INFLUENCE FACTORS ON INTENTION TO USE MOBILE BANKING

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Abstract— The wide proliferation of smartphones has driven the rapid rise of mobile banking. However, few studies have been found on mobile banking services. Therefore, this study analyzes consumer behaviors in mobile banking, focusing on the antecedents of intention to use to mobile banking. And we examines quality factors of mobile banking that influence smartphone users to use mobile banking and whether or not trust influences the relationship between attitude toward mobile banking and system quality, information quality, and service quality of mobile banking. The results based on a survey of mobile banking users indicate that attitude toward mobile banking and economic benefit affect intention to use of mobile banking. Information and service quality affect users' attitude toward mobile banking. Moreover, trust has moderating effect. These results have important theoretical and practical implications.

Index Terms—Mobile banking, System Quality, Information Quality, Service Quality, Intention to Use.

I. INTRODUCTION

Mobile banking is an innovative system used by banks to facilitate their interactions with customers through mobile devices. For customers, mobile banking provides the benefit of convenient financial transactions. Customers can use mobile banking to check account balances, transfer funds, use credit cards, and obtain funds because it provides banking services anywhere, anytime. As a result of these benefits, the use of mobile banking is increasing rapidly.

Banks are concerned about managing and optimizing the adoption of mobile banking for several reasons. First, it has been suggested that mobile banking reduces service costs. Second, customer adoption of mobile banking can disperse service demand across multiple service channels. For the increased use of smartphone based mobile banking, academic research of the quality of services provided by mobile banking providers as well as the development of differentiated services and offerings are essential.

Recently, with the increase in the number of mobile banking users, there has been growing interest in the role of service quality in mobile banking use intention. Some researchers have studied to find the factors that influence intent to use mobile banking. And many studies employed and tested portions of the [1] model to understand customers' use intention of mobile banking [2]. [3] propose an original information system (IS) success model in 1992. Based on original model, they suggest an updated model of IS success by adding service quality [1].

Although this model is a comprehensive information system model, it clearly needs further validation before it can serve as a model for the m-commerce included mobile banking. The IS success, Delone and McLean Model has not been empirically validated in the mobile environment and is not fully consistent with the belief-attitude-behavior chain in the consumer behavior studies [4].

Therefore, this model should be extended further to account for the mobile banking. At this point, there is a need for research to combine IS success model with the individual behavior model which explains system use behavior. Davis's Technology Acceptance Model (TAM) is a representative theory to explain a wide range of individual behaviors [5]. To understand consumer's mobile banking behavior within the mobile context, it is necessary to consider both information system and consumer behavior model.

Based on the literature regarding IS success and TAM, this study aims (1) to investigate the relationship between quality factors, system quality, information quality and service quality, and intention to use in mobile banking system, (2) to investigate the relationships among user friendliness, economic benefit, attitude toward mobile banking, and intention to use

II. THEORETICAL BACKGROUND AND THE RESEARCH MODEL

A. Quality of Mobile Banking

The IS success model, introduced by Delone and McLean [1], measures three dimensions: system quality, information quality, and service quality. Smartphone-based mobile banking's huge potential stems from its instantaneity and timeliness. Users can access mobile banking services anytime and anywhere. If this advantage of mobile banking disappears like mobility, accessibility, and convenience, then mobile banking may destroy itself. This is related to the establishment of system quality, and from a technical perspective, the strengthening of mobile banking's appeal through this establishment has been a key issue in development of mobile

banking. In general, mobile banking services currently focus on basic and essential features.

That is, although most retail banking services based on mobile banking are standardized, minor problems in system quality, a key quality feature, can cause an invasion of privacy, error of financial transactions, and hacking into bank's computer networks.

From this perspective, [6] provided an empirical analysis about excellence of system quality and emphasized an additional investment and strategic practice in order to estimate a trust and excellence of a system. Financial institutions provide the analysis information to customers on a real-time basis through mobile banking services to reflect the customer's response immediately and to apply and reprocess any valuable information gleaned from that response for enhancing customer satisfaction [7].

For dominant financial institutions, a use of CRM strategies through mobile banking is generalized and customers' continued use and breakaway are decided according to the synergistic effect after a connection with CRM. Despite the high potential of mobile banking services, a lack of successful case through strengthen of the customers loyalty and value creation for new business in mobile banking service indicates a lack of awareness about mobile banking firms' information quality. Due to the lack of previous direct experience, users need to rely on their perceptions such as information quality. Information quality reflects information relevancy, accuracy and timeless [8]. In terms of information quality, [9] emphasized the importance of permanent information and service quality control by providing quality information, continued quality improvement, and service improvement in order to invigorate the convergence services.

Given the rapid development of the mobile environment, it may be difficult for current mobile banking services to attract customers without differentiating themselves through quality. Therefore, to increase the value of mobile banking services, mobile banking providers should strengthen their service quality to accommodate the changing mobile environment. Mobile banking services have to provide customization services for customers according to the financial situations. When customers encounter any problems by usage of the mobile banking, mobile banking services have to give a prompt feedback for customers and solve the problems.

Service quality, which has received considerable attention from researchers in service marketing, refers to the gap between a customer's expectation and the actual outcome. Many studies have used SERVQUAL [10] to measure the quality of IT-based products or services such as mobile banking. In addition, some studies have employed an extended technology acceptance model to explain perceived usefulness and ease of use in the context of service quality [8]. [11] found that many marketing studies have used service quality to measure the success of information systems. [8] empirically analyzed the relationships between service quality, perceived usefulness, and perceived ease of use based on the technology acceptance model. [12] examined the relationships between the quality and attitudes to measure the user's acceptance of online shopping. Service quality is defined as the gap between expected and perceived services. Based on the above discussion, the quality of mobile banking services can be seen as the gap between a customer's expectation and the provided service, and if this quality exceeds the customer's expectation, and then he or she is likely to use mobile banking services. In this regard, we propose the following hypotheses to examine the relationship between mobile banking quality and attitudes toward mobile banking.

H1: System quality has a positive effect on intention to use mobile banking based on smart phone.
H2: Information quality has a positive effect on intention to use mobile banking based on smart phone.
H3: Service quality has a positive effect on intention to use mobile banking based on smart phone.

B. Technology Acceptance Model

[5] proposed the technology acceptance model (TAM) based on the theory of reasoned action. The TAM is a model for predicting and explaining IT users' adoption behavior. That is, to understand their behavior toward the adoption of some new information technology, the TAM explains the relationships between attitudes, behavioral intentions, and behaviors and considers perceived usefulness and ease of use as factors influencing IT beliefs. Because the TAM can be extended to other technologies and used for forecasting technology use, it widely considered a simple and practical model.

Previous studies have applied the TAM to a wide range of products and services and considered an increasingly diverse range of exogenous variables to enhance its predictive power [13]. [14] provided an empirical analysis of use intentions toward blogs based on attitudes toward blog use and community identification by using an extended TAM incorporating confidence.

[15] analyzed adoption intentions toward mobile data services by examining the relationships between private innovation, social impacts, trust, perceived usefulness, and use intentions based on an extended TAM. Financial services have traditionally been offered in physical environments built by retail banks, but MB services, which take advantage of mobile environments, have facilitated individual users' more efficient use of financial services.

[16] analyzed the factors influencing customers' adoption of mobile payment services by empirically examining the relationships between perceived

usefulness, perceived ease of use, attitudes, and intentions. to better understand technology adoption. Smartphone-based mobile banking offers a number of usable features that can be used anywhere, anytime (instant access). In this regard, we propose the following hypotheses, which address the relationships between perceived usefulness, perceived ease of use, attitudes, and use intentions in the context of smartphone-based mobile banking.

H4: Perceived usefulness has a positive effect on attitudes toward mobile banking.
H5: Perceived ease of use has a positive effect on attitudes toward mobile banking.
H6: Perceived ease of use has a positive effect on the perceived usefulness of mobile banking.
H7: Perceived usefulness has a positive effect on use intentions toward mobile banking.
H8: Attitudes have a positive effect on use intentions toward mobile banking.

III. RESEARCH METHODOLOGY

A. Data

We developed a questionnaire by selecting appropriate items from previous research, and based on the results of a pilot test, we revised the wording of the items. For the survey, we considered a sample of 328 mobile banking users in South Korea.
Table 1 shows the demographic characteristics of the respondents, including their gender, age, and educational level. Among them, 68.9% of the respondents were female. Most of the respondents were aged between 20 and 29.

B.Measurement

We selected the items from previous research. However, each item was formulated to fit the mobile banking context. All measurements were taken using a 7-point Likert scale ranging from 1 ('strongly disagree') to 7 ('strongly agree'). We measured system quality using items from [17]. Information quality was measured using four items drawn from [1] and [18]. Service quality was measured with four items adopted from [1], [10], and [11]. Items related to TAM were measured from [5]. Attitude to mobile banking was measured with three items adopted from [5]. Items measuring intention to use were adopted from [18].

IV. RESULTS

A. Validation and Measurement Model

We assessed the convergent and discriminant validity of the measurement model through a confirmatory factor analysis by using AMOS. To determine the fit of the measurement model, we considered X2, RMSEA, GFI, AGFI, NFI, and CFI. The measurement model provided a good fit to the data (X2 = 417.365, df = 221 (X2 / df = 1.889), RMSEA = 0.040, GFI = 0.941, AGFI = 0.921, NFI = 0.948, CFI = 0.975). We assessed the measurement model for construct reliability and validity (see Table 1).
The results for all constructs indicate sufficient convergent validity. Finally, AVE exceeded all correlations, demonstrating sufficient discriminant validity between the constructs.

Table 1: Descriptive Statistics for Scales

Factors	Items	Estimate	t-Value	Cronbach's Alpha	AVE
System uality	SY1	1.000	-	0.78	0.64
	SY2	0.956	13.03		
Information quality	IQ1	1.000	-	0.90	0.69
	IQ2	0.962	28.33		
	IQ3	0.852	24.19		
	IQ4	0.768	21.46		
Service quality	SQ1	1.000	-	0.84	0.59
	SQ2	0.958	23.44		
	SQ3	0.748	15.67		
	SQ4	0.824	19.56		
Perceived Usefulness	PU1	1.000	-	0.86	0.76
	PU2	0.809	16.62		
	PU3	0.989	20.68		
	PU4	0.985	22.38		
Perceived Ease of Use	PE1	1.000	-	0.72	0.58
	PE2	0.882	10.27		
	PE3	0.915	10.39		
	PE4	0.881	10.31		
Attitude	A1	1.000	-	0.82	0.62
	A2	0.740	15.94		
	A3	0.951	21.34		
Intention to use	I1	1.000	-	0.84	0.63
	I2	0.964	21.21		
	I3	0.797	18.25		

B.Structural Model

The hypotheses were tested using structural equation modeling with AMOS. The results for all indices for the structural model provided a good fit to the data (X2 = 443.978, df = 225 (X2 / df = 1.973), RMSEA = 0.041, GFI = 0.937, AGFI = 0.916, NFI = 0.945, CFI = 0.972). The results provide support for all hypotheses except for H1. First, system quality had no effect on attitudes toward MB ($\beta = 0.026$, $t = 0.419$), providing no support for H1. However, information and service quality had significant positive effects ($\beta = 0.258$, $t = 5.273$), providing support for H2 and H3, respectively. This suggests that information and service quality can be an important source of competitive advantage for MB with respect to other services such as internet and offline banking.

Second, consistent with the findings of previous studies, perceived ease of use (β = 0.246, t = 4.714) and perceived usefulness (β = 0.220, t = 4.150) had significant positive effects on attitudes toward MB, providing support for H4 and H5. This suggests that because MB users are familiar with smartphone features and thus can use those features, they are likely to have favorable attitudes toward MB. Third, perceived ease of use had a significant positive effect on perceived usefulness (β = 0.414, t = 10.141), and perceived usefulness (β = 0.283, t = 6.918) and attitudes (β = 0.450, t = 10.449) had significant positive effects on use intentions toward MB, providing support for H6, H7, and H8. Use intentions toward MB were largely explained by perceived usefulness and attitudes, implying that positive attitudes toward MB were the most important determinant of use intentions.

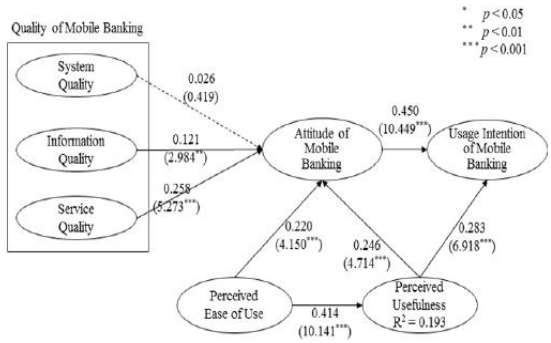


Fig. 1. Result of the research model

CONCLUSION

By taking advantage of mobile devices, MB can provide customers with financial services anytime, anywhere. MB has been considered as one of the most innovative services, and its quality is expected to improve substantially. However, MB users have experienced various inconveniences such as complex account input and certification procedures. In this study, we examined the relationship between MB quality (system, information, and service quality) and attitudes toward MB.

The results can be summarized as follows: First, perceived usefulness and perceived ease of use had significant positive effects on attitudes toward MB and that perceived ease of use had a significant positive effect on perceived usefulness. In addition, perceived usefulness and attitudes had significant positive effects on use intentions toward MB. Shih (2004) employed the TAM and found that the adoption of internet shopping is significantly related to perceived usefulness, perceived ease of use, and attitudes. The results of this study are generally consistent with the findings of previous studies, demonstrating that the TAM is an appropriate model for measuring mobile users' adoption of MB. Second, system quality had no significant effect on attitudes toward MB. [19] employed an extended TAM and found that system quality, information quality, and service quality are important determinants of attitudes toward internet shopping. In this regard, the results of the present study are inconsistent with the findings of previous studies. That is, MB users may not perceive a significant difference in system quality between smartphones and regular mobile phones. In addition, because system quality is generally high for internet banking, smartphone-based MB users may not perceive a high level of system quality. Third, information quality had a significant positive effect on attitudes toward MB, providing support for the findings of previous research [19]. Finally, consistent with previous research, service quality had a significant positive effect on attitudes toward MB.

The results have important implications. First, mobile banking customers are likely to emphasize convenient searches and access to financial information. In this regard, to attract more smartphone-based MB users, banks should place great emphasis on information quality. Second, the results suggest that service quality is the most important factor in MB. In addition, an increase in the number of smartphone users should lead to the increased use of smartphone-based MB, and in this regard, service quality may be the most important determinant of MB success. Finally, the results verify that the TAM can explain smartphone users' adoption of MB. In addition, because smartphone-based MB offers easy access by being available anytime, anywhere, it is expected to attract an increasing number of users in the future.

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