

Customer's Adoption of Mobile-Commerce A Study on Emerging Economy

Rahmath Safeena, Nisar Hundewale, and Abdullah Kamani

Abstract—Today, mobile communication technologies provide immense additional scope for consumers' banking transactions due to their always-on functionality and the option to access bank's facilities anytime and anywhere. Mobile banking is a subset of electronic banking which underlies not only the determinants of the banking business but also the special conditions of mobile commerce. It is the latest and most innovative service offered by the banks. But not enough study has been done to know regarding how customers perceive and evaluate electronically delivered mobile banking services. The study considers five factors perceived usefulness, perceived ease of use, subjective norm, consumer awareness about mobile banking and perceived risks associated with mobile banking. This study also points out that these factors have a strong and positive effect on customers to accept mobile banking system.

Index Terms—m-commerce, mobile banking; perceived usefulness, ease of use, risk, awareness, subjective norm.

I. INTRODUCTION

The proliferation of, and rapid advances in, technology-based systems, especially those related to the internet, are leading to fundamental changes in how companies interact with customers [1-3]. Mobile phone usage has spread in a very broad manner both in developing and developed countries. With mobile communications already as a prime case for leapfrogging traditional infrastructure, mobile banking (M-Banking) has great potential for extending the provision of financial services to unbanked people through a technology that is both familiar and widespread. One of the first commercial applications of the mobile commerce was mobile banking (m-banking) [4], [5]. The rapid growth of mobile applications has given rise to a new term: m-commerce. M-commerce is defined as the application of wireless communications networks and devices to the execution of transactions with monetary value – either direct or indirect [6]. As the number of mobile phone users is growing, purchasing products and services using mobile phones and other mobile devices are also increasing; also the use of Mobile Banking is still in initial stages and more research in this field is needed [7]. Internet banking and mobile banking (m-banking) has become the self-service delivery channel that allows banks to provide information and offer services to their customers with more convenience via

the web services technology. A key component of many initiatives is the implementation of Customer Relationship Management (CRM) software [8]. Many companies in the financial services sector have been quick to implement Internet capabilities, and electronic service is becoming a viable option for interaction between financial service providers and their customers [9]. Customer satisfaction and customer retention are increasingly developing into key success factors in e-banking [2]. Technology, in particular, has been increasingly employed in service organizations to enhance customer service quality and delivery, reduce costs, and standardize core service offerings [1], [9-11]. Mobile banking service allows customers to manage their accounts with ease.

Mols et al., [12] stated that the diffusion of electronic banking is more determined by customer acceptance than by seller offerings. Not enough is known regarding how customers perceive and evaluate electronically delivered services. Lee and Lin [10] have also recently highlighted the need for further research to measure the influence of e-service on customer-perceived service quality and satisfaction [1]. This study considers the five factors perceived usefulness, perceived ease of use, subjective norm, consumer awareness about mobile banking and perceived risks associated with mobile banking. Half of the people that have tried mobile banking services will not become active users. Highly publicized cases involving major security failures might have contributed to the public's concern and lack of acceptance of mobile banking. The present study aims at examining the impact of perceived usefulness, perceived ease of use, subjective norm, and consumer awareness on mobile banking and perceived risk on the acceptance of mobile banking by the consumers.

II. MOBILE BANKING

With mobile commerce or m-commerce technology, consumers can use mobile phones, Personal Digital Assistant (PDA) and laptop computers to access the internet, send and receive messages and make transactions at any time from any places without having tied to a particular location [13].

Mobile banking is a subset of electronic banking which underlies not only the determinants of the banking business but also the special conditions of mobile commerce. Mobile Banking has been gaining increasing popularity amongst various sections of the society for past few years, having recovered from the shock of the dot-com burst [14]. Mobile Banking refers to provision and availment of banking- and financial services with the help of mobile telecommunication devices. The scope of offered services may include facilities

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to conduct bank and stock market transactions, to administer accounts and to access customized information [15]. With mobile technology, banks can offer services to their customers such as doing funds transfer while travelling, receiving online updates of stock price or even performing stock trading while being stuck in traffic. Smart phones and 3G connectivity provide some capabilities that older text message-only phones do not. The convergence of mobile communications and distributed networked computing has provided the foundation for the development of a new channel of electronic business, mobile business [15]. Mobile business (m-business) is defined as the use of the mobile information technologies, including the wireless Internet, for organizational communication and coordination, and the management of the firm [16]. M-Banking is a term used for performing balance checks, account transactions, payments, credit applications etc. via a mobile device such as a mobile phone or Personal Digital Assistant (PDA). It is the convenient, simple, secure, anytime and anywhere banking. Many new e-commerce applications will be possible and significantly benefit from emerging wireless and mobile networks. These applications can collectively be termed wireless e-commerce or mobile commerce [17]. The earliest mobile banking services were offered via SMS. With the introduction of the first primitive smart phones with WAP (wireless application protocol) support enabling the use of the mobile web in 1999, the first European banks started to offer mobile banking on this platform to their customers [15]. SMS Banking is a Mobile technology that allows you to request and receive banking information from your bank on your mobile phone via SMS [18]. WAP banking is another form of the E-banking that enables the user to communicate interactively with the bank, for which client uses only GSM mobile phone with WAP service. With its options and the method of controlling WAP banking reminds an easy form of Internet banking. WAP is a universal standard for bringing Internet-based content and advanced value-added services to wireless devices such as phones and PDAs [19].

III. CONSUMER ATTITUDE TOWARDS M-BANKING

Technological innovations are having significant importance in human general and professional life. This era can safely be attributed as technology revolution. The quick expansion of information technology has imbibed into the lives of millions of people. Rapid technology advancements have introduced major changes in the worldwide economic and business atmosphere [20]. Research on consumer attitude and adoption of mobile banking showed there are several factors predetermining the consumer's attitude towards online banking such as person's demography, motivation and behavior towards different banking technologies and individual acceptance of new technology. It has been found that consumer's attitudes toward online banking are influenced by the prior experience of computer and new technology [21]. The adoption of electronic banking forces consumers to consider concerns about password integrity, privacy, data encryption, hacking, and the protection of personal information [22]. Electronic banking requires perhaps the most consumer involvement, as it requires the

consumer to maintain and regularly interact with additional technology (a computer and an Internet connection) [23]. Consumers who use e-banking use it on an ongoing basis and need to acquire a certain comfort level with the technology to keep using it [24]. Customer adoption is a recognized dilemma for the strategic plans of financial institutions. Several studies have investigated why individuals choose a specific bank. Important consumer selection factors include convenience, service facilities, reputation and interest rates [25], [26]. According to Delvin [27], customers have less time to spend on activities such as visiting a bank and therefore want a higher degree of convenience and accessibility. The service-quality attributes that the Internet banks must offer to induce consumers to switch to online transactions and keep using them are perceived usefulness, ease of use, reliability, responsiveness, security, and continuous improvement [28].

In another study by [29], they found that individual expectations regarding accuracy, security, network speed, user-friendliness, and user involvement and convenience were the most important quality attributes in the perceived usefulness of Internet-based e-retail banking. The crucial factors that affect an individual's decision to use or not to use online services the age, the difficulties of using the Internet, fear of changes in banking sector due to technological development and lack of information concerning products and services provided to customers through electronic delivery channels. Factors such as speed of transactions or the cost of using the Internet have little impact on an individual's final decision [30]. In the study by [1], revealed six composite dimensions of electronic service quality, including the provision of convenient/accurate electronic banking operations; the accessibility and reliability of service provision; good queue management; service personalization; the provision of friendly and responsive customer service; and the provision of targeted customer service. Perceived usefulness, security and privacy are the main perusing factors to accept online banking system [20]. According to a study WAP, GPRS and 3G features from mobile devices are of no significance or influence in the adoption of e-banking services [31].

IV. RESEARCH MODEL AND HYPOTHESES

Perceived usefulness and perceived ease of use are the two components of Technology Acceptance Model (TAM). According to [32], "perceived usefulness is the extent to which a person believes that using a particular system will enhance his or her performance, while perceived ease of use is the extent to which a person believes that using a particular system will be free of effort". TAM has been widely used by information system researcher; there is a common agreement among them that the model is valid in predicting the individual's acceptance of new technologies [33-36]. Perceived usefulness and perceived ease of use is significant factors affecting acceptance of an information system or new technologies. Prior research has empirically found positive relationship between perceived ease of use and perceived usefulness as critical factors on the use of e-banking [31], [37-39]. Hence an application perceived to be useful

perceived to be easier to use than another is more likely to be accepted by users. By applying these into online banking context we hypothesize:

H1: Perceived usefulness has a positive effect on intention to adopt and use MB.

H2: Perceived ease of use has a positive effect on intention to adopt and use MB

Adoption is the acceptance and continued use of a product, service or idea. According to [40], [41], consumers go through “a process of knowledge, persuasion, decision and confirmation” before they are ready to adopt a product or service. The adoption or rejection of an innovation begins when “the consumer becomes aware of the product”. Consumers will seek out services which offer the best value for money. Hence, for adoption of mobile banking, it is necessary that the banks offering this service make the consumers aware about the availability of such a product and explain how it adds value relative to other products of its own or that of the competitors. An important characteristic for any adoption of innovative service or product is creating awareness among the consumers about the service/product [40]. The amount of information consumers have about online banking has been identified as a major factor impacting the adoption. According to [40], while the use of online banking services is fairly new experience to many people, low awareness of online banking is a major factor in causing people not to adopt online banking. In an empirical study of Australian consumers found that consumers were unaware about the possibilities, advantages/disadvantages involved with online banking. Hence, we posit that:

H3: Awareness about MB has a positive effect on intention to adopt and use MB

Perceptions of risk are a powerful explanatory factor in consumer behavior as individuals appear to be more motivated to avoid mistakes than to maximize purchasing benefits [42]. The construct Perceived Risk reflects an individual’s subjective belief about the possible negative consequences of some type of planned action or behavior, due to inherent uncertainty. Pavlou [43] refers to perceived system risk as the overall amount of uncertainty perceived by an organization in a particular purchase situation. The Perceived Risk associated with online transactions may reduce perceptions of behavioral and environmental control, and this lack of control is likely to negatively influence e-commerce usage intentions [44]. Similar is with m-commerce applications. Diffusion of innovation literature is often silent on perceived risk as a factor influencing the diffusion of an innovation, despite adoption behavior often being a process of dealing with the uncertainty about incorporating an innovation into ongoing practice [45]. Services are inherently more risky than products and that the major reason for this is the higher levels of uncertainty which are associated with services [42], [46], [47]. Polatoglu and Ekin [48] also found that perceived risk was one of the major factors affecting consumer adoption, as well as customer satisfaction of mobile banking services. Perceived risk usually arises from uncertainty. Hence we hypothesize:

H4: Perceived risks have a negative impact on intention to adopt and use MB.

Subjective norm is the perceived social pressure to engage

or not to engage in a behavior. Subjective norm is determined by the total set of accessible normative beliefs concerning the expectations of important referents [49]. It is the person’s perception that most people who are important to him think he should or should not perform the behavior in question [50].individual often respond to social normative influences to establish a favorable image within a reference group. Moore and Benbasant define image as the degree to which use of an innovation is perceived to enhance one’s status in social system [51].

H5: Subjective norm has a positive effect on intention to adopt and use MB.

RESEARCH METHODOLOGY

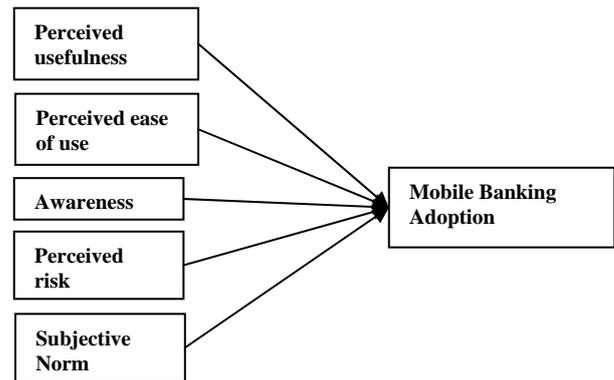


Fig.1. RESEARCH MODEL

The key intention of this paper is to evaluate those factors that manipulate the nature of customers towards mobile banking and their growing tendency towards the online financial institutions. A survey instrument in the form of questionnaire was developed through data collected from previous studies on acceptance of mobile banking. We constructed several questions in the questionnaire based on the objectives of the research. SPSS 12 package was used for analysis. Likert scale is used in order to identify the respondents’ perceptions towards mobile banking adoption. During the interviews we sought general information from the managers about mobile banking and asked them to discuss the reasons for undertaking mobile banking and to highlight mobile banking development challenges. We also asked them to discuss the issues relevant to the future of the initiative. The questionnaires were based on customers’ intention to adopt mobile banking.

Sample

Convenience sampling method was used. It is a type of non-probability sampling which involves the sample being drawn from that part of the population which is close to hand, i.e, sample population selected because it is readily available and convenient. The reasons of using this sampling type are twofold. First, it offers an easy way to obtain the raw data for the further analysis. Second, it saves times and costs since the respondents can be randomly selected. Choosing this campus is because of two reasons. First, those business and economics student are revealed with the knowledge of applied business and economics. At the same time, they are equipped with the knowledge of computer science, where the concept of mobile banking is not an alien for these students. Second, it was found that there is no study ever conducted in

the campus, it leaves a motivation to the research to perform a study in order to investigate the students' adoption for mobile banking in the near future. Table 1 shows the profile of the respondents. The sample shows that the number of male (78.84%) respondents is higher than the number of female (21.15%) respondents. The sample shows that the largest age group that responded was from 20 to 30 years of age (82.7%), followed by age 31 to 40 (11.5%), then 41 to 50 (03.8%) and >50 (1.9%). In the education background more than 55% of the respondents were postgraduate students and more than 28% were graduate students and 11.5% were PhD students.

TABLE I: PROFILE OF THE RESPONDENTS

Demographics	Items	No. of Respondent	Percent
Gender	Male	42	78.84
	Female	11	21.15
Age group	20-30	43	82.7
	31-40	6	11.5
	41-50	2	3.8
	>50	1	1.9
Education	Graduate	15	28.8
	Postgraduate	29	55.8
	PhD	6	11.5
	Other	2	3.8

V. DISCUSSION AND FINDINGS

Although mobile banking provides flexibility in performing financial transaction, fast and easy, however individuals are still reluctant to adopt the system because of several reasons. First, the security and privacy are two elements in the perceived risk. Without a proper knowledge of the system, individuals are not interested to test the system. Perceived usefulness, ease of use and consumer awareness has positive impact on the intention to adopt mobile banking while perceived risk has negative impact on it. When online banking is perceived as useful, customer's intention to adopt it would be greater. Likewise bank customers are likely to adopt mobile banking when it is easy to use. Social influence has positive effect on the use of mobile technology as the individuals think that using the advanced technology will improve his image and status in the society and also it improves his performance. This shows that bank customers anchor their online banking adoption intention to the beneficial outcomes and ease of use process of the system. This finding is particularly important for managers as they decide how to allocate resources to retain and expand their current customer base. However, building a risk-free online transaction environment is much more difficult than providing benefits to customers. Further, the research instrument was tested for reliability using Cronbach's coefficient alpha estimate.

The Cronbach's alpha values for all dimensions range from 0.60 to 0.93, exceeding the minimum alpha of 0.6 [52], thus the constructs measures are deemed reliable. Principal component factor analysis with a varimax rotation was conducted. The aim of factors analysis is to confirm the construct validity of the scales could be performed adequately by using principle component analysis. In order to reach this, the minimum factor loading of 0.6 on its hypothesized constructs is proposed by Nunnally [53]. A number of analyses were conducted for factors analysis.

Factor loading values were obtained using varimax rotation. According to the above table, most of the factor loading for each instrument exceeded 0.6, meeting the essentially significant level of convergent validity. Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 6 iterations. Using eigenvalue greater than 1 as a selection criterion. Each has cumulative frequency of 21.11, 43.16, 52.85, 58.55 and 69.94 percent respectively. These factors accounted for 69% of the variance and the factor loading were greater than 0.6. Hence the results show that H1, H2, H3, H4 and H5 are confirmed. The results are consistent and are supported by previous studies.

TABLE II: RELIABILITY TEST

Determinants	No. of items	Reliability
PU	7	0.834
PEU	5	0.760
AW	7	0.836
PR	6	0.600
SN	2	0.778

TABLE III: FACTOR LOADING

PU	PEU	AW	PR	SN
PU1-0.680	PEU1-0.558	AW1-0.850	PR1-0.833	SN1-0.901
PU2-0.681	PEU2-0.577	AW2-0.711	PR2-0.658	SN2-0.886
PU3-0.761	PEU3-0.537	AW3-0.658	PR3-0.759	
PU4-0.827	PEU4-0.569	AW4-0.600	PR4-0.650	
PU5-0.664	PEU5-0.824	AW5-0.662	PR5-0.679	
PU6-0.735		AW6-0.662	PR6-0.741	
PU7-0.647		AW7-0.658		

TABLE IV: FACTOR EXPLANATIONS.

Code	Statements
PU1	MB gives flexibility to conduct banking business 24 hours/day
PU2	MB transactions save more time.
PU3	MB makes it easier for me to do my banking.
PU4	MB helps me to know the state of my account faster.
PU5	MB provides me prompt and efficient services.
PU6	MB provides systems to give appropriate feedback.
PU7	MB gives the joy of controlling my financial transactions.
PEU1	Learning to use MB was easy for me.
PEU2	Instructions in the MB system are clear and understandable.
PEU3	I find MB system easy to use.
PEU4	MB has more flexible ways to search for information.
PEU5	I feel that user-friendliness of the MB website is important.
AW1	I think that I am aware about the benefits of MB
AW2	I think that I have received enough information about MB.
AW3	I will frequently use MB in the future.
AW4	I will strongly recommend others to use MB.
AW5	I think that using the new MB service is beneficial for me.
AW6	I have positive perception about using the MB service.
AW7	MB is compatible to my banking needs.
PR1	MB will allow unauthorized person to access personal information.
PR2	MB provides accurate, relevant and up to date information.
PR3	MB has the chance of data loss and fraud.
PR4	MB needs expertise and training.
PR5	MB has inadequate information on the website and less operational reliability.
PR6	I trust the ability of MB to protect my privacy.
SN1	People who are important to me think that I should use MB facilities
SN2	People who influence my behavior think I should use the MB.

VI. CONCLUSION

The result of this study shows that perceived usefulness, perceived ease of use, subjective norm, consumer awareness and perceived risk are the important determinants of mobile banking adoption. This study meets the desired objective; but it suffers from one setback. Study concludes that majority of customers are accepting online banking because of many favorable factors. Analysis concluded that usefulness, ease of use, subjective norm, awareness and risks related to it are the main perusing factors to accept online banking system. These factors have a strong and positive effect on customers to accept mobile banking system. The relatively small size of the sample limits generalization of the outcome of the study. The study is concentrated on a particular location and hence the result may vary with location and the demography of the people. Similar study can be conducted in other colleges and universities and results can be compared.

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