Mobile Banking Adoption in a Developing Country Like India

–Aradhana Gandhi*, Pratima Sheorey**

Abstract

Mobile banking, or banks providing banking services through mobile phones, has received a positive response since its launch. However, the penetration of Mobile Banking is still low because of several reasons. In this study, the different factors that affect the adoption of Mobile Banking services have been analyzed. Behaviour of 120 customers, who use different mobile banking services, was studied to ascertain, what motivates/discourages them to use mobile banking services. The output of Exploratory Factor Analysis was taken as an input to Hypothesis Testing using Multiple regression. The study revealed that Perceived usefulness, Perceived Relative advantage, Perceived risk, Social impact and Perceived cost impact the adoption of mobile banking in India. From a practical implication point of view, this study can encourage banks and prompt them to take necessary care while implementing mobile banking, because mobile banking adoption parameters has an impact on adoption of the technology. Based on this result, banks will have to make an extra effort to ensure that they design a mobile banking platform that is free from errors and electronic threats and portrays usefulness and relative advantage of using the technology.

Keywords: *Mobile Banking, Perceived Usefulness, Relative Advantage, Perceived Risk, Social Impact, Perceived Cost, India*

INTRODUCTION

Technological advancements in the area of telecommunications and information technology have continued to revolutionize the banking

* Symbiosis Centre for Management and Human Resource Development, Symbiosis International University Symbiosis Infotech Campus, Pune, Maharashtra, India. Email: aradhana_gandhi@scmhrd.edu

** Symbiosis Centre for Management and Human Resource Development, Symbiosis International University Symbiosis Infotech Campus, Pune, Maharashtra, India. Email: director@scmhrd.edu

industry. The delivery of financial services has experienced major changes during the past few years. A feature of the banking industry across the globe has been that it is increasingly becoming un-predictive and competitive. Banks, aided by technological developments, have responded to the challenges by adopting a new strategy, which emphasizes on attempting to build customer satisfaction through offering better products and services and at the same time to minimize operation costs (Sohail and Shanmugham, 2003). Therefore, an understanding of the customer adoption process will have important implications for bankers and customers alike.

Electronic banking is one of the most successful business-to-consumer applications in electronic commerce (Pousttchi and Schurig, 2004). Research in the area of electronic banking has spanned over a gamut of delivery options, from measuring consumers' attitudes toward automated teller machines (Moutinho and Smith, 2000) to issues on adoption and quality of services of internet banking (Barnes and Corbitt 2003). However, with a rapid increase in usage of smart mobile phones in India, the transformation of banking applications to mobile devices has been a logical development in electronic banking. Mobile banking is emerging as a wireless service delivery channel providing increased value for customers' banking transaction.

The objective of this study is to investigate a set of behavioral attributes and how they influence mobile banking adoption in a developing nation, like India. Specifically, the objective of this research is to examine the potential facilitators and inhibitors of mobile banking adoption. Several factors have been found that affect attitude towards intention to adopt mobile banking namely age, computer skills, mobile technology readiness, and social influence. The risk factor may be even more important in relation to mobile devices because higher the perception of risk of mobile banking the lower the intention to adoption of mobile banking because of the higher complexity in using the device. Although mobile banking usage is low, even within developed markets, India has a long way to go towards mass scale adoption of mobile banking. Notwithstanding this bleak outlook, more and more banks are offering mobile banking services via Third Generation (3G) mobile phones and this study seeks to test the factors that can influence adoption of mobile banking.

Technology related products and services are growing in the market, with increasing fierce competition among the banks to attract customers by offering reliable and compatible services. This study helps in finding out the factors, which banks can adopt for launching new service or

improving a pre-existing service, in this case mobile banking. This study seeks to understand a list of Indian customers' behavior towards adoption of mobile banking.

LITERATURE REVIEW

Past research on understanding individuals' adoption of mobile banking mainly relies on considering mobile banking as a technological innovation. The diffusion of innovation theory (DIT) is considered as one of the most popular theories that have attempted to explore factors that affect an individual to adopt an innovation or a new technology. DIT is a theory that seeks to explain how, why, and at what rate new ideas and technology spread. Rogers (2002) identified several attributes of an innovation that are key influences on adoption behavior. According to Rogers, these attributes are Relative advantage, complexity, compatibility, trialability, and observability. A number of previous studies have examined these factors in adoption and diffusion of Internet-based technologies and have consistently concluded these attributes, particularly those of relative advantage, ease of use, and compatibility, as the most salient factors for adoption of Internet and mobile technologies (Koenig-Lewis *et al.* 2010; Park and Chen 2007).

Apart from these factors, others involve moderate attitude towards intention to adopt mobile banking namely age, computer skills, mobile technology readiness, and social influence (Kleijnen *et al.,* 2004). Age strengthens perceived usefulness, perceived costs and perceived system quality. Technical support interacts with perceived usefulness of the services, thus intention to use increases when companies provide technical support.

In this study, we are investigating the factors that influence the adoption of mobile banking. While there are many studies that define adoption in terms of implementation, usage, utilization, or satisfaction; this study uses other variables like Perceived usefulness, Social impact, Perceived Risk, Perceived cost, Perceived Relative Advantage. These factors not only cover all the important aspect that talks about Customer's bend towards using a disruptive technology like Mobile Banking, but these factors also take into account the specifics that drives user's motivation for using financial services like Mobile Banking. The past research work done on these factors, along with hypotheses is given below:

Perceived Cost (PC)

Costs of use which includes the acquisition and usage cost is a barrier to the adoption of mobile banking. In addition to actual transparent and quantifiable costs of acquisition and use, adopters typically face a range of relatively hidden "transaction costs" which are likely to influence whether they adopt mobile commerce (Wu and Wang, 2005). Gressgard and Stensaker (2006) suggest that switching costs are very high for customers due to technological uncertainty. Several studies suggest that perceived costs could be a major barrier for the adoption of m-banking (Kleijnen *et al.,* 2004). Wu and Wang (2005) found that costs have a significant negative effect on users' behavioural intention to use m-commerce. On the other hand, lower costs, e.g. due to banks passing on lower processing costs and lower perceived costs of correcting errors, can motivate consumers to use electronic banking (Sathye, 1999). The following hypothesis is thus posited for this research:

Hypothesis 1: Higher perceived cost has a direct negative impact on use of Mobile Banking.

Perceived Usefulness (PU)

Perceived usefulness is defined as the degree to which an individual believes that using the system will help him or her to attain gains in job performance (Venkatesh and Davis, 2000). Kim *et al.* (2009) stated that individuals determine the consequences of their behaviour and then make a choice based on the need of perceived usefulness. The amount of information, which we get through mobile banking, is an important factor that influences a user to adopt this service. It refers to the parameters that enable individuals to decide whether they are benefited by using mobile banking services in their daily lives. Information system adoption research suggests that "if a system does not help people to perform their task effectively, it is not taken positively".

Hypothesis 2: Perceived Usefulness from using Mobile Banking has a positive and direct relation with his/her intention to use Mobile Banking.

Social Impact (SI)

Social Impact is defined as the degree to which an Individual perceives that how important others believe he or she should use the new system (Venkatesh *et al,* 2000). Social influence has been discussed in multiple models related to behavioural intentions to adopt new technologies. Based on literature review, it is expected that social influence will positively

influence behavioural intention in adoption of mobile payment systems in India. Social impact are factors that relate to the influence of others such as family, relatives, or friends, in the decision to use a product or service. Pedersen and Ling (2002) suggested that external and social influence cannot be ignored in any adoption model because of their contribution to adoption behaviour. Social Norms have been validated in studies such as e-mail usage (Karahana and Limayem, 2000), wireless finance adoption (Kleijnen *et al.,* 2004), and internet banking (Chan and Lu, 2004). To test the above expectation, following hypothesis was proposed.

Hypothesis 3: Social impact has a positive and direct effect on Mobile Banking adoption

Perceived Risk (PR)

This attribute refers to the degree of risks in using an innovation (Ram and Sheth, 1989). Risk perception by customers usually arises due to the doubt related to the degree of inconsistency between customers' judgment and real behaviour, and technology failing to deliver its anticipated outcome and its consequent loss (Chen 2008; Koenig-Lewis 2010). In technology adoption, there is research evidence of the importance of the perception of risk in deploying new technology or services (Gewald *et al.* 2006). In the context of mobile banking, the perception of risk is even more important due to the threat of privacy and security concerns (Luarn and Lin 2005). Secondly, fear of loss of PIN codes may also pose security threats (Kuisma *et al.* 2007). Thirdly, some users also fear that hackers may access their bank accounts via stolen PIN codes (Poon, 2008). Finally, some users may also have a fear of loss or theft of a mobile device with stored data. Therefore, perceived risk is more likely to negatively affect the mobile banking adoption.

Hypothesis 4: Perceived Risk related to Mobile Banking has a direct and negative effect on mobile banking adoption.

Perceived Relative Advantage (PRA)

Relative advantage refers to the degree to which an innovation is perceived as providing more benefits than its predecessor (Moore and Benbasat, 1991). Relative advantage results in increased efficiency, economic benefits and enhanced status (Rogers, 2003). Past research has found that relative advantage of an innovation is positively related to the rate of adoption (Moore and Benbasat, 1991). Research suggests that when user perceives relative advantage or usefulness of a new technology over an old

one, they tend to adopt it (Rogers, 2003). In the context of mobile banking adoption, benefits such as immediacy, convenience and affordability to customers have been reported (Lin 2011). Therefore, it is hypothesized that, when customers perceive distinct advantages offered by mobile banking, they are more likely to adopt it.

Hypothesis 5: The perceived relative advantage of mobile banking has a direct and positive impact on Mobile Banking adoption.

Based on the extant literature review, a conceptual model of the study was framed as depicted in Figure I.

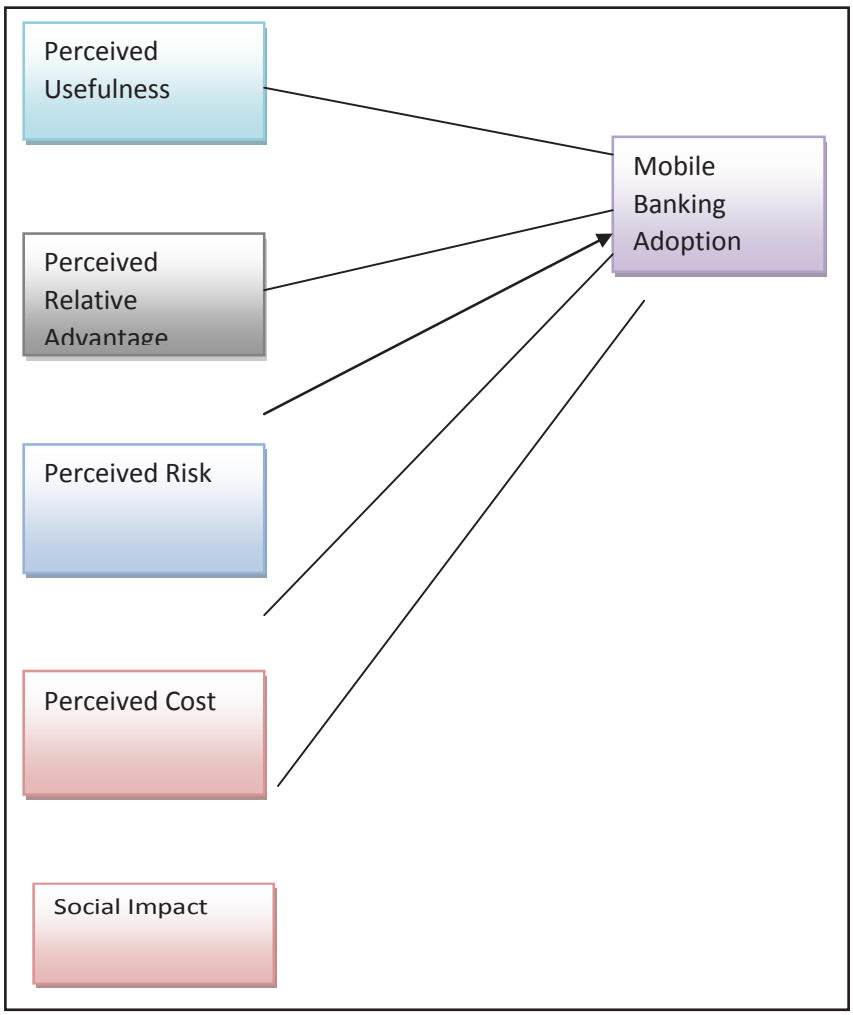

Fig. 1: Conceptual Model of Mobile Banking Adoption

RESEARCH METHODOLOGY

A questionnaire based empirical study was conducted to understand the parameters that affect mobile banking adoption. The questionnaire was pre-tested by 30 people who use mobile banking on a regular basis. The questionnaire was divided into two sections: the first section consists of a brief profile of the respondents and the second part consists of parameters related to Mobile Banking adoption. During the final survey, the respondents were given a five-point Likert scale ranging from 1 "strongly disagree", to 5 "strongly agree". A pretest of the questionnaire was conducted after which pilot testing was conducted to establish the reliability of the instrument.

Data for the study was collected from 120 customers, who use mobile banking. The Cronbach's alpha for all the constructs is greater than 0.6 and is depicted in Table I establishing the reliability of the constructs for further analysis (Hair at al., 2010).

Exploratory Factor Analysis (EFA)

An Exploratory Factor Analysis was conducted. The study used 6 constructs and 21 dimensions of Mobile Banking adoption from the literature. Principle Factor with Varimax Rotation was used with each variable to demonstrate the factor structure. Bartlett Test of Sphericity was administered to ascertain the presence of correlations among the variables. The observed significance level for the Bartlett Test of Sphericity is 0.000 and therefore it can be concluded that the strength of the relationship among the variables is strong. The second test is the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO). The value of KMO statistic above 0.80 is meritorious and below 0.50 is unacceptable[36]. The value of KMO for the current study is 0.785, which is a higher than the threshold of 0.6 and therefore depicts that there is adequate sampling adequacy (Hair *et al.,* 2010).

Eigen value of all the six factors was greater than 1. The lowest factor loading was .547, which is above the 0.50 threshold value (Hair *et al.,* 2010). The factors were interpretable and could be grouped into logical factors based on literature review and past studies. The total variance explained by the six factors is 68.711%. After getting the factor matrix, an attempt was made to give some name to the factor loadings as shown in Table 1.

Table 1: Factor Loading, Cronbach's alpha, SCR and AVE

Items	Factors	Factor Loading	Cronbach's alpha	SCR	AVE
Can access anytime	Perceived Usefulness	0.706	.787	.779	.541
Can measure effect of immediate transaction		0.589			
I am proficient at mobile banking		0.743			
I can manage my finances effectively using mobile banking		0.712			
M-Banking fits with my working style	Perceived Relative Advantage	0.678	.826	.833	.503
Good accuracy and speed is achieved in M-Banking		0.621			
Good technical support provided by my bank for M-Banking		0.728			
M-Banking is flexible to interact		0.854			
I get a chance to run M-Banking on trial basis		0.644			
Prefer conventional banking	Perceived Risk	0.573	.759	.827	.701
Tampering of information		0.665			
Pin code may get lost		0.728			
Info may get leaked		0.799			
Financial data not secure		0.739			
University (Organization) Support for using M-Banking	Social Impact	0.778	.836	.708	.549
People around me suggest to use M-Banking		0.703			
High Airtime cost– Discourages me to use M-Banking	Perceived Cost	0.829	.856	.730	.494
Lack of internet facility – Discourages me to use M-Banking		0.547			
Fits with my lifestyle	Adoption of Mobile Banking	0.696	.742	.707	.529
High compatibility		0.728			
Satisfied with service of mobile banking		0.780			

DATA ANALYSIS

The data from the empirical study were analyzed using SPSS 21.0. After the pre-testing of the questionnaire with a sample size of 30, the final data collection was conducted. 120 usable filled up questionnaires were taken for further analysis. The validity and reliability had to be established before further analysis could be performed. Construct validity is measured to understand how well the data collected in the research can be translated for research purposes. The constructs of the theoretical framework possess convergent validity because the standardized factor loadings of the items are mostly greater than 0.7 and not less than 0.5. The Scale Composite Reliability (SCR) is found to be greater than 0.7, which shows that the internal consistency of the data is high. All the Average Variance Extracted (AVE) values are greater than 0.50 except perceived cost which is close to the benchmark (.494). If the average variance extracted is less than .50, then the variance due to measurement error is greater than the variance due to the construct. Discriminant validity refers to the extent to which the operationalization diverges from the operationalization of theoretical dissimilar constructs. The AVE is greater than the squared correlation coefficients between the various constructs and therefore demonstrates discriminant validity as depicted in Table 2. This shows that the factors are independent of each other and the results are valid because these factors do not have a relationship.

Variables derived from test instruments are declared to be reliable only when they provide stable and reliable responses over a repeated administration of the test. Cronbach's alpha is an effective measure of reliability. It is a measure of internal consistency, that is, how closely related a set of items are as a group. Ideally, the value of Cronbach's Alpha should be greater than 0.7. In our study, the Cronbach's Alpha of all the constructs is higher than 0.7.

The hypotheses were tested using multiple regression analysis. After checking the assumptions of regression, the regression equation was run in SPSS. The R square value of the model is .766. This shows that 76.6% of the variance in the dependent variable, Adoption of Mobile Banking can be explained by the independent variables; Perceived usefulness, Perceived Relative advantage, Perceived risk, Social impact and Perceived

cost. The regression output is given in Table 3. Perceived Usefulness has the strongest association with Adoption of Mobile Banking (β = .754, p = .000) and therefore banks managers need to make efforts to make their mobile banking offerings useful to the customer so that more and more consumers adopt it. Perceived relative advantage (β = .153, p = .007) has the next best association with adoption of Mobile Banking. This result is expected as if consumers perceive relative advantage of this technology over the previous one, they will adopt it. The other parameters like Perceived risk (β = -.095, p = .065) had a negative relationship with Mobile Banking adoption, whereas Social impact (β = .115, p = .056) had a positive relationship with adoption of Mobile Banking. Perceived cost was insignificant and therefore does not indicate a significant relationship with Mobile Banking adoption. This result is expected as consumers using mobile phone with internet do not need to speed any significant amounts if they use mobile banking.

Table 2: Discriminant Validity

Constructs	Perceived Usefulness	Perceived relative advantage	Perceived Risk	Social_ Impact	Perceived Costs	Adoption of Mobile Banking
Perceived Usefulness	0.728					
Perceived relative advantage	.260	0.709				
Perceived Risks	.106	-.003	0.701			
Social_Impact	.474	.103	-.097	0.741		
Perceived Costs	.024	.343	.029	-.198	0.703	
Adoption of Mobile Banking	.654	.340	.161	.491	.024	0.736

Table 3: Regression Analysis

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta			
1	(Constant)	-.291	.364		-.799	.426
	Perceived Relative Advantage	.167	.060	.153	2.773	.007
	Perceived Risks	.104	.056	-.095	1.865	.065
	Social Impact	.117	.060	.115	1.936	.056
	Perceived Costs	-.080	.074	-.060	-1.084	.281
	Perceived Usefulness	.822	.065	.754	12.641	.000
a. Dependent Variable: Adoption of Mobile Banking						

The regression equation from Table 3 is as depicted above:

Y = -.291 + 0.167 * Perceived relative advantage + 0.104 * Perceived Risk + 0.117 * Social Impact + 0.822 * Perceived usefulness

Where Y is Adoption of Mobile Banking

CONCLUSION AND MANAGERIAL IMPLICATIONS

The Mobile phone usage has exploded in the last decade. Mobile phones offer great opportunities for services such as banking to reach critical mass, as compared to other options such as the Internet or landline telephone. Recognizing this, the major retail banks have started offering mobile banking services. Mobile banking is an emerging concept and its market potential is expected to be high. However, the diffusion rate is low, further the technology is shooting exponentially and the disposable income growing with each passing, all these factors leads to increasing affinity of customers towards mobile banking. At the same time the impact of social media platforms and growing cases of hacking and digital robbery leads to people sticking to the old age rules. The factor's that affects the adoption of Mobile Banking keeps on changing from time to time as it is influenced by the technology industry, which in itself is highly volatile and targeting the young generation, which again change their preference frequently,

In this study we analysed, that the adoption of Mobile Banking depends directly on satisfaction of the consumer with the mobile banking services. Due to its low level of awareness the current market for mobile banking is relatively small. Nevertheless, the market for mobile banking should not be underestimated. There is good potential for mobile banking services since mobile banking adoption is not far behind the use of mobile in India where there are 55.48 crore mobile users (India Mobile Landscape (IML) 2013 study).

However, in our research we found that the major factor that affects the adoption of Mobile Banking are Perceived usefulness, Perceived relative advantage, Social Impact and Perceived risk. We have also found that High Perceived Risk associated with Mobile Banking usage acts as a main deterrent for adoption of Mobile Banking. We ascertained in the study that customer rate Perceived Usefulness and Perceived relative advantage over all other factors when it comes to using Mobile Banking.

We suggest that bank customers need to be made aware of the advantages of mobile phone banking over other channels, be it physical banking at a branch or ATM, to shift them from using traditional technology to new technology. Banks should put in more efforts to increase Mobile banking adoption by educating the customers about its benefits and flexibility. This should be done bearing in mind the fact that information and guidance could significantly increase the perceived value added by mobile banking and decrease the perceived risks associated with innovation. Proper training of customers, promotional activities, demos, opportunity to trail, and test mobile phone banking would go a long way in making the customers to gravitate towards mobile phone banking.

There are some limitations of the study. The size of the sample taken is not sufficiently large so as to generalize the results of this study. Also, the study was limited to the respondents using mobile banking services in major metropolitan cities in India; therefore, a larger sample covering a wider geographical area need to be conducted to inculcate generalization in the results. Despite the limitations, the study provides fresh valuable insights towards mobile baking adoption.

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