

10-31-2016

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Recommended Citation

Han, Sang-Lin; Nguyen, T. P. Thao; and Nguyen, V. Anh (2016) "Why Consumers Use Mobile Commerce?," *Asia Marketing Journal*: Vol. 18 : Iss. 3 , Article 5.

DOI: 10.15830/amj.2016.18.3.65

Available at: <https://amj.kma.re.kr/journal/vol18/iss3/5>

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Why Consumers Use Mobile Commerce? – International Comparative Study of M-Commerce Model

Sang-Lin Han*
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Development of information and communication technology is changing commerce environment and consumer purchasing behavior has also been changed.

Globalization is becoming increasingly prevalent in the world today and many factors such as culture, politics, and economics may influence the applicability of management theories. Concurrently, corporate managers are faced with the challenge of offering usable and useful applications to the local users. Besides, many scholars strongly support that the criteria for M-Commerce adoption in developing countries are different from that of developed countries, due to cultural, security, social, political, economic, and technological aspects. This research tried to investigate the differences on the adoption of mobile commerce between developed and developing countries.

In this study, the motivation for studying advanced mobile phone services adoption in the South Korea and Viet Nam is presented. Second, M-Commerce adoption model is introduced as a starting point for the research model. We then integrate price, personal innovativeness, quality dimension and perceived of playfulness into our model. Next, we describe our method and report the results of our analysis. The paper concludes with a discussion of the results from both the South Korea and Viet Nam with implications.

Key words: Mobile Commerce, Personal Innovativeness, TAM, Perceived Usefulness, Perceived Playfulness

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I. Introduction

Nowadays, mobile commerce (M-Commerce) is seen as the new business model and platform that will have a significant impact on the business communities and industries. M-Commerce offers extra functionality to existing e-commerce such as location and localization services (Junglas & Watson, 2008). Mobile communication technologies have penetrated into consumer markets throughout the world (Mao et al., 2005). According to ABI Research, M-Commerce will grow into a \$119 billion of global industry by 2015, up from \$18.3 billion in 2008 (Khalifa et al., 2012).

Furthermore, the increase in M-Commerce is fueled by an unstop development of new mobile smart devices and the increasing number of people who own mobile phones. Mobile phones have become important personal devices for listening to music, watching videos, playing games, conducting business transactions, and connecting to social networking sites. The interactions between consumers and their mobile phones have presented opportunities for organizations to use M-Commerce to personalize services to customers. Realizing these opportunities, companies have been focused in M-Commerce infrastructure, services and devices investment.

However, technology development and M-Commerce development are seriously challenged when users hesitate or to be slow to adopt the

new technology. Enhanced functionality and greater levels of mobile services require an in-depth understanding of consumer perceptions and behavior. Also, by understanding deeply about the individual differences in M-Commerce adoption, telecommunications firms may formulate suitable strategies that appeal specific segments of consumer. In addition, marketers have released advanced mobile phone services, such as picture mail, internet mail, Internet browsing, and messaging that enable M-Commerce and mobile advertising (Stafford & Gillenson, 2003). Hence, according to Nysveen et al., (2005) it is very vital for marketers, researchers as well as service providers to research about the factors that affect to behavior of consumers in M-Commerce adoption and the behavioral M-Commerce adoption requirements of these services. Therefore, the first objective of this paper is investigating the antecedents that affect the M-Commerce adoption in the developed and developing countries - both South Korea and Viet Nam.

Moreover, Palvia (1998) suggested that as globalization is becoming increasingly prevalent in the world today, many factors such as culture, politics, and economics may influence the applicability of management theories. Concurrently, according to Khaslavsky (1998) this increasingly global market, vendors are faced with the challenge of offering usable and useful applications to the local users. Besides, many scholars strongly support that the criteria for M-Commerce adoption in developing countries are different

from that of developed countries, due to cultural, security, social, political, economic, and technological aspects (Saidi, 2010; Yaseen & Zayed, 2010). However, there is little research which has explicitly addressed the differences on the adoption of M-Commerce between developed and developing countries and also most current practitioners have taken a superficial approach. Therefore, the second question in this study is whether the factors influencing M-Commerce adoption differ in South Korea and Viet Nam.

The remainder of the paper unfolds as follows. First, the motivation for studying advanced mobile phone services adoption in the South Korea and Viet Nam is presented. Second, M-Commerce adoption model is introduced as a starting point for the research model. We then integrate price, personal innovativeness, quality dimension and perceived of playfulness into our model. Next, we describe our method and report the results of our analysis. The paper concludes with a discussion of the results from both the South Korea and Viet Nam with implications.

II. Literature Review and Research Hypotheses

2.1 Mobile Commerce in Viet Nam and South Korea

Growth in M-Commerce is unstoppable. M-Commerce is now 34% of all E-Commerce transactions globally-based on an accurate weighting of E-Commerce market size by country. By year-end 2015, mobile share of E-Commerce transactions is forecast to reach 40% globally.¹⁾ Therefore, understanding cross-device behavior will be the biggest challenge and opportunity for marketers, as a majority of users visit their sites via multiple devices.

In South Korea, for the first time ever, South Korea had the majority (over 50%) of their E-Commerce transactions via mobile in Q1 2015.²⁾ In addition, according to an analyst from TechNavio's Telecom, as smart phone penetration is increasing in South Korea, the demand for smartphone applications and services is also growing rapidly. For the purchase of these applications, consumers need to use M-Commerce. As mobile broadband connectivity is widely available in South Korea, commercial sites can be easily accessed, and therefore online purchases are also growing at a rapid pace. According to the report, high penetration rate of mobile broadband in the

1) Based on Criteo's Q1 2015 State of Mobile Commerce Report.

2) Based on Criteo's Q1 2015 State of Mobile Commerce Report.

country, which enables easy access to the internet for conducting M-Commerce activities, is driving the M-Commerce market in South Korea. Clearly, the development of M-Commerce in South Korea has brought both opportunities and threats for business not only in present but also in the future. To cope with this high competition, it is necessary for service providers to have better understanding of the factors impacting on the M-Commerce adoption to make an effective strategy.

On the other hand, unlike South Korea, M-Commerce practices in Viet Nam can hardly reach low-income earners that compose a majority of the population. In a market research company's report, in January 2014, only 34% of the population in Viet Nam has access to Internet on their mobile devices and the average online time via mobile devices is 30% of the total online time which also includes desktop, laptop and other devices. Around 20% of Viet Nam population is carrying smartphones with 95% of smartphone users researching products via their phone.³⁾ This indicates that M-Commerce in Viet Nam is in early stages of M-Commerce development in comparison with South Korea. In addition to the recent years, Vietnam's telecommunication sector has been allowed to start privatization efforts in the coming years. This fosters not only price-based competition but also service-based competition among mobile service

providers. The providers are enhancing the types of service that they provide to attract more and more customers. Thus a more in-depth understanding of the factors affecting M-Commerce could help Viet Nam business stimulate faster and deeper penetration of these services and realize interest of M-Commerce.

2.2 M-Commerce adoption models

Most M-Commerce articles adopted the Technology Acceptance Model (TAM) in establishing a M-Commerce adoption model (Wu & Wang, 2005; Yang and Jolly, 2008). In studying user acceptance and use of technology, the TAM developed by Davis, (1985) to explain computer-usage behavior, has been one of the cited models. O'Casey and Fenwick (2003) argue that TAM is also appropriate for research areas in electronic commerce applications since electronic commerce is based on computer technology. As scholars indicate that M-Commerce is an extension of e-commerce, it is thus justifiable to extend TAM to examine consumer intention to adopt M-Commerce. Thus, the M-Commerce adoption articles extended the TAM with new constructs aside from the original Perceived Usefulness and Perceived Ease of Use, Attitude, Intention and Actual Use constructs. Numerous studies have provided support to this model in predicting user's intention to adopt new services and

3) Seen at: <http://www.ecommercemilo.com/2014/04/vietnam-ecommerce-overview-and-market-size.html#.Vdv-Vvntnyb>

applications in different contexts (Davis et al., 1989; Igarria and Tan, 1997; Wang et al., 2003; Gefen et al., 2003; Ikart, 2005; Wu and Wang, 2005; Cheong and Park, 2005). Recently, Faqih and Jaradat (2014) proposed a theoretical framework based on TAM3 theory and concluded that perceived usefulness and perceived ease of use are important factors to explain the individual's intention to adopt M-Commerce in Jordan. The results of these previous studies confirm that, in the mobile technology context, traditional adoption models such as TAM could be applied, but need modification and extension in order to increase their prediction and explanation power. Thus, this paper conforms to these studies, and extended TAM to analyze the usage of M-Commerce.

2.3 Research model and hypotheses

2.3.1 Hypotheses

(1) Perceived Ease of Use

Perceived ease of use means a user-friendly device. This variable refers to the degree to which the prospective user expects the target system to be free of effort and it also refers to effective navigation tools that encourage service usage and the full exploitation of enhanced features. According to Kim et al., (2007) perceived ease of use was defined as the overall user-friendliness of using mobile devices to access the Internet, neither to M-Internet. This is be-

cause M-Internet runs on limited resources compared to other systems, especially for users of mobile phone where screen size and manipulation difficulty demand mental and physical efforts.

In addition, Agarwal and Karahanna (2000) assumed that the relation between Perceived Ease of Use and Perceived Playfulness lies on the logic that the easier an individual perceives M-Internet, the more he/she is likely to consider it playful. Cheong and Park (2005) also found that perceive ease of use has an impact on Perceived Playfulness. Thus, this study proposes that individuals' perceptions of mobile device's ease of use will influence his/her perceived playfulness in using M-Commerce.

Furthermore, for mobile phone users, convenience and ease are critical. Users would tend to consider services that are easier to use to be more useful and would be more likely to intend to use them. Therefore, it would be important to determine whether this perception will lead to their intention to use M-Commerce. Hence we expected the following hypotheses.

H1a: Perceived ease of use significantly affects intention to use mobile commerce.

H1b: Perceived ease of use significantly affects perceived usefulness.

H1c: Perceived ease of use significantly affects perceived playfulness

(2) Perceived usefulness

Perceived usefulness is one of the most widely studied variables in technology adoption. This has been indicated that perceived usefulness plays a vital role in the adoption of technology (Pagani, 2004; Bhatti, 2007; Kim et al., 2007). Perceived usefulness is defined as the extent to which individuals believe that using the new technology will enhance their task performance. The usefulness construct has been used extensively in information systems and technology research, and has strong empirical support as an important predictor of technology adoption (Kieran Mathieson, 1991). Other studies providing evidence of the significant effect of perceived usefulness on intention are from Davis et al., (1989); Venkatesh and Morris (2000). The ultimate reason for people to utilize M-Commerce is that they find it useful to their tasks, transactions or everyday living. An individual evaluates the consequences of their behavior in terms of perceived usefulness and base their choice of behavior on the desirability of the perceived usefulness. Hence, we posit that

H2a: Perceived usefulness significantly affects intention to use mobile commerce.

H2b: Perceived usefulness significantly affects M-Commerce usage

(3) Perceived Playfulness

Perceived playfulness refers to an individual's subjective experience of human-computer in-

teraction (Moon & Kim, 2001). This new concept is often referred to as Fun (Pagani, 2004; Bruner & Kumar, 2005) or Enjoyment (Nysveen et al., 2005). According to Nysveen et al., (2005), perceived enjoyment stands out as an important motive for using experiential mobile services. Perceived playfulness plays a significant role in developing the intention to use as well as the attitude toward the system (Agarwal & Karahanna, 2000; Moon & Kim, 2001; Teo et al., 1999). Also, Atkinson & Kydd (1997) tested the role of usefulness and enjoyment in World Wide Web (www) usage and suggested that the perceived enjoyment significantly influences the usage of www for entertainment purposes. Moon & Kim (2001) extended the TAM in the context of www and suggested that people use the internet not only for utilitarian perceived purposes but also for leisure and recreation. Hence, the perceived playfulness is introduced as a new variable in the understanding of M-Commerce adoption.

Moreover, individuals who experience immediate pleasure or joy from using a technology and perceive any activity involving the technology to be personally enjoyable in its own right aside from the instrumental value of the technology, are more likely to adopt the technology and use it more extensively than others. Thus, the hypotheses are:

H3a: Perceived playfulness significantly affects intention to use.

H3b: Perceived playfulness significantly affects M-Commerce usage.

(4) Intention to Use

Individual's intention to use M-Commerce affects positively the usage of M-Commerce. This was supported in previous studies that focused on the acceptance and use of new technology (Compeau and Higgins, 1995; Venkatesh and Davis, 2000; Hung et al., 2003; Yaseen and Zayed, 2010). Thus, we argue that:

H4: Intention to use significantly affects the M-Commerce usage.

(5) Perceived Cost

Cost means the monetary transaction costs when mobile phone users use M-Commerce. Given that the cost of accessing M-Commerce is higher than that of accessing through wire-based internet, the subscription, service and communications costs which may influence the individual's using M-Commerce is suggested to be considered carefully. This concept can be also known as the perceived financial cost or resources and perceived fee. Mathieson et al., (2001) proposed that perceived financial resource is a significant predictor of the intention to use an IS. Also, it has been showed that perceived fee directly influences perceived value (Zeithaml, 1988; Dodds et al., 1991; Chang & Wildt, 1994). Depending on the provider, there are different rates, extra charges for ad-

vanced mobile phone services. An appropriate and acceptable M-Commerce service charge is a key predictor of mobile users' satisfaction toward using M-Commerce.

In the development of behavioral intention, customers compare the benefit from the service to the cost of using the service. If the cost exceeds the benefit, they do not subscribe the service. Also, Wei et al stated that cost is one factor that can slow the development of M-Commerce. It should also be noted that most of the users of mobile phones include younger students, such as university and high school students. Therefore this study hypothesizes that:

H5: Perceived cost significantly affects the M-Commerce Usage.

(6) Personal innovativeness

Perceived innovativeness is a domain-specific individual trait that reflects the willingness of a person to try out new information technology (Agarwal & Prasad, 1998). It has long been recognized that highly innovative individuals are active information seekers about new ideas in general innovation diffusion research. They are able to cope with high levels of uncertainty and develop more positive intentions toward acceptance (Rogers, 1995). Some previous studies have explored that individuals with higher levels of innovativeness might develop more positive perceptions of usefulness, ease of use and compatibility, which in turn increases an individual's

technology usage intention (Midgley & Dowling, 1978; Limayem et al., 2000; Lee et al., 2007).

Furthermore, Lewis et al., (2003) found that personal innovativeness in technology significantly affected perceived usefulness and perceived ease of use. Lu et al., (2003) proposes that personal innovativeness in technology, along with a number of other factors, all determine user perceived short-term as well as long-term usefulness, and ease of use, which, in turn, influence user intention and attitude to adopt wireless Internet services via mobile technology. Since individuals with higher personal innovativeness in technology tend to be more risk-taking, it is also reasonable to expect them to develop more positive intentions toward the use of wireless Internet services via mobile technology. Thus, the innovative disposition may very well serve as the primary and direct antecedents for adoption decision, without much consideration to perceptions at all. Hence, we propose:

H6a: Personal innovativeness significantly affects perceived usefulness.

H6b: Personal innovativeness significantly affects perceived ease of use.

H6c: Personal innovativeness has a direct positive impact on intention to use.

(7) Quality dimension

DeLone & McLean (1992) postulated a model of information system (IS) success in which "system quality" measures technical success,

"information quality" measures semantic success, and "use satisfaction, individual impacts" and "organizational impacts" measure effectiveness success. Pitt et al., (1995) later argued that the measures seem strongly product-focus because service plays a vital role in IS effectiveness, they added "service quality" as another component of IS success. According to William H. DeLone & McLean (2003) the updated model can be adapted to the measurement challenges of the B2C E-Commerce world.

In an E-Commerce system, Halawi et al., (2007) defined system quality refers to measures of the information processing system itself in terms of usability, adaptability, reliability, availability and response time. Information quality was defined as measures of IS output, namely the quality of the information that the system produces primarily in the form of reports and captures "the content issue," which means that Web content should be personalized, complete, relevant, and easy to understand (William H. DeLone & McLean, 2003) so in this study content quality was used instead of information quality. Finally, service quality measures the quality of the support system users receive from the IS department and IT support personnel (William H. DeLone & McLean, 2003). Many research usually measures service quality with respect to responsiveness, assurance, and empathy (William H. DeLone & McLean, 2003; Delone & Mclean, 2004; Khayun et al., 2012). Lee & Chen (2014) employed the three-dimensional

quality concept from DeLone and McLean's model and denoted that perceived information, system, and service qualities all positively influence confirmation, whereas information and system qualities affect perceived usefulness and draws attention to the importance of quality in retaining M-Commerce customers.

Also, the fact that many retailers have seized the opportunity to go "mobile," but their sites have slow load times, out of date information as well as complicated navigation so that those enterprises were devastated. Hence, offering up to date product and service information, ensuring connection quality and providing good quality customer service seem paramount for anyone who wants to employed mobile business.

Since, the role of quality factor cannot be underestimated for M-Commerce success. Therefore, this study integrates the three dimensions of perceived quality: service quality, content quality, system quality with TAM to investigate the determinants of consumer intentions to adoption M-Commerce.

1) System Quality

Lin and Lu (2000) proposed that in information system context, system quality is especially important because individuals become reluctant to use the system when they experience frequent delay in response, lack of access, frequent disconnection and poor security. According to DeLone and McLean, (1992) the information quality and system quality are found to be im-

portant constructs that bring the success of information system. In this study, we also expect that the system quality has positive impact on the perceived playfulness because better system can make individuals feel M-Commerce more enjoyable and playful. Thus, we propose:

H7a: System quality significantly affects perceived usefulness.

H7b: System quality significantly affects perceived ease of use.

2) Content Quality

The concept of contents quality is similar to the information quality and used in the study of DeLone and McLean (1992) and Lin and Lu (2000) because information is often regarded as contents in the context of the Internet. With regards to this study, it is hypothesized that the contents quality has a positive influence on the perceived playfulness since better contents can make individuals feel M-Commerce to be more enjoyable and fun. According to Cheong and Park (2005) the quality of the content and the extent to which that content meets the needs and expectations of M-Commerce users could affect their perception of its usefulness. Thus, the hypothesis:

H8a: Content quality significantly affects perceived usefulness.

H8b: Content quality significantly affects perceived playfulness.

3) Service Quality

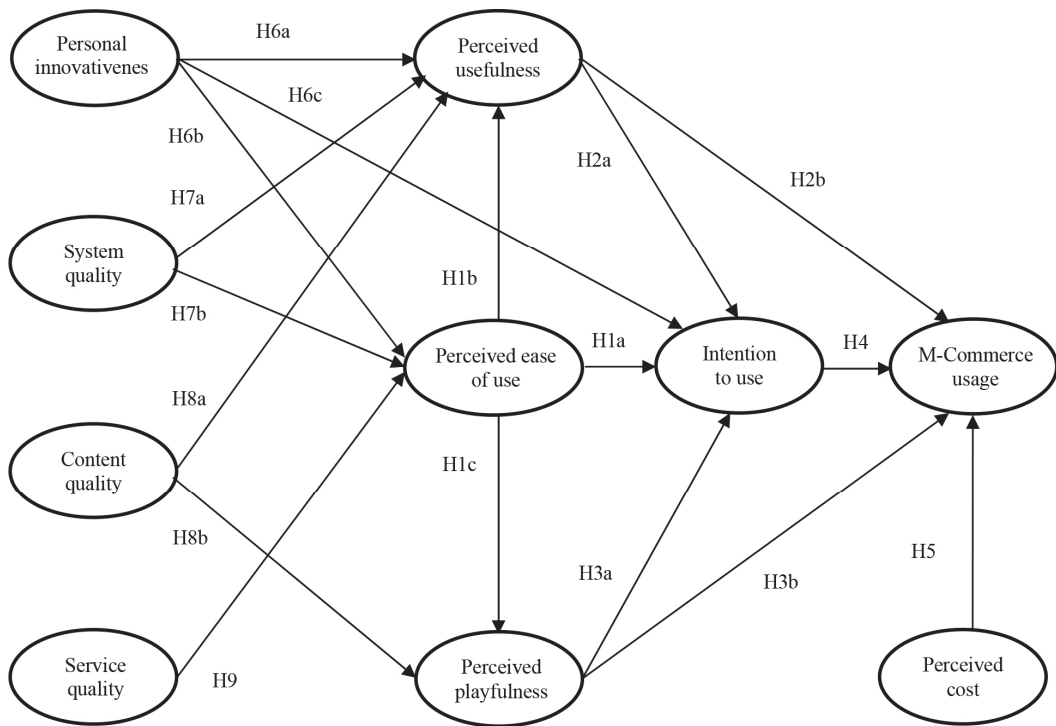
In this study, service quality is defined as the degree to which M-Commerce through the network and service provider can give customers prompt, promised, and professional service. Cho (2008) proposed that the service factor was a predictor of perceived ease of use in Korean context. Therefore, we argue that service quality has a relationship with perceived ease of use as follows:

H9: Service quality significantly affects the perceived ease of use.

2.3.2 Conceptual research model

The aim of the current study is to develop a success model for M-Commerce adoption in Viet Nam and Korea that would explain how individuals behave in accepting or using M-Commerce. The independent variables include System Quality, Content Quality, Service Quality, Personal Innovativeness and Perceived Cost factors. For mediating variables, the perceived usefulness, perceived ease of use, perceived playfulness, and intention to use are utilized in the model, as shown in the Figure 1.

<Figure 1> Proposed Research Model



III. Method

3.1 Population and sample

The data was collected by using a paper-based survey questionnaire. In Viet Nam, respondents are students from universities in Ho Chi Minh City, the principal business center of Viet Nam, and university of Da Lat in Da Lat city. In Korea, to ensure the similarity of respondents, we also collected data from students of universities in Seoul, the capital and business center of South Korea.

In addition, in this study, university students were selected since they tend to have higher technology readiness than the others. In fact, according to Jurisic & Azevedo (2011) university students are one of the most important target markets in many high-tech products.

After gathering the answered questionnaires, they were checked thoroughly to assess the validity whether to be included in the study. Those with NO answers on the query Usage of M-Commerce were excluded right away. Then, those with YES were given numbers for the data input. Among the responded cases, sample size which is used for analysis of this research in Viet Nam and South Korea is 532 respondents and 187 respondents, respectively.

3.2 Measuring the constructs

Questionnaires were developed to achieve closely the objectives of this study. The measurement of the questionnaire was adapted from scale items that were validated and used in previous research studies (Wu and Wang, 2005; Pedersen 2005; Wang et al., 2006; Kim et al., 2007; Davis, 1989, Cheong and Park, 2005; Yang and Folly, 2008; Delone and McLean, 2003; Faqih and Jaradat, 2014). The items were translated into Vietnamese and South Korean, then were modified based on group discussion. All items used 7- point Likert scales ranging from (1) strongly disagree to (7) strongly agree.

IV. Results

4.1 Demographic Results

The respondent's demographics are summarized in Table 1. In Viet Nam, almost 57.1% of the respondents are female. The majority of the respondents ages (64.1%) were students with age from early 20 to less than 25 years old range. Meanwhile, in South Korea, respondents are male is slightly much than female. However, like Viet Nam, respondent's age is young (20-25 years old) accounting for 85 percent.

<Table 1> Sample Demographics

Demographic profile		Viet Nam		South Korea	
		Frequency	Percentage (%)	Frequency	Percentage (%)
Gender	Male	228	42.9	95	50.8
	Female	304	57.1	92	49.2
	Total	532	100	187	100
Age Group	< 20	89	16.7	1	0.6
	20-25s	341	64.1	159	85
	25-30s	75	14.1	16	8.6
	30-35s	27	5.1	11	5.9
	Total	532	100	187	100

4.2 Frequencies

Multiple response analysis was also done to evaluate the respondent's answers in the M-Commerce activities they frequently use. As shown in the Table 2, even though order and percentage of top five most frequent used in South Korea and Viet Nam is slightly different, but most of this activities is similar.

It can be seen from Table 3, the character-

istics of mobile devices about its convenience such as "Availability of Internet access anywhere" and "Immediate access to Internet when needed" feel similar between two countries. However, the interesting thing is that objective of using M-Commerce in Viet Nam relates function "study or work", meanwhile for South Korea it relates to "relieves boredom". This might be the reason showing interestingly difference in using M-Commerce between South

<Table 2> Top five M-Commerce activities (Multiple Responses)

Country	Activity	Count	Percent
Viet Nam	1. News	371	69.7
	2. Instant Messaging/Chatting	345	64.8
	3. Social Network (Facebook, Twitter, others)	333	62.6
	4. Ticket Purchase	297	55.8
	5. Downloading ringtone	297	55.8
South Korea	1. Social Network (Facebook, Twitter, KaTalk)	144	77.0
	2. Information search and general web surfing	139	74.3
	3. Weather Forecast	117	62.6
	4. Instant Messaging/Chatting	117	62.6
	5. News	113	60.4

<Table 3> Top Three Motivations for Using M-Commerce

Country	Reasons for using	Count	Percent
Viet Nam	1. For study or work	286	53,8
	2. Availability of Internet access anywhere	260	48,9
	3. Immediate access to Internet when needed	234	44,0
South Korea	1. Availability of Internet access anywhere	151	80,7
	2. Immediate access to Internet when needed	148	79,1
	3. Relieves boredom	128	68,4

Korea and Viet Nam.

4.3 Measurement Assessment

4.3.1 Reliability Analysis

Reliability was done to test the degree to which the set of latent construct indicators are consistent in their measurements. The reliability of the variables was assessed by the Cronbach's Alpha and Item-total Correlation. The acceptable threshold for Cronbach's Alpha is 0,70,

while constructs which are highly inter-correlated indicate that they are all measuring the same latent constructs. **Table 4** shows that the resulting alpha values range from **0,787** to **0,934**, which are above the acceptable threshold of **0,70**. Also, the Item-total correlation test results are satisfactory.

4.3.2 Construct Validity Analysis

A confirmatory factor analysis was conducted to test the measurement model. This assesses

<Table 4> Reliability with Cronbach's alpha

Constructs	Viet Nam		South Korea	
	Items	Cronbach's alpha	Items	Cronbach's alpha
Personal innovativeness	3	0,787	3	0,866
System quality	4	0,839	4	0,814
Content quality	3	0,860	3	0,801
Service quality	3	0,870	3	0,691
Perceived usefulness	3	0,865	4	0,919
Perceived ease of use	3	0,863	3	0,892
Perceived playfulness	4	0,867	4	0,933
Intention to use	3	0,875	3	0,862
M-Commerce usage	3	0,845	3	0,858
Perceived cost	3	0,875	3	0,934

what the construct (concept) or scale is, in fact, measuring. To construct validity, two checks have to be performed: the convergent validity and discriminant validity. Convergent validity was evaluated by examining composite reliability and average variance extracted (AVE) from the measures. Discriminant validity was evaluated by the square root of AVE for each construct is greater than the correlations between the constructs and all other constructs, indicating that these constructs have discriminant validity (Fornell & Larcker, 1981).

All the model-fit indices exceeded their respective common acceptance levels suggested by previous research, thus demonstrating that the measurement model exhibited a good fit with the data collected in Viet Nam (χ^2 (419) = 799.514, CMIN/df= 1.908, p = .000; GFI = .915; CFI = .965; RMSEA = .041) meanwhile the data in South Korea demonstrating that the measurement model exhibited a fairly good fit with the data collected (χ^2 (389) = 791.836, CMIN/df= 2.036, p = .000; GFI = .784; TLI = .903; CFI = .919; RMSEA = .075).

<Table 5> Composite reliability, AVE and correlation of constructs' values

Viet Nam	CR	AVE	1	2	3	4	5	6	7	8	9	10
1. M-Commerce usage	0.847	0.649	0.806									
2. Usefulness	0.868	0.687	0.728	0.829								
3. System quality	0.841	0.570	0.628	0.695	0.755							
4. Service quality	0.873	0.696	0.447	0.556	0.677	0.834						
5. Ease of use	0.867	0.686	0.635	0.638	0.713	0.602	0.828					
6. Playfulness	0.869	0.625	0.625	0.651	0.751	0.549	0.717	0.790				
7. Content quality	0.861	0.675	0.597	0.607	0.734	0.604	0.653	0.670	0.821			
8. Perceived cost	0.874	0.699	0.465	0.443	0.573	0.609	0.469	0.449	0.662	0.836		
9. Intention to use	0.876	0.702	0.786	0.774	0.688	0.557	0.708	0.697	0.667	0.458	0.838	
10. P Innovativeness	0.795	0.566	0.520	0.517	0.566	0.562	0.516	0.505	0.529	0.499	0.519	0.752
South Korea												
1. Ease of use	0.900	0.750	0.866									
2. P Innovativeness	0.874	0.701	0.313	0.837								
3. Perceived cost	0.936	0.831	0.312	0.101	0.911							
4. Content quality	0.805	0.580	0.797	0.292	0.419	0.762						
5. Service quality	0.757	0.608	0.643	0.345	0.523	0.664	0.780					
6. System quality	0.878	0.706	0.774	0.266	0.398	0.860	0.711	0.840				
7. Intention to use	0.859	0.671	0.762	0.192	0.312	0.825	0.670	0.904	0.819			
8. Playfulness	0.933	0.779	0.705	0.237	0.295	0.676	0.583	0.656	0.613	0.883		
9. Usefulness	0.921	0.745	0.659	0.267	0.389	0.737	0.554	0.704	0.702	0.544	0.863	
10. M-Commerce usage	0.871	0.701	0.687	0.177	0.268	0.696	0.585	0.797	0.816	0.706	0.517	0.837

Note: Diagonal elements are the square root of AVE. Off-diagonal elements are the correlations among constructs.

Values for composite reliability are recommended to exceed **0.70** (Chin, Marcolin, & Newsted, 2003) and AVE values should be greater than the generally-recognized cut-off value of **0.50** (Fornell & Larcker, 1981). Table 5 shows that all composite reliability and AVE values of both Viet Nam and South Korea meet the recommended threshold values. Therefore, it is an evidence for convergent validity. In addition, the square root of AVE for each construct is greater than the correlations between the constructs and all other constructs, indicating that these constructs have discriminant validity, except content quality and system quality in South Korea.

4.4 Structural Results: Hypothesis Testing

SEM was used to test the hypotheses in South Korea and Viet Nam. The SEM results indicated that the model had an acceptable fit in Viet Nam better than in South Korea. In particular, the indices of model with data collected in Viet Nam are $\chi^2 (437) = 875.069$, $CMIN/df=2.002$, $p = .000$; $GFI = .909$; $CFI = .960$; $RMSEA = .043$ while for South Korea are $\chi^2 (407) = 873.522$, $CMIN/df=2.146$, $p = .000$; $GFI = .765$; $TLI = .893$; $CFI = .906$; $RMSEA = .079$.

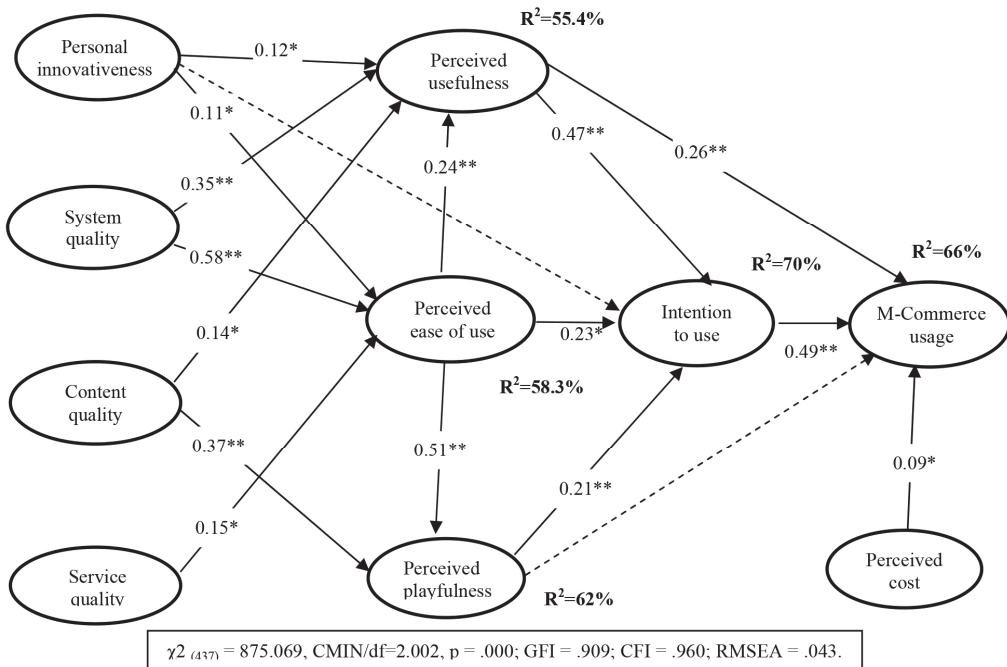
In Viet Nam, Table 8 presents the un-

<Table 6> Unstandardized structural paths

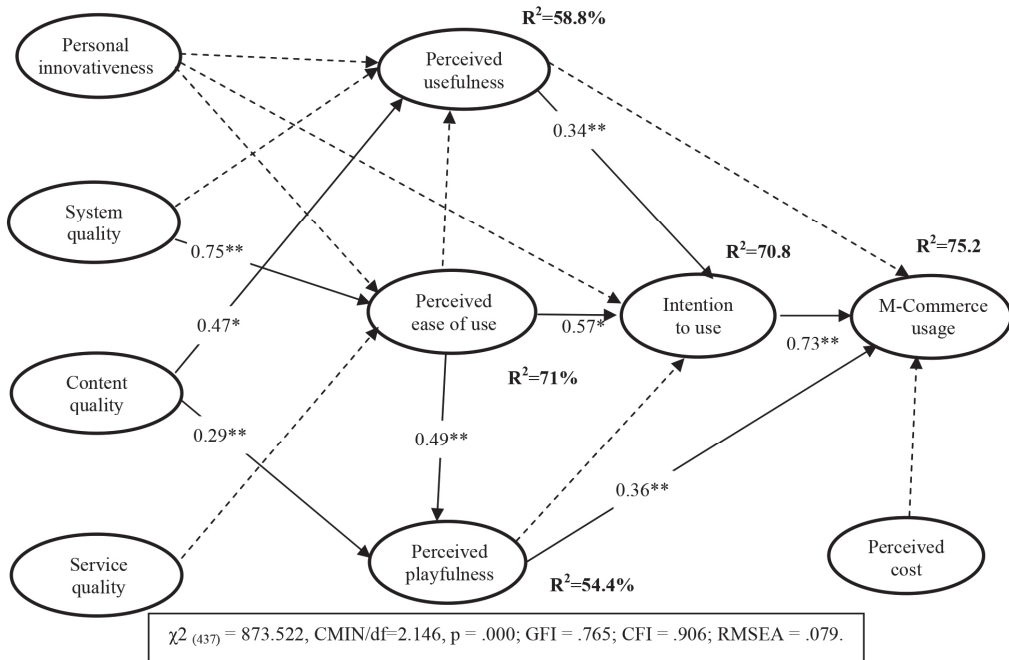
Hypothesis	Viet Nam					South Korea				
	R.E	S.E	C.R	P	Result	R.E	S.E	C.R	P	Result
H1a: Perceived Ease of Use → Intention to Use	.266	.071	3.739	.000	S**	.565	.096	5.915	.000	S**
H1b: Perceived Ease of Use → Perceived Usefulness	.250	.067	3.744	.000	S**	.111	.131	.844	.399	NS
H1c: Perceived Ease of Use → Perceived Playfulness	.571	.059	9.718	.000	S**	.535	.111	4.805	.000	S**
H2a: Perceived Usefulness → Intention to Use	.527	.060	8.781	.000	S**	.328	.073	4.516	.000	S**
H2b: Perceived Usefulness → M-Commerce Usage	.308	.077	3.994	.000	S**	-2.17	.087	-2.486	.013	NS
H3a: Perceived Playfulness → Intention to Use	.212	.056	3.804	.000	S**	.042	.072	.581	.562	NS
H3b: Perceived Playfulness → M-Commerce Usage	.084	.057	1.475	.140	NS	.381	.069	5.505	.000	S**
H4: Intention to Use → M-Commerce Usage	.508	.079	6.442	.000	S**	.847	.109	7.796	.000	S**
H5: Perceived Cost → M-Commerce Usage	.085	.043	1.991	.047	S*	.005	.048	.099	.921	NS
H6a: P. Innovativeness → Perceived Usefulness	.129	.056	2.315	.021	S*	.040	.063	.636	.525	NS
H6b: P. Innovativeness → Perceived Ease of Use	.120	.055	2.179	.029	S*	.089	.056	1.607	.108	NS
H6c: P. Innovativeness → Intention to Use	.079	.053	1.485	.138	NS	-0.089	.054	-1.656	.098	NS
H7a: System Quality → Perceived Usefulness	.412	.107	3.866	.000	S**	.267	.291	.917	.359	NS
H7b: System Quality → Perceived Ease of Use	.671	.079	8.530	.000	S**	.891	.118	7.528	.000	S**
H8a: Content Quality → Perceived Usefulness	.130	.063	2.058	.040	S*	.616	.265	2.328	.020	S*
H8b: Content Quality → Perceived Playfulness	.379	.051	7.457	.000	S**	.406	.143	2.833	.005	S*
H9: Service Quality → Perceived Ease of Use	.139	.055	2.551	.011	S*	.099	.116	.856	.392	NS

Note: *: significant at $P < .05$; **: significant at $P < .000$; S: Support; NS: Not support; P: P-value

<Figure 2a> Results of testing hypotheses - Viet Nam



<Figure 2b> Results of testing hypotheses - South Korea



standardized structural paths; and Figure 2a presents the significant structural relationship among the research variables and the standardized path coefficients with their respective significance levels. Only 2 of 17 hypotheses proposed are found insignificant (H3b, H6c). In addition, the Figure 2 shows the model explained substantial variance in both perceived usefulness ($R^2=55.4\%$) and intention to use ($R^2=70\%$), perceived ease of use ($R^2=58.3\%$), perceived of playfulness ($R^2= 62\%$) and M-Commerce usage ($R^2 =66\%$).

In South Korea, there are nine hypotheses proposed which are found insignificant (Table 6). In addition, the Figure 2b shows the model

explained substantial variance in both perceived usefulness ($R^2=58.8\%$) and intention to use ($R^2=70.8\%$), perceived ease of use ($R^2=71\%$), perceived of playfulness ($R^2=54.4\%$) and M-Commerce usage ($R^2 =75.2\%$).

V. Conclusions and Implications

This study identified various factors affecting mobile commerce adoption based on existing literature and developed a comprehensive model of mobile commerce adoption. After developing and validating a research instrument, the model

<Table 7> Comparison of Results: Viet Nam versus South Korea

Hypotheses	Results	
	Viet Nam	South Korea
H1a: Perceived Ease of Use → Intention to Use	Accept	Accept
H1b: Perceived Ease of Use → Perceived Usefulness	Accept	Reject
H1c: Perceived Ease of Use → Perceived Playfulness	Accept	Accept
H2a: Perceived Usefulness → Intention to Use	Accept	Accept
H2b: Perceived Usefulness → M-Commerce Usage	Accept	Reject
H3a: Perceived Playfulness → Intention to Use	Accept	Reject
H3b: Perceived Playfulness → M-Commerce Usage	Reject	Accept
H4: Intention to Use → M-Commerce Usage	Accept	Accept
H5: Perceived Cost → M-Commerce Usage	Accept	Reject
H6a: P. Innovativeness → Perceived Usefulness	Accept	Reject
H6b: P. Innovativeness → Perceived Ease of Use	Accept	Reject
H6c: P. Innovativeness → Intention to Use	Reject	Reject
H7a: System Quality → Perceived Usefulness	Accept	Reject
H7b: System Quality → Perceived Ease of Use	Accept	Accept
H8a: Content Quality → Perceived Usefulness	Accept	Accept
H8b: Content Quality → Perceived Playfulness	Accept	Accept
H9: Service Quality → Perceived Ease of Use	Accept	Reject

was applied in two different cultural contexts: South Korea and Viet Nam. As expected, differences were found between the South Korean and Vietnamese M-Commerce consumers in regard to M-Commerce adoption. Nine out of seventeen links in the research model were different across the two cultures.

In Viet Nam, our model was able to explain 66% of the variance in the consumer behavioral M-Commerce adoption. The relationships of the TAM model are supported by our study. Both perceived usefulness and perceived ease of use have significant impact on consumers' M-Commerce usage (Venkatesh et al, 2000). Additionally, our study added perceived cost, personal innovativeness and quality dimensions, all of these factors play as important antecedents of Vietnamese consumer's M-Commerce usage. Our results suggest that the Vietnamese people consider the functional characteristics, usefulness, ease of use and the price before making decision to use M-Commerce.

In South Korea, the model explained 75.2% of the variance and provided different sets of relationships compared to the Viet Nam sample. Perceived playfulness is highlighted as influencing directly to M-Commerce usage. It appears that consumers in South Korea emphasize the playfulness, hedonic characteristics before adopting M-commerce. There was a lack of supports for one of the TAM relationships that is the impact of perceived ease of use on the perceived usefulness. However, there are

several studies in the past which have failed to establish this relationship. Besides, it is interestingly that personal innovativeness has no impact on both perceived usefulness and perceived ease of use and system quality does not impact on the perceived usefulness as well as service quality is not the predictor of perceived ease of use. The reason might be that for the developed country such as in the South Korea with advanced telecommunication infrastructure and experienced society, system quality and service quality, personal innovativeness are possibly no longer affect to perceived usefulness and perceives ease of use. Furthermore, it is notably worthy is the relationship of perceived cost and M-Commerce usage is insignificant that is absolutely contrast with the results found in Viet Nam context. This difference found in South Korea and Viet Nam can be attributed to the disparity in economic environments. While price did not affect the Korean consumers, perceived high cost of mobile commerce did lead to a low level to use M-Commerce for Vietnamese consumers. In fact, high cost may well be the key obstacle to adopt M-Commerce in Viet Nam.

Interestingly, the finding of this study showed that when considering actual M-Commerce using, the perceived usefulness influence directly M-Commerce usage in Viet Nam meanwhile perceived playfulness influence directly M-Commerce usage in South Korea. It can be explained that in Viet Nam context when M-Commerce is in

early stage, the cost for accessing internet via mobile phone is still high in relation to Vietnamese's income. Therefore, when they consider actual using M-Commerce, cost and usefulness are more important than playfulness event though playfulness still play a vital role in intention to use M-Commerce. It means that playfulness influence indirectly on M-Commerce usage through intention to use (H3a, $\beta=0.21$), which is consistent with previous study (H. Y. Wang & Wang, 2008; Zhang et al., 2012). On the other hands, for developed, advanced telecommunication country and high income per person like South Korea, cost for accessing internet via mobile phone is very low and even free in many public zones, therefore when considering actual M-Commerce usage, cost factor has no effect on M-Commerce adoption. In addition, for South Korean customer perceived playfulness influences directly on M-Commerce usage meanwhile perceived usefulness only influence indirectly through intention to use (H2a, $\beta=0.34$).

5.1 Managerial Implications

The research also brought some implication for M-Commerce providers, operators whose purpose is promoting M-Commerce adoption of customers.

First of all, for practitioners, this study is to help mobile business vendors identify and target consumers who have a strong intention to adopt new applications and services in M-

Commerce. The idea that M-Commerce should be provided to all customers for all products and services is too broad and risky to formulate efficient marketing strategies. Companies should continue to evaluate how individual products and services should be offered for specific consumer groups based on their individual characteristics (Frolick and Chen, 2004). Our study demonstrates that various factors need to be taken into account carefully to figure out target mobile consumers in the two different contexts.

Secondly, our study provides managers of M-Commerce services whose purpose is entering the Vietnamese and South Korean marketplace specific information about users' intention to use M-Commerce services based on individual characteristics. It informs managers' decisions on delivering targeted campaigns and specific M-Commerce services for the Vietnamese and Korean consumers. Conversely, for those with low intention to use, the implication for the business is to determine if alternative pricing strategies or new functions or hedonic characteristic should be used.

In Viet Nam, M-Commerce market developers and practitioners might make some influence on customers' M-Commerce adoption are the cost of the service and perceived usefulness factors whereas in South Korea, the factor perceived playfulness plays a vital role in promoting the customer engage in using M-Commerce service. Therefore, web vendors would be well advised to develop their offerings and programs

in relation to these factors and target their marketing campaigns accordingly.

In fact, compared to other shopping media, mobile commerce makes consumer feel more convenient and convenience may be a significant motivating factor. However, in Viet Nam, M-Commerce development is still in early stages and consumers are more familiar with traditional offline shopping. This requires that business vendors create more convenient, useful as well as more secure mobile shopping channel in order to help customers establish the good experience of mobile commerce. Furthermore, since the 3G service fee in Viet Nam is still high in comparison with Vietnamese income, the customers seem more sensitive to the price so that price strategy will be become more important Marketing strategies in Viet Nam setting.

However, for a developed country, advanced telecommunication system like South Korea and with the high income of Korean the internet subscriber fee seems not to be the big problem, so the competition in M-Commerce industry does not stop at price strategy it might move to higher level, that is the added value like playfulness besides the usefulness and ease of use. Hence, for South Korea context, M-Commerce service providers should emphasize on the playfulness factor to get more competitive advantages to win in this fierce battle.

Finally, for academics, this study contributes to the literature on M-Commerce adoption by identifying characteristics of the M-Commerce

consumers in South Korea and Viet Nam and their intention behavior to adopt M-Commerce services. Besides, the comparison between Vietnamese and Korean marketplace would be very meaningful for researchers and managers to localize M-Commerce strategy recommendations.

5.2 Limitations and Future Researches

Our study makes significant research contributions in a number of ways. However, some limitations need to be noted. Firstly, the sample in this research is convenient sample and the sample proportion of Viet Nam is much more than South Korean sample. Thus, generalizability of the results might be limited to Viet Nam and South Korea or countries and cultures those are the same.

This study also provides light on future research directions. In this research, the authors did not include the “security” construct in our research model because of measure difficulty so a sound operationalization should be developed and consider the security issue in the future research. Moreover, it is also interesting if our research is integrated with trust issues in M-Commerce adoption to expand the current study.

〈Received October 15, 2016〉

〈Revised October 30, 2016〉

〈Accepted October 30, 2016〉

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