MOBILE INTERNET SERVICE – USER EXPERIENCE, SATISFACTION AND CONTINUAL USE INTENTION

Liqiong Deng, Richards College of Business, University of West Georgia, Carrollton, GA 30118, (678) 839-5532, jdeng@westga.edu
Douglas Turner, Richards College of Business, University of West Georgia, Carrollton, GA 30118, (678) 839-4847, dturner@westga.edu
Bob Gehling, School of Business, Auburn University at Montgomery, Montgomery, AL 36124, (334) 244-3482, bgehling@mail.aum.edu

ABSTRACT

The purpose of this paper is to develop a research model that investigates the effects of user experience with mobile Internet service on user satisfaction with and continual usage intention of the service. The proposed research model uses the concept of cognitive absorption to conceptualize flow experience as the optimal holistic experience that users feel when using mobile Internet service [1]. A set of hypotheses are proposed regarding the direct and indirect effects of cognitive absorption on user satisfaction through the perceived utilitarian and hedonic performance and expectancy disconfirmation of mobile Internet service.

INTRODUCTION AND MOTIVATION

In today’s rapidly expanding mobile marketplace, mobile Internet has been gaining popularity [2]. An increasing number of people use their mobile phones for various activities other than voice communication (e.g., instant messaging, sending/reading emails, browsing Internet, downloading music, playing games, checking stock quotes, shopping and making payments). In response to the increasing popularity of mobile Internet service and the need for mobile carriers to generate constant revenues from mobile Internet services [3], researchers have conducted studies to investigate factors influencing user satisfaction and retention with mobile Internet service [4, 5]. Being considered critical for customer retention and long-term relationship building [4, 6], user satisfaction has been consistently supported to be an important factor influencing user’s intention to continue using a variety of information systems, including e-commerce [7-9] and mobile Internet [4, 5] services.

Studies on user satisfaction with information systems in general and mobile Internet service in particular have established the cognitive sources of satisfaction response along the lines of expectancy confirmation and quality dimensions. For example, the quality dimensions –ease of use, usefulness, information quality, and connection quality have been found to influence satisfaction and continuance intention with mobile Internet service [4, 5]. These studies emphasize the basic quality features of mobile Internet service which users take for granted and expect minimally from the service [10, 11]. While the basic quality features are necessary to fulfill users’ minimum requirements related to task or goal achievement with mobile Internet service and serve as preconditions to user satisfaction, however they only provide a narrow view of user satisfaction by focusing on the lower threshold of satisfaction. Conceptualized as the “consumer’s fulfillment response”, satisfaction provides “a pleasure level of consumption-related
fulfillment, including levels of under- or over-fulfillment” [12]. It is suggested that the absence of basic quality features will lead to under-fulfillment and dissatisfaction but their mere presence is not sufficient to invoke over-fulfillment and may go unnoticed by users [10]. Over-fulfillment requires more than just meeting users’ expectations about task/goal achievement. According to Oliver’s notion that positive disconfirmation of expectations leads to high levels of satisfaction [13], we believe that high levels of user satisfaction could be found in Mobile Internet service that delights users by exceeding users’ expectations and allowing users to experience something more than just task/goal fulfillment, for example, pleasure, enjoyment, and empowerment. This requires us to focus on user experience, which emphasizes engagement, fun, and delight rather than just functionality or ease-of-use [14, 15].

In recent years, research on user experience with technology has started to receive more attention, as technologies are increasingly used for both utilitarian and hedonic purposes in all aspects of user’s personal life. For example, mobile Internet service is often used for entertainment and killing time [2]. The purpose of this paper is to develop a theoretical model to examine the relationships between user experience with mobile Internet service, evaluation of mobile Internet services, user satisfaction, and intention to continually use mobile Internet service. For the purpose of this study, we define mobile Internet service as providing users with wireless access to Internet contents and services via handheld mobile devices [16], such as mobile phones, portable digital assistants (PDA), and Blackberry. This definition however does not include WiFi- or Bluetooth-enabled wireless laptops and other wireless devices, because the short-range network signals limit the mobility of these devices [17].

**LITERATURE REVIEW**

**User Satisfaction**

In behavioral IS research, user satisfaction construct has been a central construct of interest, employed by IS researchers and practitioners to measure user attitude about system, evaluate IS effectiveness, and predict user behavior or behavioral intention [18]. IS research on user satisfaction suggests that user satisfaction is an important measures of information systems success [19, 20]. While user satisfaction is defined in a variety of ways in IS research, such as understanding of a system and success [21] or user beliefs about the relative value of the MIS [22], these definitions share the notion that user satisfaction is some form of evaluative response to information system [18].

Similar attitude-like constructs (e.g., consumer satisfaction) have long been an important topic of study in other fields, such as consumer research. In consumer satisfaction research, satisfaction has been shown as a function of perceived product/service performance and disconfirmation of performance expectations [13, 23]. While perceived product/service performance is a direct result of evaluation of product/service attributes, disconfirmation of performance expectations is based on the comparison between the expectations about desired product/service performance and the perceived product/service performance. Consumer satisfaction research emphasizes the importance of direct consumption experience with product/service for the evaluation of product/service performance [6]. Similarly, in the context of mobile Internet service, the formation of satisfaction response requires post-adoption experience and use of the service.
Users must rely on their direct experience with the service to form perceptions of service performance and expectancy disconfirmation.

**User Experience and Flow**

As user experience is a vague term and concerns all aspects of how people use an interactive technology [24], there is a lack of a good definition for user experience [25] in the literature. Since our focus is on the implication of a good user experience for over-fulfillment – the upper threshold of user satisfaction, the concept of flow provides one fruit way to conceptualize the optimal user experience with mobile Internet service. Flow, which is referred to as the experience of optimal fulfillment and engagement, originated from Csikszentmihalyi’s work on optimal experience [26]. The flow concept has been widely referenced across a variety of fields, including human computer interaction. Extending Csikszentmihalyi’s flow theory to website navigation, Hoffman and Novak identify flow as an important characteristic of consumer behavior on the Internet [27, 28].

Flow is a multi-dimensional construct consisting of intense concentration, a sense of being in control, loss of self-consciousness, and altered sense of time [26]. Extending the flow concept to describe user’s holistic experience with the technology, Agarwal and Karahanna (2000) introduced the concept of cognitive absorption in IS research. Cognitive absorption is composed of five dimensions of temporal dissociation, focused immersion, heightened enjoyment, control, and curiosity [1]. Temporal association refers to “the inability to register the passage of time while engaged in interaction”; focused immersion is “the experience of total engagement” in the interaction while ignoring other attentional demands; heightened enjoyment captures “the pleasurable aspects of the interaction”; control represents “user’s perception of being in charge of the interaction”; and curiosity refers to “the extent to which the experience arouses user’s sensory and cognitive curiosity” [1]. Built on the concepts of flow, personality trait of absorption, and cognitive engagement, cognitive absorption entails a state of flow in which an individual is fully immersed in the interaction with technology, characterized by a feeling of focus, motivation, and enjoyment [29].

**Consequences of Flow**

Flow experience is found to be associated with satisfaction and loyalty behavior. Csikszentmihalyi describes flow as the state “so satisfying that individuals want to repeat the activity continually”[30]. Hoffman and Novak suggest consumer returns to websites that facilitate flow, which serves as “the glue holding the consumer in the hypermedia computer mediated environment” [27].

Flow experience has both cognitive and affective components [31], which lead to changes in attitudes [32] and subsequent positive behaviors. For example, on an e-commerce website, on the one hand, the experience of control and cognitive engagement in a flow state is likely to result in attitudinal and behavioral changes by promoting user’s learning about the website; and on the other hand, the feelings of enjoyment and focused immersion encourage positive site attitudes and revisits [33, 34].
Although the flow concept is closely related to intrinsic motivation, the state of people being fully immersed in an activity for its own sake [26], however it was found that flow could occur in both goal-oriented (extrinsically motivated) and experiential (intrinsically motivated) activities [28]. Based on the dichotomy of intrinsic versus extrinsic motivation, Hassenzahl distinguishes between the utilitarian (extrinsic) and hedonic (intrinsic) aspects of user experience in human-computer interaction [35]. Utilitarian experience is goal-oriented and emphasizes the functional performance of technology for goal/task-fulfillment. In contrast, hedonic experience is not motivated by just what a technology can do, but rather the experiential and emotional value the technology may bring about, such as fun, entertainment, and enjoyment [35, 36]. The evidence of flow for both goal-oriented and experiential activities [28] suggests that flow experience not only shapes hedonic experience but also influences utilitarian experience. For instance, cognitive absorption has been consistently supported to have positive influences on perceived usefulness and perceived ease of use, which are two important beliefs about utilitarian technology use [1, 37, 38].

**RESEARCH MODEL**

Extending the findings of satisfaction research and flow theory to the context of mobile Internet service usage, we develop a research model to investigate how user experience influencing user’s satisfaction with and continual use of mobile Internet services (See Figure 1). The model constructs and their relationships are illustrated as follows.

**FIGURE 1  Research Model of Mobile Service Satisfaction and Continual Use**

Antecedents of Satisfaction

In the perspective taken here, user experience with mobile Internet service is used as an input to user’s evaluation of the service. Based on the utilitarian and hedonic view of user experience [35], we specify user-perceived utilitarian performance and hedonic performance as two primary
evaluative dimensions for mobile Internet service. It is generally agreed that mobile Internet service is used for both utilitarian and hedonic purposes [2, 39, 40]. For instance, ticket reservation service and stock quote/banking service provide utilitarian benefits by satisfying user’s transaction and information-seeking needs. Entertainment services, such as mobile gaming and downloading contents (ring tone, wallpaper, music, and video), offer hedonic benefits.

The extant research has established that consumers evaluate products/services in general and mobile Internet service in specific along the utilitarian and hedonic dimensions [41-43]. Van der Heijden et al. (2005) found that the utilitarian value and hedonic value of mobile Internet service are the two major components of user attitude toward using the service. Based on the view of satisfaction as an evaluative response, we suggest the evaluations of utilitarian and hedonic performance attributes of mobile Internet service as the direct antecedents of satisfaction. We expect both high perceived utilitarian performance and high perceived hedonic performance of mobile Internet service to generate a more positive satisfaction judgment in the user. Therefore, we suggest the following hypotheses.

Hypothesis 1: The higher utilitarian performance a user perceives of mobile Internet service, the more satisfied he/she is with the service.

Hypothesis 2: The higher hedonic performance a user perceives of mobile Internet service, the more satisfied he/she is with the service.

Extending to the findings of flow experience in web navigation to the context of mobile Internet service, we suggest flow experience with mobile Internet service has a direct effect on user satisfaction. We use cognitive absorption to conceptualize flow experience as the optimal holistic experience that users feel when using mobile Internet service [1]. User experience of cognitive absorption, which affords an extremely gratifying and enjoyable experience with mobile Internet service, will lead to high levels of satisfaction in users. Thus, the following hypothesis can be suggested.

Hypothesis 3: The more a user feels the experience of cognitive absorption with mobile Internet service, the more satisfied he/she is with the service.

Since user’s evaluation of mobile Internet service performance is based on his/her subjective use experience with the service, cognitive absorption is also likely to have a positive influence on both perceived utilitarian performance and perceived hedonic performance of mobile Internet service. The experience of cognitive absorption has been consistently supported to involve the intrinsic enjoyment of technology use [1, 34, 44, 45], which in turn provides considerable hedonic value for the user. Thus, in the context of mobile Internet service, the great gratification and pleasure derived from the experience of cognitive absorption with mobile Internet service are expected to enhance the user’s perception of hedonic value obtained from the service. In addition, users feeling cognitive absorption with mobile Internet service tend to block out other distractions and spend more time using mobile Internet service than originally intended. Due to the effect of cognitive dissonance, they will have a natural tendency to account for the time and effort spent on the mobile Internet service by attributing instrumental/utilitarian value [1]. Therefore, we propose the following hypotheses.
Hypothesis 4: The more a user feels the experience of cognitive absorption with mobile Internet service, the higher utilitarian value he/she perceives of the service.

Hypothesis 5: The more a user feels the experience of cognitive absorption with mobile Internet service, the higher hedonic value he/she perceives of the service.

The expectancy disconfirmation model of satisfaction suggests expectation disconfirmation as a direct antecedent of satisfaction [46]. That is, satisfaction judgment is dependent on the extent to which a consumer’s expectation of performance is disconfirmed [46]. There was much evidence that consumers are satisfied when they experience positive disconfirmation, which occurs when perceived performance exceeds prior expectation of performance [41, 46]. Disconfirmation of performance expectation is based on the comparison between the expectation about desired service performance and the perceived service performance [46]. Holding prior expectation constant, highly perceived performance will be judged to be better than expected, resulting in more positive disconfirmation of performance expectation. Therefore, the following hypotheses can be proposed.

Hypothesis 6: The more positive a user’s expectation disconfirmation, the more satisfied he/she is with the mobile Internet service.

Hypothesis 7: The higher utilitarian performance a user perceives of mobile Internet service, the more positive is his/her expectation disconfirmation.

Hypothesis 8: The higher hedonic performance a user perceives of mobile Internet service, the more positive is his/her expectation disconfirmation.

While it is quite straightforward for users to form satisfaction judgments based on perceived performance, making comparisons between performance and expectation requires greater levels of cognitive processing. The experience of cognitive absorption with mobile Internet service indicates a state of deep involvement with the service [1], in which users may engage in a highly elaborative process of service evaluation. The greater the evaluative processing of service performance, the more likely the user is to form an assessment concerning whether the service performance is better than or worse than expected. Thus, the experience of cognitive absorption can promote the formation of positive expectation disconfirmation judgment by enhancing the perception of service performance and facilitating an in-depth cognitive process of comparing perceived performance to expectation. This suggests the following hypothesis.

Hypothesis 9: The more a user feels the experience of cognitive absorption with mobile Internet service, the more positive is his/her expectation disconfirmation.

**Satisfaction and Continual Use**

As an evaluative response to the use experience of mobile Internet service, satisfaction with mobile Internet service influences subsequent use behavior with the service. According to Ajzen and Fishbein’s theory of reasoned action [47], satisfaction indicates positive attitude, which will result in increased positive behavioral intentions or behaviors. In consumer satisfaction research,
satisfied customers are found to be more likely to remain loyal to the product/service [12], such as making repeat purchase of same product/service. Similarly, it is expected that satisfied mobile Internet service users are more likely to continue their use of that service [4, 5]. Therefore, we suggest the following hypothesis regarding the relationship between satisfaction with and continual use of mobile Internet service.

Hypothesis 10: The more satisfied a user is with his/her use experience of mobile Internet service, the more likely he/her will continue to use the service.

RESEARCH METHOD

Sample and Data Collection

A web-based survey will be conducted to test the proposed research model and its associated hypotheses. To solicit participation, an email invitation will be sent to a major mobile service user forum – www.howardforums.com, which has over five hundred thousand members consisting of the existing and potential users of mobile Internet service. Interested participants may click on the link in the email invitation to be directed to the survey website. A screening question will be included at the beginning of survey to determine whether the respondent is using mobile Internet service at the time of the survey. The survey website will be designed in such a way that only the existing user of mobile Internet service will be able to proceed with the survey.

Measures

Our survey instrument will be developed by incorporating and adapting existing valid and reliable scales where appropriate (See Appendix).

The measurement scale of cognitive absorption (CA) construct is adopted from the original work of Agarwal and Karahanna [1]. Van de Heijden et al. suggest a modified version of HED/UT scale [43], which was derived from Batra and Ahtola’s [42] work and used in the context of mobile services. We adapt their scale items to measure the evaluation of utilitarian and hedonic values of mobile Internet service. Expectancy disconfirmation will be measured using Oliver’s disconfirmation scale [46]. Flavian et al.’s [8] measurement scale of satisfaction is adapted to measure the overall satisfaction with the use experience of mobile Internet service. Finally, the measure of continual use of mobile Internet service is derived from the prior work on IT continuance [5, 48].

EXPECTED CONTRIBUTIONS

The expected contribution of the research is two folds, theoretical and practical. The major theoretical contribution of this research is to provide understanding of how flow experience conceptualized as cognitive absorption may influence user’s satisfaction with and continual usage intention of mobile Internet service. The proposed research model explores the direct and indirect effects of the experience of cognitive absorption on user satisfaction and continuance intention. It will enhance the technology adoption/use literature by offering insights into the role of user experience for the formation of post-adoptive satisfaction and continuance intention with
consumer-oriented technology. As for practical contribution, the outcome of this research will be of interest to mobile Internet service providers. The findings concerning the effects of user experience on satisfaction and continuance intention with mobile Internet service will provide implications and guidelines for designing and delivering mobile services that permeate consumers’ daily life.

**APPENDIX**

Measurement Scales to be used in the Survey

*Cognitive Absorption*

Imagine that you’re using the mobile Internet service. Please indicate the extent to which you disagree or agree with the following statements about your use experience with the service. (1 = Strongly Disagree, 2 = Disagree, 3 = Somewhat Disagree, 4 = Neither Disagree Nor Agree, 5 = Somewhat Agree, 6 = Agree, 7 = Strongly Agree)

- CA1 Time appears to go by very quickly when I am using the mobile Internet service.
- CA2. Sometimes I lose track of time when I am using the mobile Internet service.
- CA3. Time flies when I am using the mobile Internet service.
- CA4. Most times when I get to use the mobile Internet service, I end up spending more time than I had planned.
- CA5. I often spend more time using the mobile Internet service than I had intended.
- CA6. While using the mobile Internet service I am able to block out most other distractions.
- CA7. While using the mobile Internet service, I am absorbed in what I am doing.
- CA8. While using the mobile Internet service, I am immersed in the task I am performing.
- CA9. When using the mobile Internet service, I get distracted by other attentions very easily. (R)
- CA10. While using the mobile Internet service, my attention does not get diverted very easily. (R)
- CA11. I have fun interacting with the mobile Internet service.
- CA12. Using the mobile Internet service provides me with a lot of enjoyment. (R)
- CA13. I enjoy using the mobile Internet service.
- CA14. Using the mobile Internet service bores me. (R)
- CA15. When using the mobile Internet service I feel in control.
- CA16. I feel that I have no control over my interaction with the mobile Internet service. (R)
- CA17. The mobile Internet service allows me to control my interaction with it.
- CA18. Using the mobile Internet service excites my curiosity.
- CA19. Interacting with the mobile Internet service makes me curious.
- CA20. Using the mobile Internet service arouses my imagination.

*Utilitarian Value and Hedonic Value*
Please evaluate the usage of the mobile Internet service. Indicate the degree to which you evaluate the mobile service as follows. (-3 = significantly, -2 = quite, -1 = slightly, 0 = neither, 1 = slightly, 2 = quite, 3 = significantly)

UT1. I evaluate the mobile Internet service as useless ………………… useful
UT2. I evaluate the mobile Internet service as impractical ……………… practical
UT3. I evaluate the mobile Internet service as unnecessary …………… necessary
UT4. I evaluate the mobile Internet service as unfunctional …………. functional
UT5. I evaluate the mobile Internet service as unhelpful ………………. helpful
UT6. I evaluate the mobile Internet service as inefficient ……………….. efficient
UT7. I evaluate the mobile Internet service as ineffective ……………… effective
UT8. I evaluate the mobile Internet service as harmful ………………… beneficial
UT9. I evaluate the mobile Internet service as unproductive …………. productive
HED1. I evaluate the mobile Internet service as dull ……………………. exciting
HED2. I evaluate the mobile Internet service as disgusting …………… delightful
HED3. I evaluate the mobile Internet service as uninteresting …………. fascinating
HED4. I evaluate the mobile Internet service as serious ………………… playful
HED5. I evaluate the mobile Internet service as unthrilling ……………… thrilling
HED6. I evaluate the mobile Internet service as unpleasantsant ……… pleasant
HED7. I evaluate the mobile Internet service as unamusing …………….. amusing
HED8. I evaluate the mobile Internet service as cheerless ………………. cheerful

Expectancy Disconfirmation

Please rate how well the mobile Internet service meets your expectations along the following dimensions. (1 = much less than expected, 2 = less than expected, 3 = a little less than expected, 4 = pretty much as expected, 5 = a little greater than expected, 6 = greater than expected, 7 = much greater than expected)

ED1. I rate my experience with using the mobile Internet service as much less than expected ………………… much greater than expected
ED2. I rate the service level provided by the mobile Internet service as much less than expected ………………… much greater than expected
ED3. I rate the benefits provided by the mobile Internet service as much less than expected ………………… much greater than expected
ED4. I rate the overall performance provided by the mobile Internet service as much less than expected ………………… much greater than expected

Satisfaction

Please indicate the extent to which you disagree or agree with the following statements about your satisfaction with the mobile Internet service. (1 = Strongly Disagree, 2 = Disagree, 3 = Somewhat Disagree, 4 = Neither Disagree Nor Agree, 5 = Somewhat Agree, 6 = Agree, 7 = Strongly Agree)

SAT1. I think that I made the correct decision to use mobile Internet service.
SAT2. The experience that I have had with mobile Internet service has been satisfactory.
SAT3. In general, I am satisfied with mobile Internet service.
Continuance Intention

Please indicate the extent to which you disagree or agree with the following statements about your intention to continue using the mobile Internet service. (1 = Strongly Disagree, 2 = Disagree, 3 = Somewhat Disagree, 4 = Neither Disagree Nor Agree, 5 = Somewhat Agree, 6 = Agree, 7 = Strongly Agree)

CU1. I intend to continue using the mobile Internet service in the future.
CU2. I will always try to use the mobile Internet service in my daily life.
CU3. I will keep using the mobile Internet service as regularly as I do now.
CU4. If I could, I would like to discontinue my use of the mobile Internet service. (R)

REFERENCES


