password should be unique, but it may not be possible to reduce the number of passwords to be remembered without decreasing security (The JNT Association, 2007). Given the increase in the demands for passwords, how do users perceive the challenges and address the need for securing their identities through passwords? To begin to answer this question, the research in this paper examines the perceptions of undergraduate students about their use of passwords.

Procedure

A survey was administered to undergraduate students at a small private college on the east coast. A copy of the survey questions is available in Appendix A. The purpose of the research was to gather information about the use of passwords by students and their attitudes about securing information through passwords. The frequency of password usage and the types of applications that require passwords were also investigated. The number of passwords used along with their frequency of changing the password was collected in this survey. Student perception about the importance of the use of password protection for securing a variety of electronic devices including desktop computers, iPads, laptops, cell phones and e-readers was captured in this assessment.

Population

The target population for this research is undergraduate students. This research sampled students in three undergraduate quantitative courses. The majority of students in the sample were juniors who were majoring in business; the sample size was 49. It is believed that the results of the sampling process used are generalizable to the target population of undergraduate students and reflect the perception and practice of password protection.

Research Questions

This paper examines the perceptions about password protection as well as the practice of password protection. Questions explored surrounding the perception of password protection includes: (1) How do students view the importance of password protection? (2) How difficult is it to change passwords? (3) What is the interest in an automated tool to manage passwords? Questions that address the practice of password protection by students are: (1) How many web sites and what types of sites do students visit that require passwords? (2) How many passwords do students use? (3) Do students change passwords more frequently on voluntarily or an involuntary basis? The answers to these questions are addressed in the survey and consequently they are summarized using descriptive statistics.

This research also investigates the relationship between certain perceptions and their connection to practice. These questions include: (1) Does the perception of password protection importance impact password usage? (2) Does the perception of importance affect interest in an automated software management tool? (3) Does the difficulty in changing passwords impact the interest in an automated tool? (4) Do the number of sites visited increase the usage of passwords?

The four questions addressing the relationships between perception and practice were analyzed using contingency tables with a chi-square with a phi coefficient to test the

associations. Phi is a chi-square based measure of association; the chi-square coefficient depends on the strength of the relationship and sample size. Since phi has a known sampling distribution it is possible to compute its standard error and significance (Howell, 2002). For this analysis the strength of the association will be assessed through a rule of thumb which provides a range of values for Phi and verbal assessment. Strong negative and strong positive associations are represented by Phi values between -1.0 to $-.7$ and $.7$ to 1.0 , respectively. Weak negative and positive associations are between $-.7$ to $-.3$ and $.3$ to $.7$, respectively. Values of Phi indicating little or no association are between $-.3$ to $.3$ (Simon, 2005).

Survey Instrument

Table 1 identifies the sources of the analysis from the survey questions. In this table each question and a brief caption is presented to identify the relationships that were examined. Several variables were recoded to develop categorical groups for the analysis; these groups and their labels are in Table 2. Tables 1 and 2 connect the questions in the survey to the variables that will be examined in this research. The results of this analysis are presented in the following section.

Table 1

Questions and Captions

Question	Caption
1	Web Sites Requiring Passwords
2 a	Password for Banking
2 b	Passwords for Social Networks
2 c	Passwords for Shopping
2 d	Passwords for Gaming
3	Importance of Passwords
4	Passwords Used
5	Voluntarily Change Passwords
6	Involuntarily Change Passwords
7	Difficulty in Changing Passwords
8	Familiar with Password Software
9	Name of Password Software
10	Interest in Password Software
11	Password Importance: Desktops Computers
12	Password Importance: iPad/Tablet
13	Password Importance: Laptop/Notebook
14	Password Importance: Cell Phone
15	Password Importance: E-reader

Table 2

Categorical Groups

Question	Response	Category Name (Value)
Question 1: 1. Approximately how many web sites do you visit that require a password?	a) 0 – 5	Low (1)
	b) 6 – 10	Medium (2)
	c) 11 – 15	High (3)
	d) more than 15	Very High (4)
Question 3: How do you view the importance of password security?	a. Extremely Important	High (1)
	b. Somewhat Important	High (1)
	c. Not that Important	Low (0)
	d. Not Important at all	Low (0)
Question 4: Approximately how many passwords do you use?	a. 1 – 2	Low (1)
	b. 3 – 5	Medium (2)
	c. 6 – 10	High (3)
	d. 11 - 15	Very High (4)
Question 7: How difficult do you find it to change your passwords, given many sites requirements to include a capital letter, symbol etc...?	a. Extremely Difficult	Difficult (1)
	b. Somewhat Difficult	Difficult (1)
	c. Difficult	Difficult (1)
	d. Not that Difficult	Not Difficult (0)
	e. Not Difficult at all	Not Difficult (0)
Question 10: Would you be interested in such a tool, if you aren't familiar with one?	Y	Interested (1)
	N	Not Interested (0)

Discussion Of Perceptions

Descriptive statistics are provided for the results of the perception questionnaire before examining the relationship between perception and practice. The first question examined the number of web sites that require a password. Table 3 presents the distribution of responses to

question 1. Approximately 78% of the students in the sample visit web sites that require 10 or fewer passwords.

Table 3

Question : 1. Approximately how many web sites do you visit that require a password?

	Frequency	Percent	Valid Percent	Cumulative Percent
0 - 5	20	40.8	40.8	40.8
6 - 10	19	38.8	38.8	79.6
11 -15	3	6.1	6.1	85.7
15 +	7	14.3	14.3	100.0
Total	49	100.0	100.0	

The categories of web sites that require passwords are displayed in Table 4. Approximately 57% visit at least one banking site, over 60% surf to at least two social networking sites, 32% enter at least 2 shopping sites, and about 77% do not use any gaming sites that require a password.

Table 4

Question 2: Approximately how many web sites of each type do you use that require passwords?

Web Sites Visited by Banking Category

	Frequency	Percent	Valid Percent	Cumulative Percent
0	2	4.1	4.2	4.2
1	28	57.1	58.3	62.5
2	10	20.4	20.8	83.3
3	2	4.1	4.2	87.5
4	6	12.2	12.5	100.0
Total	48	98.0	100.0	
Missing System	1	2.0		
Total	49	100.0		

Table 4 (Continued)

Web Sites Visited by Social Networking Category

	Frequency	Percent	Valid Percent	Cumulative Percent
0	2	4.1	4.2	4.2
1	18	36.7	37.5	41.7
2	14	28.6	29.2	70.8
3	7	14.3	14.6	85.4
4	5	10.2	10.4	95.8
5	2	4.1	4.2	100.0
Total	48	98.0	100.0	
Missing System	1	2.0		
Total	49	100.0		

Web Sites Visited by Shopping Category

	Frequency	Percent	Valid Percent	Cumulative Percent
0	14	28.6	29.2	29.2
1	10	20.4	20.8	50.0
2	6	12.2	12.5	62.5
3	3	6.1	6.3	68.8
4	4	8.2	8.3	77.1
5	6	12.2	12.5	89.6
6	2	4.1	4.2	93.8
7	1	2.0	2.1	95.8
8	1	2.0	2.1	97.9
30	1	2.0	2.1	100.0
Total	48	98.0	100.0	
Missing System	1	2.0		
Total	49	100.0		

Table 4 (Continued)

Web Sites Visited by Gaming Category

	Frequency	Percent	Valid Percent	Cumulative
0	38	77.6	79.2	79.2
1	2	4.1	4.2	83.3
2	3	6.1	6.3	89.6
4	1	2.0	2.1	91.7
5	1	2.0	2.1	93.8
6	1	2.0	2.1	95.8
9	1	2.0	2.1	97.9
12	1	2.0	2.1	100.0
Total	48	98.0	100.0	
Missing System	1	2.0		
Total	49	100.0		

The importance of password security is provided in Table 5. About 94% rated password protection as extremely or somewhat important.

Table 5

Question 3: How do you view the importance of password security?

	Frequency	Percent	Valid Percent	Cumulative Percent
Extremely Important	35	71.4	71.4	71.4
Somewhat Important	11	22.4	22.4	93.9
Important	2	4.1	4.1	98.0
Not that Important	1	2.0	2.0	100.0
Total	49	100.0	100.0	

The number of passwords used in displayed in Table 6; fifty-five percent of the students use between three and five passwords.

Table 6

Question 4: Approximately how many passwords do you use?

	Frequency	Percent	Valid Percent	Cumulative Percent
1 -2	13	26.5	26.5	26.5
3 - 5	27	55.1	55.1	81.6
6 -10	5	10.2	10.2	91.8
11 -15	2	4.1	4.1	95.9
15+	2	4.1	4.1	100.0
Total	49	100.0	100.0	

Tables 6 and 7 present the voluntary and involuntarily required changing of passwords, respectively. The majority of students (67%) never voluntarily change their passwords; the majority (51%) of participants is required to change their passwords on a monthly basis.

Table 6

Question 5: Approximately how often do you change your password(s) voluntarily?

	Frequency	Percent	Valid Percent	Cumulative Percent
Missing	2	4.1	4.1	4.1
Every day	1	2.0	2.0	6.1
2 - 5 times a week	2	4.1	4.1	10.2
Once a month	14	28.6	28.6	38.8
Never	30	61.2	61.2	100.0
Total	49	100.0	100.0	

Table 7

Question 6: How often do you change your password(s) because you are required to?

	Frequency	Percent	Valid Percent	Cumulative Percent
Missing	2	4.1	4.1	4.1
Every day	1	2.0	2.0	6.1
Once a week	1	2.0	2.0	8.2
Once a month	25	51.0	51.0	59.2
Never	20	40.8	40.8	100.0
Total	49	100.0	100.0	

In Table 8, the level of difficulty in changing passwords is shown. The degree of difficulty in changing passwords was almost evenly divided between those who answered as difficult or worse and those that felt it was not difficult.

Table 8

Question 7: How difficult do you find it to change your passwords?

	Frequency	Percent	Valid Percent	Cumulative Percent
Extremely difficult	7	14.3	14.3	14.3
Somewhat difficult	13	26.5	26.5	40.8
Difficult	4	8.2	8.2	49.0
Not that Difficult	19	38.8	38.8	87.8
Not Difficult	6	12.2	12.2	100.0
Total	49	100.0	100.0	

Familiarity with software that assists in creating, saving, and recalling password revealed that 85% did not know that software existed to facilitate working with passwords as displayed in

Table 9.

Table 9

Question 8: Are you familiar with any software that aids in creation, saving, and recalling your personal passwords?

	Frequency	Percent	Valid Percent	Cumulative Percent
No	42	85.7	85.7	85.7
Yes	7	14.3	14.3	100.0
Total	49	100.0	100.0	

Approximately 57% of respondents as provided in Table 10 would be interested in software that helped in managing passwords.

Table 10

Question 10: Would you be interested in such a tool, if you aren't familiar with one?

	Frequency	Percent	Valid Percent	Cumulative Percent
Missing	3	6.1	6.1	6.1
No	18	36.7	36.7	42.9
Yes	28	57.1	57.1	100.0
Total	49	100.0	100.0	

Table 11 displays the relative importance of password protection based on the type of device. In this table, extremely high importance was attributed to the desktop computer, iPad/tablet, laptop/netbook, cell phone and e-reader as 46.7%, 28.6%, 61.2%, 46.9%, and 6.1%, respectively. Clearly the laptop/netbook was identified as the most critical device for password security.

Table 11

Question 11: Importance of Password Protection by Device Type: Desktop Computers

	Frequency	Percent	Valid Percent	Cumulative Percent
Extremely important	23	46.9	48.9	48.9
Somewhat important	10	20.4	21.3	70.2
Important	5	10.2	10.6	80.9
Not Important	9	18.4	19.1	100.0
Total	47	95.9	100.0	
Missing System	2	4.1		
Total	49	100.0		

Table 11 (Continued)

Question 12: Importance of Password Protection by Device Type: iPad/Tablet

	Frequency	Percent	Valid Percent	Cumulative Percent
Extremely Important	14	28.6	30.4	30.4
Somewhat Important	12	24.5	26.1	56.5
Important	9	18.4	19.6	76.1
Not Important	11	22.4	23.9	100.0
Total	46	93.9	100.0	
Missing System	3	6.1		
Total	49	100.0		

Question 13: Importance of Password Protection by Device Type: Laptop/Netbook

	Frequency	Percent	Valid Percent	Cumulative Percent
Extremely Important	30	61.2	62.5	62.5
Somewhat Important	9	18.4	18.8	81.3
Important	4	8.2	8.3	89.6
Not Important	5	10.2	10.4	100.0
Total	48	98.0	100.0	
Missing System	1	2.0		
Total	49	100.0		

Question 14: Importance of Password Protection by Device Type: Cell Phone

	Frequency	Percent	Valid Percent	Cumulative Percent
Extremely Important	23	46.9	48.9	48.9
Somewhat Important	11	22.4	23.4	72.3
Important	7	14.3	14.9	87.2
Not Important	6	12.2	12.8	100.0
Total	47	95.9	100.0	
Missing System	2	4.1		
Total	49	100.0		

Table 11 (Continued)

Question 15: Importance of Password Protection by Device Type: E-Reader

	Frequency	Percent Valid	Percent	Cumulative Percent
Extremely Important	3	6.1	6.5	6.5
Somewhat Important	9	18.4	19.6	26.1
Important	11	22.4	23.9	50.0
Not Important	23	46.9	50.0	100.0
Total	46	93.9	100.0	
Missing System	3	6.1		
Total	49	100.0		

Discussion of the Relationships between Perception and Practice

The next analysis connects student views (perceptions about password protection) with their behavior (practice). Contingency tables with chi-square analysis were used to investigate the relationship among the variables identified in Table 12. In this table each of the variable constructs are connected to the questions in the survey and defined in terms of how the categories were created. For example, the variable importance was developed from question three and has two categories: high and low; respondents who answered this question with choices (a) or (b) were classified as high importance and students who selected (c) or (d) were assigned to the low importance category. As a result of Table 12 the variables that will be investigated using contingency table analysis are sites visited, importance, usage, difficulty, and interest.

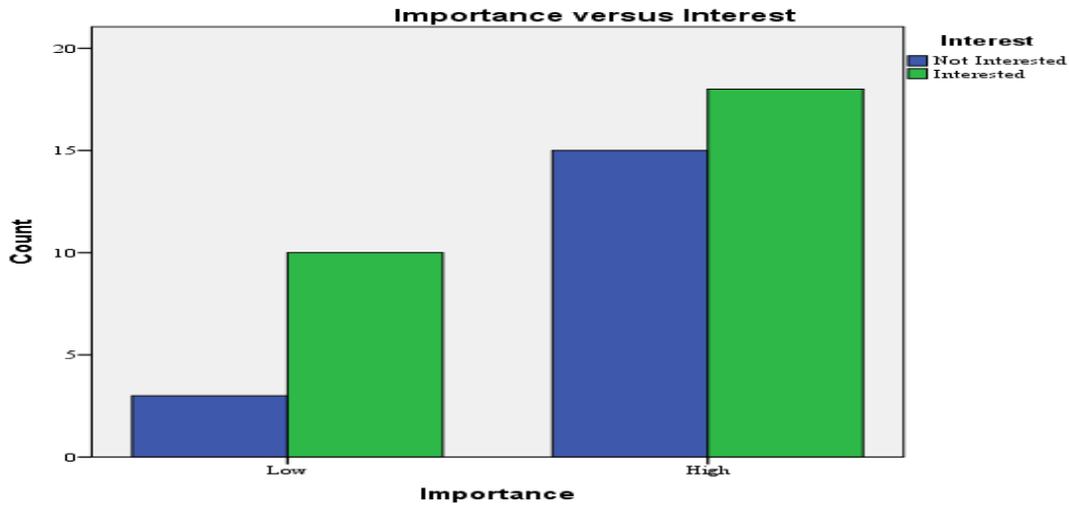
Table 12

Variables, Questions, and Categories

Variable: Description	Question	Categories
Sites Visited: Identifies web sites that require a password to visit	#1	Low (1): (a) 0 – 5 Medium (2): (b) 6 - 10 High (3): (c) 11 -15 Very High (4): (d) more than 15
Importance: Identifies the importance of passwords	#3	High (1): (a) Extremely Important High (1): (b) Somewhat Important Low (0): (c) Not that Important Low (0): (d) Not Important at all
Usage: Identifies the number of passwords used	#4	Low (1): (a) 1 – 2 Medium (2): (b) 3 – 5 High (3): (c) 6 – 10 Very High (4): (d) 11 – 15
Difficulty: Identifies the difficulty in changing passwords	#7	Difficult (1) (a) Extremely Difficult Difficult (1): (b) Somewhat Difficult Difficult (1): (c) Difficult Not Difficult (0): (d) Not that Difficult Not Difficult (0): (e) Not Difficult at all
Interest: Identifies interest in an automated password management tool	#10	Interested (1): Yes Not Interested (0): No

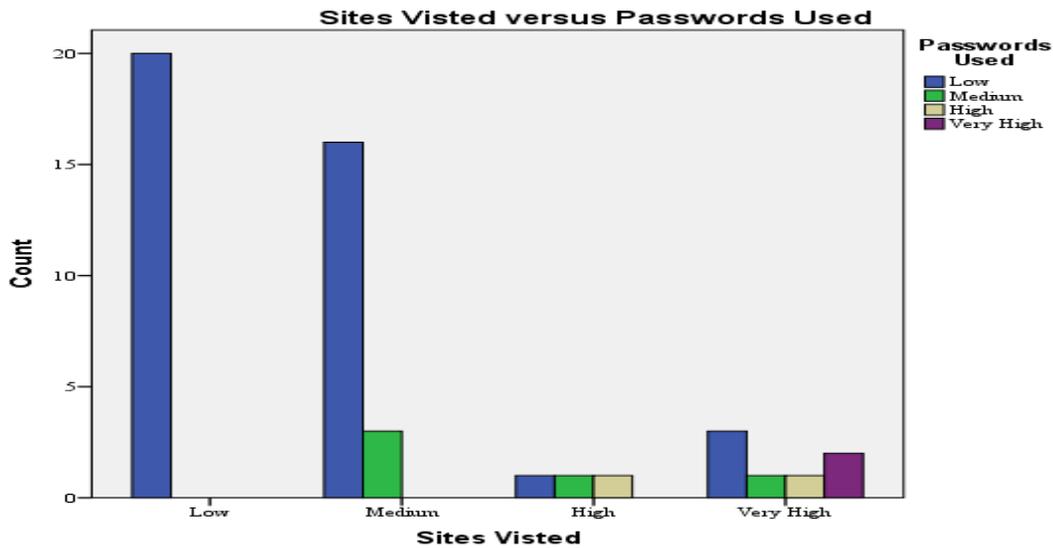
Do students who view importance as a high concern have a strong interest in automated password tools? Figure 1 presents a bar graph of the frequency for the importance and interest variables. There was no significant association between importance and interest $\chi^2 (1) = 1.961, p = .161$. The Phi coefficient was $-.206$ which also indicates a weak association between these constructs.

Figure 1



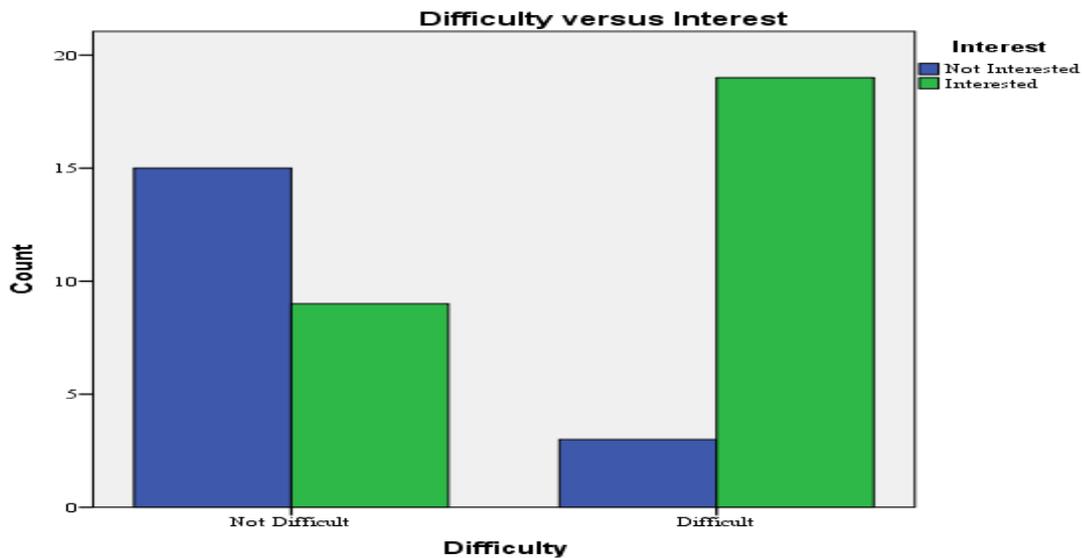
Do students who visit a larger number of sites more likely to use more passwords? Figure 2 displays the graph for the variables of sites visited and usage. There was a significant relationship at an alpha of .05 between sites visited and password usage $\chi^2 (9) = 28.964$ $p = .001$. The Phi coefficient was .769 which also indicates a strong positive association. The more sites visited the greater is their use of passwords.

Figure 2



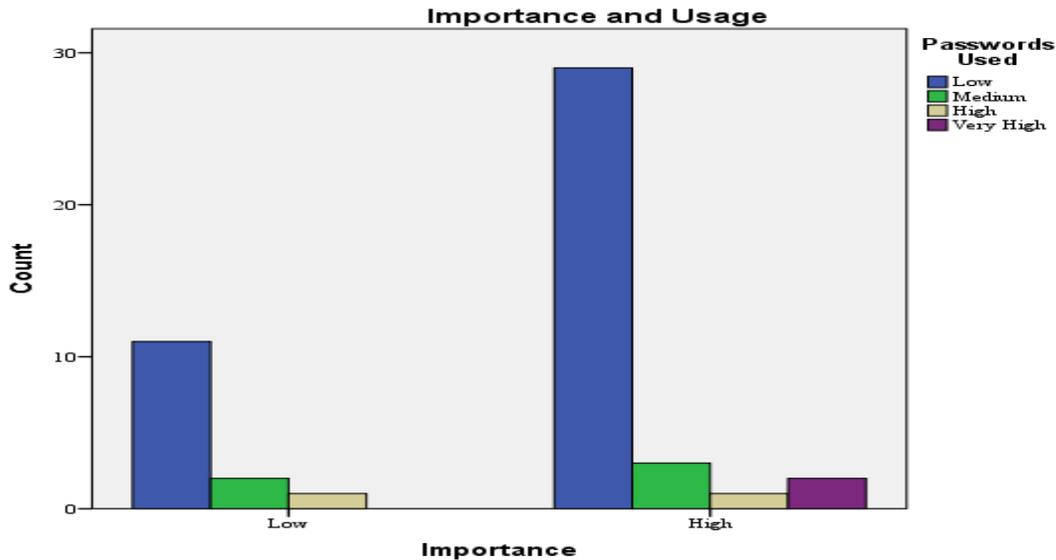
Does the level of difficult in changing password support more interest in an automated solution for managing passwords? Figure 3 presents the relationship between difficulty and interest. There was a significant relationship at an alpha of .05 between difficulty and interest $\chi^2(1) = 11.506$ $p = .001$. The Phi coefficient was .5 which also suggests a positive association between difficulty and interest.

Figure 3



Are students who view passwords as important more inclined to use passwords more frequently? Figure 4 displays the relationship between importance and usage. There was no significant association between importance and usage at an alpha of .05 $\chi^2(3) = 1.592$, $p = .661$. The Phi coefficient was .180 which also indicates a weak association between these variables. The number of sites visited that require passwords and the perception of the importance of password protection appear to be unrelated.

Figure 4



Conclusion

This paper examined the perceptions and practices of students in password protection. A survey was administered to undergraduates to collect data about their views and behaviors in password protection. This research contributes to understanding some of the attitudes and habits of students in their use of passwords. Approximately 94% of the respondents to the survey felt that password protection was important. The perception of the degree of trouble of changing password was almost evenly divided between a high level of difficult and a low level of difficulty among the students surveyed. The majority of students in the study (57%) are interested in learning about a software tool to automate password management.

In terms of the relationships between the perceptions and the behaviors reported in the survey, it was found that there is significant relationship between the number of sites requiring passwords and the use of passwords. No statistical association between the importance of passwords and their use. There was no significant relationship found between the importance of password protection and interest in a software tool to automate password management. On the

other hand there was a significant relationship between the difficulty in changing passwords and interest in an automated tool. Additional research with larger samples is recommended to develop more complete exploratory models that would connect the perception of password protection with its associated behaviors.

References

- About.com. (2011). Polybius on the Roman military. Retrieved December 1, 2011, from http://ancienthistory.about.com/library/bl/bl_text_polybius6.htm
- Howell, D. C. (2002). *Statistical methods for psychology* (5th ed.). Pacific Grove, CA: Duxbury/Thomson Learning.
- Morris, R., & Thompson, K. (1979). Password security: A case history. Retrieved December 1, 2011, from <https://info.aiaa.org/tac/isg/SOFTC/Public%20Documents/Technical%20Working%20Groups/Cyber%20Security/Password%20Security%20A%20case%20Study.pdf>
- Simon, S. (2005). What is a phi coefficient? Retrieved November 2, 2010, from <http://www.childrens-mercy.org/stats/definitions/phi.htm>
- The JNT Association. (2007). Using passwords. Retrieved December 1, 2011, from <http://www.ja.net/documents/publications/factsheets/026-using-passwords.pdf>

APPENDIX A

Survey Questions

Please provide your responses to the following questions about using passwords to secure your data and information. Note: this is a completely voluntary survey.

1. Approximately how many web sites do you visit that require a password?
 - a. 0-5
 - b. 6-10
 - c. 11-15
 - d. More than 15

2. Given the following classifications, approximately how many web sites of each type do you use that require passwords? Please insert a number for each category. You may use zero (0) to indicate that no passwords are required.
 - a. Personal Banking _____
 - b. Social Networking _____
 - c. Shopping _____
 - d. Gaming _____

3. How do you view the importance of password security?
 - a. Extremely Important
 - b. Somewhat Important
 - c. Important
 - d. Not that Important
 - e. Not Important at all

4. Approximately how many passwords do you use?
 - a. 1-2
 - b. 3-5
 - c. 6-10
 - d. 11-15
 - e. More than 15

5. Approximately how often do you change your password(s) voluntarily?
 - a. Every day
 - b. 2-5 times a week
 - c. Once a week
 - d. Once a month
 - e. Never

6. How often do you change your password(s) because you are required to?
 - a. Every day
 - b. 2-5 times a week
 - c. Once a week
 - d. Once a month
 - e. Never

7. How difficult do you find it to change your passwords, given many sites requirements to include a capital letter, symbol etc...?
 - a. Extremely Difficult
 - b. Somewhat Difficult
 - c. Difficult
 - d. Not that Difficult
 - e. Not Difficult at all

8. Are you familiar with any software that aids in creation, saving, and recalling your personal passwords? Y N

9. If you answered Yes to Question 8, what is the name of the software? _____

10. Would you be interested in such a tool, if you aren't familiar with one? Y N

Please rate each of the following devices listed in the table by circling your choice. How would you rate the importance of securing each of them with password protection?

(1-Extremely Important, 2-Somewhat Important, 3-Important, 4-Not Important)

TABLE 1: Electronic Devices

		Extremely Important	Somewhat Important	Important	Not Important
11	Desktop Computer	1	2	3	4
12	iPad/Tablet	1	2	3	4
13	Laptop/Netbook	1	2	3	4
14	Cell Phone	1	2	3	4
15	E-Reader	1	2	3	4

Equity and Athletics: Towards an Efficiency Analysis of Title IX Compliance

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Abstract

June 2012 marks the 40th anniversary of the federal statute prohibiting sex discrimination in education programs receiving federal funds (Title IX). With this milestone, there are allegations of inefficient, out-of-control spending by athletic directors and university presidents as part of an athletic “arms race,” coupled with continuing charges that institutions are not in compliance with Title IX. Our study uses Data Envelopment Analysis (DEA) to offer a model aimed at measuring how efficient universities are in managing their athletic department resources to comply with federal regulations and policies set forth in Title IX of the Education Amendments of 1972.

Introduction

Next year will mark the 40th anniversary of Title IX of the Education Amendments of 1972, a federal law which simply states that

“No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance [27].”

At the time it was voted into law, its sponsors and supporters never predicted the impact that those 37 words would have on intercollegiate athletics. In fact, for many of them, athletics was not a part of the discussions or even on their mind at the time [10]. Today, most individuals who are familiar with Title IX associate it with athletics largely because it has dramatically changed the nature of high school and college sports. According to the Women’s Sports Foundation, since the statute was passed in 1972, the number of women participating in collegiate athletics has increased more than 900% [26].

While opportunities and resources have increased for women, evaluating whether Title IX has led to equity in college sports today has been complicated by the increased, mostly out-of-control spending that has characterized the current athletic “arms race.” Since Title IX was passed in 1972, for every \$1 spent on women’s sports, nearly \$2 has been spent on men’s sports [3].

During 2009-2010, the U.S. Department of Education’s Office of Postsecondary Education (OPE) collected data from more than 2000 institutions (colleges, universities, and community colleges) [26]. Athletic department expenditures ranged from just over \$9

million to nearly \$114 million, with an average Division I institution spending \$24.01 million annually [26]. In terms of Title IX compliance, universities are required to provide playing opportunities at the intercollegiate level for men and women in a nondiscriminatory manner. For that purpose, nondiscrimination is measured in one of three ways (each institution can opt for any one of the three). The first of the three options is to “provide participation opportunities substantially proportionate to the ratio of males and females in the student body (an option known as the ‘proportionality prong.’)” [7]. Of the universities that submitted enrollment data and intercollegiate playing opportunity data for males and females to the NCAA sought to comply with Title IX’s only 182 of 1879 Division I and Division II universities provided a proportional number of participation opportunities as compared to their undergraduate enrollment—1427 schools did not meet the proportionality compliance option of Title IX [26]. For the same year and data set, when considering the academic financial aid (i.e., scholarship) requirements of Title IX compliance, only 321 universities provided financial aid scholarships within the 1% requirement—1174 schools were not in compliance [26]. At the average Division I institution, women receive only 34% of the average athletic department budget even though they represent on average 51% of the student body [16]. Despite these facts that suggest there may be significance noncompliance with the law, not even one university has lost federal funding or been referred to the Justice Department for investigation during the 40 year history of the law [24].

It is possible that some institutions are complying with Title IX’s participation requirements in one of the other two ways provided for in the Office of Civil Rights’ 1996 Letter of Clarification creating the “3 prong test.” As already noted, the Policy Interpretation provides two other ways that institutions can comply with participation requirements, If electing to comply with the first prong, institutions must provide athletic participation opportunities for men and women in proportion to undergraduate enrollment of men and women. To comply with the second prong, institutions need to show continuing progress toward increasing the opportunities for the under represented sex. Finally, to comply with the third prong, institutions need to provide athletic participation opportunities for men and women in proportion to the interests of the student body (as determined, for example, by an interest survey or requests to upgrade a club team to varsity status).

While a “third-prong” approach to compliance has rarely been used, numerous institutions frequently comply with using the “second prong” of “showing continuing progress toward increasing the opportunities for the under represented sex.” While exactly what constitutes acceptable progress is not specifically enumerated in the law’s regulations or Policy Interpretation, generally showing a pattern of increasing the number of women’s teams or reducing the number of men’s teams will suffice (the latter “leveling down” approach is, however, is viewed by proponents of the law as contrary to the affirmative spirit of the statute which is meant to increase opportunities for the underrepresented sex). The practice of cutting men’s team has stirred controversy as some athletics directors have blamed their decision to cut men’s teams on Title IX—even though Title IX does not require or even suggest tactical decisions, which are the responsibility of athletics directors and university presidents [18].

The US Department of Education's Office of Civil Rights is responsible for enforcing Title IX. Their approach requires that complaints be filed against institutions before any action is taken. This relatively passive approach to enforcement has arguably opened the door for the out-of-control spending—the athletics “arms race”—that has occurred over the past two decades. The spending has occurred in areas such as coaching, recruiting, equipment, travel, facilities and other areas covered by a second major component of Title IX which requires men's and women's programs as a whole receive equal treatment in what is often referred to informally as the Title IX “laundry list areas. Even though total spending for men's programs far outweighs total spending for women's programs at many Division I institutions, proving discrimination is difficult because the law allows for different amounts of spending depending on the nature of particular sports (and generally males and females do not compete in the same sports, making sport to sport comparisons only partially relevant and useful for comparative purposes). Between 1994 and 2001 capital expenditures related to athletics increased 250% which left many to conclude that constraints created by Title IX has had little, if any, impact on the athletic arms race [3].

As Brake [3] described the situation, it was almost as if “Title IX's equal treatment standard walk[ed] right into the thicket of commercialized college sports without the tools to critique or dismantle the worst excesses of the current structure.” In other words, patterns of extreme excess spending often get lost or go unnoticed as Title IX relies on comparing aggregate athletic spending rather than only on sport to sport differences; reasoning that sport to sport comparisons are difficult because some sports cost more than others, require different equipment, facilities, maintenance, etc.

Compounding the situation is the longstanding contention that football and men's basketball deserve to be exempted from Title IX because they generate high revenues compared with other men's and women's sports. Even though this position has been rejected at every turn by U.S. Courts and Congress, it maintains traction in public discourse and plays into athletic administrator's decision-making. Further complicating matters is continued propagation of the false notion that the production of revenue results in profitability. The idea that high revenues equate with profitability is a myth for all but 14 university athletic programs [3].

The purpose of this study is to develop a model that simultaneously combines multiple requirements of Title IX compliance and multiple financial aspects of athletic department operations and decision-making. Our model offers a means for evaluating the relative performance or efficiency of decision makers charged with obeying Title IX law while at the same time competing to win in the business of big-time college athletics.

Literature Review

Research related to Title IX has generally focused on interpretive studies and qualitative analyses by sport historians, legal scholars, sociologists, and physical educators. For example, Brake [3] discussed legal aspects of Title IX requirements using past judicial

rulings and policy. Suggs [18] offered a history of Title IX analyzing its impact on universities and leadership opportunities in coaching and athletic administration.

Over the past decade, the number of published studies of quantitative research related to Title IX has increased. For example, Kennedy used participation, scholarships, coaching salaries, and operation expenses to rank schools from the conferences that comprise the Bowl Championship Series (BCS) [11]. In his study, Kennedy created a playoff bracket comparison of schools between the top eight performers crowning Ohio University as the “National Champion of Title IX Compliance.” In a similar study, Kennedy analyzed compliance of schools from conferences regularly participating in the NCAA Basketball Tournament by school-to-school comparisons of participation and scholarship compliance [12]. His March Madness of Title IX compliance resulted in the DePaul Blue Demons as the champions.

Stafford [20] used regression to examine relationships between participation and scholarship compliance. Her conclusions mirror those of Anderson, et al. [1] who also used a regression approach to suggest that institutions having larger undergraduate enrollments with lower proportions of female undergraduates are more likely to be in compliance. Studies by Agthe and Billings [2] and by Stafford [21] suggested that schools with football programs are less likely to comply with Title IX’s participation and scholarship requirements. A study by Sigelman and Wahlbeck [19] also suggested that schools with football teams are “no where near compliance” and analyzed several possible actions that schools could undertake to become compliant with Title IX. Although the hypothetical actions they suggested may be interesting, they focus on exempting football from Title IX regulations, an idea that has been debated and rejected by Congress with the defeat of the Tower Amendment in 1974, which sought to exempt “revenue producing” sports [3].

Data Envelopment Analysis (DEA) has been used to evaluate the performance of organizations in many different domains since first being introduced by Charnes, et al. [8]. For example, DEA has been used to measure efficiency in a wide variety of areas including education [4], manufacturing [17, 23], transportation [5], and service applications [4]. Although we are unaware of any studies involving DEA and Title IX, DEA has been used in sports to rank the performance of countries participating in the 2004 Athens Olympics [20].

Model Formulation

We use the well-known DEA linear program formulation of Charnes, et al. [8] where the objective, in general, is to measure the efficiency, e , of a decision making unit (DMU) k by comparing the sum of its weighted outputs to the sum of its weighted inputs as follows:

$$e_k = \frac{\sum_{j=1}^t v_j Y_{jk}}{\sum_{i=1}^s u_i X_{ik}} \quad (1)$$

where $k=1, \dots, n$ DMUs. Each DMU has $j=1, \dots, t$ outputs Y_{jk} that are generated from $i=1, \dots, s$ inputs X_{ik} both of which are weighted by v_j and u_i respectively.

The ratio form above is transformed into a linear program with the weights as decision variables and the inputs and outputs as parameters as shown below in (2), (3), (4), and (5).

$$\max \sum_{j=1}^t v_j Y_{jk} \quad (2)$$

subject to:

$$\sum_{i=1}^s u_i X_{ik} = 1 \quad (3)$$

$$\sum_{j=1}^t v_j Y_{jk} - \sum_{i=1}^s u_i X_{ik} \leq 0 \quad \forall k \quad (4)$$

$$u_i, v_j \geq 0 \quad \forall i, j \quad (5)$$

The DEA model is then applied to k DMUs and efficiency scores are calculated for each DMU by solving the model k times—once for each DMU.

Illustrative Example

In order to illustrate the potential of using a DEA approach for evaluating relative efficient use of athletic resources, we select 14 universities from the OPE Equity in Athletics Data [26] as shown below in Table 1.

School	Total Athletic	--- Enrollment ---		-- Participants --	
	Expenses	Male	Female	Men	Women
University of Oregon	60,212,724	7,923	8,184	239	168
University of Maryland	59,686,748	12,613	11,683	421	368
University of Connecticut	58,474,394	7,949	8,064	369	350
Purdue University	57,544,619	17,980	12,704	335	275
Clemson University	56,199,722	7,366	6,368	324	285
University of Missouri	55,619,509	10,381	11,179	304	190
Indiana University	55,131,144	14,867	15,139	398	377
Rutgers University	54,438,214	13,565	12,817	303	341
University of Illinois	54,147,484	16,170	14,216	375	352
University of Louisville	53,706,623	5,579	6,059	333	261
West Virginia University	53,368,035	11,455	9,078	298	278
Arizona State University	53,297,963	20,844	22,182	355	294
University of Arizona	51,627,538	12,185	13,629	260	210
Virginia Tech	50,863,680	13,145	9,857	392	224

Table 1: Universities Included in the DEA Analysis

Although the overall size of the 14 universities, as indicated by enrollments, varies significantly from 11,638 to 43,026, they were chosen for this study because they appear to be relatively homogeneous in terms of the financial resources of their athletic departments.

Next, using enrollment, participation, and scholarship aid information for the 14 schools presented in Table 2 below, we develop two output measures for our DEA model.

School	% Women	% Women	Difference	% Women	Difference
	Enrollment	Participants		Scholarship \$	
University of Oregon	50.81	41.28	- 9.53	42.86	1.58
University of Maryland	48.09	46.64	- 1.44	44.16	- 2.48
University of Connecticut	50.36	48.68	- 1.68	50.00	1.32
Purdue University	41.40	45.08	3.68	41.97	- 3.11
Clemson University	46.37	46.80	0.43	40.23	- 6.57
University of Missouri	51.85	38.46	- 13.39	45.14	6.68
Indiana University	50.45	48.65	- 1.81	46.45	- 2.19
Rutgers University	48.58	48.42	- 0.16	45.87	- 2.54
University of Illinois	46.78	43.94	- 2.85	44.06	0.12
University of Louisville	52.06	52.95	0.89	44.61	- 8.34
West Virginia University	44.21	48.26	4.05	41.34	- 6.93
Arizona State University	51.55	45.30	- 6.25	41.78	- 3.52
University of Arizona	52.80	44.68	- 8.12	43.14	- 1.54
Virginia Tech	42.85	36.36	- 6.49	37.77	1.41

Table 2: Enrollment, Participation, and Scholarship Data

First, we compare the proportion of men and women athletic participants to the proportion of undergraduate men and women enrolled at each school and calculate the percentage to which the school has met their enrollment proportion target. We call this output indicator the Participation Achievement Indicator. For example, at the University of Connecticut 50.36% of the undergraduate students were women and 49.64% were men. In order to

meet the participation requirements of Title IX based on enrollment, there would need to be 50.36% women and 49.64% men participating in athletics. In 2009-2010, there were 719 athletic participants at the University of Connecticut of which 48.68% were women and 51.32% were men. While they fell short of their goal, they were within the 5% window for compliance set forth in the 1979 Policy Clarification issued by the Office of Civil Rights [25]. Although they did not meet their goal 100%, they did achieve 96.66% of their participation goal. The Participation Achievement indicator for the University of Connecticut is calculated as follows:

$$Participation\ Achievement_{UCONN} = \frac{\% \text{ of women athletic participants}}{\% \text{ of women undergraduates}} \quad (6)$$

Second, we compare the proportion of dollars spent on scholarships for women and men to the proportion of women and men athletic participants and calculate the Scholarship Achievement indicator for the University of Connecticut as follows:

$$Scholarship\ Achievement_{UCONN} = \frac{\% \text{ of scholarship \$ spent on women}}{\% \text{ of women athletic participants}} \quad (7)$$

Because Athletic Directors and University Presidents are responsible for deciding how to best use available resources in order to meet legal requirements of Title IX and achieve strategic goals of their respective athletic departments, their salaries and the dollars spent on athletic operations are used as inputs to the DEA model.

Participation Achievement indicators and Scholarship Achievement indicators for all 14 universities used as outputs and inputs to the DEA model are shown in Table 3 below.

School	----- Outputs -----		----- Inputs -----		
	Participation	Scholarship	Athletic	President	Athletic Dir.
	Achievement	Achievement	Op Expenses	Salary	Salary
Arizona State University	87.87	92.23	52,849,963	728,350	448,000
Clemson University	99.07	85.97	55,598,212	431,633	601,510
Indiana University	96.42	95.50	54,635,398	337,144	495,746
Purdue University	91.11	93.11	57,038,701	566,440	505,918
Rutgers University	99.66	94.75	53,733,484	593,800	414,000
University of Arizona	84.63	96.56	51,025,538	633,206	602,000
University of Connecticut	96.66	97.29	58,149,394	668,239	325,000
University of Illinois	93.92	99.72	53,131,623	245,498	575,000
University of Louisville	98.29	84.24	53,010,510	428,385	1,427,704
University of Maryland	97.00	94.69	59,211,658	498,284	475,090
University of Missouri	74.18	82.64	54,959,734	385,983	659,775
University of Oregon	81.24	96.17	59,712,724	573,743	500,000
Virginia Tech	84.86	96.13	50,285,804	744,892	577,876
West Virginia University	90.83	85.65	52,962,435	464,700	405,600

Table 3: DEA Model Inputs and Outputs

Results

DEA Efficiency was then calculated for each school by solving the model of (2), (3), (4), and (5) 14 times—once for each school. DEA results are displayed in Table 4 below.

School	----- Outputs -----		----- Inputs -----			DEA Efficiency
	Participation Achievement	Scholarship Achievement	Athletic Op Expenses	President Salary	Athletic Dir. Salary	
Rutgers University	99.66	94.75	53,733,484	593,800	414,000	1.0000
University of Connecticut	96.66	97.29	58,149,394	668,239	325,000	1.0000
University of Arizona	84.63	96.56	51,025,538	633,206	602,000	0.9886
Clemson University	99.07	85.97	55,598,212	431,633	601,510	0.9476
Arizona State University	87.87	92.23	52,849,963	728,350	448,000	0.9276
West Virginia University	90.83	85.65	52,962,435	464,700	405,600	0.9249
Virginia Tech	84.86	96.13	50,285,804	744,892	577,876	0.9067
University of Maryland	97.00	94.69	59,211,658	498,284	475,090	0.8949
Purdue University	91.11	93.11	57,038,701	566,440	505,918	0.8918
University of Oregon	81.24	96.17	59,712,724	573,743	500,000	0.8103
University of Missouri	74.18	82.64	54,959,734	385,983	659,775	0.7879
Indiana University	96.42	95.50	54,635,398	337,144	495,746	0.6252
University of Illinois	93.92	99.72	53,131,623	245,498	575,000	0.4996
University of Louisville	98.29	84.24	53,010,510	428,385	1,427,704	0.3873

Table 4: DEA Results

Our DEA results show that some universities are more efficient than others in compensating the two employees responsible for complying with Title IX. A DEA Efficiency score of 1.0 indicates that the school has efficiently used their available financial resources (based on their level of compliance achievements) relative to all of the other schools included in the study. A DEA Efficiency score less than 1.0 indicates that the school is inefficient in its use of their resources. It is important to note that, in DEA analysis, the DMU Efficiency score is only relative to the schools (i.e. DMUs) in this particular study and should not be compared with any schools (DMUs) outside of the study. In other words, a school that is efficient in our study here (Rutgers and Connecticut) may be inefficient if even one other school were to be added or removed from the study (or visa versa).

References

- [1] Agthe, D.E. and Billings, R.B. (2000) The Role of Football Profits in Meeting Title IX Gender Equity Regulations and Policy. *Journal of Sport Management*, 14, 28-40.
- [2] Anderson, D.J., Cheslock, J.J., and Ehrenberg, R.G. (2006) *The Journal of Higher Education*, 77(2), 225-250.

- [3] Brake, D. (2010) "Getting in the Game." New York University Press. New York, New York.
- [4] Bessent, A., Bessent, W., Charnes, A., Cooper, W.W., and Thorogood, N. (1983) "Evaluation of educational program proposals by means of data envelopment analysis. *Educational Administration Quarterly*, 19(2), 82-107.
- [5] Bhagavath, V. (2006) "Technical Efficiency Measurement by Data Envelopment Analysis: An Application in Transportation. *Alliance Journal of Business Research*, 60-72.
- [6] Brown, J.R. and Ragsdale, C.T. (2002) "The Competitive Market Efficiency of Hotel Brands: An Application of Data Envelopment Analysis." *Journal of Hospitality & Tourism Research*, 26(4), 332-360.
- [7] Carpenter, L.J. and Acosta, R.V. (2005) Title IX. Human Kinetics. Champaign, Illinois.
- [8] Charnes, A., Cooper, W.W., and Rhodes, E. (1978) "Measuring the efficiency of decision making units. *European Journal of Operational Research*, 2, 429-444.
- [9] Cheslock, J.J. and Eckes, S.E. (2008) "Statistical Evidence and Compliance with Title IX." *New Directions for Institutional Research*, 138.
- [10] Dunkle, M. and Sandler, B. (1974) "Sex Discrimination Against Students: Implications of Title IX of the Education Amendments of 1972." *Inequality in Education*, Center of Law and Education, Harvard University. Cambridge, MA.
- [11] Kennedy, C.L. (2003) "Part One: The BCS of Title IX Compliance and the Champion for 2004 Is ? ? ?" *Gender Issues*, Fall, 50-60.
- [12] Kennedy, C.L. (2003) "Part Two: March Madness and Gender Equity." *Gender Issues*, Fall, 62-70.
- [13] Kennedy, C.L. (2006) "College Sports and Title IX #3." *Gender Issues*, Spring, 69-79.
- [14] Kennedy, C.L. (2007) "The Athletic Directors' Dilemma: \$\$\$ & Women's Sports." *Gender Issues*, 24, 34-45.
- [15] Kennedy, C.L. (2010) "A New Frontier For Women's Sports (Beyond Title IX)." *Gender Issues*, 27, 78-90.
- [16] Liederman, D. (2008) "Backsliding for women's sports. *Inside Higher Education*. October 31, 2008 at <http://www.insidehighered.com/news/2008/10/31/women>

- [17] Sarkis, J. and Talluri, S. (1999) "A decision model for evaluation of flexible manufacturing systems in the presence of both cardinal and ordinal factors. *International Journal of Production Research*, 37(13), 2927-2938.
- [18] Schachter, R. (2007) Title IX Turns 35. *University Business*, 44-50.
- [19] Sigelman, L. and Wahlbeck, P.J. (1999) "Gender Proportionality in Intercollegiate Athletics: The Mathematics of Title IX Compliance." *Social Science Quarterly*, 80(3), 518-538.
- [20] Soares de Mellow, J.C., Angulo-Meza, L., and Branco DaSilva, B.P. (2009) "A ranking for the Olympic Games with unitary input DEA models." *IMA Journal of Management Mathematics*, 20, 201-211.
- [21] Stafford, S.L. (2004) "Progress Toward Title IX Compliance: The Effect of Formal and Informal Enforcement Mechanisms." *Social Science Quarterly*, 85(5), 1469-1486.
- [22] Suggs, W. (2005) *A Place on the Team: Triumph and Tragedy of Title IX*. Princeton University Press. Princeton, New Jersey.
- [23] Talluri, S., Huq, F., and Pinney, W.E. (1997) "An application of data envelopment analysis for cell performance evaluation and process improvement in cellular manufacturing. *International Journal of Production Research*, 35(8), 2157-2170.
- [24] Thomas, K. (2011) "Long Fights for Sports Equity, Even With a Law" in the *New York Times* at http://www.nytimes.com/2011/07/29/sports/review-shows-title-ix-is-not-significantly-enforced.html?_r=2&hpw accessed on October 3, 2011.
- [25] U.S. Congress (1979) "A policy interpretation: Title IX and intercollegiate athletics." *U.S. Federal Register*, Volume 44, Number 239.
- [26] U.S. Department of Education (2011) *Equity in Athletics Data* at <http://ope.ed.gov/athletics/>
- [27] US. Department of Justice (1972) *Title IX of the Education Amendments of 1972*. <http://www.justice.gov/crt/about/cor/coord/titleixstat.php> accessed on October 4, 2011.

EXOTIC, EROGENOUS, EROTICA: MEASURING 'ADVERTISING EROTICA' FOR LUXURY BRANDS

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Abstract

Businesses spend trillions of dollars attempting to encourage consumers to purchase their goods or services globally. Businesses realize that consumers make their purchases based on the power of advertising and branding. Hard-sell advertisements are in-your-face direct advertisements that suggest using a particular product or service over the competition while soft-sell advertisements are more subtle and incorporate subliminal messages. The research study focuses on why some advertisers prefer to send subtle messages, how these advertising messages unconsciously encourage and entice the consumer to purchase these products or services and why these methods are so successful. The study focuses on the power of soft-sell advertising and conceptualizes 'Advertising Erotica' framework while delving into the sexual, sensual and erotic feelings evoked by the ad leading to positive attitudes towards the ad and brand, and positive purchase intentions.

Keywords: Advertising Appeals, Advertising Erotica, Hard-Sell, Sensual, Soft-sell

INTRODUCTION

Imagine yourself arriving home after a long day at work and upon checking your mailbox, you discover your favorite magazine has arrived. You flip the pages until you notice Calvin Klein's newest ad featuring a male model wearing only underwear. You look at the ad for a while, imagining if your significant other would appeal to you in the same manner as the model. You make a mental note to venture out on your lunch break the next day in search of these perfect looking underwear. You finally accomplish your goal, but do you know why you wanted to purchase them? If the end results of you perusing your magazine ended in a final sale for Calvin Klein, then the advertisers have done their job.

Advertisers use hard-sell and soft-sell to appeal to consumers' interest. Although there are no concrete definitions of hard-sell and soft-sell, there are general definitions. (Okazaki,

Mueller, & Taylor, 2010) Hard-sell is defined as a direct approach to selling while soft-sell focuses on levels of indirectness and subtlety, and often intends to build a mood or image. Hard-sell advertisements encourage the customer to “buy now”, an attitude seen in many children’s commercials; whereas, soft-sell appeals to the mood, the unconscious, and atmosphere. Okazaki, Mueller & Taylor (2010) note that soft-sell advertisements are typically conveyed through a beautiful scene or the development of an emotional story or verse. It has been concluded that soft-sell advertisements do not emphasize reason, but rather convey general association with the brand. Soft-sell appeal is one in which human emotions are emphasized to induce an affective (feeling) reaction from the viewer (Okazaki 2010).

The research paper introduces a new concept called ‘advertising erotica’. Advertisers use soft-sell appeal to promote erotic advertising. Advertising Erotica is the arousal of the senses, for advertisement of a particular product or services, through images depicting adults engaging in sexual activities. While advertisers use these images, there are three constructs that are deliberately aimed at bringing shock value to the consumer. In order for the shock value to be apparent, all of these advertisements must possess three things: distinctiveness, ambiguity and transgression of social or cultural taboos. (Pope, Voges, & Brown, 2004)

All ads usually have distinctiveness and ambiguity, but the transgression social or cultural taboo is the most critical element in erotic advertising. (Pope, Voges, & Brown, 2004) Many luxury designers use this approach when they advertising to their target market. Luxury designers such as Dior for example advertised perfume shaped coincidentally like the male sex or Calvin Klein using a model for jeans standing upright in a shower with him using them to cover just his genital area for added appeal. After all, brand loyalty is about engaging the customer in

the ad experience. In order for advertising erotica to be effective, the product and message they are trying to subliminally convey must be understood and received by the intended audience.

LITERATURE REVIEW

There have been many investigations that have explored the rational versus emotional as well as direct versus indirect appeals, but Grain (1997) and Vagnoni (1980, 1997) stated that emotional oriented advertising creates bonds and entertains consumers. It has been concluded in most of the research that “hard-sell” and “soft-sell” are broader concepts than the other appeal classification. Beard (2004) notes that hard-sell and soft-sell appeals debates have been around as early as 1911. The advertisers of the U.S. automotive industry in 1911 met to discuss the reason ‘why’ versus ‘atmospheric’ or ‘impressionistic’ advertising is most efficient. (Okazaki, Mueller, & Taylor, 2010) As time has progressed these two concepts have remained the consistent and unchanged; many research studies have not attempted to study and focus on measures “hard-sell” and “soft-sell” explicitly, but in general they have drawn some conclusion about the general used appeal types. There has been an attempt by Laskey, Day, and Crask (1989) and Puto and Well (1984) to distinguish between rational, factual and informational advertising (hard-sell) and imaginative, emotional and transformational advertising (soft-sell). Mueller (1987) defined soft-sell appeal as one in which mood and atmosphere convey through a beautiful scene or through development of an emotional story or verse. She later defined hard-sell as “Sales orientation is emphasized here, specifying brand name and product recommendation. Explicit mention may be made of competitive product, sometimes by name, and the product advantage depends on performance.” A consumer is considered to have experienced transformational advertising when they benefit from the consumption of the good or service provided to them.

Soft-sell has been associated with emotional appeal building mood or image, but does not incorporate the levels of indirectness and subtlety. Lambiase and Reichert (2002, 2003 and 2006) highlight the sexual themes and imagery focuses in advertising. They have proven that content analysis is insufficient to explain a consumer's response to advertising and that actual sexual imagery by itself does not have much impact on brand perception or awareness. Scopophilia, a psychoanalytic concept, is used to account for the ability of the consumer to engage with brands through different advertising mediums. (Oswald 2010) The concept of 'scopophilia', which is when one obtains sexual pleasure by looking at nude bodies, erotic photographs and such. Scopophilia is used many times by designers such as Armani, Calvin Klein and Gucci because it allows the consumer to engage passionately with the print advertisement, a substitute in place of the real thing.

Many luxury brands prefer to use this advertising when appealing to its' customer base.

Oswald (2010) positions the consumer as a participant in the brand world while the brand communicates brand positioning. Lopez and George (1995) defined erotica as images that unambiguously depict adults in various stages of undress and engaging in overt sexual activities such as cunnilingus, fellatio and intercourse, while mild erotic is defined as images that combine nudity or near nudity with overt sexual activity not displaying the genital area. Belch et al (1982), LaTour (1990) and Smith et al (1995) established that sexual stimuli in ads can increase consumer arousal, but nudity can make an ad more interesting. This holds true for Bruce Weber's homoerotic campaign for Calvin Klein, in which he posed for the brand almost nude in most instances, which restored profitability to the company. (Halasz and Stansell 2007)

Oswald (2010) concludes that Calvin Klein and Dolce & Gabbana both challenge mores while increasing market share. This however, plays an important role in the ways consumers respond to

the advertising. These examples show what strong visual codes for the engagement of consumers in the eroticism of the ad than the actual content. While Armani, Dolce& Gabbana and Gucci all use print ad of erotic images to engage their consumers,

H1: Advertising erotic influences consumers luxury designers brand loyalty.

Luxury designers such as Prada and Louis Vuitton use symbolism or imagery to engage their customers. These designers use projective identification, which is the dialectical movement between the psychic driver or when the consumer internalizes themselves in the projection, or the print advertisement. (Oswald 2010) Lacan's (1970, 2005) mirror phase, emphasizes a mimetic relationship between the consumer's self-image in the advertisement. This is beneficial to the advertisers because while advertising erotica is about engaging the consumer with overt sexual innuendoes projective identification engages the consumer in the same manner.

However, these projections allow the consumer to relate to the realness of the print ads story and not to the eroticism that is depicted in other luxury brand designers.

H2: Product functionality for luxury designers creates brand loyalty.

Mental Stimulation can be thought of as the cognitive construction of hypothetical scenarios. (Escalas, Imagine Yourself in the Product, 2004) Due to the cognitive construction and hypothetical scenarios, these stories usually come in the form of narratives when we stimulate our events, frequently think about our own actions and behaviors and create stories with ourselves in mind. This creates scenarios and stores where you the consumer are the main character. For example, there was an advertisement showing a Cadillac taking a fast drive through the mountains and the car stops. Then the door opens up and the long legs of a female executive steps out to the ground. (Miller, 2005) These ads immerse the customer in the printed images and encourage customers to want to buy their product. When the advertisers place the

subject, product and brand logo in certain set-ups the ads engages the consumer in a play for identification and positions. They are held between the risqué world, suspended logic and unfulfilled desires. (Miller, 2005)

Sexy is defined as marked by tending to arouse sexual desire or interest (Lysonski, 2005) About 11% of women and 7% of men say that sex in advertising frequently or always directly affects their purchase decision; only 23% of all adults say that sexual content in ads at least sometimes directly affects their purchasing decisions. (Walsh 1994). Advertisers understand that in order to get a customer to purchase, they have to see themselves or someone they hold in high regard with that product in their imagination. The mental stimulation caused by this process is known as a cognitive construction.

H3: Is consumer brand loyal more effective with erotic advertising?

CONCEPTUAL FRAMEWORK

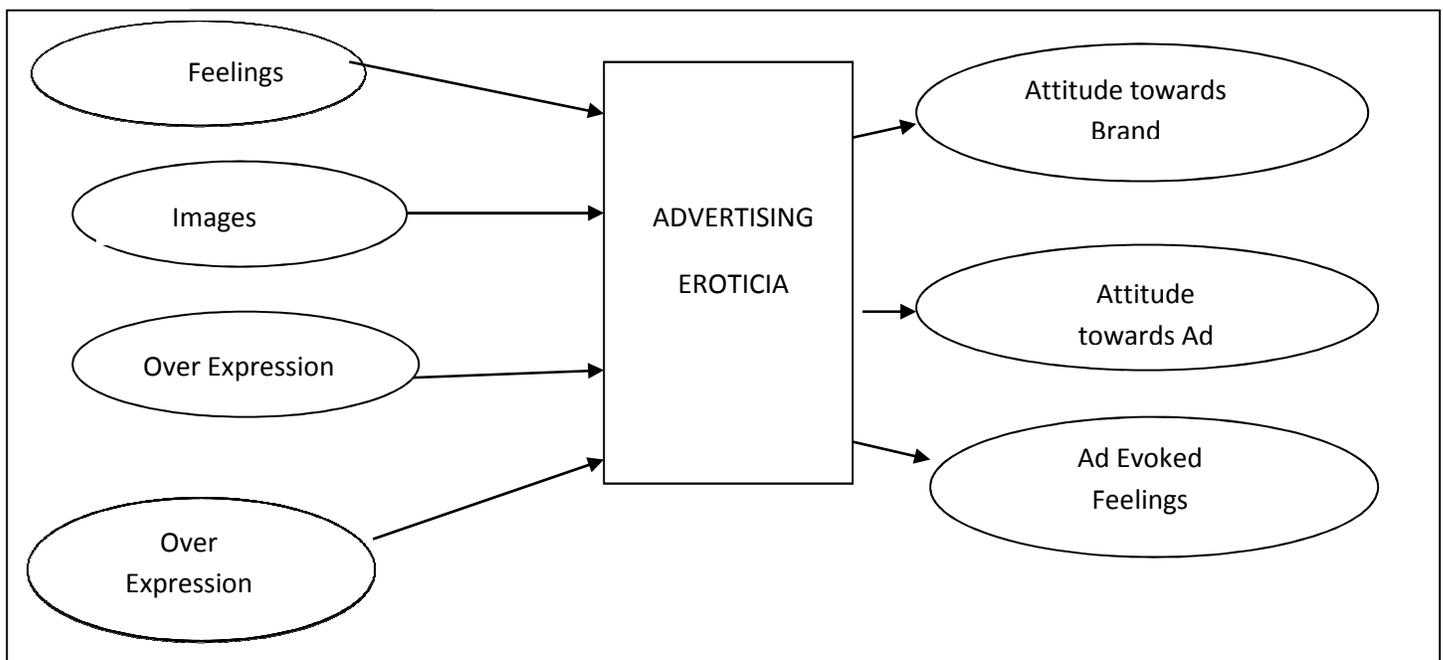


Figure 1: Advertising Erotica Conceptual Framework

The above model in Figure 1 presents 'Advertising Erotica' conceptual model is elaborated using five case studies. The cases in comparison were chosen from designer luxury brand. Armani, Calvin Klein and Gucci were brands that explicitly showed advertisements that excite erotica. Prada and Louis Vuitton were luxury brand chosen for the mild erotic advertisements that were intended to make the consumer feel warm, but not sexually charged. Whether it is a peep show, strip tease or a fantastical image, advertising erotica is about what can be imagined and not seen. Images such as these that at one times belonged in the world of pornography are now commonplace in family magazines and newspapers, in TV commercials, on billboards and online. (Kilbourne, 2005)

CASE EXAMPLES

Luxury Brands use erotic advertisements to arouse desire for the product not the person or individual. The images are catered to selling the product and not sex. Luxury Brands challenge the status quo by engaging the consumer in an advertisement adventure that incorporates a lot of erotic teaser ads.

Armani

Armani is a luxury brand that has been in the luxury designer market for over thirty years. The brand prides itself on having impeccable tailoring, muted colors, luxurious fabrics and luxe creations. In the photo below David Beckman for Armani underwear holds a rope in his hands as he gazes seductively at the camera. It can be inferred that the rope symbolizes the male genital in this particular print advertisement. When viewed the consumer would naturally have a feeling over expressed erotica.



Figure 2: Armani

Calvin Klein

Calvin Klein began as a coat shop in Midtown New York. Calvin Klein is known for the softness and comfort of their undergarments and his introduction to the new concept for designer jeans.



Figure 3: Calvin Klein

In 1980, Bruce Weber did an erotic advertisement photo-shoot for Calvin Klein. Calvin Klein wanted to add eroticism to this print ad by allowing the viewer to come to a conclusion about what his pose represents. This ad captures advertising erotica because the consumer can imagine themselves or others in this scene and become engaged in the ad because of the erotic feeling the consumer feels.

Gucci

Gucci was originally a saddle making family owned business. The brand is known for its simplicity, exceptional fabrics and excellence. The Gucci brand, because of its simplicity and excellence, has all around functional for everyday consumers to the very elite.



Figure 4: Gucci

This print ads depict advertising erotica because the consumer can feel even sexier and most attractive themselves with the designer’s product on.

Oswald (2010) concluded that Calvin Klein and Dolce & Gabbana both challenge social mores while increasing market share. However, this plays an important role in the ways consumers respond to the advertising. These examples show what strong visual codes for the engagement of consumers in the eroticism of the ad than the actual content. This is beneficial to the advertisers because while advertising erotica is about engaging the consumer with overt sexual innuendoes projective identification engages the consumer in the same manner.

Mild Advertising Erotica

Prada

Prada is a well know family powerhouse in the luxury brand arena. Prada is known for its quality, unique patterns and designs and time taken to make each individual design.



Figure 5: Prada

Prada uses the similar type of advertising while using only sultry expressions with the eye and face expressions. The print advertisements allow the consumers to internalize themselves in the projection. This advertisement depicts two young ladies that are enjoying their downtime while being dressed comfortably. This ad engages the consumer using mild erotica such as sexy poses or piercing eyes.

Louis Vuitton

Louis Vuitton is the oldest luxury brand in the market. They are known for their simplicity and usefully common everyday goods. The luxury designer wants to appeal to both the high end consumer to the everyday Jane or John Doe.



Figure 6: Louis Vuitton

Louis Vuitton use advertisements that explore the many daily activities and different sides of life. The advertised images range from safari trips to relaxing images of home arrivals

from a long business trip. Louis Vuitton luxury brands use images of life to attract their consumer base. All of their advertisement campaigns appeal to even the simplest things in life evoking warm feeling when viewed.

Eroticism in advertising is about getting the consumer to see that they will be sexier if they use their products. The symbolic content, the meaning or the status of the product, to the consumer is beyond the purpose or benefit. Many of these advertisements want to arouse desire for the product not for people or the individual. Branding is an important factor in regards to marketing, but the symbolic relationship has become more significant than name and designated packaging. Not only is brand crucially important to the advertisers, but the ability to evoke the senses while gazing at an image for a period of time. This means that advertisement will involve the balance between the reality of the consumer and their passion.

DISCUSSION

While Armani, Calvin Klein and Gucci all use print ad of erotic images to engage their consumers, there are other luxury designers such as Prada, Louis Vuitton and Burberry that use symbolism or imagery to engage their customers. These designers use projective identification, which is the dialectical movement between the psychic driver or when the consumer internalizes themselves in the projection, or the print advertisement. (Oswald 2010) Lacan's (1970, 2005) mirror phase, emphasizes a mimetic relationship between the consumer's self-image in the advertisement. However, these projections allow the consumer to relate to the realness of the print ads story and not to the eroticism that is depicted in other luxury brand designers.

Advertisements that used to be part of an adult, secret, mysterious world is now public, ordinary and everywhere. (Kilbourne, 2005) Luxury Advertisers want to create latent meaning. One of the most effective ways to create latent meaning is by using metaphors. There have been

countless ads that use sophomoric doubles entendres, such as ‘We keep it up longer’ (for a radio), ‘Your ability to score has just improved’ (for video game) and ‘Whip it out and show it to your friends’ (for a skateboard). (Kilbourne, 2005) Advertisers use of these construction to stimulate events and promote thinking about the consumers own behaviors and desires. These images have the ability to evoke an imaginary sense allowing the consumer to complete the image with their own personal projections and create scenarios where the consumer is the main character. The message from the advertiser is that they want you to see the image rather than the product (Leiss, Klein, & Jhally, 1997).

MANAGERIAL IMPLICATIONS

Luxury advertising was once a unique domain for the male fantasies of women ranging from a goddess to a common sex slave, but due to fire from conservative groups and prompted lawsuits this advertising eroticism has changed. Artist Robert Mapplethorpe challenged the prevalent sexual interpretation of females as the object of desire. Mapplethorpe eroticized the male body in art, which is now seen as an object of desire in many luxury advertisements. (Oswald, 2010) In addition, consumers can now see the true essence of the brand due to Bruce Weber’s contributions. He introduced the eroticized male to advertising, building on Mapplethorpe’s artwork. Due to Weber’s contributions, advertising erotica can be experienced by both male and female consumers.

Soft-sell advertising utilizes sexual, sensual and erotic feelings to invoke positive attitudes towards the print ad and brand. Sexuality is natural and it is included in our life and advertisers count on this type of engagement from the consumer with their advertisements. Luxury designers count on engagements, strong affective response, and brand world of creativity, innovation and symbolic satisfaction. They know that the customer has the ability to

buy and it allows for larger sales and bigger profits. (Oswald, 2010). If the end results are positive market response, increased brand sales, awareness and loyalty with luxury designers then positive attitudes that are invoked in the target consumer will result in positive purchase intentions.

CONCLUSION

The transformation is when the consumer benefits from the consumption of the good or service provided to them. Many luxury designers' ads usually have distinctiveness and ambiguity, but social or cultural taboo is the most critical element in erotic advertising. Luxury designers use this approach when advertising to their target market because loyalty is about engaging the customer in the brand experience. Luxury designers such as Armani, Calvin Klein and Gucci prefer to use this advertising when appealing to its' customer base. This form is most affective for them because the advertising style allows the consumer to engage passionately with the print advertisement, a substitute in place of the real thing. In many of these advertisements they encourage viewers to imagine positive scenarios involving the product and the consumer. Belch et al (1982), LaTour (1990) and Smith et al (1995) stated that sexual stimuli in ads can increase consumer arousal, but nudity can make an ad more interesting. In conclusion, when a consumer engulfs themselves in the brand by seeing images of themselves in the advertisement the consumer experiences transformation. Whether it is a peep show, strip tease or an image fantasy, advertising erotica is about the experience of what can be imagined and not seen.

REFERENCES

VALS Model, (n.d.). Retrieved September 8, 2011, from VALS: <http://strategicbusinessinsights.com/vals/ustypes.shtml>

- Beard, F. K. (2004). Hard-Sell 'Killers' and Soft-Sell 'Poets'. *Journalism History* , 141-149.
- Boyd III, H. C. (2006). Persuasive Talk: Is It What You Say or How You Say It? *Journal of Advertising and Research* , 84-90.
- Delbaere, M., McQuarrie, E. F., & Phillips, B. J. (SPRING 2011). Personification in Advertising. *Journal of Advertising* , 121-130.
- Dolliver, M. (1999). Questions of the Week: Is there Too Much Sexual Imagery in Advertising. *Adweek* , p. 22.
- Escalas, J. E. (2004). Imagine Yourself in the Product. *Journal of Advertising* , 37-48.
- Escalas, J. E. (2004). Imagine Yourself in the Product. *Journal of Advertising* , 37-48.
- Kilbourne, J. (2005). What Else Does Sex Sell? *International Journal of Advertising* , 119-122.
- Leiss, W., Klein, S., & Jhally, S. (1997). *Social Communication in Advertising: Persons, Products and Images of Well-Being*. London: Routledge.
- Lopez, P. A., & George, W. H. (1995). Men's Enjoyment of Explicit Erotica: Effects of Person-Specific Attitudes and Gender- Specific Norms. *Journal of Sex Research* , 275-279.
- Lysonski, S. (2005). Sexism vs Sexy: The Conundrum. *International Journal of Advertising* , 116-119.
- Mehta, A., & Purvis, S. C. (2006). *Journal of Advertising Research* , 49-56.
- Miller, M. (2005). Sexism in Advertising and Marketing to Women. *International Journal of Advertising* , 113-124.
- Okazaki, S., Mueller, B., & Taylor, C. (2010). Measuring Soft-Sell Versus Hard- Sell Advertising Appeals. *Journal of Advertising* , 5-20.
- Orth, U. R., & Holancova, D. (WINTER2003-4). Consumer Response to Sex Role Portrayals in Advertisement. *Journal of Advertising* , 77-89.
- Oswald, L. R. (2010). Marketing Hedonics: Toward a Psychoanalysis of Advertising Response. *Journal of Marketing Communication* , 107-131.
- Pope, N. K., Voges, K. E., & Brown, M. R. (2004). The Effect of Provocation in the Form of Mild Erotica on Attitude to the Ad and Corporate Image. *Journal of Advertising* , 69-82.
- Puto, C., & Wells, W. (1984). Informational and Transformational Advertising: The Differential Effects of Time. *Advances in Consumer Research* , 638-643.
- Taute, H. M. (2011). Emotional Intelligence and Emotional Information Management. *The Journal of Advertising* , 31-43.

African-American Stereotypes in Advertising and its Effects on Society

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Abstract: Advertising aims to adapt to the ever-changing consumer perceptions of all races, sexes, ethnicities and attitudes of consumers worldwide. Yet to date there are still advertisements that portray persons of color in either a stereotypical manner or as background to European Americans. For instance, there are two different commercials for the same product that depicts an African American and European American family having dinner. In the commercial with the African American family, only the mother is having dinner with her kids. However, in the commercial with the European American family, the mother and father are having dinner with their kids. This research study explores and investigates the role of advertising in targeting African American consumers through stereotypes and further examines the following questions. What affects do today's commercial advertisements have on race relations?

- Do the stereotypes project the true feelings of African American population?
- Are these types of stereotypical advertisements harmful to the self-esteem of people of color, and how do these perceptions affect different ethnicities including gender?
- Should advertisers be held responsible for the continued perpetuation of the stereotypes?

Keywords: Stereotypes, minorities, race, gender, advertisement

INTRODUCTION

The racial and ethnic composition of America has changed considerable from a decade ago. And this composition is going to continue to change decades into the future. With the influx of immigrants from all over the globe, America is becoming browner. Yet, it does not seem as though many advertisers are paying close attention to this undeniable fact. Although the representation of ethnic groups in advertisements have increased in recent years (Zinkhan et al, 1988), it is still not enough. There are still less representation of people of color in television and magazine advertisements. And when people of color are represented there is a hint of covert stereotyping.

Stereotyping is a psychological categorization of specific social groups held by the general public which influences decision making and information processing tasks (Gaertner and McLaughlin, 1983; Bodenhausen, 1988; Greenwald and Banaji, 1995). Stereotyping has a negative association with a particular culture or race. However, there is such a term as positive stereotyping. Positive stereotypes

point out the “positive” attributes of a culture or ethnic group e.g., Asian are great at math, African-Americans are better at sports, or the “Latin Lover.” However, positive stereotypes are just as damaging as “negative stereotypes.” For example, if Asians are smarter at math, does that mean that blacks and whites are not? Additionally, when saying that African Americans are better at sports, does that mean they don’t have the mental capacities to be intelligent? And “positive stereotypes” can cause unnecessary stress to the persons who are trying to live up to them. Stereotypes as a whole are dangerous because they lump one group of people unfairly into a specific category.

African Americans currently face the same stereotypes from times passed. Many African Americans in television advertisements are seen, but not heard. However, when they are heard they share the advertisement with a white counterpart. This is noteworthy; television advertisements merit particular attention because they are key components of television, and because as Entman and Rojecki (2000) contended, they are “indicators of the culture’s racial heartbeat” (p. 162), representing both cultural norms but also having the potential to improve racial relations (Henderson and Baldasty, 2003).

Advertisers may not realize how important of a role they play when it comes to stereotyping African Americans, and are not intentionally producing stereotypical advertisements. Their goal is to get information out about a product or service to their market segment. But advertisers need to pay attention to who they are marketing to, and let their market segment assist with determining if a particular print or commercial may be perceived as stereotypical, especially if the market segmentation is African American. Advertisers have a strong influence on shaping the perceptions of people, based on the how characters in the advertisements are portrayed. Furthermore, advertisements have the ability to either help eradicate the negative perceptions of African-Americans, or they can facilitate pervasive stereotypes, which may increase racism. There is also more at risk.

Negative stereotypes of African American in advertising, may affect the self-esteem of African Americans. The continuation of minimal representation or negative depictions of oneself reflected in media may cause many African Americans to question their self-worth and importance to society. More importantly, these destructive images or lack thereof affect African American children exponentially, since African American children watch considerably more television than Caucasian children (Slaughter, 2003). It is also important to note that children cannot fully differentiate what is fact and what is fiction when watching television. Advertisers must realize that more is at stake than selling a product or service. There are also social responsibilities to contend with.

Currently, African Americans have the purchasing power of approximately \$910 billion, and this figure is expected to increase to \$1.2 trillion by the year 2012. The buying power of African Americans is further reason why advertisers must revisit how they are targeting their markets. Not only is non-stereotypical advertising a matter of social responsibility, but it can quite possibly affect the bottom line. It is also apparent that advertisers are not acknowledging the changing demographics when it comes to targeting African Americans. In this research study the stereotyping of African American in advertisements will be explored. This stereotyping not only affects African Americans, but all Americans as a whole. The goal of this research is to examine how advertising stereotypes propagate racism, its effects on society and determine if advertisers share a responsibility in the perpetuation of stereotypes or if they are simply providing Americans with what they want.

LITERATURE REVIEW

Stereotypes

Gaertner and McLaughlin (1983), Bodenhausen (1988), Greenwald and Banaji (1995), as stated earlier, have defined stereotyping is as a psychological categorization of specific social groups held by general public which influences decision making and information processing tasks. Stereotyping has been further dichotomized into polarized appraisal theory (Linville, 1982; Linville and Jones, 1980) or in-

group bias theory (Brewer, 1979; Wilder, 1981). These theories assume that people categorized individuals on whether they belong to the in-group or out-group (Qualls and Moore, 1990). In-groups are those that look like the persons doing the categorization and out-group are those that look dissimilar to the person doing the categorization.



Figure 1: African Americans in marginal roles (1924 & 2011)

African American stereotypes have been studied for many decades. Shuey et al. reported that .6% of African Americans were in advertisements, 95.3 % of the time they were represented as unskilled laborers, entertainers or athletes (1953). Kern-Foxworth expressed that people of color are frequently not present; when they are, it is often in marginal or stereotypical roles (1994). One may wonder how the absence of African Americans may lead to stereotypes. One explanation is dominant group ideology. Hirschman (1993, 537), defines ideology as a widely shared “system of beliefs that emanate from the promulgate” a certain world view and that ideology is one means by which dominant groups sustain and dominate their power over other groups. It is possible to communicate dominant group ideology through media. Duckitt states that media can communicate racial prejudice in a number of ways, including omission (i.e., ignoring the existence of African Americans), stereotyping and showing African Americans in disproportionate number of “bad” or low status roles (1992). As Bristor et al. stated, it is important to bring attention to these types of covert and possible unintentional negative portrayals of African Americans in order to readdress race-based inequalities (1995).

Additionally, racism in advertising is reflected by low minority visibility and the use of certain stereotypes. When referring to advertisements for television, Bristol et al. reported that only 17% of African Americans were featured in minor roles (1995). However, Taylor and Lee found consolatory gains in the frequency of African Americans (11% of ads used African American models), as well as improvements in role portrayals and products advertised. However, these gains may not be enough. Although the frequency of African Americans appearing in print ads has increased, there still is an imbalance of positive portrayals. As compared to Caucasian Americans, African Americans are portrayed more as minimum wage workers or single mothers in advertisements. There should be a rise in the number of African-Americans being portrayed as professionals, at least to the same extent as Caucasian Americans. Bandura opines that media is an important environmental influence on human functioning and the way character roles are portrayed on television influences how viewers interpret and respond to characters (1977, 1986, and 2002). All images of African Americans can shape and strengthen postulations of those who have limited interactions with them. And if more negative portrayals are presented via advertisements, stereotypes of African Americans will persist. In order to prevent these negative assumptions, Bristol et al. suggests African Americans should be portrayed in roles other than successful athletes, but also in high status roles, such as managers and other professional (1995).

Most importantly, the consideration of African American seeing these advertisements must be taken into account. Advertisement that portray African Americans negatively or maintain stereotypes may also affect the self-esteem of African Americans. Another apprehension that should be expressed is the possible loss of revenue advertisers may undergo from the African American community. African Americans, like any other population, are more likely to purchase products or services from companies that have persons in advertisements that look like them. Whittler and Dimeo (1991) suggest that advertisers cannot afford to offend African Americans by not including them in their commercial

messages. African American buying power has increased 166% from 1990-2007 compared to a 124% in White buying power (Selig Center, 2007). Therefore, it also seems plausible that the commercial messages should not contain any negative stereotypes. African Americans are brand loyal, demonstrate a high propensity for big ticket purchases, and prefer to support companies that embrace diversity (Miller & Kemp, 2005).

The purpose of this paper is to examine exactly what type damage may come about due to advertising stereotypes of African Americans. Additionally, this research will answer the following questions:

- Do the stereotypes project the true feelings of the African American population?
- Are these types of stereotypical advertisements harmful to the self-esteem of people of color and how do these perceptions affect different ethnicities including gender?
- Should advertisers be held responsible for the continued perpetuation of the stereotypes?

CONCEPTUAL FRAMEWORK

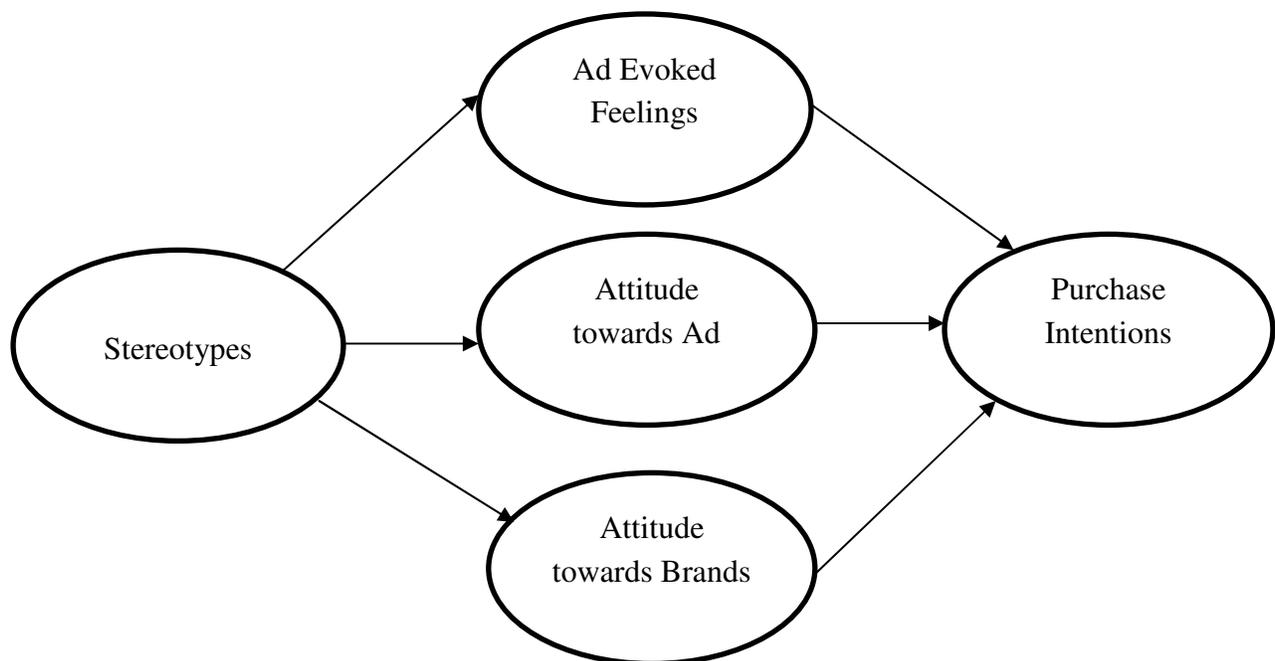


Figure: 2: Stereotypes Conceptual Framework

Nearly 70% of African Americans are concerned with how they are portrayed in advertising (Beasty, 2005) and almost 60% believe that print and television advertisements are intended for solely for white people (Mueller, 2008). The Stereotypes Hypothesis Model expounds upon the relationship between stereotypes, ad evoked feelings, attitudes towards ads, attitudes towards brands and purchase intentions. Figure 2 demonstrates the conceptual framework. The conceptualization is that there is a direct relationship of stereotypes with ad evoked feelings, attitude towards the ad, and attitude towards the brand, which all will affect current or future intentions to purchase a product.

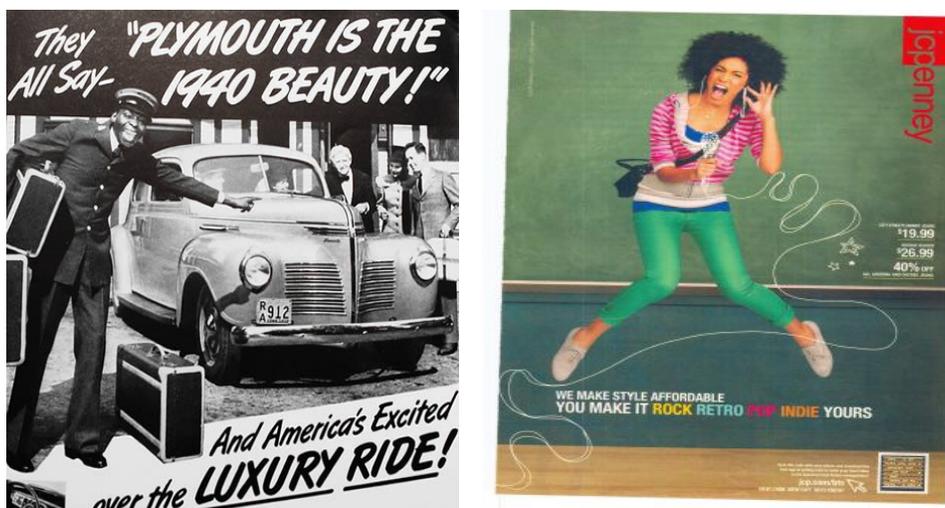


Figure 3: African Americans portrayed in over-exaggerated roles in 1940 and 2011

RESEARCH METHODOLOGY

A sample of 72 students from a Historically Black College University (HBCU) was surveyed for the purpose of this research. Out of the 72 students surveyed 60% were women and 81.9% were African American, and 9.7% were Caucasian American. Ten health and fashion magazines (Seventeen, Shape, Men's Health, Women's Health, Oprah, Allure, Elle, Details, Lucky, and Cosmopolitan) were examined, which resulted in 60 advertisements. Table 1 below provides details of the sample.

Table 1: Gender, Age and Ethnicity of the Sample

Gender

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Male	29	40.3	40.3	40.3
Female	43	59.7	59.7	100.0
Total	72	100.0	100.0	

Age

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 21 - 25	50	69.4	69.4	69.4
26 - 30	14	19.4	19.4	88.9
31 - 35	6	8.3	8.3	97.2
36 - 40	2	2.8	2.8	100.0
Total	72	100.0	100.0	

Ethnicity

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid African American	59	81.9	84.3	84.3
White (Caucasian)	7	9.7	10.0	94.3
Asian	1	1.4	1.4	95.7
Native Hawaiian or other Pacific Islander	1	1.4	1.4	97.1
Other	2	2.8	2.9	100.0
Total	70	97.2	100.0	
Missing System	2	2.8		
Total	72	100.0		

Qualitative Stage – 60 ads/stimuli were presented to a panel of 21 students and five faculty members. The purpose of this qualitative stage was to determine which ads contained negative stereotypical portrayals of African Americans. The occurrences of negative stereotypical portrayals were counted and gave rise to five ads/stimuli that were nominated – one of an African American male portrayed in a

marginal role, two of African-American women in erotic roles, and two of African-American women in over-exaggerated portrayals.

Quantitative Stage – These five ads were formulated into an online survey to measure attitudes and behaviors amongst males and females. Seventy-two students participated in the survey, in random order. The population at a HBCU is mostly homogenous with parallel socio-demographic backgrounds. Gender and was included as a cataloging question. The findings from this research were indiscriminate for males versus females.

DATA ANALYSIS AND RESULTS

A one-way analysis of variance was conducted to explore the impact of positive and negative cultural meanings on gender, as shown in Table 2. Figure 4 shows the cultural ad-interpretation differences between males and females. Stereotypes generate different responses amongst males and females, as shown in Table 2 and Figure 4.

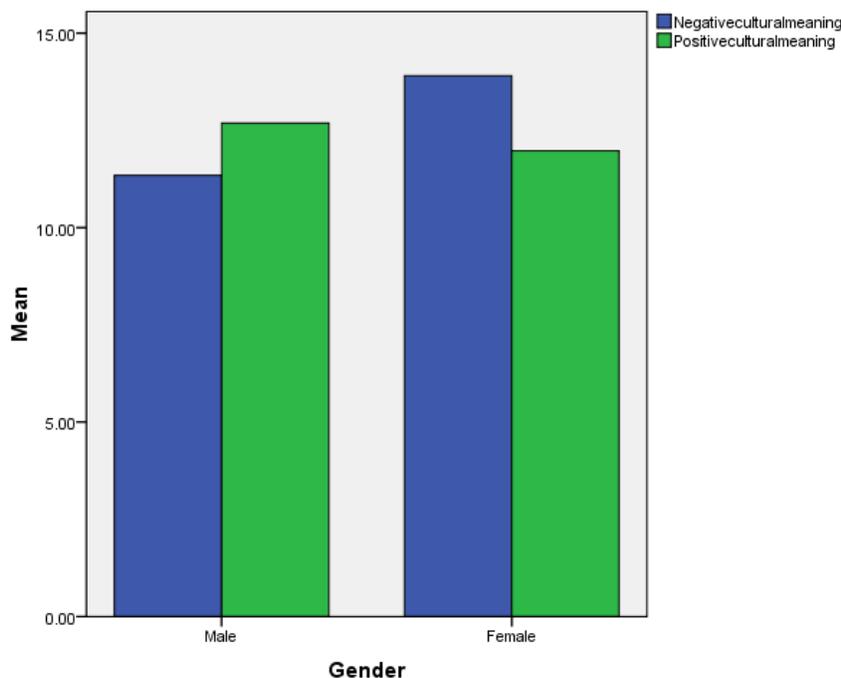


Figure 2: Gender Based cultural ad-interpretation differences

Table 2: ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Does the ad provide a different but POSITIVE meaning when applied to different (your) culture/sub-culture?	Between Groups	3.691	1	3.691	3.226	.077
	Within Groups	78.956	69	1.144		
	Total	82.648	70			
Does the ad provide a different but NEGATIVE meaning when applied to different (your) culture/sub-culture?	Between Groups	11.726	1	11.726	13.436	.000
	Within Groups	60.218	69	.873		
	Total	71.944	70			
View the ad again, at least view it 3 more times – on repeated viewings, do you encounter different POSITIVE messages?	Between Groups	7.290	1	7.290	8.029	.006
	Within Groups	62.654	69	.908		
	Total	69.944	70			
View the ad again, at least view it 3 more times – on repeated viewings, do you encounter different but NEGATIVE messages?	Between Groups	11.060	1	11.060	13.201	.001
	Within Groups	57.813	69	.838		
	Total	68.873	70			

Table 3 provides the male and female ad-interpretation differences in detail as below.

Table 3: Cultural Ad-Interpretation Differences by Gender

	Gender		Statistic	Std. Error
Does the ad provide a different but POSITIVE meaning when applied to different (your) culture/sub-culture?	Male	Mean	2.3448	.18752
		Skewness	.122	.434
		Kurtosis	-1.022	.845
	Female	Mean	1.8810	.17109
		Skewness	.922	.365
		Kurtosis	-.578	.717
Does the ad provide a different but NEGATIVE meaning when applied to different (your) culture/sub-culture?	Male	Mean	2.4828	.17631
		Skewness	.187	.434
		Kurtosis	-.788	.845
	Female	Mean	3.3095	.14252
		Skewness	-1.064	.365
		Kurtosis	-.011	.717
View the ad again, at least view it 3 more times – on repeated viewings, do you encounter different POSITIVE messages?	Male	Mean	2.4138	.16843
		Skewness	.275	.434
		Kurtosis	-.562	.845
	Female	Mean	1.7619	.15168
		Skewness	1.156	.365

		Kurtosis	.312	.717
View the ad again, at least view it 3 more times – on repeated viewings, do you encounter different but NEGATIVE messages?	Male	Mean	2.4828	.18316
		Skewness	.291	.434
		Kurtosis	-.906	.845
	Female	Mean	3.2857	.13324
		Skewness	-.843	.365
		Kurtosis	-.442	.717

A two-tailed correlation was performed for the ad-evoked feelings, as shown in Table 4, along with the exploratory factor analysis. Factor Analysis is presented as Table 5.

Table 4: Correlation Analysis for Ad-Evoked Feelings

		Worried _carefree	Insulted _honor ed	Indifferent _interested	Irritated _pl eased	Depressed _cheerful	Regretful _rejoicing
•Worried _carefree	Pearson Correlation	1	.806**	.742**	.812**	.766**	.849**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	71	71	71	71	71	71
•Nervous _calm	Pearson Correlation	.898**	.768**	.737**	.748**	.738**	.783**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
	N	71	71	71	71	71	71
Contemplative _impulsive	Pearson Correlation	.762**	.765**	.747**	.753**	.754**	.655**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
	N	71	71	71	71	71	71
Critical _accepting	Pearson Correlation	.768**	.742**	.689**	.739**	.687**	.660**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
	N	71	71	71	71	71	71
Cautious _adventurous	Pearson Correlation	.836**	.780**	.727**	.745**	.740**	.803**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
	N	71	71	71	71	71	71

Dubious____ confident	Pearson Correlation	.831**	.780**	.800**	.791**	.797**	.759**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
	N	71	71	71	71	71	71
•Pessimistic__ _hopeful	Pearson Correlation	.806**	.869**	.848**	.885**	.906**	.768**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
	N	71	71	71	71	71	71
Callous____ affectionate	Pearson Correlation	.728**	.784**	.708**	.794**	.833**	.670**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
	N	71	71	71	71	71	71
Bad_____ good	Pearson Correlation	.796**	.914**	.685**	.883**	.876**	.730**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
	N	71	71	71	71	71	71
Sad____happy	Pearson Correlation	.862**	.844**	.673**	.807**	.821**	.822**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
	N	71	71	71	71	71	71
Insulted____ honored	Pearson Correlation	.806**	1	.772**	.923**	.876**	.774**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	71	71	71	71	71	71
Indifferent____ _interested	Pearson Correlation	.742**	.772**	1	.815**	.843**	.777**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	71	71	71	71	71	71
Irritated____ pleased	Pearson Correlation	.812**	.923**	.815**	1	.904**	.803**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	71	71	71	71	71	71
Unemotional_ _sentimental	Pearson Correlation	.749**	.743**	.833**	.772**	.826**	.837**

	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
	N	71	71	71	71	71	71
Depressed__c cheerful	Pearson Correlation	.766**	.876**	.843**	.904**	1	.833**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	71	71	71	71	71	71
Regretful__r rejoicing	Pearson Correlation	.849**	.774**	.777**	.803**	.833**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	71	71	71	71	71	71

Table 5: Rotated Component Matrix

	Component				
	1	2	3	4	5
•Worried _____carefree	.361	.666	.300	.327	.408
•Nervous _____calm	.273	.632	.297	.322	.499
•Contemplative__impulsive	.387	.237	.296	.743	.313
•Critical _____accepting	.411	.293	.214	.219	.772
•Cautious_____adventurous	.311	.570	.332	.633	.133
•Dubious_____confident	.357	.410	.446	.576	.260
•Pessimistic_____hopeful	.625	.229	.471	.370	.378
•Callous_____affectionate	.658	.128	.298	.431	.415
•Bad_____good	.270	.377	.186	.297	.797
•Sad_____happy	.610	.612	.209	.336	.180
•Insulted_____honored	.693	.393	.357	.265	.266
•Indifferent_____interested	.315	.231	.753	.299	.365
•Irritated_____pleased	.664	.342	.478	.216	.285
•Unemotional__sentimental	.306	.413	.694	.429	
•Depressed_____cheerful	.663	.297	.565	.243	.205
•Regretful_____rejoicing	.371	.650	.556	.152	.188

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 12 iterations.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.905
Bartlett's Test of Sphericity	Approx. Chi-Square	1825.812
	df	120
	Sig.	.000

RESEARCH FINDINGS

After conducting the research, it was found that women viewed the advertisements depicting African-Americans as having a more negative cultural meaning and less positive cultural meaning than men, as shown in Table 1. After viewing the ads multiple times, women were least likely to see positive cultural meaning in the advertisement than men. However, upon further viewing women perceived more negative meaning from the advertisements. This means that stereotypes disturb women more than men. Positive meanings from an advertisement and brand may lead to brand interest and an optimistic intent to purchase. However, advertisements that represent brands that are perceived as having negative meaning will not lead to positive intentions to purchase. Also, with regard to ad-evoked feelings of regret, depression, irritation, indifference, insult and worried feelings, women were found to be more affected than men with the presence of negative stereotypes, as illustrated in Table 6 below.

Table 6: Effect of Ad-Evoked Feelings on Gender

Gender			Statistic	Std. Error
Regretful_____rejoicing	Female	Mean	4.1724	.29806
		Skewness	-.078	.434
		Kurtosis	-.670	.845
	Male	Mean	3.4762	.29165
		Skewness	.289	.365
		Kurtosis	-.761	.717
•Depressed____cheerful	Female	Mean	4.1724	.30621

		Skewness	.064	.434
		Kurtosis	-.631	.845
	Male	Mean	3.4048	.29328
		Skewness	.322	.365
		Kurtosis	-.765	.717
•Irritated _____ pleased	Female	Mean	4.0690	.33635
		Skewness	.200	.434
		Kurtosis	-.847	.845
	Male	Mean	3.1905	.32374
		Skewness	.567	.365
		Kurtosis	-.909	.717
•Indifferent _____ interested	Female	Mean	4.0000	.34024
		Skewness	.262	.434
		Kurtosis	-.861	.845
	Male	Mean	3.6190	.28299
		Skewness	.149	.365
		Kurtosis	-.882	.717
•Insulted _____ honored	Female	Mean	3.6897	.34421
		Skewness	.201	.434
		Kurtosis	-.964	.845
	Male	Mean	3.1190	.31642
		Skewness	.705	.365
		Kurtosis	-.727	.717
•Worried _____ carefree	Female	Mean	4.3103	.31429
		Skewness	.043	.434
		Kurtosis	-.731	.845
	Male	Mean	3.3810	.32502
		Skewness	.471	.365
		Kurtosis	-1.037	.717

CONCLUSIONS

The purpose of this study is to examine the types of damage that may come about due to advertising stereotypes of African Americans. The proposed 'stereotypes' conceptual model may be accepted to explain that perceived stereotypes affect African Americans feelings about an advertisement, which leads to attitudes about the brand and intentions to purchase a product.

The research findings from this study are significant with the respect to the use of positive/negative synchronic polysemy and positive/negative diachronic polysemy to determine positive intent of purchase. There are a few limitations with this research that should be discussed. First, a convenient sample of 72 students from a Historically Black College University was surveyed and the majority of the students were African American. Therefore, the sample size was not representative. Second, there were limitations with the advertisements chosen. Out of the five selected advertisements, four were portrayals of women. And full depictions of all possible African American stereotypes were not examined.

These finding reflect similar results from previous research. African Americans are aware and affected by negative portrayal in advertisement and yet advertisers still use them. One reason may be that those making decisions about the advertisements are not African Americans and may not see the advertisements as stereotypical portrayals. Another indication is that African-Americans are seen as a homogenous group that only responds to broad advertisements. Implications from this study demonstrate that more realistic advertisements of African Americans in roles other stereotypical depictions are needed. For instance, more advertisements of African Americans as managers, bank tellers, teachers, and doctors, etc., are necessary to reflect more accurate portrayals of the group. Future research may focus on the reasons why women are affected by stereotypical portrayals in advertisements more than men. Additionally, more research should be conducted determine why advertisers continue to use stereotypical advertisements of African Americans.

REFERENCES

- Bailey, A. A., (2006). A year in the life of the African-American male in advertising. *Journal of Advertising*. 35(1), 83-104.
- Bandura, A. *Social Learning Theory*. Oxford, England: Prentice-Hall, 1977, Print.
- Brewer, M. B. (1979). In-group bias in the minimal intergroup situation: A cognitive-motivational analysis. *Psychology Bulletin*. 86(2), 307-324.
- Bristor, J. M., Lee, R. G., Hunt, M. R., (1995). Race and ideology: African American images in television advertising. *Journal of Public Policy & Marketing*. 14(1), 48-59.
- Duckitt, J. *The Social Psychology of Prejudice*. New York: Praeger Press. 1992.
- Entman, R., Rojecki, A. (2000). *The Black image in the white mind: Media and race in America*. Chicago: University of Chicago Press.
- Gaertner, S. L., McLaughlin, J. P., (1983). Racial stereotypes: associations and ascriptions of positive and negative characteristics. *Social Psychology*. 56, 5-18
- Greenwald, A. G. and Banaji, M. R. (1995). Implicit social cognition: Attitudes, self-esteem, and stereotypes. *Psychology Review*. 102, 4-27.
- Henderson, J. J., Baldasty, G. J. (2003). Race, advertising, and prime-time television. *The Howard Journal of Communications*. 14(2), 97-112.
- Hirschman, E. C. (1993). Ideology in consumer research, 1980 and 1990: A marxist and feminist critique. *Journal of Consumer Research*. 19, 537-555.
- Hollerbach, K. L., (2009). The impact of market segmentation on African-American frequency, centrality and status in television advertising. *Journal of Broadcasting & Electronic Media*. 53(4), 599-614.
- Linville, P. W. (1982). The complexity-extremity effect and age-based stereotyping. *Journal of Personality and Social Psychology*. 42(2), 193-211.
- Linville, P. W., Jones E. (1980). Polarized appraisal of out-group members. *Journal of Personality and Social Psychology*. 38(5), 689-703.

Maher, J. K., Herbst, K. C., Childs, N. M., Finn, S. (2008). Racial stereotypes in children's television commercials. *Journal of Advertising Research*. 48(1), 80-93.

Mastro, D. E., Stern, S. R., (2003). Representations of race in television commercials: A content analysis of prime-time advertising. *Journal of Broadcasting & Electronic Media*. 47(4), 638-637.

Messineo, M. J. (2008). Does advertising on black entertainment television portray more positive gender representations compared to broadcast networks? *Sex Roles*. 59(9/10), 752-764.

Millard, J. E., Grant, P. R. (2006). The stereotypes of Black and White women in fashion magazine photographs: The pose of model and the impression she creates. *Sex Roles*. 54(9/10), 659-673.

Miller, P., & Kemp, H. (2005). What's black about it? Ithaca, NY: Paramount Market Publishing, Inc.

Qualls, W. J., & Moore, D. J., (1990). Stereotyping effects on consumers' evaluation of advertising: Impact of racial differences between actors and viewers. *Psychology & Marketing*. 7(2), 135-151.

Selig Center (2007). The multicultural economy 2007. Atlanta, GA: University of Georgia Press.

Shuey, A. M., King, A., & Griffith, B. (1953). Stereotyping Negroes and Whites: An analysis of magazine pictures. *Public Opinion Quarterly*. 17(Summer), 281-287.

Slaughter, E. "Survey of Children's Health and Obesity in America." *Prevention Magazine*, 2003.

Stevenson, T. H., & Swayne, L. E., (1999). The Portrayal of African-Americans in business-to-business direct mail: A benchmark study. *Journal of Advertising*. 28(3), 25-35.

Taylor, C. R., & Lee, J. Y. (1995). Portrayals of African-American, Hispanic, and Asian Americans in magazine advertising. *American Behavioral Scientist*. 38(4), 608-621.

Watson, S., Dejong, P. E., & Slack, J. L., (2009). Impact of racial attitudes on consumers' evaluation of Black character advertisements: Does spokesperson skin color make a difference? *Communication Research Reports*. 26(2), 91-104.

Whittler, T. E. (1991). The effects of actors' race in commercial advertisement: Review and extension. *Journal of Advertising*. 20(1), 54-60.

Wilder, D. A. (1981). Perceiving Persons As Group: Categorization and Intergroup Relations. In D.L. Hamilton (Ed.), *Cognitive Process in Stereotyping in Intergroup Behavior*. Hillsdale, N. J.

Zinkhan, G., Qualls, W. J., & Biswas, A. (1988). The racial composition of domestic advertising: A longitudinal analysis of blacks in magazines and television. Working Paper, University of Houston.

The purpose of this study was to examine the types of damage that may come about due to advertising stereotypes of African-Americans.

THE VALUE OF SOCIAL NETWORKS IN THE WORLD OF ADVERTISING

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ABSTRACT: Since the inception of the Internet, firms have developed strategies to incorporate the Web in their business models. Most recently, the explosion of social networking sites has changed the business world. This study looks into the phenomenon of social networks and its impact on advertising. Firms are gravitating toward social networking sites to reach target markets, create brand awareness, promote positive attitudes toward their brand names and develop brand trust. This study will investigate how social networking sites can be used as a marketing tool for firms by addressing the following research questions:

1. How does social communication impact brand trust and attitude?
2. Will participation in social networks increase brand awareness?
3. Can social networks assist marketers in identifying and communicating with target markets?

Key Words: Social Networks, Advertising, Brand Awareness, Brand Trust, Target Markets, Brand Attitude, WOM

INTRODUCTION

The evolution of technology continues to change and challenge the business environment. The world of advertising is no exception. In 2000, 44.1% of the United States population was using the Internet. By 2010, that number increased to 77.3% (internetworldstats.com, 2011) demonstrating a 33% increase in ten years. As Internet use increases, the type of Internet use continues to evolve. Today's new development is online social networking sites. Social networking sites are defined as web-based services that allow individuals to construct a public or semi-public profile within a bounded system; articulate a list of other users with whom they share a connection; and view and traverse their list of connections and those made by others within the system (Boyd & Ellison, 2007). Social networks are made up of users and their relationships. Most online social networks allow members to post profiles, connect to friends and family, maintain friendships, and invite others to join, creating a complex virtual network of communication (Wasserman & Faust, 1994). The business world is becoming more

knowledgeable about the potential benefits these social network sites hold for them. The constant growth in Internet users and the expansion of use throughout the population show that it is inevitable for firms to include online advertising in their marketing strategy, especially within social networking sites.

As technology evolves people are spending more and more time online for daily functions whether at work or at home. A 2005 study by the University of South California showed that 78.6% of Americans go online, averaging 13.3 hours of use a week (www.TMCnet.com, 2006).

Figure 1 list internet users by age group.

Age	Pct of Americans In Age Group Online
12-17	87%
18-24	82%
25-29	85%
30-34	83%
40-44	76%
45-49	73%
50-54	68%
55-59	68%
60-64	55%
65-69	57%
70-75	26%
76+	17%

Source: Wash Post 2/6/06 quoting Pew Internet & American Life Project surveys conducted Oct.-Nov. 2004 (teens) and Jan.-June 2005 (adults)

Figure 1: Age of Internet Users

This shift in society creates a shift in how firms need to reach their target customers and consumer markets. Traditional forms of advertising are slowly becoming obsolete. Firms must develop strategies that will enable them to identify and reach those users who are moving away from reading the newspapers, watching television, etc. Firms must research and investigate online activities to reach their customer base. Consumers are now empowered and advertising

has lost its well-established route (Savulescu, 2011). Firms with a strong network base will dominate the market and increase revenues (Arthur, 1996). In order to ensure that marketers are successfully reaching their target markets, firms must invest in online advertising.

Brand communities are specialized, non-geographically bound communities based on a structured set of social relationships among brand admirers (Muniz & O'Guinn, 2001). Social networking sites provide the ideal platform for these types of communities to exist. Social networks allow firms to establish profiles where consumers can opt to be associated with specific brands and have the ability to display links to those brands or to information about those brands on their own profile. Marketers are able to publish product information and updates. Real product owners are able to communicate with one another and the firm and social communication is king in brand communities. Consumers are now able to give feedback and provide opinions on demand. Communication is constant, with no time restraints, allowing information seekers to obtain required information 24 hours a day. Brand communities are resourceful for both the customer and the firm, by allowing each to connect with others and obtain required information.

The goal of this study is to determine if social networking sites assist marketers in identifying and communicating with target markets. The research will also determine if participation in online social network sites, thereby creating brand communities, has an impact on brand trust, attitude and awareness. This research addresses the following questions:

- Does positive social communication creates positive brand trust and attitude, while negative social communication creates negative brand trust and attitude;
- Does participation in social networks increase brand awareness; and
- Do social networks aid marketers in identifying and communicating with target markets?

LITERATURE REVIEW

Online advertising got its start in 1994, just after the rise of the Internet. There are various forms of online advertising to include email, banner messages, click-through, etc. Firms have invested a large percentage of their marketing budgets to online advertising. Online advertisements generate visits to a firm's individual website, lifts online and offline sales and contribute to brand awareness. Revenue for online advertising grew tremendously from 1996-2000. In 2000, online advertising spending in the United States was at \$8.2 billion (IAB, 2000). Growth leveled off in 2000. Online revenue declined in 2001-2002, then began to climb again in 2003. Hollis (2005), state that a revived U.S. economy, industry maturity, and continued evidence of advertising success aided in this 2003 improvement. Firms began to understand that people were using the web to research products and decide on their next purchase. All online research does not lead to online purchases but can lead to future in-store purchases. Eighty-nine percent of consumers pre-shop online, which suggest that online advertising drives in-store revenues (Sathish, Kumare & Bharath, 2011). Search engines and social networks receive the majority of their revenues from advertisement. Advertisement is the primary source of revenue for social networking sites. Google reported advertising revenue of \$1.578 billion in September 2005, while MySpace reported \$440 million in advertising revenue in 2007 (Cha, 2009). This study will focus on online advertising within social networking sites only, with a primary focus on Facebook as the leading social networking site.

Social Networks and Brand Awareness

Social networks have been around since the beginning of time. People have formed social networks with family, friends, co-workers, etc., for years, so the concept of social networks is not new. In contrast, online social networking sites are a new phenomenon. Social networking sites have become increasingly popular because of their ability to connect people with common

interest throughout the world (Acar & Polonsky, 2007). With its increased number of users, social networks have the potential to provide profitable benefits to companies making social networking sites a new platform for marketing. In 2009, Facebook reported having more than 307 million users worldwide, while MySpace reported having 123 million (Albanesius, 2009). Today there are more than 800 million active Facebook users (www.facebook.com, 2011). MySpace reportedly has 33.1 million active users today (<http://en.wikipedia.org/wiki/Myspace>, 2011); this is a significant decrease from 2009, moving MySpace from the number one visited social networking site to 91. Facebook has superseded MySpace and has become the dominant social networking site. Facebook was launched in February 2004 and became very popular over a short time span (Savulescu, 2011). Research shows that Facebook is the ideal marketing platform with 1) its significant user base, 2) the time users spend on Facebook, due to its entertainment and functionality; and 3) its continuous flow of new features and services (Alba & Stay, 2008). Members use social networking sites to reconnect with past friends, co-workers, lost loved ones and family members. It allows people to interact, socialize and keep in touch no matter where they are. Facebook statistics note that more than 50% of active users log onto Facebook in any given day (www.facebook.com, 2011). Social networking websites, such as Facebook, have created forums for firms to join and reach their customer base. Firms have the ability to create company profiles, such as “Pages” (i.e., Fanpage) or “Groups” on Facebook. Firms are allowed to participate in the social network site, but are not allowed to be intrusive and pushy as some traditional advertising has the reputation of being. The primary difference in a Fanpage profile versus a personal profile is that company pages are not allowed to send out friend requests. This limitation allows Facebook to provide the brand with a presence, while respecting members’ privacy and social environment.

Participating in social networks and establishing a presence in them provide firms the

Fanpage and “Like” the page or suggest the page to a friend. This process helps spread brand awareness throughout the network and allow those who want to receive product updates or information from a particular firm to do so. Those who are not interested in a particular brand are not burdened with pop-up messages, etc. This method of “come at your own will” has benefits for the firm as well. Instead of the traditional method of advertising to the masses, hoping to reach that potential customer, firms have the ability to cater to those consumers who have expressed interest. Interested parties can then receive updates and notification from brands that they are truly interested in. Previous research has shown that continuous exposure increases a person’s liking of an item and establishes a positive attitude toward a stimulus (Monroe, 1976) therefore concluding that continuous positive brand exposure not only enhances brand awareness, but promotes a positive attitude towards a brand. We will discuss attitude toward a brand later in this paper. Given the above environment and data, I surmise that social networks can be used to promote brand awareness. Therefore the following hypothesis will be evaluated:

H1: Participation in social networks is positively related to brand awareness.

Social Communication, Brand Trust and Brand Awareness

In this study, social communication is used to define all aspects of online communication between members, friends, brands, etc., performed within a social networking site such as Facebook. Social communication may take several forms, e.g., posts, blogs, chat, IM, comments, likes, dislikes, etc. The most common forms of social communication are user generated content (UGC) and word of mouth (WOM) communication. UGC is any material created and uploaded to the Internet by a non-media professional, such as a comment, video, pictures, etc. (Sathish & Bharath, 2011). WOM is defined as an unpaid form of advertising, where satisfied (or unsatisfied) customers tell others how much they liked (or disliked) a company’s product or service. Consumers are empowered by social communication and are

more critical, but also eager to receive and contribute information (Savulescu, 2011). Research has shown that word of mouth is powerful within social networks and influences brand attitude and purchase decisions; if users decide to purchase a product they can influence their friends to purchase the product, increasing the possibility of sales (Ulusu, 2010). Seventy percent of consumers visited social media websites to get information, of which 49% made purchase decisions based on that information (DEI Worldwide, 2008). Consumers trust user-generated messages on social media over traditional mass media and are more likely to believe real experiences, accessed from online communities, than company advertised media (Dennis et al., 2010; Chung & Austria, 2010). Brand communities have a positive effect on consumers' brand attitude and attachment (McAlexander, Schouten & Koenig, 2002). The free, always available, user-generated content within these communities encourages positive brand attitude (Riegner, 2007). Consumers are positive about communicating with brands online and when they experience positive social advertising and valuable information, they are willing to take action and spread positive WOM about the brand (DEI Worldwide, 2008). A majority of users see online recommendations from others as valuable and credible, with 60% of social network users reporting that they were likely to pass along information they received online (DEI Worldwide, 2008). Thus, social communication has a strong influence over brand trust and attitude within social networking sites. Given the above discussion, the following hypothesis will be evaluated:

H2: Social communication is a significant predictor of brand attitude and trust.

Social Networks and Target Markets

Social network functionalities such as “Fanpages” and “Groups”, mentioned earlier, can be utilized to identify a brand's target market. The benefit to the brand is that instead of seeking customers who are interested in their brand those interested parties are willingly coming to them.

Therefore, marketers tasked with identifying target markets must change their focus from simply

identifying the target market to keeping the interested parties engaged in social media. Facebook members create profiles listing their interest, likes, dislikes, profession, favorite movies, music, etc., and allow members to group based on those similar characteristics. Information clustered in this way provides marketers with valuable information about a population that could later lead to identification of their target markets. Social networking sites provide brands the opportunity to comfortably approach consumers and specifically target them based on common characteristics or interests. Social networks can facilitate information between brands and members, but requires involvement and activity from marketers (Savulescu, 2011). Social networks provide firms the ability to communicate with existing and potential customers through the creation of online brand communities.

Firms recognize that social networking sites allow them to create brand communities and that these web-enhanced brand communities lead to relationship-marketing communication (Ulus, 2010). Through the use of groups and pages discussed above, social networks give brands the ability to develop a community where they are able to market to a specific group of potential consumers. These communities provide direct communication to consumers interested in specific products. It allows marketers to receive user feedback, provide connections to devoted users and provide an avenue to present product information updates and recalls. Brand communities allow firms to distribute information quickly about products or new developments. Marketers are able to receive and respond to a customer's request quickly and obtain instant feedback. In addition to useful information, brand communities provide members with easy information exchange with other members promote involvement through generation of ideas and promote community participation that is not restricted by time or space (Palmer & Koenig-Lewis, 2009). Brand communities should be interactive and used as a way to maintain and enhance relationships with consumers (Chung & Austria, 2010). Social media has created a new

content for marketers (Savulescu, 2011). Given these findings, social networks assist with segmenting target markets and facilitating communication, through the use of brand communities and the collection of member profile data. Thus, the following hypothesis will be examined:

H3: Social networks will have a significant impact on identifying and communicating with target markets.

CONCEPTUAL FRAMEWORK

A conceptual model (Figure 2) was used in this study to demonstrate the relationship between social networks/social communication and brand awareness, brand attitude, brand trust and target markets, that ultimately leads to a successful social marketing strategy. This study introduces the S.A.M. Conceptual Framework Model. The S.A.M. model is defined as the Socially Advertised Marketing Model. This model is designed to emphasize social media and social communication and demonstrate their impact on key marketing concepts. In this study, the S.A.M. model will illustrate the causal relationship and connections between social networks and social communication and show their effect on increasing brand awareness, promoting positive brand attitude, fostering brand trust and identifying target markets, leading to the development of a brand specific social marketing strategy. The S.A.M. model shows how social networking sites provide the platform for brands to speak directly to consumers, allowing brands to understand what consumers want.

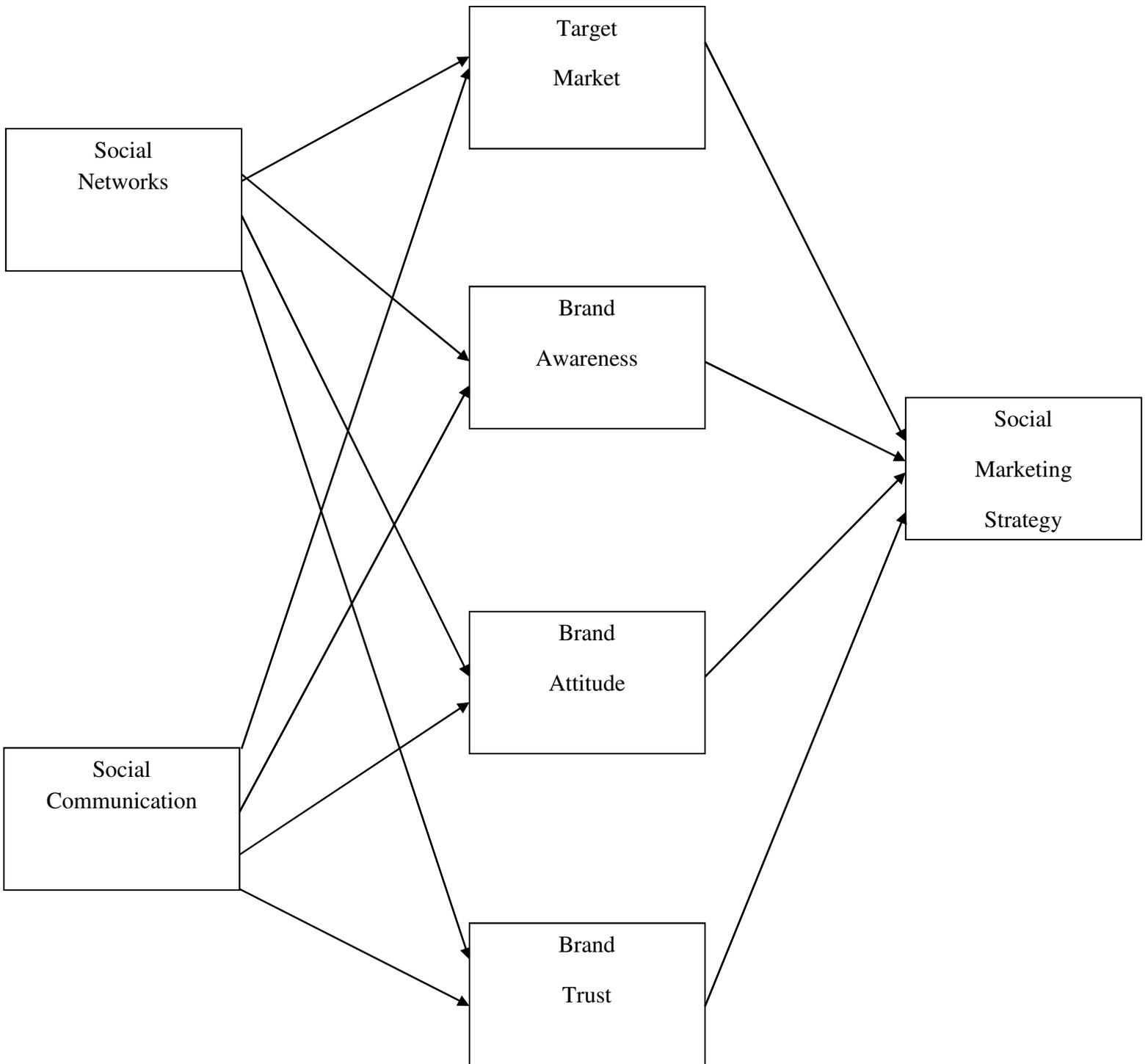


Figure 2: The Socially Advertised Marketing (S.A.M.) Model.

Brand must engage in social conversation with consumers, avoiding product focused conversations. Using the appropriate social etiquette is important in the social environment.

Having the appropriate interactions and social conversation with consumer within a social

networking site will establish the brand's community. This brand community helps marketers

select and communicate with its target market. Once the brand community is established marketers have the opportunity to establish brand awareness. Marketers must make consumers aware of their brand and what they have to offer by developing relationships with consumers. Brands need to create a company profile that is creative and inviting. When brands welcome open communication, feedback and interaction with consumers it develops a positive image for the brand. Brand should listen to consumers, provide useful information and be open to both positive and negative feedback. This helps shape the consumers' attitude toward the brand. When brands maintain established relationships with consumers they promote brand trust.

Consumers will look for ways to be involved with the specific brand and will solicit others to get involved. Brands should develop contests, incorporate consumer ideas into future products, create free giveaways, design exclusive specials for online community members only, etc., to keep consumers engaged. The S.A.M. model in this study demonstrates how the use of social networking sites and social communications, allow brands will create a brand community that will attract and identify their target market, create brand awareness, develop brand attitude and establish brand trust, leading to an effective social marketing strategy. Existing research in the area of social media, social networks, social networking sites, social communication, brand awareness, brand trust, brand attitude, and target markets is the basis of this study. Thorough review and analysis were used to identify and consolidate research findings in the above areas. Those findings are discussed throughout this study. Exploratory findings were used to guide the development of the conceptual framework and the S.A.M. model. Previous research supports the causal relationship depicted in the S.A.M. model (see Figure 2 above).

MANAGERIAL IMPLICATIONS

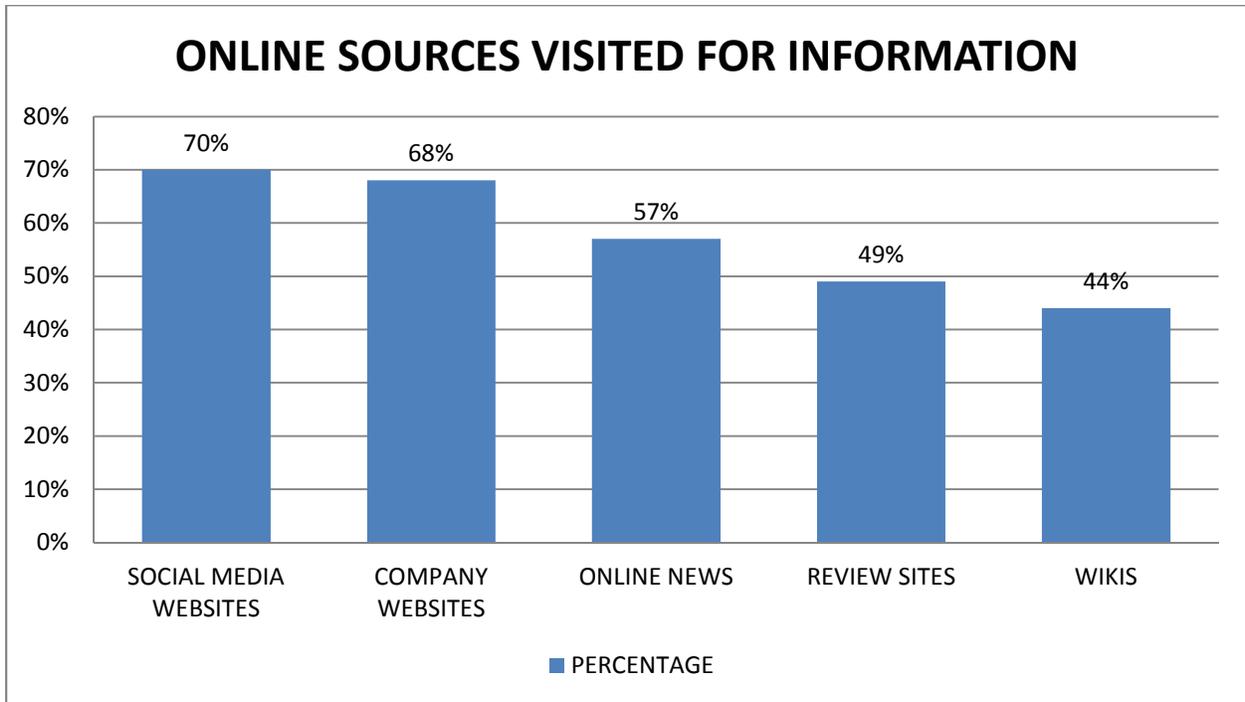
Starbucks has received kudos from the marketing world on its efficient use of marketing within social networks, particularly Facebook. Starbucks is an example of a brand that can be said to

have a firm understanding of the S.A.M. concept. Starbucks has mastered communication within Facebook. This brand knew that it was important to establish a presence within the leading social networking site and master the art of social communication. They realized that the standard form of marketing would not work in this particular medium. They developed a brand community within Facebook, creating a company profile that felt more personal than business. Starbucks shares thoughts and opinions on music, current events, sports, holidays, etc., through daily status updates. They offer coupons, deals and online exclusives and not just of their products, but other goods & services such as CD's. Starbucks trust its members and believe in the level of service that they provide to their customers. This is evident in the decision they have made to allow all user-generated content to be displayed on their home page, as their default. This is something that not a lot of brands opt to do, some even delete negative comments, but Starbucks has chosen to do this as a measure of open communication. This instills trust in the consumers. The page is interactive, they accept and utilize consumer feedback they receive from users within the social network and often reward members with special deals online. Starbucks knows its target market and communicates well with them no matter the subject. They have fostered a positive brand attitude within their users and developed trust for the brand. Starbucks has demonstrated that they are aware of the difference in marketing within social networking sites and have learned to be successful using guidelines and key concepts as those noted in the S.A.M. model (figure 2). Others such as Addias have learned how to successfully implement a social marketing strategy, similar to that of the S.A.M. model. Starbucks encourages user feedback and are very interactive with their community members, this demonstrates effective community management.

In contrast, Wal-Mart has not been so successful in implementing a social marketing strategy. Wal-Mart's attempts to enter the social world failed. Wal-Mart created a Facebook page, but

discussions. This facilitated one way communication, which is not favorable in a social networking environment. Some of the top reasons for joining a social network are to communicate and network. If a brand is not willing to provide open communication, they will never succeed in the social networking world. Wal-Mart entered the social environment attempting to use the same tactics used in traditional advertising, which is not feasible within social networking sites, where the consumer has control. The focus must be directed on the consumer and not the product or service. Wal-Mart failed to establish relationships with consumers and they delivered poor social communication. When asked why they would not allow discussions on their page, the brand representative answered by stating that “the wall post were the opportunity we decided to make available for online discussions”. The brand failed to listen to the consumer, failed to understand the need for consumer involvement within the brand community and delivered poor social communication with the lack of concern displayed in their response. This ignited a host of negative comments about the brand. They failed to recognize that the social environment is different and requires different advertising strategies than traditional advertisement. They did not establish relationships in order to build brand awareness, to develop positive brand attitude or to establish trust with consumers. If Wal-Mart were to adopt the S.A.M. model of advertising, they would be able to establish a successful social marketing strategy that could prove successful and allow them to establish and maintain consumer relationships.

The 2008 DEI study showed that more people visit social media websites to obtain brand information than any other online channel (see Figure 3).

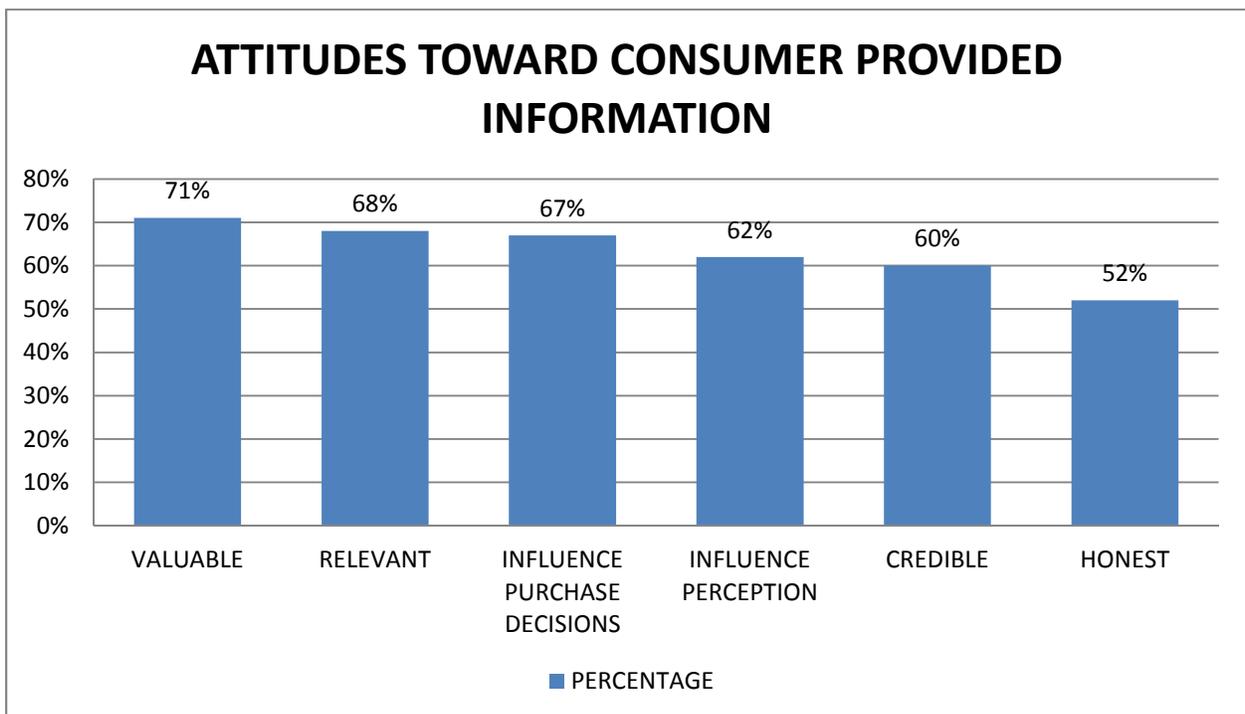


Percentage of people who report the types of online sources they have visited to get information on a company, brand or product (DEI, 2008)

Figure 3: Online Sources Visited for Information

With the increased popularity of social networking sites, the mere presence of a brand in those communities promotes brand awareness. As mentioned, social networking sites afford brands the ability to develop brand communities, which provide the platform for brands to interact with consumers. Fanpages within social networking sites allow brands to establish a presence and nurture brand awareness. Maintaining interactive Fanpages in popular social networking sites will foment brand awareness. Social networks have forced marketers to understand that advertising should not be centered on the product or the brand, but must first focus on the customer, creating a brand-consumer engagement within a social network (Savulescu, 2011). Sales follow relationship. To be effective firms must connect and establish relationships through the development of brand communities. The analysis of existing research supports hypothesis (H1), confirming that participation in social networks will increase brand awareness.

Positive social communication is the crux to success within social networks for positive brand trust and attitude. Research shows that brand trust and attitude is developed through social communication, primarily WOM and UGC. When people read about a brand or product within a social networking site, they place a higher value on those comments. Research shows that 71% of users value recommendations and information received online (see Figure 4, DEI, 2008). On Facebook, when users receive suggestions to like a product, page, group or brand, they typically do. This can lead users to view that brand's page or group, ergo attracting new customers. Social communication exists on a brand's Fanpage or within brand established Groups. Groups within social networking sites facilitate brand trust and attitudes. This type of user-promoted and trusted marketing is valuable to a firm.



Base: Among those who ever searched information online (DEI, 2008)

Figure 4: Attitudes Toward Consumer Provided Information

Consumers value online interactions with brands, with 67% of online searchers stating that they would likely pass along information they received online from brand representatives (DEI, 2008). If a firm wants to promote positive talk about its brand throughout a social network, it

must communicate well with its existing and potential customers. Firms must establish and maintain relationships with members in order to be accepted. Once accepted members will suggest the brand to others, comment on the brand, and post the brand on their personal profile, etc., promoting positive social communication. This positive communication creates trust between the firm and its existing and potential customers. Users that experience positive communication with brands are more likely to spread positive WOM about that brand, value the information received, and take action thus having a positive effect on brand attitude.

Conversely, when customers feel invaded by the brand or believe that an advertisement is too aggressive for the social environment, they are likely to spread negative word of mouth which has a negative effect on brand attitude. Social communication, therefore, drives brand trust and attitude and supports our hypothesis (H2) that social communication has a significant impact and is positively related to brand trust and attitude.

Social networks provide propitious information such as member likes, dislikes, interest, profession, characteristics, demographic information, etc., all of which marketers seek to obtain. Research studies examined within the literature review substantiate that social networking sites provide brands with a database of information for marketing purposes. Firms are able to conduct market analysis, perform segmentations and target specific members within a social networking site. Social networks offer firms the flexibility to use a variety of targeting strategies and to simultaneously implement multiple strategies, catering to the dynamics of various groups. While social networks can provide the apparatus to identify and communicate with a brand's target markets, marketers must know how to effectively communicate with consumers within social networking sites. Marketers must be creative and develop advertisement that does not feel like advertisement when communicating with their target market. In the world of social networking, conversation is the new advertising (Kotler, et al., 2010). Firms must find ways to socialize with

the type of communication people want to have. Marketers must understand that people are there to connect, not to be targeted. Communication with customers and potential customers should be about anything that interests the consumer or the popular topic of the day, not just about product information. If this is accomplished and incorporated into the firm's marketing strategy, the firm will be successful. Our hypothesis (H3) is supported and the answer to our question is yes, social networking sites can assist marketers in identifying and communicating with target markets.

CONCLUSION

This study will add to existing research on the topic of social media throughout the marketing industry. Future research will need to take a deeper look into the benefits of social networks on advertising. A longitudinal study is warranted to evaluate the long term impact of social media on marketing, given various marketing strategies. Firms should be cautious about generalizing the results of this study, as this research is purely exploratory in nature. More quantitative research is needed in this area. Future quantitative research will be pursued to test and validate the S.A.M. model introduced in this study.

The study provides useful insight for management and marketing professionals on the need to have social media at the core of their online marketing strategy. This study provides management with the framework to develop a cogent social marketing strategy. The study provides detail into the options available to firms within social networks. The study describes the benefits of these options to the company, social etiquette requirements, the importance of brand communities and the dominating factors that drive consumers. This study will prove beneficial to consumers, as more brands adopt an effective social strategy, consumers will have access to more user-generated content and in depth knowledge of products and services.

Consumers will also benefit from the valuable access to resources, both from users and the

brands. This study supports the findings of previous research, concluding that social media marketing is pivotal to reaching consumers in today's society. No modern plan targeting users online is complete without a social network marketing component (Ulusu, 2010).

In conclusion, this study shows that social networks have changed the world of advertising by forcing marketers to think outside of the box. The constant stream of traffic makes involvement in social networks a must for firms, providing an unlimited amount of exposure with the potential to increase brand awareness, facilitate brand trust, and promote positive brand attitude and select target markets. The research concludes that social networks provide enormous value to the revitalized world of advertising and should be appropriately integrated into a firm's online marketing strategy.

REFERENCES

- Acar, S. A., & Polonsky, M. (2007). Online Social Networks and Insights into Marketing Communications, *Journal of Internet Commerce*, 6(4), 55-72.
- Alba, J., & Stay, J. (2008). I'm on Facebook—Now What??? How to Get Personal, Business and Professional Value from Facebook. Cupertino: *Happy About*.
- Albanesius, C. (2009). More Americans Go to Facebook Than MySpace, *PC Magazine*, June 16, <http://www.pcmag.com/article2/0,2817,2348823,00.asp> [Retrieved October 1, 2011].
- Arthur, W. B. (1996). Increasing Returns and the New World of Business, *Harvard Business Review*, 74 (July-August), 100-111.
- Boyd, D. M., & Ellison, N. B. (2007). Social network sites: Definition, history, and scholarship, *Journal of Computer-Mediated Communication* [online], 13(1) article 11. <http://jcmc.indiana.edu/vol13/issue1/boyd.ellison.html> [Retrieved September 26, 2011].
- Cha, J. (2009). Shopping on Social Networking Web Sites: Attitudes Toward Real Versus Virtual Items, *Journal of Interactive Advertising*, 10(1), 77-93.
- Chung, C., & Austria, K. (2010). Social Media Gratification and Attitude toward Social Media Marketing Messages: A Study of the Effect of Social Media Marketing Messages on Online Shopping Value. *Proceedings of the Northeast Business & Economics Association*, 581-586.

- DEI Worldwide (2008). Engaging consumers online. The Impact of Social Media on Purchasing Behavior; Volume one: initial findings United States 2008 [online]. <http://www.deiworldwide.com/files/DEIStudy-Engaging%20ConsumersOnline-Summary.pdf> [Retrieved September 25, 2011].
- Dennis, C., Morgan, A., Wright, L., & Jayawardhena, C. (2010). The Influences of Social E-Shopping in Enhancing Young Women's Online Shopping Behaviour. *Journal of Customer Behaviour*, 9(2), 151-174.
- Fulgoni, G. M., & Mörn, M. (2009). Whither the Click? How Online Advertising Works. *Journal of Advertising Research*, 49(2), 134-142.
- Hollis, N. (2005). Ten Years of Learning on How Online Advertising Builds Brands. *Journal of Advertising Research*, 45(2), 255-268.
- IAB. Interactive Advertising Revenue Report 2000. PriceWaterhouseCoopers, 2000.
- Kotler, P., Kartajaya, H., & Setiawan, I. (2010). Marketing 3.0: From Products to Consumers to the Human Spirit. Translated by Smaranda Nistor. Bucuresti: *Publica*.
- McAlexander, J. H., Schouten, J. W., & Koenig, H. (2002). Building Brand Community, *Journal of Marketing*, 66(1), 38-54.
- Monroe, K. B. (1976). The Influence of Price Differences and Brand Familiarity on Brand Preferences. *Journal of Consumer Research*, 3(1), 42-49.
- Palmer, A., & Koenig-Lewis, N. (2009). An Experiential Social Network-Based Approach to Direct Marketing. *Direct Marketing: An International Journal*, 3(3), 162-176.
- Riegner, C. (2007). Word of Mouth on the Web: The Impact of Web 2.0 on Consumer Purchase Decisions. *Journal of Advertising Research*, 47(4), 436-447.
- Satish, M., Prem Kumar, V. B., & Bharath, S. (2011). Impacts of Online Advertising on Sales, *Journal of Marketing & Communication*, 7(1), 11-17.
- SĂVULESCU, R. (2011). Brand Talk on Facebook - a New Challenge in Marketing Communication. *Revista Romana de Comunicare si Relatii Publice*, 13(2), 19-30.
- Ulusu, Y. (2010). Determinant Factors of Time Spent on Facebook: Brand Community Engagement and Usage Types. *Journal of Yasar University*, 5(18), 2949-2957.
- Wasserman, S., & Faust, K. (1994). Social Network Analysis: Methods and Applications. *Cambridge University Press*, Cambridge.
- www.internetworldstats.com (2011). Internet Usage and Population Statistics for North America, <http://www.internetworldstats.com/stats14.htm#north> [Retrieved September 25, 2011].

www.facebook.com (2011). Statistics, <http://www.facebook.com/press/info.php?statistics> [Retrieved October 1, 2011].

www.wikipedia.com (2011). MySpace, <http://en.wikipedia.org/wiki/Myspace> [Retrieved October 1, 2011].

www.entrepreneur.com/encyclopedia/term/82660.html [Retrieved November 4, 2011].

www.TMCnet.com (2006). USC Study Finds Broadband to be Most Popular Type of Internet Connection. (January 11, 2006) <http://news.tmcnet.com/news/2006/jan/1277873.htm> [Retrieved November 11, 2011].

www.social-media-optimization.com (2007). A Failed Facebook Marketing Campaign. (October 11, 2007) <http://social-media-optimization.com/2007/10/a-failed-facebook-marketing-campaign/> [retrieved November 11, 2011].

**Live or Die: Slice-of-Life versus Slice-of-Death
Advertising Appeals as Vehicles for Corporate Social Responsibility**

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Abstract: Companies today understand that an integration of varying advertising appeals coupled with corporate social responsibility initiatives can positively impact marketing, branding, and overall organizational success. This research study analyzes different advertising appeals with an emphasis on Slice-of-Life versus Slice-of-Death appeals for socially responsible ads, and their impact on American culture Generation-Y. An empirical study is conducted on young adults in the United States to gauge their consumer perceptions, attitudes and purchase intentions. The research investigates how different advertising appeals and factors have evolved, and what methods best attract generation Y.

Key Words: Slice-of-life, Slice-of-death, Advertising appeals, Corporate social responsibility, Generation Y

INTRODUCTION & REVIEW

Advertising appeals are necessary to analyze, to help businesses determine which advertising approach they will take. Advertising appeals are an approach used to attract consumers and influence their feelings toward the product being advertised. There is hard sell, which focuses on a direct approach to selling; and there is soft sell, which is a more indirect or subtle approach (Okazaki, Mueller, & Taylor, 2010). Emotional appeal is relating to customers social and psychological needs to convince them about a company's product (Belch & Belch, 2007). There is also sexual appeal, Informational appeals, Imagery appeals, Teaser appeals, Reminder appeals and Transformational appeals (Belch & Belch, 2007). Along with those appeals there can and are different combinations of all of the appeals. Although there are many different advertising appeals this research will focus on the effectiveness of slice-of-life and slice-of-death. Slice- of –life is the type of advertising that attempts to show a real-life situation involving a problem, conflict or situation consumers may face in their daily lives. Then the ad shows how their product or service can resolve the problem (Belch & Belch, 2007). Slice-of-life particularly tries to show how customers cannot live without their product. Slice-of-life approach is normally used for consumer to product advertisements (Belch & Belch, 2007). Slice –of death is opposite of Slice-of-life, it shows how a product has a negative influence on a customer, they due this in order to get

customers from using a product (Belch & Belch, 2007). Slice of death ads are particularly popular in corporate social responsibility ads and health related awareness ads. They are normally used for business to business advertisements (Belch & Belch, 2007).

Corporate social responsibility (CSR) allows businesses to focus on promoting solutions to problems and awareness to the community. CSR ads “make claims about issues such as the environment, consumer protection, neighborhood revitalization, education, arts and entertainment, and health (Silver & Boyle, 2010).” These CSR ads complement or contradict messages from other media sources (Silver & Boyle, 2010). For corporate social responsibility among different cultures the types of appeal that is used most frequently are the Slice-of-life and Slice-of death advertisements. We will explore those advertisement appeals as it relates to Generation Y in the United States. Today businesses are faced with the challenge of appealing their advertisements to their target audience. Businesses can target their audience by gender, race, culture, and even age. Generation Y is the fastest growing segment in today’s workforce and is in the age group that was born between 1977 and 1994 (Maciejewski, 2004). This group is also believed to be one of the largest generations ever, possessing significant spending power (Maciejewski, 2004). Since Generation Y, is our current and upcoming young adult population, many organizations need to figure out how to attract this generation.

The research goal is to analyze the effectiveness of slice- of –life and slice-of-death advertising appeals for corporate responsibility. This research addresses the following questions:

1. Are slice- of –life and slice-of-death advertising appeals an effective approach for corporate social responsibility;
2. Are slice- of –life and slice-of-death advertising appeals effective towards generation-Y; and
3. What factors affect slice- of-life and slice-of-death advertising appeal and does it impact purchase intention.

CONCEPTUAL FRAMEWORK

With respect to the slice-of life and slice-of death advertising appeals there is not much data in the literature. There is more literature on advertising appeals as a whole, specifically hard-sell and soft sell. However the appeals that this research focuses there is a gap in the literature regarding slice-of life and slice-of death.

According to Belch and Belch (2010), slice-of-life portrays a problem or conflict that most consumers may face in their daily lives. These ads are often known to be unrealistic and irritating because it reminds customers of real life issues such as dandruff or bad breath (Belch and Belch, 2010 p.277). Slice-of-death advertising appeals according to Belch and Belch (2010), is an appeal that is used along with fear. The focus is on negative consequences that result when an individual makes the wrong decision in choosing to use a product or service (Belch and Belch, 2010 p.277).

Slice-of-life and slice-of-death are mostly only in textbook and in the literature as sources used for business schools and marketing students to learn the different types of appeals. Therefore, the review of this literature regarding both appeals is brief.

Figure 1 illustrates our conceptual framework- "Slice-of-Life and Slice of Death" model depicting the drivers of slice –of-life and slice-of-death and their consequences. We conceptualize a direct relationship of slice –of-life and slice-of-death with attitude towards the advertisement, ad belief, and ad irritation; which further affect the purchase intentions. Figure 1 shows three drivers for slice –of-life and slice-of-death advertising appeals-feeling, inherent drama, and acceptance. These drivers lead to the attitude towards the ad, belief, irritation and purchase intentions.



FIGURE 1: Slice –of-Life and Slice-of-Death Conceptual Framework

RESEARCH METHODOLOGY AND FINDINGS

A focus group was conducted where a sample size of 67 undergraduate and graduate students at a Historically Black College University (HBCU) was selected for the purpose of the research study, out of which 42 were women. The ads were taken from different print ads from different sources depicting

slice-of-life and slice-of-death. (i.e. ads of the world) . The ads were screened – the result was an initial six ads, with three in each category.

Research Findings

After conducting the research, we obtain the results as shown in Appendix I, Table 1. Women have a higher acceptance, feeling, inherent drama, attitude toward ads , belief of ad, irritation from ad, and overall purchase intention, with respect to slice-of-life ads. Women also have higher of these same factors with respect to slice of death, except for attitude toward ad. The implications from these findings indicate women have a higher overall repose towards slice of life and slice of death ads. However males attitudes toward slice of death ads are higher. As shown in Appendix I, Table 2, age was also analyzed. With respect to Generation Y, which is around the age range of 17 to 37, they do have a higher acceptance, feeling, inherent drama, attitude toward ads, belief of ad, irritation from ad, and overall purchase intention, with respect to slice-of-life and slice-of-death ads. This implies that Generation Y, which we have found has and will have a great amount of purchasing power, have a high overall response towards slice-of-life and slice-of-death ads.

CONCLUSION

The research study analyses the concepts of advertising appeals, particularly slice-of-life and slice-of-death appeals. However, there is little literature on these appeals and there are no fundamental dimensions used to measure these appeals. Our proposed slice-of-life and slice-of-death conceptual model may be accepted with the dimensions of attitude toward ads, belief of ad, irritation from ad, and overall purchase intention, with theory and reasonable explanations. Attitudes toward ads have been added to see individual's attitudes towards these types of ads. Belief and irritation was analyzed to see if individuals actual believed in these ads after seeing them or if they were irritated by it. Lastly purchase intention was analyzed to see consumers overall intent to purchase or support these products once viewing these types of ads.

Our research findings are significant with respect to acceptance, feeling, inherent drama, attitude toward ads, belief of ad, irritation from ad, and overall purchase intention and slice-of-life and slice-of-death ads. The limitations of this study are that only print ads were used and analyzed. The sample size was small and Generation Yers were the majority of the sample. Future research may focus more on corporate social responsibility as it relates to slice-of-life and slice-of-death advertisements.

REFERENCES

- Belch, G. E., & Belch, M. A. (2007). *Advertising and promotion: an integrated marketing communications perspective*. (7 ed., pp. 264-296). New York City, New York: McGraw-Hill Irwin.
- Dens, N., & De Pelsmacker, P. (2010). Consumer response to different advertising appeals for new products: The moderating influence of branding strategy and product category involvement. *Journal of Brand Management*, 18(1), 50-65. doi:10.1057/bm.2010.2
- Dubihlela, J., & Dubihlela, D. (2011). Youth attitudes towards advertisements depicting nudity and alcohol: ethical dilemmas in advertising. *South African Journal of Psychology*, 41(2), 207-217.
- Jing, Z. (2010). THE PURSUASIVENESS OF INDIVIDUALISTIC AND COLLECTIVISTIC ADVERTISING APPEALS AMONG CHINESE GENERATION-X CONSUMERS. *Journal of Advertising*, 39(3), 69-80. doi:DOI 10.2753/JOA0091-3367390305
- Maciejewski, J. I. (2004). Is the Use of Sexual and Fear Appeals Ethical? A Moral Evaluation By Generation Y College Students. *Journal of Current Issues & Research in Advertising*, 26(2), 97-105.
- Mortimer, K., & Grierson, S. (2010). The relationship between culture and advertising appeals for services. *Journal of Marketing Communications*, 16(3), 149-162. doi:10.1080/13527260802614229

- Okazaki, S., Mueller, B., & Taylor, C. (2010). Global Consumer Culture Positioning: Testing Perceptions of Soft-Sell and Hard-Sell Advertising Appeals Between U.S. and Japanese Consumers. *Journal of International Marketing*, 18(2), 20-34. doi:10.1509/jimk.18.2.20
- Okazaki, S., Mueller, B., & Taylor, C. R. (2010). MEASURING SOFT-SELL VERSUS HARD SELL ADVERTISING APPEALS. *Journal of Advertising*, 39(2), 5-20.
- Pechmann, C., & Knight, S. J. (2002). An Experimental Investigation of the Joint Effects of Advertising and Peers on Adolescents' Beliefs and Intentions about Cigarette Consumption. *Journal of Consumer Research*, 29(1), 5-19.
- Searles, K. (2010). Feeling Good and Doing Good for the Environment: The Use of Emotional Appeals in Pro-Environmental Public Service Announcements. *Applied Environmental Education & Communication*, 9(3), 173-184. doi:10.1080/1533015X.2010.510025
- Silver, I., & Boyle, M. (2010). Constructing Problems by Promoting Solutions: Corporate Advertisements about U.S. Poverty. *Journal of Poverty*, 14(3), 347-367. doi:10.1080/10875549.2010.494960
- Taute, H. A., McQuitty, S., & Sautter, E. (2011). EMOTIONAL INFORMATION MANAGEMENT AND RESPONSES TO EMOTIONAL APPEALS. *Journal of Advertising*, 40(3), 31-43.
- Tian, K. R. (2010). China Compared with the US: Cultural Differences and the Impacts on Advertising Appeals. *International Journal of China Marketing*, 1(1), 45-59.
- Zhang, J. (2009). THE EFFECT OF ADVERTISING APPEALS IN ACTIVATING SELF CONSTRUALS. *Journal of Advertising*, 38(1), 63-81.

APPENDIX I

Table 1: GENDER

SLICE OF LIFE		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for		Minimum	Maximum
						Mean			
						Lower Bound	Upper Bound		
PITOTA	Male	25	10.0400	1.48549	.29710	9.4268	10.6532	8.00	12.00
	Female	42	11.2381	2.06964	.31935	10.5932	11.8830	4.00	16.00
	Total	67	10.7910	1.95043	.23828	10.3153	11.2668	4.00	16.00
PITOTID	Male	25	2.2400	.52281	.10456	2.0242	2.4558	1.00	3.00
	Female	42	3.0000	.79633	.12288	2.7518	3.2482	1.00	4.00
	Total	67	2.7164	.79403	.09701	2.5227	2.9101	1.00	4.00
PITOTF	Male	25	7.5200	1.04563	.20913	7.0884	7.9516	6.00	9.00
	Female	42	7.5476	1.87672	.28958	6.9628	8.1324	3.00	12.00
	Total	67	7.5373	1.60801	.19645	7.1451	7.9295	3.00	12.00
PITOTAT	Male	25	22.4400	5.96574	1.19315	19.9775	24.9025	12.00	31.00
	Female	42	27.9762	5.53256	.85369	26.2521	29.7003	17.00	36.00
	Total	67	25.9104	6.26373	.76524	24.3826	27.4383	12.00	36.00
PITOTAB	Male	25	17.3200	5.24182	1.04836	15.1563	19.4837	8.00	25.00
	Female	42	22.0714	4.92080	.75930	20.5380	23.6049	11.00	28.00
	Total	67	20.2985	5.51311	.67353	18.9538	21.6433	8.00	28.00
PITOTAI	Male	25	16.9200	5.17945	1.03589	14.7820	19.0580	8.00	24.00
	Female	42	22.4048	5.13743	.79272	20.8038	24.0057	12.00	28.00
	Total	67	20.3582	5.77009	.70493	18.9508	21.7656	8.00	28.00
PITOTPI	Male	25	7.5600	2.02237	.40447	6.7252	8.3948	4.00	12.00
	Female	42	9.3571	2.13931	.33010	8.6905	10.0238	3.00	12.00
	Total	67	8.6866	2.25771	.27582	8.1359	9.2373	3.00	12.00
SLICE OF DEATH									
SODP1TOTID	Male	25	2.8800	.97125	.19425	2.4791	3.2809	1.00	
	Female	40	3.5750	.78078	.12345	3.3253	3.8247	1.00	4.00
	Total	65	3.3077	.91725	.11377	3.0804	3.5350	1.00	4.00
SODP1TOTF	Male	25	6.9200	2.19697	.43939	6.0131	7.8269	3.00	11.00
	Female	40	7.6000	1.61404	.25520	7.0838	8.1162	5.00	12.00
	Total	65	7.3385	1.87314	.23233	6.8743	7.8026	3.00	12.00
SODP1TOTAT	Male	25	18.8800	6.00916	1.20183	16.3995	21.3605	6.00	30.00
	Female	40	17.6500	8.45364	1.33664	14.9464	20.3536	6.00	36.00
	Total	65	18.1231	7.57980	.94016	16.2449	20.0013	6.00	36.00
SODP1TOTAB	Male	25	16.1200	5.30189	1.06038	13.9315	18.3085	4.00	24.00

	Female	40	18.5750	7.35854	1.16349	16.2216	20.9284	4.00	28.00
	Total	65	17.6308	6.70720	.83193	15.9688	19.2927	4.00	28.00
SODP1TOTAI	Male	25	15.4000	4.89898	.97980	13.3778	17.4222	4.00	24.00
	Female	40	16.6750	6.78379	1.07261	14.5054	18.8446	4.00	28.00
	Total	65	16.1846	6.11834	.75889	14.6686	17.7007	4.00	28.00
SODP1TOTPI	Male	25	6.8000	2.14087	.42817	5.9163	7.6837	3.00	9.00
	Female	40	6.9250	3.04991	.48223	5.9496	7.9004	3.00	12.00
	Total	65	6.8769	2.71861	.33720	6.2033	7.5506	3.00	12.00
SODP2TOTA	Male	25	10.6800	1.90875	.38175	9.8921	11.4679	8.00	16.00
	Female	40	11.0000	2.67946	.42366	10.1431	11.8569	4.00	16.00
	Total	65	10.8769	2.40122	.29783	10.2819	11.4719	4.00	16.00
SODP2TOTID	Male	25	2.5200	.82260	.16452	2.1804	2.8596	1.00	4.00
	Female	40	2.9000	.84124	.13301	2.6310	3.1690	1.00	4.00
	Total	65	2.7538	.84836	.10523	2.5436	2.9641	1.00	4.00
SODP2TOTF	Male	25	7.3200	1.65126	.33025	6.6384	8.0016	6.00	12.00
	Female	40	7.6750	1.71550	.27124	7.1264	8.2236	3.00	12.00
	Total	65	7.5385	1.68705	.20925	7.1204	7.9565	3.00	12.00
SODP2TOTAT	Male	25	21.1600	6.01858	1.20372	18.6757	23.6443	9.00	32.00
	Female	40	23.5000	7.02742	1.11113	21.2525	25.7475	6.00	36.00
	Total	65	22.6000	6.70774	.83199	20.9379	24.2621	6.00	36.00
SODP2TOTAB	Male	25	17.2800	5.24023	1.04805	15.1169	19.4431	8.00	24.00
	Female	40	19.1250	5.74763	.90878	17.2868	20.9632	4.00	28.00
	Total	65	18.4154	5.58987	.69334	17.0303	19.8005	4.00	28.00
SODP2TOTAI	Male	25	16.9200	4.85558	.97112	14.9157	18.9243	8.00	24.00
	Female	40	19.2500	5.66478	.89568	17.4383	21.0617	4.00	28.00
	Total	65	18.3538	5.44986	.67597	17.0034	19.7043	4.00	28.00
SODP2TOTPI	Male	25	7.8400	1.86369	.37274	7.0707	8.6093	6.00	12.00
	Female	40	8.6750	2.32476	.36758	7.9315	9.4185	3.00	12.00
	Total	65	8.3538	2.18254	.27071	7.8130	8.8947	3.00	12.00

TABLE 2: AGE

SLICE OF LIFE		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for		Minimum	Maximum
						Mean			
						Lower Bound	Upper Bound		
PITOTA	21 - 25	46	10.7174	2.08341	.30718	10.0987	11.3361	4.00	16.00
	26 - 30	13	11.3846	1.66024	.46047	10.3813	12.3879	8.00	14.00
	31 - 35	6	11.0000	.63246	.25820	10.3363	11.6637	10.00	12.00
	36 - 40	2	8.0000	.00000	.00000	8.0000	8.0000	8.00	8.00
	Total	67	10.7910	1.95043	.23828	10.3153	11.2668	4.00	16.00
PITOTID	21 - 25	46	2.7174	.86057	.12688	2.4618	2.9729	1.00	4.00
	26 - 30	13	2.8462	.68874	.19102	2.4300	3.2624	2.00	4.00
	31 - 35	6	2.5000	.54772	.22361	1.9252	3.0748	2.00	3.00
	36 - 40	2	2.5000	.70711	.50000	-3.8531	8.8531	2.00	3.00
	Total	67	2.7164	.79403	.09701	2.5227	2.9101	1.00	4.00
PITOTF	21 - 25	46	7.7391	1.79425	.26455	7.2063	8.2720	3.00	12.00
	26 - 30	13	7.3846	1.04391	.28953	6.7538	8.0154	6.00	9.00
	31 - 35	6	6.6667	.81650	.33333	5.8098	7.5235	5.00	7.00
	36 - 40	2	6.5000	.70711	.50000	.1469	12.8531	6.00	7.00
	Total	67	7.5373	1.60801	.19645	7.1451	7.9295	3.00	12.00
PITOTAT	21 - 25	46	25.2391	6.43319	.94852	23.3287	27.1496	12.00	36.00
	26 - 30	13	28.0000	6.53197	1.81164	24.0528	31.9472	18.00	36.00
	31 - 35	6	28.5000	2.34521	.95743	26.0389	30.9611	25.00	30.00
	36 - 40	2	20.0000	.00000	.00000	20.0000	20.0000	20.00	20.00
	Total	67	25.9104	6.26373	.76524	24.3826	27.4383	12.00	36.00
PITOTAB	21 - 25	46	19.5652	5.79138	.85389	17.8454	21.2850	8.00	28.00
	26 - 30	13	22.1538	5.11283	1.41804	19.0642	25.2435	12.00	28.00
	31 - 35	6	23.3333	2.06559	.84327	21.1656	25.5010	20.00	26.00
	36 - 40	2	16.0000	.00000	.00000	16.0000	16.0000	16.00	16.00
	Total	67	20.2985	5.51311	.67353	18.9538	21.6433	8.00	28.00
PITOTAL	21 - 25	46	19.9130	6.18897	.91251	18.0751	21.7509	8.00	28.00
	26 - 30	13	21.7692	5.47957	1.51976	18.4580	25.0805	12.00	28.00
	31 - 35	6	22.1667	2.04124	.83333	20.0245	24.3088	20.00	24.00
	36 - 40	2	16.0000	.00000	.00000	16.0000	16.0000	16.00	16.00
	Total	67	20.3582	5.77009	.70493	18.9508	21.7656	8.00	28.00
PITOTPI	21 - 25	46	8.3913	2.16516	.31924	7.7483	9.0343	3.00	12.00
	26 - 30	13	9.5385	2.50384	.69444	8.0254	11.0515	4.00	12.00
	31 - 35	6	10.0000	1.54919	.63246	8.3742	11.6258	9.00	12.00

	36 - 40	2	6.0000	.00000	.00000	6.0000	6.0000	6.00	6.00
	Total	67	8.6866	2.25771	.27582	8.1359	9.2373	3.00	12.00
SLICE OF DEATH									
SODP1TOTA	21 - 25	44	10.3864	2.43249	.36671	9.6468	11.1259	4.00	16.00
	26 - 30	13	11.3846	2.02231	.56089	10.1625	12.6067	9.00	16.00
	31 - 35	6	11.6667	1.36626	.55777	10.2329	13.1005	10.00	14.00
	36 - 40	2	8.5000	.70711	.50000	2.1469	14.8531	8.00	9.00
	Total	65	10.6462	2.30102	.28541	10.0760	11.2163	4.00	16.00
SODP1TOTID	21 - 25	44	3.1591	1.03302	.15573	2.8450	3.4732	1.00	4.00
	26 - 30	13	3.4615	.51887	.14391	3.1480	3.7751	3.00	4.00
	31 - 35	6	4.0000	.00000	.00000	4.0000	4.0000	4.00	4.00
	36 - 40	2	3.5000	.70711	.50000	-2.8531	9.8531	3.00	4.00
	Total	65	3.3077	.91725	.11377	3.0804	3.5350	1.00	4.00
SODP1TOTF	21 - 25	44	7.0909	2.02103	.30468	6.4765	7.7054	3.00	12.00
	26 - 30	13	7.9231	1.44115	.39970	7.0522	8.7940	6.00	11.00
	31 - 35	6	8.0000	1.67332	.68313	6.2440	9.7560	6.00	10.00
	36 - 40	2	7.0000	.00000	.00000	7.0000	7.0000	7.00	7.00
	Total	65	7.3385	1.87314	.23233	6.8743	7.8026	3.00	12.00
SODP1TOTAT	21 - 25	44	18.1591	7.59726	1.14533	15.8493	20.4689	6.00	36.00
	26 - 30	13	20.6923	8.12798	2.25430	15.7806	25.6040	10.00	36.00
	31 - 35	6	11.6667	3.44480	1.40633	8.0516	15.2818	7.00	17.00
	36 - 40	2	20.0000	.00000	.00000	20.0000	20.0000	20.00	20.00
	Total	65	18.1231	7.57980	.94016	16.2449	20.0013	6.00	36.00
SODP1TOTAB	21 - 25	44	16.1818	6.69006	1.00856	14.1479	18.2158	4.00	28.00
	26 - 30	13	20.6923	6.67563	1.85149	16.6583	24.7264	8.00	28.00
	31 - 35	6	21.8333	4.40076	1.79660	17.2150	26.4516	17.00	28.00
	36 - 40	2	17.0000	1.41421	1.00000	4.2938	29.7062	16.00	18.00
	Total	65	17.6308	6.70720	.83193	15.9688	19.2927	4.00	28.00
SODP1TOTAI	21 - 25	44	14.9773	6.06357	.91412	13.1338	16.8208	4.00	28.00
	26 - 30	13	19.9231	6.06165	1.68120	16.2601	23.5861	8.00	28.00
	31 - 35	6	17.0000	4.97996	2.03306	11.7739	22.2261	11.00	24.00
	36 - 40	2	16.0000	.00000	.00000	16.0000	16.0000	16.00	16.00
	Total	65	16.1846	6.11834	.75889	14.6686	17.7007	4.00	28.00
SODP1TOTPI	21 - 25	44	7.0000	2.61481	.39420	6.2050	7.7950	3.00	12.00
	26 - 30	13	7.6923	2.92645	.81165	5.9239	9.4607	3.00	12.00
	31 - 35	6	4.5000	2.50998	1.02470	1.8659	7.1341	3.00	9.00
	36 - 40	2	6.0000	.00000	.00000	6.0000	6.0000	6.00	6.00
	Total	65	6.8769	2.71861	.33720	6.2033	7.5506	3.00	12.00

Are Widgets the Next Big Thing? The Changing Face of Social Media Advertising

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Abstract Social media content such as blogs, social networks like Facebook and Twitter, and discussion forums are becoming more ubiquitous every day. Advertisers are certainly aware of this fact, and are utilizing these social media sites to reach millions of consumers. One of the most popular forms of advertising using social media is widgets. This research aims to investigate how widget advertising can be effective with regards to targeting consumers, how certain demographics impact widgets, and how widget advertising can positively and/or negatively impact a business or organization. The research focuses on the following questions:

1. How can social media widget advertising (SMWA) be more effective for targeting consumers as compared to traditional forms of advertising?
2. Are companies designing specific technology widgets in order to target specific demographics?
3. Is widget advertising always positive or can it also have negative consequences?

Keywords: social media widget advertising, technology widget, social media, traditional marketing, and balanced scorecard

Introduction

Social media content, such as blogs, social network sites like Facebook and Twitter, discussion forums, video and news sharing sites, and wikis, have experienced rapid growth in the last few years. As of February 2011, Facebook had over 500 million users worldwide who spent over 700 billion minutes per month on the site, Twitter had more than 175 million users, and 2 billion YouTube videos were being watched daily (Gupta, Armstrong, & Clayton, 2011). The rapid growth of social media in recent years has had a substantial impact on consumer behavior, and marketers have taken notice. However, that is not to say that social media is an easily understood concept, with pundits too often emphasizing “media” as being most important, when “social” is the significant element (Drury, 2008). Social media allows people to share and interact with one another through various avenues, one of those avenues being widgets.

Widgets are a popular form of advertising via social media. Widgets are “small free software programs that can be grabbed and embedded into web pages, desktops, start-pages, or mobile devices,” displaying a variety of content (Hynes, 2010, p. 112). Marketers can use widgets to advertise through social media. Social media widget advertising (SMWA) allows consumers to interact with companies and each other by giving consumers the ability to share their likes and dislikes about a particular product or service. SMWA is a relatively new concept, and some marketers are reluctant to use SMWA because it is not a proven form of advertising. Marketing through social media is different from marketing through traditional forms of media like print advertisements and television and radio commercials, and those differences must be taken into account.

Traditional methods of marketing generally involve communicating a specific message, while marketing through social media is more about building relationships and interacting with consumers (Drury, 2008). Consumer behavior has changed drastically in recent years. In the past, businesses would bombard consumers with advertisements; consumers now go out of their way to avoid advertisements. Commercial-free television and radio are heavily promoted to give viewers and listeners an incentive to tune in. Consumers have demonstrated that they no longer want to be told what to think about products; they would rather receive the information and build a dialogue with companies about their ideas and perceptions.

As SMWA becomes more popular, it is important to realize that the power to influence consumer attitudes and behaviors is shifting from the businesses to the consumers. Determining the advantages and disadvantages of SMWA is crucial to marketers so they can formulate strategies to effectively market their products. This paper aims to investigate the following questions:

- How can SMWA be more effective for targeting consumers as compared to traditional forms of advertising? The marketing world is constantly evolving and marketers must develop new methods of reaching consumers. SMWA could be the answer to these changing times.
- Are companies designing specific technology widgets in order to target specific demographics? It is a widely-held belief that social media is used by people age 18 to 29 than any other age group. Determining who uses social media most frequently would go a long way in making progress with SMWA.
- Is SMWA always positive or can it also have negative consequences? As mentioned earlier, SMWA is a relatively new concept, and many companies prefer to rely on the more proven and traditional forms of advertising. Establishing the pros and cons of SMWA will allow companies to decide whether or not widget advertising suits them.

The Evolution of Marketing

Marketing is imperative to the success of most businesses and organizations. Marketing involves meeting consumers' needs while making a profit (Keller & Kotler, 2009). The marketing concept first appeared in the mid-1950s, "when companies began to focus more on customers by developing products that might meet their needs, rather than just mass producing what already existed" (Wright et. al, 2010, p. 73). Until recently, the majority of marketing was executed through traditional media, such as print advertisements, television, radio, and news websites. Marketing through these traditional forms of media is often one dimensional; advertisers can dictate the content and heavily influence the message received by consumers (Drury, 2008). However, consumer behavior has evolved over the past few years, and marketers must tailor their attempts to reach consumers. Now, building relationships with consumers is one of the most

essential aspects of marketing. In order to form and sustain these relationships with consumers, it is crucial that marketers understand their wants, needs, and goals (Wright et. al, 2010). Social media gives consumers the opportunity to interact with businesses and organizations, allowing marketers to develop connections with their audience.

Using social media to interact with consumers is no longer optional at this point (Gupta, Armstrong, & Clayton, 2011). Online advertising is currently a billion dollar industry (Evans, 2009). One way marketers are trying to use social media to reach consumers is through the use of widgets. Social media widget advertising (SMWA) is becoming more popular due to “the extensive availability of effective delivery tools in the form of the phenomena of online social software” (Hynes, 2010, p. 116). In addition, using SMWA is relatively inexpensive and “encapsulating useful content with the application and syndicating it across the web is a very innovative and economical way” of communicating with consumers (Hynes, 2010, p. 116). However, SMWA is not without its flaws. Although SMWA is gaining in popularity, “widgets are not achieving their full potential as novel and exciting pieces of Internet software technology” due to its experimental and underdeveloped nature (Hynes, 2010, p. 117). Once marketers start seeing widespread success through SMWA, it will likely become a preferred form of advertising. Hence, the first research question:

RQ1: How can SMWA be more effective for targeting consumers as compared to traditional forms of advertising?

Designing for Demographics: Targeting Specific Audiences

Social media advertising is rapidly increasing in popularity and has gained a great deal of attention in general interest media around the world (Colliander & Dahlen, 2011). Studying

social media is often quite challenging considering the fact that most research focuses on adult populations, while adolescents and young adults are known for being some of the most likely users of social media (Cachia, Compano, & Da Costa, 2007; Hargittai, 2008). According to Taylor, Lewin, and Strutton (2011), social media advertisers should target members of the 18 to 34 year old demographic due to their high usage of digital–video recorders and aversion of to print media.

In recent years, social media has become more age neutral (Stroud, 2008). It seems as if early adopters of technology are usually young due to the associations with fashion, trends, and a sense of belonging (Stroud, 2008). However, when these technologies demonstrate staying power and real benefits, they tend to catch on with older age groups (Stroud, 2008). Some social networking sites, such as LinkedIn, were established specifically for the business community, which contains older people (Stroud, 2008). In addition, social media is being adopted by the corporate sector and government agencies (Stroud, 2008). It is important that social media advertisers do not overlook these opportunities to market their products and services, whether it is through widgets or other avenues.

Age is not the only factor that could potentially impact the way advertisers market their products and services. Gender may also play a role. According to Darley and Smith (1995), males and females process advertising differently. Males are more likely than females to use the Internet for leisure, entertainment, and functional purposes (Weiser, 2000). Females are more likely to use the Internet for communication and interaction (Weiser, 2000). Women are also more likely to feel more strongly about the invasiveness of advertising (Wolin & Korgaonkar, 2003). It is reasonable to expect marketers to take note of this and tailor their advertisements accordingly.

Because of the relative newness of SMWA, companies can make the necessary adjustments in order to effectively reach their target audience. Furthermore, widgets could potentially attract new demographics and give businesses and organizations more exposure. The above discussion suggests the following research question:

RQ2: Are companies designing specific technology widgets in order to target specific demographics?

The Ups and Downs of SMWA

As mentioned earlier, SMWA is a relatively new concept, meaning that marketers are not able to determine its long term effects. There appears to be numerous positives from using SMWA, but those advantages must also be tempered with the negatives. When companies employ traditional forms of marketing, they are in control of the messages transmitted and the images that are portrayed. The downside to these traditional forms of marketing is that they leave very little opportunity for interaction. The exact opposite is true with social media advertising. Social media advertising allows a company to experience a higher level of engagement with consumers, but it is accompanied by a loss of brand control (Gupta, Armstrong, & Clayton, 2011). SMWA allows consumers to share their likes and dislikes with businesses and organizations, and these firms must be prepared with the potential negative feedback (Gupta, Armstrong, & Clayton, 2011). Furthermore, many consumers feel that online advertising disrupts the flow of online activities (Retie, 2001). Marketers must examine their brands and determine whether or not the rewards of SMWA outweigh the risks. Therefore, the study examines the following research question:

RQ3: Is widget advertising always positive or can it also have negative consequences?

Methodology

A model called the Social Media Policy Scorecard for the Technology Sector (Figure 7) was theorized in order to analyze how SMWA may be used to meet certain objectives within a firm or organization. The model was based on the Balanced Scorecard concept. The Balanced Scorecard is typically used to assist managers in achieving a balance between financial and non-financial objectives in the short term and the long term (Brewer & Speh, 2000). Figure 1 illustrates a Balanced Scorecard, which shows the strategies and objectives of a firm from four different perspectives: financial, process and technology, learning and growth, and customer (David, 2011).

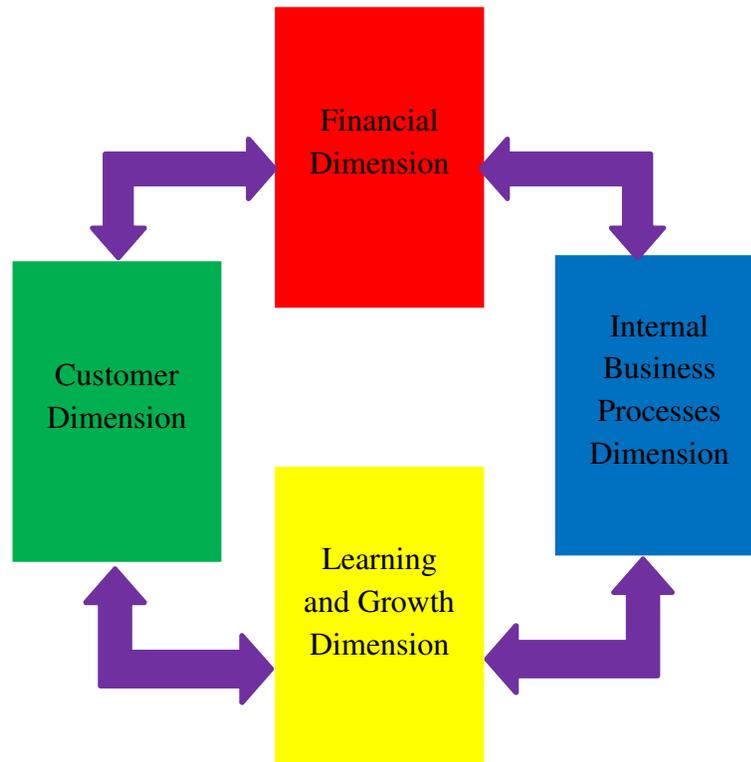


Figure 1: The Balanced Scorecard Model

To create the Social Media Policy Scorecard for the Technology Sector, the social media policies of five companies from the technology sector were analyzed using Crawdad Text Analysis Software (Corman, Kuhn, McPhee, & Dooley, 2002), which generated key words and phrases.

The five companies used for the study were Dell, Hewlett Packard (HP), Internet Business Mastery (IBM), Intel, and Microsoft. The technology sector was chosen because it is rated number one on Yomogo's Social Media Reputation Index, powered by Alterian's SM2 tool (Richards, 2011). All five brands are ranked in the top fifty brands in social media (Richards, 2011).

The roots of this research are based on grounded theory. Grounded theory is a methodology developed by Glaser and Strauss (1967) as a means of conducting research for subject matter involving social sciences (Suddaby, 2006). Glaser and Strauss challenged the idea that social and natural sciences dealt with similar subject matter (Suddaby, 2006). Grounded theory is built upon two major concepts: constant comparison and theoretical sampling (Suddaby, 2006). With regards to constant comparison, "data are collected and analyzed simultaneously" (Suddaby, 2006, p. 634). Theoretical sampling involves constructing decisions about which data should be collected next (Suddaby, 2006).

Social Media Policy Scorecard for the Technology Sector

One of the advantages of conducting research involving social sciences is that it "looks at how human invention continually generates new ways of interaction and organization" (Suddaby, 2006, p. 641). The Social Media Policy Scorecard for the Technology Sector illustrates how a firm or organization may use social media to effectively reach customers by acting as widgets, create ethical value, generate economic value, and add social value. The Social Media Policy Scorecard for the Technology Sector could also be applied to other sectors and industries. However, it is crucial to acknowledge that certain perspectives may or may not be useful to a particular sector or industry. The perspectives are listed in order of importance, from most

important to least important. The importance of each perspective can vary within a sector or industry, so one must tailor the scorecard to fit the specific needs and desires of his firm.

Figure 2 shows Dell’s Social Media Policy Scorecard. Dell’s scorecard shows the human resources, learning and growth, customer, financial, and legal perspectives. Human resources are the most important perspective when dealing with social media. Social media cannot work without human resources. However, the human resources perspective is not to be confused with the customer perspective. The human resources perspective deals with the internal perspectives of an organization while the customer perspective deals with the external perspectives of the organization.

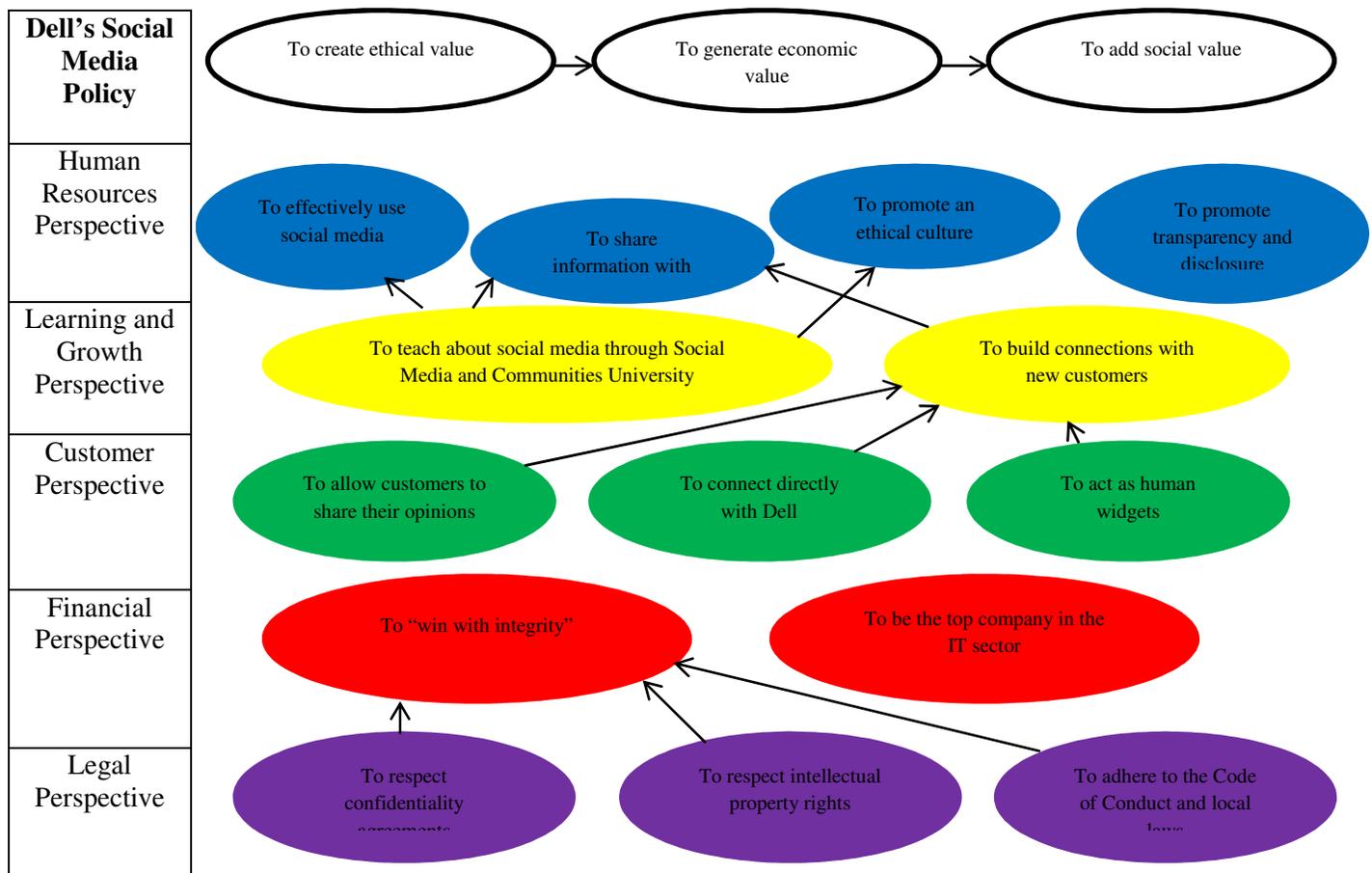


Figure 2: Dell’s Social Media Policy Scorecard

Figure 3 illustrates HP’s Social Media Policy Scorecard. This scorecard only contains three perspectives: human resources, customer, and legal. The legal perspective is extremely important when analyzing social media policies, as it is very easy for a firm or organization to find itself vulnerable to litigation. Organizations must ensure that the content posted is truthful and honest and does not defame any of their competitors.

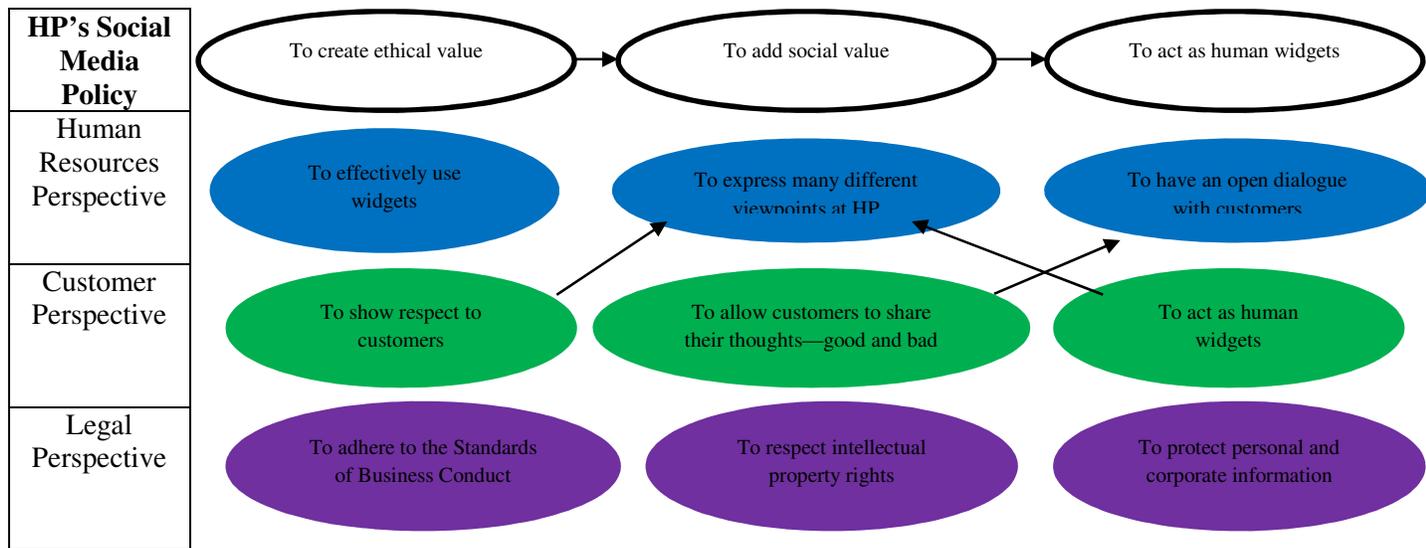


Figure 3: HP’s Social Media Policy Scorecard

Figure 4 shows IBM’s Social Media Policy Scorecard. Like Dell’s scorecard, IBM’s scorecard focuses on all five perspectives. Not only does IBM’s policy discuss protecting itself, but also its partners, suppliers, and clients. It is important to realize that social media affects many parties, and this must be taken into when considering whether or not to use social media as a form of advertising.

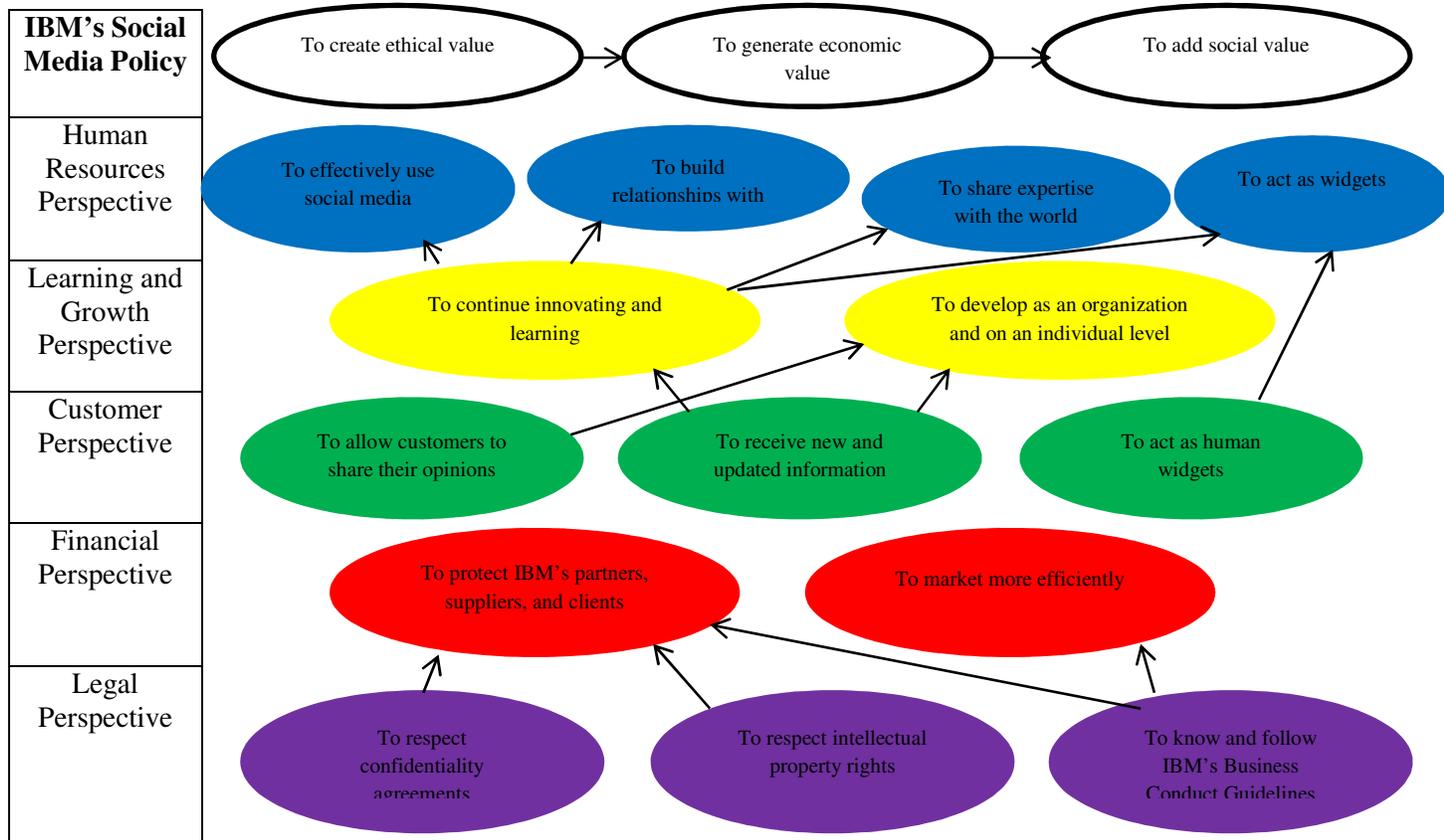


Figure 4: IBM's Social Media Policy Scorecard

Figure 5 shows Intel's Social Media Policy Scorecard. Intel's scorecard features the human resources, learning and growth, customer, and legal perspectives. Like Dell, employees must complete special training before participating in social media activities at Intel. If employees are going to act as human widgets, spreading information and opinions through word of mouth, then they must familiarize themselves with the proper procedures in order to get the best results.

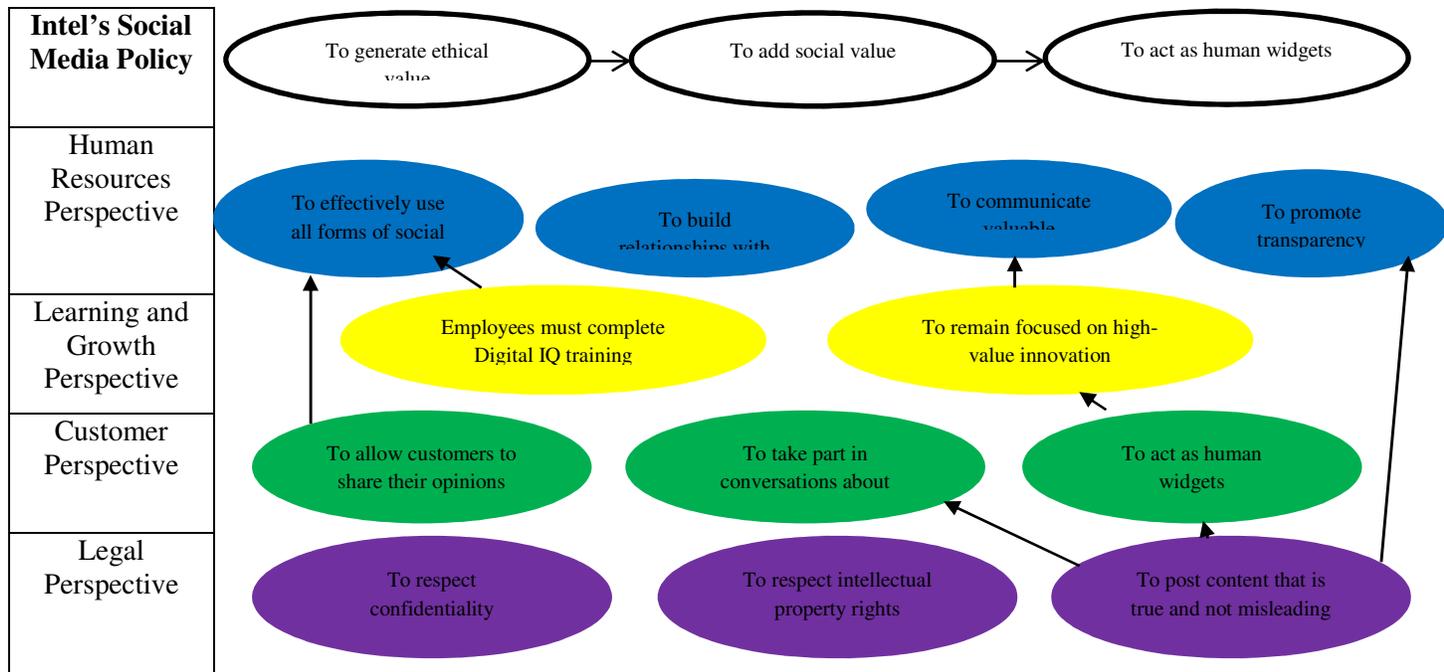


Figure 5: Intel's Social Media Policy Scorecard

Figure 6 illustrates Microsoft's Social Media Policy Scorecard. Microsoft's scorecard focuses on four perspectives: human resources, learning and growth, customer, and legal. Microsoft stresses the importance of using proper procedures, such as following the Confidential Information Policy and respecting intellectual property rights.

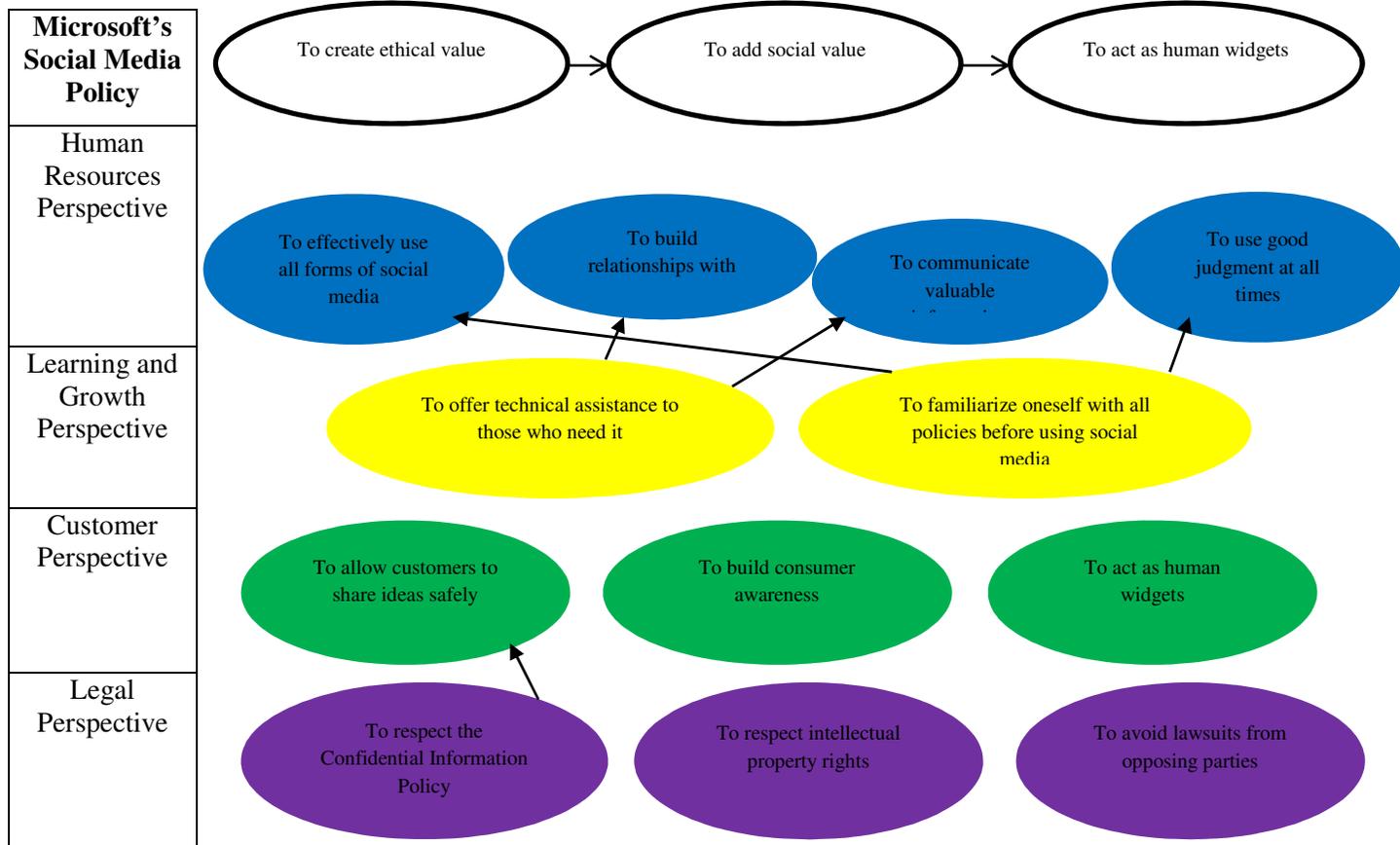


Figure 6: Microsoft's Social Media Policy Scorecard

The five companies featured social media policies that were quite similar. The policies primarily discussed having an open dialogue with customers, following the appropriate guidelines when participating in social media, building consumer awareness, marketing more effectively, and avoiding legal issues by respecting intellectual property rights and confidentiality agreements. The Social Media Policy Scorecard for the Technology Sector (Figure 7) was created by compiling the most frequent and most important elements from the scorecards for the five companies in the technology sector. Using the scorecard allows companies to determine whether or not SMWA and other forms of social media advertising will work for them. After creating the

Social Media Policy Scorecard for the Technology Sector, it appears as if using SMWA can create value for an organization if used properly.



Figure 7: Social Media Policy Scorecard for the Technology Sector

Managerial Implications

Numerous managerial implications were identified through the analysis of social media policies. Human resources are the most important aspect of participating in social media. Managers and employees can use social media to act as widgets, sharing information and directly communicating with customers. The direct lines of communication allow customers to have more power with regards to marketing. While many will express themselves positively,

customers can also share negative thoughts or opinions about a brand or product, leaving the company open to criticism and damage to its reputation. This is why it is crucial for managers and employees to fully grasp their company's guidelines and policies concerning social media. Furthermore, training may be offered in order to maximize the benefits of using social media. SMWA can also be used to build brand awareness, reaching consumers in addition to customers. SMWA is an easy and less expensive way to reach a wide number of consumers. The funds saved on marketing and advertising through SMWA could be spent on other areas. Like with traditional forms of advertising, managers must be aware of the legal implications that come with SMWA. Because virtually anyone can participate in SMWA, companies can become vulnerable to litigation and lawsuits. It is imperative that everyone—managers, employees, customers, and consumers—pay careful attention to the content they put out in cyberspace. Content transmitted over the Internet can last for many years, so discretion is key when using SMWA. SMWA could possibly transform the landscape of the advertising world, but until people become more familiar with it, it is up to managers to ensure that the potential benefits outweigh the potential negative consequences.

Conclusion

The Social Media Policy Scorecard for the Technology Sector was created in order to examine how social media, specifically SMWA, could provide value to a firm or organization. SMWA allows firms to reach far more people than traditional forms of advertising. This builds brand awareness and makes marketing more efficient. Because SMWA reaches so many people, there is not one particular demographic that marketers need to attract. People of all ages, races, and walks of life participate in social media. It was a widely held stereotype that social media only appealed to adolescents, teenagers, and young adults. However, there has been an influx of older

adults using social media sites, such as LinkedIn, to find employment and to connect with business contacts. While there are many benefits to SMWA, it can also negatively impact a business or organization. SMWA takes away a great deal of power from the firm and places it in the hands of customers and consumers. Word-of-mouth (WOM) advertising can make or break a product or brand, so companies must brace themselves for the fallout should it occur.

SMWA is a relatively new subject, so there is little information currently available. Future research could explore the pros and cons of human widgets compared with technology widgets. This research examined the technology sector. Future research could investigate another sector and determine if SMWA is as effective in that sector. As SMWA becomes more popular, more strategies and models can be developed in order to improve SMWA. In addition, the profitability of companies that use SMWA can be compared to companies that do not use SMWA.

Technology is constantly changing and ever-evolving, so only time will tell if SMWA is here to stay or merely a flash in the pan.

References

- Brewer, P.C., & Speh, T.W. (2000). Using the balanced scorecard to measure supply chain performance. *Journal of Business Logistics*, 21(1), 75-93.
- Cachia, R., Compañ˜o, R. & Da Costa, O. (2007). Grasping the potential of online social networks for foresight. *Technological Forecasting and Social Change*, 74(8), 1179–1203.
- Chatterjee, P. (2011). Drivers of new product recommending and referral behaviour on social network sites. *International Journal of Advertising*, 30(1), 77-101.
- Colliander, J. & Dahlen, M. (2011). Following the fashionable friend: The power of social media. *Journal of Advertising Research*, 51(1), 313-320.
- Corman, Kuhn, McPhee, & Dooley (2002). Crowdad Text Analysis Software (Version 1.2) [Software]. Available from <http://www.crowdadtech.com/software.htm>.
- Darley, W.K. & Smith, R.E. (1995). Gender differences in information processing strategies: An empirical test of the selectivity model in advertising response. *Journal of Advertising*, 24(1), 41-56.
- David, F.R. (2011). *Strategic management: Concepts and cases* (13th ed.). Upper Saddle River, NJ: Prentice Hall.
- Drury, G. (2008). Opinion piece: Social media: Should marketers engage and how can it be done effectively? *Journal of Direct, Data and Digital Marketing Practice*, 9, 274-277.
- Evans, D.S. (2009). The online advertising industry: Economics, evolution, and privacy. *Journal of Economic Perspectives*, 23(3), 37-60.
- Glaser, B.G., & Strauss, A.L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. New York: Aldine.
- Gupta, S., Armstrong, K., & Clayton, Z. (2011). *Social media*. Boston: Harvard Business Publishing.
- Hargittai, E. (2008). Whose space? Differences among users and non-users of social network sites. *Journal of Computer-Mediated Communication*, 13, 276-297.
- Hynes, M. (2010). Leveraging new opportunities from the use of web widgets in online web 2.0 environments. *Journal of Internet Business*, 8, 109-141.
- Keller, K. & Kotler, P. (2009). *Marketing management* (13th ed.). Upper Saddle River, New Jersey: Pearson.
- Retie, R. (2001). An exploration of flow during internet use. *Internet Research*, 11(2), 103-111.

- Richards, S. (2011, Feb 7). The top 50 brands in social media. Retrieved from <http://econsultancy.com/us/blog/7171-the-top-50-brands-in-social-media>.
- Steinfeld, C., Ellison, N.B., & Lampe, C. (2008). Social capital, self-esteem, and use of online social network sites: A longitudinal analysis. *Journal of Applied Developmental Psychology, 29*, 434-445.
- Stroud, D. (2008). Social networking: An age-neutral commodity—Social networking becomes a mature web application. *Journal of Direct, Data and Digital Marketing Practice, 9*, 278-292.
- Suddaby, R. (2006). From the editors: What grounded theory is not. *Academy of Management Journal, 49*(4), 633-642.
- Taylor, D.G., Lewin, J.E., & Strutton, D. (2011). Friends, fans, and followers: Do ads work on social networks? *Journal of Advertising Research, 51*(1), 258-275.
- Weiser, E.B. (2000). Gender differences in internet use patterns and internet application preferences: A two-sample comparison. *Cyber Psychology & Behavior, 3*(2), 167-178.
- Wolin, L.D. & Korgaonkar, P. (2003). Web advertising: Gender differences in beliefs, attitudes and behavior. *Internet Research, 13*(5), 375-385.
- Wright, E. Khanfar, N.M., Harrington, C., & Kizer, L.E. (2010). The lasting effects of social media trends on advertising. *Journal of Business & Economics Research, 8*(11), 73-80.

Classification Accuracy Evaluation for three Statistical Methods

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ABSTRACT

Accurately classifying observations into predefined groups is a commonly encountered multivariate analysis problem. When the dependent variable has only two levels (1=Event, 0=Non-event and such) binary logistic regression is the most widely used approach. However, researchers often come across dependent variables with more than two levels: for example, 1=Good, 2=Medium and 3=Low. When a qualitative dependent variable has three or more levels, there are several analytical techniques that a researcher can use to classify observations into one of those mutually exclusive categories. Here's a list of three such approaches:

- (1) **Multiple Discriminant Analysis (MDA):** This method is appropriate when there is a categorical dependent variable with three or more categories and metric independent variables.
- (2) **Multinomial Logistic Regression Analysis:** This is a generalized version of binary logistic regression analysis ('Generalized Logit' henceforth) to handle more than two levels for the dependent variable.
- (3) **Multiple Binary Logistic Regression Analyses:** 'Binary Logit' models can be developed for each of the categories of the dependent variable, and the results can be combined to derive group memberships. For example, if there are three levels for the dependent variable – Good, Medium and Low – then one Binary Logit model can be built for {Good} vs. {Medium, Low}, another Binary Logit model can be built for {Medium} vs. {Good, Low} and third one for {Low} vs. {Good, Medium}. The calculated probabilities from each of these three models can be compared with each other to infer group memberships for each category.

The purpose of this study is to compare the results of these three analytical methods to evaluate which method performs better in terms of achieving a high true classification rate (i.e., hit rate).

Two random samples from the same dataset are used for this study, one partition served as a modeling sample, and another as a hold-out (or validation) sample. The validation sample was used to compare the results of these three approaches. The analysis was performed primarily using SAS.

INITIAL DISCUSSION

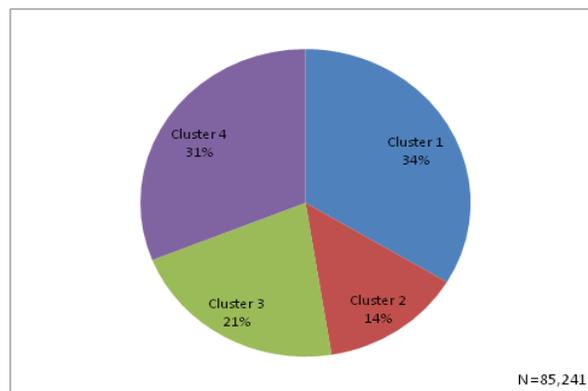
- Building multiple Binary Logit models has an intrinsic appeal. Unlike Discriminant Analysis, the Binary Logit analysis doesn't rely on any assumptions about the distribution of independent variables.
- If there are many categorical variables with two or more categories, then they obviously violate the normality assumption for MDA. Most of the time the analysis data contain categorical variables, which makes Binary Logit method more desirable.

- If there are different sets of variables that distinguish each individual group from the others, then a set of custom models (like Binary Logits) that maximize the separation of each cluster has an intuitive appeal. The MDA and Generalized Logit analysis on the other hand use one set of predictors that maximizes separation across all groups. These two methods can't capitalize on any individual cluster that differs from other clusters on a unique set of variables (that is different from the one-size-fits all set of variables across all clusters.)
- In spite of the obvious advantages of the Binary Logit method, the other two methods have something that Binary Logits doesn't: simplicity. With MDA and Generalized Logit Analysis model approaches, *a single* model is required which makes it easier to implement and interpret the results. If the differences in performance are not large enough, using Discriminant or Generalized Logit Analysis may be preferable because it would require less time and provide a simpler solution.

DETAILS OF THE DATA

After carefully considering several different sets of data, a customer transaction dataset for a US cruise company was selected for the study. The original dataset contained transactional history information for 85,241 unique customers. There were more than 700 variables in total. Some examples are: number of cruise trips taken, duration of trips, total revenue, and gratuity. Most of these transactional fields were summarized for a specific timeframe. In addition to these transactional variables, additional information about the household composition was also available for each customer – like number of adults and kids in the household, average age etc.

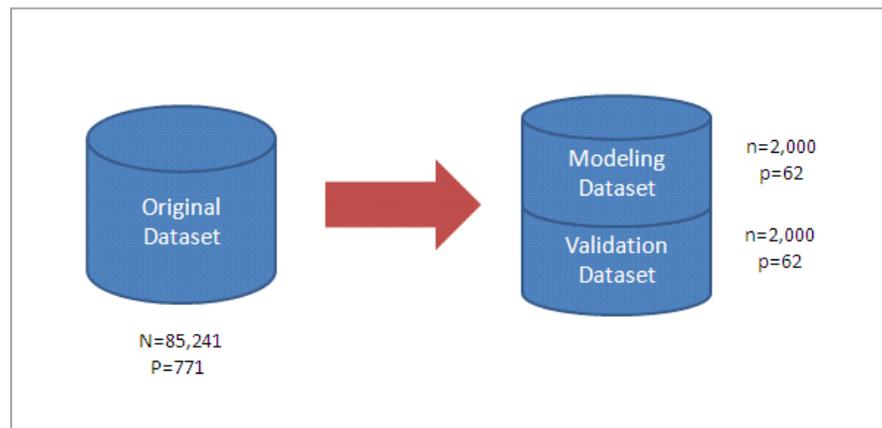
There are four unique segments that are assigned to each customer. These segments were originally developed based on responses to a survey that focused primarily on attitudinal characteristics of the customers. The survey responses were available for a limited set of customers (85,241 – which is not their entire customer base). Our goal is to be able to use the behavioral and demographics data to infer the segment memberships as accurately as possible. Once a model is established, the demographics and behavioral data can be used to score the remainder of the customer population – where survey response data is not available – to infer their segment memberships. Knowing the segment membership for all customers is important for the marketing campaigns; the type of creatives (look and feel of the marketing materials) and the tonality of the marketing message are determined based on an individual customer's segment membership. The distribution of these four segments is as follows:



SAMPLING

A random sample of 2,000 unique customers was taken from the original set and will be used as the modeling set. Another set of 2,000 (mutually exclusive) distinct customers were randomly pulled to create the validation set. The modeling dataset will be used to calculate parameter coefficients (i.e. develop the model), and the validation set will be treated as a hold-out sample to evaluate the performance of the model.

From the initial set of independent variables, 62 variables were selected for phase I of the analysis based on several criteria; all of these 62 variables are continuous variables and don't have any missing values (except for three where averages were used to impute missing values). The categorical variables were not considered for the first round of analysis. The comparison of the three different methods will be done by utilizing the continuous variables first (Phase I). After comparing the results, categorical variables will be added to the pool of independent variables for further analysis (Phase II).



INITIAL LOOK AT THE DATA

Since MDA relies on several assumptions about the distribution of the independent variables, the following tests were performed: (1) Shapiro-Wilk test to check the normality assumption, and (2) Levene's test for checking the homogeneity of variance. Normal probability plots were also generated to visually confirm the normality of variables.

The p-values for the Shapiro-Wilk test were all <0.001 . Hence, none of the variables follow normal distribution. The Levene's test had non-significant p-values (<0.05) for 23 independent variables – which suggests that these variables have homogeneous variance and possibly covariance matrix.

Seven transformations were created to see if any of these improve the normality of any variable :

- (1) Cube
- (2) Square
- (3) Square Root
- (4) Natural Log
- (5) Inverse of the Square Root

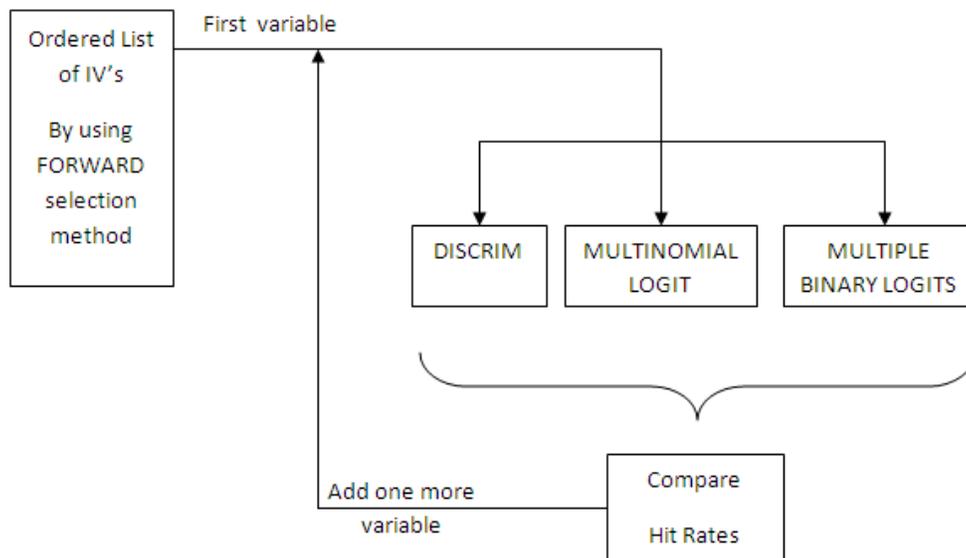
- (6) Inverse
- (7) Log base 10

Still none of the transformed variables were normally distributed – the p-values for Shapiro-Wilk test were all significant at the 0.05 level. However, the actual value of Shapiro-Wilk test statistic itself did improve for some transformed variables. Based on the improvement of Shapiro-Wilk test statistics, some transformed variables were selected and the original variables were discarded from further consideration.

MODELS: APPROACH

Phase 1: Using these 62 independent variables (all continuous), several models were built to compare their performances against each other. There are several different ways in which one could select the optimal number of variables to achieve the highest accuracy. Two approaches were used to select variables and build the best models for each modeling technique:

- (A) First, a **forward selection** step will be used to determine the order of variables according to their (cumulative) importance. Once the order is established, a series of models will be built – first with one variable, then by adding the subsequent variables – one at a time. For Binary Logit, this would mean one model for each cluster for each step. For the other two methods, this would mean one model for each step. The approach is depicted in the flow-chart below:



- (B) **Stepwise variable selection** method will be used to develop the best models for each of the three methods. For MDA and Generalized Logit, one best model will be developed (for each method) based on the best set of variables determined by the stepwise variable selection. For

Binary Logit, this would mean building a single (best) model for each cluster and then combining their scores together for segment assignment. The segment assignments will be compared with the results from all three methods to determine which method gives the best hit rates.

Phase 2: All categorical variables will be considered – in addition to those 62 continuous variables from Phase 1 – as potential independent variables in phase 2 of the analysis. The categorical variables clearly violates some distributional assumptions for MDA – because of this, a phased approach is considered to evaluate the performance first without categorical variables and then with all variables.

Each of these models will be scored to assign segments based on the predicted probabilities. Once all the models are built and scored, their hit rates will be compared against each other to see which methodology performs the best. Each of the three methods (MDA, Generalized Logit, and multiple Binary Logits) will produce predicted probabilities for each of the four clusters. MDA also assigns the segment based on the highest probability score, but the logistic analyses don't produce segment assignments. To keep things on an even scale, the individual segment probabilities will be used to derive segment memberships using a consistent approach. This approach will be used for all three methods. A detailed explanation of this approach can be found in the Appendix.

MODEL VALIDATION

Primarily, since the purpose of these models is to accurately predict segment memberships, the overall **Hit Rate** will be used to evaluate the strength of the model.

Hit Rate = Number of correctly classified records / Number of records in the dataset

Since the number of records in each cluster is not equal, the hit rate can be biased – a model that performs better on the large clusters (cluster 1 and 4) can achieve high hit rates, even if it works poorly on the smaller cluster. In order to consider the classification accuracy across all clusters (as opposed to overall), another metric will be created along with hit rate: Hit Ratio.

Hit Ratio = Number of correctly classified records / Number of misclassified records

This metric is independent of the influence of cluster size. It provides the classification lift, i.e. how many correctly classified records for each misclassified one. [Desired value of hit ratio: The size of each cluster in the population is: 34%, 14%, 21% and 31%. If random samples of aforementioned sizes are assigned to each cluster respectively, the hit ratio for each cluster will be equal to: $34\%/(1-34\%)$, $14\%/(1-14\%)$ and so on. The weighted average of these hit ratios is: 39%. This establishes the baseline value for hit ratio. This is the hit ratio that one would get by randomly dividing the population into groups with original cluster sizes. Any value above 39% would indicate a lift over the random approach.]

MODEL RESULTS: PHASE I

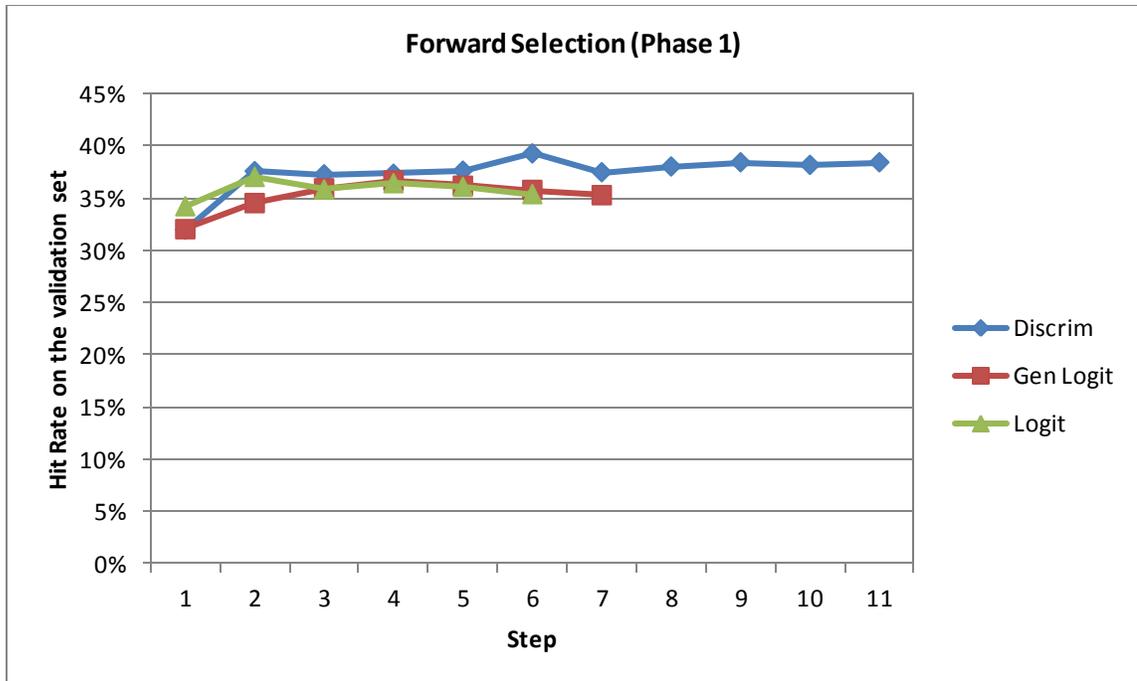
(A) Forward Selection Method

The variables that entered the models in the forward selection process are listed below:

Step	MDA	Generalized Logit	Logit			
			Cluster 1	Cluster 2	Cluster 3	Cluster 4
1	avg_cruise_cnt	max_cruise_cnt	max_cruise_cnt	maxage	avg_cruise_cnt	avgtimeit
2	Maxage	Mintimeit	CUBE_C162	avg_tenure	LOG_cntpers	avg_Grat
3	LOG_cntpers	avg_diem_trev	mintimeit	tip	maxage	avg_diem_trev
4	Mintimeit	CUBE_C162	avg_Grat	max_cruise_cnt	firstdate	lastdate
5	CUBE_C162	avg_Grat	avg_diem_trev		lastdur	
6	avg_Grat	avg_tenure			CUBE_C162	
7	Lastdur	lastdate				
8	max_tenure					
9	Cntfemale					
10	max_diem_obs					
11	Firstdate					

It is interesting to note that the individual Binary Logit models selected variables that are very similar to the variables selected in MDA Discriminant and Generalized Logit. It appears that the variables that help distinguish across all clusters (in MDA and Generalized Logit) are very similar to the variables that distinguish each individual cluster from the others. If this were not the case – i.e. if the variables that distinguish each individual cluster from others are somewhat different that the variables that distinguishes across all clusters – then the individual Binary Logit models would have been beneficial. But given the similar set of variables that got selected across all three methods, it seems like one model approach (MDA and Generalized Logit) may perform as well as (if not better than) multiple models approach.

As explained before, for each methodology, a model is developed for each step (i.e. one variable model, two variables model etc.) and the probabilities are used to assign segments by using the approach laid out in the Appendix. These models were then used to score the validation set to see how then perform on a dataset that was not used in the modeling exercise. These results are shown in the chart below:



For the Generalized Logit analysis forward variable selection stopped at five variables, and the Binary Logit stopped at the sixth step (5 variables were selected for cluster 1 model, 4 for cluster 2, 6 for cluster 3 and, and 4 variables for cluster 4 model). While for MDA, the forward selection method kept adding variables until step 11. (Note that for MDA, the significance level of an F-test from an analysis of covariance is used as the selection criterion and the default cut-off value is 0.15 in PROC STEPDISC in SAS).

For the first step (single variable models), the performance on the validation set is very similar –but Binary Logit has slightly higher hit rate. As the second variable is added to these models, the MDA approach yields a slightly higher hit rate than Binary Logit, and the Generalized Logit produced the lowest hit rate. From the addition of the third variable onwards, Binary Logit and the Generalized Logit both yield very similar hit rates. The MDA with 6 variables resulted in the highest hit rate across all models and approaches. Adding more than 6 variables in MDA didn't improve the performance.

In addition to the hit rates, the hit ratios are also shown in the table below. Both, the hit rates and hit ratios, suggest that the MDA with six variables yields the best performance on the validation set.

Step	MDA	Generalized Logit	Logit
1	47.0%	47.1%	52.1%
2	60.2%	52.8%	58.8%
3	59.5%	56.1%	55.9%
4	59.6%	57.9%	57.3%
5	60.4%	56.7%	56.5%
6	64.7%	55.7%	54.8%

7	60.0%	54.5%	
8	61.4%		
9	62.4%		
10	61.8%		
11	62.4%		

These results are surprising given the fact that several the assumptions about the distribution of the independent variables are violated by this data. But in spite of those violations, MDA performed better as compared to the other two methods under consideration. As mentioned before, one reason for this could be the fact that the Binary Logit couldn't really benefit from using different sets of independent variables for each cluster. The variables that differentiate each cluster from others are very similar to the variables that differentiate across all clusters.

(B) Stepwise Selection Method

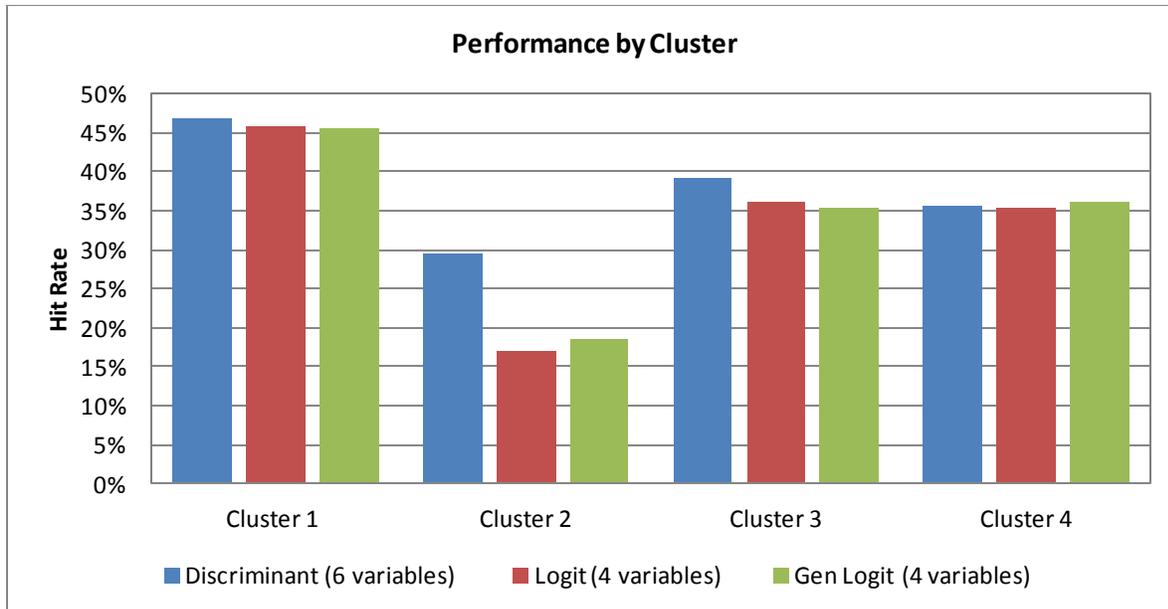
For each cluster, a stepwise selection process was executed to determine the best Binary Logit model. These best models are then used to score the validation set to calculate the probabilities. All these probabilities are then combined (by using the approach laid out in the Appendix) to assign the segments. For the other two methods, stepwise selection process yielded the exact same list of variables (in the same order of entry) as the forward selection. (The stepwise selection process, in these two cases, didn't eliminate any variable that was already entered after adding an additional variable. Because of this, it worked exactly the same as forward selection process.) The hit rate and ratio for the Binary Logit approach are shown in the table below:

Overall Hit Rate	36.59%
Overall Hit Ratio	57.70%

Only three variables entered the model: avg_timetil, avg_Grat, and avg_diem_trev. These success metrics are still inferior as compared to the best model Discriminant model performance. And these two metrics are slightly inferior to the ones yielded by forward selection process.

Based on these results, we can conclude that the method of variable selection didn't improve the performance of Binary Logit approach. And MDA remains undefeated.

Before concluding that the MDA approach performed best for the given data, classification rates for each cluster are studied to see if a particular method produced results that are uneven across clusters. The results for the best model (from forward selection method) for each of the three methods are shown below:



Overall, MDA performed better across all clusters – except for cluster 4 where generalized Logit produced just a tad higher hit rate. The reason why MDA produced high overall hit rate seem to be driven by its performance on cluster 2. The other two methods didn’t perform as well on cluster 2.

MODEL RESULTS: PHASE II

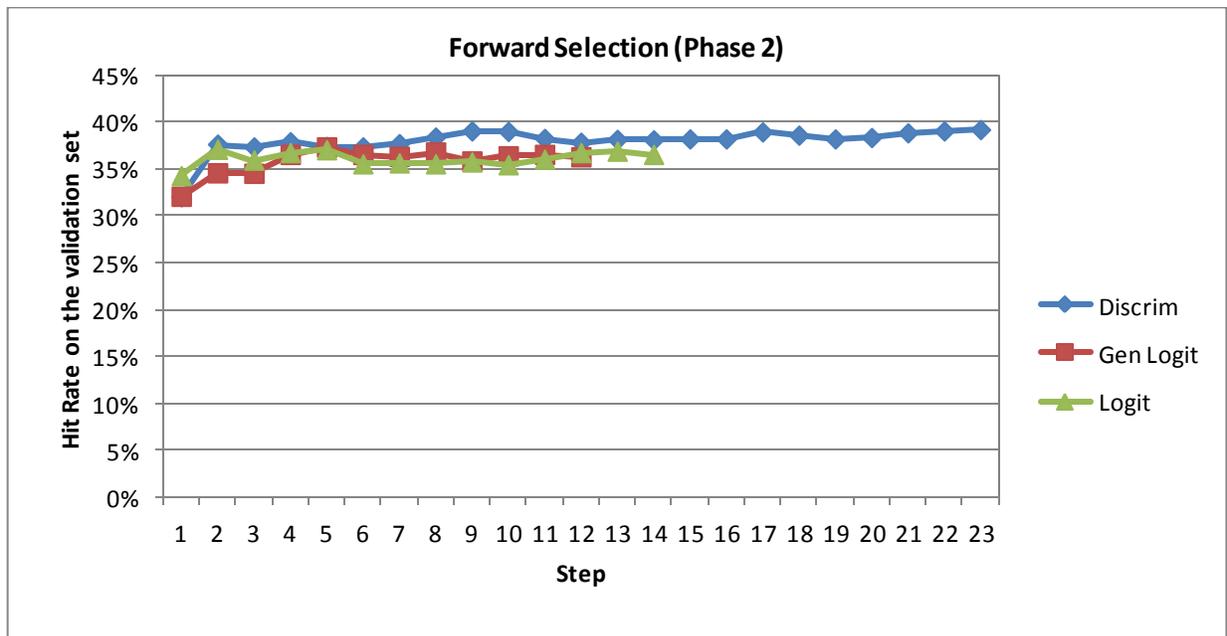
In the next phase of the analysis, categorical variables were added to the pool of independent variables. The categorical variables that had more than two categories were used to create dummies – one for each category. In total 124 new variables (all dummy indicators) were added. It’s worth noting again that the addition of categorical variables in MDA clearly violates the normality assumption. But the MDA models will be developed nonetheless and compared with the other two methods to evaluate the bottom-line results (in terms of hit rates and hit ratios.) The idea is that even if the individual variable violates some of the assumptions, as long as good classification rates are achieved the method is still valuable. It’s not rare to come across a business problem where a better classification rate is of utmost importance and explaining an individual variable’s contribution in the model is not very important (or not as important as the former).

For simplicity, only one variable selection method will be used in this phase of the analysis: the forward selection method (which produced a slightly better classification rates in the earlier phase.)

Step	MDA	Generalized Logit	Logit			
			Cluster 1	Cluster 2	Cluster 3	Cluster 4
1	avg_cruise_cnt	max_cruise_cnt	max_cruise_cnt	maxage	avg_cruise_cnt	Avgtimetil
2	maxage	mintimetil	CUBE_C162	avg_tenure	LOG_cntpers	avg_Grat
3	LOG_cntpers	avg_mktg_trev	mintimetil	ship_EC	maxage	photo_I
4	photo_I	photo_I	avg_Grat	ship_MI	shoreex_I	HAWAII
5	booktype_G	CUBE_C162	photo_I	cntfemale	booktype_G	Cntfemale

6	avg_Grat	avg_Grat	avg_mktg_trev	avg_cruise_cnt	casino5yr	ship_LE
7	mintimefil	port_NYC	child1517	max_TOT_GRATUITY	multi_ship	SCARIBBEAN
8	shoreex_l	scaribbean	SCARIBBEAN		ship_LE	source_1
9	CUBE_C162	meta_u	sail_holiday		gratuity_l	fantasy_dass
10	fantasy_dass	max_tenure	CANADA		source_1	
11	ship_LE	Hawaii			source_0	
12	port_GAL	port_MSY			LOG_min_tenure	
13	firstdate				ship_VA	
14	casino5yr				CUBE_C162	
15	SCARIBBEAN					
16	HAWAII					
17	cntfemale					
18	max_tenure					
19	source_1					
20	source_0					
21	child1517					
22	max_diem_obs					
23	port_NYC					

Note that while some of the variables selected in phase 1 still ended up being selected in phase 2 – however, there are a lot of additional dummy indicators that made it to the list of independent variables selected by the forward selection method. While all three methods selected more variables than it did in phase 1, MDA stands out as the method with most number of variables. The hit rates for each of the selection step are displayed on the chart below:



The highest hit rate, once again, comes from the MDA method. Total 23 variables got selected in the forward selection method, but the chart shows that the maximum hit rate was achieved by the first 9 variables (38.99%). Except for the one-variable model, the Binary Logit analysis produced lower hit rates for every single step. In general, the Generalized Logit analysis produced higher hit rates than Binary Logit did, but the highest hit rate for Generalized Logit is not very different from that of the Binary Logit approach.

CONCLUSION

For the data that were used for this study, it appears that MDA method performed best in terms of assigning the correct segments to each observation. This finding was not very surprising for Phase 1 of this analysis (which included only continuous variables) especially because the variables that got selected by the individual Binary Logits were similar to the set of variables selected by the MDA method. This indicated that the Binary Logits couldn't really take advantage of custom solutions for each clusters but rather relied on variables that helped distinguish between *all* clusters.

The findings are surprising for Phase 2, though. After the inclusion of dummy indicators, the individual Binary Logit models selected sets of independent variables that varied substantially across all clusters. But even in that case, the hit rates for a single solution were as good (in the case of Generalized Logit Analysis) or better (in the case of MDA).

It is important to restate that this study focused solely on the classification rates and not on the interpretations of independent variables' contributions. But one can argue that a MDA based classification model may be preferable because of its simplicity (only one set of independent variables.)

Further research would be needed to generalize these findings, but based on this research it appears that when dealing with a dependent variable that has more than two levels, MDA should be seriously considered for correctly classifying observations into appropriate clusters. Binary Logit Analysis is appealing because it doesn't rely on any distributional assumptions about the independent variables, but we observed that in spite of several violations of assumptions, MDA produced higher classification rates.

APPENDIX

Segment Assignment Approach

- (1) Create ranks for each probability. The rank should be equal to 1 for the record with the highest probability, and then increment by 1. An illustrative example below shows 6 records, with three predicted probabilities. Three rank variables are created (one for each cluster) by using the associated predicted probabilities.

Observation	A	B	C	Rank A	Rank B	Rank C
100	0.9	0.5	0.7	1	5	3
101	0.5	0.9	0.5	5	1	5

102	0.7	0.8	0.6	3	2	4
103	0.6	0.6	0.8	4	4	2
104	0.8	0.4	0.4	2	6	6
105	0.4	0.7	0.9	6	3	1

- (2) Create a new field 'Min rank' by taking the highest rank value across three clusters. For example, for the first record, the highest rank is 1 (for Rank 1), so Min Rank will take a value of 1. Once all values for Min Rank are assigned, sort the dataset in ascending order by this field. This sort order establishes the order to segment assignments – a segment will be assigned for the first observation, then moving down the list.

Observation	A	B	C	Rank A	Rank B	Rank C	Min Rank
100	0.9	0.5	0.7	1	5	3	1
105	0.4	0.7	0.9	6	3	1	1
101	0.5	0.9	0.5	5	1	5	1
102	0.7	0.8	0.6	3	2	4	2
103	0.6	0.6	0.8	4	4	2	2
104	0.8	0.4	0.4	2	6	6	2

- (3) Segment assignment is done based on the maximum probability for each record. For example, the first record has the highest probability for cluster A, so that will be assigned to the first observation. Then move down the list and assign segment based on the highest probability for that record. When moving down the list, if a segment becomes "saturated", i.e. the % of assigned observations in a particular segment equals the % of observations in the original dataset then this segment will no longer be considered for segment assignment. This way, when segment assignments are completed for the entire dataset, the resulting segment distribution will be exactly same as the segment distribution in the original dataset. (Note that this is not a necessary condition. If a completely new sample were to be scored by using one of these models, enforcing the same segment distribution – as the original sample - is not necessary and perhaps undesirable. For the purpose of the study, since both modeling and validation set were taken from a single set of all customer data, enforcing the same segment distribution makes sense.)

Observation	A	B	C	Rank A	Rank B	Rank C	Min Rank	Segment
100	0.9	0.5	0.7	1	5	3	1	A
101	0.4	0.7	0.9	6	3	1	1	C
102	0.5	0.9	0.5	5	1	5	1	B
103	0.7	0.8	0.6	3	2	4	2	B
104	0.6	0.6	0.8	4	4	2	2	C
105	0.8	0.4	0.4	2	6	6	2	A

The rationale for creating the Min Rank field and use that field to dictate the order of segment assignment is to ensure that the observations with highest probabilities are taken care of first. Imagine

all the records competing for segment assignments. The observation that has the highest probability (for any of the three segments) will get the first chance to be assigned a segment.

Details Model Results for MDA

The detailed results from the SAS output window for the MDA phase 2 (step 9, which produced the highest hit rate) are displayed below:

**The STEPDISC Procedure
Forward Selection: Step 9**

Variable(s) that have been Entered

CUBE_C162 LOG_cntpers avg_Grat avg_cruise_cnt booktype_G maxage mintimetil photo_1 shoreex_1

Multivariate Statistics

Statistic	Value	F Value	Num DF	Den DF	Pr > F
Wilks' Lambda	0.781905	18.88	27	5800.8	<.0001
Pillai's Trace	0.226373	18.03	27	5964	<.0001
Average Squared Canonical Correlation	0.075458				

The DISCRIM Procedure

Observations	1998	DF Total	1997
Variables	9	DF Within Classes	1994
Classes	4	DF Between Classes	3

Class Level Information

cluster	Variable Name	Frequency	Weight	Proportion	Prior Probability
1	_1	656	656.0000	0.328328	0.250000
2	_2	282	282.0000	0.141141	0.250000
3	_3	418	418.0000	0.209209	0.250000
4	_4	642	642.0000	0.321321	0.250000

Pooled Covariance Matrix Information

Covariance Matrix Rank	Natural Log of the Determinant of the Covariance Matrix
9	36.78289

The DISCRIM Procedure

Pairwise Generalized Squared Distances Between Groups

$$D^2(i|j) = (\bar{X}_i - \bar{X}_j)' \text{COV}^{-1} (\bar{X}_i - \bar{X}_j)$$

Generalized Squared Distance to cluster

From cluster	1	2	3	4
1	0	0.20332	1.56474	0.35174
2	0.20332	0	1.61486	0.23154
3	1.56474	1.61486	0	0.82826
4	0.35174	0.23154	0.82826	0

The DISCRIM Procedure

Linear Discriminant Function

$$\text{Constant} = -0.5 \bar{X}_j' \text{COV}_j^{-1} \bar{X}_j \quad \text{Coefficient Vector} = \text{COV}_j^{-1} \bar{X}_j$$

Linear Discriminant Function for cluster

Variable	1	2	3	4
Constant	-11.53922	-11.09329	-14.88390	-12.27101
avg_cruise_cnt	0.62252	0.66451	1.47190	0.84855
maxage	0.24571	0.22924	0.26466	0.25009
LOG_cntpers	0.20884	0.59957	1.52478	1.13257
photo_l	1.88033	1.27741	1.52487	1.27187
booktype_G	-0.39214	-0.27207	-0.93810	-0.44652
avg_Grat	0.01914	0.02683	0.02070	0.02928
mintimetil	0.01597	0.01502	0.01418	0.01319
shoreex_l	1.14104	1.37037	1.60585	1.11860
CUBE_C162	0.0000152	0.0000161	0.0000165	0.0000164

Green Culture: The impact of employee environmental culture

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Abstract

The concepts of sustainability, social responsibility, and environmentally friendly operations have been well noticed topics in the operations management literature. However, very few studies look at the workforce level of analysis to determine impacts on firm performance. This study looks at the development of employee environmental culture and the impact on the firm. Effects of environmental training, goal setting, and management support of environmental programs are considered. Further, moderating effects of environmental culture on Lean and TQM programs are also examined. Extensions and areas for future research are discussed.

Green Culture: The impact of employee environmental culture

1. Introduction

“About 60% of 824 manufacturers surveyed by the [Manufacturing Performance Institute] recognized the importance of environmental sustainability – up from 35% in 2009.”
- *Wall Street Journal, October 20, 2011.*

Sustainability initiatives, environmental management, and ‘green’ programs are *increasingly* stressed in corporate annual reports as well as academic literature. Many companies are adopting environmental strategies and pursuing environmental certifications not only to meet regulations but to provide the firm with a socially responsible image. Corbett and Klassen (2006) note the growing trend of research in environmental management, stating the field will become part of mainstream operations management by the year 2015.

Most of the work in environmental management and corporate social responsibility considers the business unit, the firm, or the industry level of analysis. Current research considers environmental and social strategies and standards and how these relate to the triple bottom line (environmental, social, and financial performances). However, the relationship between firm strategy and performance is quite complex and difficult to explain using a traditional macro approach (Hitt et al., 2007). Using a more micro approach, studying the individual level workforce should be an integral part of the environmental and operations management agenda (Angell & Klassen, 1999; Sarkis et al., 2010). Worker involvement in environmental activities can have a positive influence on environmental performance (Angel del Brio, Junquera, & Ordiz, 2008).

Companies recognize the importance of bringing environmental initiatives to the workforce level. In fact, Johnson & Johnson state as part of their Healthy Planet initiatives that

“100 percent of our facilities provided environmental literacy programs to employees, covering topics such as sustainability, sustainable forestry, water conservation, biodiversity, and climate change” (Johnson & Johnson, 2011).

The purpose of this study is to take a finer approach to environmental programs by looking at the impact of employee culture. The workforce level of analysis will allow us to fill the gap in the bottom-up effects on performance. Specifically, this study will examine how employee environmental culture is developed and how this culture impacts operations. Previous literature has defined organizational culture as “a set of shared mental assumptions that guide interpretation and action in organizations by defining appropriate behavior for various situations” (Ravasi & Schultz, 2006, p. 437). For the current study, I define *employee environmental culture* as the shared mental assumptions regarding environmental initiatives that guide the interpretation, importance, and action for such initiatives within the organization. The rest of this paper is organized as follows: (1) a literature review for studies examining environmental management and environmental performance, (2) model development including the employee perspective and the operations perspective, (3) proposed data and methodologies for testing hypotheses, and (4) extensions and future research.

2. Literature Review

Given the increasing importance of environmental programs within corporate strategies and annual reports, academic literature has examined the impact of environmental management and environmental performance. Environmental performance can be difficult to quantify and measure since there is not a standardized approach (Montabon, Sroufe, & Narasimhan, 2007). Environmental performance has been operationalized as a decrease in pollution emissions (King

& Lenox, 2001), decrease in energy/water use (Rothenberg, Pil & Maxwell, 2001), and descriptions in corporate reports (Montabon, Sroufe, & Narasimhan, 2007). Consistent findings include the benefits of higher environmental performance such as meeting regulatory requirements, cost savings, increased efficiencies, and provoking a green image for the firm (Corbett & Klassen, 2006; Kleindorfer, Singhal, & Van Wassenhove, 2005).

Environmental management systems and ISO 14001 certifications are associated with higher levels of environmental performance (Klassen & McLaughlin, 1996; Melnyk, Sroufe, & Calantone, 2003). Programs that focus on waste reduction techniques, such as lean manufacturing, are found to have improved environmental performance (Florida, 1996; King & Lenox, 2001; Rothenberg, Pil & Maxwell, 2001).

Several studies have acknowledged the importance of individuals within organizations by looking at top management in environmental initiatives. Klassen (2001) finds that a plant manager's personal social orientation impacts the level of proactive environmental orientation within a plant. Corbett and Klassen (2006) state that superior environmental performance is often a reflection of good management. These studies consider the impact of 'top-down' management of environmental initiatives. However, frontline employees are actually *executing* the environmental strategy through environmental practices. The purpose of the current study is to examine the impact of the frontline employees on environmental performance.

3. Model and Hypotheses

3.1 The Employee Perspective: influences on employee environmental culture

Employee training is vital because it builds capabilities and knowledge for workers who are participating in organizational programs (Sohel & Schroeder, 2003). Daily and Huang

(2001) state that environmental training should be provided to employees of all levels so they have the knowledge and skills to accomplish the goals of an environmental management system. Employee training in specific environmental initiatives not only reminds employees of the benefits of environmental programs but also shows employees environmental initiatives are important to the firm. Training can be used to alter the attitude and behavior among employees (Sarkis et al., 2010). The existence of environmental training programs can shift the shared mental assumptions of the importance of environmental initiatives, therefore changing the environmental culture of the firm.

H1: Environmental Training is positively associated with Environmental Culture

Locke (1968) states that goals are an important determinant of task behavior because goals give an object and aim for behavior. Locke and Latham (2002) give four ways goals affect performance: (1) goals direct attention toward relevant activities, (2) goals function to energize employees, (3) goals create persistence to complete a task, and (4) goals indirectly affect action. Goals that are specific to the environment will give focus to frontline employees on the importance of environmental initiatives and will positively influence environmental culture.

H2: The presence of environmental goals is positively associated with Environmental Culture

Klassen (2001) found that manager's personal social orientation impacts the level of environmental management orientation at the plant. Higher levels of personal support for environmental initiatives should filter down through the organization and positively impact the employee environmental culture. Top management support is shown to provide needed resources as well as impact the attitude of frontline workers towards organizational initiatives (Zhu, Fredendall, & Douglass, 2008).

H3: The support of environmental initiatives by management is positively associated with Environmental Culture

Figure 1 shows the employee perspective for this model. Environmental training, environmental goals, and management support of environmental initiatives are expected to have a positive relationship with the overall environmental culture.

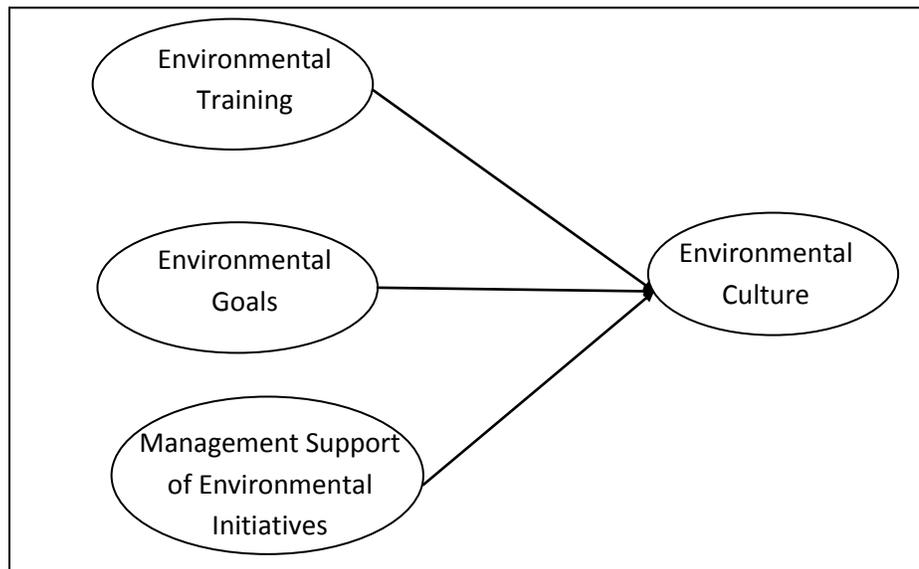


Figure 1: the impact of training, goals, and support on Environmental Culture.

3.2 The operations perspective: the impact of environmental culture

Previous work has examined the relationship between lean practices and environmental performance. Lean philosophies focusing on waste reduction are inherently environmentally friendly. The going phrase ‘lean is green’ has been supported (King & Lenox, 2001; Rothenberg, Pil & Maxwell, 2001). The following hypothesis is consistent with prior literature.

H4a: Lean Practices are positively associated with Environmental Performance

Total quality management (TQM) and environmental management have been shown to be closely related as seen in terms such as ‘total quality environmental management’ (Corbett & Klassen, 2006). TQM focuses on prevention, source reduction, and statistical process control which are principles that also apply to environmental practices (Corbett & Klassen, 2006; Sarkis et al., 2010).

H4b: TQM Practices are positively associated with Environmental Performance

Lean practices and TQM practices each comprise of a diverse set indicators for each philosophy. Lean production consists of 10 distinct dimensions: (1) supplier feedback, (2) JIT delivery by suppliers, (3) supplier development, (4) customer involvement, (5) pull system, (6) continuous flow, (7) setup time reduction, (8) total preventive maintenance, (9) statistical process control, and (10) employee involvement (Shah & Ward, 2007). TQM consists of 12 dimensions: (1) top management commitment, (2) supplier quality management, (3) supplier performance, (4) customer focus, (5) SPC usage, (6) benchmarking, (7) internal quality information usage, (8) employee involvement, (9) employee training, (10) design quality management, (11) employee empowerment, (12) product quality (Ahire, Golhar, & Waller, 1996). While all dimensions are important to the success of the program (ie. Lean or TQM), the *choice of emphasis* on various dimensions could be impacted by the environmental culture of the employees. Therefore the link between Lean/TQM practices and environmental performance is expected to be moderated by the employee environmental culture.

H5a: Environmental Culture positively moderates the relationship between Lean Practices and Environmental Performance

H5b: Environmental Culture positively moderates the relationship between TQM Practices and Environmental Performance.

Figure 2 shows the direct linkage between Lean practices as well as TQM practices and overall environmental performance. Employee Environmental Culture is expected to moderate the relationships.

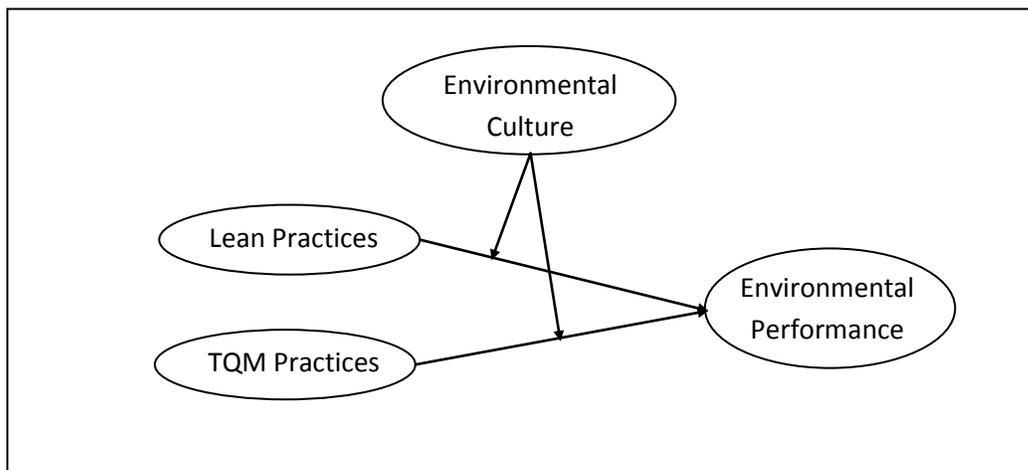


Figure 2: the moderating effect of Employee Environmental Culture

4. Data and Methods

For testing the hypotheses, the best methodology would be a mail or online survey questionnaire. The use of a single respondent per firm is still appropriate when at this level of analysis. The study can be framed similar to de Leeuw and van den Berg (2011) who examined the influence of shop floor behavior on operational performance. Existing scales for Lean Practices (Shah & Ward, 2007) and TQM practices (Ahire, Golhar, & Waller, 1996) and Environmental Training (Sarkis, Gonzalez-Torre, and Adenso-Diaz, 2010) could be used. Environmental Performance can be a subjective measure on the questionnaire and can also be secondary data from the EPA's toxic release inventory (TRI) database. The TRI database

includes names and addresses of the environmental managers that report pollution information to the EPA, this could be used as a potential mailing list for respondents.

Scale development procedures would be needed for measuring environmental goals, management support of environmental initiatives, and environmental culture. Interviews with several environmental managers as well as discussions with academics who work in environmental operations can be valuable sources of initial scale development. Since the constructs in this study are latent in nature, structural equation modeling would prove to be an appropriate methodology for testing the hypotheses.

5. Conclusions, Extensions and Future Work

The purpose of this study is to examine the impact of employee environmental culture within a firm. The study is intended to fill a gap in the operations management literature in two ways: (1) the development of employee environmental culture, and (2) the impact of employee environmental culture on operations programs such as Lean and TQM. While this study looks at the employee impact via a 'collective culture' measurement, future work can examine the impact of each individual employee. Specific extensions to this project are discussed below.

5.1 Multilevel Approach

While the individual worker is important to the day-to-day operations and execution of corporate initiatives, all performance outcomes and strategies are typically at the facility or firm level. This indicates a need for a multi-level approach to examining the impact of the individual to performance measures. Multilevel theory attempts to understand how constructs and processes are related across levels of analysis. This approach also tries to explain how and why phenomena at lower levels (ie. the individual) create a higher order construct (Ployhart & Moliterno, 2011). The multilevel approach can greatly enhance our understanding of

organizational performance by incorporating the micro aspects of thoughts, feelings, and subsequent actions of individuals (Hitt et al., 2007).

Several studies in operations management have attempted to look at a multilevel phenomena by considering the management-employee relationship and the impact on performance. de Leeuw and van den Berg (2011) examine the impact of management practices on shop floor behavior and the impact of the shop floor on operational performance. Chinander (2001) uses a case study to examine the alignment between management and front line workers and how that gap impacts environmental performance. A proposed framework for a multilevel approach can be seen in Figure 3.

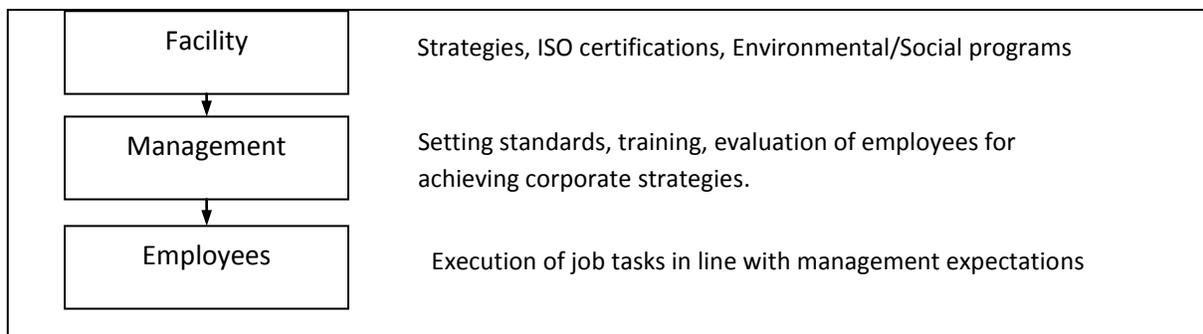


Figure 3: A multilevel perspective

The problem with the multilevel approach is a ‘level of analysis’ problem in data collection. While employees are nested within managers, and managers are nested within facilities, typical performance outcomes will be at the facility or firm level. To fully model this nesting and have enough statistical power, the 30 x 30 rule leads to a needed sample size of 27,000 datapoints (30*30*30). While individual level performance measures would allow for less datapoints (30*30 = 900 datapoints), the performance measure would typically be a manager ‘subjective rating’ which makes it difficult to also model the manager effect. Also, the most

interesting aspect of a multilevel approach is the ability to link the underlying effects to overall firm performance which is an issue that must be overcome.

5.2 Project Teams

Examination of project teams might provide an area for multilevel analysis. Team members are nested within team leaders and project outcomes can be the performance measures. Project management and the impact of project leadership has been examined in the operations management literature (Scott-Young & Samson, 2008). Hanna, Newman, and Johnson (2000) find a positive relationship between operational and environmental performance when implementing projects using employee involvement teams. A focus on projects with an environmental or 'lean' emphasis might prove an interesting addition to the environmental literature as well as the project management literature.

5.3 Alignment

Chinander (2001) study discusses the potential gap between management and front line workers. The degree of alignment between management and implementation of practices by the workforce would be an interesting contribution to the environmental management literature. This type of study addresses the question "do we practice what we preach?" when it comes to environmental initiatives. Does the alignment between environmental strategy and actual environmental practices significantly impact performance? The potential problems with this study will be finding data on 'actual practices' versus 'firm strategy'. In a survey data collection, response bias would be a concern.

References

- Ahire, S., Golhar, D., and Waller, M. 1996. Development and Validation of TQM Implementation Constructs, *Decision Sciences*, 21(1) 23 – 56.
- Angel del Brio, J., Junquera, B., & Ordiz, M. 2008. Human resources in advanced environmental approaches – a case analysis. *International Journal of Production Research*, 46(21): 6029-6053.
- Angell, L., and Klassen, R. 1999. Integrating environmental issues into the mainstream: an agenda for research in operations management. *Journal of Operations Management*, 17 575 – 598.
- Chinander, K.R. 2001. Aligning accountability and awareness for environmental performance in operations. *Production and Operations Management*, 10(3) 276 – 291.
- Corbett, C., and Klassen, R. 2006. Extending the Horizons: Environmental Excellence as Key to Improving Operations. *Manufacturing and Service Operations Management*, 8(1) 5 – 22.
- Daily, B.F., and Huang, S. 2001. Achieving sustainability through attention to human resource factors in environmental management. *International Journal of Operations & Production Management*, 21(12): 1539-1552.
- de Leeuw, S., and van de Berg, J.P. 2011. Improving operational performance by influencing shopfloor behavior via performance management practices. *Journal of Operations Management*, 29 224 – 235.
- Florida, R. 1996. Lean and green: the move to environmentally conscious manufacturing. *California Management Review*, 39(1) 80-105.

- Hanna, M.D., Newman, W.R., and Johnson, P. 2000. Linking operational and environmental improvement through employee involvement. *International Journal of Operations & Production Management*, 20(2): 148-165
- Hitt, M.A., Beamish, P.W., Jackson, S.E., and Mathieu, J.E. 2007. Building Theoretical and Empirical Bridges Across Levels: Multilevel Research in Management. *Academy of Management Journal*, 50 (6) 1385 – 1399.
- Johnson and Johnson. October 2011. Environmental Training and Education. Source: http://www.jnj.com/responsibility/ESG/Environment/Environmental_Management/Training_and_Education .
- King, A., and Lenox, M. 2001. Lean and Green? An Empirical Examination of the Relationship between Lean Production and Environmental Performance. *Production and Operations Management*, 10(3) 244-256.
- Klassen, R. 2001. Plant-Level Environmental Management Orientation: The Influence of Management Views and Plant Characteristics. *Production and Operations Management*, 10(3) 257-275.
- Klassen, R., and McLaughlin, C. 1996. The Impact of Environmental Management on Firm Performance. *Management Science*, 42 (8) 1199 – 1214.
- Kleindorfer, P., Singhal, K., and Van Wassenhove, L. 2005. Sustainable Operations Management. *Production and Operations Management*, 14(4) 482 – 492.
- Locke, E.A. 1968. Toward a theory of task motivation and incentives. *Organizational Behavior and Human Performance*, 3: 157-189.
- Locke, E.A. and Latham, G.P. 2002. Building a Practically Useful Theory of Goal Setting and Task Motivation. *American Psychologist*, 57(9): 705-717.

- Melnyk, S.A., Sroufe, R.P., and Calantone, R. 2003. Assessing the impact of environmental management systems on corporate and environmental performance. *Journal of Operations Management*, 21(3): 329-351.
- Montabon, F., Sroufe, R., and Narasimhan, R. 2007. An examination of corporate reporting, environmental management practices and firm performance. *Journal of Operations Management*, 25 998 – 1014.
- Ployhart, R., and Moliterno, T.P. 2011. Emergence of the human capital resource: A multilevel model. *Academy of Management Review*, 36(1) 127 – 150.
- Ravasi, D., and Schultz, M. 2006. Responding to Organizational Identity Threats: Exploring the Role of Organizational Culture. *Academy of Management Journal*, 49(3) 433-458.
- Rothenberg, S., Pil, F.K., and Maxwell, J. 2001. Lean, Green, and the Quest for Superior Environmental Performance. *Production and Operations Management*, 10(3): 228-243.
- Sarkis, J., Gonzalez-Torre, P., and Adenso-Diaz, B. 2010. Stakeholder pressure and the adoption of environmental practices: The mediating effect of training. *Journal of Operations Management*, 28 163 – 176.
- Scott-Young, C. and Sampson, D. 2008. Project success and project team management: Evidence from capital projects in the process industries. *Journal of Operations Management*, 26 749 – 766.
- Shah, R. and Ward, P. 2007. Defining and developing measures of lean production, *Journal of Operations Management*, 25 785 – 805.

Sohel, A., and Schroeder, R. 2003. The impact of human resource management practices on operational performance: recognizing country and industry differences. *Journal of Operations Management*, 21(1) 19-43.

Wall Street Journal. 2011. Why Small Manufacturers Lag in 'Green' Efforts. October 20.

Zhu, X., Fredendall, L., and Douglas, T. 2008. The evolving role of quality management: The role of Six Sigma. *Journal of Operations Management*, 26 630 – 650.

Antecedents of Job Satisfaction for Generation –Y Workers

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Abstract

As society advances, and the market transcends international, social and economic boundaries, there are a multitude of reasons to seek greater understanding on the development of successful firms and satisfied employees. With the changing demographics of today's workplace (e.g. retirement of baby-boomers), organizations will need to heavily rely on the skills of Generation-Y workers who are certain to be in high-demand. This study will investigate the role mentor relationships play on job satisfaction and ultimately turnover intentions of this young cohort of employees. Through the lens of the attribution theory, it is posited that these relationships will afford Generation-Y employees an alternative method of explaining both positive and negative performance. As such, these employees will experience increased self-efficacy and job satisfaction.

Introduction

The integration of the newest generation into today's workforce, often referred to as Generation-Y, is forcing organizations to reevaluate traditional training and on-boarding processes (Frank, Finnegan & Taylor, 2004; Martin & Tulgan, 2002). This generation has its own work-related values, attitudes and behaviors which are inherently different from those of past generations. As organizations attempt to gauge their preparedness for the arrival of Generation-Y workers, they must ask themselves questions such as: "How will we engage them?" "How do we gain their trust?" "What will make them want to stay?" In response, mentoring programs have emanated as an approach for supporting these young workers. The goal of such pairings is to offer fundamental guidance and leadership as a means of promoting career development from the moment the employment relationship begins (Noe, 1988; Rekar

Munro, 2007; Scandura, 1992), understand that doing so will build confidence in their ability to perform required tasks. The current study will answer the research question, does the employee development attributed to mentor relations lead to increased job satisfaction and thus reduced turnover intentions for these workers?

Employee turnover costs the U.S. economy \$5 trillion per year (Frank, Finnegan, & Taylor, 2004), and the cost of turnover for Generation-Y is alarmingly high (Martin, 2005; Weaver, 2009), with estimates that turnover within this generation costs firms approximately 1.5 to 1.8 times the worker's annual salary. More than the tangible and direct costs, such as hiring and recruitment resources to replace the lost employee and onboarding costs associated with training, there are also indirect costs such as loss of productivity and potential loss of business.

By definition, mentorships are “an intense interpersonal exchange between a senior experienced colleague (mentor) and a less experienced junior colleague (protégé) in which the mentor provides support, direction, and feedback regarding career plans, and personal development” (Russell & Adams, 1997). Mentor relationships have been studied from various aspects. Researchers have investigated the roles of mentors (Noe, 1988), benefits of mentor relationships (Donner & Wheeler, 2001; Scandura, 1992; Scandura & Lankau, 2002), and results of mentor relationships (Dreher & Ash, 1990, Hunt & Michael, 1983). The literature, however, gives little focus to the demographics of the mentor-protégé dyad or the effects of these relationships on other aspects of employee behavior. The proposed research study will address this gap in the literature by using the attribution theory as a theoretical framework.

The attribution theory is examines how individuals attempt to explain causes of behavior and events (Weiner, 1992). As employees seek to understand their work environment, mentor relationships may provide extrinsic motivation that influences behavior and performance.

The objective of this study is to expand current organizational behavior research by examining the subgroup level, studying mentor relationships as antecedents of job satisfaction for Generation- Y employees. It is predicted that age will have a significant effect on organizational commitment. Moreover, younger workers with mentors are anticipated to have a stronger commitment to the company and higher levels of job satisfaction. It is further predicted that protégés will report higher self-efficacy as a result of the guidance provided by these mentor relationships, thus these employees will experience greater job satisfaction resulting in a decreased desire to leave the firm.

Theoretical Background and Hypotheses

Generation-Y workers venture into the workforce with very distinct workplace preferences. Often criticized for their sense of entitlement and exhaustive questioning, this generation expects continuous recognition and need daily feedback (Hastings, 2008; Tulgan & Martin, 2001) which sometimes strains the limited management resources of companies who are operating more efficiently with less human capital today than in the past. As employers understand more about Generation Y's need for connections at work, given Zaslow's (2005) assertion that younger employees need extra 'coddling,' perhaps the most appropriate response is for the firm to institute a formal mentoring program.

To gain a better perspective of why the closeness of a mentor relationship might be an ideal accommodation for this group, one need only look at the behavior of recent college graduates. Many of these young adults earn college degrees only to return home to be cared for and governed by their parents, in some cases, for five or more years post-baccalaureate. "There's a crisis of coddling in American families. It's evident in the frantic efforts of parents who write their children's college application essays...and we notice it in the workplace, where

entry-level employees expect bosses to look after them in the way their mothers do” (Zaslow, 2005, p. 347).

Weiner (1992) suggests “a person's own perceptions or attributions determine the amount of effort the person will engage in activities in the future; when attributions lead to positive affect and high expectancy of future success, such attributions should result in greater willingness to approach to similar achievement tasks in the future.” Considering the self-serving bias dimension discussed in the attribution theory, Generation-Y employees in mentor relationships will have the ability to attribute internal factors for success and external factor-the mentor- for failure. For example, if the employee performs well, it is because of his/her skills and ability whereas if he/she does not perform well, it is because the mentor failed to adequately prepare them. Because of the unusual value this group places on relationships, employers will need to identify ways to engage these employees from the very beginning of the employment relationship. In this instance, protégés will view the mentor relationship positively as long as they are successful .

Self-Efficacy and Job Satisfaction

Self-Efficacy is defined as “the conviction that one can successfully execute the behavior required to produce outcomes” (Bandura, 1977). Rooted in Bandura’s concept, Schyns and Von Collani (2002) define occupational self-efficacy as “one’s belief in one’s own ability and competence to perform successfully and effectively in situations and across different tasks in a job.” Employees with high levels of occupational self-efficacy are far more likely to weather the storm and accept changes within their organizations.

Exploring unfamiliar tasks during the training phase of a new career can be stressful, and dissonance between personal expectations and the workplace reality may occur (Hunt & Weintraub, 2002). Many times employees are ill-prepared for the rigorous learning curve. Often, the ambiguity of this fresh experience, combined with anxiety and fear of failure, is overwhelming for young workers (Hastings, 2008). The application of the attribution theory in this instance would be “it incorporates cognitive theory and self-efficacy theory.” Studies indicate training and practice may work to increase a worker’s perception of his or her ability (McNatt, Campbell & Hirshfield, 2005). In this sense, mentor relationships may work to counteract the disillusion of Generation-Y workers by allowing for a more personal format for information exchange, a stable and safe environment in which to practice, and guidance throughout the process of maneuvering through the uncertainties of the early days of the employment relationship.

Gouillart and Kelly (1995) stated that “learning builds self-esteem and promotes competence and efficacy in approaching work related problems. “ Studies have shown that 70-90% of workplace learning happens through mentoring and informal learning (Pfeffer & Sutton, 2000; Tannenbaum, 1997). The foundational support suggest these younger employees need a collaborative work environment and a feeling of inclusion (Wanguri, 1996). Lankau and Scandura (2002) found support provided by mentorships may result in less confusion on roles and expectations which could lead to greater job satisfaction. The attribution theory suggests when there is a positive affect associated with the attributions and high expectancy of future success, such attributions should result in greater willingness to approach similar achievement tasks (Weiner, 1992). As such, the following is proposed:

Proposition 1: Proteges will report higher self-efficacy

Proposition 2: Employees with higher self- efficacy will report higher levels of job satisfaction

Age , Organizational Commitment and Job Satisfaction

Organizational commitment is defined as “the relative strength of an individual’s identification with and involvement in particular organization” (Mowday, Porter & Steers, 1982). Employers use the process of socializing new hires as a way to retain high performing employees and foster positive organizational attitudes like organizational commitment (Griffeth, Hom & Gaetner, 2000). One way this may be achieved is through developing and promoting mentor relationships. Several studies on mentorships have shown there to be a positive relationship between mentoring and organizational commitment, corporate responsibility and organizational citizenship (Ayree & Chey, 1994; Chao, Walz & Gardner, 1992; Payne & Huffman, 2005). Thus, the following is proposed:

Proposition 3: Organizational commitment will be positively related to job satisfaction

There is research investigating the relationship between age and job satisfaction that dates back decades. Gibson and Klein provided a summary of the research in 1970, showing that most studies had done little more than offer theories on the relationship, yet stopped short of providing substantial data to support them. Altimus and Tersine (1973) examined the relationship between age and job satisfaction at a micro level in an attempt to determine the sub-factors of job satisfaction. They found that workers in the youngest age group of their sample were significantly less satisfied than workers in other age groups on several intrinsic job variables. Since then, studies examining the correlation between age and job satisfaction have continued, but this appears to be an under-researched area in occupational study (Rekar Munro, 2009).

Companies are realizing the need to proactively address the growing concern of retaining the talent of Generation-Y. In a recent BusinessWeek article (September, 2007), Stef Witteveen, CEO of Randstad North America, explains how the company partners Generation-Y employees with more seasoned employees to facilitate learning and to build trust. At Randstad, every new sales person is given a mentor with whom to work until they develop a solid sales foundation. The organization works to recruit and train a winning team of committed company players, paying special notice to the characteristics of successful, satisfied employees who go on to become leaders within the organization. In 2007, of the 600 people hired by the company, 420 were in their twenties. By employing a formal mentoring system, Randstad has been able to increase the retention rate of those Generation-Y employees by approximately 10 percent.

Proposition 4: Age will impact organizational commitment and job satisfaction

As employers begin to understand more about Generation Y's need for connections at work, perhaps the most appropriate response a company can have to Zaslow's (2005) assertion that younger employees need coddling is to institute a formal mentoring program.

Mentoring has been found to increase employee engagement (Wanguri, 1996); improve employee recruitment and retention (Baron, 2000; Conklin, 2002). A study by Dreher and Ash (1990) found that business school graduates with strong mentorship relationships earned higher promotions and generally had higher income than their non-mentored peers. This study also suggests that mentor relationships may affect overall job satisfaction. This leads to the development of the fifth proposition:

Proposition 5: Proteges will have higher levels of job satisfaction

Job Satisfaction and Turnover Intentions

“Turnover intentions” is defined as an employee’s intention to voluntarily change jobs or companies (Schyns, 2004). Generation-Y employees expect to change organizations frequently and often commence the employment relationship with the intent to leave, or turn over, as soon they perceive a more favorable option (Hastings, 2008). Evidence of corporate scandal has been a part of their daily reality, therefore, they are skeptical of traditional hierarchies and do not subscribe to the idea of company loyalty (Martin & Tulgan , 2002). Barraged by media scrutiny of these scandals, Generation-Y’s experiences have left them with low levels of trust and loyalty for corporate culture (Wolburg & Pokrywczynski, 2001), which increases the probability that under the right circumstances, these employees would not hesitate to leave. Martin (2005) suggests Generation-Y considers one year on the job to be a long-term commitment, and a study by Hastings (2008) found that less than 20 percent of Generation-Y participants anticipate working for the same company for six years or more.

Locke (1969) describes job satisfaction as a multi-dimensional concept which includes perceptions about the ability of the job to fulfill needs (cognitive aspects) and attitudes involving the context of the job (affective aspects). Previous research in this area supports a consistent correlation between job satisfaction and retention (Tett & Meyer 1993, Tourangeau & Cranley, 2006). It is reasonable to suggest that employees who are more satisfied are less likely to leave a position than those who may be less satisfied which leads to the development of the next proposition:

Proposition 6: There will be a negative relationship between job satisfaction and turnover intentions.

Implications for Practitioners

Employee turnover costs the U.S. economy \$5 trillion per year (Frank, Finnegan, & Taylor, 2004), and the cost of turnover for Generation-Y is alarmingly high (Martin, 2005; Weaver, 2009), with estimates that turnover within this generation costs firms approximately 1.5 to 1.8 times the worker's annual salary. More than the tangible and direct costs, such as hiring and recruitment resources to replace the lost employee and onboarding costs associated with training, there are also indirect costs such as loss of productivity and potential loss of business.

The rate at which Generation Y employees "job-hop" and leave the workforce is unlike that of previous generations (Hastings, 2008; Markiewicz, 2003). Most hiring managers would agree that this is a significant problem that requires immediate attention. Organizations are considering measures to develop more meaningful and longstanding relationships with their employees (Conklin, 2002). Some employers have worked to promote retention and increase organizational commitment by focusing on how new hires are socialized (Griffeth, Hom, & Gaetner, 2000).

Employee socialization is an ongoing process which can be used to help the new hire learn and understand the personality of an organization. Many organizations have elected to use mentorships as a tool for behavior modeling throughout the socialization process (Hunt & Michael, 1983; Scandura, 1992). By having mentors demonstrate the desired behavior, new

hires have an opportunity to learn the right way to do things; thereby increasing their own chances of producing successful outcomes. Research has shown that employees who perceive they have achieved more personal learning have also reported higher levels of job satisfaction. (Lankau & Scandura, 2002). It is reasonable to postulate that mentorships, through behavior modeling and knowledge transfer, facilitate more favorable occupational environments. Thus, mentorships would be inversely related to turnover intentions and positively related to job satisfaction and organizational commitment.

Methodology

For this study, a mixed-methods approach including focus group discussions, on-on-one interviews, and survey instruments would be used will be used to elicit information about the variables. Whenever possible, existing scales will be used. However, for certain items, new scales will need to be developed.

Participants will be divided into three age ranges: a) workers 29 years of age and younger (in keeping with the definition of Generation-Y provided by Zemke, et. al, 2000). b) workers 30-40 years of age, representing a 10 year span of employees who are possibly mid-career and might have experienced some transitions in the employment relationship; and c) workers 41 years of age and older to encompass those employees who have more work history and who are likely more seriously considering, and possibly developing plans, for post employment.

The focus group and interviews would target employees from small, medium and large companies, a variety of industries, and both public and private sectors. New and well established organizations with a focus on hiring members of Generation-Y will be identified.

References

Altimus, C.A. and Tersine, R. (1973) Chronological Age and Job Satisfaction: The Young Blue Collar Worker. *Academy of Management Journal*, 16(1): 53-66.

Armour, S. (2005). *Generation Y: They've arrived at work with a new attitude*: USA Today.

Aryee, S. and Chay, Y.W. (1994). An examination of the impact of career-oriented mentoring on work commitment attitudes and career satisfaction among professional and managerial employees.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84: 191-215.

Barling, J., Dupre, K. E., and Hepburn, C. G. (1998). Effects of parents' job insecurity on children's work beliefs and attitudes. Journal of Applied Psychology, 83: 112-118.

Baron, T. (2000). IT talent shortage renews interest in mentoring. *Information Week* 24 April, 166-168.

Berfield, S. (September 10, 2007). *Bridging the Generation Gap*. BusinessWeek Online, p. 11.

Campbell, S.M., Ward, A.J., Sonnenfeld, J.A. and Agle, B.R. (2008). Relational ties that bind: Leader?follower relationship dimensions and charismatic attribution, *Leadership Quarterly* , 19(5): 556-569.

Castaneda, M., Kolenko, T.A., and Aldag, R.J. (1999). Self-management perceptions and practices: A structural equations analysis. *Journal of Organizational Behavior*, 20(1): 108.

- Chao, G., Walz, P., and Gardner, P. (1992). Formal and informal mentorships. *Personnel Psychology*, 45(3): 619-636.
- Chao, G., O'Leary-Kelly, A.M., Wolf S., Klein, H.J. and Gardner, P. (1994). Organizational socialization: Its content and consequences. *Journal of Applied Psychology*, 79: 730-743.
- Christensen, K.E. and Staines, G. L. (1990). Flexitime: A variable solution to work/family conflict? *Journal of Family Issues*, 4: 455-477.
- Collins, M. H., Hair, Jr., J. F. and Rocco, T. S. (2009). The older-worker-younger-supervisor dyad: A test of the Reverse Pygmalion effect, *Human Resource Development Quarterly*, 20(1): 21-41.
- Conklin, J. (2002). The benefits of mentoring, *Quality Progress*, 35(11): 91.
- Coomber, B. and Bariball, K. (2007). Impact of job satisfaction components on intent to leave and turnover for hospital-based nurses: a review of the research literature. *International Journal of Nursing Studies*, 44: 297-314.
- Dreher, G.F. and Ash, R.A. (1990). A comparative study of mentoring among men and women in managerial, professional, and technical positions. *Journal of Applied Psychology*, 75: 539-546.
- Donner, G. and Wheeler, M. (2001) Discovery path: a retention strategy for mid-career nurses. *Canadian Journal of Nursing Leadership*, 14(1): 27-31.
- Edwards, C. (2009). The pursuit of happiness [human resource management] *Engineering & Technology*, 4(4): 76-80.
- Fortune Magazine, May 28, 2007. 155(10).
- Frank, F.D., Finnegan, R.P. and Taylor C.R. (2004) *The race for talent: retaining and engaging workers in the 21st century*. New York: The Human Resource Planning Society.
- Galt, V. (2000). Young workers want better than 'boomer parents' had, dean says. *The Globe and Mail*, December 7, B15.
- Golembiewski, R. T. and Prohl, C.W. (1978). A survey of the empirical literature on flexible work hours: character and consequences a major innovation, *Academy of Management Review*, 3: 837-853.
- Gouillart, F.J. and Kelly, J. N. (1995). Transforming the organization. New York: McGraw-Hill.

- Griffeth, R.W., Hom, P.W. and Gaertner, S. (2000). A meta-analysis of antecedents and correlates of employee turnover: update, moderator tests, and research implications for next millennium. *Journal of Management*, 26: 463-488.
- Hacker, C.A., (2003). Turnover: A Silent Killer, *Information Systems Management*, 20(2):14-19.
- Hastings, S. (2008). One size doesn't fit all. *Times Educational Supplement*, 31(1): 4770.
- Hira, N.A. (2007). *You Raised them, Now Manage them*. Fortune, 155(10): 38-44.
- Hunt, D. and Micheal, C. (1983). Mentorship : A Career Training and Development Tool. *Academy of Management Review*, 8(3): 475-485.
- Hunt, J. and Weintraub, J. (2002). *The Coaching Manager: Developing Top Talent in Business*. Sage Publications, 1st edition.
- Ironson, G.H., Smith, P.C., Brannick, M.T., Gibson , W.M. and Paul, K.B. (1989) Construction of a job in general scale: a comparison of global, composite, and specific measures. *Journal of Applied Pshychology*, 74(2): 193-200.
- Izzo, J. (2002). *Values Shift: The New Work Ethic and What it Means for Business*. Toronto: Prentice Hall Canada.
- Jackson, D.W. and Sirianni, N.J. (2009). **Building the bottom line by developing the frontline: Career development for service employees**, *Business Horizons*, 52(3): 279-288.
- Jurkiewicz, C. (2000). *Generation X and the public employee*. *Public Personnel Management*, 29(1):55-74.
- Jurkeiwci, C. and Bradley, D. (2002). **Generational Ethics: Age Cohort and Healthcare Executives' Values**, *HEC Forum (New York)* 14 (2):148.
- Kanter. R. (1999). Change is everyone's job: Managing the extended enterprise in a globally connected world. *Organizational Dynamics*. 28: 6-24.
- Kogan, M. (2001) *Bridging the Gap*. Retrieved October 5, 2009, from http://cmsreports.com/generation_next.
- Krosnick, J. A., & Alwin, D. F. (1989). Aging and susceptibility to attitude change. *Journal of Personality and Social Psychology*, 57: 416-425.
- Lancaster, L.C & Stillman, D. (2002). *When Generations Collide: Who they are, Why they clash, and How to solve the generational puzzle at work*. New York: Harper.

- Lankau, M., and Scandura, T.A. (2002). An investigation of personal learning in mentoring relationships: Content, antecedents, and consequences. *Academy of Management Journal*, 45: 779-790.
- Landry, G., and Vandenberghe, C. (2009), Role of Commitment to the Supervisor, Leader-Member Exchange, and Supervisor-Based Self-Esteem in Employee-Supervisor Conflicts, *The Journal of Social Psychology*, 149(1): 5 -28.
- Laughlin, C. (2001). Young Workers Values, Attitudes and Behaviors. *Journal of Occupational & Organizational Psychology*, 75(4): 543-559.
- Locke, E.A. (1969). What is job satisfaction? *Organizational Behavior and Human Performance*, 4: 309-336.
- Maccoby, M. (1995). *Why Work?: Motivating the New Workforce*. Miles River Press: Alexandria, VA.
- Maertz Jr., C., Griffeth, R. Campbell, N., and Allen, D. (2007). **The effects of perceived organizational support and perceived supervisor support on employee turnover**, *Journal of Organizational Behavior*, 28(8): 1059-1071.
- Markiewicz, P. (2003). Who's filling Gen Y's Shoes? Brand-Channel (May, 2003). Retrieved September 30, 2009, from http://www.brandchannel.com/features_effect.asp?pf_id=156.
- Martin, C. and Tulgan, B. (2002). *Managing the Generation Mix*. N.Y.: HRD Press.
- McDermott, Lynda C. (2001). **Developing the New Young Managers**, *T+D*, 42(7): 55-65.
- McNatt, D.B., Campbell, S., and Hirschfeld, R.R. (2005). *Building self-confidence: A meta-analysis of the effectiveness of self-efficacy interventions in work-related contexts*. Poster Session at the Twentieth annual conference of the Society for Industrial and Organizational Psychology, Los Angeles, CA.
- Mills, K. (2009). Engagement Rings True. *BRW*, 31(14): p29.
- Mowday, R.T., Porter, L.W., and Steers, R.M. (1982). *Employee-organization linkages: The psychology of commitment, absenteeism, and turnover*. New York: Academic Press.
- Mueller, C.W and McCloskey, J.C.(1990). Nurse job satisfaction: a proposed measure. *Nursing Research*, 39:113-117.
- Niu, C., Wang, A., Cheng, B. (2009) Effectiveness of a moral and benevolent leader: Probing the interactions of the dimensions of paternalistic leadership, *Asian Journal of Social Psychology*, 32(8):12.

- Noe, A. R. (1988). An investigation of the determinants of successful assigned mentoring. *Personnel Psychology*, 41(3): 457-479.
- Payne, S. C., and Huffman, A. (2005). A longitudinal examination of the influence of mentoring and organizational commitment and turnover. *Academy of Management Journal*, 48 (1): 158-168.
- Pelletier, R. (2005). **Younger Managers; Older Workers**, *Occupational Health & Safety*, 74(11):22-24.
- Pelligrini, E. and Scandura, T. (2008). Paternalistic Leadership: A Review and Agenda for Future Research Paternalistic Leadership: A Review and Agenda for Future Research Paternalistic Leadership: A Review and Agenda for Future Research, *Journal of Management*, 34(3): 566-593.
- Pfeffer, J. & Sutton, R. (2000). *The Knowing-Doing Gap*. Boston: Harvard Business School Press.
- Rainey, G.W. and Wolf, L. (1982). The organizationally dysfunctional consequences of flexible work hours: A general overview, *Public Personnel Management Journal*, Summer 165-175.
- Reker Munro, C. (2009). Mentoring Needs and Expectations of Generation-Y Human Resources Practitioners: Preparing the Next Wave of Strategic Business Partners. *Journal of Management Research*, 1(2): E1.
- Rekar Munro, C. (2007). Work-life harmony practices of HR practitioners: Leading by example or in search of an example? *HR Professional*. Oct. 2007.
- Rowold, J. and Laukamp, L., (2009). **Charismatic Leadership and Objective Performance Indicators**, *Applied Psychology: An International Review*, 58(4): 602-622.
- Russell, J.E.A., and Adams, D. M. (1997). The changing nature of mentoring in organizations: An introduction to the special issue on mentoring in organizations. *Journal of Vocational Behavior*, 51: 1-14
- Saks, A.M. and Ashforth, B.E. (1997). Organizational socialization: Making sense out of past and present as a prologue for the future. *Journal of Vocational Behavior*, 51: 234-279
- Scandura, T. (1992). Mentorship and career mobility: An empirical investigation. *Journal of Organizational Behavior*, 13(2): 169-174.
- Scarpello, V. and Campbell, J.P. (1983). Job satisfaction: are all the parts here? *Personnel Psychology*. 36(3): 577-600.

Schyns, B. (2004). The influence of occupational self-efficacy on the relationship of leadership behavior and preparedness for occupational change. *Journal of Career Development*, 30:247-261.

Schyns, B. and Von Collani, G. (2002). A new occupational self-efficacy scale and its relation to personality constructs and organizational variables. *European Journal of Work and Organizational Psychology*, 11: 219-241.

Tannenbaum, S. (1997). Enhancing continuous learning: Diagnostic findings from multiple companies. *Human Resource Management*. 36: 437- 452.

Taris, T.W. and Schreurs, P.J.G. (2009). Well-being and organizational performance: An organizational-level test of the happy-productive worker hypothesis, *Work & Stress*, 23(2): 120-136.

Tett, R.P. and Meyer, J.P. (1993). Job satisfaction, organizational commitment, turnover intention, and turnover: path analyses based on meta-analytic findings. *Personnel Psychology*, 46: 259-293.

Tourangeau, A., and Cranley, L. (2006). Nurse intention to remain employed: understanding and strengthening determinants. *Journal of Advanced Nursing*, 55 (4): 497-509.

Tulgan, B. and Martin, C. (2001). *Managing Generation Y Global Citizens Born in The Late Seventies and Early Eighties*. HRD Press, Amherst, Massachusetts.

Wanous, J. P., Reichers, A.E. and Austin, J. T. (2004). Cynicism about Organizational Change: An Attribution Prospective, *Psychological Reports*, 94(3): 1421-1435.

Wanous, J.P., Reichers, A.E. and Hudy, M.J. (1997). Overall job satisfaction: how good are single item measures? *Journal of Applied Psychology*, 82 (2): 247-252.

Weaver, R. (2009). Retain Generation Y Job-Hoppers. Article retrieved on October 8, 2009, from <http://ezinearticles.com/?Retain-Generation-Y-Job-Hoppers&id=2113074>.

Weiss, D.J., Dawis, R.V., England, G.W., and Lofquist, L.H. (1967). *Manual for the Minnesota Satisfaction Questionnaire*. Minneapolis: University of Minnesota.

Weiner, B. (1992). *Human Motivation: Metaphors, Theories and Research*, Newbury Park, CA: Sage Publications

Wexley, K.N. and Latham, G.D. (1991). *Developing and Training Human Resources in Organizations*. Harper Collins, New York.

Wilson, B., Squires, M., Widger, K., Cranley, L. and Tourangeau, A. (2008). Job Satisfaction among a Multigenerational Nursing Workforce. *Journal of Nursing Management*, 16: 716-723

Wolburg, J and Pokrywczynski, R. (2001). A psychographic analysis of Generation Y college students. *Journal of Advertising Research*. (41), #5: 33-52.

Zaslow, J. (2005). *The Coddling Crisis: Why Americans think Adulthood begins at 26*. Wall Street Journal.

Zemke, R. (2001). Here come the Millenials. *Training*. 38(7): 44-49.

Zemke, R., Raines, C. and Filipczak, B. (2000). *Generations at work*. Wichita Falls, TX: Clair Raines & Associates.

GREEN PURCHASING AND SUPPLY: A LITERATURE REVIEW AND FUTURE RESEARCH

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Abstract:

This is a conceptual paper that is intended to offer an integrated and fresh look into the area of green purchasing and supply as per the extant literature. Research proposals are then made based on the findings from the literature review.

1. Introduction

Although firms experience increasing stakeholder pressure on their environmental performance, only few of them go beyond their regulatory requirements. Yet, the natural environment should be a solid justification for going beyond the usual ways of doing things. In this sense, the purchasing role could be significant. Its evolution from a tactical orientation to a more strategic, integrative one has been widely recognized (Carter and Narasimhan, 1996; Carr and Pearson, 2002). Purchasing professionals are no longer confined to paperwork processing and non-value-adding activities (Monczka et al., 2004). The purchasing function is today an important contributor to strategic success, helping firms meet the challenges of an increasingly competitive and dynamic environment. Suppliers not only are instrumental in the value creation of the firm, they also significantly influence its environmental impact (Paulraj, 2011). Because purchasing is at the beginning of a green supply chain, a firm's environmental efforts cannot be successful without integrating environmental goals into purchasing activities. Given its gate-keeper role, purchasing could foster green product or process innovation among supply chain members (New et al., 2000).

A green multiplier effect of purchasing and supply management has been suggested, given the potential links between supply chain members and customer (Preuss, 2007).

Recognizing the growing need for integrating environmentally sound choices into supply chain management research, Srivastava (2007) offered a review of Green Supply Chain Management (GrSCM) literature. However, his review did not focus on the literature on green purchasing. Consequently, an integrated and fresh look into the area of green purchasing and supply is warranted, as we are not aware of a similar work. Table 1 represents a succinct classification of the extant research. Our literature review revealed that terms such as “green purchasing”, “green procurement”, “green supply”, “environmental purchasing”, “environmental procurement” and “environmental supply” are used to characterize environmental aspects of upstream supply chain. For instance, environmental purchasing can be defined as purchasing’s involvement in supply chain management activities in order to facilitate recycling, reuse, and resource reduction (Carter and Carter, 1998). Bowen et al. (2001b, p. 42) expanded on this definition and defined green supply as “supply management activities that are attempts to improve the environmental performance of purchased inputs, or of the suppliers that provide them. They might include activities such as co-operative recycling and packaging waste reduction initiatives, environmental data gathering about products, processes or vendors, and joint development of new environmental products or processes.” In this paper we use ‘green purchasing and supply’ terminology. Thus, in the next sections we review the three streams of green purchasing and supply research, i.e. (1) green purchasing and supply practices; (2) implications of green purchasing and supply; and (3) influencing factors of green purchasing and supply. Based on the review of extant research, we then elaborate our research proposal.

[Insert Table 1 about here]

2. Literature review

2.1. Green purchasing and supply practices

Early on researchers looked for potential areas that would increase the impact of supply on environmental results. Based on case studies of five firms in the furniture industry, Walton and Handfield (1998) identified five such areas, as follows: materials used in product design for the environment; product design processes; supplier process improvement; supplier evaluation; and inbound logistics processes. Among these, the most prevalent green supply practices were product-based initiatives such as waste reduction at the customer-supplier interface, and the least prevalent were advanced green supply initiatives such as building environmental criteria into risk-sharing and reward-sharing agreements, as reported by Bowen et al. (2001b) based on a sample of UK business units. However, interviews conducted by Preuss (2001) with purchasing managers of Scottish manufacturing firms revealed that, in terms of environmental protection initiatives, the purchasing function in manufacturing firms was far from being employed to full capability.

Given the mismatch between the increasing importance of purchasing in financial terms and a rather low involvement in environmental initiatives, it was encouraging to find that purchasing managers did want more involvement in environmental issues pertaining to hazardous materials, investment recovery, product design, and supply chain relationships (Zsidisin and Hendrick, 1998). Yet, perhaps owing to differences in government legislation, Zsidisin and Hendrick (1998) found differences between levels of involvement of purchasing managers in Germany, UK, and US. The Chinese state-owned enterprises (SOEs) also provided their own perspective. Given that GrSCM was a new concept in China, Zhu and Geng (2001) found that the understanding of green purchasing was high among senior managers in large and medium SOEs (LMSOEs), but they were lacking ways of integrating it into green supply chains. On the other hand, mid-level managers and employees were found as having poor understanding of green

purchasing. In addition, it was reported that most LMSOEs cared little about some aspects of green purchasing such as evaluation of second-tier suppliers and product packaging. That was because green purchasing practices of Chinese firms were still in the early stages, lagging behind practices in developed countries, as Zhu and Sarkis (2006) noted.

As green purchasing is somewhat a new concept, purchasing managers might face some challenges if no appropriate support from the firm's specific departments exists to bridge the gap between environmental considerations and cost-down strategies. Chen (2005) proposed some guidelines and principles for green purchasing practices and procedures. Similarly, Handfield et al. (2002) noticed the gap in the assessment of suppliers as to their environmentally responsible processes and products, and thus proposed an Analytical Hierarchy Process (AHP) system to help integrating environmental criteria in the sourcing decision process. Given the difficulty of making a decision for different suppliers when considering all the environmental criteria, Lu et al. (2007) presented an AHP method with simple and efficient procedures, to measure a multi-objective project. Also, Kannan et al. (2008) analyzed the interaction of criteria used to select the green suppliers which addressed environmental performance using AHP and Interpretative Structural Modeling. They found that quality and flexibility had very low dependence and high driving power, whereas cost and service had high dependence and low driving power.

Cousins et al. (2004) noted that firms' perceptions of environmental threats and opportunities combined with the strategic level of the purchasing function to predict the extent to which environment-related supplier initiatives were undertaken. Hence, they proposed four generic categories of environment-related supplier initiatives, based on the perceived losses and available resources, as follows: "why bother", "no choice", "go first", and "enthusiasts." However, further investigation is required to determine the effects of environment-related supplier initiatives over time, which will affect the exposures faced, the losses perceived by managers, and the strategic

level of the purchasing function. Bowen et al. (2001b) had also proposed four archetypal patterns of green supply practices and shown how each approach was a rational response to a variety of corporate environmental and purchasing and supply contexts. They had found evidence suggesting that a proactive green supply approach could prepare firms for superior longer-term performance through improved management of environmental risks and the development of capabilities for continuous environmental improvement.

For instance, more extensive logistical and technological integration with suppliers, and a smaller, more focused supply base was found by Vachon and Klassen (2006b) as favoring greater collaborative environmental practices. Their sample of US and Canadian plants in the package printing industry revealed a weak positive relationship between both logistical and technological integration, and environmental monitoring of suppliers. Further, Vachon (2007) reported that, as environmental collaboration with suppliers increases, a greater proportion of environmental investment is made toward pollution prevention. On the other hand, no positive relationship was found between increased environmental monitoring of suppliers and environmental investment for management systems (away from pollution prevention). In the Australian automotive industry, Simpson et al. (2007) did not find that the supplier's level of environmental commitment was related to the environmental performance requirements of its major customer. They did find that supplier's environmental performance is influenced by its customer's environmental performance requirements when relationship-specific investments are present.

Using a public university (The Universitat Autònoma de Barcelona) as case study, Bala et al. (2008) analyzed the effectiveness of introducing green initiatives to suppliers of goods and services such as office materials, recycled toner cartridges, fair trade coffee, reusable glass bottles and catering services. The existence of a regular pattern for predicting success when implementing a suppliers' greening program in public universities was not found. However, contract

specifications, process implementation, market characteristics, supply chain profiles, and supplier characteristics were identified as factors to be considered.

Finally, given the prevalence of survey-based research in green purchasing and supply, Zhu et al. (2008b) investigated the GrSCM practices construct and its defining measurement items. GrSCM practices considered were internal environmental management, green purchasing, cooperation with customers including environmental requirements, eco design, and investment recovery. As the scales were developed using survey data provided by Chinese manufacturers (mainly in the automobile, power generating, chemical/petroleum, and electrical and electronic industries), researchers should be cautious when applying them in other countries settings.

2.2. Implications of green purchasing and supply

Anecdotal evidence suggests that green purchasing and supply, by reducing disposal and liability costs, conserving resources, and improving public image, improves a firm's economic position. Carter et al. (2000) provided the first empirical examination of the relationship between environmental purchasing and firm performance. Using questionnaires from original equipment consumer products manufacturers and Compustat-reported financial data, they found that environmentally friendly purchasing policies led to increased firm performance as measured by net income. This contradicted Min and Galle's (1997) previous findings according to which the two most highly rated obstacles to effective green purchasing were purchasing managers' perceptions that environmental programs were costly and that recycling was uneconomical.

Given that globalization has resulted in both pressures and drivers for supplier firms in emerging countries to meet both quality and environmental requirements of their customer firms in developed countries, researchers investigated the above relationship in the Chinese context. As such, Zhu and Sarkis (2004) considered both green purchasing and cooperation with customers

regarding environmental requirements as external GrSCM, and investigated them along with other practices, i.e. internal environmental management, investment recovery, and eco design. Using a sample of manufacturing firms in various industries in China, these researchers reported positive relationships of external GrSCM with environmental performance, positive economic performance, and negative economic performance. However, these findings did not hold true when green purchasing was considered an individual GrSCM practice. Based on surveys in the Chinese automotive industry, Zhu et al. (2007) found that green purchasing had a negative influence on environmental performance, whereas no significant impact was detected on other performance aspects, i.e. positive economic, negative economic, and operational performance. A more detailed discussion on these works is provided in Section 3.

Besides the direct relationship between the adoption of green purchasing and performance, some researchers examined whether other organizational practices serve as moderators of the relationship. The reduction of environmental impact by means of pollution prevention is nevertheless linked to the operational activities of the firm (Hart, 1995). Thus, the use of operations management techniques might play a role in moderating the relationship between green purchasing and performance. Given that Quality Management (QM) practices serve as the foundation for environmental programs, Zhu and Sarkis (2004) did find that QM practices are a positive moderating factor for the relationship between external GrSCM (i.e. green purchasing and cooperation with customers regarding environmental requirements) and environmental performance, respectively economic performance. Unlike QM practices, it has been argued in the literature that Just-In-Time (JIT) practices are a double-edged sword with respect to their influence on environmental and economic performance. In their study, Zhu and Sarkis (2004) found JIT practices as positively moderating the relationship between external GrSCM and economic performance, but negatively moderating the relationship with environmental performance.

Building on the positive relationship between green purchasing and environmental performance, respectively economic performance, Zhu and Sarkis (2007) questioned whether various institutional pressures (i.e. market, regulatory, and competitive pressures) act as moderators. Survey data provided by Chinese manufacturers in various industries indicated that both environmental pressure from customers and environmental regulation pressure weakly affected the positive relationship between green purchasing and environmental performance. However, environmental competitive pressure was found as a strong moderator of the positive relationship between green purchasing and positive economic performance. That is, with low trade barriers and increasing foreign competition, Chinese manufacturers in the automotive industry are more compelled to improve their environmental practices and environmental performance.

In addition to the relationship between purchasing function and performance, Rao and Holt (2005) investigated the links between greening certain functions within the organizations, i.e. inbound, production, and outbound. As a major portion of the world's manufacturing takes place in Southeast Asia and, thus, GrSCM practices are increasingly important; these researchers conducted a multi-country study on ISO 14001 certified firms in Philippines, Indonesia, Malaysia, Thailand, and Singapore. No evidence was found to argue that the greening of the inbound function leads to green production, perhaps due to the small sample size (52 firms). However, Rao and Holt (2005) found that greening the inbound function led to economic performance (new market opportunities, product price increase, profit margin, sales, market share) both directly and indirectly (i.e. greening inbound led to greening outbound, which led to competitiveness, which in turn led to economic performance).

Researchers focused on other GrSCM practices as well. For instance, Vachon and Klassen (2006a) assessed the impact of environment-related or green project partnerships, i.e. the extent of interaction between a plant and its primary suppliers and major customers in developing and

implementing pollution prevention technologies, at the plant level. Using US and Canadian plants in package printing industry, they reported that, as the extent of green project partnership with primary suppliers increased, delivery performance and environmental performance improved. However, no significant relationship was found regarding other dimensions of manufacturing performance, such as cost, quality, and flexibility.

Using case studies of seven Small- and Medium-Sized (SME) suppliers in Korean automobile industry, Lee and Klassen (2008) examined how the GrSCM strategy of a large buying firm influences the development and deployment of suppliers' environmental capabilities. These researchers conjectured that buyers' monitoring-based GrSCM positively influenced the initial development of suppliers' internal environmental management capabilities (EMCs), and that buyers' support-based GrSCM was positively related to improvement of suppliers' internal EMCs. Further, Lee and Klassen (2008) proposed that buyers' monitoring-based GrSCM combined with external resources positively influenced the development of external EMCs for SME suppliers.

Anecdotal evidence has suggested that firms that encourage their suppliers to adopt environmental measures are able to improve their environmental performance. Recently, Testa and Iraldo (2010) surveyed facility managers from all manufacturing sectors in seven countries (Canada, France, Germany, Hungary, Japan, Norway, and US), and found that making specific requests to suppliers to assure a certain performance level, and involving them in GrSCM practices could enable a firm to better manage its own environmental performance. Also, Lee (2008), using a sample of SME suppliers in Korea, found that buyer GrSCM practices had a positive influence on the willingness of SME suppliers to participate in GrSCM initiatives. Bai and Sarkis (2010) introduced a formal model using rough set theory for evaluating the results of green supplier development programs' relationship to environmental or economic performance in an organization.

2.3. Influencing factors in green purchasing and supply

Almost two decades ago, a survey addressed to National Association of Purchasing Management (NAPM) members in various industries identified the high cost of environmental programs, uneconomical recycling and uneconomical reuse as the three most important barriers to green purchasing (Min and Galle, 1997). Green purchasing professionals appeared as not fully recognizing the potential economic benefits of green purchasing. However, the finding was contradicted by Carter et al.'s (1998) study on the role of purchasing in environmental endeavors at the organization level in the US and Germany. Their study revealed that environmental purchasing was positively influenced by the level of training that personnel received in buying environmentally friendly inputs and the setting of clear goals for environmental purchasing. On the other hand, the extent to which purchasing managers were evaluated on environmental purchasing was found as negatively related to environmental purchasing. A similar result was reported with regards to the inclusion of environmental factors in a firm's mission statement. Although support from top and middle management was expected to have a positive influence on environmental purchasing, Carter et al. (1998) did not find evidence in that sense. However, a decade later and in a different context, Zhu et al. (2008a) found that management support and organizational learning levels were positively related to the extent of green purchasing engaged in by Chinese manufacturing firms.

More recently, Bjorklund (2011) found that environmental awareness and priorities among the top/middle management as well as the character of the environmental management are important drivers in the environmental purchase of transportation services. However, one cannot argue the same about the importance of knowledge and priorities of employees. The characteristics of the product expressed in terms of financial value, and the characteristics and availability of substitutes represent a low focus as well, according to Bjorklund's (2011) study. It appeared that

firm resources, with the exception of the financial resources, have little or no influence on the environmental purchasing of transportation services in Swedish firms in food and forestry sectors. According to Bjorklund (2011), the findings were supported by the difference between environmental purchasing and other forms of purchasing, i.e. the greater emphasis on the reputation and image of the firm and its products.

Investigating green purchasing practices of US firms in various industries, Min and Galle (2001) found that the firm size measured as the number of employees positively influenced the decision to adopt a green purchasing strategy. However, the finding did not hold true when the number of purchasing employees or annual purchasing volume defined the firm size. Further, Min and Galle (2001) reported that the buying firm's waste separation activities positively affected its frequency of usage of recycling and reusing as a source reduction strategy. As expected, the concern over perceived high environmental costs limited the buying firm's degree of involvement in green purchasing.

Bowen et al. (2001a) provided a first analysis of the role of supply management capabilities in green supply. Thus, they found that the extent to which the firm possessed appropriate supply management capabilities was positively related to the implementation of product-based green supply, but not of process-based green supply. In addition, a positive relationship was identified between the proactivity of the firm's environmental approach and the likelihood of implementing green supply (both product- and process-based). However, the same green supply implementation did not appear as being influenced by the strategic level of purchasing and supply activity in the firm.

As regards the external factors that may positively or negatively influence environmental purchasing, Carter and Carter (1998) provided an early study in this sense. Based on a sample of original equipment consumer products manufacturers, their study did not indicate that the

perceived influence of the regulatory sector on environmental purchasing activities was significantly greater than the output, input, and competitive sectors. Similarly, the quality of environmentally friendly inputs was not found as positively associated with the level of environmental purchasing. However, Carter and Carter (1998) found that the output sector (i.e. buyers) impacts the level of environmental purchasing activities to a significantly greater degree than do the input (i.e. suppliers) and competitive (i.e. competitors) sectors. Also, the vertical coordination between suppliers and buyers was found as positively influencing the level of environmental purchasing activities.

One difference between environmental purchasing and other forms of purchasing is the influence of government and authorities (Bjorklund, 2011). Indeed, buying firm's perceived importance of state and federal environmental regulatory compliance was found by Min and Galle (2001) as significantly influencing its green purchasing efforts. Bjorklund (2011) also reported that environmental purchasing of transportation services is greatly influenced by external factors such as the means of control applied by government and other authorities, in addition to customers and carriers. In addition, customers' environmental and non-environmental demands are important.

In the Chinese context of automobile, thermal power generating and electronic industries, Zhu and Sarkis (2006) found that environmental performance of suppliers was considered a less important driver for GrSCM practices when compared to the regulations, marketing, and internal drivers. Further, drivers and pressures from suppliers were generally perceived as different amongst the three industries. However, it was not clear from this study which pressures were truly tied to which practices, and thus the drivers/pressures of green purchasing (one of the GrSCM practices examined) remained unidentified. On the other hand, Zhu et al. (2007) found that GrSCM pressures/drivers (i.e. regulative, market, suppliers, internal) had no significant impact on the green purchasing in the Chinese automotive industry. They explained their finding by the fact that

Chinese firms may face similar and very early pressures/drivers, but react at a different pace when adopting GrSCM practices (green purchasing being one of them). Since most of these firms were at early adoption stages in implementing GrSCM practices, the impact of pressures/drivers on the extent of implementation may become more obvious as the pressures become more prevalent and adoptions mature.

3. Research proposals

Among the literature on green purchasing and supply reviewed in the above sections, two papers have drawn our attention. First, Zhu and Sarkis (2004) investigated whether GrSCM practices are worth the effort made by early adopting firms in Chinese manufacturing industries in terms of performance. More specifically, these researchers examined four integrative GrSCM practices, as follows: internal environmental management, external GrSCM, investment recovery, and eco-design (or design for environment). External GrSCM encompassed both suppliers and customers. Thus, green purchasing practices such as providing design specifications to suppliers that include environmental requirements for purchased items, cooperation with suppliers for environmental objectives, environmental audit for supplier' internal management, suppliers' ISO 14000 certification, and second-tier supplier environmentally friendly practice evaluation, were considered. Cooperation practices with customers for eco-design, cleaner production, and green packaging were considered as well. Regarding performance, three types were examined, i.e. environmental performance, positive economic performance, and negative economic performance. The environmental performance was assessed by the reductions of air emissions, waste water, and solid wastes, decreases of consumption for hazardous/ harmful/ toxic materials and of frequency for environmental accidents, and the improvement of the firm's environmental situation. The positive economic performance was measured by the decrease of costs for materials purchasing

and for energy consumption, of fees for waste treatment and waste discharge, and of fines for environmental accidents. The negative economic performance was measured by the increase of investments, operational costs, training costs, and cost of purchasing environmentally friendly materials. Zhu and Sarkis (2004) reported that the extent of adopting each GrSCM practice was positively associated with all three types of performance. However, these researchers failed to explain the positive relationship with both economic performances. On the contrary, Zhu and Sarkis (2004, p. 282) state: “The economic performance is a plus and the strong relationship exists between GrSCM practice and positive economic performance, but the lack of a significant relationship with negative economic outcomes evidences this positive relationship between GrSCM and economic performance even further.”

Second, using firms operating in the Chinese automotive industry, Zhu et al. (2007) explored the relationships between GrSCM practices such as internal environmental management, green purchasing, customer cooperation regarding environmental issues, investment recovery, and eco-design, and performance. In comparison with Zhu and Sarkis’ (2004) work, this paper decomposed the external GrSCM construct to perceive green purchasing and customer cooperation regarding environmental issues as individual practices. Also, in addition to Zhu and Sarkis (2004), operational performance, as measured by the increase of amount of goods delivered on time, scrap rate, product line, decrease of inventory levels, improvement of capacity utilization and products’ quality, was examined. Thus, Zhu et al. (2007) found that green purchasing was negatively associated with environmental performance, whereas customer cooperation had a marginally significant ($p < 0.10$) positive impact on environmental performance. In addition, neither green purchasing nor customer cooperation was found associated with positive economic performance, negative economic performance, or operational performance.

Given that the above studies reported positive, non-significant or even negative associations of green purchasing adoption to performance, it seems that the relationship between green purchasing and supply, and performance warrants further investigation. For instance, in order to justify the positive impact of external GrSCM on both types of economic performance reported by Zhu and Sarkis (2004), the relationship with positive economic performance has to be stronger than the relationship with negative economic performance. How firms manage to implement green purchasing and supply so that to obtain a net economic benefit is an interesting question. Building on the opposite results reported by Zhu and Sarkis (2004) and Zhu et al. (2007) regarding green purchasing, we posit that customer cooperation focused on environmental issues is an important complement to the green purchasing and supply practice. That is, customer cooperation can be viewed as a ‘complementary asset’ to green purchasing and supply adoption. According to Teece (1986), a complementary asset is a resource or capability that allows firms to capture the profits associated with a strategy, technology, or innovation. The role of complementary assets has been previously studied in the operations management literature, e.g. Swink and Nair (2007) examined the role of design-manufacturing integration as complementary asset in explaining how AMT adoption contributes to manufacturing performance. By viewing green purchasing and supply as a sourcing innovation, we posit that cooperation with customers regarding environmental requirements serves to strengthen the advantages that derive from green purchasing and supply capabilities. Anecdotal evidence has suggested that although customers make environmental requests to their suppliers, they may fail to integrate these expectations into their purchasing decisions (Business for Social Responsibility, 2001). Although customers can pressure their suppliers with environmental requests, more collaborative processes for addressing environmental issues can lead to better policies which may yield greater environmental and financial benefits. For instance, suppliers can work with their customers to change product

specifications that ruled out prevention activities they wanted to engage in. We thus suggest the following hypotheses, as per Figure 1:

- H1a: *Green purchasing and supply is positively associated with environmental performance.*
- H1b: *Green purchasing and supply is positively associated with financial performance.*
- H2a: *Customer cooperation regarding environmental requirements positively moderates the relationship between green purchasing and supply, and environmental performance.*
- H2b: *Customer cooperation regarding environmental requirements positively moderates the relationship between green purchasing and supply, and financial performance.*
- H3: *Environmental performance is positively associated with financial performance.*

[Insert Figure 1 about here]

In order to test the aforementioned hypotheses, a cross-sectional study could be conducted based on data collected from US manufacturing firms via an Internet-based survey. Thus, the scales developed by Zhu et al. (2008b) could be tested in an US context. In addition, we posit that initially, the adoption of green purchasing and supply is negatively associated with financial performance, due to higher training costs, greater transaction costs regarding environmentally friendly materials, increased operational costs, and higher investments. However, we expect that these effects eventually translate into high financial performance. Thus, a longitudinal study could be conducted to test the following hypothesis, as per Figure 2:

- H4: *In the long run, there is a U-shaped relationship between green purchasing and supply, and financial performance.*

[Insert Figure 2 about here]

References:

Bai, C., & Sarkis, J. (2010). Green supplier development: analytical evaluation using rough set theory. *Journal of Cleaner Production*, 18(12), 1200-1210.

Bala, A., Muñoz, P., Rieradevall, J., & Ysern, P. (2008). Experiences with greening suppliers. The Universitat Autònoma de Barcelona. *Journal of Cleaner Production*, 16(15), 1610-1619.

Bjorklund, M. (2011). Influence from the business environment on environmental purchasing — Drivers and hinders of purchasing green transportation services. *Journal of Purchasing & Supply Management*, 17, 11–22.

Bowen, F.A., Cousins, P.D., Lamming, R.C., & Faruk, A.C. (2001a). The role of supply management capabilities in green supply. *Production and Operations Management*, 10(2), 174-189.

Bowen, F. E., Cousins, P. D., Lamming, R. C., & Faruk, A. C. (2001b). Horses for Courses. *Greener Management International*, (35), 41.

Business for Social Responsibility (2001). Supplier's perspectives on greening the supply chain - A report on suppliers' views on effective supply chain environmental management strategies. Prepared by Business for Social Responsibility Education Fund, San Francisco, CA. <http://149.168.34.62/ref/20/19927.pdf>

Carr, A.S. and Pearson, J.N., (1999). Strategically managed buyer–supplier relationships and performance outcomes. *Journal of Operations Management*, 17 (5), 497-519.

Carter, C. R., & Carter, J. R. (1998). Interorganizational Determinants of Environmental Purchasing: Initial Evidence from the Consumer Products Industries. *Decision Sciences*, 29(3), 659-684.

Carter, C. R., Ellram, L. M., & Ready, K. J. (1998). Environmental Purchasing: Benchmarking Our German Counterparts. *International Journal of Purchasing & Materials Management*, 34(4), 28-38.

Carter, C. R., Kale, R., & Grimm, C. M. (2000). Environmental purchasing and firm performance: an empirical investigation. *Transportation Research: Part E*, 36(3), 219.

Carter, J.R. and Narasimhan, R., (1996). Is purchasing really strategic? *International Journal of Purchasing and Materials Management*, 32 (1), 20-28.

Chen, C. (2005). Incorporating green purchasing into the frame of ISO 14000. *Journal of Cleaner Production*, 13(9), 927-933.

Cousins, P. D., Lamming, R. C., & Bowen, F. (2004). The role of risk in environment-related supplier initiatives. *International Journal of Operations & Production Management*, 24(6), 554-565.

Handfield, R., Walton, S. V., Sroufe, R., & Melnyk, S. A. (2002). Applying environmental criteria to supplier assessment: A study in the application of the Analytical Hierarchy Process. *European Journal of Operational Research*, 141(1), 70-87.

Hart, S.L., (1995). A natural-resource-based view of the firm. *Academy of Management Review* 20 (4), 986–1014.

Kannan, G. G., Noorul Haq, A. A., Sasikumar, P. P., & Arunachalam, S. (2008). Analysis and selection of green suppliers using interpretative structural modelling and analytic hierarchy process. *International Journal of Management & Decision Making*, 9(2), 1.

Lee, S.-Y. (2008). Drivers for the participation of small and medium-sized suppliers in green supply chain initiatives. (2008). *Supply Chain Management*, 13(3), 185-198.

Lee, S.-Y., & Klassen, R. D. (2008). Drivers and Enablers That Foster Environmental Management Capabilities in Small- and Medium-Sized Suppliers in Supply Chains. *Production & Operations Management*, 17(6), 573-586.

Lu, L. Y., Wu, C. H., & Kuo, T. C. (2007). Environmental principles applicable to green supplier evaluation by using multi-objective decision analysis. *International Journal of Production Research*, 45(18/19), 4317-4331.

Min, H., & Galle, W. P. (1997). Green Purchasing Strategies: Trends and Implications. *International Journal of Purchasing & Materials Management*, 33(3), 10-17.

Min, H., M., & Galle, W. P. (2001). Green purchasing practices of US firms. *International Journal of Operations & Production Management*, 21(9/10), 1222

Monczka, R., Trent, R., & Handfield, R. (2004), *Purchasing and Supply Chain Management*, 3rd ed., Southwestern College Publishing, Cincinnati, OH.

New, S, K Green and B Morton (2000). Buying the environment: The multiple meanings of green supply. In *The Business of Greening*, S Fineman (ed.). London: Routledge.

Paulraj, A. (2011). Understanding the relationships between internal resources and capabilities, sustainable supply management and organizational sustainability. *Journal of Supply Chain Management*, 47(1), 19-37

Preuss, L. (2001). In *Dirty Chains? Purchasing and Greener Manufacturing*. *Journal of Business Ethics*, 34(3/4), 345-359.

Rao, P., & Holt, D. (2005). Do green supply chains lead to competitiveness and economic performance?. *International Journal of Operations & Production Management*, 25(9), 898-916.

Simpson, D., Power, D., & Samson, D. (2007). Greening the automotive supply chain: a relationship perspective. *International Journal of Operations & Production Management*, 27(1), 28-48.

Srivastava, S. K. (2007). Green supply-chain management: A state-of-the-art literature review. *International Journal of Management Reviews*, 9(1), 53-80.

Swink, M., & Nair, A. (2007). Capturing the competitive advantages of AMT: Design-manufacturing integration as a complementary asset. *Journal of Operations Management*, 25(3), 736-754.

Teece, D.J., (1986). Profiting from technological innovation: implication for integration, collaboration, licensing and public policy. *Research Policy* 15, 285–305.

Testa, F., & Iraldo, F. (2010). Shadows and lights of GSCM (Green Supply Chain Management): determinants and effects of these practices based on a multi-national study. *Journal of Cleaner Production*, 18(10/11), 953-962.

Vachon, S. (2007). Green supply chain practices and the selection of environmental technologies. *International Journal of Production Research*, 45(18/19), 4357-4379.

Vachon, S., & Klassen, R. D. (2006a). Green project partnership in the supply chain: the case of the package printing industry. *Journal of Cleaner Production*, 14(6/7), 661-671.

Vachon, S., & Klassen, R. D. (2006b). Extending green practices across the supply chain. (2006). *International Journal of Operations & Production Management*, 26(7), 795-821

Walton, S. V., & Handfield, R. B. (1998). The Green Supply Chain: Integrating Suppliers into Environmental Management Processes. *International Journal of Purchasing & Materials Management*, 34(2), 2-11.

Zhu, Q., & Geng, Y. (2001). Integrating Environmental Issues into Supplier Selection and Management. *Greener Management International*, (35), 27.

Zhu, Q., & Sarkis, J. (2004). Relationships between operational practices and performance among early adopters of green supply chain management practices in Chinese manufacturing enterprises. *Journal of Operations Management*, 22(3), 265-289.

Zhu, Q., & Sarkis, J. (2006). An inter-sectoral comparison of green supply chain management in China: Drivers and practices. *Journal of Cleaner Production*, 14(5), 472-486.

Zhu, Q., Sarkis, J., & Lai, K. (2007). Green supply chain management: pressures, practices and performance within the Chinese automobile industry. *Journal of Cleaner Production*, 15(11/12), 1041-1052.

Zhu, Q., Sarkis, J., Cordeiro, J. J., & Lai, K. (2008a). Firm-level correlates of emergent green supply chain management practices in the Chinese context. *Omega*, 36, 577-591.

Zhu, Q., Sarkis, J., & Lai, K. (2008b). Confirmation of a measurement model for green supply chain management practices implementation. *International Journal of Production Economics*, 111(2), 261-273.

Zsidisin, G. A., & Hendrick, T. E. (1998). Purchasing's involvement in environmental issues: a multi-country perspective. *Industrial Management & Data Systems*, 98(7/8), 313

Table 1. Green purchasing and supply - Literature review

Study	Methodology	Context/Industry	Country
<i>Practices</i>			
Walton and Handfield (1998)	case studies (five firms)	furniture	US
Zsidisin and Hendrick (1998)	survey (200 responses)		US, UK, Germany
Bowen et al. (2001b)	survey (70 responses); interviews	operating units of public limited companies	UK
Preuss (2001)	interviews (30 firms)	industries: electronics, mechanical engineering, hydraulic equipment and electronic motors, cables and antennae, plastics, paper labels, textiles, tyres, chemicals, quality paper, ships for non-military use	UK
Zhu and Geng (2001)	survey (302 interviews), interviews	manufacturing and processing enterprises	China
Handfield et al. (2002)	Delphi study; Analytical Hierarchy Process; three case studies		
Cousins et al. (2004)	conceptual		
Chen (2005)	conceptual		
Zhu and Sarkis (2006)	survey (118 responses)	automobile, power generating, electronic/electrical	China
Vachon and Klassen (2006b)	survey (56, respectively 28 responses)	package printing	US, Canada
Lu et al. (2007)	Analytical Hierarchy Process; fuzzy logic process		
Vachon (2007)	survey (56, respectively 28 responses)	package printing	US, Canada
Simpson et al. (2007)	survey (56 responses)	automotive	Australia
Kannan et al. (2008)	Interpretative Structural Modeling; Analytic Hierarchy Process; case study (one firm)	automotive	India
Bala et al. (2008)	case studies (five suppliers)	suppliers of office material, recycled toner cartridges, fair trade coffee, reusable glass bottles and catering services to The Universitat Autònoma de Barcelona	Spain
Zhu et al. (2008b)	survey (341 responses)	automobile, power generating, chemical/petroleum, electrical and electronic	China

Table 1 (continued). Green purchasing and supply - Literature review

Study	Methodology	Context/Industry	Country
<i>Implications</i>			
Min and Galle (1997)	survey (527 responses)	chemical, food, printing, paper, oil/gas extraction, textiles, furniture, petroleum refineries, lumber, and apparel	US
Carter et al. (2000)	survey (437 responses)	original equipment consumer products manufacturers	US
Zhu and Sarkis (2004)	survey (186 responses)	manufacturing and processing	China
Rao and Holt (2005)	survey (52 responses)	ISO 14001 certified organizations	Philippines, Indonesia, Malaysia, Thailand, Singapore
Vachon and Klassen (2006a)	survey (56, respectively 28 responses)	package printing	US, Canada
Zhu et al. (2007)	survey (89 responses); case study (one plant)	automotive supply chain enterprises	China
Zhu and Sarkis (2007)	survey (341 responses)	(mainly) automobile, power generating, chemical/petroleum, electrical and electronic	China
Lee and Klassen (2008)	case studies (seven suppliers)	automotive	Korea
Lee (2008)	survey (142 suppliers)	automotive	Korea
Testa and Iraldo (2010)	survey (4188 facility managers with varying response rates)		Canada, France, Germany, Hungary, Japan, Norway, US
Bai and Sarkis (2010)	multistage rough set theory		
<i>Influencing factors</i>			
Min and Galle (1997)	survey (527 responses)	chemical, food, printing, paper, oil/gas extraction, textiles, furniture, petroleum refineries, lumber, and apparel	US
Carter et al. (1998)	survey (437, respectively 125 responses)	original equipment consumer products manufacturers	US, Germany
Carter and Carter (1998)	survey (437 responses)	original equipment consumer products manufacturers	US
Min and Galle (2001)	survey (527 responses)	chemical, food, printing, paper, oil/gas extraction, textiles, furniture, petroleum refineries, lumber, and apparel	US
Bowen et al (2001a)	surveys (70 responses), interviews	operating units of public limited companies	UK
Zhu and Sarkis (2006)	survey (118 responses)	(mainly) automobile, power generating, and electronic/electrical	China
Zhu et al. (2007)	survey (89 responses); case study (one plant)	automotive supply chain enterprises	China
Zhu et al. (2008a)	survey (314 responses)	manufacturing	China
Bjorklund (2011)	survey (50 responses)	food and forestry sectors	Sweden

Figure 1. Proposed research model (1)

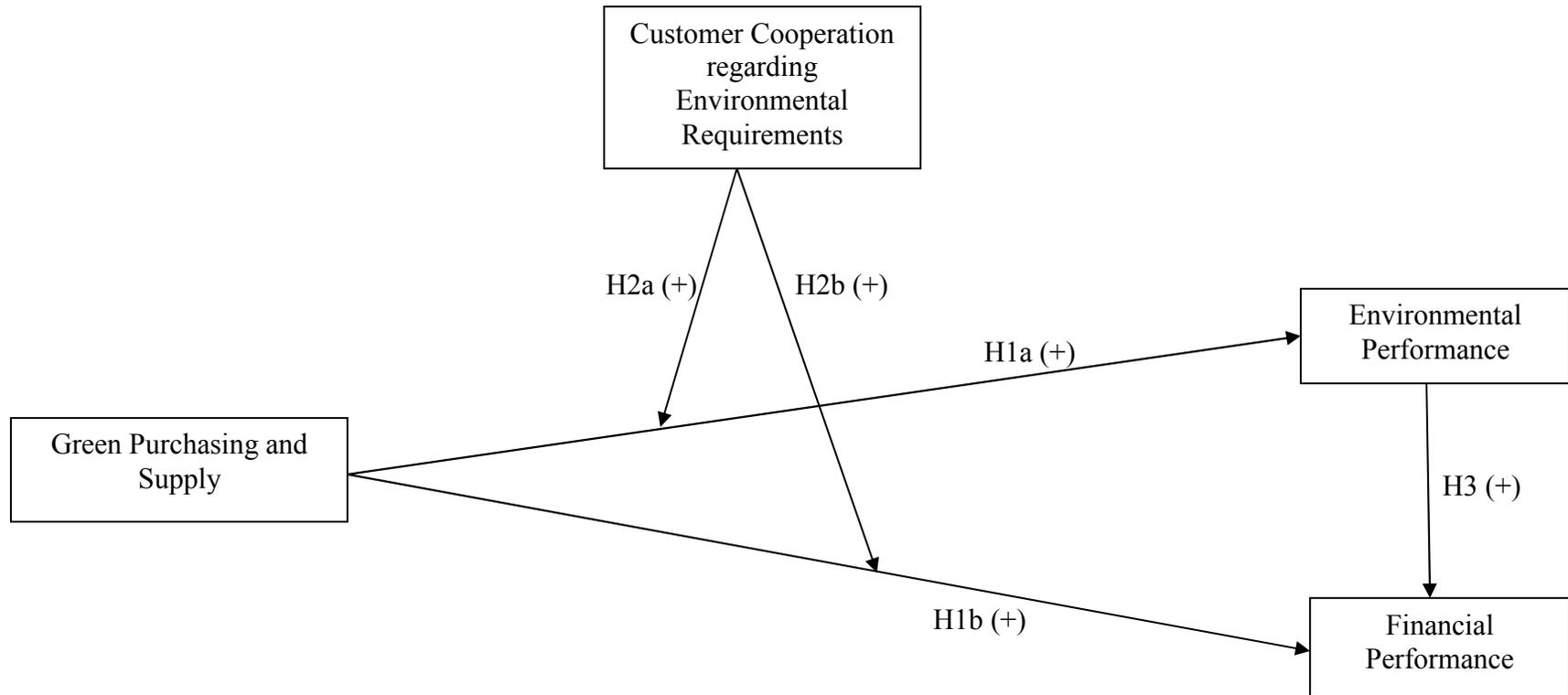
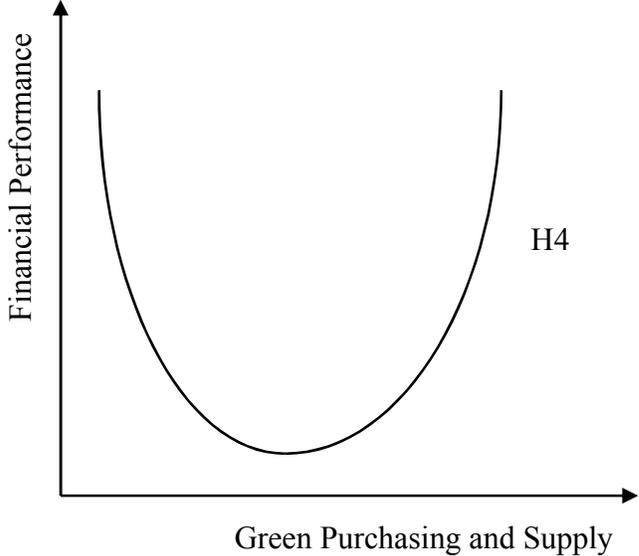


Figure 2. Proposed research model (2)



**WHAT LIES BENEATH? THE ROLE OF INNOVATIVE CULTURE ON
BUSINESS PROCESS IMPROVEMENTS AND ENVIRONMENTAL
MANAGEMENT INITIATIVES**

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1. Introduction

In today's competitive business environment firms are expected to focus on the triple bottom line. The triple bottom line, which emphasizes the concern for people, planet, and profits, is a collection of criteria for setting the standards for the economic, ecological and social success of companies and even countries. There are several initiatives that emphasize the reporting of ecological footprints (Hart, 1997) in order to make sure that the businesses care about the environment and fair human resources practices over and above firm profits. The triple bottom line argues that a company is responsible to stakeholders rather than only to shareholders. Stakeholders are the parties that are influenced, either directly or indirectly, by the actions of the firm. The responsibility to stakeholders has become a serious concern and firms are under pressure to act in line with these concerns that are driven by these external parties. Therefore, the rise of corporate social responsibility programs and environmental initiatives are in part due to these external or institutional pressures. These external drivers are very well known and studied previously (Delmas, 2001).

Moreover, there might be some internal drivers behind the adoption environmental initiatives as well as other process improvement programs. For instance, some firms such as 3M or DuPont are known for their innovative initiatives (Walley and Whitehead, 1994). In these companies, innovation is the core task and it does not only take place in their products but also in their processes. Thus, business improvement and environmental sensitivity are prominent concerns in this type of business environments. Another example would be Toyota production system, which is the pioneer of lean systems and lean thinking (Womack et al., 1996). These companies are performing better than some others on the innovation front and in multiple aspects of business processes.

Thus, it is obvious that there are firms, or perhaps industries, which value innovation to a great extent and they might be driven by their innovative culture to implement quality programs, process improvements and most likely environmental management programs. In this study, I would like to address the possible underlying internal drivers and understand whether the organizational structure of the firm might be leading to several improvement programs including environmental management systems by presenting the relevant literature, and propose several hypotheses related to the firm structure resulting in these programs along with possible industry effects. Specifically, in Section 2, I will present the literature on resource based view, complementary assets in relation to innovative culture, as well as the relevant environmental management and business process improvement literature. I will also talk about the industry effects in the literature review section. Then, in Section 3, I will propose the model regarding the innovative organization culture, which might be the main reason behind the adoption of several business improvement programs along with environmental management systems and describe the possible measures for this study. I will conclude and present future research opportunities in Section 4.

2. Literature Review

2.1 Resource Based View, Complementary Assets and Innovative Culture

Resource based view of the firm argues that a firm gains sustained competitive advantage when it possesses resources that are valuable, rare, inimitable and non-substitutable (Barney, 1986; Barney, 1991; Peteraf, 1993). Firm resources include all assets, capabilities, processes, attributes, information and knowledge that are embodied in the firm (Barney, 1991). The resources of the firm are mainly classified into physical,

human, and organizational assets (Barney, 1991). Innovative culture emerges as an intangible organizational resource that helps the firm to gain competitive advantage (Kleinschmidt et al., 2007). It is considered as a key resource, which is developed over time and this path dependency makes it heterogeneous, immobile, and not readily bought and sold (Kleinschmidt et al., 2007). Moreover, organizational resources, such as culture, are considered as being less productive in themselves but more of a mechanism that enables a firm to gain an ability to assemble, integrate, and manage them via organizational capabilities (Eisenhardt and Martin, 2000). Thus, the innovative culture can be deemed as a resource that manifests itself as an organizational capability, which can be a process, improvement program or management system.

Furthermore, Christmann (2000) talks about complementary assets, which is a term coined by Teece (1986), as the resources or capabilities that allow firms to appropriate the rents associated with a strategy, technology or innovation. Complementary assets provide synergistic benefits to the firm and they are inimitable. Christmann (2000) considers capabilities for process innovation and implementation as complementary assets that strengthen the impact of environmental best practices on cost advantage. This particular study is closely related to the current research inquiry in that it relates process innovation to environmental programs. She also mentions that firms that have the best practices regarding environmental management have the complementary assets for process innovation and implementation, and she gives examples of best practice firms that also have innovativeness as a common characteristic from the chemical industry. Hence, those firms' process-focused best practices are due to their possession of high levels of process innovation capability. The findings of Christmann (2000) indicate that innovation of proprietary pollution prevention technologies contributes to cost advantage and firms with high levels of complementary assets benefit

from cost advantages more. Hence, the innovativeness is a critical resource to be considered about environmental management and business improvement.

2.2 Business Improvement Initiatives & Environmental Management

In the literature there are several studies that discuss environmental performance along with other business process improvement systems. It is proposed that there are synergies that emerge from business improvement programs that lead to higher environmental performance. For instance in a study of lean initiatives in relation to environmental performance, King and Lenox (2001) have found that lean production leads to pollution prevention and lower emissions. The paper hypothesizes that greater engagement in lean production leads to adoption of a formal environmental management system, which in turn leads to reduction of waste at the source as well as via end-of-pipe treatment, and lower pollution emissions. The authors have found support for their hypotheses in this study and they conclude that “lean is green”. Their findings also indicate that ISO 9000 quality standards are associated with adoption of ISO 14001 environmental management standard. Although this last one is not the main purpose and the finding of this study, it provides motivation for the current study because it underlines the adoption of an environmental management system standard when there are other standards already adopted in place. This might be indicative of an inherent culture to be innovative in all aspects of business processes.

Similarly, Rothenberg et al. (2001) looks at lean production characteristics and measures of environmental performance within the automobile manufacturing industry. Although this study seems to look at the same phenomena as King and Lenox (2001), the authors claim that lean plants have higher volatile organic compounds (VOC) emissions due to costliness of abatement equipment and the focus of lean on only value-added

investments. The authors hypothesize that lean manufacturing contributes to improved resource efficiency, and they have found that the three aspects of lean (buffer minimization, work systems, and human resource practices) lead to management practices that support resource efficiency. Moreover, they suggest that there are complementarities between lean practices and environmental efficiency goals depending on their qualitative data. The finding about the complementarities is probably the most important one for the current study because this may enhance the motivation to adopt business improvement programs and lead to the emergence of a higher order orientation towards being innovative.

In the study that looks at the impact of environmental management orientation and proactive approach of the managers on responsiveness to environmental issues, Klassen (2001) has found that the factor that makes a difference for an environmental management program to be successful is the approach and the culture within the organization. This study basically focuses on internal factors within a plant that impact environmental management practices. The author states that there are three aspects, which determine the level of proactiveness towards environmental initiatives, which are systems analysis and planning; organizational responsibility; and management controls. The three traits together are considered a measure of environmental management orientation in manufacturing in this study. The findings from this study have indicated that plant managers that emphasize short-term economic value have a significantly more reactive environmental management orientation, while the managers who emphasize ethical value and long-term economic views have a more proactive environmental management orientation. There is apparently some variation between internal dynamics of a corporation due to the culture of the organization and this likely leads to varying

levels of environmental orientation. However, this might be true for all types of improvement programs, not only environmental programs.

Angell (2001) study compares and contrasts environmental and quality initiatives of Baldrige Award Winners. Environmentally proactive firm concept is discussed here. Those firms supposedly have the ability to transfer learning and generate momentum from existing programs such as quality programs. Top management support and other human related aspects (such as cross functional teams) of the respondent firms are also discussed in the context of these process innovations. This study is another example that combines quality initiatives with environmental management programs.

Bowen et al. (2001) examine whether supply management capabilities stem from organizational factors or corporate environmental proactivity. The authors propose that there are two types of green supply: greening of the supply process by adaptations to the supplier management activities to include environmental considerations; and product based green supply that is achieved via changes to actual product supplied. Supply management capabilities are defined as the “bundles of skills and resources that are developed through a more strategic supply approach” and they stem from proactive corporate environmental approach and a strategic purchasing supply process. The results of this study indicate that capabilities are an important predictor of green supply behavior. Hence, there is clearly an embedded capability or deeper organizational structure that is causing the adoption of green practices.

Corbett and Klassen (2006) consider environmental excellence as a key to improving operations by incorporating environmental management in total quality management. They consider the business improvement efforts as a whole. They link quality control (internal processes), TQM (inclusion of suppliers and customers), and management (inclusion of the natural environment and other stakeholders) in this

particular study. The authors also provide a framework for extending the horizons of supply chain management. They link internal coordination efforts, supply chain coordination (inclusion of the supply network and final customer), and the closed-loop supply chain (includes all end-of-use activities) as a means to business excellence. They talk about the unexpected side benefits of environmental programs and how environmental programs will become an integral part of operations area. Although this study lacks empirical validation, the insights about synergistic impacts of business improvement and environmental programs open the venue for the research questions embodied in the current study. Again, a higher order understanding and effort in the organization might be the distinguishing force when it comes to adoption and application of improvement programs depending on the assertions of the synergistic impacts of environmental programs and business improvement campaigns.

Corbett and Kirsch (2001) employ ISO 9000 as an explanatory factor for diffusion of ISO 14000 certification. Although they describe the environmental initiatives at a broader level (international level), this study treats national environmental attitudes as predictors for ISO 14000 certification. If this is considered at the firm level, organizational culture (which is again a higher order factor) could also be the explanatory factor as to why a firm opts for employing an environmental campaign.

Delmas (2001) uses resource-based view lens to study environmental management standards (EMS) and employs EMS as an intangible resource (an organizational capability). Moreover, she describes how ISO 14001 requirements relate to the structure of the organization, communication methods and how those standards need to be integrated into a company's other management systems. This shows a very likely internalization requirement for a firm to adopt EMSs and absorb it in the culture in order for those programs to reside in organizational capabilities.

Womack et al. (1996) talk about industry specific breakthrough needs (specifically for automobile industry) within lean thinking. The environmental concerns that the firms in this industry should have due to the nature of the output they produce are apparent, since the society is expecting remedies for declining environmental conditions because of emissions of toxic gases. The authors mention that lean innovations and motor vehicle industry patenting show the rate of innovation in this particular industry. They also say that motor vehicle industry has no choice but respond in dramatic ways to the expectations regarding the environmental concerns. The next section elaborates the possible industry effects on innovation in more detail.

2.3 The Impact of Industry: Clockspeed

Fine (1996) introduces the idea of industry clockspeed to indicate the pace of movement of the industries. It is proposed as a metric to classify industries and it has been a useful concept since its inception. Fine (2000) proposes that there are clockspeed amplifiers such as rapid rates of technological innovation and clockspeed dampers such as system complexity. Thus, there are internal forces that clash and determine where the industry lies in the clockspeed continuum. In the current study, the aim is to understand the impact of pace of change in the industry on the organizational structure. Therefore, clockspeed concept provides a useful means to investigate the research quest.

For instance, Mendelson and Pillai (1999) have found that higher industry clockspeed is related to faster execution in product development and manufacturing, and more frequent changes in organizational structure. Hence, this study relates the strategic reorientation and restructuring to the industrial clockspeed measure. Since the adoption and implementation of business improvement programs could be considered as major restructuring of the organization, this relation opens the venue for the current study to use

industry clockspeed as a moderator for the structural relationship between the innovative culture and the improvement/environmental programs considered here.

Mendelson (2000) investigates whether organizational IQ, which is a measure of organization's architecture, is related to financial and market success and whether this relationship is moderated by clockspeed. This study considers organizational practices as mutually complementary and asserts that they should be adopted together. Moreover, the effectiveness of the organizational architecture, or the organizational IQ as the author names it, is contingent on the external environment, which is operationalized by industry clockspeed. The findings indicate that the relationship between the organizational IQ and success is stronger in fast moving industries. In a similar fashion, the current study aims at looking at the structural fit of various programs under different clockspeed environments.

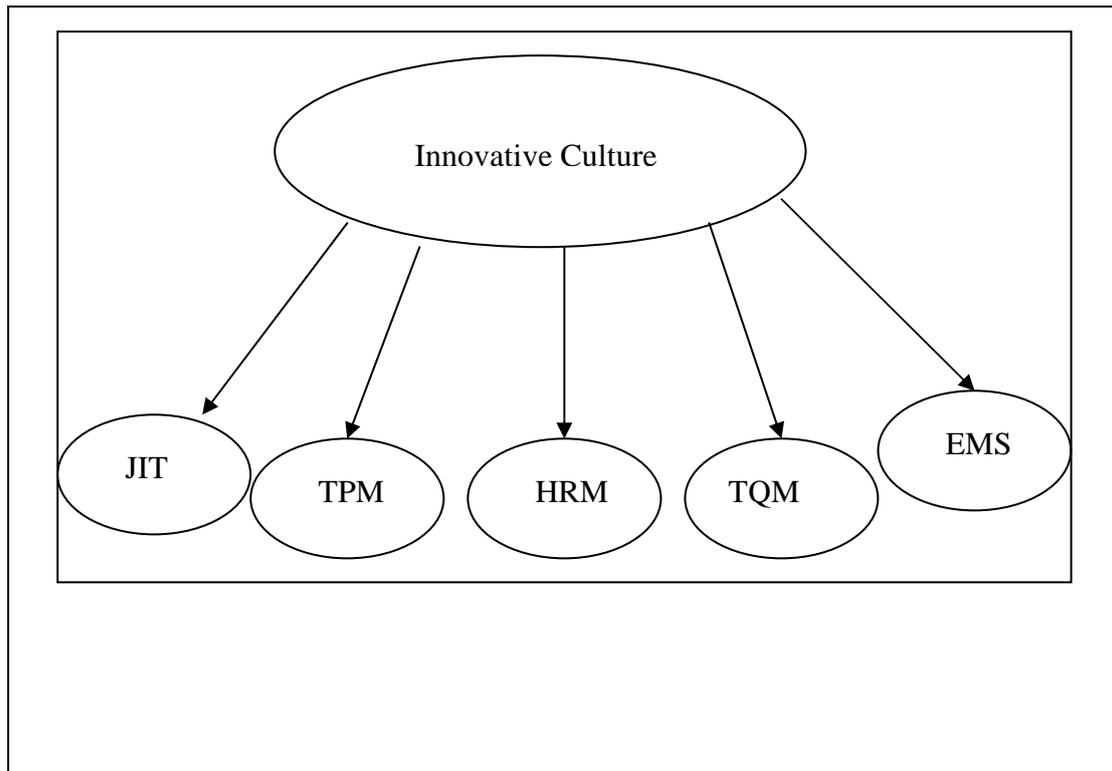
3. Model, Measures and Methods

3.1 Model

Given the literature background on the research based view, complementary assets, the relationships between business process improvement programs, innovative culture and industry clockspeed, the current study proposes that when an innovative culture is in place, it is very likely that a firm is going to be willing to adopt and implement business process improvement programs and environmental systems to enjoy the benefits of the complementarities between them. Hence, the main driver of the adoption of these programs is internal; namely, the culture of the organization. The baseline model depicting these relationships is shown in Figure 1.

Hypothesis 1: The degree of innovative culture determines the degree of adoption of business process improvement programs such as JIT, TPM, HRM, TQM and environmental management systems.

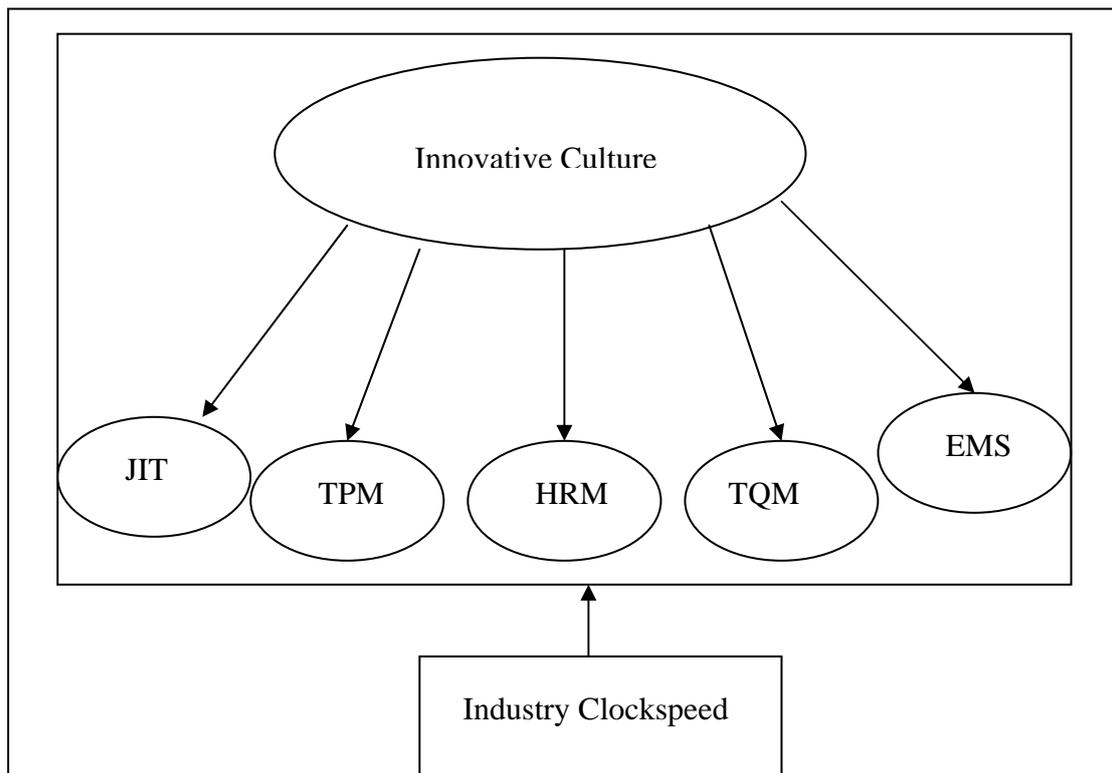
Figure 1: Baseline Model



Considering the importance of industry clockspeed for the innovation front due to the varying pace of change in the industries, this study investigates how much industry clockspeed plays a role in the structural relationship of innovative culture and business improvement programs including environmental management systems. The moderation model is illustrated in Figure 2.

Hypothesis 2: The structural relationship of innovative culture with business process improvement programs as well as environmental management systems is stronger in high clockspeed industries.

Figure 2: Multi-group model



3.2 Measures and Methods

There are already established scales that can be found in the literature to measure the variables in this study and they will be discussed in this section. A questionnaire that is answered by top management would be appropriate to get the responses from the firms on each of the variables employed. Moreover, the responses should come from firms spanning several industries to warrant enough variability regarding the industry clockspeed measure.

For the JIT scale, Mackelprang and Nair (2010) study would be useful since it is a recent meta-analysis on JIT practices. According to this study, JIT scale should be operationalized as a multi-item, multi-dimensional measure. The main dimensions of JIT include: Setup time reduction, small lot sizes, JIT delivery from suppliers, daily schedule

adherence, preventive maintenance, equipment layout, kanban, JIT link with customers, pull system and repetitive nature of master schedule.

Similarly, Nair (2006) has a relatively recent quality management meta analysis, which could be used to determine the scales for the TQM measure that will be used in this study. TQM scale is a multi-dimensional one as well. The main items to operationalize the TQM measure include: management leadership, people management, product design and management, quality data analysis, supplier quality management and customer focus.

Shah and Ward (2003) study on lean practices is a seminal one and it would provide the basis to construct the lean practices scale. Basically, lean practices consist of four main bundles; namely, JIT (Just in Time), TQM (Total Quality Management), TPM (Total Preventive Maintenance) and HRM (Human Resource Management) according to Shah and Ward (2003). JIT and TQM scales have already been discussed by referring to other seminal papers. Hence, only TPM and HRM aspects of lean production could be picked from the lean bundles proposed by Shah and Ward (2003) to incorporate into the current study, since the suggested JIT and TQM scales already provide an excellent and comprehensive coverage of those concepts. Moreover, using these subscales would provide finer gradations regarding the structural relationship with the innovative culture.

Environmental management systems measure could be adapted from Klassen and Whybark (1999). The authors of this study consider pollution control technologies such as remediation and end-of pipe controls; management systems such as management policies, procedures and operating practices related to environmental concerns; and pollution prevention technologies such as product adaptation and process adaptation as the types of environmental technologies. For the purposes of the current study, this

environmental technology portfolio suggested by Klassen and Whybark (1999) provides the intended operationalization.

Industry clockspeed concept could be used to analyze the moderating influence of industry effects on the structural relationship. Multi-group analysis is a suggested method when the moderator variable is discrete, such as industry groups (Vinzi et al., 2010, p.496). In the current study, the intent is to categorize the firms into industry clockspeed groups (i.e. small, medium and high) rather than using the industry category per se to see the impact of pace of change on the structural relationship rather than the specific industry effects. Mendelson and Pillai (1998; 1999) employ three indicators to measure industry clockspeed: change in input prices, product life and product-line freshness, which would be enough to capture the industry dynamics and subgroup the sample accordingly.

Finally, innovative culture concept can be gauged by adapting the scale of innovativeness as an organizational culture from Hurley and Hult (1998). Innovativeness is considered as a mechanism by which organizations develop capabilities and adapt to their external environments, which perfectly would fit to the innovative culture definition aimed with this study. The items for this scale include: acceptance of technical innovation, active managerial search for innovative ideas, readily acceptance of innovation in program/project management, penalties for new ideas that don't work (reverse coded), resistance to innovation in a particular program due to its riskiness (reverse coded).

4. Conclusions and Future Research

In this study, I have proposed a framework for the adoption and implementation of business process improvement programs as well as environmental management systems in relation to innovative culture of the firm. Moreover, the strength of model fit is hypothesized to be influenced by the industry clockspeed. The resource based view and complementary assets notion are central to build the arguments presented in this study. This work can be considered as an initial attempt at moving forward to an empirical questionnaire based study. Future research can complete the following steps of this work to empirically validate the framework by collecting data using the scales proposed in this study and analyzing whether the relationships asserted here hold for firms that span several industries enabling the researcher to control for the industry clockspeed concept, which is essential to the research inquiry for this study.

REFERENCE

- Angell, L.C., 2001. Comparing the environmental and quality initiatives of Baldrige award winners. *Production and Operations Management* 10 (3), 306-326.
- Barney, J.B., 1986. Strategic factor markets: Expectations, luck, and business strategy. *Management Science* 32 (10), 1231-1241.
- Barney, J.B., 1991. Firm resources and sustained competitive advantage. *Journal of Management* 17, 99-120.
- Bowen, F., Cousins, P., Lamming, R., Faruk, A., 2001. The role of supply management capabilities in green supply. *Production and Operations Management* 10 (2), 174-189.
- Christmann, P., 2000. Effects of "best practices" of environmental management on cost advantage: The role of complementary effects. *Academy of Management Journal* 43 (4), 663-680.
- Corbett, C.J., and Kirsch, D.A., 2001. International diffusion of ISO 14000 certification. *Production and Operations Management* 10 (3), 327-342.
- Corbett, C.J., Klassen, R., 2006. Extending the horizons: Environmental aspects of lean operations. *Manufacturing & Service Operations Management* 8 (1), 5-22.
- Delmas, M., 2001. Stakeholders and competitive advantage: The case of ISO 14001. *Production and Operations Management* 10 (3), 343-358.
- Eisenhardt, K.M., Martin, J.A., 2000. Dynamic capabilities: What are they?. *Strategic Management Journal* 21 (10-11), 1105-1121.
- Fine, C.H., 1996. Industry clockspeed and competency chain design: An introductory essay. *Proceedings of the 1996 MSOM Conference*.
- Fine, C.H., 2000. Clockspeed-based strategies for supply chain design. *Production and Operations Management* 9 (3), 213-221.
- Hart, S.L., 1997. Beyond greening: Strategies for a sustainable world. *Harvard Business Review* (Jan-Feb), 66-76.
- Hurley, R.F., Hult, G.T.M., 1998. Innovation, market orientation, and organizational learning: An integration and empirical examination. *Journal of Marketing* 62 (Jul), 42-54.
- King, A, Lenox, M., 2001. Lean and Green? An empirical examination of the relationship between lean production and environmental performance. *Production and Operations Management* 10 (3), 244-256.
- Klassen, R.D., 2001. Plant-level environmental management orientation: The influence of management views and plant characteristics. *Production and Operations Management* 10 (3), 257-275.
- Klassen, R.D., Whybark, D.C., 1999. Environmental management in operations: The selection of environmental technologies. *Decision Sciences* 30 (3), 601-631.

- Kleinschmidt, E.J., De Brentani, U., Salomo, S., 2007. Performance of global new product development programs: A resource based view. *The Journal of Product Innovation Management* 24, 419-441.
- Mackelprang, A., Nair, A., 2010. Relationship between Just-in-Time manufacturing practices and performance: A meta-analytic investigation. *Journal of Operations Management* 28, 283-302.
- Mendelson, H., 2000. Organizational architecture and success in the information technology industry. *Management Science* 46 (4), 513-529.
- Mendelson, H., Pillai, R.R., 1998. Clockspeed and informational response: Evidence from the information technology industry. *Information Systems Research* 9 (4), 415-433.
- Mendelson, H., Pillai, R.R., 1999. Industry clockspeed: Measurement and operational implications. *Manufacturing & Service Operations Management* 1 (1), 1-20.
- Nair, A., 2006. Meta-analysis of the relationship between quality management practices and firm performance – Implications for quality management theory development. *Journal of Operations Management* 24, 948-975.
- Peteraf, M. A., 1993. The cornerstones of competitive advantage: A resource-based view. *Strategic Management Journal* 14, 179-191.
- Rothenberg, S., Pil, F., Maxwell, J., 2001. Lean, green and the quest for superior performance. *Production and Operations Management* 10 (3), 228-243.
- Shah, R., Ward, P., 2003. Lean manufacturing: Context, practice bundles and performance. *Journal of Operations Management* 21, 129-149.
- Teece, D., 1986. Profiting from technological innovation: Implications for integration, collaboration, licensing, and public policy. *Research Policy* 15, 295-305.
- Vinzi, V.E., Chin, W.W., Henseler, J, Wang, H., 2010. *Handbook of partial least squares: Concepts, methods, and applications*. Berlin, Germany: Springer-Verlag.
- Walley, N., Whitehead, B., 1994. It's not easy being green. *Harvard Business Review* (May-Jun), 46-52.
- Womack, J.P., Jones, D.T., Roos, D., 1990. *The machine that changed the world*. New York: Free Press.

**A VALUE-BASED, POLICY DRIVEN METHODOLOGY FOR
SUSTAINABLE, RESILIENT, FLOOD-DISASTER PLANNING**

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**A VALUE-BASED, POLICY DRIVEN METHODOLOGY FOR
SUSTAINABLE, RESILIENT, FLOOD-DISASTER PLANNING**

ABSTRACT

This paper describes a policy-driven approach to both mitigation and recovery planning for communities impacted by flooding. The methodology prescribes actions to counter disaster effects that threaten goals tacit behind a given policy. Results in terms of damages, resilience measures, and resource levels are generated for each policy considered; this provides local planning groups sufficient information to examine the effects of implementing various policy options. An example is provided to illustrate the procedure. Conclusions are drawn and future work described.

Keywords: Optimization, Disaster Management, Resilience, Sustainability, Decision Support

A VALUE-BASED, POLICY DRIVEN METHODOLOGY FOR SUSTAINABLE, RESILIENT, FLOOD-DISASTER PLANNING

1.0 INTRODUCTION

Sudden-onset natural disasters, including earthquakes, floods, and tsunamis, continue to threaten life and property across the world and are demanding increased attention from researchers as to planning, mitigation, and proper response. The recent earthquake and tsunami in Japan is a grim example of a disaster and the ensuing responses taken to return a country to normalcy.

Certain themes are emerging from researchers in terms of disaster planning and response, and these include such concepts as *disaster resilience*, *goal-driven methodologies*, and *sustainability*. Because natural disasters can reoccur, it is important to evaluate plans and responses not just in terms of the amelioration and recovery from an immediate disaster, but also in scenarios that consider the goals of a community attendant with both short-term recovery and long-range sustainability.

1.1 Disasters and Resilience

A system's response to a disaster depends on the systems' *resilience* (Cutter et al, 2008). Resilience as defined by Cutter is the ability of a system to recuperate from a disaster and "bounce back" to its original operational functions or to a better functional level, and is generally considered a function of rapidity and robustness, as may be seen in Figure 1. In this figure, system quality is plotted versus time; at the time of a disaster, a sudden, vertical drop in system quality occurs, and the ability of a system to recuperate from a disaster lies in its ability to limit damages resulting from the disaster (robustness) and secondly the speed with which the system is able to get back to full functionality (rapidity).

Research in the area of resilience with respect to post-disaster recovery has long been qualitative in nature. But, based on original work and definitions by Bruneau et al. [2003], Zobel has defined a resilience measure for both single disaster events [Zobel, 2010] and multi-disaster events [Zobel & Khansa, 2011] so that decision makers can now guide their decisions by using resilience as a quantitative measure that incorporates the time-based (dynamic) effects of a disaster.

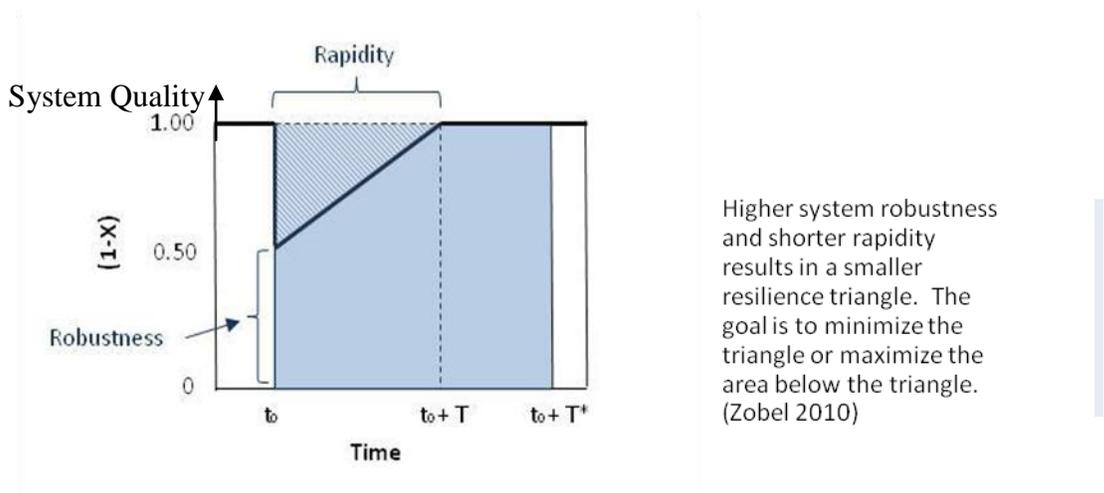


Figure 1: Resilience Triangle (adapted from [Zobel 2010])

There is hope that the dynamic definition of resilience can be melded with studies of pre- and post-disaster *static* resilience by Cutter et al. (Cutter, Burton et al. 2010). Miles and Chang [2011] have developed clever and intricate mathematical models of post-disaster recovery. However, at this point very little work exists in creating an overarching quantitative framework that connects pre-disaster resilience to post-disaster resilience, much less to subsequent disasters suffered by the community. Such a framework could provide an avenue for improved decision making, which would enable more effective use of resources toward such goals as maximizing community resilience and enabling sustainable recovery. Stated differently, there is a need for

tying social goals or policies to disaster planning, and to the resulting resilience posture of the impacted communities.

1.2 A Goal-Driven Methodology

Much outstanding research has been performed developing so-called *indicator models* that describe a community's resilience position at a given point in time. Birkmann in a 2006 review of various measures of disaster resilience, noted however that indicator models exploring vulnerability (the lack of resilience), lack a strong theoretical connection between the disaster goal or policy pursued and the resulting impact on the community as described by various measures of disaster resilience. Moreover, he pointed out that most vulnerability indicator models have no clear connection between resources and disaster actions (Birkmann 2006). He then suggested that good indicator methodology must employ goals to define the appropriate characteristics of interest, which in turn provides a better estimate of resilience for disaster impact assessment on a multi-dimensional scale.

The methodology advanced in this paper attempts to address this deficiency in linkage from policy to effects during and after a disaster. In particular, this research makes an explicit connection between a policy choice, decisions that accrue as a result of that choice, and the resulting status/recovery/resilience the community achieves.

1.3 Sustainable Recovery

One of the goals set forth by planners, researchers, etc., is *sustainable* recovery. Sustainable disaster recovery is a *process* shaped by social, economic, natural, and physical elements and implemented through both pre-disaster and post-disaster actions. While the concept of sustainability has been adopted by hazard researchers and applied to mitigation, sustainable

recovery following a disaster is not a widespread phenomenon, particularly in the United States (Smith and Wenger, 2007).

Characterization of sustainable disaster recovery includes the following elements [(Smith & Wenger, 2007; Wiek, Ries, Thabrew, Brundiers, & Wickramasinghe, 2010)]:

1. It is *locally driven*. Decision making is driven by the local community and emphasizes inclusion of all stakeholders in a transparent manner.
2. It uses *local income*. Through pre-disaster planning, there are post-disaster sources of local income for the community.
3. There is a *long-term focus*. Decision making includes a long-term perspective in which the effects of decisions transcend the initial disaster.
4. Disaster planning and response are *compatible with current institutional settings*. Disaster planning and management are built into current governmental systems, and include the development of local, state and federal policies that enable sustainable recovery.
5. There is an emphasis on post-disaster recovery that aims to *bring to equilibrium the effects of disasters on differing levels of social vulnerability and power*.

1.4 Purpose and Structure of this Paper

This paper describes a policy-driven approach to both mitigation and recovery planning for communities impacted by flooding. Note that it does not *prescribe* any specific policy. Rather it generates consequences for each given policy to be evaluated. In particular, for each policy considered, the methodology prescribes actions to counter disaster effects that threaten goals tacit behind that policy; results in terms of damages, resilience measures, and resource levels are subsequently generated. These output measures for each policy to be evaluated are then

provided to local planning groups so that they may intelligently examine the various consequences of implementation.

Section 2 describes the design of a proposed methodology that develops dynamic resilience indicators through the development of goals that follow through on various policy options – including sustainable recovery. Section 3 provides a descriptive disaster example, in which the proposed methodology is applied. The next section (4) provides the solution reached using the methodology. Section 5 discusses future work that is now underway to enhance the designed methodology. Finally, in section 6, conclusions are drawn.

2.0 A Value-Based Methodology for Flood-Disaster Planning

In this section a disaster planning methodology for flooding is outlined. The proposed methodology does *not* deal with planning during the flood (for example, which individuals should be rescued first and which fallen trees should be removed from which roads and in what order). Rather, the methodology seeks to address larger-view issues pre-disaster such as, what may the community do to *mitigate* against possible effects of a potential flood, as well as post-disaster planning concerning recovery. An example of mitigation would be when and where a community should build levees; an example of a recovery decision would be whether to rebuild homes in a flood plain.

2.1 Set Policy Options

The first step in the methodology (see Figure 2) is to *set* all *policy options* of interest. For example, three fictitious (but very possible) policy options are listed in Table 1; we refer to these as the *Min (Community) Cost* option; the *Economically Driven* option; and the *Sustainable* policy alternative. (We will use these three policy options in the example of section 3.) Each option implies certain philosophical (i.e., value-based) assumptions tacitly. In Table 1 we

assume for the sake of illustration several such values. The point is *not* that these philosophical assumptions are correct and should be adopted; rather, it is that the community in question's policy with tacit goals should be surfaced.

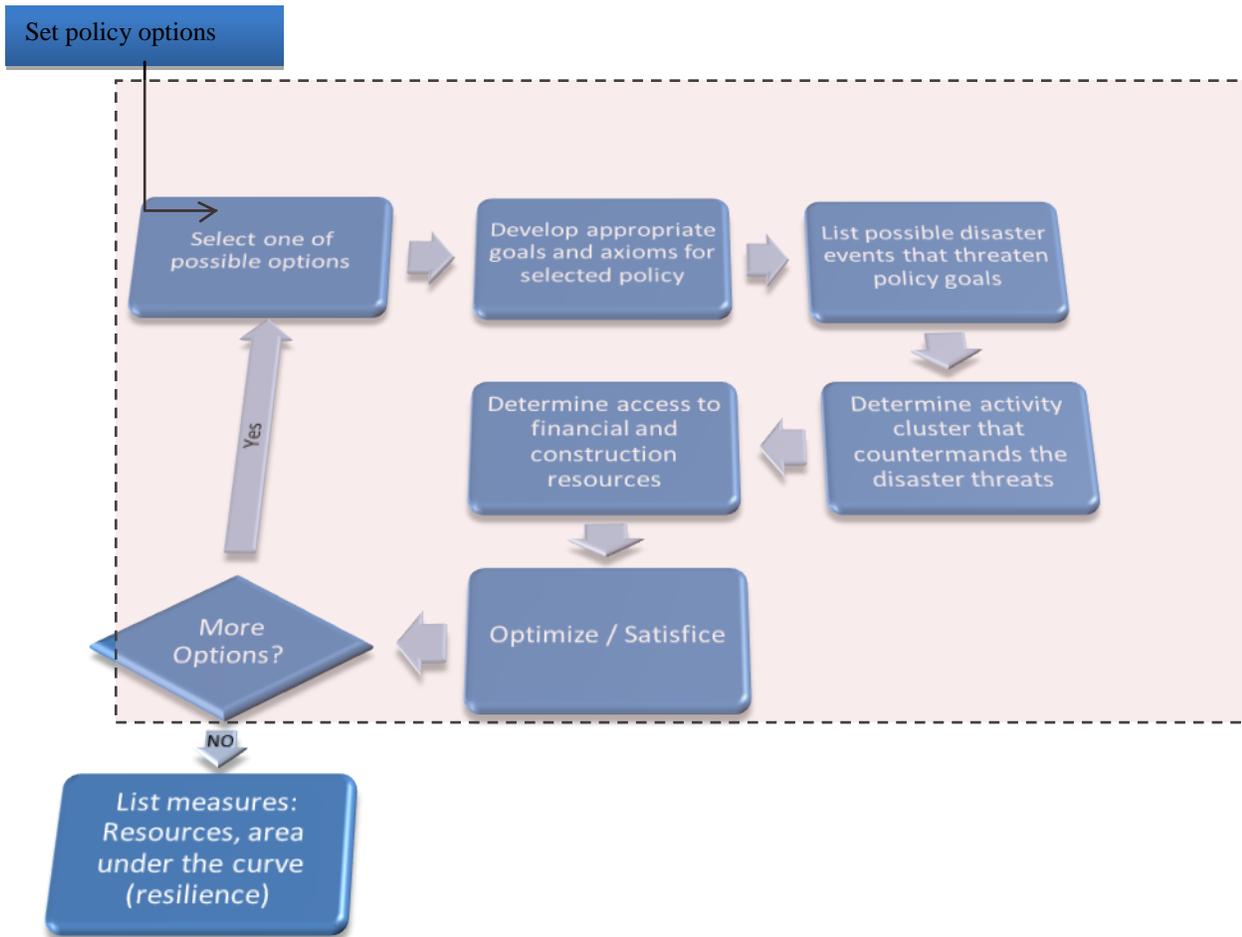


Figure 2. A Methodology for Policy-Driven, Sustainable, and Resilient Flood-Planning and Recovery

THREE (FICTITIOUS) RECOVERY POLICIES and THEIR UNDERLYING PHILOSOPHIES

Policy 1: Minimize (Community) Cost

Philosophy:

- Rather than invest money that most probably will be wasted, we will gamble that either the flood will not hit us, or if it does, we will be able to get federal aid.
- Times are hard and funds are limited. If we do “get hit,” we will repair and rebuild with particular attention to minimizing cost.
- If we do get flooding, this will not be the time to correct social inequities.
- If it does flood, we will allow contractors to rebuild in the flood plain if that is their best option.

Policy 2: Economically Driven

Philosophy:

- We will make decisions that are in the financial best interests of *our community*. That will determine mitigation levels within each area of the community.
- We will ensure that those who are most likely to contribute the most financially to our community have top priority in receiving available funds.
- This is not the time to correct social inequities.
- We will allow contractors to rebuild less expensive neighborhoods in the flood plain if that helps builders and contractors financially.

Policy 3: Sustainable

Philosophy:

- We will attempt to minimize dependence on the federal or state government.
- We will mitigate against possible flooding.
- We will take the long view with our planning to mitigate against future floods.
- If it does flood, we will not allow rebuilding in the flood plain.
- We will not allow a disaster to let the “rich get richer and the poor poorer.” That is, if we do get flooding, we will not allow the financially less fortunate to be struck disproportionately.

Table 1. Underlying Philosophies behind Policy Decisions

2.2 Develop Appropriate Goals for Each Policy under Consideration

In this step of the methodology, practical goals are developed that, if met, will ensure successful implementation of the policy and its goals, within financial bounds. For example, a community may have a high proportion of elderly residents, and it may set the practical goals that (1) it will

be prepared to have sufficient volunteers trained and available and (2) sufficient handicap-equipped vehicles with drivers to assist the elderly in the case of an evacuation.

2.3 List Possible Disaster Events that Threaten Policy Goals

This step lists all possible *events* of nature and otherwise that threaten the goals developed in the previous section. Possible events of nature would include such happenings as (1) roads are flooding; (2) power poles are down and electricity is out; (3) water accumulates to a significant level; and (4) water levels remain after 7 days.

2.4 Determine Activity Clusters that Countermand Possible Disaster Events

In this portion of the methodology, *activities* are stipulated that ameliorate or prevent each event in the previous step. For example, a town may choose to ensure that, in the event of possible flooding, sandbags are placed around its most lucrative businesses and the homes of the wealthiest individuals in the town. Alternatively, a community may choose to restore essential (“lifeline”) services first.

Steps 2.3 and 2.4 may often be combined into a decision tree. Figure 3 shows a simplified situation of four events and a corresponding activity (A_1 : sandbagging) that mitigates against Event 2. This activity may be undertaken, in which case there is a corresponding financial loss of \$250K (primarily the cost of the sandbags and labor); or the activity may be ignored, in which case one must traverse further down the tree to ascertain consequences such as property damages, health risks, etc. Since each event has a probability of occurrence, an expected value may be calculated at each node, and the tree may be solved to determine which activities make economic sense for this given policy.

(Due to the space limitations, no decision trees will be included in the illustrative example developed in Section 3.)

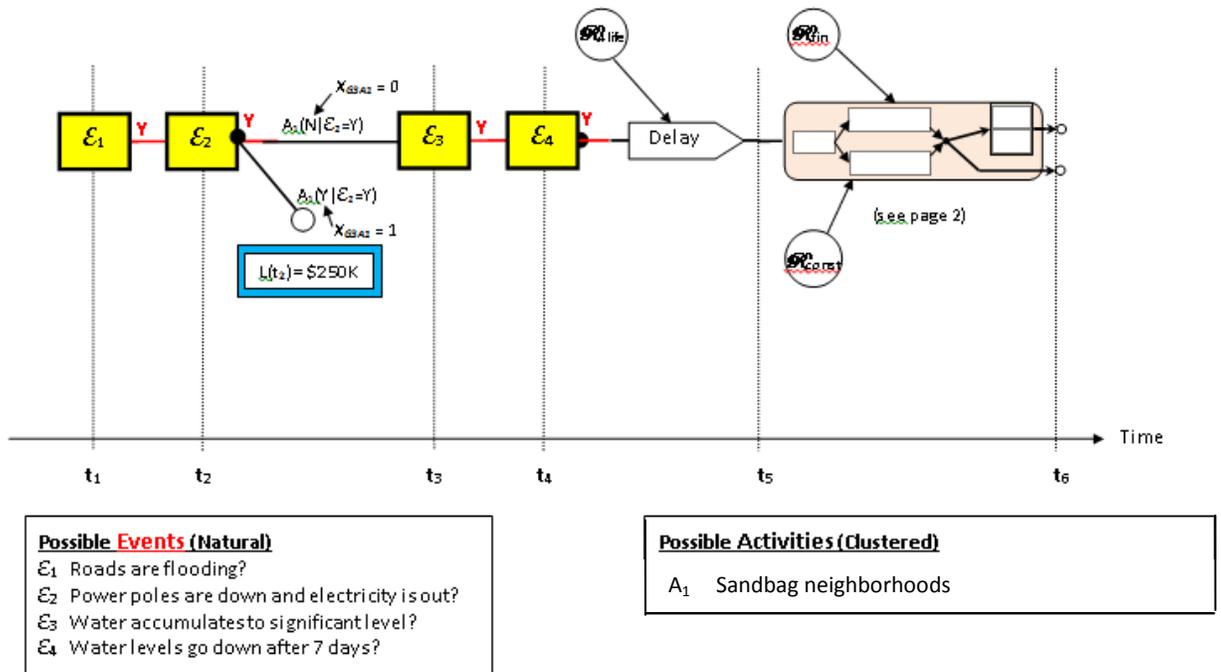


Figure 3. An Illustrative Decision Tree with Events and an Activity Cluster

2.5 Determine Access to Financial and Construction Resources

Access to financial and construction resources determine the post-disaster recovery process, in terms of duration and level of rebuilding. This methodology explicitly incorporates household attributes, decisions, and functions (such as insurance and personal savings), as well as business attributes and functions, enhancing similar work in the ResilUS model developed by Miles and Chang [2011]. By aggregating over businesses and then households in a community, a pool of funds is determined that can be added to other sources of capital, including federal and state funds, NGO's, etc.

2.6 Optimize/Satisfice

Using the information developed in the five steps above, decision trees may be solved (using expected values), policy goals may be prioritized, and a resulting lexicographic goal

programming problem (gpp) written for each policy under consideration. Using pseudo random numbers, probabilities may be drawn to determine possible disaster/recovery scenarios, and each resulting gpp may be solved to “optimality.” By simulating thousands of scenarios for each policy, a most likely, satisfied solution may be generated for each policy option.

2.7 List Measures: Resources, Resilience, etc.

In step 2.6 above, the methodology evaluates each policy under consideration by a community and generates measures, damages, resources levels, and resilience that ensue with that policy. Planners may then clearly see the ramifications of possible choices and hence make a more-informed decision. The methodology also provides a solution for consequences under *recurring* disasters.

3.0 A Flooding Example

The community chosen to illustrate the methodology of this paper is the Hampton Roads area of Virginia, and as such, the maps and 2010 Census Data utilized in this paper are taken from this area. However, as there is no intention to dictate to Hampton Roads what their planning policies should be and how they should respond to flood disasters, the rest of the data used in this example is fabricated. Consequently, to emphasize this point, the community under study in this example is referred to as *Floodville*.

A Google map rendering of Floodville is shown in Figure 4a, and a FEMA risk-of-flooding overlay is shown in Figure 4b. Figure 5 provides the median income for Floodville for the same area. Note in this figure that the median income has been stratified into three groups: those with median annual income above \$70,000 (called “upper”); those less than \$27,000 (termed “lower”); and those in between (“middle”). Finally, Figure 6 provides the flood risk overlay together with the annual median income overlay – all on one map.

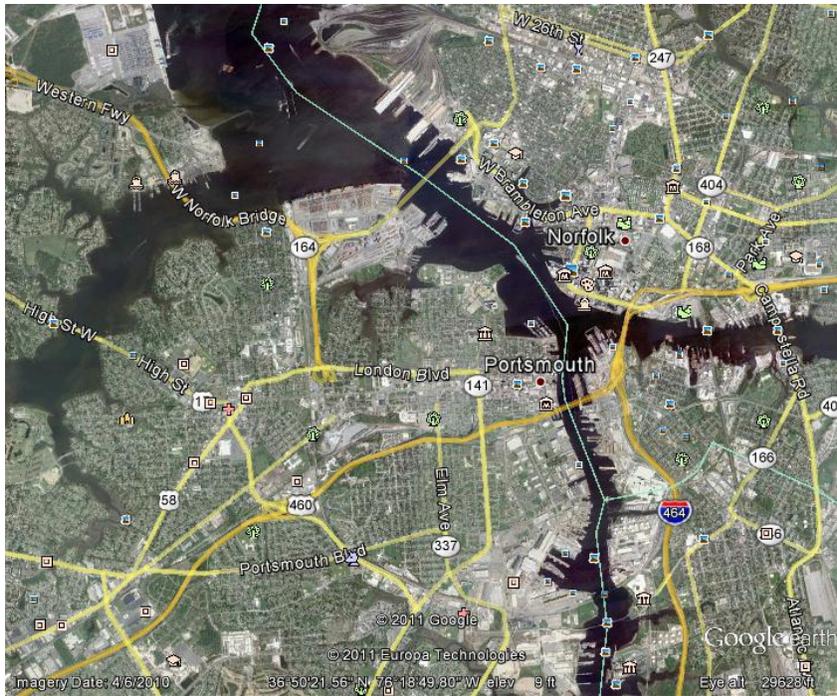


Figure 4a. Google Map Image of Example Community

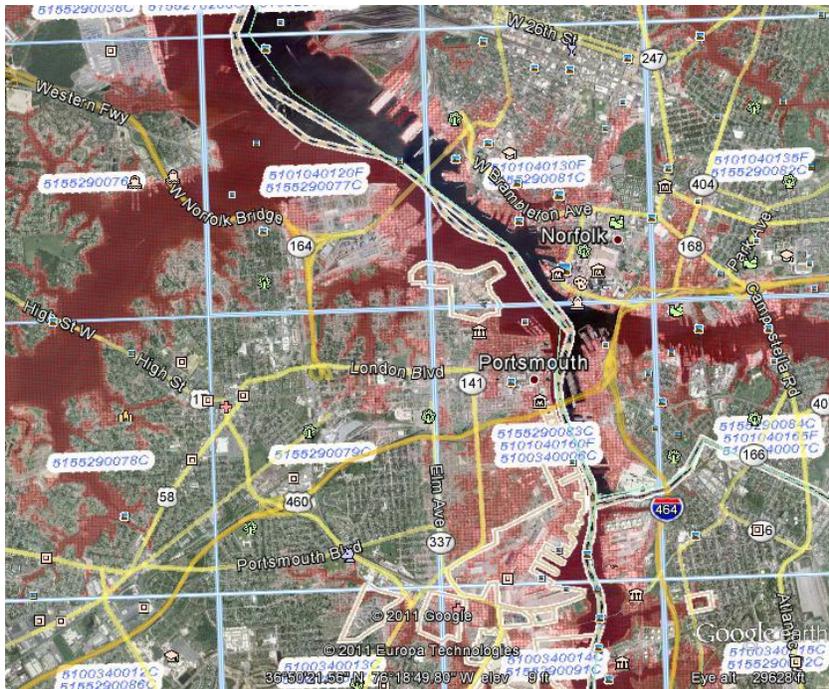


Figure 4b. Same Google Map Image shown in Fig 4a with a Flood Hazard Overlay Added.

Key: Shaded Red Area – High Flood Risk
 Shaded Pink Area – Moderate Flood Risk

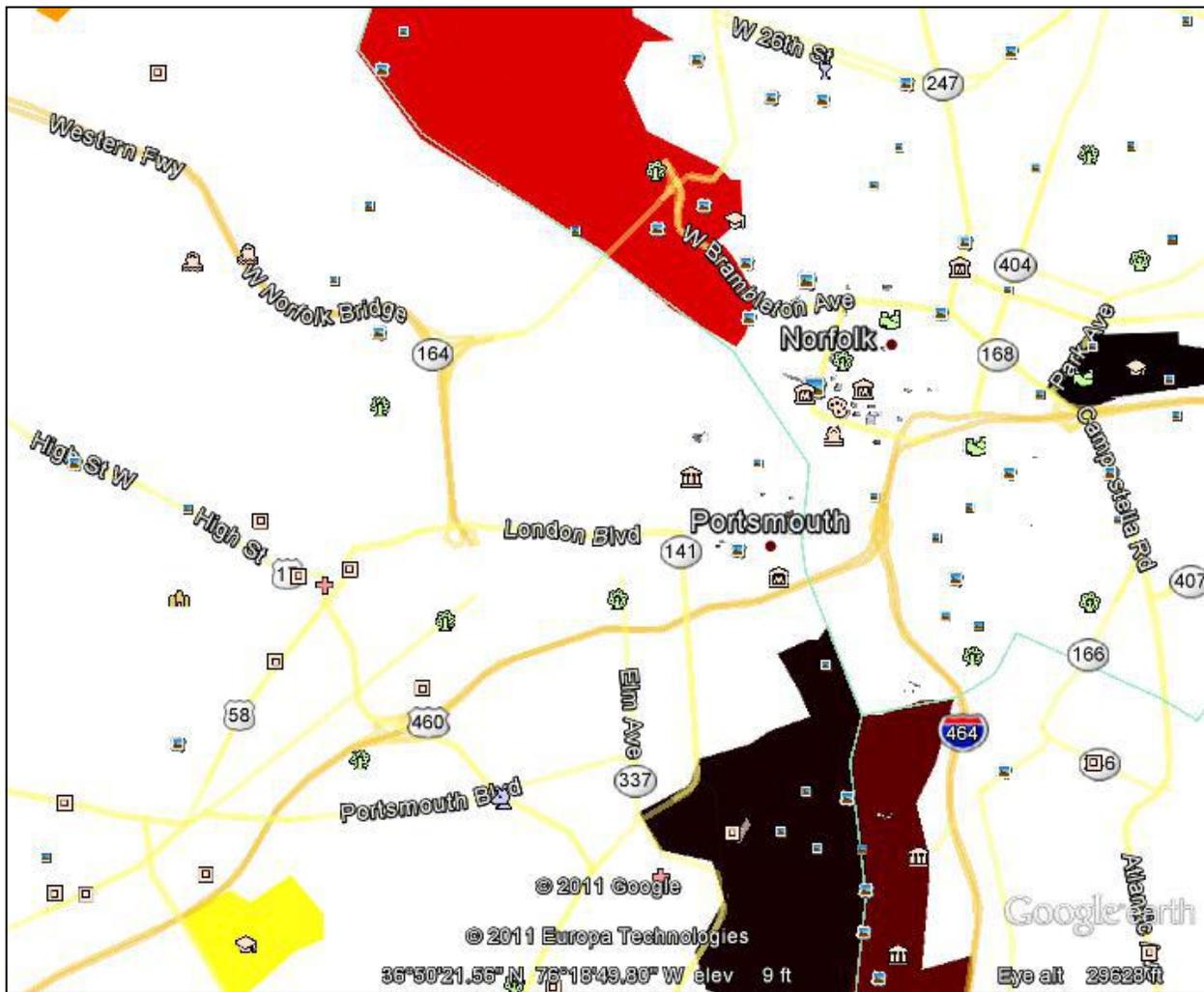


Figure 5. Economic Level Overlay

<p><u>Key:</u> <i>Light</i></p> <p><i>Red/Brown/Yellow</i></p> <p><i>Dark</i></p>	<p>Median Household Income of up to \$27,000</p> <p>Median Household Annual Income of \$27,000 – \$70,000</p> <p>Median Household Annual Income in excess of \$70,000</p>
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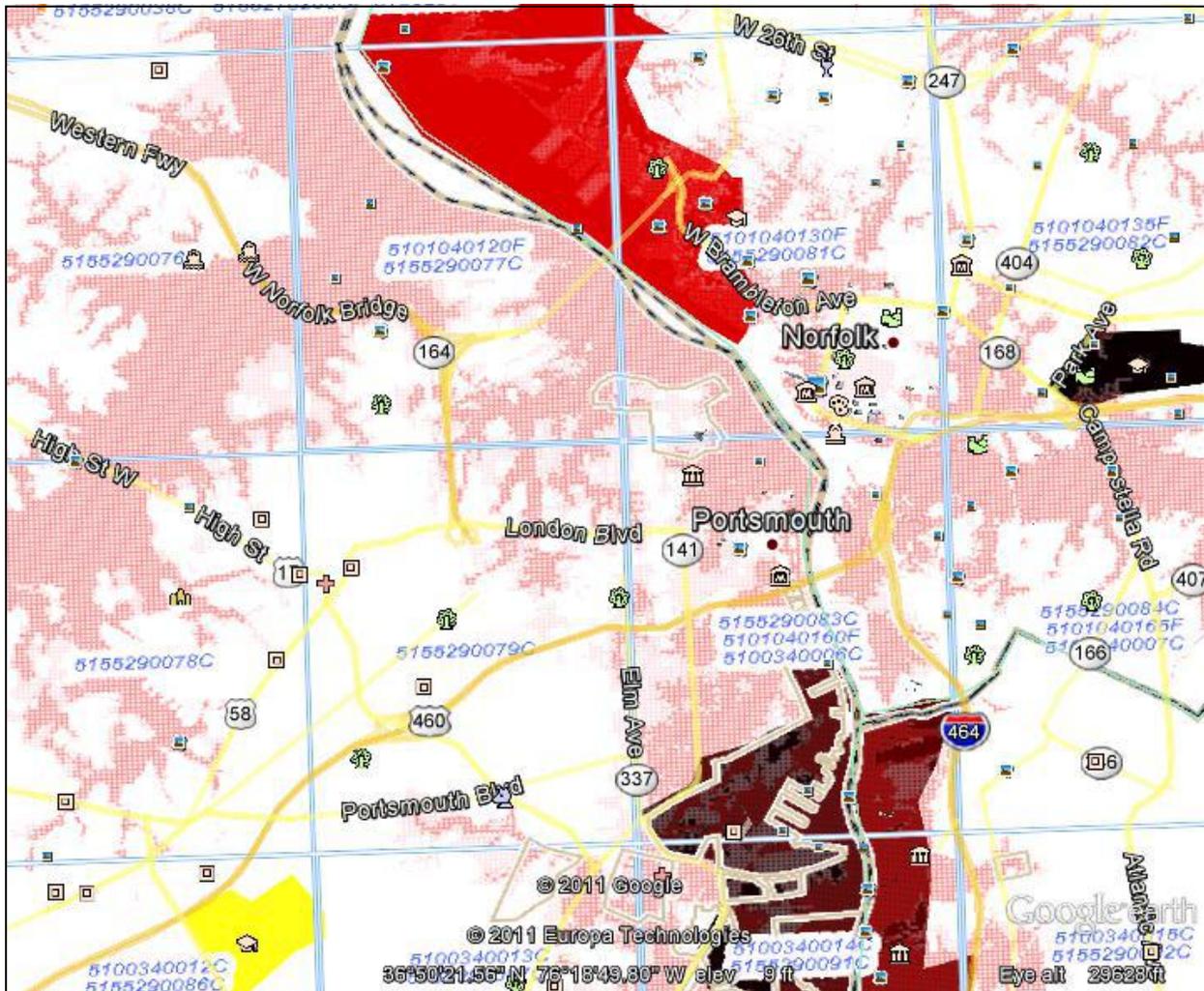


Figure 6. Flood Hazard Overlay *plus* Population Density Overlay

3.1 Set Policy Options for the Example Community

The first step in the methodology (see Figure 2) is to determine and specify all *policy options* of interest. In this fabricated example, the three policy options of Table 1 are utilized, namely:

- Policy 1: the *Min (Community) Cost* option. [With this policy, the overarching concern is to minimize the cost to the community of *Floodville* of any flooding.]
- Policy 2: the *Economically Driven* option. [With this second policy, the primary interest is to promote and enhance the economic well-being of the community. This implies helping key businesses and the key contributors to the tax base.]

Policy 3: the *Sustainable* policy alternative. [Here the focus is on taking the “long view” and planning to mitigate against not just an imminent flood, but those “down the road.”]

3.2 Develop Appropriate Goals for Each Policy under Consideration

For pedagogical purposes, only four goals are defined in this example for each of the three policies. (See Table 2, the first two columns, for a summary):

Policy 1: the *Min (Community) Cost* option. Being hard pressed financially, Floodville will *not* expend any funds at this time to mitigate against a future flood. Should a flood occur, the community will not impose any new building restrictions.

Policy 2: the *Economically Driven* option. Floodville will expend some limited funds at this time to mitigate against a future flood, but the priority will be to protect those businesses and homes most critical to the tax base. Should a flood occur, the community will not impose any new building restrictions.

Policy 3: the *Sustainable* policy alternative. Floodville will expend some limited funds at this time to mitigate against a future flood, but the priority will be to allocate funds across all income strata so that the lower income homes do not bear a disproportionate share of the burden of the disaster. Should a flood occur, the community *will* impose new building restrictions that prohibit funding being provided in areas likely to be struck by a future flood.

3.3 List Possible Disaster Events that Threaten Policy Goals

The major event considered in this simplified example is that flooding will occur at levels that threaten both homes and businesses across the town of Floodville.

3.4 Determine Activity Clusters that Countermand Possible Disaster Events

For each policy, here are the activities consistent with the goals set above. See the first two columns of Table 2.

Policy 1: the *Min (Community) Cost* option.

- sandbagging: No part of town will be sandbagged.
- rebuilding in the flood plain: The town will allow this. Note, however, that as only those in the lower median income category presently have homes in the flood plain, only they will be affected.

Policy 2: the *Economically Driven* option.

- sandbagging: The community will be sandbagged, but as funds are limited, only up to the budgeted amount. Practically, this means 80% of the upper median-income homes will be protected and 25% of the middle median-income homes.
- rebuilding in the flood plain: The town will allow this. Note, however, that as only those in the lower median income category presently have homes in the flood plain, only they will be affected.

Policy 3: the *Sustainable* policy alternative.

- sandbagging: The community will be sandbagged, but as funds are limited, only up to the budgeted amount. Practically, this means that only 60% of all homes (regardless of median income) will be protected.
- rebuilding in the flood plain: The town will not allow this.

Policy 1: Minimize (Community) Cost	Sandbagging	Rebuild in flood plain?	Recovery: Grant Priority	Recovery: Construction Priority
<i>Upper</i>	No	N/A	1	1
<i>Middle</i>	No	N/A	2	2
<i>Lower</i>	No	Yes	3	3
Policy 2: Economically Driven	Sandbagging	Rebuild in flood plain	Recovery: Grant Priority	Recovery: Construction priority
<i>Upper</i>	0.8	N/A	1	1
<i>Middle</i>	0.25	N/A	2	2
<i>Lower</i>	No	Yes	3	3
Policy 3: Sustainable	Sandbagging	Rebuild in flood plain	Recovery: Grant Priority	Recovery: Construction priority
<i>Upper</i>	0.6	No	equal % of need	1
<i>Middle</i>	0.6	No	equal % of need	1
<i>Lower</i>	0.6	No	equal % of need	1

Table 2. Policy Options/Decisions Considered for the Example

3.5 Determine Access to Financial and Construction Resources

Access to financial and construction resources determine the post-disaster recovery process, in terms of duration and level of rebuilding. To simplify the exposition of this example, we assume

funds in terms of a recovery grant are received from the federal government and that the primary issue for Floodville is to determine the distribution of these funds. The decisions under each policy are shown in the last two columns of Table 2 and are as follows:

Policy 1: the *Min (Community) Cost* option.

- recovery grant priority: Funds will be expended, until depleted, in the priority order of upper median-income home reparation, then middle income homes, and finally lower-income homes.
- construction priority: Construction resources will be allocated in the same order as recovery grant monies, namely upper, then middle, then lower.

Policy 2: the *Economically Driven* option.

- recovery grant priority: Funds will be expended, until depleted, in the priority order of upper median-income home reparation, then middle income homes, and finally lower-income homes.
- construction priority: Construction resources will be allocated in the same order as recovery grant monies, namely upper, then middle, then lower.

Policy 3: the *Sustainable* policy alternative.

- recovery grant priority: Funds will be expended, until depleted, without regard to median income. That is to say, all income groups will receive funding so that each gets an equal percentage based on need.
- construction priority: Construction resources will be allocated in the same order as recovery grant monies, namely without regard to income, but rather based on need.

3.6 Optimize/Satisfice

Using the information developed in the five steps above, an Excel program was developed to determine the optimal solution under each policy. Additional parameters were set (not shown here) such as size of homes (square feet) in each income group, the amount of surge/flooding occurring, etc. Damage estimates (see Figure 7) were made using data provided by the U.S. government online [Cost of Flooding].

Size of Home: Area in Square Feet

Water Level	1000 (Lower)	2000 (Middle)	3000 (Upper)
1 inch	\$10,600	\$20,920	\$31,240
2 inches	\$10,670	\$21,000	\$31,330
3 inches	\$11,450	\$22,590	\$33,730
4 inches	\$15,150	\$29,650	\$44,150
5 inches	\$17,310	\$33,870	\$50,430
6 inches	\$20,150	\$39,150	\$58,150
1 foot	\$27,150	\$52,220	\$77,290
2 feet	\$33,700	\$62,880	\$92,060
3 feet	\$36,600	\$68,100	\$99,600
4 feet	\$39,950	\$74,580	\$109,210

Figure 7. FloodMap: A Flood Disaster Damage Estimator

Source: The Cost of Flooding, 2011,
http://www.floodsmart.gov/floodsmart/pages/flooding_flood_risks/the_cost_of_flooding.jsp

3.7 List Measures: Resources, Resilience, etc.

Measures from the Excel program were generated and are shown in the next section.

4.0 Solution & Results

Many different output measures are generated by this methodology, and in fact, one of the key goals of this research stream is to determine those measures that best equip communities (and ultimately state and federal planners as well) with the information they need to make the wisest decisions.

In this section, what the author believes is one of the more interesting output measures is illustrated. This measure addresses those areas such as the east coast of the United States that face repeated disasters, such as (perhaps) three category 2 hurricanes or worse over a decade. In particular, this measure takes the disaster stipulated and then postulates that two more

occurrences of the same magnitude disaster occur in the short term. That is, this measure assumes that three identical back-to-back-to-back disasters occur. With this measure, myopic strategies should suffer in comparison to those that are more long-range in their planning. Conversely, decisions made using this measure would most likely be unnecessarily costly in regions where repeated disasters are rare. [Note that all measures in this methodology do *not* assume multiple disasters; rather, one is merely selected here to demonstrate the types of questions that can be addressed with this methodology.]

Figure 8 shows the recovery levels recorded over the cumulative impacts of the three subsequent disasters for each of the three policies. Each policy is drawn with similar scales for ease of comparison. Disaster 1 occurs at time 0, and is shown as the initial decline in recovery levels in each of the plots. Three “dips” are shown for each policy; each dip corresponds to a new disaster. For the sustainable disaster recovery policy, over disaster 1, damage levels also include the costs of moving households from floodplains, since rebuilding in the flood plains is no longer allowed by policy option 3, to higher ground.

One may conclude from Figure 8 that policy option 3 may not be the best option (economical is better) over the short term (disaster periods one and maybe two), but it in fact is the best policy over the long term (after disaster 3).

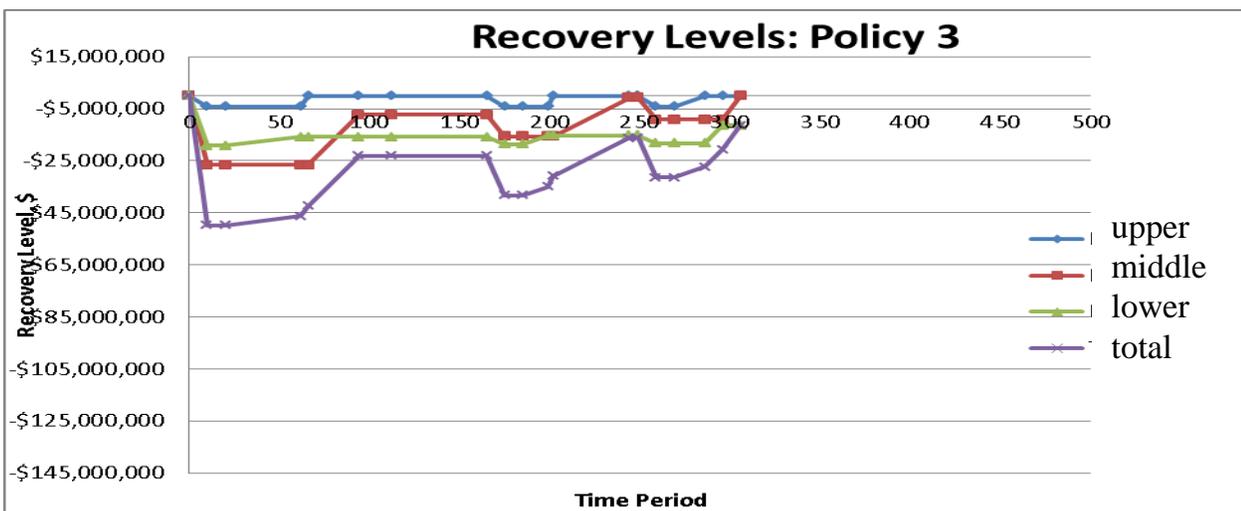
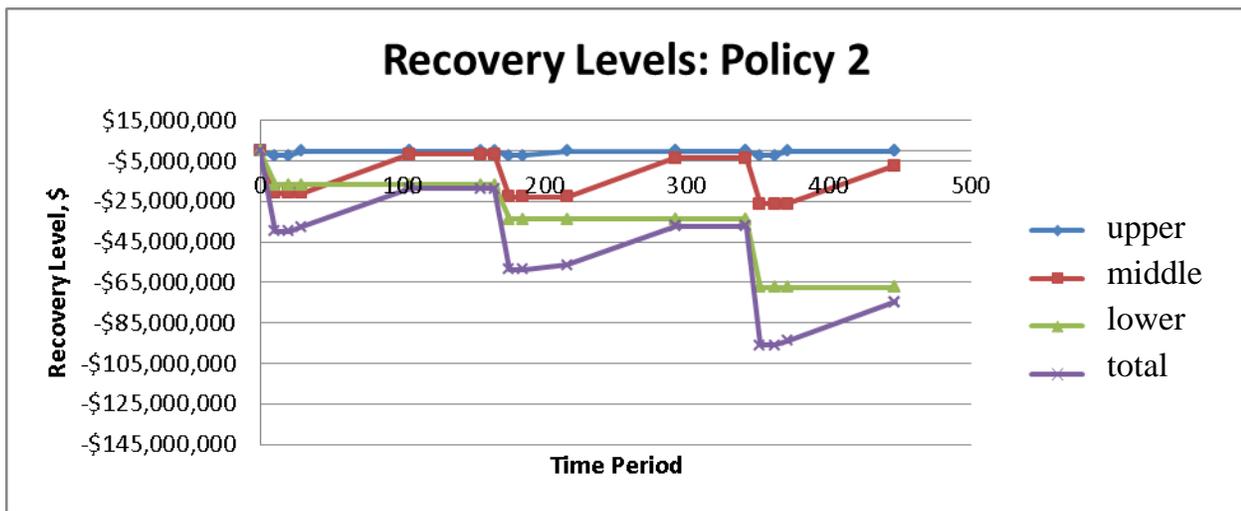
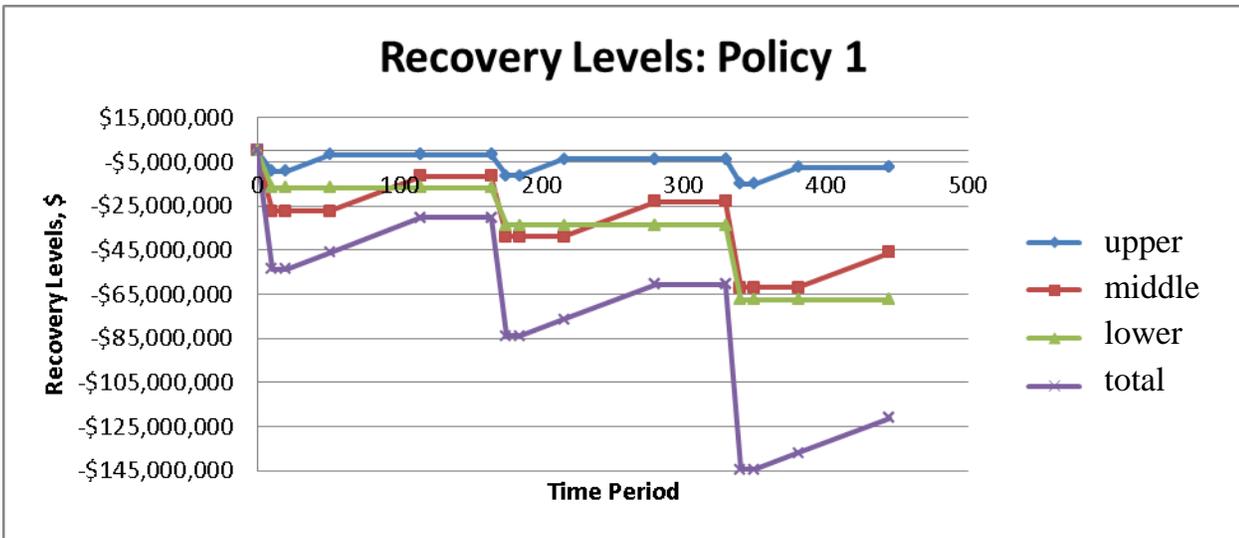


Figure 8. Cumulative Damage Results over Time for the Example

Additional measures are directly calculated by the methodology, but some may also be inferred directly from Figure 8. For example, resilience is a function of robustness (recovery levels) and rapidity (recovery durations). Higher recovery levels and faster recovery durations represent higher resilience measures. Thus, from the results of Figure 8, it is seen that policy option 3 has a higher resilience than either of the other two options over the three disaster periods.

5.0 Implications and Future Work

The work presented in this paper evaluates a simplified disaster example and as such, future research work in this area is fertile as more complex features are integrated. Some of the issues worthy of future work include evaluating various tradeoffs the different policy options offer. For example, the sustainable policy option should be more advantageous in locations where disasters are frequent, and should be less promising in areas where repetitive disasters occur less frequently; determining the “breakeven point” would be helpful. A second tradeoff issue to explore would be when, as a function of the number of households in a floodplain, to ban rebuilding in that floodplain.

Another potential area for investigation is to incorporate the interactions of other agents in this disaster recovery model. For example, how would the inclusion of other agents such as nearby communities, NGOs, and FBOs affect disaster recovery?

Finally, a third area of future work is to include other aspects of resilience such as social, institutional, environmental factors, and to determine how specific policy options have different effects on these dimensions of resilience.

6.0 Conclusions

In this paper, the author has developed a policy-driven methodology that iterates through each policy under consideration by a community and proceeds to generate measures, damages, resource levels, and resilience that ensue with each of these policies. Using this approach, planners may clearly see the ramifications of possible choices they are making and hence make better-informed decisions.

Acknowledgements

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REFERENCES

- (2011, 10/17/2011). "The Cost of Flooding." Retrieved October 26, 2011, from http://www.floodsmart.gov/floodsmart/pages/flooding_flood_risks/the_cost_of_flooding.jsp.
- Birkmann, J. (2006). Indicators and the criteria for measuring vulnerability: Theoretical bases and requirements. Measuring vulnerability to natural hazards: towards disaster resilient societies. J. Birkmann. Tokyo, United Nations University Press: 55 - 77.
- Bruneau, M., Chang, S. E., Eguchi, R.T., Lee, G. G., O'Rourke, T. D., and Reinhorn, A. M. (2003). A framework to quantitatively assess and enhance the seismic resilience of communities. Earthquake Spectra 19(4): 733-752.
- Cutter, S. L., Barnes, L., Berry, M., Burton, C., Evans, E., Tate, E., & Webb, J. (2008). A place-based model for understanding community resilience to natural disasters. *Global Environmental Change-Human and Policy Dimensions*, 18(4), 598-606.
- Cutter, S. L., C. G. Burton, et al. (2010). "Disaster Resilience Indicators for Benchmarking Baseline Conditions." Journal of Homeland Security and Emergency Management 7(1).
- Miles, S. B. and S. E. Chang (2011). "ResilUS: A Community Based Disaster Resilience Model." Cartography and Geographic Information Science 38(1): 36-51.
- Smith, G. P. and D. Wenger (2007). Sustainable Disaster Recovery: Operationalizing an Existing Agenda. Handbook of Disaster Research. H. Rodriguez, E. L. Quarantelli and R. R. Dyes. New York, Springer: 234 - 257.
- Wiek, A., Ries, R., Thabrew, L., Brundiers, K., & Wickramasinghe, A. (2010). "Challenges of sustainable recovery processes in tsunami affected communities." Disaster Prevention and Management, 19(4), 423-437.
- Zobel, C. W. (2010). "Comparative Visualization of Predicted Disaster Resilience." Proceedings of the 7th International ISCRAM Conference – Seattle, USA, May 2010.
- Zobel, C. W. (2011). "Representing perceived tradeoffs in defining disaster resilience." Decision Support Systems 50(2): 394-403.
- Zobel, C. W., and Khansa, L. (2011). Characterizing multi-event disaster resilience. Computers & Operations Research, Special Issue on MCDM in Emergency Management.

Say It without Saying It: How Consumers Interpret ‘Tropes’ in Advertising and Its Impact on Campaign Success

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Abstract: As consumers we are subject to various mediums of advertising including print, radio, and commercials. The going trend in advertising is to have a witty trope or metaphor which appeals to the consumer. Each consumer interprets these tropes differently, creating a difference in opinions toward the advertised product. The success of an advertising campaign weighs heavily on how consumers will receive a particular message. This research introduces the RRRAL Framework, a new innovative framework which determines if an advertising campaign is successful. This research addresses the following questions.

- How do consumers interpret the figurative language presented?
- Is the perceived message the intended message of the company?
- How is the campaign impacted by the interpretation of the presented tropes?

Introduction

According to Merriam-Webster Learner’s Dictionary, the word trope is defined as a word, phrase, or image used in a new and different way in order to create an artistic effect. Another definition for trope is a word or expression used in a figurative sense. These two definitions when partnered together create the crux of many advertisements. Tropes are expressed through figurative language, pictures, and digital effects in commercials. Tropes can be highly effective in conveying a message if they are presented in the correct context to the correct audience. It is imperative to remember that although a particular trope or metaphor presented in an advertisement may prove to be positively appealing to one audience it may create raves for a dissimilar audience. Various phrases, gestures, as well as colors differ in meaning throughout the world. For instance, in America it is rude to slurp; conversely it is considered good table manners in Japan. The same rule applies when creating advertisements for various cultures, subcultures, and age groups. In addition it is proven that tropes influence persuasiveness

as well as memorability in advertisements (Toncar & Munch, 2003). In order for an advertisement to be effective, you must know the likes and dislikes as well as what is appropriate or not appropriate for your target market. The comprehension of a trope in an advertisement can elevate a campaign to prodigious success but if the consumer is left feeling perplexed the campaign may result in epic failure. Consumers may interpret tropes in various ways. Depending on what is displayed or written in the trope, consumers may interpret it in a sexual, emotional, sarcastic, literal, or humorous context. In some cases the consumer may not understand the trope and thereby are unable to produce an interpretation. These interpretations are not always mutually exclusive. Trope advertising may trigger several interpretations at once or altered interpretations upon each viewing. Although the consumer is decoding the trope, the message received may not be the intended message of the company.

Examples of commercials using tropes include the York Peppermint Patty Pieces commercial ending in the tagline “All Your Favorites in Pieces”, Trojan Condoms using the tagline “You Can’t Wait to get it on”, Smirnoff with the closing voice over “It’s Like Having a Bartender in Your Cooler” (see exhibit 1), as well as Old Spice’s Scent Vacation with the tagline, “Become one of the Freshest Smelling Places on Earth” (see exhibit 2). Tropes are also presented in print ads. Some print ads with tropes include Absolut Blank “It All Starts with an Absolut Blank” (see exhibit 3), Dolce Gusto “It’s Great to Change Every Day; Coffee is not Just Black”, and Got Milk?, “I’m Sorry I Listened to What You Said and not What You Meant”. Each of these advertisements includes visual effects along with playful puns which are left to the consumer to ponder. To some these taglines may be concrete however to others they may be ambiguous. The interpretation of these tropes may or may not have an impact on the success of said campaigns.

Consumers may love, hate, or be indifferent to various tropes. The primary purpose of this research is to discover how consumers' interpretations of tropes in advertising impact the success of the campaign.

Exhibit 1



Exhibit 2



Exhibit 3



Literature Review

Within the past 20 years, advertisements have become less straight forward and more metaphorical; be it through pictures or words, most advertisements today present some form of trope (McQuarrie & Phillips, 2005). This tactic is prevalent in magazine advertisements. Examples of trope advertisements include taglines such as “smell like a man, man” (Old Spice), “you can’t wait to get it on” (Trojan), and “all your favorites in pieces” (Hershey). The explanation for this execution style is that advertisers believe that consumers are more receptive to metaphorical advertisements (McQuarrie & Phillips, 2005). The purpose of this research is to (1) look deeper into how consumers process and react to tropes in advertising, (2) determine whether the perceived message of the consumer is what the advertiser was trying to convey and the importance of this understanding, and (3) introduce a new empirical framework which displays how consumers’ interpretation of tropes impact the success of an advertising campaign.

How Consumers Process Tropes

In order to successfully comprehend tropes in advertising, consumers must allow their mind to explore the underlying meaning which the advertiser is attempting to convey (Toncar & Munch, 2001). An example of this type of advertisement is Trojan’s closing tagline “You can’t wait to get it on” (see exhibit 1). In this commercial, the advertiser is using a pun. They are referring to the sexual act as well as the product. Another example of trope advertising is in the Smart car ad (see exhibit 2). This trope is depicted solely through pictures. The image reveals a world of pollution through the windshield of the car, but where the wipers have cleaned is clear skies. The intended message is that people should drive the Smart because it is conducive to a less polluted environment. Ford also makes use of trope advertising in a print ad which uses an

octopus as a car with the subheading stating “Great Grip Come Rain or Shine” (see exhibit 3). Other trope infused ads can be found in the appendix. According to Toncar and Munch (2001) tropes in print advertising should have a higher positive effect on cognitive processing as well as memory and attitude toward the advertisement. It is also been proven that using tropes in advertising is an effective way to reach consumers who are rather disinterested. Advertising research has shown that the comprehension of tropes is prohibited by shallow information processing, which is a part of levels one and two of Mick’s levels of subjective comprehension (Toncar & Munch, 2001). The benefit of shallow processing is that the explicit message lies within these two levels which thereby lead to the consumer concluding the intended message based off of the explicit message provided in the copy. Because consumers are required to think on a deeper level when processing a trope, consumers may feel a great sense of accomplishment after successfully decoding the message, hence having a higher appreciation for the company for creating a cunning advertisement. The converse of trope advertising is that one may encounter those consumers who do not wish to attempt to cypher through the hidden meaning and just take the information for face value which may lead to a misunderstanding of the ad thereby causing the consumer to lose respect for the company because they do not comprehend the message. There is controversy as to how consumers in high involvement situations react to tropes versus how consumers in low involvement situations interpret tropes. From one perspective, high involvement situations are more favorable for trope advertising because the audience is in a heightened mode which causes them to be more receptive and participative with the advertisement. They are more likely to take the time to focus and interpret the trope. Conversely, other research shows that high involvement situations are not suitable for trope advertising because they become distracted from the claim of the ad which causes the ad to lose its

effectiveness (Petty & Cacioppo, 1983). When dealing with low involvement situations, trope advertising is efficacious because the viewers are less interested in processing explicit messages. The added entertainment of a crafty trope grabs the attention of the viewer which increases the effectiveness of the ad (Toncar & Munch, 2001). According to a study conducted by Toncar and Munch (2001) high involvement consumers were more receptive to explicit messages versus tropes when focusing on claim type and attitude toward the product; however there was no significant difference between those individuals who received tropes and those who received explicit messages when focusing on claim type and receiver's attitude. Low involvement viewers were highly positively affected by tropes all around. Attitude towards products, receiver attitude, as well as depth of processing were positively correlated with trope advertising. Therefore it is safe to conclude that when advertising to low involvement audiences it is more effective to use tropes because it increases brand recognition and gives the consumer a positive outlook on the product.

Exhibit 1

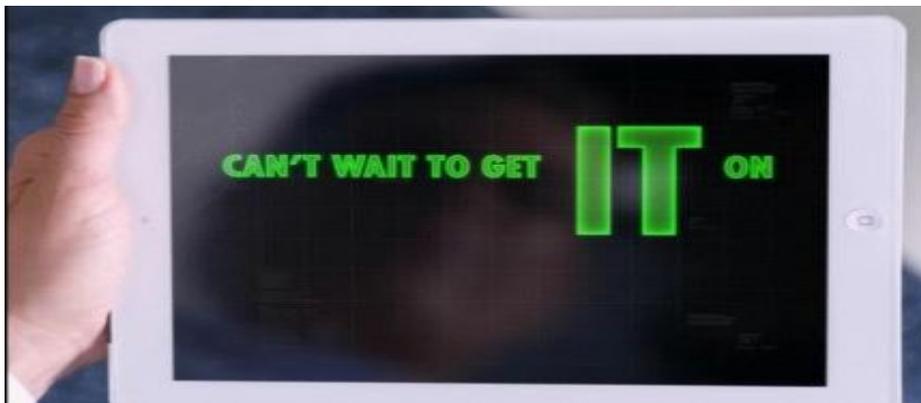


Exhibit 2

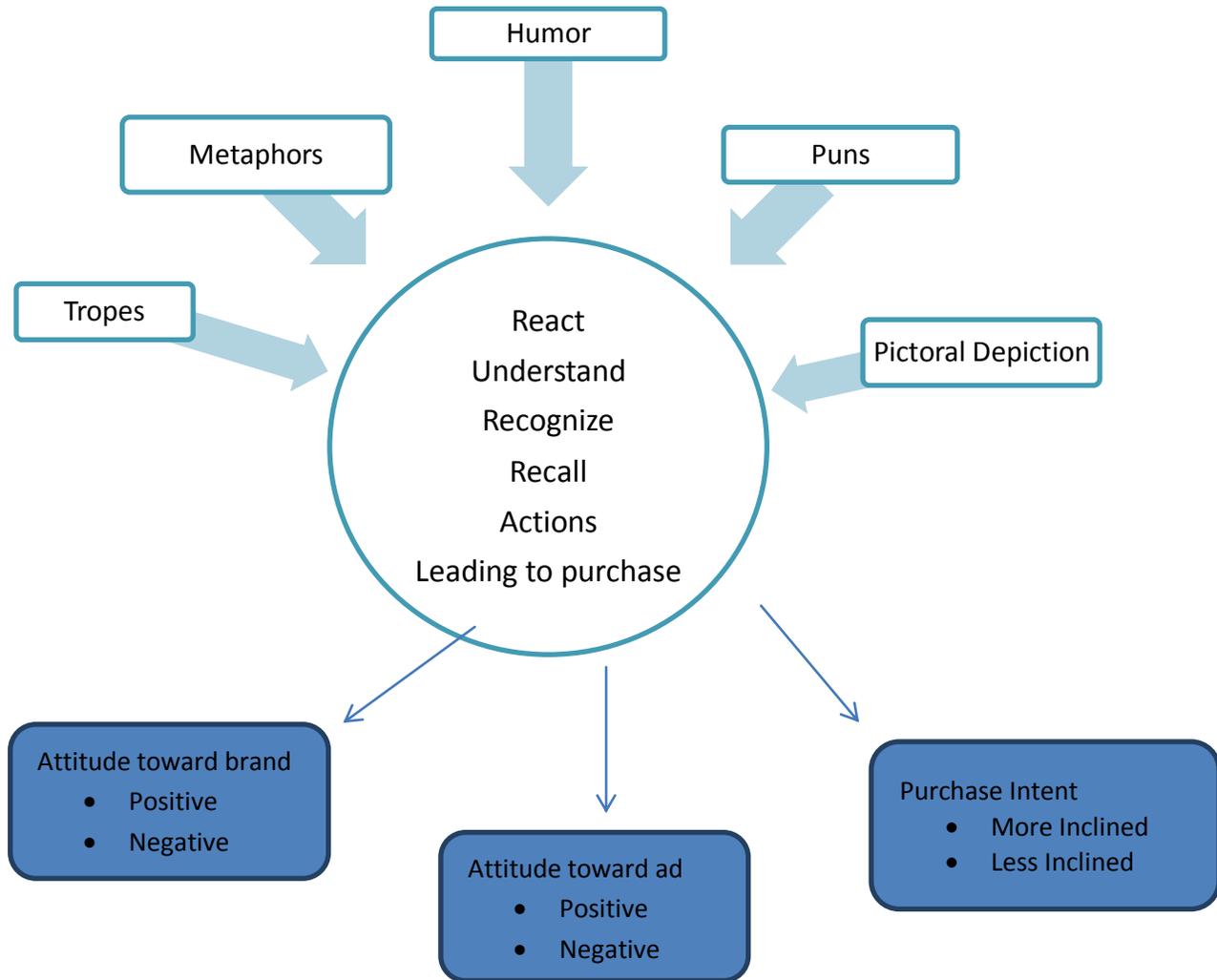


Exhibit 3



Conceptual Framework

Exhibit 4



As previously stated, this research is partially intended to introduce an innovative framework which will determine campaign success when using tropes. This framework states that in order for a campaign to be deemed successful, the ad should evoke a reaction, be uniquely understood, recognition of the product or brand should increase, the product or brand should be easily recalled, and actions leading to purchase should be taken (RURRAL). Indicators of the

RURRAL framework include tropes, metaphors, humor, puns, and pictorial depiction. The output from RURRAL includes attitude toward the ad, attitudes toward the brand, and purchase intent. Attitudes toward the ad as well as the brand can be positive or negative. The viewer may be more or less inclined to purchase the brand or product after viewing the ad.

A study was conducted using a sample of 63 people. Each individual viewed five trope advertisements and expressed on a scale of 1-5 with 1 being least positive and 5 being most positive, how each ad made them feel as well as their purchase intent.

Data Analysis

A focus group research was conducted where a sample size of 63 undergraduate students at a Historically Black College University (HBCU) was selected for the purpose of the research study, out of which 39 were women, 89% were at age between 21 and 30, 63.5% were Marketing and Management major even though students were from all different majors. 56% students are seniors and 32% are graduate students. In addition, 81% of students are African Americans. Please see Table 1 for description of sample.

Table 1-Description of sample

Item	Classification	Percentage
Gender	Male	38.1
	Female	61.9
Age	21 - 25	73.0
	26 - 30	15.9
	31 - 35	3.2
	36 - 40	3.2
	46 - 50	1.6
	51 - 55	3.2
	Area of Specialization	Marketing
Management		20.6
Accounting		3.2
CIS		1.6
G-LIB		1.6
General Business		15.9
Other		14.3
College Standing		Sophomore
	Junior	9.5
	Senior	55.6
	Graduate Student	31.7
	Other	1.6
Ethnicity	African American	80.6
	White (Caucasian)	11.3
	Asian	1.6
	Native Hawaiian or other Pacific Islander	1.6
	Other	4.8

At first, the authors and a graduate assistant screened magazines and newspapers and got 20 ads. These 20 ads were presented to a group of 4 marketing professors. Among them, three are assistant professors and one is a lecturer who is teaching Principle of Marketing. 5 ads were finally selected and used in this research. These ads were put into an online survey and respondents were asked to read the ads and rate their feelings evoked by these ads and also their attitude toward ad, attitude toward brands and purchase intention.

We checked the correlations among the ad evoked feelings and found that they are highly related. Please see Table 2 for correlations for feelings such as Worried - carefree, Insulted - honored, Indifferent - interested, Irritated - pleased, Depressed - cheerful, and Regretful - rejoicing. The correlations among them are between 0.653 and 0.875 and they are significant at the 0.01 level.

**Table 2 - Correlation between Ad-Evoked Feelings
(1=strongest negative feeling; 7=strongest positive feeling)**

Correlations

		Worried _carefree	Insulted _honored	Indifferent_ interested	Irritated _pleased	Depressed _cheerful	Regretful_ rejoicing
Worried _carefree	Pearson Correlation	1	.734**	.651**	.736**	.771**	.768**
	Sig. (1-tailed)		.000	.000	.000	.000	.000
	Covariance	2.633	1.745	1.610	1.862	1.870	1.793
Insulted_ honored	Pearson Correlation	.734**	1	.742**	.792**	.786**	.803**
	Sig. (1-tailed)	.000		.000	.000	.000	.000
	Covariance	1.745	2.149	1.657	1.810	1.721	1.694
Indifferent_ interested	Pearson Correlation	.651**	.742**	1	.770**	.663**	.717**
	Sig. (1-tailed)	.000	.000		.000	.000	.000
	Covariance	1.610	1.657	2.321	1.829	1.508	1.571
Irritated_ pleased	Pearson Correlation	.736**	.792**	.770**	1	.815**	.787**
	Sig. (1-tailed)	.000	.000	.000		.000	.000
	Covariance	1.862	1.810	1.829	2.429	1.897	1.765
Depressed_ cheerful	Pearson Correlation	.771**	.786**	.663**	.815**	1	.853**
	Sig. (1-tailed)	.000	.000	.000	.000		.000
	Covariance	1.870	1.721	1.508	1.897	2.232	1.834
Regretful_ rejoicing	Pearson Correlation	.768**	.803**	.717**	.787**	.853**	1
	Sig. (1-tailed)	.000	.000	.000	.000	.000	
	Covariance	1.793	1.694	1.571	1.765	1.834	2.071

** . Correlation is significant at the 0.01 level (1- tailed).

According to Guans (1998), ads usually evoked 5 different feelings. An exploratory principal components analysis with Varimax rotation was performed on the items of this semantic differential in order to reveal the basic dimensions of the feelings elicited. The result allowing the most homogeneous factor definition was obtained with a 2 orthogonal factor solution (Table 3), explaining 75% of the variance, which is shown in Table 3. This result is different from what Geuens (1998) found.

Table 3 – Summary of Exploratory Factor Analysis results for Ad-Evoked Feelings

Rotated Component Matrix		
	Component	
	1	2
Worried_carefree	.463	.732
Nervous_calm	.366	.802
Contemplative_impulsive	.424	.756
Critical_accepting	.404	.845
Cautious_adventurous	.437	.793
Dubious_confident	.418	.789
Pessimistic_hopeful	.396	.816
Callous_affectionate	.825	.380
Bad_good	.706	.574
Sad_happy	.779	.510
Insulted_honored	.856	.436
Indifferent_interested	.720	.488
Irritated_pleased	.766	.434
Unemotional_sentimental	.773	.361
Depressed_cheerful	.876	.378
Regretful_rejoicing	.832	.437
Eigenvalues	11.996	1.093
% of variance	74.975	6.833
Cronbach alpha	0.969	0.966

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.924
Bartlett's Test of Sphericity	Approx. Chi-Square
	1.437E3
	df
	120
	Sig.
	.000

We also run the reliability analysis for attitude toward ads, attitude towards brands and purchase intention. The Cronbach's alphas for these three constructs are 0.811, 0.931 and 0.841 (please see table 4). According to Hair, Anderson, Tatham & Black (1998), the reliability of the construct is acceptable if Cronbach's α exceeds 0.70 and item-to-total correlations have greater than 0.50.

Table 4 - Summary of Confirmatory Factor Analysis results for Aad, Ab and PI

Construct	Indicators	Cronbach alpha
Aad	1. I like this ad a lot. 2. I don't think this ad is interesting. 3. I think this ad is very convincing. 4. This ad is very appealing. 5. This ad is easy to forget. 6. This ad is not effective.	0.811
Ab	7. Do you like the advertised brand? 8. Do you think this is a good brand? 9. Do you feel favorably towards this brand? 10. Would you recommend the advertised brand to others?	0.931
PI	11. I would not consider trying this brand. 12. If I ran across this brand in a shop, I would buy it. 13. Do you feel favorably towards this brand? 14. When buying the advertised product, I would choose for another brand. 15. When buying the advertised product, I shall probably buy the advertised brand.	0.841

The next step, we should run a structural equation model to test the relationship among ad evoked feelings and attitudes toward ads, attitudes toward brand and purchase intention. We first run a correlation matrix which is show in table 5. From the table 5, we can see the ad evoked feeling 1 is significantly positive related to attitudes toward ads, attitudes toward brand and purchase intention.

Table 5- Correlations among ad evoked feelings and attitudes toward ads, brand and purchase intention

	Mean	Std. Deviation		Feeling 1	Feeling 2	Aad	Ab	PI
Ad evoked feeling 1	0	1.00	Pearson Correlation	1	.000	.381**	.459**	.396**
			Sig. (2-tailed)	1.000	1.000	.002	.000	.001
			Covariance	1.000	.000	1.437	1.382	1.303
Ad evoked feeling 2	0	1.00	Pearson Correlation	.000	1	.038	.232	.028
			Sig. (2-tailed)	1.000	1.000	.767	.069	.831
			Covariance	.000	1.000	.145	.699	.091
Aad	14.751	3.721	Pearson Correlation	.381**	.038	1	.694**	.777**
			Sig. (2-tailed)	.002	.767	.000	.000	.000
			Covariance	1.437	.145	13.876	7.954	9.555
Ab	10.374	3.075	Pearson Correlation	.459**	.232	.694**	1	.813**
			Sig. (2-tailed)	.000	.069	.000	.000	.000
			Covariance	1.382	.699	7.954	9.457	8.251
PI	12.601	3.301	Pearson Correlation	.396**	.028	.777**	.813**	1
			Sig. (2-tailed)	.001	.831	.000	.000	.000
			Covariance	1.303	.091	9.555	8.251	10.900

** . Correlation is significant at the 0.01 level (2-tailed).

Discussion

The RURREAL framework which stands for react, understand, recognize, recall, and actions leading to purchase, is intended to determine if a campaign is successful when using tropes. From our analysis, these ads evoked two kinds of feelings, which are different from what Geuens (1998) found. A structural equation model will be used to examine the relations between the feelings and attitudes towards ads, brands and purchase intention. But the correlation matrix shows that the ad evoked feeling 1 is significantly positive related to all of these three constructs, which is consistent with what we are trying to explore in this research.

Conclusion

The past 10 years have shown significant changes in the advertising industry. With tropes being a fairly new technique in advertising, it has become increasingly popular among advertisers. Studies have shown that among audiences with low involvement, tropes are effective in increasing brand recognition. These audiences are also more likely to recall ads with tropes. Conversely, high involvement audiences often miss the intended message of the advertisement and therefore lose respect for the brand. However, using tropes with high involvement audiences has no effect on the viewer's attitude and decoding the intended message. Tropes are an effective technique for advertising campaigns when targeted towards the correct audience.

References

- Braun-Latour, K. A., & Zaltman, G. (2006). Memory Change: An Intimate Measure of Persuasion. *Journal of Advertising Research*, 57-72.
- Childers, T. L., & Jass, J. (2002). All Dressed Up With Something to Say: Effects of Typeface Semantic Associations on Brand Perceptions and Consumer Memory. *Journal of Consumer Psychology*, 93-106.
- Coulter, R. A., Zaltman, G., & Coulter, K. S. (2001). Interpreting Consumer Perceptions of Advertising: An Application of the Zaltman Metaphor Elicitation Technique. *Journal of Advertising*, 1-21.
- Lau-Gesk, L., & Meyers-Levy, J. (2009). Emotional Persuasion: When the Valence Versus the Resource Demands of Emotions Influence Consumers' Attitudes. *Journal of Consumer Research*, 585-599.
- McQuarrie, E. F., & Phillips, B. J. (2005). Indirect Persuasion in Advertising: How Consumers Process Metaphors Presented in Pictures and Words. *Journal of Advertising*, 7-20.
- McQuarrie, E., & Mick, D. G. (1999). Visual Rhetoric in Advertising: Text-Interpretive, Experimental, and Reader-Response Analyses. *Journal of Consumer Research*, 37-54.
- McQuarrie, E., & Phillips, B. J. (2005). INDIRECT PERSUASION IN ADVERTISING. *Journal of Advertising*, 7-20.
- Mothersbaugh, D. L., Huhmann, B. A., & Franke, G. R. (2002). Combinatory and Separative Effects of Rhetorical Figures on Consumers' Effort and Focus in Ad Processing. *Journal of Consumer Research*, 589-602.
- Toncar, M. F., & Munch, J. M. (2003). THE INFLUENCE OF SIMPLE AND COMPLEX TROPES ON BELIEVABILITY, IMPORTANCE AND MEMORY. *Journal of Marketing Theory and Practice*, 39-53.
- Toncar, M., & Munch, J. (2001). Consumer Responses to Tropes in Print Advertising. *Journal of Advertising*, 55-65.
- van Enschoot, R., Hoeken, H., & van Mulken, M. (2008). Rhetoric in Advertising: Attitudes towards verbo-pictorial rhetorical figures. *Information Design Journal*, 35-45.

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A Failed Attempt to Redesign: A Look at How Bureaucracy and Evolving Technology at a University Altered the Direction of an Overly Optimistic Project

Abstract

Introduction

Information technology is an agent of change for an organization (Markus and Robey 1988). It facilitates the change directed by the organization and the needs of that organization. If properly managed, the change can be swift and productive. To implement the change, skilled individuals employ resources. In this case, an organizational unit was looking to update the look and functionality of their website. The functionality would be upgraded by a student looking to fulfill requirements for a degree and overseen by a faculty member in a separate academic organizational unit. The look would come from a new template that had been used for site design for several organizational units. This template was held by another organizational unit in a bureaucracy.

A bureaucracy is an organizational type which relies heavily on rules of process and responsibility (Weber 1968). These rules and responsibility restrict the free flow of ideas and inhibit change. In this case, ownership of the website and the template were in the process of being changed. The rules for how to obtain and use the template had not been established at the beginning of this case and, after another year of negotiations, were not complete.

In order to protect the anonymity of those involved in this case, names and descriptions have been altered or obscured. The authors are student and faculty member mentioned above.

Case Narrative

Background

The mission of the Honors Program at University X has always been to “foster a spirit of creativity” within its students. However, the director of the Honors Program, referred to as the Director, believed the web presence of the Honors Program sent a conflicting message because of the outdated user interface and content. In order to correct this problem, the Director enlisted the assistance of one of the current Honors Program members majoring in Information Technology. The case study illustrates the challenges and lessons learned in attempting to revamp the Honors Program website and redesign its database.

University X is located in the Southern region of the United States. University X has over 20,000 students. The Honors Program at University X boasts over 450 students. The Honors Program stresses the importance of service learning projects, experiential learning projects, and research. In order to encourage participation in at least one of the three categories, students are required to complete a hands-on project

that directly relates to one of the categories each academic year. Students could either complete their project in the fall, spring or summer. At the start of the semester in which the student wished to complete the project, the student is required to register the project online by using the sign-up form located on the Honors Program website.

Case Description

The remainder of the case details the redesigning efforts. The systems development and life cycle (SDLC) process was used to break the project into manageable parts. The SDLC was used because it is a recognized standard.

Each phase is detailed in the following pages as well as the individuals the authors worked with during each phase in order to carry out the project. Table 1 illustrates the different phases, the work associated with each phase, and the time allotted for each phase.

Table 1: Tasks and Timeline

Phase (time frame)	Tasks
Planning (October – mid-Nov. 2010)	Develop a preliminary understanding of the situation and how information systems might help solve a problem or make an opportunity possible
Analysis (mid-Nov 2010 – mid- Feb. 2011)	Analyze the situation thoroughly to determine requirements, structure those requirements
Design (mid-Feb – mid-April 2011)	Elicit and structure all information requirements; Develop all technological and organization specification
Implementation (mid –April – July 2011)	Write programs, build data files, test and install new system, train Honors Program personnel, finalize documentation
Maintenance (July - ? 2011)	Monitor operation and usefulness of a system; Repair and enhance the system

Planning Phase

The first step of the SDLC process is the planning phase. This phase is said to be the most important because poorly defined requirements can cripple a project (Langer 2008).

For this particular IT project, it meant meeting with an IT professional who worked for the University to get a better understanding of the University's web policies; as well as, meeting with both the Director and the student assistants who managed the Excel file and the Access Database to properly identify the problem.

The planning phase concluded ahead of schedule.

Meeting with the Director Fall 2010

The student writer met with the Director first. The Director explained that a previous member of the Honors Program designed the current site using University X's web template. The Director said the current template was outdated. He expressed a desire to upgrade to newer version of University X's web template.

The Director also explained the importance of the sign-up form. The sign-up form was the main method of collecting student information each semester. The Director encouraged the student writer to meet with both of the student assistants to get a better understanding of the flow of information from the website to the Access Database. Subsequent meetings with the two student assistants of the Honors Program revealed the following:

After the student entered the information and clicked the submit button, the information was sent via email to the Assistant Director of the Honors Program. Then, the data was handed over to one of the student assistants of the Honors Program. The first assistant would manually enter the new information into an Excel spreadsheet to verify that certain criteria had been met. The Excel spreadsheet contained past information on all students from past semesters. New Information from the current semesters was added to the older information. Then, the second student assistant would export the Excel spreadsheet into Access and overwrite the older database. It is worth noting that the Honors Program had one database which consisted of one table. The one table consisted of over 502 records and 118 fields.

Requirements Analysis

Meetings with the Director and the student assistants revealed two major problems: manual entry of data and an outdated web interface. The student author met with her Faculty mentor and discussed using the server side scripting language, PHP, combined with a MySQL database to automatically migrate the data from the web into a MySQL database. Doing so would eliminate manual data entry and significantly improve data integrity. Both the student and Faculty authors agreed the database, consisting of one table, needed to be normalized and broken up into smaller tables.

The Director used the upgraded site of College of Liberal Arts and Social Sciences as a model of good website. The Director also indicated the finished Honors Program site should look very similar to that of the College of Liberal Arts and Social Sciences.

The Requirements Analysis phase concluded as scheduled with the decisions to use PHP and MySQL to transfer and store the data and to obtain a copy of the newest version of University X's web template.

Design

Meeting with University X's IT Personnel March 2, 2011

Both the student and Faculty mentor met with an I.T. Personnel of University X who had access to the newest version of the web template. The I.T. Personnel worked for the Marketing Department. The meeting revealed Marketing was no longer in charge of the web template. I.T. Services had taken control of the template. The I.T. Personnel did not feel comfortable giving the student and Faculty mentor the web template because the University was currently attempting to use SharePoint to develop an even newer version of the web template and thus control the appearance University's websites using SharePoint.

It was readily apparent that many in the organization knew where the template was, knew how to use the template, but did not want to release it. The Faculty mentor suspected they were creating a structure to handle it (moving responsibility from IT service to Marketing and then to a sub-set of a piece of IT Services with multiple reports). The structure points to "bureaucracy in action"! The intent may have not been malicious, but the concealment of information was deliberate.

Spring 2011

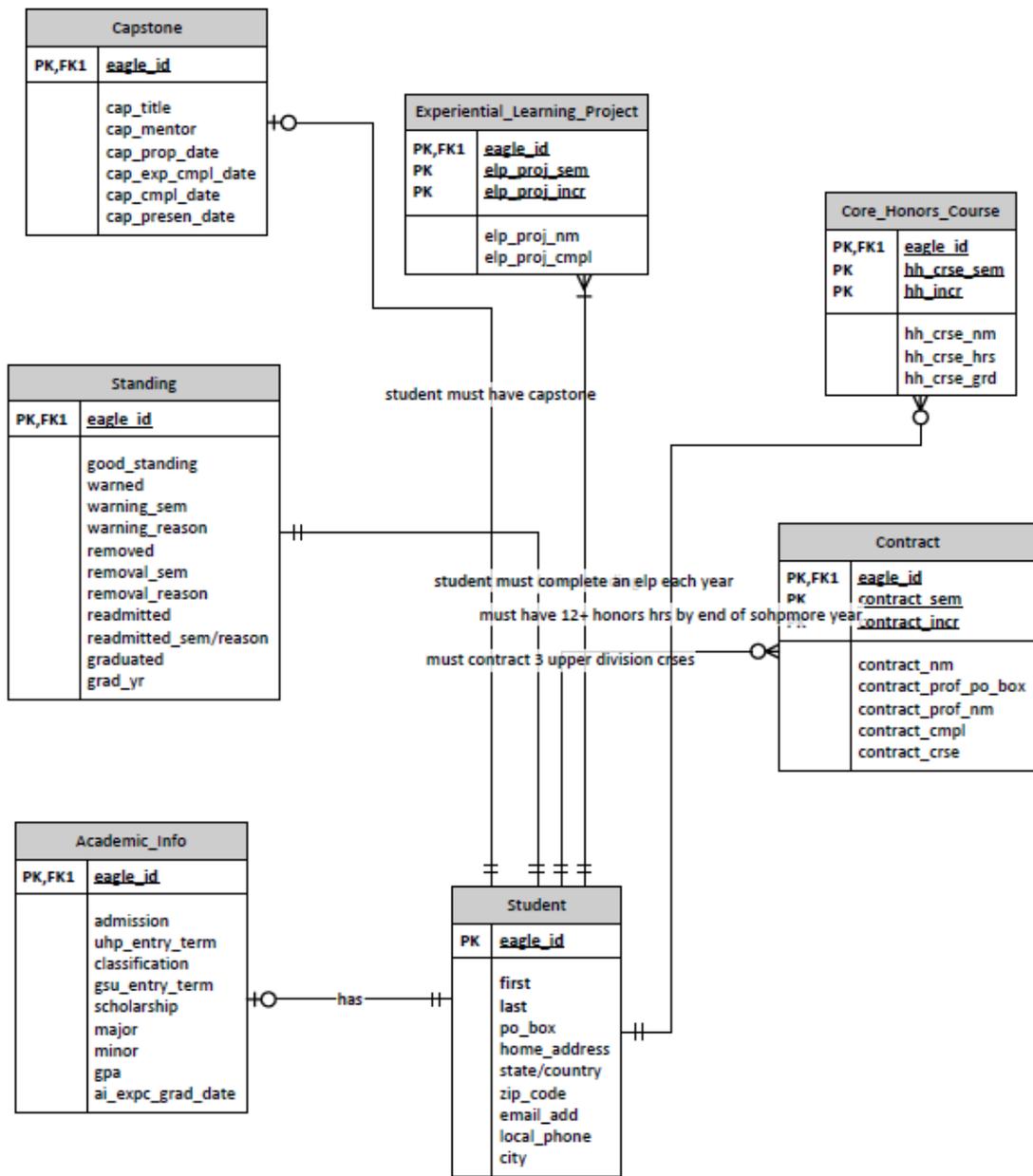
Both the Faculty mentor and the student agreed to continue on with the Design phase while other methods of procuring the template were explored. The Faculty mentor contacted the Computer Science Department as well as the Chair of the IT department asking for a copy of the template.

By the end of April, the student author had scheduled several additional meetings with the Honors Program student worker in charge of the Access database. The specifications for the MySQL database were further refined until the Honors Program database was broken into the following seven tables:

- Student (the student's personal information)
- Standing (current standing of student: good or probation)
- Core_Honors_Courses (honors courses the student has taken)
- Capstone (capstone requirements upper division students have completed)
- Contract (honors courses upper division students have contracted)
- Experiential_Learning_Project (hands-on projects the students have completed in the past)
- Academic_Info (academic information pertaining to each student)

Around early June, the entity relationship diagram for the database was finalized. Figure 1 shows the final ER diagram.

Figure 1: Finalized ER Diagram



The Design Phase concluded unsuccessfully: the ER diagram was completed behind schedule. Parts of the template were established; however, the important parts were still missing. This project needed a complete web template.

Implementation Phase

Meeting with the Director June 17, 2011

The student author met with the Director to discuss the progress with the ER diagram. The Director shared information about and gave a demonstration on a new web based auditing system University X would be moving towards widely using: DegreeWorks. DegreeWorks helps students and advisors track courses needed for graduation. Since DegreeWorks would track all the courses the students complete, it was no longer necessary to maintain an Honors Program database with all that information. Instead, the scope of this project was decreased to just creating a database that would keep track of the hands-on projects (service learning, experiential learning, and academic research) the students completed.

This meant the ER diagram from Figure 1 was no longer valid. All the tables except the `Experiential_Learning_Project` table and the `Student` table would be dropped. Following this meeting with the Director, The MySQL database was created and a mock sign-up form was created to test the data entry, transfer, and ultimate insertion into the MySQL database.

Summer 2011 (mid-June – late- July 2011)

After working on the database for the majority of the summer, the direction of the project changed again. The Director indicated he was no longer certain a database would be appropriate for collecting the information about the hands-on projects. Instead, the Director wanted to use Survey Monkey instead. Once again, the scope of the project had been decreased from its initial size. One reason could have been the Director's unfamiliarity with databases. Instead of using a database, the Director chose to use a more familiar tool that did not require any additional knowledge on his part.

Another task was added to the scope of this project. The Director wanted a new form to be placed on the website which would collect alumni information and store it in a database.

University X had started using an even newer version of their web template on some of its pages. To clarify, there were 3 versions of the template currently being used. The first version (the version the Honors Program currently had), the second version (the version this project tried to get) and the third version (the newest version the Director now wanted).

Meeting with Director (August 17, 2011)

The Faculty mentor, Director, and student all met to discuss the future direction of the project. During this meeting, the Director revealed he had contacted I.T. Services to see if the Honors Program website was able to be upgraded to the newest version of the template, one of the key pieces of the original project. He was asked to drop of some materials that would be included in the project that was to be completed by the student author. This information was given to a student worker who reported to both Marketing and I.T. Services. The student moved the website to the new template, incorporated the changes that the Director wanted all within an hour.

The Implementation Phase was not complete. The scope of the project changed continuously. The original requirements were not completed because they were no longer necessary. Even though the Faculty mentor worked very hard to get a complete template, it was not possible. But, the Director was able to have someone in Marketing or I.T. Services complete this task and modernize the Honors Program website to the newest and latest version of the template.

Maintenance

The maintenance phase was never started because the original project was never completed because of the scope reductions.

Discussion

The Role of Evolving IT

During the span of this project, University X witnessed 3 different web templates. Some pages of the University's website still used the oldest version (the version the Honors Program website used at the start of the project), others were converting to the second version (the version the Faculty mentor worked very hard to acquire), while other departments were being upgraded to the newest version (the version the Director asked Marketing to use to style the Honors Program website).

DegreeWorks was the other unexpected element the Faculty mentor and student encountered during this IT project. DegreeWorks decreased the scope of the project significantly. The database size went from seven tables to only two. This caused the Director to question the necessity of the database and to ultimately scrap the database and use Survey Monkey instead.

There were two main objectives in this project: 1) revamp the Honors Program website and 2) redesign the database. DegreeWorks led to the termination of the database and one half of this project.

The Role of Bureaucracy

The Faculty mentor made many attempts to procure a complete copy of the second version of the template. Near the end of summer 2011, the newest version of the web template appeared. In other words, his efforts to acquire the second version over the past six months meant nothing. The Director wanted the most current version.

The reluctance the student encountered from Marketing disillusioned the Director. After several months without any results, the Director finally contacted I.T. Services who referred him to Marketing. Marketing redesigned the Honors Program website. In doing so, the last major part of the project was completed.

Final Thoughts

In hindsight, the student believes this project was overly optimistic because even though ample time was given to each phase, as seen in Table 1, no thought was given to the possibility of failing to procure the template. The student thought Marketing would be more helpful. The failed attempts made in this project contributed to the student's overall understanding of I.T. projects and the reality that failure is a real possibility that is sometimes outside the control of the individuals working on the project team.

Langer, A. M. (2008). System Development Life Cycle (SDLC)

Analysis and Design of Information Systems, Springer London: 10-20.

Markus, M. L. and D. Robey (1988). "Information Technology and Organizational Change: Causal Structure in Theory and Research." ManagementScience **34**(5): 583-598.

Weber, M. (1968). Economyandsociety: anoutlineofinterpretivesociology. Bedminster Press, New York.

Decision Support and Enterprise Content Management Systems: Current and Future Trends

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ABSTRACT

Although enterprise content management (ECM) can be viewed as an evolutionary phase of information management that involves the management of structured and unstructured content through the complete content lifecycle, the capacity for decision-making support is not utilized to any great extent, and there appears to be strong need to investigate the relationship between decision support (DS) and ECM systems. The goal of this paper is to explore the relationship between ECM systems and DS. Based on classifying the decision support systems (DSS) into classic systems [34] and specialized systems [15], we conclude that ECM systems can have the capabilities of the classic DSS, and have only a portion of group decision support systems (GDSS) capabilities. Finally, based on literature we attempt to determine the decision support capabilities of ECM in near future.

Keywords:

Enterprise content management, decision support systems, real-time decision making

INTRODUCTION

As the business environment is getting ever more complex and competitive, the requirement of good and timely decision-making is becoming increasingly evident, and the employment of decision support (DS) technology is becoming not only desirable but also essential. DS technology can reduce uncertainty and increase efficiency in the decision-making process, and much research has been published focusing on the efficiency and effectiveness of DS systems [5,6]. DS technology encompasses many types of systems, including decision support systems (DSS) in its original and narrow sense [38], expert systems (ES) [23], executive information systems (EIS) [43,35], and group decision support systems (GDSS) [15]. In addition, there are hybrid systems and newer types of DS technologies, often developed and designed around specific problem contexts, including systems that make use of knowledge management (KM) techniques [27,4]. For example, by using a knowledge-based approach, Zack [47] showed how the organizational and technological DS systems are linked to solve knowledge-based problems.

Enterprise content management (ECM) systems are implemented in many organizations to deal with the increasing information overload and with the complexity of the structured and unstructured organizational data. ECM has many definitions; for instance, the ECM Association (AIIM) defines ECM as “the strategies, methods and tools used to capture, manage, store, preserve, and deliver content and documents related to organizational processes. ECM tools and strategies allow the management of an organization's unstructured information, wherever that information exists” (www.aiim.org). ECM is also defined as “the strategies, tools, processes and skills an organization needs to manage all its information assets (regardless of type) over their lifecycle” [37, p.648]. ECM can be viewed as an evolutionary phase of information management that involves the management of structured and unstructured content through the complete content lifecycle [10]. There appears to be a consensus in the published research that ECM is not only a practical set of technologies but also includes organizational concepts that involve many business perspectives [9,24,42,11]. Rockley [32] reported that one of the main goals of ECM implementation is to have transparent content sharing by making different and disparate applications (i.e. web content

management, records management) interoperable. Shared transparent content that facilitates cross-departmental collaboration can facilitate the capturing of knowledge and content [19].

“Enterprise content management (ECM) is an integrated approach to managing all of an organization’s information including paper documents, data, reports, web pages, and digital assets”[37]. So the content of the enterprise can be classified into data, information, and knowledge. In the ideal enterprise, we believe that content activities are correlated with the content types as depicted in figure 1. Raw data is collected by the capture activity, then it is arranged and classified through organize activity to make it easily navigable. The output of this activity can be perceived as information. After that the information is analyzed through process activity in order to get knowledge that helps in decision-making.

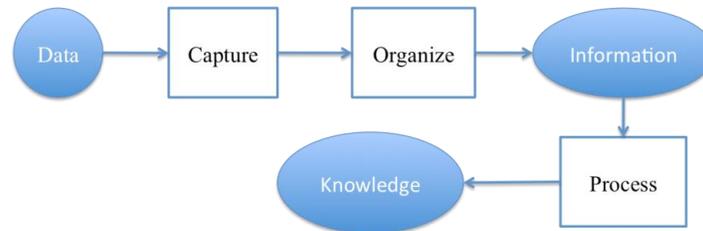


Figure 1: Content Levels and ECM Activities

However, in real-world organizations, the process activity is ignored and only few firms analyze the content to improve decision-making. “In the rush to use computers for all transactions, most organizations have neglected the most important step ... the human realm of analyzing and interpreting data and acting on the insights” [14, p.121]. Thus, many organizations are not utilizing the decision support capabilities of ECM. As potential long-term benefits of ECM, the capacity for decision-making support is not utilized to any great extent, and there appears to be strong need to investigate the relationship between DS and ECM systems. Smith and Mckeen [37] conclude that ‘very few’ firms utilize ECM to analyze the content to provide decision-making information to be used to make informed decision, and thus to help in generating business value.

This paper has two objectives. First, after classifying the decision support systems into classic systems [34] and specialized systems [15], we want to determine under which category the decision support capabilities of ECM can be categorized. In other word, do the ECM systems have only basic DS capabilities (i.e. providing access to data, processing data) or do they have more advanced DS capabilities (i.e. facilitating collaboration and communication)? We argue that such determination will provide the practitioners with an overview of the level (basic vs. advanced) of ECM decision support capabilities. Such an overview gives practitioners more knowledge about the ECM systems that managers deal daily with. To achieve this objective, we will investigate, based on literature of ECM and DS, the common components among the classic and the advanced DSS and the ECM. The second objective is expecting what the decision support capabilities of ECM can be in near future. Anticipating the future trends can help both researchers and practitioners. Future trend can work as a research agenda for researchers. For example, researchers can investigate the influence of mobile technology on the decision support capabilities of ECM. Also, future trend also informs practitioners that an advanced decision support can be achieved by ECM systems.

The reset of the paper is arranged as follows. In section 2, we discuss the details and types of decision support capabilities and classify them to basic and specialized decision support capabilities. In section 3, we discuss the future DS capabilities of ECM systems based on literature. Finally, we conclude in section 4.

THE DECISION SUPPORT CAPABILITIES OF ECM: BASIC VS. SPECIALIZED

In this section we make two comparisons. First, we compare between the components of classic DSS and those of ECM. Then, we compare between the components of specialized DSS, namely group decision support system (GDSS), and those of ECM.

Classic Decision Support Capabilities of ECM

Decision support systems are technology solutions that are used to support problem solving and decision making. Classic DS capabilities can be limited to the basic decision support capabilities such as providing access to data and/or processing data. Shim's et al. [34] defines the classic DSS tools as techniques that should have the following components: "(i) sophisticated database management capabilities with access to internal and external data, information, and knowledge, (ii) powerful modeling functions accessed by a model management system, and (iii) powerful, yet simple user interface designs that enable interactive queries, reporting, and graphing functions" (pp. 111-112).

Based on ECM literature, database management system (DBMS) is an essential part of ECM systems. For example, Rampone [30] argue DBMS is one of the requirements of content management system in order to support storage and retrieval. Relational database management system is an important component of Alfresco (one type of ECM system) architecture [7]. PostgreSQL, which is an open database management system, is used to design CMS for libraries [46]. Surjanto et al. [40] use a relational database management system is used to enhance the content management of XML document. According to the Gilbane Report [41], Inmagic released an open source content management system that combines the benefits of database management with high speeds search and categorization. Zena, which is an open source ECM, use MySQL as its main database management system [25].

The ECM literature also shows that model management system is another component of ECM. Carvalho [12] and Nordheim and Päiväranta [26], purport that ECM systems have a content management model that allows structuring the content and metadata model in order to have functional customization. Content management model can consist of role management, template management, taxonomy management, and metadata management [44].

In addition, interface design is highly discussed in ECM literature. For instance, AIIM [1] mentions that enterprise content management systems "... provide users with greater access to digital information from a common user interface through the utilization of industry standard Internet browser technology (p. 3)." Alfresco Enterprise Content Management provides a user-friendly and a graphical user interface components that allows accessing the content services [7]. Suna [39] argues that user interface, that includes Graphic User Interface and enterprise information portal, is one layer of the enterprise content management architecture. Drupal, which is an open source content management system, has a graphical interface that helps in configuring the blocks of the content [17].

Based on the Shim's et al. [34] definition of classic DSS and the above ECM review, we argue that ECM has similar components to classic DSS, and based on this we also conclude that ECM can have the capabilities of the classic DSS.

Specialized Decision Support Capabilities of ECM

In this section, we review the related literature to determine if ECM has common components with a specialized DSS. We chose GDSS as the specialized DSS that may have common components with ECM because we noticed that the term "collaboration", which entails group interaction, is repeated many times in ECM literature. GDSS is computer technology solutions that are used to enhance the process of group decision making; GDSS eliminates communication barriers, and helps in achieving structuring decision analysis by managing the timing and content of discussions [22,8]. To determine the main components of GDSS, we adopt the definition of DeSanctis and Gallupe [15]. GDSS "combines *communication*, *computing*, and *decision support technologies* to facilitate formulation and solution of unstructured problems by a group of people." Therefore, based on this definition, GDSS has three major components: communication, computing, and decision support technologies. Table 1 shows some examples about each component.

Communication	Computing	Decision support
<ul style="list-style-type: none"> •Electronic messaging •Local- and wide-area networks, •Teleconferencing •Store and forward facilities 	<ul style="list-style-type: none"> •Multi-user operating systems •Fourth generation languages •Data base, data analysis facilities •Data storage and modification capabilities 	<ul style="list-style-type: none"> •Decision modeling methods (i.e. decision trees) •Structured group methods (i.e. Delphi techniques) •Group discussion directing rules

Table 1: Examples of GDSS Components [15]

Communication components are included in many ECM systems. Collaboration, which includes video conferencing, collaborative authoring, and shared whiteboards, is considered a key component function that needs to be managed in ECM [18]. Blair [9] argues that electronic collaboration techniques such as web conferencing applications are considered as a part of the ECM system. Alsup [2] suggests that ECM systems consist of the integration among the traditional repositories of unstructured information (i.e. paper) and the modern ones (i.e. local area networks, and electronic mail).

Furthermore, some examples of the computing components exist in ECM systems. Amato et al. [3] claim that their proposed content management system, which is designed for digital library application, can serve several users requests in less than a second. Content analysis is one primary content activity that is discussed in [31,37]. However, the decision support components lack support from ECM literature. We could not find any ECM research that mentions the decision support component as a part of ECM. Table 2 summarizes the findings of the previous subsections

Type of DSS	DSS Components	Support from ECM Literature
Classic DSS	Database management system	[30,7, 46,40,41,25]
	Model management system	[12,26,44]
	Interface design	[1,7,39,17]
Specialized DSS (GDSS)	Communication	[18,9,2]
	Computing	[3,31,37]
	Decision support	No support from ECM literature

Table 2: Types of DSS, their Components, and Support from ECM Literature

Therefore, we conclude that ECM systems have only part of GDSS components, namely communication and computing components. Therefore, one can assume that ECM systems have only a portion of GDSS capabilities.

Both basic types of ECM decision support capabilities (classic and specialized) help in supporting both operational and strategic decisions. For operational decisions, ECM can improve internal and external collaboration, provide new (or modified) customer products and/or services that involve digital content, make the work easier for workers by reducing the tedious routines [28], enhance content quality and consistency [32], information traceability, secure, easy, and correct access to information, provision of legal requirements, function, limit duplication [26], the speed of search and retrieval [33], and provide effective training that raises the efficiency of employees. For strategic decisions, ECM can help in cost savings in information processing [32,28], satisfy governmental regulations and standards (compliance), having professional representation of the enterprise in the eyes of its stakeholders [28], and increase the efficiency and the flexibility of business processes [31].

FUTURE DS CAPABILITIES OF ECM

Before discussing the future trends of ECM, we need to highlight that the current ECM capabilities are not fully utilized. In order to get the most benefits of ECM, we believe that strong business process analysis, application development, and system design are required.

In section 2 we have shown that only a portion the GDSS components exist in the current ECM systems. The first logical expectation is to have an ECM system that has all GDSS components and capabilities in

near future. Thus, we expect that ECM systems will be able to communicate, compute, and have decision support methods that allow ECM to be a full specialized DSS.

In addition, we expect in near future to have an advanced version of the aforementioned DS capabilities, that allow ECM to achieve real-time decision making (RTDM). According to Fan et al. [16], real-time data processing and decision-making is a potential feature in enterprise systems. RTDM needs real time information capabilities [45] that future ECM can have. We believe that ECM can have RTDM by adopting mobile business technology because it offers many decision support benefits. Mobile business can be defined as the mobile technologies applications that enhance the current business processes and helps in entering new market segments [21]. Thus, adopting the mobile business principles provides decision makers with different useful features such as the following:

- Accessibility: mobile applications can be accessed in any place at any time [20].
- Context sensitivity: mobile technology helps in identifying, for example, the physical environment as well as geographic position [36].
- Interactivity: mobile technology allows decision makers for greater interactivity since the setup time is relatively short and the connectivity is always online [21].
- Transparency: process transparency increases by the use of mobile applications, which decreases the cost of process control [13].
- Convenience: for specific applications, mobile technology offers more convenience and familiarity when compared to standard PC applications [29].

Figure 2 summarized the future of ECM trends.

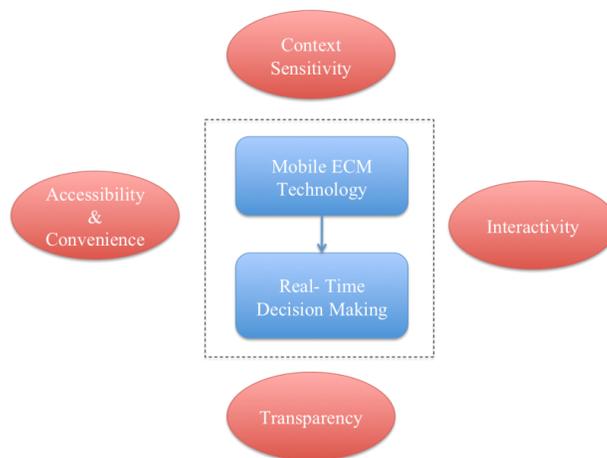


Figure 2: Future ECM Trend

CONCLUSION

ECM systems are implemented in many organizations to deal with the complexity of the structured and unstructured organizational data. However, many organizations are not utilizing the decision support capabilities of ECM, and the capacity for decision-making support is not utilized to any great extent. Therefore, we have investigated the DS capabilities of ECM by focusing on current and future trends. We have shown that ECM systems have the all components of the basic DS, and part of the specialized DS. These findings will raise the awareness of the practitioners that ECM systems can have the basic DS capabilities and part of the GDSS capabilities. We have also identified the future trends of ECM, which can work as a research agenda for researchers. For example, researchers can investigate the influence of mobile technology on the decision support capabilities of ECM. Also, future trend also informs practitioners that an advanced decision support can be achieved by ECM systems.

However, the paper has some limitations. First, the ECM systems that are reviewed in this paper are not the same and vary based on the organizations needs. The components of one ECM system in one organization may differ from the components of another ECM system in another organization. Based on that, the basic and specialized decision support capabilities will also vary. Second, the comparison among ECM systems, classic DSS, and specialized DSS is based only on the definitions of Shim et al. [34] and DeSanctis and Gallupe [15]. There are other definitions of classic and specialized DSS that we did not consider in this paper. Finally, the research is based on literature review of ECM and DS research, and lacks empirical testing. In our future research, we will design a survey and test the proposed hypotheses in a real-world organization.

References

- [1] AIIM (2007) Recommended Practice, Analysis, Selection, and Implementation of Electronic Document Management Systems (EDMS), available from <http://www.aiim.org/documents/standards/arp1-2007.pdf>
- [2] Alsup, M. (2004) Enterprise Content Management: The New Rationale, Gimmel Group, available from: http://www.gimmel.com/Publications/Documents/ECM_The_New_Rationale.pdf
- [3] Amato, G. Gennaro, C. Rabitti, F. and Savino P. (2005) Functionalities of a Content Management System specialized for Digital Library Applications, available from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.76.1420&rep=rep1&type=pdf>.
- [4] Anderson-Lehman, R., Watson, H. J., Wixom, B. H., and Hoffer, J. A. (2004) Continental Airlines flies high with real-time business intelligence, *MIS Quarterly Executive*, 3(4), 163-176
- [5] Arnott, D. (2004) Decision support systems evolutions: framework, case study, and research agenda, *European Journal of Information Systems*, 13(4), 247-259
- [6] Arnott, D., and Pervan, G. (2005) A critical analysis of decision support systems research, *Journal of Information Technology*, 20(2), 67-87
- [7] Aziz, B. Arenas, A. Cortese, G. Crispo, B. and Causetti, S. (2010) A Secure and Scalable Grid-Based Content Management System, *Proceedings of the International Conference on Availability, Reliability and Security*
- [8] Barkhi, R., Jacob, V.S. and Pirkulb, H. (2004) The Influence of Communication Mode and Incentive Structure on GDSS Process and Outcomes, *Decision Support Systems*, 37(2), 287-305
- [9] Blair, B. (2004) An Enterprise Content Management Primer, *Information Management Journal*, 38(5), 64-66.
- [10] Boiko, B. (2002), *Content Management Bible*, Hungry Minds, New York
- [11] Brocke, J., Simons, A., and Cleven, A. (2008) A business process perspective on enterprise content management: towards a framework for organisational change, *Proceedings of the 16th European Conference on Information Systems*, Galway, Ireland, 1680-1691
- [12] Carvalho, R. A. (2007) in IFIP International Federation for Information Processing, Volume 254, Research and Practical Issues of Enterprise Information Systems II Volume 1, eds. L. Xu, Tjoa A., Chaudhry S. (Boston: Springer), 173-183.
- [13] Chen, M. (2005) A methodology for building mobile computing applications: business strategy and technical architecture, *International Journal of Electronic Business*, 2(3), 229-43.
- [14] Davenport, T.H., Harris, J.G., De Long, D.W., and Jacobson A.L. (2001) Data to knowledge to results: building an analytic capability, *California Management Review*, 43(2), 117-138
- [15] DeSanctis, G. and Gallupe, R.B. (1987) A foundation for the study of group decision support systems, *Management Science*, 33(5), 589-609
- [16] Fan, M. Stallaert, J. Whinston, A.B. (2000) The adoption and design methodologies of component-based enterprise systems, *European Journal of Information Systems*, 9, 25-35
- [17] Fennell, C. M. (2007) Content Management and Web 2.0 with Drupal, *Medical Reference Services Quarterly*, 26(S1), 143-167
- [18] Fowler, D. (2008), *Implementing Enterprise Content Management Using Microsoft SharePoint*, Capstone Report, University of Oregon
- [19] Jenkins, T. (2004) *Enterprise Content Management: What you Need to Know*, OT: Open Text Corporation

- [20] Laukkanen, T. (2005), Comparing consumer value creation in internet and mobile banking, in Brookes, W., Lawrence, E., Steele, R. and Chang, E. (Eds), *Proceedings of the 4th International Conference on Mobile Business*, Sydney, July 11, IEEE Computer Society, Washington, DC, 655-8.
- [21] Lehner, F. (2003), *Mobile und drahtlose Informations systeme: Technologien, Anwendungen, Markte*, Springer, Berlin
- [22] Limayem, M. Banerjee, P. and Ma, L. (2006) Impact of GDSS: Opening the Black Box, *Decision Support Systems*, 42, 945-957
- [23] Luconi, F.L. Malone, T.W. and Scott Morton M.S. (1986) Expert systems: the next challenge for managers. *Sloan Management Review*, 27(4)
- [24] Munkvold, B.E. Päivärinta, T. Hodne, A.K. and Stangeland, E. (2006) Contemporary issues of enterprise content management: the case of Statoil, *Scandinavian Journal of Information Systems*, 18, 69-100
- [25] Naik, U. Shivalingaiah D. (2009), Open Source Software for Content Management System, *Proceedings of the 7th International CALIBER*
- [26] Nordheim, S. and Päivärinta, T. (2006) Implementing enterprise content management: from evolution through strategy to contradictions out-of-the-box, *European Journal of Information Systems*, 15, 648-662
- [27] Oppong, S.A. Yen, D.C. and Merhout, J.W. (2005) A new strategy for harnessing knowledge management in e-commerce, *Technology in Society*, 27(3), 413-435
- [28] Päivärinta, T., and Munkvold B.E. (2005) Enterprise content management: an integrated perspective on information management, *Proceedings of the 38th Hawaii International Conference on System Sciences*, IEEE Computer Society, Big Island, HI, USA
- [29] Perry, M. O'Hara, K. Sellen, A. Brown, B. and Harper, R. (2001), Dealing with mobility: understanding access anytime, anywhere, *Transactions on Computer-human Interaction*, 8(4), 323-47.
- [30] Rampone, S. (2009) A Web Content Management System for a Geo-Archeological Research Program, *Journal of Uncertain Systems*, 3(2), 95-107
- [31] Reimer, J.A. (2002) Enterprise content management, *Datenbanken Spektrum*, 2(4), 17-35
- [32] Rockley, A. (2006) Content management 2006: market directions and trends, *The Rockley Bulletin*.
- [33] Seeley, C. (2002) Igniting Knowledge in Your Business Processes: How to Connect Knowledge Activities with Your Business Processes, *KM Review*, 5(4), 12-15
- [34] Shim, J.P. Warkentin, M. Courtney, J.F. Power, D.J. Sharda, R. Carlsson, C. (2002) Past, present, and future of decision support technology, *Decision Support Systems*, 33(2), 111-126
- [35] Singh, S.K., Watson, H.J., and Watson, R.T. (2002) EIS Support for the strategic management process, *Decision Support Systems*, 33(1), 71-85
- [36] Skelton, G.W. and Chen, L-D. (2005), Introduction to m-business applications: value proposition, applications, technologies and challenges, in Skelton, G.W. and Chen, L-D. (Eds), *Mobile Commerce Application Development*, Idea Group Inc., Hershey, PA, 1-21.
- [37] Smith, H.A. and McKeen J.D. (2003) Developments in practice VIII: enterprise content management, *Communications of the Association for Information Systems*, 11, 647-659
- [38] Sprague, R.H. (1980) A framework for the development of decision support systems, *MIS Quarterly*, 4(4), 1-26
- [39] Suna, M. (2002), *Business Benefits of Content Management*, Master Thesis, Lappeenranta University Of Technology
- [40] Surjanto, B. Ritter, N. and Loeser. H. (2000) XML Content Management Based on Object-Relational Database Technology, *Proceedings of the 1st International Conference on Web Information Systems Engineering*, Hong Kong, China, 1, 70-79.
- [41] The Gilbane Report (2003), *Open Source Content Management Systems Redux*, available from <http://gilbane.com/artpdf/GR11.3.pdf>
- [42] Tyrväinen, P., Päivärinta, T., Salminen, A., and Iivari, J. (2006) Characterizing the evolving research on enterprise content management, *European Journal of Information Systems*, 15(6), 627-634
- [43] Watson, H.J., Rainer, R.K., and Koh, C.E. (1991) Executive information Systems: a framework for development and a survey of current practices, *MIS Quarterly*, 15(1), 13-30

- [44] Weiseth, P.E. Munkvold, B.E. Tvedte, B. and Larsen, S. (2006) The Wheel of Collaboration Tools: A Typology for Analysis within a Holistic Framework”, *Proceedings of the ACM Conference on Computer-Supported Cooperative Work*, New York, 239-248
- [45] Wu, S.D. Robin, O. Roundy, Robert, H. Storer, Louis, A. Martin-Vega. (1999) Manufacturing Logistics Research: Taxonomy and Directions: Technical Report 1254, School of Operations Research and Industrial Engineering, Cornell University, September
- [46] Yu, H. (2005) *Content and Workflow Management for Library Web Sites: Case Studies*, Information Science Publishers, Hershey, PA
- [47] Zack, M.H. (2007) The Role of Decision Support Systems in an Indeterminate World, *Decision Support Systems*, 43(4), 1664-1674

THE S.H.A.R.P. Conceptual Framework for Young African-American Adults What is Cool?

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Neural Networks and Consumer tracking studies have gained wide popularity and acceptance in studying young adults' marketing and consumption behavior. In this research paper, the author introduces and proposes a revolutionary method to direct advertising campaigns sources of influences on young adults' psychology and moving dynamic interests. The ideas suggested will advance the thinking of the advertising industry to profit from alternative messages to young adults through mass advertising and welfare of society as a whole. The author discusses what goals and directions are for the next generation of research and advertising; how to use mass advertising to address social issues; and how to profit clients through the use of neural networking by way of implementing the SHARP model. This research proposes a conceptual framework - SHARP (Support, Humor, Acceptance, Relevance, and Peer Pressure) and focuses on the following research questions.

- How can advertising agencies change what is perceived as cool?*
- What power does advertisement have on the ideas young adults seek?*
- What does it mean to promote what is not visible rather than what is visible?*

These are the questions and ideas this paper seeks to address. The SHARP conceptual model strives to challenge and improve the way advertising is created.

Key Words: Neural Networks, Consumer Tracking, Psychology, Advertising, Cool

I. INTRODUCTION

The word "Cool" is a very fluid concept; therefore, there is no clear or absolute definition because it changes so often depending on how, when, where, and why it is used. For the purpose of basic interpretation of this research, 'cool' will be described as a desired state of personal peace and social acceptance satisfaction. Young adults refer to ages seventeen through twenty-four. Young adults thrive on being cool, in countless varying ways, and if advertisers can hone on these concepts, profit margins will be almost limitless.

Neural networks can be viewed as an enabling tool for marketing professionals to work smarter and achieve higher levels of effectiveness. A neural network from a marketing perspective represents a software decision tool which assists the decision makers in the selection of an appropriate response to a particular situation (Lin 2004). Behavioral targeting involves the

collection of information about a consumer's online activities in order to deliver advertising targeted to their potential upcoming purchases, usually conducted by advertising agencies (Dwyer 2009). The clear intent of behavioral targeting is to track consumers over time, to build up digital dossiers of their interests and shopping activities (Dwyer 2009).

The research paper proposes a way for advertisers using neural networks and consumer targeting to track the abstract realm of young adults; understanding their thoughts, ideas, and dreams that are influenced by peer pressure and navigating their lives in multiple directions. Advertising campaigns can be tailored to address the interests of young adults while promoting social change in a positive way. A new and widely accepted approach to reach target audiences is the edge needed by government and private organizations to address negative issues in society. This ground breaking conceptual method is being introduced and proposed as the S.H.A.R.P. conceptual framework in the upcoming sections.

II. LITERATURE REVIEW

In 1961, Russell Colley prepared a report for the Association of National Advertisers titled *Defining Advertising Goals for Measured Advertising Results (DAGMAR)*. In it, Colley developed a model for setting advertising objectives and measuring the results of an ad campaign. The major emphasis of the DAGMAR model (Colley, 1961) is that communications effects are the logical basis for advertising goals and objectives against which success or failure should be measured. The DAGMAR approach (Colley, 1961) to setting objectives has had considerable influence on the advertising planning process. Many promotional planners use this model as a basis for setting objectives and assessing effectiveness of their promotional campaigns. Colley's work has led to improvements in the advertising and promotional planning process by providing a better understanding of the goals and objectives toward which planner's

efforts should be directed. This usually results in less subjectivity and leads to better communication and relationship between client and agency (Belch & Belch 2009).

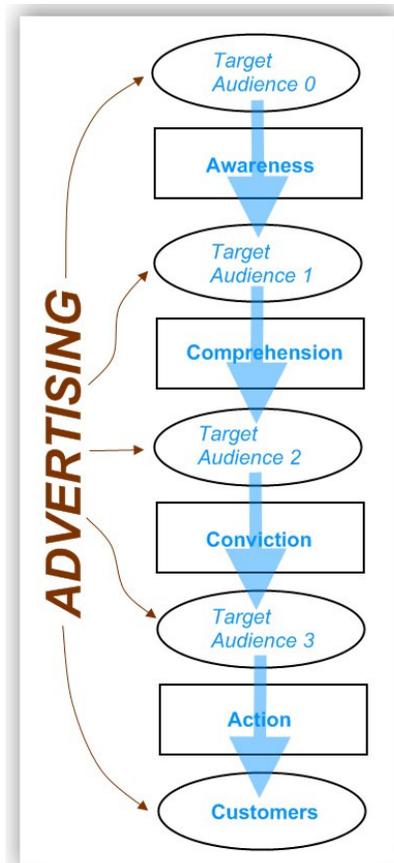


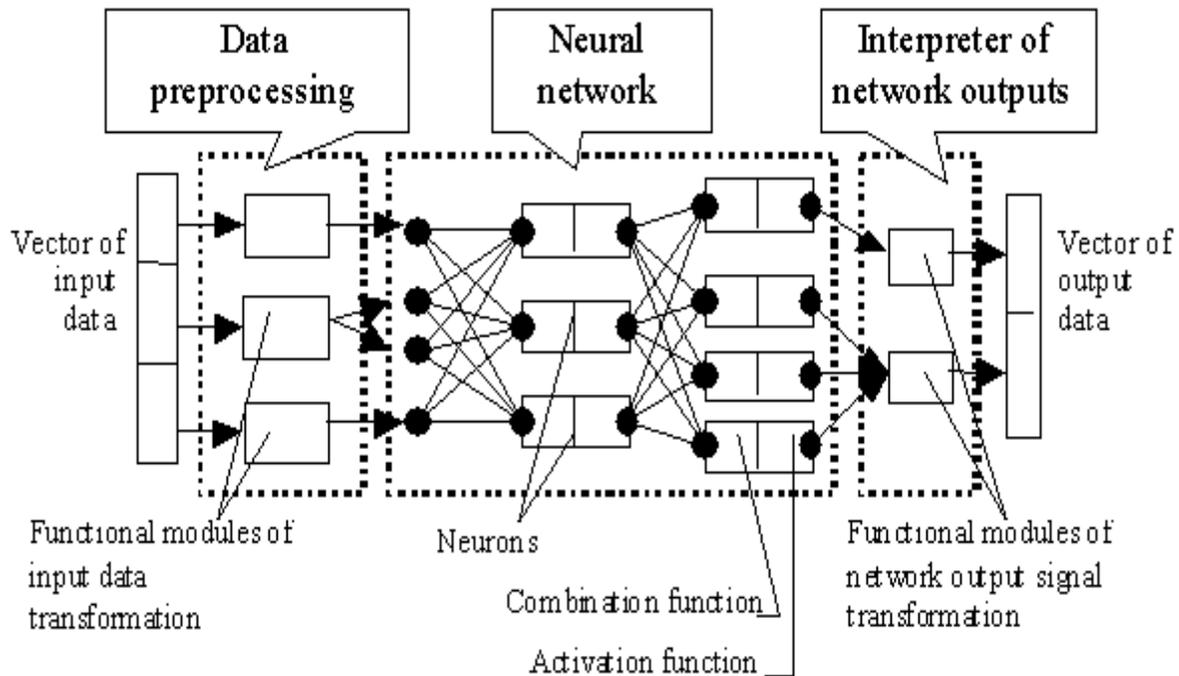
Figure 1: DAGMAR Model (Colley, 1961)

Motion effect theories assume that human beings exhibit an inherent preference for moving objects. That is when people are exposed to moving images, they focus their attention on the source of the motion and process relevant information. This activity is manifested in physiological changes such as decrease in heart rate, increase in skin conductance, and variable brain electrical activity (Sundar & Kalyanaraman 2004).

According to Jerry Kirkpatrick (1986), there in essence are two “social” criticisms of advertising. Overall, both charges attribute to advertising the power of physical force---that is, the power to force consumers against their wills to buy products they don’t need or want. The criticism for this model says that advertising changes the consumer’s tastes by forcing consumers to conform to the desires of producers, rather than the other way around, as free-market advocates have always argued. In short, according to this charge, advertising is immoral (Kirkpatrick 1986). The SHARP model proposes to eliminate all of this.

A neural network can be developed to shed light on the way in which consumers respond to stimuli contained in advertising messages. Considerable research suggests that advertising executional cues can influence communications effectiveness. MacInnis, Moorman, and Jaworski (Lin 2004) developed a framework that explicitly provides linkage between executional cues to communication effectiveness through their impact on consumers’ motivation, opportunity, and ability, and the levels of processing from advertisements is influenced by consumers’ motivation, ability and opportunity to process brand information during or immediately after exposure to an advertisement. A simple perception-type model would postulate that consumers respond to certain characteristics of the advertising of a product with decision or intentions to purchases (Lin 2004). This is where the proposed SHARP model perfectly fits. Neural networks change the way to use information in marketing. With such a new information technology, a company using a neural network, can have affordable real-time access to all the raw data it desires. The real difference among competitors will be the quality of analysis each performs and the capacity of decisions flowing from it (Lin 2004).

Figure 2 illustrates the concept of neural networks, which is based upon the way we understand the human brain is structured. Neural networks are computer systems linking inputs with outputs



in a network of structure of nodes and arcs. They are inspired by replicating portions of what is known about the way the human brain functions (Lin 2004).

Figure 2: Neural Networks and their impact on Marketing discipline (Lin 2004)

Friestad, Wright, and Boush (2005) note an elaborated and detailed model of content, structure, and usage of everyday persuasion knowledge that focused on the context of advertising and marketing messages. They discussed in depth the different types of persuasion-related knowledge and skills that children, adolescents, and young adults gradually develop to cope effectively with marketers' and others' strategic attempts to influence them. A girl's or boys' marketplace persuasion knowledge develops from nothing into an increasingly interrelated and

valid structure of casual---explanatory beliefs about several topics (Wright, Friestad, Boush 2005).

Two objective challenges of adolescence, forming a personal identity and fitting in socially with peers, likely contribute to adolescents' heightened self-consciousness (Pechmann, Levine, Loughlin, Leslie 2005). Furthermore, adolescents often turn to peers to help them forge identities that are independent of their parents, which may make them even more self-conscious. Adolescents' self-consciousness and social anxiety should tend to make them more receptive to image advertising and high-status, heavily advertised brands. It appears that adolescents with low self-esteem are especially attracted to image advertisements and status brands and that they manifest other signs of materialism (Pechmann, Levine, Loughlin, Leslie 2005).

III. CONCEPTUAL FRAMEWORK

An ongoing concern of advertising practitioners is the persuasive impact of their marketing communications. One of the most widely employed measures of persuasive impact is change in brand attitude. Consequently, research attention continues to focus on describing the specific types of cognitive and affective responses to advertising that both lead to and result from brand attitude formation (Coulter & Punj 2004).

I propose the SHARP conceptual framework in this section. Figure 3 illustrates the SHARP model in theory. The five outside bubbles represent the five aspects advertising campaigns must meet in order to reach the "millennials". The innermost center circle represents the consumers; the outside represents the elements and conditions of society. The middle circle ring represents the use of neural networks, in how they merge the consumer with the outside elements by identifying needs and interests using the means typed in the circle.



Figure 3: Conceptual SHARP Model targeting young adults

The SHARP model (Figure 3) analyzes five focus points of emphasis to make a successful advertisement campaign for young adults. The information needed to make the model be effective is imperative, and can only be gathered by using neural network systems and behavioral tracking of trending thoughts for the target audience. The SHARP model can be applied to any product or service the firm is promoting or selling. The SHARP model affirms that all advertisements addressed towards young adults should involve: Support, Humor, Acceptance, Relevance, Peer pressure.

The common denominator and equalizer among all young adults is curiosity. With curiosity as the foundation, tracking ideas and thoughts involves so much more than data interfacing social

network platforms of Facebook and Twitter, although they are both excellent places to get general ideas of the target audience. Tracking ideas include following the music industry to see what young adults are listening and responding to, and identifying motives for actions. This means if sex, money, fashion, or partying, for example, are important to young adults, then these topics can be used by advertisers in a positive way to accomplish their objective. Neural networks present a radical attempt to break the logjam of information by building computers that mimic the way in which humans think. In the long run, results from applications of neural networks to the marketing domain will not only lead to a deeper understanding of fundamental marketing decision processes but also enable study of the normative aspects of marketing systems (Lin 2004).

Support is to promote the interest or cause of; to uphold or defend as valid or right. Once a trending thought, idea, or dream is identified, it must be supported by and supporting of young adults as a whole. Humor is to adapt oneself to. Humor is the glue in advertising to young adults. Humorous appeals are used extensively in television, radio, and print advertising. This research examines the effectiveness of humor in accomplishing specific communications and sales objectives. It is argued that previous unsuccessful applications of light-hearted messages are attributable, in part, to our incomplete knowledge of how consumers' process humorously conveyed information. The discussion focuses on the importance of recognizing and managing variables which mediate the impact of humor on audience response and on the need for further development and testing of behavioral theory as keys to the effective utilization of humor in advertising. The central issue therefore is not whether entertaining commercials can be effective. Rather, advertisers must direct their attention to questions concerning (1) when humorous appeals should be applied, and (2) how amusing messages should be presented. Answers to these

questions require an understanding of the factors and mechanisms which underlie consumer response to humorous stimuli (Duncan 1979).

Acceptance is an agreeing either expressly or by conduct to the act or offer of another so that a contract is concluded and the parties become legally bound. Young adults must accept any successful advertising attempt; however, this includes more than being socially acceptable. In 1973, Wright suggested that consumer acceptance of advertising was mediated by the cognitive responses generated by message recipients' rather than by content of the advertisement itself. By combining attribute students with music, humor, affectionate vignettes, story elements, role portrayal, and the like, ad-execution cues evoke moods and feelings that go beyond the evaluative reactions toward a commercial (Batra 1986).

Relevance is a practical and especially social applicability; the ability (as of an information retrieval system) to retrieve material that satisfies the needs of the user. Relevance is timing and ever changing. Young adults rush to stay current and possibly ahead of what may be the next new attention grabber in any setting. The importance of relevance is not just time correlation with young adults, but also how well does it relate to what young adults face or feel in their daily lives. By targeting niche markets directly, one need not track the behavior of a user to deliver relevant ads. This has many benefits, not the least of which is that it completely placates the privacy advocates. For example, OneRiot is the advertising network for the real-time social web. OneRiot partners with leading brands and media companies to reach millions of social influencers across an exclusive network of top Twitter apps, mobile apps, social networks and content discovery sites. Real-time campaigns with OneRiot build brand awareness, community engagement and drive viral social sharing. OneRiot employs many innovative techniques to deliver real-time social targeting for its partners. One technology cornerstone is the company's

proprietary Trending Topics Engine. This analyzes streaming conversational data from leading social destinations – including Facebook, Twitter and MySpace – to surface the topics that are driving most engagement across social web networks right now. OneRiot then algorithmically matches relevant advertising campaign content to those topics in real-time, and delivers advertising messages that are targeted to users during key opportunities for social engagement (Kansascity.com, 2010).

Peer pressure occurs when an individual experiences implied or expressed persuasion to adopt similar values, beliefs, and goals, or to participate in the same activities as those in the peer group. Successful young adult advertising campaigns must survive this crucial test. David Ogilvy of Ogilvy and Mather said, "If you try to persuade people to do something or buy something, it seems to me you should use their language, the language in which they think." Everywhere people go, there are marketers that want to sell something, not in the language in which consumers think, but also in the language based in the way they think consumers best friends think, the way that the object of desire thinks, even in the way the million strangers who seen or interact with each day think. This goes way beyond things a person would normally do, but sometimes people do anything just to be considered cool.

IV. DEVELOPMENT OF A SCALE FOR ‘SHARP FRAMEWORK’

In this research paper, a 25-item scale for ‘SHARP’ framework is developed for measuring advertising effectiveness. The scale developed is given below as Table 1.

Table 1 – SHARP Framework Measurement Scale for Ad Effectiveness

Scale	Code in SPSS
1. This advertisement agrees with my life goals	Sharp_S1
2. This advertisement gives me motivation	Sharp_S2
3. This advertisement supports my background	Sharp_S3
4. I have similar experiences with the ad’s intent or message	Sharp_S4
5. I would want this for my family	Sharp_S5
6. I find this advertisement “corny” or “lame”	Sharp_H1
7. How funny is this advertisement?	Sharp_H2
8. I have thought about this before	Sharp_H3
9. I have to think about the advertisement before I laugh	Sharp_H4
10. I would use this as a joke	Sharp_H5
11. There is a clear positive stereotype in this advertisement	Sharp_A1
12. There is a clear negative stereotype in this advertisement	Sharp_A2
13. This advertisement changes my initial impressions of the topic portrayed	Sharp_A3
14. I grew up around situations/messages like this	Sharp_A4
15. I agree with this advertisement	Sharp_A5
16. I can relate how much to this advertisement	Sharp_R1
17. This advertisement is current with today’s interests	Sharp_R2
18. I would have understood this advertisement 3 years ago	Sharp_R3
19. This advertisement is old and has no “flavor”	Sharp_R4
20. I agree with the thought process behind this advertisement	Sharp_R5
21. I am one of the more popular persons in my daily surroundings	Sharp_P1
22. I like the advertisement but would not show it publicly	Sharp_P2
23. I can crack jokes at people this advertisement portrays or affects	Sharp_P3
24. I can see my friends in this advertisement	Sharp_P4
25. This advertisement could be so much better	Sharp_P5

The research was conducted on a sample size of 75 undergraduate students at a Historically Black College University (HBCU), selected for the purpose of the research study, out of which 41 were women. The study was confined to ads with African American stereotypes, given in Appendix I. The SHARP framework was presented to 75 students, who were exposed to 5 different ads with African-American stereotypes, and the likert type agreement scale was used where 1 = strongly disagree and 5 = strongly agree. SPSS was used for Exploratory Factor Analyses for ‘Sharp’ scale.

V. RESEARCH FINDINGS

A Web based survey was conducted from students enrolled in business school at a historic black college and university at Georgia. Elimination of incomplete responses left 75 eligible responses for analysis. Among responders, 46.1% are male students, and 53.9% are female. 47.4% are Marketing majors, 31.6% are Management majors, 11.8% are Accounting majors, 2.6% are Computer Information System major and 6.6% are from some other majors. Most responders are either Senior (50%) or Junior (47.4%).

After conducting the factor analyses for 5 ads using African-American stereotypes, the following results are obtained as shown in Table 2.

Table 2 – Exploratory Factor Analyses - Rotated Component Matrix

	Component				
	1	2	3	4	5
Sharp_H1	.910	.091	-.055	-.051	.127
Sharp_H2	.900	.290	-.009	-.006	.032
Sharp_H5	.879	.253	-.040	.161	.067
Sharp_P2	.118	.222	.026	.878	.029
Sharp_H4	.827	.276	.053	-.142	-.309
Sharp_P3	.313	.237	.045	.813	.019
Sharp_R4	.795	.074	.123	.186	.363
Sharp_A3	.687	.306	.106	.438	.067
Sharp_P5	.050	.259	.435	.647	.018
Sharp_S4	.198	.896	.215	.118	.080
Sharp_S3	.292	.863	.190	.096	.067
Sharp_S2	.130	.817	.399	.120	.233
Sharp_S5	.261	.810	.286	.056	-.020
Sharp_S1	.258	.749	.354	-.056	.245
Sharp_R1	.371	.241	.701	.284	-.074
Sharp_A4	.182	.218	.562	.162	.649
Sharp_H3	.635	.542	.237	.088	-.150

Sharp_P1	.437	.584	.147	.205	.098
Sharp_R3	.007	.170	.892	-.012	-.006
Sharp_R2	-.100	.223	.887	.000	.089
Sharp_R5	.083	.410	.756	.151	-.007
Sharp_A5	.101	.538	.562	.162	.704
Sharp_A1	.112	.274	.237	.088	.666
Sharp_P4	.311	.356	.348	.720	.069
Sharp_A2	.609	.296	.162	.059	.617
Eigen values	7.49	6.42	4.36	1.33	1.00
% of variance	25.96	29.67	12.56	10.32	10
Cronbach alpha	.94	.95	.84	.85	.81

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.863
Bartlett's Test of Sphericity	Approx. Chi-Square	2135.306
	df	300
	Sig.	.000

VI. DISCUSSIONS

The SHARP scale developed in this paper has good reliability as shown in the Table 2. The 25-item scale of SHARP framework that loaded as per the Table 2 above can be easily dissected into 5 factors - Support (S) with 6 factors; Humor (H) with 7 factors; Acceptance (A) with 4 factors; Relevance (R) with 4 factors and Peer Pressure (P) with four factors as well.

The factors are given in Table 3 below:

TABLE 3: ‘SHARP’ SCALE FACTORS OBTAINED FROM PRINCIPAL COMPONENT ANALYSIS

SUPPORT	SPSS Code
1. This advertisement agrees with my life goals	Sharp_S1
2. This advertisement gives me motivation	Sharp_S2
3. This advertisement supports my background	Sharp_S3
4. I have similar experiences with the ad’s intent or message	Sharp_S4
5. I would want this for my family	Sharp_S5
6. I am one of the more popular persons in my daily surroundings	Sharp_P1
HUMOR	
7. I find this advertisement “corny” or “lame”	Sharp_H1
8. How funny is this advertisement?	Sharp_H2
9. I have thought about this before	Sharp_H3
10. I have to think about the advertisement before I laugh	Sharp_H4
11. I would use this as a joke	Sharp_H5
12. This advertisement changes my initial impressions of the topic portrayed	Sharp_A3
13. This advertisement is old and has no “flavor”	Sharp_R4
ACCEPTANCE	
14. There is a clear positive stereotype in this advertisement	Sharp_A1
15. There is a clear negative stereotype in this advertisement	Sharp_A2
16. I grew up around situations/messages like this	Sharp_A4
17. I agree with this advertisement	Sharp_A5
RELEVANCE	
18. I can relate how much to this advertisement	Sharp_R1
19. This advertisement is current with today’s interests	Sharp_R2
20. I would have understood this advertisement 3 years ago	Sharp_R3
21. I agree with the thought process behind this advertisement	Sharp_R5
PEER PRESSURE	
22. I like the advertisement but would not show it publicly	Sharp_P2
23. I can crack jokes at people this advertisement portrays or affects	Sharp_P3
24. I can see my friends in this advertisement	Sharp_P4
25. This advertisement could be so much better	Sharp_P5

The reliability of the scale is high with Cronbach alpha for ‘Support’ as 0.94; ‘Humor’ as 0.95; ‘Acceptance’ as 0.84; ‘Relevance’ as 0.85; and ‘Peer Pressure’ as 0.81.

VII. CONCLUSION

The research paper presents the SHARP conceptual model as the futuristic mainframe foundation of how advertising campaigns are developed, directed, and created for many years to come. It identifies the definition of “cool”, how neural networks can be used to its potential, and addresses the social criticisms of advertising by way of the SHARP model.

The SHARP model developed in this research paper is tested empirically for exploratory factor analysis with 5 factors of SHARP – SUPPORT, HUMOR, ACCEPTANCE, RELEVANCE and PEER PRESSURE. The model needs to be further tested in the future research with regard to ad and brand attitudes and brand equity concepts.

REFERENCES

- Advertise On Social Web OneRiot*. (n.d.). Retrieved October 14, 2010, from Kansas City.com: <http://www.kansascity.com/2010/10/12/2304604/advertise-on-twitter-apps-and.html>
- Duncan, C. (1979). Humor In Advertising: A Behavioral Perspective. *Journal of the Academy of Marketing Science* .
- Dwyer, C. (2009). Behavioral Targeting: A Case Study of Consumer Tracking on Levis.com. *Proceedings of the Fifteenth Americas Conference on Information Systems* .
- Kirkpatrick, J. (1986). A Philosophic Defense of Advertising. *Journal of Advertising* , 42-48 & 64.
- Lin, B. (n.d.). Applications of Neural Network in Marketing Decision Making. *Louisiana State University in Shreveport* .
- (2009). In G. B. Michael Belch, *Advertising and Promotion: An Integrated Marketing Communications Perspective, 8th edition*. McGraw-Hill.
- Pechmann, C., Levine, L., Loughlin, S., & Leslie, F. (2005). Impulsive and Self-Conscious: Adolescents' Vulnerability to Advertising and Promotion. *American Marketing Association* , 202-221.

Punj, G. N., & Coulter, K. S. (2004). The Effects of Cognitive Resource Requirements, Availability, and Argument Quality on Brand Attitudes. *Journal of Advertising* , 53-64.

Rajeev Batra, M. R. (1986). Affective Responses in Mediating: Acceptance of Advertising. *The Journal of Consumer Research* , 234-249.

Sundar, S. S., & Kalyanaraman, S. (2004). Arousal, Memory and Impression-Formation Effects of Animation Speed in Web-Advertising. *Journal of Advertising* , 7-17.

Wright, P., Friestad, M., & Boush, D. M. (2005). The Development of Marketplace Persuasion Knowledge in Children, Adolescents, and Young Adults. *American Marketing Association* , 222-233.



Creative Advertising Appeals on Global Cultural Spectrum

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Abstract: The research focuses on consumer advertising appeals on a cross cultural spectrum. It is imperative for advertising agencies to understand that each culture is not only different on a global cultural spectrum but also unique in different sub-cultures. The perceptions of advertising appeals are ever changing and this research study discusses the different appeals used to target consumers across the global cultural spectrum. This study addresses the following questions:

- Which emotional appeals to use when targeting different cultures?
- How appeals differ in different cultures and subcultures across the globe?
- How do males and females react to different hard-sell and soft-sell (warmth, humor and eroticism) advertising appeals?

The research paper proposes the AD Hard-Soft conceptual framework which focuses on attitudes toward the ad, brand and purchase intentions through the usage of hard-sell and soft-sell advertising appeals. The paper uses qualitative research wherein different ads with varying advertising appeals were utilized and their findings are recorded. The differences between hard-sell and soft-sell are highlighted through this research.

Key Words: Advertising Appeals, Global Cultural Spectrum, Hard-Sell, Soft- Sell, Sex Appeals

I. INTRODUCTION & REVIEW

As globalization continues to develop at a fast pace, many consumers are being able to view advertisements of products from regions they could not view a few years ago. According to (Kalliny & Gentry, 2007), the diminishing of national boundaries has increased more than ever the selection of products and brand names from which customers can choose. Many of the top 100 brands have worldwide presence in more than 100 countries (Mueller, Okazaki, & Taylor, 2010).

Hard sell refers to a more direct approach to selling which in contrast soft-sell approaches are more subtle and indirect (Okazaki, Mueller, & Taylor, 2010 a). The approach is also viewed as the difference of video advertising between commercials (soft-sell) and infomercials (hard-sell). These hard-sell appeals exploit the values of having more words and fewer pictures or more pictures and fewer words which can make a major impact on the effectiveness of certain. In Figure 1 below (Okazaki, Mueller, & Taylor, 2010 a) the comparison of hard sell and soft sell are illustrated below through the two different

automobile ads. The picture on the left has a soft sell approach to selling this car. There are two headlines about the approach that is completely irrelevant to the car. The second picture to the right is a more hard sell direct approach. There are less pictures and they go on to say that there is no equal comparing them to other companies.

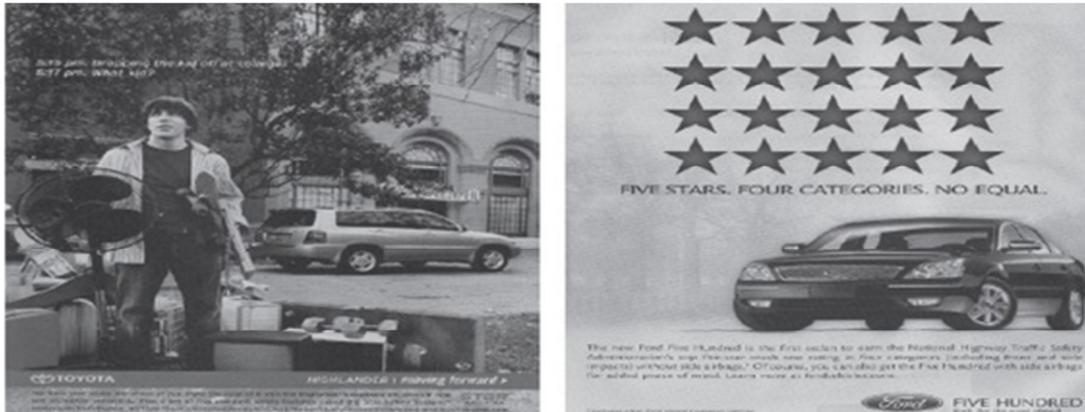


Figure 1: Soft Sell versus Hard Sell Ads

In this research study, hard-sell and soft-approaches are compared and contrasted. The soft-sell approach is more suitable when it is based on image-oriented content that does not emphasize specific reasons to buy but rather conveys general association with the brand (Okazaki, Mueller, and Taylor, 2010 a). This is why Japan, China, India, and other Eastern nations favorably use soft-sell approaches that will not offend consumers by using a direct aggressive approach. It is culturally offensive and even disrespectful to directly approach consumers with the benefits and features of a product or service without first luring them in with a favorable image, perhaps through sensitivity of emotions which are culturally significant and relevant. In contrast, the hard-sell approach is based on distinct and explicit content that emphasizes product advantages, performance (Okazaki, Mueller, and Taylor, 2010 b) and the factual information may be mixed easily with soft-sell by way of imagery and animation.

In contrast to the many definitions that have been provided for hard-sell and soft-sell in the advertising literature, there is no common definition or specific device that can be used to measure either type of appeal.

The research goal is to compare and contrast the effectiveness of hard-sell and soft-sell approaches vis-à-vis different cultures. This research addresses the following questions.

- Why is soft-sell appeal more effective for brand awareness, while hard-sell is more effective to persuade a consumer to make an immediate purchase;
- Why culture is the reason advertising appeals must differ to be effective in target markets of various geographic locations; and
- How modern trends are influencing people of different cultures to be more acceptant of advertising appeals that would otherwise be rejected.

The research proposes the AD Hard-Soft conceptual framework highlighting the attitudes toward the advertising, brand and purchase intentions with the usage of hard-sell and soft-sell advertising appeals.

II. LITERATURE REVIEW

Okazaki, Mueller, and Taylor (2010 b) notes that the hard-sell and soft-sell advertising concepts have been researched and provided with definitions since 1911. Through intensive research, reviews, and discussions they “proposed that three fundamental dimensions underlie soft-sell and hard-sell appeals: feeling vs. thinking, implicit versus explicit, and image versus fact” (Okazaki, Mueller, and Taylor, 2010 b). Soft-sell approaches that displayed images, beautiful pictures and scenery, and other indirect methods were less annoying and aggressive.

(Chu, Gerstner, and Hess, 1995) concluded that hard-sell approaches had a better chance of surviving in a more competitive environment, consumers are negatively affected, and sellers gain more from making their products better (to make features more appealing than competitors). In fact, telemarketers are taught not to use hard-sell approaches at all, but to simply use a script that detects interested consumers (Jolson, 1986). Soft-sell approaches may be more effective when selling products that provide pleasure, whereas technological and functional products and services sell best with a hard-sell approach that can

promote the features and benefits. However, simply using a hard-sell approach may fail if good customer service and satisfaction is not provided for the consumer (Marr and Prendergast, 1990).

To further distinguish between hard-sell and soft-sell, "...three primary dimensions of soft-sell appeals: feeling (creative, instinctive, imaginative, and abstract), implicitness (insinuation, appealing, subjective, and expressive), image (entertaining, interpretive, playful, and impression based)" were provided by Okazaki, Mueller, and Taylor (2010 b). On the other hand, Okazaki, Mueller, and Taylor (2010 a) stated that hard-sell appeals consist of three dimensions: thinking (rational, logical, analytic, factual, and concrete), explicitness (precise, explanation, convincing, persuasion, and instructive), and fact (educational, descriptive, realistic, informative, and evidence-based).

Bülbül and Menon (2010) provided distinctions of how hard-sell appeals are more concrete and they may generate behavioral responses instantly. Their research suggested that hard-sell advertisements influence the consumer to make a decision immediately, but loyalty will not be established as it would through the feelings that are generated through soft-sell advertisements that produce emotions. Chandy, Tellis, Macinnis, and Thaivanich (2001) provide a framework for determining why certain appeals work better in different markets and cultures. Chinese commercials use more soft-sell approaches because it is not polite to be direct in the Chinese culture (Lin, 2001).

Most modern, Western nations use more hard-sell approaches, with the exception of Britain. Britain uses soft-sell approach widely and effectively due to the presence of multi-cultural diverse population, differences in the social-cultural contexts, advertising industry environment variances, and differences in philosophy and execution that may be controlled by government and political structure (Nevett, 1992).

Sexual Appeals in Advertising

"Sexual appeals in advertising often are composed of a variety of execution elements, including visual elements (e.g., attractive models and nudity), suggestive verbal elements and music, or "scent-strip" advertising (Garcia & Yang, 2006). It can be stated that different regulations in different countries play a major role in what is advertised and what is not. "Such restrictions may

also be applied to advertising codes in China, for our findings also indicated Chinese ads in both TV and magazine showed the lowest degrees of nudity across all countries” (Paek & Nelson, 2007). Due to China’s strong regulations on nudity on television, the culture in China can be perceived as one who does not agree with the sexual appeals of advertising. Many advertisers would have to create a new campaign to target their product to a Chinese consumer if their product had any signs of sexual appeals in the advertisement.



Figure 2: Sexual Appeal used in Axe Body Spray – Banned in some countries

In the Figure 2 above is a popular commercial from Axe Body Spray being advertised in many countries. The commercial starts by showing a man that turn into a chocolate figurine after dousing himself in Axe Dark Temptation body spray. While wandering the streets and through different areas of his city he is licked and at the end a woman takes a bite out of his butt. This commercial is considered very risqué in parts of the world such as India where this advertisement has been banned by the government. This is a very prime example on the importance of knowing your region and making sure your advertisements are adaptable.

Figures 3 and 4 are both Levi’s advertisements using different methods to appeal to different crowds. Figure 3 is an advertisement where everyone is fully clothed and there is a simple tagline. Figure 4 uses more of a sexual appeal by using a topless male actor and a female feeling on his genital area. When a small focus group was asked to select the best way to convey the message, the views were split 50% by

50%. Many of the students in the focus group felt the clothed models were more decent and more interesting. One student wrote, “Great message and tagline; it was not sexist or bias.” Some female students felt that the shirtless model in Figure 4 was a lot better because they viewed the model as sexy. A female student wrote, “He’s cute and it’s a sexy ad that I would like to see my boyfriend in.” It is safe to say that sexual appeals can be used and be effective but often if the message is conveyed correctly through words, it can be just as effective.

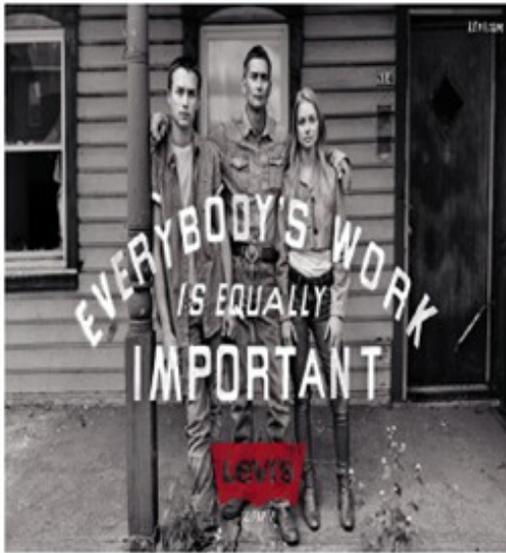


Figure 3: Non-Sexual

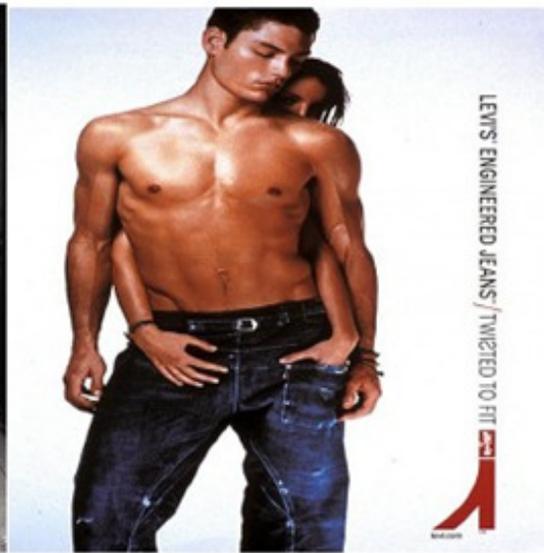


Figure 4: Sex Appeal

Brand and Ad Attitudes

Mitchell and Olson (1981) highlighted the major influence of the attitude towards the ad (A_{ad}) by demonstrating that the effect of visual and emotional elements on the attitude towards the brand (A_b) is mediated by A_{ad} . This theory assumes a direct link between A_{ad} and A_b and implies that a positive attitude towards the ad is directly carried over to a positive attitude towards the brand (Geuens and Pelsmacker, 1998). Research has concluded that ad evaluations were debilitated by negative affect and stimulated by positive affect (Goldberg and Gorn 1987; Mitchell 1986; Russo, Shah, and Park 1994; Scrull 1983).

Figure 5 illustrates the Dual Mediation Hypothesis Model. This model has received most support as a means of representing the interrelationships between Aad, brand and ad cognitions, Ab and PI (MacKenzie and Lutz, 1989; Brown and Stayman 1992).

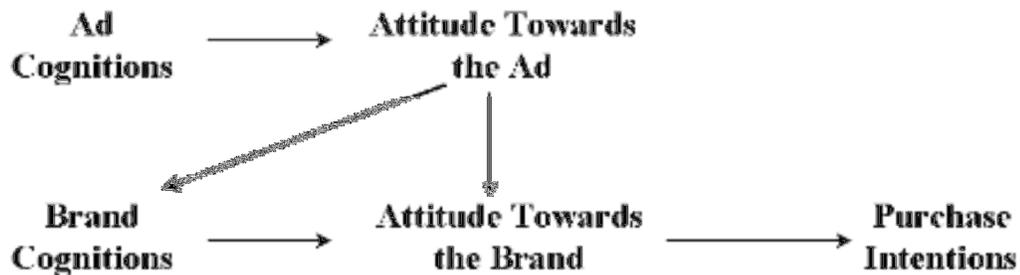


Figure 5: Dual Mediation Hypothesis Model

Figure 5 (Dual Mediation Hypothesis Model) supports models of Okazaki, Mueller, and Taylor (2010) in a way that there is no direct correlation between the dimensions and the advertising appeals, but they can be used as ad-measurements and consequences. Common feelings and other characteristics may be apparent in certain types of appeals, but there has been no proof of how brand and ad attitudes, purchase intention, purchase initiators, and other factors are directly correlated as a result of certain ads displaying specific appeals.

III. CONCEPTUAL FRAMEWORK

Okazaki, Mueller, and Taylor (2010) provided with the models of hard-sell and soft-sell advertising appeals. Dual Mediation Hypothesis Model elaborated on the relationships between ad and brand cognitions, and ad and brand attitudes, leading to purchase intentions. A model called AD Hard-Soft Framework (Figure 6) is conceptualized, illustrating the hard-sell and soft-sell advertising appeals and their consequences on building ad and brand attitudes and purchase intentions. The model is created from the goals and objectives of a firm, which may actually determine which appeal is used, along with the cultural context of the firm / company.

The AD Hard-Soft model in Figure 6 illustrates the cause and effect relationship between the advertising appeals (hard-sell and soft-sell), attitudes (towards the advertisement and brand), and subsequently to purchase intentions.

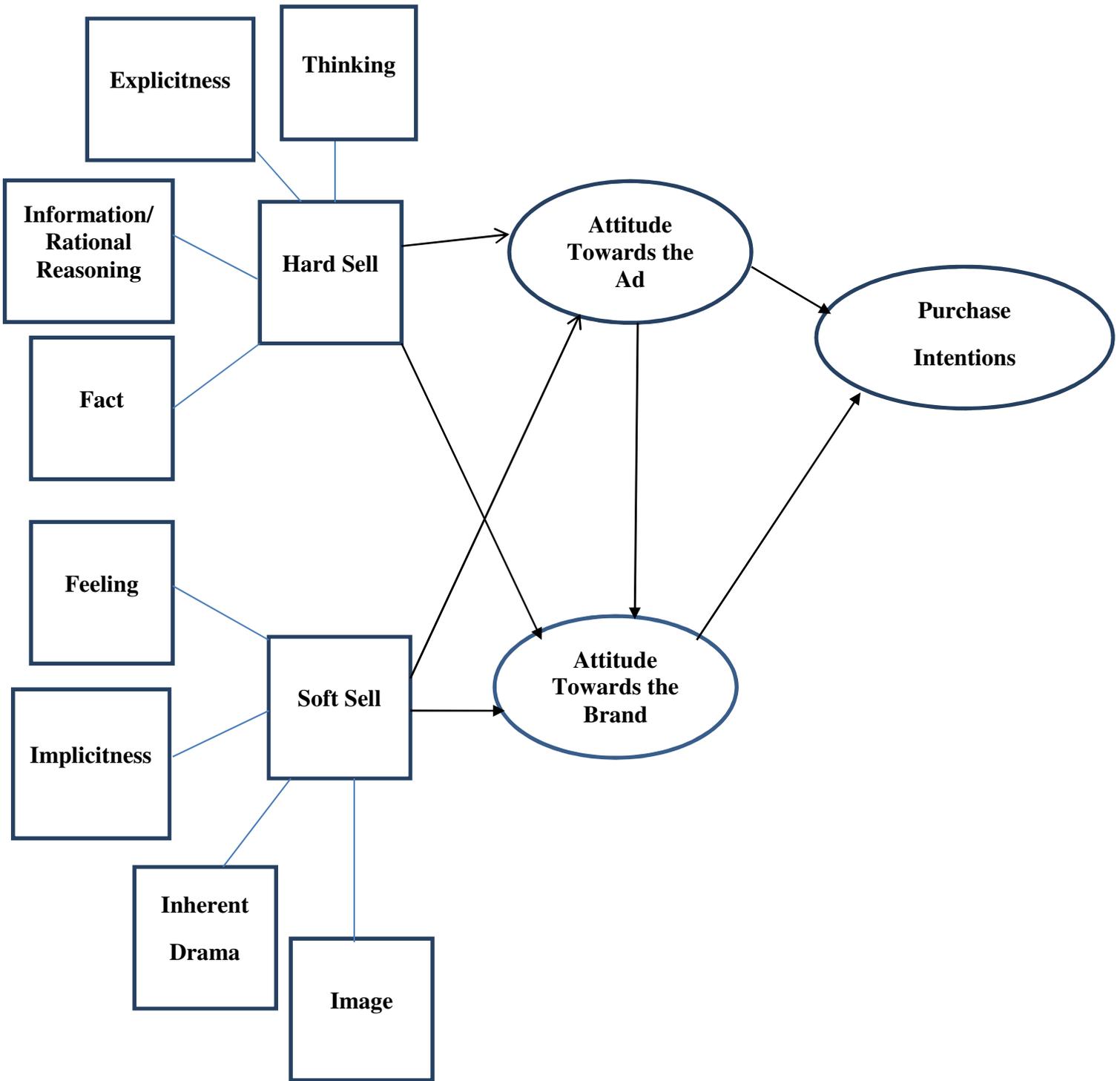


Figure 6: AD Hard-Soft Conceptual Framework and Drivers of Hard-Sell and Soft-Sell Appeals

Figure 6 illustrates our conceptual framework - “AD Hard-Soft” model depicting the drivers of hard-sell and soft-sell appeals and their consequences. We conceptualize a direct relationship of hard sell and soft sell advertising appeals with attitude towards the advertisement, attitude towards the brand; which

further affect the purchase intentions. Figure 6 shows four drivers for hard sell advertising appeal – thinking, explicitness, informational/rational reasoning and fact; and four drivers for soft sell advertising appeal – feeling, implicitness, inherent drama and image. These drivers lead to the attitude towards the ad, brand and purchase intentions.

IV. RESEARCH METHODOLOGY

A focus group research was conducted where a sample size of 70 undergraduate students at a Historically Black College University (HBCU) was selected for the purpose of the research study, out of which 45 were women. The group was divided into 2 focus groups of 35 students each. The study was confined to alcoholic and automobile ads. There are several reasons for choosing these categories – all subjects were old enough to drink legally and responsibly, and they had a common preference for cars / automobiles. Seven Volumes of 5 business / fashion magazines and newspapers (Vanity Fair, Time, Cosmopolitan, Wall Street Journal, and People) were screened – the result was an initial set of 33 ads in three categories.

First Qualitative Stage – 33 ads / stimuli were presented to a jury of 15 students in order to judge the degree of humor, warmth, eroticism of each stimulus. The results of this qualitative stage were ordered category ranking of 33 stimuli – frequency counts were conducted and finally, 8 stimuli were selected – 2 stimuli with the highest number of assignments to the “humorous” category, 2 warm, 2 erotic, and 2 non-emotional/neutral hard-sell stimuli. The hard sell neutral stimulus was defined as the one often assigned as “not humorous”, “not erotic”, and “not warm”).

Second Qualitative Stage - These 8 stimuli were then presented to the two focus groups of 35 students each, in random order for each student. Randomization was used to avoid systematic measurement errors as a result of respondent wear-out. Since the population at a HBCU is homogenous with similar socio-demographic characteristics; only gender was included as a classification question. Thereafter, the findings were recorded for these focus groups and generalized for males versus females.

V. RESEARCH FINDINGS

After conducting the research, we obtain the results as shown in Appendix I. Women feel more cheerful than men when warm and soft sell ads are conveyed and the opposite is true for erotic stimuli – men feel more cheerful than women when exposed to erotic ads. Soft Sell emotional appeals of warmth, humor and eroticism lead to more positive feelings than the non-emotional hard sell appeals.

Brand interest, and positive emotion and impression about the brand and an ad, leads to positive purchase intention. Soft sell strategies make ads more interesting and likeable leading to positive intentions to buy, while hard-sell strategies ignite more likeability but do not strike interest in the target audience.

VI. CONCLUSION

The research study revisits the concepts of advertising appeals, especially hard-sell and soft-sell appeals, and explains how there is not one widely accepted definition for an appeal. However, the fundamental dimensions to measure these appeals are widely accepted, as depicted in Figure 1a and 1b. Our proposed AD Hard-Soft conceptual model may be accepted with new dimensions of information/ rational reasoning dimension, inherent drama, and image, with theory and reasonable explanations. The information/rational reasoning dimension has been added because it is needed to explain the functional aspect of the hard-sell approach. Without information and reasoning, the functional perspective of the hard-sell approach is non-existent in an advertising strategy. Likewise, the inherent drama dimension has been added to the soft-sell model because emotions, feelings, and the other dimensions that measure a soft-sell appeal do not exist if the advertising strategy cannot emphasize the benefits of purchasing a product or service.

Our research findings are significant with respect to the use of warmth, humor and eroticism as soft-sell appeals and neutral stimulus as hard sell appeal. The limitations of the study are that only print ads were used and analyzed, students alone were included and existing products' ads were used. It may be argued that for new brands and new products, emotional soft-sell advertising appeals may be less suited and

informational hard-sell appeals will work better. Future research may focus on the new added dimensions of hard-sell and soft-sell advertising appeal drivers.

REFERENCES

- Brown, S.P., D.M. Stayman (1992) Antecedents and Consequences of Attitude towards the Ad: A Meta-analysis. *Journal of Consumer Research*. 19, June, 34-51.
- Bülül C, Menon G. (2010) The Power of Emotional Appeals in Advertising. *Journal of Advertising Research*. June 2010; 50(2):169-180.
- Chandy R, Tellis G, Macinnis D, Thaivanich P. (2001) What to Say When: Advertising Appeals in Evolving Markets. *Journal of Marketing Research (JMR)*. November 2001; 38(4):399-414.
- Chu W, Gerstner E, Hess J. (1995) Costs and Benefits of Hard-Sell. *Journal of Marketing Research (JMR)*. February 1995; 32(1):97-102.
- Garcia, E., & Yang C.C., K. (2006). Consumer Responses to Sexual Appeals in Cross- Cultural Advertisements. *Journal of International Consumer Marketing* , 19 (2), 23.
- Goldberg, M.E., G.J. Gorn (1987) Happy and Sad TV Programs: How They Affect Reactions to Commercials. *Journal of Consumer Research*. December; 387-403.
- Geuens, Maggie, & Pelsmacker, Patrick de (1998) Feelings Evoked by Warm, Erotic, Humorous or Non-Emotional Print Advertisements for Alcoholic Beverages. *Academy of Marketing Science Review*. 98 (1).
- Jolson M. (1986) Prospecting by Telephone Prenotification: An Application of the Foot-In-The-Door Technique. *Journal of Personal Selling & Sales Management*. August 1986; 6(2):39.
- Kalliny, M., & Gentry, L. (2007). Cultural Values in Arab and American Television Advertising. *Journal of Current Issues and Research in Advertising* , 29, 17.
- Lin C. (2001) Cultural values reflected in Chinese and American television advertising. *Journal of Advertising*. 2001; 30(4):83-94.
- Mackenzie, S.B., R.J. Lutz (1989) An Empirical Examination of the Structural Antecedents of Attitude Towards the Ad in an Advertising Pretesting Context. *Journal of Marketing*. 53, April, 48-65.
- Marr N, Prendergast G. (1990) EFTPOS: The Perils of a Cost-Driven Venture. *Service Industries Journal*. October 1990; 10(4):748-758.
- Mitchell, A.A. (1986) The Effect of Verbal and Visual Components of Advertisements on Brand Attitudes and Attitude towards the Advertisement. *Journal of Consumer Research*. June; 12-23.
- Mitchell, A.A., J.C. Olson (1981) Are Product Attribute Beliefs the Only Mediator of Advertising Effects on Brand Attitude? *Journal of Marketing Research*. 18 August, 318-332.

Mueller, B., Okazaki, S., & Taylor, C. R. (2010). Global Consumer Culture Positioning: Testing Perceptions of Soft-Sell and Hard-Sell Advertising Appeals Between U.S. and Japanese Consumers. *Journal of International Marketing* , 18 (2), 20-34.

Nevett T. (1992) Differences Between American and British Television Advertising: Explanations and Implications. *Journal of Advertising*. December 1992; 21(4):61-71.

Okazaki S, Mueller B, Taylor C. (2010 a) Global Consumer Culture Positioning: Testing Perceptions of Soft-Sell and Hard-Sell Advertising Appeals Between U.S. and Japanese Consumers. *Journal of International Marketing*. June 2010; 18(2):20-34.

Okazaki S, Mueller B, Taylor C. (2010 b) Measuring soft-sell versus hard-sell advertising appeals. *Journal of Advertising*. 2010; 39(2):5-20.

Paek, H.-J., & Nelson, M. (2007). A Cross-Cultural and Cross-Media Comparison of Female Nudity in Advertising. *Journal of Promotion Management* , 13 (1), 145-167.

Russo France, K., R.H. Shah, C.W. Park (1994) The Impact of Emotional Valence and Intensity on Ad Evaluation and Memory. *Advances in Consumer Research*. 21, 583-588.

Scrull, T.K. (1983) Affect and Memory: the Impact of Affective Reactions in Advertising on the Representation of Product Information in Memory. *Advances in Consumer Research*. 10, 520-525.



Appendix I

Table 1- Perceived Level of Warmth, Eroticism, Humor, and Fear in Ads (1=low, 7=high)

Level of	Warm	Erotic	Humor	Fear	Neutral
Warm	4.9	4.2	3.5	1.5	2.2
Erotic	3.7	4.4	1.8	1.3	2.1
Humor	3.3	2.7	5.1	2.3	1.5
Fear	3.4	2.8	2.1	4.9	2.5

**Table 2 - Correlation Between Ad-Evoked Feelings
(1=strongest negative feeling; 7=strongest positive feeling)**

Correlations

		Worried _ carefree	Depressed _ cheerful	Insulted _ honored	Indifferent _ interested	Irritated __ pleased	Regretful __ rejoicing
worried _ carefree	Pearson	1	.634**	.553**	.498**	.620**	.577**
	Correlation						
	Sig. (1-tailed)		.000	.000	.000	.000	.000
	Covariance	2.835	1.537	1.261	1.222	1.529	1.366
Depressed __ cheerful	Pearson	.634**	1	.628**	.536**	.675**	.712**
	Correlation						
	Sig. (1-tailed)	.000		.000	.000	.000	.000
	Covariance	1.537	2.076	1.225	1.125	1.425	1.440
Insulted __ __ honored	Pearson	.553**	.628**	1	.569**	.620**	.604**
	Correlation						
	Sig. (1-tailed)	.000	.000		.000	.000	.000
	Covariance	1.261	1.225	1.835	1.123	1.231	1.150
Indifferent __ interested	Pearson	.498**	.536**	.569**	1	.616**	.563**
	Correlation						
	Sig. (1-tailed)	.000	.000	.000		.000	.000
	Covariance	1.222	1.125	1.123	2.125	1.315	1.152
Irritated __ pleased	Pearson	.620**	.675**	.620**	.616**	1	.636**
	Correlation						
	Sig. (1-tailed)	.000	.000	.000	.000		.000
	Covariance	1.529	1.425	1.231	1.315	2.146	1.309
Regretful __ rejoicing	Pearson	.577**	.712**	.604**	.563**	.636**	1
	Correlation						
	Sig. (1-tailed)	.000	.000	.000	.000	.000	
	Covariance	1.366	1.440	1.150	1.152	1.309	1.973

** . Correlation is significant at the 0.01 level (1-tailed).

Table 3 – Summary of Exploratory Factor Analysis results for Ad-Evoked Feelings

	Rotated Factor Loadings				
	Cheerful (reverse coded)	Insulted	Irritated	Interested	Carefree (reverse coded)
•Pessimistic ____ hopeful	.777	.253	.156	.284	.177
•Callous ____ affectionate	.731	.265	.180	.285	.172
•Dubious ____ confident	.662	.258	.335	.229	.236
•Bad ____ good	.618	.462	.385	.151	.024
•Cautious ____ adventurous	.549	.353	.339	-.018	.449
•Critical ____ accepting	.458	.376	.394	.125	.455
•Insulted ____ honored	.237	.754	.194	.246	.153
•Depressed ____ cheerful	.670	.282	.206	.317	.293
•Regretful ____ rejoicing	.368	.668	.187	.219	.253
•Sad ____ happy	.423	.607	.461	.100	.139
•Irritated ____ pleased	.252	.224	.585	.339	.224
worried ____ carefree	.258	.326	.284	.141	.784
nervous ____ calm	.304	.260	.764	.201	.269
•Unemotional __ sentimental	.215	.174	.081	.861	.266
•Indifferent ____ interested	.288	.386	.266	.612	.287
•Contemplative __ impulsive	.214	.265	.287	.205	.807
Eigenvalues	3.32	3.27	2.46	1.75	1.60
% of variance	20.77	20.49	15.37	10.92	9.97
Cronbach alpha	0.92	0.84	0.80	0.82	0.82

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Rotation converged in 7 iterations.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.967
Bartlett's Test of Sphericity	Approx. Chi-Square	19284.226
	Sig.	.000

Table 4 - Perceived Level of Warmth, Eroticism, Humor, and Fear in Ads (1=low, 7=high) for Males and Females

Level of	Warm	Erotic	Humor	Fear	Neutral
Cheerful (Male)	3.5	4.1	3.5	2.5	4.2
Cheerful (Female)	3.9	3.2	3.9	1.5	3.2
Insulted (Male)	3.9	3.4	2.8	4.0	4.1
Insulted (Female)	3.7	4.4	3.8	4.3	3.9
Irritated (Male)	3.7	3.7	3.8	4.3	4.5
Irritated (Female)	3.3	3.9	3.5	3.8	4.1
Interested (Male)	3.8	4.5	3.6	3.9	3.5
Interested (Female)	3.7	4.0	3.4	4.3	2.8

Buzzing the Traditional Media off through Ambient Advertising

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Abstract: Ambient advertising is a unique, intimate and non-traditional form of communication between the product and the consumer and uses all physical and environmental elements leading to stronger customer engagement. This innovative form of communication goes straight to the top of the consumer's mind and stays there for an extended period of time. The research study explores the innovations in ambient advertising including flash mob dancing, use of structures, posters, props, the backs of bus tickets, supermarket floors, shopping carts, bank receipts, animals, and other strange and unusual venues. The study further examines how ambient advertising can effectively support both traditional and digital media. This unconventional form of advertising makes effective use of surroundings and physical environments to grab attention of the intended audience leading to positive brand and ad attitudes and purchase intentions. This research paper investigates the following questions:

- What are the social and economic effects on the potential consumer engagement from innovative ambient advertising techniques like flash mob dance and the effective utilization of physical spaces for conveying advertising messages?
- How is traditional advertising different from ambient advertising?
- Is ambient advertising the future of advertising?

Keywords: Ambient Advertising, Traditional Advertising, Digital Marketing, Flash Mobs, Physical Space Utilization

INTRODUCTION

Ambient advertising utilizes the environment and elements of the environment to advertise a message.

Generally, ambient advertising utilizes the environment in a more cost-efficient manner than traditional forms of advertising such as television, print and radio. Every year more and more chunks of marketing budgets are used for ambient media in lieu of traditional forms. In recent years with the economic downturn, ambient media has thrived in part because more people commute to work, walk in transit hubs and shopping malls. Megan Hicks writes in the *Journal of Media & Cultural Studies* about the use of pavement for ambient media: "When companies post advertisements for their products in places that are novel, inventive or borderline illegal, they call it 'guerilla marketing'. Urban footpaths have become a site for such tactics with advertisers appropriating the means and methods of pavement artists and stencil graffitists to generate brand awareness" (2009). Advertising has no limits with ambient 'guerilla' marketing. The world is literally the ambient artists'

playground and in an economy like today's, the low cost of creating an effective campaign is enticing to all business owners.

Ambient media also delivers what is known as "proximity to point of sale" advertising. The ambient media is geographically placed near the point of sale to make it easy for a consumer to buy the product. In the past decade ambient media has emerged and so advertisements are showing up in the most unusual places. The uniqueness of this new advertising method is what sends the message straight to the mind of the potential consumer and makes it stay there for an extended period of time. The consumer simply cannot get the message out of his mind because of the bizarre nature of how the consumer is exposed to the message. This top of mind awareness is something that marketers all over the world have strived to achieve with print, television, radio and billboard for many years. Ambient advertising catches the consumer by surprise and this is what leaves the lasting impression in their mind.

Ambient advertising is originally derived from outdoor advertising (i.e.: billboards) which is the oldest form of advertising. Through ambient advertising marketers are able to use the environment which ends up costing much less than traditional advertising and in addition the consumer is more engaged with the message. One form of ambient advertising is referred to as "guerilla advertising". Some techniques of this guerilla advertising are "positioning out-of-place artifacts in carefully chosen sites, and promoting products using promoters who behave in out-of-the-ordinary ways." This type of advertising catches the consumer when they are not expecting an advertisement and so it leaves an especially lasting impression in their mind about the product or service.

Figure 1 shows an ambient marketing campaign that DDB Worldwide in Hong Kong did for their client McDonald's. DDB was faced with the challenge of combating flat sales and cutting through the chatter of food options to ignite excitement over McDonald's New York style burger. DDB took one of Hong Kong's most famous icons, the Hong Kong Red Taxi, and turned it yellow to imitate the New York style taxi. For two weeks passengers were offered free rides to any McDonald's in these yellow New York style taxis. Passengers could flag the taxi down, go to a taxi stand, or call a reservation line to be picked up. A redemption coupon for

McDonald's New York style burger was given out with every cab ride. It was a huge success. Most

McDonald's sold out on the first day of the campaign launch. The cabs were spotted everywhere, including Twitter, Facebook, websites, blogs and even national TV. While thousands of passengers sampled the free New York Style Burger and taxi ride, thousands more talked about it and the New York Style burger became one of the fastest selling new burgers in years for McDonalds.



FIGURE 1: McDonald's Campaign by DDB Worldwide Hong Kong

The McDonalds campaign by DDB Worldwide in Hong Kong creates a buzz because it is out of the ordinary.

Ambient advertising can attribute much of its success to the element of surprise that comes with the ad. When

a person reads a newspaper or flips through a magazine they expect to see advertisements and so their brain scans the advertisements in a unique way because the person/receiver “expects” the ad. The element of surprise is crucial to the success of an ambient advertising. As ambient advertising gets more popular and becomes more frequent, the lasting effects of the surprise element may fade.

Figure 2 shows an ambient campaign that JWT in Auckland, New Zealand did for their client Nestle which owns the brand Kit Kat. The creative team at JWT came up with a poster that could be put together by passersby at concert venues and outdoor events. The JWT team embraced the slogan of Kit Kat which is “Have a Break” by literally giving people a break by giving them a free chair to sit in. JWT prototyped and tested various designs to create a plywood flat-packed Kit Kat poster that could be made into a sturdy functional chair.

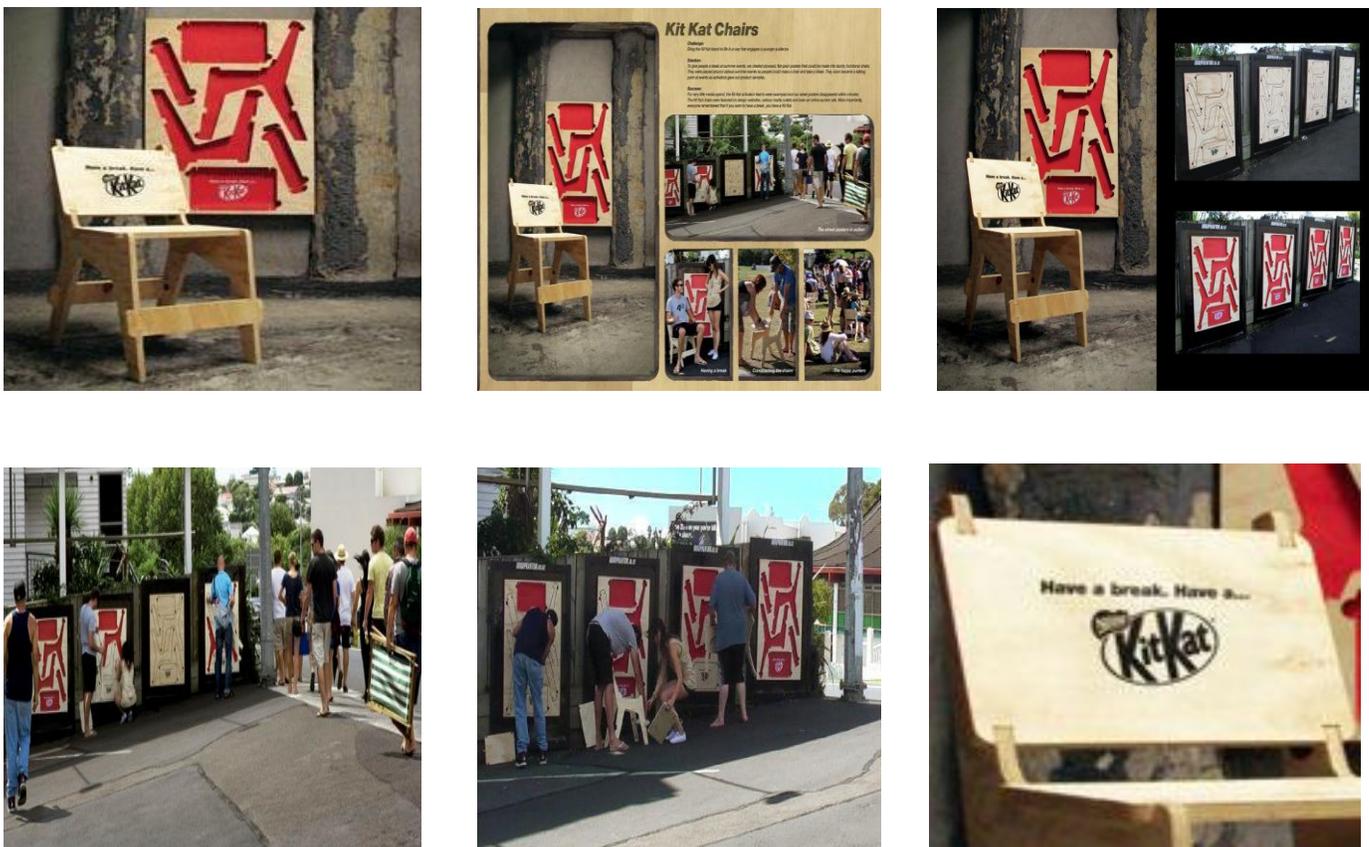


FIGURE 2: Kit Kat Campaign by JWT in Auckland, New Zealand

The poster chairs were placed strategically near outdoor summer concerts for people to take down and enjoy a break during the gig.” (*JWT.com*) Each chair was stamped with the Kit Kat brand logo so that every person that

got one would always be reminded that in order to have a break, you have to have a Kit Kat. This is one extremely creative ambient campaign in which the person not only gets to take part in putting together the chair but they then get to sit in the chair and after that they can keep the chair and take it home to always be reminded of this brand Kit Kat.

The” once static” advertising message has now evolved into a “dynamic, interactive and consumer-involving content” and because of this consumers are becoming actively engaged in the creation of a brand. This evolution of advertising mediums is taking place right now. From the perspective of the product creator or business owner, this new form of emerging advertising has huge implications that can lead to less money being spent on advertising and more of a profit. The key to ambient advertising is delivering the right message in the right place. This new form of advertising has huge implications in countries like China where the internet is censored.

In London, for example the cosmetics company Clinique has persuaded cab drivers to chat with their riders about skin care products. Clinique’s strategy is for the cab driver to then drive the passenger straight to the mall where they can purchase some Clinique product. The message and the call to action have to be right on target in order to generate revenue with ambient advertising. Now more than ever, brands are looking to engage their consumers in unique ways that will leave a lasting impression and ambient media has the ability to do just that when done right.

LITERATURE REVIEW

In Gambetti’s paper on “Engaging Urban Touch Points” (2010), she talks about several key factors that drive the rapid expansion of this new form of ambient media and they are as follows:

- perception among advertisers that these media provide high engagement, targeting options, proximity to point-of-sale, measurable impact and cost effectiveness;
- exposure to and recall of these media is growing as individuals spend more time commuting to work, walking in urban areas, waiting in transit hubs, and shopping at retail outlets;
- the vast majority of consumers view alternative out-of-home media as favorable and educational; and
- new technology enables companies to launch digital advertising platforms that generate higher revenues than the conventional formats they replace

The globalization of the world and the internet makes it possible to market your ambient campaign to the world.

Gambetti also says that “Ambient communication is of special interest to marketers who need to make decisions about the most effective communication mix...Moreover, outdoor advertising, along with Internet advertising, is the medium that has undergone the most significant changes in recent years. These changes have enhanced ambient media’s ability to elicit consumer brand engagement, focusing the attention on engagement as the new effectiveness parameter for innovative brand communication.”

The ability of ambient advertisements to engage the potential consumer is what leaves an imprint in the consumer’s mind. The consumer connects this experience and the feelings during the experience with the brand. Gambetti also talks about the benefits of ambient (a.k.a. guerilla marketing): the “benefits of guerilla actions are that they reach consumers in places and at times when their advertising consciousness is deactivated.”

Unlike a TV ad or a billboard or a radio commercial, ambient media catches us by surprise when we least expect to see an ad. For instance the pavement is becoming a popular place to advertise. Hicks talks about this in the *Journal of Media & Cultural Studies*. She says “in recent years corporations have recognized that new technologies and new media expand the opportunities for pavement advertising...In the near future we are likely to see even more advertisements on the ground, many of them authorized and legal as government departments lease spaces on public streets and motorways as horizontal billboards.” Corporations want to advertise for less and create a lasting impression on their brand by using Ambient ‘guerilla’ marketing. The following (Figure 3) ad was created by Meister Proper of Grey Worldwide in Germany and is a brilliant ambient campaign that utilizes the pavement.



FIGURE 3: Mr. Clean ad done by Proctor & Gamble Co.

In The Futurist Magazine, Marvin J. Cetron talks about Advertising's New Frontiers. Ambient media can be anything from the back of a bus ticket to a supermarket floor, to shopping carts or bank receipts...anything is fair game in the world of Ambient 'guerilla' marketing. Consumers have to notice the ads because they are being placed where they "can't be avoided" Cetron talk about "A British company recently installing 150,000 hand dryers in washrooms in pubs, airports, and shopping centers. Each dryer comes with a digital screen showings ads, videos, and animation. That amounts to a captive audience of about 40 million people as they dry their hands." Digital media is just one form of ambient media. Chances are you probably already encounter digital ambient media when you stand at the gas pump. Most gas stations are getting on the bandwagon and have installed or will soon be installing digital platforms at each gas pump so that you can sit there and watch the advertisement as you pump your gas.

Certon also talks about another growing ambient trend in "dogverts". This is when a company outfits the dog with clothes that have their logos or messages on them and hire people to parade them around the city. According to Certon (2004) Sony Ericsson hired professional dog walkers to parade their canine charges proclaiming their new picture-messaging phones as *something to drool about.*" The surprise element within these ambient marketing campaigns is crucial and some fear that after a while, the impact may wear off. A spokesperson for Henley Centre, a strategic marketing consulting firm said that "While companies are trying to get notices and stand out from the crowd, ambient media is actually adding to the advertising clutter, and there

is a danger that consumers will just switch off and ignore company messages”. This has one drawback to the very nature of Ambient media. Ambient media is successful now because people do not expect to see it. However as ambient media is used more often, people will begin to anticipate it and avoid it altogether.

CONCEPTUAL FRAMEWORK

Figure 4 illustrates how to buzz off traditional media through Ambient Advertising using the R.I.P. Model. There are three key elements that influence a consumer’s purchase intentions after experiencing an ambient advertisement. The first key element is the “Relationship Strength” between the customer and the product. The feelings towards the brand prior to experiencing the ambient ad and the relationship between the consumer and the product both contribute to the opinion of the ambient ad. The second key element that contributes largely to the effectiveness of ambient media is the “Inherent Dramatic Surprise / Excitement” element. Ambient advertising by nature is unexpected. The element of surprise causes drama and excitement. The third element that contributes to the effectiveness of ambient advertisements is the “Prodigious / Exceptional Execution element”. Prodigious means extraordinary or marvelous. Ambient media is always prodigious in one way or another whether it is the concept of the ad itself, the magnitude or size of the ad or the impact of the ad on the consumer. This trait of ambient media is crucial to ability to leave a brand at the top of the consumer’s mind.

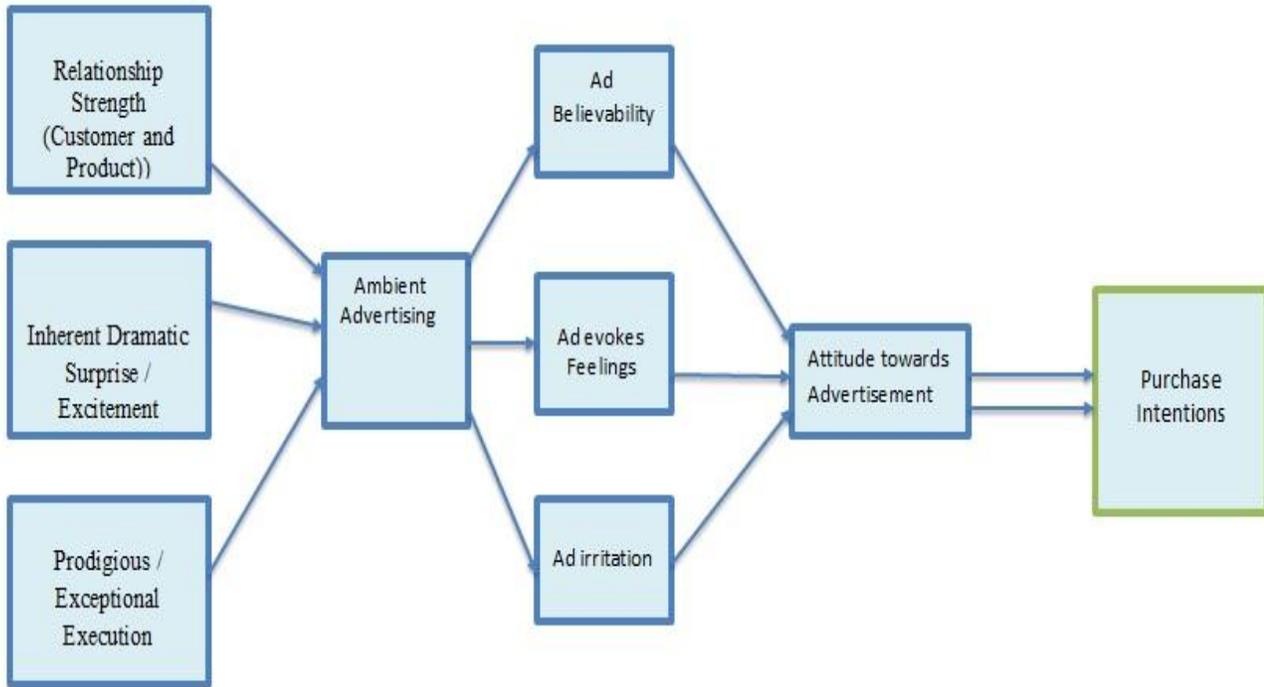


FIGURE 4: R.I.P. Conceptual Model for Ambient Advertising

RESEARCH METHODOLOGY

A survey based quantitative research was conducted where a sample size of 81 undergraduate students at a Historically Black College University (HBCU) was selected for the purpose of the research study, out of which 52 were women. Table 1 shows the demographic details.

Table 1: Gender, Age and Ethnicity of the Sample

		Gender			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	29	35.8	35.8	35.8
	Female	52	64.2	64.2	100.0
	Total	81	100.0	100.0	

Age:

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 21 - 25	60	74.1	74.1	74.1
26 - 30	13	16.0	16.0	90.1
31 - 35	4	4.9	4.9	95.1
36 - 40	1	1.2	1.2	96.3
46 - 50	1	1.2	1.2	97.5
56 - 60	1	1.2	1.2	98.8
61 and above	1	1.2	1.2	100.0
Total	81	100.0	100.0	

Ethnicity:

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid African American	64	79.0	79.0	79.0
White (Caucasian)	13	16.0	16.0	95.1
Asian	1	1.2	1.2	96.3
Native Hawaiian or other Pacific Islander	2	2.5	2.5	98.8
Other	1	1.2	1.2	100.0
Total	81	100.0	100.0	

First Qualitative Stage – 25 ads / stimuli were presented to a jury of 15 students in order to judge the degree of ambient advertising of each stimulus. The results of this qualitative stage were ordered category ranking of 25 stimuli – frequency counts were conducted and finally, 5 stimuli were selected – the three factors of the conceptual framework: Relationship Strength, Inherent Dramatic Surprise and Prodigious Exception, were the focus of ordered category ranking.

Second Qualitative Stage - These 8 stimuli were then presented to the one focus group of 20 students in random order for each student. Randomization was used to avoid systematic measurement errors as a result of respondent wear-out. Since the population at a HBCU is homogenous with similar socio-demographic characteristics; only gender was included as a classification question. Thereafter, the findings were recorded for these focus groups and generalized for males versus females.

RESEARCH FINDINGS

After conducting the research, the results were obtained as shown in Table 2 highlighting correlation analysis.

Table 2: Correlations

		AdBelivability	AdIrritation	InherentDrama	ProdigiousExecution	RelationshipStrength
AdBelivability	Pearson Correlation	1	.944**	.808**	.208	.660**
	Sig. (2-tailed)		.000	.000	.067	.000
	Sum of Squares and Cross-products	61223.295	36584.885	18162.000	3969.179	10379.449
	Covariance	795.108	475.128	235.870	51.548	134.798
	N	78	78	78	78	78
AdIrritation	Pearson Correlation	.944**	1	.770**	.173	.620**
	Sig. (2-tailed)	.000		.000	.130	.000
	Sum of Squares and Cross-products	36584.885	24545.654	10953.000	2082.538	6176.346
	Covariance	475.128	318.775	142.247	27.046	80.212
	N	78	78	78	78	78
InherentDrama	Pearson Correlation	.808**	.770**	1	.306**	.740**
	Sig. (2-tailed)	.000	.000		.006	.000
	Sum of Squares and Cross-products	18162.000	10953.000	8246.000	2141.000	4275.000
	Covariance	235.870	142.247	107.091	27.805	55.519
	N	78	78	78	78	78
ProdigiousExecution	Pearson Correlation	.208	.173	.306**	1	.480**
	Sig. (2-tailed)	.067	.130	.006		.000
	Sum of Squares and Cross-products	3969.179	2082.538	2141.000	5920.718	2346.795
	Covariance	51.548	27.046	27.805	76.892	30.478
	N	78	78	78	78	78
RelationshipStrength	Pearson Correlation	.660**	.620**	.740**	.480**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	Sum of Squares and Cross-products	10379.449	6176.346	4275.000	2346.795	4042.987
	Covariance	134.798	80.212	55.519	30.478	52.506
	N	78	78	78	78	78

** . Correlation is significant at the 0.01 level (2-tailed).

Table 3 below illustrates the presence of three factors for measuring ambient advertising.

Table 3: Rotated Component Matrix

	Component		
	Inherent Dramatic Surprise / Excitement	Prodigious / Exceptional Execution	Relationship (Between Product and Customer)
AmbientFeeling4 I agree with this advertisement.	.919	.153	-.047
AmbientFeeling1 There is a clear positive message in this advertisement.	.903	.032	-.15
AmbientFeeling7 Does this ad make you feel good or excited?	.886	.082	.157
AmbientFeeling5 The advertisement is dramatic.	.722	.070	.262
AmbientFeeling2 There is a clear exception in this advertisement.	.096	.927	.059
AmbientFeeling6 Does this ad make you feel bad or overwhelmed?	-.045	.888	.304
AmbientFeeling3 I grew up around situations/messages like these.	.474	.640	.088
AmbientFeeling9 Are you encouraged to support this cause or buy product after seeing this ad?	.119	.104	.834
AmbientFeeling8 Does this ad make you feel indifferent to the product?	.168	.303	.909
AmbientFeeling10 Would you buy this product after seeing this ad?	.104	.119	.872
Eigen Values	4.69	2.23	1.15
% of variance	46.87	22.34	11.55
Cronbach alpha	.806	.811	.759

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Rotation converged in 5 iterations.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.840
Bartlett's Test of Sphericity	Approx. Chi-Square
	582.884
	df
	45
	Sig.
	.000

Women feel more cheerful than men when ambient ads are conveyed. Men preferred traditional ads over ambient advertising as the elements of surprise, drama and relationships were found less significant for men than women. Brand interest, and positive emotion and impression about the brand and an ad, leads to positive purchase intention. Ambient strategies make ads more interesting and likeable leading to positive intentions to buy, while traditional strategies ignite more likeability but do not strike interest in the target audience.

DISCUSSIONS

The 'RIP' effect illustrates how and why the impact of ambient advertising is unique to that of any other form of advertising. The three elements aforementioned break down the impact of ambient media and why it works so well for bringing Top Of Mind Awareness to a brand or a product. The relationship between the customer and the product always contributes to the buying intentions a customer has about a brand. The extraordinary nature of ambient media helps to leave a lasting impression on anyone who experiences it. The inherent dramatic surprise element of ambient media is perhaps the most important element of all. Ambient media engages the customer in a way no other media can because the consumer does not expect to experience it. This element creates drama and excitement about the ad or about the brand or product being advertised.

CONCLUSION

Ambient Advertising reaches potential consumers in a unique and creative and often engaging way. This emerging form of advertising cuts through the traditional advertising clutter and sends the advertised product or brand straight to the top of the consumers mind and it stays there for a significant amount of time. Ambient media pushes the traditional limits of advertising into a whole new arena. Ambient media is the future of advertising. Ambient campaigns require a lot of preparation and a lot of creativity and they must be executed well or the campaign is wasted. The engaging nature of this new form of advertising is what consumers want. Consumers want to be engaged and interact because it is human nature. Ambient media accomplishes what traditional media conquers and more.

REFERENCES

- Gambetti, R. C. (2010). Ambient Communication: HOW TO ENGAGE CONSUMERS IN URBAN TOUCH-POINTS. *California Management Review*, 52(3), 34-51.
- Advertising's New Frontiers. (2004). *Futurist*, 38(4), 11.
- Okazaki, S. (2010). Global Consumer Culture Positioning: Testing Perceptions of Soft-Sell and Hard-Sell Advertising Appeals Between U.S. and Japanese Consumers. *18*(2), 20-34
- Duran, A. (2006). Flash mobs: Social influence in the 21st century. *Social Influence*, 1(4), 301-315.
- Hicks, M. (2009). Horizontal billboards: The commercialization of the pavement. *Continuum: Journal of Media & Cultural Studies*, 23(6), 765-780. Reyburn, D. (2010). Ambient Advertising. *Marketing Health Services*, 30(1), 8-11.
- Ryan-Segger, T. (2007). HOW AMBIENT MEDIA HAS GROWN UP. *B&T Weekly*, 57(2603), 18-20.
- Shankar, A., & Horton, B. (1999). Ambient media: advertising's new media opportunity?. *International Journal of Advertising*, 18(3), 305-321.
- Alarcon, C. (2005). Ambient media innovations target upmarket consumers. *B&T Weekly*, 54(2502), 11.
- Bashford, S. (2010). Out of home top of mind. *Marketing (00253650)*, 28-29.
- REICH, B. (2009). Digital Media's Key to Success: Must-Read Content. *Nieman Reports*, 63(3), 15.

APPENDIX



Client: Nestle Brand Kit Kat bench
Agency: JWT - London (2009)



Client: Frontline
Agency: Saatchi & Saatchi –
Jakarta, Indonesia (2009)



Client: McDonalds
 Agency: Cossette West- Vancouver
 &TBWA - Switzerland (2009)



Client: Rimmel
 Agency: JWT - London (2009)



Client: McDonalds
 Agency: DDB Group - Hong Kong (2011)



Client: Nestle Brand Kit Kat
 Agency: JWT- Auckland, New Zealand (2010)



Client: Proctor & Gamble
 Agency: Grey Worldwide in
 Germany

The American Taxation Model: A Perspective Into Methods of Federal Finance and Deficit

Stabilization

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Abstract

This paper investigates whether the present national taxation model (NTM) is quantifiably adequate in accruing and redistributing taxable revenue without concurrently increasing the federal deficit outlay. As of late, the flat tax model (FTM) and the fair tax model (FRTM) have been suggested as optimal alternatives to the NTM due to the elimination of the progressive marginal tax rates (MTR) that are inclusive in determining individual taxation liability and eliminating the need for agency oversight through a more streamlined process. Using historical taxation data, this paper characterizes the NTM as being an adequate tool for maintaining an equilibrium between revenue collection and redistribution, possessing the propensity to close the “fiscal gap” between revenue intake and expenditures as well as a conduit in stabilizing the deficit outlay by way of four avenues of approach. The first approach requires a decrease in present governmental outlays to 2008 levels and the elimination of allowable deductions for expenditure stabilization and equilibrium balance. The second approach suggests a complete decrease in governmental outlays to 2001 levels; thereby, securing expenditure stabilization and an equilibrium balance without the need of eliminating allowable deductions. The third approach requires an increase in governmental taxation levels that would cover the fiscal gap between collected revenue and expenditures. The final approach requires governmental cash injections into the economy through a central resource that would cover the fiscal gap and maintain a positive equilibrium in present outlay levels.

The American Taxation Model: A Perspective Into Methods of Federal Finance and Deficit
Stabilization

Each year the federal government collects its annual operational revenue through levying several types of taxes on individuals and businesses alike. A tax schedule in the form of a marginal taxation rate (MTR) is used to determine statutory tax liability at various levels of earned income. This form of taxation is considered to be progressive because the MTR increases as a taxpayer's taxable income increases. Yet, this manner of taxation has been acclaimed to have repeatedly failed in its mission to accrue revenue to meet the net operational cost of governmental operations. As a result, a "fiscal gap" has emerged between collection and revenue outlays¹, forcing the government to issue federal notes for purchase domestically and internationally for continued funding of discretionary and programmatic operations. In turn, this practice of continued borrowing has incurred increased federal deficit outlays to levels not seen since World War II (Anderson, Wallace & Warner, 1986). In response, a flat tax or fair tax model has been suggested as a possible alternative to replace the present NTM.

In the first section of this paper, I postulate such a premise fails to solve the overarching issue of annual programmatic and discretionary federal funding. I further submit the crux of the issue not to be whether the method of taxation is quantifiable, but instead, whether present levels of revenue intake and of governmental expenditures are quantifiably adequate in maintaining equilibrium with revenue intake, revenue outlays and deficit stability. As the data derived from the Congressional Budget Office and the Treasury Department's Financial Management Service indicates, there has failed to be an equilibrium between expenditure outlays and intake outlays

¹ The use of the terms outlays, expenditures, costs and spending are interchangeable.

for some time (“Budget and economic outlook”, 2011). Therefore, since the method of taxation is not the issue and the levels of revenue intake and expenditure tends to be the primary concern, other solutions must be cultivated to bring intake and spending to an equilibrium so the national deficit outlay might stabilize.

In Section 2, I propose three alternatives to the present NTM that have the propensity to stabilize present federal intake and outlay levels: (1) redevelop the present model by decreasing the federal outlay to 2008 levels and eliminate allowable governmental deductions, (2) redevelop the present model through decreasing the federal outlay to 2001 levels and sustain allowable governmental deductions, or (3) inject cash into the economy through the printing of additional currency that would be made available for immediate consumption. Each could serve as a solution to stabilizing the present NTM, but each would also usher in specific opportunity costs in federal spending habits as well as the individual spending habits of families across the country.

The Present National Taxation Model

For the federal government to exist, it must first find a means to pay for its own existence so it might provide, at a minimum, the constitutionally required services to its citizens. Therefore, taxation is the only vehicle available in accruing the requisite revenue to meet this need. However, the fundamental choice in levying any tax is the source from which taxable revenue will derive and the amount that will be levied from that source so governmental programs and services offered might be financed.

Sources and Levels of National Revenue Intake and Outlays

The present NTM derives its revenue from collecting taxes from the following sources: (1) the Business Income Tax, (2) the Individual and Estate and Trust Income Tax, (3)

Employment Taxes, (4) Estate and Gift Taxes and (5) Excise Taxes.² Revenue collected from each source is used to finance governmental operations over a fiscal year. Ideally, a fiduciary equilibrium between intake and output should be met so as to prohibit a deficit. Therefore, the ideal budgetary constraint would be given by the following form

$$G_t \leq T, \quad (1)$$

where governmental expenditures G_t should be less than or equal to the sum of all taxation revenue intake T within the federal fiscal year T is subject to

$$T = \sum_{i=1}^5 T_i = T_1, T_2, T_3, T_4, T_5 \quad (2)$$

where T_i = Total national income collected
 T_1 = Business Income Tax
 T_2 = Individual and Estate and Trust Income Tax
 T_3 = Employment Taxes
 T_4 = Estate and Gift Taxes
 T_5 = Excise Taxes.

therefore, the equation is derived as

$$G_t \leq T = \sum_{i=1}^5 T_i = T_1, T_2, T_3, T_4, T_5 \quad (3)$$

In FY 2010 total gross revenue collected from all sources totaled \$2.345 trillion, with \$467.3 billion in taxable returns and \$1.877 billion in net collections (U.S. Dept. of Treasury,

² Table 1 and Figure 1 show a breakdown of each taxable revenue source and the percentage of revenue derived from each.

Internal Revenue Service, 2010). However, the federal government's gross cost of operation that year totaled \$4.472 trillion, with a net operational cost of \$4.296 trillion less earned revenue. That same year, the net operational cost for governmental operations totaled \$2.080 trillion, less taxes and other revenue and unmatched transactions and balances. Therefore, the United States ran a deficit of \$1.294 trillion as the operational costs exceeded taxable revenues (Financial Management Service, 2010).³

In addition to the deficit that was incurred in FY 2010, federal revenue intake has been insufficient for more than 30 years in preventing fiscal gaps from being incurred. In the Congressional Budget Office's (CBO) report *The Budget and Economic Outlook: Fiscal Years 2011 to 2021* a chart titled "Revenues, Outlays, Deficits, Surpluses, and Debt Held by the Public, 1971 to 2010" shows a history of continual fiscal gaps in revenue intake and governmental spending since 1971.⁴ As a result, debt held by the public has increased from \$303 billion in FY 1971 to \$10.435 trillion in as of December 2011, with total outstanding debt sitting at \$15.125 trillion (U.S. Dept. of Treasury, Congressional Budget Office, 2010 and U.S. Dept. of Treasury, Bureau of Public Debt, 2011). There has been widespread speculation that the source of this fiscal gap lies in the method of taxation used to collect revenue. For years, legislators have been prompted to initiate new and revised forms of taxation that would streamline the process and simplify it down to the individual level. However, the crux of the issue has never been whether the present model of taxation is at fault, but whether net revenue intake has met governmental outlays.

³ See also Table 5: United States Government Reconciliations of Net Operating Cost and Unified Budget Deficit for the Years Ended September 30, 2011, and 2010).

⁴ See Table 6: *Revenues, Outlays, Deficits, Surpluses, and Debt Held by the Public, 1971 to 2010, in Billions of Dollars*

The Progressive Marginalization of the NTM

Though the national income is derived from more than one source, the proceeds from the individual income tax and the employment tax make-up the bulk of the national income.

Employment taxes are direct taxes that served as 35% of the gross national income in FY 2010.

These taxes are automatically levied from an individual's paycheck to finance many of the programmatic services offered by the federal government, such as social security, medicare, medicaid and unemployment. Similarly, the individual income tax is an annual direct tax on all taxable income and served as 50% (\$1.175 trillion of \$2.345 trillion) of the gross national income collected by the federal government in FY 2010 (IRS, 2010). Because such a high level of the national income is involved in the individual income tax, the method of collection has been a source of contention in many levels of government.

In a working paper published by several members of the CBO, they describe the U.S. tax structure to be, "a hybrid of income- and consumption-tax provisions that is complex, distortionary, and replete with tax preferences (Altig, et al, 1997). They base their assumptions on the premise that levying taxes can actually make an economy more efficient as well as less efficient (Amos, 1994). The type of taxation model used by a nation typically depends on a model's level of efficiency and its propensity to distort economic decisions. To achieve a certain level of efficiency in taxation and reduce possible distortions in application, a nation might choose a progressive tax system, under which, as a person earns more, their average tax rates rise; a proportional tax system, under which, everyone pays the same; or a regressive tax system, under which, as a person earns more, their average tax rates fall (Wessels, 2006). In his *General Theory of Employment Interest and Money*, British economist John Maynard Keynes (1953)

pronounced that, “the outstanding faults of the economic society in which we live are its failure to provide for full employment and its arbitrary and inequitable distribution of wealth and incomes” (p. 372). Therefore, when the federal government began to devise the present NTM, it took Keynes’ argument into account and cultivated a progressive NTM designed to combine equality and efficiency without distorting a process that should be simplistic in application

Under the present NTM, individual annual income taxes are divided into statutory marginal tax rates of 35%, 33%, 28%, 25%, 15% and 10%. Each scheduled rate has a specified level of income that must be earned before a margin of taxation might be applied to an person’s income level.⁵ To determine an individual’s tax liability, the use of

$$T_l = T(Y_i), \quad (4)$$

where T_l = Individual tax liability

T = Individual MTR

Y_i = The sum of all taxable income an individual earns,

serves as a functional model. This means that an individual’s tax liability T_l is determined by first adding the total taxable earnings over a fiscal year Y_i and multiplying those earnings by the taxable schedule T under which the sum of all that taxable income falls (Kramer, 1983).

In many advanced industrialized democracies, such marginal tax rates may even increase more rapidly than the levels shown here. Yet, it is evidenced that democratic forms of government tend to show a strong preference for progressive marginal tax rates on income (p. 223). In their 2001 study “Representative Democracy and Marginal Rate Progressive Income

⁵ See Table 5: Marginal Tax Rate Table for 2011.

Taxation”, New York University professors Oriol Carbonell-Nicolau and Esteban Klor (2001) describe the progressivity of taxation as follows:

A common feature of tax systems in all industrial democracies is the progressivity of statutory income taxation; that is, in these countries, the amount of income tax paid as a proportion of income rises with income. More surprisingly, in an overwhelming majority of these countries the statutory income tax schedule is progressive at the margin; not only the average tax rate increases with income, but so does the marginal tax rate (this is so for all OECD countries; see OECD, 1997) (p. 1138).

The reason advanced democracies prefer this form of taxation reverts to sheer voter egotism. One might suppose that in a democracy the choice of a tax schedule should be decided by the citizens directly. However, if a nation gave the direct vote to its citizenry for determining tax schedules it would lead to a “gross instability and cycling over tax structures, with new majority coalitions perpetually emerging and overturning the existing tax code in favor of a new one which favors them” (Kramer, 1983, p. 226). As a result, Klor and Carbonell-Nicolau’s study found no existence of an equilibrium between a direct democracy and MTRs. However, they did find that in a representative democracy MTR schedules were not voted on by the citizens directly, but were instead voted on by a set of elected representatives who have different attitudes towards taxation and redistribution (Klor & Carbonell-Nicolau, 2001). Therefore, their study concluded that only progressive MTR models were compatible with the existence of equilibrium which is consistent with the observed stability of tax structures and demand for progressivity in developed democracies (p.3).

Suggested Reforms for the Present NTM

Critics against the use of the present NTM have argued for the enactment of other models that are perceived to reduce inefficiency, inequality and the propensity for distortion when applied to an economy. For some time, the proposal of a more proportionate model, such as a flat tax model (FTM) or a fair tax model (FRTM) has been considered as a more viable alternative to the present NTM, through which the ideology and methodology of revenue collection would be as follows:

Income [would] be taxed once and only once at a rate that applies to all types of income and earners...⁶ [and] all individuals [would] pay a single flat tax on all labor income that is defined to include wages, salaries, and pension income derived from deferred wages.

All types of non-labor income- interest dividends, etc.-[would] not subject to the individual income tax but would be taxed in the business sector (Ho & Stiroh, 1998, p. 86).

Under either one of these methods the bulk of tax liability would also shift from the upper and lower class to the middle class, increasing taxable revenues from families who, historically, would have paid a lower sum. However, even with the implementation of either of these plans, there still remains a level of progressivity in theory and application, though less than the current NTM (Ho & Stiroh, 1998).*

Apologetic for the Present NTM's Usage

Other objections against the present NTM involve the perception of inequality that critics believe the aforementioned reforms might solve. One such inequality is the application of higher

⁶ Ho & Stiroh Cf. Robert Hall and Alvin Rabushka's, *The Flat Tax*, 1995, p. 55

MTRs to a minority of voters who have a higher reported earned income. Though that higher MTR is set by a majority of voters to fall exclusively on the minority of voters, it is important to note that it is not the voters themselves who set the MTRs, but the elected representatives who set the standard that would best serve their constituency. As a majority of Congress has set such MTRs as the standard Walter Blum and Harry Kalvin (1953) argue, “[the] majority rule with all its difficulties is superior to any principle for resolving group decisions. Not to agree with this preference for majority rule is to reject democratic self-government” (p.19).*

That same minority also claim that the application of a MTR schedule has the propensity to lessen economic productivity within a society and would essentially serve as a disincentive to earn higher wages. However, no serious research pertaining to this economic claim would be complete without having first referenced how the Laffer Curve might influence such productivity disincentives. University of Virginia Professor Max Moszer (1981) explains, “Laffer contends that higher tax rates, by removing incentive, will discourage work, lead to less output, and thereby reduce the government’s total tax revenue (p. 23). In Blum and Kalvin’s analysis of this claim, they found the degree to which progression tends to lower productivity is difficult to gauge as there is no way to measure how strong that tendency to lessen productivity might be.⁷ This is because the crux of the matter essentially boils down to whether a progressive MTR increase will decrease a person’s willingness to work, save and invest and whether that person will take his earned income and consume it now or later based on his MTR. Yet, a trend analysis

⁷ “Since taxes reduce the effective pay [of an individual], all governmental actions reduce output. The traditional theory holds that it is impossible to know a priori whether a cut in rates will reduce or increase the desire to work.” Professor Moszer’s Cf. Richard A. Musgrave & Peggy B. Musgrave. *Public Finance in Theory and Practice*, 2nd ed. (New York: McGraw-Hill, 1973) p. 407.

of past empirical data gives a snapshot of where national revenue levels might cap based on historical revenue intake at certain progressive MTR levels.

Application of the Laffer Curve

Figure 2 shows a static display of the Laffer Curve. As MTRs increase, total tax revenues continue to increase along the upward slope of the curve until the MTRs reach a critical apex. At that point any increase in MTRs induces a negative return on taxable revenues and a decrease in an aggregate demand to work, as there is less of an incentive to earn wages. Figure 3 shows the elasticity of MTRs falling on the upward slope of the Laffer Curve having an inverse effect on the Static Aggregate Supply Curve (SASC). All else held constant, as an MTR falls from P_0 to P_2 the available supply of labor moves from Q_0 to Q_2 , increasing the overall supply of willing labor. In contrast, an increase in MTRs from P_0 to P_1 would cause the MTR to fall on the downward slope of the Laffer Curve and have an inelastic effect, shifting the SASC from Q_0 to Q_2 , decreasing the overall supply of willing labor. In turn, the economy begins to contract in its ability to meet aggregate demand of goods and services and an increase in the unemployment rate occurs due to the MTR levels being a disincentive for the available labor market to earn heavily taxed wages.

A good example of a Laffer Curve effect on taxable governmental income is a historical trend analysis of MTR data and revenue collection between 1980 and 1988. In 1980, the MTR schedule reached 70% on those who earned more than \$200 thousand/year. That same year, 116,757 individuals filed tax returns under that schedule, providing a taxable income of \$36.2 billion and a collected national income of \$19 billion. However, in 1988 MTRs were reduced to 28% on those earning more than \$200,000/year. That year, 723,697 individuals filed under that

schedule, providing a taxable income of \$352.95 billion and a collected national income of \$99.74 billion (“Soi tax stats;” 1980 & 1984). Such an increase in tax revenue would be a strong Laffer Curve effect, but it is also important to note that the decrease in the MTR was not the sole reason national income increase. Other factors during this time period that should be considered include an increases in the American population, the rate of inflation and the number of the wealthy individuals within America. However, even with these changes, the strong Laffer Curve effect cannot be ignored.

Discussion of the Data

Presently, reform of the NTM fails to be the issue at point. The empirical research discussed has confirmed the model to be quantifiably adequate in accruing a superior level of tax revenue and in meeting the majority rule in its usage. Neither changing the MTR structure nor the taxation method will fill the fiscal gap and stabilize the deficit outlay to equilibrium. To meet the need for true reform the imbalance between spending and revenues will have to be addressed in lieu of the method of collecting those revenues. In order to put fiscal policy on a sustainable course difficult decisions will have to be made. The CBO’s *Long-Term Budget Outlook*, drives this point home,

To restore investors’ confidence, policymakers would probably need to enact spending cuts or tax increases more drastic and painful than those that would have been necessary had the adjustments come sooner...To keep deficits and debt from climbing to unsustainable levels, policymakers will need to increase revenues substantially as a percentage of GDP, decreasing spending significantly from projected from projected levels, or adopt some combination of those two approaches (CBO, 2011).

However, to state the need for reforms is not enough. Options have to be given to policymakers and taxpayers as to how to meet this need, otherwise true reform and economic growth will be a need plagued with inaction.

Proposal 1: Redeveloping Expected Governmental Outlays and Deductions

The first proposal takes into account present and historical governmental outlays in revenue intake and expenditures over a two year period (2008-2010). In FY 10 the IRS accrued \$2.345 trillion in gross collections and provided \$467.3 billion in deductible returns, bringing net collections to \$1.877 trillion as shown in Figure 4 (IRS, 2010). Those deductions accounted for 20% of total revenues accrued and 10% of the government's net total operational cost that year. That same year, federal discretionary spending totaled \$1.349 trillion and federal programmatic spending totaled \$2.093 trillion, with a net interest of \$196.9 billion and offsetting receipts totaling \$-184.1 billion, bringing the total of expenditure outlays to \$3.455 trillion before other costs and taxation revenues were applied (CBO, 2011).⁸ Conversely, in FY 08 discretionary spending was set at \$1.134 trillion and programmatic spending was set at \$1.780 trillion with a combined total of expenditure outlay of \$2.982 trillion. Therefore, discretionary spending increased 8.4%, programmatic spending increased 8.5% and total outlays increased by 8.6% in two years.

As a result of this increase, a budgetary deficit of \$1.294 trillion was incurred.⁹ However, if present programmatic and discretionary expenditures were decreased to 2008 levels and all deductions and returns were eliminated, much of the fiscal gap would close, providing additional revenue to supplement governmental operations. All things held constant, this is a

⁸ See Table 6.

⁹ See Table 5.

mathematically feasible method because subtracting 2010 Outlays from 2008 outlays leaves a total of the equivalent of all allowable deductions the IRS refunded in FY 10 and nothing remaining.

$$2010 \text{ Outlays} - 2008 \text{ Outlays} = X - 2010 \text{ Deductions} = Y, \text{ therefore,} \\ \$3,455 \text{ billion} - \$2,982 \text{ billion} = \$467 \text{ billion} - \$467 \text{ billion} = \$0.^{10}$$

This would mean that an expenditure cut of more than \$2.982 trillion would have to be enacted and revenue intake would have to remain around present levels without deductions. The suggestion of pursuing this route, though feasible and bold in application would be ill advised as an primary strategy of deficit reduction in a short time span as it could have negative returns on economic growth and individual acceptance. It is also important to note that even in 2008, the U.S. ran a budgetary shortfall of \$459 billion, meaning implementing this will not fully eliminate annual deficits. However, a reduction of this level would be an option to be enacted slowly and over time so outlays might fall to more manageable levels and allow the nation time to learn how to operate with fewer public services that have been historically funded by the federal government.

Proposal 2: The Redevelopment of Expected Governmental Outlays

In FY 01 discretionary spending was set at \$649 billion and programmatic spending was set at \$1.097 trillion with a combined total of expenditure outlay of \$1.862 trillion (CBO, 2011). Net Revenue Intake that year was \$1.874 trillion, incurring a surplus in revenue intake to governmental outlays.¹¹ However, in FY 10 outlays increased 54% to \$3.455 trillion, with net governmental intake increased only to \$1.877 trillion (CBO, 2011). As a result, the U.S. incurred

¹⁰ It is important to note that these sums are rounded to the nearest billionth.

¹¹ See Table 3.

a budgetary deficit of \$1.294 trillion in FY 10. All things held constant, decreasing present programmatic and discretionary expenditures to FY 01 gross levels and maintaining allowable deductions at current levels will incur a balance between revenues and costs.¹² This would mean that an expenditure cut of more than \$1.593 trillion would have to be enacted and revenue intake would have to remain around present levels with deductions. Implementing a plan such as this would be a more feasible plan to enact, however, it would have to be over time for many of the same reasons as Proposal 1.

The National Deficit: A Discussion of Importance in Application to Taxation

In the 1987 Oliver Stone directed the hit movie “Wall Street”. In this film Michael Douglas portrays the rising CEO of Wall Street’s investment world Gordon Gekko. The speech given by Mr. Gekko has been used time and time again to explain American capitalism and the invisible hand Adam Smith referred to - greed and self interest:

The point is, ladies and gentleman, that greed -- for lack of a better word -- is good.

Greed is right. Greed works. Greed clarifies, cuts through, and captures the essence of the evolutionary spirit. Greed, in all of its forms -- greed for life, for money, for love, knowledge -- has marked the upward surge of mankind. And greed -- you mark my words -- will not only save Teldar Paper, but that other malfunctioning corporation called the USA (Pressman, 1987).

Using this train of thought, American economists have gone on to include the doctrine of deficit spending as an addition to greed to save the United States for decades. Since World War II much of U.S. economic policy has rested in the principles British economist John Maynard Keynes

¹² See Figure 5: *2001 & 2010 Revenue Intake and Outlay Expenditures*.

espoused in his works during the 1930s. Out of his economic ideals came the demise of classical economics and the rise of neo-classical economics. Under his suppositions, if national investment exceeded saving, there would be inflation. If saving exceeded investment, there would be a recession, therefore during a depression the policy of the government should be to encourage spending and discourage saving. In his *Treatise on Money* Keynes (1930) stated, “For the engine which drives Enterprise is not Thrift, but Profit” (p. 131).

To supplement this encouragement of spending, it was Keynes’ position that interest rates should be continually lowered to allow public consumption of debt over liquidity so a perpetual economic quasi-boom might occur and recessions and depression might be forever avoided all together. To implement Keynes theory the federal government has printed increased levels of currency for decades, but as has historically earned less growth with each influx of cash injections within the economy and increased levels of debt. From 1950-1959, the U.S. added \$338 billion to the national deficit due to receiving 73¢ of growth on every \$1 produced. From 1990-1999, the U.S. added \$12.5 trillion to the national deficit due to receiving 31¢ of growth to every \$1 produced. Then from 2000-2008 (1st Quarter), the U.S. added another 24.3 trillion to the national deficit due to receiving only 19¢ for every \$1 produced. Therefore, to stimulate the national economy, additional debt had to be taken on. As a result, the monetary base of the U.S. economy increased and inflation devalued currency levels due to an oversupply (Lewis, 2011, p. 112).

Why is the National Deficit an Issue?

One may not understand the negativity surrounded by increasing the deficit so economic stimulus might be induced for the public good. The concern is misleading though. Spending

money for such purposes is permissible generally so long as, "...borrowed funds are put into productivity-enhancing investments with a high return" (Lewis, 2011). However, as indicated by the figures in the 1950s, 1990s and 2000s this has not been the case with the U.S.. Continuing to increase the deficit in this manner and to have discretionary and programmatic outlays at higher levels then revenue intake will force the government to borrow at high rates, with little ability to pay existing debt to domestic and international investors. In turn, this could lead to those investors to lose confidence in governmental securities and be less willing to finance U.S. governmental requests. As a result the government's ability to continue to finance programmatic and discretionary outlays as well as its capacity to induce economic stimulus could be limited. Therefore, the only method by which the U.S. can operate at a sustainable level is through cutting spending or increasing taxes.

Conclusion

This research is designed to suggest that the present NTM is a quantifiable method in accruing the requisite revenues for governmental operations. In sum, the crux of the federal deficit is set in expenditures exceeding revenues in lieu of the method and theory by which revenues are collected. It is necessary to stay within MTRs that are socially acceptable and economically justifiable as the Laffer Curve dictates, so revenue intake might be maximized. Yet, without cutting expenditure levels or taking steps to expand the national economy, revenue collected by any means becomes inadequate in filling the fiscal gap that will occur. This research is further guided by the classical principles of economics and resists the neo-classical precepts Keynes suggested due to their inefficiency in inducing economic stability in deficit outlays for decades.

References

- Altig, A., Auerbach, A., Kotlikoff, L., Smetters, K., & Walliser, J. The Federal Reserve, Federal Reserve Bank of Cleveland. (1997). *Simulating u.s. tax reform* (Working Paper 9712).
- Amos, O. (1994). *Economic literacy: A comprehensive guide to economic issues from foreign trade to health care*. Hawthorne, NJ: Career Press.
- Anderson, A., Wallace, M., & Warner, J. (1986). Government spending and taxation: What causes what?. *Southern Economic Journal*, 52(3), 630-639.
- Becsi, Z. (2000). The shifty laffer curve. *Economic Review, Federal Reserve Bank of Atlanta* (Third Quarter), 53-63.
- Blum, W., & Kalven, H. (1953). *The uneasy case for progressive taxation*. Chicago, IL: The University of Chicago Press.
- Cassou, S., & Lansing, K. (2000). Growth effects of a flat tax. *Centre for Economic Policy Research*, doi: JEL Classification: H21, E13, E62, O41.
- Ho, M., & Stiroh, K. (1998). Revenue, progressivity, and the flat tax. *Contemporary Economic Policy*, XVI(January 1998), 85-97.
- Keynes, J. (1930). *A treatise on money: the applied theory of money*. (Vol. 2, pp. 131-132). London, England: Harcourt, Brace and Company.
- Keynes, J. (1953). *The general theory of employment, interest, and money*. New York, NY: First Harvest/Harcourt, Inc.
- Klor, E., & Carbonell-Nicolau, O. (2001). Representative democracy and marginal rate progressive income taxation. *Journal of Public Economics*, 87(5-6), 1137-1164.
Retrieved from <http://pluto.mssc.huji.ac.il/~eklor/RDIT.pdf>
- Peters, B. (1991). *The*

politics of taxation: a comparative perspective. (p. 1). Cambridge, MA: Basil Blackwell, Inc.

Kramer, G. (1983). Is there a demand for progressivity?: A comment. *Public Choice*, 41, 223-228.

Lewis, H. (2011). *Where Keynes went wrong: And why world governments keep creating inflation, bubbles, and busts.* Mount Jackson, VA: Axios Press.

Moszer, M. (1981). A comment of the laffer model. *Cato Journal*, 1, 23-44.

Pressman, E. (Producer), & Stone, O (Director). (1987). *Wall Street* [Motion picture]. United States: 20th Century Fox.

Seligman, E. (1909). Progressive taxation in theory and practice. *American Economic Association Quarterly*, IX(4), 297-298.

U.S. Congress, Congressional Budget Office [CBO]. (2010). *The budget and economic outlook: Fiscal years 2011 to 2021* (Publication Number 4236). Retrieved from website: http://www.cbo.gov/ftpdocs/120xx/doc12039/01-26_fy2011outlook.pdf.

U.S. Congress, Congressional Budget Office [CBO]. (2011). *Budget and economic outlook: Historical budget data.*

U.S. Department of Treasury, Bureau of Public Debt [BPD]. (2011). *The debt to the penny and who holds it.* Retrieved from website: <http://treasurydirect.gov/NP/BPDLogin?application=np>.

U.S. Department of Treasury, Financial Management Service [FMS]. (2010). *The government's financial position and condition.* Retrieved from website: www.fms.treas.gov/finrep/mda.

U.S. Department of Treasury, Internal Revenue Service [IRS]. (2010). *Internal Revenue Service Data Book, 2010* (Publication 55B). Retrieved from website: <http://www.irs.gov/pub/irs-soi/10datbk.pdf>.

U.S. Department of Treasury, Internal Revenue Service [IRS]. (1980 & 1984). *Soi tax stats: Soi bulletins* (Publication 1136). Retrieved from website: <http://www.irs.gov/taxstats/article/0,,id=117514,00.html>

Wessells, W. (2006). *Economics*. (4th ed.). Hauppauge, NY: Barrons Educational Series, Inc.

- * P. 9- Ho & Stiroh describe the progressivity in the flat tax to be, “progressive, but less so than the current combination of a personal income tax and a corporate profits tax (p.85).” Also, Cassou & Lansing stated in their research that, “It is important to recognize that a flat tax (or a pure consumption tax) can still exhibit features which are progressive (p. 8).”
- * P. 10- In 1897 the same point was argued by Mr. W.D. Guthrie against the constitutionality of the “Dudley Bill” in the New York State legislature due to a progressive inheritance tax that was being proposed.

‘The great danger of all democracies is that one class votes the taxes for another class to pay. Heretofore, our bulwark has been that, as all taxes are equally and uniformly imposed, classes could not be discriminated against, and this protected all...Introduce the policy of graduated taxes, establish the doctrine that they are permissible under our system, and the whole burden of taxation can be thrown on a few rich.’ To this argument which is political rather than economic in character, it may be replied that the fears here expressed have not been realized in practice, and that the reasoning, if carried to its logical conclusion, would result in a complete distrust of democratic government as such. There is no advantage in conjuring up fanciful dangers which have been disproved by experience (Seligman, 1909).

Figure 1.

Percentage Breakdown of Net Governmental Revenue Collections in FY 2010

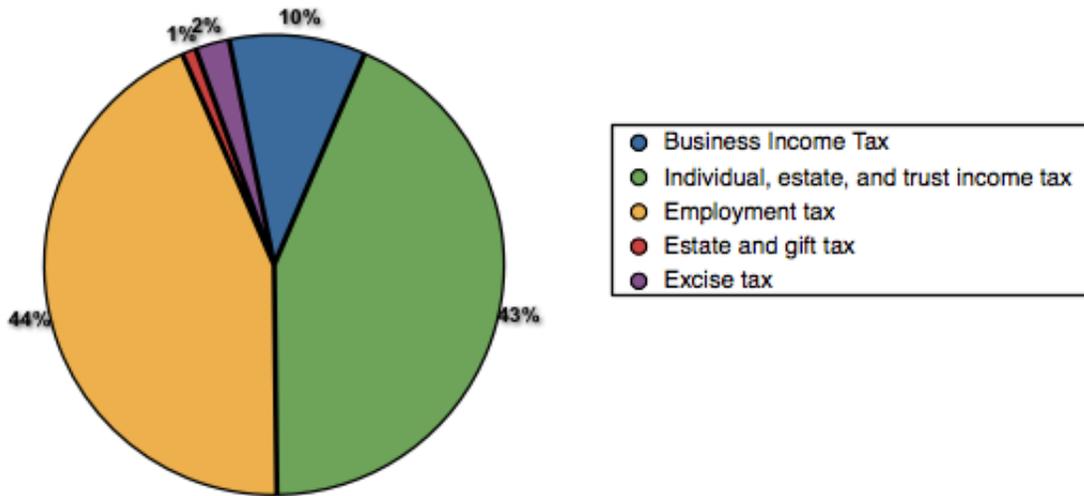


Figure 1. This is a breakdown of the percentage of net collections by the federal government for each source of taxable revenue in FY 2010 in accordance with Table 1 (IRS, 2010).

Figure 2.

Static Model of the Laffer Curve

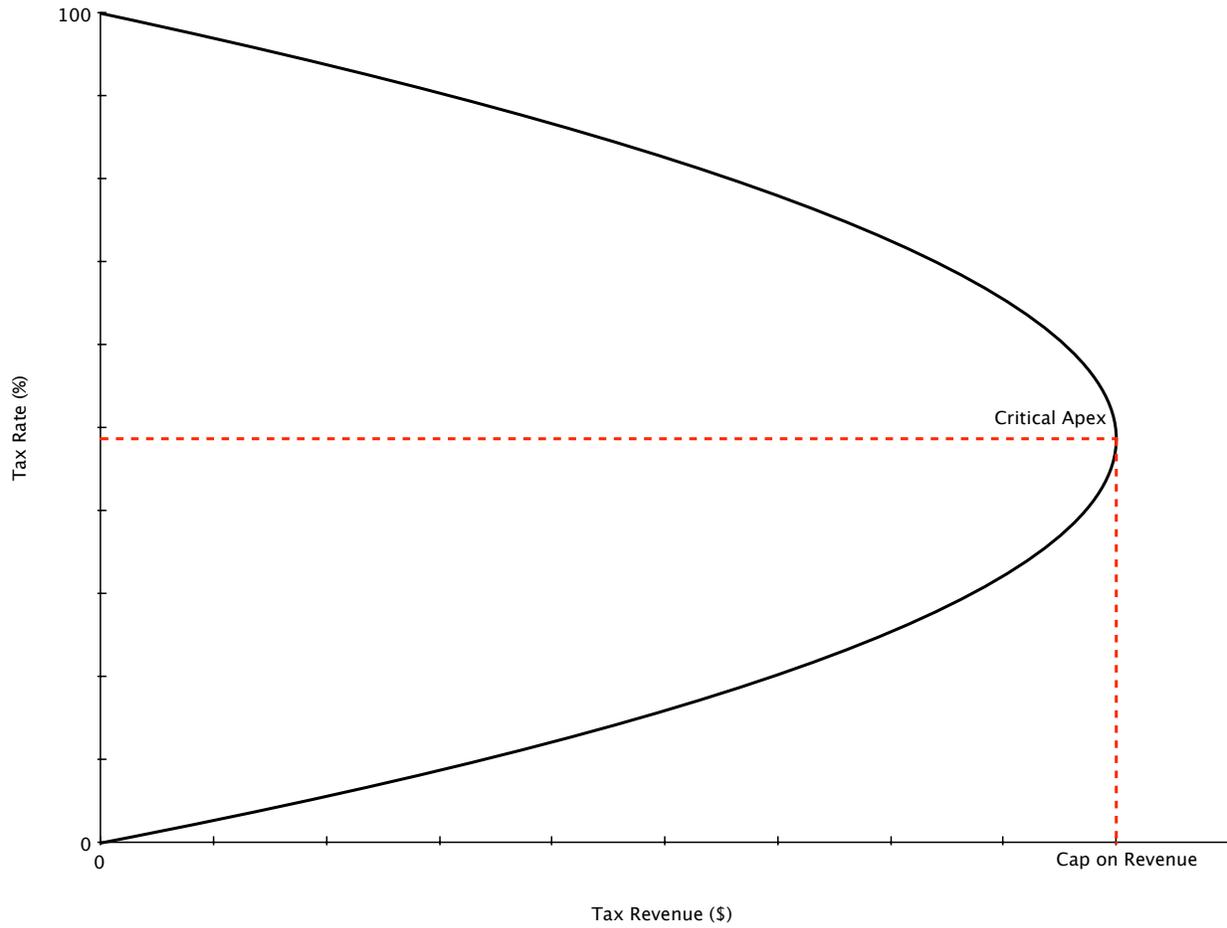


Figure 3.

Supply of Labor Subject to MTR

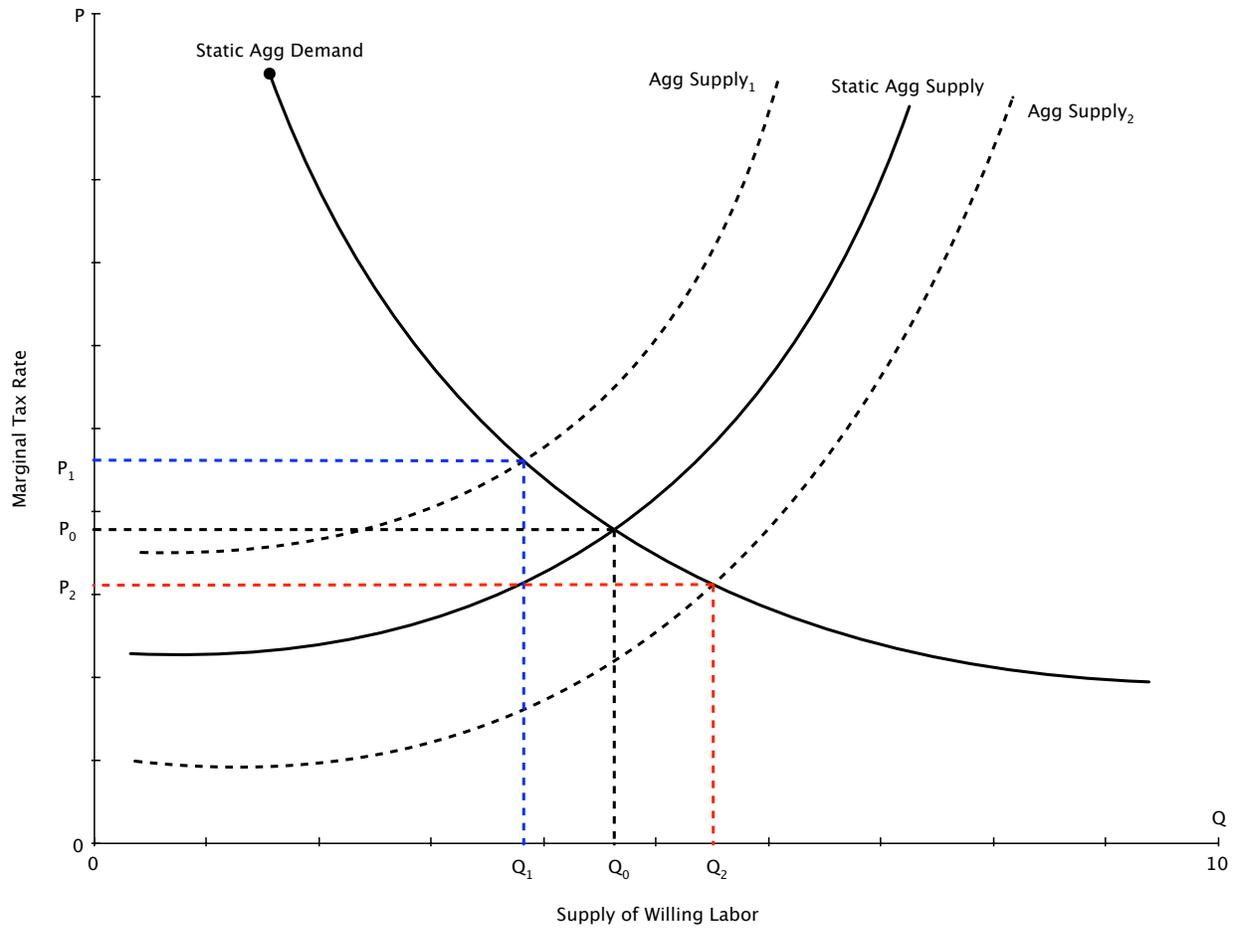
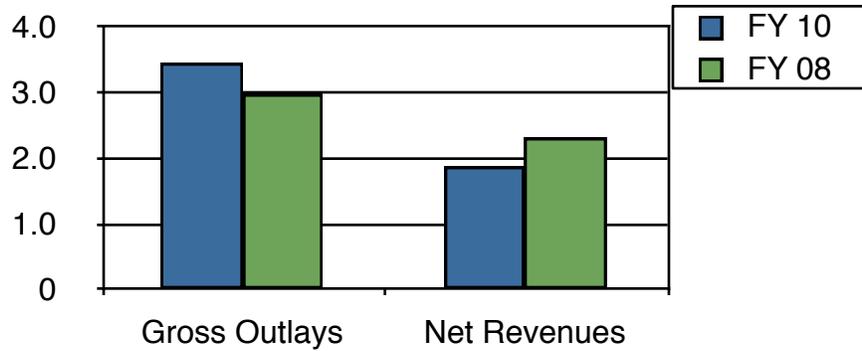


Figure 4.

2008 & 2010 Revenue Intake and Outlay Expenditures



Notes:

- 1) Net governmental intake is taken into account in lieu of gross intake due allowable deductions being taken out of available revenue for programmatic and discretionary spending (CBO, 2011).

Figure 5.

2001 & 2010 Revenue Intake and Outlay Expenditures



Notes:

- 2) Net governmental intake is taken into account in lieu of gross intake due allowable deductions being taken out of available revenue for programmatic and discretionary spending (CBO, 2011).

Table 1.

Collections and Refunds, by Type of Tax, Fiscal Years 2009 and 2010

Type of tax	Gross collections [1]			Refunds [1, 2]	Net collections [1]	
	2009	2010	Percentage of 2010 total	2010	2010	Percentage of 2010 total
	(1)	(2)	(3)	(4)	(5)	(6)
United States, total	2,345,337,177	2,345,055,978	100.0	467,302,973	1,877,753,005	100.0
Business income tax	225,481,588	277,937,220	11.9	98,338,609	179,598,611	9.6
Corporation	224,929,251	277,473,918	11.8	n.a.	n.a.	n.a.
Tax-exempt organization unrelated business income tax	552,337	463,302	[3]	n.a.	n.a.	n.a.
Individual and estate and trust income tax [4, 5]	1,190,382,757	1,175,989,528	50.1	361,974,202	814,015,326	43.4
Individual income tax withheld	880,759,170	899,588,661	38.4	n.a.	n.a.	n.a.
Individual income tax payments [6]	294,662,618	264,098,927	11.3	n.a.	n.a.	n.a.
Estate and trust income tax	14,960,969	12,301,939	0.5	3,542,928	8,759,011	0.5
Employment taxes	858,163,864	824,188,337	35.1	4,216,048	819,972,289	43.7
Old-Age, Survivors, Disability, and Hospital Insurance (OASDHI), total [5]	846,688,399	812,997,371	34.7	4,114,497	808,882,874	43.1
Federal Insurance Contributions Act (FICA)	792,767,896	761,734,808	32.5	n.a.	n.a.	n.a.
Self-Employment Insurance Contributions Act (SECA)	53,920,503	51,262,563	2.2	n.a.	n.a.	n.a.
Unemployment insurance	6,765,012	6,542,861	0.3	100,098	6,442,763	0.3
Railroad retirement	4,710,453	4,648,105	0.2	1,453	4,646,652	0.2
Estate and gift taxes	24,677,322	19,750,836	0.8	908,069	18,842,767	1.0
Estate	21,583,131	16,930,741	0.7	814,842	16,115,899	0.9
Gift	3,094,191	2,820,095	0.1	93,227	2,726,868	0.1
Excise taxes	46,631,646	47,190,057	2.0	1,866,046	45,324,011	2.4

n.a.—Not available.

- [1] Excludes adjustments and credits to taxpayer accounts, as well as excise taxes paid to the U.S. Customs and Border Protection and the Alcohol and Tobacco Tax and Trade Bureau.
- [2] Includes overpayment refunds, refunds resulting from examination activity, refundable tax credits, and other refunds required by law. Refundable tax credits include those associated with the American Recovery and Reinvestment Act (ARRA) of 2009, such as: Making Work Pay Tax Credit, American Opportunity Tax Credit, and the First-Time Homebuyer Credit. Under the provisions of ARRA, the Earned Income Tax Credit expanded to a total of \$54.7 billion and the Child Tax Credit expanded to a total of \$22.7 billion. Rebate Recovery Credits associated with the Economic Stimulus Act of 2008 are also included here. Reported amounts include \$2.2 billion in interest, of which \$1.4 billion was paid to corporations and \$0.8 billion was paid to all others (related to individual, employment, estate, gift, and excise tax returns).
- [3] Less than 0.05 percent.
- [4] Collections include Presidential Election Campaign Fund contributions of \$45.2 million in Fiscal Year 2009 and \$40.8 million in Fiscal Year 2010.
- [5] Collections of withheld individual income tax are not reported by taxpayers separately from Old-Age, Survivors, Disability, and Hospital Insurance (OASDHI) taxes on salaries and wages (under the Federal Insurance Contributions Act or FICA) and taxes on self-employment income (under the Self-Employment Insurance Contributions Act or SECA). The OASDHI tax collections and refunds shown in this table are based on estimates made by the Secretary of the Treasury pursuant to the provisions of Section 201(a) of the Social Security Act as amended and include all OASDHI taxes. Amounts shown for individual income tax withheld and individual income tax payments were derived by subtracting the FICA and SECA tax estimates from total individual income tax withheld and individual income tax payments. Refund estimates, and, therefore, net collection estimates, were not made for the components of income and OASDHI taxes.
- [6] Includes collections of estimated income tax and payments included with individual income tax return filings.

NOTES:

Detail may not add to totals because of rounding.

Partnership and S corporation data are not shown in this table since these entities generally do not have a tax liability. Instead, they pass through any profits or losses to the underlying owners who include these profits or losses on their income tax returns.

SOURCE: Chief Financial Officer, Revenue Financial Management.

Table 2.

Collections and Refunds, by Type of Tax, Fiscal Years 2007 and 2008

Type of tax	Gross collections [1]			Refunds [1, 2]	Net collections [1]	
	2007	2008	Percentage of 2008 total	2008	2008	Percentage of 2008 total
United States, total	2,691,537,557	2,745,035,410	100.0	428,838,202	2,316,197,206	100.0
Corporation income tax	395,535,825	354,315,825	12.9	53,569,392	300,746,433	13.0
Regular	394,666,355	353,548,654	12.9	n.a.	n.a.	n.a.
Tax-exempt organization business income tax	869,471	767,171	[3]	n.a.	n.a.	n.a.
Individual income tax [4, 5]	1,366,241,437	1,425,990,183	52.0	[6] 366,132,092	1,059,858,091	45.8
Income tax withheld	928,632,327	970,654,194	35.4	n.a.	n.a.	n.a.
Other [7]	437,609,110	455,335,989	16.6	n.a.	n.a.	n.a.
Employment taxes	849,732,729	883,197,626	32.2	5,713,515	877,484,111	37.9
Old-Age, Survivors, Disability, and Hospital Insurance (OASDHI), total [5]	837,596,094	870,927,700	31.7	5,600,900	865,326,800	37.4
Federal Insurance Contributions Act (FICA)	787,759,756	817,677,221	29.8	n.a.	n.a.	n.a.
Self-Employment Insurance Contributions Act (SECA)	49,836,338	53,250,479	1.9	n.a.	n.a.	n.a.
Unemployment insurance	7,416,738	7,331,036	0.3	119,336	7,211,700	0.3
Railroad retirement	4,717,897	4,938,890	0.2	-6,721	4,945,611	0.2
Estate and gift taxes	26,977,953	29,823,935	1.1	1,021,742	28,802,193	1.2
Estate	24,557,815	26,543,433	1.0	963,209	25,580,224	1.1
Gift	2,420,138	3,280,502	0.1	58,533	3,221,969	0.1
Excise taxes	53,049,612	51,707,840	1.9	2,401,462	49,306,378	2.1

n.a.—Not available.

[1] Includes adjustments and credits. Gross collections exclude excise taxes paid to the Customs Service and the Alcohol and Tobacco Tax and Trade Bureau. Because refunds of such taxes are recorded by the IRS, they are shown in this table.

[2] Includes overpayment refunds, refunds resulting from examination activity, refundable earned income tax credits, refundable child tax credits, and other refunds required by law. Also includes \$4.4 billion in interest, of which \$3.5 billion were paid to corporations, and \$0.9 billion were paid to all others (related to individual, employment, estate, gift, and excise tax returns).

[3] Less than 0.05 percent.

[4] Collections include Presidential Election Campaign Fund contributions of \$49.8 million in Fiscal Year 2007 and \$49.5 million in Fiscal Year 2008. Refunds include \$95.7 billion of economic stimulus payments associated with the Economic Stimulus Act of 2008.

[5] Collections of individual income tax are not reported by taxpayers separately from Old-Age, Survivors, Disability, and Hospital Insurance (OASDHI) taxes on salaries and wages (under the Federal Insurance Contributions Act or FICA), and on self-employment income (under the Self-Employment Insurance Contributions Act or SECA). The OASDHI tax collections and refunds shown in this table are based on estimates made by the Secretary of the Treasury pursuant to the provisions of Section 201(a) of the Social Security Act as amended and include all OASDHI taxes. Amounts shown for individual income tax withheld and other income tax were derived by subtracting the FICA and SECA tax estimates from total tax withheld and other taxes paid. Refund estimates and, thus, net collections estimates were not made for the components of income and OASDHI taxes.

[6] Includes \$2.4 billion (including interest of \$36.5 million) in estate and trust income tax refunds.

[7] Includes estate and trust income tax collections of \$21.5 billion in Fiscal Year 2007 and \$25.6 billion in Fiscal Year 2008.

NOTE: Detail may not add to totals because of rounding.

Table 3.

Collections and Refunds, by Type of Tax, Fiscal Years 2000 and 2001

Type of tax	Gross collections			2001 refunds ¹	Net collections	
	2000	2001	Percentage of 2001 total		2001	Percentage of 2001 total
United States, total ²	2,096,916,925	2,128,831,182	100.0	253,832,487	1,874,998,696	100.0
Corporation income tax	235,654,894	186,731,643	8.8	37,939,963	148,791,680	7.8
Regular	234,980,057	186,079,534	8.7	n.a.	n.a.	n.a.
Tax-exempt organization business income tax	674,837	652,109	(³)	n.a.	n.a.	n.a.
Individual income tax ^{4,5}	1,137,077,702	1,178,209,880	55.3	206,736,440	971,473,440	52.0
Withheld by employers	780,529,446	795,063,869	37.3	n.a.	n.a.	n.a.
Other	356,548,256	383,146,011	18.0	n.a.	n.a.	n.a.
Employment taxes	639,651,814	682,222,895	32.0	6,284,234	675,938,661	35.5
Old-Age, Survivors, Disability, and Hospital Insurance (OASDHI), total ⁵	627,903,375	670,456,157	31.5	6,143,113	664,313,044	34.9
Federal Insurance Contributions Act (FICA) ⁵	593,297,234	634,193,860	29.8	n.a.	n.a.	n.a.
Self Employment Insurance Contributions Act (SECA)	34,606,141	36,262,297	1.7	n.a.	n.a.	n.a.
Unemployment insurance	6,986,140	7,064,093	0.3	132,532	6,931,561	0.4
Railroad retirement	4,762,299	4,702,645	0.2	8,589	4,694,056	0.2
Estate and gift taxes	29,721,620	29,247,916	1.4	923,912	28,324,005	1.5
Estate	25,618,377	25,289,663	1.2	848,899	24,440,764	1.3
Gift	4,103,243	3,958,253	0.2	75,013	3,883,241	0.2
Excise taxes ¹	54,810,895	52,418,848	2.5	1,947,938	50,470,910	2.7

n.a - Not available .

[1] Includes principal and interest paid on refunds. Represents overpayment refunds resulting from examination activity, earned income tax credit refunds, and \$35.51 billion in advance individual income tax refunds. See also Table 9, footnote 1.

[2] Excludes excise taxes paid to the Customs Service and Bureau of Alcohol, Tobacco and Firearms. Refunds of such taxes, however, are recorded by the Internal Revenue Service and are, therefore, included.

[3] Less than 0.05 percent.

[4] Collections also include Presidential Election Campaign Fund contributions of \$60.7 million in Fiscal Year 2000 and \$58.1 million in Fiscal Year 2001.

[5] Collections of individual income tax are not reported separately from old-age, survivors, disability, and hospital insurance (OASDHI) taxes on salaries and wages (under the Federal Insurance Contributions Act or FICA, and on self-employment income under the Self-Employment Insurance Contributions Act or SECA). The OASDHI tax collections and refunds shown in Table 1 are based on estimates made by the Secretary of the Treasury pursuant to the provisions of Section 201(a) of the Social Security Act as amended and include all OASDHI taxes. Amounts shown for the two categories of individual income tax were derived by subtracting the OASDHI tax estimates from the combined total collections for the two taxes (refund estimates were not made for these two categories).

NOTE: Details may not round because of rounding.

SOURCE: Chief Financial Officer, Revenue Accounting, Office of Revenue Systems N:CFO:R:S

Table 4.

United States Government Statements of Operations and Changes in Net Position for the Years Ended September 30, 2011, and 2010

(In billions of dollars)	Non- Earmarked Funds	Earmarked Funds	Consolidated	Non- Earmarked Funds	Earmarked Funds	Consolidated
	2011			2010		
Revenue:						
Individual income tax and tax withholdings	1,092.9	772.9	1,865.8	902.6	830.3	1,732.9
Corporation income taxes	175.1		175.1	179.6		179.6
Unemployment taxes		56.1	56.1		45.2	45.2
Excise taxes	21.3	52.2	73.5	22.6	49.0	71.6
Estate and gift taxes	7.3		7.3	18.8		18.8
Customs duties	28.5		28.5	25.1		25.1
Other taxes and receipts	120.4	20.9	141.3	96.9	30.6	127.5
Miscellaneous earned revenues	11.3	4.9	16.2	11.3	4.5	15.8
Intragovernmental interest		202.0	202.0		195.0	195.0
Total revenue	<u>1,456.8</u>	<u>1,109.0</u>	<u>2,565.8</u>	<u>1,256.9</u>	<u>1,154.6</u>	<u>2,411.5</u>
Eliminations			(202.0)			(195.0)
Consolidated revenue			<u>2,363.8</u>			<u>2,216.5</u>
Net Cost of Government Operations:						
Net cost	2,110.6	1,550.2	3,660.8	2,553.5	1,742.5	4,296.0
Intragovernmental interest	202.0		202.0	195.0		195.0
Total net cost	<u>2,312.6</u>	<u>1,550.2</u>	<u>3,862.8</u>	<u>2,748.5</u>	<u>1,742.5</u>	<u>4,491.0</u>
Eliminations			(202.0)			(195.0)
Consolidated net cost			<u>3,660.8</u>			<u>4,296.0</u>
Intragovernmental transfers	(540.5)	540.5		(482.1)	482.1	
Unmatched transactions and balances (Note 1.T)	(15.6)		(15.6)	(0.8)		(0.8)
Net operating (cost)/revenue	<u>(1,411.9)</u>	<u>99.3</u>	<u>(1,312.6)</u>	<u>(1,974.5)</u>	<u>(105.8)</u>	<u>(2,080.3)</u>
Net position, beginning of period	<u>(14,119.7)</u>	<u>646.9</u>	<u>(13,472.8)</u>	<u>(12,208.6)</u>	<u>752.7</u>	<u>(11,455.9)</u>
Prior period adjustments—changes in accounting principles (Note 21)	(2.0)	2.0	-	63.4	-	63.4
Net operating (cost)/revenue	(1,411.9)	99.3	(1,312.6)	(1,974.5)	(105.8)	(2,080.3)
Net position, end of period	<u>(15,533.6)</u>	<u>748.2</u>	<u>(14,785.4)</u>	<u>(14,119.7)</u>	<u>646.9</u>	<u>(13,472.8)</u>

Table 5.

United States Government Reconciliations of Net Operating Cost and Unified Budget Deficit for the Years Ended September 30, 2011, and 2010

(In billions of dollars)	2011	2010
Net operating cost	(1,312.6)	(2,080.3)
Components of net operating cost not part of the budget deficit:		
Increase in liability for military employee benefits (Note 15):		
Increase in military pension liabilities.....	98.6	85.6
(Decrease)/increase in military health liabilities.....	(62.4)	78.9
(Decrease) in other military benefits.....	(1.2)	(0.3)
Increase in liability for military employee benefits.....	35.0	164.2
Increase in liability for veteran's compensation (Note 15)	58.9	223.8
(Decrease)/increase in liabilities for civilian employee benefits (Note 15):		
(Decrease)/increase in civilian pension liabilities.....	(13.2)	103.5
(Decrease)/increase in civilian health liabilities.....	(13.0)	3.3
Increase in other civilian benefits.....	4.2	8.3
(Decrease)/increase in liabilities for civilian employee benefits.....	(22.0)	115.1
Increase/(decrease) in environmental and disposal liabilities (Note 16):		
Increase/(decrease) in Energy's environmental and disposal liabilities.....	0.4	(17.5)
Increase/(decrease) in all others' environmental and disposal liabilities.....	2.4	(3.0)
Increase/(decrease) in environmental and disposal liabilities.....	2.8	(20.5)
Depreciation expense.....	68.4	57.5
Property, plant, and equipment disposals and revaluations.....	(4.6)	(9.8)
Increase in benefits due and payable.....	6.7	3.5
(Decrease)/increase in insurance and guarantee program liabilities.....	(13.9)	9.4
Increase in other liabilities.....	10.5	62.4
Seigniorage and sale of gold.....	-	(0.4)
(Decrease) in accounts payable.....	(9.5)	(0.3)
(Increase) in net accounts and taxes receivable.....	(11.7)	(7.1)
TARP yearend upward/(downward) re-estimate.....	23.3	(23.6)
Decrease in Non-TARP Investments in American International Group, Inc. due to valuation losses.....	9.9	2.7
(Decrease)/increase in liabilities to Government-sponsored enterprises.....	(43.7)	268.0
(Decrease)/increase in valuation loss on investments in Government-sponsored enterprises.....	(3.0)	8.1
Components of the budget deficit that are not part of net operating cost:		
Capitalized fixed assets:		
Department of Defense.....	(51.3)	(59.4)
All other agencies.....	(36.4)	(33.1)
Total capitalized fixed assets.....	(87.7)	(92.5)
Effect of prior year TARP downward re-estimate.....	23.6	110.0
(Increase) in inventory.....	(9.9)	(1.6)
(Increase) in investments in Government-sponsored enterprises.....	(20.8)	(52.6)
(Increase) in debt and equity securities.....	(0.8)	(5.8)
Decrease/(increase) in other assets.....	4.0	(24.7)
Credit reform and other loan activities.....	(10.5)	8.0
All other reconciling items.....	9.0	(7.6)
Unified budget deficit	(1,298.6)	(1,294.1)

Table 6.

Revenues, Outlays, Deficits, Surpluses, and Debt Held by the Public, 1971 to 2010, in Billions of Dollars

	Revenues	Outlays	Deficit (-) or Surplus				Debt Held by the Public ^a
			On-Budget	Social Security	Postal Service	Total	
1971	187.1	210.2	-26.1	3.0	n.a.	-23.0	303.0
1972	207.3	230.7	-26.1	3.1	-0.4	-23.4	322.4
1973	230.8	245.7	-15.2	0.5	-0.2	-14.9	340.9
1974	263.2	269.4	-7.2	1.8	-0.8	-6.1	343.7
1975	279.1	332.3	-54.1	2.0	-1.1	-53.2	394.7
1976	298.1	371.8	-69.4	-3.2	-1.1	-73.7	477.4
1977	355.6	409.2	-49.9	-3.9	0.2	-53.7	549.1
1978	399.6	458.7	-55.4	-4.3	0.5	-59.2	607.1
1979	463.3	504.0	-39.6	-2.0	0.9	-40.7	640.3
1980	517.1	590.9	-73.1	-1.1	0.4	-73.8	711.9
1981	599.3	678.2	-73.9	-5.0	-0.1	-79.0	789.4
1982	617.8	745.7	-120.6	-7.9	0.6	-128.0	924.6
1983	600.6	808.4	-207.7	0.2	-0.3	-207.8	1,137.3
1984	666.4	851.8	-185.3	0.3	-0.4	-185.4	1,307.0
1985	734.0	946.3	-221.5	9.4	-0.1	-212.3	1,507.3
1986	769.2	990.4	-237.9	16.7	*	-221.2	1,740.6
1987	854.3	1,004.0	-168.4	19.6	-0.9	-149.7	1,889.8
1988	909.2	1,064.4	-192.3	38.8	-1.7	-155.2	2,051.6
1989	991.1	1,143.7	-205.4	52.4	0.3	-152.6	2,190.7
1990	1,032.0	1,253.0	-277.6	58.2	-1.6	-221.0	2,411.6
1991	1,055.0	1,324.2	-321.4	53.5	-1.3	-269.2	2,689.0
1992	1,091.2	1,381.5	-340.4	50.7	-0.7	-290.3	2,999.7
1993	1,154.3	1,409.4	-300.4	46.8	-1.4	-255.1	3,248.4
1994	1,258.6	1,461.8	-258.8	56.8	-1.1	-203.2	3,433.1
1995	1,351.8	1,515.7	-226.4	60.4	2.0	-164.0	3,604.4
1996	1,453.1	1,560.5	-174.0	66.4	0.2	-107.4	3,734.1
1997	1,579.2	1,601.1	-103.2	81.3	*	-21.9	3,772.3
1998	1,721.7	1,652.5	-29.9	99.4	-0.2	69.3	3,721.1
1999	1,827.5	1,701.8	1.9	124.7	-1.0	125.6	3,632.4
2000	2,025.2	1,789.0	86.4	151.8	-2.0	236.2	3,409.8
2001	1,991.1	1,862.8	-32.4	163.0	-2.3	128.2	3,319.6
2002	1,853.1	2,010.9	-317.4	159.0	0.7	-157.8	3,540.4
2003	1,782.3	2,159.9	-538.4	155.6	5.2	-377.6	3,913.4
2004	1,880.1	2,292.8	-568.0	151.1	4.1	-412.7	4,295.5
2005	2,153.6	2,472.0	-493.6	173.5	1.8	-318.3	4,592.2
2006	2,406.9	2,655.1	-434.5	185.2	1.1	-248.2	4,829.0
2007	2,568.0	2,728.7	-342.2	186.5	-5.1	-160.7	5,035.1
2008	2,524.0	2,982.5	-641.8	185.7	-2.4	-458.6	5,803.1
2009	2,105.0	3,517.7	-1,549.7	137.3	-0.3	-1,412.7	7,544.7
2010	2,161.7	3,455.8	-1,371.1	81.7	-4.7	-1,294.1	9,017.8

Sources: Congressional Budget Office (CBO); Office of Management and Budget.

Notes: The estimates of the automatic stabilizers and related measures differ from those reported by CBO in May 2010 because of revisions to estimates of potential gross domestic product and the natural rate of unemployment and because of technical changes to the calculations of the responses of the federal budget to the business cycle. For CBO's previous estimates, see Congressional Budget Office, *The Effects of the Automatic Stabilizers on the Federal Budget* (May 2010).

* = between zero and 0.05 percent.

Table 7.

Marginal Income Tax Rate Table for 2011

Percentage	Single	Married-Joint	Head of Household	Married-Separate
10%	0-8500	0-17,000	0-12,150	0-8,500
15%	8,501-34,500	17,001-69,000	12,151-46,250	8,501-34,500
25%	34,501-83,600	69,001-139,350	46,251-119,400	34,501-69,675
28%	83,601-174,400	139,351-212,300	119,401-193,350	69,676-106,500
33%	174,401-379,150	212,301-379,150	193,351-379,150	106,501-189,575
35%	379,151 & Up	379,151 & Up	379,151 & Up	189,576 & Up

*Source-www.irs.gov

Table 8.

1980 Taxes Paid on Income over \$200 Thousand with MTR at 70%

Earned Income	1980 Returns	1980 Taxable Income (\$millions)	1980 Income Tax Paid (\$millions)
\$200k-500k	99,971	\$22,696.01	\$11,089.11
\$500k-\$1 Mill	12,397	\$6,512.42	\$3,613.20
\$1 Mill & Up	4,389	\$7,013.23	\$4,301.11
Total	116,757	\$36,221.66	\$19,003.42

* Source-www.irs.gov

Table 9.

1988 Taxes Paid on Income over \$200 Thousand with MTR at 28%

Earned Income	1988 Returns	1988 Taxable Income (\$millions)	1988 Income Tax Paid (\$millions)
\$200k-500k	547,239	\$134,655.95	\$38,466.62
\$500k-\$1 Mill	114,562	\$67,552.23	\$19,040.60
\$1 Mill & Up	61,896	\$150,744.78	\$42,254.82
Total	723,697	\$352,952.96	\$99,742.04

Organizational Culture and Privacy Practice

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Abstract

Protecting customers' and employees' privacy is an obligation of all organizations. Such protection requires more than privacy statements; it also demands effective privacy practices, including but not limited to shared values, work routines, information policies, training programs, rewards and punishments, and external monitoring. Most importantly, an organization's culture has profound impact on its privacy practice. This paper focuses on privacy practices in selected industries and organizations and examines the impacts of organizational culture on privacy practice. The methodology for this study involves interviews, observations, and surveying. This is a research in progress with following up studies.

Introduction

In today's technological world, information privacy protection is more important than ever. Information privacy is a critical issue for many industries, including financial institutions, government agencies, health care providers, and public libraries. Different industries choose various means to deal with information privacy and employ various privacy practices.

This paper focuses on organizational culture and its impacts on privacy practice. In addition, the study explores privacy regulations affecting public libraries, financial institutions, and government agencies and discusses the challenges that those organizations have in managing information privacy. The purpose of the study is to provide insights regarding the role of organizational culture in the implementation of privacy practices across different industries. Organizational culture plays a critical role in key organizational areas and studying it may provide a solution for privacy protection.

Literature Review and Research Questions

Given the focus of this study, it is important to be able to define the concepts of organizational culture and privacy. There are several different definitions of those terms, some of which are discussed below. Even though numerous definitions of the term organizational or corporate culture emerge from different scholarly articles, most authors agree that it is difficult to define that concept since it is something intangible. That difficulty also comes from the fact that corporate culture is “organization-specific” (Igo and Skitmore 2006) and it would be almost impossible to try to find a single definition that would apply to every type of organization or industry. Therefore, organizational culture is “often referred to as the shared meanings of assumptions, beliefs, and understandings held by a particular group or ‘mini-societies’ about its problems, practices, and goals” (Igo and Skitmore 2006). Organizational cultures “differ mainly in terms of symbols, heroes and rituals at various depths and often called ‘practices’ established by a strong organizational belief system and reflecting what people believe to be the ‘best’ thing to do in a given circumstance” (Igo and Skitmore 2006). A slightly different definition is found in another article, according to which, organizational culture is “a collective understanding, a shared and integrated set of perceptions, memories, values, attitudes and definitions that have been learned over time and which determine expectations (implicit and explicit) of behavior that are taught to new members in their socialization into the organization” (Shepstone and Currie 2008).

Given the definitions above, it is probably safe to conclude that corporate culture comes from within the organization itself. It emerges from the way people behave and communicate and is therefore unique to each particular organization.

Besides the numerous definitions of organizational culture, various types of culture are also discussed. For example, Igo and Skitmore talk about four different types of organizational culture: clan, hierarchical, adhocracy, and market culture (Igo and Skitmore 2006). A clan culture is defined as a culture that focuses on human relations and “adopts flexible operation procedures focusing on internal relationships” (Igo and Skitmore 2006). The second type of culture is hierarchical culture, which strives for stability and control “through clear task setting and enforcement of strict rules” (Igo and Skitmore 2006). An organization that is characterized by an adhocracy culture is usually a dynamic, entrepreneurial, and creative place, where risks are encouraged and welcomed. The last type of culture that Igo and Skitmore identify is a market

culture, which is associated with high productivity and economical operation (Igo and Skitmore 2006).

That suggested classification of organizational culture is one of the criteria that I am planning to use when analyzing my research findings. It seems like there might be a link between the type of culture as classified above and the privacy practice in use. As Igo and Skitmore point out, this way of classifying culture can help develop a summary profile to show the relative balance between various indicators. A research method that grew out of this type of classification is the Organizational Culture Assessment Instrument (OCAI). It incorporates a mix of qualitative and quantitative techniques to determine and compare the key cultural characteristics of a given organization. This instrument has been embodied into much of the current research and theory literature and is accepted as accurately determining both the type and strength of cultures prevalent in organizations. It has been rated as one of the 50 most important models in the history of business study and has proven its worth since its conception in the mid 1980s.

The other critical concept in this study is privacy, or information privacy. According to Smith and his colleagues, information privacy is defined as “the ability of the individual to personally control information about one’s self” (Smith et al 1996). It “refers to an individual’s ability to control when, how, and to what extent his or her personal information is communicated to others” (Son and Kim 2008). What can be implied from those definitions is that information privacy is a human right and how much information is to be disclosed should be solely the individual’s decision. That will be one of the things that I will be observing as I conduct my further research – if the studied organization gives its customers and employees the freedom to choose how much personal information is disclosed.

Information privacy is related to all types of organizations. The concern for privacy in public libraries, for example, has considerably increased in the past two decades due to the increased use of technologies to access information. As Adams states “procedures must be in effect to ensure not just that active and archival files are secure but that no files related to patrons’ personally identifiable information (PII) are kept any longer than absolutely necessary” (Adams et al. 2005). Different states have different policies regarding the handling of patron PII, but in general, “the American Library Association recommends retaining only the data necessary to conduct library business and only for the time needed to complete the transaction or business” (Adams et al. 2005). However, the final decision and responsibility are within the library’s

control. It is important to point out that after the events of 9/11 and the passage of the USA PATRIOT Act, many laws regarding privacy have changed. Therefore, librarians have to learn “how these changes affect their responsibilities to protect patron privacy while still obeying the law” (Balas 2005).

There are general guidelines that exist to ensure that patrons are given the privacy they need when they use the services that public libraries provide. For example, during the checkout process, library employees should avoid making comments about the books that patrons are checking out that would make patrons feel uncomfortable (Adams et al. 2005). In addition, “staff should also review the physical layout of the circulation area to make certain that the titles being checked out and returned by patrons are not needlessly displayed for wide public viewing” (Adams et a. 2005). Similar measures should be applied to items that are on hold for patron pick-up.

Most public libraries in the Unites States have already installed computer stations for patrons’ use. Patrons use those computer stations to access the Internet, browse library catalogs, and locate information on the Web. As already mentioned, the use of technology poses additional privacy concerns and makes patrons more vulnerable to privacy threats. For example, “online catalogs typically record searches and retain them for some period of time in transaction logs” (Adams et al. 2005). It is extremely important that a library privacy policy clearly informs patrons “about the risks of entering personal information on web-based forms and the privacy risks of using email” (Adams et al. 2005). Some libraries may even choose to go beyond simply warning patrons about potential threats to their privacy and also outline ways in which patrons can minimize those threats, such as looking for security icons on the screen.

Another industry that deals with privacy issues is the banking industry. As Hietala points out, “keeping confidential information private is an obligation of financial institutions” (Hietala 2008). However, a recent study conducted in 2011 shows that there is an “overall decrease in consumer perceptions of banks’ trustworthiness in regard to consumers’ private information” (Tellervision 2011). In general, banks’ positive images are reinforced by factors, such as financial stability, overall service quality and experience, privacy policy disclosures (especially online), respectful marketing and advertising, and strong online identity authorization procedures (Tellervision 2011). On the contrary, negative perception factors include financial instability, notification of a data breach, annoying and/or irrelevant marketing and advertising, difficult or

poorly designed online banking process, and aggressive sharing of customers' personal data (Tellervision 2011).

Multiple acts have been passed in attempts to protect customers' personal information. Examples include the Gramm-Leach-Bliley Act (GLBA) and the Federal Financial Industry Examiners Council (FFIEC) Interagency Guidelines, which are targeted specifically towards financial institutions. The GLBA and the FFIEC include requirements such as developing and implementing information security programs, performing risk assessments, implementing access controls and authentication, encrypting customer information, and exercising due diligence in selecting and monitoring third-party service providers (Hietala 2008).

Privacy practice has been the subject of several important texts in recent years. However, none of these studies have discussed the impact that organizational culture might have on privacy practice. The purpose of that paper is to conduct research on privacy practices in selected industries and organizations and to examine the impact of organizational culture on privacy practice. I will be exploring the following questions:

RQ1: How does organizational culture differ in organizations and how does privacy practice differ in organizations?

RQ2: How does organizational culture, including its various components, influence the privacy practice of an organization?

Research Methods

This study is based on case studies. Specific instruments employed in the study include interviews, observations, surveying, and the Organizational Culture Assessment Instrument (OCAI) method.

The OCAI method provides an overall culture profile of an organization in terms of the four cultural forms discussed earlier (clan, hierarchical, adhocracy, and market) and six key dimensions of organizational culture: dominant characteristics, organizational leadership, management of employees, organizational glue, strategic emphasis, and criteria for success. The dominant characteristics of a culture represent the degree of teamwork, sense of belonging, level of creativity and dynamism, focus on goals and competition, reliance upon systems, and emphasis on efficiency. The organizational leadership is about various leadership styles employed by employees and managers. The management of employees discusses primarily the

work environment. Next, the organizational glue looks at the bonding mechanisms that hold the organization together such as cohesion, teamwork, and loyalty. The strategic emphasis is the organization's overall strategy and long-term development plan. Finally, the criteria for success determine the distribution of rewards and punishments as well as the development of new products and services (Igo and Skitmore 2006).

I plan to use the review criteria developed by Quinn and Rohrbaugh (1983). A simplified presentation of the relationship between the four cultural forms and the key dimensions of organizational culture is shown in Figure 1.

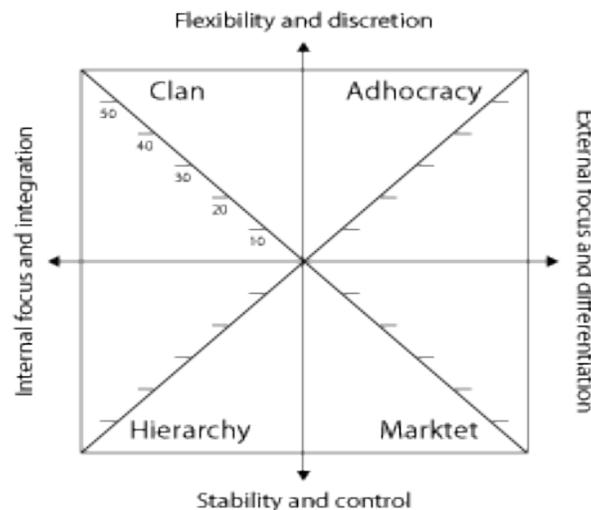


Figure 1

The OCAI method is appropriate for my survey because it is proven to give a validated and quantified image of organizational culture. It measures six key aspects of organizational culture and provides a quick and easy way to understanding organizational culture.

I plan to distribute the questionnaire to approximately 12 participants. I will study three different industries – public libraries, government agencies, and banks. I will evaluate two organizations from each industry, or a total of six organizations. My goal will be to interview one to three employees or managers from each organization. A copy of the questionnaire is presented in Appendix 1.

Preliminary Findings

In an attempt to better understand the organizational culture of public libraries and to answer important questions about privacy policy, I chose to study two different public libraries

which I will call Library of Knowledge and Library Tech for the purposes of that study. I interviewed three managers from the Library of Knowledge; two of them completed the Organizational Culture Assessment Instrument and responded to the survey questions. I also interviewed one manager from Library Tech. The findings are reported below.

At the Library of Knowledge, new patrons are required to fill out paper application forms on their first visit at the library, but they are not required to sign a privacy statement. The types of personal information that are collected are name, date of birth, address, and phone number. The patrons are not required to provide their social security numbers and are not asked any questions about their race. The library collects as much information as needed to confirm the residency of new patrons and to contact them in case they do not return materials. They have the option to provide their email addresses in order to receive electronic reminders about due dates for books that they check out. After a new patron fills out an application form, a library employee enters the information into a computer database and the application form is shredded.

Customers' personal information is stored in a computer database. After the information is entered into the library's computer database, the only people that have access to that information are the library employees. All full-time employees have access to patrons' records. Part-time employees, interns, or volunteers are not granted access to patrons' records.

Personal information about library users is not revealed to a third party unless the patron is a child under the age of 14. Parents and/or guardians of children under the age of 14 have the right to see the items that their child has checked out. Once the child turns 14, he or she becomes the only person who may request to view that information. The only exception to that rule is if police presents a warrant that they need to see a patron's record.

The Library of Knowledge has a privacy statement that is kept in their policy and procedures book. In the branch that was studied, a copy of the privacy statement is displayed on a board along with other information about the library and some general announcements. However, that policy statement is not on the library website and patrons are not notified of any changes in the privacy policy. A hard copy of the privacy statement is not distributed to patrons either; its primary purpose is for internal use of employees.

After observing the library facility and the computer stations located in the building for patrons' use, it was noted that patrons using the computers have little or close to no privacy. As the computer stations are located in the center of the main space, people passing by could see the

information that is displayed on the screens or even the passwords that patrons type to log in to the machines.

The results from the Organizational Culture Assessment Instrument are presented below:

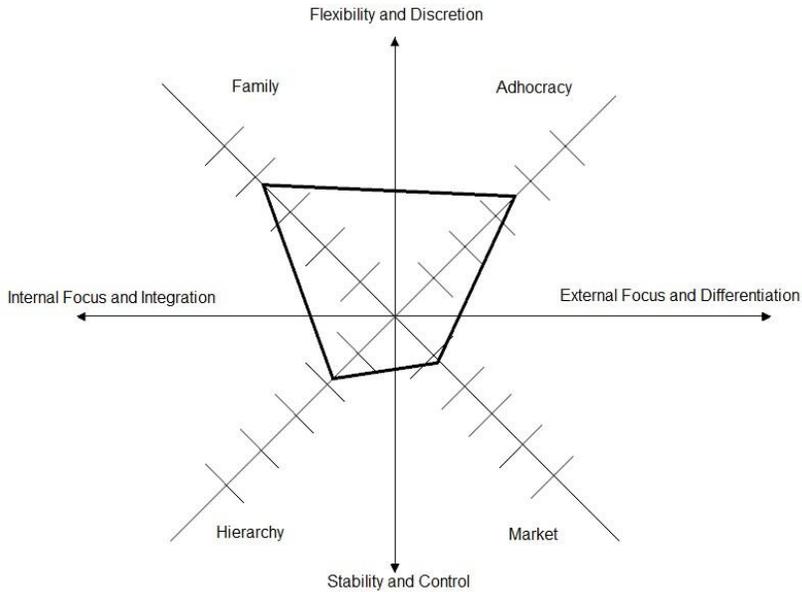


Figure 2: Library of Knowledge

Library of Knowledge	Score
Family	38
Adhocracy	35
Market	11
Hierarchy	18

Figure 3: Library of Knowledge

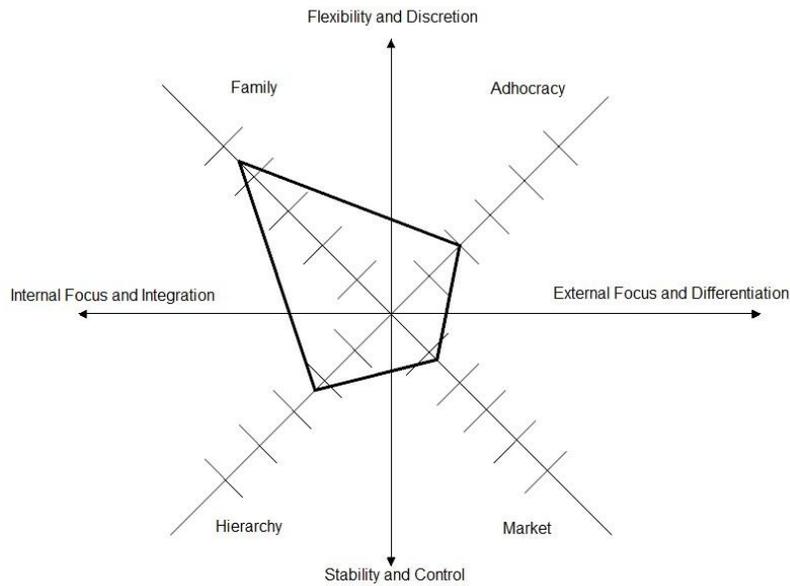


Figure 4: Library Tech

Library Tech	Score
Family	45
Adhocracy	20
Market	12
Hierarchy	23

Figure 5: Library Tech

In addition to public libraries, I also studied a city agency that I will call City Main. Employees from City Main filled out the attached survey and the OCAI method. According to the information that they provided, City Main does not have a privacy policy for customers and customers are not required to sign a privacy statement before they can use the services provided by the agency. City Main uses a computer database to store customers' information. The agency always obtains the customers' permissions before disclosing their personal information to a third party. City Main does not send unsolicited mail, such as advertising and promotional messages, without obtaining customers' consent. City Main uses security cameras as part of its privacy policy. All new hires undergo new employee training and are introduced to the organizational

privacy policy. The Director of Public Relations and the Director of Human Resources are in charge of the organizational privacy policy and of any changes to it. City Main does not conduct privacy audit. The findings from the OCAI method are reported below.

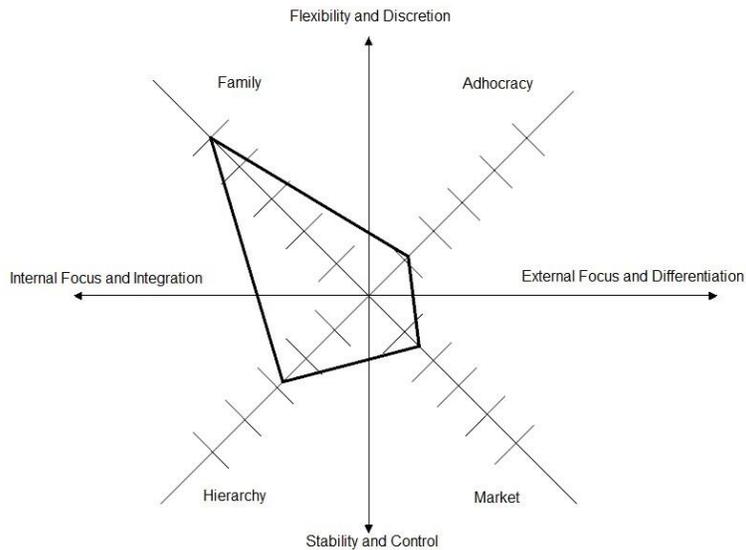


Figure 6: City Main

City Main	Score
Family	50
Adhocracy	11
Market	14
Hierarchy	28

Figure 7: City Main

Another organization that I studied is a regional bank that I will call Bank Savings. Three employees at various positions, including managers and non-managers, participated in the study. According to the surveys that they completed, the highest ranked executive in the organization who is in charge of privacy policy is the CEO. Bank Savings has a privacy policy that is displayed on the company website for customers’ use and information. A hard copy of the privacy policy is also distributed to customers and customers are notified of any changes to the privacy policy. Customers are not required to sign a privacy statement before they can use the

bank's services. The bank has policies on what information must be obtained in order to become a new customer. The information that is stored about each customer includes SSN, date of birth, address, phone, bank account number, and place of employment. Customer information is stored in both computer database and hard files. In order to prevent unauthorized access to customer information, computers are under password and/or fingerprint protection and if any paper files are kept, they are under lock and key. The mechanisms that Bank Savings employs to ensure the accuracy and integrity of customer information include double checking all information received and recorded for accuracy, logging off computers when away from the desk, and keeping paper files locked up in a desk or file cabinets. In addition, Bank Savings always obtains customers' permissions before disclosing their personal information to a third party and does not use customers' contact information to send them unsolicited mail, such as advertising and promotional messages, without obtaining their consent. The bank uses security cameras in the building. Privacy policies are included in new employee training. The bank conducts privacy audit daily. Finally, according to the employees who participated in the study, there have been no complaints from customers regarding privacy issues in the past one year.

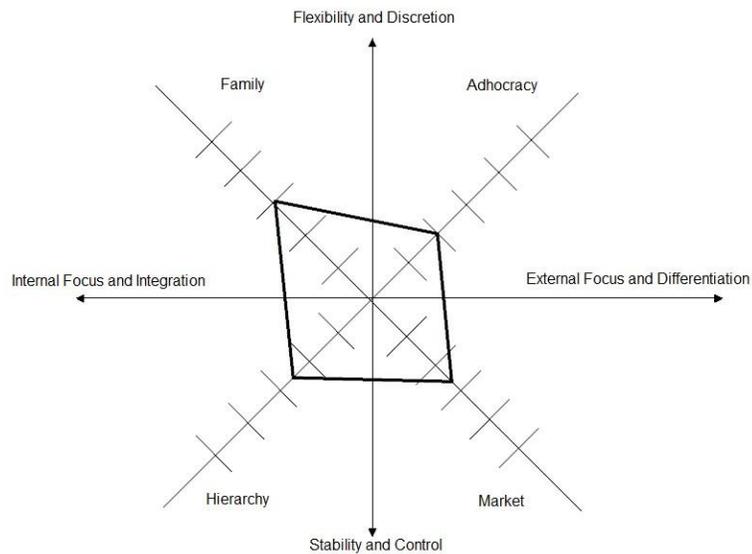


Figure 8: Savings

Savings	Score
Family	30

Adhocracy	20
Market	25
Hierarchy	25

Figure 9: Savings

References

Tellervision, “Consumers’ Trust in Banks’ Privacy Abilities Decreases.” 2011.

Adams et al. “Privacy Issues for Public Libraries.” *Privacy in the 21st Century: Issues for Public, School, and Academic Libraries.* 2005.

Balas. “Should There Be an Expectation of Privacy in the Library?” 2005.

Hietala. “Managing Information Privacy.” 2008.

Igo and Skitmore. “Diagnosing the Organizational Culture of an Australian Engineering Consultancy Using the Competing Values Framework.” 2006.

Quinn and Rohrbraugh. “A Spatial Model of Effectiveness Criteria – Towards a Competing Values Approach to Organizational Analysis.” 1983.

Shepstone and Currie. “Transforming the Academic Library – Creating an Organizational Culture that Fosters Staff Success.” 2008.

Smith et al. “Information Privacy: Measuring Individuals’ Concerns About Organizational Practices.” 1996.

Son and Kim. “Internet Users’ Information Privacy-Protective Responses – A Taxonomy and a Nomological Model.” 2008.

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The poster will describe a project that was built for a class. The overall goal of the project was to create a virtual sandbox for students and faculty to be able to work and play in that is contained within itself, without fear of affecting production environments that may be within virtual proximity of the sandbox. The sandbox itself contains many different machines running different operating systems, different pieces of software (i.e. Networking tools, overlaying GUI's, alternatives to main stream software), and varying levels of infection. The sandbox was made in such a way that the harmful parts cannot leave the environment to spread to less secure parts of a network. The machines in the sandbox can also be able to be recreated easily due to the nature of the project using templates/snapshots through Vmware. On the economic side of the project, we kept most of the parts of what we are using free so that this setup will be easily reconstructed by other universities that wish to use the same setup. We have a secure sandbox environment in which classes and individuals may come to learn about how to deal with infections, security issues, and how to set up a production environment without risk or fear of hurting the actual network it will be running on. In the future, we wish to be able to setup a connection with other schools that will be using the same or similar setup so that we can host our own war games at a distance.

Perceptions of Corruption and Financial Transparency in Nigerian Banks

ABSTRACT

Nigeria continues to be rated as one of the most corrupt countries in the world. Since the banking sector plays a significant role in the allocation of capital and economic development in the country, this study was undertaken to determine how corruption in banks is perceived in comparison to the country as a whole. The Corruption Perception Index (CPI), which include data sets from 180 countries, and the World Bank Environment Survey (WBES), which include data sets from 80 countries are widely used as indicators of corruption and the control of corruption in various countries. This study draws from some of the data sets from those surveys related to Nigeria and supplements with additional data collected related to perception of corruption in the banking sector in Nigeria. Corruption and financial transparency in the banking industry are examined as perceived by those working in the industry.

To determine perceptions on corruption and transparency in banks, the 25 consolidated banks in Nigeria were surveyed using a questionnaire. The questionnaire was delivered to a bank officer and picked up after completion, which resulted in a 100% response rate. Responses to a majority of questions are based on a 5-point Likert scale. As a measure of financial transparency, websites and 2010 annual reports for each of the 25 banks were reviewed for selected disclosure items.

Results of the study indicate that the Central Bank of Nigeria and the Economic and Financial Crime Commission have made banks and others aware that corruptive activities will not be ignored. The CNB's consolidation of banks in 2005 and the prosecution of bank officials by the EFCC are indications of their commitment to tackle the problem. Despite their efforts, however, corruption still remains throughout Nigeria, including the banking sector. Although bankers believe corruption is engrained in the culture of Nigeria, they do not believe corruption in the banking sector is as significant as it is in the public sector. They also do not believe that transparency has a major impact on the level of corruption because they perceive the level of transparency to be adequate; however, a review of websites and annual reports of the 25 consolidated Nigerian banks suggest that the transparency level is weak. Nigerian banks must do a better job of increasing transparency.

Keywords: corruption, transparency, disclosures, banking sector, Nigeria

Horton's Introduction:

Consumer behavior is sought out for target marketing to examine a better way for companies to develop their strategy. This research study delves into the human mind and analyzes the mind's capacity to memorize various advertisements that it is exposed to through a variety of media. Investigation is done to show the media effectiveness of advertisements by way of the human mind capturing the ads displayed for a few seconds through TV commercials and through social media.

There are many media outlets that young consumers explore on a daily basis. The most commonly used media outlets today are media such as: internet, television, and radio. In addition, social media have gained the world's attention and relationship building tool that it offers. In fact, social media is mainstream and currently reaching a large segment. Human mind capturing is an attention holder that allows the mind to remember advertisement. A HMC model shows it in more details. Does brand recognition play a role in advertisement? It does because many customers who like a certain brand are loyal.

The social relevance of advertised product or services online can be a reason why consumer recalls information from advertisement. Advertising needs to stop consumers and hold their attention in effective ways: "Where the eye stops, the sale begins." Because of rising media noise due to competing advertisements and active ad avoidance by consumers, it has become increasingly challenging for firms to attain this goal (Pieters & Wedel, et al.). This is arguable if the ad can hold the consumers attention, then the product is bought.

The social media that are being examined are from popular site known around the world is Facebook and Twitter to name a few. The sample sizes can be done in Savannah its surrounding areas. The preferred is online over commercial ads measurability through a survey can be

conduct in the future. Understanding while on Facebook, an advertisement relating to the information provided on page is direct relevance to what users put on their page. This is a sign of target marketing. Browsing through the television channels and still do not connecting with a commercial that relates to consumers wants and needs is annoying. The key to this knowing the audience is being able to relate. Sometimes it will be an initiative to sign up for something while viewing an advertisement on the social media. Why users and companies continue to log on? This paper offers the measurement of media effectiveness. Media effectiveness directly relates to what source of media can be used to get the best use when promoting advertisement.

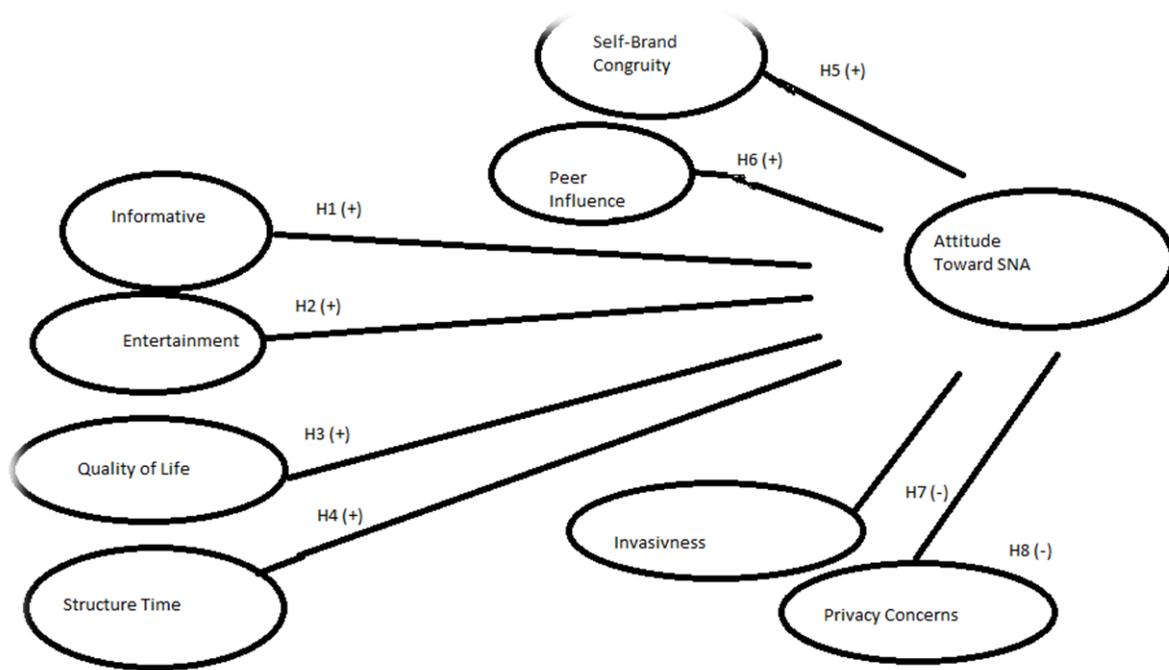
This particular subject is very interesting to market researchers or advertising companies because most commercials are boring and users sometimes just want to know what the product has to offer. My hypothesis is social media advertising is proven to be more effective than television commercials. Companies pay millions of dollars to include their advertisements on social network sites. This investigation will make it evidence that social media advertisements play a major role on memorization.

This paper explores social media trends and effectiveness with Ads in comparisons with television commercials. Hypothesis: Advertisements done on social media are more effective than commercial ads.

The rise in social media advertising also marks a continued trend by marketers to establish more intimate relationships with their customers (Wright, Khanfar, Harrington, & Kizer 2010). Advertisers today must create a more creative way to market to the website users. In fact, the number one communication channel for which advertising trends are expected to grow is online.

In 2009, an independent research was conducted and it uncovered upcoming advertised trends according to Readex Research 2009.

Social media have impact both the consumer and the company. Not only do social media user sometimes actively seek out advertising content, they often participate in the dissemination of the advertizing to other consumer (Talyor, Lewin, & Strutton 2000) Figure 1.0 below is a hypothesises model of perceived informativeness and entertainment is positively related to attitudes toward social network advertisement.



Best practices facilitates compliance with applicable legal and regulatory requirements and, further utilities to consider their goals and overall strategy in engaging social media upfront, thereby enabling them to maximize their return on investment (Baker, 2009). Advertisers today are consistently trying to get the most out of their work through advertisement memorization

whether it's the product or brand name they want their market to recall. Shopping is done mostly online today more than ever. Why not place ads on social media? It will grab the consumer attention with discounts and deals, allow them to establish relationship, and prompt response time.

All of these are necessary to properly entering on the social media world.

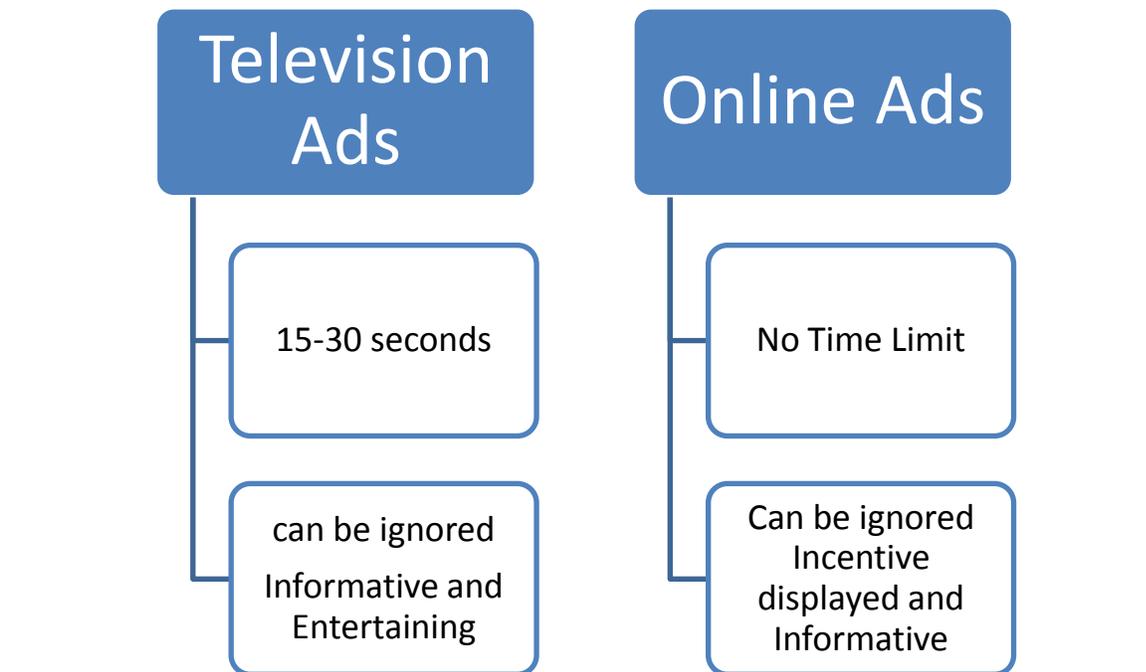


Figure 1: Show the measure of effectiveness on consumers

This figure depicts consumer attitudes towards advertisement usage. I have created a comparison model that show what both offer. It also gives example they have the ability of doing for consumer. Some consumer engages in the advertisement; however on social media it is appealing to interactive with consumer through Ads.

Many companies and consumer are realizing that we live in a technology and social connection world. People want to know what's going on, what happen, and what's new any stream of outlet would sacrifice. The understanding that market research face is some advertisements are better done via television and the others are better done on social media to increase memorization and recognition. The sample was not valid due to not enough surveys were collated. The majority however, suggested that advertisement to their option or understanding that advertisements done on television are better. My hypotheses are still arguable. The fact that my sample size is small doesn't make it validity more accurate. Human Mind Capturing offers the researcher the distinction between effect and function of television advertisement and social media (online) advertisement. A model that is in the early stage of development and when it reaches the full development it would show the effect of the outlet verse the other.

VALIDATING AN ENTROPIC MEASURE FOR STATIC MANUFACTURING COMPLEXITY

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ABSTRACT

Manufacturing systems are complex. System complexity is, in part, due to the structural aspects of the manufacturing system termed static complexity. Firms must manage complexity to avoid poor performance that can reduce their competitiveness. Part of a lean manufacturing and six sigma efforts focuses on simplification. In order to simplify, a measure of the static complexity of a manufacturing system is needed. Frizelle and Woodcock (1994) proposed such a measure using an entropy-based approach. Until now, it has gone untested. This article reports an analysis of the validity of Frizelle and Woodcock measure based upon a large scale simulation.

INTRODUCTION

Many firms have adopted a form of the lean manufacturing philosophy or have implemented improvement efforts including six sigma techniques both of which have a focus on simplification. This implies that manufacturing systems are complex. System complexity is, in part, due to the structural aspects of the manufacturing system termed static complexity. In order to simplify, a measure of the static complexity of a manufacturing system is needed. In 1998, Calinescu, Efstathiou, Scirn, and Bermejo [3] describe two methods of measuring manufacturing complexity and provide support for their applications using some simple examples. One of the measures was an entropic measure proposed by Frizelle and Woodcock [7]. As part of a study of the components of manufacturing complexity, a large scale simulation was developed. During the research, statistics were recorded to test this proposed measure of static complexity. This paper presents a brief description of the simulation and a discussion of the results regarding Frizelle and Woodcocks measure. The report is organized as follows. The first section briefly discusses manufacturing complexity and some proposed measures. The second section contains a description of the simulation. Next is a discussion of the analysis, then the results followed by a conclusion.

MANUFACTURING COMPLEXITY

According to Casti [4] a good general definition of complexity is that a complex system is one that has a counterintuitive, unpredictable or complicated structure and behavior. Certainly, given this definition, manufacturing systems are complex. Their structure is complicated and their behavior is unpredictable. Factories struggle day-to-day to achieve desired results using a range of “mitigators”, for example, expeditors, computerized planning and scheduling systems, and extra capacity. Calinescu et al. [3] summarized some of components of manufacturing complexity they recognized as: product structures, plant structure (e.g., number and type of

equipment, personnel, and shop layout), manufacturing planning and scheduling efforts, information flow, and the variability resulting from external causes (e.g., customer changes, quality failures, and machine breakdowns).

According to Frizelle and Woodcock [7] and Deshmukh et al. [6], manufacturing complexity can be separated into two constituents – static and dynamic complexity. Static complexity is the complexity resulting from the design of the manufacturing system, i.e. its structure. Dynamic complexity is the result due to the uncertainty that stems from the dynamic nature of system resources as it passes through time (Deshmukh et al. [6]). Gabriel [9] has identified eleven potential measurable factors affecting static manufacturing complexity noted from past literature. These were product mix, product mix ratio, number of components, product complexity, process complexity, integration between processes, number of machines/resources, routings, processing times, layout, and lot sizes.

The imperative question is “how can manufacturing complexity be measured?” A few have proposed measures. Cooper et al. (1992) developed a measure for the semiconductor wafer manufacturing industry, limiting its applicability. Frizelle and Woodcock [7] and Deshmukh et al. [6] each proposed entropy-based formulations derived from information theory research. As discussed previously, both broke manufacturing complexity into two separate components – static and dynamic complexity. Deshmukh et al. [6] measured the complexity of flexible manufacturing systems (FMS) using the product mix, product mix ratio, routings, processing times, and the number of machines. Again, this measure has limited applicability because it was design for FMS.

Frizelle and Woodcock’s proposed measure is not design for a specific situation, so would have broad applicability. Their formulation is presented below, consists of the two separable components of complexity – static and dynamic complexity.

$$\begin{aligned}
 H(S) &= H_{Static}(S) + H_{Dynamic}(S) \\
 H_{Static}(S) &= - \sum_{i=1}^M \sum_{j=1}^{N_j} p_{ij} \log_2 p_{ij} \\
 H_{Dynamic}(S) &= -P \log_2 P - (1 - P)P \log_2(1 - P) - \\
 &\quad (1 - P) \left(\sum_{i=1}^{M^q} \sum_{j=1}^{N^q} p_{ij}^q \log_2 p_{ij}^q + \sum_{i=1}^{M^m} \sum_{j=1}^{N^m} p_{ij}^m \log_2 p_{ij}^m + \sum_{i=1}^{M^b} \sum_{j=1}^{N^b} p_{ij}^b \log_2 p_{ij}^b \right)
 \end{aligned}$$

Frizelle and Woodcock envisioned static complexity as creating “resistance” to the process flow. It exclusively uses the number of resources, the number of manufactured items, the number of states that can occur for each resource (e.g., running item A, running item B, or idle), and queue length at each resource. Based upon the probability of the occurrences for each state and each resource, a value for static complexity is computed. In the equation for $H_{Static}(S)$, p_{ij} is the probability that product i is running on machine j .

One criticism of this measure is that collecting the data would be arduous. As Calinescu et al. [3] evaluated the entropic measure of manufacturing complexity proposed by Frizelle and

Woodcock [7], they found that obtaining and analyzing the data for this measure was very time-consuming and likely impractical. None the less, to demonstrate the application of the Frizelle and Woodcock method, Calinescu et al. [3] used a simple two machine example. They concluded that adding resources or products to a system will increase the computed value. This would concur with the notion that system complexity increases as equipment, workers and products are added.

Frizelle and Woodcock conducted three trials to support their measure. The results of the trials from Frizelle and Woodcock [7] are presented in Table 1. This shows the measure of complexity tends to be higher in systems with more manufactured items and workstations.

Table 1 Summary of Frizelle and Woodcock (1994) trial results

Trial	Processes	Machines or workstations	Number of manufactured items	Static Complexity
1	5	19	352	95
2	35	59	350	96.4
3	57	74	126	75

SIMULATION DESIGN

In order to evaluate measures of static manufacturing complexity, a large scale simulation was developed using AWESIM. Some of the details of the simulation follow. More specifics about the simulation design may be found in Gabriel [9].

From the literature, eight measureable components related to the structure of manufacturing systems were identified as shown in Table 2. To test the Frizelle and Woodcock measure and to explore effects of changing these eight factors, a design using two levels for each variable was used. A few common external factors were included to explore effect of the eight items in a dynamic environment. Internal dynamic elements, e.g. quality problems and machine breakdowns, were not included in order to focus on the effects of static complexity. Table 3 presents a list of the factors and the settings for the two levels for each factor.

Table 2 Measureable Elements of Internal Static Manufacturing Complexity

Static Complexity Elements	Definition
Product Mix	The number of end-products produced in a manufacturing system.
Product Mix Ratio	The proportion of production volume attributed to the largest volume end-product.
Product Structure Depth	The number of levels in a product structure for an end-product.
Product Structure Breadth	The maximum number of manufactured items at a single level in an end-product's product structure.
Component Commonality	A measure of the shared used of components.
Number of Routing Steps	Number of distinct manufacturing operations that items require based upon their manufacturing routing.
Number of Work Centers	The number of work centers in a manufacturing system.
Routing Commonality	A measure of the degree of similarity of routing sequences among manufactured items in a system.

A batch-type manufacturing simulated because these systems are one of the most dominant types per Safizadeh, Ritzman, Sharma, and Wood [13]. Orders flowed from workcenter to workcenter without splitting batches. At each workcenter, orders were prioritized using the earliest due date rule with ties broken by first-come-first-served. To maintain equity among experiments, trial runs were made to adjust the meantime between arrivals to achieve an average utilization at the bottleneck workcenter of 85%. This has been a common mid-range setting used in the past (Barman [1]); Pierreval, H. and N. Mebarki, [11]; Fry et al., [8]). The set-up time is set arbitrarily to 1.0 hour. Set-up time was included in the shop design primarily to measure the effect of component commonality. When manufacturing orders for the same item are processed consecutively they will require a single set-up.

Five end-products were created for the simulation. In experiment at the low setting for P, there were only two end-products. The same two end-products were used at the high level for factor P with an additional three end-products.

Table 3 Table of Experimental factors

Complexity Factor	Levels	
	High Setting	Low Setting
Product Mix – (PM)	5	2
Product Mix Ratio (PMR)	All equal	1 Dominant/Others equal
Product Structure Depth (D)	5	2
Product Structure Breadth (B)	5	2
Component Commonality (CC)	0 %	~30 %
Number of Routing Steps (RS)	10	4
Number of Work Centers (WC)	10	4
Routing Commonality (RC)	0 %	~50 %
Due Date Tightness Factor (k)	30% orders late	10% orders late

The due date tightness was also included as a factor because how due dates are set may impact the amount of lateness and tardiness produced by a system. At the high level due dates were “tight”, having a lower value for k than when due dates are “loose”. The due date tightness factor, k, was established in preliminary runs for the manufacturing system in the experiment that was deemed to be the “simplest”. The value for k was set such that, after the warm-up period, approximately 10% of the orders were tardy. The high setting for k was set, for this “simplest” case, when approximately 30% of the orders were tardy.

Orders were generated to include a random order quantity with an average total order size was approximately 200 units for each end-product. The average order size for each end-product was based upon the specific product mix ratio for the experimental run. The simulated system encountered variation in order sizes. This was accomplished using a coefficient of variation of 0.30 for the demand for each end-product.

Manufacturing order release dates for components at the end of each product structure branch were determined using the total work content (TWK) method (Goodwin and Goodwin [10]). The orders for the lowest level component on the longest branch of a product structure were released on the order arrival date. By using the same due date tightness factor at all levels in the product structures, orders had the same opportunity to complete as their “sister” items in the product structure.

The batch means method was used to make the simulation runs for all experiments. Each experimental run contained a “batch” of 15 independent replications in accordance to literature (Schmeiser [14]; Pritsker [12]) to capture the variance of dependent variables. A pilot simulation run was made at each of the 256 experimental combinations to determine the “worst case” time until steady state is achieved. This transient period was used to determine the size of replications. The number of orders in a replication for all experiments was determined by the amount of time needed to clear the transient period for the worst case multiplied by the average orders per hour. During the steady state period the average orders per hour were

determined. Thus, for every replication in every experimental run, the same number of orders was evaluated. The longest transient period observed was 28,500 hours. This yielded an average of 91 orders. To ensure a long enough observation period, the replication size used was 200 orders, more than twice as long as the warm-up period. The statistics were accumulated for 200 consecutive orders to avoid censoring data (Blackstone et al. [2]). For each experiment, data was collected beginning with order 201 and ending with order 400. An interval equal to one replication batch was left between batches where statistics were not collected to maintain independence of batches.

Data for calculating static complexity was collected at each work center during the simulation by recording the item processed, the run time for the order, the set-up time for the order, and the completion time of the processing. This data was captured well after clearing the transient period, beginning at the 200,000 hour through the 700,000 hour for all experiments. This was done so that the calculations would be from data gathered over the same 500,000 hours and should result in a “fair” value from experiments. For each experiment the proportion of the 500,000 hours at each workcenter used to process and set-up for each product was calculated. The proportion of idle time at each workcenter was determined by subtracting the proportion of processing time and proportion of set-up time at the workcenter from 1, or 100%.

RESULTS

Five performance measures were used to capture a broader perspective of operating concerns. These were the standard deviation of flow time (S_{FT}), the average and the standard deviation of lateness (L_{MEAN} , S_L), and the average and standard deviation of tardiness (T_{MEAN} , S_T). The average lateness relates to a business’ concern to have order completed close to the due date so that customers are satisfied without completely so early that significant inventory cost is incurred when orders must wait for the due date to be shipped. The average tardiness is a customer-centric measure evaluating the operation’s ability to meet customer due dates without a penalty for orders being completed early. The standard deviations were calculated to measure variability in performance because the definition of complexity states that systems are unpredictable, meaning there is variability. Systems that have more static complexity should exhibit greater variability. The results from the experiments (256 unique system designs) show a range in performance as shown in Table 4. Here the minimum, maximum, mean, and the values associated with the “simplest” system and the most “complex” system are reported where the simplest system is the one with the “low” factor settings and the most complex system is the one with the “high” factor settings. The range of values for Frizelle and Woodcock’s measure of static complexity, denoted $H(S)$, are also shown.

Table 4 Descriptive Statistics

	Minimum	Maximum	Mean	Std. Deviation	Median	Simplest	Most Complex
H(S)	8.2	49.5	21.7	9.3	19.1	8.8	48.9
S _{FT}	93.5	1489.9	799.1	339.2	766.3	544.9	737.0
L _{MEAN}	-284.4	1471.4	522.8	405.4	455.0	141.8	592.4
S _L	76.3	1336.0	673.9	326.4	578.9	355.4	717.1
T _{MEAN}	10.3	1471.4	579.7	371.2	485.3	205.6	635.4
S _T	37.8	1290.7	633.9	334.3	542.8	312.5	676.9

Tables 5 and 6 present the factor settings of the simulated systems that had the “best” and “worst” performance. “L” and “H” denotes the low and high complexity setting, respectively. Note that Frizelle and Woodcock’s measure, H(S), closely modeled the systems that would logically have the lowest and complexity. At no time did the predicted lowest complexity or highest complexity system resulted in having the best or worst complexity, respectively. One system achieved the best performance for three of the performance measures. Counter to expectations, when component commonality and routing commonality were at the high complexity setting, the systems performed better than all others.

Table 5 The Simulated Systems with Best Performance

	Best Value	Factor Settings							
		D	B	CC	PMR	OPS	WCS	RC	k
H(S)	8.2	L	L	L	L	L	L	H	L
S _{FT}	93.5	L	L	H	H	L	L	H	H
L _{MEAN} *	-3.4	L	L	L	H	H	H	L	H
S _L	76.3	L	L	H	H	L	L	H	L
T _{MEAN}	10.3	L	L	H	H	L	L	H	L
S _T	37.8	L	L	H	H	L	L	H	L

* For mean lateness the best system was the system with a mean lateness closest to 0.

As shown in Table 6, one simulated system had the worst performance for L_{MEAN} and T_{MEAN}. All settings were high complexity except component commonality and routing commonality, which is opposite of expected, but was similar with what was observed for the best performing systems. Another simulated system had the worst performance for both the standard deviation of lateness and of tardiness. In those systems, component commonality and routing commonality along with the number of routing operations were at the low complexity setting, opposite of what was anticipated.

Table 6 The Simulated Systems with Worst Performance

	Worst Value	Factor Settings							
		D	B	CC	PMR	OPS	WCS	RC	k
H(S)	49.497	H	H	H	H	H	H	L	H
S _{FT}	1489.9	H	H	L	L	L	L	H	L
L _{MEAN} *	1471.4	H	H	L	H	H	L	H	H
S _L	1336.0	H	H	L	H	L	L	H	H
T _{MEAN}	1471.4	H	H	L	H	H	L	H	H
S _T	1290.7	H	H	L	H	L	L	H	H

* For mean lateness the best system was the system with a mean lateness closest to 0.

The results for each performance measure did not meet the normality requirement for statistical analysis. Values for each measure were transformed using an appropriate statistical transformation function. In all cases this was done by calculating the square root of values. Surprisingly, an initial factor analysis indicated that the five measures were highly correlated. A single factor emerged explain 92.4% of the variance (Eigenvalue = 4.621) with factor loadings ranging from 0.901 to 0.991. This factor was designated as MFGPERF, a measure of overall manufacturing performance.

The initial test for the validity of H(S), linear regression was used to determine if H(S) helps predict changes in performance. Systems with greater static complexity should perform worse. The regression results are presented in Table 7. Stepwise regression was used including the variables H(S) and k. The due date tightness factor was included, because this was not an element of structural complexity, rather it was included to ensure that effects on the four corresponding performance measures were consistent regardless of how due dates were set. The results revealed that H(S) was statistically significant; however, according the change in adjusted R², H(S) only explained 1.6% of the 3.7% of variation in manufacturing performance. Additionally, the regression coefficient (and Beta) was negative and, as such, did not perform as expected. Since smaller values in the performance measures denote better system performance, the regression coefficient should be positive meaning that systems with greater static complexity have worse performance as purported by Frizelle and Woodcock [7].

Table 7 Stepwise Regression results MFGPERF = k, H(S)

Model	Unstandardized Coefficients		Standardized Coefficients		Significance	Adj. R ²
	B	Std. Error	Beta	t		
(Constant)	-.139	.016		-8.724	.000	0.019
k	.279	.023	.139	12.338	.000	
(Constant)	.174	.031		5.700	.000	0.037
k	.277	.022	.139	12.392	.000	
H(S)	-.014	.001	-.134	-12.006	.000	

In the simulation, the mean time between arrivals (MTBA) of product orders was adjusted to make utilization in the systems comparable. This may of itself induce variation in system

performance. To account for this another stepwise regression was performed included MTBA as well as K and H(S). The results are reported in Table 8. This time the model explained 48.4% of the variation, according to adjusted R^2 , with H(S) only contributing 0.1% to that total. It should be recognized that including MTBA resulted in having a coefficient for H(S) where its sign was as expected. None the less, since the amount of variation in performance explained by H(S) is so minute, the validity of H(S) is still not supported.

Table 8 Stepwise Regression results $MFGPERF = k, H(S), MTBA$

Model	Unstandardized Coefficients		Standardized Coefficients		Significance	Adj. R^2
	B	Std. Error	Beta	t		
(Constant)	-1.303	.018		-72.256	.000	.464
MTBA	.004	.000	.681	81.529	.000	
(Constant)	-1.443	.020		-73.926	.000	.483
MTBA	.004	.000	.681	83.043	.000	
k	.279	.016	.139	16.997	.000	
(Constant)	-1.502	.030		-49.427	.000	.484
MTBA	.004	.000	.686	81.478	.000	
k	.279	.016	.140	17.016	.000	
H(S)	.002	.001	.021	2.529	.011	

Because the previous regression results imply that MTBA is the primary cause of the variation in system performance, this calls into question the effect of the structure of the manufacturing system made up of the eight design elements included in the simulation. It could be that those elements didn't affect the performance, because it was all due to the external variation caused by the timing of order arrivals. In order to address this, an ANOVA model was evaluated containing the eight complexity factors and the due date tightness factor, k. The results in Table 9 show that seven of the nine factors affected manufacturing performance, and explained 57% of the variation in performance based upon adjusted R^2 . In addition, an ANCOVA model was assessed adding MTBA, to see its added effect. As shown in Table 10, although MTBA was statistically significant, there was no change in adjusted R^2 . It appears that the design factors played a major part in manufacturing performance and MTBA had little to no impact.

Table 9 ANOVA results of experimental factors

Source	Type III Sum of Squares	df	Mean Square	F	Significance	η^2
Corrected Model	4,377.33	9	486.37	1,129.87	.000	
Intercept	0.00	1	0.00	0.00	1.000	
k	149.27	1	149.27	346.78	.000	* .019
P	58.52	1	58.52	135.93	.000	* .008
D	729.40	1	729.40	1,694.45	.000	* .095
B	1,194.87	1	1,194.87	2,775.77	.000	* .156
CC	1.50	1	1.50	3.48	.062	* .000
PMR	18.54	1	18.54	43.06	.000	* .002
OPS	0.13	1	0.13	0.30	.583	.000
WC	2,220.83	1	2,220.83	5,159.12	.000	* .289
RC	4.27	1	4.27	9.93	.002	* .001
Error	3,301.67	7670	0.43			
Total	7,679.00	7680				
Corrected Total	7,679.00	7679				

Adjusted R² = 0.570

* Significant at 0.10

Table 10 ANCOVA results of experimental factors with MTBA

Source	Type III Sum of Squares	df	Mean Square	F	Significance	η^2
Corrected Model	4,379.75	10	437.97	1,018.06	.000	
Intercept	2.33	1	2.33	5.43	.020	
k	149.27	1	149.27	346.98	.000	* .019
P	58.69	1	58.69	136.43	.000	* .008
D	207.34	1	207.34	481.95	.000	* .027
B	390.12	1	390.12	906.83	.000	* .051
CC	1.33	1	1.33	3.10	.078	* .000
PMR	19.22	1	19.22	44.67	.000	* .003
OPS	0.05	1	0.05	0.12	.732	.000
WC	518.91	1	518.91	1,206.19	.000	* .068
RC	4.22	1	4.22	9.81	.002	* .001
MTBA	2.42	1	2.42	5.62	.018	* .000
Error	3,299.25	7669	0.43			
Total	7,679.00	7680				
Corrected Total	7,679.00	7679				

Adjusted R² = 0.570

* Significant at 0.10

CONCLUSION

This study attempted to test the entropy-based measure of static manufacturing complexity proposed in Frizelle and Woodcock [7]. A simulation of 256 systems ranging in complexity by altering eight factors in the system's structure was used endeavoring to objectively assess the

measure. Although statistically significant, H(S) explained, practically, none of the variation that occurred in overall system performance. The ANOVA results showed that the experimental factors strongly affected performance.

This simulation was of a batch-type system, only one of the major generic types of manufacturing process. This may limit the generalizability of conclusions drawn from the results. Additionally, factors were only altered at two levels, in some cases not appearing to be that extreme. However, the simulation permitted the research to eliminate some of the dynamic complexity from quality issues, machine breakdowns, order changes, and managerial intervention. Even though using simulation has its limitations, the results of this research do not validate Frizelle and Woodcock's measure of static complexity.

During this study, there were some items of interest that suggest further investigation should be conducted. When reviewing the performance of the simulated systems, component commonality and routing commonality appeared to have the opposite effect to system performance than would be expected. It was expected that systems with more shared components or systems where there was a larger frequency of items with common process paths would be less complex and result in better performance. This was not the result demonstrated by the results.

The results did show that seven of the eight system design factors had a large effect on manufacturing performance. Since the Frizelle and Woodcock measure was not validated, a new measure utilizing these factors should be proposed to make progress towards finding a practical measure for manufacturing complexity.

REFERENCES

- [1] Barman, S., "The Impact of Priority Rule Combinations on Lateness and Tardiness," *IIE Transactions*, Vol. 30, 1998, 495-504.
- [2] Blackstone, J., D. Phillips, and G. Hogg, "A State-of-the-Art Survey of Dispatching Rules for Manufacturing Job Shop Operations," *International Journal of Production Research*, Vol. 20, No. 1, 1982, 27-45.
- [3] Calinescu, A., J. Efstathiou, J. Scirm, and J. Bermejo, "Applying and assessing two methods for measuring complexity in manufacturing," *Journal of Operational Research Society*, Vol. 49, No. 7, 1998, 723-733.
- [4] Casti, J. L., *Connectivity, Complexity, and Catastrophe in Large-Scale Systems*, New York: Wiley, 1979.
- [5] Cooper, W. W., K. K. Sinha, and R. S. Sullivan, "Measuring complexity in high-technology manufacturing: indexes for evaluation," *Interfaces*, Vol. 22, No. 4, 1992, 38-48.
- [6] Deshmukh, A. V., J. J. Talavage, and M. M. Barash, "Complexity in manufacturing systems, Part 1: Analysis of static complexity," *IIE Transactions*, Vol. 30, 1998, 645-655.
- [7] Frizelle, G. and E. Woodcock. "Measuring complexity as an aid to developing operational strategy," *International Journal of Operation and Production Management*, Vol. 15, No. 5, 1994, 26-39.
- [8] Fry, T. D., M. D. Oliff, E. D. Minor, and G.K. Leongs, "The effects of product structure and sequencing rule on assembly shop performance," *International Journal of Production Research*, Vol. 27, No. 4, 1989, 671-686.
- [9] Gabriel, T. J., 2008. Measuring the Manufacturing Complexity Created by System Design. *Proceeding from the 38th annual Conference of the Southeastern Decision Sciences Institute*.
- [10] Goodwin, J. S. and J. C. Goodwin, "Operating Policies for Scheduling Assembled Products," *Decision Sciences*, Vol. 13, No. 4, 1982, 585-603.
- [11] Pierreval, H. and N. Mebarki, "Dynamic Selection of Dispatching Rules for Manufacturing System Scheduling," *International Journal of Production Research*, Vol. 35, No. 6, 1997, 1575-1591. Pritsker, A., *Introduction to Simulation and SLAM II*, 3rd Edition, John Wiley and Sons: New York, 1986.
- [12] Pritsker, A., *Introduction to Simulation and SLAM II*, 3rd Edition, John Wiley and Sons: New York, 1986.
- [13] Safizadeh, M., L. Ritaman, D. Sharma, C. Wood, "An Empirical Analysis of the Product-Process Matrix", *Management Science*, Vol. 42, No. 11, November, 1996, 1576-1591.
- [14] Schmeiser, B., "Batch Size Effects in the Analysis of Simulation Output," *Operations Research*, Vol. 30, No. 3, 1982, 556-567.

A COMPARISON OF SCALING APPROACHES USED IN THE DEVELOPMENT OF MANUFACTURING CAPABILITY SCALES

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ABSTRACT

This study will review a set of papers that have developed new scales for the four generally accepted manufacturing capabilities – quality, delivery, flexibility and cost. These papers were assessed using Schwab's [56] framework consisting of three stages of scale development: (1) item generation (2) scale development and (3) scale evaluation. Issues of reliability and validity were identified and suggestions for future research were included.

INTRODUCTION

For over 30 years researchers have studied four generally accepted manufacturing capabilities or dimensions of performance: quality, delivery, flexibility and cost. These capabilities have served as the basis for a variety of theoretical models of manufacturing performance including tradeoff models, cumulative models and integrative models.

Tradeoff models proposed that companies had to choose one of the capabilities on which to compete and make decisions based on that decision [57]. For instance, manufacturers who choose high quality cannot also compete on low cost. In contrast, cumulative models posited that companies could compete on multiple capabilities and that a certain order of implementation made sense. The sand cone model, one of the best known of these cumulative models, suggested that companies first achieve quality followed by delivery followed by flexibility and finally cost (see, for instance, [18] [42]). In the last few years, researchers have developed integrative models that attempt to explain the differing results from prior studies by introducing contingency factors such as asset frontiers and operating frontiers into the mix (see, for example, [27] [54] [38]). Empirical studies testing these models have used a variety of scales and have produced divergent results (see, for instance, [4] [69] [46] [53]).

This paper will argue that model development and testing may yield more conclusive results as researchers make additional progress constructing scales for manufacturing capability studies. Since future progress requires knowledge of the current research on capability scales, this paper will review recent papers that developed comprehensive capability scales and then applied them at real manufacturing companies. Analysis of the scaling techniques used in each of these papers will involve such issues as item generation, study design, scale construction and scale evaluation. This study will use the results of the analysis to address specific weaknesses found in the scaling approaches that were implemented. This discussion will yield some guidelines that researchers may use to develop comprehensive scaled measures for manufacturing capability.

OVERVIEW OF CAPABILITY MEASUREMENT STUDIES

Although this study will review papers that developed comprehensive scales measuring quality, delivery, flexibility and cost, it also will also provide an overview of other streams of empirical work on capability measures. These research streams include: (1) legacy papers that may have used single-item measures but are important because the theory they developed was used as a basis for later studies; (2) papers in which the combination of capabilities was different from the four generally accepted capabilities; and (3) papers that used measures from previous studies but did no scale development.

Many of the earliest capability studies used single-item measures for the capabilities or focused on single capabilities. These papers developed both conceptual and empirical measures. They are important because they are often cited as sources for ideas for scaled measures (for instance, [41] [28] [20] [61] [18] [22] [50] [64] [16] [67] [66] [69] [49] [52] [32] [65] [48] [19] [47] [3] [23]).

The second group of papers studied some combination of capabilities that was different from the four generally accepted capabilities. They either added additional capabilities or considered fewer than the four capabilities (for example, [26] [36] [64] [40] [42] [52] [39] [37] [62] [63]). One study identified four capabilities but collapsed these to only three factors for eventual analysis [33]).

The third group of papers used items from previous studies in a new application context without making changes to the previous items. For instance, Boyer [7], Boyer and McDermott [8] and Boyer and Lewis [9] used items from the Miller and Vollmann [41] study in their studies. Similarly, Safizadeh, Ritzman, Sharma and Wood [52], Safizadeh, Ritzman and Mallick [51] and Rosenzweig, Roth and Dean [48] used existing measures but did not test and develop scales. Grossler and Grubner [23] used measures from the 2002 Manufacturing Strategy Survey.

In contrast to the three types of papers described in this section, a fourth type of study developed comprehensive scales for the capabilities of quality, delivery, flexibility and cost. This fourth type of study is discussed in greater detail in the next section.

STUDIES OF SCALES FOR ALL FOUR CAPABILITIES

Only five studies have developed scales to measure all four generally accepted capabilities ([68], [60], [2], [14] and [55]). A rich variety of statistical methods were utilized in these studies ranging from analysis of variance to regression analysis to path analysis (Table 1). Cluster analysis was used in two of the studies.

The papers can be separated into two groups. The first group contains studies that developed scaled measures to assess whether companies were using the trade-off model, the sand-cone model or an integrative model. Amoako-Gyampah and Meredith [2] tested the capability scale using data from a developing country showing that there were no tradeoffs and that quality was the foundation followed by cost. Schroeder, Shah and Peng [55] determined that a mediated model was a better fit for the data than the sand-cone model.

TABLE 1
Statistical Methods and Study Purpose

Investigators (Year Published)	Statistical Methods	Purpose
Ward et al. (1998)	ANOVA	Predicted process choice
Sum et al. (2004)	Cluster Analysis	Identified strategic types based on company performance
Amoako-Gyampah and Meredith (2007)	Correlations and Multiple Regressions	Identified capabilities used in Ghana No tradeoffs are apparent Quality is foundation followed by cost
Chung and Swink (2009)	Cluster Analysis and MANOVA	Identified clusters of AMT utilization patterns
Schroeder et al. (2011)	Path Analysis	Identified the best model fit: sandcone vs. mediated model Mediated model a better fit

The second group of papers developed scale measures for use as variables in the study of organizational performance. The earliest study by Ward, McCreery, Ritzman and Sharma [68] used the scale measures to predict process choice. Sum, Kow and Chen [60] examined small and medium companies and developed a taxonomy of operations strategies based on operational performance. Chung and Swink [14] identified clusters of advanced manufacturing technology usage patterns based on their development of the four capabilities.

SCALE DEVELOPMENT PROCESS

The process of developing scales is based on research from social sciences. A number of steps have been proposed. Schwab [56] identified a three stage framework to evaluate scales. The three stages were (1) item generation (2) scale development and (3) scale evaluation [29].

Stage I: Item Generation.

The relationship between the questionnaire items and their theoretical domain should be explained clearly and it is helpful to have a “third party sort the items” [29]. Thorough item generation is the basis for claims of content validity [29].

Many sources were used in generating questions for the scales (Table 2). The sources were both conceptual and empirical studies. It is interesting to note that the Ward, McCreery, Ritzman and Sharma [68] scales were used in three of the other four scale development studies.

All five studies used Likert scales having either five or seven points (Table 3). Three of the studies asked respondents to rate their performance relative to competitors using some form of the scale from worse than the competition to better than the competition [60] [14] [55].

TABLE 2
Stage I: Scale Antecedents

Author (Year)	Antecedents Author (Year)
Ward et al. (1998)	Miller and Vollmann (1984) Garvin (1987) Gerwin (1993)
Sum et al. (2004)	Swamidass and Newell (1987) Vickery, Droge & Markland (1993) Ward, Duray, Leong & Sum (1995) Ward, McCreery, Ritzman & Sharma 1998) Kathuria (2000)
Amoako-Gyampah and Meredith (2007)	Ferdows and De Meyer (1990) Corbett and Van Wassenhove (1993) Ward, Leong & Boyer (1994) Noble (1995) White (1996) Ward and Duray (2000) Flynn and Flynn (2004) Grossler and Grubner (2006)
Chung and Swink (2009)	Hayes and Wheelwright (1984) Giffi, Roth & Seal (1990) Ferdows and De Meyer (1990) Roth and Miller (1990) Roth (1996) Safizadeh, Ritzman, Sharma & Wood (1996) Ward, McCreery, Ritzman & Sharma (1998) Rosenzweig, Roth & Dean (2003) Flynn and Flynn (2004) Rosenzweig and Roth (2004)
Schroeder et al. (2011)	Ward, McCreery, Ritzman & Sharma (1998) Anand and Ward (2004)

The two remaining papers asked respondents to rate importance either as emphasis placed on the capability questionnaire item [2] or its importance in selling primary product [68].

Stage II: Scale Development Process.

There are two components in the scale development process: design of the study that is used to collect the data and scale construction and assessment [56].

Design of the study. The identified studies tended to use similar study designs. Four of the five studies identified themselves as cross-sectional and utilized some form of survey to gather data (see Table 4). Two of the studies used a mail survey [68] [60] and one used hand-delivered surveys [2]. Chung and Swink [14] used an Internet-based survey. Schroeder, Shah and Peng

TABLE 3
Stage I: Likert Scales

Author (Year)	Scale Measure	Number of Points	Low Point	High Point
Ward et al. (1998)	Importance in selling the products in your primary product line	5	Not Important	Extremely Important
Sum et al. (2004)	Current strength/performance compared to their major competitors	7	Worst in industry	Best in industry
Amoako-Gyampah and Meredith (2007)	Degree of emphasis that your manufacturing plant places	7	No emphasis	Extreme emphasis
Chung and Swink (2009)	Performance relative to your principal competition	7	Much worse	Much better
Schroeder et al. (2011)	How your plant compares with competition in your industry, on a global basis	5	Poor, low end of industry	Superior

[55] provided no information about the type of survey or the time-frame for the study. The reader was referred to another study in which this information was provided.

All but one of the studies surveyed only manufacturing firms. Sum, Kow and Chen [60] surveyed the 50 largest small to medium enterprises in Singapore and included some service companies in their population and the resulting sample.

Three of the studies used single country data (Table 4). Ward, McCreery, Ritzman and Sharma [68] used U.S. data. Sum, Kow and Chen [60] based their study in Singapore while Amoako-Gyampah and Meredith [2] used data from Ghana. Schroeder, Shah and Peng [55] surveyed six countries for their data. Chung and Swink [14] provided no information about the countries used in the study.

Four of the five studies used the plant as the level of analysis [68] [2] [14] 55] (Table 4). Sum, Kow and Chen [60] surveyed CEO's at the corporate level.

Three of the five studies provided information regarding response rates (ranged from 50.4% to 86%) (Table 4). A variety of respondents were used to gather information including positions related to operations (three of the five studies), CEOs (one of the studies) and a variety of positions (one of the studies) (Table 4).

TABLE 4
Stage II: Study Design

Investigators (Year Published)	Study Type¹	Time Frame for Data Acquisition²	Data Source³	Countries Included	Industries	Level of Analysis	Sample Size (response rate)	Participants
Ward, et al. (1998)	S	CS	M	U.S. (Midwest, Northeast)	Discrete parts	Plant	114	Various Top Management Positions
Sum et al. (2004)	S - mail	CS	SME	Singapore	Various	Corporate	43 (86%)	CEO
Amoako- Gyampah and Meredith (2007)	S – hand delivered	CS	M	Ghana	Various	Plant	126 (50.4%)	Operations managers or their equivalent
Chung and Swink (2009)	S - Internet	CS	M			Plant	224	Plant Managers
Schroeder et al. (2011)			M	Finland, Germany, Japan, Korea, Sweden, U.S.	Machinery, electronics, automobile suppliers	Plant	189 (65%)	Plant Manager

¹ Study Type: S = Survey Questionnaire, I = Structured Interviews using Questionnaire, C = Case Study

² Cross Sectional/ Longitudinal (CS/L)

³ M = Manufacturing, SME = Small/Medium Enterprises

Scale construction and assessment. Scale development methodologies usually include assessments of scale stability and reliability as part of the process of initial scale development [29]. Factor analysis and reliability measures are generally accepted [30]. Confirmatory factor analysis (CFA) begins with a proposed structure and tests to determine whether the items on the questionnaire fit the proposed structure [15] [58] [6] [29]. Reliability may be assessed by either stability or internal consistency [12]. Stability is seldom addressed because it requires repeated measures [12]. Internal consistency is usually assessed by measuring reliability using Cronbach's alpha [17] [45].

All five studies used Cronbach's alpha, composite reliability and confirmatory factor analysis for step two (Table 5). Individual scale reliabilities were provided in three of the studies [68] [60] [2] while Schroeder, Shah and Peng [55] provided summary information. The lowest alpha was .59 for the flexibility measure [2] with all the others greater than .65. A minimum Cronbach's alpha of .60 is generally supported in the literature [43] [31] [29] values as low as .50 for exploratory research are acceptable [59] [44] [24] [2]. Chung and Swink [14] reported composite reliabilities of .70 to .91 for their scales and Schroeder, Shah and Peng [55] reported confirmatory factor analysis composites of greater than .65.

TABLE 5
Stage II: Scale Construction and Reliability Assessment

Author (Year)	Initial Scale Construction	Reliability
Ward et al. (1998)		Cronbach's alpha Quality=.72 Delivery=.79 Cost=.80 Flexibility=.70
Sum et al. (2004)		Cronbach's alpha Quality=.71 Delivery=.75 Cost=.90 Flexibility=.82
Amoako-Gyampah and Meredith (2007)		Cronbach's alpha Quality = .79 Delivery = .74 Cost =.74 Flexibility = .59
Chung and Swink (2009)	Confirmatory Factor Analysis composite reliability .70 to .91	
Schroeder et al. (2011)	Confirmatory Factor Analysis composite reliability >.65 for all	Cronbach's alpha >.65 for all

Stage III: Scale Evaluation.

Scales are evaluated by some combination of validity measures. In general, validity is the measure of the “extent to which the instrument captures what it is intended to capture” [29, p. 352]. There are different measures of validity that assess different aspects of the scale: content (face) validity, construct validity, criterion-related validity, convergent validity and discriminant validity [12] [5] [29] (Table 6).

Content or face validity is an assessment of whether the scale items “adequately capture the construct domain” [29, p. 352]. The assessment is completed before the scale is utilized in any further analysis and answers the question of whether the items included in the scale measure capture enough of the complexity of the construct to provide a usable measure. The measurement of content validity is subjective and usually researchers support such claims by conducting a thorough literature review, pre-testing the instrument in an actual company, having people outside the field examine the results of the initial factor analysis to define the factors and conducting an item analysis of the scales [1].

Schroeder, Shah and Peng [55] was the only study to specifically address content validity. The study detailed the review of proposed items by both academic researchers and operations managers, the process of pre-testing the questionnaire items at several plants and the translation and rechecking of the items for accuracy.

Construct validity is an assessment of the scale after it is constructed and it examines whether the scale measures the theoretical construct it was intended to measure [11] [13] [29]. There is no direct measure but Spector [58] suggests that researchers must build up data to support claims of construct validity. Exploratory factor analysis is often used in this process [34] [25] [58] [29]. Exploratory factor analysis extracts factors from a set of questions in order to identify a unidimensional scale [34] [58] [29]. Principal components factor analysis with an orthogonal rotation such as Varimax is often used [29]. Most researchers suggest that numerical measures provided by exploratory factor analysis can be used to support construct validity [35] [25] [58] [29].

Amoakeo-Gyampah and Meredith [2] explained that construct validity was supported in their study by the fact that all the items used in their scales came from previous studies and that the wording was clarified for Ghanaian managers (Table 6). None of the other studies specifically mentioned construct validity.

Criterion-related validity is sometimes called predictive or external validity and also occurs after the initial scale is developed. The most common means of assessing criterion-related validity is to “measure the “relationship between the scale and surrogate measures of the construct” [29, p. 354]. Ward, McCreery, Ritzman and Sharma [68] addressed the issue of criterion-related validity by citing the literature showing that flexibility and cost tend to result in different process choices and using analysis of variance to show that there are significant relationships between company’s choices of capabilities and processes (Table 6). None of the other studies specifically mentioned criterion-related validity.

TABLE 6
Stage III: Scale Evaluation

Author (Year)	Content Validity	Construct Validity	Criterion-related Validity	Convergent Validity	Discriminant Validity
Ward et al. (1998)			Relationship between capabilities and process choice	PCA with varimax rotation – loadings Cost (.57-.84) Delivery (.45-.80) Flexibility (.56-.76) Quality (.46-.79)	PCA with varimax rotation – scree plot
Sum et al. (2004)					
Amoako-Gyampah and Meredith (2007)		1) Items all came from previous studies 2) questions clarified and reworded for Ghanaian managers		PCA with varimax rotation loadings Cost (.77-.80) Delivery (.67-.67) Flexibility (.58-.77) Quality (.41-.81)	PCA with varimax rotation – minimal cross loadings Correlations - <.70 and significant
Chung and Swink (2009)				CFA Model fit statistics $\chi^2 = 146.45$ (df=63, p<.001) CFI=.922 RMSEA=.077	Avg variance for each construct > squared correlation between construct and any other constructs
Schroeder et al. (2011)	1) Review by academic researchers and operations managers 2) Pretest at several plants 3) Translated and rechecked			Standardized Factor Loadings: Cost (.59-.81) Delivery (.70-.85) Flexibility (.51-.72) Quality (.68-.71)	Pairwise χ^2 difference tests 31.4-72.2

CFA = Confirmatory Factor Analysis PCA = Principal Components Analysis

Convergent and discriminant validities are closely related and occur after scale development. Convergent validity is usually assumed when different items on the same scale are highly related to each other [13] [58] [29]. Measurement usually involves the use of correlation matrices [13] [58] [29] but confirmatory factor analysis is also used [1]. Discriminant validity assesses whether the different scales measure different constructs suggesting that the scales should have low correlations to each other [10] [58] [29]. In addition to the use of correlation matrices [58], Chi-square difference tests are also used [1].

Table 6 shows that four of the five studies addressed issues of convergent and discriminant validity. Two of the studies used principal components factor analysis with varimax rotations [68] [2]. This method was supported by the Ahire, Golhar and Waller [1] study. Chung and Swink [14] used confirmatory factor analysis and Schroeder, Shah and Peng [55] used standardized factor loadings for convergent validity and pairwise Chi-square difference tests for discriminant validity.

CONCLUSIONS AND SUGGESTIONS FOR RESEARCHERS

The development of reliable and valid scales is an important part of the process of developing good theory in the area of manufacturing capabilities. This study has identified several commonalities in the five reviewed studies along with a few important differences.

All five studies appeared to use similar methodologies for their surveys. The method of data acquisition was different (mail, hand delivery and internet) but all used a survey format. The time frame for all studies providing information identified the studies as cross-sectional in nature. All but one of the studies focused on manufacturing companies at the plant level. Sum, Kow and Chen [60] conducted their survey in a mix of manufacturing and service companies and gathered their information from the corporate level by sending the surveys to the CEOs of the companies.

The process of scale construction and reliability assessment usually included some analysis of the initial scales using confirmatory factor analysis and a measure of each scale's reliability using Cronbach's alpha. Only one paper reported doing both [55]. All but one of the papers measured reliability; Chung and Swink [14] only examined the initial scale with confirmatory factor analysis.

The evaluation of the final scales by measuring validity is vital to the development of scales. Convergent and discriminant validity was assessed by all but one of the studies [60]. It is very important that researchers show the questionnaire items break down into constructs and also that the constructs measure different things.

While all but one of the studies addressed the issues of convergent validity and discriminant validity, other aspects of validity such as content validity, construct validity and criterion-related validity were relatively ignored by these studies. This constitutes a weakness in the set of papers as a whole.

Content validity is subjective, but all researchers should comment on whether they have utilized enough sources to make the claim that the items for the construct measure capture enough complexity from the construct to provide a measure that can be used. Content validity was only mentioned in one paper [55], although several of the studies had supporting information in them.

The second measure of validity, construct validity, was only addressed by one paper. Amoako-Gyampah and Meredith [2] were careful to support claims of construct validity, probably partially due to the fact that the study was conducted in Ghana and there were issues related to translating the questionnaire into another language.

Criterion-related validity is not measured in every study but if the construct measure lends itself to measurement by another variable, then it should be assessed. Ward, McCrerry, Ritzman and Sharma [68] was the only study to address the issue of criterion-related validity.

The above analysis suggests several guidelines for researchers planning to develop scales to measure capabilities in manufacturing. First and most important is that researchers interested in scale development complete the generally accepted process of scale development. For the scale construction and reliability assessment portion of scale development, the process of initial scale construction and checks for proposed scale reliability should be explained. In scale evaluation, content validity, construct validity, convergent validity and discriminant validity should be explained. Criterion-related validity may not be possible for many scale measures.

Second, when assessing scales, researchers should use commonly accepted measures. For instance, Cronbach's alpha is a commonly accepted measure for reliability and while it might be useful to have another measure as support, researchers expect to see the measure.

Third, researchers should provide necessary information in the paper – rather than referring the reader to previous research for data needed to evaluate the current paper. For instance, the reader needs information about the sample and sampling method used in the study and should not be expected to search other articles to find it.

The guidelines presented above can help support future research efforts on scale development for manufacturing capabilities. Progress in this area is critical because it is so closely linked to the development of effective capability deployment models. Simply put, model development begins with good measures for constructs and good measures begin with good scale development techniques.

REFERENCES

- [1] Ahire, S.L., Golhar, D.Y. & Waller, M.A., Development and validation of TQM implementation constructs, *Decision Sciences*, 1996, 27(1), 23-56.
- [2] Amoako-Gyampah, K. & Meredith, J.R., Examining cumulative capabilities in a developing economy, *International Journal of Operations and Production Management*, 2007, 27(9), 928-950.
- [3] Anand, G. & Ward, P.T., Fit, flexibility and performance in manufacturing: Coping with dynamic environments, *Production and Operations Management*, 2004, 13(4), 369-385.

- [4] Avella, L, Vazquez-Bustelo, D. & Fernandez, E., Cumulative manufacturing capabilities: an extended model and new empirical evidence, *International Journal of Production Economics*, 2011, 3(1), 707-729.
- [5] Bohrnstedt, G.W., Measurement, in: Rossi, P.H., Wright, J.D. & Anderson, A.B. (eds), *Handbook of Survey Research*, Academic Press, New York, 1983.
- [6] Bollen, K.A., *Structural Equations with Latent Variables*, Wiley, New York, 1989.
- [7] Boyer, K.K., Longitudinal linkages between intended and realized operations strategies, *International Journal of Operations and Production Management*, 1998, 18(4), 356-373.
- [8] Boyer, K.K. & McDermott, C., Strategic consensus in operations strategy, *Journal of Operations Management*, 1999, 17, 289-305.
- [9] Boyer, K.K. & Lewis, M.W., Competitive priorities: Investigating the need for trade-offs in operations strategy, *Production and Operations Management*, 2002, 11(1), 9-20.
- [10] Campbell, D.T. & Fiske, D.W., Convergent and discriminant validation by the multitrait-multimethod matrix, *Psychological Bulletin*, 1959, 56, 81-105.
- [11] Carmines, E.G. & Zeller, R.A., *Reliability and Validity*, Sage Publications, Beverly Hills, 1979.
- [12] Churchill, G.A., A paradigm for developing better measures of marketing constructs, *Journal of Marketing Research*, 1979, 16(2), 64-73.
- [13] Churchill, G.A., *Marketing Research: Methodological Foundations, 4th ed.*, The Dryden Press, Chicago, 1987.
- [14] Chung, W. & Swink, M., Patterns of advanced manufacturing technology utilization and manufacturing capabilities, *Production and Operations Management*, 2009, 18(5), 533-545.
- [15] Cole, D.A., Utility of confirmatory factor analysis in test validation research, *Journal of Consulting and Clinical Psychology*, 1987, 55(4), 584-594.
- [16] Corbett, C. and Van Wassenhove, L. "Trade-Offs? What Trade-Offs? Competence and Competitiveness in Manufacturing Strategy", *California Management Review*, 1993, 35(4), 107-122.
- [17] Cronbach, L.J., Coefficient alpha and the internal structure of tests, *Psychometrika*, 1951, 16, 297-334.
- [18] Ferdows, K. and De Meyer, A., "Lasting Improvements in Manufacturing Performance: In Search of a New Theory", *Journal of Operations Management*, 1990, 9(2), 168-184.
- [19] Flynn, B.B. & Flynn, E.J., An exploratory study of the nature of cumulative capabilities, *Journal of Operations Management*, 2004, 22, 439-457.
- [20] Garvin, D.A., Competing on the eight dimensions of quality, *Harvard Business Review*, 1987, 65(6), 101-109.
- [21] Gerwin, D. "Manufacturing Flexibility: A Strategic Perspective", *Management Science*, 1993, 39(4), 395-410.
- [22] Giffi, C., Roth, A.V. & Seal, G.M., *Competing in World Class Manufacturing: America's 21st Century Challenge*, Business One Irwin, Homewood IL, 1990.
- [23] Grossler, A. & Grubner, A., An empirical model of the relationships between manufacturing capabilities, *International Journal of Operations and Production Management*, 2006, 26(5), 458-485.
- [24] Gupta, Y.P. & Somers, T.M., Business strategy, manufacturing flexibility, and organizational performance relationships: a path analysis approach, *Production and Operations Management*, 1996, 5(3), 204-233.
- [25] Hair, J.F., Anderson, R.E. & Tatham, R.L., *Multivariate Data Analysis with Readings*, MacMillan, New York, 1987.

- [26] Handfield, R.B. & Pannesi, R.T., An empirical study of delivery speed and reliability, *International Journal of Operations and Production Management*, 1992, 12(2), 58-72.
- [27] Hayes, R.H. and Pisano, G.P., Manufacturing Strategy: At the Intersection of Two Paradigm Shifts, *Production and operations Management*, 1996, 5(1), 25-41.
- [28] Hayes, R.H. and Wheelwright, S.C. *Restoring Our Competitive Edge*, Wiley, New York, NY, 1984.
- [29] Hensley, R.L., A review of operations management studies using scale development techniques, *Journal of Operations Management*, 1999, 17, 343-358.
- [30] Hinkin, T.R., A review of scale development practices in the study of organizations, *Journal of Management*, 1995, 21(5), 967-988.
- [31] Jones, A.P. & James, L.R., Psychological climate: Dimensions and relationships of individual and aggregated work environment perceptions, *Organizational Behavior and Human Performance*, 1979, 23, 201-250.
- [32] Kathuria, R., Competitive priorities and managerial performance: A taxonomy of small manufacturers, *Journal of Operations Management*, 2000, 18, 627-641.
- [33] Kazan, H., Ozer, G. & Cetin, A., The effect of manufacturing strategies on financial performance, *Measuring Business Excellence*, 2006, 10(1), 14-26.
- [34] Kim, J.Q. & Mueller, C.W., *Introduction to Factor Analysis*, Sage Publications, Newbury Park, 1978a.
- [35] Kim, J.Q. & Mueller, C.W., *Factor Analysis: Statistical Methods and Practical Issues*, Sage Publications, Newbury Park, 1978b.
- [36] Kim, J.S. & Arnold, P., Manufacturing competence and business performance: A framework and empirical analysis, *International Journal of Operations and Production Management*, 1993, 13(10), 4-26.
- [37] Koufteros, X.A., Vonderembse, M.A. & Doll, W.J., Examining the competitive capabilities of manufacturing firms, *Structural Equation Modeling*, 2002, 9(2), 256-282.
- [38] Lapre, M.A. & Scudder, G.D., Performance improvement paths in the U.S. airline industry: Linking trade-offs to asset frontiers, *Production and Operations Management*, 2004, 13(2), 123-134.
- [39] Mapes, J. New, C. & Szejcaewski, M., Performance trade-offs in manufacturing plants, *International Journal of Operations and Production Management*, 1997, 17(9/10), 1020-1033.
- [40] Miller, J. & Roth, A.V., A taxonomy of manufacturing strategies, *Management Science*, 1994, 40(3), 285-304.
- [41] Miller, J.G. & Vollmann, T.E., *North American Manufacturers Survey: Summary of Survey Responses*, Boston University Manufacturing Roundtable Report Series, Boston, MA. 1984.
- [42] Noble, M.A., Manufacturing strategy: Testing the cumulative model in a multiple country context, *Decision Sciences*, 1995, 26(5), 693-721.
- [43] Nunnally, J.C., *Psychometric Theory*, McGraw-Hill, New York, NY, 1978.
- [44] Nunnally, J.C. & Bernstein, I.H., *Psychometric Theory, 3rd Edition*, McGraw-Hill, New York, NY, 1994.
- [45] Peter, J.P., Reliability: A review of psychometric basics and recent marketing practices, *Journal of Marketing Research*, 1979, 16(2), 6-17.
- [46] Rosenzweig, E.D. & Easton, G.S., Tradeoffs in manufacturing? A meta-analysis and critique of the literature, *Production and Operations Management*, 2010, 19 No 2, 2010, pp. 127-141.

- [47] Rosenzweig, E.D & Roth, A.V., Towards a theory of competitive progression: Evidence from high-tech manufacturing, *Production and Operations Management*, 2004, 13(4), 354-368.
- [48] Rosenzweig, E.D., Roth, A.V. & Dean, J.W., The influence of an integration strategy on competitive capabilities and business performance: An exploratory study of consumer products manufacturers, *Journal of Operations Management*, 2003, 21(4), 437-456.
- [49] Roth, A.V., Competitive Progression Theory: Explanation and Evidence, in Voss, C.A. (ed.), *Manufacturing Strategy: Operations Strategy in a Global Context: Papers Frintge 3rd International Conference of the RUROMA*, London, 1996, pp. 563-568.
- [50] Roth, A.V. and Miller, J.G., Manufacturing Strategy, Manufacturing Strength, Managerial Success, and Economic Outcomes, in Ettlie, J.E., Burstein, M.C. and Fiegenbaum, A. (Eds.), *Manufacturing Strategy: The Research Agenda for the Next Decade*, Kluwer Academic Publishers, Boston, MA, 1990.
- [51] Safizadeh, M.H., Ritzman, L.P. & Mallick, D., Revisiting alternative theoretical paradigms in manufacturing strategy”, *Production and Operations Management*, 2000, 9(2), 111-127.
- [52] Safizadeh, M.H., Ritzman, L.P., Sharma, D. & Wood, C., An empirical analysis of the product-process matrix, *Management Science*, 1996, 42(11), 1576-1591.
- [53] Sarmiento, R., Issues with the modeling of manufacturing performance: the trade-offs: Cumulative capabilities paradox, *Journal of Modeling in Management*, 2010, 5(3), 263-274.
- [54] Schmenner, R.W. and Swink, M.L., On theory in operations management, *Journal of Operations Management*, 1998, 17(1), 97-113.
- [55] Schroeder, R.G., Shah, R. and Peng, D.X., The cumulative capability ‘sand one’ model revisited: A new perspective for manufacturing strategy, *International Journal of Production Research*, 2011, 49(16), 4875-4901.
- [56] Schwab, D.P., Construct validity in organizational behavior, in: Staw, B.M. & Cumings, L.L. (Eds.), *Research in Organizational Behavior*, Vol. 2, JAI Press, Greenwich, CT, 1980.
- [57] Skinner, W., Manufacturing – Missing link in corporate strategy, *Harvard Business Review*, 1969, May-June, 136-145.
- [58] Spector, P.E., *Summated Rating Scale Construction: An Introduction*, Sage University Paper Series on Quantitative Application I the Social Sciences, Series No. 07-082, Newbury Park, CA: Sage, 1992.
- [59] Srinivasan, A., Alternative measure of system effectiveness: associations and implications, *MIS Quarterly*, 1985, 9(3), 243-253.
- [60] Sum, C., Kow, L.S. & Chen, C., A taxonomy of operations strategies of high performing small and medium enterprises in Singapore, *International Journal of Operations and Production Management*, 2004, 24(3), 321-345.
- [61] Swamidass, P.M. and W.T. Newell, 1987. Manufacturing strategy, environmental uncertainty and performance: A path analytic model, *Management Science*, vol. 33, no. 4, pp. 509-524.
- [62] Swink, M., Narasimhan, R. & Kim, S.W., Manufacturing practices and strategy integration: Effects on cost efficiency, flexibility and market-based performance, *Decision Sciences*, 2005, 36(3), 427-457.
- [63] Theodorou, P. & Florou, G., Manufacturing strategies and financial performance – The effect of advanced information technology: CAD/CAM systems, *Omega*, 2008, 36, 107-121.
- [64] Vickery, S.K., Dröge, C.L.M. & Markland, R.E., Production competence and business strategy: Do they affect business performance? *Decision Sciences*, 1993, 24(2), 435-455.

- [65] Ward, P.T. & Duray, R., Manufacturing strategy in context: Environment, competitive strategy and manufacturing strategy, *Journal of Operations Management*, 2000, 18(2), 123-138.
- [66] Ward, P.T., Duray, R., Leong, G.K. & Sum, C.C., Business environment, operations strategy, and performance: An empirical study of Singapore manufacturers, *Journal of Operations Management*, 1995, 13, 99-115.
- [67] Ward, P.T., Leong, G.K. & Boyer, K.K., Manufacturing proactiveness and performance, *Decision Sciences*, 1994, 25(3), pp. 337-358.
- [68] Ward, P.T., McCreery, J.K., Ritzman, L.P. & Sharma, D., Competitive priorities in operations management, *Decision Sciences*, 1998, 29(4), 1035-1046.
- [69] White, G.P., A meta-analysis model of manufacturing capabilities, *Journal of Operations Management*, 1996, 14, 315-331.

EVALUATING TWO REPLENISHMENT POLICIES IN MASTER PRODUCTION SCHEDULING WITH DEMAND UNCERTAINTY

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Abstract

We evaluate two inventory replenishment policies in a single end-product master production scheduling environment with supply capacity limits and demand uncertainty. The replenishment policies we consider are order quantity policy and order-up-to levels policy. The performance measures considered include service levels, average cost, cost standard deviation, expected upside risk, "cost-at-risk", and probability of exceeding a target cost. The input factors considered are the target service level, the demand coefficient of variation, the average utilization, and different parameters defining risk measures. The main solution methodology is simulation-based optimization. A computational experimental design is used to explore the impact of parameters on performance measures under both replenishment policies.

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1 INTRODUCTION

Since Material Requirements Planning (MRP) was first introduced in the late 1960s, it has been widely adopted and is still regarded as one of most commonly-used resource planning systems. Although MRP enhancements such as Manufacturing Resource Planning (MRP II), Enterprise Resource Planning (ERP), and Advanced Planning Systems (APS) have been developed, their underlying logic still uses basic MRP, which assumes deterministic demand, infinite capacity, and constant lead times. In reality these assumptions do not always hold and there can be significant uncertainty in demand, capacity, and realized lead times. To buffer against some of these uncertainties, MRP systems suggest using safety stock or safety lead time, but ad hoc rules are used to set stock levels. While recent ERP implementations are based on improved information technology, newer intelligent software is required to consider alternative replenishment policies and performance metrics such as risk. In the words of (1), “current ERP technology provides an information rich environment that is ripe for very intelligent planning and execution logic, yet little has changed since the late 1970s in the logic associated with such applications as forecasting, reorder point logic, MRP, production scheduling, etc. The current systems are now just executing the old logic much faster and in real-time. The area is ripe for innovative new approaches to these old problems.” The need for new replenishment planning tools is further supported by the work of companies such as SAS (2), SmartOps (<http://www.smartops.com/>), and Optiant (<http://optiant.com/>, acquired in March 2010 by Logility, <http://www.logility.com/>). (3) reviews the state of the art and studies newer methods to setting safety stocks. In a similar spirit, we address the need to develop improved approaches for robust resource planning under non-stationary stochastic demand and supply capacity limits.

We consider a single end-product master production scheduling problem with supply capacity limits and dynamic stochastic demand specified by a forecast mean and forecast error in each time period. We present two stochastic models, order quantity (OQ) model and order-up-to level (OUL) model, for this discrete time, finite horizon inventory replenishment planning problem. We use simulation-based optimization method to compare performance of the two models. The performance measures we consider include average cost, service levels, cost standard deviation or coefficient of variation, expected upside risk, “cost at risk” (akin to Value at Risk in finance), and probability of exceeding a target cost. A computational experimental design is performed to discover the impact of input parameters on performance measures under both the OQ and OUL replenishment options. The input factors considered in this paper include the shortage penalty cost (or target service level), the demand coefficient of variation, the average utilization, and parameters defining different risk measures. The lot sizing rule used is lot-for-lot because it has been popular (4), works well when setup costs are low, and permits us to focus on uncertainty without confounding effects of batching.

The main contributions of this paper are: (i) We explicitly incorporate demand uncertainty specified by the first two or three moments (mean, standard deviation, skewness) and supply capacity limits in the MPS context. (ii) We consider two replenishment options: the traditional MRP order quantity (OQ) model and the order-up-to level (OUL) model. (iii) We implement simulation-based optimization of order quantities and order-up-to levels. (iv) We consider several performance criteria including expected cost, risk measures, and service

levels. (v) We provide computational results and discuss the business insights derived from those results.

The remainder of this paper is organized as follows. In Section 2 is a brief literature review. In Section 3, we describe the convex stochastic programs for OQ and OUL. In Section 4, we present the simulation-based optimization for the two proposed options. In Section 5, we perform the computational experiment and present the managerial insights. In Section 6, we summarize the results and list avenues for future work.

2 LITERATURE REVIEW

Uncertainty issues under MRP have received considerable attention. For instance, (5) and (6) categorize demand and supply uncertainty in MRP and conclude that safety stock is preferred for buffering quantity uncertainty, while safety lead time is preferred for dealing with timing uncertainty. (7) reviews how the effectiveness of MRP systems changes with uncertainty parameters. (8) notes that safety stock, the use of appropriate lot sizing rules, and rescheduling are the most robust approaches to cope with uncertainty. Other relevant papers include (9), (2), (1), (3).

Different inventory control policies are considered in (10), and (11). Our research is based on (12), where a two-moment heuristic for order quantity optimization was developed under supply and demand uncertainty and service level requirements. Compared to their work, our research proposes a simulation-based *order-up-to* optimization model for setting order quantities at the MPS level and we compare the proposed model to the corresponding order quantity model, studied in (13). (14) proved that the order-up-to policy is the optimal control policy for a single stage, single-item, discrete-time production system (similar to our MPS model). We also consider the impact of different input factors on costs and risks for both models. Risks in operations, or specifically in inventory management, have been considered previously by (15), (16), (17), (18); these papers focus on a specific risk measure whereas we compare different risk measures computationally.

3 THE STOCHASTIC INVENTORY MODEL

We impose the following assumptions, which are identical to (13) and listed here for completeness: Demand in each period is non-stationary, independent normal, and specified by the first two moments (mean and variance). The delivery lead time quoted by the supplier is 100% reliable, but inventory replenishment orders are constrained by the supplier's supply capacities, which are known but may change from period to period. The initial on-hand inventory I_0 and the scheduled receipts (planned orders that have been released but not yet received) are known. Manufacturing lead time for in-house production is negligible. There is no setup cost for each replenishment order; a lot-for-lot batch-sizing rule is used.

The sequence of events in each period t is as follows: Determine beginning inventory, place an order for replenishment, receive deliveries from the supplier, observe and satisfy

demand, incur holding or shortage costs at the end of the period. The problem data and decision variables include:

- Demand data: D_t ($t = \tau, \dots, \tau + H - 1$) denotes the demand (gross requirements) in time period t , where τ is the current period and H is the length of the planning horizon. D_t has mean, $\mu(D_t)$, and variance, $\sigma^2(D_t)$.
- Supply data: L denotes the delivery lead time. K_t is the supply capacity in period t , which specifies an upper bound on the replenishment order in period t .
- Cost data: The inventory holding cost rate in period t is h_t ; inventory shortage cost rate in period t is p_t . Excess demand is fully backlogged.
- Decision variables: S_t denotes the order-up-to level in each time period t . O_t denotes the planned order in period t . We use vector $\vec{O}_H = (O_\tau, \dots, O_{\tau+H-1})$ to denote the fixed order vector and $\vec{S}_H = (S_\tau, \dots, S_{\tau+H-1})$ to denote the order-up-to level vector over the planning horizon H . R_t is the scheduled receipt in period t . Let I_t be the ending inventory level, and let IP_t denote the corresponding inventory position. $IP_t = I_t$ plus orders placed but not yet received. Inventory costs are based on $I_t^+ = \max(0, I_t)$, the on-hand inventory, and $I_t^- = \max(0, -I_t)$, the amount of backlog.

The finite horizon, single end product, master production scheduling problem operates as follows. Demand information, $\mu(D_t)$ and $\sigma^2(D_t)$, over planning horizon H is obtained by forecasting. Delivery lead time L and supply capacity K_t are known from the supplier. In each period t , ($t = \tau, \dots, \tau + H - 1$), we place an order $O_t \leq K_t$, which is delivered after lead time L as scheduled receipt R_{t+L} . We track ending inventory level I_t , which may be obtained using inventory balance equations $I_t = I_{t-1} + R_t - D_t$. I_{t-1} plus scheduled receipts R_t minus demand D_t . If the inventory level is positive, we incur holding costs; otherwise, we incur shortage costs. The objective of this study is to minimize total inventory holding and shortage costs over the planning horizon.

We consider two stochastic inventory models: order quantity (OQ) model and order-up-to level (OUL) model. The OQ model searches for the best order quantity vector, \vec{O}_H , to minimize the total inventory costs. The OUL model searches for the best order-up-to level vector, \vec{S}_H . In the OUL model, the order quantity in a time period changes with different demand realizations.

The master production scheduling problem of determining either order quantities or order-up-to levels may be formulated as a stochastic program.

OQ model: The formulation of the model is described as follows.

$$(SP_{OQ}) \quad \min C(\vec{O}_H) \equiv \sum_{t=\tau}^{\tau+H-1} E(C_t), \text{ where } C_t = h_t I_t^+ + p_t I_t^- \quad (1)$$

$$s.t. \quad I_t = I_{t-1} + R_t - D_t, \forall t \quad (2)$$

$$R_t = O_{t-L}, \forall t \quad (3)$$

$$0 \leq O_t \leq K_t, \forall t \quad (4)$$

$$I_t^+ \geq I_t, I_t^+ \geq 0 \quad \& \quad I_t^- \geq -I_t, I_t^- \geq 0, \forall t \quad (5)$$

The objective function (1) minimizes the expected total holding and shortage penalty costs by selecting the optimal order vector, \vec{O}_H . Constraints (2) are inventory balance equations. Constraints (3) relate receipts to order placement; (4) ensure that order quantities do not exceed supply capacity; and (5) define the on-hand and shortage variables.

OUL model: The formulation is as follows.

$$(SP_{OUL}) \quad \min C(\vec{S}_H) \equiv \sum_{t=\tau}^{\tau+H-1} E(C_t), \text{ where } C_t = h_t I_t^+ + p_t I_t^- \quad (6)$$

$$s.t. \quad I_t = I_{t-1} + R_t - D_t, \forall t \quad (7)$$

$$IP_t = I_{t-1} + (O_{t-1} + \dots + O_{t-L}), \forall t \quad (8)$$

$$O_t \leq (S_t - IP_t), \quad 0 \leq O_t \leq K_t, \forall t \quad (9)$$

$$R_t = O_{t-L}, \forall t \quad (10)$$

$$I_t^+ \geq I_t, \quad I_t^+ \geq 0 \quad \& \quad I_t^- \geq -I_t, \quad I_t^- \geq 0, \forall t \quad (11)$$

Constraints (8) track the inventory position IP_t , which is defined as the inventory level I_{t-1} plus the total amount on order. Constraints (9) enforce that the order quantity seeks to raise inventory position up to S_t but cannot order more than the supply capacity K_t . Note that this constraint is a linearized version of $O_t = \min((S_t - IP_t)^+, K_t)$; this linearization is valid because, by standard dynamic programming arguments, the OUL policy is optimal for this environment (14). Consequently, in steady-state, starting with $IP_t \leq S_t$, it is never cost effective to have an order quantity O_t bigger than $S_t - IP_t$ and $S_t - IP_t$ never becomes negative.

To solve the above stochastic programming problem, we use a simulation-based optimization approach which we describe next.

4 SIMULATION-BASED OPTIMIZATION

Since the demand realization in each period can take many possible values, the combination of demand realizations over H periods can be very large. Simulation is an effective way to estimate expected total cost by restricting attention to a subset of demand realizations while controlling accuracy of the cost estimate. In addition, because our cost function is Lipschitz continuous and convex in the decision variables, our simulation-based optimization uses infinitesimal perturbation analysis (IPA, efficiently estimate the cost gradient with respect to each decision respect to each decision variable. This permits application of standard gradient based search to seek the best decision vector that minimizes the total cost. A flow chart of the overall procedure is in Figure 1. Below we provide further details only for the OUL policy because the OQ policy is discussed in (13).

4.1 OUL Policy

The simulation-based optimization approach to determine the minimum expected cost and the corresponding optimal order-up-to levels proceeds as follows:

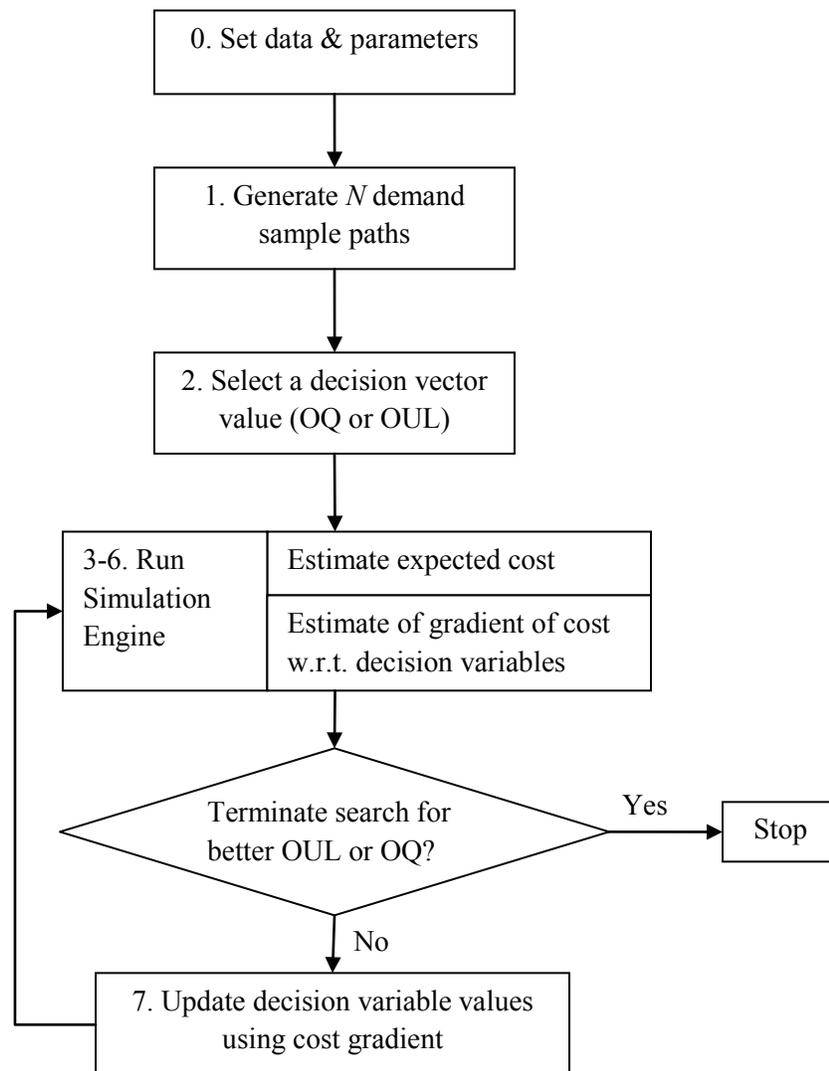


Figure 1: Flow Chart for Simulation-Based Optimization

1. Given the problem data, we generate N sample paths, where the n^{th} sample path is a realization of the demand vector, $\vec{\omega}_n = (d_\tau, \dots, d_{\tau+H-1})$.
2. Select an initial order-up-to level vector \vec{S}_H . Let $n = 1$.
3. Pick the n^{th} sample path, $\vec{\omega}_n$. For $t = \tau, \dots, \tau + H - 1$, we use (7) to calculate the ending inventory level $I_t(\vec{\omega}_n)$. Set $C_t(\vec{\omega}_n) = h_t I_t(\vec{\omega}_n)^+ + p_t I_t(\vec{\omega}_n)^-$. Set $C(\vec{S}_H, \vec{\omega}_n) = \sum_{t=\tau}^{\tau+H-1} C_t(\vec{\omega}_n)$.
4. We use IPA to update the gradient estimate of $C(\vec{S}_H, \vec{\omega}_n)$ using the following expressions.

$$dC_i(\vec{\omega}_n) = \frac{dC(\vec{S}_H, \vec{\omega}_n)}{dS_i} = \sum_{t=\tau}^{\tau+H-1} \frac{dC_t(\vec{\omega}_n)}{dS_i} \quad (12)$$

where S_i is the order-up-to level in period i . Let $\mathbf{1}(A)$ be the 0-1 indicator functions of A . Then

$$C_t(\vec{\omega}_n) = [h\mathbf{1}(I_t(\vec{\omega}_n) > 0) - p\mathbf{1}(I_t(\vec{\omega}_n) < 0)]I_t(\vec{\omega}_n).$$

That is, if $I_t(\vec{\omega}_n)$ is negative, $C_t(\vec{\omega}_n) = -pI_t(\vec{\omega}_n)$; if $I_t(\vec{\omega}_n)$ is positive, $C_t(\vec{\omega}_n) = hI_t(\vec{\omega}_n)$. Hence $\frac{dC_t(\vec{\omega}_n)}{dS_i}$ is either $-p\frac{dI_t(\vec{\omega}_n)}{dS_i}$ or $h\frac{dI_t(\vec{\omega}_n)}{dS_i}$. Differentiating the inventory balance equations (2), we see that

$$\frac{dI_t(\vec{\omega}_n)}{dS_i} = \frac{dI_{t-1}(\vec{\omega}_n)}{dS_i} + \frac{dR_t(\vec{\omega}_n)}{dS_i}$$

$\frac{dI_{t-1}(\vec{\omega}_n)}{dS_i}$ is known from past iterations; $R_t(\vec{\omega}_n) = O_{t-L}(\vec{\omega}_n)$, so $\frac{dR_t(\vec{\omega}_n)}{dS_i} = \frac{dO_{t-L}(\vec{\omega}_n)}{dS_i}$. If $0 \leq O_{t-L}(\vec{\omega}_n) < K_{t-L}$, $\frac{dO_{t-L}(\vec{\omega}_n)}{dS_i} = \frac{dS_{t-L}}{dS_i} - \frac{dIP_{t-L}(\vec{\omega}_n)}{dS_i}$; otherwise, $\frac{dO_{t-L}}{dS_i} = 0$. When $t - L = i$, $\frac{dS_{t-L}}{dS_i} = 1$; otherwise, $\frac{dS_{t-L}}{dS_i} = 0$. The gradient estimate, $\frac{dIP_{t-L}(\vec{\omega}_n)}{dS_i}$, is also known from previous iterations. In the current iteration, we update $\frac{dIP_t(\vec{\omega}_n)}{dS_i}$ using equation (8): $\frac{dIP_t(\vec{\omega}_n)}{dS_i} = \frac{I_{t-1}(\vec{\omega}_n)}{dS_i} + (\frac{O_{t-1}(\vec{\omega}_n)}{dS_i} + \dots + \frac{O_{t-L}(\vec{\omega}_n)}{dS_i})$, where all right-hand-side gradient estimates are known. Thus, starting with $t = \tau$ and proceeding until $t = \tau + H - 1$, we compute $\frac{dI_t(\vec{\omega}_n)}{dS_i}$ and $\frac{dC_t(\vec{\omega}_n)}{dS_i}$. Applying (12), we obtain the gradient estimate $dC_i(\vec{\omega}_n)$.

5. Incrementing n by 1, we repeat steps 3-5 for all the different sample paths.
6. Set $C(\vec{S}_H) = \frac{1}{N} \sum_n C(\vec{S}_H, \vec{\omega}_n)$ and $dC_i \equiv \frac{dC(\vec{S}_H)}{dS_i} = \frac{1}{N} \sum_n dC_i(\vec{\omega}_n)$. Note that this expression interchanges the summation and derivative operators, which is valid in our IPA because our cost function is Lipschitz continuous ((19)).
7. If $dC_i \neq 0$, we modify the order quantity by the step-size $\Delta > 0$, as in standard gradient search. If $dC_i < 0$, let $S_i = S_i + \Delta$; else if $dC_i > 0$, let $S_i = \max(0, S_i - \Delta)$. We then reset all derivatives w.r.t. S_i to zero and repeat steps 2-7 for the new order vector. The procedure terminates if $(dC_i < eps \text{ for all } i)$ or $(\Delta < eps)$. As in standard gradient search, we halve the step-size Δ after a constant number of non-improving iterations (in which $C(\vec{S}_H)$ does not decrease).

5 COMPUTATIONAL RESULTS

In this section, we study the performance of the OQ and OUL policies and we conduct sensitivity analysis on three input factors through an experimental design. We first describe the test instance generator and then present the risk performance measures. Finally we present results from our full-factorial experiment.

5.1 Test Instance Generation

We generate our test instances using $U(a, b)$, a uniform random variate between a and b . U takes on discrete or continuous values depending on the parameter being generated. Let lead time $L = U(2, 6)$ and planning horizon $H = U(4, 11) + L$, where both L and H are discrete parameters. The initial inventory is zero. The initial scheduled pipeline orders R_t , $t = \tau, \dots, L$ are independent and continuous $U(20, 120)$. The continuous mean demand $\mu(D_t) = U(10, 100)$. Assuming demand in a time period is normally distributed, we generate demand variates using a finite-normal generator that rejects any generated negative demand. We set the number of simulated demand sample paths to 20,000. The three input factors considered in this paper are shortage penalty cost (or target service level), demand coefficient of variation, and utilization.

1. Shortage penalty cost is denoted by p . We fix $h = 1$ and allow p to change among three levels: low, medium, and high, corresponding to $p = 3, 5.67, \text{ and } 19$, respectively. Note that, a shortage penalty cost p corresponds to a target service level, $\alpha = \frac{p}{p+h}$. The chosen p values correspond to $\alpha = 0.75, 0.85, \text{ and } 0.95$.
2. Demand cv , $cv = \frac{\sigma(D_t)}{\mu(D_t)}$, is used to measure demand variability. We assign three levels for this factor: low level $cv = 0.1$, medium level $cv = 0.3$, and high level $cv = 0.5$. Given the cv and $\mu(D_t)$, we calculate $\sigma(D_t)$ as $cv \times \mu(D_t)$.
3. Utilization u_t . Let $\bar{\mu}$ be the average of the mean demand $\mu(D_t)$ over the planning horizon. Then, $u_t = \bar{\mu}/K_t$ ($t = 1, \dots, H$). We set three levels for utilization: low $u_t = U(0.1, 0.2)$, medium $u_t = U(0.5, 0.6)$ and high $u_t = U(0.9, 1)$. Given the $\bar{\mu}$ and u_t , we calculate $K_t = \bar{\mu}/u_t$.

5.2 Risk Performance Measures

Uncertainty in inventory cost comes with the risk that an undesirably high inventory cost occurs. We consider three measures of inventory cost risk:

PET: probability of exceeding a target cost,

EUR: expected upside risk which quantifies how much cost exceeds the target, and

CAR: cost at risk, which is similar to Value at Risk (VaR) from Finance, (20).

Given a target cost, we calculate PET as the number of times that the inventory cost exceeds the target cost over all the sample paths and then divided by the total number of sample paths. To calculate EUR, we determine its upside risk as the amount by which that sample path's cost exceeds the target cost for each sample path. When a sample path's cost is less than the target cost, the upside risk is zero. We average the resulting upside risk over all the sample paths to estimate EUR. Note that at a target cost of zero, EUR equals the expected cost and PET equals 1.0; at a large enough target cost $EUR = 0 = PET$. We adapt the Value at Risk (VaR) measure from finance to a Cost at Risk (CAR) measure for our problem. A CAR statistic has three components: a planning horizon, a confidence level, and a cost level. CAR is the cost level at which the chance that the realized cost over the planning horizon will not exceed CAR is equal to the specified confidence level (say 95%). The PET and CAR risk measures are "inverses" of each other in the sense that for target cost equal to CAR and confidence level $1 - \beta$, the PET is β . Unlike PET, CAR and EUR are both measured in units of cost.

5.3 Performance of OQ vs. OUL

To measure the performance of the two policies, we consider three different levels for each input factor resulting in 27 ($3 \times 3 \times 3$) combinations. For each combination we replicate for 30 times and this yields $27 \times 30 = 810$ test instances. Other settings are exactly the same as in Section 5.1. All our computations are conducted on a Dell Inspiron 9300 machine with a 1.60 GHz CPU and 1GB RAM. We compare cost performance of the two policies using a relative percentage error (RPE) in costs, $RPE = \frac{OQ \text{ Cost} - OUL \text{ Cost}}{OUL \text{ Cost}} \times 100\%$, where OQ Cost and OUL Cost denote the expected total cost of the OQ and OUL policies, respectively. In computing the expected costs for each policy, we use the same sample paths (see variance reduction using common random numbers, (21)).

In Table 1, we compare various performance measures of the OQ and OUL policies averaged over the test instances. For each policy, we report the average cost, cost standard deviation and range, RPE, Type 1 service level (SL), fill rate and run time in CPU seconds, where

$$\text{Type 1 SL} = s(\vec{O}_H) \equiv \frac{1}{H} \sum_{t=\tau}^{t=\tau+H-1} P(I_t \geq 0) \text{ and fill rate} = s(\vec{O}_H) \equiv E \left[\frac{\sum_{t=\tau}^{\tau+H-1} (D_t - I_t^-)^+}{\sum_{t=\tau}^{\tau+H-1} D_t} \right].$$

From Table 1, we note that OUL policy incurs on average 10.6% less costs and provides slightly higher service levels and lower cost risk (standard deviation and range) than OQ policy does. The OQ optimization runs three times faster than the OUL, but both procedures are fast and take under 91 seconds on average. In the remainder of this section, we seek to identify when it is most appropriate to use the OUL policy and when the OQ policy will perform almost as well.

Table 1: Performance Comparison between OQ and OUL Policies

Policy	Avg. Cost	Cost Std.Dev.	Cost Range	RPE	Type 1 SL	Fill Rate	Run Time
OQ	1408.8	818.4	8543.7	10.6%	75.5%	87.9%	25.7
OUL	1312.7	710.3	6328.8	0.00%	75.3%	88.1%	90.8

Performance Comparison by Input Factors: We compare the performance of each policy at different levels of three input factors: demand cv , utilization u , and penalty cost p . Our results are summarized in Table 2 - 4. Each of these tables presents the average performance measures for different values of input factors, and the performance measures are averaged over instances with different values of the other parameters. For instance, Table 2 shows average performance measures for different values of demand cv . The first entry of total cost column 880.5 in Table 2 corresponds to the average optimal total cost of the OQ policy for $cv = 0.1$, averaged over instances with different values of utilization u , and penalty cost p .

Demand cv . In Table 2, we report the performance of each approach when demand cv changes from 0.1 to 0.5 in step of 0.2. Both policies incur higher total cost average, cost standard deviation, and lower service levels when demand cv increases from low to high. As demand cv increases, the RPE of OQ policy initially increases and then stabilizes. This implies that for products with intermediate demand uncertainty, operations managers can expect the largest saving from using an OUL policy. This is partly explained by the fact that when cv becomes high, the order capacity restricts improvements that the OUL can achieve. We also note that the impact of the tested cv changes dominates the impact of replenishment policy change from OQ to OUL. That is, if the OQ policy is being used then reducing demand cv from 0.3 to 0.1, if feasible, reduces cost from 1367.4 to about 880.5, a percentage change of 35.6% which exceeds the RPE of 12% in Table 2. So we conclude that, in this case, it is more beneficial to improve demand cv than to change the replenishment policy. This observation is similar in spirit to (22), who studied performance improvement versus policy change from MRP to Kanban. In general, whether it is better to improve demand cv or change the policy from OQ to OUL depends on the current value of cv , how much improvement in cv is feasible and at what cost, and the projected costs and benefits from policy changes.

Table 2: Performance Comparison for Different Demand cv

cv	Approaches	Avg. Cost	Cost Std.Dev.	RPE	Type 1 SL	Fill Rate
0.1	OQ	880.5	250.5	8.2%	76.1%	91.3%
	OUL	844.0	213.0	0.00%	76.0%	91.5%
0.3	OQ	1367.4	792.1	12.0%	76.1%	88.0%
	OUL	1263.1	677.2	0.00%	75.9%	88.3%
0.5	OQ	1978.5	1412.8	11.7%	74.4%	84.4%
	OUL	1830.9	1240.6	0.00%	74.1%	84.5%

Utilization u . Table 3 illustrates the impact of utilization u on the performance measures. Lower u implies higher supply capacity and similarly higher u indicates lower supply capacity. As expected, the average total costs and cost standard deviation of both policies increase and their service levels decrease when u increases from low to high. Further, the RPE of OQ policy decreases with u . This suggests that when more supply capacity is available (or can be secured), the OUL policy will result in more significant cost savings relative to the OQ policy. The impact of improvements in u dominates an OQ to OUL policy change for high u but not for medium to low u .

Table 3: Performance Comparison for Different Utilization u

u	Approaches	Avg. Cost	Cost Std.Dev.	RPE	Type 1 SL	Fill Rate
Low	OQ	1144.9	571.8	15.0%	80.2%	91.4%
	OUL	1011.3	406.2	0.00%	80.2%	91.9%
Medium	OQ	1174.7	617.1	13.9%	79.3%	90.8%
	OUL	1048.6	472.7	0.00%	79.2%	91.2%
High	OQ	1906.8	1266.5	2.9%	67.1%	81.4%
	OUL	1878.1	1251.9	0.00%	66.6%	81.3%

Penalty Cost p . In Table 4, we present the performance of each approach when p changes from 3 to 19. As expected, the average total costs, cost standard deviation, and the service levels of both policies increase as p increases. When p decreases from 19 to 3, the RPE of OQ policy increases from 8.4% to 12.4% correspondingly. This implies that the OUL policy performs much better than the OQ policy when the p value is medium or low, possibly due to capacity limits. Under limited supply capacity, OQ to OUL policy changes should be targeted to items with moderate value of p (corresponding to moderate values of target service levels).

Table 4: Performance Comparison for Different Shortage Penalty Cost p

p	Approaches	Avg. Cost	Cost Std.Dev.	RPE	Type 1 SL	Fill Rate
3	OQ	851.1	368.5	12.4%	70.4%	85.8%
	OUL	772.1	282.4	0.00%	70.1%	86.2%
5.67	OQ	1124.9	569.7	11.1%	75.6%	88.1%
	OUL	1032.1	465.8	0.00%	75.4%	88.3%
19	OQ	2250.4	1517.0	8.4%	80.5%	89.8%
	OUL	2133.8	1382.7	0.00%	80.4%	89.8%

In summary, the OUL policy outperforms the OQ policy for all the three factors. The relative percentage error (RPE) of the OQ policy increases with demand cv at low cv values and decreases with utilization u or penalty cost p . For the tested instances, the impact of a replenishment policy change from OQ to OUL dominated the impact of process improvements when utilization changed from medium to low, otherwise improvements in demand cv , u , and p dominated replenishment policy improvement from OQ to OUL.

6 SUMMARY

We study a single end-product master production scheduling problem with supply capacity limits, inventory holding and shortage cost, and dynamic stochastic demand specified by a forecast mean and a forecast error in each time period. We solve this problem using two inventory policies, OQ and OUL, which set order quantities and order-up-to levels respectively. We use a simulation-based optimization approach to evaluate and compare the two policies. The performance measures we consider include average total cost, cost standard deviation or coefficient of variation, expected upside risk, cost at risk, probability of exceeding a target

cost, and service levels. Based on the test instances, we observed that the OUL policy incurs on average 10.6% lower costs and provides slightly higher service levels and lower risks than the OQ policy does. We studied the impact of demand coefficient of variation (cv), shortage penalty cost and supply capacity utilization on costs, risk measures and service levels. The OUL policy results in more cost savings than the OQ policy does when demand uncertainty is higher, supply capacity is higher, and penalty cost is lower. On average, in terms of the cost reduction, the impact of penalty cost was higher than that of demand cv , whose impact was larger than utilization. On average, demand cv had a bigger impact on risk measures than on penalty cost and utilization had the least impact on risk among the three input factors.

References

- [1] Robert F. Jacobs and F.C. Weston Jr. Enterprise resource planning (ERP) - a brief history. *Journal of Operations Management*, 25(2):357–363, 2007.
- [2] SAS. SAS analytics for inventory optimization: Improve your supply chain investment. *SAS White paper*, www.sas.com, 2007.
- [3] J.J. Kanet, M.F. Gorman, and M. Stößlein. Dynamic planned safety stocks in supply networks. *International Journal of Production Research*, 47(24), 2009.
- [4] J. Haddock and D. E. Hubicki. Which lot-sizing techniques are used in material requirements planning. *Production and Inventory Management Journal*, Q3:53–56, 1989.
- [5] D.C. Whybark and J.G. Williams. Material requirements planning under uncertainty. *Decision Sciences*, 7(4):506–606, 1976.
- [6] V. D. R. Guide and R. Srivastava. A review of techniques for buffering against uncertainty with MRP systems. *Production Planning and Control*, 11:223–233, 2000.
- [7] J. H. Yeung, W. C. K. Wong, and L. Ma. Parameters affecting the effectiveness of MRP systems: a review. *International Journal of Production Research*, 36:313–331, 1998.
- [8] S. C. L. Koh, S. M. Saad, and M. H. Jones. Uncertainty under MRP-planned manufacture: review and categorization. *International Journal of Production Research*, 40(10):2399 – 2421, 2002.
- [9] P. Jonsson and S.-A.. Mattson. A longitudinal study of material planning applications in manufacturing companies. *International Journal of Operations and Production Management*, 26(9):971–995, 2006.
- [10] P. Hautaniemi and T. Pirttilä. The choice of replenishment policies in an MRP environment. *International Journal of Production Economics*, 59:85–92, 1999.
- [11] M. Z. Babai and Y. Dallery. Dynamic versus static control policies in single stage production-inventory systems. *International Journal of Production Research*, 47(2):415–433, 2009.
- [12] Ramesh Bollapragada and Uday S. Rao. Replenishment planning in discrete-time, capacitated, non-stationary, stochastic inventory systems. *IIE Transactions*, 38(7):583–595, 2006.

- [13] K. Feng, U.S. Rao, and A. Raturi. Setting planned orders in master production scheduling under demand uncertainty. *International Journal of Production Research*, 49(13), 2011.
- [14] Roman Kapuscinski and Sridhar Tayur. A capacitated production-inventory model with periodic demand. *Operations Research*, 46(6):899–911, 1998.
- [15] G. Eppen, K. Martin, and L. Schrage. A scenario approach to capacity planning. *Operations Research*, 37(4):517–527, 1989.
- [16] E. Luciano, L. Peccati, and D.M. Cifarelli. VaR as a risk measure for multiperiod static inventory models. *International Journal of Production Economics*, 81-82:375–384, 2003.
- [17] C.S. Tapiero. Value at risk and inventory control. *European Journal of Operational Research*, 163:769–775, 2005.
- [18] M.A. Cohen and H. Kunreuther. Operations risk management: Overview of paul kleindorfers contributions. *Production Operations Management*, 163:525–541, 2007.
- [19] Michael Fu. *Simulation*, volume 13 of *Handbooks of ORMS*, chapter 19. Elsevier North-Holland, 2006.
- [20] Philippe Jorion. *Value at Risk: The New Benchmark for Managing Financial Risk*. McGraw-Hill, Inc., 3 edition, 2006.
- [21] A.M. Law and W.D. Kelton. *Simulation modeling & analysis*. McGraw-Hill, Inc., 3 edition, 2000.
- [22] L.J. Krajewski, B.E. King, L.P. Ritzman, and D.S. Wong. Kanban, MRP, and shaping the manufacturing environment. *Management Science*, 33(1):39–87, 1987.

EVALUATING PORT PREPAREDNESS FOR INCREASED CONTAINER FREIGHT TRAFFIC IN THE MID-ATLANTIC AND SOUTHEASTERN UNITED STATES

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Abstract

The international business environment today is characterized by supply networks which move components from suppliers to manufacturers and then distribute final products to customers spanning the globe. This means that materials and products are moving extremely long distances in greater numbers and with greater frequency. Containerization is a key element which has radically altered international shipping in the last twenty (20) years. Given the dominance of container shipping, two major factors are presenting new opportunities for U.S. Ports on the East Coast and Gulf Coast: (1) the desire for ocean carriers to benefit from economies of scale and (2) the new third channel for larger vessels to pass through the Panama Canal. This means there is a corresponding need for ports and connecting infrastructure to make the proper improvements to accommodate the shipping companies. This paper will present a systematic evaluation of issues related to preparedness for a selection of ports on the Mid-Atlantic and Southeastern United States coastline.

Introduction

In order to move materials and products through a global supply chain originating in the Far East and destined for North America or Europe a multitude of handoffs are required (Russell and Saldanha, 2003). Many of the handoffs involve switching transportation modes and the various logistics elements must function effectively to achieve an acceptable level of delivery performance. The critical elements for intermodal shipping are (1) ocean carriers; (2) rail to handle the vast quantities of containers traveling longer distances to inland destinations; and (3) trucking for transfers between modes and for moving the “last mile” to the customer.

Rail Intermodal has two variations, Container on Flatcar (COFC) as described above and Trailer on Flatcar (TOFC) which involves a regular trailer from an eighteen-wheeler tractor-trailer is loaded on the railcar. Table 1 contains statistics for the Intermodal volume for the most recent years with complete data available:

Table 1. Rail Intermodal Statistics for U.S.

RAIL INTERMODAL ACTIVITY	2006	2007	2008	2009	2010
Containers (COFC)	11,801,146	11,933,486	11,599,096	10,065,795	11,726,040
Trailers (TOFC)	2,432,928	2,145,466	2,060,399	1,604,555	1,664,064
Total Rail Intermodal Volume	14,234,074	14,078,952	13,659,495	11,670,350	13,390,104

Source: Intermodal Industry Statistics: http://www.intermodal.org/statistics_files/stats1.shtml

From Table 1 we can see a drop in container volume in 2009 due to the economic downturn worldwide. The data also clearly shows the dominance of containers as the preferred shipping method for intermodal freight.

The shift away from trailers and to containers for Rail Intermodal coincides with rapid growth of container usage for ocean freight and a significant increase in import/export activity. The growth of intermodal shipments in the last twenty years can be attributed to a set of factors with some complex interactions at work. Some of the factors to consider include:

- The growth of outsourcing
- The growth of “diverse” supply chains
- New technology developments, in particular the Internet (Leinbach and Capineri, 2007).

The impact has exposed some of the shortcomings or constraints that exist in transportation systems. Some of the issues that have surfaced include:

- Inadequate rail service availability
- Seaport congestion
- Stress on international gateways
- Concerns about security (Leinbach and Capineri, 2007).

These factors have impacted intermodal shipping and commerce in general in the U.S. in different ways in connection with random events such as Hurricane Katrina in 2005 (Pettit et al., 2010) and the longshoremen dock strikes at Los Angeles and Long Beach in 2002 (Lee, 2004).

Another major factor which will soon impact intermodal shipping in the U.S., North America, Central America and South America is the addition of a new deeper and wider third channel at the Panama Canal. Scheduled for completion by 2014, the new channel will permit passage of “post-Panamax” vessels carrying more than 10,000 TEUs. The term “Panamax” is used to describe the maximum size vessel which can pass through the current Panama Canal (prior to the expansion) and the term “post-Panamax” is used to describe the new larger vessels which will be able to navigate the new channel.

When the new channel opens, the most important change will be the option for cargo ships to travel from originating points in Asia via the Panama Canal to destinations on the Gulf and East Coasts of the U.S. (and the East coast of other countries throughout North, Central and South America). Many of the U.S. ports are not currently able to handle the “post-Panamax” vessels and the increased volume of containerized cargo. A small number of ports are better prepared than others.

Based on all of these observations and given the nature of the global supply chain and the dominant usage of containers in the shipping process, it is important to evaluate the preparedness for continued growth in intermodal shipping at the East and Gulf Coast U.S. ports. The concept of preparedness will be discussed in the following section of the paper as it relates to specific ports, the rail systems and highways in the regions near those ports.

Preparedness

The term “preparedness” has often been used in connection with security in the various transportation modes particularly in the last decade (Bragdon, 2008). For the purposes of this paper, preparedness is viewed as the interrelated combination of accessibility, capacity and sustainability. Naturally these concepts relate primarily to infrastructure and operations. In the context of infrastructure and operations preparedness refers to capabilities rather than security.

The Ocean Freight Factor

Until 1996, the maximum size of ocean freighters was approximately 4500 to 5000 twenty foot equivalent units (TEUs) (GlobalSecurity.org, 2011). The size of “Panamax” container ships was limited by the dimensions of the Panama Canal lock chambers. Due to the constraints of the canal, ship dimensions from 1984 until 1996 were:

- Overall ship length, 294.1 m (or 965 feet)
- Maximum ship breadth (beam), 32.3 m (or 106 feet)
- Maximum draft, 12.0 m (or 39.5 feet) (GlobalSecurity.org, 2011).

Since 1996, the maximum size of container ships being built for other routes has grown steadily with the maximum size now more than 3x the “Panamax” vessel size (GlobalSecurity.org, 2011). In 2005, the first innovative design for a container ship with a capacity of 13,000 TEUs was unveiled by Korean shipbuilder Hyundai Heavy Industries (GlobalSecurity.org, 2011). In 2011, ocean freight carriers (such as APM/Maersk) are placing orders for vessels as large as 18,000 TEUs to serve other routes (such as Asia to Europe) in their global network (Park, 2011).

“Post-Panamax” vessels will have the following nominal dimensions:

- Overall ship length, 366 m (or 1,200 feet)

- Ship breadth (beam), 49 m (or 160 feet)
- Ship draft, 15.0 m (or 50 feet) (Panama Canal Authority, 2006).

The acquisition of “post-Panamax” vessels is the main action already taken by ocean freight companies to be prepared for the opening of the new section of the Panama Canal in 2014. Orders are placed and the larger container ships are under construction in time for delivery by 2014. The Evergreen Group, one ocean freight company, placed orders for ten (10) “post-Panamax” container ships in June, 2010 with delivery scheduled for 2012 (Leach, 2010). In 2011, orders were placed industry-wide for 52 container ships of 10,000 TEUs or larger capacities according to *The Journal of Commerce* (King, 2011). That brought the total number of “post-Panamax” vessels on order to 158 ships which will add more than two million TEUs in container ship capacity (King, 2011).

The new Panama Canal section will handle ships able to carry more than 10,000 TEUs and the per-ship cargo is expected to triple from 4,400 TEUs to 12,600 TEUs according to the Panama Canal Authority (Leff, 2011). Conveniently, the new vessel purchases are taking place at a time when many of the smaller vessels are in need of replacement.

Benefits

Even the ocean cargo companies are being pinched by increasing fuel prices (Park and Morris, 2011; Leff, 2011). Larger vessels will carry significantly larger cargo quantities and spread the fuel costs over the greater number of containers. The propulsion technology is also much better in the new vessels for fuel economy and simultaneously addresses the emissions concerns associated with the low quality fuels currently being used by older ocean vessels (Park and Morris, 2011). Economies of scale will also be realized because larger cargo loads on larger vessels translate to fewer trips that will be required by smaller vessels to move the same quantity. The economies of scale will likewise spread the at-sea-costs in every category across the larger number of containers carried on board.

Preparedness of U.S. Ports

The ‘water depth’ for the entry channels and at dockside is at the top of the list for getting prepared for the “post-Panamax” vessels. The ports must also have the necessary equipment such as cranes with reach capabilities for unloading the larger vessels which will be 22 containers wide (Jacksonville Business Journal, 2009). Capacity at the port relates to several factors including container loading/unloading rate, container storage capacity, reefer storage capacity (with power supplies for refrigeration units), truck throughput and railcar throughput. Multiple terminals at proximate locations are a favorable arrangement and a good way to

enhance capacity. Required security procedures may constrain cargo movement as another capacity issue particularly at a higher volume of cargo traffic.

Accessibility to the port is critical for truck traffic and for rail traffic. Roadway congestion is another issue that affects the timeliness of shipments making immediate access to Interstates a desirable characteristic. Rail usage can help ease roadway congestion. The next sections will highlight a selection of these preparedness factors.

Water Depth

Dredging to change water depth requires approval by the U.S. Congress. This is handled through the Water Resources Development Act (WRDA) which Congress acts upon frequently. Gaining Congressional approval is preceded by significant amounts of time spent on planning, obtaining funding for studies, conducting environmental impact and feasibility studies and obtaining funding for the actual dredging project and/or other improvement projects.

As of the 2007 WRDA, only three (3) U.S. Ports on the East Coast had Congressional approval to dredge to 50 feet. The three ports are: New York/New Jersey (underway), Norfolk (already at 50 feet with approval to go to 55 feet), and Miami (local funding \$70+ million, Federal funding withdrawn, Florida Governor has pledged state funds to make up the balance) (Gerrity, 2011; Site Selection, 2011).

Table 2 lists the current water depth for a sample of East coast ports on the next page. The data in Table 2 confirms that the ports in Norfolk, VA., Miami and New York/New Jersey have a distinct advantage over the other ports currently. Baltimore is not far behind if they could take action to increase the dockside water depth. Norfolk is actually well ahead of the other ports with current water depth at 50 feet and with approval to dredge to a depth of 55 feet when it becomes necessary to have that depth.

The advantage for these three ports is further endorsed by the CEO of the Panama Canal, Alberto Aleman, who expressed the opinion that the three (3) largest Ports on the East Coast will handle the majority of the increased volume once the third lane of the Panama Canal is completed. “The East Coast has many ports, and the large ships are not going to stop at every port,” Aleman was quoted as saying in the article published in the *Manila Bulletin*.

Table 2. U.S. Port Navigation Status

Port	Current Depth	Comments
Boston (Massport)	Channel depth 40 feet	Feasibility study underway to increase depth to 45 to 50 feet
New York/New Jersey (PANYNJ)	Channel depth to container terminals – 40 to 45 feet	Project underway to deepen main and access channels to 50 feet by 2014; \$2.3 billion federal funding; non-container terminals have depth ranges of 35 to 45 feet
Philadelphia (PRPA)	Channel depth is 40 feet	Project underway to increase depth to 45 feet; began in 2010 and will be several years to complete
Baltimore (MPA)	Channel depth is 50 feet	No terminal depths at 50 feet
Norfolk (VPA)	Only U.S. Atlantic Port with 50 feet depth for channel and all the way to docks	U.S. Army Corps of Engineers (USACE) have authorized channel for 55 feet; general reevaluation report (GRR) underway to go to 55 feet
Charleston, SC (SCSPA)	Entrance channel is 47 feet and harbor channel is 45 feet at low tide	USACE reconnaissance study completed in July 2010 to determine federal interest in deepening channel to provide funding for feasibility study in USACE FY 2011 Work Plan
Savannah, GA (GPA)	Channel depth is 42 feet	USACE will dredge to 48 feet if project study issues are resolved; cost is \$588 million; Savannah has to be reauthorized in the next WRDA by Congress because cost now exceeds 120% of original estimate
Jacksonville (JAXPORT)	Main channel depth is 40 feet	Port looking to go to 45 feet; feasibility study underway for a project estimated between \$500 million and \$600 million; cross current issue at St. John's River and Intracoastal Waterway also must be resolved
Port of Miami	Main channel depth is 42 feet	Port has authorization for 50 feet channel depth; full amount of USACE funding is not approved; Florida Governor has pledged \$77 million from the state; currently in pre-construction and design phase

SOURCES: July 5, 2011 by American Association of Port Authorities (AAPA) as reported in Site Selection, November, 2011.

For comparison, we present water depth information in Table 3 for four Gulf Coast ports.

Table 3. Water Depths at Gulf Coast Ports in the U.S.

Port	Current Water Depth (mean water level)
Houston, TX	39 feet at Wharf #1; 35 feet at Wharf #2 & #3
New Orleans, LA	47 feet in Mississippi River channel; 45 feet dockside at Napoleon Ave. 1 & 2 terminals; 43 feet at Napoleon C/B
Mobile, AL	45 feet
Tampa, FL	43 feet

Sources: The Port of Houston Authority, Ports America, Alabama State Port Authority, Tampa Port Authority

Water depth addresses water draft but in the upward vertical direction there is also a concern for the “air draft”. The air draft is the space needed to clear overhead infrastructure such as bridges since the larger vessels will be taller in addition to being deeper and wider in dimension. Many of the ports are located a few miles (or many miles) upstream on a river from the ocean inlet which will make older bridges and even newly constructed bridges a concern. Are those bridges at a sufficient height to allow the mega-sized post-Panamax vessels to pass underneath? In the future contractors need to be cognizant of the required air draft clearance requirements and the responsible agencies need to assure that the requirements are met.

Cooperation

Another factor which favors some ports over others is an agreement with the Panama Canal Authority. In 2003, the Panama Canal Authority (PCA) “has undersigned mutual cooperation agreements with the most important ports on the U.S. East Coast and the Gulf of Mexico” (Panama Canal Authority, 2006). The port authorities included in that agreement are listed in Table 4:

Table 4. Port Authorities aligned with Panama Canal Authority

Port Authorities signing Agreement	Port
New York/New Jersey	New York/New Jersey
Georgia	Savannah
Virginia	Norfolk (or Hampton Roads – all locations)
Massachusetts	Boston
South Carolina	Charleston
Florida	Miami and Tampa
Texas	Houston
Louisiana	New Orleans

This might seem to be a huge advantage but the PCA has also signed Memorandums of Understanding (MOU) with a number of other ports in the last two years. Among them are the Port of Gulfport in Mississippi, Port of Mobile in Alabama, (Area Development Online, 2011) and the Port of Freeport in Texas (The Journal of Commerce, 2011). Even the Port of Wilmington in North Carolina signed a MOU with PCA in 2010 (The Journal of Commerce, 2010). In addition, many of the original ports signed five year extensions with PCA in recent years as well.

Accessibility

Port accessibility is determined by a variety of factors. Proximity of rail and proximity of interstate highways are the primary factors. The following anecdotal evidence will highlight the importance of this issue and the variety of issues involved:

- Miami has a project underway to return rail service to the Port.
- New York/New Jersey – project is scheduled to improve air draft clearance at the Bayonne Bridge to allow larger vessels to pass underneath.
- New Orleans – port is within 5 miles of six Class I Railroads and also within 5 miles of I-10 interstate highway.
- New Orleans is the only U.S. Port with service by six Class I Railroads. Canadian National is the largest volume railroad serving the port.
- The majority of trucks exiting the Port of Wilmington in North Carolina take a southerly route to a U.S. highway rather than a westerly route which is a direct connection to I-40. The optional route avoids numerous traffic lights and heavy traffic through a suburban area in Wilmington, NC.
- Port of Wilmington, NC – the port is more than 20 miles up the Cape Fear River from the ocean buoy.
- Savannah – the Garden City terminal has more ship-to-shore cranes than any other single U.S. Port facility.
- Norfolk, VA to Pritchard, W.VA. – modifications were made to 28 different tunnels, overpasses and bridges to permit the passage of trains with double-stacked containers.
- New Orleans – Canadian National Railroad working with port to develop and utilize an on-dock rail facility immediately adjacent to Napoleon Avenue terminal.

From all of these examples we can see that the accessibility issue will be completely different from one port to the next. The state department of transportation, each port authority and other interested parties will need to work together to address specific bottlenecks or hurdles.

Infrastructure

Another infrastructure/operations preparedness factor is the port facility itself. Is there sufficient berth space to accommodate the mega-sized post-Panamax vessels without sacrificing a berth position for simultaneous arrivals? Does the port have sufficient rail access and sufficient loading capabilities from vessel to rail? These issues can be addressed through improvements but the overall capability may be impacted if docks have to be enlarged or if rail has to be extended taking away valuable real estate on the port.

Several ports have made equipment investments including Savannah with four new super “post-Panamax” cranes arriving in 2009 (Jacksonville Business Journal) and Wilmington, NC with the

delivery of four new “post-Panamax” cranes in 2010 (Porttechnology.org, 2011). Berths are also being modified at many ports to accommodate the longer vessels.

Preparedness of Rail Intermodal

Reliable rail infrastructure and reliable rail performance is critical if higher utilization of rail intermodal is to be realized (Monroe, 2011). Speed limitations and congestion are related issues. The ability to handle double-stack containers on rail is a constraint which is being addressed in several areas (e.g. rail condition and tunnel height, etc) (Yohe, 2010). Location and development of “inland ports” or rail intermodal terminals – some new developments have occurred while others are still being investigated.

Preparedness issues for Rail include:

- Rail condition (weight capable for double-stacked containers?)
- Bridge and tunnel heights to permit passage of double-stacked containers (air draft)
- Equipment capabilities at the port (for rail at the port) OR at intermodal yards away from the port.

Rail Benefits

The rail portion of the intermodal linkage has several major benefits which are contributing to the attractiveness of that mode for land-side intermodal shipping overall. Over the last 20 years fuel efficiency has improved dramatically for rail. In 1980, one ton of freight moved by rail 235 miles per gallon of fuel and by 2007 one ton of freight moved 436 miles per gallon of fuel (Overview of U.S. Freight Railroads, 2008). That is more than an 85 percent improvement in fuel efficiency. According to statistics from Burlington Northern Santa Fe, a more recent statement claims that one ton of freight can be moved 500 miles per gallon of fuel (BNSF Fact Sheet, 2011) which indicates the continued improvement of rail equipment performance.

By contrast, the trucking industry is notorious for the extremely low mileage per gallon of fuel achieved by roadway equipment. “On average, rail is three or more times more fuel efficient than trucks ...” (Overview of U.S. Freight Railroads, 2008). As a result, rail has a significantly smaller energy usage, a smaller carbon footprint and can claim the green benefits that are associated with removing trucks from the roadways for longer shipping distances.

In the last few sections we have highlighted a sampling of issues related to waterway depths, equipment upgrades, infrastructure and a variety of access issues. We do not presume to have the complete comprehensive list of issues described here. There are bound to be other preparedness factors which will be critical at one specific port and not another.

Summary

Here we briefly summarize the findings discovered in the course of this research. Nine ports have signed a “cooperative agreement” with the Panama Canal Authority (PCA) dating back to 2003. Additional ports have signed MOUs with the PCA as recently as 2010 and 2011. This means the ports with new MOUs are lagging behind compared to the ports involved in the earlier agreement. Due to the required Congressional approval process, only three ports have approval to dredge to the needed water depth of 50 feet for the entry channels and at dockside. Funding is an ongoing issue given the recent economic conditions. Equipment upgrades are also needed to be compatible with the size of the larger vessels. Highway access and rail access may be an issue that requires action to improve port performance to be in contention as a port-of-call for additional container volume. Many ports are initiating improvement projects but not all are likely to benefit from increased cargo freight traveling through the expanded Panama Canal.

Leading ports in terms of preparedness are the ones with Congressional approval for dredging – New York/New Jersey, Norfolk and Miami. Other successful contenders in the next five to ten years may come from a group which includes Baltimore, Charleston, Savannah, Tampa, Jacksonville, New Orleans, Mobile and Gulfport, MS. If other ports benefit significantly that will be somewhat unexpected based on the current information.

Future Research

This paper has addressed the issues related to equipment and infrastructure issues for a select group of U.S. Ports. In order to explore topics more thoroughly with relevant data, future research will likely focus more directly on a smaller sample of Ports. For instance, researchers may devote more time for identifying capabilities related to Port equipment and Port access issues. Another interesting topic would be to look at the resilience of the East and Gulf Coast ports to handle specific percentages of additional cargo which may be diverted from the West Coast ports. These are just a few of the very promising research opportunities which warrant further investigation.

References

- Area Development Online. (2011). "Gulf Ports Anticipate Panama Canal Expansion's Benefits," Area Development Online: Site and Facility Planning. Downloaded from:
<http://areadevelopment.com/Print/logisticsInfrastructure/directory2011/gulf-mexico...>
- BNSF Fact Sheet. (2011). Downloaded from: http://www.bnsf.com/about-bnsf/pdf/fact_sheet.pdf
- Bragdon, Clifford. (2008). *Transportation Security*. Butterworth-Heinemann: Burlington, MA, USA.
- Gerrity, Michael. (2011). "Special Report: Benefits of Panama Canal's 2014 Expansion Now a 'Game Changing' Reality for Port of Miami," World Property Channel, 03/19/11.
- Global Security. (2011) Container Ship Types, page last updated 7/17/2011:
<http://www.globalsecurity.org/military/systems/ship/container-types.htm>
- Intermodal Industry Statistics from IANA (2011): http://www.intermodal.org/statistics_files/stats1.shtml
- Intermodal Industry Statistics. Year 2007 Industry Statistics – Overview. Downloaded December 21, 2010. <http://test.intermodal.org/statistics_files/stats2.shtml>
- Intermodal Industry Statistics. Year 2008 Industry Statistics – Overview. Downloaded December 21, 2010. <http://test.intermodal.org/statistics_files/stats6.shtml>
- Jacksonville Business Journal. 2009. "Savannah gets super post-Panamax cranes," Feb. 23, 2009. Downloaded from: <http://www.bizjournals.com/jacksonville/stories/2009/02/23/daily9.html>
- King, Mike. (2011). "Ship orders rise despite falling rate," *The Journal of Commerce*, Aug 31, 2011. Downloaded from: <http://www.joc.com/container-shipping/ship-orders-rise-despite-falling-rates>
- Leach, Peter T. (2010). "Evergreen orders 10 Post-Panamax Ships," *The Journal of Commerce*, July 2. Downloaded from: <http://www.joc.com/maritime/evergreen-orders-10-post-panamax-ships-0>
- Leff, Alex. (2011). "Panama Canal expansion a 'game changer'," [ticotimes.net](http://www.ticotimes.net), June 17, 2011. Downloaded from: <http://www.ticotimes.net/layout/set/print/Business-Real-Estate/Panama-Canal-expansion-a-game-changer-Friday-June-17-2011>
- Leinbach, Thomas R. and Capineri, Cristina. 2007. The global economy and freight transport flows. In *Globalized Freight Transport*, edited by Leinbach and Capineri. Edward Elgar Publishing Inc.: Cheltenham, UK and Northampton, MA, USA, pp. 1-14.
- Monroe, R.W. (2011) Recent Trends and Performance Issues in Multimodal Logistics. Digital proceedings of the 22nd Annual POMS Conference: *Operations Management the Enabling Link*, May, Reno, NV.
- Panama Canal Authority. (2006). "Proposal for the Expansion of the Panama Canal," copyright Panama Canal Authority.
- Panama Canal Expansion seen boosting volume at 3 big US Ports. *Manila Bulletin*. February 24, 2011. Downloaded from <http://www.mb.com.ph/articles/306178/panama-canal-expansion-seen-boosting-volume-3-big-us-ports>
- Park, Kyunghye. (2011). "Maersk said set to order 10 biggest container ships," *Bloomberg Businessweek*, February 18, 2011. Downloaded from: <http://www.businessweek.com/news/2011-02-18/maersk-said-set-to-order-10-biggest-container-ships.html>
- Park, K. and S. Morris. (2011). "Maersk orders up to 30 of biggest container ships on trade," *Bloomberg Businessweek*, February 21, 2011. Downloaded from: <http://www.businessweek.com/news/2011-02-21/maersk-orders-up-to-30-of-biggest-container-ships-on-trade.html>
- Pettit, T.J., J. Kiksel, and K.L. Croxton. (2010). "Ensuring supply chain resilience: Development of a conceptual framework," *Journal of Business Logistics*, Vol. 31, No. 1, pp. 1-21.
- Ports America. (2011). <http://www.portsamerica.com/new-orleans-louisiana.html>

Port of Virginia – Port Stats. (2010). <http://www.portofvirginia.com/development/port-stats.aspx>

Porttechnology.org. (2011). “Post-Panamax cranes arrive to complete first phase of container terminal expansion,” Downloaded from:
http://www.porttechnology.org/technical_papers/post_panamax_cranes_arrive_to_complete_first_phase_of_container_terminal_expansion

Overview of U.S. Freight Railroads. (2008) Overview of U.S. Freight Railroads, Association of American Railroads. Downloaded from:
<http://www.aar.org/PubCommon/Documents/AboutTheIndustry/Overview.pdf>

Russell, Dawn M. and Saldanha, John P. (2003). Five tenets of security-aware logistics and supply chain operations. *Transportation Journal*, Summer, Volume 42, Issue 4.

Tampa Port Authority. 2011. <http://www.tampaport.com/Port-Facilities/Container-Facilities/Port-of-Tampa-Container-Terminal-Berths-212-213>

The Journal of Commerce. 2010. “Panama Canal Authority and North Carolina State Ports Authority Establish Partnership,” Dec. 15, 2010. Downloaded from: <http://www.joc.com/print/422746>

The Journal of Commerce. 2011. “Panama Canal Authority and Port Freeport (TX) Sign Memorandum of Understanding,” Sept. 13, 2011. Downloaded from: <http://www.joc.com/press-release/panama-canal-and-port-freeport-tx-sign-memorandum-understanding>

The Port of Houston Authority, 2011:
http://www.portofhouston.com/maritime/general_cargo/woodhouse.html

Yohe, R. (2010). Railroad Tunnel Project Completed, Prichard Intermodal Update. *WSAZ-TV3, NewsChannel*, September 13. Downloaded January 14, 2011:
<http://www.wsaz.com/home/headlines/102616649.html>

A TAXONOMY FOR CATEGORIZING SUPPLY CHAIN EVENTS: STRATEGIES FOR ADDRESSING SUPPLY CHAIN DISRUPTIONS

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Abstract

Supply chain disruptions have become a topic of interest for academic researchers in the last decade. This interest has been motivated by real world events which have caused major disruptions around the world in the global supply chains for many major companies. Given the actual events that have occurred, there is an obvious interest on the part of supply chain practitioners as well. This paper will review and update the list of literature on supply chain disruptions for the past ten years. By analyzing the literature, this paper will also propose a taxonomy to organize the literature on supply chain disruptions. Dimensions for the taxonomy will be derived from the subtopics or perspectives that are identified in the literature review.

Introduction

A number of publications have addressed the topic of supply chain strategies. Fisher (1997) published a widely cited article which looked at strategies along two major dimensions – functional products and innovative products. Fisher’s approach also looked at the predictability of demand and the length of the product lifecycle (Fisher, 1997). Christopher and Towill (2002) followed the lead of Fisher and added another factor for short or long lead-time for products. Christopher, Peck and Towill (2006) followed the same basic schema utilizing two key dimensions – replenishment lead-times and predictability/variability of demand. Their ultimate end result was the association of the key dimensions with four “Resulting Pipelines” or four supply chain strategies:

- Lean using Continuous Replenishment given Short Lead-times plus Predictable Demand;
- Agile emphasizing Quick Response associated with Short Lead-times plus Unpredictable Demand;
- Lean emphasizing Planning and Execution given Long Lead-times plus Predictable Demand; and
- Leagile which emphasizes both elimination of waste and quick response for both Production and Logistics (i.e., Postponement) associated with Long Lead-times plus Unpredictable Demand (Christopher, Peck and Towill, 2006).

This literature provides a glimpse at supply chain strategies but does not address supply chain disruptions explicitly. For this paper the supply chain strategy literature will serve to inform and guide our research and to assist with organizing the literature on supply chain disruptions. Potential supply chain disruption classifications and/or categorizations include (but are not limited to):

- Type or category of industrial/manufacturing operations, i.e. product, process, or project;
- Degree of technology integration in the supply chain, i.e. information technology defines the supply chain vs. information technology used for supply chain administration and support.
- Degree of supply chain disruption along a continuum.

Literature Review

The majority of the literature on supply chain disruptions has been published since the year 2000 which corresponds with a greater frequency of real world events which caused disruptions. In 2004, there was an increase in the number of articles published on the topic which can be partially attributed to the length of time to gather data and the review process for the articles.

Christopher and Peck (2004) deal with supply chain disruptions in their discussion about building resiliency into the supply chain. Sheffi (2005) and Sheffi and Rice (2005) also advocate resiliency and discuss individual examples of supply chain disruptions. Lee (2004) proposes agility as a potential remedy for supply chain disruptions and also provides details about several example cases.

As a preliminary review of the literature we take just a few articles to look at some examples of supply chain disruptions. Table 1 summarizes a sample of supply chain disruptions as seen in just these few articles:

Table 1. Sample of Supply Chain Disruption Events described in Literature

Authors (Year)	Date of Disruption	Scenario or Event
Christopher & Peck (2004)	September 2000	U.K. Fuel price protests
Christopher & Peck (2004)	February 2001	Outbreak of Foot & Mouth disease in U.K. cattle
Christopher & Peck (2004)	September 2001	U.S. Terrorist Attacks
Sheffi (2005)	March 2000	Philips lightning strike and fire in New Mexico plant
Lee (2004)	March 2000	Philips lightning strike and fire in New Mexico plant
Lee (2004)	1999	Taiwan earthquake delayed computer component shipments
Lee (2004)	2001	9/11 Terrorist Attacks in New York City and Washington, D.C.
Lee (2004)	2002	Dockworkers (Longshoremen) strike at LA/Long Beach Ports
Lee (2004)	2003	SARS outbreak in Asia

Supply chain risk management is a very broad topic which includes supply chain disruptions as a sub-category. The definition of ‘supply chain risk management’ (SCRM) has gained significant support in the literature as being: “the identification of potential sources of risk and implementation of appropriate strategies through a coordinated approach among supply chain members, to reduce supply chain vulnerability” (Jüttner, Peck and Christopher, 2003; Jüttner, 2005; Ponomarov and Holcomb, 2009). Risk of supply chain disruptions is described by Hendricks and Singhal (2005a) as “an indication of a firm’s inability to match demand and supply”. Christopher and Lee (2004) suggest that the increased “vulnerability of supply chains to disturbance or disruption” can be attributed to:

- “External events such as wars, strikes or terrorist attacks”, and
- “The impact of changes in business strategies” such as
 - ‘Lean’ business practices
 - Increased outsourcing decisions, and
 - Initiatives to reduce the supplier base (Christopher and Lee, 2004).

Tang and Tomlin (2008) also point to a variety of initiatives which have made supply chains more vulnerable to disruptions including:

- Increased product variety, frequent product introductions and a greater number of sales channels/markets
- Supply base reduction, use of online procurement options (i.e. e-markets and online auctions), and
- Outsourcing of several functions including manufacturing, information services and logistics.

Under stable conditions the initiatives can be very successful but given the turbulent environment the risk of disruption is magnified. These initiatives have created supply chains that are much longer and more complex which makes them more susceptible to disruptions (Tang and Tomlin, 2008). Industry studies have also found that companies recognize the vulnerability of their supply chains and are concerned about that vulnerability (AMR, 2006; Tang and Tomlin, 2008).

“Supply chain wide risk management ... is not yet recognised as a key element in business continuity planning” (Juttner et al. 2003). That statement portrays the state of SCRM as it was almost ten years ago. The literature described in this paper will indicate that some progress has been made but much more needs to be done to identify, assess and mitigate the risk of supply chain disruptions.

As we launched this research project, the first question was: which leading journals are publishing supply chain disruption articles? We conducted searches for “supply chain disruptions”, “supply chain risk”, and “supply chain risk management” utilizing Google Scholar to answer this question. Google Scholar attempts to rate the literature in the same ways that researchers do. Google scholar weighs “the full text of each document, where it was published, who it was written by, as well as how often and how recently it has been cited in other scholarly literature” (GoogleScholar website).

A summary of journals is provided in Table 2 for our primary search results for “supply chain disruptions”:

Table 2.**Journals Ranked by number of “Supply chain disruptions” returned by Google Scholar Search**

Journal	Count of Articles	Authors and Years
<i>IJLM</i>	6	Sheffi (2001), Croxton et al. (2001), Christopher and Peck (2004), Jüttner (2005), Khan and Burnes (2007), Rao and Goldsby (2009)
<i>IJPDLM</i>	6	Christopher and Lee (2004), Norrman and Janssen (2004), Guinipero et al. (2004), Peck (2005), Hale and Moberg (2005), Carter and Rogers (2008)
<i>IJPE</i>	6	Minner (2003), Lee and Whang (2005), Tang (2006a), Xiao et al (2007), Tang and Tomlin (2008), Oke and Gopolakrishnan (2009)
<i>JOM</i>	5 on topic (6 in results)	Choi and Hartley (1996), Hendricks and Singhal (2003), Hendricks and Singhal (2009), Braunscheidel and Suresh (2009), Neiger et al. (2009)
<i>IJL: Research and Applications</i>	3	Jüttner, et al (2003), Tang (2006b), Peck (2006)
<i>Management Science</i>	3	Hendricks and Singhal (2005b), Tomlin (2006), Yang et al (2009)
<i>POM</i>	3	Hendricks and Singhal (2005a), Kleindorfer and Saad (2005), Kouvelis et al. (2006),
<i>Decision Sciences</i>	2	Frohlich (2002), Craighead et al. (2007)
<i>IJPR</i>	2	Blackhurst et al. (2005), Wu et al. (2007)
<i>JBL</i>	2	Wagner and Bode (2008), Pettit et al (2010)
<i>Journal of Purchasing & Supply Management</i>	2	Wagner and Bode (2006), Schoenherr et al (2008)
<i>JSCM</i>	2	Sengupta et al (2006), Roth et al (2008)
<i>MIT Sloan Mgt Review</i>	2	Chopra and Sodhi (2004), Levy (1997)
<i>HBR</i>	2	Lee (2004), Slone et al (2007)

The top 100 articles returned by a search of Google Scholar were reviewed to obtain the article counts by journal. The results in Table 2 list 46 articles which appeared in the 14 journals with two or more articles published. Among the 100 articles the total number of different journals was 43. Other formats included in the search results were: 7 different books, 4 items as citations only, 2 working papers and 1 master’s thesis. Two journals were removed from the table because the articles did not address “supply chain disruptions” specifically.

Several important elements of supply chain risk management emerge from the literature. There are four main elements for organizing descriptive information about supply chain risk and supply chain disruptions:

- Probability and Impact
- Sources of Risk
- Approaches for Assessing Risks
- Strategies for Mitigating Risks

The remainder of the paper is organized to discuss each of the four elements that we see commonly in the literature. We will also tabulate a sample of the literature to indicate which articles include sections on each of the four common themes.

Probability and Impact

A simplified definition of risk can be stated as ‘Risk = Probability of a Loss times the Impact of that Loss’ (Manuj and Mentzer, 2008b). This basic definition leads to our first descriptor - “probability and impact” which is commonly presented in the form of a 2x2 matrix. Bhattacharya, Geraghty, and Young (2009) use the “low probability-high impact” (LPHI) designation throughout their paper and they focus primarily on events that fit the LPHI quadrant. The organization for their perspective can be depicted in a 2x2 matrix as follows:

	Low Impact	High Impact
High Probability of occurrence	HPLI	HPHI
Low Probability of occurrence	LPLI	LPHI

In general, the LPHI quadrant has received the largest share of attention by researchers. Examples of authors addressing this quadrant include:

- Bhattacharya, Geraghty & Young, 2009 (use the LPHI designation as primary topic)
- Christopher & Lee, 2004 (SARS; dock strike)
- Knemeyer, Zinn, & Eroglu, 2009
- Kleindorfer & Saad, 2005
- Sheffi & Rice, 2005 (terrorism, earthquakes, supplier bankruptcy, & blizzard)
- Tang, 2006b (hurricane, terrorism, supplier insolvency)

Sheffi and Rice (2005) utilize a similar perspective but use slightly different terminology. Sheffi & Rice (2005) use the following 2x2 matrix to label their view of supply chain vulnerability:

	Light Consequences	Severe Consequences
High Disruption Probability		High Vulnerability
Low Disruption Probability	Low Vulnerability	

Sheffi and Rice do attempt to provide examples in each of the four quadrants as seen in the following matrix:

	Light Consequences	Severe Consequences
High Disruption Probability	Sheffi & Rice (2005) suggest “single port closure and transportation link disruption” as examples in this quadrant.	Sheffi & Rice (2005) suggest “loss of key supplier, labor unrest, economic recession, and visible quality problems” as examples in this quadrant.
Low Disruption Probability	Sheffi & Rice (2005) suggest “computer virus, wind damage, flood and workplace violence” as examples in this quadrant.	Sheffi & Rice (2005) suggest “terrorism, earthquakes, supplier bankruptcy, & blizzard” as examples in this quadrant.

A different variation of this type of matrix was summarized by the Supply Chain Digest editorial staff in 2008. Their version was an attempt to look at a broader range of probabilities and impacts within the supply chain and then depict that accordingly. The following matrix is an adapted depiction of the table produced by Supply Chain Digest from that effort:

		Business Impact		
		Low	Medium	High
Likelihood Of Occurrence	High	Yellow	Red	Red
	Medium	Green	Yellow	Red
	Low	Green	Green	Yellow

Sources: Kinaxis white paper, 2009 based on Supply Chain Digest, 2008

The color-coding which is included in this format can be interpreted as a supply chain “current threat level” similar to the system we are familiar with for U.S. Homeland Security. The color green is associated with the lowest likelihoods and the lowest impacts and indicates the companies in these cells are on “Go” for supply chain activity. The color yellow is associated with combinations which warrant a moderate level of vulnerability and indicates “Caution”. The color red indicates a high level of vulnerability due to the combinations involved and indicates a potential “Emergency” situation. This matrix does provide a greater range for assessing vulnerabilities which do not fit into the more black and white 2x2 matrices shown above.

Going a step further in the level of detail, Engelhardt-Nowitzki and Zsifkovits (2006) use a 5x5 matrix with more breakdowns for both probability and impact. Their “Risk Level Classification” system follows:

		Probability				
		Frequent	Likely	Occasional	Seldom	Unlikely
Impact	Critical	Extremely High	Extremely High	High	High	Medium
	Serious	Extremely High	High	High	Medium	Medium
	Moderate	High	Medium	Medium	Medium	Low
	Minor	Medium	Medium	Medium	Low	Low
	Negligible	Medium	Low	Low	Low	Low

Source: Engelhardt-Nowitzki and Zsifkovits, 2006.

Note that we have added the color-coding to the 5x5 cells since the shading in the published version by the original authors was gray-scale.

This matrix provides many more combinations to consider. It should be noted that 8 out of 25 cells would have the company on high alert or in disaster recovery mode (i.e. cells for “High” and “Extremely High”). By comparison 7 out of 25 cells are classified at a “Low” Risk Level and 10 out of 25 are classified as “Medium” Risk Level.

In this section we have described four different matrices for classifying supply chain risk levels. Managers must decide which matrix is best-suited for assessing supply chain risk within their companies. Managers may also ask whether developing more detailed matrices to evaluate risk will afford sufficient benefit to warrant the effort that is required.

Sources of Risk

The second descriptor that is frequently seen in the literature is “Sources of Risk” (or “Dimensions of Risk” or “Scope of Risk”). This portion of the supply chain risk literature attempts to identify and describe the primary sources of risk in the supply network. Christopher (2011) provides a list of five “main sources of risk” and Sodhi, Son and Tang (2011) summarize the sources of risk taken from several articles. We list the sources of risk from a sampling of those authors in Table 3:

Table 3. Sample List of Articles including Sources of Risk (most recent publication date first)

Author(s)	Sources of Risk (or scope of risk)
Christopher (2011)	Five sources, (1) process, (2) control, (3) demand, (4) supply, and (5) environmental - [same as appeared in Christopher and Peck (2004)]
Trent and Roberts (2010)	Four disruption risk categories: (1) Operational risk, including equipment failure, abrupt discontinuity of supply, labor strikes, and quality issues; (2) Natural disasters such as earthquakes, hurricanes, and tornadoes; (3) Terrorism or political instability; (4) Commercial or market risk, including shifting demand and supply patterns and unexpected increases in prices
Wagner and Bode (2008)	(1) Demand side, (2) Supply side, (3) Regulatory, legal and bureaucratic, (4) Infrastructure, and (5) Catastrophic
Tang and Tomlin (2008)	Six categories for “rare-but-severe disruptions”, (1) supply, (2) process, (3) demand, (4) intellectual property, (5) behavioral risks and (6) political/social risks
Manuj and Mentzer (2008a)	Eight categories, (1) supply, (2) operational, (3) demand, (4) security, (5) macro, (6) policy, (7) competitive, and (8) resource risks
Khan and Burnes (2007)	Four families of 19 risk factors: (1) infrastructure; (2) business controls; (3) business values; and (4) relationships
Wagner and Bode (2006)	Three sources, (1) supply-side, (2) demand-side, and (3) catastrophic
Kersten et al. (2006)	(1) process, (2) control, (3) demand, (4) supply, and (5) environmental [Citing Christopher and Peck (2004)]
Jüttner (2005)	Supply, Demand and Environmental
Christopher and Peck (2004)	Five risks, (1) process, (2) control, (3) demand, (4) supply, and (5) environmental

Table adapted from Sodhi, Son and Tang (2011)

For the reader who wants to learn more about ten other articles with different variations on “sources of risk”, we recommend the article by Sodhi, Son and Tang (2011). From this list of articles we see some agreement but we also see a wide variety of hypothesized sources of risk. A separate analysis by this paper’s authors found 39 individual sources of risk discussed in a sample of 20 articles on the topic of SCRM (Monroe, et al., 2012). That would indicate a somewhat fragmented view of ‘sources of risk’ by researchers.

Approaches for Assessing Risk

Assessing risk is an intermediate phase prior to the implementation of a strategy. There are some common basic elements but again we see some variety from different sources. We offer a few examples here.

Jüttner et al. (2003) proposed the basic risk analysis steps as follows:

1. “Assessing the risk sources for the supply chain;
2. Defining the supply chain adverse consequences;
3. Identifying the risk drivers; and
4. Mitigating risks for the supply chain” (Jüttner et al., 2003; Rao and Goldsby, 2009).

Harland et al. (2003) propose the “supply network risk tool” which includes six different phases:

1. Map supply network
 - a. Structure of actors
 - b. Key measures
 - c. Ownership
2. Identify risk and its current location
 - a. Type
 - b. Potential loss
3. Assess risk
 - a. Likelihood of occurrence
 - b. Stage in lifecycle
 - c. Exposure
 - d. Likely triggers
 - e. Likely loss
4. Manage risk
 - a. Develop risk position
 - b. Develop scenarios
5. Form collaborative supply network risk strategy
6. Implement supply network risk strategy

Sheffi and Rice (2005) advocate assessing vulnerability by asking the following three questions:

1. “What can go wrong?”
2. “What is the likelihood of that happening?”
3. “What are the consequences if it does happen?”

Strategies for Mitigating Risks

A number of articles address strategies in some manner. We will highlight a few of those and then talk about a common perspective found in the broader group of articles.

Jüttner et al. (2003) conduct an extensive field study with a wide range of industries to identify supply chain vulnerabilities and to begin to understand the consequences of disruptions. One of their contributions was a list of four “risk mitigating strategies” as follows:

1. Avoidance
2. Control
3. Cooperation
4. Flexibility

The latter three strategies are further subdivided. For example, “Flexibility” is composed of three more detailed approaches: “Postponement,” “Multiple Sourcing” and “Localised Sourcing” (Jüttner et al., 2003).

Chopra and Sodhi (2004) offer eight basic “mitigation” strategies:

1. Add capacity

2. Add inventory
3. Have redundant suppliers
4. Increase responsiveness
5. Increase flexibility
6. Aggregate or pool demand
7. Increase capability
8. Have more customer accounts

Their list of strategies focuses primarily on the supply-side and the demand-side for sources of risk. The environment and other possible sources of risk are not considered.

Tang (2006b) discusses “robust strategies” and he describes nine (9) different strategies:

1. Postponement
2. Strategic stock
3. Flexible supply base
4. Make-and-Buy
5. Economic supply incentives
6. Flexible transportation
7. Revenue management
8. Dynamic assortment planning
9. Silent product rollover

We refer the reader to the Tang (2006b) article for a more detailed discussion on each of these strategies.

Manuj and Mentzer (2008a) identify six (6) different strategies from their qualitative study and with support from the earlier literature:

1. Postponement
2. Speculation
3. Hedging
4. Control/share/transfer
5. Security, and
6. Avoidance

From this sample of articles we can see that “Postponement” has been advocated multiple times and “Flexibility” also appears with regular frequency. From the broader group of articles we also see “flexibility,” “agility,” and “resilience” as mitigating strategies or recovery strategies (Christopher and Peck, 2004; Lee, 2004; Sheffi, 2005; Sheffi and Rice, 2005).

There appears to be more commonality in the ‘mitigating strategies’ that appear in the literature when compared with ‘sources of risk’ and the variety seen there. However, the longer the list of strategies the more divergent the strategies become. ‘Supply-side’ risk and ‘demand-side’ risks also seem to receive the most attention in the strategies that are discussed. That leaves a broad segment of ‘sources of risk’ that has not been adequately addressed.

One area that does deserve more discussion is the distinction between ‘mitigating strategies’ and ‘recovery strategies’. The difference between pre-disruption and post-disruption needs to be considered as research goes forward.

Classification of Selected Articles

We have discussed a few example articles which address one or more of the four common themes that we identified in the literature. Table 4 shows in summary form which articles include material related to specific common themes:

Table 4. Articles including the Common Themes (in chronological order)

Authors (Year)	Four Common Themes			
	Probability and Impact	Sources of Risk*	Approaches to Assess Risk	Strategies to Mitigate Risk
Jüttner et al. (2003)	X	X	X	X
Harland, et al. (2003)	X	X	X	X
Cavinato (2004)	X	X		
Christopher and Lee (2004)		X	X	X
Christopher and Peck (2004)	X	X		X
Chopra and Sodhi (2004)	X	X	X	X
Spekman and Davis (2004)	X	X		X
Zsidisin et al. (2004)	X	X	X	X
Sheffi and Rice (2005)	X	X	X	X
Kleindorfer and Saad (2005)		X		
Tomlin (2006)				X
Wagner and Bode (2008)	X	X	X	X
Braunscheidel and Suresh (2009)		X		X
Knemeyer, Zinn and Eroglu (2009)	X	X	X	X
Tang, O. and Musa (2011)	X	X	X	X

Note: * ‘sources of risk’ may also be ‘dimensions of risk’, ‘scope of risk’ or a similar term

From Table 4 we can see that the ‘Four Common Themes’ do appear with regularity in the articles that we have reviewed. A larger sample would reveal more articles in the vein of Kleindorfer and Saad (2005) and Tomlin (2006) where only one of the common themes is found. That is an expected result and we do not see that diminishing the support for our thesis about the ‘Four Common Themes.’ We anticipate that a larger sample would yield similar results as shown here without very much degradation.

Summary

We began by using an objective approach to identify leading journals that publish topics related to supply chain risk management (SCRM) and supply chain disruptions (SCD). We tabulated the frequency of articles published and ranked the leading journals by frequency of the topic being published. We then used those articles to look for common themes and identified ‘four common themes’ on the topics of ‘probability and impact,’ ‘sources of risk,’ ‘approaches to assess risk’ and ‘strategies to mitigate risk’. These are the most commonly seen descriptors in the SCRM/SCD literature. We selected representative articles under each one of the ‘four common themes’ and highlighted the major points under each

common theme. Finally we tabulated a sample of articles to provide confirming evidence about the frequency of the common themes in the literature.

This paper has contributed to the knowledge base about supply chain risk management and supply chain disruptions by identifying the 'four common themes'. We have utilized approximately 70 articles from the broader literature to conduct our analysis and we have also used a subset of those articles to highlight the content under each common theme.

For future research, one issue that warrants investigation is the difference in strategies based on 'mitigation' versus 'recovery'. There appears to be a lack of discussion about strategies that deal with other 'sources of risk' beyond 'supply-side' and 'demand-side' issues which needs to be addressed in more detail. There is also a need for research that quantifies the overall consequences of supply chain disruptions. The literature organization and other results presented in this paper can provide a foundation for future research on a variety of topics related to SCRM and SCD.

References

AMR, (2006), "AMR Research Report on Managing Supply Chain Risk," AMR Research, Inc.

Bhattacharya, A., J. Geraghty, and P. Young. (2009), "On the Analytical Framework of Resilient Supply-Chain Network Assessing Excursion Events," 2009 Third Asia International Conference on Modelling & Simulation. IEEE Computer Society.

Blackhurst, J., C.W. Craighead, D. Elkins and R.B. Handfield. (2005), "An empirically derived agenda of critical research issues for managing supply-chain disruptions," *International Journal of Production Research*, Vol. 43, No.19, pp. 4067-4081.

Braunscheidel, M.J. and N.C. Suresh. (2009), "The organizational antecedents of a firm's supply chain agility for risk mitigation and response," *Journal of Operations Management*, Vol. 27, No. 2, pp. 119-140.

Carter, C.R. and D.S. Rogers. (2008), "A framework of sustainable supply chain management: moving toward new theory," *International Journal of Physical Distribution & Logistics Management*, Vol. 38, No. 5, pp. 360 – 387.

Cavinato, Joseph L. (2004), "Supply chain logistics risks: From the back room to the board room," *International Journal of Physical Distribution & Logistics Management*, Vol. 34, No. 5, pp. 383-387.

Choi, T.Y. and J.L. Hartley. (1996), "An exploration of supplier selection practices across the supply chain," *Journal of Operations Management*, Vol. 14, No. 4, pp. 333-343.

Chopra, S. and Sodhi, MM.S. (2004), "Managing risk to avoid supply-chain breakdown," *MIT Sloan Management Review*, Fall, pp. 53-61.

Christopher, Martin and Denis R. Towill. 2002. Developing market specific supply chain strategies. *International Journal of Logistics Management*, Vol. 13, No. 1: 1-14.

Christopher, M. and H. Lee. (2004), "Mitigating supply chain risk through improved confidence," *International Journal of Physical Distribution & Logistics Management*, Vol. 34, No. 5, pp. 388-396.

- Christopher, M. and H. Peck. (2004), "Building the resilient supply chain," *International Journal of Logistics Management*, Vol. 15, No. 2, pp. 1-13.
- Christopher, Martin, Helen Peck and Denis Towill. 2006. A taxonomy for selecting global supply chain strategies. *International Journal of Logistics Management*, Vol. 17, No. 2: 277-287.
- Christopher, M. (2011), *Logistics and Supply Chain Management*, 4th Ed., Financial Times Series/Pearson Education Limited: Edinburgh Gate, UK.
- Craighead, C.W., J. Blackhurst, M.J. Rungtusanatham and R.B. Handfield. (2007), "The severity of supply chain disruptions: Design characteristics and mitigation capabilities," *Decision Sciences*, Vol. 38, No. 1, pp. 131-156.
- Croxton, K.L., S. Garcia-Dastugue, D.M. Lambert, D.S. Rogers. (2001), "The supply chain management processes," *International Journal of Logistics Management*, Vol. 12, No. 2, pp. 13-36.
- Engelhardt-Nowitzki, C. and H.E. Zsifkovits. 2006. Complexity-Induced supply chain risks – Interdependencies between supply chain risk and complexity management. In *Managing Risks in Supply Chains*, W. Kersten and T. Blecker [Editors], Erich Schmidt Verlag GmbH & Co.: Berlin: 37-56.
- Fisher, Marshall. 1997. What is the right supply chain for your product? *Harvard Business Review*, March-April, pp. 105-116. Reprint 97205.
- Frohlich, M.T. (2002), "e-Integration in the supply chain: Barriers and performance," *Decision Sciences*, Vol. 33, No. 4, pp. 537-556.
- Giunipero, L.C. and R.A. Eltantawy. (2004), "Securing the upstream supply chain: A risk management approach," *International Journal of Physical Distribution & Logistics Management*, Vol. 34, No. 9, pp. 698-713.
- Google Scholar website: <http://scholar.google.com/intl/en/scholar/about.html>
- Hale, T. and C.R. Moberg. (2005), "Improving supply chain disaster preparedness: A decision process for secure site location," *International Journal of Physical Distribution & Logistics Management*, Vol. 35, No. 3/4, pp. 195-207.
- Harland, C., R. Brenchley, and H. Walker. (2003), "Risk in supply networks," *Journal of Purchasing & Supply Management*, Vol. 9, pp. 51-62.
- Hendricks, K.B. and V.R. Singhal. (2003), "The effect of supply chain glitches on shareholder wealth," *Journal of Operations Management*, Vol. 21, No. 5, pp. 501-522.
- Hendricks, K.B. and V.R. Singhal. (2005a), "An empirical analysis of the effect of supply chain disruptions on long-run stock price performance and equity risk of the firm," *Production and Operations Management*, Vol. 14, No. 1, pp. 35-52.
- Hendricks, K.B. and V.R. Singhal. (2005b), "Association between supply chain glitches and operating performance," *Management Science*, Vol. 51, No. 5, pp. 695-711.
- Hendricks, K.B. and V.R. Singhal. (2009), "The effect of operational slack, diversification, and vertical relatedness on the stock market reaction to supply chain disruptions," *Journal of Operations Management*, Vol. 27, No. 3, pp. 233-246.
- Jüttner, Uta, H. Peck and M. Christopher. (2003), "Supply chain risk management: Outlining an agenda for future research," *International Journal of Logistics: Research & Applications*, Vol. 6, No. 4, pp. 197-210.
- Jüttner, Uta. (2005), "Supply Chain Risk Management - Understanding the Business Requirements From a Practitioner Perspective," *International Journal of Logistics Management*, Vol. 16, No. 1, pp. 120-141.

- Kersten, W., M. Böger, P. Hohrath and H Späth. (2006), "Supply chain risk management: Development of a theoretical and empirical framework," In *Managing Risks in Supply Chains*, W. Kersten and T. Blecker [Editors], Erich Schmidt Verlag GmbH & Co.: Berlin: 3-17.
- Khan, O. and B. Burnes. (2007), "Risk and supply chain management: Creating a research agenda," *International Journal of Logistics Management*, Vol. 16, No. 1, pp. 120-141.
- Khan, O., M. Christopher and B. Burnes. (2008), "The impact of product design on supply chain risk: A case study," *International Journal of Physical Distribution & Logistics Management*, Vol. 38, No. 5, pp. 412-432.
- Kinaxis White Paper. 2009. Essential characteristics of a supply chain risk management strategy. Downloaded from www.kinaxis.com on December 20, 2011
- Kleindorfer, P.R. and G.H. Saad. (2005), "Managing disruption risks in supply chains," *Production and Operations Management*, Vol. 14, No. 1, pp. 53-68.
- Knemeyer, A.M., W. Zinn, and C. Eroglu. (2009), "Proactive planning for catastrophic events in supply chains," *Journal of Operations Management*, Vol. 27, pp. 141-153.
- Kouvelis, P., C. Chambers and H. Wang. (2006), "Supply chain management research and *Production and Operations Management*: Review, Trends, and Opportunities," *Production and Operations Management*, Vol. 15, No. 3, pp. 449-469.
- Lee, Hau L. (2004), "The Triple-A Supply Chain," *Harvard Business Review*, October, 2004.
- Lee, Hau L. and S. Whang. (2005), "Higher supply chain security with lower cost: Lessons from Total Quality Management," *International Journal of Production Economics*, Vol. 96: Issue 3, pp. 289-300.
- Levy, D.L. (1997), "Lean production in an international supply chain," *MIT Sloan Management Review*, Winter, pp. 94-102.
- Manuj, I. and J.T. Mentzer. (2008a), "Global supply chain risk management strategies," *International Journal of Physical Distribution & Logistics Management*, Vol. 38, No. 3, pp. 192-223.
- Manuj, I. and J.T. Mentzer. (2008b), "Global supply chain risk management," *Journal of Business Logistics*, Vol. 29, No. 1, pp. 133-155.
- Minner, S. (2003), "Multiple-supplier inventory models in supply chain management: A review," *International Journal of Production Economics*, 81-82, pp. 265-279.
- Monroe, R.W., J.M. Teets, and P.R. Martin. (2012), "Supply chain risk management: An analysis of 'sources of risk' in the literature," *working paper for 2012: MTM-001-12*.
- Neiger, D., K. Rotaru, and L. Churilov. (2009), "Supply chain risk identification with value-focused process engineering," *Journal of Operations Management*, Vol. 27, pp. 154-168.
- Norrman, A. and U. Jansson. (2004), "Ericsson's proactive supply chain risk management approach after a serious sub-supplier accident," *International Journal of Physical Distribution & Logistics Management*, Vol. 34, No. 5, pp. 434-456.
- Oke, A. and M. Gopalakrishnan. (2009), "Managing disruptions in supply chains: A case study of a retail supply chain," *International Journal of Production Economics*, Vol. 118, Issue 1, pp. 168-174.
- Peck, Helen. (2005), "Drivers of supply chain vulnerability: An integrated framework," *International Journal of Physical Distribution & Logistics Management*, Vol. 35, No.3/4, pp. 210-232.
- Peck, Helen. (2006), "Reconciling supply chain vulnerability, risk and supply chain management," *International Journal of Logistics: Research & Applications*, Vol. 9, No. 2, pp. 127-142.
- Pettit, T.J., J. Fiksel, and K.L. Croxton. (2010), "Ensuring supply chain resilience: Development of a conceptual framework," *Journal of Business Logistics*, Vol. 31, No. 1, pp. 1-21.

- Ponomarov, S.Y. and M.C. Holcomb. (2009), "Understanding the concept of supply chain resilience," *International Journal of Logistics Management*, 20:1: 124-143.
- Rao, S. and T.J. Goldsby. (2009), "Supply chain risks: A review and typology," *International Journal of Logistics Management*, Vol. 20, No. 1, pp. 97-123.
- Roth, A.V., A.A. Tsay, M.E. Pullman, and J.V. Gray. (2008), "Unraveling the food supply chain: Strategic insights from China and the 2007 recalls," *Journal of Supply Chain Management*, Vol. 44, No. 1, pp. 22-39.
- Schoenherr, T., V.M. Rao Tummala, and T.P. Harrison. (2008), "Assessing supply chain risks with the analytic hierarchy process: Providing decision support for the offshoring decision by a US manufacturing company," *Journal of Purchasing & Supply Management*, Vol. 14, pp. 100-111.
- Sengupta, K., D.R. Heiser, and L.S. Cook. (2006), "Manufacturing and service supply chain performance: A comparative analysis," *Journal of Supply Chain Management*, Vol. 42, No. 4, pp. 4-15.
- Sheffi, Y. (2001), "Supply chain management under the threat of international terrorism," *International Journal of Logistics Management*, Vol. 12, No. 2, pp. 1-11.
- Sheffi, Y. 2005. *The Resilient Enterprise*, MIT Press: Cambridge, MA, USA.
- Sheffi, Y. and J. Rice. 2005. A Supply Chain View of the Resilient Enterprise. *MIT Sloan Management Review*, Fall 2005, 47:1: 41-48.
- Slone, R.E., J.T. Mentzer, and J.P. Dittmann. (2007), "Are you the weakest link in your company's supply chain?," *Harvard Business Review*, September, pp. 1-11.
- Sodhi, M. S., Son, B.-G. and Tang, C. S. (2011), "Researchers' Perspectives on Supply Chain Risk Management," *Production and Operations Management*. doi: 10.1111/j.1937-5956.2011.01251.x
- Spekman, R.E. and E.W. Davis. (2004), "Risky business: Expanding the discussion on risk and the extended enterprise," *International Journal of Physical Distribution & Logistics Management*, Vol. 34, No. 5, pp. 414-433.
- Supply Chain Digest. 2008. Supply Chain News: Understanding supply chain risk matrices. Supply Chain Digest Editorial Staff, July 13, 2008. {as referenced in Kinaxis white paper}
- Tang, C.S. (2006a), "Perspectives in supply chain risk management," *International Journal of Production Economics*, Vol. 103, Issue 2, pp. 451-488.
- Tang, C.S. (2006b), "Robust strategies for mitigating supply chain disruptions," *International Journal of Logistics: Research and Applications*, Vol. 9, No. 1, pp. 33-45.
- Tang, C.S. and B. Tomlin. (2008), "The power of flexibility for mitigating supply chain risks," *International Journal of Production Economics*, Vol. 116, Issue 1, pp. 12-27.
- Tang, O. and S.N. Musa. (2011), "Identifying risk issues and research advancements in supply chain risk management," *International Journal of Production Economics*, Vol. 133, No. 1, pp. 25-34.
- Tomlin, Brian. (2006), "On the value of mitigation and contingency strategies for managing supply chain disruption risks," *Management Science*, Vol. 52, no. 5: 639-657.
- Trent, R. and L. Roberts. 2010. *Managing Global Supply and Risk*. J. Ross Publishing, Inc.: Fort Lauderdale, FL.
- Wagner, S.M. and C. Bode. (2006), "An empirical investigation into supply chain vulnerability," *Journal of Purchasing and Supply Management*, Vol 12, pp. 301-312.
- Wagner, S.M. and C. Bode. (2008), "An empirical examination of supply chain performance along several dimensions of risk," *Journal of Business Logistics*, Vol. 29, No. 1, pp. 307-325.
- Wu, T., J. Blackhurst, and P. O'Grady. (2007), "Methodology for supply chain disruption analysis," *International Journal of Production Research*, Vol. 45, No. 7, pp. 1665-1682.
- Xiao, T., X. Qi and G. Yu. (2007), "Coordination of supply chain after demand disruptions when retailers compete," *International Journal of Production Economics*, Vol. 109, Issues 1-2, pp. 162-179.

Yang, Z. (Ben), G. Aydin, V. Babich, and D.R. Beil. (2009), "Supply disruptions, asymmetric information and a backup production option," *Management Science*, Vol. 55, No. 2, pp. 192-209.

Zsidisin, G.A., L.M. Ellram, J.R. Carter and J.L. Cavinato. (2004), "An analysis of supply risk assessment techniques," *International Journal of Physical Distribution & Logistics Management*, Vol. 34, No. 5, pp. 397-413.

Appendix

Table 5. Journal Abbreviations Used

Journal Abbreviation	Full Journal Title
<i>Dec. Sci.</i>	<i>Decision Sciences</i>
<i>HBR</i>	<i>Harvard Business Review</i>
<i>IJPDLM</i>	<i>International Journal of Physical Distribution & Logistics Management</i>
<i>IJPE</i>	<i>International Journal of Production Economics</i>
<i>IJPR</i>	<i>International Journal of Production Research</i>
<i>IJLM</i>	<i>International Journal of Logistics Management</i>
<i>IJL:R&A</i>	<i>International Journal of Logistics: Research & Applications</i>
<i>JBL</i>	<i>Journal of Business Logistics</i>
<i>JOM</i>	<i>Journal of Operations Management</i>
<i>JP&SM</i>	<i>Journal of Purchasing & Supply Management</i>
<i>JSCM</i>	<i>Journal of Supply Chain Management</i>
<i>MIT SMR</i>	<i>MIT Sloan Management Review</i>
<i>MGT. SCI.</i>	<i>Management Science</i>
<i>POM</i>	<i>Production and Operations Management</i>

DESIGNING AN UNDERGRADUATE CORE COURSE IN SUSTAINABLE OPERATIONS

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ABSTRACT

A sustainable company pursues a business strategy that is based on creating sustainable value for shareholders, while also protecting the environment and improving life for other stakeholders. Operations Management is closely related to all three aspects of sustainability: profit, planet, and people. This paper presents a design for an undergraduate core course in Sustainable Operations. Key topic areas for the course include environmental management systems, product design, process design, facilities, Supply Chain Management, and Lean Systems. The discipline of Sustainable Operations is evolving rapidly, and the course will change along with the discipline.

INTRODUCTION

According to the Principles for Responsible Management Education (PRME), business graduates should be “generators of sustainable value for business and society at large” and “work for an inclusive and sustainable global economy” [32, Principle 1]. Principle 1 embraces the three aspects of sustainability – profit, planet, and people – that are widely recognized in business. This principle integrates the traditional profit goals of business with corporate social responsibility, including service to society and environmental sustainability. The Association to Advance Collegiate Schools of Business (AACSB) supports the PRME principles and holds an annual Sustainability Conference to educate business faculty about integrating sustainability into Business curricula. Operations Management is related to all three aspects of sustainability and is the Business discipline most closely associated with environmental sustainability. This paper describes the development of an undergraduate core course in Operations Management.

AN OVERVIEW OF SUSTAINABILITY

Savitz and Weber [26] define a sustainable company as one that “creates profit for its shareholders while protecting the environment and the lives of those with whom it interacts”. This definition implies that a company is accountable to its stakeholders, including shareholders, customers, employees, suppliers and their employees, communities, governments, and anyone who is affected by the company’s environmental practices. Historically, the concept of sustainability had its roots in the realization that countries needed to find ways to develop their economies while protecting the earth for future generations [26]. In 1987, the World Commission on Environment and Development stated that sustainable development would “meet the needs of the present without compromising the ability of future generations to meet their own needs.” [34, p. 24]. The ability to meet present needs without adversely impacting future

generations is often called environmental sustainability. In 1995, the World Summit on Sustainable Development declared that “economic development, social development, and environmental protection are interdependent and mutually reinforcing components of sustainable development, which is the framework for our efforts to achieve a higher quality of life for all people.” [35, p, 5]

Using these ideas as a foundation, John Elkington [7] proposed a “Triple Bottom Line” approach to capturing a company’s shareholder value, its environmental record, and its contributions to society. This three-pronged approach to sustainability is often described as “profit, planet, and people”. Partly as a result of the phrase “Triple Bottom Line”, there has been a lively debate in the literature about whether companies can or should quantify their environmental and social records in terms of dollars [13]; consideration of that issue is beyond the scope of this paper. However, there is a growing consensus that companies can and should set environmental and social goals, determine parameters for their activities in those areas, and measure their results [26]. Pressure from governments, non-governmental organizations, customers, and the public has increased the importance of environmental issues in operations management [2, 17]. In addition, the costs of materials and energy are likely to grow as demand for these resources increases, particularly in China and India [17]. Higher resource costs may make it cost-effective for companies to invest in more efficient product designs and process technologies.

The profit aspect of sustainability involves managing the short-term and long-term viability of a company. Performance metrics include traditional measures of business performance, such as sales, market share, earnings, and return on investment. However, the focus on sustainability has also led to new business models. According to Patrick J. Cescau, retired Unilever CEO, companies that focus on sustainability see environmental and social challenges as opportunities to reduce waste, develop new products and technologies, and serve new markets [3]. A recent article in *Harvard Business Review* suggested that sustainability is now “the key driver of innovation”[20]. Laszlo described how this innovative approach to strategy and sustainability has been implemented at Dupont, Wal-Mart, Lafarge, and a Cargill subsidiary, NatureWorks LLC [18]. In the field of Operations Management, Porter and van der Linde used examples from the chemical, electronics, and appliance industries to show that the innovations required to comply with environmental regulations often result in more efficient processes, higher product quality, safer products, and higher profits [22]. This is most likely to happen if new regulations require breakthrough improvements in environmental performance and companies have adequate time to respond to the regulations [22].

The United Nations (UN) Global Compact has helped to define the social and environmental aspects of sustainability [30]. The ten principles of the Global Compact are divided into four sections: human rights, environment, labor, and anti-corruption. The environmental section states that companies should take a precautionary approach to environmental issues, which means that companies should protect human health and the environment even if the evidence of risk is not conclusive. The logic behind this principle is that the impact of practices that damage the environment may not be visible for decades; the effect of greenhouse gases on the ozone layer is frequently cited as an example. The labor section of the Global Compact includes provisions related to non-discrimination, freedom of association, collective bargaining, and avoidance of forced labor and child labor. The Global Compact has been signed by more than 8,700

corporations and stakeholder organizations [31], and its principles have influenced some corporate Codes of Conduct. Companies that sign the Global Compact obligate their organizations to abide by its principles and to ensure that their suppliers do the same. Ensuring supplier compliance can be a daunting challenge, especially for those multinational companies that have hundreds of suppliers in developing countries.

The PRME principles [32] were developed by an international task force of representatives from leading universities. Universities that subscribe to the PRME principles agree to incorporate the principles of global social responsibility, as described in the UN Global Compact and other international initiatives, into their curricula and research. These universities also agree to provide “effective learning experiences for responsible leadership” [32, Principle 3] to their students, to work with business partners in developing effective approaches for meeting social and environmental responsibilities, and to engage in dialogue with a variety of stakeholders on issues related to social responsibility and environmental sustainability.

Savitz and Weber [26] noted that a sustainable company must balance its obligations to different stakeholders. This is an important point for courses in Sustainable Operations, where the interests of different stakeholders may conflict. For instance, using automated process technology often benefits shareholders by reducing costs; if the cost reduction leads to lower prices, customers also benefit. However, the automated technology also means that fewer employees will be needed. Even if the company is growing rapidly and adding new jobs, the skills of the surplus employees may not match the new jobs that are being created.

KEY TOPICS FOR SUSTAINABLE OPERATIONS MANAGEMENT COURSES

Many topics in Operations Management are related to efficiency, reducing costs, and reducing wastes. Some, such as product design and quality management, are also related to increasing sales and revenue. Both lower costs and higher revenue increase profitability. Consequently, the profitability aspect of sustainability is easily addressed in an Operations Management course.

The authors identified six major environmental sustainability topics that we believe should be covered in an undergraduate Sustainable Operations course. These topics were (1) ISO 14000 certification for environmental management systems, (2) product design for the environment, (3) sustainable process design and technology, (4) Leadership in Energy and Environmental Design (LEED) certification for facilities, (5) Sustainable Supply Chain Management (SSCM), and (6) Lean Systems in services and manufacturing. Most Operations Management faculty are probably familiar with Lean Systems. The other topics are summarized below.

ISO 14000 Standards

The ISO 14000 series of standards for environmental management systems was developed under the auspices of the International Organization for Standardization (ISO), which is often called the International Standards Organization. The foundation standard, ISO 14001 requires development of an environmental management system that (1) identifies the environmental management impacts of a company’s activities, (2) sets objectives and targets for improvement, (3) helps the company achieve those objectives, (4) enables the company to show that those objectives have

actually been achieved, and (5) leads to continuous improvement of environmental performance [14]. In addition to ISO 14001, there are 15 related standards for environmental management systems; eight more standards are currently under development [15].

Product Design for the Environment

Product design for the environment is based on a life cycle assessment that attempts to reduce the environmental impact of a product throughout its life, including the use of materials in production and packaging, the use of energy in production, the amount of energy consumed by the product (if applicable), transportation of raw materials and the product, and the recycling or reuse of materials when the product is no longer useful; life cycle assessment of products is required for ISO 14001 certification [12, 24]. An important aspect of life cycle assessment is the calculation of the product's carbon footprint, which estimates the amount of carbon dioxide and other greenhouse gases that will be associated with the product during its life cycle [24].

Common objectives of “green” product design include using recycled materials in the product, making the product recyclable, using less material, using lighter materials, using nontoxic materials, designing products for ease of repair, and producing a product that requires less energy to operate [12, 24]. Value engineering, a common technique for reducing product costs and improving product function, has been extended to include methods for reducing the environmental impact of products [12].

The concept of extended producer responsibility states that a company should be held responsible for a product throughout its useful life, and even after its useful life [24]. In the United States, Canada, and the European Union, there are an increasing number of state and national laws that require manufacturers to make provisions for recycling or safe disposal of their products. Depending on the jurisdiction, products covered by these laws include batteries, computers, household appliances, and/or cars [12, 24]. Manufacturers have responded to these laws by developing techniques to design products that can be disassembled more easily, which facilitates recycling or reuse of materials [25].

Sustainable Process Technologies

Sustainable process technologies use materials, water, and energy efficiently [10, 24]. Where renewable energy is available or can be generated onsite, it can be an important component of a sustainable process strategy. Ideally, toxic substances should not be used in operations processes, and toxic byproducts should not be produced [27]; the emphasis should be on preventing pollution, instead of controlling it. Waste and toxic materials should be recycled, reused, composted onsite, or incinerated to generate electricity [8, 27]. This “zero landfill” approach is propelled by rising landfill costs and by the fact that the decomposition of landfilled materials generates methane and other greenhouse gases [6]. Although the zero landfill movement is still in its early stages, the following companies have at least one zero landfill manufacturing facility: Crown Equipment [6], General Motors [11], Honda [4], Subaru [8], and Tremco Commercial Sealants [29].

Another aspect of sustainability involves complying with environmental regulations related to processes. For instance, companies that operate in the United States must comply with the Toxic Substances Control Act (TSCA); the European Union has a similar law called Registration, Evaluation, and Authorization of Chemicals (REACH) [10]. Heizer and Render give examples of environmental regulations that affect construction contractors, health care facilities, and businesses that emit greenhouse gases [12].

LEED Buildings

The United States Green Building Council is a nonprofit organization that promotes the design, construction, operation, and maintenance of buildings that are energy efficient, cost effective, and environmentally sustainable [33]. Leadership in Energy and Environmental Design (LEED) is an internationally recognized certification for buildings that meet USGBC objectives for energy efficiency and sustainability. Since the first LEED standards were introduced in 2000, nearly nine billion square feet of floor space have been rated under these standards [33].

LEED certifications are offered for the design and construction of new buildings, and for the maintenance and operations of existing buildings. It is expected that revised certification standards will take effect in 2012. Under the new standards, the application for either type of certification will cover ten areas: an integrative, data-driven decision making process for developing the applicant's LEED program; location and transportation, sustainable site; water efficiency; energy and atmosphere; materials and resources; indoor environmental quality; performance; sustainability innovations not covered elsewhere in the standards; and responsiveness to regional environmental issues [33]. Applications for certification are rated on a 110-point scale, with four possible certification levels: Certified (40-49 points), Silver (50-59 points), Gold (60-79 points), and Platinum (80-110 points). In addition to the general standards, there are industry-specific standards for retailing, hotels, warehouses and distribution centers, schools, health care facilities, data centers, and residences [33].

Sustainable Supply Chain Management

Sustainable supply chain management (SSCM) seeks to extend the principles of sustainable operations throughout a supply chain; SSCM is still in a fairly early stage of development, and best practices are still emerging. Pagell and Wu [21] examined ten companies that are considered to be leaders in this field. On the basis of data from these companies, Pagell and Wu [21] developed several propositions about SSCM: (1) SSCM requires top management leadership and commitment, driven by core values. (2) SSCM should be embedded in a business model that addresses profitability, environmental sustainability, and social responsibility. (3) SSCM requires an organizational capability for innovation. (4) SSCM should be part of every employee's job and a factor in daily business discussions. (5) Companies that pursue SSCM are likely to make substantial investments in human capital. (6) Companies that practice SSCM are likely to include environmental and social performance in their supplier selection process, and to require suppliers to identify all organizations in their supply chains. (7) Companies that pursue SSCM are likely to develop long-term relationships with suppliers. These propositions need to be tested with larger samples of companies.

There is a need for a common metric to measure the sustainability of supply chains. This issue is being addressed by The Sustainability Consortium, an international, non-profit organization with more than 80 members, including manufacturers, retailers, other service businesses, trade associations, non-governmental organizations, and universities [28]. The Consortium is developing a Sustainability Measures Reporting System (SMRS), which will allow companies to apply Life Cycle Assessment across their entire supply chains [28]. The SMRS will allow companies to use standard metrics to evaluate all their suppliers on both environmental and social aspects of sustainability [28]. If the SMRS is widely adopted, suppliers will also benefit, because their sustainability performance will be measured consistently by various customers.

Corporate social responsibility involves voluntary actions by companies for the benefit of society, beyond legal requirements and direct benefits to the firm [19]. Corporations undertake a variety of social responsibility initiatives. Some of these initiatives are reactive; for instance, corporate codes of conduct for suppliers are often a response to abusive labor practices in developing countries. Other initiatives, such as Starbucks' use of Fair Trade coffee, are a proactive attempt to improve the lives of stakeholders, protect the environment, or assist communities. To help organizations assess their social responsibility efforts, the International Organization for Standardization has developed the ISO 26000 guidelines on Social Responsibility [1]. These guidelines cover six areas: organizational governance, human rights, labor practices, the environment, fair operating practices, and community involvement and development [1]. Compared with the UN Global Compact, ISO 26000 has a broader scope and provides more detailed guidance to companies.

Coverage of Sustainability Topics in Operations Management Textbooks

Coverage of sustainability topics in seven recent operations management textbooks was reviewed; the results are shown in Table 1. Lean systems were discussed in all seven textbooks, and ISO 14000 was covered in six books. Lean Systems have been a standard topic in Operations Management for some time, and ISO 14000 may be an emerging standard topic. Four textbooks discussed both design for the environment and sustainable process design and technology. Only two textbooks discussed SSCM; the only mention of sustainable facilities was an extended example of a LEED building in Russell and Taylor [24].

Among these textbooks, the leaders in sustainability coverage are Russell and Taylor [24] and Heizer and Render [12]. Collier and Evans [5] and Stevenson [27] include a moderate amount of sustainability coverage. The other three books cover Lean Systems, and two of them also cover ISO 14000 [9], [16], [23].

TABLE 1
 COVERAGE OF SUSTAINABILITY TOPICS
 IN OPERATIONS MANAGEMENT TEXTBOOKS

	Collier & Evans 2 nd ed. 2007 [5]	Finch 2 nd ed. 2006 [9]	Heizer & Render 8 th ed. 2011 [12]	Jacobs, Chase, & Aquilano 12 th ed. 2009 [16]	Reid & Sanders 4 th ed. 2010 [23]	Russell & Taylor 7 th ed. [24]	Stevenson, 10 th ed. 2009 [27]
ISO 14000	X		X	X	X	X	X
Design for the environment	X		X			X	X
Sustainable process design and technology	X		X			X	X
Sustainable facilities						X	
Sustainable Supply Chain Management			X			X	
Lean systems	X	X	X	X	X	X	X

COURSE DESIGN

Both authors teach Operations Management at a southeastern university that offers BSBA and MBA programs. Administrators and some faculty in the College of Business Administration were aware of the growing importance of sustainability in Business education. In 2010, the College’s Business Advisory Board recommended adding sustainability to the BSBA and MBA curricula; this was the only recommendation made by the Business Advisory Board that year. In response to this suggestion, the authors designed an undergraduate core course in Sustainable Operations, which was taught for the first time in the fall semester of 2011. In addition to educating all undergraduate business majors about sustainability, this course links the Business core to a new interdisciplinary concentration in Sustainable Business. On the basis of Table 1 and other considerations, Heizer and Render [12] was adopted as the textbook for the course.

As stated earlier, the profitability aspect of sustainability is easily incorporated into Operations Management courses. Consequently, the initial design for the Sustainable Operations course did not require major topic changes in order to explain the profit aspect of sustainability. Table 2 shows how the planet and people aspects of sustainability are being covered in the course. Because of the nature of Operations Management, the environmental aspects of sustainability receive more extensive coverage than the “people” or social aspects. The sequence of course topics follows the textbook.

TABLE 2
SUSTAINABILITY TOPICS FOR AN
UNDERGRADUATE CORE COURSE IN SUSTAINABLE OPERATIONS

Topic	Planet	People
Introduction to Sustainable Operations	Sustainability and the Triple Bottom Line. Overview of PRME and the UN Global Compact	Overview of PRME and the UN Global Compact
Global Operations Strategy	Effect of environmental damage on company reputation.	Effect of suppliers' labor practices on company reputation
Project Management	Sustainability example.	
Sustainable Product Design	Design for the environment and design for disassembly. Life cycle assessment of products. Carbon footprint. Extended producer responsibility.	Safe products. Improved products for customers.
Managing Quality	ISO 14000. Reducing waste.	Employee empowerment. Better product quality.
Sustainable Process Design and Technology	Reducing use of energy and resources. Minimize toxic waste and pollution. Zero landfill. Examples of environmental regulations	Better air and water quality. Impact of process technology on employees
Location Strategies	Use of space and resources. Impact of location decisions on transportation and the carbon footprint.	Impact of location decisions on people and communities.
Layout Strategies	Standards for LEED buildings.	Health benefits of LEED buildings
Sustainable Supply Chain Management	Environmental responsibility and the environmental impact of transportation as factors in vendor selection.	Labor section of the UN Global Compact. Respect for diverse cultures.
Inventory Management	Resource use. Preparation for Lean Systems.	
Lean Systems	Methods for reducing space requirements and eliminating waste.	More challenging jobs. Lean services

The course begins with an overview of stakeholders, sustainability, the Principles for Responsible Management Education, and the United Nations Global Compact. These topics are covered in conjunction with the first chapter of the textbook, which introduces students to Operations Management and productivity. With the exception of linear programming, all chapters in the course have an environmental impact or connection; most also have an impact on people. Six key operations management topics for the course were identified earlier in this paper; five of those topics currently receive the greatest amount of coverage. The sixth key topic, SSCM, will be developed further as more experience is gained with the course. The Global Operations Strategy topic may also be developed further and could become a key topic. As stated

earlier, a sustainable company must balance its obligations to different stakeholders (Savitz & Weber, 2006). The authors expect to incorporate this insight into the course.

SUMMARY

A sustainable company pursues a business strategy that is based on creating sustainable value for shareholders, while also protecting the environment and improving life for other stakeholders. Operations Management is closely related to all three aspects of sustainability: profit, planet, and people. This paper has presented a design for an undergraduate core course in Sustainable Operations. The discipline of Sustainable Operations is evolving rapidly, and the course will change along with the discipline.

WORKS CITED

- [1] Benoit, C., & Vickery-Niederman, G. Social Sustainability Assessment Literature Review. The Sustainability Consortium, Arizona State University, and the University of Arkansas, 2010.
- [2] Carter, C. R., & Easton, P. L. Sustainable Supply Chain Management: Evolution and Future Directions. *International Journal of Physical Distribution and Logistics Management*, 2011, 41(1), 46-62.
- [3] Cescau, P. J. Foreword to Laszlo, C., *Sustainable Value: How the World's Leading Companies are Doing Well by Doing Good*. Stanford, CA: Stanford University Press, 2008.
- [4] Chappell, L. It's Not Easy Boasting Zero Landfill. *Automotive News*, 2011, 85(6473), 4.
- [5] Collier, D. A., & Evans, J. R. *Operations Management: Goods, Services, and Value Chains*, 2nd ed. Mason, OH: Thomson South-Western, 2007.
- [6] Duffy, Brian. A Manufacturer's Journey. *Sustainable Facility*, 2010, 35(4), 22-27.
- [7] Elkington, J. *Cannibals with Forks: The Triple Bottom Line of 21st Century Business*. Philadelphia: New Society, 1998.
- [8] Farzad, Roben. The Scrappiest Car Manufacturer in America. *Bloomberg Businessweek*, 2011, (4232), 68-74.
- [9] Finch, B. J. *Operations Now: Profitability, Processes, Performance*, 2nd ed. Boston: McGraw-Hill/Irwin, 2006.
- [10] Gelderman, Treitz, & Rentz. Toward Sustainable Production Networks. *International Journal of Production Research*, 2007, 45(18-19), 4207-4224.

- [11] GM Plant Eliminates Waste, Goes Landfill-Free. *Business and the Environment*, 2007, 18(12), 11.
- [12] Heizer, J., & Render, R. *Principles of Operations Management*, 8th ed. Upper Saddle River, N.J.: Pearson Education/Prentice Hall, 2011.
- [13] Henriques, A., & Richardson, J. *The Triple Bottom Line: Does It All Add Up?* London: Earthscan, 2004.
- [14] International Organization for Standardization. ISO 14001 Video. Geneva, Switzerland: International Organization for Standardization, 2004. Web.
- [15] International Organization for Standardization. 13020.10: Environmental Management Standards. Geneva, Switzerland: International Organization for Standardization, 2011. Web.
- [16] Jacobs, F. R., Chase, R. B., & Aquilano, N. J. *Operations and Supply Management*, 12th ed. Boston: McGraw-Hill/Irwin, 2009.
- [17] Kleindorfer, P. R., Singhal, K., & Van Wassenhove, L. Sustainable Operations Management. *Production and Operations Management*, 2005, 14(4), 482-492.
- [18] Laszlo, C. *Sustainable Value: How the World's Leading Companies are Doing Well by Doing Good*. Stanford, CA: Stanford University Press, 2008.
- [19] Luthans, F., & Doh, J. P. *International Management: Culture, Strategy, and Behavior*, 8th ed. New York: McGraw-Hill/Irwin, 2012.
- [20] Nidumolu, R., Prahalad, C. K., & Rengaswami, M. R. Why Sustainability is Now the Key Driver of Innovation. *Harvard Business Review*, 2009, 87(9), 56-64.
- [21] Pagell, M., & Wu, Z. Building a More Complete Theory of Sustainable Supply Chain Management Using Case Studies of Ten Exemplars. *Journal of Purchasing*, 2009, 45(2), 37-56.
- [22] Porter, M. E., & van der Linde, C. Green and Competitive: Ending the Stalemate. *Harvard Business Review*, 1995, 73(5), 120-134.
- [23] Reid, R. D., & Sanders, S. *Operations Management*, 4th ed. Hoboken, N. J.: Wiley, 2010.
- [24] Russell, R. S., & Taylor, B. W., III. *Operations Management: Creating Value Along the Supply Chain*, 7th ed. Hoboken, N. J.: Wiley, 2011.
- [25] Saitou, Kasuhiro. Built to Be Reclaimed. *Mechanical Engineering*, 2011, 52-54.

- [26] Savitz, A. W., with Weber, K. *The Triple Bottom Line: How Today's Best-Run Companies are Achieving Economic, Social, and Environmental Success – and How You Can Too*. San Francisco: Wiley/Jossey-Bass, 2006.
- [27] Stevenson, W. J. *Operations Management*, 10th ed. Boston: McGraw-Hill/Irwin, 2009.
- [28] The Sustainability Consortium. Web site, 2011.
- [29] Tremco's Toronto Facility Reaches Zero Landfill. *Adhesives & Sealants Industry*, 2011, (18, 6), 12.
- [30] United Nations. United Nations Global Compact, 2000. New York: United Nations.
- [31] United Nations Global Compact Organization. Overview of the UN Global Compact, 2011. Web.
- [32] United Nations. Principles for Responsible Management Education, 2007. Web.
- [33] United States Green Building Council Web Site, 2011.
- [34] World Commission on Environment and Development. *Our Common Future*, 1987. Web.
- [35] World Summit on Sustainable Development. Copenhagen Declaration on Sustainable Development, 1995. Web.

TOP JOURNALS FOR PUBLISHING OPERATIONS MANAGEMENT RESEARCH: A META ANALYSIS

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INTRODUCTION

As academics, we feel that determining the ranks of academic journals is important for a variety of reasons. For example, they are used by academic institutions to make promotion and tenure decisions, they are used to determine the research reputation and international rankings of institutions and departments, they are used in faculty and student recruitment, they are used to establish incentives to researchers such as increased salary and/or reduced teaching loads, and they are used to establish “experts in the field,” which can lead to prestigious appointments for an individual. In addition, journal rankings provide a researcher with information useful in deciding where to submit his/her research for publication. The higher a journal is ranked, the more it would be expected to entice researchers to submit their “best stuff” for publication. However, determining definitive journal rankings is difficult at best and likely not possible. As pointed out by Holsapple and Lee-Post [1], journal ranking methods such as perception surveys, citation studies, and bibliometrics have some justification but also possess some inherent flaws. In addition, academic perception of journal quality has been shown to be affected by researcher methodology (empirical versus modeler), geographic location (Europe, US, Asia, etc.), and whether or not an individual has published in a particular journal.

PREVIOUS RESEARCH

In a recent *Omega* article entitled “Knowledge dissemination in operations management: Published perceptions versus academic reality,” Meredith, Steward, and Lewis [2] contribute to the important issue of ranking journals that publish Operations Management (OM) articles. The authors present a ranking of journals based on results from a survey of AACSB accredited institutions. In their survey, the authors requested the official “in-house” list of OM journals these institutions use to evaluate academic research in any business discipline. Using the survey results, a weighted average metric was calculated and used to provide a rank for journals dedicated to publishing strictly Operations Management research. Journals that were not deemed to be “OM-dedicated” (termed reference and interdisciplinary journals) were intentionally omitted from their published rankings.

We feel that such an approach falls short in identifying a set of journals that are considered important outlets for OM research and further, fails to identify a complete set of journals that are used by institutions to make tenure and promotion decisions for OM faculty. Indeed, the efforts by the authors [2] to differentiate OM from other related disciplines such as Operations Research and Management Science are to be commended. However, it is likely, and we feel hoped by many, that OM will never completely sever its connections with OR and MS and that methodologies oriented toward modelers will continue to be positively viewed. Perhaps, OM can be viewed as an adolescent when compared to other disciplines such as Finance and Accounting, which have a fairly well defined set of discipline-dedicated research journals. We believe that OM continues to mature and, at some point, will have its own set of widely accepted and well defined journals dedicated to the discipline. However, we feel that OM has not yet reached a status where a widely recognized set of discipline-specific journals exists. We have found that many of the top rated journals used to assess quality OM research (as evidenced in fifteen previously published studies [1-15]) are journals that are not OM-dedicated journals.

PROPOSED RESEARCH

In our study, we will first present a set of 117 journals that is a nearly complete list of journals that have published OM research. This list will include all of the journals that were rated in at least one of the fifteen previously published studies or were included on at least one of the AACSB school lists (provided in [2]). Next we will present a second set of journals that we feel is representative of the current thinking as to the top quality journals for OM research. The second set will include all journals that were rated in at least three of the fifteen published studies and were included on at least three of the AACSB school lists. (These two journal sets will be presented during the conference presentation and will be available from the authors upon request.) We will also compare our second set of journals with the OM-dedicated set of journals in [2] using a variety of metrics appropriate for comparing the quality/visibility of journals. These metrics include the number of in-house AACBS school lists in which the journal appeared, the number of previous OM journal-ranking studies that included the journal, as well as a variety of citation metrics [16-18]. We hypothesize that the mean values for our journal set will be higher (better) than the mean values for the OM-dedicated journal set presented in [2]. Using two-sample *t*-tests, we will compare the associated means of the two sets of OM journals to see which set is used on more AACSB school lists, which set is studied and rated more often in the OM literature, and which set is cited more often.

REFERENCES

- [1] Holsapple, Clyde W. and Anita Lee-Post, Behavior-based analysis of knowledge dissemination channels in operations management, *Omega*, Volume 38, Issues 3-4, June-August 2010, Pages 167-178.
- [2] Meredith, Jack R., Michelle D. Steward, Bruce R. Lewis, Knowledge dissemination in operations management: Published perceptions versus academic reality, *Omega*, Volume 39, Issue 4, August 2011, Pages 435-446.

- [3] Barman, Samir, Richard J. Tersine and M. Ronald Buckley, An empirical assessment of the perceived relevance and quality of POM-related journals by academicians, *Journal of Operations Management*, Volume 10, Issue 2, April 1991, Pages 194-212.
- [4] Barman, Samir, Mark D. Hanna and R. Lawrence LaForge, Perceived relevance and quality of POM journals: A decade later, *Journal of Operations Management*, Volume 19, Issue 3, May 2001, Pages 367-385.
- [5] Donohue, Joan M. and Jeremy B. Fox, A multi-method evaluation of journals in the decision and management sciences by US academics, *Omega*, Volume 28, Issue 1, February 2000, Pages 17-36.
- [6] Goh, Chon-Huat, Clyde W. Holsapple, Linda Ellis Johnson and John R. Tanner, An empirical assessment of influences on POM research, *Omega*, Volume 24, Issue 3, June 1996, Pages 337-345.
- [7] Goh, Chon-Huat, Clyde W. Holsapple, Linda Ellis Johnson and John R. Tanner, Evaluating and classifying POM journals, *Journal of Operations Management*, Volume 15, Issue 2, May 1997, Pages 123-138.
- [8] Gorman, Michael F. and John J. Kanet, Evaluating Operations Management-Related Journals via the Author Affiliation Index, *Manufacturing and Service Operations Management*, Volume 7, Issue 1, Winter 2005, Pages 3-19.
- [9] Olson, Josephine E., Top-25-business-school professors rate journals in operations management and related fields, *Interfaces*, Volume 35, Issue 4, 2005, July-August 2005, Pages 323-338.
- [10] Petersen, Charles G., Gerald R. Aase, Daniel R. Heiser, Journal ranking analyses of operations management research, *International Journal of Operations & Production Management*, Volume 31, Issue 4, 2011, Pages 405-422
- [11] Soteriou, Andreas C., George C. Hadjinicola and Kalia Patsia, Assessing production and operations management related journals: the European perspective, *Journal of Operations Management*, Volume 17, Issue 2, January 1999, Pages 225-238.
- [12] Theoharakis, Vasilis, Chris Voss, George C. Hadjinicola and Andreas C. Soteriou, Insights into factors affecting Production and Operations Management (POM) journal evaluation, *Journal of Operations Management*, Volume 25, Issue 4, June 2007, Pages 932-955.
- [13] Vokurka, Robert J., The relative importance of journals used in operations management research: A citation analysis, *Journal of Operations Management*, Volume 14, Issue 4, November 1996, Pages 345-355.
- [14] Xu, Zhou, Brenda Cheang, Andrew Lim and Qi Wen, Evaluating OR/MS Journals via PageRank, *Interfaces*, Volume 41, Number 4, July/August 2011, Pages 375-388.
- [15] Zsidisin, George A., Michael E. Smith, Regina C. McNally and Thomas J. Kull, Evaluation criteria development and assessment of purchasing and supply management journals, *Journal of Operations Management*, Volume 25, Issue 1, January 2007, Pages 165-183.
- [16] *Journal Citation Reports: Science and Social Science Editions*, ISI Web of Knowledge, Thomson Reuters, 2004-2009.
- [17] Publish or Perish (version 3.1), Tarma Software Research Pty Ltd., Downloaded on April 18, 2011, from <http://www.harzing.com>.
- [18] SCImago, SJR - SCImago Journal & Country Rank 2009, Retrieved April 18, 2011, from <http://www.scimagojr.com>.

MONITORING CUSTOMER PERCEPTIONS OF SERVICE PROBLEMS

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ABSTRACT

This paper proposed a methodology for tracking the effect of service errors on customer satisfaction. The methodology used a standard control chart technique in conjunction with customer survey data from an actual service setting. Results revealed that there was a downward shift in customer perceptions over time. The methodology also helped the manager identify specific problems that contributed to the downward trend.

INTRODUCTION

Customer surveys remain a popular tool in service quality management. Surveys can help a service manager determine how satisfied customers are with overall service, how customers perceived various dimensions of service and the types of problems customers experienced during service delivery. Typically, survey data are aggregated to produce a snapshot of service quality at a particular time. While this approach can furnish useful information, it does not provide a means for “understanding customer experiences over time” [7, p.11]. In particular, the snapshot approach does not allow the manager to monitor the cumulative effect of service errors on customer satisfaction over time nor does it help the manager identify those individual service errors which significantly eroded customer satisfaction. Without this kind of monitoring, a service manager will be unable to quickly spot a downward trend in customer satisfaction or immediately to identify specific service problems contributing to the trend.

This paper will propose a methodology for tracking the effect of service errors on customer satisfaction. The methodology will use a standard control chart technique in conjunction with customer survey data. The paper is organized as follows. The next section will briefly discuss control chart use in services and identify key requirements for monitoring customer perceptions of service errors. Section three will present the proposed methodology. Section four will illustrate the application of the proposed methodology in an actual service setting. The final section of the paper will discuss the implications of the study and offer suggestions for future research.

CONTROL CHARTS IN SERVICES

Control charts offer the same advantages in service operations as in manufacturing contexts. These advantages were delineated by Craig [3] and include: 1) the chart’s superiority in providing a running check on process performance compared to alternative methods such as ANOVA, 2) a visual representation of the concept of an “out of control” process, 3) immediate

identification of out of control points and 4) the potential for gaining additional knowledge about the process [5].

Despite these advantages, services have generally lagged behind the manufacturing sector in routinely using control charts to improve quality [12] [15]. There are a few exceptions such as the health care sector [18], but, for the most part, services have failed to exploit the full potential of control chart use – particularly for tracking the cumulative effect of service problems on customer perceptions.

Why has this happened? There are several reasons apart from poor implementation. First, many service managers have dismissed the control chart as an inappropriate tool for studying customer perceptions because it has traditionally been applied to operating data [6] [14]. Early service applications of control charts, which typically utilized cost, efficiency, revenue and productivity data, reflect this bias [1] [8] [9] [13] [19]. Second, the selection of inappropriate performance measures in any application context – including services- greatly diminishes the effectiveness of the control chart [4] [17]. Third, implementation of a control chart method that is not suited to the service process being studied can actually produce misleading results and cause managers to make process changes that are counterproductive [12] [14].

The preceding paragraph summarized mistakes to avoid in control chart implementation. These mistakes give rise to three rules for effectively using control charts in services: 1) be open to using perceptual data when constructing control charts; 2) select meaningful variables to measure and 3) match the control chart methodology to the service question being studied. In the following section these simple rules serve as the basis for a control chart methodology for monitoring the effect of service errors on customer perceptions.

METHODOLOGY

Three major components comprise the proposed methodology for tracking the cumulative effect of service errors on customer perception. These components correspond to: 1) selection of the types of data to be collected, 2) choice of variables to monitor and 3) selection of a control chart techniques that meets the needs of the study.

Types of Data Collected

The collection of customer information on actual service failures obviously involves some type of customer survey. Such a survey must not just assess customer evaluations of service quality on the components of service delivery, but also capture information on specific occurrences of service failures. Thus, a customer survey must not only contain scaled items but also opened ended questions that allow customers to explain the service failure they experienced. As Shewhart and Chase [11, p.245] noted, “The customer is the ultimate judge of all service errors.”

Choice of the Variable(s) Monitored

If a manager wishes to monitor the overall effect of service errors on customer perceptions, then he or she must chart a metric that reflects the overall effect. One way of constructing such a metric is to simply average the scores of the scaled items on the customer survey.

Selection of a Control Chart Methodology

Tracking the cumulative impact of service errors over time requires a process control methodology in which process memory is imbedded. One such process control methodology is the Exponentially Weighted Moving Average Control (EWMA) Chart [10]. It should be noted that “the EMWA can be viewed as a weighted average of all past and current observations” thus making it suitable for tracking cumulative effects [10, p.412]. Additionally, the Exponentially Weighted Moving Average Control chart also has superior shift detection properties [10, p. 412] and is robust in handling data that depart from normality [2] [10]. It is very applicable to Phase II monitoring and is “almost a perfectly non-parametric (distribution-free) procedure” [10, p. 413].

A method for constructing an Exponentially Weighted Moving Average Control chart was discussed by Montgomery [10]. The method is summarized below.

Generating the Values for the Individual EWMA. The mean generated by an initial in-control process should be used as the first EWMA (Z_0) [10, p. 406]. For each succeeding value of EWMA (Z_i), the EWMA from the previous period is used in the computations along with the observed value (X_i). The general formula is shown below.

$$Z_i = \lambda X_i + (1 - \lambda)Z_{i-1} \quad (1)$$

Computation of the Upper and Lower Control Limits. The adjusted formula for the variance shown below [10].

$$\sigma_{Zi}^2 = \sigma^2 \left(\frac{\lambda}{2 - \lambda} \right) [1 - (1 - \lambda)^{2i}] \quad (2)$$

This adjusted standard deviation is incorporated into formulas for the UCL and the LCL. The formulas shown below are taken from Montgomery [10, pp. 409-410].

$$UCL = \mu_0 + L\sigma \sqrt{\frac{\lambda}{(2 - \lambda)} [1 - (1 - \lambda)^{2i}]} \quad (3)$$

$$Centerline = \mu_0 \quad (4)$$

$$LCL = \mu_0 - L\sigma \sqrt{\frac{\lambda}{(2 - \lambda)} [1 - (1 - \lambda)^{2i}]} \quad (5)$$

One important feature of the EWMA chart is that the control limits computed for the chart are not static (i.e. they change for each time period) although they do eventually arrive at a steady state [10].

CASE APPLICATION

A full service restaurant operating in the Southeast United States served as the application context for the proposed methodology. This restaurant was a privately owned business and enjoyed a good reputation as a local grill and pub. The restaurant manager was interested in

assessing customer perception of various components of service delivery including: food quality, performance of service personnel, seating comfort, atmospherics and service waits. In addition, the manager was very interested in analyzing service failures that restaurant customers experienced. Consequently, a survey was developed that contained two types of questions: 1) 5 point Likert scaled questions to assess perceived quality of the service delivery components and 2) an open ended question that allowed customers to describe specific service problems they encountered at the restaurant. Surveys were administered over a four day period. All completed surveys were classified into two categories: those which reported service problems and those that did not. The surveys which reported service problems provided the data used in this study.

Most of the reported failures tended to minor in nature. Thus, it might appear that the overall effect of these service problems on perceived service quality would be muted. However, the EWMA chart methodology described previously was used to examine if this were actually the case.

The development of this control chart consisted of several stages. 1) A preliminary data set of 20 surveys was analyzed. For each of these customer surveys, the average of all scores on the scaled items was computed. 2) These values were then plotted on a control chart for individuals, which is useful for detecting large shifts in a process mean. The resulting chart which was in-control is shown in Figure 1. The mean of this chart is 4.6 and the standard deviation estimated from the average two-period moving range was .35775. (See the Appendix for details on the construction of this chart). 3) A second data set of 25 additional surveys was analyzed. Once again, the average of all the scaled items was calculated for each survey. 4) These data were then used in the calculations of the Z_i values that are plotted on the EWMA chart ($\lambda = .20$ and $L = 3$). The mean generated by the initial in-control process (4.6) was used as the first EWMA (Z_0) [10 p. 406]. The computations for the first time period are shown below.

$$Z_1 = \lambda X_1 + (1 - \lambda)Z_0 = .20(5) + (1 - .20)(4.6) = 4.68 \quad (6)$$

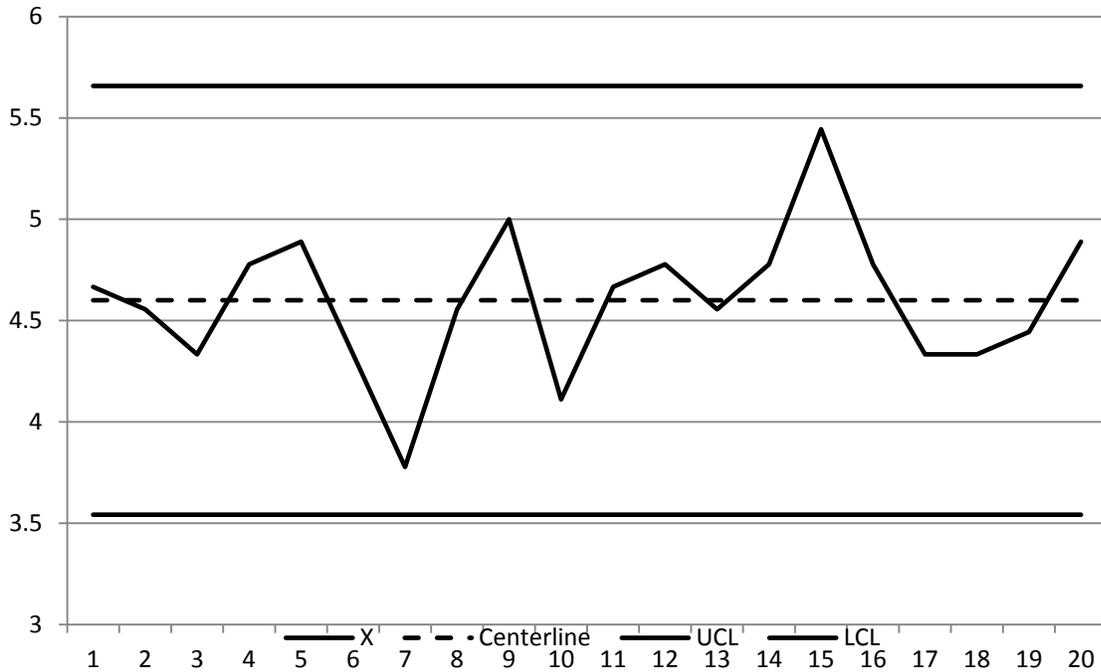
For the remaining periods, a similar method was used. For example, in period two the EWMA from period one (Z_1) was used in the equation.

$$Z_2 = \lambda X_2 + (1 - \lambda)Z_1 = .20(4.33333) + (1 - .20)(4.68) = 4.610667 \quad (7)$$

5) The control limits of the EWMA chart were then calculated using the formulas discussed in the previous section. For instance in period one the following calculations were used:

$$\begin{aligned} UCL_1 &= \mu_0 + L\sigma \sqrt{\frac{\lambda}{(2 - \lambda)} [1 - (1 - \lambda)^{2i}]} \\ &= 4.6 + (3)(.35775) \sqrt{\frac{.20}{2 - .20} [1 - (1 - .20)^{2(1)}]} \\ &= 4.813465 \end{aligned} \quad (8)$$

FIGURE 1
X-Chart for Individuals



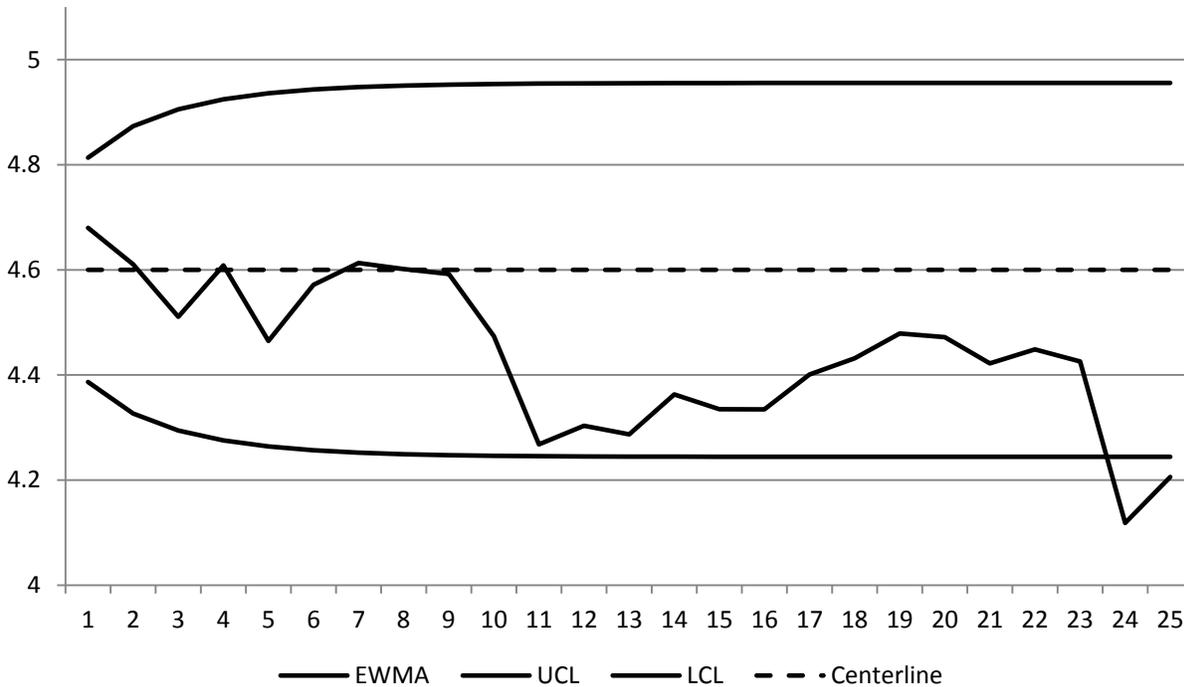
$$\begin{aligned}
 LCL_1 &= \mu_0 - L\sigma \sqrt{\frac{\lambda}{(2-\lambda)} [1 - (1-\lambda)^{2i}]} \\
 &= 4.6 - (3)(.35775) \sqrt{\frac{.20}{2-.20} [1 - (1-.20)^{2(1)}]} \\
 &= 4.386535
 \end{aligned}
 \tag{9}$$

6) The Z_i values found in step four were then plotted on the EWMA chart which is shown in Figure 2. As this chart shows, there is a steady decline in customer perception of the overall service. In fact, observations 24 and 25 lie below the lower control limit. Clearly, this chart is out of control and the cumulative effect of the service errors has resulted in lower perceived quality over time.

DISCUSSION

The EWMA chart discussed in the previous section demonstrated that there was a downward shift in customer perceptions over time, particularly after observation nine. Analysis of the customer comments corresponding to observations 10 -25 reveals that there were several specific service problems that may have contributed to this shift. A number of customers complained

FIGURE 2
Exponentially Weighted Moving Average Chart
 $\lambda = .20$



about some aspect of the service setting such as uncomfortable seating, noise problems and lighting problems. Problems with an unpleasant bartender were also mentioned as were long waits to be seated, and a few problems with the food quality. Observation 24 corresponded to a complaint about uncomfortable seating in the restaurant’s patio dining area while observation 25 dealt with complaint that the entrée was cold rather than hot when served. Given that customer perception of quality has declined, the restaurant manager can use these comments to make the necessary adjustments to service delivery.

The case application illustrates that the proposed methodology exhibits several strengths as a tool for analyzing and improving service delivery. First, since the EWMA chart is especially sensitive to small shifts in the process mean, it can be used to detect subtle changes in performance that the manager might miss by relying on personal observation and judgment alone. Second, since the Z_i values are the weighted averages of past observations and the current observation, the EWMA chart imbeds the memory of past errors in the charting process, unlike the Shewhart chart for individuals. Third, unlike the Shewhart chart for individuals, the EWMA chart is robust to departures from normality. Fourth, the EWMA approach can also be used to help managers forecast future performance. As [10, p. 416] notes, “the EWMA statistic Z_i can be viewed as a **forecast** of the process at time $i+1$ and we often plot the EWMA statistic one period ahead,” thereby allowing “the analyst to visually see how much difference there is between the current observation and the estimate.”

While the proposed methodology possesses several strengths, it also may pose a few problems. A primary problem is that some managers may be intimidated by the statistical aspects of the EWMA chart and may feel that they lack the training needed to implement and interpret the chart. Obviously, a manager can overcome this difficulty by acquiring a solid background in statistical process control methods; the present emphasis on six sigma and lean service operations may convince some otherwise reluctant managers to undertake this training. Another potential difficulty of the proposed methodology is that it requires a commitment to collecting and analyzing customer service data. However, the methodology uses only data associated with customer reported service failures so that the volume of data utilized should be far less than that normally associated with customer satisfaction surveys.

The analytical approach proposed in this study represents only an initial step in the investigation of the cumulative effect of service failures on customer perceptions. Future research could examine alternative types of control charts that are suitable for tracking cumulative effects. In addition, the effectiveness of constructing and tracking several components of perceived quality could also be investigated. While this study used only one charting technique, it may help the service manager view overall perceived quality as a variable that must be managed and help the manager reduce the number of service errors that have a significant cumulative effect on customer satisfaction.

APPENDIX X-Chart for Individuals

The methodology suggested by Western Electric's *Statistical Quality Control Handbook* [16, p.21] was used to construct the initial chart. The 20 observation initial data set consisted of the average scores for the nine survey questions. The centerline for the X-Chart for Individuals was the mean of the scores. The mean was computed at 4.6 (standard deviation of .35775).

$$\bar{X} = \frac{\text{Total Average Score}}{n} = \frac{95}{20} = 4.6 \quad (10)$$

The moving range limits utilize successive ranges taken from the values of X. The moving range limits were created as follows: The moving range for two successive observations are taken beginning with the first and second observation and then moving on to the second and third observation and so forth through the data. They are then averaged to get the average of the moving range [16 p. 21-22]. The average of the two-period moving range was .397661.

$$M\bar{R} = \frac{\text{total of moving ranges}}{\text{number of moving ranges}} = \frac{7.555556}{19} = .397661 \quad (11)$$

In creating the UCL and the LCL, the constant 2.66 was used [16, p. 22]. The UCL and LCL were computed as 5.657778 and 3.542222.

$$UCL = \bar{X} + 2.66(M\bar{R}) = 4.6 + 2.66(.397661) = 5.657778 \quad (12)$$

$$LCL = \bar{X} - 2.66(M\bar{R}) = 4.6 - 2.66(.397661) = 3.542222 \quad (13)$$

The completed control chart is shown in Figure 1. All the initial data points plotted in-control. The data from the initial process ($\mu = 4.6$ and $\sigma = .35775$) were used in the Phase II analysis.

REFERENCES

- [1] Apte, U.M. & Reynolds, C.C. Quality Management at Kentucky Fried Chicken, *Interfaces*, 1995, 25(3), 6-21.
- [2] Borrór, C.M., Montgomery, D.C. & Runger, G.C. Robustness of the EWMA control chart to non-normality, *Journal of Quality Technology*, 1999, 31(3), 309-316.
- [3] Craig, C.C. Control charts versus the analysis of variance in process control by variables, *Industrial Quality Control*, January, 1947, 14-16.
- [4] Deming, W. E. *Out of the Crisis*. Cambridge, MA: Massachusetts Institute of Technology, Cambridge, MA: Massachusetts Institute of Technology, Center for Advances Engineering Study, 1986.
- [5] Duncan, A.J. *Quality Control and Industrial Statistics, 4th Edition*. Homewood, IL: Richard D. Irwin, Inc., 1974.
- [6] Harvey, J. Service quality: A tutorial, *Journal of Operations Management*, 1998, 16(5), 583-597.
- [7] Lusch, R.F., Vargo, S.L. & O'Brien, M. Competing through service insights from service-dominant logic, *Journal of Retailing*, 2007, 83(1), 5-18.
- [8] Mandel, B.J. The regression control chart, *Journal of Quality Technology*, 1969, 1(1), 1-9.
- [9] Mehring, J.S. Achieving multiple timeliness goals for auto loans: A case for process control, *Interfaces*, 1995, 25(2), 81-91.
- [10] Montgomery, D.C. *Introduction to Statistical Quality Control, 5th Edition*. Hoboken NJ: John Wiley and Sons, 2005.
- [11] Stewart, D.M. & Chase, R.B. The impact of human error on delivering service quality, *Production and Operations Management*, 1999, 8(3), 240-263.
- [12] Sulek, J., Statistical quality control in services, *International Journal of Services Technology and Management*, 2004, 5(5/6), 522-531.
- [13] Sulek, J.M., Lind, M. & Marucheck, A. Assessing the outcomes of quality improvement interventions, *International Journal of Quality and Reliability Management*, 1995, 12(9), 170-182.
- [14] Sulek, J.M., Marucheck, A. & Lind, M.R. Measuring performance in multi-stage service operations: an application of cause selecting control charts, *Journal of Operations Management*, 2006, 24(5), 711-727.
- [15] Utley, J.S. & May, J.G. Monitoring service quality with residuals control charts, *Managing Service Quality*, 2009, 19(2), 162-178.
- [16] Western Electric Co, Inc. *Statistical Quality Control Handbook*, Charlotte NC: Delmar Printing Company, 1956.
- [17] Wood, M. Statistical methods for monitoring service processes, *International Journal of Service Industry Management*, 1994, 5(6), 53-68.
- [18] Woodall, W.H. The use of control charts in health-care and public-health surveillance, *Journal of Quality Technology*, 2006, 38(2), 89-134.

[19] Wyckoff, D.D. New tools for achieving service quality, *Cornell Hotel and Restaurant Administration Quarterly*, 1984, 25(3), 78-91.

Using Monopoly to Teach Intermediate Accounting Students

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Abstract

Prior studies have shown that non-traditional teaching techniques are an effective method of enhancing student performance and perceptions of learning. This paper reports the observations and outcomes of the use of Monopoly™ as a simulation in an intermediate level accounting course. The objective of this research is to determine if the use of a simulation in an intermediate level accounting course is an effective and engaging method for students to review introductory financial accounting concepts in preparation for intermediate level topics.

Introduction

Intermediate accounting can be a challenging course to teach due to the one or two semester break most students have between their introductory and intermediate accounting classes. In addition, intermediate level students may have different levels of course preparation as they generally have been taught by several different professors. The use of a common experience, such as playing Monopoly™, to review materials covered in principles of accounting may be an effective way to provide students with a common background to enhance learning and to provide a foundation for intermediate level topics.

There is a large body of research investigating the connection between students' experiences and learning. Dewey (1938), Lewin (1951), and Piaget (1970) all believed that learning takes place when a learner is stimulated by his environment. Based on their work, Kolb (1984), the creator of the Experiential Learning Theory and the Learning Style Inventory, defined learning as "the process whereby knowledge is created through the transformation of experience" (p.41). He stated that "Knowledge results from the combination of grasping and transforming experience" (p.41). Halpern and Hakel (2003) also support the use of experiential learning concluding "Lectures work well for learning assessed with recognition tests, but work badly for understanding" (p.40). Both educational and psychological research suggest that the use of an experiential approach to teaching is more effective than presenting material through a lecture format.

The use of non-traditional methods such as cases and simulations to help students learn has been supported by many studies including Leong (2005), Saunders and Christopher (2003), and Lewis and Mierzwa (1989). The specific effectiveness of Monopoly™ as a teaching tool to encourage students' active participation was first studied by Knechel (1989) using MBA students as subjects. He concluded that using the game as a simulation was equally effective as a standard practice set in helping students learn while being more interesting and less time consuming for students to complete. Albrecht (1995), Tanner and Lindquist (1998), Kober and Tarca (2000), and Gamlath (2007) expanded on Knechel's work and found that the use of a Monopoly™ simulation enhanced learning, improved social relationships with classmates, and increased students' enjoyment of the course. These researchers focused primarily on beginning accounting students; this study sought to determine if these effects are also found at the intermediate level.

The Simulation

Students in an intermediate accounting class were divided into groups of three or four at the end of the third week of the course. Each team was provided with a Monopoly™ game and provided with a rule sheet. The students were given three weeks to complete the assignment. The objectives of the simulation were to:

- correctly record each economic event in both journal entry and ledger form,
- properly summarize and communicate the results of the events to external users through the preparation of an income statement, statement of stockholders' equity, balance sheet, and statement of cash flows, and
- obtain the largest amount of retained earnings.

The game followed traditional Monopoly™ rules beginning with a \$1500 investment by shareholders in a real estate development corporation. Play continued for thirty “days” (moves) so monthly financial statements could be prepared. Players were required to purchase a minimum of four properties and construct at least two houses. They were allowed to mortgage properties and to obtain loans in the event of bankruptcy in order to complete a full month of transactions. By passing “Go”, players could earn “property management revenue”. Community Chest and Chance cards were modified to create transactions that related more closely to a business situation.

At the end of the month, players were required to record adjusting journal entries for items such as depreciation, interest, and taxes. They also had to reconcile the amount of cash on hand to the balance shown in their accounting records. Finally, they had to prepare the four financial statements.

Study Setting

Students enrolled in an undergraduate intermediate accounting class (n=15) were assigned the Monopoly™ simulation as a required component of their course. The students were allowed three weeks to complete the simulation. No class time was allocated for the simulation.

All of the students in the class were traditional college age. Sixty percent of the students were juniors, 20% were seniors, and 20% were sophomores. The majority of these students intended to major in business with a concentration in accounting (67%), for whom the course was required, and the remaining students came from a variety of majors for whom the course was an elective. The average length of time that had passed since the end of the students' introductory accounting course was 11.5 months. A survey was administered in-class on the day the simulation was due in order to assess their perceptions of the project. The response scale was 1= Agree Strongly, 2 = Agree, 3 = Neither Agree nor Disagree, 4 = Disagree, and 5 = Strongly Disagree.

Results

The students agreed that they initially thought the project would be fun when it was assigned (average response 1.7). Their agreement that the project was fun at the end of the simulation was 1.9 so their perceptions had not changed substantially over the course of the assignment. When asked about their agreement with the statement "This project should never be used again!", the students disagreed (average response 4.3). Their narrative responses showed that they liked the opportunity to work in a group setting for example: "it was fun working with other people in the class" and "playing Monopoly™ with a group was a lot of fun compared to just doing tedious journal entries...".

Students stated that the worst part of the project was the length of time it took to complete and the difficulty in finding time for groups to meet. However, two students commented that there should be more entries required which would require even more time. In general, non-accounting majors rated the project as less enjoyable even though they felt that they had learned a lot from the project (average response 2.4 versus 2.1 for majors).

Students also felt that the simulation provided them with a good way to review material covered in the introductory financial accounting course (average response 1.7). One student stated "The best part of the project was being able to play the game and ask questions as it progressed. By helping each other with the journal entries, we were able to explain what we know and had a better review of the financial accounting concepts."

Summary and Conclusion

The objective of this study was to determine if the use of a Monopoly™ simulation in an intermediate level accounting course would provide students with an engaging and effective means of reviewing material covered in their introductory accounting course. The results of this study support previous research which shows that the use of non-traditional teaching aids increase student interest. I found that accounting students enjoyed the simulation and felt that it had helped them to review their previous course work.

REFERENCES

- Albrecht, W.D. (1995). A financial accounting and investment simulation game. *Issues in Accounting Education*, 10(1), 127-142.
- Dewey, John. (1938). *Experience and Education*. New York: Kappa Delta Pi.
- Gamlath, S. (2007). Outcomes and Observations of an Extended Accounting Board Game. *Developments in Business Simulation and Experiential Learning*, 34, 132-137.
- Halpern and Hakel. (2003). Applying the Science of Learning to the University and Beyond: Teaching for Long-Term Retention and Transfer. *Change*, 35(4), 36-41.
- Knechel, R.K. (1989). Using a business simulation game as a substitute for a practice set. *Issues in Accounting Education*, 4(2), 411-424.
- Kober, R., & Tarca, A. (2000). For Fun or Profit? An Evaluation of an Accounting Simulation Game for University Students. *Accounting Research Journal*, 15, 98-111.
- Kolb, David. (1984). *Experiential Learning: Experience as the Source of Learning and Development*. Upper Saddle River, New Jersey: Prentice Hall.
- Leong, L. (2005). Improving students' interest in learning: some positive techniques. *Journal of Information Systems Education*, 16(2), 129-132.
- Lewin, Kurt. (1951). *Field Theory in Social Sciences*. New York: Harper & Row.
- Lewis, D.J. and Mierzwa, I.P. (1989). Gaming: A teaching strategy of adult learners. *The Journal of Continuing Education in Nursing*, 20(2), 80-84.
- Piaget, Jean. (1970). *Genetic Epistemology*. New York: Columbia University Press.
- Saunders, G. and Christopher, J.E. (2003). Teaching outside the box: A look at the use of some nontraditional models in accounting principles courses. *The Journal of American Academy of Business*, 3(1/2), 162-165.
- Tanner, M., & Lindquist, T. (1998). Using Monopoly and Team-Games-Tournaments in accounting education: a co-operative learning teaching resource. *Accounting Education*, 7(2), 139-162.

THE EFFECT OF BUSINESS STUDENT'S GPA, FIELD TEST PERFORMANCE AND ENGAGEMENT ON PERFORMANCE IN THE GLO-BUS BUSINESS SIMULATION

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ABSTRACT

Business programs usually include a capstone course, like strategic management, that attempts to integrate much of the “silos” of business knowledge from the foundation business courses. Increasingly, business programs are using on-line business simulations as part of such a course. Additionally, in order to assess the student learning of broad business concepts, business schools often give a field test to students in their senior year. This research sets out to study the relationship between student performance in the simulation and indicators of knowledge, capability and engagement using GPA, field test scores, and other measurements of student activity related to the business simulation.

INTRODUCTION

Strategic Management has been the capstone course in many undergraduate business programs for years. As such, students in this course have been expected to demonstrate mastery of basic skills expected of all graduates (in terms of oral and written communication and in terms of content knowledge), and increasing demands have been placed on instructors to provide data for assurance of learning efforts. Traditional business programs have produced students who are experts in silo-based disciplines [5, p. 38]. But, there is a recognition that the traditional “silo” approach to business education is not preparing graduates that are prepared for the increasingly complex, connected world [4, p. 24] [5, p. 38] [6, p. 44]. There are renewed calls for an “integrated curriculum” that engages students in meaningful learning and equips them to work in a more technology driven, complex, global environment.

The traditional focus of business education has relied on developing the analysis skills of students. Ackoff, [2, pp. 16-19] points out that a shift from what he calls “Machine-Age” thinking to “Systems-Age” thinking is needed to succeed in the increasingly complex business world. This shift will require supplementing the strong analysis skills developed in the silo approach to education with skills to synthesize relationships between/among disciplines. Where analysis deals with understanding the parts (e.g., the individual disciplines of business) separately and aggregating these into an explanation of the whole, synthesis focuses on the expectations of the larger system and then derives the parts to support the larger system. Synthesis challenges the belief that optimization of the parts of the system will lead to the best system and addresses the interactions among parts of the system.

There are several alternative methods that can be used in academic instruction. Two common methods used in Strategic Management include using simulations and case studies. The different advantages cited for simulations over cases [3, p. 199] suggests that simulations may help develop synthesis skills (e.g., allowing students to experience interactions among various parts of a system, permitting students to see consequences of their decisions, engaging students in evaluating feedback and making successive decision, and producing conceptual learning). This research explores the relationship between traditional measures of student learning (GPA, scores on nationally normed tests, and academic preparation) and success in GLO-BUS [1], a business strategy simulation geared toward engaging undergraduate students in a competitive, hands-on managerial role in an international environment [7]. Does this simulation result in “more of the same” (students who do well in traditional measures of academic achievement being more successful in the simulation) or are students developing additional skills that can be applied in their professional careers?

This study is based on results from student teams at North Georgia College & State University. All students in the BBA capstone Strategic Management course were required to participate in the team-based GLO-BUS simulation as part of the course. Teams of 2 to 4 students from the same section were formed by the instructor to ensure some diversity in academic preparation (different majors, different GPA, etc). These same students must take the ETS Major Field Test in Business as part of the course and complete additional, more traditional, strategic management assignments. Students are expected to be within two semesters of graduation and must have successfully completed principles/foundation courses in accounting, economics, finance, management, and marketing.

ANALYSIS

General Information

This analysis is exploratory in nature. The analysis looks at team success in the simulation and attempts to determine how team member characteristics and actions of the team relate to the results the team produces. In some cases, the inability to support relationships is a positive result—i.e., finding that we cannot support a clear association between traditional academic measures of success (grades and test scores) and success in the simulation *might* be an indication that the traditional content knowledge needs to be supplemented with different skills.

The data for the analysis were obtained from 291 students in 105 teams (31 with two team members; 67 with three; and 7 with four) from 14 sections over 4 semesters (Fall 2010, Spring 2011, Summer 2011, and Fall 2011) on 2 campuses (a traditional day program on the main campus and a part-time evening program on a nearby site). There were multiple instructors but a single facilitator for the simulation portion of all sections.

Variables

The Company Score a team received served as the dependent variable. Independent variables were clustered into six areas: team make-up, academic maturity, local measures of academic performance, nationally normed measures of academic performance, work experience, and

engagement in the simulation. Two additional factors were considered. Using GLO-BUS, one class section of students constituted an “industry” where each team constituted a company in the same industry. So, just as we would expect to see section-to-section differences, these industries might have inherent differences. Also, the semester the class was conducted was included as a potential source of variation.

Team make-up included variables reflecting the team size, the number of accounting majors, the number of finance majors, the number of management majors, the number of marketing majors, and a dummy variable describing if the team was “balanced” in terms of majors represented (meaning that there was at least one member from accounting or finance and at least one member from management or marketing). This resulted in the identification of six variables.

Academic maturity considered the number of earned hours that the team members had at the start of the semester when they took Strategic Management. The average, maximum, and standard deviation of Earned Hours were recorded for each team. This resulted in the identification of three variables.

Local academic performance used the cumulative GPAs for the team members at the start of the semester. Again, the average, maximum, and standard deviation of team member GPAs were recorded. No distinction was made between students who had some transfer credit and students who completed all of their coursework at North Georgia. More than 70% of the students had some transfer credit. This resulted in the identification of three variables.

Nationally normed academic performance was based on results from the Major Field Test taken as a requirement in the course (and weighted 10% in the final course grade). Like the previous two areas, the average, maximum, and standard deviation of team member MFT scores were recorded. This resulted in the identification of three variables.

Experience was measured indirectly. Day sections of the course are typically composed of traditional students. These are a mix of resident females, resident males (mostly members of the corp of cadets), 18-23 year old commuter students, and a limited number of non-traditional students. Many of these students work part-time but most who are working are not in career positions. Evening sections are generally thought of as made up of non-traditional students. All of these students commute to class. Many of the students in these sections are working full-time in career positions and are older than the traditional college student. Although some “day” students commute to the remote campus for some courses, the discussions in these sections tend to have a more “informed” tone based on the real-world work experience of the class members. The location where the team took the course is used to indirectly account for experience. This resulted in the identification of one dummy variable.

Engagement in GLO-BUS included a number of program-generated measures of team member activity. The individual measures from team members were combined to provide a total and average team value for each variable related to engagement. The variables considered included total number of logins, number of operational logins, time in the simulation, number of saves, and number of reports viewed. This resulted in the identification of eighteen variables.

Since faculty tend to agree that each section has a unique personality and represented its own competitive “industry,” information related to the section was recorded. In addition, since the Strategic Management course should be taken close to graduation, the term that the student takes the course may reflect whether the student is “on track,” playing catch-up, or speeding up progress toward the degree so the term was recorded. Dummy variables were created to reflect the section and the semester for each team. Since there is only one section each semester on the remote campus, Section and Semester for this location were confounded.

Approach to Analysis

The analysis consisted of initial correlation analysis. This was followed by step-wise regression. Both the correlation and regression analysis were conducted by using data from all teams from both campuses and separately for the traditional and non-traditional sections (since the initial analysis indicated that there was sufficient evidence to support different results from the two locations). In addition, significant differences between average performance by teams from different locations was explored.

RESULTS

All Teams

As seen in Table 1, correlation analysis based on all of the teams showed strong correlations to Company Score ($p < .01$) for Academic Maturity (Average Earned Hours), for Nationally Normed Academic Performance (Average MFT Score), and for 14 of the 18 Engagement variables. Other significant correlations ($p < .05$) related to Academic Maturity (Max Earned Hours), Nationally Normed Academic Performance (Max MFT Score), Experience, and two more of the Engagement variables. Interestingly, none of the variables related to Team Make-up, Local Measures of Academic Performance, nor Semester or Section were significant.

The best model identified by Stepwise regression for use when all teams were included in the analysis (without considering Semester or Section) included a measure of Engagement (Average Number of Operational Logins) and a Nationally Normed Measure of Academic Performance (Average MFT Score). The model produced an adjusted R^2 of only .204. When Semesters were added to the model, the same independent variables remained in the model, the adjusted R^2 increased to .282, and the p value associated with the addition of the Dummy variables was .04; therefore, controlling for Semesters appeared reasonable. When Sections were added to the initial model, the significant independent variables include one of the same variables from before (Average MFT) and two new variables (Total Number of CIR Reports viewed and Total Number of Team Logins). The adjusted R^2 increased to .408, and the p value associated with the addition of the Dummy variables was $< .001$; therefore, controlling for Sections appeared reasonable. Several instances related to confounding of Semester and Section precluded analysis including both of these in the same model. Of the three models identified, the last one appears to be the best.

Table 1: Correlations with company scores for all teams (N=105)

Independent Variable	Pearson Correlation
Team Size	-.014
Balance	.017
# of ACCT Majors	-.006
# of FINC Majors	.152
# of MGMT Majors	-.031
# of MKTG Majors	-.108
Avg. Earned	.290**
Max Earned	.239*
St. Dev. Earned	.165
Avg. GPA	.113
Max GPA	.073
GPA st.dev.	.019
Avg MFT	.330**
Max MFT	.247*
MFT st.dev.	.063
Trad Class	-.247*
TEAM Logins	.303**
Avg. Logins	.330**
# Ops Logins	.351**
Avg # Ops Logins	.373**
Team Duration (min.)	.280**
AVG Team Time	.310**
Tot # Saves	.051
Avg. # Saves	.066
Total Rpts	.304**
Avg. Rpts	.320**
# Corp Logins	.214*
Avg # Corp Logins	.233*
Tot # GSR	.256**
Avg # GSR	.273**
Tot #CIR	.320**
Avg # CIR	.336**
Tot #COR	.279**
Avg # COR	.293**

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Based on the correlation analysis that identified Experience (indirectly measured by location the class) as significant ($p = .011$), regression analysis that reflected that Non-traditional teams have Company Scores that averages 8.85 points higher than Traditional teams, a recognition that more than 75% of the teams were considered to be from Traditional sections, further analysis on the two subgroups was undertaken.

Teams from Traditional Sections

As expected, the correlation analysis using the data from teams in Traditional sections was very similar to the results when all teams were included. The only independent variables that showed strong correlation ($p < .01$) with Company Score were Nationally Normed Academic Performance (Average MFT Score) and 12 of the variables related to Engagement. At the $p < .05$ level, Academic Maturity (Average Earned Hours), Nationally Normed Academic Performance (Max MFT Score), and 4 more variables related to Engagement were identified. Again, none of the variables related to Team Make-up, Local Measures of Academic Performance, Semester, nor Section were significantly correlated with Company Score.

The best model identified by Stepwise regression for use when the analysis was limited to teams in Traditional sections (without considering Semester or Section) included a measure of Engagement (Average Number of Operational Logins) and a Nationally Normed Measure of Academic Performance (Average MFT Score)—the same variables identified when all teams were included. The model produced an adjusted R^2 of only .185. When Semesters were added to the model, the same independent variables remained in the model, the adjusted R^2 increased to .269, and the p value associated with the addition of the Dummy variables was .011; therefore, controlling for Semesters appeared reasonable. When Sections were added to the initial model, only one significant variable in addition to the Section was significant—the number of CIR Reports viewed (one of the Engagement variables). The adjusted R^2 increased to .369, and the p value associated with the addition of the Dummy variables was $< .001$; therefore, controlling for Sections appeared reasonable. Several instances related to confounding of Semester and Section precluded analysis including both of these in the same model. Of the three models identified, the last one appears to be the best. [CIR reports are competitive intelligence reports provided by GLO-BUS and contain information about what the competitors in the industry are doing, e.g., prices, advertising, and number of camera models being offered.]

Teams from Non-Traditional Sections

The correlation analysis using the data from teams in Non-Traditional sections was radically different from the other two. The only independent variable that showed significant correlations with company score was Standard Deviation of Earned Hours ($p = .05$); and teams that included more diversity in Academic Maturity tended to have higher Company Scores.

The best model identified by Stepwise regression for use when the analysis was limited to teams in Non-traditional sections (without considering Semester/Section) included measures of Academic Maturity (Standard Deviation of Earned Hours), a Local Measure of Academic Performance (Max GPA), and one measure of Engagement (Total Number of COR Reports viewed). The model produced an adjusted R^2 of .329. [COR Reports are company operating reports that provide financial information about the team's company, e.g. production costs, financial performance in each regional market, and overall company financial statements.] Since there is only one Non-traditional section each semester, these two variables cannot be evaluated separately. Adding Semester/Section to the model produced surprising changes. Stepwise regression identified six independent variables—one related to Academic Maturity (Max Earned Hours), one related to a Local Measure of Academic Performance (Max GPA), two

related to team make-up (the number of Accounting Majors and the number of Management majors on the team), and two related to Engagement (Average Time the Team spent on GLOBUS and the Total Number of COR Reports viewed). The adjusted R^2 increased dramatically to .701.

Comparing Traditional and Non-Traditional Sections

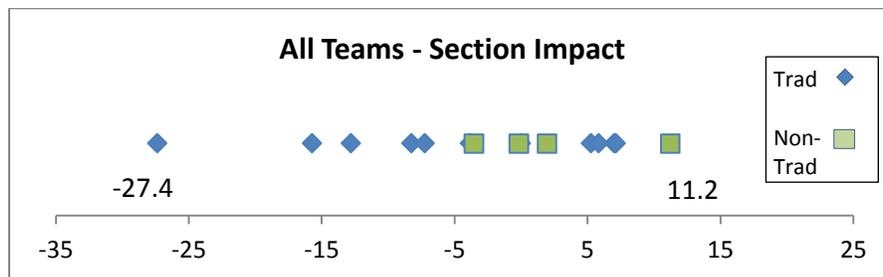
Teams from Traditional sections appear to be more focused on what the competition is doing (CIR Reports) than what is happening within their own company (COR reports). Other significant ($p < .10$) differences between Traditional and Non-traditional teams related to Academic Maturity (all three measures are significantly higher for the Non-traditional teams), Nationally Normed Academic Performance (both the Average and Max MFT Scores are higher for the Non-Traditional teams), Engagement (Average Team Time is almost three hours higher for Non-traditional teams and the viewing of COR reports—total and average—are higher for Non-traditional teams), and Team Make-up (the number of Marketing majors per team is significant lower for Non-traditional teams—not a surprise, since the Marketing major is no longer available on the remote campus). The resulting performance for Non-traditional teams is significantly higher (at 8.85 points on average).

Although none of the specific discipline measures (Financial Management, Operations Management, Marketing Management, HR Management, and Corporate Social Responsibility) show statistically significant differences, teams from Non-traditional sections averaged higher on each measure than team from Traditional sections.

Impact of Section

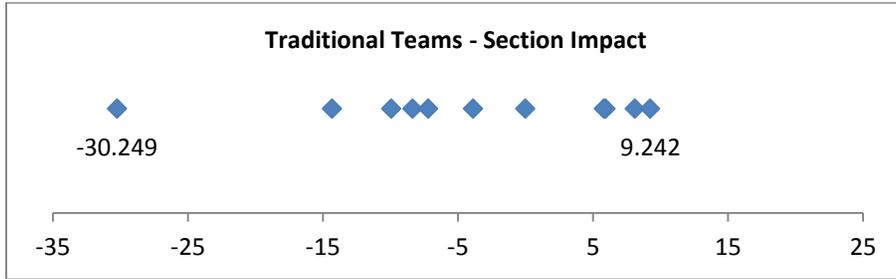
Figures 1, 2, and 3 provide a graphical illustration of the expected differences between Sections based on the model identified in the Stepwise regression process. The same horizontal scale is used to allow for easier comparisons.

Figure 1: All Teams included—Section impact when Average Number of Operational Logins and Average MFT Score are held constant.



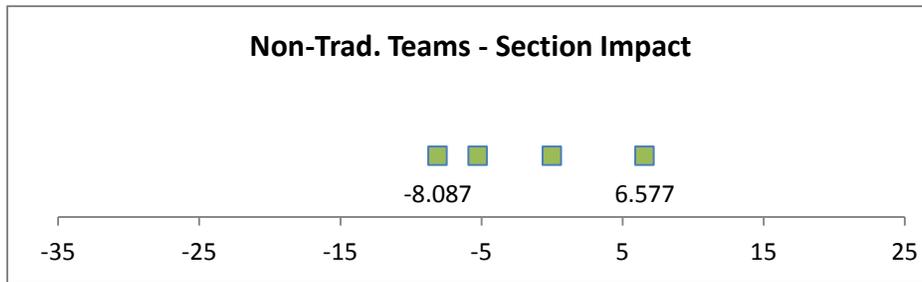
Teams from different sections but have the same average number of operational logins and the same average MFT score could expect to see average Company Scores up to 38.6 points apart. In this graph, different symbols are used to denote the location of the section. This provides visual support for the result that teams from Non-Traditional sections tend to perform better on the simulation.

Figure 2: Traditional teams included—Section impact when Number of CIR Reports views is held constant.



Variation in average Company Scores varies greatly for teams from Traditional sections.

Figure 3: Non-Traditional teams included—Section impact when Max Earned Hours, Total COR Reports Viewed, Average Team Time, Max GPA, Number of Accounting, and Number of Management majors are held constant.

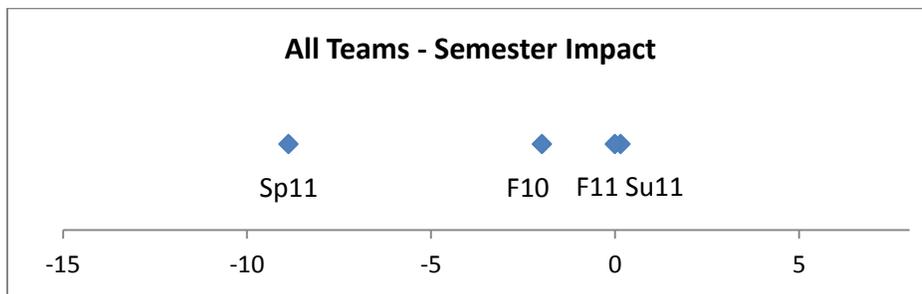


When comparing average Company Scores from teams in Non-traditional sections to those in Traditional sections, we see less variation from section to section.

Impact of Semester

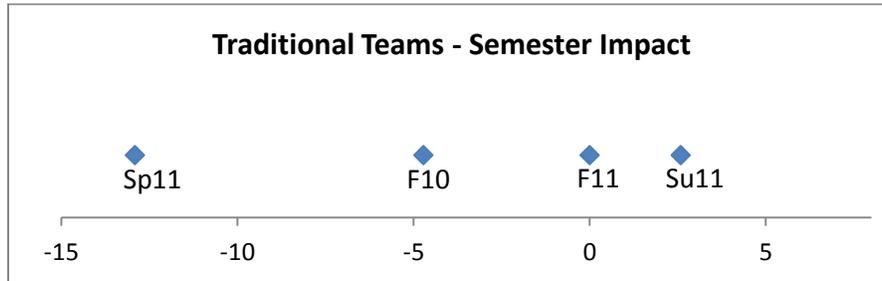
Figures 4, 5, and 6 provide a graphical illustration of the expected differences between Semesters based on the model identified in the Stepwise regression process. The same horizontal scale is used to allow for easier comparisons.

Figure 4: All Teams included—Semester impact when Average Number of Operational Logins and Average MFT Score are held constant.



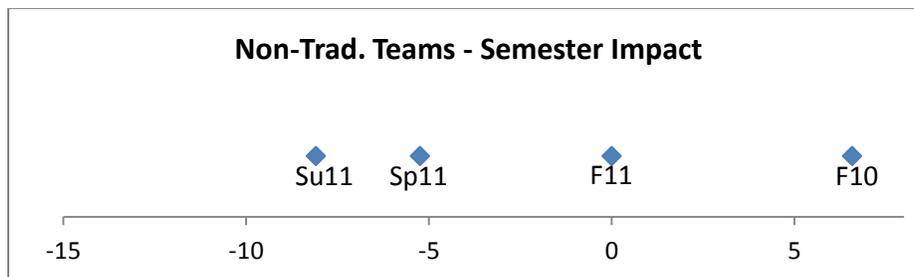
Although Spring semester provides the largest graduating class (and is generally considered the class that traditional students will graduate, when all teams were considered, Company Scores tended to be lower in Spring.

Figure 5: Traditional teams included—Semester impact when Number of CIR Reports views is held constant.



When only Traditional teams were considered, the ranking of semesters remains the same as when all teams were considered, but the variability increases.

Figure 6: Non-Traditional teams included—Semester impact when Max Earned Hours, Total COR Reports Viewed, Average Team Time, Max GPA, Number of Accounting, and Number of Management majors are held constant.



When only Non-traditional teams are considered, the ranking changes. Summer semester moves from “best” to “worst.” This may be a function of the specific semester that the data were collected—since this section was presented in a “hybrid” format with half of the face-to-face class time replaced with on-line instruction.

LIMITATIONS AND EXTENTIONS

This investigation was exploratory in nature. Although there are some initial informative findings, limitations of the research should be recognized. First, this analysis only included students from one institution using one of the popular strategic planning simulations available. This was helpful in that, the students encountered a very similar program of study. However, this makes the results less generalizable to other institutions. A natural extension would be to include student results from a broad range of business schools.

This research attempted to show relationships between a team-based scores on the GLO-BUS simulation and some individual measures, like GPA and score on the major field test. Regardless of the balance of the majors constituting a team or the GPAs of students in the team, how well a team functions is affected by other factors that were not measured in the GLO-BUS simulation. Interpersonal and behavioral factors can affect team performance.

Also related to variables included in this study was the use of total time recorded on the simulation system for all team members. Total times may not represent actual activity time. It could simply be time logged on but not doing anything, or it could be that two team members are logged on side-by-side, not using two computers separately. They are really only working from one computer.

Additionally, although the sample contained 105 teams of students, during the exploratory analysis, a difference in results appeared between the day and evening sections of the capstone course. The evening sections only provided 24 teams (observations), leaving a relatively small sample when considering the number of variables investigated. This could have impacted the statistical results.

The results indicated that the amount of career-level work experience may play a role in performance in the simulation. This was measured indirectly using the participants in the evening classes. In future research, specific demographic information, including student age and work experience, could be incorporated.

Since the use of teams in the simulation limits conclusions about the impact of individual student measures like GPA and major field test scores, another extension of this research would be to have student participate in the simulation individually.

CONCLUSION

In this exploratory analysis, four semesters of student participation in the business strategy simulation, GLO-BUS, was evaluated to understand what factors affect performance in the simulation. If GPA or scores on nationally normed tests are strongly linked to performance on the simulation, the argument of the necessity for using such simulations would be weakened. In this case the simulation would be more or less another measure of the knowledge and skill already attained by students. Use of a simulation is intended to aid learning by having student synthesize their knowledge and skills. The results show that, to some degree, knowledge is important, as it should be. More importantly, the results show that student teams who were more engaged in the simulation by spending more time reviewing financial results and market reports, and simply spending time understanding the game performed better. This hopefully indicates that the synthesis does occur when students commit to engaging in the simulation.

The findings also showed that there was a performance difference between traditional and non-traditional student teams. Company scores from teams in section comprised of nontraditional students tended to score higher and have less variation from other teams in the class section. This appears to be due to the tendency for these teams to be more engaged in the simulation.

REFERENCES

- [1] About GLO-BUS, (2011). Retrieved December 31, 2011, from http://www.mhhe.com/irwin/BSG_Glo-Bus/
- [2] Ackoff, R.L. *Ackoff's Best*, New York: John Wiley & Sons, Inc., 1999
- [3] Mitchell R. Combining cases and computer simulations in strategic management courses. *Journal of Education for Business*. 2004, 79(4), 198-204.
- [4] Olian, J. Business schools: a look back, a look ahead. *BizEd*, 2011 10(6), 24-25.
- [5] Phan, P. Building the 21st-century curriculum. *BizEd*, 2011, 10(5), 38-45.
- [6] Stumpf, S. A., & Tymon Jr., W. G. Why Integrated Education Over Functional? *BizEd*, 2002, January, 44-45.
- [7] Thompson, A.A. Jr., *GLO-BUS Developing Winning Competitive Strategies Instructor's Guide*, McGraw-Hill, 2012

Using Supply Chain Management Principles to Develop an Assurance of Learning Framework

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ABSTRACT

The new paradigm for many regional and specialized accreditation agencies emphasizes student learning assessments. In order for universities to maintain their accreditation status with these agencies, academic institutions have to demonstrate compliance with Assurance of Learning (AoL) requirements. In this paper, we develop a stakeholder driven AoL based model that meets the Southern Association of Colleges and Schools (SACS) and Association to Advance Collegiate Schools of Business (AACSB) accreditation standards. The framework incorporates common supply chain management practices that are used by best in class (BIC) organizations. Furthermore, we propose integrating our framework into the university's strategic plan, which drives all operational and tactical decisions. This student learning based model will decrease the number of redundant processes, improve collaboration throughout the university, and promote a more comprehensive and relevant curriculum for students.

Keywords: Assurance of Learning, Supply Chain Management, Accreditation, Assessment Outcomes, Best in class, SACS, AACSB

INTRODUCTION

In recent years many accreditation agencies have adopted a new paradigm for assessing educational institutions. Accrediting bodies began to shift from assessing what instructors were teaching in a classroom, to focusing on the amount of knowledge that students gained during classroom instruction. This transformation was the pinnacle of decades of research acknowledging the disparities that exist between the information that an instructor teaches and the actual knowledge that students gain (DeZure 2000; Lubinescu 2001; Pringle 2007; Weldy 2008). In many instances, assessment models based on student achievement and success, referred to as Assurances of Learning (AoL), reveal inherent flaws in the traditional system that fail to address the teaching and learning gaps that exist. Thus, many academic institutions are challenged with developing creative methods to bridge this gap and meet the assessment standards imposed by many accreditation agencies (Hollister 2007; Weldy 2010).

LITERATURE REVIEW: SACS and AACSB

Van Vught (Van Vught 1994) defines accreditation as “the most fully developed institutionalization of the idea of accountability in higher education.” Although regional and program specific accreditation agencies have varying standards, there are numerous consistent themes that exist among these agencies. In program specific accreditation agencies, like AACSB, peers interpret the quality of a program within the context of the program’s self-defined goals and activities. In contrast, regional accreditation agencies like SACS provide recognition to institutions that meet minimum standards of quality. Institutions are required to respond to any criticism or recommendations given and develop a plan that addresses these issues (Lubinescu 2001).

In 1988, the US Department of Education required all federally approved accreditation agencies to include assessment in their post secondary accreditation standards (Apostolou 1999). During the 1990’s, public pressure increased for accountability and student retention at publically funded institutions (BHEF 2004; Lubinescu 2001). In response, accreditation agencies began to revise their standards to focus on outcome-based, AoL requirements. In 2002, AACSB drafted new standards requiring institutions to provide evidence of student learning (i.e. AoL) and increase faculty involvement in the accreditation/assessment process. Programs were given a three year window to implement the new AACSB standards (Martell 2007) that were adopted in 2003 (AACSB International 2003). AACSB released an interpretation of AoL standards in 2007 (AACSB 2007) which provided an assessment framework for defining program goals and designing assessment measures that substantiate student learning.

In 2007, SACS also adopted standards requiring institutions to demonstrate student learning. AoL based standards were more detailed in the 2008 SACS Standards Edition (SACS 2007; SACS 2008). By 2010, most accreditation agencies that fall under the Council for Higher Education Accreditation (CHEA) had adopted AoL based standards (Lubinescu 2001). AoL based assessment requirements served as an impetus for increased research about sustainable AoL process development and management (Buckman 2007; Gardiner 2010; Shaftel & Shaftel 2007; Weldy 2010).

Despite differing processes and standards, both AACSB and SACS have similar fundamental principles. The initial accreditation and reaccreditation standards for both agencies have an intense focus on three main areas: 1.) Institutions must develop and adopt a mission statement which drives the direction and activities for all units; 2.) Programs (or majors) must develop learning goals, which support the unit mission (Weldy 2008; Garceau 2011), and adopt assessment measures to assess each goal; and 3.) A continuous improvement process must be identified to routinely review assessment data and make program changes based upon the results (referred to as “closing the loop”). AACSB places a heavier focus on including stakeholders in the overall AoL system design process.

INITIAL AOL IMPLEMENTATION VS. FIRM’S STRIVING TO BE BIC

AoL requires institutions to develop, implement, reassess and continuously improve student learning strategies. During the initial implementation or infancy stage of the AoL model, institutions often modify their existing structure to incorporate learning assessment measures. Implementing an efficient AoL based system, however, should lead institutions to review (and often revise) their mission statement, curriculum, and course objectives, based upon stakeholder input (Gardiner 2010; Martell 2007; Weldy 2008).

Potential Barriers to AoL Implementation

Many universities are enmeshed in a cycle where AoL goals are added post hoc to their current curriculum. We contend that institutions implementing learning outcome assessments in this manner are still in the infancy stage of the AoL system development. With this approach, the current curriculum and university structure is driving the AoL process. Departments often operate in a silo, where information sharing, joint planning and collaboration between academic units is not emphasized. The results of the infancy stage AoL model provide a myopic view of learning outcome goals that are largely designed to meet accreditation agency standards and are not necessarily aimed at improving student learning. If academic institutions want students to attain rigorous and relevant knowledge that prepares them to think critically and contribute to academic and industrial innovations, a more mature AoL model is needed (Patton 2001). AoL must create an environment where continuous improvement drives the learning process and provides a foundation and direction for academic units to support.

Typically, the initial implementation of the AoL model has several barriers which can impede an institution's ability to effectively and efficiently improve student learning outcomes on a continuous basis. These barriers include: 1.) Concerns that learning deficiencies reflect poor teaching and instruction practices (Kelley 2010; Martell 2007); 2.) An inadequate amount of time and funds dedicated to redesign curriculums and internal processes to achieve learning outcome goals (Martell 2007; Pringle 2007); and 3.) Beliefs that each department can optimally design, implement, assess and improve learning strategies without collaboration and information sharing both internally and externally with stakeholders (Lightner 2011). Table 1 provides a more detailed list of common issues with AoL model implementation. We assert that mitigating these barriers will lead to improved student learning.

Potential Barriers to Organizations Implementing BIC Practices

Supply chain management (SCM) literature about best in class organizations has revealed remarkable commonalities between the challenges of universities in the infancy stage of AoL model implementation and organizations that have not reached the highest current performance level in an industry (i.e. not best in class). To better understand these similarities, we reviewed the findings from numerous benchmarking and SCM best practices studies. Our review revealed numerous barriers that keep companies from

achieving the highest level of industry performance. Some common barriers are: 1.) Defining customer requirements based on history or perception with little feedback from the stakeholders; 2.) Misaligning of strategic and operational goals; 3.) Low level commitment to change; 4.) Lack of coordination and cooperation between departments and business units; 5.) Approaching problem solving in a reactive instead of proactive manner; and 6.) Unwillingness or indifference to sharing information (Stewart 1995; Mittelstaedt 1992; Fawcett et al. 2008).

Table 1: Common issues with firms not BIC and institutions in the infancy stage of AoL implementation

Issues with firms not BIC	Issues with universities' infancy stage AoL system
Defining customer requirements based on history or perception with little feedback from the stakeholders	Departments designing learning goals and assessments without collaboration and information sharing both internally and externally with stakeholders
Misaligning of strategic and operational goals	Lack of consistency (and cohesion) between Schools/Colleges goals
Approaching problem solving in a reactive instead of proactive manner	AoL goals are added post hoc to their current curriculum instead of redesigning the curriculum based on AoL principles
Lack of coordination and cooperation between departments and business units	Lack of global solutions to common problems
Low level commitment to change	An inadequate amount of time and funds dedicated to redesign curriculums and internal processes to achieve learning outcome goals No formal accountability for "closing the loop"

In Table 1, we highlight the similarities between firms that are not BIC and institutions that are in the infancy stage of AoL implementation. For instance, both firms and institutions that meet this criterion are not demand or stakeholder driven (first issue listed in Table 1). Instead they are using history, perception and individual expertise to shape most operational and strategic decisions and under utilizing stakeholder input and feedback. Companies have acknowledged that many of the practices listed in Table 1 have led to redundant processes, operational inefficiencies, higher costs and overall sub-optimal results and have hence attempted to mitigate these unfavorable outcomes. Best practice benchmarking is a commonly used strategy that continuously compares (and consequently seeks to improve) processes, products and services to competitors and renowned industry leaders (Patton 2001; Mittelstaedt 1992).

Academic institutions can benefit from best practice benchmarking research in order to design efficient AoL systems. Thus, we propose adopting organizational best in class practices to improve academic learning outcome goals and assessment strategies. In this research, we present a framework for AoL models based on SCM practices for BIC organizations. We will then apply this model to strategic and assessment planning for the Department of Management at Fayetteville State University (FSU), a constituent member of a 17 institution University of North Carolina (UNC) system.

Challenges with FSU's Initial AoL Based System

FSU is accredited by SACS and the School of Business and Economics (SBE) is accredited by AACSB. SBE was first accredited by AACSB in 2006 and was scheduled for reaffirmation in 2012. The University was scheduled for SACS reaccreditation in 2011. Both reaccreditation processes required the implementation of AoL based systems, whereas prior accreditation success was achieved through an input based (i.e. examining competencies being taught in the classroom) assessment process. Transitioning from teaching based assessments to learning based assessments was not a seamless process. We encountered many of the challenges presented in Table 1. More specifically, these challenges included the lack of adequate funding to support faculty training and assessment activities (Martell 2007), faculty resistance to learning and adopting a new process (Pringle 2007), and convincing faculty and administration that learning shortfalls should (and would) be viewed as curricular design issues opposed to teaching deficiencies (Kelley 2010).

During initial transitioning phases, we adapted our current academic structure to fit the new AoL requirements. Since the university and various program specific accreditation agencies were all transitioning to AoL based systems, the university wanted to capitalize on merging objectives and unify departmental efforts. Figure 1 shows the initial administrative structure that was created to incorporate AoL throughout the university. As shown in this figure, a Vice Chancellor for Assessment was appointed to oversee all university assessment operations. Each school/college appointed an assessment coordinator to synchronize all school/college assessment activities. Coordinators met with a committee of faculty members to determine the learning outcomes that each department would assess, and the classes where assessments would be administered. The willingness of professors to create and administer assessment measures heavily influenced learning outcomes and course selections. We adopted and implemented this assessment structure for approximately two academic years.

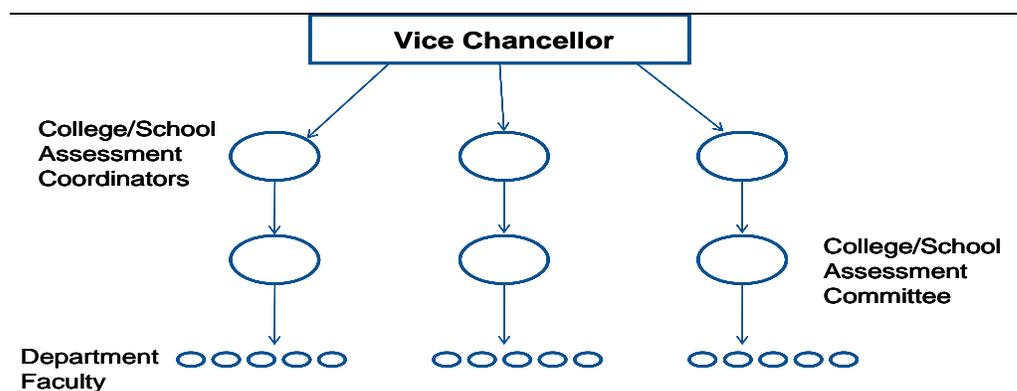
Committees met and reviewed our assessment procedures continuously during the two year implementation phase. The following is a list of recurrent concerns that were noted:

1. **Lack Of Consistency (And Cohesion) Between Schools/Colleges-** Each department developed their own assessment goals and processes. Very little communication occurred between departments, which led to frequent duplication of resources (i.e. budget, rubric development, etc.).

2. **No formal accountability for “closing the loop”**- No official process existed for providing seamless administrative oversight of all assessment activities. As a result, there was a lack of consequences for failing to follow up and use assessment results to improve future student learning activities.
3. **Lack of global solutions to common problems**- Individual faculty members developed improvement plans (for closing the loop). Chairs, Deans, and upper level administrators were not included in the review process. Thus, global solutions to common problems occurring across departments were not appropriately recognized and addressed.
4. **Individual assessment initiatives were not fully supported**- Learning goals, assessment measures, and improvement plans were developed and implemented by individual faculty members. Thus, when a faculty member suggested an improvement plan which required significant changes or resources, they were not always successful convincing administrators to support their idea.

In light of our desire to attain AACSB and SACS reaffirmation, we sought to develop a more efficient AoL process, which addressed the aforementioned issues.

Figure 1: Former FSU Assessment Model



ADDRESSING ISSUES WITH FSU’S INITIAL IMPLEMENTATION

SCM Fundamentals

There are extensive strategic benefits and savings associated with effective SCM practices. Best in class companies are successful because they have learned to perform their core competencies and manage their supply chains/logistics operations with minimal effort, time and resources. Thus, many industry competitors study and emulate best in class companies because their supply chains perform at a superior level that often results in reduced costs, a larger consumer base, and less redundant activities (Coyle et al. 2008; Fawcett et al. 2008). Some SCM practices exhibited by best in class companies are 1.) Integrated operations; 2.) Mutually shared information; 3.) Cooperation between business units; 4.) Central goals and synergistic focus on serving customers; and 5.) Dedication to joint planning and long term external relationship building (Mentzer et al. 2001).

SCM is the “systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole (Mentzer et al. 2001).” Supply chains can be viewed as a network of organizations that are involved in various operational processes to create value in the form of products/services for a customer (Christopher 1992).

The question that remains is how can universities learn from the SCM practices of best in class companies? If FSU were to use a system that encompasses the best SCM practices listed above, many of the aforementioned issues regarding the initial AoL based model would be minimized, if not eliminated. We posit that the optimal AoL based academic environment would be stakeholder driven, with mutually shared information and collaborative efforts toward reaching joint learning goals. Ideally, if an institution has learning based accreditation requirements, facilitating an effective AoL system should be included in their overall strategic plan.

We have taken liberties with the typical view of supply chain members that often involve suppliers, manufacturers, wholesalers, distributors and customers. For the purposes of our research, we view academic institutions as manufacturers, the industry stakeholders (i.e. residents, graduate institutions and potential employers) as customers, and students as valued commodities. By defining academic entities in this manner, we can begin analyzing academic institutions as a supply chain member.

Proposed Model Design Using SCM Principles

The first phase of the proposed AoL framework involves explicitly defining the individual components and roles of each entity in the supply chain. Institutions should begin by defining their stakeholders -from the institutional level down to departmental units. If academic institutions view their stakeholders as customers, a comprehensive study must be conducted to determine stakeholder needs and expectations. Moreover, envisioning students as valuable commodities necessitates in depth studies to ascertain specific competencies that stakeholders expect from student graduates. The implementation of this phase will foster collaborative and joint planning efforts that will better prepare students.

A second phase should entail developing a unified institutional mission, strategic goals, and learning outcomes, based upon stakeholder findings. Specific skills, identified by stakeholders as necessary competencies for student graduates, should drive the development of strategic and learning goals. All academic units should be required to incorporate at least one strategic goal that involves implementing a sustainable assessment process. By aligning assessment activities with strategic planning, support for assessment initiatives should increase. This phase will enhance visibility of learning goal strategies and promote connectivity throughout the academic units.

A software application should be adopted for managing all unit goals and learning outcomes. The software will be a resource that maintains all university-wide aligned processes and allows seamless university oversight. Preferably, the software should be capable of generating useful activity reports and descriptive statistics.

In the third phase, schools/colleges align their mission, goals, and learning outcomes with the university's initiatives. Schools/colleges should not be expected to adopt identical objectives as the university, nonetheless, collectively all institutional goals/learning outcomes should be represented in at least one academic unit. Additional field specific goals and learning outcomes should be adopted based upon feedback from content area stakeholders. All colleges/schools should comply with the university recommendation to include a strategic goal regarding planning, implementing, and/or monitoring assessment activities.

In the fourth phase, the departmental mission, goals, and learning outcomes are aligned with the schools/colleges objectives. Similar to phase three, departmental units should not be required to adopt all school/college level objectives, nonetheless, all school/college learning outcomes and goals should be represented by at least one academic unit. Furthermore, departments in related fields would ideally share similar learning outcomes. All departmental units should consider incorporating additional content specific goals based upon feedback from content area stakeholders. Each department should adopt at least one strategic goal regarding specific assessment initiatives.

The final phase involves continuously improving existing AoL strategies, goals and learning outcomes. During this phase, academic units will develop a system for evaluating assessment results; the curriculums, goals, and teaching strategies should be modified based upon these results and feedback from stakeholders. This phase is designed to "close the loop" and continuously improve student learning.

Our proposed strategic planning and assessment model, shown in Figure 2, lays the foundation for meeting critical SACS and AACSB accreditation standards. With our model, AoL competencies (largely determined by stakeholders) drive the development of mission statements, learning outcomes and strategic goals. In this figure, we see that the development of these measures at each level is influenced by stakeholder information and alignment with the preceding level. Furthermore, the strategic and learning goals for each unit should directly support the unit's mission (Garceau 2011).

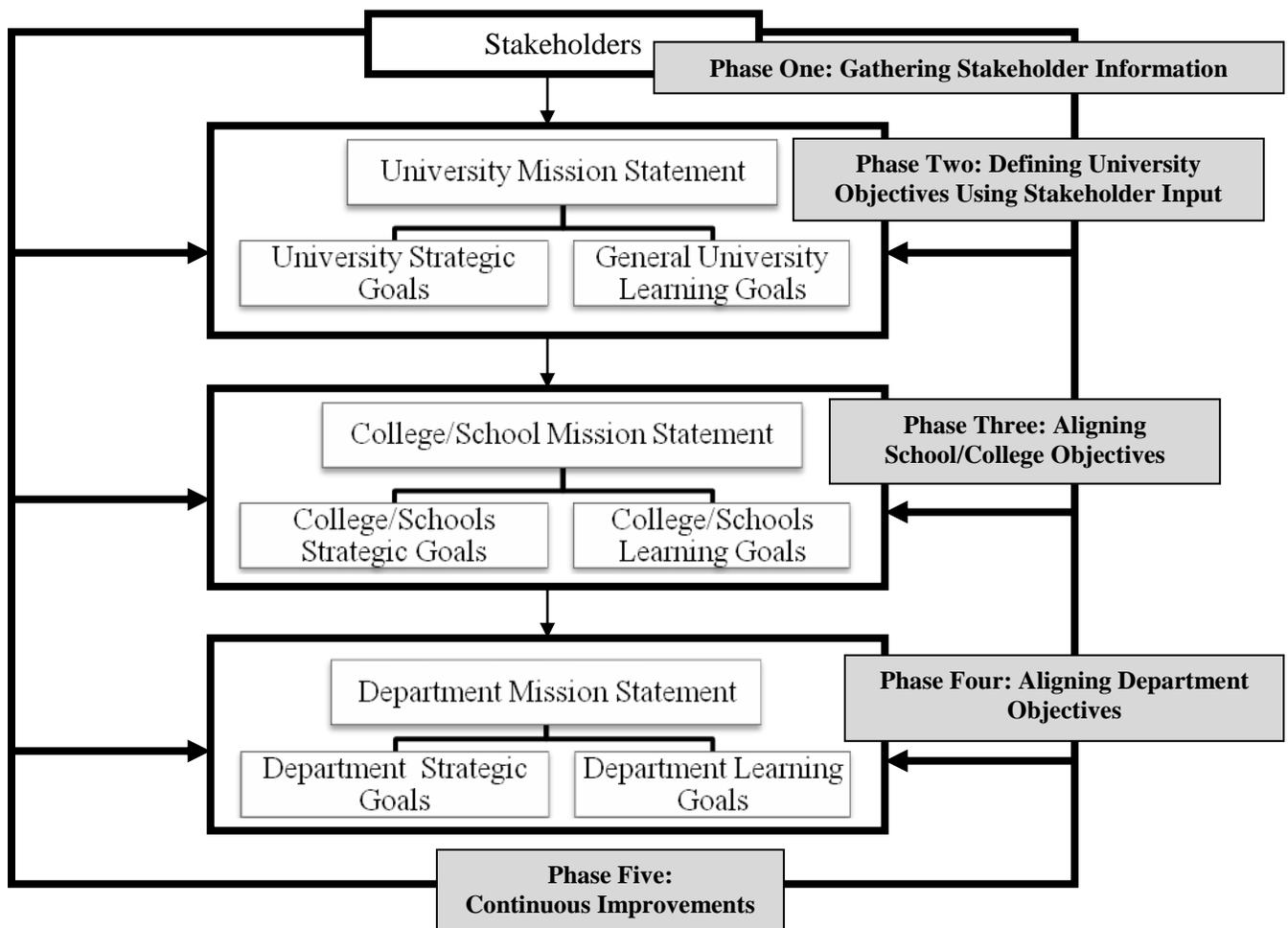
IMPLEMENTING THE PROPOSED ASSESSMENT MODEL AT FSU

Phase One: Gathering Stakeholder Information

As we were implementing our initial AoL process, the UNC system commissioned the UNC Tomorrow initiative. The initiative was developed to proactively anticipate and identify the needs of North Carolina (NC) residents. The project began with a year long research study which included in depth dialogues with community residents, faculty,

businesses, nonprofit organizations, and government leaders. Their research study was summarized in a UNC Tomorrow report which outlined 7 major findings (UNCTC 2007). The 17 constituent UNC system institutions were then charged with the task of developing institutional missions, programs, curriculums, and assessment procedures which address the needs of NC residents. Deficiencies in the existing AoL process and the UNC Tomorrow charge presented an opportunity for FSU to enhance student learning outcomes by incorporating stakeholder information.

Figure 2: Strategic Planning and Assessment Model



Phase Two: Defining University Objectives Using Stakeholder Input

FSU revised their mission statement and developed a strategic plan in response to UNC Tomorrow findings. The university's strategic plan included the following six priorities: 1.) Improving retention and graduation rates; 2.) Stimulating economic transformation; 3.) Developing intellectual and cultural centers; 4.) Creating leaders and global citizens; 5.) Fostering collaborations and partnerships; and 6.) Promoting fiscal resourcefulness and

sustainability. After developing the university's strategic plan, administrators asked all academic units to review and update their mission statements, strategic plans, and learning goals to ensure consistency with university objectives. Schools/colleges were provided general guidelines to assist with implementing their directives.

FSU adopted Taskstream software to manage all strategic planning and assessment activities. The software simplifies administrative monitoring of university operations and allows administrators to easily generate reports detailing learning goal assessments and unsuccessful attempts at meeting AoL objectives. These reports will help administrators determine whether adequate improvement plans are in place to improve future learning activities. Moreover, reports can reveal patterns of similar failing assessment outcomes across departments and prompt administrators to consider more global improvement planning options, such as providing core subject tutoring labs, prerequisite changes, or curriculum modifications to improve student learning. All departments were required to attend Taskstream software training.

Phases Three and Four: Aligning School/College and Department Objectives

Phases Three and Four are still ongoing works in progress. The School of Business and Economics convened an SBE Advisory Board (consisting of graduates, business leaders, and potential employers) to solicit business stakeholder feedback. Strategic goals/learning outcomes will be aligned from the university level down to departmental units, and coordinated throughout SBE. All university guidelines will be adhered to regarding revising unit missions, updating (and aligning) strategic plans, organizing assessment initiatives, and maintaining Taskstream documents (including learning goals, assessment instruments, assessment data, and improvement plans).

Phase Five: Continuous Improvements

SBE will require departments to set target goals regarding student achievement for each learning outcome. Departments will be mandated to review assessment results each year and develop plans to augment learning strategies when achievement goals are not attained. All deficient learning outcome areas must be reassessed the following year to determine the effectiveness of the improvement plans; after a year, if the plans do not improve student learning results, alternative solutions must be explored. Learning goals must be continuously reassessed each year, until the goals are consistently realized. All improvement plans, target goals, and assessment results will be managed and maintained in Taskstream. The assessment data will be continuously reviewed by the Dean and upper level administrators.

CONCLUSION AND FUTURE WORKS

The proposed AoL framework has far reaching implications that can benefit students, academic institutions, communities and numerous industries. Through using SCM practices of best in class organizations, universities will be able to reduce duplication of resources and provide a stakeholder driven education that is both relevant and rigorous.

As FSU culminates the third and fourth phases, it will be apparent that the university mission, strategic goals, and assessment processes are developed and aligned in direct response to the stakeholders' needs assessment. Our future research will focus on enhancing continuous improvement strategies.

REFERENCES

- AACSB International. (2003). *Eligibility procedures and standards for business accreditation*. St. Louis, MO.
- AACSB (2006). *Eligibility procedures and accreditation standards for business accreditation*. Retrieved July 13, 2011, from <http://www.aacsb.edu/accreditation/business/STANDARDS.pdf>
- AACSB. (2007). *AACSB assurance of learning standards: An interpretation*. Retrieved July 13, 2011 from <http://www.aacsb.edu/accreditation/Papers/AOLPaper-final-11-20-07.pdf>
- Ammons, J. L., & Mills, S. K. (2005). Course-embedded assessments for evaluating cross-functional integration and improving the teaching learning process. *Issues in Accounting Education*, 20(1),1-19.
- Apostolou, B. A. (1999). Outcomes assessment. *Issues in Accounting Education*, 14(1),117-197.
- Buckman, K. (2007). What counts as assessment in the 21 century? *Thought and Action: NEA Higher Education Journal*, 23, 29-37.
- Business-Higher Education Forum (2004). Public Accountability for Student Learning in Higher Education. Retrieved June 2011 from http://www.bhef.com/publications/documents/public_accountability_04.pdf . (American Council of Education)
- Christopher, M. (1992). *Logistics and Supply Chain Management*. London: Pitman Publishing.
- Coyle, J., Langley, C., Gibson, B., Novack, R. & Bardi, E. (2008). *Supply chain Management: A Logistics Perspective*. Ohio: South-Western Cengage Learning.
- DeZure, D. (Ed.), (2000). *Learning from Change*. Virginia: Stylus Publishing.
- Fawcett, S. (2008). Benefits, barriers, and bridges to effective supply chain management. *Supply Chain Management: An international journal*, 13(1), 35-48.

Garceau, L. & Tarnoff, K.A. (2011). "Seeking Initial or Maintenance of Accreditation: What a Peer Review Team Really Looks For When It Comes To AoL." AACSB Assessment Conference, Atlanta, GA. March 14-16, 2011.

Gardiner, L. R., Corbitt, G. & Adams, S. J. (2010). Program assessment: Getting Practical How To Model. *Journal of Education of Business*, 85, 139-144.

Hollister, K. K. & Koppel, N. B. (2006), Framework for Meeting AACSB Internationals assurance of Learning Requirements: Application to Information Technology. *Journal of Informatics Education Research*, 8 (3), 1-14.

Kelley, C., Tong, P. & Choi, B.J. (2010). A review of Assessment of Student Learning Programs at AACSB Schools: A Dean's Perspective. *Journal of Education of Business*, 85, 299-306.

Lightner, C. (2011). "Integrating AoL into the Strategic Planning Process." AACSB Assessment Conference, Atlanta, GA. March 14-16, 2011.

Lubinescu, E.S., Ratcliff, J.L. & Gaffney, M.A.(2007). Two Continuums Collide: Accreditation and Assessment. *New Directions for Higher Education*, 113, 5-21.

Martell, K. (2007). Assessing student learning: Are business schools making the grade. *Journal of Education of Business*, 82, 189-195.

Mentzer, J. , DeWitt, W., Keebler, J., Min, S., Smith, C. & Zacharia, Z. (2001). Defining Supply Chain Management. *Journal of Business Logistics*, 22(2), 1-25.

Mittelstaedt, R. (1992). Benchmarking: How to Learn from Best-in-Class Practices. *Global Business and Organizational Excellence*, 11 (3), 301-315.

Paterno, J.(1998). Foot ball coach speech presented at Penn State University

Patton, M. (2001). Learned Evaluation, Knowledge Management, Best Practices, and High Quality. *American Journal of Evaluation*, 22, 329-336.

Pringle, C., & Michel, M. (2007). Assessment practices in AACSB Accredited Business Schools. *Journal of Education of Business*, 82, 202-211.

SACS (2007). Principles of Accreditation: Foundation for Quality Enhancement. 2007 Interim Edition. Retrieved June 2011 from <http://www.sacscoc.org/pdf/2007%20Interim%20Principles%20complete.pdf>.

SACS (2008), Principles of Accreditation: Foundation for Quality Enhancement. 2008 Edition. Retrieved June 2011 from <http://www.sacscoc.org/pdf/2008PrinciplesofAccreditation.pdf>.

Shaftel, J., & Shaftel, T. L. (2007). Educational assessment and the AACSB 2007. *Issues in Accounting Education*, 22, 215-232.

Stewart, G. (1995). Supply chain performance benchmarking study reveals keys to supply chain excellence. *Logistics Information Management*, 8(2), 38-44.

Tompkins, J. (2000). Speech presented at the warehouse of the future conference (Atlanta, GA)

UNC Tomorrow Commission (2007). UNC Tomorrow Commission Final Report. Retrieved June 2011 from

http://www.northcarolina.edu/nctomorrow/reports/commission/Final_Report.pdf .

Van Vught, F.A (1994). "Intrinsic and Extrinsic Aspects of Quality Assessment in Higher education." In Westerheijden, D.F., Breenan, J., and Massen, P. A. M. (eds.), *Changing Contexts of Quality assessment*. Utrecht: Lemma.

Weldy, T. G., Spake, D. E, & Sneath, J. Z. (2008). Challenges and best practices: Meeting AACSB and SACS requirements. *Proceedings of the 4th Annual Academic Business World International Conference*, 119--128.

Weldy, T. G. & Turnispeed, D. L. (2010). Assessing and Improving Learning in Business Schools: Direct and Indirect Measures of Learning, *Journal of Education of Business*, 85, 268-273.

CHALLENGES IN IMPLEMENTING THE ASSURANCE OF LEARNING PROGRAM

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ABSTRACT

All business schools that are accredited by AACSB are required to develop and implement Assurance of Learning (AOL) Programs. The primary goal of AOL program at a member school is to systematically gather, analyze, and report evidence of student learning to stakeholders and utilize the findings to develop and implement strategies to improve curricula. A successful implementation of AOL program results in two main benefits to the institution: assessment of learning goals and objectives (1) results in a continuous improvement in education quality and (2) provides necessary documentation to satisfy requirements of the accrediting bodies. To help business schools in developing and implementing an assessment process, AACSB provides specific guidelines in its Standards for Accreditation [1], as well as conducts several workshops each year. However, to institute a mature AOL program takes time and an understanding of the common pitfalls to avoid. This paper reports experiences of one university in the AOL process and gives examples of good and bad practices as we strive to improve.

INTRODUCTION

The AOL process centers around five main steps. These are: (1) developing learning goals and objectives, (2) aligning curriculum with goals, (3) identifying method and measures, (4) collecting, analyzing and reporting data, and (5) closing the loop. Each school follows the same five steps but enjoys a great amount of flexibility in terms of strategies to execute each step. This flexibility leads to extensive variability in the implementation of AOL program at member schools. Schools, especially in the first few assessment cycles, may be inclined to choose strategies that appear easy to implement at the expense of undermining the validity of the process itself. Peer Review teams evaluate both continuity and quality of the AOL process during the reaccreditation visits. The goal of this paper is to highlight some of the challenging choices that schools make regarding the process as well as the structure of the AOL program and how these choices affect the AOL program quality.

CHALLENGES IN DEVELOPING THE ASSURANCE OF LEARNING PROCESS

1. Developing Learning Goals and Objectives

The AOL process begins with a clear statement of a set of learning goals and objectives. Learning goals represent type of knowledge, skill, and attitudes the school would like its students to possess upon graduation. These goals should reflect the mission of the university as well as expectations of the industry in its potential hires. Generally, in small teaching schools the task of

creating an assessment plan falls upon a committee. The committee is responsible for deciding the initial type and number of learning goals to be adopted by the school. The challenge for the committee is to reconcile and reflect the expectations of the internal stakeholders such as students, faculty and the University and external stakeholders such as industry and accrediting bodies in its conceptualization of learning goals and objectives. The initial draft is presented to the faculty body for adoption. It is vital at this stage that appropriate amount of discussions are held with the entire faculty body to generate a sense of ownership and buy in into the process. A set of learning goals may require changes over time to accommodate the dynamism of the business environment. For example business schools are now beginning to recognize the emerging importance of socially responsible behavior and sustainable business practices in the society and reflect it in their AOL programs. Schools must be vigilant of the business trends and changing requirements of the industry to bring appropriate adjustments to the knowledge and skill sets of its graduates. Therefore, it is important to cyclically review and revise learning goals to maintain harmony between industry demand and institutional supply of student learning.

2. Aligning Curriculum with Goals

Once a set of learning goals and objectives is adopted, the next step is to identify where in the curriculum this learning will take place. This step requires input from each faculty member about their courses to map each course offered by the school to some learning objective. It is reasonable to assume that although each course will not cover all learning objectives, each should cover at least one. The major challenge to complete this step is the difficulty in gathering information about each course. Some faculty members are more forthcoming than others, and the time pressure may incline the committee to map only those courses to learning objectives on which the information is readily available. Since the course map also acts as a sample frame during the assessment phase, courses that were mapped will be assessed heavily whereas courses that were omitted will not be assessed at all.

3. Identifying Methods and Measures

The choice of methods and measures will primarily depend on whether the school chooses to utilize an indirect approach to assess student learning or a direct approach. An indirect approach entails measuring perceived learning through surveying alumni, employers or graduating students; whereas, a direct approach utilizes in-class demonstration of student learning through exams, projects, exercises, simulations, etc. Accrediting bodies prefer schools to pursue direct or course embedded assessment as the primary method of choice as such measures can provide great insights into effectiveness of teaching strategies on student learning. The major challenges at this stage are to identify where in the curriculum each objective will be assessed, which methods will be adopted to collect data on each objective, and who will be responsible for conducting the assessment. The course map developed during step 2 serves as a sampling frame for identifying courses to assess learning objectives. For course embedded assessment, faculty members teaching the selected courses are required to develop appropriate assessment vehicles and build the assessment activity into their respective class syllabi. In an effort to obtain required sample size, frequently multiple courses or multiple sections of a course are targeted per objective. The challenge for the assessment committee is to maintain an effective oversight on individual class activities to maintain content validity. For example, different assessment

vehicles may be implemented in two different courses measuring critical thinking. One faculty member may ask students to analyze a short case for a course while another may require students to answer an essay question. In spite of the difference in methods, the same objective scale should be applied to assess students' ability to think critically. At our school, faculty members assessing the same objective create and share a common rubric to assess students' work.

4. Data Collection and Reporting

The committee usually collects data from all sampled courses and prepares a report based on the data analysis. It is important that results of the assessment process are disseminated to the entire faculty body and implications of the results be discussed to identify strengths and weaknesses of the curriculum. Generally, faculty meetings become the forum for such presentations and discussions. During such meetings, assessment reports are one among many items on the agenda and may not get the required time for a fruitful discussion to take place. In response to this challenge, at South Carolina State a day is set aside at the end of the academic year to discuss assessment results and future actions at length.

5. Closing the Loop

Peer Review Teams have noted that the biggest challenge in AOL has been closing the loop. This refers to using results to make positive changes in the curriculum. The extent of data generated each semester is fruitless unless and until the data can be used to identify curriculum changes and faculty development strategies. However, curriculum changes take time and require faculty consensus. Also, the effect of curriculum changes is only seen after some time has elapsed for the changes to be effective. The biggest challenge at this stage is to get faculty to initiate and adopt changes to curriculum or teaching strategies. One area identified by the AOL process at SC State as needing improvement is communication, particularly writing. A Title III grant was developed to move towards addressing this issue. A 'Writing Across the Curriculum in Business' (WACB) program was developed that included the development of a writing lab, writing competitions, writing workshops for students and faculty and a summer writing institute. In early summer 2011, Business Program faculty members led the Business Program Summer Student Writing Institute. The event was sponsored by the WACB Program. The writing institute was developed as an enrichment program for students to enhance the ability to discover, refine, and communicate their ideas in writing. All undergraduate and graduate students majoring in business at SC State University were eligible to participate. The writing enrichment program was designed for students who wanted to improve their writing skills and develop their own style and wanted to explore writing for publication. Participants in the program were expected to delve into the full writing process, including revision and publication, sharing writing in small groups, writing intensive activities and spending mentoring time with published writers. Using scholarly publications as models, students examined the elements of effective writing and applied them to their individual project. The following writing components were emphasized: exploring the research gap; asking a significant question; developing a working hypothesis and thesis statement; writing an abstract, introduction, body, and conclusion; creating a literature review; developing the discussion and implications; integrating research; using academic voice; writing clearly and succinctly; integrating citations; and documenting sources.

CONCLUSION

The paper highlights common challenges faced by business schools during the implementation of the AOL process. The goal of the paper is not to provide an exhaustive list of issues but to present common issues as identified by the authors at their school. The authors recommend that schools continue to critically evaluate and revise the AOL process as well as the organization of the process in terms of allocation of resources and personnel.

REFERENCES

[1] www.aacsb.edu/accreditation/standards/

GENDER BIAS IN STUDENT EVALUTIONS OF TEACHING

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ABSTRACT

A large data set of student course evaluations from a private, liberal arts, master's university is analyzed. Both the faculty and the student body are approximately seventy percent female. Some previous published research found higher evaluations or perceptions of women, others found higher scores for men, yet others reported no differences. The effect of institution, discipline, and course has been reported to mediate some but not all gender biases. The data set was analyzed to isolate gender from other factors such as rank and seniority. There was no difference by gender in student evaluation scores of faculty at senior faculty ranks. However, at junior ranks, male faculty received significantly higher teaching evaluations than their female colleagues. A survey was created to assess explicit gender and other bias among the student raters of faculty. Results of the analysis of the data set and the gender bias survey are reported. Implications for future research and the use of student evaluations are discussed.

INTRODUCTION

Effective teaching has many definitions [9]. As a result, there is little agreement in how to evaluate teaching effectiveness. Agreement centers on the ideas that institutions should first identify the uses of their evaluation system and should formulate their own system that includes student input. In an increasingly customer-centric system of higher education, it is difficult to argue against giving students an opportunity to provide feedback on their perceptions of the education they are receiving. There is a large body of work that questions how student feedback should be collected and interpreted and how that information should be used (e.g. promotion and tenure decisions). An additional body of literature has identified a number of factors that appear to mediate evaluations of faculty, orthogonal to actual teaching performance. These include factors related to the professor such as attractiveness, ethnicity and gender, and factors more relevant to the course such as discipline, level, and institution type. While the literature has been clear to identify these biases as potential contributors to evaluations, administrators often fail to consider bias in interpretation and use of evaluation data.

In our university, course evaluations are conducted at the end of each semester for every course. Students are asked to rate their agreement with each of sixteen aspects of the course and instructor on a five-point scale. Contrary to what would be predicted by chance, thirty-four percent of all course evaluations contained the highest scores possible across every item in the evaluation. Although we might aspire to having students who are raving fans, this type of

response confounds other analyses, and may be due to reasons other than the students' perception of the highest level of excellence in the course and instructor.

In the remaining sections, a brief review of relevant literature from a vast body of work on student course evaluations is presented. We then analyze the differences observed between male and female faculty evaluations. A survey instrument was designed to elicit whether students have a gender bias in evaluating instructors. The findings from an analysis of this survey are presented. Conclusions and implications are discussed.

LITERATURE REVIEW

A considerable amount of research has focused on the reliability and validity of student evaluations. In an effort to clarify the issues surrounding student evaluations, Peterson, et.al. [11] developed a taxonomy of the literature based on a Journal Storage (JSTOR) search of student evaluations of teaching which returned over 5,200 listings. Using Peterson's taxonomy of the literature, the work reported here fits into the category "factors influencing students' ratings". They divide this category into teaching-related factors and non-teaching-related factors, with the latter group including semester, course session, faculty type, course level, course focus, and course type. They found that non-teaching factors could cloud the assessment of teaching-related factors.

In a specific test of factors that influence evaluations, Felton & Stinson [5] found that about half of the variation in students' evaluations of instructor quality could be explained by the students' ratings of the instructor's easiness and sexiness. They caution "If these findings reflect the thinking of American college students when they complete in-class student opinion surveys, then universities need to rethink the validity of student opinion surveys as a measure of teaching effectiveness" [5, p. 91]. Based on a review of the literature, Wright [14] also found that student consumers rate instructors using a different set of criteria than do faculty peers or administrators. He further suggest that students may, in fact, use criteria unrelated to learning and further, prefer styles detrimental to their learning.

The work of Shevlin, et. al. [13] suggests that there is a central trait which influences student's evaluations of the lecturer. They used a confirmatory factor analysis model of lecturer ability, module effectiveness, and lecturer charisma. They found that the charisma factor explained 69% of the variance in lecturer ability and 37% of the variance in module attributes. In a review and call for more research on course evaluations, Trout [14] suggested that "what numerical forms apparently measure is the degree to which students are happy or satisfied with the instructor (personality), the course (requirements), and the outcome (grade)."

Feeley [4] defined a halo effect in student evaluations as the "...individual rater's failure to discriminate among conceptually distinct aspects of a stimulus person's behavior" [4, p. 226]. He presents a detailed review of studies of the halo effect in psychological measurement. He found considerable overlap among factors related and unrelated to teaching effectiveness, content, and

teaching behaviors. He concluded that student evaluations of teaching are influenced by a halo effect. Repede, Clark and McGrath [12] found a halo effect that artificially inflated course evaluation. The halo effect was attributed to students' perception of instructor "likeability" and sense of humor. Other factors, however, clearly affect likeability.

Results from studies of gender differences in student evaluations of teaching have been complex and at times equivocal. Research in this area was at its peak in the 1980 and 1990s with numerous simulation, survey, and actual teaching evaluation examinations. While some research found higher evaluations or perceptions of women, others found higher scores for men, yet others reporting no differences [7]. The effect of institution, discipline and course appear to mediate some but not all gender biases with women receiving higher ratings in feminine stereotyped courses (e.g., service related courses) and men receiving higher scores in masculine stereotyped courses (e.g., business courses) [1]. Other research found a relationship between student gender and faculty gender with female students rating women faculty higher than men, while male students showed no gender bias [2]. One fairly consistent earlier finding was that classes taught by women contained more interaction and more participation than classes taught by men [7]. Interestingly, in those same studies, classes with more student participation were associated with lower competency ratings for faculty [8]. There is no question about the continued existence of general gender biases favoring men, at least on an implicit level. People are much less willing to openly acknowledge explicit sexism (or racism for that matter). Since faculty evaluations would fall prey to implicit bias, it would make sense that these biases translate to differences in evaluations of men and women faculty. Most researchers have concluded that general gender based attitudes can and do affect student evaluations of faculty. However, there has been little recent research on gender bias in student evaluations of university faculty. This paper presents an examination of both implicit and explicit bias in faculty evaluations.

METHODOLOGY

Our university is small, liberal arts, master's university. The university uses an in-class survey administered at the end of each semester for students to rate sixteen aspects of the course and instructor (Appendix 1). Because the survey is administered within regular class meetings, it has a response rate exceeding ninety-five percent. The survey was developed in 1994. It was created using questions identified in the literature as exhibiting the highest validity and reliability, at that time. Students rate their agreement with these sixteen items on a five-point Likert scale. The survey is constructed in such a way that all items are positive expressions. A computed variable, "total score" was also created within this study. Therefore, "strongly agreeing" (5 points) is the highest rating for each item and the maximum possible is 80 points, representing a "perfect score" of "all fives".

A total of 22,224 student evaluations of teaching in undergraduate lecture courses were completed in the fall and spring semesters from fall 2008 through fall 2010. Online, hybrid, and

directed-study courses were excluded from this study. De-identified faculty data were linked to course evaluations. This data included faculty status (full-time vs. part-time and adjunct), faculty seniority (Professor and associate vs. assistant and instructor) and faculty gender. This research has received the approval of the Queens University IRB.

An analysis of variance (ANOVA) was initially conducted to explore the main and interaction effects of gender, seniority, and status on the dependent variable “total score”. The main effect of gender and the interaction effect of gender and seniority were significant ($p < .00$ for each). The main effect of seniority was not significant ($p = .28$). No other effects were significant.

Based on this result, a t-test of means for total score was conducted, controlling for seniority. Within the subset of evaluations of faculty at the rank of associate or full professor, there was no significant difference between faculty gender (Table 1). For junior faculty, however, the difference of total score by gender was significant (Table 2). A series of t-tests for the mean by gender of each of the sixteen evaluation items was conducted. Students rated male faculty significantly higher than female faculty on every one of the sixteen items (Table 3).

TABLE 1: EVALUATION TOTAL SCORE BY GENDER FOR SENIOR FACULTY

	Gender	N	Mean	Std. Deviation	Std. Error Mean	significance
Total	F	3644	71.70	15.552	.258	.191
	M	3458	71.24	13.582	.231	

TABLE 2: EVALUATION TOTAL SCORE BY GENDER FOR JUNIOR FACULTY

	Gender	N	Mean	Std. Deviation	Std. Error Mean	significance
Total	F	9892	68.52	16.593	.167	.000
	M	2923	70.82	14.733	.273	

TABLE 3: EVALUATION ITEMS BY GENDER FOR JUNIOR FACULTY

	Gender	N	Mean	Std. Deviation	Std. Error Mean	significance
R1	F	9892	4.44	1.091	.011	.000
	M	2923	4.53	.956	.018	
R2	F	9892	4.40	1.131	.011	.002
	M	2923	4.48	1.029	.019	
R3	F	9892	4.38	1.152	.012	.000
	M	2923	4.51	1.019	.019	
R4	F	9892	4.15	1.291	.013	.000
	M	2923	4.34	1.150	.021	
R5	F	9892	3.99	1.377	.014	.000
	M	2923	4.24	1.224	.023	
R6	F	9892	4.28	1.202	.012	.000
	M	2923	4.42	1.060	.020	
R7	F	9892	4.25	1.191	.012	.000
	M	2923	4.37	1.097	.020	
R8	F	9892	4.35	1.158	.012	.000
	M	2923	4.48	1.036	.019	
R9	F	9892	4.26	1.230	.012	.000
	M	2923	4.36	1.129	.021	
R10	F	9892	4.44	1.134	.011	.000
	M	2923	4.58	.993	.018	
R11	F	9892	4.40	1.200	.012	.000
	M	2923	4.54	1.050	.019	
R12	F	9892	4.22	1.272	.013	.000
	M	2923	4.37	1.093	.020	

R13	F	9892	4.34	1.256	.013	.000
	M	2923	4.50	1.066	.020	
R14	F	9892	4.28	1.272	.013	.000
	M	2923	4.45	1.097	.020	
R15	F	9892	4.19	1.280	.013	.000
	M	2923	4.30	1.144	.021	
R16	F	9892	4.15	1.366	.014	.000
	M	2923	4.36	1.192	.022	

A survey instrument was designed to elicit more explicit gender bias in evaluating instructors. In order to reduce reactivity and to gather data on other areas of bias, student were asked to compare men and women, majority and minority ethnic/race faculty, junior, senior faculty, and old and young faculty. The survey asks students to rate each of these instructors as a group on each of the sixteen items in the course evaluation (Appendix 2). Anonymous demographic data about the student respondent was also collected as part of the survey. The survey was a voluntary, anonymous questionnaire presented to a convenience sample of undergraduate students.

Fifty-nine students responded to the survey. The proportions of students by ethnicity, gender, and class are approximately equal to those proportions within the student body as a whole (Table 4)

TABLE 4: FREQUENCY OF RESPONSES

		<i>What is your student status?</i>				<i>Total</i>
		<i>Freshman</i>	<i>Sophomore</i>	<i>Junior</i>	<i>Senior</i>	
<i>What is your gender</i>	<i>Male</i>	5	5	7	4	21
	<i>Female</i>	2	3	19	14	38
<i>Total</i>		7	8	26	18	59

		ethnicity		Total
		majority	minority	
What is your gender	Male	14	6	20
	Female	28	9	37
Total		42	15	57

FINDINGS

A series of paired t-tests of means was conducted for each of the faculty groups on the evaluation item “This was an excellent course”. There were no significant differences (Table 5).

TABLE 5: THIS WAS AN EXCELLENT COURSE

	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
Pair 1 Part -time/Adjunct Faculty - Full-time Faculty	.03333	1.14931	.14837	.225	59	.823
Pair 2 Male Faculty - Female Faculty	.15000	.68458	.08838	1.697	59	.095
Pair 3 Minority Race/Ethnicity Faculty - Majority Race/Ethnicity Faculty	.16667	.71702	.09257	1.800	59	.077
Pair 4 Senior Faculty - Junior Faculty	-.03333	.51967	.06709	-.497	59	.621
Pair 5 Younger Faculty - Older Faculty	-.01695	.47312	.06160	-.275	58	.784

A similar test was conducted for the item “This was an excellent instructor”. The only significant difference was on the dimension of faculty ethnicity (Table 6).

TABLE 6: THIS WAS AN EXCELLENT INSTRUCTOR

	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
Pair 1 Part -time/Adjunct Faculty - Full-time Faculty	.07018	.97942	.12973	.541	56	.591
Pair 2 Male Faculty - Female Faculty	.01754	.40050	.05305	.331	56	.742
Pair 3 Minority Race/Ethnicity Faculty - Majority Race/Ethnicity Faculty	.17544	.57080	.07560	2.320	56	.024
Pair 4 Senior Faculty - Junior Faculty	-.01724	.51269	.06732	-.256	57	.799
Pair 5 Younger Faculty - Older Faculty	-.06897	.55763	.07322	-.942	57	.350

Based on the significant difference of ethnicity on “This is an excellent instructor”, minority and majority ethnicity faculty groups were compared across all items. Survey respondents reported that minority faculty demonstrated each and every item on the survey more often (i.e., were better) than majority ethnicity faculty. These differences were significant ($p < .05$) for seven of the sixteen items (Table 7).

TABLE 7: EVALUATION ITEMS BY ETHNICITY

		Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
Pair 1	Minority Race/Ethnicity Faculty - Majority Race/Ethnicity Faculty	.13333	.59565	.07690	1.734	59	.088
Pair 2	Minority Race/Ethnicity Faculty - Majority Race/Ethnicity Faculty	.13333	.43048	.05557	2.399	59	.020
Pair 3	Minority Race/Ethnicity Faculty - Majority Race/Ethnicity Faculty	.15000	.48099	.06210	2.416	59	.019
Pair 4	Minority Race/Ethnicity Faculty - Majority Race/Ethnicity Faculty	.14754	.40150	.05141	2.870	60	.006
Pair 5	Minority Race/Ethnicity Faculty - Majority Race/Ethnicity Faculty	.16667	.71702	.09257	1.800	59	.077
Pair 6	Minority Race/Ethnicity Faculty - Majority Race/Ethnicity Faculty	.11667	.64022	.08265	1.412	59	.163
Pair 7	Minority Race/Ethnicity Faculty - Majority Race/Ethnicity Faculty	.21667	.64022	.08265	2.621	59	.011
Pair 8	Minority Race/Ethnicity Faculty - Majority Race/Ethnicity Faculty	.18644	.65586	.08539	2.183	58	.033
Pair 9	Minority Race/Ethnicity Faculty - Majority Race/Ethnicity Faculty	.18333	.46910	.06056	3.027	59	.004
Pair 10	Minority Race/Ethnicity Faculty - Majority Race/Ethnicity Faculty	.08333	.49717	.06418	1.298	59	.199
Pair 11	Minority Race/Ethnicity	.13333	.50310	.06495	2.053	59	.045

	Faculty - Majority						
	Race/Ethnicity Faculty						
Pair 12	Minority Race/Ethnicity	.16949	.49663	.06466	2.621	58	.011
	Faculty - Majority						
	Race/Ethnicity Faculty						
Pair 13	Minority Race/Ethnicity	.07143	.49935	.06673	1.070	55	.289
	Faculty - Majority						
	Race/Ethnicity Faculty						
Pair 14	Minority Race/Ethnicity	.07143	.49935	.06673	1.070	55	.289
	Faculty - Majority						
	Race/Ethnicity Faculty						
Pair 15	Minority Race/Ethnicity	.12069	.42209	.05542	2.178	57	.034
	Faculty - Majority						
	Race/Ethnicity Faculty						
Pair 16	Minority Race/Ethnicity	.17544	.57080	.07560	2.320	56	.024
	Faculty - Majority						
	Race/Ethnicity Faculty						

CONCLUSIONS AND IMPLICATIONS

A number of different results emerged in the data. First, gender differences in evaluations were complex, in keeping with previous literature. In the explicit test of gender bias (survey items), students declared a clear lack of bias on all aspects of teaching. However, on the implicit measures of evaluation, biases were evident, but again complex. Women who hold junior faculty positions were rated lower than junior men, with no similar difference at senior ranks. So while students say they are not biased, in practice they are. This is consistent with the broader literature on explicit and implicit gender and ethnicity bias. It is socially unacceptable to say that men are better than women or that majority ethnicity/race is better than minority/ethnicity. As was the case in early changes in sexism, showing that you favor minority over majority individuals is preferred. This appears to be the case in the survey of explicit biases. Only implicit gender biases were examined in this study and reveal ongoing negative views of women faculty, specifically at the junior level.

Gender bias in lower ranks may be much more problematic than at senior levels since course evaluations impact junior faculty more than senior faculty. Senior faculty are more immune to poor evaluations from students since they do not have tenure and promotion looming over them. Junior faculty do have to meet expectations for tenure and promotion and course evaluations are often a heavily weighted factor in these decisions.

Moreover, although there are more women in academia now than in 1980 and 1990s, women still hold disproportionately more lower level (part time, non-tenured) and receive lower salaries than men. Finkelstein [6], in summarizing an extensive review of studies on female faculty, found that women tended to be segregated by discipline and by institutional type; to be disproportionately represented at lower ranks; to get promoted at a slower rate than their male colleagues; to participate less in governance and administration; and to be compensated at a rate that averaged only 85 percent of that of their male colleagues. Newell and Kuh [10], who had conducted a fairly large national survey of professors of higher education, reported that women had generally lower academic-year salaries and heavier teaching loads than men and that they perceived more pressure to publish and were less happy with the structure of their departments. Differences such as these have led some authors to use the term "chilly" to describe the academic climate experienced by women faculty member. Add implicit biases, and junior women faculty have indeed a harder path to success.

Another interesting possibility is not to look at junior (usually younger) women faculty as receiving lower evaluations than men or senior faculty but rather as junior male faculty as being advantaged relative to other groups. This finding is interesting in light of the high percentage (70%) female student body. It may be that female students see young male faculty as "better" than other groups based on general likeability and attractiveness. Young women may see these young men as more attractive and therefore better teachers. This would be consistent with literature finding that evaluations are higher for those faculty perceived as more attractive.

In our earlier study of halo effects in teaching evaluations, our analysis suggested that if a university wants only to maximize teaching evaluation scores, then the university should hire "likeable faculty who have a good sense of humor" [12, p. 849]. The work reported here might suggest that our original suggestion should be amended to "young, likeable, male faculty who have good sense of humor. Alternatively, biases could and should be considered in the interpretation and use of evaluation data.

APPENDIX 1: COURSE-INSTRUCTOR EVALUATION

(Strongly Disagree, Disagree, Neither Agree Nor Disagree, Agree, Strongly Agree)

1. Course objectives were clearly stated on the syllabus
2. Course requirements and grading system were clearly stated on the syllabus
3. Specific course content was related to the overall course objectives
4. This course significantly increased my understanding of the subject
5. This was an excellent course
6. Tests, projects, presentations, and papers were graded fairly
7. Tests and assignments were returned promptly
8. The instructor was well prepared for class
9. The instructor used class time productively
10. The instructor demonstrated knowledge of the subject
11. The instructor showed enthusiasm and genuine interest in this course
12. The instructor demanded the 'best work possible' from me
13. The instructor was courteous and respectful to students
14. I felt free to express ideas and ask questions in class
15. The instructor was available outside of class for help
16. This is an excellent instructor

APPENDIX 2: RESPONSE STYLE SURVEY

(Sample Question)

Teaching Evaluation Survey					
1. These faculty clearly state objectives on the syllabus.					
	Never	Rarely	Sometimes	Often	Always
Part -time/Adjunct Faculty	<input type="radio"/>				
Full-time Faculty	<input type="radio"/>				
Male Faculty	<input type="radio"/>				
Female Faculty	<input type="radio"/>				
Minority Race/Ethnicity Faculty	<input type="radio"/>				
Majority Race/Ethnicity Faculty	<input type="radio"/>				
Senior Faculty	<input type="radio"/>				
Junior Faculty	<input type="radio"/>				
Younger Faculty	<input type="radio"/>				
Older Faculty	<input type="radio"/>				

REFERENCES

- [1] Basow, S. A. Student Evaluations: The Role of Gender Bias and Teaching Styles.” In *Career Strategies for Women in Academe: Arming Athena*. Eds Lynn H. Collins, Joan C. Chrisler, and Kathryn Quina. (1998) Thousand Oaks: Sage Publications.
- [2] Bennett, S. K. Student Perceptions and Expectations for Male and Female Instructors: Evidence Relating to the Question of Gender Bias in Teaching Evaluation.” *Journal of Educational Psychology*. 74/ 2 (1982): 170-179.
- [3] Cooper, W.H. Ubiquitous Halo. *Psychological Bulletin*, 1981, 90, 218-244.
- [4] Feely, Thomas H. Evidence of Halo Effects in Student Evaluations of Communication Instruction. *Communication Education*, 2002, 51(3), 225-236.
- [5] Felton, J., Mitchell, J. & Stinson, M. Web-based Student Evaluations of Professors: The Relations Between Perceived Quality, Easiness and Sexiness. *Assessment & Evaluation in Higher Education*, 2004, 29(1), 91-108.
- [6] Finkelstein, M. J. "The Status of Academic Women: An Assessment of Five Competing Explanations." *Review of Higher Education*, 7 (1984), 233-46.
- [7] Goodwin, L.D. & Stevens, E.A. The influence of gender on university faculty’ members’ perceptions of “good” teaching. *The Journal of Higher Education*, 1993, 64(2), 166-185
- [8] Macke, A. S., L. W. Richardson, and J. Cook. Sex-typed Teaching Styles of University Professors and Student Reactions. Columbus: The Ohio State University Research Foundation, 1980.
- [9] Marsh, H. W. Weighting for the Right Criteria in the Instructional Development and Effectiveness Assessment (IDEA) System: Global and Specific Ratings of Teaching Effectiveness and their Relations to Course Objectives. *Journal of Educational Psychology*, 1994, 86, 631-648.
- [10] Newell, L. J., and G. D. Kuh. "Taking Stock: The Higher Education Professoriate." *Review of Higher Education*, 13 (1989), 63-90.
- [11] Peterson, Richard L., Berenson, Mark L., Misra, Ram B., and Radosevich, David J. An Evaluation of Factors Regarding Students’ Assessment of Faculty in a Business School, *Decision Sciences Journal of Innovative Education*, 2008, 6(2), 375-402.
- [12] Repede, J., Clarke, C., and McGrath, R. “Can Evaluations of Teaching be Too Good?” *Proceedings of the Southeast Decision Sciences Institute*, 2011. 843-851.

[13] Shevlin, M., Banyard, P., Davies, M. & Griffiths, M. The Validity of Student Evaluation of Teaching in Higher Education: Love me, love my lectures? *Assessment & Evaluation in Higher Education*, 2000, 25(4), 397-405.

[14] Trout, P. Flunking the Test: The Dismal Record of Student Evaluations. *Academe Online: Magazine of the AAUP*, 2000, 86(4).

[15] Wright, R. Student Evaluations of Faculty: Concerns Raised in the Literature, and Possible Solutions. *College Student Journal*, 2006, 40(2), 417-422.

Voice Chat and Second Language Oral Proficiency

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Abstract

This paper examines previous work on the effectiveness of computer-mediated communication (CMC) in improving language proficiency. Some of the advantages of CMC are pointed out, particularly the claims that it results in less hierarchical power relationships and tends to create a more stress-free communicative environment than face-to-face settings, especially classroom settings. Conflicting research reports on the efficacy of CMC vs. face-to-face communication in language acquisition are also reviewed. While there is a growing body of research literature on the use of both asynchronous and synchronous CMC in language teaching, the implementation of voice chat is still relatively new terrain, and the body of published research is rather small. Therefore, I propose a study on the effectiveness of voice chat vs. face-to-face communication in improving second language oral proficiency.

Voice Chat and Second Language Oral Proficiency

With advances in educational technology, the foreign language classroom is expanding beyond its traditional four walls. One of the most promising new technologies is computer-mediated communication (CMC), which comes in two guises: asynchronous, which includes email, discussion boards, blogs and the like, and synchronous, which includes real-time communication technologies such as text and voice chat. With the advent of synchronous CMC, students now have access to online conversation partners and tutors, even though they may be half a world away. These technologies can provide invaluable opportunity for conversation practice outside of the classroom. Given the absence of classroom time in distance education settings, along with the relatively undisputed proposition that conversation practice is essential to attaining spoken proficiency in a second language, chat technologies are a potential boon to the teaching of foreign languages at a distance.

Despite the obvious advantage that voice chat expands a student's pool of available conversation partners, it does have some potential limitations. Chief among these are the absence of non-verbal cues and shared spatial reference, both of which are available in face-to-face communication. Another potential shortcoming of chat technologies is that turn taking is less clearly defined than in face-to-face communication. While voice chat is a promising means for foreign language students to communicate with others online, we do not know whether it is as effective as face-to-face communication at improving second language oral proficiency. In the following sections I review previous literature on the advantages of CMC in language acquisition, and suggest a project to study the effectiveness of voice chat.

Literature Review

Interest in CMC has spawned a considerable amount of research. Perhaps the most obvious advantage of chat technologies is that they can easily be integrated into distance education settings, which increase access to foreign language education (and indeed to education

in general) for students who otherwise might not be able to participate in traditional courses taught in university classrooms. During graduate school I worked as an online German tutor for the distance education center of a major US university, which gave me the opportunity to experience first-hand the implementation of voice chat (Yahoo Messenger and Skype) as a tool for language teaching. My opinion was that it was an effective way to provide students with language practice. In this section I will review previous work on the use of synchronous CMC in FL teaching.

Planning Time

One of the benefits of CMC is that participants have more time to plan their conversational turns than in face-to-face communication. This is especially true with asynchronous communication, as students can write to one another with days or weeks intervening between message and response, but it is also true of synchronous CMC. Face-to-face communication is very fast, and CMC (at least the text-based variants) allows more time to plan conversational turns. Pacheo (1998), for example, found that asynchronous CMC allowed students more time to organize their thoughts before communicating. Beauvois' (1998) findings concurred with Pacheo's; she found that students participating in synchronous CMC via a local area network (LAN) produced language that was more formal and complex than when they engaged in face-to-face communication. Warschauer (1995) had similar findings; students participating in his chat project produced more total language, as well as language that was more formal and complex. Salaberry (2000) found that students produced past-tense forms correctly more often in a chat environment than face-to-face. He attributed this to the fact that students have more time to monitor themselves (see Krashen, 1981) in chat than in face-to-face communication.

Equality of Participation

Another major advantage to CMC is that students are able to participate in communication more equally than in classroom settings. Several studies have argued that CMC is less hierarchical and teacher centered than traditional classrooms (Warschauer, 1995; Collentine and Collentine, 1997; Beauvois, 1998; Salaberry, 2000). In CMC, participants can send messages whenever they desire, without having to wait for acknowledgement from the instructor to speak. For this reason, they produce more output in the CMC setting than in the classroom (Collentine and Collentine, 1997, pp. 413-414).

Beauvois found that students initiate topics in CMC more often than in the classroom, where topics are typically initiated and changed by the instructor (1998, p. 207). Hierarchical relationships in traditional classrooms exist not only among teachers and students, but also among more and less advanced students. Warschauer found that students participated on a more equal footing in CMC than in traditional classroom settings, where more advanced students tend to dominate (1995, p. 21).

The benefits of this type of format are readily apparent. Whenever students are allowed to control the flow of conversation, they produce more language. They are likely to be more interested in communicating, as they are free agents in the discussion, and help shape the course of the conversation. Salaberry argued that, since the hierarchical teacher-student and student-student structures present in the classroom are minimized in synchronous CMC, students have more freedom to set the topic and are therefore more goal-oriented, which can be a predictor of success in second language acquisition (Salaberry, 2000, p. 22).

There is also some evidence to suggest that learning may be more cooperative in a chat environment. Salaberry found that students worked harder to help each other succeed in communicating, and that there was more scaffolding in chat than in classroom settings (2000, p. 19). Similarly, Collentine and Collentine found that students participating in synchronous CMC had abundant exposure to comprehensible input (1997, p. 423), and were able to build on existing

knowledge structures (1997, p. 421), an important strategy in language learning.

Pitfalls

Despite the advantages, there are also some potential pitfalls associated with synchronous CMC. Freedom to contribute to the conversation at any time can lead to confusion. Cornelius and Boos found that mutual understanding is better in face-to-face communication than in chat. They traced this to the relative absence of turn taking in CMC (Cornelius and Boos, 2003, p. 151). They did argue that students can be trained in effective turn taking (2003, p. 170), but a full discussion of their suggestions is beyond the scope of this paper. Malone (1995) notes that non-verbal and prosodic cues are absent from text-based CMC, but argues that emoticons can add the flavor of genuine conversation to CMC (1995, p. 67). It is doubtful, however, that these truly replace the pragmatic function carried by the natural non-verbal cues present in face-to-face communication.

CMC and Learning

Results on the efficacy of CMC vs. face-to-face communication have thus far been mixed but promising. Salaberry (2000) studied the use of Spanish past-tense markers in required contexts both in face-to-face communication and chat. He found that in the chat setting, students used the past tense more often in required contexts (2000, p. 18). In face-to-face communication, students were more likely to use the present tense to express past events. He attributed students' success in the chat setting to increased monitoring time (2000, p. 17; see Krashen, 1981 for an explanation of the monitor model).

Beauvois found that students produced longer responses in a chat setting than in the classroom, and that their language was more in-depth than in the classroom environment. She attributed this to increased student-centeredness in the chat environment; because students were able to focus on what they were interested in discussing, they provided fuller and better-

developed answers than in the classroom (1998, p. 208). She also found that students used more compounding, an indicator of syntactic complexity (1998, p. 212).

Several scholars have investigated the potential role of text-based chat for improving oral proficiency. De la Fuente (2003) examined the effectiveness of chat vs. face-to-face communication for vocabulary acquisition, and found that, while both helped improve recognition of new words, face-to-face communication was more effective for improving oral production of new vocabulary (2003, p. 70).

Abrams (2003) tested the effect of text-based CMC on oral production of German. All participants in the study took part in an in-class oral discussion in order to establish their pre-treatment oral proficiency. They then participated in two follow-up discussions designed to assess changes in their oral proficiency. They were divided into two treatment groups and one control group. The control group participated in normal classroom activities. The first treatment group participated in a weeklong asynchronous CMC activity (a discussion board) before each of the two follow-up oral discussions. The second treatment group participated in one hour of synchronous CMC one day before each of the follow-up interviews.

Abrams found that the synchronous group had increased total output as compared to the other two groups (2003, p. 162). However, students in the synchronous group did not have language that was more syntactically complex, lexically dense or lexically rich. Syntactic complexity in Abram's study was defined by number of embedded clauses divided by the total number of clauses. Lexical density was computed by dividing the number of different words by the total number of words in a sample of spoken language, and lexical richness was determined by counting the number of different word classes found in a sample of spoken language (2003, p. 163). This study could have benefited from longer-term treatments of the CMC groups. The synchronous CMC group, in particular, could have had more than two chat sessions of one hour each before the follow-up discussions.

Beauvois (1997) also questioned whether learning in text-based CMC could transfer to

oral skills. In her study, students who communicated using a LAN outperformed a control group on an oral test of grammar, pronunciation, and vocabulary. However, Beauvois admitted that the grading system was subjective (1997, p. 107). She thought that the students in the LAN group performed better because the environment was low stress, because they received more input than those in the control group and because they could participate in the discussion at will (1997, p. 108).

Voice Chat and Learning

Relatively little has been published on voice chat and oral proficiency. Jaya (2008) speculated on some potential advantages of Skype for distance learners of ESL, but did not conduct a study. Jepson (2005, p. 83) noted that an advantage to synchronous CMC is that it allows learners to engage in authentic, unstructured conversation, not led by an instructor. Satar and Özdener (2008) studied text and voice chat as a means to improve spoken the English skills of high-school age native speakers of Turkish. Three groups of 30 students each participated in a four-week study: a voice chat group, a text chat group, and a control group that received no treatment. The authors found that both the text and voice chat groups exhibited significant improvement in proficiency, whereas the control group with no treatment did not. However, only those students in the text chat group had significant reduction in anxiety post treatment (2008, pp. 602-603).

Satar and Özdener argue that there is less pressure in a text chat environment than in face-to-face or voice chat environments (2008, p. 596). This would seem to be borne out in the survey results from the participants in their experiment. While participants in text chat environments are often more active than in live physical classrooms, because they have more time to think about their conversational turns (see p. 4 above), this may not be the case with voice chat, where faster responses tend to be the norm (2008, p. 598). The voice chat environment may thus be more anxiety inducing; indeed in a post-experiment survey, students reported that they

were concerned about their pronunciation in the voice chat environment, and that this made them reticent to speak (2008, p. 605). Similarly, Murphy found that recording responses to pre-determined activities on audiocassette was stressful to some students. Students struggled with the need to speak quickly enough to cover all of the points required by the tasks, while at the same time focusing on accuracy. As a result, most students pre-planned everything they wanted to record, then read their scripts aloud onto the cassettes (2005, pp. 308-309). Satar and Özdener suggest that voice chat may be better for more proficient speakers, who do not mind the pressure of having to take speaking turns more quickly, but text chat may be better for less proficient learners, who could benefit from having more time to plan their conversational turns. Text chat, they argue, could give less proficient learners more of a confidence boost than voice chat (2008, p. 606). For further discussion on anxiety in distance learning, see Hurd 2007a and 2007b.

Jepson (2005) observed interactions in five text chat rooms and five voice chat rooms, with one text chat and one voice chat session occurring simultaneously, on five occasions. He found that there were more repair moves in the voice chat sessions than in text chat, and that most repairs involved negotiation of meaning. Specifically, the chat sessions contained examples of clarification requests, confirmation checks, self-repetition, recasts, and explicit corrections. Comprehension checks, questions, and self-correction were not found, nor was negative feedback. Jepson suggested that this might be because these kinds of behaviors were considered face threatening (2005: 89), but he did also note that he had no way of knowing whether participants in the chat sessions were self correcting their messages before sending them (2005, p. 85).

In spite of this, he suggests that the higher number of repair moves in voice chat sessions may have been due to the fact that they moved at a slower pace. This may have given the participants more time to engage in repair strategies (2005, p. 90). This would seem to be at odds with the findings of Satar and Özdener that voice chat sessions are fast paced, and can thus be associated with higher anxiety levels.

The studies above seem to indicate that chat technology may be as effective as face-to-face communication in improving L2 proficiency, yet results are mixed, particularly with regard to spoken language. Voice chat as a means for improving oral proficiency remains an opportunity for more research. Indeed, what is most glaringly lacking are studies comparing voice chat with face-to-face communication as a means to improve second-language proficiency. For this reason, I propose the study outlined in the following sections.

Proposed Study

Research questions

How effective is voice chat vs. face-to-face communication in improving L2 oral proficiency? When we consider this question against the backdrop of previous research on the effectiveness of text-based chat vs. face-to-face communication, several questions arise. Does voice chat provide the same level of improvement as face-to-face practice? What is the role of non-verbal cues, which are only partially present in voice chat communication (prosodic cues are present, but gestures are not)? Do text messages, which are available to users of voice chat, provide an advantage over face-to-face communication? It is perhaps beyond the limits of the proposed study to answer all of these questions, but they do warrant further research on voice chat and second language learning.

Methodology

Participants would be drawn from third semester university German classes and divided into three groups. The first group would be required to meet face-to-face with a tutor/conversation partner for two thirty-minute sessions per week (see Fox, 1998 for the value of tutors in L2 distance learning). Those in the second group would be required to participate in voice chat sessions with a virtual tutor/conversation partner for two thirty-minute sessions per

week. Participants in the third group would not be provided with tutors/conversation partners. The treatment would last for the better part of a semester, about ten weeks.

Participants would be administered a pre-test oral proficiency interview at the beginning of the semester, and a post-test interview at the end of the semester. The degree of improvement would then be calculated for all students in the study and compared across all three groups in order to determine how effective voice chat is compared to face-to-face communication for the development of L2 oral proficiency. (We would, of course, have to reckon with a certain degree of self-selection among our participants, as more motivated students would be more likely to volunteer for tutoring. However, since I am primarily interested in comparing improvement between the two tutoring groups, and since students who volunteer for tutoring will be randomly assigned to the voice chat and face-to-face groups, self-selection for tutoring is not likely to skew the relevant results.)

Both the pre-tests and post-tests would be assessed in two ways. First, the interviews would be graded for grammatical accuracy, pronunciation and overall fluency. These are established measures typically used in assessing oral skills in proficiency-oriented language courses, although the grading system is admittedly somewhat subjective.

The second method of assessment is more complicated, and partially follows Abrams (2003). Each of the interviews would be transcribed, and the total number of words would be counted over a five-minute period. This would be used to measure total output. Then the number of different words would be compared to the total number of words in a fifty-word segment. To do this, the first fifty words of the response to a given question would be selected. The number of different words would then be divided by 50, giving us the lexical density of the response (cf. Abrams, 2003). Finally, the number of dependent clauses would be divided by the total number of clauses. This tells us the percentage of dependent clauses, and is an indicator of syntactic complexity (cf. Abrams, 2003).

If the improvement evident in the control group is not statistically different from that of

the voice chat group, we can conclude that voice chat is a viable alternative to face-to-face communication. Either way, the findings from this type of study would have important implications for distance education and for language students who wish have access to conversation partners who are not physically present.

Resources

The study proposed would require three types of resources: human, hardware, and software. For human resources, it would be necessary to hire a tutor, who would be responsible for scheduling sessions with students, chatting with and tutoring them in both face-to-face and voice chat settings, and keeping records of the sessions. If 10 students were to participate in each group, that would mean 20 hours of tutoring per week (20 students total x 2 half-hour sessions each). If the study were expanded to include more students, we would need an additional tutor. Since the tutor would also need to schedule sessions, keep records of the time spent with each student, and save any text chat logs associated with the sessions, we would need to pay him or her for 25 hours per week. It would be necessary to obtain grant funds to pay the tutor.

The project would not require a significant amount of hardware. The tutor and each student would need to have a computer with a microphone, headphones or speakers, and a broadband Internet connection. Most students and potential tutors would likely have this equipment already, but if necessary students could be surveyed prior to commencement of the study, and those without the necessary hardware and Internet connection could be placed into the face-to-face tutoring group. Besides computers, it would be necessary to have a high-quality audio recorder for the pre- and posttests.

There are only two software requirements associated with the project. First, both the tutor and students would need to download Skype, which is free of cost and relatively easy to use. Second, we would need SPSS or similar software to perform the statistical analysis once the data had been collected.

References

- Abrams, Z. (2003). The effect of synchronous and asynchronous CMC on oral performance in German. *The Modern Language Journal*, 87 (2), 157-167.
- Beauvois, M. (1997). Write to speak: The effects of electronic communication on the oral achievement of fourth semester French students. In J. Muyskens (Ed.), *New ways of learning and teaching: focus on technology and foreign language education* (pp. 93-115). Boston: Heinle.
- Beauvois, M. (1998). Conversations in slow motion: Computer-mediated communication in the foreign language classroom. *The Canadian Modern Language Review*, 54 (2), 198-217.
- Collentine, J. and Collentine, K. (1997). The compatibility of computer-mediated communication solutions with beginning level foreign language curricula. *Computer Assisted Language Learning*, 10 (5), 411-425.
- Cornelius, C. and Boos, M. (2003). Enhancing mutual understanding in synchronous computer-mediated communication by training: Trade-offs in judgmental tasks. *Communication Research*, 30 (2), 147-177.
- De la Fuente, M. (2003). Is SLA interactionist theory relevant to CALL? A study on the effects of computer-mediated interaction in L2 vocabulary acquisition. *Computer Assisted Language Learning*, 16 (1), 47-81.
- Fox, M. (1998). Breaking down the distance barriers: Perceptions and practice in technology-mediated distance language acquisition. *ReCALL* 10 (1): 59-67.
- Hancock, J. Dunham, P. (2001). Language use in computer-mediated communication: The role of coordination devices. *Discourse Processes*, 31 (1), 91-110.
- Hurd, S. (2007a). Distant voices: Learners' stories about the affective side of learning a language at a distance. *Innovation in Language Teaching and Learning* 1 (2): 242-259.
- Hurd, Stella. (2007b). Anxiety and non-anxiety in a distance language learning environment: The distance factor as a modifying influence. *System* 35, 487-508.
- Jaya, R. (2008.) Skype voice chat: A tool for teaching oral communication. *Language in India* 8, 40-45.
- Jepson, K. (2005.) Conversations – and negotiated interaction – in text and voice chat rooms. *Language Learning and Technology* 9 (3), 79-98.
- Krashen, S. (1981.) *Second Language Acquisition and Second Language Learning*. Oxford: Pergamon.
- Malone, A. (1995). Orality and communication on the Internet. *University of Melbourne Working Papers in Linguistics*, 15, 57-76.
- Mollering, M. (2002). Computer mediated communication: Learning German online in Australia. *ReCALL*, 12 (1), 27-34.

- Murphy, L. (2005.) Attending to form and meaning: The experience of adult distance learners of French, German and Spanish. *Language Teaching Research* 9 (3), 295-317.
- Murray, D. (1987). Computer-mediated communication as a tool for language learning. *TESOL Newsletter*, 21 (3), 13-14.
- Pacheco, A. Q. (1998). Internet-based ESL instruction at the university level. *Kanina*, 22, special issue, 95-108.
- Salaberry, R. (2000). L2 morphosyntactic development in text-based computer-mediated communication. *Computer Assisted Language Learning*, 13 (1), 5-27.
- Satar, H. M and Özdener, N. 2008. The effects of synchronous CMC on speaking proficiency and anxiety: Text versus voice chat. *The Modern Language Journal* 92: 595-613.
- Warschauer, M. (1995). Comparing face-to-face and electronic discussion in the second language classroom. *Calico*, 13 (2, 3), 7-26.

Assessment of Computer Skills Acquisition in Middle Schools

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Abstract

The purpose of this study is to examine the role of school, teacher and student characteristics on student acquisition of computer skills. The theory of affordance is used to provide a theoretical framework for explaining how 1) school characteristics (e.g., access to computer, attendance rates, suspensions), 2) teacher characteristics (e.g., license status of teachers, years of teaching experience, teacher turnover rates), and 3) student characteristics (e.g., socio-economic status and minority status) are associated with the attainment of computer skills in 8th grade level of middle schools. Regression analysis was used to analyze the data. The findings indicated that attendance, lower rates in behavioral problem incidents, and access to computers significantly helped to improve computer skills exam success. Teacher licensure status was the only teacher characteristic that significantly helped to improve computer skills exam success. In contrast, minority and economically disadvantaged status was associated with lower computer skills exam success rates.

Keywords: computer skills, the theory of affordance, technological affordance, educational affordance, social affordance

Introduction

Universities are experiencing declining enrollments in information technology-related majors (Thibodeau, 2010). State boards of education as well as professional organizations in both education and computing have recognized the existence of this problem and have developed recommendations for the K-12 computer skills curriculum. For example, the International Society for Technology in Education (ISTE, 2007) has advocated the need for students to be proficient in critical thinking, computer/information technology literacy, and use of computers as tools in order to increase learning and performance. The North Carolina State Board of Education currently maintains a computer proficiency requirement for high school graduation detailed in the North Carolina Standard Course of Study (NCSCOS). The North Carolina Department of Public Instruction (NCDPI) noted that the goal of the computer skills requirement is to foster skill development so that students have sufficient computer skills for use in high school, at home, and in the workplace (NCDPI, 2002). Computer skills acquisition at middle and secondary school levels are argued to be critical to increasing enrollment in technology-related majors at post-secondary schools. Enrollment and matriculation in technology-related majors are needed to ensure a future workforce in the information technology field.

The goal of this study is to assess potential factors that impact the acquisition of computer skills at the middle school level. While the effects of class size, school climate, attendance, teacher quality on general student math and reading learning outcomes has received considerable attention in the research literature, this study seeks to examine the correlations among these variables with the acquisition of computer skills. This study argues that the majority of previous related research has tended to assess the effects of school, teacher and student variables in relative isolation as opposed to comprehensively. The specific objective of this study is to identify middle school grade-level-8 school, teacher, and student characteristics that may correlate with computer skills test performance.

This study addresses that objective by attempting to answer the following research questions:

- Do *school characteristics* such as attendance rates, access to computers and suspensions correlate with the attainment of proficiency in computer skills?
- Do *teacher characteristics* such as license status of teachers, advanced degrees, years of teaching experience and teacher turnover rates correlate with the attainment of proficiency in computer skills?
- Do *student characteristics* such as socioeconomic status and minority status correlate with the attainment of proficiency in computer skills?

Literature Review

Affordance Theory

Using Gibson's (1977) theory of affordances, Kirschner et al. (2004) suggested that the effectiveness of an instructional or learning technology is contingent upon the technological, educational (or learning), and social affordances present in the learning environment. According to Kirschner et al. (2004), affordances are those artifacts of an environment that determine if and how the environment can be utilized to successfully complete a learning task. The technological affordances of the learning environment must facilitate instructional delivery and student learning task completion. Technological affordances refer to the "presence" of specific tools and artifacts (e.g., computer hardware and software) that support task accomplishment. Educational (or learning) affordance refers to the task environment's ability to stimulate, facilitate and maintain collaborative participation and interactions typical to the team learning process. For example, educational/learning affordance is realized through the use of lesson plans and instructional content that enable learners to interact with the technology in a meaningful way. In other words, educational/learning affordance is the ability to "derive utility" from a technology or procedure to learn to execute a specific task. Social affordance refers to the ability of a learning environment to allow peer-to-peer interactions during learning. In summary, technological, educational and social affordances are properties of the task/learning environment that determine the effectiveness of the learning process. In other words, any successful use of an instructional technology such as CAL applications will impact learning outcomes through facilitating instructional delivery of content and providing appropriate teacher-student-technology interaction.

School Characteristics

School climate is often associated with the level of safety, stability, and orderliness present in a school environment (Dupper & Meyer-Adams, 2002). Little or no violence, stable student attendance, and behavioral problems/disruption characterize a positive school climate. The converse characterizes a negative school climate. Previous research has demonstrated that attendance is significantly correlated with academic success. Students with better attendance than their classmates exhibit superior performance on standardized achievement tests (Nicholes, 2003) and that schools with higher rates of daily attendance tend to generate students who perform better on achievement tests than do schools with lower daily attendance rates (Sheldon, 2007). Students exhibiting disruptive behaviors such as task avoidance, inattentiveness, hyperactivity, and aggression are more likely to experience academic failure because of the negative effects these behaviors have on their ability to learn (Scott, Nelson, & Liaupsin, 2001).

When teaching in smaller class sizes, teachers are better able to manage behavior, effectively use teaching resources, maintain a positive climate, and maintain instruction continuity (Finn, Pannozzo, & Achilles, 2003). In larger class sizes, experience more disruptions and have greater difficulty engaging in one-on-one dialog with students which minimizes less instruction time and ultimately lower test scores (Cooper & Robinson, 2000). Barron, Kemker, Harnes, &

Kalaydjian (2003) noted that access to computers represents a potential key factor in acquiring computer skills and successful computer-assisted learning outcomes.

Teacher Characteristics

Research has argued that that the quality of the teacher in the classroom is the most important schooling factor predicting student outcomes (Goldhaber, 2002). Teacher quality often refers to teacher characteristics such as 1) license status of teachers, 2) years of teaching experience, and 3) teacher turnover rates. Teachers are better professionally prepared and more experienced possess deeper knowledge of content and have a greater propensity for goal-oriented thinking. Problems associated with teacher turnover include 1) continual hiring needs and instability, 2) a lack of mentors for new teachers, 3) instability in students' classroom experience, and 4) lower quality of instruction from substitutes.

Student Characteristics

Schools with a significant number of economically disadvantaged students experience relatively poorer student performance because they are typically deprived in levels of human, physical, and fiscal resources available to educate students (Myers, Kim, & Mandala, 2004). The level of minority status has also been shown to be related to student achievement. There is evidence that minority students tend to feel disconnected from their school environment if the associated climate is negative (i.e., violence, frequent suspensions, lack of support, etc.) (Koth, Bradshaw, & Leaf, 2008).

Research Model and Hypotheses

The research model and hypotheses (with study result) appear respectively in Figure 1 and Table 1 below. The research model draws on the theory of affordance and recent research on school factors (attendance rates, access to computers, and suspensions), teacher characteristics (license status of teachers, advanced degrees, years of teaching experience, teacher turnover rates) and student characteristics (socioeconomic status, minority status).

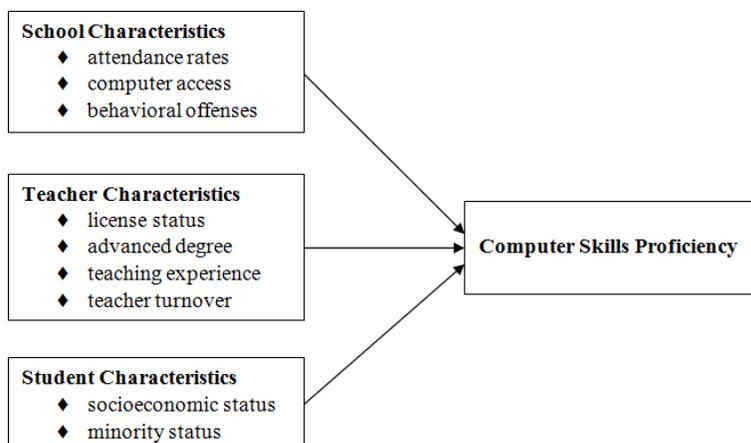


Figure 1. *Research Model*

Table 1. Hypotheses

Hypotheses	Results
H1a: Greater attendance rates will be associated with higher acquired computer skills proficiency	Supported
H1b: Greater access to computers will be associated with higher acquired computer skills proficiency	Supported
H1c: Greater frequency of suspensions will be associated with lower acquired computer skills proficiency	Supported
H2a: Greater number of licensed teachers will be associated with greater acquired computer skills proficiency	Supported
H2b: Greater number of teachers with advanced degrees will be associated with greater acquired computer skills proficiency	Not supported
H2c: Greater number of years of teaching experience will be associated with greater acquired computer skills proficiency	Not Supported
H2d: Greater frequency of teacher turnover will be associated with lower acquired computer skills proficiency	Not Supported
H3a: Greater number of economically disadvantaged students will be associated with lower acquired computer skills proficiency	Supported
H3b: Greater number of minority status students will be associated with lower acquired computer skills proficiency.	Supported

Research Methodology

Data from student computer skill performance in their eighth-grade year attending North Carolina traditional-regular calendar middle schools with grades 6th to 8th grade classes during the 2008-2009 year were analyzed in the study. Table 2 below provides a summary of the study's variables and regression results appear in Table 3.

Table 2. Variable definitions

attendance rates	average percentage rate of student school attendance
computer access	the number of students per internet-connected instructional computer
suspensions	the number of short-term (10 days or less) per 100 students.
licensed teachers	the percentage of classroom teachers with clear initial or clear continuing licenses in all license areas
advanced degrees	the percentage of teachers who have completed an advanced college degree, including a master's or doctoral degree in the education field
teaching experience	the ratio of teachers who have taught for 0 - 3 years to 4 or more years
teacher turnover	the percentage of classroom teachers who left their school district from March of the prior year to March of the current year

economically disadvantaged	the percentage of students that qualify for reduced lunch
minority status	the percentage of students that are of minority status
computer skills	the percentage of students passing all portions of the computer skills proficiency exam

Table 3. *Regression results*

Independent variable	β	t	p
1. Class Size	-.017	-.437	.663
2. Female-Male Ratio	.074	2.137	.033
3. Attendance	.116	2.734	.007
4. Computer Access	-.129	-3.258	.001
5. Suspensions	-.131	-2.569	.011
6. Licensed Teachers	.099	2.206	.028
7. Teacher Advanced Degrees	-.036	-.903	.367
8. New-Experienced Ratio	.032	.842	.401
9. Teacher Turnover	.005	.119	.906
10. Economically Disadvantaged	-.165	-3.056	.002
11. Minority	-.447	-8.632	.000

$N = 393$ cases; $R^2 = .56$ for the model with overall model significance $< .001$
 Dependent variable: Computer Skills Proficiency

Discussion

Results indicate that schools with majority females perform better in the computer skills acquisition exam. Further, qualified teachers combined with student attendance are critical to performance. Diminished access to computers and discipline problems that lead to suspensions suggest a disruptive environment have a negative impact on learning. Finally, schools with higher levels of minority and economically disadvantaged students exhibit lower computer skills exam score. This could be attributed to the “digital divide” of observed in minority and low income communities.

References

- Barron, A.E., Kemker, K., Harmes, C., & Kalaydjian, K. (2003). Large-scale research study on technology in K-12 schools: Technology integration as it relates to the National Technology Standards. *Journal of Research on Technology in Education*, 35(4), 489–507.
- Cooper, J. L., & Robinson, P. (2000). The argument for making large classes seem small. In J. MacGregor, J. L. Cooper, K. A. Smith, & P. Robinson (Eds.), *Strategies for energizing*

- large classes: From small groups to learning communities* (pp. 5-16). *New Directions for Teaching and Learning*, No. 81. San Francisco: Jossey-Bass.
- Dupper, D. R., & Meyer-Adams, N. (2002). Low-level violence: A neglected aspect of school culture. *Urban Education*, 37(3), 350-364.
- Finn, J. D., Pannozzo, G. M., & Achilles, C. M. (2003). The “Why’s” of class size: Student Behavior in small classes. *Review of Educational Research*, 73(3), 321-368.
- Gibson, J. J. (1977). The Theory of Affordances. In R. Shaw & J. Bransford (Eds.). *Perceiving, Acting, and Knowing: Toward an Ecological Psychology* (pp. 67-82). Hillsdale, NJ: Lawrence Erlbaum.
- Goldhaber, D. (2002). The mystery of good teaching: Surveying the evidence on student achievement and teachers’ characteristics. *Education Next*, 2(1), 50–55.
- ISTE (2007). *National Educational Technology Standards for Students: Technology Foundation Standards for all Students*. Retrieved January 16, 2011, from http://www.iste.org/Libraries/PDFs/NETS_for_Student_2007_EN.sflb.ashx.
- Kirschner, P., Strijbos, J., Kreijns, K., & Beers, P. J. (2004). Designing electronic collaborative learning environments. *Educational Technology Research & Development*, 52(3), 47–66.
- Koth, C. W., Bradshaw, C. P., & Leaf, P. J. (2008). A multilevel study of predictors of student perceptions of school climate: The effect of classroom-level factors. *Journal of Educational Psychology*, 100(1), 96–104.
- Myers, S. L. Jr., Kim, H., & Mandala, C. (2004). The effect of school poverty on racial gaps in test scores: The case of the Minnesota Basic Standards Tests. *The Journal of Negro Education*, 73(1), 81-98.
- NCDPI (2002). NC Test of Computer Skills. Retrieved January 16, 2011 from <http://www.ncpublicschools.org/accountability/testing/computerskills/handbook>.
- Nicholes, J. D. (2003). Prediction indicators for students failing the state of Indiana high school graduation exam. *Preventing School Failure*, 47(3), 112–120.
- Scott, T.M., Nelson, C.M., & Liaupsin, C.J. (2001). Effective instruction: The forgotten component in preventing school violence. *Education and Treatment of Children*, 24(3), 309–322.
- Sheldon, S. B. (2007). Improving student attendance with school, family, and community partnerships. *Journal of Educational Research*, 100(5), 267-275.
- Thibodeau, P. (2010). Undergrads Flock to Computer Science Programs, *Computerworld* (March 26).

Homework Managers and Online Learning Supplements for Business Statistics

Session Facilitator and Moderator

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Presentations:

MyStatLab by **Pearson Education**

Wiley Plus by **John Wiley & Sons**

CengageNOW by **Cengage Learning**

Abstract

Representatives from the publishers will give an overview of the features of their online learning software that can perform tasks such as real-time evaluation/grading, diagnostics, directed examples/tutoring and references to an e-text. Learn how these tools can be a win-win for the instructor and students so students can work at their pace whenever they have time and get specific guidance based their performance.

Excel Add-ins for Business Statistics

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Presentations:

XLStat by Pearson (Arts & Sciences)

PHStat2 by Pearson (Professional & Career)

KADDSTSAT by John Wiley & Sons

JMP9.0 by JMP Academic Team

Abstract

Using Excel in a business statistics class is desirable since it is a ubiquitously available computational tool in the business world but not ideal. Its graphical and analysis capabilities and built-in statistical add-in procedures are often judged to be inadequate or awkward for several methods or statistical analysis procedures covered in a typical business statistics class. Presentations will give an overview of the graphical and analysis capabilities/features of the respective statistical analysis software that can be added to a computer and accessed directly from within Excel.

Suggested Innovations/Activities for Improving the Learning Environment

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Abstract

Session will have short presentations of suggested improvements/practices to improve instruction followed by interactive audience discussion. Topics include: obtaining anonymous feedback at the end of each class, using clickers in the classroom, creating an atmosphere supportive of the students' mastery of the material, general tips for award-winning teaching and whether calculus should be replaced by more data analysis in the business school curriculum.

Session Contributors and Respective Topic Addressed

Steven Custer & Robert L. Andrews, Virginia Commonwealth University

Listen to your students: A simple method to improve your teaching

“Practice makes perfect.” is often quoted but it is not totally true. Practice by itself is of little benefit; only practice with feedback leads to improvement. A simple low tech, low cost method of improving your teaching is to get immediate anonymous feedback at the end of each class. This presentation discusses methods of doing this and the benefits (some unexpected) of doing so.

Joan Donohue, Management Science Department, University of South Carolina

Using Clickers to Improve the Classroom Learning Environment

Classroom response systems, commonly known as *clickers*, can be used in business statistics classes to:

- Turn a silent classroom into a buzz of interactive learning.
- Provide immediate feedback on students' understanding of concepts being taught.
- Encourage students to attend class.

To use clickers in the classroom, the instructor asks questions related to the class lecture. Older clicker models allow only multiple choice responses whereas newer clickers allow text and numeric answers as well. Students need to purchase a clicker that they bring to class each day and use it to respond to questions posed by the instructor. Answers can be anonymous or recorded and tied to the student. During the question-and-answer period, the instructor can allow the students to discuss their responses with their peers. The instructor can then show the correct answer and a histogram of responses for the entire class. This process provides an opportunity for collaboration, active learning, peer instruction, and interaction. It also allows students to find out what they might have misunderstood and get immediate feedback. In addition, the instructor obtains instant feedback on how well students are following the material presented during class, potentially promoting not just student engagement but also performance. Students are encouraged to come to class when their clicker responses are tied to their grade in the class.

Dmitriy Nesterkin, Management & Decision Sciences, Coastal Carolina University

Teaching Business Stats: Still Searching for One-Size-Fits-All Formula

This talk covers some of the experience-based approaches that may aid a faculty member in creating an atmosphere supportive of the students' mastery of the statistics material. The recommendations are grouped into two categories: 1) influencing students' attitudes towards learning statistics, and 2) managing students' learning processes. Lastly, the talk emphasizes how institutional structures can play a vital role in supporting the teaching success of the business statistics faculty.

Norman M. Scarborough, Presbyterian College

Personal Best Practices and Class Examples for Effective Instruction

A Council for Advancement and Support of Education South Carolina Professor of the Year award winning instructor shares from over 30 years of experience. He will summarize some of the best practices and class examples that have been effective for him as a teacher.

Barry Wray & Ravij Badarinathi, Department of ISOM, U.N. C. Wilmington

Improve the Business Curriculum: More Focus on Data and Analysis, Less Focus on Calculus

Business school graduates are entering a new digital age filled with a plethora of available data to support to decision making. This session will focus on the importance for students entering the workplace to be able to effectively analyze the data and leverage it for improved decision making. For this reason statistical tools are more applicable than calculus for the professional success of the typical business student. The discussion will focus on the merits and weaknesses of each and how much emphasis should be placed on each in a business school curriculum that seeks to add maximum value to the student.

**ANALYTICS: WHAT IS IT?
WHAT ARE ITS IMPLICATIONS FOR THE BUSINESS CURRICULUM?**

Session Facilitator and Moderator

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Session Contributors and Panelists

James R. Evans, University of Cincinnati

Barbara Price, Georgia Southern University

Noreen Sharpe, Georgetown University

Abstract

Is analytics something new or simply repackaging of traditional statistics and management science topics? How does industry define and use business analytics? What do students really need to know and understand to be successful in data driven decision making world? Where should the skills for business analytics be taught in a business program? Panelists will address these questions and the audience will be encouraged to participate in discussions.

WHAT QUANTITATIVE CONCEPTS SHOULD OUR STUDENTS ACQUIRE & HOW DO WE HELP THEM?

Session Facilitator and Moderator

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Session Contributors and Panelists

Cliff T. Ragsdale, Virginia Tech

Quinton J. Nottingham, Virginia Tech

Jian Cao, JMP Academic Team

Abstract

An important first step in helping students acquire necessary quantitative skills and concepts is to convince them of their need to do so. In this session, the panelists will present a variety of techniques they have used to help students realize the importance of developing their quantitative reasoning abilities. These techniques also highlight the practical importance of a number of quantitative concepts that our students should acquire.

DATA VISUALIZATION

Session Facilitator and Moderator

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Session Contributors and Panelists

Richard DeVeaux, Williams College

Bob Stine, Wharton School, U. Penn

Kellie Keeling, University of Denver

Abstract

Session will give an introduction to and overview of some data visualization tools and methods for examining data sets with multiple variables. Visual representations of data are used to discover and describe patterns and relationships ranging from simple to complex. For business decisions it is important to effectively communicate the proper information in an understandable way.

Piedmont Home Furnishings: Developing an Online Decision Support System

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Abstract

The undergraduate Decision Support Systems option within Virginia Tech's Business Information Technology department involves many project-based courses. This paper discusses the course project that has been developed over time for one such course: BIT 4444 – Web-based Decision Support Systems. This course project involves constructing a database-enabled on-line order reporting and analysis system using PHP, JavaScript, and MySQL. Students gain experience with elements of project management and interface design, along the underlying technologies upon which the final deliverable is constructed.

Keywords: Web technologies, decision support systems, pedagogy, project development

Introduction

Students majoring in Business Information Technology (BIT) at Virginia Tech have the option of concentrating in either Decision Support Systems (DSS) or Operations Management (OM). Although each option involves the use of analytical problem-solving techniques to improve the effectiveness of managerial decision-making, the DSS option tends to concentrate more on the development of computer applications and technologies. BIT 4444: Web-Based Decision Support Systems is one of the more advanced courses in the Decision Support Systems option, and the material covered in this course frequently has been delivered in the context of a semester-long project that attempts to tie together concepts presented earlier on in the BIT curriculum. This paper discusses the pedagogical framework that has successfully supported the delivery of this project, in the context of a specific, and effective, project implementation.

Web-based decision support systems

The web environment provides an excellent platform for exposing business students to a wide variety of different concepts related to technology-based decision support, such as networking, security, data management, and interoperability. It also supports a

discussion of generally relevant topics such as information standards, open source software, user accessibility, and internationalization. The focus of BIT 4444 provides the opportunity to discuss current advances in technology within the context of the class, since many of these advances take place within the domain of the World Wide Web.

In order to motivate and support discussions about technology and its place in the global economy, the BIT 4444 class frequently uses a book such as Thomas Friedman's *The World is Flat* [1] as an auxiliary textbook. Students who have not previously read the book tend to be surprised at how relevant (and interesting) it is, not only with respect to the specific technologies studied in the class, but also with respect to the overall industry into which they will be entering. In particular, one of the focal points for the book is the enabling impact of open source software for individuals and organizations that might not otherwise have the resources to compete in the global economy.

Project definition

The (fictional) client for the BIT 4444 course project is Piedmont Home Furnishings (PHF), a medium-sized furniture company located in the Piedmont-Triad region of North Carolina. In the problem set-up, PHF currently has sales agents responsible for several different regions across the United States, and they submit their orders by email or by FedEx to be entered into a spreadsheet back at the High Point, North Carolina headquarters of the company. The students are asked to help PHF improve the efficiency of their ordering process by creating a secure on-line system through which agents can submit order and customer information directly to a database, and with which they can run a variety of dynamic sales reports.

The students are provided with a database containing historical information about PHF's products, sales, employees, and customers, and they are given paper copies of both the order forms and customer forms that the company currently uses. Furthermore, they are provided with paper copies of several reports that the company would like to have available to them, as part of the new system. Finally, the students are provided with a boilerplate project proposal which lays out the specifics of both the overall timeline and the technology requirements for the project.

Deliverables

There historically have been two main types of project deliverables for the PHF project: project planning documents, and system prototype deliverables. The first required planning document provides an initial response to the project proposal. This must be professionally written and it includes an executive summary and detailed estimates of both costs and schedule requirements for the project. Furthermore, students are expected to make a compelling argument as to the accuracy and necessity of their estimates, and to provide several different options for systems that could be implemented. A follow-up document is then submitted halfway through the semester to give the students the

opportunity to revise and refine their estimates, based upon the progress that they have made to that point.

Students are also required to provide a business analysis of some aspect of the company, such as sales agent performance or new product development. They first must describe the problem and explain how their proposed solution will help to address it. They are then responsible for actually incorporating analytic techniques into the system, and for generating an output report that helps to solve the identified "problem." At the end of the semester, the students then give an oral presentation to the class, in order to discuss the problem and to demonstrate their chosen approach to solving it.

The technology deliverables for the project are submitted in four phases. The first phase coincides with in-class discussions of interface design with HTML and XHTML, and requires the students to create a working user interface with basic password protection and a complete menu system, as well to design all of the user forms (new customer / edit customer / new order / edit order, etc.). This then serves as a shell within which additional functionality is added over the course of the semester.

The second phase deliverable requires the students to connect the password protection system with the database, using PHP and MySQL, and to read customer and order information in from the database into the edit forms. They must also create a simple output report for sales information, based on user preferences for different criteria. In the third phase deliverable, students then include the ability to write user inputs back to the database, and they generate their business analysis reports. The fourth phase technology deliverable requires the students to incorporate data validation functionality into the project using JavaScript, along with error handling, and it also includes linking the system with an external component (FusionCharts) that provides the PHP-based ability to generate dynamic charts based on different report outputs.

Pedagogical structure

With the exception of two in-class midterm exams for testing individual understanding of the course material, all submissions and all evaluations for the BIT 4444 class are done on-line. Students produce the deliverables by working in project groups of three to five individuals for the duration of the semester. Each group is provided with a password protected folder on the University's web server, and PHP files placed within these folders can then be directly connected with an online MySQL database. Project deliverables are then submitted by uploading them to these web folders at the time that they are due, and the technology deliverables are then expected to run from that location.

Grading is also done electronically and grade sheets are simply uploaded back to a group's folder for downloading at their convenience. An electronic peer evaluation form is provided for each assignment, and individuals are responsible for providing feedback on the relative performance of their group members. The final individual grade for each

assignment is then a weighted combination of the overall group grade and the individual peer assessments.

Several weeks are typically given to prepare each deliverable, and a portion of each class period is set aside to discuss questions and issues that any group may have come across while working on the assignments. This gives students, who are typically fourth-year students, the flexibility to work around other obligations, such as job interviews and other coursework. Despite frequent encouragement to start early and work steadily towards the completion of the current task, groups often do end up attempting to complete a deliverable at the last moment - this can provide a very powerful learning experience about the necessity to properly plan the completion of a long-term project, and the consequences for not doing so.

The content of each programming assignment is determined by the various stages of the development process, from user interface development to database incorporation and decision modeling / report generation. To give the students a more realistic view of the development process, however, they are also required to generate project planning materials which include such things as estimates of time, effort, schedule, and project costs. At the end of the course each group is given the opportunity to demonstrate their work to the rest of the class, and to further justify their choices.

Extensions

One of the advantages of guiding students through a web-based decision support system project like the one described above is that there is significant opportunity to expand upon the core idea of the project, depending on the position of the course within the curriculum. The use of the web allows the discussion to scale very easily to the idea of expanding sales internationally and implementing an e-commerce-based solution to further automate portions of the ordering process. Additional technologies also have been discussed and implemented, at various times, in the context of this course. Among these are a variety of different types of markup language such as XML and XSLT for creating customized reports, and associated technologies such as Wireless Markup Language (WML) to support exporting reports to different platforms like cell phones and PDAs.

Because other portions of the BIT curriculum are heavily Microsoft-based (students first learn to build decision support systems using Excel and VBA, and then build on that experience by learning to implement such systems using VB.NET and Microsoft Access), another technology that is sometimes included in the PHF project is ASP.NET. This not only allows the students to experience two very different web development paradigms side-by-side, but also it provides the opportunity to discussion integrating different web applications with a PHP system.

Conclusions

Regardless of the specific technologies chosen to be included within a given semester, students tend to appreciate the real-world nature of the Piedmont Home Furnishings project. The project requires a lot of work from the students, but they typically learn a great deal and are generally pleased to have an actual learning outcome to show to family members and to potential employers. The importance of including the project planning aspect of the course has decreased since a dedicated project management course was added to the BIT curriculum, although this has tended to be the aspect of the project that students will generally remember as having been particularly valuable to them. In contrast, the business analysis problem has become an even more important aspect of the project, as the BIT department has re-emphasized the importance of data analytics to the curriculum and as employers have continued to stress their need for creative problem solvers.

Whatever focus is taken, however, with respect to individual components, the underlying benefit of the Piedmont Home Furnishings project is that it provides a solid framework for experiential learning that exposes students to the process of decision support system development, just as much as it exposes them to the technologies used to do that development. Several different projects have been used as part of the web-based component of the BIT curriculum, and the PHF project has proven to be one of the more effective approaches to facilitating desired student learning outcomes.

References

- [1] Friedman, T.L. *The World is Flat: a Brief History of the Twenty-first Century*. New York: Farrar, Straus and Giroux, 2005.

HEURISTIC BASED PROBLEM SOLVING

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“It is a vulgar fallacy to suppose that scientific inquiry cannot be fundamental if it threatens to become useful, or if arises in response to problems posed by the everyday world. The real world, in fact, is perhaps the most fertile of all sources of good research questions calling for basic scientific inquiry.”

Herbert Simon, 1979

ABSTRACT

In a pure version of the neoclassical paradigm, Homo Economicus makes rational choices as predicted by the rational decision theory. Following the best algorithm(s), first best solutions to problems are found and optimal choices made. Operational models often deviate systematically from one or more assumptions underlying full rationality, which leads to illustrations of bounded rationality in the process or the outcome. Heuristics are suboptimal strategies. Successful suboptimal strategies produce ‘good enough’ solutions, when the first best is unattainable or resource-wise undesirable. We first highlight some such heuristics used in business problem solving. Then, we examine an empirically developed algorithm that uses simple rules of thumb (heuristics) to predict choice problem outcomes such as that of the Allais Paradox. This is a small first step towards informing actual process of choice in business settings with the science of heuristics. At this stage, the current piece gathers dispatches of work, separated both by time and by discipline, in one place and entertains a farfetched structural relevance.

Keywords: Heuristics, Suboptimal Choice, Rational Decision Theory

Rational Decision Theory: A Refresher

In his Nobel Prize lecture, Simon (1979) remarks that the science of economics have focused on rational decision making as equivalent to allocating scarce resources. And in so practicing, commendable achievements are gained beyond traditional domain of economics into other disciplines including psychology. He refers to decision theory as an “important colonial territory” of the empire of economics science. While praising the mathematical sophistication of economics science, he questions “the relevance of some of

the more refined parts of this work to the real world.” Economics, in this terrain, produces models that are valuable as long as “ they do not contradict aggregate observations of concern to political economy.” Contradictions at the observed micro level, however, are of no concern. Therefore, Simon portrays economists as those who “believe that business men maximize,” but “know that economic theory satisfice.” Here, we notice a fundamental clarification of characterizations of the theorist and eventually the modeler versus that of the assumptions of theory and the actor as modeled based on the theory of rational decision making. The theorist, in real world, is limited to satisficing, however, as the modeler, he is omniscient and so can specify and formulate the optimal process of choice and the best final outcome to result from that.

Bounded rationality, as a major alternative framework, allows and calls for realizing this unrealistic imposition and moves to relax the omniscience property of modeler. Simon understands the establishment of organizations in the modern world as a manifest of recognition of human limitations in real environment and the effort to adapt to the business environment to the best possible level of continually adjusting aspirations. A boundedly rational scientist, therefore, starts with observations, then categorizes the observations in systematic manners and tries to make sense of these categories and eventually to extend them to upcoming situations. In what follows, we simply take up a mini exercise of this sort. First, we gather a number of examples from scientific observations that share a common ground, in the most general sense of acknowledgment of the role of heuristic strategies in business choice processes. They also, all use this feature to provide recommendations for success in the field/market of interest, and to shed light on consumer behavior. Thereafter, we take the farfetched leap to establish connections with a heuristic algorithm, which can provide a prediction for problems that are categorized as paradox in the rational framework. We emphasize, both the strength of such heuristic model and the simplicity of the algorithm to highlight the fruitfulness of scientific inquiry based on acknowledgment of limitation to aspirations.

Tracing Heuristics in Business Decision Making

Heuristics as simple rules of thumb are formulated in the context of specific tasks and are taught regularly as useful strategies across academic fields of business education. Management education, specifically, deals directly and at the level of textbook material with useful heuristics (for example see Gaither and Frazier, 2002). In an innovative attempt to test the rational decision theory, Berk, Hughson and Vandezande (1996) used a large data set from the famous TV game, Price Is Right. They detect several heuristics strategies that describe the way in which players make their choices. These heuristics are simple, they improve over time with learning and they are not the same for all players facing the same task. Moreover, they do not find evidence for the use of optimal/rational strategies by the players. This is where the usual criticism of experimental setups to evaluate rational theory of choice does not hold, since incentives are “large enough.” In this paper, we want to focus on the notion of game of change or bidding in a lottery/auction as the basic building block for models of decision making. Therefore, we take a closer look at the bidding heuristics and its construction by Berk et al.

Berk et al (1996) use stylized facts to construct a series of heuristics that captures the actual behavior of bidders in the game. These stylized facts are derived from the distribution of bids' standings compared to the price and previous bids: in a set of four bidders, each time, a player can overbid or underbid, and place bids based on previous values or independently. Three facts, "1) Contestants do not bid optimally, but neither do they bid randomly. They use some strategy; 2) Contestants use previous bids as an input to their bidding strategies; 3) Judging by the suboptimal behavior of the fourth bidder, at least half the time contestants do not use strategies that increase their likelihood of winning¹" lead to "three heuristic bidding rules: simple bidding, sincere bidding or smart bidding." (p. 960) Simple bids are equivalent to bidders' expectation of the price independent of available information. Sincere bidders bid for the expected price too, but they use and update their information. A smart forth bidder maximizes the probability of winning the auction. All probabilities are constructed in the form of Bayesian prior and posterior distributions. Based on these heuristic rules, they run simulations and test the use of such probability distributions. The fact that players are not rational optimizers raises the question of plausible alternative frameworks, for which Berk et al. have two suggestions, bounded rationality and fairness. They reject the notion of fair play as a rule followed by the players, using a fairness concept defined by Rabin (1993) to be the higher frequency of cutting off unfair bidders compared to fair ones. They find, however, evidence for bounded rationality in the following sense. A boundedly rational agent is not omniscient, that is, she either cannot see all outcomes or all ways/strategies to get to those outcomes, or both. Hence, when players demonstrate learning from observation of winning strategies by improving their own strategies, this is considered as evidence for bounded rationality. This interpretation is based on a definition of bounded rationality that allows learnt experience to enter the information set of the agent, and in turn to expand the set of strategies, or in other words, to adjust the aspiration level. Berk et al. showed that "a few simple rules of thumb can better explain observed behavior than the fully rational game theoretic model." (p. 965)

Nudging agents towards better choices is usually designed by using the simple heuristic of defaults. The idea is that we are naturally inclined to follow the suit of existing structures, that is, unless we have strong motivations to the contrary. This simple fact provides a fertile field for designing environments that are suggestive of certain choices in favor of alternatives. Hence, a smart strategic design can guarantee a certain desired outcome. Famous example is setting organ donation as an opt out default to get a majority donors (for examples refer to Gigerenzer, 2007, or Thaler and Sunstein, 2008.) In the field of marketing, Goldstein, Johnson, Herrmann and Heitmann (2008) used this default heuristic to develop a smart marketing strategy: "How to design defaults so that everyone wins." They focus on features that are included in the standard version of products, unless consumers decline them, which "boost satisfaction and profits." Examples are insurance for rentals, and click next for quick install "recommended." These designs nudge you towards choices that are safer, more profitable, and enhance satisfaction. They assert that "default taxonomy and decision tool" are strong instruments for senior managers, who can set the defaults of products and services in a manner that all

¹ This might be modeled as tossing a coin and picking from winning strategies in one case only. This is just a primary thought to be dealt with in depth later.

parties gain most. They divide defaults into a few major categories, some of which as follows. In the presence of alternative products the unique and only available setting of a specific product or service is referred to as the Hidden Option; companies' best guess absent preference information constitute Benign Defaults; When customers are forced to make a choice or be denied certain services afterwards, a Default Alternative is used; and finally, random assignment of customers to one of several configurations makes for Random Defaults . Moreover, they acknowledge criteria under which the best option would be setting no default, and depict a decision tree for designing mass defaults and personalized defaults.

Complex algorithms have also been used to capture concepts derived from bounded rationality limitations on information sets. One such concept is named Consideration Set (s) in marketing literature. Using this concept, Dzyabura and Hauser (2011) developed Consideration heuristics, which refer to suboptimal strategies that describe the process of forming and then choosing from consideration sets. They configure the use of heuristic decision rules by consumers using an active machine learning method, which selects questions adaptively. They show that “adaptive questions outperform market-based questions when estimating heuristic decision rules.” Adaptive questions are derived from prior beliefs and answers, and following a Bayesian algorithm for learning and update of beliefs. Their approach proves superior in validation to previously used compensatory rules. In this section, we provided examples of work in business literature that study and configure the use of heuristics in business decision making. Next, we examine the construction of a heuristic model, and go through the way in which this simple heuristic model can solve a rational theory paradox.

A Heuristic Model: Application and Construction

Throughout this paper we emphasized the importance of a tradition in modeling decision and the process of choice as a game of chance. Traditionally, lotteries with specified gains and attached probabilities to each amount of gain (or loss) have been used to formalize choice made by rational (or otherwise) agents. In a rational framework the best choice is the one that maximizes the probability-weighted sum of gains (losses), otherwise known as expected utility maximization. Heuristics do not optimize, and the priority heuristic is no exception. The process of choice from a simple lottery with two possible gains of amount x and probability p or gain y otherwise, denoted as $(x, p; y)$ is as follows (from Brandstatter et al, 2006, p. 413).

Priority Rule. Go through reasons in the order: minimum gain, probability of minimum gain, maximum gain, probability of maximum gain.

Stopping Rule. Stop examination if the gains differ by $1/10$ (or more) of the maximum gain; otherwise, stop examination if probabilities differ by $1/10$ (or more) of the probability scale.

Decision Rule. Choose the gamble with the more attractive gain (probability).

Allais (1953, p. 527) constructed a choice problem that when solved by people produced results that were not compatible with the predictions of the expected utility theorem (EUT). Moreover, the EUT does not make a specific prediction for the outcome, it only generates a relative order of choices as briefed in the following. Consider two choice problems using the abovementioned notation. Lottery 1= {A:(100 million, 1; 0) or B:(500 mil, 0.1; 100 mil, 0.89; 0, 0.01)}, which is equivalent to the choice between A= 100 mil with certainty (versus nothing); and B= 500 mil with 10% chance, 100 mil with 89% chance and nothing the rest of time or 1% chance. Make a choice between A and B, save it. Now consider Lottery 2= {C : (100 mil, 0.11; 0) or D: (500 mil, 0.10; 0)}, which amounts to a choice between C = 11% chance of winning 100 million, versus B= 10% chance of winning 500 million.² One can use the EUT to constructs a relative expected value for each lottery, that is, $EU(A) - EU(B)$ also, $EU(C) - EU(D)$. These two relative expected values are equal. So, the EUT predicts that if A (B) is chosen in Lottery 1, a person with well behaved preference ordering would choose C (D) in Lottery 2. In reality however, people with a considerable majority choose A and D. This is why the problem is called Allais Paradox.

Now, let us use the Priority Heuristic to predict the choices in these lotteries. For Lottery1, minimum gains are 100 for A and 0 for B, the difference between minimum gains is 100 mil, and our Stopping Rule of 1/10 of maximum gain is $0.1 * 500$ or 50 mil. Since 100 mil is larger than 50 mil, we stop and predict that the choice is A. For Lottery 2, minimum gains are 0 for C and) for D, that is no difference, so move to next reason. Probability of minimum gain for C is 89% and for D is 90% , the difference is 1% which is less than our Stopping Rule threshold of 10%, so move on to the next reason. Maximum gain for C is 100 mil and for D is 500 mil, with a difference of 400 mil which is larger than $1/10 * 500 = 50$ mil, so stop and choose D. Notice that the Priority Heuristic makes a specific (not relative) prediction, and it accords with the actual choice of people. Also, notice that the process of choice is simple in setting thresholds that are intuitively appealing at 10% probability or 10 of the maximum of all choices. Finally, notice that there are no weighted sum calculations involved in the process of choice. The calculations are simply considering either gain or probability at each step, which constitutes a non-compensatory procedure.³ This means that a model of choice is constructed that follows simple rules, doesn't exhaust all information, and yet generates a powerful predictive tool.

So far, we have mainly concentrated on simple heuristics that produce efficient outcomes and make for powerful managerial (such as default heuristics) and consumer (such as consideration heuristics) tools. In this last part, preceding our general discussion, we have gathered enough ground to look methodologically into the way in which a successful heuristic model such as the Priority Heuristic is constructed. As we shall see, the method utilized by Brandstatter et al. is a manifestation of what Simon advocates as empirical based theory construction for developing a behavioral framework (as opposed to

² Notice that Allais made the second lottery by reducing the probability of winning 100 mil in A and in B by 89%.

³ A compensatory or fully rational decision process involves consideration of all information, assignment of weights/probabilities to possible outcomes, and weighing and adding all these considerations.

Armchair Economics). Well, the first assumption is that people tend to consider reasons in order, and not as weighted sums, that is to say they consider the information in a non-compensatory manner, usually following certain heuristics. The amounts bear more importance and so are considered before attending to probabilities. The strong aversion that possibility of regret from a loss imposes on us emotionally, leads to taking note of minimum gains before maximums. Probabilities of minimum and maximum follow the respective gains. A simple threshold of 10% of the best possible, which is one for probability (certainty), and maximum of all games for gains generates stopping rules. And the choice is naturally to pick the more attractive option, whatever attractive contains in the context.⁴ The point we wish to stress here is that we can describe the way in which scientists/modelers have gone about constructing a heuristic model is itself following a set of heuristics. Only the heuristics used in the scientific inquiry by (still notably boundedly rational modelers) are more refined and sophisticated than those used by the agent in the model. Juxtaposing this with the fact that the modeler in rational theory is omniscient, highlights yet another realistic aspect of the study of heuristics at beyond the modeling or meta-modeling level.

Discussion

This paper used a general definition of heuristics as rules of thumb, exemplified in rules that are successfully used in business decision making – consumer behavior and operational management. Psychologists have been studying heuristic algorithms for a good while. The priority heuristic is a case in point. We examined this heuristic at two levels: (1) Predictive ability of the model, e.g., it predicts the Allais Paradox outcome. (2) How a heuristic algorithm is constructed, i.e., this is an empirical based process. What constitutes a heuristic model? As seen in the case of priority heuristic, the approach to formalization starts with extracting rules from observations. This is a serious methodological deviation from the practice of economics modeling that begins with assumptions derived coherently from an axiomatic framework. The latter has been scrutinized by Herbert Simon (1979) as “Armchair Economics.” It was also Simon who proposed the development of a framework (mainly for organizational behavior) that is based on empirical evidence, instead of mathematically coherent structures. It is admittedly requiring a sizable leap to associate heuristics of individual general choice processes with fundamentally calculative choices in the specific domain of business. However, it is helpful (methodologically) to recall that any problem of choice, even any decision that we daily make (of any level of importance) is essentially operationalized as a lottery. This has been the scientific method since Ramsey (1926). Moreover, some evolutionary and cognitive scientist have theorized the existence of a set of capabilities rooted in our evolutionary process that underlie a considerable portion of our reactions, reflections, choices and actions (See Gut Feelings for a series of such instances.) Putting these two observations together, we assert that there will be fruitful implications coming from the study of heuristics for business decision making in a structured way. This formal attempt starts with organizing observed, successfully used heuristics in management and other business choice situations. Then to discover common patterns and tracking them back to simple rules of thumb. Developing formal models of

⁴ Following this line of reasoning, a similar algorithm can be developed for lotteries that include losses.

business/management heuristics would lead to a reliable predictive set of tools as well as a mechanism for generating decision aids.

REFERENCES

- [1] Berk, J.B., Hughson, E., & Vandezande, K. The price is right, but are the bids? An investigation of rational decision theory. *American Economic Review*, September 1996, 86(4), 954-970.
- [2] Brandstatter, E., Gigerenzer, G., & Hertwig, R. The priority heuristic: making choices without trade-offs. *Psychological Review*, 2006, 113(2), 409-432.
- [3] Dzyabura, D. & Hauser, J.R. (forthcoming). Active machine learning for consideration heuristics. *Marketing Science*.
- [4] Gaither, N. & Frazier, G. *Operations management*. South-Western, 2002.
- [5] Gigerenzer, G. *Bounded and rational*. In R. J. Stainton (Ed.), *Contemporary debates in cognitive science*. Oxford, UK: Blackwell, 2006.
- [6] Gigerenzer, G. *Gut feelings: The intelligence of the unconscious*. Penguin Group Inc., New York, 2007.
- [7] Goldstein, D.G., Johnson, E. J., Hermann, A., & Heitmann, M. Nudge your customers toward better choices. *Harvard Business Review*, December 2008, 99-105.
- [8] Rabin, M. Incorporating fairness into game theory and economics. *American Economic Review*, December 1993, 83(5), 1281-1302.
- [9] Ramsey, F.P. Mathematical logic, *The Mathematical Gazette*, October 1926, 13(184), 185-194.
- [10] Simon, H.A. Rational decision making in business organizations. *American Economic Review*, September 1979, 69(4), 493-513.
- [11] Simon, H.A. The failure of armchair economics. *Challenge*, November-December 1986, 18-25.
- [12] Thaler, R.H. & Sunstein, C.R. *Nudge: Improving decisions about health, wealth, and happiness*. Yale University Press. New Haven & London, 2008.