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An Empirical Examination of Perceived Risk in Mobile-Banking

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Abstract

Financial institution that offered mobile applications to the consumers should give attention to the perceived risk factors of Mobile Banking adoption in order to retain existing customers as well as attract new consumers. The study suggests that banks should build an application with features to facilitate users' assessment of Mobile Banking services and thus minimize the perceived risk and maximize the perceived ease of Mobile Banking services. The impact of risk and trust on Mobile Banking adoption has also been examined and shown to be significant to Mobile Banking adoption in the context in India. This study is based on the Descriptive research, where valid responses are collected from the respondent by filling questionnaire. Keeping the TAM proposed by Davis as a theoretical basis, an extended TAM incorporating security and privacy related issues for Mobile Banking adoption is conceptualized. The paper reveals that perceived risk has a negative impact on behavioural intention of Mobile Banking adoption and trust has a negative impact on perceived risk. A well-designed mobile application was also found to be helpful in facilitating easier use and minimizing perceived risk concerns regarding Mobile Banking usage. The purpose of this paper is to examine the effect of perceived risk on Mobile Banking user adoption.

Keywords- Mobile Banking, Technology Acceptance Model (TAM), Trust, Perceived risk.

I. Introduction

Mobile payments were trailed in 1998 in Finland and Sweden where a mobile phone was used to pay for a Coca Cola vending machine and car parking. Commercial launches followed in 1999 in Norway. The first commercial payment system to mimic banks and credit cards was launched in the Philippines in 1999 simultaneously by mobile operators Globe and Smart. Mobile Banking Model that bring development in Information and Communication Technology (ICT), comfort and access of services, and competition with peer forced banks to introduce Mobile Banking services in India. Mobile Banking can be broadly classified into Bank-led model and Mobile Service Provider Led Model. In the bank led model, only bank's customers can avail the mobile banking service of the bank. With these facilities, the customers can do various banking transactions as per their convenience. The Mobile Service Provider Model is totally different from bank-led model; in this the mobile customers those who don't even have the access of traditional bank account can do banking transactions through their mobile service provider. Mobile banking services can be classified into SMS Banking, Application (Software) oriented, Browser (Internet) based model and Mobile Apps.

There are two major technical developments that occurred GSM and CDMA technologies. The European developed GSM standard and the U.S. developed CDMA standard. The NTT DoCoMo in Japan introduced internet service on mobile phones in the year 1999. The 3rd Generation mobile phone became essential communication system for millions of users worldwide. The 3G technology was developed with the concept of packet switching instead of circuit switching for data transmission. The 4th Generation (4G) system provides mobile ultra-broadband Internet access, for example to laptops with USB wireless modems, to smart phones, and to other mobile devices technology introduced in the year 2009 with the technology advancement like WiMAX and Long Term Evolution (LTE) technologies.

SMS Banking refers to utilizing banking services through SMS from the registered mobile number of the customer. Application or Software oriented refers to downloading the application developed by the bank for utilizing the mobile banking service that works in traditional mobile handsets. Browser is software that is used to display web pages in the Internet. The mobile banking refers to internet based mobile banking where the communication is made to internet application which is optimized for mobile handsets. Mobile

Apps refer to mobile applications developed for Smart phones using Android, Windows, Java, etc. The services offered under the mobile banking vary from one bank to another. The common services are Balance Enquiry, Mini Statement, Money Transfer and Utility Bill Payments.

International Experience about M-PESA, Kenya which quickly captured a significant market share for cash transfers, and grew astoundingly quickly, was capturing 17 million subscribers by December 2011 in Kenya alone. It is the first mobile banking solution launched based on the Mobile Service Led Model in the year 2007 by the telecom operators Safari.com and Vodafone. It has become very popular among the customers and captured major market in Kenya.

SMART Money and G-Cash application was launched in Philippines. SMART Money works on the Philippines 'nationwide network, one can send money to SMART's 50.9 million subscribers wherever they are in the country which is an electronic wallet to do most of the banking transaction through mobile.

II. Mobile Banking in India

India with a 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 are 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.

The 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..The transactional services that were provided were: 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 enrolments, Credit card applications, Register utility billers and make bill payments etc., which made the process of banking faster.

Banks are constantly adopting technology to expand its business and to reach different level of customers. Apart from ATM, Internet banking and other technology-enabled services, Mobile Banking is one of the services provided by banks to its customers. Astonishing growth in telecommunication sector, its penetration including rural population and technology feasibility are the major factors for the introduction of Mobile banking services. Some banks in India have started providing mobile banking service to their customers that include State Bank of India (SBI), Union Bank of India (UBI), Punjab National Bank (PNB), HDFC, ICICI, Axis Bank, etc.

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..The non-financial services provided by the banks are 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 organisations that mobile banking can be mass banking channel.

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.

III. 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 began in 2005-06. Research in mobile banking started in the year 2005 as short message services (SMS) of mobile alerts for new 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 making use of NEFT) transaction that can be commenced on mobile 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 [19]. In 2012-13 Airtel-Axis Bank launched a mobile banking service for financial inclusion and money transfer. RBI has issued operative guidelines stating that only those banks which are licensed and supervised in India and having a presence in India will be permitted to offer mobile banking services [5].

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 [23]. The challenges faced by Indian banks to increase the mobile banking user database are Handset operability, Scalability, Security, Reliability, Application Distribution etc. [7].

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 [8].Venkatesh (2000) defined self-efficacy as judgement of one's capability to make use of mobile banking [9]. Agarwal*et al.*, (2000) declare that there is empirical proof to support the causal relationship between behavioural intention and perceived self-efficacy [11]. A study by Sripalawat*et al*. (2011) tested positive and negative factors that affects m-banking acceptance in Thailand [12].

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 anchors. 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 [13]. They tested socio- cultural factors in the form of perceived credibility, perceived utilization, facilitating conditions and demographic factors, which play an important role in influencing adoption and sustained usage. In addition, perceived credibility and facilitating conditions also influence attitude.

IV. Research Model and Hypothesis

TAM model which deals with perceptions as opposed to real usage, suggests that when users are presented with a new technology, two important factors influence their decision about how and when they will use it (Davis,1989)[20]. These key factors are:

- Perceived usefulness (PU) - This was defined by Davis as "the degree to which a person believes that using a particular system would enhance his or her job performance".
- Perceived ease-of-use (PEoU) - Davis defined this as "the degree to which a person believes that using a particular system would be free from effort"

In this research study, perceived risk is the main focus along with some other factors related with risk i.e. social risk, financial risk, security risk, privacy risk and trust. 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 [6].

Perceived risk increased user resistance to innovation. User resistance is the intent to avoid and refuse to use mobile banking services [7]. Perceived risk is the degree of threat or negative impact arising from the use of the innovation that is perceived by the users. Social influence refers to a situation in which people agree with the reputation of mobile banking.

Perceived security is the degree of protection provided by the bank to meet the users' security demands that is perceived by the mobile banking users. Perceived privacy is the degree of private information protection provided by the bank that is perceived by the mobile banking users.

Financial risk is the degree of complexity or difficulty of using mobile banking services perceived by the mobile banking users. Trust is the degree of accuracy and reliability of mobile banking services perceived by the mobile banking users.

Based on the literature reviews above, we formulate the hypothesis as follows:

H1 : Social risk (SR) has a positive significant influence on Perceived Risk.

H2 : Perceived Security (PS) has a negative significant influence on Perceived Risk.

H3 : Perceived Privacy (PP) has a negative significant influence on Perceived Risk.

H4 : Financial risk (FR) has a positive significant influence on Perceived Risk.

H5 : Trust (T) has a negative significant influence on Perceived Risk.

H6 : Perceived Risk (PR) has positive significant influence on user resistance (UR).

With the help of TAM, a proposed model is prepared. By obtaining these hypotheses, the basic framework of this study is set as is shown in Fig. 1.

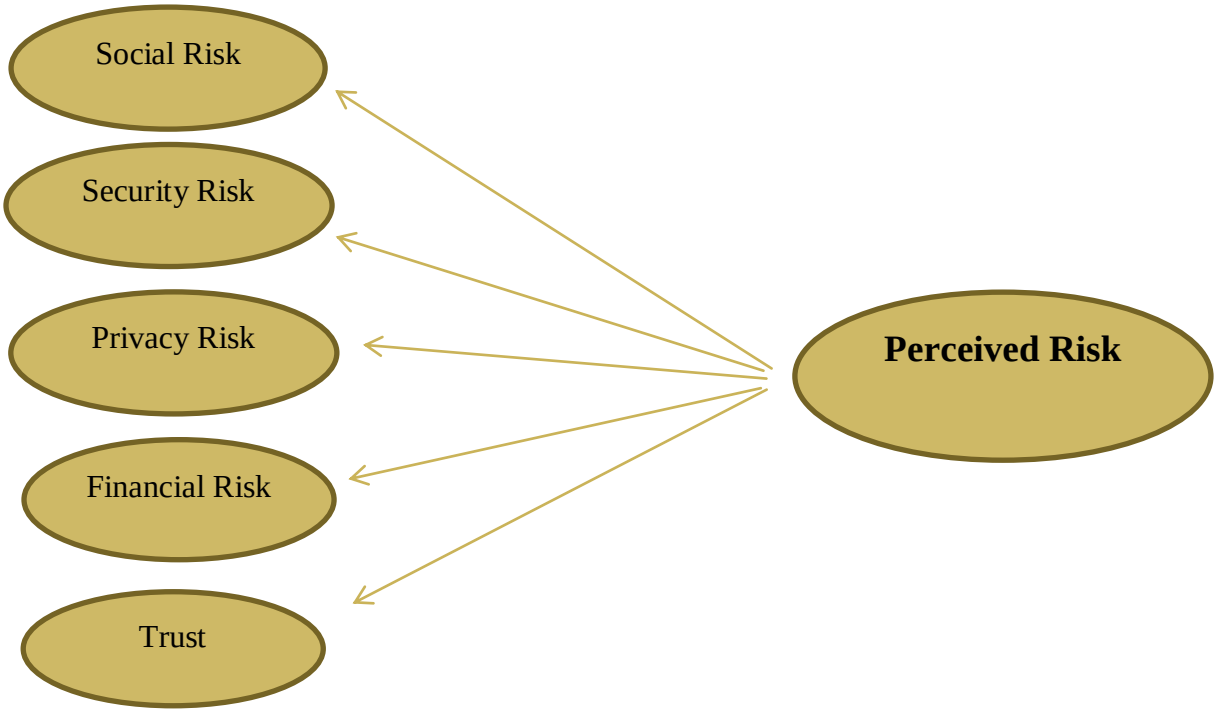

Fig-1 RESEARCH PROPOSED MODEL

V. 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 (1-5), 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 the form e-shopping [15], internet banking (Tan and Teo,2000; wang *et al*.,2003) [16].

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 [17]. 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.

VI. Data Collection and Analysis

In order to test the hypothesis, a survey was conducted with students and employees in Lucknow as the subjects. In the questionnaire, the measurement items for the variables were measured based on a 5-point Likert scale. The demographic characteristics of the sample population were as follows. Of the 100 respondents, 55 (55.0%) were male and 45 (45.0%) were female. With respect to age, 95 (95.0%) were under the age of 30 and 5 (5.0%) were over the age of 30. In this study, the reliability of multi-item scale was measured by determining the Cronbach's α.

The Cronbach's α coefficients for all the measurement variables in this study were calculated to be higher than 0.8 with high internal consistency, based on which it can be determined that the scale was highly reliable. The reliability of the questionnaire used in this study was measured by factor analysis. For the factor analysis, factors with an Eigen value, signifying the amount of dispersion explained by the factor of 1 and higher were selected. The factor loadings of all items were above 0.7. Therefore, the validity of the measurement tool can be seen that there is no problem. Before performing a regression analysis to test the hypothesis, Pearson's correlation analysis is conducted to identify the correlation between the variables and their descriptive statistics. According to the results of correlation analysis, there is a significant correlation, which is in consistent with the direction predicted in the hypothesis. In order to verify the factors influencing perceived risk, social influence, perceived security, perceived privacy risk, trust and financial Risk were set as independent variables and the perceived risks as a dependent variable for a multiple regression analysis, and perceived risk was set as independent variables and the user resistance as a dependent variable for a simple regression analysis. The results of regression analysis are shown in Table 1.0.

TABLE 1.0

Dependent Variable	Independent Variable	Beta	T	P – valve	tolerance	VIF
	(Constant)		6.556	.000		
	SR	.444	7.210	.000	.852	1.172
	PS	.032	.490	.625	.762	1.313
PR	PP	-.112	-1.798	.073	.817	1.223
	FR	.201	3.301	.001	.858	1.165
73	T	-.194	-3.258	.001	.895	1.117
R^2 =0.375	Revised R^2 =0.358			F= 23.278	P-Valve=0.000	
	(Constant)		6.628	.000		
UR	PR	.411	6.348	.000	1.000	1.000
R^2 =0.169	Revised R^2 =0.165			F=40.298	P-Valve=0.000	

The results of the multiple regression analysis with respect to the regression coefficient (beta) of each of the independent variables are as follows: regression coefficient (beta) for social risk was a significant positive value of 0.444 (p=0.000); perceived security, an insignificant value of 0.032 (p=0.625); financial risk, a significant positive value of 0.201 (p=0.001); perceived privacy, an insignificant value of -0.112 (p=0.073); and trust, a significant negative value of -0.194 (p=0.001). Based on these results, it can be determined that the perceived risks increase at higher social risk and financial risk, and lower trust. With respect to the degree of the influence of the selected factors on the perceived risk, social risk had the greatest influence, followed by financial risk and trust. Financial risk, Security risk and Privacy risk hinders to the mobile banking customers [18]. These results support hypothesis 1, 4 and 5. The regression coefficient (beta) between perceived risk and user resistance was 0.411 (p=0.000), this result supports hypothesis 6, based on which it can be determined that higher the perceived risks, the higher the user resistance.

VII. Conclusion and Suggestion

There are many studies, which examined the adoption of mobile banking in India. Most of the studies were based on Technology Acceptance Model and few others include constructs like social factor, trust, cost factor, perceived risk. 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, browse Search Engines and to access social networks. The difference in the percentage of mobile internet users and mobile banking users is high. Financial transactions are always observed to be Risky**.** The banks need to establish a strict and thorough security policy and make their customers aware of the fact that there are low risks associated with mobile banking in order to reduce the non positive social influence on alleged security, in addition to reinforcing and supplementing the security measures from the technical aspect. We know many consumers perceive the authentication procedure for security to be quite complex. This means that it is necessary for banks to implement simpler log-in and authentication procedures, under the premise that this does not reduce the level of security. Financial risk, Security risk and Privacy risk hinders the mobile banking customers. This study supports other research finding that there is a negative relationship between risk factor, which is associated with the usage of mobile banking and customer satisfaction. Risk is the most important measures of factor, which affects the customer satisfaction.

Reduction of risk related to day-to-day transactions performed through mobile device enables customers to build up trust in the banking services being offered. Banking industry needs to fulfil the expectations of the consumers.

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