

# 모바일 커머스 사용 만족의 선행요인과 결과에 대한 연구

## Antecedents of Mobile Commerce Satisfaction and Outcomes: Empirical Test

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### 요 약

모바일 커머스는 새로운 비즈니스 상거래의 방식으로 등장하고 있다. 새로운 방식의 비즈니스임에도 불구하고 아직까지 왜 많은 사람들이 점점 모바일 커머스에 매료되는지 또한 지속적으로 사용을 하는지에 대한 연구가 적다. 본 연구는 외적인 동기요인과 내적인 동기요인이 모바일 커머스 사용자의 만족에 어떻게 영향을 미치는가에 대한 연구이다. 본 연구모델은 기술수용 모델과 가치만족 이론 그리고 동기이론을 적용하여 모바일 커머스에 대한 이용자들의 사회적 행동이론을 연구하였다. 본 연구는 인지적 믿음인, 내적인 동기요인과 외적인 동기요인이 사용자 만족에 영향을 주고 그리고 만족한 사용자는 결과적으로 긍정적인 입소문 내는것으로 밝혀졌다.

**키워드 :** 모바일 커머스, 인지된 유용성, 인지된 사용편리성, 인지된 즐거움, 만족, 입소문

## I. Introduction

The Internet has become a valuable channel for retailers to interact with the general public as well as potential customers. Recently, the development of wireless technology has given rise to a new innovation which allows customers to conduct business wirelessly - mobile commerce. Mobile commerce (M-Commerce) has been defined as "content delivery and transaction on mobile devices" (Leung and Antypas, 2001) or "wireless E-commerce"

(Frolick and Chen, 2004, p. 53). M-Commerce has been applied not only to content delivery and transactional services using hand-held devices, but also to regular retailing services (Lytinen and Yoo, 2002). The value of M-Commerce is vast because it enables businesses to create more contact points with customers and to extend business into new avenue (Frolick and Chen, 2004; Venkatesh, 2003b). For example, eBay initiated a service that enables customers to bid through mobile devices (Venkatesh *et al.*, 2003b). Mobile commerce is be-

coming an increasingly important source of retailing, with \$500 million in revenues in 2002, and with expected revenues of half of a trillion dollars in 2008 (Urbaczewski *et al.*, 2003).

The behavioral aspects of customers' use of M-Commerce need to be considered when developing M-Commerce strategies. Understanding these aspects of behavior helps businesses predicting customers' reactions. Despite the importance of such insights, little knowledge exists regarding customers' behavior in mobile commerce. This paper attempts to address this knowledge gap by posing the following research questions: what are the important factors in determining consumers' satisfaction with mobile commerce? How does a company obtain a favorable reputation in the wireless environment? In answering these questions and developing the conceptual model, we draw on value satisfaction, its synthesis with the technology acceptance model (TAM) (Davis, 1989), and a host of motivation studies. The research model explains that extrinsic and intrinsic motivations may influence customers' satisfaction, which in turn influences word-of-mouth as a consequence of satisfaction in a wireless context - an indication of a company's reputation. The remainder of the paper is organized as follows. The next section provides the theoretical background for the research model, and is followed by a description of the research model. The subsequent two sections report the research design and the analyses. The final section presents a discussion of the findings and concluding remarks.

## II. Theoretical Background

In determining individuals' satisfaction with certain technologies, motivations such as goal-directed motivations and pleasure motivations play a critical

role (Agarwal and Karahanna, 2000). In this study, we synthesize value-satisfaction approach, TAM and other relevant theories to formulate our research model.

### 2.1 Value-satisfaction Approach

An expectancy-value approach - such as customer value-satisfaction hierarchy - can assist in comprehending customers' satisfaction in a wireless context (Melone, 1990). The expectancy-value approach postulates that an individual's attitude emerges from a multiple belief structure in a linear-addictive form (Melone, 1990). This approach has been extended to explain individual users' behavior in terms of how beliefs form attitudes, and, in turn, how attitudes influence behavioral intention. An individual user's satisfaction is enhanced by the evaluation of product-service attributes; Ajzen and Fishbein (1980) adopted this approach and suggested a more decomposed form known as the theory of reasoned action. Davis (1989) developed the technology acceptance model based on both the expectancy-value approach and the theory of reasoned action.

The chain relationship of customer value and satisfaction has been empirically proven in marketing research (Oliver, 1997; Olsen, 2002; Olsen and Johnson, 2003; Varki and Colgate, 2001). Value is defined as a judgment about the quality received at a particular price (Oliver, 1997). Value has been extended to perception-based approaches including procedural, distributive, and interactional justice in satisfaction studies (Oliver, 1997; Maxham III and Netemeyer, 2002). These approaches have also been widely accepted in information systems research. Bailey and Pearson (1983) studied satisfaction with information systems in an expectancy-value frame-

work. In addition, many studies applied either the theory of reasoned action or the theory of planned behavior (Harrison *et al.*, 1997; Song and Zahedi, 2005; Taylor and Todd, 1995).

In summary, these approaches posit that individuals' salient beliefs are determinants of attitude, which, in turn, impact behavior. We applied such an approach as our overarching theory, with other theories being used to identify salient beliefs in determining satisfaction with M-Commerce.

## 2.2 Technology Acceptance Model

In TAM, two factors are primary determinants of system use: perceived ease of use and perceived usefulness. Perceived usefulness is defined as the user's subjective probability that using a specific technology will increase his or her job performance within an organizational setting (Davis, 1989). Perceived ease of use is the user's assessment that the system will be easy to use and require little effort. Davis's model specifically postulates that technology usage is determined by behavioral intention to use the technology, which itself is determined by both perceived usefulness and perceived ease of use.

Studies on TAM have been expanded in various contexts. In offline contexts, TAM has been extended and synthesized with innovation diffusion theory (Plouffe *et al.*, 2001) and cognitive absorption (Agarwal and Karahanna, 2000). It has been compared to the theory of reasoned action and the theory of planned behavior (Mathieson, 1991; Taylor and Todd, 1995; Harrison *et al.*, 2001). TAM has been applied to different technologies' acceptance (Adams *et al.*, 1992; Chau, 1996; Igbaria *et al.*, 1995a; Venkatesh and Morris, 2000) such as voice mail, e-mail, micro-computer, Word, Excel, data

systems, information retrieval, and so forth. (Adams *et al.*, 1992; Igbaria *et al.*, 1995; Chau, 1996; Venkatesh and Morris, 2000). TAM has also been extended to online contexts (Gefen *et al.*, 2003; Koufaris, 2002; Lederer *et al.*, 2000; Moon and Kim, 2001; Wang and Benbasat, 2005) with respect to trust issues, usability, virtual community, and shopping bots. Additionally, Venkatesh *et al.* (2003b) argued that predicting users' behavior in a wireless context would be similar to that of an e-commerce context. Finally, Sarker and Wells (2003) noted that TAM can be applied to the context of M-commerce acceptance.

## 2.3 Intrinsic Motivations

Intrinsic motivation refers to "the performance of an activity for no apparent reinforcement other than the process of performing the activity per se". (Teo *et al.*, 2005, p. 26). Perceived enjoyment and social influence are used to explain end users' acceptance of information technologies as intrinsic motivations (Davis *et al.*, 1989; Shang *et al.*, 2004). The concept of intrinsic motivation was characterized by self-deterministic behavior, such as interest, excitement, happiness, competence, and task involvement (Agarwal and Karahanna, 2000; Clugston *et al.*, 2000; Hoffman and Novak, 1996; Van der Heijden, 2004).

Results of previous studies have suggested that an individual engages in a particular behavior due to fun and enjoyment (Teo *et al.*, 1999). Perceived enjoyment can be defined as an individual's tendency to interact spontaneously with a certain technology (Venkatesh, 2000; Webster and Martocchio, 1992). Many studies have provided theoretical grounds and evidence regarding the importance of perceived enjoyment or playfulness for technology usage (Davis *et al.*, 1992; Shang *et al.*, 2004;

Venkatesh, 2000).

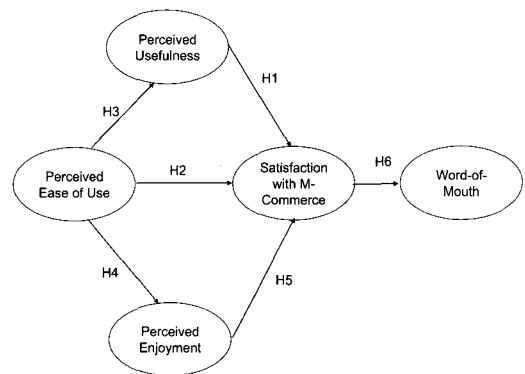
In addition, social influence may affect individuals' behavior. Ajzen (1991) conceptualized the importance of social influence in the theory of planned behavior. Social influence refers to an individual's perception that their referents, whose opinions they value, desire them to perform or not perform a behavior (Karahanna *et al.*, 1999). In this study, we consider word-of-mouth (WOM) as one of attributes of social influence as discussed in the literature related to end-user training (Galletta *et al.*, 1995). Word of Mouth (WOM) is defined as "all informal communications, both positive and negative, between individuals about characteristics of a supplier, usage, or particular goods and services or their sellers" (Westbrook, 1987, p. 261). Marketing researchers have established that WOM influences a consumer's product and service choices (Bansal and Voyer, 2000).

Intrinsic and extrinsic motivations were examined in concert with TAM in studies of traditional computing as well as in the context of Internet usage. Therefore, we argue that it is valuable to conduct similar studies in wireless environments to examine the external validity of TAM.

### III. Research Model and Hypotheses

We synthesize the value satisfaction approach, TAM, and intrinsic motivations to formulate our research model as presented in <Figure 1>. Many studies have tested and validated TAM. In the context of technology adoption, which conceptualizes users' behavior in adopting technologies. TAM (Davis, 1989) postulates that individuals' intentions are determinants by their behavior. Intention in TAM is a function of perceived ease of use and

perceived usefulness (Davis, 1989). Perceived usefulness refers to "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989, p. 320). Based on TAM, when individuals believe that M-commerce is useful, they will continue to use M-commerce. Perceived ease of use can be defined as "the degree to which a person believes that using a particular system would be free of effort". (Davis, 1989, p. 320). In other words, TAM posits that an individual's beliefs about ease of use and usefulness are the determinants of personal behavioral intention to adopt technologies. Thus, when individuals perceive that M-commerce is easy to use, they will be more likely to continue to use M-Commerce. Furthermore, individuals will believe that M-Commerce is useful when it is easy to use.



<Figure 1> Research Model

Many researchers have investigated users' satisfaction in terms of end-user satisfaction, which is considered an important factor in IS success and use (Doll *et al.*, 2004; McKinney *et al.*, 2002). User satisfaction is one of the most widely accepted dependent constructs and is defined as "the sum of one's feelings or attitudes toward a variety of factors affecting that situation" (Galletta and Lederer,

1989). It has also been defined in information systems research as “felt need, system acceptance, perceived usefulness, feelings about the information system, and information systems appreciation” (Ives *et al.*, 1983).

While these terms are different, they deliver a common notion that user satisfaction is a form of evaluative response from information systems users (Melone, 1990). After DeLone and McLean (1992) provided guidance for studying end-user satisfaction using their D-M model, there were many attempts to verify and modify the D-M model (Molla and Licker, 2001; Seddon, 1997). Doll *et al.* (2004) reviewed the literature of satisfaction and refined the satisfaction measure as a second-order construct of content, accuracy, format, timeliness, and ease of use. Additionally, McKinney *et al.* (2002) proposed a comprehensive model for Web customers’ satisfaction. They argued that Web customers’ satisfaction is a result of satisfaction with information quality and system quality. They decomposed information quality and system quality into various aspects of information (relevance, understandability, reliability, adequacy, scope, and usefulness) and system (access, usability, entertainment, hyperlinks, navigation, and interactivity). Some studies applied the TAM constructs to the study of satisfaction (Bhattacharjee and Premkumar, 2004; Lin *et al.*, 2005). Hence, we hypothesize that:

Hypothesis 1: Perceived usefulness of M-Commerce has a positive effect on satisfaction with M-commerce.

Hypothesis 2: Perceived ease of use of M-Commerce has a positive effect on satisfaction with M-commerce.

Hypothesis 3: Perceived ease of use of M-Com-

merce has a positive effect on the perceived usefulness of M-Commerce

Igbaria *et al.* (1995b) found that perceived enjoyment significantly influences perceived ease of use in the context of computer usage. Also, Moon and Kim (2001) revealed that perceived ease of use was significantly related to perceived playfulness (enjoyment) as well as behavioral intention to use. In the wireless context, many companies offering wireless products provide a variety of shapes, sizes, colors, designs, and various functions in their handheld devices. Ease of using the products facilitates users’ emotional motivation and enjoyment, which in turn determines users’ continued desire to use the technology. Venkatesh (2000) found that perceived enjoyment has a positive impact on perceived ease of use after interacting with technologies. However, other studies found the reverse relationship between perceived enjoyment and perceived ease of use. Teo *et al.* (1999) investigated the effects of intrinsic and extrinsic motivation on technology usage, focusing in particular on Internet technology. They found that perceived ease of use positively influences perceived enjoyment. Van der Heijden (2004) argued that perceived ease of use is positively associated with perceived enjoyment. Webster and Martocchio (1992) noted that higher playfulness results in increased satisfaction. In addition, Lin *et al.* (2005) found that perceived enjoyment is an important construct in satisfying customers in the context of usage of Web contents. Hence, we hypothesize that:

Hypothesis 4: Perceived ease of use has a positive effect on perceived enjoyment.

Hypothesis 5: Perceived enjoyment has a positive

effect on satisfaction with M-Commerce.

Many studies in IS have explained that the role of social influence in using technologies accounts for isomorphic behavior by mimicking external referents who may not have close relationships with the individual (Kim and Song, 2004). Brown and Reingen (1987) found that active information seeking behavior from external referents is also tightly connected to strong social relationships. Using external referents in an individual's behavior is more powerful under certain conditions, such as insufficient information, inability to evaluate products, complex or difficult product description, low credibility, or a high requirement for social approval (Engel *et al.*, 1995, p. 726). With respect to this theoretical background, we considered word-of-mouth (WOM) as one type of social influence important to intrinsic motivation. WOM is a flow of information, which reflects contents of social influence (Frenzen and Nakamoto, 1993). WOM has been recognized as one of the facilitating conditions in influencing consumers' behavior, such as purchasing, choice, and satisfaction (service quality) (DeWitt and Brady, 2003; Frenzen and Nakamoto, 1993; Keiningham and Perkins-Munn, 2003; Liu *et al.*, 2001; Swanson and Davis, 2003). Ozanne and Churchill (1968) found that decision makers used informal sources (company associates, business associates, friends, etc.) for a new automatic machine tool in a firm. WOM may influence decision makers more strongly under uncertainty. Finally, WOM plays an important role in diffusion/adoption research and in decision making regarding services (Anderson, 1998; Murray, 1991).

Recently, WOM has become an important mechanism on the Internet as forms of online feedback

and reputation, have become widely used (Dellarocas, 2003). In the current Internet market, consumers obtain information about products and services either from sources such as friends or from personal communication with unknown people in communities who have experience with the products or service (Ratchford *et al.*, 2001). Internet WOM makes an impact on a potentially unlimited number of other Internet users. Recent research on Internet markets indicates that opinion leaders act as advocates or opponents for their family and peer groups, encouraging or discouraging Web shopping within their social network (O'Cass and Fenech, 2003). Richins (1983) found that negative WOM was a function of dissatisfaction. Maxham III and Netemeyer (2002) found that WOM was significantly influenced by satisfaction. Szymanski and Henard (2001) found that negative WOM is predicted by negative overall satisfaction. Therefore, we hypothesize that:

Hypothesis 6: Satisfaction has a positive effect on word-of-mouth.

## IV. Data Analysis and Results

### 4.1 Instrument development

Our research model contains five constructs. The scales for measuring these constructs were developed based on an extensive review of literature to ensure their content validity. The instrument was first prepared in English and then translated into Korean. To reduce semantic disparity due to cultural and linguistic differences, the instrument in Korean was translated back into English and any potentially confusing wording and phrases were carefully revised. Constructs were measured via a

multiple-item scale from previous studies. The questionnaire for perceived usefulness (PU), perceived ease-of-use (PEOU), and behavioral intention was adapted from Davis' original scales (1989). The validity of these items has been well established in previous studies (Agarwal and Karahanna, 2000; Gefen *et al.*, 2003; Jarvenpaa *et al.*, 2000; Venkatesh and Davis, 2000). The items for the enjoyment construct represent beliefs about the extent to which participating m-commerce is enjoyable (Igarria *et al.*, 1995a; Venkatesh, 2000). The word of mouth items were adopted from previous marketing studies and modified for this study (Maxham III and Netemeyer, 2002; Price and Arnould, 1999). All items used seven-point Likert scales anchored from "strongly disagree (=1)" to "strongly agree (=7)". The instruments are included in Appendix A.

#### 4.2 Research Methodology and Sample Data

Recently, mobile devices have become popular, functioning as a handheld computer for many users. Therefore, the research methodology used in this study is the field study. All subjects were recruited in Korea and presently use one or more mobile devices such as cell phone and PDA. Although most participants in this study were students and thus

were relatively young, we believe that the use of such subjects in this study does not present a significant threat to external validity. After recruiting participants, we distributed a survey form, which measured the constructs in this study. To increase the subjects' motivation to provide accurate answers to the survey questions, the participants received \$5 cash value rewards. Most participants used mobile services for checking e-mail or for sending and receiving text messages. Also, many participants get information, purchase products and services, and play games with their mobile device. The profiles of the participants are reported in <Table 1>, below.

#### 4.3 Construct reliability

<Table 2> provides construct reliabilities. The constructs have Cronbach's alpha values well above the threshold of 0.70 and the composite factor reliability (CFR) is above the cutoff point of 0.70 (Nunally, 1978; Segars, 1997). Furthermore, average variance extracted (AVE), the index indicating the amount of variance captured by a construct compared to the variance caused by the measurement error, exceeded the threshold of 0.50 (Fornell and Larcker, 1981). These values indicate that the construct captured a relatively high level of instrument reliability.

<Table 1> Profiles of Participants (n=191)

Age	Mean: appr. 26	Std. 8.10	Gender	Male: 104	Female: 87
Major activities using mobile device:*					
Game	33	Getting Info	37	GPS	9
Text service	102	Sports	20	Calling	5
Shopping	27	Mail	72	Education	7
Stock	8				

Note) \* Participants allowed marking on multiple categories.

<Table 2> Reliability Measures and Correlation of Model Constructs

Constructs	Cronbach Alpha	CFR <sup>a</sup>	AVE <sup>b</sup>
Perceived Usefulness	0.87	0.88	0.79
Perceived Ease of Use	0.92	0.95	0.87
Perceived Enjoyment	0.90	0.94	0.84
Satisfaction	0.77	0.87	0.70
Word of Mouth	0.87	0.92	0.80

Note) <sup>a</sup> Composite factor reliability  
<sup>b</sup> Average variance extracted

#### 4.4 Convergent and Discriminant Validity

We first carried out confirmatory factor analysis (measurement model), which specifies the links between the latent and manifest variables (Anderson and Gerbing, 1982). The loading coefficients for all items were well above the recommended loadings 0.7 (Fornell and Larcker, 1981) as reported in Table 3. Also, the t-values for the loadings of manifest variables were well above 2.54. The fit indices for the CFA showed acceptable model fit. The normed chi-square (chi-square/degree of freedom,  $\chi^2 = 90.18$ ; d.f. = 67) was 1.35 and RMSEA (Root Mean Square Error of Approximation) was 0.043, which indicate a good model fit (Bentler, 1989; Hu and Bentler, 1999).

Also, CFI (Comparative Fit Index), TLI (Tucker-Lewis Index), GFI (Goodness of Fit Index), and AGFI (Adjusted Goodness of Fit Index) were 0.99, 0.98, 0.95, and 0.93, respectively-all above the cut-off values (Bentler and Bonnet, 1980; Hu and Bentler, 1999). Furthermore, SRMR (Standardized Root Means Square Residual) representing an overall badness-of-fit was 0.036, which is well below the suggested threshold of 0.10, providing further support for the model fit (Hu and Bentler, 1999).

<Table 3> Confirmatory Factor Analysis: Measurement Model

Constructs	Items	Loading	t-value	R <sup>2</sup>
Perceived usefulness (PU)	PU1	0.90	14.72	0.74
	PU2	1.00	0.00	0.80
Perceived ease of use (PEOU)	PEOU1	0.93	21.84	0.76
	PEOU2	0.81	8.31	0.50
	PEOU3	1.00	0.00	0.69
Enjoyment (ENJ)	ENJOY1	1.00	0.00	0.81
	ENJOY2	0.84	19.77	0.70
	ENJOY3	0.94	21.55	0.77
Satisfaction (SATIS)	SATIS1	0.99	13.16	0.62
	SATIS2	1.00	0.00	0.68
	SATIS3	0.90	10.87	0.39
Word of Mouth (WOM)	WOM1	1.00	0.00	0.73
	WOM2	0.93	15.73	0.68
	WOM3	0.98	16.80	0.69

We also checked discriminant validity. One of the guidelines for discriminant validity is that the original measurement model (CFA) can be compared with other alternative measurement models, which included every possible combination of collapsing two construct into one (Gefen *et al.*, 2003). The chi-square value in the original CFA was significantly better than the reduced measurement models, as shown in <Table 4>. Hence, the test of discriminant validity was also met.

#### 4.5 THE model estimation

The hypothesized research model was tested using structural equation modeling (SEM) technique. <Figure 2> shows the estimation results of the model, including fit indices. The SEM estimation has a normed chi-square of 1.87 ( $\chi^2=132.20$ ; d.f. = 71), which is below the recommended threshold of 3. CFI and TLI are 0.97 and 0.96, respectively. GFI



<Table 4> Pariwise Discriminant Analysis of Constructs (\*)

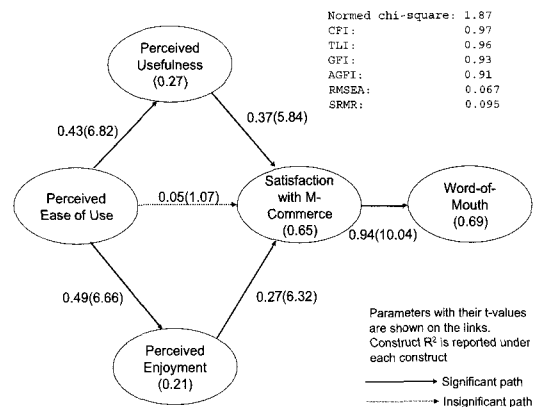
Models	$\chi^2_{df}$	$\chi^2$ difference from original
Original measurement model	$\chi^2_{67} = 90.18$	-
Word of Mouth and Satisfaction	$\chi^2_{71} = 130.20$	40.02
Word of Mouth and Perceived usefulness	$\chi^2_{71} = 193.88$	103.70
Word of Mouth and Perceived ease of use	$\chi^2_{71} = 398.67$	308.49
Word of Mouth and Enjoyment	$\chi^2_{71} = 273.10$	182.92
Satisfaction and Perceived usefulness	$\chi^2_{71} = 154.36$	64.18
Satisfaction and Perceived ease of use	$\chi^2_{71} = 343.55$	253.37
Satisfaction and Enjoyment	$\chi^2_{71} = 194.05$	103.87
Perceived usefulness and Perceived ease of use	$\chi^2_{71} = 283.19$	193.01
Perceived usefulness and Enjoyment	$\chi^2_{71} = 215.86$	125.68
Perceived ease of use and Enjoyment	$\chi^2_{71} = 426.30$	336.12

Note) \* Based on Gefen *et al.* (2003), Table 3 shows that the chi-square of the original CFA is significantly smaller than the CFA of any alternative model. Since combining two latent variables adds four degrees of freedom to the model, the chi-square differences between the original CFA and any alternative model should be greater than at least 11.14 at  $p = 0.025$ .

and AGFI are 0.93 and 0.91, respectively. They are above the recommended threshold of 0.90. In addition, RMSEA and SRMS are 0.067 and 0.095, respectively. They are desirably at or below the recommended threshold values (Gefen *et al.*, 2000).

Next, each hypothesis in the suggested research model and the variance explained ( $R^2$ -value) were examined. Hypotheses 1 and 2 posited links from perceived usefulness and perceived ease of use to satisfaction. Satisfaction was significantly and positively influenced by perceived usefulness (path coefficient = 0.37, t-value = 5.84). However, perceived ease of use was not found to have a significant impact on satisfaction (path coefficient = 0.05, t-value = 1.07). Hypothesis 3 posited a link between perceived usefulness and perceived ease of use from the traditional TAM model. Perceived ease of use significantly and positively influences perceived usefulness (path coefficient = 0.43, t-value = 6.82).

Hence H3 was supported.



<Figure 2> SEM Results

Hypothesis 4 posits that perceived ease of use positively influences an intrinsic motivation, perceived enjoyment. This hypothesis was supported with a path coefficient value of 0.49 and a t-value

of 6.66. Hypothesis 5 posited that perceived enjoyment has a positive effect on satisfaction. Hypothesis 5 was supported with a path coefficient value of 0.27 and a t-value of 6.32. Finally, hypothesis 6 posited the outcome of satisfaction. Our data supported H6 with a coefficient value of 0.94 and a t-value of 10.04. The constructs within the model have a relatively high  $R^2$  ranging from 0.21 to 0.69, which indicates that the research model has reasonable explanatory power.

## V. Discussion and Concluding Remarks

The current study applied the traditional TAM model to a wireless context and considered intrinsic motivations, namely: perceived usefulness, perceived ease of use, and perceived enjoyment. The test of the research model indicates that mobile users are satisfied with M-Commerce because they perceived the M-Commerce to be useful and enjoyable. The current model showed that perceived usefulness and perceived enjoyment account for 65% of the variance in satisfaction. We did not find a direct effect of perceived ease of use on satisfaction; instead we noted only an indirect impact on satisfaction. According to the prior literature, Adams *et al.* (1992) find that the usefulness is an important determinant of system use, however, they suggest that the perceived ease of use might not as important as usefulness in prolong exposure. The perceived ease of use has been inconsistent or less significance rather than the perceived usefulness (Chau *et al.* 1999). We may carefully confer the reason from the previous findings.

This finding provides very important insights to our field. Many studies on TAM have excluded attitude in explaining the technology acceptance be-

havior. Venkatesh and his colleagues (Venkatesh and Davis, 1996; Venkatesh and Davis, 2000; Venkatesh *et al.*, 2003a) excluded attitude from the technology acceptance model. They argued that the role of attitude in explaining behavioral intention or behavior of adopting technologies is very limited. However, social studies and theories (the Theory of Reasoned Action and the Theory of Planned Behavior) emphasize the importance of understanding attitude as a mediator (Ajzen, 1985; 1989; Ajzen and Fishbein, 1980). In the MIS area, Geffen and Straub (2000) note that findings from previous studies have indicated that perceived usefulness appears to have a stronger effect on actual usage than attitude. Although we viewed satisfaction as an attitudinal construct, it would have been beneficial to measure the attitude construct separately from satisfaction as Bhattacharjee and Premkumar have done in a previous study (2004). This finding theoretically proposes that studies on technology acceptance need to examine how long beliefs (PEOU and PU) remain unchanged over an extended time period and how well the beliefs are able to withstand an attack from outside. In addition, the participants were generally familiar with M-Commerce in terms of almost identical functionalities provided by most M-Commerce site.

Also, we found satisfaction to be a significant predictor of word-of-mouth. The level of satisfaction accounts for 69% of variance in word-of-mouth. This result suggests that satisfied customers are willing to spread favorable word-of-mouth to their referent community. This finding provides insight for companies as to how they can obtain a favorable reputation from existing and potential customers in the context of a wireless environment.

In summary, our study applies and validates the existing dominant theories in users' behavior in a

wireless environment. The results showed that the easier M-Commerce is to use, the more useful and enjoyable it is. Usefulness and enjoyment of M-commerce, in turn, contribute to users' satisfaction, which significantly impacts word-of-mouth.

Our findings have implications for both the academic and business areas. It is critical that M-Commerce becomes an alternative channel for doing business. How satisfied customers are in the wireless context is of great importance to companies. Our model is theoretically sound, therefore, we propose that in order to successfully conduct business in the wireless environment, companies should provide easy to use, useful, and enjoyable content. Furthermore, the results also indicate that practitioners must be careful in using the technology acceptance model in measuring their customers' reaction to their services. They need to take into account the methods or tools used to measure users' attitudes in order to correctly utilize TAM.

This study has limitations and could be extended in a number of ways. First, our study examines satisfaction with M-Commerce based on one-time data collection. However, users' satisfaction over time ultimately generates loyalty. Therefore, the current study needs to be extended to see how mobile customers' satisfaction actually changes over time. Theoretically, expectation-disconfirmation approach addresses the concern. Second, in line with the previous extension, one time data collection may not be able to correctly measure social influence. It would be valuable to measure and validate the levels of stable and positive word-of-mouth as well as the levels of unstable and negative word-of-mouth. Third, the current study measured the most prevalent beliefs constructs using a certain type of technology. However, there may exist other types of important beliefs influencing satisfaction with

M-Commerce, such as perceptions about transaction cost, security, privacy, accessibility, and trust-related factors. Therefore, future studies need to explicate possible factors that may also be relevant to satisfaction with M-Commerce. Fourth, the current study did not find any significant impact of perceived ease of use on satisfaction. This matter can be addressed by employing the concept of attitudinal strength, which may provide more reliable validity of TAM in a wireless context. Finally, we collected data from university students, and therefore, it should be carefully interpreted to generalize our results.

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## APPENDIX A: Instrument

All items were measured on seven-point likert scale.

Constructs	Items	Measures
Perceived Usefulness	PU1	Using the mobile site through a device enables me to seek what I want.
	PU2	The mobile site through a device provides variable services to me.
Perceived Ease of Use	PEOU1	I find it easy to access the mobile site through a device when I want it to do.
	PEOU2	I feel the mobile site through a device easy to use.
	PEOU3	I find it easy to get the mobile site to do through a device what I want it to do
Perceived Enjoyment	ENJ1	When using the mobile site through a device I am playful
	ENJ2	When using the mobile site through a device I am exciting
	ENJ3	When using the mobile site through a device I am interesting
Satisfaction	SATIS1	I feel that I am pleased with my use of mobile commerce through a mobile device.
	SATIS2	I feel that I am contented with my use of mobile commerce through a mobile device.
	SATIS3	I feel that I am delighted with my use of mobile commerce through a mobile device.
Word-of-mouth	WOM1	I would recommend the usability of mobile service to my friends.
	WOM2	When I am asked about a mobile service, I will tell to try the service to most of my friends.
	WOM3	I would recommend the mobile service to someone, when I used it at the first time.

## Antecedents of Mobile Commerce Satisfaction and Outcomes: Empirical Test

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### Abstract

Traditional commerce has transformed into electronic commerce, then, mobile commerce again plays a critical role in diversifying different types of business. Although the fast changing of mobile commerce as an emerging channel of communication in business, not many studies address why consumers stay on mobile commerce and how they are influenced and influence other consumers. In this study, we investigate the impact of extrinsic and intrinsic motivation on customers' satisfaction and its results. We adopt the Technology Acceptance Model (TAM), value-satisfaction theories, and other motivation studies in developing theoretical framework. We then synthesize these theoretical approaches to conceptualize mobile customers' behavior. Specifically, we postulate cognitive beliefs that influence customers' satisfaction with mobile commerce, and, in turn, significantly contribute to the spread of positive word-of-mouth. The current research model and its results could provide a rigorous basis for understanding customers' behavior in wireless contexts.

**Keywords:** *Mobile Commerce, Perceived Usefulness, Perceived Ease of Use, Perceived Enjoyment, Satisfaction, Word-of-Mouth*

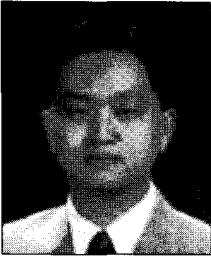
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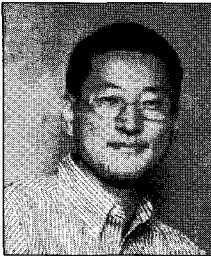
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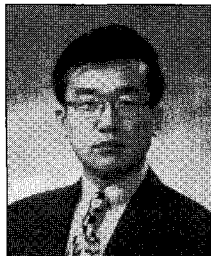
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