Middle-East Journal of Scientific Research 23 (11): 2633-2638, 2015
ISSN 1990-9233
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DOI: 10.5829/idosi.mejsr.2015.23.11.22633

Effect of Risk Factors in the Penetration of Mobile Banking in India-an Empirical Study

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Abstract: This study investigates the perception of bank customers towards difficulties in adapting mobile banking technology and risk associated with it. India has achieved higher growth in Information Technology (IT) and attained the cateogory of country with higher per centage of young population. Inspite of massive growth reported in IT sector, mobile banking technology has not created good impact among Indian population. Hence this study has been carried out to analyze the effect of risk factors associated with mobile banking technology. Questionnaires were adminstered among 153 customers associated with Nationalised Bank provided with mobile banking system. The Responses were analysed with correlation and regression analysis. It was found that social risk has no effect impact in the penetration of mobile banking. The other risk factors such as security, privacy, financial performance and time determine the penetration of mobile banking. This study reflects the perception of both users and non-users of mobile banking in India and could not be generalised to global mobile banking. The contribution of the research is drawing relationship of perceived risk factors on the usage of mobile banking. Banks should invest on educating the customers on mobile banking and rely on mobile banking benefit maximisation.

Key words: Mobile Banking · Perceived Risk · Mobile Technologies · Bank transactions

INTRODUCTION

India with total of more than 150 banks that includes scheduled banks, private sector banks, public banks, foreign banks, co-operative banks witnessed a massive growth in the past two decades after the intervention of technology into the banking functions. The first technological facility provided for customers that is ATM- automated teller machine introduced in early 1990's paved the way for the growth of number of banking customers wherein most of the government and private organisations started paying salaries through banks. Later online/internet banking facility were delivered to the customers in the early 2000's which include non transactional task like viewing account balances, viewing recent transactions, bank statements download, paid cheques image view, ordering of cheque books, Download account statements etc. and transactional task like funds transfer between the customer's linked accounts, Paying third parties, including bill payments and third party fund transfers, Investment purchase or sale, Loan applications and transactions, such as repayments of enrollments, Credit card applications, Register utility billers and make bill payments etc., which made the process of banking faster. Mobile banking is a recent phenomenon for the Indian Banking Industry which provides financial services like bill payments, peer to peer payments, Funds transfer, Remittance, shopping and donations, mobile balance recharge etc. and non-financial services like balance inquiry, mini statement, PIN change, Cheque Book request, Due alert for payments, locating ATM's etc., With growing penetration of mobile usage into the country, there is high potential that mobile banking can be mass banking channel.

Mobile Banking: M-banking embarked by the end of the 1990s when the German company Paybox,, launched the first service in collaboration with Deutsche Bank. Initially, it was tested mostly in European countries like Germany, Spain, Sweden, Austria and the United Kingdom. Kenya being first among developing countries to introduce a text-based m-banking service, M-Pesa, in 2007, had more than seven million registered M-Pesa users by 2012.

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Researchers use various terms to refer to mobile banking, including pocket banking [1], branchless banking [2], m-banking (Liu *et al*., 2009), or m-payments, m-transfers, m-finance [3]. As an important component of electronic banking, m-banking usually constitutes an alternative delivery channel (ADC) for various financial and non-financial transactions. Other prominent ADCs include ATMs, point-of-sale terminals, interactive voice response, mobile phones and the Internet. Regardless of the terminology they use, scholars generally define m-banking as an application of m-commerce that enables customers to access bank accounts through mobile devices to conduct transactions such as checking account status, transferring money, making payments, or selling stocks [4-6].

In addition, a few studies (e.g., Akturan and Tezcan, 2012; Masrek *et al*., 2012; Shih *et al*., 2010) cite m-banking as an innovative communication channel in that the customer interacts with a bank through a portable device [7, 8].

The continuous innovations in telecommunications have paved way for the banking services to launch new access methods and one among that is mobile banking in which the customers and bank interactions is through mobile phones [9]. The Indian banks are in urge to make use of this technology to pull down their operational expenses and to increase the number of customers (Peterson, 2009). Mobile Banking refers to making use of financial services provided by banks through mobile telecommunication devices. The services offered includes bank transaction facilities, administering accounts and accessing customized information [10]. Customers' expectation in mobile banking is the round the clock availability and ease of transactions. Mobile banking has a larger zone to explore as customers still prefer traditional banking (Ashta, 2010; Wang, Wang, Lin & Tang, 2003) [11].

Mobile banking can also be called as SMS banking as most often it is performed by SMS. Commercial banks find this avenue more convenient to make their services more comfortable to their customers. With the increased demand of smart phones and growing usage of internet on mobile handsets, application based banking has emerged as a new concept within this space. Other than SMS banking, banks are now offering banking services on mobile handsets through WAP-based internet websites and application based mobile banking services [12].

Mobile Banking in India: India's mobile users have increased to a greater extent where nowadays it has become a inherent part of life. Most possess even more than two mobile connections. As per latest data released by Telecom Regulatory Authority of India (TRAI), the total number of subscribers of mobile connection amounted to 933 million. Though the mobile internet is used enormously for accessing social networks and other applications, the usage of mobile for banking transactions is still in the moderate growing phase. The survey 2015 results given by the financial brand.com states that in India only 9.8% of population use mobile banking daily, 17.2% weekly, 16.8% monthly, 18.5% few times a year and 37.7% have never used mobile banking. Recently most of the banks have come with their own mobile banking apps and it could provide the pavement for increasing the number of mobile banking users in India.

Review of Literature: The banking transaction services through mobile in India was first offered by ICICI bank in January 2008 (Mr. V. Vaidyanathan, 2008) but SMS alerts begun in 2005-06 [13].

Research in mobile banking started in the year 2005-2006, as short message services (SMS) of mobile alerts for transactions started during the particular period. Then in the year 2008, Reserve Bank of India (RBI) issued the guidelines for mobile banking transactions and MTNL (Mahanagar Telephone Nigam Ltd.) launched 3G in India. India launched its first IMPS (Immediate Payment Service (IMPS) in 2010-2011 which is an instant interbank (similar to NEFT) transaction that can be commenced only through online or mobile phones or through SMS. In the year 2011-12, Vodafone and HDFC bank launched m-paisa and Airtel launched Airtel Money in 5 cities in India. In 2012-13 Airtel-Axis Bank launched a mobile banking service for financial inclusion and money transfer. RBI issued operative guidelines stating that only those banks which are licensed and supervised in India and having a physical presence in India will be permitted to offer mobile banking services [14]. As per RBI report, there are 82 banks that are permitted by RBI to offer and provide mobile banking services throughout India (Reserve bank of India, 2014) as compared to 21 Banks in the year 2010. Comparatively the increase in number of banks providing mobile banking services has not resulted in increase in the number of mobile banking users at the same pace. The challenges faced by Indian banks to increase the mobile banking user database are Handset operability, Scalability, Security, Reliability, Application Distribution etc.

Suoranta and Mattila (2004) pointed out that perceived risk, demographics and attributes applicable to innovation diffusion such as complexity, relative advantage, compatibility and making trials influences the mobile banking adoption in Finland [15].

Amin *et al*. (2008) analysed the factors that examined the intention to use mobile banking among BIM Bank's customers. They found the significant factors that affect the acceptance of mobile banking and they are perceived ease of use, perceived usefulness, perceived credibility, normative pressure and the amount of information on mobile banking [16]. In the same vein, Koenig-Lewis *et al*. (2010) demonstrated that perceived usefulness, compatibility and risk are important barometers for adopting m-banking services.

Palani and Yasodha (2012) exhibited that gender, education and income play a vital role in changing customer's perceptions on mobile banking services offered by Indian Overseas Bank [17].

Khalifa and Shen (2008) and Wang *et al*., (2006) proposed that cost is a most important factor in consideration in the adoption of m-commerce [18]. Perceived cost can be defined as the magnitude to which a person feels using mobile banking will cost money, Luarn and Lin [19].

Venkatesh (2000) defined self-efficacy as judgement of one's capability to make use of mobile banking [20]. Agarwal *et al*., (2000) declare that there is empirical proof to support the casual relationship between behavioural intention and perceived self-efficacy [21].

A study by Sripalawat *et al*. (2011) tested positive and negative factors that affects m-banking acceptance in Thailand [22].

Perceived usefulness, Subjective norms, perceived ease of use and self-efficacy were considered as the positive factors and lack of information, device barrier, perceived financial cost and perceived risk as the negative factors. It was found that the positive factors are more influenced than negative factors towards the mobile banking acceptance and the most influential factor for adoption of m-banking in Thailand is the subjective norm.

Crabbe *et al*. (2009) reviewed how far the social and cultural characteristics impacts m-banking adoption in Ghana [23]. They tested socio- cultural factors in the form of perceived credibility, perceived utilization, facilitating conditions and demographic factors play an important role in influencing adoption and sustained usage. In addition, perceived credibility and facilitating conditions also influence attitude.

The Innovation Diffusion theory postulated that: relative advantage, complexity, compatibility, trialability and observability are the five characteristics affected the adoption of an innovation. Moore and Benbasat (1991) developed a measurement instrument for this: the perceived characteristics of innovating (PCI) towards the technology [24].

As an extension to TAM, Venkatesh *et al*. proposed TUAUT in 2003. They found that usage of an information technology and user adoption are influenced mainly by four factors: performance expectancy, social influence, effort expectancy, and facilitating conditions [25]. UTAUT was built on the following eight theories: the theory of reasoned action (TRA), TAM, the motivational model, TPB, the PC utilization model, the innovation diffusion theory (IDT), the social cognitive theory (SCT) and the integrated model of technology acceptance and planned behavior. Though UTAUT has not been widely used as TAM, researchers' has recently applied this to explore user acceptance of mobile technologies [26-28]. Effort expectancy and Performance expectancy are found to be the main determinants of behavioral intention in using mobile services in Finland (Carlsson *et al*., 2006). The mobile commerce acceptance has also been studied with revised UTAUT Model (Min *et al*., 2008). In addition to the original determinants, trust, convenience, privacy and cost are also shown to affect the behavioral intention (Min *et al*., 2008). Moreover, education and gender have significant moderation effects on user adoption (Park *et al*., 2007).

Research Methodology: The objective of the study is to examine the influence of risk factors on the adoption of mobile banking by Indian Banking customers. A structured questionnaire was prepared and employed to collect data with Likert scales (1-7), in which anchors range from "strongly disagree to strongly agree". The questionnaire items were adapted from well tested scales offered by existing literature. The scales for measuring perceived privacy risk and perceived security risk were adapted from studies on e-services and e-shopping [29], internet banking (Tan and Teo,2000; wang *et al*.,2003) [30].

The measurement items for perceived social risk, perceived performance risk, perceived financial risk and perceived time risk were adapted from study on mobile banking adaption of the youth market [31]. The demographic details like age, gender, family annual income, educational qualification and name of the bank they prefer most or rank higher for technology services were also collected.

The population of the study includes any Indian citizen having a Bank account and possessing mobile internet. It includes both mobile banking users and non users but potential future users. Convenient Sampling method was adopted and includes the customers of different banks that can be categorized as Private Banks, public Banks, Foreign Banks, Modernized Banks, traditional Banks etc., Totally 220 persons were approached and was able to get only 153 complete responses. The statistical tools used for the study are Factor analysis, percentage analysis, Regression and correlation analysis. The limitations of the study are the survey is conducted in India and hence it could not be generalized to other countries and the respondents include both the users and non-users of mobile banking.

Data Analysis and Results: Exploratory factor analysis is used to confirm the reliability of the used constructs. The results of Cronbacn's α are 0.766 for social risk, 0.740 for performance risk, 0.892 for financial risk, 0.870 for time risk, 0.824 for security risk, 0.698 for privacy risk and 0.825 for Intention to use that sounds good casting the reliability of the constructs. The percentage analysis of the demographic characteristics of the sample is displayed in the following table:

Demographic details	n	percentage
Age		
18-25	46	30
26-35	41	26.79
36-45	33	21.5
45&above	33	21.5
Total	153	100
Gender		
Male	80	52.287
Female	73	47.7
Total	153	100
Educational Qualification		
School Level	37	24.18
Graduate	38	24.83
Post Graduate	43	28.10
Others	35	22.87
Total	153	100
Family Income(INR)		
Below 30000	52	33.98
30001-40000	48	31.37
40001-50000	32	20.91
50000&above	21	13.73
Total	153	100
Bank Rank for Technology Services		
Private Banks	76	49.67
Public Banks	19	12.41
Old Banks	9	5.882
New Banks	49	32.03
Total	153	100

Reliability and Validity Measures: Squared multiple correlation (SMC) is used to measure each item as Fornell and Larker (1981) have emphasized the reliability of both each variable as well as construct [32].

Construct	Item	Mean	SD	λ	SMC	CR	α	AVE
Social Risk	SR1	5.46	1.3	0.776	0.610	0.773	0.766	0.534
	SR2	5.42	1.62	0.789	0.673			
	SR3	5.67	1.07	0.614	0.356			
Performance Risk	PR1	5.12	1.34	0.771	0.593	0.724	0.740	0.553
	PR2	5.05	1.43	0.673	0.452			
	PR3	5.32	1.44	0.751	0.564			
Financial Risk	FR1	4.64	1.49	0.928	0.885	0.893	0.892	0.798
	FR2	4.59	1.42	0.867	0.715			
Time Risk	TR1	4.38	1.72	0.818	0.635	0.875	0.870	0.669
	TR2	4.87	1.56	0.893	0.796			
	TR3	4.96	1.74	0.810	0.642			
Security Risk	SR1	5.34	1.23	0.830	0.654	0.833	0.824	0.670
	SR2	5.16	1.22	0.774	0.569			
	SR3	5.23	1.30	0.787	0.671			
Privacy Risk	PR1	4.67	1.44	0.898	0.813	0.693	0.698	0.682
	PR2	4.83	1.35	0.753	0.544			
Intention to Use	I1	5.48	1.29	0.859	0.738	0.826	0.825	0.706
	I2	5.44	1.25	0.819	0.667			

Notes: SD=standard deviation, λ=standardized factor loading, SMC=squared multiple correlation, CR=composite reliability, α=Cronbach alpha, AVE=average variance explained

Table values depict that all values of SMC are more than the cut-off 0.30 as suggested by Bagozzi and Yi (1988) [33]. The alpha values of all the constructs are higher than the acceptable cut-off that is 0.7 and hence the reliability is assured.

As shown in Table, there is statistical significance in each standardized factor loadings (λ) that range from 0.614 to 0.928 that validates the adequacy of convergent validity. The values of composite reliability and average value explained are also more than their cut –off criterion 0.7 and 0.5 respectively and acceptable. Therefore, the convergent validity is adequate [34].

CONCLUSION

There are so many studies that examined the adoption of mobile banking in India. Most of the studies were based on TAM Model and few others include constructs like compatibility, system quality, service quality, facilitating conditions, relative advantage, received credibility, perceived trust, perceived cost, perceived self-efficacy, Innovation Diffusion theory, perceived risk, trial ability, Theory of planned behavior, UTAUT, etc,. However, all the studies were an extension of TAM.

In India, the mobile internet usage has penetrated larger and deeper into the society. Larger section makes use of mobile internet to check mails, browse search engines and to access social networks. The correlation between the mobile internet users and mobile banking users is negative. The difference in the percentage of mobile internet users and mobile banking users is high. Finance and Financial transactions are always observed to be Risky. Hence this research was conducted on risk factor that influences the penetration of mobile banking in India and so far there is no study on mobile banking considering only risk factors.

The perceived risk levels of sample population under the age group of 25 is low as compared to the general population because young generation always adopt technology faster and are mostly techno-literate. This has already been verified by Featherman and Pavlou (2003) with sample population of university students and the results indicated perceived risk levels were less for the population because they were younger, computer literate and more comfortable with internet based transactions [34].

Social risk is not prioritized by most of the respondents. Time Risk and Performance risk results as a constraint during the learning process of mobile banking technology. Financial risk, Security risk and Privacy risk hinders the adoption of mobile banking by customers above the age of 35.

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