Empirical Investigation of the Relationship between the Operational Competence of Service Providers and the Use and Adoption of Mobile Commerce

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Absract

This study models the operational competence of mobile service providers as an endogenous factor that presumably impacts the mobile commerce (m-commerce) adoption of consumers and examines the relationship between the perceptions of consumers toward the operational performance of m-commerce providers and their m-commerce adoption likelihood. Quantitative research is applied with data collected from wireless Internet consumers in South Korea. The data is analyzed using factor analysis and structural equation modeling methods. The findings suggest that the operational competence of m-commerce providers is a significant antecedent to the m-commerce use and adoption of consumers in Korea. In this environment, the operational competence of mobile service providers in managing facilities, equipment, systems and technology plays a central role in enhancing m-commerce use and adoption. Based on the results, important managerial implications are discussed.

Keywords: electronic commerce, mobile commerce, mobile marketing, mobile services, marketing strategy.

1. Introduction

The Economist Intelligence Unit (2008) reported that digital service in many developed countries is rapidly increasing and people who have not gone digital are rapidly doing so. One reason is that high speed wireless Internet access and increased capability of mobile devices are creating a menu of digital commerce transactions. As content delivery over wireless Internet and mobile devices becomes faster and more secure, there is wide speculation that mobile commerce will surpass electronic commerce over the wire line Internet. Mobile commerce (m-commerce) is any transaction that includes the buying and selling of goods and services over an array of emerging mobile equipment and network technology. The emerging technology behind m-commerce includes wireless application protocol (WAP), third generation mobile (3G), and general packet radio service (GPRS), and

offers broad capabilities that enable business firms to enter the mobile marketplace.

This technology has made far greater strides in Europe, Japan and South Korea, where mobile devices equipped with web-ready mobile-browsers are much more common than in other countries. Among those advanced countries, one place where mobile devices are being extensively used to conduct m-commerce is South Korea. Using Bluetooth technology, smart phones offer web browsing, multimedia-casting, real video/audio, e-mail, fax, and telephone capabilities. Mobile telecommunication companies in South Korea believe that mobile technology will become synonymous with youth life style. According to a recent survey conducted in South Korea on mobile wireless Internet (National Internet Development Agency of Korea, 2008), almost all (99.8%) of the population ages 12-59 have mobile communication devices and they are aware of wireless Internet access and m-commerce. More than 50% of the population are already users of mobile wireless Internet of which 69.4% of these use mobile communications (e.g., multimedia messaging service (MMS), e-mail, blog, instant messenger, etc), and 24.8% use m-commerce including mobile banking, mobile stock trading, mobile retailing, and mobile learning.

With the increasing number of 3G mobile phone users, the usage of wireless Internet on mobile devices is rapidly increasing and offers unsurpassed personalization and convenience. The proliferation of mobile wireless Internet applications is forcing traditional organizations like banks, retailers and other financial institutions to review and expand their service capacities beyond the traditional electronic commerce over the Internet. The industries affected by m-commerce may include: financial services (e.g., mobile banking, mobile financial transaction services), telecommunications (e.g., service change, bill payment), information services, and the retailing industry. The potential of mobile technology and the future of m-commerce is expanding.

Despite this confluence of technology development and its usage, m-commerce has received relatively inadequate attention in the academic arena in terms of empirical research. To address this gap in knowledge this study illustrates how an attitude and intention model toward adoption of m-commerce at the individual level can uncover the real value of m-commerce. Furthermore, in the process of m-commerce adoption, the relation between the operational competence of m-commerce providers and the perception of consumers toward the m-commerce use, and the role of operational competence of service providers in enhancing the m-commerce adoption of consumers, have not been sufficiently explored. This study models specifically the operational competence of m-commerce providers as an endogenous fac-

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tor that impacts the perception of consumers toward the m-commerce use and adoption.

2. Literature Review

2.1. Mobile Marketing and Determinants of M-commerce Adoption

One of the marketer's goals is to be able to communicate with potential customers anywhere and anytime. The mobile phone has made a revolutionary contribution toward this goal as mobile phones are a communication medium that keeps people connected independent of place and time (Jain et al., 2007). Therefore, it can be a most effective tool for direct marketing as wireless marketing involves reaching and servicing customers and developing relationships with them by providing premium services (Barutcu, 2007). Scharl, Dickinger, and Murphy (2005) defined mobile marketing as using a wireless medium to provide customers with time-and location-sensitive, personalized information that promotes products, services and ideas, thereby benefiting all stakeholders.

The web's interactive and quick-response capabilities via mobile phones have definitely helped them to become a direct marketing channel (Li & Lee, 2006). Moreover, the high penetration rate of mobile phones has contributed toward the increased delivery of advertisements for products and services (Tsang, Ho, & Liang, 2004). The multimedia message service (MMS) is increasingly being used in mobile campaigns, especially in Asia (e.g., Japan and South Korea) and Europe. MMS advertisements consist of digital image inputs (e.g., graphics and audio clips) which can be more creative and effective than that of traditional platforms (Hsu, Lu, & Hsu, 2007; Kim & Jun, 2008).

The rapid growth of mobile phones has led to the development of a new term: mobile commerce (m-commerce). Siau, Lim, and Shen (2001) defined m-commerce as a new type of electronic commerce transaction conducted through mobile devices using wireless communication networks and other wired electronic commerce technologies (Sarker & Wells, 2003). Clarke (2001) defined m-commerce as the application of wireless communication networks and devices to the execution of transactions with monetary value. Frolick and Chen (2004) defined m-commerce as any form of mobile communications between a business and its customer. Dholakia and Dholakia (2004) defined m-commerce as electronic commerce transactions carried out via mobile phones and wireless networks. Easton's (2002) approach could be more descriptive, simple and close to what these organizations need to know about the m-commerce term. Easton claimed that m-commerce is the purchase of a product or a service through wireless devices, which is more convenient to sign up to mobile services by using the traditional interface of the PCs.

Briefly, mobile commerce can be understood as a business model that allows a consumer to complete all steps of a commercial transaction using a mobile device. In this regard, this study defines m-commerce as any transaction that includes the buying and selling of goods and services, the transactions of ownership to use goods and services, and the ability to conduct commerce in the ubiquitous nature through mobile devices such as a mobile phone, a personal

digital assistant (PDA) and emerging mobile equipment and network technology such as Bluetooth, Wi-Fi and WiMax. The growth and use of m-commerce as an emerging technology has the potential to dramatically change the way consumers conduct transactions. M-commerce driven by wireless communications technology is already generating interest among marketers (Aungst & Wilson, 2005) and has led to changes in advertising, retailing, and shopping in consumer markets. Companies wishing to develop business models in mobile markets should be ready for the emergence of mobile marketing and m-commerce.

Although similar in many respects to Internet-based electronic commerce, m-commerce has some core characteristics that differentiate itself from electronic commerce. It is argued that the main difference between electronic commerce and m-commerce is that m-commerce is associated with wireless technologies (Anckar & D'Incau, 2002; Bai, Chou, Yen, & Lin, 2005; Han, Harkke, Landor, & Mio, 2002). This allows m-commerce to have key properties that marketers desire including: (1) ubiquity - being available at any time and any location; (2) personalization - while mobile hardware has limited memory capacity, software can enable a finer degree of sorting and categorization to meet the needs of mobile phone users; (3) flexibility - the mobile phone permits the user to conduct transactions and/or receive information even when they are engaged in another activity such as travelling or working; and (4) instant connectivity - the marketer can easily connect to target customers. While it is generally agreed that m-commerce is the use of mobile devices for communications and commerce transactions, it should be determined by which definition is more close to the needs of an organization due to the continuous technological revolution (Balasubramanian, Peterson, & Jarvenpaa, 2002).

The adoption of m-commerce has practical and emotional aspects that expose the intention to use m-commerce, and the attitudes toward m-commerce adoption. Many studies revealed the perceptions of usefulness, ease of use, convenience, enjoyment, attitude and intention, and demographic measures are critical factors that influence the adoption of mobile services (Benou & Bitos, 2008; Venkatesh, Ramesh, & Massey, 2003). For example, Kalliny and Minor (2005) claimed when ease of use and usefulness increase, positive attitudes and intention to use mobile services increase as well. Furthermore, convenience raises the level of intention and positive attitudes toward mobile services, but also promotes user recall as well. In addition, the level of enjoyment and security presented a grey area within the study. For instance, if a person enjoys the physical aspect of shopping at a mall, they will not be favorable to mobile shopping, whereas a person who dislikes the effort of shopping will be more positive toward the mobile technology.

Consumers who trust services offered through their mobile devices enjoy a high level of convenience that increases positive attitudes and intention to use m-commerce. Accordingly, it is presumably said that the perception and use of m-commerce are heavily influenced by hedonic and utilitarian elements. Hedonism is defined as the doctrine that pleasure or happiness is the sole or chief goal in life and a way of life based on or suggesting the principles of hedonism (Merriam-Webster Online Dictionary, 2011). In this regard, this study defines

the tendency of consumers that look for pleasure or happiness in using or adopting mobile commerce as hedonistic. Utilitarianism holds that the goal is preference satisfaction and/or ease of usage (Encyclopedia Britannica Online, 2011). In this regard, this study defines utilitarian as the tendency of consumers to look for maximizing satisfaction and/or time efficiency through using or adopting mobile commerce and maximizing the utility of mobile commerce. Besides mobile service quality, Bauer et al. (2005) emphasized that entertainment value, information value and advertising content communications are some of the strongest reasons for the acceptance of the mobile phone as a marketing tool (Germanakos et al., 2008; Standing, McManus, Standing, & Karjaluoto, 2007).

2.2. Perceived Operational Competence and the Perceptions of M-commerce Use

The operational competence is defined as the perceived ability of m-commerce providers to deliver high levels of day-to-day operational performance. This is an experiential construct deriving from cues collected during use, including the timeliness of trade execution or cancellation, the quality of fulfillment, and the quality and promptness of assistance. Perceptions of operational competence are particularly relevant when trust is formed through repeated interactions (Ganesan, 1994). In the mobile commerce environment, perceived operational competence should lead to consumers trust toward m-commerce adoption. M-commerce providers must induce such trust in the absence of personal meetings. M-commerce consumers will response such trust only to an m-commerce provider who is perceived to be competent because individual m-commerce consumers rely entirely on the trading structures and processes implemented by the m-commerce providers.

The link between the ability of service providers and the trust of consumers has also been theoretically established. Consistent with our interpretation of competence, Mayer, Davis, and Schoorman (1995) defined that the ability of service providers as the group of skills, competencies and characteristics that enable a party to have influence within specific domains. Expertness and reliability can be relevant dimensions of the operational competence of m-commerce providers. Accordingly, perceived operational competence can engender consumers trust because the interactive nature of m-commerce can endow the consumerswith illusions of control since the illusions of control can create trusting beliefs (McKnight, Cummings, & Chervany, 1998). In particular, m-commerce consumers can form tentative beliefs and then watch for cues that confirm their beliefs.

Next, consider the impact of perceived operational competence on m-commerce adoption. Smith and Barclay (1997) determined that task performance, which is closely allied with perceptions of operational competence, positively influences mutual satisfaction in partnerships. The SERVQUAL study suggests that reliability and competence are key dimensions along which services are evaluated for quality (Parasuraman, Zeithaml, & Berry, 1988). In traditional environments, operational competence is typically generated by consumers observing the facilities, employees, and equipment of service providers. To the same extent, managers are interested in examining service quality,

specifically tangibles, reliability dimensions, and customer satisfaction in an Internet shopping environment (Shankar, Smith, & Rangaswamy, 2003).

However, in the mobile commerce environment, many conventional service quality dimensions are less relevant. For example, dimensions such as tangibles, reliability, and competence as defined in SERVQUAL are less applicable in the mobile commerce environment. In particular, dimensions of the physical appearance and the operational competence of m-commerce providers are unobservable in the mobile commerce environment. However, even in the absence of human physical interactions, operational competence in the mobile commerce environment still grows out of the perceptions of consumers toward the operational competence of m-commerce providers. This interaction helps consumers form perceptions about m-commerce benefits such as the reliability of information, trust on the fulfillment, and efficiency of transaction execution. That is why perception-based technology adoption is more likely in the mobile commerce environment.

2.3. Research Framework and Hypotheses

The operational competence of m-commerce providers would be useful to understand how to influence the perceptions of m-commerce benefits and m-commerce experience. However, the role of the operational competence of m-commerce providers has not been well explored in m-commerce literature. In this respect, it is a meaningful contribution to the literature if this study documents the role of the operational competence of m-commerce providers, in particular, in m-commerce use and adoption. Building on these arguments, the research framework is developed in Figure 1.

Accordingly this study proposes five hypotheses:

H1: The operational competence of m-commerce providers positively influences the perception of hedonistic use of m-commerce.

H2: The operational competence of m-commerce providers positively influences the perception of utilitarian use of m-commerce.

H3: The operational competence of m-commerce providers positively influences the intention of m-commerce adoption.

H4: The perception of hedonistic use of m-commerce positively influences the intention of m-commerce adoption.

H5: The perception of utilitarian use of m-commerce positively influences the intention of m-commerce adoption.
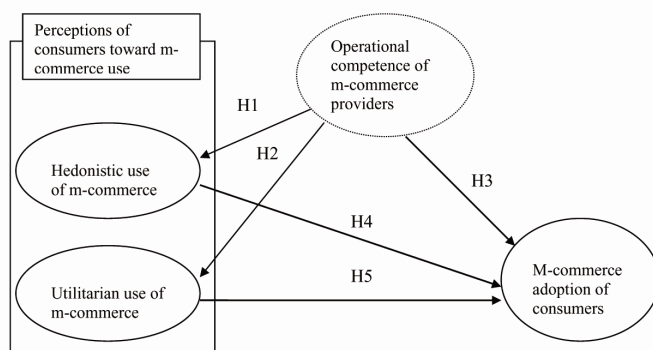
<Figure 1> Research Models

3. Research Methodology

3.1. Survey and Sample Characteristics

A questionnaire was developed for collecting the perceptions toward m-commerce use and m-commerce adoption variables. A survey was conducted to online panel members through a web-based survey method during October - December 2008 in Korea. In total, about 540 panel members have responded, and 500 respondents were chosen for in-depth analysis (Table 1). More than 54% had been employed full time for 1 year or more. The average income per capita for these respondents was $2,100 US dollars per month, which is slightly higher than the average income per capita of $1,900 US dollars per month for Korean employees in 2008 (Table 1).

<Table 1> Basic data of the sampled individuals

Sample characteristics		N	%
Sex	Male	314	63
	Female	186	37
Age	Below 19 years old	20	4
	20-29	129	26
	30-39	181	36
	40-49	113	23
	Above 50 years old	57	11
Education	Secondary (high school)	141	28
	Junior college	80	16
	University	249	50
	Graduate	30	6
Monthly income	Less than $1000	75	15
	$1001-2000	144	29
	$2001-3000	133	27
	$3001-4000	67	13
	$4001-5000	53	11
	More than $5001	28	6

The respondents were spending a mean of $51.30 (S.D. = 12.4) for their monthly expenses of mobile communication services and had an average of 3.2 years (S.D. = 1.7) experience in subscribing to mobile service providers. The respondents had a mean of 4.8 (S.D. = 1.2) out of a 7 point scale when asked if they were satisfied with their current mobile service providers and their intention to continue subscribing to their current mobile service provider had an average of 4.6 (S.D. = 1.3) out of a 7 point scale.

To measure m-commerce adoption variable, this study used two questions: "intention to adopt m-commerce" and "intention of continuing m-commerce use" with each answer ranging from 'least likely=1' to 'most likely=7.' Four survey questions were used to measure the perceptions of consumers toward the operational competence of m-commerce providers. Several of these questions were selectively borrowed from SERVQUAL, while others were modified and developed specifically for m-commerce. The perceived image of m-commerce usage was measured by using a total of 12 questions developed by the authors. The response format for each of these questions was a seven-point scale which ranged from 'strongly disagree=1' to

'strongly agree=7.' To ensure the minimization of idiomatic wording, all questions were first translated into Korean and then results were checked and translated back to English by the authors.

3.2. Factor Analysis and Reliability Test of M-commerce Usage Image Scales

Factor analysis with a varimax rotation procedure was employed to identify underlying dimensions of m-commerce usage image. Then, a statistical test was used to test internal consistency for the survey items. Exploratory factor analysis for m-commerce usage image yielded two factors based on an eigenvalue cut-off of 1. The sums of squared loadings from the two-component have the cumulative value of 61% in explaining the total variance of the data. The two components of the m-commerce usage image are named as "hedonistic use" and "utilitarian use."

To test the appropriateness of factor analysis, two measures were used. The Kaiser-Meyer-Olkin (KMO) overall measure of sampling adequacy (MSA) was 0.940, which falls within the acceptable level. In addition, the Bartlett's test of sphericity was 5614 (df=136, significant at $p < 0.001$), which showed a significant correlation among the variables. Further scale refinement was done by examining item-to-total correlation. This led to the retention of 8 questionnaire items, which represented the two factors; hedonistic use (4 items, α = 0.903) and utilitarian use (4 items, α = 0.866) respectively (Table 2).

<Table 2> Results of Factor Analysis and Reliability Test for M-commerce Usage Image

Items	Factor loadings	Eigenvalue	Extracted variance	Factor name	Corrected item-total correlation	α
Upper class	0.846	3.575	32.789%	Hedonistic	0.765	0.903
Happy	0.843				0.775	
Exciting	0.796				0.778	
Charming	0.718				0.695	
Honest	0.773	2.855	28.559%	Utilitarian	0.628	0.866
Reliable	0.767				0.782	
Beneficial	0.726				0.759	
Improved	0.705				0.633	
Total variance			61.348%			

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

3.3. Measurement and Structural Model

The analysis of moment structures (AMOS: Arbuckle, 2006) was used for an empirical testing of the model, and the maximum likelihood estimation (MLE) was applied to estimate numerical values for the components in the model. To diagnose the presence of distribution problems in the data and to gauge their effects on the parameter estimates, bootstrapping (Efron, 1987; Stine, 1989) was employed and 300 bootstrap replications were done. Confirmatory factor analysis was applied to test the validity of the scales in measuring specific constructs of the measurement model and Fornell and

Larker's (1981) guideline was applied.

To diagnose possible identification problems, the degree of freedom with large standard error variances (Bollen & Joreskog, 1985) were evaluated and an identification problem was remedied in accordance with Hayduk's (1987) guidelines. To evaluate the overall goodness-of-fit of a proposed model, the criteria of Bollen (1989, p. 275) was applied. The goodness-of-fit measures included as follow: (1) the measures of the sample discrepancy included the minimum value of the discrepancy (CMIN), the probability of getting a large discrepancy (P), the root mean square residual (RMSR), and the minimum discrepancy divided by its degrees of freedom (CMIN/DF); (2) the measures of the population discrepancy included the estimate of the noncentrality parameter (NCP) and the root mean square of approximation (RMSEA); (3) the measures of parsimony included the parsimony ratio (PRATIO), the number of degrees of freedom (DF), and the number of distinct parameters being estimated (NPAR); (4) information-theoretic measures included the Akaike information criterion (AIC), the Browne-Cudeck criterion (BCC) and the Bayes information criterion (BIC); (5) the measures of comparisons included the Bentler-Bonett normed fit index (NFI), the Bollen's relative fit index (RFI), the Tucker-Lewis coefficient index (TLI), and the comparative fit index (CFI); and (6) the measures of goodness-of-fit and related fit included the goodness-of-fit index (GFI), the adjusted goodness-of-fit index (AGFI), and the parsimony goodness-of-fit index (PGFI).

3.4. Results of Hypothesis Test

The results of the data analysis generally achieved acceptable goodness-of-fit measures, specifically the index of GFI (0.919), which indicates that the fit of the proposed model is about 92% of the saturated model (the perfectly fitting model). The index of NFI (0.851) indicates that the fit of the proposed model is about 85% over the null model. For NFI, the closer its values are to 1, the better the fit of the hypothesized model over the null model. Many fit measures represent an attempt to balance between parsimonious and well fitting model, that is, two conflicting objectives - simplicity and goodness-of-fit (Steiger, 1990). This study prefers a simple and parsimonious model instead of complex ones.

Hypothesis 1 "There is a causal relationship between the operational competence of m-commerce providers and the perception of hedonistic use of m-commerce" is supported by tests of the data. The result shows a positive relationship between the operational competence of m-commerce providers and the hedonistic use of m-commerce, which is statistically significant (p < 0.001) at a 95% confidence level (Table 3). Hypothesis 2 "There is a causal relationship between the operational competence of m-commerce providers and the perception of utilitarian use of m-commerce" is supported. The result shows the relationship between the operational competence of m-commerce providers and the utilitarian use of m-commerce is statistically significant (p < 0.001). This suggests that the perceived operational competence of m-commerce providers causes positive effects on the perceptions of m-commerce use.

<Table 3> Outputs of Structural Equation Model (SEM) Estimates

Path diagram	Proposed model Estimate (S.E)	Bootstraping # Estimate (bias)
H1: Operational competence → Hedonistic use	0.499(0.068)***	0.499(0.000)***
H2: Operational competence → Utilitarian use	0.648(0.070)***	0.651(0.003)***
H3: Operational competence → M-commerce adoption	0.665(0.075)***	0.672(0.007)***
H4: Hedonistic use → M-commerce adoption	0.020(0.071)	0.025(0.005)
H5: Utilitarian use → M-commerce adoption	0.112(0.096)	0.117(0.005)

*** p < 0.001, coefficients are statistically significant at a 95% confidence level.
# 300 usable bootstrap resample analyzed.
Goodness-of-fit measures: N = 500, CMIN = 872.185, DF = 147, Probability level = 0.000, CMIN/DF = 5.933, NPAR = 43, PRATIO = 0.860, RMSR = 0.073, RMSEA = 0.093, NCP = 725.185, AIC = 958.185, BCC = 961.775, BIC = 1266.024, NFI = 0.851, TLI = 0.852, RFI = 0.827, CFI = 0.873, GFI = 0.919, AGFI = 0.904, PGFI = 0.854

Hypothesis 3 *"There is a causal relationship between the operational competence of m-commerce providers and m-commerce adoption"* is supported by tests of the data. The result shows that this relationship is statistically significant (p < 0.001) at a 95% confidence level. This suggests that the operational competence of m-commerce providers does have a direct influence on the m-commerce adoption of consumers. Hypothesis 4 *"There is a causal relationship between the perception of hedonistic use of m-commerce and the m-commerce adoption of consumers"* is not supported. The result shows the relationship between the hedonistic use of m-commerce and the adoption of m-commerce is not statistically significant (p > 0.1) at a 95% confidence level (Table 3). Hypothesis 5 *"There is a causal relationship between the perception of utilitarian use of m-commerce and the m-commerce adoption of consumers"* is not supported. The result shows the relationship between the utilitarian use of m-commerce and the adoption of m-commerce is not statistically significant (p > 0.1). This suggests that the perceptions of m-commerce usage don't directly influence on m-commerce adoption.

Overall, the results of the hypothesis test suggest that the operational competence of m-commerce providers produces positive effects in enhancing perceptions of m-commerce use, and directly influences the intention of m-commerce adoption. This study found that the operational competence of m-commerce providers can cause direct effects on the intention of m-commerce adoption.

4. Discussion and Conclusion

Perceptions of operational competence by consumers have a strong effect on m-commerce adoption and use. The measures of perceived operational competence that are employed largely reflect operational efficiency and effectiveness. The effect of perceived operational competence on m-commerce use and adoption shows an interesting variation across usages. In terms of direct effect, the perceptions of opera-

tional competence influence to a lesser extent hedonistic use (weight = 0.499) than utilitarian use (weight = 0.648) in Table 3. Therefore, while perceived operational competence is important in both usages, its path of impact varies. It appears that compared with utilitarian use, hedonistic use is less likely to drive m-commerce use and adoption based directly on consumers' evaluation of the operational competence of m-commerce providers. Being more aware of the m-commerce adoption process, consumers are likely to place a greater emphasis on issues related to utilitarian perspective of using m-commerce. In addition, the weight for the direct effect of perceived operational competence on m-commerce adoption is 0.665 in Table 3, which is the highest among the models. This implies that the higher perceived the operational competence, the more likely are consumers to adopt m-commerce. Accordingly, managers should seek a more critical review of operational competence related factors to enhance m-commerce adoption.

The findings of this study confirm that customers strongly rely on the operational competence of service providers, which is demonstrated specifically by m-commerce providers. Consequently, managers of m-commerce industries should work to create stronger perceptions of operational competence by highlighting existing organization's physical appearance (e.g., facilities, employees, equipment, systems, and appearance of other tangibles) and their impact on operational performance. Managers must primarily focus on the speed of transaction, the accuracy and timeliness of information - these are the most salient dimensions of perceived operational competence in this study. In this way, m-commerce use and adoption in the m-commerce environment can be managed effectively when issues of the operational competence of m-commerce providers and the trust of consumers are simultaneously addressed. M-commerce providers must work in two directions when building the trust and adoption of consumers - they must focus inward to improve operational competence (e.g., higher system availability and faster responses) and must focus outward to improve the organization's physical appearance (tangibles). Managers need to find credible ways to demonstrate that information and communications technologies including wireless Internet, mobile networks and mobile devices are indeed being deployed and managed in ways that protect and advance the best interests of their customers.

Another finding is the rather weak impact of perceptions of m-commerce use on the intention of m-commerce adoption. In fact, it had no impact for consumers on m-commerce adoption. Also, the mediating role of perceptions of m-commerce usage was found to be insignificant. One plausible explanation is that m-commerce has become so pervasive that few people dispute its usefulness. Furthermore, from a technical standpoint m-commerce as an innovation is not disruptive per se. Its technology trajectory can be reasonably predicted by the public, at least in the short run, given the immense promotion by m-commerce providers and the availability of information and communications technology. Another reason could be found that the shift from advocating hedonistic advantages (or information and communications technology savvy) to fulfilling personal desires in m-commerce use and adoption further dilutes the impact of m-commerce usage on consumers intention of m-commerce adoption. However, the results of this study yield a dilemma that needs further investigation. The results show that both hedonistic and utilitarian usages are not important in considering m-commerce adoption in this sample. This may pose a dilemma for practitioners who need to know which factors to focus on to attract m-commerce adoption. For those emphasizing utilitarian use, the decision to use m-commerce may be easier than for those who care about both utilitarian and hedonistic use.

The results of this study also indicate that the operational competence of m-commerce providers effects on the m-commerce adoption of consumers. For m-commerce service providers, the implication is straightforward - their mobile networks need to be universally available and reliable to attract m-commerce consumers. Also, mobile network interconnectivity is a key determinant of m-commerce availability. Unlike geographic coverage, network interconnectivity deals with the ability of one m-commerce provider to route traffic to other providers, including its competitors. In this case, the findings suggest that it is possible to take advantage of different market segmentation approaches. Recent attempts by some m-commerce providers to promote its services to highly targeted consumer groups seem to be moving in this direction.

For example, KTF, a mobile communication service provider in South Korea, has launched two mobile service brands targeted at specific two consumer groups, utilitarian and hedonistic, which separately target utilitarian consumers (brand name "MagicN") and hedonistic consumers (brand name "SHOW"). Even though it is too early to decide whether m-commerce and mobile marketing will be adopted or not in other countries, the results of this study help in establishing that m-commerce acceptance level can be quite high, and that mobile phone users are ready to embrace mobile commerce and marketing in its fullest sense. Specifically, mobile phone users have a positive attitude toward m-commerce. To the same extent, mobile advertising, mobile entertainment service, location-based mobile service, and mobile banking are more positively accepted by mobile phone users in Korea.

This paper presents a preliminary step toward understanding the process of operational competence of m-commerce providers and its influence on m-commerce adoption. As described above, the findings regarding the endogenous nature of operational competence to m-commerce usage image and m-commerce adoption have significant implications for managerial decisions and further theoretical development. The results suggest that the operational competence of service providers has a strategic role in the m-commerce context and that ignoring it will likely have an adverse effect on m-commerce adoption.

Mobile devices have been the fastest adopted consumer product of recent years, and the fundamental difference between electronic commerce over the Internet and m-commerce is that m-commerce presents a new opportunity beyond cost and speed. M-commerce can be tailored to personal devices and offers the user unparalleled value with services that are ubiquitous, personalized, and convenient. There is a major opportunity to deliver valuable content and offer convenient services to the end user as mobile phone subscribers continue to rise year after year in world marketplaces.

There are several directions for future research. The perceived op-

erational competence deserves further validation and elaboration. As discussed earlier, a detailed examination could potentially delineate multiple dimensions such as competencies related to information provision and transaction execution. An elaboration of operational competence should consider the breadth and depth of m-commerce offered. From a methodological point of view, though self-reported data are necessary in studies of this kind, they are associated with some well-known limitations. For example, they are subject to skewed responses due to suggestive stimuli, stereotype and alteration through biases related to social desirability and cognitive consistency. In this regard, future research should include the views of groups representing people who have been adopted and not yet adopted m-commerce and groups that have experienced and those who have not experienced electronic commerce. In moving beyond self-reported data, future research could link measures of revealed preferences with objective measures of the characteristics of m-commerce providers. The authors hope that the results presented here will catalyze a more rigorous exploration of the operational competence of m-commerce providers and m-commerce adoption.

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