Constraint and Dedication based Motivations on Use Continuance for a Web Portal Site

Soongeun Hong, Young Sik Kang, and Heeseok Lee

KAIST Business School
207-43, Cheongryangri-dong, Dongdaemun-gu, Seoul, 130-012, Korea
Tel: +82-2-958-3654, Fax: +82-2-958-3604, E-mail: [*hongsoon, yskang, hsl*]*@business.kaist.ac.kr*

Abstract

Most of the IS continuance research has assumed that IS use is activated by an intention to use, which in turn is determined by the evaluation of IS usage. Perceived usefulness is one of the evaluation variables most widely used. Typically, the past studies adopt this perceived usefulness because it views continuance as an extension of acceptance behavior. However, the literature on interpersonal relationships suggests that individuals are motivated to maintain relationships either because they genuinely want to or they believe they have no other option. The former is referred to as dedication-based relationship maintenance and the latter as constraint-based relationship maintenance. The IS continuance can be considered as the relationship maintenance situation with the existing IS that the user is currently using. The belief constructs previously used in IS continuance researches fall into the category of dedication-based ones. Additional constraint-based belief constructs are needed to explain the IS continuance behavior. In this regard, switching cost represents an important avenue for better understanding and predicting customer retention in that it can be regarded as the constraint-based motivation for relationship maintenance or IS use continuance. For an empirical exploration, 275 samples were collected from the users of a web portal site. Data analysis using Structural Equation Modeling (SEM) shows that perceived usefulness shows a significant direct effect on continuance intention while perceived switching cost significantly affects continuance usage.

Keywords:

IS Continuance, Switching Cost, Satisfaction

Introduction

As many researchers have pointed out, the user retention is crucial for the success of the IS. The often paradoxical relationship between investment in information systems (IS) and gains in productivity has been attributed to a lack of user acceptance of IS [1]. Having the technology available is simply not enough; it must be accepted and used appropriately by its target user group in order to realize anticipated productivity gains. An IS can truly be considered as a success when a significant number of users have moved beyond initial adoption and used the IS on a continued basis [8]. Furthermore, when it comes to the

Internet sites, where the users are free to choose whether to stay or leave, IS continuance at the individual user level is central to the survival of many business-to-consumer electronic commerce firms, such as internet service providers, online retailers, and online banks [5].

The determinants of computer technology acceptance and utilization among users have been consistently drawing the interests of the researchers. Most of the researches have used different theoretical frames and presented only limited insight into IS continuance and adoption. Among them, studies based on the technology acceptance model (TAM) formed the main stream in this research area. They normally focused on the initial adoption of IS. It is only in recent years that researchers started to advocate the need to understand the continued IS usage behavior. IS continuance describes behavior patterns reflecting continued use of an IS. It refers to a form of post-adoption behavior [8].

Most of the IS continuance research has assumed that IS use is activated by an intention to use, which in turn is determined by the evaluation of IS usage [19]. Perceived usefulness is one of the evaluation variables most widely used. Typically, TAM adopts this perceived usefulness because it views continuance as an extension of acceptance behavior; i.e., it employs the same pre-adoption variables to explain both adoption and continuance decisions.

However, continued usage is a matter of continuous decision making among alternatives in the competitive alternative systems. Among the determinants of decisions under the multiple-choice situation, despite their potential importance in the retention process, the role of switching barriers has received relatively little attention in marketing [15], let alone in IS field.

Furthermore, the literature on interpersonal relationships suggests that individuals are motivated to maintain relationships either because they genuinely want to or because they believe they have no other option. The former is referred to as dedication-based relationship maintenance and the latter as constraint-based relationship maintenance. It is recognized in these literatures that both sets of motivations must be studied for a firm understanding of why relationships are maintained [4]. When we extend the IS continuance perspective to include the search for alternatives and choice decision making processes, additional constraint-based belief constructs are needed to explain the IS continuance behavior. In this regard, perceived switching cost represents an important avenue for better understanding and predicting customer retention in that it can be regarded as the constraint-based motivation

for relationship maintenance or IS use continuance.

Perceived switching cost can be defined as the perceived economic and psychological costs associated with changing from one alternative to another [16]. It has been proved that switching costs have a significant impact on repeat choice behavior [6]. Thus, we can propose that perceived switching costs hold true for IS continuance, because IS continuance often imposes monetary and non-monetary costs on IS users [5]. This paper addresses this research issue and attempts to develop a research model.

Literature Review

Agarwal and Prasad [1] showed that future use intention is by the individual's assessment of IS utility, i.e., perceived usefulness. Bhattacherjee [5] used perceived usefulness as the surrogate for expectation in ECT. In the IS continuance theory (ICT) of Bhattacherjee [5], ECT [21] was integrated with findings from IS usage research to theorize IS continuance. ICT employs a field survey of online banking users and suggests that users' continuance intention is determined by their satisfaction with IS use and perceived usefulness of continued IS use. The model introduced the satisfaction construct instead of attitude or affect, which had been traditionally used by IS research.

Recently, Kim, et al. [17] adopted feeling and belief as the dual determinants of attitude formation and tested their effect on IS continuance intention. They adopted perceived usefulness as the belief and playfulness as the feeling. In their integrative research on IS continuance, Kim and Malhotra [18] and Kim, et al. [19] also adopted perceived usefulness as the main belief construct.

On the other hand, Jackson et al. [14] suggested that perceived ease of use affects the behavioral intention for use. Bajaj and Nidumolu [3] pointed out that models such as TAM ignore the possibility of feedback from past behavior, and they proposed a model having a feedback loop from past behavior to current attitudes and beliefs. They developed a model that incorporated a feedback loop from past behavior to current attitudes and beliefs, especially the perceived ease of use.

If we follow the classification of motivation to keep relationships as dedication-based and constraint-based ones, the belief constructs previously used in IS continuance researches fall into the category of dedication-based ones. In contrast, the economic perspective in relationship marketing explains continuance in terms of costs and benefits of staying in the relationship versus leaving it. This literature therefore emphasizes switching costs and attractiveness of alternatives. Furthermore, much of the literature on long-term relationship orientation has emphasized such dependence-mediated relationship maintenance, that is, constraint-based relationship maintenance [4]. Thus, additional constraint-based belief constructs are needed to explain the IS continuance behavior.

Table 1 summarizes the main antecedents of IS continuance intention as were used in the previous studies.

Table 1 - Antecedents of IS Continuance Intention

Antecedents	References
Perceived usefulness	Agarwal & Prasad [1], Bhattacherjee [5], Kim, et al. [17], Kim and Malhotra [18], Kim et al. [19]
Perceived ease of use	Jackson, et al. [14], Bajaj & Nidumolu [3]

Theoretical Backgrounds

Jones et al. [15] proved that switching barriers make customer defection difficult or costly. Among the switching barriers, perceived switching costs are consumer perceptions of the time, money, and effort associated with switching. As the perceived costs increase, the likelihood of consumers engaging in such behavior diminishes.

Burnham et al. [6] defined switching costs as the onetime costs that customers associate with the process of switching from one provider to another. While switching costs must be associated with the switching process, they need not be incurred immediately upon switching. Furthermore, switching costs need not be limited to objective economic costs. When consumers state that "it's not worth it" to switch providers, they may perceive impediments ranging from search costs, transaction costs, learning cost, loyal customer discounts, customer habit, emotional cost and cognitive effort, coupled with financial, social, and psychological risk on the part of the buyer. Among those factors of switching cost perception, learning costs are the time and effort costs of acquiring new skills or know-how in order to use a new product or service effectively. Learning investments are often provider-specific, meaning new investments must be made to adapt to a new provider. Another factor, monetary loss cost is the onetime financial outlay that is incurred in switching providers other than those used to purchase the new product itself. Adopting a new provider often involves onetime expenditures such as deposits or initiation fees for new customers. In addition, switching products or providers may involve replacing transaction-specific assets in which the consumer has invested.

The IS continuance can be considered as the relationship maintenance situation with the existing IS that the user is currently using. The switching cost is more likely to give a firm understanding of user continuance.

Research Model and Result

The ICT of Bhattacherjee [5], suggests that users' continuance intention is determined by their satisfaction with IS use and perceived usefulness of continued IS use. User satisfaction is defined as the summary of a psychological state resulting when the emotion surrounding disconfirmed expectations is coupled with the consumer's prior feelings about the consumption experience.

Furthermore, if we consider the converse of confirmation, i.e., the disconfirmation that leads to the discontinuance intention which is synonymous with the switching or

stopping intention, the switching cost becomes an important factor. Furthermore, the inclusion of switching cost extends the theoretical model beyond the limitations of prior studies with only dedication-based motivations.

Based on the above propositions, our research model can be depicted as shown in Figure 1. Our model extends the previous IS continuance model by including switching cost.
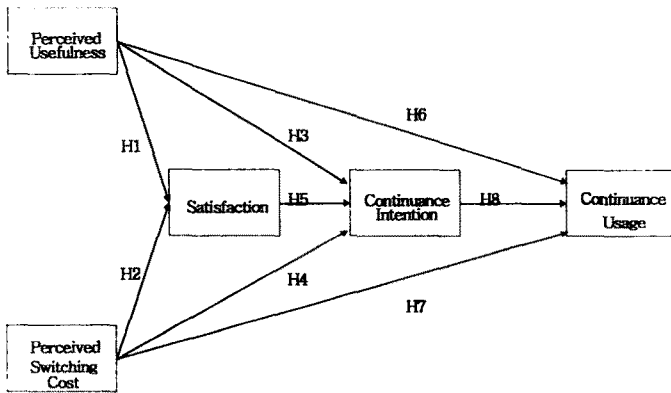

Figure 1 - Research Model

Hypotheses

The followings are further details for causal effects in the model.

According to the ICT model [5], perceived usefulness affects satisfaction. The perceived usefulness was included as the expectations construct in the ICT. The expectation concept is duplicated as perceived usefulness and perceived switching cost in this study. Perceived switching cost is related with the continuance usage indirectly through the opposite side of the continuance usage. Thus, it can be regarded more as the constraint based motivation of continuance usage than the dedication based motivation. Perceived usefulness means the motivation from a preference while perceived switching cost can be regarded as the lack of realistic option. Perception of lack of alternatives can lead to dependence on the current relationship. Conversely, this dependence can lead to dedication to the current relationship through self-justification motives. That leads to the proposition that the user with high switching cost can rationalize their dependence. They can think that the dependence is not driven by dependence but by their own volition, for instance, by dedication [4]. Thus the following relationships can be proposed.

H1: Perceived usefulness would positively affect satisfaction.

H2: Perceived switching cost would positively affect satisfaction.

According to ICT model [5], perceived usefulness affects the behavioral intention.

H3: Perceived usefulness would positively affect continuance intention.

As the perceived costs of an activity increase, the likelihood

of consumers engaging in such behavior should diminish. For example, research in information economics demonstrates that as the costs of information increase, the extent of search declines. In addition, research on employee turnover demonstrates that employees are less likely to change jobs as the costs of doing so increase [15]. Information system is likely to involve various behavioral and psychological costs and such costs should act to diminish switching tendencies. Thus, we may propose that higher perceived switching cost is associated with higher continuance intention.

H4: Perceived switching cost would positively affect continuance intention.

According to ICT, users' satisfaction is one of the antecedents of the behavioral intentions for the behavior. Accordingly, we may propose that:

H5: Satisfaction would positively affect continuance intention.

Thus far, many of the IS continuance studies set the continuance intention as the main dependent variable based on the assumption that continuance intention leads to continuance usage. However, when we consider the effects of constraint motivations, we need to further elaborate on the real continuance usage behavior instead of continuance intention. Even though there maybe intention, the real behavior can be changed due to factors outside the internal control factors such as perceived switching cost. Thus we should expand the assumptions on the continuance intention concerning the effects of perceived usefulness and perceived switching cost to those on the continuance usage behavior.

H6: Perceived usefulness would positively affect continuance usage.

H7: Perceived switching cost would positively affect continuance usage.

H8: Continuance intention would positively affect continuance usage.

Research Design and Administration

A multiple-item method was adopted to construct the questionnaires. All items except satisfaction were seven-point Likert-type scale from 'strongly disagree' to 'strongly agree'. Satisfaction was measured using seven-point semantic differential scales. Most of the measures were operationalized by the use of the constructs adopted by relevant previous studies. These constructs have been validated by the previous studies on IS continuance and technology acceptance model. The operational definition of instruments and their related research are summarized in Table 2.

Perceived switching cost comprises not only economic costs but also psychological and emotional costs. In this research, conceptual definitions and measurement scales were adopted from Jones et al. [15].

The other constructs, such as continuance intention, continuance usage, satisfaction, and perceived usefulness

were measured with the items developed by relevant   previous studies.

Table 2 - Conceptual Construct Definitions, Items, and Sources

Construct	Conceptual definition	Measures		Sources
Perceived Usefulness	Perception of the expected utilitarian benefits of the system use	PU1	Overall	Adapted from [10,13]
		PU2	Information	
		PU3	Added value	
Perceived Switching Cost	Perceptions of the time, money, and effort associated with switching	SC1	Hassling effect of switching	[15]
		SC2	Effort and time needed for switching	
		SC3	Costs in time, money and effort for switching	
Satisfaction	Feelings about the system use	ST1	Dissatisfied/ Satisfied	[5]
		ST2	Displeased/Pleased	
		ST3	Frustrated/Contented	
		ST4	Terrible/Delighted	
Continuance Intention	Intention to continue using the system	CI1	Continue using	[5]
		CI2	Discontinue using	
		CI3	Preference for alternative means	
Continuance Usage	Continued usage of the system	CU1	Duration	[23]
		CU2	Frequency	

To enhance the validity of the proposed model's measurement item, a pretest and a pilot survey were conducted before the main survey. For assuring content validity in web site context, two doctoral students of MIS reviewed a set of questionnaire items based on relevant previous research. A pilot survey was conducted using the initial questionnaire items. 100 users of a Korean search engine portal site participated in the pilot survey.

To verify the reliability and construct validity of questionnaire items adopted for the pilot survey, the internal consistency method and exploratory factor analysis (EFA) using SPSS 10 were performed.

After conducting pretest and pilot test, the final set of questionnaire items used in main survey was confirmed.

The target information system was one of the Korean search engine portal site. The initial survey questionnaires with all the research constructs were collected among university student of computer related class at the beginning of the semester. One month later, second round of survey questionnaires were collected by mainly focusing on the continued usage.

We obtained 278 responses. Among them, 3 responses were discarded because they were only partially completed. As a result, 275 samples were used for our final analysis.

The research model was tested using partial least squares (PLS), a structural modeling technique that is well suited for highly complex predictive models [24]. PLS Graph version 3.0 was used for the analysis, and the bootstrap resampling method was used to determine the significance of the paths within the structural model.

Among the commercial statistical software packages that adopt the structural equation modeling approach , the most widely used are LISREL (Linear Structural Relationships) and PLS. Although both of them are based on structural equation modeling, they are very different in their estimation approaches and objectives. The primary measures used in LISREL are overall goodness-of-fit measures that assess how well the hypothesized model fits the observed data. The analysis is thus "theory-oriented" and emphasizes the transition from exploratory to confirmatory analysis. PLS is based on least squares estimation with the primary objective being to maximize the explanation of variance in the dependent constructs. PLS is primarily intended for causal-predictive analysis in case of high complexity but low theoretical information. Because a major task of this study is to examine the causal-relationships, PLS was adopted for the analysis.

Measurement Model

The convergent and discriminant validity were assessed for construct validity testing. The convergent validity of the research instruments is commonly estimated by assessing item reliability, construct reliability and average variance extracted (AVE). All item reliabilities are higher than the 0.50 cut off value. All constructs also exceeded the recommended level of construct reliability 0.80 [20] and average variance extracted 0.50 [7,12]. It is noted that the measures support convergent validity.

Discriminant validity can be assessed by comparing the squared correlation between two constructs with their respective average variances extracted. Discriminant validity is demonstrated if the average extracted variances of both constructs are greater than the squared correlation. The discriminant validity test results show the discriminant validities between constructs are good within the criteria. The details are shown in Table 3 and 4. In Table 4, the numbers forming the diagonal line are average variance extracted.

Table 3 - Reliability and Convergent Validity Test

Item	Item Reliability	Construct Reliability	Average Variance Extracted
PU1	0.775		
PU2	0.784	0.916	0.645
PU3	0.836		
SC1	0.918		
SC2	0.954	0.954	0.875
SC3	0.933		
ST1	0.766		
ST2	0.919	0.936	0.787
ST3	0.922		
ST4	0.931		
CI1	0.894		
CI2	0.866	0.921	0.794
CI3	0.914		
CU1	0.814	0.820	0.696
CU2	0.854		

PU; perceived usefulness, SC; perceived switching cost,
ST; satisfaction, CI; continuance intention,
CU; continuance usage.

Table 4 - Discriminant Validity Test

	PU	SC	SF	CI	CU
PU	0.803				
SC	0.207	0.935			
SF	0.135	0.493	0.887		
CI	0.135	0.191	0.176	0.891	
CU	0.157	0.508	0.513	0.184	0.834

Structural Model

The test of structural model includes estimates of the path coefficients which indicate the strengths of the relationships between the dependent and independent variables and the R^2 values which represent the amount of variance explained by the independent variables. Figure 2 shows the results of the structural model.
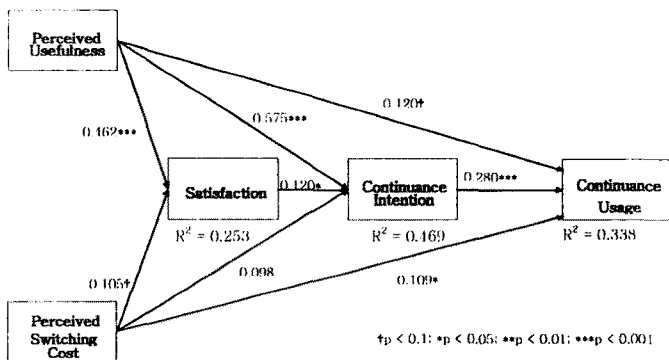

Figure 2 –Analysis Results

Explanatory power of the model is fairly good. R^2 ranges

from 0.253(satisfaction) to 0.469 (continuance intention). Continuance intention (0.280), perceived switching cost (0.190), and perceived usefulness (0.120) had significant influence on continuance usage explaining 33.8% of the total variance. In terms of significance level, continuance intention was the highest ($p<0.0001$) while perceived usefulness was the lowest ($p<0.1$). On the contrary, perceived usefulness (0.575) showed highest and most significant influence on continuance intention compared with satisfaction (0.120) and perceived switching cost (0.98). In this case, perceived switching cost showed insignificant influence on continuance intention.

These results show contrasting role of perceived usefulness and perceived switching cost. Perceived usefulness, which is a dedication based motivation, has a strong direct relationship with continuance intention. In contrast, perceived switching cost, which is a constraint based motivation, has a strong relationship with real behavior even though its effect on continuance intention is negligible. Perceived usefulness (0.462) also had dominant effect on satisfaction compared to perceived switching cost (0.105).

Implications

In this study, we compared two sets of motivations on IS continuance. One was the traditional dedication based motivation represented by perceived usefulness. The other was the newly added constraint based motivation represented by perceived switching cost. With the former motivation, its dominant role in the previous studies was confirmed as was proposed in ICT. With the latter constraint-based motivation, perceived switching cost showed meaningful role as the antecedent of continuance behavior.

In most previous studies on IS continuance, the main dependent variables used include continuance intention rather than continuance behavior. This was partly because of the difficulty of longitudinal survey design which is required for the study on continuance behavior. This limitation of research design can raise the need to investigate the different antecedents of continuance intention and behavior. We are interested in the topic because we want to know what makes users stay as a loyal user not what makes users want to stay as a loyal user. The users' intention may not result in a real behavior as intended. Furthermore, in a meta analysis of studies that adopted the theory of reasoned action (TRA) and the theory of planned behavior (TPB) [2] as the theoretical model, Sutton [22] pointed out that there are many cases where intention failed to show enough predictive power for behavior. For the behaviors that are completely under volitional control, which is the assumption made by TRA, intention could be the sufficient cause of behavior. On the other hand, TPB allows behavior to be influenced by control factors in addition to intention [22]. A number of control factors have been proposed as additional determinants of behavior, which include past behavior, habit, and self-identity [9]. Perceived switching cost can be added into that pools of control factors.

The weak effect of perceived switching cost on satisfaction and continuance intention can be explained by the principle of correspondence [11], which states that in order to maximize predictive power, the predictor(perceived switching cost) and the criterion should be measure at the same level of specificity. The measures should be matched with respect to four components: action, target, time, and context. Satisfaction and continuance intention are in the context of continuance behavior while perceived switching cost is in the context of discontinuance or switching behavior. Though these two extremes of behavior are closely related they differ in the specificity of context.

Conclusion

By the inclusion of perceived switching cost in addition to the perceived usefulness widely adopted in the previous studies, our continuance model of IS users may be able to help further explain the continuance context of usage. Even though the direct effect of perceived switching cost on continuance intention was insignificant, its effect on real continuance usage was stronger than that of perceived usefulness. This result supports the importance of the study of constraint based motivations in IS continuance.
A similar position was held by the habit construct in related studies [18,19]. Comparing the effects of those two different types of direct determinants of continuance usage remains for further studies.

References

[1] Agarwal, R., and Prasad, J. (1997). "The role of innovation characteristics and perceived voluntariness in the acceptance of information technologies," *Decision Sciences*, Vol. 28, pp. 557-582.
[2] Ajzen, I. (1991). "The theory of planned behavior," *Organizational Behavior and Human Decision Processes*, Vol. 50, pp. 179-211.
[3] Bajaj, A., and Nidumolu, S. R. (1998). "A feedback model to understand information system usage," *Information & Management*, Vol. 33, pp. 213-224.
[4] Bendapudi, N., and Berry, L. L. (1997). "Customers' motivations for maintaining relationships with service providers," *Journal of Retailing*, Vol. 73, pp. 15-37.
[5] Bhattacherjee, A. (2001). "Understanding information systems continuance: an expectation-confirmation model," *MIS Quarterly*, Vol. 25, pp. 351-370.
[6] Burnham, T. A., Frels, J. K., and Mahajan, V. (2003). "Consumer switching costs: a typology, antecedents, and consequences," *Journal of the Academy of Marketing Science*, Vol. 31, pp. 109-126.
[7] Chau, P. Y. K. (1997). "Reexamining a model for evaluating information center success using structural euation modeling approach," *Decision Sciences*, Vol. 28, pp. 309-334.
[8] Cheung, C. M. K., and Limayem, M. (2005). "The role of habit in information systems continuance: examining the evolving relationship between intention and usage," *26th International Conference on Information Systems*, pp.

[9] Conner, M., and Armitage, C. J. (1998). "Extending the theory of planned behavior: a review and avenues for further research," *Journal of Applied Social Psychology*, Vol. 28, pp. 1429-1464.
[10] Davis, F. D., Bagozzi, R. P., and Warshaw, P. R. (1992). "Extrinsic and intrinsic motivation to use computers in the workplace," *Journal of Applied Social Psychology*, Vol. 22, pp. 1111-1132.
[11] Fishbein, M., and Ajzen, I. (1975). *Belief, attitude, intention and behavior: an Introduction to theory and research*, Addison-Wesley Publishing Company, Inc.
[12] Fornell, C., and Larcker, D. F. (1981). "Evaluating structural equation models with unobservable variables and measurement error," *Journal of Marketing Research*, Vol. 18, pp. 39-50.
[13] Heijden, H. v. d. (2003). "Factors influencing the usage of websites: the case of a generic portal in the Netherlands," *Information & Management*, Vol. 40, pp. 541-549.
[14] Jackson, C. M., Chow, S., and Leitch, R. A. (1997). "Toward an understanding of the behavioral intention to use an information system," *Decision Sciences*, Vol. 28, pp. 357-389.
[15] Jones, M. A., Mothersbaugh, D. L., and Beatty, S. E. (2000). "Switching barriers and repurchase intentions in services," *Journal of Retailing*, Vol. 76, pp. 259-274.
[16] Jones, M. A., Mothersbaugh, D. L., and Beatty, S. E. (2002). "Why customers stay: measuring the underlying dimensions of services switching costs and managing their differential strategic outcomes," *Journal of Business Research*, Vol. 55, pp. 441-450.
[17] Kim, H.-W., Chan, H. C., Chan, Y. P., and Gupta, S. (2004). "Understanding the balanced effects of belief and feeling on information systems continuance," *International Conference on Information Systems*, pp. 297-309.
[18] Kim, S. S., and Malhotra, N. K. (2005). "A longitudinal model of continued IS use: An integrative view of four mechanisms underlying postadoption phenomena," *Management Science*, Vol. 51, pp. 741-755.
[19] Kim, S. S., Malhotra, N. K., and Narasimhan, S. (2005). "Two competing perspectives on automatic use: a theoretical and empirical comparison," *Information Systems Research*, Vol. 16, pp. 418-432.
[20] Nunnally, J. C. (1978). *Psychometric theory*, McGraw-Hill.
[21] Oliver, R. L. (1980). "A cognitive model for the antecedents and consequences of satisfaction decisions," *Journal of Marketing Research*, Vol. 17, pp. 460-469.
[22] Sutton, S. (1998). "Predicting and explaining intention and behavior: How well are we doing?" *Journal of Applied Social Psychology*, Vol. 28, pp. 1317-1338.
[23] Thompson, R. L., Higgins, C. A., and Howell, J. M. (1991). "Personal computing: Toward a conceptual model for utilization," *MIS Quarterly*, Vol. pp. 125-143.
[24] Wixom, and Todd (2005). "A theoretical integration of user satisfaction and technology acceptance," *Information Systems Research*, Vol. 16, pp. 85-102.