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Factors affecting adoption of mobile banking in Pakistan: Empirical Evidence

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Abstract

In this research paper we investigated the determinants likely to influence the adoption of mobile banking services, with a special focus on under banked/unbanked low-income population of Pakistan. The adoption of mobile banking services has been a strategic goal, both for banks and telcos. For this purpose, Technology Acceptance Model (TAM) was used, with additional determinants of perceived risk and social influence. Data was collected by surveying 372 respondents from the two largest cities (Karachi and Hyderabad) of the province Sindh, in Pakistan using judgement sampling method. This study empirically concluded that consumers' intention to adopt mobile banking services was significantly influenced by social influence, perceived risk, perceived usefulness, and perceived ease of use. The most significant positive impact was of social influence on consumers' intention to adopt mobile banking services. The paper concluded with discussion on results, and several business implications for the banking industry of Pakistan.

Keywords: Mobile banking; technology adoption; social influence; perceived risk; low-income sector; Pakistan

1. Introduction

The union of telecommunication and banking services has fashioned opportunities for the surfacing of mobile commerce, in particular mobile banking. Mobile banking services provide time liberty, expediency and swiftness to customers, along with cost savings. Mobile banking delivered prospects for banks to enlarge market diffusion through mobile services (Lee, Lee and Kim, 2007). Mobile phones became a tool for everyday use, which created an opportunity for the evolution of banking services to reach the previously under banked/ unbanked population (CGAP, 2006). In Pakistan, cell phone penetration is high. In a latest statistics published by Pakistan Telecommunication Authority cell phone subscribers has reached over 120.5 million by September 2012 (Attaa, 2012). However, only 12% of the Pakistani population having access to formal banking (Mahmood, 2011), the prospects of providing mobile banking services to large under banked/unbanked population is high. According to (CGAP 2011), mobile banking market in Pakistan is on rise. The mobile banking providers have made investments into the mobile banking infrastructure for effective stipulation of mobile banking service to the low-income population. The largest mobile banking service providers in Pakistan are Telenor with EasyPaisa and United Bank Limited (UBL) with Omni, operating since October, 2009. According to ("Mobile Banking Accounts", 2013), out of total 1.4 million mobile accounts in Pakistan, only 66% of them are currently active.

The primary objective of this study is to investigate factors likely to promote and thwart the intention to adopt mobile banking services among low-income population segment of Pakistan. A clear understanding of these determinants will enable mobile banking service providers to develop suitable marketing strategies, business models, processes, awareness programs and pilot projects (GSMA, 2009).

There are basic questions which need to be answered:

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- ✓ What are the determinants influencing the adoption of mobile banking services for low-income sector of Pakistan?
- ✓ Is the low-income sector of Pakistan influenced by their peers in the intention to adopt mobile banking services?
- ✓ Is the low-income sector of Pakistan aware of mobile banking services, and what is their perception of security and privacy provided?

A proper study is required to assess the relevance and effects of perceived risk and social influence in the intention to adopt mobile banking services for the low-income population segement in Pakistan. The center base of study is the two largest cities, Karachi and Hyderabad of Sindh province in Pakistan. This study appears to be the first effort to use TAM for consumers' intention to adopt mobile banking services, specifically the low-income sector in a developing country like Pakistan. This paper is prepared as follows: section 2 presented with literature review and hypotheses formulation. Section 3 discussed research methodology, followed by data analyses and presentation of results in section 4. In section 5 discussions on results obtained presented, and finally section 6 consisted of concluding remarks of this research.

2. Literature Review

The scope of this study is to cover the main constructs derived from Technology Acceptance Model (TAM) (Davis, 1989); including intention to adopt mobile banking services, perceived usefulness, and perceived ease of use. After critically reviewing the literature that pertain the developments in Pakistan mobile banking situation some important information we gathered, which is the context of this study. The variables perceived risk and social influence are added to TAM in order to develop a research model to probe variables affecting adoption of mobile banking by low-income sector in Pakistan. Here we explore previous researches and got some details that is mentioned one by one including mobile banking concept.

2.1 Perceived Ease of Use

Widespread research has provided support that perceived ease of use had a significant effect on usage intention; it is an important forecaster of technology adoption. This study seeks to revalidate such relationships in the perspective of mobile banking services offered. Perceived ease of use refers to the degree to which a person believes that using a particular system would be free of effort (Davis, 1989; Liu and Li, 2010). In a recent research by (Chitungo and Munongo, 2013) conducted on the adoption of mobile banking services in rural districts of African country Zimbabwe, perceived ease of use had significant effect on users' attitude thus influenced the intention to adopt. In another research by (Cheah et. al, 2011), perceived ease of use was found positively related with the intention to adopt mobile banking services in the country of Malaysia. A study performed on the factors influencing the intention to adopt mobile banking services in Kenya, perceived ease of use was one of the significant factors in usage intention (Lule, Omwansa, and Waema, 2012).

Hence, the following hypothesis has been proposed in the context of adoption of mobile banking:

H_1: Perceived ease of use has a positive influence on the intention to adopt mobile banking services among low-income sector of Pakistan.

2.2 Perceived Usefulness

Perceived usefulness has been defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989, p. 320). Perceived usefulness is the primary precursor that determines the behavioral aim to use a computer system (Venkatesh and Davis, 2000). Previous researches have shown that perceived usefulness influenced computer usage directly (Ha and Stoel, 2009; Huang, 2008; Sudha et al, 2010). Once the consumers realize the importance of the technology based alternate method of service delivery, the intention to adopt such services would increase. According to (Akturan and Tezcan, 2012), perceived usefulness directly affected attitudes towards mobile banking, and that attitude was the major determinant of mobile banking adoption intention among 435 university students of Turkey. The research conducted by (Amin, Baba, and Muhammad, 2007) on current consumers of mobile banking in Malaysia, perceived usefulness was found to be a significant determinant in the intention to adopt such services. The results of the research performed by (Safeena,

Hundewale, and Kamani, 2011) showed that perceived usefulness was the important determinant of mobile banking adoption.

Hence, the following hypothesis has been proposed in the context of adoption of mobile banking:

H_2: Perceived usefulness has a positive influence on the intention to adopt mobile banking services among low-income sector of Pakistan.

2.3 Perceived Risk

Perceived risk as defined by (Pavlou, 2001), "It is the user's subjective expectation of suffering a loss in pursuit of a desired outcome". The quality of online services offered, the possible risk of illegal activities and fraud has always been a concern for both consumer and service providers (Ba and Pavlou, 2002). The risk factor as percieved by bank consumers in electronic transactions may comprise of financial risk, service performance risk, community risk, psychological risk, time risk, and physical risk (Forsythe and Shi, 2003). According to (Dineshwar and Steven, 2013), perceived risk and reliability were found to be the main obstacles to mobile banking usage in the African country of Mauritius. Risk in mobile banking is perceived to be higher than conventional banking because information exchange on wireless infrastructure, which produced inherent doubts among consumers as hacking and other malicious attacks, might cause financial and personal data loss (Yousafzai et al, 2003).

Hence, the following hypothesis has been proposed in the context of adoption of mobile banking:

H_3: Perceived risk has a negative influence on the intention to adopt mobile banking services among low-income sector of Pakistan

2.4 Social Influence

Venkatesh et al. (2003) defined social influence as the level to which a person perceives that essential others believe he/she should exercise the technology. (Riquelme and Rios, 2010) surveyed 681 Singaporean consumers and concluded that perceived usefulness, social norms and risks were three crucial factors influencing the adoption of mobile banking. In an investigation of 158 customers from a major bank in Malaysia, (Amin, Baba, and Muhammad, 2007) empirically established that person aim to use mobile banking was significantly affected by community nearby them. Similarly, (Singh et al, 2010) exposed that individual's decisions to accept mobile commerce services were inclined by acquaintances and family members. The empirical research conducted by (Yu, 2012) in Taiwan by sampling 441 respondents, the most significant predictor was social influence, in the individual intention to adopt mobile banking.

Hence, the following hypothesis has been proposed in the context of adoption of mobile banking:

H_4: Social Influence has a positive effect on the intention to adopt mobile banking services among low-income sector of Pakistan.

3. Research Methodology

The present study investigated the relationship between perceived ease of use, perceived usefulness, perceived risk, social influence, and customer intention to adopt mobile banking within the context of low-income population of Pakistan. According to (Cooper and Schindler, 2011) correlation study identifies the association among two or more factors. Correlation research design has been selected to answer the research questions and later multiple regression analysis was used to test the hypotheses. The present research is a unique one for Pakistan population sector of low-income. For data collection we distributed 400 questionnaires in the cities of Karachi and Hyderabad, province of Sindh, Pakistan by applying judgement sampling method. The survey was conducted in localities comprising of low-income population sector in these cities during the period of November 5, 2012 to December 27, 2012. The survey questionnaire consisted of two parts. The first part recorded the respondents' demographic details. The second part recorded respondents' multi-item attitudes of each factor in the model using the seven-point Likert scale from 1 being Strongly Disagree to 7 being Strongly Agree. When required, the questionnnaire items for factors affecting intention to adopt mobile banking were being translated to local languages in order to achieve better accuracy in data collection. The total number of non-usable questionnaires (28) was omitted, and 372 completely filled questionnaires were used for analysis.

4. Data Analysis

The following Table No. 1 summarized the demographic information of the 372 respondents who participated in the survey. Out of 372 respondents, 78.2% were male and rest was female. For this survey, almost 60% of the respondents were young aged up to 35 years old. The monthly salary earned up to Rs. 50,000 per month comprised 91% of the total 372 respondents participated in the survey. The self-employed respondents contributed 53%, service oriented 38.4%, and rest with mixed occupation status. The general awareness of mobile banking services among the respondents was high with 94.10%. This was may be due to the fact that 91.40% of the respondents were holding conventional bank accounts. However, of the total 372 respondents of the survey, only 47 (12.60%) are holding mobile bank accounts.

Table 1 Demographic Characteristics of the respondents

Variable	Classification	Frequency	Percentage
Gender	Male	291	78.2
	Female	5481	21.8
		372	*100%*
Age Group	Up to 25 years	61	16.4
	26-35 years	158	42.5
	36-45	107	28.8
	More than 45	46	12.4
		372	*100%*
Salary (Rs)	Up to 20,000	244	65.6
	20,001-50000	95	25.5
	More than 50,000	33	8.9
		372	*100%*
Occupation	Service	143	38.4
	Self Employed	*197*	53.0
	Other	32	8.6
		372	*100%*
City	Karachi	279	75.0
	Hyderabad	93	25.0
		372	*100%*
Mobile Banking Awareness	Yes	350	94.1
	No	22	5.90
		372	*100%*
Conventional Bank Account	Yes	340	91.40
	No	32	8.60
		372	*100%*
Mobile Bank Account	Yes	47	12.60
	No	325	87.40
			100%

Source: This study

The data analysis was done using the software Statistical Package for Social Sciences (SPSS) version 17. Cronbach's Alpha was used to determine the internal reliability of the multi item variables. Cronbach's Alpha Index can determine whether the questionnaire is reliable and the data can be used for further analysis (Hair et al., 2005). According to (Nunnally and Bernstein, 1994), the acceptance level of Cronbach's Alpha Index should exceed 0.60. The following Table No. 2 showed the results of reliability statistics of the analysis, which all were above the value of 0.60.

Table. 2 Reliability Coefficients

Scales	No. of Items	Cronbach's Alpha
Intention to Adopt	4	0.665
Perceived Ease of Use	3	0.883
Perceived Usefulness	3	0.792
Perceived Risk	3	0.895
Social Influence	3	0.911

Source: This Study

Table No. 3 reported the results of correlation analysis, which examined the association between the variables under study. The variables social influence (r = 0.781), perceived ease of use (r = 0.749), and perceived usfulness (r = 0.743) had strong positive correlation with the intention to adopt mobile banking services among low-income sector of Pakistan. The variable perceived risk (r = - 0.733) was found to have strong negative correlation with dependent variable, intention to adopt mobile banking services. Table No. 3 also indicated a preliminary support for the significant relationships between adoption of mobile banking services and independent variables.

Table 3 Correlation Matrix

Constructs	Intention to Adopt	Perceived Ease of Use	Perceived Usefulness	Perceived Risk	Social Influence
Intention to Adopt	1.00				
Perceived Ease of Use	0.749**	1.00			
Perceived Usefulness	0.743**	0.720**	1.00		
Perceived Risk	- 0.733**	- 0.713**	- 0.743**	1.00	- 0.734**
Social Influence	0.781**	0.759**	0.721**	- 0.734**	1.00

**Correlation is significant at 0.01 level of significance

Source: This study

Multiple regression analysis is generally used by researchers to examine the associations between a set of independent variables and a single dependent variable (Hair et al., 2005). The concern of this model is whether the independent variables perceived ease of use, perceived usefulness, perceived risk, and social influence have an impact on dependent variable intention to adopt mobile banking services among low-income population segment of Pakistan, as hypothesized by researchers. Table No. 4 showed the results of regression analysis.

Table No. 4 Multiple Regression Analysis

Model	R = 0.843		R-Square = 0.710	Adj. R Square = 0.707	
Model	F-Value = 225.172		Sig. = 0.000		
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Constant	1.843	0.320		5.762	0.000
Perceived Ease of Use	0.187	0.042	0.214	4.468	0.000
Perceived Usefulness	0.198	0.042	0.221	4.683	0.000
Perceived Risk	-0.152	0.042	-0.173	-3.645	0.000
Social Influence	0.276	0.041	0.332	6.777	0.000

Source: This study

Model Summary from Table No. 4 showed statistically significant (p-value < 0.01) relationships between the four independent variables (Perceived ease of use, Perceived usefulness, Perceived risk, and Social influence) and dependent variable (Intention to adopt) towards using mobile banking services. The coefficient of correlation R was 0.843 and coefficient of determination R^2 was 71.0%. Thus, the four independent variables significantly explained 71.0% of variance in the consumers' intention to adopt mobile banking services among low-income sector of Pakistan.

5. Discussion

The first hypothesis H_1, perceived ease of use was found to have significant positive influence (t = 4.468, p-value < 0.01) on the consumers' intention to adopt mobile banking services among low-income sector in Pakistan. The finding was consistent with past studies conducted related to adoption of mobile banking services (Chung and Kwon, 2009; and Kim et al, 2008). This result implied that if mobile banking application is user friendly, basic skills acquired to use the application, consumers are more likely to adopt mobile banking services.

The second hypothesis H_2, perceived usefulness was found to have significant positive impact (t = 4.683, p-value < 0.01) on the consumers' intention to adopt mobile banking services. Similar results were demonstrated from previous studies by (Laurn and Lin, 2005; Cheah et al, 2011; and Khalifa and Shen, 2008). This implied that those customers who find mobile banking services useful, beneficial, and convenient in managing their funds efficiently and effectively would be the potential adopters.

Perceived risk was found to have significant negative impact (t = -3.645, p-value < 0.01) on the customers' intention to adopt mobile banking services in Pakistan, which supported our third hypothesis H_3. This was in line with many past studies by (Al-Jabri and Sohail, 2012; Tan and Teo, 2000; Luo et al, 2010; and Gu et al, 2009). The consumers perceived higher risks and uncertainty such as loss of data and misuse of financial information would discourage them in the adoption of mobile banking services. Therefore, it is imperative for stake holders to plan higher security in providing mobile banking services in order to achieve higher consumer acceptance.

Finally in this study, the fourth hypothesis H_4, social influence had the most significant positive impact (t = 6.777, p-value < 0.01) on the intention to adopt mobile banking services among consumers of low-income sector of Pakistan. The result was consistent with several past studies by (Sripalawat et al, 2011; Puschel and Mazzon, 2010; Schepers and Wetzels, 2007; and Yu, 2012). The research results suggested there was a strong public unity among low-income economic sector of Pakistan. The finding from this study highlighted that potential adopters of technology can be influenced by people surrounding them, e.g. friends and family.

6. Conclusion

This research pointed out the importance of social influence as the most significant factor in the intention to adopt mobile banking, service providers should develop special awareness programs for the potential adopters of this technology. The service providers should advertize the benefits of mobile banking to this large number of cell phone subscribers in Pakistan through SMS service. The research intended to analyze specifically the adoption behavior of low-income population segment of Pakistan. With the spread of word of mouth, more consumers would likely to adopt this technology, which eventually increases the number of formal banking customers. This will lead to increase in the economic growth of the country from the finance and banking sector.

The financial institutions must also devise plans in order to build trust level for potential consumers of this low-income, less educated population segment of Pakistan. The inherent nature of risk in online banking has always been an inhibitor factor in the intention to adopt mobile banking services by the potential consumers. There is a need for devising plans at the national level to reduce the nature of perceived risk in a country of Pakistani population with diversified cultures, local languages, and ethhnic backgrounds. As the government of Pakistan invested heavily in the promotion of Information and Communication Technology (ICT) sector in last 15 years, extensive measures should also be taken to induct more and more active consumers in formal banking system of the country.

This research was conducted in only one province of Pakistan. Further studies may also consider selecting respondents from other provinces, as well as incorporating additional factors in understanding the intention to adopt mobile banking services.

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