FACTORS INFLUENCING THE ADOPTION OF MOBILE BANKING – THE BRAND PERSPECTIVE

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ABSTRACT

The purpose of this study is to investigate the determinants of customers' satisfaction on M-banking and their intention to use M-banking by integrating Information Systems Success Model and the concept of brand images. The survey methodology was utilized and subjects included MBA students and business people in Taiwan. A total of 174 valid questionnaires were collected. Partial Least Squares was utilized to test the proposed model. The results indicated that information quality, service quality, and brand image affected customer satisfaction, while customer satisfactions had an impact on customers' intention to use M-banking.

Keywords: Mobile Banking, Brand Image, Information Systems Success Model

INTRODUCTION

With the advances in mobile technologies, banks can leverage Mobile-banking (M-banking) as an important, boundless, convenient, and highly interactive channel for financial services. Banks can provide their customers with more immediate financial services. Consequently, M-banking is one of the most important applications in the financial industry [1]. The primary characteristics of M-banking include meeting customers' requirements of ubiquitous financial services and the integration of the functions of telephone banking and automatic teller machines [2]. The only thing that customers need to do is simply using mobile communication devices, which can display their financial information including deposit, credit card balances, and so forth. Therefore, M-banking can assure customers of acquiring financial services anytime and anywhere.

Though there are still many limitations on M-banking, M-banking will play an important role in the financial industry. The services provided by financial industry will include banking, insurance, and securities. Besides, the financial industry can provide customers more convenient one-stop integrated services through activities such as joint marketing, information cross-sharing, and combined selling of financial products. In this trend, banks will require to fulfill the customer demands by means of multi-channel services. Hence, M-banking will become an important platform which banks can interact with their customers.

Previous studies [3][4][5] indicate that although mobile communication has been quite prevailing recently, M-banking does not gain much popularization among the public. Such a phenomenon might indicate that customers concern themselves with the adoption of M-banking. Therefore, there are still many research spaces for the adoption of M-banking [6]. Although the issues of M-banking adoption have drawn lots of attentions from researchers to investigate, most studies [5][7][8] have been conducted through the lense of either Innovation Diffusion Theory [8][9][10][11] or Technology Accpetance Model [1][5][13][14][15][16]. However, previous study [12] has pointed out that traditional adoption

models are insufficient to gain a comprehensive understanding of the factors that affect individuals' intention to adopt mobile commerce services. Therefore, using different perspectives to investigate the factors affecting the adoption of M-banking were required.

In Marketing, an important factor affecting customers to adopt new products or services depend on the brand image of that company [17]. To better understand customers' attitudes toward M-banking, the brand image is incorporateded in this study to investigate the critical factors that affecting customers' adoption of M-banking, which is expected to be helpful for banks in the promotion of M-banking to customers.

LITERATURE REVIEW

M-banking

M-banking, also referred to as cell phone banking, is the use of mobile devices such as cell phones or personal digital assistants (PDAs) to access banking networks via the wireless application protocol (WAP), 3G (3rd Generation), or Wireless Lan. Through M-banking, customers can access banking services such as account management, information inquiry, money transfer, and bill payment [4][13]. M-banking has the potential to provide ubiquitous financial services. However, the acceptance rate of M-banking is still not as high as expected [3][4][5]. The reasons why M-banking is not well accepted include differences in technical specification, easily disruption of usage, privacy or security concern, and lack of trust between banks and telecom carriers [18][19]. Although there are many studies [7][8][10] focus on the adoption of M-banking, research from the perspective of brand image is still scarce.

Information Systems (IS) Success Model

For attracting customers to use M-banking, banks provide various types of financial products or services on M-banking. In addition, banks also provide customers with sufficient information and ease to use interfaces. M-banking is one of the most successful applications of electronic commerce [18]. When organizations promote the applications of electronic commerce, they must depend on the support of IS. While the establishment of high quality IS relies on the help of other supporting factors, DeLone & McLean [20] propose IS Success Model to evaluate the success of IS. With the proliferation of electronic commerce, DeLone & McLean [21] [22] further propose a revised model for broader scope of application which consists of six constructs, namely, system quality, information quality, service quality, customer satisfaction, use, and net benefits.

Brand Images

The brand image refers to a set of associations toward a brand [23] and exists in consumer's mind and is connected with the association of a brand [24]. Kotler [25] asserts that brand image is a brand belief which a consumer develops for each brand in terms of its attributes and used to distinguish the product or service of different sellers and competitors. The European Customer Satisfaction Index model incorporates corporate image and validates that corporate image has a direct effect on customer satisfaction [26]. This study adopts the customer image, product image and enterprise image of brand association to represent the construct of brand image.

User Satisfaction

In the field of IS, user/customer satisfaction is a common measure of IS success, for which several standardized instruments have been developed and validated [27]. In M-banking service, in particular, satisfaction depends on numerous factors (e.g. IS quality, banking service, interface design, and trust) [28]. User satisfaction is a perceptual or subjective measure to determine IS effectiveness [29]. It can also be an adequate substitute for objective measures of IS effectiveness. Therefore, this study applies

customers' perceputal satisfaction for measuring customers' attitude to understand the determinants of M-banking adoption even customers do not have M-banking experiences since the use of M-banking is still not common [7][9][10][11][14].

RESEARCH MODEL AND HYPOTHESES

Based on the above-mentioned theoretical foundations, namely, IS Success Model, brand images, and customer satisfaction, this study proposes a research model (As depicted in Fig. 1) consisting of seven constructs (i.e., system quality, information security quality, information quality, service quality, brand images, customer satisfaction, and intention to use M-banking.

The measurement of system quality typically focuses on the desired characteristics of the IS itself which produces the information [9]. System quality is measured in terms of interactivity, access, usability, and respnose time [30]. Prior studies also reveal that M-banking or Internet banking acceptance will be affected by information security concern [31][32]. Thus, this study adopts information security qaulity to measure customer beliefs concerning the security protection of M-banking. Information security qaulity is defined as the extent to which a person believes that using M-banking will be free of security and privacy threats [33].

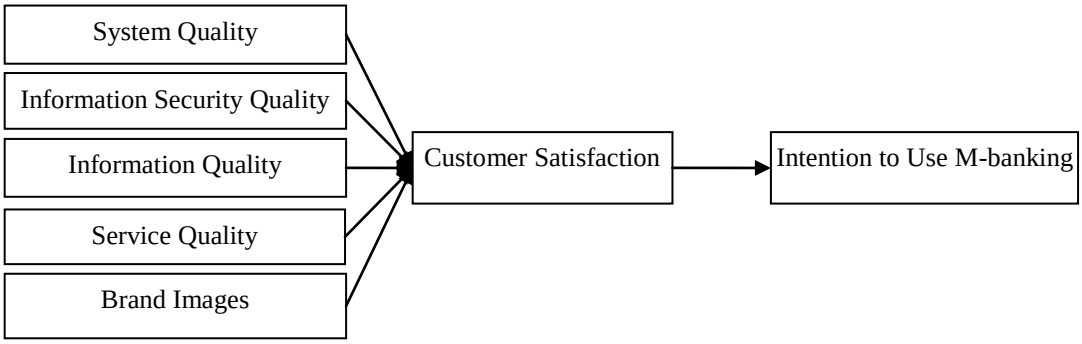

Figure 1. Research model

Information quality focuses on the information content provided by M-banking, this study defines information quality as measures of M-banking information output [20]. According to previous literatures [27][30], higher information quality is expected to lead to higher customer satisfaction. Information quality is measured in terms of accuracy, timeliness, completeness, relevance, and consistency [21]. Service quality means the overall support delivered by the service provider [21]. Prior literatures also reveal that service quality is the antecedent of customer satisfaction [34][35][36]. Service quality is measured in terms of reliablility, responsiveness, assurance, and empathy [37]. Biel [24] defines brand images as perceptions about a brand as reflected by the brand associations held in consumers' memory. This study measures brand image in terms of customer image, product image and enterprise image [38]. Customer satisfaction primarily has been measured by various subsets of beliefs about specific systems, information, and other related characteristics [39]. This study defines customer satisfaction as the degree to which potential M-banking customers' expected feelings about M-banking services, which is the perceptions of internal belief and attitude [39][40]. Prior literatures also find that customer satisfaction has an impact on the intention to use products or services [41]. The above-mentioned arguments lead to the following hypotheses:

H_1: There is a positive relationship between system quality and customer satisfaction about the use of M-banking service.
H_2: There is a positive relationship between information security quality and customer satisfaction about the use of M-banking service.

H_3: There is a positive relationship between information quality and customer satisfaction about the use of M-banking service.
H_4: There is a positive relationship between service quality and customer satisfaction about the use of M-banking service.
H_5: There is a positive relationship between brand image and customer satisfaction about the use of M-banking service.
H_6: There is a positive relationship between customer satisfaction and intetion to use of M-banking service.

METHODOLOGY

Intrument Development

Most of the questionnaire items were adapted and modified from prior validated studies [27][30][33][37][39][40][42][43][44]. In order to improve the reliability and validity of this instrument, a panel of experts (including academia and practitioners) was formed to review each question and make necessary changes. After that, a pilot study was employed. The questionnaires were then sent to several potential M-banking customers to test. The results were further reviewed by the panel for improvement. After this two-round process, a final questionnaire was develoed.

The survey instrument was divided into two major parts. The first part was the respondent's demographic information such as gender, age, education level, job occupation, and income. The second part contained questions regarding the seven constructs of the investigated model. Each construct was measured by multi-item questions adapted from previous validated literatures and each item was measured in five-point Likert scale.

Sample and Data Collection

MBA students and business people were recruited as subjects for this study. Previous studies [2][7] assert that 1) 14-18 year old people are main population in the use of mobile services, 2) young adult people have primarily financial basis to conduct M-banking, and 3) 25-60 year old business people are major potential customers of M-banking services. Therefore, this study proposes that subjects are among the potential adopters of M-banking. Convenience sampling was utilized in this study and data was collected through online survey for about two months.

RESULTS

A total of 182 responses were collected by this study. After disgarding 8 incomplete responses, the online survey yielded 174 valid responses. Since the effective sample size of this study was only 174, which was inappropriate to use covariance-based structural equation modeling for data analysis [45]. Therefore, this study adopted Partial Least Squares (PLS) [46] to estimate the measurement and structural parameters. The PLS software utilized was Smart PLS 2.0 M3 [47].

Demographic Data Analysis

Demographic statistics indicated that female (52.9%) was more than male (47.1%). Age of the respondents was between twenties (27.0%) and thirties (50.0%). Most of the respondents have an income of 40,001-70,000 in NT dollars (51.7%). Most respondents are familiar with computers (95.4%) and the Internet (96.7%). In addition, 37.4% of respondents have experiences of M-banking.

Measurement Model

The examinations of measurement model aimed at the analysis of reliability and validity, including three main parts [48, p. 198]: 1) item reliability; 2) convergent validity; 3) discriminant validity. In the

analysis of item reliability, this study utilized principal component analysis provided by PLS [49, p. 93]. The selection criteria is the cross loadings of the measurement items. Previous study [48] suggested that measurement items should be dropped when the loading is lower than 0.7. According to this rule, one item was removed from information quality and five items were dropped from brand images. Thus, a second-run factor analysis indicated that all the loadings were greater than 0.7, which conformed to the suggested criteria. Furthermore, the lowest composite reliability (CR) of this study was 0.91 (customer satisfaction) which was greater than the cut-off value of 0.7 [46]. The lowest average variance extraction (AVE) of this study was 0.58 (service quality), which was also greater than the recommended threshold of 0.5 (Henseler et al., 2009), indicating that the dimensions of this study were both sufficient in reliability and convergent validity [50]. As for the discriminant validity, the judging criterion [51] is the square root of the AVE must exceed the correlation coefficients between dimensions. The results illustrated that all variables met the above criteria, which indicated that the measurements of this study were also sufficient in discriminant validity. The result of reliability and discriminant validity testing is shown in table 1.

Table 1. Reliability and Discriminant Validity

Variables	AVE	Correlation Coefficients (diagonal were the square root of AVE)							Mean	Stddev	CR	Cronbach's α
		SQ	Sec	IQ	ServQ	BI	CS	ItoU				
SQ	0.58	**0.76**							4.15	0.56	0.94	0.93
Sec	0.92	0.58	**0.96**						4.66	0.67	0.97	0.96
IQ	0.61	0.67	0.52	**0.78**					4.10	0.57	0.93	0.92
ServQ	0.71	0.59	0.48	0.71	**0.84**				4.18	0.62	0.96	0.96
BI	0.72	0.20	0.04	0.34	0.31	**0.85**			3.57	0.58	0.91	0.87
CS	0.75	0.23	0.13	0.32	0.15	0.39	**0.87**		4.10	0.65	0.92	0.89
ItoU	0.83	0.19	0.13	0.28	0.10	0.33	0.78	**0.91**	3.39	0.78	0.94	0.90

Note: SQ-Service Quality, Sec-Security, IQ-Information Quality, ServQ-Service Quality, BI-Brand Images, CS-Customer Satisfaction, ItoU-Intention to Use

Structural Model

To test the effects and statistical significance of the parameters in the structural model, this study uses a bootstrapping procedure with 500 resamples [52, p. 323]. At a significance level of 0.05, the results reveal a positive and significant effect for information quality and brand images on customer satisfaction, whereas service quality has a significant negative effect on customer satisfaction. Furthermore, customer satisfaction exhibits a positive and significant effect on behavior intention. The R^2 for customer satisfaction is 0.217 and R^2 for behavior intention is 0.615. The result of hypothesis testing is shown in Fig 2.

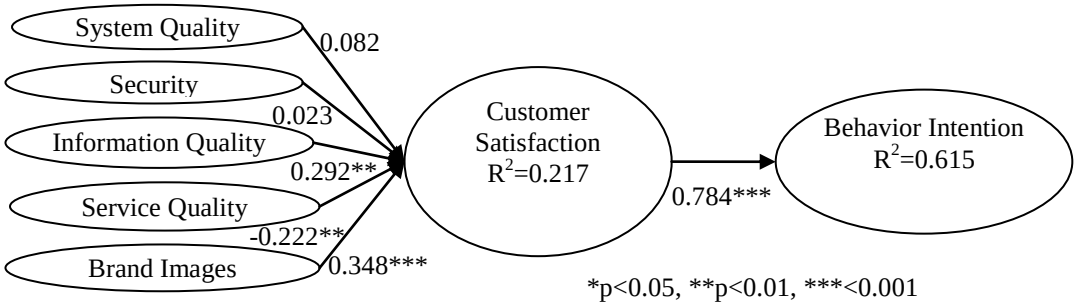

Figure 2. Structural Model

DISCUSSIONS AND CONCLUSIONS

First of all, there is no significant relationship between system quality and customer satisfaction. This study infers that the insignificant result might be due to that most respondents do not have experiences on M-banking. Second, there is also no significant relationship between information security and customer satisfaction. However, the average Likert scale scores exceed 4.5 indicating that the respondents place high importance on security, which is similar with the results of Suoranta's [53] investigation. Based on this finding, this study articulates that although the customers hold that the security mechanism of mobile banking is important, if the security measures are complicated, customers might think that mobile banking is not easy to use which results in the dissatisfaction with M-banking [54][55].

Third, there is a significant relationship between information quality and customer satisfaction. The primary purpose of bank customers using M-banking is to obtain the necessary banking services anytime and anywhere [56]. Banks can provide high quality and stable information is an important factor for the satisfaction of bank customers. Therefore, M-banking services can provide complete, realtime, and accurate financial information will affect the satisfaction of M-banking customers [28][57]. Fourth, there is a significant relationship between service quality and customer satisfaction, but the direction is negative. In other words, the higher service quality leads to lower customer satisfaction. Previous marketing research [58] indicates that in spite of the higher service quality provided by business, customers complain more when they encounter problems due to customers' higher expectations for business. As far as banks is concerned, customers are willing to give banks other chances to improve even they have a lot of complains about banking services. Therefore, customers may complain about the service quality of mobile banking services while they are still satisfied about mobile banking services.

Fifth, there is a significant relationship between brand image and customer satisfaction. Previous studies also point out that the brand image will affect customer satisfaction [23][59] and loyalty [59][60]. Thus, the bank image might affect the customer satisfaction of M-banking. Lastly, there is a significant relationship between customer satisfaction and behavior intention, in other words, if customers are satisfied with banks, it is possible that they will use M-banking services. The M-banking service is also one kind of services, which is the same as the customer service-based portals or IS. When customers are satisfied with the services, they are willing to use the services.

The study finds that brand image is the primary dimension that affects customer satisfaction. It's the customer who decides whether to use M-banking. Consequently, in addition to the content and quality of M-banking services, the bank images can also reinforce the willingness of customers to use. The banks may hope to win or retain a positive image among technology-savvy sections of the society and strengthen the brand-reputation of being innovative and visionary [2, p. 117]. Furthermore, information quality has the second highest impact on customer satisfaction, which indicates that the availability of complete, realtime, and accurate financial information will affect the willingness of customers on the use of M-banking services.

Contributions of this study can be divided into academic and practical. For academic, future research could focus on brand images to expand the direction of research. For the practice, in order to promote the usage of M-banking, the banks should pay more attention to the image of banks and the building of brands besides the function, security, and information of M-banking systems, which will have a positive impact on the promotion of M-banking. However, this study utilized a cross-sectional rather than longitudinal observation, which might not be able to reflect the impact on the dimensions of the framework when time changes. Further investigation might be necessary to validate the research model and the generalizability of the study.

REFERENCES (The full reference list available upon request from authors.)