

Determinants of Continuance Intention in Mobile Payment Services: Based on the IS Success Model[☆]

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ABSTRACT

Highly competitive environment has been forcing e-commerce industries to seek strategies to achieve competitive advantages. Mobile payment is a kind of service that allows mobile phone user to easily and conveniently initiate payments and transfer funds using their mobile phone anytime, and anywhere. This study is designed to identify factors that affect the intention of continued use of mobile payment services between users in Korea and Laos.

As a result, first, in the case of Korean consumers, system quality, information quality and service quality were shown to have a positive effect on trust and satisfaction. In addition, trust and satisfaction were shown to have a positive effect on continuance intention. Second, in the case of Laotian consumers, system quality and service quality were shown to have a positive effect on trust, and system quality and information quality were shown to have a positive effect on satisfaction. In addition, trust and satisfaction were shown to have a positive effect on continuance intention.

The study has its implications by analyzing factors affecting the continuance intention with the comparison of the customers from a developed nation and a developing nation, providing a direction of development for developing competitive advantages for those in development. For the developed, the study provides a guideline of what to modify and supplement in cases of entering the markets of developing nations.

☞ keyword : Mobile payment, Information System Quality, Trust, Satisfaction, Continuance Intention

1. Introduction

Mobile payment or mobile payment system is payment methods through devices such as smartphones, electronic tablets or any other electronic devices that is capable of beginning, activating, and/or verifying payments for products or services [1]. In the early 2000s, Mobile payment service has been recognized widely as a hot topic and soon became part of everyday life [2, 3]. Mobile payment transaction volumes continues to grow in a rapid pace worldwide with the main regions of growth being Emerging Asia, Central Europe, Africa and the Middle East.

Since the beginning until now, many studies about mobile payment has been announced regarding the continuance intention of customers, how customers react to different

technologies or with comparisons of different service providers[4-6]. However, it is undeniable that most of these studies mainly focus on nations that have a certain level of development in the field of mobile payment. Studies with comparisons has mostly focused on different suppliers from same nations, or compared nations with similar levels of commercialization[6, 7]. When it comes to the comparison of parties with different levels of commercialization, related studies are hard to find.

Thus, there is a need for research of mobile payment on a global scale for that some have raced ahead, while others are stragglng behind in the use of mobile payment[8].

In Korea, mobile payment has penetrated into every aspects, presenting unlimited potential for new applications. Korean people are active in conducting a financial transaction through mobile payment service [9]. Meanwhile, in Laos, mobile payment is still at its early stage, but with a steady upward development for the future [10].

Various studies suggested that information technology theories such as technology acceptance model (TAM),

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investigates initial adoption and usage of mobile payment service at the pre-acceptance stage. Factors such as perceived ease of use and perceived usefulness are used to identify the initial stage [11]. However, rather than the firsttime use there is still remaining other significant factors to be identified affecting post-acceptance stage, considering how crucial is to retain users [12, 13].

This study plans to analyze the factors that affect the continuance intention of mobile payment services of Korea and Laos through applying information system success model (IS success model) by DeLone & McLean(2003) [14] as a conceptual base. System quality, information quality and service quality is presented as independent variables of the mobile payment quality factors. Trust and user satisfaction is used as mediating variables affecting the continuance intention. Moreover, this study will compare the factors affecting the continuance intention of mobile payment of Korea and Laos.

2. Theoretical Background

2.1 Mobile Payment

Mobile Payment Service is defined as all services performed online and offline and payment services that use mobile devices to pay for goods purchased [15].

Mobile simple payment services help consumers make payments faster and easier without the inconvenience of carrying physical money, but do not require separate fees. This convenience and low cost (or no cost) are the biggest advantages of FinTech services [6].

There are two broad types of mobile payments technologies: proximity payments and remote payments. When both parties are physically in the same location, it is referred to as proximity payments. In this case, communication between parties is done directly using contactless radio technologies. Remote payments, on the other hand, can be done irrespective of the payer's location, and are performed using a communication link, SMS, or a mobile application. Proximity-based mobile payments use different technologies to establish communication required for a successful transaction. These are also referred to as point-of-sale (POS) solutions. On the basis of Technology

such as SMS, a mobile browser, or a mobile application Bar codes or a contactless interface to chip-enabled payment technology, such as NFC-enabled mobile phones, contactless stickers, tags [17].

2.2 Information System Quality

Through comprehensively sorting out the results of the preceding studies, DeLone and McLean (1992) [18] construct a process of mutual causality of the performance dimensions of information system into the 6 following categories of system quality, information quality, information use, user satisfaction, individual impact and organizational impact.

Through later studies, Service Quality was added as a another category of Information System Quality, and now Information System Quality consists of sub-dimensions of System Quality, Information Quality and Service Quality [14].

In the information system success model, system quality means technical success in producing and communicating accurate information [18]. In their study, DeLone and McLean (1992) [18] explained system quality to be consisted of sub dimensions of data accuracy, data currency, database contents, ease of use, system accuracy, system flexibility, system reliability and etc. Although perceived ease of use is widely to measure system quality because of many researches relating to the TAM [19]. However, Rivard et al.(1997) [20] argued that perceived ease of use does not cover the system quality construct as a whole; They proposed an instrument that includes of 40 items that measure eight system quality factors: namely, reliability, portability, user friendliness, understandability, effectiveness, maintainability, economy, and verifiability. In future studies, DeLone and McLean (2003) [14] constructed the E-Commerce success model with five measurement items, including usability, availability, reliability, adaptability and response time.

In the information system success model, it was found that information quality means a significant success in ensuring that the intended information is delivered successfully [18]. DeLone, McLean (1992) [18], among MIS success measures, measures of information quality include importance, relevance, usefulness, understandability, appearance, accuracy, reliability and etc. Also, in their later study in 2003 [14], completeness, ease of understanding,

personalization, relevance and security was presented. Information quality often performs as key dimensions of user satisfaction instruments. Juran(1988) [21] noted that the use of information emphasizes the fact that the information output has some value which is delivered to customers, whether internal or external to the organization.

Service quality is the degree to which a service meets the expectations of customers based upon the quality of the support that users receive from a provider's support structure [22]. Pitt et al. explained the need of measuring service quality in IS success, "commonly used measures of IS effectiveness focus on the products rather than the services of the IS function. Thus, there is a danger that IS researchers will mismeasure IS effectiveness if they do not include in their assessment package a measure of IS service quality" [23] Later, service quality was added with the subdimensions of assurance, empathy and responsiveness [14]. DeLone & McLean(2003) [14] defined service quality as the overall support delivered by a service provider regardless of whether this support is provided by an internal IS department, a new organizational unit or outsourced to an Internet Service Provider.

2.3 Trust

Trust, in a broad sense, is the confidence a person has in his or her favorable expectations of what other people will do, based, in many cases, on previous interactions. Trust reflects a willingness to be in vulnerability based on the positive expectation toward another party's future behavior [24]. Trust includes three beliefs: ability, integrity and benevolence [25]. Ability means that service providers have knowledge and expertise necessary to fulfill their tasks. Integrity means that service providers keep their promises and do not disappoint users. Benevolence means that service providers consider users' interests, not just their own organizational goals. Gefen(2000) [26] is research on the role trust shows that trust in the vendor impact the respondents' intentions to inquire about books, and their intentions to purchase them. Mou et al.(2017) [27] examined how trust interacts with other consumer beliefs and the results revealed that trust are important at both initial and post-stages in the consumer acceptance of online health service. Hsu et

al.(2014) [28] used the perspectives of Delone and Mclean IS success model and trust to examine the determinants of repurchase intention in online group-buying. Teo et al.(2008) [29] applied trust and information systems success model to examine electronic government success.

2.4 Satisfaction

In general, user satisfaction can be defined as a favorable feeling for the use of a particular product or service [30]. Assael (2004) explains that satisfaction occurs when consumer expectation is met, and this satisfaction can strengthen the intent of use by forming a positive attitude through post-use evaluations of products or services [31]. Past studies have often divided customer satisfaction from a transactional perspective and a cumulative perspective [32]. This user satisfaction is an important variable and leading factors as well as trailing factors are being actively studied. The characteristics of products and services, their quality and prices are presented as factors that can affect user satisfaction in various studies. In particular, the user's satisfaction with the information system can be measured according to the acquisition of value for the quality attributes provided by the information system, and the satisfaction obtained through this can affect repeated purchases, intent to use and etc [22].

2.5 Continuance Intention

Continuance intention is defined as an individual's intention to continue using a service in the post acceptance stage [11].

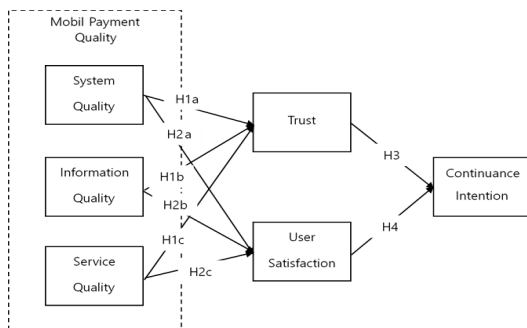
Long-term relationships with existing customers have significant implications for the enterprise because they help build an economic and stable demand base in terms of cost. A study on how to reduce customer deviance demonstrated that a 5% reduction in customer deviance affects a company's revenue growth by up to 85% and emphasized that a company with a large number of loyal customers achieves better financial performance [33]. Continuance intention is purposed in research model as a way to further the predictive validity of proposed model of mobile payment service quality. Number of studies investigate continuance intention usage. For example, Wu & Chen(2017) [34]

purposed a unified model by adapting TAM model and TTF model to investigate continuance intention to use MOOCs. Cho & Lee(2017) [35] researched on motivations determining continuance intention to use smart devices among people with physical disabilities.

3. Research model and Hypotheses

This study applied the Information Systems (IS) success model developed by DeLone & McLean(2003) [14] as the conceptual base and integrate IS post-adoption research. Thus, a research model to investigate mobile payment service users' continuance intention is proposed. System Quality, Information Quality and Service Quality are presented as independent variables; and Trust and Satisfaction are involved as mediators affecting users' continuance intention to use mobile payment services.

- H1a: System quality will have a positive effect on trust
- H1b: Information quality will have a positive effect on trust
- H1c: Service quality will have a positive effect on trust
- H2a: System quality will have a positive effect on satisfaction
- H2b: Information quality will have a positive effect on satisfaction
- H2c: Service quality will have a positive effect on satisfaction
- H3: Trust will have a positive effect on continuance intention
- H4: Satisfaction will have a positive effect on continuance intention



(Figure 1) Research Model

4. Analysis Results

4.1 Sample

A total of 203 survey responses were received in Korea. After excluding those responses from people without experience of using a mobile payment service, 200 (N=200) were deemed usable. A total of 190 responses were received in Laos. After excluding responses from people with no experience of using mobile payment services, the final number of usable samples was 189 (N=189). The main characteristics of the sample in this study are shown in Table 1.

(Table 1) Sample Characteristics

		Korea (N=200)		Laos (N=189)	
		Sample Size	Ratio (%)	Sample Size	Ratio (%)
Gender	Male	120	60.0	105	55.6
	Female	80	40.0	84	44.4
Age	<=19	0	0.0	9	4.8
	20-29	127	63.5	97	51.3
	30-39	33	16.5	39	20.6
	40-49	24	12.0	26	13.8
	>=50	16	8.0	18	9.5
Educational Background	Middle School	1	.5	3	1.6
	High School	103	51.5	33	17.5
	Vocational collage	1	.5	4	2.1
	Undergraduate	52	26.0	84	44.4
	Post-graduation	43	21.5	65	34.4
Profession	Student	131	65.5	62	32.8
	Officer/Managerial	47	23.5	104	55.0
	Specialist	5	2.5	5	2.6
	Sales/Service	11	5.5	10	5.3
	Other	6	3.0	8	4.2
Duration of use (month)	1~6	10	5.0	16	8.5
	6~12	23	11.5	21	11.1
	12~18	31	15.5	23	12.2
	18~24	28	14.0	19	10.1
	>24	108	54.0	110	58.2
Frequency of use (monthly)	1~3	31	15.5	36	19.0
	3~5	40	20.0	37	19.6
	5~10	44	22.0	41	21.7
	>10	85	42.5	75	39.7

4.2 Validity and Reliability test

The reliability and validity of the measured items in this study were tested. Among the measurement items, variance is significant if the communality value is greater than 0.4, and factor loading greater than 0.4. Due to its exploratory research status, a Cronbach's alpha value of 0.6 or higher is acceptable. After factor analysis, reliability analysis was conducted. Cronbach's alpha values range from .746 to .910; therefore, the reliability of the measurement items meets the standard.

(Table 2) Validity and Reliability result

Variables		Factor loading	Cronbach's Alpha
System quality	SYS1	.832	.889
	SYS2	.866	
	SYS3	.869	
	SYS4	.836	
Service Quality	INF1	.791	.799
	INF2	.774	
	INF3	.827	
	INF4	.712	
Service Quality	SER1	.744	.846
	SER2	.836	
	SER3	.838	
	SER4	.812	
Trust	TRU1	.861	.828
	TRU2	.842	
	TRU3	.793	
	TRU4	.099	
User's Satisfaction	SAT1	.865	.910
	SAT2	.876	
	SAT3	.902	
	SAT4	.838	
Continuance Intention	USE1	.889	.746
	USE2	.868	
	USE3	.702	

* Factor loading >=.4, Cronbach's >=.6

4.3 Correlation Analysis

Correlation analysis was used to analyze the relationship between constructs. The analysis result shows that the conceptual relationships between concepts are positive for all variables; this indicates a direction consistent with the research hypotheses, and the in-depth analysis of the model is considered to be valid.

(Table 3) Correlation Analysis

	Inter-Construct Correlation					
	1	2	3	4	5	6
1.SYS	1					
2.INF	.338**	1				
3.SER	.286**	.385**	1			
4.TRU	.428**	.474**	.543**	1		
5.SAT	.635**	.474**	.512**	.612**	1	
6.USE	.652**	.398**	.298**	.376**	.586**	1

** . Correlation is significant at the .01 level (2-tailed).

4.4 Hypotheses Test

First, the hypothesis test for Korean consumers is as follows. In the relationship between mobile payment quality and trust, system quality has a positive effect on trust $t = 4.024$ ($p = .000$); information quality has a positive effect on trust $t = 4.092$ ($p = .000$); and service quality has a positive effect on trust $t = 6.358$ ($p = .000$). Thus, hypotheses H1-a, H1-b, and H1-c are supported. In the relationship between mobile payment quality and user satisfaction, system quality has a positive effect on satisfaction $t = 9.368$ ($p = .000$); information quality has a positive impact on satisfaction $t = 3.649$ ($p = .000$); and service quality has a positive effect on satisfaction $t = 5.675$ ($p = .000$). Thus, hypotheses H2-a, H2-b, and H2-c are supported. In the relationship between trust and continuous intention, trust has a positive effect on continuous intention $t = 9.368$ ($p = .000$). Thus, hypotheses H3 is supported. In the relationship between satisfaction and continuance intention, $t = 10.177$ ($p = .000$), and hypothesis H4 is supported.

The results of this study are as follows:

(Table 4) (Korea) Hypothesis test

hypotheses			t	Result
H1a	System quality => Trust	.235	4.024**	supported
H1b	Information quality => Trust	.249	4.092**	Supported
H1c	Service quality => Trust	.379	6.358**	Supported
H2a	System quality => Satisfaction	.483	9.368**	Supported
H2b	Information quality => Satisfaction	.196	3.649**	Supported

	hypotheses		t	Result
H2c	Service quality => Satisfaction	.299	5.675**	Supported
H3	Trust => Continuance Intention	.376	5.712**	Supported
H4	Satisfaction => Continuance Intention	.586	10.177*	supported

* $p < 0.05$, ** $p < 0.01$

Next, the hypothesis test results for Laos consumers are as follows. In the relationship between mobile payment quality and trust, that system quality has a positive effect on trust $t = 5.512$ ($p = .000$); information quality has no effect on trust $t = .283$ ($p = .777$); and service quality has a positive effect on trust $t = 9.533$ ($p = .000$); thus, hypotheses H1-a and H1-c are supported, but H1-b is not. In the relationship between mobile payment quality and user satisfaction, system quality has a significant effect on satisfaction, $t = 2.743$ ($p = .007$); information quality has a significant effect on satisfaction $t = 6.310$ ($p = .000$), whereas service quality has no significant effect on satisfaction $t = .403$ ($p = .687$); thus, hypotheses H2-a and H2-b are supported, whereas H2-c is not. In the relationship between trust and continuance intention, $t = 5.907$ ($p = .000$); thus, hypothesis H3 is supported. In the relationship between satisfaction and continuance intention, $t = 3.111$ ($p = .002$); thus, hypothesis H4 is supported.

(Table 5) (Laos) Hypothesis test

	hypotheses		t	Result
H1a	System quality => Trust	.306	5.512**	supported
H1b	Information quality => Trust	.015	.283	Not Supported
H1c	Service quality => Trust	.537	9.533**	Supported
H2a	System quality => Satisfaction	.191	2.743*	Supported
H2b	Information quality => Satisfaction	.414	6.310**	Supported
H2c	Service quality => Satisfaction	.028	.403	Not Supported
H3	Trust => Continuance Intention	.397	5.907**	Supported
H4	Satisfaction => Continuance Intention	.222	3.111**	supported

* $p < 0.05$, ** $p < 0.01$

5. Conclusions

Retaining users and facilitating their continuance intention is essential for service providers of mobile payment. With the IS success model, this study has verified the factors that affect the continuance intention of mobile payment services in Korea and Laos. The analysis results show both differences and similarities as the followings.

First, in the case of Korea, it was shown that the system quality, information quality and service quality has a significant effect on trust, with service quality having the most effect. However, for the case of Laos, while system quality and service quality effected trust, information quality was shown to not affect trust.

Second, for Korea, analysis results show that all three sub dimensions has an effect on satisfaction, system quality having the most. However, for Laos, it was shown that only system quality and information quality has an effect on satisfaction, service quality not affecting satisfaction.

Third, both results from Korea and Laos revealed that trust and satisfaction has a significant effect on continuance intention, consistent with extant findings [12]. Due to the nature of mobile payment systems created on wireless networks, deemed of high risk, it is essential for service providers to build trust with users and ensure the security and reliability of the service. Thus, the effect of satisfaction on continuance intention deserves further attention.

From a theoretical perspective, this study identifies factors affecting the continuance intention of mobile payment services. As previously stated, extant research have already provided studies of countries with advanced services. Thus, this study aims to aid the study by comparing two countries, one with an advanced service, and another that is still in its early stage. Moreover, this study contributes to the existing theory on the IS success model and IS continuance in the context of mobile payment systems.

From a managerial perspective, these findings may assist providers of mobile payment services to improve the quality of services by strengthening performances, system quality, information quality and service quality to secure trust, satisfaction and post-adoption usage of mobile payment services.

In detail, the results imply that in order to facilitate users' continuance intention of mobile payment, service providers need to improve information quality and service quality to construct user trust. To do so, service providers should focus on supplying reliable information, relevance, accuracy and useful information. Furthermore, they should focus on improving easy to use mobile payment systems with a well-designed interface to enhance the users' perception of system quality and eventually, satisfaction.

Moreover, for service provider in a developed nation the findings of the study may act as a guideline of modification and supplementation in cases of entering markets of nations still in the stage of development.

However, the findings of this research should not be over-generalized, due to the following limitations. First, this study focused on the comparison between the users of Korean and Laos with experience of mobile payment use. Users with a different background and a different experience of mobile payment systems may result in a different usage perception standard. For generalization to be possible, further research is required.

Second, Korea has raced far ahead compared to Laos in the development and usage of mobile payment services, and these services have now conquered many business sectors. Meanwhile, Laos is still in the initial stages of progress with only three service providers in the market. Thus, future research may establish the pre-acceptance stage of mobile payment usage in Laos.

Third, in order to be consistent with the purpose of this research, factors affecting the continuance intention of Koreans and Laotians to use mobile payment services were analyzed. However, other alternative variables that may affect the continuance intention besides trust and user satisfaction, such as perceived usefulness and perceived security was not analyzed. Hence, future research should also examine other variables.

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