2012 IEEE International Conference on Systems, Man, and Cybernetics
October 14-17, 2012, COEX, Seoul, Korea

The Role of Trust and Security in Smartphone Banking Continuance

Aries Susanto, Younghoon Chang, Hangjung Zo, Myeong Cheol Park
Department of Management Science
Korea Advanced Institute of Science and Technology (KAIST)
Daejeon, Republic of Korea
ariessht@ieee.org, younghoonchang@kaist.ac.kr, joezo@kaist.edu, imcpark@kaist.ac.kr

Abstract— **Prior studies had notably figured out that security, satisfaction, and trust are very critical elements in mobile-based banking usage. This study is to propose an explanatory and exploratory research framework based on the Expectation Confirmation Model. The results showed that perceived security and satisfaction were strong determinant factors for the formation of consumers' reuses decisions and relational behaviors building towards Smartphone banking services in South Korea, whereas perceived usefulness and trust were not statistically significant on usage continuance intention. This study will briefly draw some related concluding remarks.**

Keywords-usage continuance; e-commerce; e-banking; trust; perceived security; satisfaction; consumers' behavior

I. INTRODUCTION

As a business-to-consumer (B2C) classification of electronic commerce [3], electronic banking or e-banking may comprise of Internet banking/online banking, phone banking, automatic teller machine (ATM) banking, and mobile-based banking [8]; including Smartphone banking [25]. It provides mutually advantageous services such as cost and time saving, convenient services, benefits [23]. Thus, e-banking can deliver an imperative role to indulge and satisfy customers' needs of financial services more flexible, including to intermediate either Information Technology (IT)-based financial services or conventional off-line systems [28], [23].

The use of e-banking services are now becoming much more important regarding consumer satisfaction, especially in the modern financial business world including in mobile-based banking area such as Smartphone banking. The concept of satisfying consumers with what they need and require have been getting a crucial consideration for several decades in the context of marketing and consumer behaviors [3], [32]. Many firms always attempt to continuously contemplate a definite structure of business functions in enabling them consecutively profitable regarding the complex appearance of consumers' mindsets and attitudes.

Many studies have noticed the eminence of satisfaction and trust as required fundamental factors for prosperous long-term relationships with customers [2] and as the determinant key for e-commerce success [11]. As an attitude, consumer satisfaction is shaped through a psychological collation of the perceived quality of the product or service that a customer presumably gets from a transaction exchange with the degree of quality of what the consumer can perceive beyond the product and service reception or consumption [32].

The consumption process of product and service consists of three common stages of behavior: pre-consumption, consumption, and post-consumption [3], [5]; which appear both in electronic-based transactions such as e-commerce and traditional transactions [5].

Furthermore, prior studies empirically explored the relationships between dimensions which affecting the consumers in continuous use in e-commerce and mobile-based banking services, (e.g., system usefulness, security, trust, satisfaction) [3], [24], [28], [37]-[38]. However, there are relatively a few empirical studies that accommodate the significance of security and trust in the context of e-commerce in general [6], and particularly mobile-based technology services–Smartphone banking usage [25].

This study is to propose an extended framework by using the Expectation-Confirmation Model (ECM) for empirically measuring the relational embodiment of consumers' usage decision factors in Smartphone banking, which in turn affirmatively affect the continuous usage of e-banking services within South Korea regarding to technology use.

II. LITERATURE REVIEW

A. Smartphone Banking in Korea

Smartphone banking is typically a classified term used for conducting balance inquiries, transaction histories, payments, money transfers and other financial transactions through a mobile-based device e.g. Smartphone. It is an extended technology services for mobile banking as an initial mobile-based feature which provides a basis for automated banking and financial services [23].

A Smartphone integrates multifunction of a mobile device with an advanced communication and computing-enabled features abilities [25] and coped with traditional mobile device's limitations such as small display screen, inconvenient keyboard, functional services, and relatively more insecure [23], [28].

This research was supported by the MKE (The Ministry of Knowledge Economy), Republic of Korea, under the ITRC (Information Technology Research Center) support program supervised by the NIPA (National IT Industry Promotion Agency). (NIPA-2012-H0301-12-1004).

978-1-4673-1714-6/12/$31.00 ©2012 IEEE

Despite its limitations, Smartphone banking use tends to get more widely accepted and used toward many countries, especially with the successful penetration of Smartphone devices: e.g., iPhone (Apple), Galaxy (Samsung), and BlackBerry (RIM) which have brought a rapid growth of mobile-based banking use; particularly in South Korea.

The utilization of Smartphone banking services in South Korea was initially introduced in 2000 and continuously becoming more acceptable and favorable as one of the most-used application across the country with 51.8% of Internet users gaining access the Internet through mobile device [26]. South Korea as one of the most online banking enabled countries are capable to use such application due to its well-developed telecommunication infrastructure such as high internet usage growth [28] and well-accelerated broadband connection across the country, including a wide-used wireless-based connection.

B. Technology Acceptance Paradigm

Perceptions about the use of Smartphone banking for accommodating users' financial needs will form the dynamics of attitudes which derive the impact on intention to use and consume offered service by banks.

Such attitudes in the context of IT usage deal with innovations of a technology system [34]–an Internet-based service–which becomes main considerations on the principal outcome of the use of Technology Acceptance Model (TAM) [11]-[12] in particular, in investigating the effect of individuals' internal beliefs, attitudes, and intentions toward an information system (IS) [1].

In general, consumers evaluate information while using a technology system as the form of innovation and subsequently determine whether to adopt or reject such usage based on their beliefs [1], which in turn led to confirmation of the behavioral process of use [34].

System usage corresponds to a fundamental behavior of interest in the technology acceptance study, both of during the period of actual use and also future usage intention [11], [1] as the form of intention to continuously use an IS system which underlies on the consumer satisfaction/dissatisfaction model (CS/D) [32], [10].

The TAM was adapted from previous theory: the Theory of Reasoned Action [16] and was widely used to illustrate and to figure out individuals' acceptance of IT usage [3] based on two dependent variables of beliefs–perceived usefulness (PU) and perceived ease of use (PEOU) [11]-[12]–as determinative factors of attitude towards behavioral intentions to use an IT system which finally lead to actual usage [11]-[12], [3].

PU is defined and described as "the degree to which a person believes that using a particular system would enhance his job performance," whereas PEOU as "the degree to which a person believes that using a particular system would be free of effort [11]." After all, TAM defined the concept of intention as the impact of social norms and attitudes which will be possibly interceded by other factors and taken from personal beliefs and attitudes [16].

C. Expectation-Confirmation Model (ECM)

The preeminent conceptual model in the research of consumers' post-consumption behavioral formations is dominantly by the consumer behavior literature [10] for consumer repurchasing behavior study [32], [10] in the marketing research area in particular. It postulates that consumer satisfaction is presumed to be pertinent to the size and indication of disconfirmation [32].

As such, the disconfirmation is a perception derived from the comparative distinction between a one's pre-purchase expectations and post-purchase performance with the consumed product or service [32].

Several studies have empirically investigated users' behaviors toward IS adoption and technology usage, particularly in the period of post-adoption or post-consumption from the individual perspectives [11], [3], [5] which propose that the determinant formations for an individual adoption decided to use technology may differ with phase to phase within the period of usage: from initial adoption to consequential phases of following usage. The difference occurs due to the role of individual experience whose is obtained from using the product or service, which in turn, leads to perceived performance on its consumption [22], [38].

One prominent model for interpreting the contextual dimensions related to expectations, disconfirmation, performance, and consumer satisfaction as the main constructs [10] is the Expectation Disconfirmation Theory (EDT) [10], [32] or later the Expectation Confirmation Model (ECM) [3] that has been empirically performed by several studies. However, previous studies still deliver arguable findings in accordance with the defined roles of expectations, disconfirmation, and performance in interpreting the term of satisfaction [16]. Additionally, there is still less attention paid from previous studies which have proposed the significance of ECM in coping with electronic-based system usage continuance; particularly in online banking [3].

Expectations designate the attributes of expected product and service which seem to be a supposition [3] and perform as the basic criteria principally used in ECM framework. Subsequently, expectations are then used to evaluate performance and shape an evaluated disconfirmation result that is postulated to derive the impact on satisfaction [32]. If expectations belief is considered greater than perceived performance, a negative disconfirmation will affect satisfaction or dissatisfied and vice versa [32].

Since the adoption process of technology-based system may significantly influence the success of IS use [22], ECM reveals such consideration and posits that usage continuance of Information Systems (IS) underlying on one's intention to continuously use IT with dependent and representative variables of post-adoption usage beliefs [10]–expectation beliefs in post-adoption usage and confirmed expectations on perceived usage performance which all are comprised in dimension of PU [3]. Moreover, ECM has been assigned to engage several research questions in IS use and adoption, particularly related to the IS continuance paradigm [3] and

dynamics of users' beliefs and attitudes within their IS usage period [5].

Accordingly, such dependent variables are relevant factors to an individual's level of satisfaction when adopting and using an IT system, which in turn, determine his/her decision to perform continuance intention.

Therefore, the ECM emphasizes more on the post-adoption stage rather than pre-adoption period and only includes PU as the usage-related belief due to the impact of PEOU tends to get mitigated after users become more familiar with IT system usage [22], [3]. Perceived performance belief was eliminated from referred model–EDT–to attenuate mixed understanding on confirmation which already has interceded sequent impact of performance belief [3]-[5].

D. Trust

Many prior studies have observed and investigated the significant role of trust to successfully deal with e-commerce and Smartphone banking-related activities. Trust has still been receiving primary concerns in e-commerce discipline such as Smartphone banking due to its crucial role in mediating information exchange. However, there are arguably various definitions and different viewpoints of trust, including a debate on defining the concept of trust [21]. In other words, the definition of trust is still not yet precisely prescribed and defined due to its complexity [30] which pertinently derives misled arguments, including its antecedents and outcomes, and the construct of trust itself [29].

Notwithstanding, most studies in trust have widely accepted the definition of trust as a confirmed comprehension on trust by employing Mayer et al.'s postulation [29] in the context of e-commerce domain [35].

The coped range of trust may vary, which is relying on the relationships' past experience, development phases, and indications in the extant condition [35], including calculative-based trust based on perceived costs and benefits and knowledge-based trust from an accumulated trust-relevant knowledge based on undergone experience [30].

E. Perceived Security

Despite the dimension of performance belief has already been captured as hypothesized by ECM, the variable perceived security might probably be considered a motivational characteristic which becomes a definite form of a confirmation based on performance resulted from a technology-based usage like Smartphone banking services. It is presumed that consumers who perceived that security condition-related are well-applied when using Smartphone banking services, will show better performance and higher effective feedback to the bank system.

Consumers will automatically interact with the systems when using services, based on experience acting as a positive trigger that enhances the possibility of future usage [18]. Therefore, perceived security might be assumed as an individual state which would be getting higher or lower at certain points while access and use the Smartphone banking services.

Consumers' behavioral navigation in online environments will involve intrinsic and extrinsic motivations such as PU and perceived security [18]. It was clearly stated that there are two broad classifications of such distinct motivations to conduct an activity through: "Extrinsic motivation refers to the performance of an activity because it is perceived to be instrumental in achieving valued outcomes that are distinct from the activity itself, such as improved job performance, pay, or promotions. While extrinsic motivation influences behavior due to the reinforcement value of the outcomes, intrinsic motivation refers to the performance of an activity for no apparent reinforcement other than the process of performing the activity per se [13]."

Gefen and Straub [17] also recommended the concept of transactional tasks incorporating the dimensions of PU and perceived security which regarded as IT extrinsic, while PEOU was disregarded to derive the impact on usage intention for performing such tasks. Therefore, we argue that both PU and perceived security can be included as the extrinsic motivations.

III. Research Model and Hypotheses

A. Research Model

Our study attempts to extend previous frameworks–ECM–described below as a proposed model for incorporating determinant factors on Smartphone banking usage continuance intention. The previous model designated the dynamics of IS use continuance in online banking context [3], which observed several variables such as confirmation, PU, satisfaction and IS continuance intention as the independent variable.

The proposed model reveals some augmented constructs: perceived security and trust beside the existing variables which is previously hypothesized [3] to increment the formation of the concept of usage continuance in the context of Smartphone banking as shown on Figure 1.

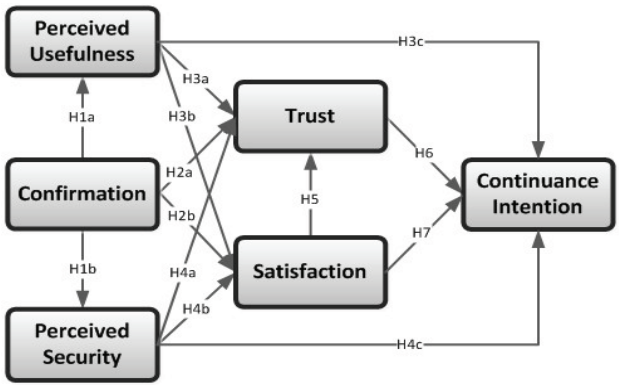

Fig.1. Proposed research model

Therefore, this study develops hypotheses for perceived security construct which also simultaneously represents privacy and without the inclusion of perceived risk [8], though it is considered as an indispensable condition for trust [29].

The conceptual dimensions among trust, perceived security, and perceived risk are respectively related [15], whereas privacy is an inseparable factor in information security-related element [31]. Furthermore, the previous study has noted that

the relationship between trust and risk is considered complex and mutually reciprocal which derives an arguable matter in the context of e-commerce [8].

Consequently, the inclusion of perceived risk here is removed because our main assumption is on the role of trust and perceived security in order for users to view Smartphone banking usage continuance more positively [15]. Accordingly, personal risk behavior might be acceptably figured out by evaluating the concept of perceived web-based security [7].

B. Research Hypotheses

Bhattacherjee [3] hypothesized an extended framework based on EDT with only PU inclusion as the usage-related belief. Perceived performance belief was removed from attributing model: EDT to derive more understanding on a perceived confirmation structure which already has accommodated performance belief impact [3]-[5].

Accordingly, the dimension of PU was hypothesized to include the antecedents from external variables which relate to system features of the computer program used in the measurement process to investigate users' perceptions of performance impacts and the important factors pertinent to system usage [12].

It emphasizes the users' perceptions on influential factors of technology use such as system design quality and system characteristics which are significantly needed to amend their productivity as well as dimensions of information quality– relevance, accuracy, and timeliness [27]. Those variables direct relational intermediary between the internal beliefs, attitudes, and intentions [12].

Although the dimension of performance variable has already been captured by confirmation as postulated by ECM [3], we believe that confirmation would reasonably influence perceived security as an expectancy of post-adoption stage which motivates users to continuously use [4]. As a general motivation, perceived security will be perceived as well PU as a confirmation by consumers after using related services for the comparison between their pre-purchase expectations and post-purchase performance [32] and either as the form of IT usage experience [3] or first-hand usage experience [4]. Thus, we hypothesize that:

H1a: Consumer's degree of confirmation is positively correlated to PU of Smartphone banking services.

H1b: Consumer's degree of confirmation is positively correlated to perceived security of Smartphone banking services.

Consumer satisfaction hypothesized as an indication of positive disconfirmation which derived from the comparative distinction between pre-purchase expectations and post-purchase performance after using the product or service [32], whereas trust has also been confirmed as the significant variables influencing the IS adoption attitudes both in pre-usage and post-usage phase [38], we then posit that:

H2a: Consumer's degree of confirmation is positively associated with his/her trust of using Smartphone banking services.

H2b: Consumer's degree of confirmation is positively associated with his/her satisfaction of using Smartphone banking services.

Based on previous ECM's hypothesis, PU is the factor affecting consumers' post acceptance perception such as satisfaction, despite it is still regarded to derive impact in an IS acceptance context as hypothesized through TAM [3]. PU also has been found recently to drive significant impact on the IS continuance context [38], including its strong significance on trust formation within online banking use [36]. Accordingly, we have hypotheses that:

H3a: PU of the system will positively influence his/her trust on using Smartphone banking services.

H3b: PU of the system will positively affect his/her satisfaction with Smartphone banking services.

H3c: PU of the system will positively associate with his/her intention to continue using Smartphone banking services.

Many previous studies have empirically observed and found the significance of perceived security as the antecedent of trust, though they still appear in the IT usage stage [7], [14]. However, still the salience of security definitely cannot be refuted in post adoption phase because security concerns play an important role in e-commerce and consumers will use an IT-based system like e-commerce only if it is perceived useful, easy to use, efficient, and secure [14]. Moreover, perceived security should be treated as an antecedent of transact intention [15] or probably of usage continuance. We therefore assume that:

H4a: Perceived security of the system will positively influence his/her trust on using Smartphone banking services.

H4b: Perceived security of the system will positively affect his/her satisfaction with Smartphone banking services usage.

H4c: Perceived security of the system will positively influence his/her intention to continue using Smartphone banking services.

Consequently, we finally posit that consumers will catch overall satisfaction at certain point with the increasing usage on a mediated channel of an IT-based system such as the Smartphone banking; consumers may then be expected to reuse the system again as well as to perceive higher trust through post-adoption trust [38]. Besides, such satisfaction may lead consumers to repeat their consumption [24] whereas trust is required as a crucial factor in prosperous long-term relationships with customers [2] and the key for e-commerce success [11]. Therefore, we hypothesize that:

H5: Consumer satisfaction with the system will positively affect his/her trust on using Smartphone banking services.

H6: Consumer trust with the system will positively affect his/her intention to continue using Smartphone banking services.

H7: Consumer satisfaction with the system will positively correlate with his/her intention to continue using Smartphone banking services.

IV. Research Methodology

To effectively correspond to our proposed model and hypotheses, this study conducted a pilot study and distributed a form of questionnaire using a seven-point Likert's scale for data collecting in order to support the constructs of the research model within March to April 2012. Measured items from previous studies will be modified [3], [23], [5]-[7], [15], [38],

[36] and used for properly compromising with Smartphone banking context. Accordingly, the expected data collection was assembled by conducting a voluntary participation from university students who already have used Internet banking and mobile-based/Smartphone banking services.

The collected sample data from a pilot study with 96 respondents was statistically analyzed and measured using Structural Equation Modeling (SEM) for examining causal relations among hypothesized variables and the measurement model. We conducted Confirmatory Factor Analysis (CFA) through standard determination of reliability, convergent and validity discriminant validity of estimated factors [9], [19] for all the investigated factors using Smart PLS 2.0.

V. Initial Results

Based on our pilot test result, we found that our measurement items and variables are satisfied with requirement of composite reliability, convergent reliability and discriminant validity in proper ranges [9], [19]. It means that we can continuously use our measurement items for further analysis and more comprehensive evaluation.

The proposed hypotheses were analyzed by partial least squares (PLS) method. The results of path coefficients and *t*-values are shown in Figure 2. The measurement of the significance of all the paths in our proposed model was performed by using the bootstrap re-sampling procedure.

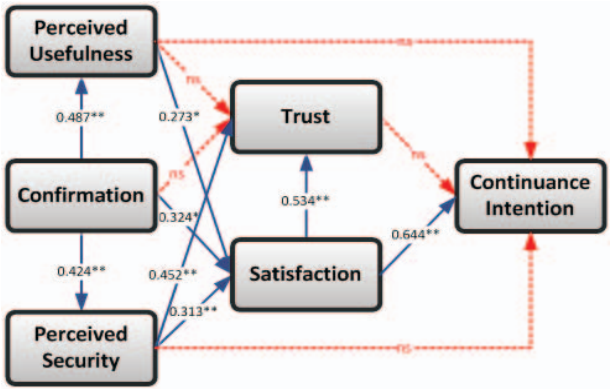

Fig.2. Hypotheses results
Significance level: *. p value<0.05; **. p value<0.001; ns. p value=not significant.

Eight of thirteen hypotheses were accepted for our model overall except five hypotheses: H2a, H3a, H3c, H4c, and H6. Confirmation was found to be strongly related with PU, security, and consumer satisfaction. The relationship between confirmation and trust was insignificant. PU was found to be only significantly correlated with consumer satisfaction but not associated with continuance intention. Security was found to be related to trust and satisfaction but not with continuance intention. Satisfaction was found to be strongly related to both trust and continuance intention, whereas trust was statistically insignificant with continuance intention. The variance of trust was 75.1 percent; satisfaction was 49.0 percent; and continuance intention was 54.6 percent respectively.

The results revealed interesting findings, where PU did not statistically affect consumer trust. Although customers perceived Smartphone banking was useful, but they might not consider Smartphone banking as a more useful alternative for replacing other e-banking services such as Internet banking, but rather than as a supplement service. Furthermore, customers perceived Smartphone banking was useful, but could not drive their trust to continuously use the services.

On the other hand, though security was strongly perceived in affecting customers' trust and satisfaction, it could not influentially engage customers' intention to use Smartphone banking continuously. Similar to prior studies which found that perceived security was an important trust antecedent [7], [14] and had a weak relationship with e-banking adoption [33], the relationship between PU and usage intention was found insignificant [36] as well as trust which did not positively correlate with a system's usage continuance intention [20], [37].

Furthermore, trust in using Smartphone banking was regarded insignificant in influencing their intention to keep using Smartphone banking services, even though they were definitely satisfied with such services.

VI. Concluding Remarks

As a result, consumer satisfaction is the strongest factor which plays a critical role in either influencing consumer trust or encouraging consumers to continuously use Smartphone banking services. Despite few hypotheses were not statistically significant to support our previous presumptions, the role of other factors such as PU, security, and trust are irrefutable in incorporating consumers' behavior and attitude in a technology system use, particularly in the Smartphone banking area.

Hence this study simply integrates the use of the appropriate models of IT usage continuance by structuring our hypothesized behavioral variables, we believe that it will bring out significant and more representative impact of mobile-based technology use such as e-banking use.

It is adequately considered in the ECM framework as an IS usage continuance measure to be applied in the context of e-banking as a sub-classification of e-commerce [3] for investigating behaviors from users' perspectives due to its influential impact on their decision.

VII. Limitations and Future Study

This study has several limitations. First, this study only conducted a pilot study with a limited sample of university students, though students are considered more independent, more familiar with Internet-based technology services, and are more highly educated than common consumers [30].

Second, the conceptual investigation of this research was limited to gauge the Korean bank customers' perspectives in accordance with the Smartphone banking context; even though they might have used other e-banking services such as ATM and Internet banking to fulfill their financial transactions. Therefore, the results could not be concluded to explain such conditions and might not correctly convey the appropriate of the relational behaviors building process in e-banking area.

Consequently, these limitations need further considerations in order to generate more suitable IS continuance model in the

future studies with more supporting research theories and bigger sample size to provide broader validity and reliability.

ACKNOWLEDGMENT

We wish to acknowledge Victor Manuel Conzalez Holguin and Marian Mtingwi for giving helpful comments and recommendations in the completion of this article.

REFERENCES

[1] R. Agarwal, and J. Prasad, "The role of innovation characteristics and perceived voluntariness in the acceptance of information technologies," Decision Sciences, vol. 28, pp. 557–582, June 1997.

[2] S. Balasubramanian, P. Konana, N. M. Menon, "Customer satisfaction in virtual environments: A study of online investing," Management Science, vol. 49, pp. 871–889, July 2003.

[3] A. Bhattacherjee, "Understanding information systems continuance: An Expectation-Confirmation Model," MIS Quarterly, vol. 25, pp. 351–370, September 2001.

[4] A. Bhattacherjee and A. Barfar, "Information technology continuance research: Current state and future directions," Asia Pacific Journal of Information Systems, vol. 21, pp. 1–18, June 2011.

[5] A. Bhattacherjee and G. Premkumar, "Understanding changes in belief and attitude toward information technology usage: A theoretical model and longitudinal test," MIS Quarterly, vol. 28, pp. 229–254, June 2004.

[6] L. V. Casalo, C. Flavian, and M. Guinaliu, "The role of security, privacy, usability and reputation in the development of online banking," Online Information Review, vol. 31, pp. 583–603, 2007.

[7] H. H. Chang and S. W. Chen, "Consumer perception of interface quality, security, and loyalty in electronic commerce," Information & Management, vol. 46, pp. 411–417, October 2009.

[8] T. C. E. Cheng, D. Y. C. Lam, and A. C. L. Yeung, "Adoption of Internet banking: An empirical study in Hongkong," Decision Support Systems, vol. 42, pp. 1558–1572, December 2006.

[9] W. W. Chin, The Partial Least Squares Approach to Structural Equation Modeling, G.A. Marcoulides, Ed., Modern Methods for Business Research, Lawrence Erlbaum Associates, London, 1998, pp. 295–336.

[10] G. A. Churchill and C. Surprenant, "An investigation into the determinants of customer satisfaction," Journal of Marketing Research, vol. 19, pp. 491–504, November 1982.

[11] F. D. Davis, "Perceived usefulness, perceived ease of use, and user acceptance of information technology," MIS Quarterly, vol. 13, pp. 319–340, September 1989.

[12] F. D. Davis, R. P. Bagozzi, P. R. Warshaw, "User acceptance of computer technology: A comparison of two theoretical models," Management Science, vol. 35, pp. 982–1003, August 1989.

[13] F. D. Davis, R. P. Bagozzi, and P. R. Warshaw, "Extrinsic and intrinsic motivation to use computers in the workplace," Journal of Applied Social Psychology, vol. 22, pp. 1111–1132, July 1992.

[14] S. Devaraj, M. Fan, and R. Kohli, "Antecedents of B2C channel satisfaction and preference: Validating e-commerce metrics," Information Systems Research, vol. 13, pp. 316–333, September 2002.

[15] X. Fang, S. Chan, J. Brzezinski, and S. Xu, "Moderating effects of task type on wireless technology acceptance," Journal of Management Information Systems, vol. 22, pp. 123–157, 2005.

[16] M. Fishbein and I. Ajzen, Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research, Addison-Wesley, Reading, MA, 1975, pp. 1-18.

[17] D. Gefen and D. Straub, "The relative importance of perceived ease of use in IS adoption: A study of e-commerce adoption," Journal of the Association for Information Systems, vol. 1, pp. 1–30, October 2000.

[18] J. Ghani, R. Supnick, and P. Rooney, "The experience of flow in computer-mediated and in face-to-face groups," in: J. Degross, I. Benbasat, G. Desanctis, C. Beath (Eds.), Proceedings of the Twelfth International Conference on Information Systems, New York, pp. 229–237, 1991.

[19] J. F. Hair, W. C. Black, B. J. Babin, and R. E. Anderson, Multivariate Data Analysis. Pearson Prentice Hall, NJ: Upper Saddle River, 2009, pp. 1–31.

[20] W. He, Y. Fang, and K. K. Wei, "The role of trust in promoting organizational knowledge seeking using knowledge management systems: An empirical investigation," Journal of American Society for Information Science and Technology, vol. 60, pp. 526–537, March 2009.

[21] D. L. Hoffman, T. P. Novak, and M. Peralta, "Building consumer trust online," Communications of the ACM, vol. 42, pp. 80–85, April 1999.

[22] E. Karahanna, D. W. Straub, and N. L. Chervany, "Information technology adoption across time: A cross-sectional comparison of pre-adoption and post-adoption beliefs," MIS Quarterly, vol. 23, pp. 183–213, June 1999.

[23] D. J. Kim, D. L. Ferrin, and H. R. Rao, "Trust and satisfaction, two stepping stones for successful e-commerce relationships: A longitudinal exploration, Information Systems Research, vol. 20, pp. 237–257, June 2009.

[24] H. W. Kim, Y. Xu, and J. Koh, "A comparison of online trust building factors between potential customers and repeat customers," Journal of the Association for Information Systems, vol. 5, pp. 392–420, October 2004.

[25] S. H. Kim, "Moderating effects of job relevance and experience on mobile wireless technology acceptance: adoption of a smart phone by individuals," Information & Management, vol. 45, pp. 387–393, September 2008.

[26] (2011) Korea Internet and Security Agency (KISA). "Survey on the Internet Usage 2011: Executive Summary" [Online]. Available: http://isis.kisa.or.kr/eng/board.

[27] A. L. Lederer, D. J. Maupin, M. P. Sena, and Y. Zhuang, "The Technology Acceptance Model and the world wide web," Decision Support Systems, vol. 29, pp. 269–282, October 2000.

[28] K. C. Lee and N. Chung, "Understanding factors affecting trust and satisfaction with m-banking in Korea: a modified DeLone and McLean's model perspective", Interacting with Computers, vol. 21, pp. 385–392, December 2009.

[29] P. Luarn and H. H. Lin, "Toward an understanding of the behavioral intention to use mobile banking," Computers in Human Behavior, vol. 21, 873–891, November 2005.

[30] D. H. McKnight, V. Choudhury, and C. Kacmar, "Developing and validating trust measures for e-commerce: An integrative typology," Information Systems Research, vol. 13, pp. 334–359, September 2002.

[31] A. Miyazaki and A. Ferdnandez, "Internet privacy and security: an examination of online retailer disclosures," Journal of Public Policy and Marketing, vol. 19, pp. 54–61, 2000.

[32] R. L. Oliver, "A cognitive model of the antecedents and consequences of satisfaction decisions," Journal of Marketing Research, vol. 17, pp. 460–469, November 1980.

[33] T. Pikkarainen, K. Pikkarainen, K. Harjaluoto, and S. Pahnila, "Consumer acceptance of online banking: An extension of the technology acceptance model," Internet Research, vol. 14, pp. 224–235, 2004.

[34] E. M. Rogers, Diffusion of Innovations. New York: The Free Press, 1995, pp. 162-185.

[35] D. M. Rousseau, S. B. Sitkin, R.S. Burt, and C. Camerer, "Not so different after all: A cross-discipline view of trust," Academy of Management Review, vol. 23, pp. 393–404, 1998.

[36] B. Suh and I. Han, "Effect of trust on customer acceptance of internet banking," Electronic Commerce Research and Applications, vol. 1, pp. 247–263, 2002.

[37] B. Vatanasombut, M. Igbaria, A. C. Stylianou, W. Rodgers, "Information systems continuance intention of web-based applications customers: The case of online banking," Information & Management, vol. 4, pp. 419-428, November 2008.

[38] V. Venkatesh, J. Y. L. Thong, F. K. Y. Chan, P. J. H. Hu, and S. A. Brown, "Extending the two-stage information systems continuance model: Incorporating UTAUT predictors and the role of context," Information Systems Journal , vol. 21, pp. 527–555, November 2011.