

Assessing User Attitudes Toward Mobile Commerce In The U.S. Vs. Korea: Implications For M-Commerce CRM

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ABSTRACT

Mobile Commerce (m-commerce) relies on “customer or user interactions” via a mobile device and telecommunications infrastructure for the purpose of interacting, advertising, promoting, and selling products and services. The author of this study explored user attitudes and behavior toward m-commerce in the U.S. vs. Korea. In this paper, the author investigated comparison analysis for the U.S. vs. Korea for the following issues: 1) the factors affecting user attitudes toward mobile phone business; 2) how those factors affect perceived ease of use (EOU) and usefulness (U); 3) the effects of perceived ease of use (EOU) and usefulness (U) on overall attitudes toward the mobile phone business; and 4) how overall attitudes toward mobile phone business affect user/customer satisfaction. Surveys were conducted in two countries and the results reveal the different aspects affecting mobile phone usage in the U.S. vs. Korea. This study also found that user attitudes toward the mobile phone business significantly impact the level of m-satisfaction. Furthermore, this study provides managerial implications and offers suggestions to m-businesses.

Keywords: M-Commerce, M-Satisfaction, Ease of Use, Usefulness, Technology Acceptance, M-commerce CRM.

INTRODUCTION

With the evolution of technology, Mobile Commerce (m-commerce) has provided most of the services provided by electronic commerce (e-commerce). Similar to e-business, m-commerce, m-business, and the emergent m-industry have been viewed as a “virtualization” of product, service, knowledge, or information exchanges with the presence of information technology. Previous studies state that m-commerce is thought to be the next big phase in technology involvement following the Electronic Commerce (E-Commerce) era (Chew 2006). A study by Dickinger, Heinzmann, and Murphy (2005) also stressed that, as a communication and commerce tool, the mobile phone extends the unrivaled access from the Internet to environmental information anyplace and anytime. M-commerce and m-industry have adopted technology and provided services for the Information Superhighway (I-Way).

This study posits that m-commerce has been developed as a media in a Hypermedia Mobile-Mediated Environments (HMMEs¹) and replicates all of the activities of CMC systems such as accessing email messenger, chatting, and social networking systems, watching TV (i.e., DMB – Digital Multi Broadcasting System), and downloading coupons, etc. Therefore, as previous studies (Hoffman, Novak, and Chattered 1995) mentioned for e-commerce, m-commerce is a significant part of the marketing tools of a network, which enables and requires new types of strategies, requiring firms to learn new ways of interacting with customers. A maturing m-commerce market and challenging business and economic environments have suggested that the m-industry adopt new technology perspectives and strategies for distribution, marketing, customer service, and procurement (<http://www.forrester.com>). By identifying Hypermedia Mobile-Mediated Environment (HMME) m-business

¹ The term has been modified from HMC (Hypermedia Computer-Mediated Environment), proposed by Hoffman, Novak, and Chattered (1995).

framed market opportunities by looking at the value system with a lens that yields ideas about new business possibilities (Mohammed, Fisher, Jaworski, and Cahill 2002).

The author of this paper considers that the m-commerce as a tool in the collaborative-media environment is appropriate and much more specific than many of the uses of collaborative systems in other areas. The motivation of this research is the belief that factors that affect user attitudes toward mobile phone might affect the development of m-commerce and better usages of m-commerce which replicates various services that are available from e-commerce. Although there is considerable research on the topic of m-commerce, not many studies have explored issues of m-commerce in specific countries. In this paper, the author of this study explored user attitudes and behavior toward m-commerce in the U.S. vs. Korea. The author explores how U.S. and Korea mobile phone users are satisfied with and adopt the existing and potential services of m-commerce and the roles played by the MMC medium, which is responsible for the creation of telepresence. Those countries were selected as the U.S. is relatively in its early stages of m-commerce development (Chew 2006), while Korea is relatively in its maturity stages of m-commerce development. Previous studies (Chew 2006) addressed that the U.S. was a pioneer in the development of the Internet and E-Commerce era, while the U.S. is only in its early stages of M-Commerce development and adoption compared to many European and Asian countries (e.g., Sweden, Japan, Korea). Various studies have investigated user attitudes or behavior toward m-businesses in foreign markets (e.g., Lim, Widdows, and Park 2006). However, not many studies have explored user attitudes or behavior toward m-businesses by comparing two countries. The author in this paper investigated comparison analysis for the U.S. vs. Korea for the following issues: 1) the factors affecting user attitudes toward mobile phone business; 2) how those factors affect perceived ease of use (EOU) and usefulness (U); 3) the effects of perceived ease of use (EOU) and usefulness (U) on overall attitudes toward the mobile phone business; and 4) how overall attitudes toward mobile phone business affect user/customer satisfaction.

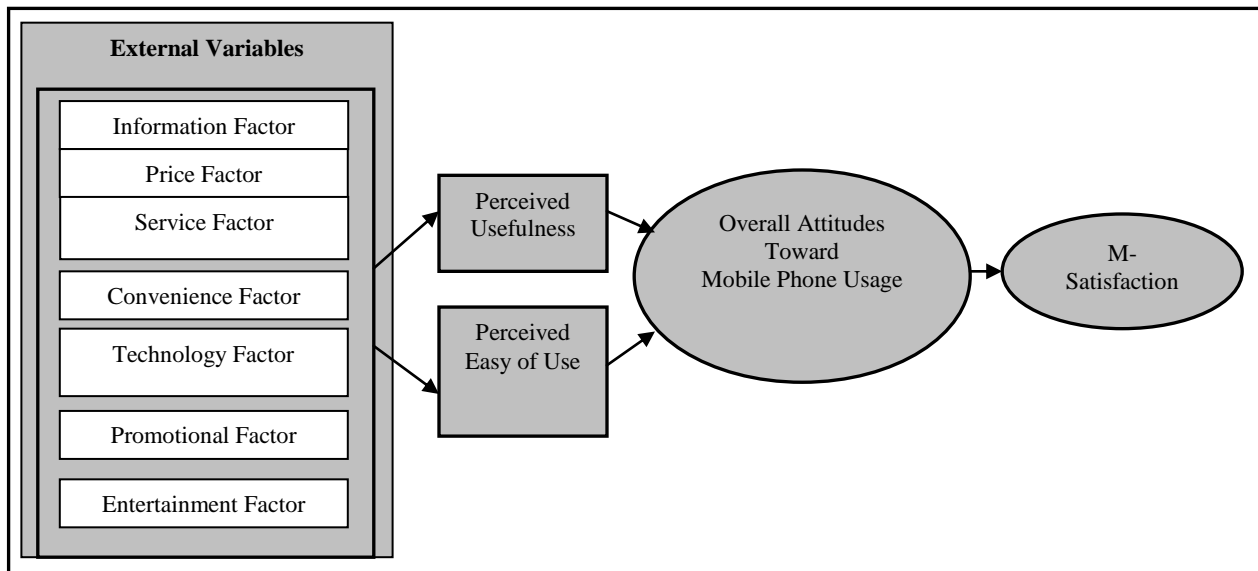
HYPOTHESES DEVELOPMENT

M-commerce (Mobile Commerce) refers to all data-driven business transactions and exchanges of value by users of mobile devices via wireless telecommunication networks (Cronin 2003). With increasing attention, m-commerce has developed rapidly in the last few years (Dickinger, Heinzmann, and Murphy 2005) and m-industry has been facing serious challenges (Carlsson, Hyvonen, Repo, and Walden 2005). According to Dickinger, Heinzmann, and Murphy (2005), business conducted through a mobile phone extends access to environmental information anytime and anywhere. Moreover, this ubiquitous access is particularly important in an increasingly mobile world (Dickinger, Heinzmann, and Murphy 2005). As mobile phone services replicate services available in online environments, it is also expected that product exchanges might also become available through mobile devices. For added value services (VAS), this study proposes that m-business should apply e-marketing strategies and theories.

Uses and gratification theory (Herzog 1944; McGuire 1974; Luo 2002) has been applied in this study to explain users' attitudes and user satisfaction toward m-commerce usages. Well-known satisfaction theories that have explained consumer attitudes to brick-and-mortar businesses, such as contrast theory (Engel and Blackwell 1982; Cardozo 1965) and dissonance theory (Festinger 1957), have been applied in this study of m-commerce/businesses. *Uses and gratification theory* has been developed from research in the context of traditional media, such as TV, magazines, or radio (Herzog 1944; McGuire 1974). It has been extended to research in the context of the online and mobile environment (e.g., Luo 2002). The present study has been supported by another theory, the *Theory of Reasoned Action* (TRA), which suggests that individuals' performance of a given behavior is primarily determined by their intention to perform that behavior (Ajzen and Fishbein, 1980). This study adopted the *Technology Acceptance Model*, which has been widely used in the research of online user behavior, to describe users'/customers' attitudes and behavior in the mobile environment. The author in this paper expects that model explains why mobile phone users' willingness to adopt services how their internal beliefs and attitudes affect their usage behavior (Davis 1989; DeSantics 1983; Ives, Olson, and Baroudi 1983). Diffusion of innovation theory (Rogers 1995) also have applied to explain the mobile phone usage behavior that users/customers adopt new technology by considering factors, such as innovation, over time, communication through certain channels, and among the members of a social system.

The theory also has applied previous study (Carlsson, Hyvonen, Repo, and Walden 2005) to explain the features of users and the features of technological innovations for mobile services. Therefore, within the uses and gratification theory framework and TRA, this study, by exploring factors that affect perceived EOU and U, investigates how the mobile device can be an interactive marketing tool for users. In particular, this study classifies factors that can be used to measure perceived EOU and U. As show in figure 1, the proposed model of this study is determined by the different factors that trigger perceived ease of use and usefulness, overall attitudes, and M-satisfaction in two countries, U.S. vs. Korea.

Figure 1
The Proposed Model of Users’ Attitudes Toward Mobile Phone Usage & M-Satisfaction:
Comparison Analyses of U.S. vs. Korea



Factors proposed in this study include information, price, service, convenience, technology, promotional, and entertainment factor (Figure 1). This study measures the impact of such factors on user attitudes toward the mobile phone usage. The study also measures how user attitudes toward mobile phone usage affect user satisfaction. In this study, perceived usefulness and ease of use are considered predictors to investigate the external variables that affect users’ acceptance of mobile phone usage behavior. This study also measures how the impact of the perceived usefulness and ease of use on user attitudes differs in the U.S. and Korea.

H1: As perceived usefulness (U) on mobile phone usage is greater, positive user attitudes toward mobile phone usage increase in both the U.S. and Korea markets.

H1a: As perceived ease of use (EOU) on mobile phone usage is greater, positive user attitudes toward mobile phone usage increase in both the U.S. and Korea markets.

H1c & d: The impact of perceived usefulness (U) and ease of use (U) on user attitudes toward mobile phones will differ in the U.S. market from the Korea market.

Attitudes Toward Mobile Phone Usage And M-Satisfaction

Attitudes toward mobile phone usage have been often considered a variable to measure the effectiveness of system (e.g., Zhou 2002; Chen and Wells 1999). In order to investigate attitudes toward m-commerce, this study applied value systems that are proposed by Mohammed, Fisher, Jaworski, and Cahill (2002) in the online environment including trapped, new-to-the-world, and hybrid values. For trapped value, m-businesses offer more efficient markets and efficient value system (e.g., phone navigation system, download coupons); for new-to-the-

world value, m-businesses offer customized offerings (e.g., receive promotional messages), building community (e.g., receiving/sending messages to online community that is connected to mobile business), introducing new functionality or experience (e.g., connecting to online messenger system, checking emails); and for hybrid value, m-businesses offer disrupting pricing (e.g., download coupons), enabling ease of access (e.g., access to Internet), and radically extending reach values (e.g., watching TV) (Mohammed, Fisher, Jaworski, and Cahill 2002). By applying prior studies that investigated within the online environment (Schubert and Selz 1999; Cho, Im, Hiltz, and Fjermestad 2002), this study also posits that attitudes toward mobile phone usage should be discussed to measure the ease of building a relationship with a business, user loyalty, m-satisfaction with services provides by m-businesses.

Satisfaction or dissatisfaction theories, such as cognitive dissonance theory (Festinger, 1957), contrast theory (Engel and Blackwell, 1982; Howard and Sheth, 1969; Cardozo, 1965), and adaptation level theory (Helson, 1964) have been applied in this study to measure m-satisfaction. The traditional market places emphasis on “user and customer satisfaction” as a way to earn consumer loyalty and attract new customers. Previous studies (Cho and Fjermestad 2005) have examined the firm’s approach to Customer Relationship Management (CRM) in order to account for the new realities of market spaces. Previous studies (Cho Cho, Im, Hiltz, and Fjermestad 2002) have posited that maximizing customer satisfaction and maintaining customer loyalty are major components for electronic - Commerce Customer Relationship Management (E-CRM). It is hypothesized that positive attitudes toward mobile phone increase m-satisfaction. It is also hypothesized that the impact will differ in the U.S. market from Korea market.

H2: As positive attitudes toward mobile phone usage increase, the degree of m-satisfaction also increases in both the U.S. and Korea markets.

H2a: The impact of the attitudes toward mobile phone usage on m-satisfaction will differ in the U.S. from the Korea market.

Information Factor

Similar to the online environment, users in m-commerce environments are able to easily find information and communicate easily and conveniently, 24 hours a day, 7 days a week. As a source of information and communication, the mobile phone significantly affects user behavior. Therefore, the quality of information content provided by the mobile phone (e.g., map or driving directory, restaurant guide, promotional ads) often reduces user search efforts and stimulates behavioral intention to use. Mobile phone users often log on to the Web to check email, get news, obtain map or driving directories and restaurant guides, etc. It is expected that overall perception and aroused satisfaction will positively affect an individual user’s perceived usefulness and ease of use. This study hypothesized that positive user attitude toward mobile phone usage increase as their perceived ease of use and usefulness of information increase.

H3 As users’ willingness to get more information via mobile phone increases, perceived usefulness increases in both the U.S. and Korea markets.

H3a: As users’ willingness to get more information via mobile phone increases, perceived ease of use increases in both the U.S. and Korea markets.

H3b: The impact of the willingness to get more information via mobile phone on perceived usefulness and ease of use will differ in the U.S. from the Korea market.

Price Factor

Price plays a large role in the choice and quantity of decisions (Krishnamurthi and Raj 1988). Previous researchers stated that price is a major factor for measuring consumer sensitivity (Krishnamurthi and Raj 1988). Price affects the perception of online users positively and negatively. Hanson (2000) posits that the Internet will raise or lower price sensitivity among customers. Similar to online users, mobile phone users pay additional fees in order for value added services (VAS), such as downloading TV programs, books, accessing the Internet, etc. This study posits that how users’ willingness to pay for such services and mobile devices are significantly related to

perceived usefulness and ease of use. This study hypothesized that customers' perception of the price factor (i.e., willingness to pay) of mobile phone usage is related to the customer perceived usefulness and perceived ease of use.

H4: As users' willingness to pay for mobile phone services increases, perceived usefulness increases in both the U.S. and Korea markets.

H4a: As users' willingness to pay for mobile phone services increases, perceived ease of use increases in both the U.S. and Korea markets.

H4b: The impact of the willingness to pay on perceived usefulness and ease of use will differ in the U.S. from the Korea market.

Service Factor

Services that are provided via mobile phone have been developed rapidly. Penetration rates of Internet-enabled phones have been drastically increased, whereas adoption rates still varied by regions (e.g., 82% in Japan, 41% in Europe, and 32% in North America in 2003: Kearney 2003). Existing and potential services are varied based on the development of mobile technology. Services such as SMS (short message service), voice messages, changing or downloading ringtones, accessing the Internet, and other basic functions (including alarm, calendar, game, and organizer) are available for most of the mobile phone users in the world, whereas value added services (VAS) such as downloading or listening to music, receiving receipts for credit card transactions, downloading coupons, watching TV (i.e., called DMB – Digital Multi-Media Broadcasting), reading books, paying for vending machines or transit, and receiving advertising or promotions are available for some mobile phone users and also in some countries that provide those services. M-businesses extend models and services by working with banks, credit card companies, and retailers to develop the right micro-payment solutions and business models (<http://www.marketresearch.com/product/>). Pioneers of location-based services - such as Korea and Japan - describe the precise combinations of infrastructure and applications needed to ensure success (<http://www.marketresearch.com/product/>). Mobile phone users in certain countries, such as Japan, use integrated services, such as receiving messages for credit card usage, enjoying msn and other instant messenger systems, receiving messages through mobile phones that are received from online community services, receiving promotional price discounts for family restaurants and coupons, etc.

Compared to mobile phone users in countries where m-commerce is developed more, users in the U.S. use fewer functions or services because of availability. This study hypothesizes that user perception of the service quality of mobile phone usage positively affects perceived usefulness and ease of use.

H5: As users apply more services via mobile phone, perceived usefulness increases in both the U.S. and Korea markets.

H5a: As users apply more services via mobile phone, perceived ease of use increases in both the U.S. and Korea markets.

H5b: The impact of the willingness to use services on perceived usefulness and ease of use will differ in the U.S. from the Korea market.

Convenience Factor

Various researchers found that a major factor to increase consumer satisfaction from e-commerce and m-commerce is convenience (Cho, Im, Hiltz, and Fjermestad 2002). As with the Internet, a media-inherent characteristic of the m-commerce is its accessibility: 24 hours/7days a week. Mobile users can save time when they manage businesses, enjoy services, and place orders. Mobile phone users easily get access to the Internet, download music, check email, enjoy m-books, and obtain coupons. This study hypothesizes that user perception of the convenience of mobile phone usage positively affects perceived usefulness and ease of use.

H6: As users' perception of the convenience of mobile phone usage increases, perceived usefulness increases in both the U.S. and Korea markets.

H6a: As users' perception of the convenience of mobile phone usage increases, perceived ease of use increases in both the U.S. and Korea markets.

H6b: The impact of user perception of the convenience of mobile phone usage on perceived usefulness and ease of use will differ in the U.S. from the Korea market.

Technology Factor

Mobile phone usage cannot only adopt new technologies but also consider usability factors to meet the ultimate needs and wants of customers. Prior studies discussed how perceived usefulness and ease of use are influenced by various factors, including the system's technical design characteristics (Benbasat and Dexter 1986; Dickson, DeSanctis, and McBride 1986; Malone 1981). Technology factors include website effectiveness -speed and customer interface design factors (Mohammed, Fisher, Jaworski, and Cahill, 2002) such as content, context, and customization. Technology and media-inherent factors, proposed by Schubert and Dettling (2002), are applied in this study of e-commerce. This study posits such factors that are related to the technology should be also applied for m-commerce environments. This study hypothesized that user perception of the technology factor of mobile phone usage is positively associated with perceived usefulness and perceived ease of use.

H7: As users' willingness to apply the advanced technology of mobile phones increases, perceived usefulness increases in both the U.S. and Korea markets.

H7a: As users' willingness to apply the advanced technology of mobile phones increases, perceived ease of use increases in both the U.S. and Korea markets.

H7b: The impact of willingness to apply the advanced technology of mobile phone on perceived usefulness and ease of use will differ in the U.S. from the Korea market.

Promotional Factor

M-businesses have been used as promotional tools in some countries. The mobile phone has been used as an important marketing tool for price, product, promotion, and place. Customers in Korea and Japan, for example receive promotional price discounts and coupons for family restaurants, movies, hair salons, fitness centers, institutions, etc. The mobile phone business also applies discriminating pricing strategy by offering promotions for students, different age groups, etc. This study hypothesized that promotional factors affect consumer attitudes toward mobile phone.

H8: As users perceive the mobile phone more as a promotional tool, perceived usefulness increases in both the U.S. and Korea markets.

H8a: As users perceive the mobile phone more as a promotional tool, perceived ease of use increases in both the U.S. and Korea markets.

H8b: The impact of user perception of the mobile phone as a promotional tool on perceived usefulness and ease of use will differ in the U.S. from the Korea market.

The Entertainment Factor

Prior studies (Danet et al. 1996) note that computer-mediated communication (CMC) is strikingly playful. Various studies have recognized the inherently playful nature of the computer as a medium (Danet et al. 1996). Danet et al. (1996) mentioned that millions of people are playing with their computer keyboards or mobile devices in various ways. Previous studies (Webster and Martocchio 1992; Gardner, Young, and Ruth 1989) state that playfulness is an important factor to acquaint users with the computer, by shifting attitudes from fearful and awesome aspects to positive factors. It is also viewed as the capacity to draw satisfaction from the immediate intellectual development of a topic, irrespective of any ulterior motive (Dewey 1913). Social escapism motivation refers to consumers' motives for using the Web as a reliever of day-to-day boredom and stress (Zhou 2002: Korgaonkar and Wolin 1999). Mobile phone usage is a pleasurable, fun, and enjoyable activity that allows for escape from reality (Zhou 2002). As Zhou (2002) cited, users may perceive mobile phone usage as more

entertaining than informative. This study proposes that user perceptions about mobile phone usage as an entertainment factor significantly affect their perceived usefulness and ease of use.

H9: As users perceive mobile phone usage more as an entertainment factor, perceived usefulness increases.

H9a: As users more perceive mobile phone usage more as an entertainment factor, perceived ease of use increases.

H9b: The impact of user perception of the mobile phone as an entertainment factor on perceived usefulness and ease of use will differ in the U.S. from the Korea market.

METHODOLOGY

Data Collection

Among mobile devices, this study measures user attitudes toward the mobile phone. This study conducted surveys with about five hundred seventy randomly selected subjects in the U.S. and Korea (two hundred eighty from the U.S. and two hundred ninety from Korea) who are mobile phone users and have usage experience with the mobile phone for least two years. The data collected both from convenience sample (i.e., samples selected from Information Systems (IS) and the management departments at two major universities in the U.S.) and from mall intercept survey (i.e., three selected malls in the U.S.). the questionnaire was developed in English, but translated to Korean. Back translation was used to check whether the questionnaire items had been properly translated. This study collected data from respondents whose recent mobile phone usage is more than 2 years. Approximately 65% of the respondents answered that they had used a mobile phone for more than four years. The response rate was about 89% (U.S.) and 88% (Korea) and approximately 98.7% (U.S.) vs. 91.9% (Korea) of respondents answered that they have used mobile phone over two years.

Operational Measures

Multi-item scales were used to measure each of the seven constructs that served as the basis for the questionnaire items. The item scales were taken from previous studies (e.g., Davis 1989; Davis, Bagozzi, and Warshaw 1989; Bearden and Teel 1980; Fishbein and Ajzen 1975)² and modified to serve the objectives of the present study. Quantitative methods, including factor analysis, regression, and ANOVA (Analysis of Variance), were applied to measure perceived usefulness, perceived ease of use, online users' attitudes toward sites, behavioral intention to use, and m-satisfaction. This study measured whether factors such as "information factor," "price factor," "service factor," "convenience factor," "technology factor," "promotional factor," and "entertainment factor" affect perceived usefulness and ease of use toward mobile phone usages. The scales in this study were developed from previous studies: for example, scales for perceived usefulness and perceived ease of use were from the study by Davis (1989) and Davis, Bagozzi, and Warshaw (1989). Scales for other variables were from studies by Succi and Walter (1999), Zhou (2002), Schubert and Selz (1999), and Chen and Wells (1999). Likert scales, semantic differential scales, and open-ended questions were used to measure the items. For Likert scale questions, a five-point scale was used with extremes labeled "Strongly Disagree" and "Strongly Agree" was used. Multivariate data analyses, such as factor and regression analyses were used to analyze the data in this study.

RESULTS

Respondent Demographics

Of the two hundred seventy respondents, 52.0% (U.S.) vs. 47.6% (Korea) were female and 48.0% (U.S.) vs. 52.1% (Korea) were male. About 4.1% (U.S.) vs. 0% (Korea) were between the ages of 19-20; 35.5% (U.S.) vs. 30.1% (Korea) were between the ages 21-30; 34.2% (U.S.) vs. 31.7% (Korea) were in the 26-30 age group; 14.1% (U.S.) vs. 16.5% (Korea) were in the 31-35 age group; 3.9% (U.S.) vs. 8.7% (Korea) were in the 36-40 age group; 3.0% (U.S.) vs. 7.4% (Korea) were in the 41-45 age group; and 3.9% (U.S.) vs. 5.2% (Korea) were age 46 or older. Approximately 7.0% (U.S.) vs. 6.5% (Korea) reported that their highest educational level was high school graduate,

² Seven-point (1 = strongly dissatisfied, 4 = Not dissatisfied at all, 7 = Strongly satisfied) scales were employed.

while 27.7% (U.S.) vs. 24.6% (Korea) had an associate degree, 39.6% (U.S.) vs. 49.5% (Korea) were still studying at a university for an undergraduate degree, and 23.4% (U.S.) vs. 19.4% (Korea) had master’s degree or higher. Approximately 59.0% (U.S.) vs. 69.7% (Korea) had an annual average income of between \$10,000 and \$30,000, while 12.6% (U.S.) vs. 20.5% (Korea) had an annual average income of between \$30,001 and \$50,000 and 13.4% (U.S.) vs. 8.8% (Korea) had an annual average income of more than \$50,001. About 20.8% were white American, 39.8% were Asian American, 1.3% were African American, 3.0% were Hawaiian, and 1.7% were Hispanic.

As shown in table 1, more than 60% used mobile phones less than 1 hour per day and about 50% spent less than \$50 per month in the U.S. Approximately 50% tried or frequently used basic functions such as voice messages (52.7% answered “frequently use”), text messages (31.9% answered “frequently use), and alarm systems (43.1% answered “frequently use”), whereas hardly any had used advanced functions such as picture messages (63.6% answered “hardly use”), Internet access (75.5% answered “hardly use”), e-mail checking (82.9% answered “hardly use”), or listening to music (85.4% answered “hardly use”).

Table 1
Summary of Respondents’ Mobile Phone Usage in the U.S. vs. Korea

Amount of Usage Time/Day	Percentage		Monthly Average Fee Spent	Percentage	
	U.S.	Korea		U.S.	Korea
Less than 30 min	36.6%	5.5%	Less than \$30 per month	10.6%	2.9%
Between 30 min to 1 hr	36.1%	21.4%	\$31 - \$50 per month	39.6%	18.8%
Between 1hr and 2hr	15.8%	41.7%	\$51 - \$70 per month	20.7%	39.8%
Between 2hr and 3hr	6.2%	31.4%	\$71 - \$90 minutes per month	14.1%	22.7%
More than 3hr	5.3%	0%	\$91 - \$110 per month	11.0%	10.0%
			More than \$111 per month	4.0%	5.8%

A *chi-square* test was conducted to measure whether those selected subject groups from two countries differ in demographics. The result ($\chi^2 = 13.01$: significant at 0.01 level) shows that two groups are not statistically different. Another *chi-square* tests were conducted to test respondents’ mobile phone usage in the U.S. vs. Korea. Results found that amount of usage time per day is not different in the U.S. from in Korea ($\chi^2 = 60.04$: significant at 0.01 level) and monthly average fee spent is not significantly different in the U.S. from Korea ($\chi^2 = 20.21$: significant at 0.01 level).

In order to check construct reliability, this study measured Cronbach’s alpha for multi-item scales to measure each of the nine constructs that served as the basis for the questionnaire items. This study found that Cronbach’s alpha for the information factor showed 0.71% (U.S.) vs. 0.73% (Korea); for price 0.80% (U.S.) vs. 0.83% (Korea); service, 0.74% (U.S.) vs. 0.78% (Korea); convenience, 0.83% (U.S.) vs. 0.88% (Korea); technology, 0.84% (U.S.) vs. 0.86% (Korea); promotional, 0.81% (U.S.) vs. 0.88% (Korea); entertainment, 0.85% (U.S.) vs. 0.89% (Korea); and perceived ease of use & usefulness, 0.87% (U.S.) vs. 0.89% (Korea).

Hypotheses Testing

The first step in this analysis was intended to validate the factors that affect two predictors: perceived usefulness and ease of use. This study ran a confirmatory factor analysis to identify those factors. Using principal components analyses as the extraction method and Varimax rotation methods with Kaiser Normalization, the most relevant data emerged. These analyses showed a distinct reduction of six factors, with Eigen values over 1.00 both in the U.S. and Korea markets. Seven factors that affect perceived usefulness and ease of use toward mobile phone usages appeared to be “information factor,” “price factor,” “service factor,” “convenience factor,” “technology factor,” “promotional factor,” and “entertainment factor (Table 2).” Separate factor analyses was done to group scale items for the predictors, perceived usefulness and ease of use that affect attitudes toward mobile phone. Scale items were developed from the previous study by Davis (1989). This study shows the results of factor analysis for external

variables, which affect perceived usefulness and ease of use. These factors, which have Eigen values over 1.00 are grouped as variables. Three items represent perceived ease of use (EOU) and four items represent perceived usefulness (U).

Table 2
Component Matrix: Results for U.S. mobile market

Items		Component						
External Factors	Scale Items	1	2	3	4	5	6	7
Convenience I	Use of mobile phone is more convenient than e-commerce as I carry all the time.	.882						
Convenience III	I use mobile phone as I can easily access to it 24hours/7days.	.876						
Price II	I am willing to spend more to purchase a better mobile phone.		.828					
Price I	I am willing to use better services of mobile phone.		.778					
Information II	I am satisfied with the information quality.			.815				
Information IV	I often use mobile phone in order to get information.			.754				
Technology III	I am quite satisfied with the interface of the mobile phone that I often use.				.702			
Technology II	I often update the new technology enabled services via mobile phone.				.680			
Entertainment III	I use mobile phone as it gives me a pleasure.					.774		
Entertainment V	It is fun to use mobile phone.					.689		
Entertainment IV	If is fun to receive messages via mobile phone.					.664		
Service I	I feel comfortable dealing with new services.						.761	
Service II	I like to try new services such as downloading music via mobile phone.						.632	
Promotion I	I am willing to receive promotional messages via mobile phone.							.741
Promotion II	I am willing to download coupons via mobile phone.							.698
Eigen Value		4.842	2.351	1.632	1.542	1.383	1.119	1.09

This study analyzed simple linear regression analyses and the analyses of variance (ANOVA). Factor scores were used for regression analyses. This study used regression analyses for the impacts of external variables to the predictors that are perceived usefulness and ease of use. Another regression analysis was conducted to examine the effects of perceived usefulness and ease of use to the attitudes toward the websites and the effects of attitudes toward the websites on e-satisfaction and behavioral intention to use. Table 3 presents the results of the regression analyses for the effects of external variables to the perceived usefulness (U) and ease of use (EOU). Factor coefficients from factor analyses, were used for regression analyses. Stepwise regression analysis was applied to determine how indicators affect perceived usefulness and ease of use. The results in table 3 show that factors such as information, convenience, and entertainment factors affect perceived usefulness and perceived ease of use in the U.S. while factors such as information, price, service, convenience, technology, and entertainment factors affect perceived usefulness and perceived ease of use in Korea. Thus, hypotheses 3, 3a, 6, 6a, 9, and 9a were accepted while hypotheses 4, 4a, 5, 5a, 8, and 8a were partly accepted in the Korea market only. The study also found that impacts of factors differ in the U.S. from Korea markets. Thus, hypotheses 3b, 6b, and 9b were accepted while hypotheses 4b, 5b, 7b, and 8b were not tested as hypotheses along with such impacts being rejected in the U.S. market.

Table 3
Summary of The Effects of External Variables on the Perceived Usefulness (U) and Perceived Easy of Use (EOU):
U.S. vs. Korea

Variable	Standardized Coefficient (Sig- <i>t</i> -value) U.S.		Standardized Coefficient (Sig- <i>t</i> -value) KOREA	
	U	EOU	U	EOU
Information factor	.194 (2.867***)	.170 (1.810*)	.307 (3.718***)	.277 (4.112***)
Price factor	.073 (1.654)	.062 (1.551)	.222 (3.874***)	.257 (3.070***)
Service factor	.042 (1.425)	.001 (.077)	.313 (4.749***)	.102 (1.842*)
Convenience factor	.302 (3.648***)	.191 (3.142***)	.233 (3.011***)	.208 (3.358***)
Technology factor	.005 (1.088)	.003 (.977)	.119 (1.928*)	.309 (4.705***)
Promotional factor	.054 (1.364)	.081 (1.805)	.061 (1.194)	.012 (.227)
Entertainment factor	.121 (2.319**)	.118 (2.047**)	.402 (7.006***)	.303 (3.425***)

*** Significant at 0.01 level (2-tailed); ** Significant at 0.05 level (2-tailed); * Significant at 0.1 level (2-tailed)

The results of the analysis of variance found the models significant at the .01 level with $F = 11.253$ and 6.409 (two-tailed, $r\text{-square} = .313$ and $.403$) for U.S. market $F = 13.183$ and 14.281 (two-tailed, $r\text{-square} = .510$ and $.513$) for Korea market for perceived usefulness and ease of use. Another regression analysis was conducted to see how attitudes toward mobile phone are affected by perceived usefulness and ease of use. Table 4 shows the results of regression analysis for the impact of U and EOU to the attitudes toward the websites and impact of overall attitudes toward m-satisfaction. The results of analysis of variance found that overall, the regression model was significant ($F = 7.42$ and 6.03 , significant at the .01 level, two-tailed, $r\text{-square} = .402$ and $.312$ for the U.S. market; $F = 10.51$ and 9.069 , significant at the .01 level, two-tailed, $r\text{-square} = .535$ and $.435$ for Korea market). The study found that impact of perceived usefulness and ease of use on overall attitudes toward the mobile phone and overall attitudes to m-satisfaction were all significant.

Table 4
The Effects of Predictors on the Overall Attitudes toward Websites: U.S. vs. Korea

Predictors	Standardized Coefficient (Sig- <i>t</i> -value): U.S.	Standardized Coefficient (Sig- <i>t</i> -value): KOREA
Perceived Usefulness	.124 (2.187**)	.277 (4.112***)
Perceived Ease of Use	.096 (1.686*)	.194 (2.867***)
Attitudes toward mobile phone to M-Satisfaction	.123 (2.173**)	.205 (3.011***)

*** Significant at 0.01 level (2-tailed); ** Significant at 0.05 level (2-tailed); * Significant at 0.1 level (2-tailed)

DISCUSSION AND CONCLUSION

This research paper explored users’ attitudes toward m-commerce and m-satisfaction. The findings of the study contribute to the development of the uses and gratification theory and *Technology Acceptance Model*, while also providing implications and suggestions for m-businesses. Applying various theories and models, this study investigated which factors affect the attitudes of online user attitudes toward m-commerce; how those factors affect perceived ease of use and usefulness; the effects of perceived ease of use and usefulness on overall attitudes toward m-commerce; and how user attitudes toward mobile phone users affect m-satisfaction in the U.S. vs. Korea market. This study found important factors that affect online consumer attitudes toward mobile commerce: a) factors such as information, convenience, and entertainment factors significantly affect perceived usefulness and ease of use for both the U.S. and Korea markets; b) factors such as price, service, and technology factors significantly affect perceived usefulness and ease of use for the Korea market only; and c) for both markets, a promotional factor does not significantly affect perceived usefulness and ease of use.

Furthermore, this study provides implications and offers suggestions for m-businesses development and user acceptance. This study suggests that there are enormous opportunities for the model of m-commerce and m-business that allows for the co-existence of virtual click-and-mortar market spaces with mobile market spaces. This unification seems appealing to us because it does not force on users or customers either virtual or mobile market systems, but instead gives them the opportunity to mix one and the two based on the specifics of their communication and buying situation. This study suggests that m-commerce marketers should apply diverse usages, e.g., offering coupons, using mobile phone as a payment tool, watching TV, to evoke solutions for MMC. The author believes that more applications and usages will lead to higher user satisfaction and loyalty toward m-commerce customer relationship management (CRM). The implications of this study include the idea that to become a leader in the competitive market, m-commerce with maximized user satisfaction should have key success factors in the m-business model. This study suggests recommendations for the future m-commerce markets or businesses, particularly in the U.S as with the belief that Mobile-Mediated Communication (MMC³) system might replicates all activities of Computer-Mediated Communication (CMC) systems in the near future.

The study has some limitations. Although this study used multivariate statistics, such as factor and regression analysis, the study did not measure the cause and effect relationship using a program, such as LISREL. The researchers will consider this issue in future research. A framework to classify the different levels of involvement will be also developed and applied to measure user attitudes toward mobile phone by also considering various cultures. For future studies, researchers will also investigate causes that affect different impacts toward mobile phone usage cross-cultures/countries. For further studies, a larger number of subjects will be surveyed.

REFERENCES

1. Ajzen, I. and Fishbein, M. (1980). *Understanding Attitudes and Predicting Social Behavior*. Englewood Cliffs, NJ, Prentice-Hall.
2. Bearden, William. O. and Jesse E. Teel (1980), An Investigation of Personal Influences on Consumer Complaining, *Journal of Retailing*, 56, 3, 3-20.
3. Benbasat, I. And Dexter, A. S. (1986). An Investigation of the Effectiveness of Color and Graphical Presentation under Varying Time Constraints, *MIS Quarterly*, March, 59-84.
4. Cardozo, R. N. (1965). An Experimental Study of Customer Effort, Expectation, and Satisfaction. *Journal of Marketing Research*, 2, August, 244-49.
5. Carlsson, Christer, Hyvonen, Kaarina, Repo, Petteri, and Walden, Pirkko (2005), Asynchronous Adoption Patterns of Mobile Services, Proceedings of the 38th Hawaii International Conference on System Sciences, January.
6. Chen, Q. and Wells, W. D. (1999). Attitudes Toward the Site. *Journal of Advertising Research*, September/October, 27-37.
7. Chew, Anthony A. (2006), The Adoption of M-Commerce in the United States, Honors Thesis, California State University, Long Beach, CA.
8. Cho, Y. and Fjermestad J. (2005). Using eCCRM to Maximize/Minimize Customer Satisfaction/Dissatisfaction. Will be appeared in *Advances in Management Information Systems: Special Issue on Customer Relationship Management*, Summer, Upcoming issue.
9. Cho, Y., Im, I., Hiltz, S. & Fjermestad, J. (2002). An Analysis of Online Customer Complaints: Implications for Web Complaint Management. Proceedings of the 35th Hawaii International Conference on System Sciences, January, Big Island, Hawaii, 176b.
10. Cronin, Mary J. (2003), Mobile Commerce – Internet Encyclopedia, Boston: Carroll School of Management, Boston College.
11. Danet, B., Wachenhauser, T., Bechar-Israeli, H., Cividalli, A., and Rosenbaum-Tamari, Y. (1996). Curtain Time 20:00 GMT: Experiments with Virtual Theater on Internet Relay Chat. *Journal of Computer-Mediated Communication (JCMC)*, 2(3) December, <http://jcmc.huji.ac.il/vol2/issue3/>.
12. Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, 13(3), September, 319-340.

³ The term has been modified from Computer-Mediated Communication, proposed by Hoffman, Novak, and Chattered (1995).

13. Davis, F. D., Bagozzi, R. P., Warshaw, P. R. (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Management Science*, 35(8), August, 982-1003.
14. DeSantis, G. (1983). Expectancy Theory as an Explanation of Voluntary Use of a Decision Support System. *Psychological Reports*, 52, 247-260.
15. Dewey, J. (1913). Play. A *Cyclopedia of Education*, P. Monroe, ed. Macmillan, NY, NY, 725-727.
16. Dickinger, Astrid, Heinzmann, Peter, and Murphy, Jamie (2005), "Mobile Environmental Applications," Proceedings of the 38th Hawaii International Conference on System Sciences, January.
17. Dickson, G. W., DeSanctis, G. and McBride, D. J. (1986). Understanding the Effectiveness of Computer Graphics for Decision Support: A Cumulative Experimental Approach. *Communication of ACM*, 29, 40-47.
18. Engel, J. F. and Blackwell, R. D. (1982). *Consumer Behavior* (4th ed.). New York, Holt, Rinehart and Winston.
19. Festinger, L. (1957). *A Theory of Cognitive Dissonance*. Stanford, California: Stanford University Press.
20. Gardner, E. P., Young, P., and Ruth, S. R. (1989). Evolution of Attitudes Toward Computers: A Retrospective Review. *Behavior and Information Technology*, 8(2), 89-98.
21. Hanson, Ward (2000), *Principles of Internet Marketing*, South-Western College Publishing.
22. Helson, H. (1964). *Adaptation-Level Theory*, New York: Harper & Row.
23. Herzog, H (1944). *What Do We Really Know About Day-Time Serial Listeners?: Radio Research*. Paul F. Lazarsfeld and Frank N. Stanton, (eds.), New York: Sloan and Pearce.
24. Hoffman, D. L., Novak, T., and Chatterjee, P. (1995). Commercial Scenarios for the Web: Opportunities and Challenges. *Journal of Computer-Mediated Communication*, 1(3), <http://jcmc.indiana.edu/vol1/issue3/hoffman.html>.
25. Howard, J. A. and Sheth, J. N (1969). *The Theory of Buyer Behavior*. New York, John Wiley and Sons.
26. Ives, B., Olson, M. H., and Baroudi, Jack J. (1983). The Measurement of User Information Satisfaction. *Communications of the ACM*, 26(10), 785-793.
27. Krishnamurthi, L. and Raj, S. P. (1988). A Model of Brand Choice and Purchase Quantity Price Sensitivities. *Marketing Science*, 7(1), Winter, 1-20.
28. Korgaonkar, P. K. and Wolin, L. D. (1999). A Multivariate Analysis of Web Usage. *Journal of Advertising Research*, March/April, 53-68.
29. Lim, Heejin, Widdows, Richard, and Park, Jungken (2006), M-Loyalty: Winning Strategies for Mobile Carriers, *Journal of Consumer Marketing*, Volume 23, Issue 4, 208-218.
30. Luo, Xueming (2002), Uses and Gratifications Theory and E-Consumer Behaviors: A Structural Equation Modeling Study, *Journal of Interactive Advertising*, Volume 2, Number 2, Spring.
31. Malone, T. W. (1981). Toward a Theory of Intrinsically Motivating Instruction. *Cognitive Science*, 4, 333-369.
32. Mcguire, W. J. (1974). *Psychological Motives and Communication Gratification: The Uses of Mass Communications*. Jay G. Blumler and Elihu Katz, (eds.), Beverly Hills, CA: Sage Publications.
33. Mohammed, R. A., Fisher, R. J., Jaworski, B. J., and Cahill, A. M. (2002). *Internet Marketing: Building Advantage in a Networked Economy*. McGraw-Hill Irwin, MarketSpace U.
34. Rogers, Everett M. (1995), *Diffusion of Innovations*, 4th ed., New York: The Free Press.
35. Schubert, P. and Dettling, W. (2002). Extended Web Assessment Method (EWAM): Evaluation of E-Commerce Applications from the Customers' Viewpoint. Proceedings of the 35th Hawaii International Conference on System Sciences, Hawaii, 175b.
36. Schubert, Petra and Dorian Selz (1999), "Web Assessment: Measuring the Effectiveness of Electronic Commerce Sites Going Beyond Traditional Marketing Paradigms," Proceedings of the 32nd Hawaii International Conference on System Sciences.
37. Succi, M. J. and Walter, Z. D. (1999). Theory of User Acceptance of Information Technologies: An Examination of Health Care Professionals. Proceedings of the 32nd Hawaii International Conference on System Sciences, Hawaii, 4013.
38. Webster, J. and Martocchio, J. J. (1992) Microcomputer Playfulness: Development of a Measure With Workplace Implications. *MIS Quarterly*, June, 201-226.
39. Zhou, Zheng (2002). Users' Attitudes Toward Web Advertising: Effects of Internet Motivation and Internet Ability. *Advances in Consumer Research*, 29, 71-78.

ONLINE RESOURCES

1. <http://www.marketresearch.com/product/display.asp?productid=1139101&g=1>
2. <http://www.forrester.com>