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An Exploratory Study of Mobile Banking Systems Resistance in Korea and Finland

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ABSTRACT

This study investigates mobile banking systems adoption in two countries; Korea and Finland, and proposes a mobile banking resistance model. Both Korea and Finland are currently using the most advanced wireless infrastructure and mobile banking systems. However, numerous inhibitors of mobile banking systems have delayed the widespread use of mobile banking systems. This study reports the significant inhibitors of mobile banking systems as well as the characteristics of those who are classified as non-adopters. More specifically, this paper finds whether the people who do not use mobile banking systems actually reject, postpone or oppose it. To accomplish the research objective, this study deploys the combination of the qualitative and quantitative research method. In the first phase, a case study using semi-structured interview is deployed to identify the factors inhibiting mobile banking use. 20 non-mobile banking users from Korea and Finland were interviewed in this phase of study. The result indicated that well developed traditional electronic banking services in both countries are significant barriers to mobile banking adoption. In addition, perceived risk and lack of knowledge about mobile banking contribute to non-adoption or rejection of mobile banking systems. In the second phase, the proposed mobile banking resistance model will be tested using a survey. Findings from the use of qualitative methods will be explained further with quantitative analysis of SEM.

Keywords: Mobile banking, innovation resistance, use inhibitors, case study, cross-cultural study

INTRODUCTION

Mobile banking (m-banking) is one of the most promising and value-added mobile commerce (m-commerce) services. It provides convenience and enhanced value to both banks and customers (Suoranta & Mattila, 2004; Tansuhaj *et al.*, 1991). Mobile banking is now gaining rapid popularity in Europe and Asia with the significant market penetration of mobile handsets and the optimally designed marketing tactics of service providers (Suoranta & Mattila, 2004). However, mobile banking is still marginally adopted across the globe, and the growth appears much slower than anticipated (Mallat *et al.*, 2004).

Although a large number of studies in various disciplines have been made on how innovation diffuse over time and what is the nature of adopters, resistance to innovation, or non adoption of innovation has received relatively little attention. In information systems (IS) research, the same trend has been observed. Even though numerous theories and models have been introduced to explain why an individual adopt a specific technology and what makes an individual reach to the decision, such theories and models have extensively focused on the factors fostering adoption and usage. Consequently, factors which inhibit information systems have largely been overlooked or simply considered as a lack of adoption factors (Venkatesh & Brown, 2001).

This study investigates mobile banking adoption in two countries, Korea and Finland where the most advanced wireless infrastructure and mobile banking systems are used and reports the significant inhibitors of mobile banking as well as the characteristics of non adopters. Specifically, this paper answers whether the people who are considered non adopters actually reject, postpone or oppose mobile banking and whether the inhibitors and the characteristics of non adopters differ depending on country.

To accomplish the research objective, this study deploys the combination of the qualitative and quantitative research methods. In the first phase, the author uses semi-structured interview to identify the factors inhibiting mobile banking use. Twenty non mobile banking users from Korean and Finland are interviewed in this phase of study. In the second phase, a mobile banking systems resistance model is proposed and tested based on the factors found in the qualitative study. The authors believe that understanding and analyzing the structure of non adopter group not only help identify the barriers of current mobile banking adoption but also help develop the better systems which meet the requirements of current non-adopters.

THEORETICAL BACKGROUND

Inhibitors in Information Systems

In prior information systems adoption studies, the factors which inhibit IS were often simply considered as a lack of adoption factors (Venkatesh & Brown, 2001). However, inhibitors and enablers are not opposite constructs but dual-factored ones (Cenfetelli, 2004b). According to Cenfetelli(2004b), inhibitors and enablers of IS usage are separate constructs like satisfaction and dissatisfaction. He argued that while enablers are psychologically meaningful at either end of a positive-negative spectrum, inhibitors are only meaningful at the negative end. Consequently, inhibitors and enablers have different antecedents and effects. Inhibitors arise from a different set of causal factors than that of enablers, and they also differ from enablers in their effects on consequent variables (Cenfetelli, 2004b). Cenfetelli proposed that unlike enablers, most inhibitors arise from accident, error, or the byproduct of some other benefit while implementing and using an IS, and they solely predict the rejection of IS. He also added that rejection of technology is explained by inhibitors while adoption is explained by enablers.

Numerous IS inhibitors have been reported. According to Venkatesh and Brown (2001), unlike adopter who are driven by utilitarian outcomes, hedonic outcomes, and social outcomes from adoption, non-adopters are influenced primarily by rapid changes in technology and the consequent fear of obsolescence. Gatignon and Robertson (1989) also found that secrecy contributes to the rejection of an IS even though the lack of secrecy did not predict adoption. In addition, transaction failure (Meuter *et al.*, 2000) and lack of IS knowledge (Cragg & King, 1993) were also introduced as the significant inhibitors of IS use.

Innovation resistance in Marketing

Consumer's resistance to innovation has also received little attention in marketing like inhibitors in IS. Marketing literatures have extensively concentrated on the characteristics and behaviors of consumers who do innovate on any given occasion. Consequently, little attention has been given to why some innovations are resisted by consumers (Szmigin & Foxall, 1998). It is partially caused by the fact that marketing has more benefits from the early identification of consumer innovators since their behavior and characteristics can be used as a significant determinant of diffusion of a product across a wider market.

Resistance to an innovation can be classified into three different categories: outright rejection, postponement, or opposition (Szmigin and Foxall, 1998). The most extreme form of resistance is rejection which refers to a consumer's conscious decision to avoid an innovation. When there is mass rejection of an innovation by consumers, the responsibility for the producer is to change or modify the innovation appropriately and then resubmit it to consumers. Users may postpone adopting an innovation although they may find it acceptance. Most often this would appear to be caused by situational factors such as consumers' financial or employ status. The final form of resistance is opposition, which ultimately leads to rejection although the consumer may try out the innovation before finally rejecting it. Some of the reasons for opposing innovations include habit resistance, situational factors, and cognitive style.

Innovation resistance comes from both functional and psychological barriers (Ram & Sheth, 1989). Functional barriers are more likely emerge if consumers perceive significant changes from adopting the innovation while psychological barriers are created through conflict with consumer's prior beliefs (Molesworth & Suortti, 2002). Usage barrier, value barrier, and risk barrier are typical examples of functional barrier. Usage barrier is caused by compatibility with existing workflow, practices, or habits. Usage barrier is the most common reason for consumer resistance to an innovation. The second functional barrier to an innovation is value barrier caused by comparing with other product. This simply means that if an innovation does not offer a strong performance-to-price value, there is no incentive for customers to adopt. The last functional barrier is risk barrier. All innovation has a certain level of risk, and customers try to postpone adoption until they can learn more about it. There are four types of risk inherent in an innovation; physical risk, economic risk, functional risk, and social risk (Molesworth & Suortti, 2002; Ram & Sheth, 1989). Physical risk simply refers to possible harm to person or property that may be inherent in the innovation. Economic risk refers to economic loss by adopting current innovation. Many individuals

and corporate decide to wait for a new generation of products with a better performance to reduce economic risk. A significant reduction of computer prices by technology advance delays the adoption of personal computer (Venkatesh & Brown, 2001). Function risk is involved in the function of an innovation while social risk is involved in social and peer evaluation.

The first source of psychological resistance is the cultural change created for the customer by an innovation. The greater an innovation requires a customer to deviate from traditions, the greater the resistance. For example, computerized dating may not be acceptable to all society members (Ram & Sheth, 1989). Image barrier is related with the identification of an innovation such as their origins and classes. However, the extent to which customers willing to adopt or the extent to which customers resist to a new product vary depending on cultures. For example, different values related to fatalism, religious commitment, and traditionalism cause different adoption or resistant rates among countries (Tansuhaj *et al.*, 1991). In cross-cultural consumer behavior research using five countries, Tansuhaj *et al.* found that when the cultural variables are related to willingness to innovate and to perceived risk, fatalism is found to explain significant variation in innovation resistance.

CURRENT STATUS OF MOBILE BANKING SYSTEMS

Mobile banking has two big advantages over narrow sense of e-banking; security and convenience (Herzberg, 2003). E-banking is based on account-holder authentication by the payment system which can fail in multiple ways but do not distinguish the source of fraud. However, mobile devices, usually with a built-in display and keyboard, are well-positioned to provide a technical solution for reducing fraud and allowing the fair allocation of responsibility for damages from fraud. In addition, unlike e-banking, the transactions through mobile banking can be made anywhere whether on foot or in cars, planes, or trains. Mobile banking services began in 1999 in European and Asian countries, and have gained rapid popularity with the significant market penetration of mobile phones, the optimally designed marketing tactics of service providers, and the increased exposure to mobile technology (Suoranta & Mattila, 2004). Like many other mobile commerce services, mobile banking services are provided by several different entities, with which the customers of mobile banking services must interact to complete a successful mobile banking transaction, especially the mobile device provider, mobile operator, and content provider (Varshney & Vetter, 2002). Even though mobile banking has gained rapid popularity, it is still marginally adopted across the globe, and, especially in the USA, the growth appears much slower than anticipated (Mallat *et al.*, 2004).

Mobile banking adoption literatures have identified some of the significant features which differentiate mobile banking adoption from that of other previous information technology (IT). First, the average mobile banking user's characteristics differ from that of other ITs, especially wired Internet banking users. According to Suoranta and Mattila (2004), unlike Internet banking which wealthier customers are more willing to adopt and use, the wealthier respondents were less willing to adopt the new mobile banking. One of the reasons explaining the discrepancy is that the lack of fixed-line Internet is one of the major drivers of mobile banking adoption (Mattila, 2003). Lee *et al.* (2003) found that increasing one's self-prestige is also an important driver of mobile banking adoption. In their research, they conclude that mobile banking service increases one's self-prestige, and this in turn reduces the social risk or psychological risk of mobile banking adoption. However, too early stage of development process (Mattila, 2003), the security issue of financial transaction (DeZoysa, 2001), and the cost and quality of the handset are still big barriers to mobile banking adoption. Therefore, many potential adopters who intend to wait and get comments from other users are frequently observed, in order to evaluate the performance of the mobile banking services, before a decision on the adoption is made (Tansuhaj *et al.*, 1991).

Mobile Banking in Korea and Finland

Like in most other countries in Asia and Europe, SMS was also the first technology employed as a mobile banking technology in South Korea, where more than 70 percent of its 48 million citizens carry one or more mobile handsets and one-third of all mobile phone subscribers use their handsets for m-commerce activities (Kim, 2004). However, unlike most other countries, SMS mobile banking services in South Korea, where well advanced e-banking services are available, did not attract customers at all and was considered as a failure since not much interest was shown (Kwon, 2004). Since then, various technologies including WAP and Virtual Machine (VM) have been tested and used to attract customers (Korea, 2004), but customers did not display much interest. However, a new Integrated-Circuit (IC) chip technology provided by the nation's smallest mobile operator changed the history of mobile banking in South Korea (Kim, 2004). The new chip-based offerings were a big hit as a total 280,000 people signed up for the new services during the first four months after its introduction in September 2003. Since then, the number of mobile banking users has dramatically increased and reached 1.8 million as of December 2005 (Korea, 2006). The most important feature of IC chip-based mobile banking is that bank account data is encrypted on a smart-card chip, so it enables customers to connect to their account quickly and securely by pressing a single

button on their mobile phone. In addition, to prevent someone else using a mobile phone or IC-chip, a special password or code given by banks is required for the user to make each transaction.

Unlike in Korea where the number of mobile banking users seems to be growing, the interest towards mobile banking in Finland has been diminishing. One of the Finnish banks has unofficially reported that the number of their mobile banking logins dropped between years 2000 and 2003 by 10 percent units. The official records upheld by the National Bankers' Association including all the Finnish banks show that the number of customers using mobile banking as their primary financial service delivery channel to pay bills has dropped to half over the past few years (Finnish Bankers' Association 2004). E-banking, on the contrary, has been gaining more users on an annual basis: in April 2004 more than 64 percent of the bank customers in general report using e-banking as their primary financial service delivery channel to pay bills (Finnish Bankers' Association 2004). The available user numbers include both e-banking and mobile banking users as banks offer a bundled service packages including both types of online services under one user passwords. In year 2004 there were statistically more than 0.6 online banking agreements per capita in Finland (Finnish Bankers' Association 2004).

RESEARCH METHODOLOGY

Numerous IS studies settled on undertaking sample survey, but it does not allow the researcher to collect in-depth data. Therefore, some researchers have called for an integration of different methods to produce richer and more reliable results (Mingers, 2001; Sawyer, 2001). Even though all research design has a flaw, researchers can maximize the legitimacy of the results by using several types of methods (Mingers, 2001). There several different types of multi-method design. Among them, this study deploys the combination of qualitative and quantitative methods in sequential order. In the first phase, qualitative research is employed in order to explore factors contributing to mobile banking resistance. A case study is conducted for exploring the factors, and semi-structured interview is conducted for data gathering in this case study. Semi-structured interview is conducted by asking central interview questions and other relevant questions. The research model proposed by the case study is tested using a cross-cultural sample survey in Korea and Finland. This approach, the combination of case study and sample survey, is believed to generate findings that are not only theoretically rigorous but also practically relevant (Trauth, 2001).

Study Phase I: Qualitative Research

There are five common qualitative research designs: case study, ethnography, phenomenological study, grounded theory study and content analysis (Myers & Avison, 2002). This study employs a case study because of the nature of this study. The method of data collection was through interviews with individuals who did not use mobile banking systems. The interviewer began the interview process by asking a few socio-demographic questions, such as age and gender of the subject. The interview then shifted to the exploration of the stated study constructs related to mobile banking resistance.

The respondents were selected by purposive sampling. The total of 40 non-mobile banking users across the different segments was interviewed. After respondents were assured of confidentiality and protection of their privacy, each interview, lasting 15 to 20 minutes, was conducted. In Finland, three of the respondents had tried using mobile banking and two had not heard at all about the possibility of using mobile handset for banking. Ten of the respondents seemed to have made a conscious decision to reject using mobile banking services and had no plan what so ever to start using mobile banking services under any conditions. Two of the respondents said that they are planning to start using mobile banking services in the future and eight were opposing the mobile banking service usage in general. In Korea, all of the respondents are aware of mobile banking, but none of them has ever used it. However, unlike in Finland, none of the respondents in Korea has rejected mobile banking, and a majority of the respondents (18) are planning to use but still do not decide the timing.

In both countries, the most common reason for non adoption of mobile banking seems to be the well developed narrow sense of e-banking and other traditional banking services (See Table 1). A majority of the respondents expressed the satisfaction with current e-banking service and no need to use mobile banking service in this point. This implies that new services they find in mobile banking quite useless as they already have their needs fulfilling service in use. The respondents were not experienced in using mobile services in general and did not perceive mobile handset as the proper device to access Internet services in general. In addition, the respondents also expected getting all the banking services from one place. Although mobile banking in Finland and Korea offers close to all the same services as e-banking, some services including the mortgage service are not available in mobile banking yet. Some of the respondents seemed to worry about having to spend more time solving banking related issues by using mobile banking than it would take from them to get the same transaction done via other banking channels. They were especially concerned about having to contact bank branch in the case the mobile banking wouldn't be successful and in this way spend at least double the time.

In Korea, another important reason for non adoption of mobile banking is requiring new handset, which costs at least \$600. Since IC-chip based mobile banking is only available on certain devices, many people hesitate to replace their handsets for only mobile banking purpose and prefer to use traditional phone banking, which is conducted by calling the representatives of bank. Visiting bank to pick up the IC-chip and subsequent verification processes were also identified as significant inhibitors. In addition, price drop and introduction of new devices caused by emerging mobile technology also delay the adoption of mobile banking in Korea. Many potential adopters expect significant price drop in mobile device and services and intend to wait. Government subsidy policy on mobile devices and services also delay the adoption of mobile banking. One the other hand, in Finland, the price and speed of data transfer were not seen as inhibitors for the adoption among respondents. The ones who had tried mobile banking had not experienced any major difficulties in mobile banking usage. 13 of the respondents simply said they don't want to use mobile banking services. When further asked why they don't want to, they were unable to specify the true reasons behind their non-adoption. Interestingly, even though the respondents claimed to be well aware of the services and options of mobile banking, when further asked would they consider starting using mobile banking if certain specific services such as account balance check and bill payment would be available via mobile channel, the majority of them expressed strong interest in using mobile banking. However, the above-mentioned services are already available via mobile channel in Finland but clearly the respondents were unaware of such option. Therefore it can be concluded that one of the inhibitors of mobile banking usage seems to be the lack of knowledge regarding the available services and their use.

Over half (11) of the respondents in Finland assumed mobile banking consisting of more errors than e-banking. This belief was not related to risk barriers but more towards usage barriers as the errors included catastrophic errors such as interruptions in the wireless connection. The respondents complained about not getting enough information regarding mobile banking and especially the lack of guidance how to actually use the services. The banks are offering e-banking usage guidance to mature customers in most cities but it is true that such services do not exist in the field of mobile banking yet.

	Reasons for Korea	#	Reasons for Finland	#
Usage Barrier	<ul style="list-style-type: none"> Requiring new handset Verification Process 	16 8	<ul style="list-style-type: none"> Inexperience in using mobile services in general Afraid of errors in usage Lack of guidance 	17 11 8
Value Barrier	<ul style="list-style-type: none"> E-banking services Traditional phone banking* (by talking to bank representatives) ATM and branch offices 	13 3 2	<ul style="list-style-type: none"> E-banking services Computer preference over mobile handsets "I just don't want to" 	20 17 13
Risk Barrier	<ul style="list-style-type: none"> Rapid price drop of mobile handsets Government policy 	7 2	<ul style="list-style-type: none"> Search for more comfortable usage experience 	10

Table 1. Summary of findings in Study Phase I

Findings

Several important factors were found in our qualitative study. First, the technology implemented for mobile banking systems is very important. The success of South Korea's IC chip based mobile banking service clearly shows that a good technology ultimately appeals to customers, especially it matches with culture. Koreans live in an intense culture where all processes are speeded up (Shim 2005). This intense culture applies to a wide range of behavioral patterns including mobile services. Therefore, the IC-chip based mobile banking service, which enables customers to connect to their account quickly by pressing a single button on their mobile phone, attracted to many Koreans while SMS and WAP based mobile banking services failed. However, in case of Finland, like many other European countries, no killer technology has introduced yet. Even though some Western Europe banks started providing a new mobile banking services using the Japanese iMode technology in the hope of revolutionizing mobile bank, this popular interactive service neither appeals to European customers nor changes the dominant trend of SMS in Europe (Marenzi, 2004).

Second, it is clear that current e-banking services are significant barriers to mobile banking services. Both Korea and Finland have a well developed e-banking system which can be accessed at any time, and many customers have become accustomed to e-banking services. Therefore, customers do not see significant relative advantages of mobile banking services over e-banking services.

Finally, the service of all entities in mobile commerce cycle, especially mobile operators, significantly influences the mobile banking adoption. Unlike Korean customers who are all aware of mobile banking services, many Finland customers are not aware of mobile banking services and it has been a significant barrier to mobile banking service adoption. As shown in Korea's case where mobile banking systems have been developed and controlled by mobile operators, the role of mobile operators and their marketing activities significantly determine the growth of mobile banking.

Study Phase II: Quantitative Research

In this section, the authors present a mobile banking resistance model based on the previous qualitative study result and test the model with a cross cultural survey in Korea and Finland. The research model proposes that mobile banking resistance is highly associated with satisfaction with e-banking, perceived risk of mobile banking, and lack of knowledge/awareness of mobile banking. The authors also propose that the relationship between above three factors and mobile banking resistance is significantly influenced by culture.

RESEARCH PLAN

To test these hypotheses, a survey using 200 non mobile banking users in each country will be conducted. In the summer of 2007, the authors will conduct this survey by distributing 200 copies of a two-page research instrument to individuals in both countries. The data obtained from the survey will be first tested for reliability (Cronbach's alpha) and validity. Then, factor analysis and structural equation modeling (SEM) will be used to test the significance of H1, H2, and H3. Factor analysis is a technique whereby several variables can be grouped together to represent factors, and SEM is an advanced statistical method that allows optimal empirical assessment of a structural (theoretical) model together with its measurement model and is increasingly being used in IS research for the casual modeling of complex, multivariate data sets in which the researcher gathers multiple measures of proposed constructs.

The authors believe that the finding for this exploratory research will be valuable for mobile service providers for less developed countries. The results will be presented at the conference in August 2007, and the preliminary findings (along with a discussion of their implications) will be included in the Conference Proceedings.

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