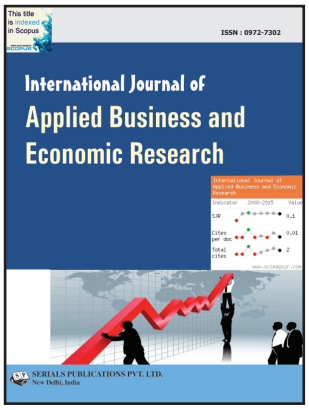

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The Effect of Service Characteristics and User Involvement on the Intention to Continuous use of Mobile Easy Payment Service

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ABSTRACT

The purpose of this study is to explore the composite effect of service characteristics and user involvement on the intention to continuous use of mobile easy payment service. In this regard, the present study includes each four important components of service characteristics and user involvement respectively. The data were collected from 302 users of mobile easy payment services in Korea. The statistical technique, such as reliability and validity, exploratory factor analysis, hierarchical regression were used for data analysis. The study found that the characteristics of payment services have an overall positive influence on users' intention of continuous use, and user involvement has a moderating effect between the two variables. User involvement has a positive significant effect on intention of continuous use, and it has a moderating effect on the relationship of ease of use, technical functionality, user support and intention of continuous use. Thus, the study reveals that high involvement users tend to be more interested in information of services and alternative evaluation, perception of brand differences, and brand preferences. In order to increase user satisfaction and intention to continuous use of mobile easy payment services, developers or service providers are requested to enhance its ease of use, security, functionality as well as the service level of the system. They also should try to meet with and enhance the user involvement in the related business of mobile payment service.

Keywords: Mobile easy payment services, user involvement, Intention to continuous use.

1. INTRODUCTION

The use of mobile payments (m-payments) is increasingly being used as a way to perform transaction processing (Dennehy & Sammon, 2015). Mobile payments is defined as "any conventional or new payment system which enables financial transactions to be made securely from one organization or individual to

another over a mobile network (Shon and Swatman, 1997)", or simply, "payments carried out via the mobile phone (Kruger, 2001)". Although the implementation details differ somewhat depending on the providers, the underlying structure is similar (Kruger, 2001, Heijden, H., 2002, Ku & An, 2003, Cheong et. al., 2014)

Mobile easy payment system refers to the simple payment system enough to moderate for small sum payments for both sellers and purchasers (Heijden, 2001; Kim, 2016). It adopts smart mobile devices of payment terminals and does not require any other payment devices. The devices communicate each other through such equipment as NFC (Near Field Communication), Beacon, Bluetooth, etc. mounted on the devices (Cheong, 2014, Ali, et. al., 2014). NFC is a set of communication protocols that allows two electronic devices, typically one of them is handheld device, to get in and communicate within 4 cm. Beacons are small and inexpensive devices that transmit small amounts of data via BLE (Bluetooth Low Energy) up to 50 meters, and used for indoor and outdoor location technology. Bluetooth is a wireless technology standard for exchanging data over short distances from fixed and mobile devices. There are many other technologies and solutions for building the mobile payment service.

As a platform of payment service using mobile devices, mobile easy payment services has the characteristics of both service and information system. Previous research explored the characteristics of electric or internet based payment system such as ease of use, security, technical feasibility, and user support (Shon and Swatman, 1997, Heijden, 2002, Kim, 2010, Yu, 2012, Oh, 2015, Kim, 2016). Shon and Swatman (1997) conducted a Delphi study of validity criteria for internet payment systems and identified 15 factors distributed to six types of stakeholders. In their study, almost all groups responded that security and reliability was important. Merchants, consumers and financial institutions favored lower transaction costs. For network providers, scalability and universality were important factors. In addition to these, merchants also cited flexibility as an important factor. Clemons and Croson (1997), in their study of e-payment system, argued that "the issues are not simply whether benefits from the product will exceed the costs of its creation assuming that it is adopted, but rather issues of channel coordination, consumer acceptance, and merchant acceptance".

Based on the previous work on Internet payment system and empirical study, Heijden (2002) introduced the critical success factors for introduction of mobile payment systems; cost relativeness, ease of use, and perceived risk. He demonstrated that customer and merchant acceptance are interdependent especially during the early stages of the lifecycle. Meanwhile, merchant regarded transaction fees compared to other payment systems as the most important factors. Shin et. al., (2014) discussed that the new form of payment system is "proximity" and that security, cost, and convenience are three main factors for smartphone users making a mobile payment. In their comparative study of Korea and the United States for the perceptions and preference toward mobile payment methods, mobile security is the most strongest factor which influence the mobile payment frequency among the tree factors.

Over the past few years, the concept of involvement has been studied as an important variable in consumer behavior or information systems research. Whether the topic is brand choice in marketing, cognitive structure in psychology, attitude in education, user satisfaction in information system, involvement is frequently mentioned as an important or potentially significant variable. The definition of involvement refers to "a person's perceived relevance of the object based on inherent needs, values, and interests" (Antil, 1984, Zeithaml, 1988). Zaichkowsky (1985) proposed four variables for the construct of involvement: search

for product information, alternative evaluation, perception of brand differences, and brand preferences. He demonstrated that high involvement consumers tend to be more interested in acquiring information about the product than low involvement consumers. Consumers with a high level of involvement are likely to use information that is consciously compared to competitive alternative choices. He also said that the higher the involvement, the stronger the belief in the product and the higher the preference for the product, because consumers of high involvement recognize the greater difference in product attributes.

Park (2014) and Hwang (2014) showed in his study of consumer involvement and Service qualities that the respondents of higher involvement group perceived the service quality dimensions highly than those of lower involvement group for the service categories. Johnson et. al., (2017) demonstrated that the consumers' level of product involvement has a strong influence on the shopping behaviors and orientation in a study of store preferences and clothing benefits. Kim (2003) studied presentation type and content in terms of consumer involvement in the internet advertisement. He suggested that when deciding on the types of user presentations and content, the practitioners should make decisions based on consumers' level of ad engagement, the interaction between the presentation and the content. There are other many researches regarding the consumer involvement in marketing area but there are not so much studies in the domain of mobile payment services.

As mobile payment service has the generic characteristics of both information system and service process, we may apply research agenda of information system area and marketing area such as system functionality, system ease of use and usefulness, system use, service quality, consumer satisfaction, consumer attitude, and so on. Our specific research questions are as follows:

(i) Do characteristics of easy payment have an impact on intention to continuous use of mobile easy payment system?

(ii) Does user involvement of mobile easy payment system have a direct or moderating impact on the continuous use of it?

(iii) How does the relationship vary among each sub-component of variables?

The paper is structured as follows: First, the paper presents the conceptual model and formulated the hypotheses. Next, the research method section describes the sample design, data collection, and measures used for data analysis. Based on 302 users of mobile payment services in Korea the hypotheses are tested. Finally results, conclusion and managerial implications are present. The paper ends up with the limitations and suggests agenda for future research.

2. HYPOTHESES FORMULATION

Previous research shows that characteristics of easy payment services have a positive effect on the intention to use. System functionality and ease of use, user support increased user satisfaction, ad thus, have a positive impact on continuous use of the system (Choi and Kim, 2016, Ham and Choi, 2016). Choi and Kim (2016) applied Technology Acceptance Model for mobile payment environment and showed that users perception of ease of use, usefulness have positive impact on intention to use. Ham and Choi (2016) found out that recognized security, appropriateness, complexity, usability and expectation congruence affect accepting attitudes of financial consumers.

As mobile payment service has the generic characteristics of information system, we may apply research agenda of information system area such as system functionality, system ease of use and usefulness, system use and so on. Accordingly, this study established the hypothesis for each relationship for the effects of the characteristics of easy payment services and intention to use.

H1: The characteristics of easy payment services have a positive (+) effect on intention to continuous use.

1-1 Ease of use has a significant positive (+) effect on intention to continuous of easy payment services.

1-2 The security has a significant positive (+) effect on intention to continuous of easy payment services.

1-3 The technical functionality has a significant positive (+) effect on intention to continuous of easy payment services.

1-4 User support has a significant positive (+) effect on intention to continuous of easy payment services.

In previous study, user involvement was found to have relationship with human business behavior (Kim 2003, Park 2014). Kim (2003) said in his internet ad research, the level of ad involvement had a significant impact on the preference of banner ads. Park (2014) showed that the respondents of higher involvement group expected and perceived the service qualities highly than those of lower involvement group.

There are a lot of research regarding the relationship between the consumers' evaluation on service quality and their attitude (Cronin and Talyor, 1992, Buttle, 1996, Park, 2014). However, it is not easy to find study devoted to systematically investigate the role of users' involvement on users' continuous intention to use of the service. As mobile payment service has the generic characteristics of service process, we may apply research agenda of marketing and consumers' behavioral area such as service quality, consumer satisfaction, consumer attitude, and so on. Accordingly, the following hypotheses were established for the moderating role between the relationship of service characteristics and intention to continuous use of mobile payment services.

H2: The user involvement will play a moderating role in the relationship between characteristics of easy payment services and intention to continuous use.

2-1 In the characteristics of easy payment services and intention to continuous use, search for information will play a moderating role.

2-2 In the characteristics of easy payment services and intention to continuous use, alternative evaluation will play a moderating role.

2-3 In the characteristics of easy payment services and intention to continuous use, perception of brand differences will play a moderating role.

2-4 In the characteristics of easy payment services and intention to continuous use, brand preferences will play a moderating role.

3. RESEARCH METHODS

Sample Design and Data Collection

The study generated primary data through structured questionnaire obtained personally from the four university students located in the south-west of Seoul, Korea. Among the 302 cases 52.3% of respondents were male, and 78.3% were in their early twenties, and 71.9% were using more than 3 times of the payment service in a week.

Table 9.1
Profile of s Sampled Respondents

	Items	*No. of cases*	*Percentage*
Gender	Male	158	52.3%
	Female	144	47.7%
Age	35 and higher	14	4.6%
	30 to 34	48	15.9%
	25 to 29	85	28.1%
	20 to 24	152	50.3%
	Below 20	3	1.0%
Frequency of use	10 and higher	31	10.3%
(per week)	6~9 times	50	16.6%
	3~5 times	136	45.0%
	Below 3	85	28.1%

Variables and Measures

Relevant literature has been reviewed extensively to generate items pertaining to different dimensions of characteristics of easy payment services, user involvement and intention to continuous use. A well-structured questionnaire was developed to gather required information.

Characteristics of easy payment services: the study comprised of items borrowed from related research (Heijden, 2002, Kim, 2010, Yu, 2012, Oh, 2015, Kim, 2016). Out of eight items pertained to characteristics of easy payment services, remaining four to competitor characteristics. Again the study used second-order construct to confirm these dimensions.

User involvement: this study reviewed items in the marketing and consumer behavior domain (Antil, 1984, Zaichkowsky, 1986, Cronin et. al., 1992, Park, 2014, Johnson et. al., 2017). Of the many measures of user involvement, this study use the framework and measurement Zaichkowsky (1986) because it has been regarded to be a reliable and valid measure of various involvement construct (Johnson et. al., 2017).

Intention to continuous use: the study adopted items from the domain of Information Systems (Bhattacherjee, 2001, Kim et. al., 2010, Choi et. al., 2016, Ham et. al., 2016). First-order construct was used to capture intention to continuous use. Finally, intention to continuous use consisted of four items.

The instrument comprised of total 24 items, out of which 5 pertained to personal demographics and remaining items belonged to three major constructs of the study. A 5-point Likert scale was employed ranging from "strongly disagree" (1) to "strongly agree" (5) for each construct.

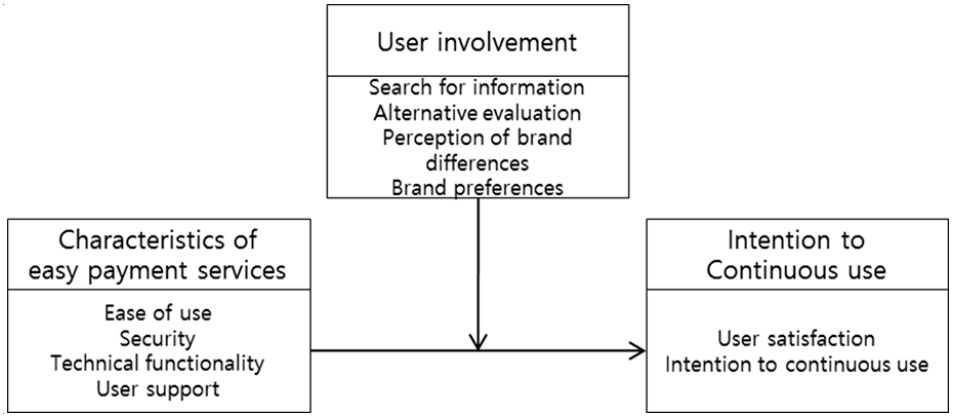

Figure 9.1: Research Model

4. METHOD OF ANALYSIS

Data Collection and Sample Characteristics

Before applying any multi-variate research technique, data have to be screened and normalcy has to be verified. Table 9.2 shows the convergent validity and reliability of the construct and Table 9.3 shows the correlations among descriptive variables. The results show that validity and reliability were fine for each variable.

Table 9.2
Convergent validity and reliability

Construct and item		*Factor loading*	*Eigenvalue*	*% of variance*	*Cronbach's a*
Ease of use	Eas 1	.794	1.327	8.847	.786
	Eas 2	.791			
	Eas 3	.799			
Security	Sec 1	.898	1.084	7.228	.818
	Sec 2	.843			
Technical functionality	Tec 1	.878	3.327	22.182	.820
	Tec 2	.742			
	Tec 3	.857			
User support	Sup 1	.761	1.505	10.032	.809
	Sup 2	.865			
	Sup 3	.820			
User involvement	Inv 1	.858	4.643	30.953	.933
	Inv 2	.886			
	Inv 3	.876			
	Inv 4	.974			

Cumulative % of variance = 76.595, principal component analysis, varimax rotation method

Table 9.3
Correlation Matrix and Descriptive Statistics

S. No.	*Variable*	*Mean*	*S.D*	*1*	*2*	*3*	*4*	*5*	*6*
1.	Ease of use	4.360	.605	1.000**	.398**	.405**	.172**	.049	.425**
2.	Security	3.949	.675		1.000	.382**	.128*	.153**	.463**
3.	Technical functionality	4.178	487			1.000	.101*	.086	.460**
4.	User support	3.304	745				1.000	.472	.198
5.	User involvement	3.648	.795					1.000	.482
6.	Intention to continuous use	3.944	.671					.	1.000

S.D. = Standard Deviation, $n = 302$; $^{*}p < 0.05$; $^{**}p < 0.01$.

Hypothesis Test

The hierarchical regression analysis was conducted to test the research model. Table 9.4 shows the standardized coefficient and significance level when Intention to continuous use of the service is the dependent variable. The study results show that the characteristics of payment services have an overall positive influence on users' intention of continuous use, and user involvement has a moderating effect between two variables.

Table 9.4
Regression analysis results

Model		*Model 1*	*Model 2*	*Model 3*
Independent Variable	Ease of use (X1)	.190**	.233**	–.576*
	Security (X2)	.272**	.216**	.364
	Technical functionality (X3)	.268**	.254**	.999**
	User support (X4)	.103*	–.118*	–.637**
Control variable	User involvement (UI)		.472**	.406
Interaction	X1*UI			1.634**
	X2*UI			–.249
	X3*UI			–1.845**
	X4*UI			.872**
R^2		.351	.520	.573
Adj. R^2		.342	.512	.560
R^2 change		.351	.520	.573
F Change		40.105	64.250	43.549
F (Sig)		.000	.000	.000

$n = 302$; $^{*}p < 0.05$; $^{**}p < 0.01$.

The regression model was used to review <H1>; characteristics of easy payment services will have a positive (+) intention to continuous use. Model 1 of Table 9.4 shows the standardized coefficients of regression model when the characteristics of the services are independent variables and the intention to continuous use is dependent variable. The coefficients range from .103 (for user support) to .272 (for security) and all the significant values are below 0.01 ($p < 0.05$). We can, therefore, accept hypothesis 1.

To examine <H2>; the moderating effects of user involvement, stepwise hierarchical regression analysis was conducted. Model 2 and 3 of Table 9.4 show the test results of testing the moderating model. User involvement played moderating role in the function of all the characteristics variables except that of security. As a result, we can accept hypothesis 2 marginally.

5. RESULTS AND IMPLICATIONS

This study examined the effect of characteristics of easy payment services on intention to continuous use of the services. Moreover, it explored whether the user involvement has a moderating effect between the two variables. The results show that the characteristics of the easy payment services have a direct positive effect on continuous use, and the user involvement has a partially moderating effect between service characteristics and intention to continuous use.

The results of this study have useful implications for practitioners who develop and operate mobile payment systems. First of all, mobile payment service has the characteristics of both the system and service platform. As a system point of view, practitioners should design and develop the application including required functionality, user friendly interfaces and secure transactions. On the other hand, the services should be provided timely for user's request through online or offline procedures. The other implication is that building customer base and improving user involvement are among the most important management challenges in successfully deploying and implementing mobile payment systems. As there are many mobile payment systems and users have the right of choice, a specific payment services should build comparative advantages in terms of alternative evaluation or brand preferences. This may have to do with the company's overall PR strategy and customer support process.

6. CONCLUSION

This study showed that the characteristics of easy payment system have a direct and indirect effect on its intention of continuous use. The user involvement also has a positive direct and moderating effect on continuous intention to use. This implies that high involvement users tend to be more interested in information of services and alternative evaluation, brand preferences, and shopping orientation.

The developers or service providers of payment system on mobile platforms are requested to enhance its ease of use, security, functionality as well as the service level of the system. They also try to meet with and enhance user involvement in the area of mobile payment services.

7. LIMITATIONS AND FUTURE AGENDA

Although this study provides meaningful results and implications for the relationship between characteristics, user involvement, and intention to continuous use of mobile payment services, it has some limitations and thus has further research issues. Firstly, besides the user involvement, other factors may also play an important role in explaining intention to use. Examples of such factors include the type of service user, (i.e. merchant or consumer), user's lifestyle (Yoon et. al., 2009), literacy of service user, user's payment scale, each transaction size, etc. Secondly, this research is mainly focused on 20s and 30s in Korea, so there is a limit to generalize to all countries and all strata. Users in other countries or different generations may have different results from this study (Shin et. al., 2014). These limitations and research issues will be the topics to be covered in future studies.

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