

# Predicting the Antecedents of Mobile Banking Acceptance in India by Structural Equation Modelling

Dr. Deerga Sharma

Assistant Professor  
The North Cap University

## Abstract

The present study has proposed a model for determining various antecedents impacting the embracement of mobile banking technology in India. Based on structured questionnaire, a survey of 300 mobile banking users of five commercial banks was conducted using convenience sampling method. Through structural equation modelling, interrelationship of constructs and items is deduced in the study. The research is unique as it has considered the role of Government support, bank initiatives and perceived self-efficacy in mobile banking adoption which was not considered in previous research in Indian context. The finding would enhance the diffusion of mobile banking technology among Indian consumers and foster the competitive capacity of mobile banking service providers.

**Keywords-** Mobile banking, Technology Acceptance model, Behavioural intention

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## Introduction

Mobile banking has transformed the working of Indian banking system. The blending of internet and mobile devices has changed the way various financial services are provided to the consumers (Luo and li, 2010). The technology has made the mobile phone a strategic and profit-making device for offering product, services, and useful information to the users (Bauer et al. 2005; Varshney and Vetter, 2002). Mobile banking facility caters the requirement of accessing several banking services without visiting the bank branches (Ahluwalia and Varshney, 2009). The new service frontier has paved way for adoption of automated banking (Lee and Chung, 2009).

Globally, India has second largest consumer base of telecom users (India Brand Equity Foundation, 2018). Telecom Regulatory Authority of India (TRAI, 2018) reported that till July 2018, there are 1006.27 million wireless subscribers in India. Although, far-reaching accessibility of mobile phone specifically in rural areas is still inadequate in the country.

Rajasthan is the biggest state of India where 60% of the population lives in rural areas. According to All India Rural Financial Inclusion Survey (2016), the state witnesses a satisfactory progress of financial inclusion owing to various initiatives taken by government for increasing the financial literacy and enhancing the customer base of

various banking institutions. Although, mobile banking adoption is in developing stage in the state.

In India, various past studies on technology adoption were conducted (Shaikh and Karjaluo, 2015; Bashir, 2015) but none of the studies considered the influence of factors such as banking initiatives and government support on behavioural intentions for accepting mobile banking technology in Rajasthan. Moreover, the findings of available literature (Ketkar et al., 2012; Sharma, 2017) cannot completely infer the technology adoption in Indian scenario as the studies used different theories while depicting independent results. The current study has introduced a research model determining various antecedents inciting the selection of mobile banking services by employing extended Technology Acceptance Model (TAM). The suggested research model would contribute to the extant studies by integrating the critical roles of Government support, bank initiatives and perceived self-efficacy in mobile technology adoption.

Further, the research paper is divided in subsections. Several literatures pertinent to mobile banking adoption is revisited and hypothesis are framed to predict key factors impacting mobile banking acceptance in section two. The research methodology is discussed in section three. Data analysis is presented in section four and section five deals with conclusions and scope for following research.

## Literature Review

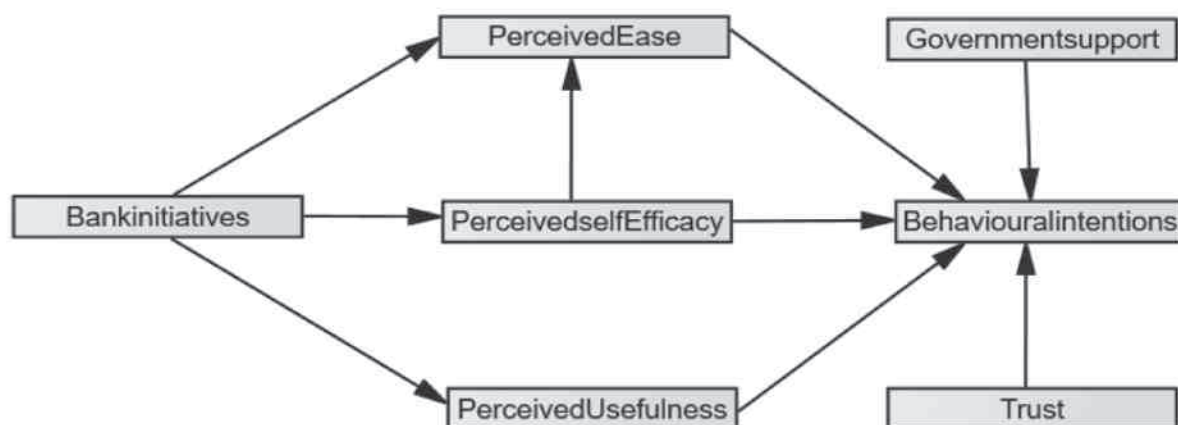
### Technology Acceptance Model (TAM)

The model has been accepted in various past researches as a powerful and parsimonious model in determining the individual intentions to adopt the information system. By the theory Davis (1989) advanced that behavioural intentions instigate the affirmation of a new technology. It showed that two beliefs perceived ease of use, perceived usefulness and attitude influences the behavioural intentions while selecting a novel technology.

### Development of hypotheses for the proposed model

The proposed model wherein it is suggested that various bank initiatives, Government support, perceived self-efficacy, ease of use and usefulness of mobile banking has positive influence on the behavioural intentions to use mobile banking service is presented in Figure 1. The constructs are incorporated in a theoretical model that would provide deeper insights, as these factors are not used in one model by existing theories inducing the development of following hypotheses for present study.

Figure 1. Proposed Research Model



### **Perceived ease of use (PEOU)**

It is supposition of a personal that availing services of the technology is uncomplicated (Davis 1989). The study (Motrimer et al., 2015) recommended that mobile banking technology to be comprehensive and apparent for enhancing its acceptance. Hence, the study postulated that:

**H 1- Perceived ease of use positively influences the behavioural intentions to use mobile banking.**

### **Perceived usefulness (PU)**

It is the conviction of a personal that utilising the technology would augment the work efficiency (Davis, 1989). The study of Hanafizadeh et al., (2014) proposed the interrelationship of usefulness and behavioural intentions to utilise mobile for conducting several transactions. Hence, the study premised that:

**H 2- Perceived usefulness positively influences the behavioural intentions to use mobile banking.**

### **Perceived Self-efficacy (PSE)**

It signifies efficaciousness of a consumer to adopt innovative technologies (Koksal, 2016). The study of Khalifa et al. (2008) showed the impact of individual attributes on m-commerce adoption. The research of Jeong and Yoon (2013), had established a causal relationship of ease and self-efficacy. Therefore, it is proposed that:

**H3a- Perceived self-efficacy positively influences the perceived ease of use to adopt mobile banking.**

**H3b- Perceived self-efficacy has positively influences the behavioural intentions to use mobile banking.**

### **Banks Initiatives (BNI)**

Banks initiatives amplify the acceptance of mobile banking facility (Sathye, 1999). Bank efforts in terms of efficient, user friendly and customer centric services enhances the acceptability of mobile banking among different class of customers. The previous research of Marakarkandy and Yajnik (2017) found a positive influence of banks initiatives on two variables specifically ease of use and usefulness. The present study investigated the impact of banks initiatives on mobile banking usage through following hypothesis:

**H4a- Banks initiatives positively influences the perceived ease of use to utilise mobile banking.**

**H4b- Banks initiatives positively influences the perceived usefulness to use mobile banking.**

**H4c- Banks initiatives positively influences the self-efficacy to use mobile banking.**

### **Trust (TR)**

Trust is indispensable for using any banking service. The security mechanisms provided by banks enhances the trust of customers and ensures them regarding privacy of their personal data. (Singh and Srivastava, 2018). Hence the study proposed that:

**H5- Trust positively influences the behavioural intentions to use mobile banking.**

### **Government Support (GOVS)**

The factor induces the utilisation of mobile banking for conducting transactions. The development of the concept of financial inclusion, low cost internet services, promotion of digital transactions to enhance banking channels usage, supportive regulatory framework for providing safety to the users of banking services are some of the attempts of the Government for stimulating the usage of the technology. Hence, following hypothesis is proposed:

**H 6-Government Support positively influences the behavioural intentions to use mobile banking.**

### **Behavioural Intentions (BI)**

This expresses subjectivity to execute a particular conduct (Fishbein and Ajzen (1975). Alwahaishi and Snasel, (2013) observed that behavioural intentions influences acceptance of innovative technologies.

### **Research Methodology**

#### **1 Questionnaire Designing**

The study has proposed a model by borrowing some constructs from past studies (Luarn and Lin, 2005; Yu, 2012; Makanyeza, 2016; Singh and Srivastava 2018; Marakarkandy, 2017). The structured questionnaire gathered the data related to demographic aspects of consumers residing in Rajasthan and established interrelationship among the selected constructs. The 25 items of the 7 constructs were rated on five-point Likert scale. By convenience sampling, the information was gathered from various mobile banking users of five commercial banks operating in Rajasthan. The banking customers were selected for responses as they were using various banking services and expected to be acquainted with mobile banking services. For collecting data, the study used online survey wherein email and various social media platforms namely LinkedIn and Facebook were used. The duration of data collection was from November 2018- May 2019. Initially 400 responses were collected out of which 100 responses were not included as the forms were not complete and some had invalid responses.

### The Demographic profile

Males and females constituted 58.7 percent and 41.3 percent of the respondents used in the study. The data indicated that mobile banking is very popular among youth as around 93 per cent respondents were below age 50. The demographic profile of respondents also showed that mobile banking is mostly utilised by postgraduate's 54

percent followed by graduates 39 per cent and PhD and higher education 7 percent. In the sample, majority of mobile banking users were fell under the category of 3lakhs and 9lakhs. Table1 highlighted the demographic profile of various mobile banking users.

**Table 1. Demographic variables**

Variables	Classification	Frequency	Percentage
<b>Gender</b>	Male	176	58.7
	Female	124	41.3
<b>Age</b>	21-30 years	120	40
	31-40 years	94	31.3
	41-50 years	66	22
	51 years and above	20	6.7
<b>Education</b>	Bachelors	117	39
	Postgraduate	162	54
	PhD and more	21	7
<b>Income</b>	3-5 lacs	80	26.7
	5-7 lacs	105	35
	7-9 lacs	85	28.3
	9lacs and above	30	10

Note: \* Percentage is computed based on total sample of 300

### Data Analysis

#### Reliability and validity measures

In order to verify the suitability of adapted scale, reliability and validity assessment was conducted. All the items

containing Cronbach's alpha value of more than 0.7 indicated internal consistency of the selected constructs (Nunnally, 1978). Table 2. has depicted the values.

**Table 2. Constructs, items and Cronbach's  $\alpha$  Values**

<b>Constructs</b>	<b>Measurement items</b>	<b>Cronbach's <math>\alpha</math></b>
<b>PU</b>	PU1 PU2 PU3 PU4	0.83
<b>PEOU</b>	PEOU1 PEOU2 PEOU3 PEOU4	0.91
<b>PSE</b>	PSE1 PSE2 PSE3 PSE4	0.92
<b>BNI</b>	BNI1 BNI2 BNI3	0.87
<b>TR</b>	TR1 TR2 TR3	0.94
<b>GOVS</b>	GOVS1 GOV2 GOVS3 GOVS4	0.91
<b>BI</b>	BI1 BI2 BI3	0.76

Besides, the data displayed Average Variance Extracted(AVE) of maximum=0.86; minimum=0.53 for the constructs and composite reliability was above 0.7. Standardised loading factors of all the items were above the suggested value of 0.6 confirming the convergent validity

of the proposed model as suggested by Bagozzi and Yi, (1988). Table 3 showed AVE and composite reliability of all the constructs.

**Table.3 Summary of Standardised factor loading, Reliability and Validity Measures**

<b>Constructs</b>	<b>Measurement items</b>	<b>Standardized factor loading</b>	<b>Average Variance Extracted</b>	<b>Composite Reliability</b>
<b>Perceived Usefulness</b>	PU1	0.683	0.55	0.83
	PU2	0.765		
	PU3	0.791		
	PU4	0.731		
<b>Perceived Ease of use</b>	PEOU1	0.794	0.73	0.91
	PEOU2	0.863		
	PEOU3	0.849		
	PEOU4	0.910		
<b>Perceived Self Efficacy</b>	PSE1	0.817	0.74	0.92
	PSE2	0.897		
	PSE3	0.879		
	PSE4	0.853		
<b>Bank Initiatives</b>	BNI1	0.669	0.70	0.87
	BNI2	0.909		
	BNI3	0.924		
<b>Trust</b>	TR1	0.934	0.86	0.95
	TR2	0.877		
	TR3	0.973		
<b>Government Support</b>	GOVS1	0.803	0.73	0.91
	GOVS2	0.885		
	GOVS3	0.867		
	GOVS4	0.876		
<b>Behavioural Intentions</b>	BI1	0.789	0.53	0.78
	BI2	0.778		
	BI3	0.618		

### Discriminant Validity

The correlation matrix presented in table 4. Higher value of square root of AVE than the correlations among constructs

confirms that constructs are different from each other and hence supported the discriminant validity of the model.

**Table 4. The correlation Matrix**

Constructs	TR	PEOU	PSE	BNI	BI	PU	GOVS
TR	0.929						
PEOU	-0.084	0.855					
PSE	0.037	0.283	0.862				
BNI	-0.115	0.552	0.239	0.842			
BI	-0.045	0.251	0.240	0.159	0.733		
PU	0.002	0.126	0.182	0.199	0.321	0.744	
GOVS	-0.060	-0.048	-0.051	-0.071	-0.077	0.050	0.858

### Confirmatory factor analysis (CFA) of the suggested model

The study examined the measurement model for ensuring convergent and discriminant validity. For testing nomological validity of constructs structural model was employed.

#### Model fit assessment of measurement model

The CFA approach using AMOS was used for the assessment of the model. For the calculation of model parameters maximum likelihood estimation method was opted. The suggested model depicts  $\chi^2=1.52$ . The various model fit indices of model are GFI=0.91, AGFI=0.89, NFI=0.92, CFI= 0.97, RMSEA=0.04 reflecting that the

model could be used for further analysis (Byrne, 2010).

#### Assessment of Structural Model

Goodness of fit indices are employed in current study for checking the extent to which data fits in suggested model. Path coefficients were used to determine the interrelationship between various constructs.

The structural model had  $\chi^2/df = 1.77$ . The model fit indices of structural model exhibits GFI=0.98, AGFI=0.95, NFI=0.92, CFI=0.96, RMSEA=0.05 (Byrne, 2010) illustrating that the research model could be accepted. The results are demonstrated by table 5.

**Table 5: Fit Indices of the Measurement and Structural Models**

Fit Index	Recommended Value	Measurement Model	Structural Model
$\chi^2/df$	3.00	1.52	1.77
Goodness-of-fit Index(GFI)	$\geq 0.90$	0.91	0.98
Adjusted Goodness-of-fit Index	$\geq 0.90$	0.89	0.95
Normed-fit index (NFI)	$\geq 0.95$	0.92	0.92
Comparative Fit Index (CFI)	$\geq 0.95$	0.97	0.96
Root Mean Square error of Approximation (RMSEA)	$\leq 0.07$	0.04	.05

**Hypothesis testing**

The study conducted path analysis for testing the proposed

casual interrelationships of various constructs shown in table 6.

**Table 6. Regression Weights of the variables**

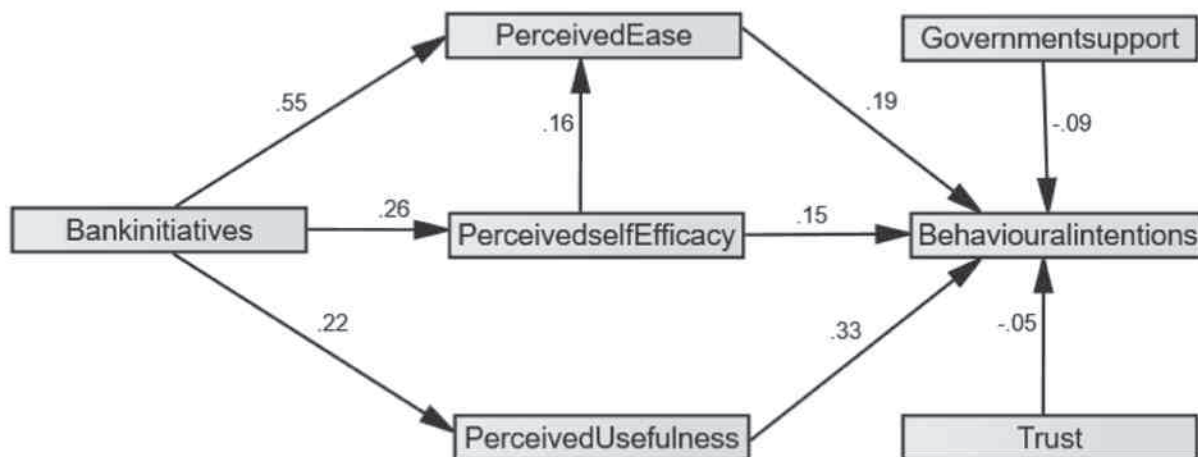
		Estimate	S.E.	C.R.	P
Perceived Self-Efficacy	<--- Bank Initiatives	.295	.064	4.613	***
Perceived Ease	<--- Bank Initiatives	.554	.048	11.639	***
Perceived Usefulness	<--- Bank Initiatives	.139	.035	3.964	***
Perceived Ease	<--- Perceived Self-efficacy	.143	.042	3.430	***
Behavioural Intentions	<--- Perceived Usefulness	.380	.060	6.362	***
Behavioural Intentions	<--- Perceived Ease	.134	.039	3.470	***
Behavioural Intentions	<--- Perceived Self-Efficacy	.095	.034	2.808	.005
Behavioural Intentions	<--- Government Support	-.052	.029	-1.805	.071
Behavioural Intentions	<--- Trust	-.020	.022	-.909	.363

Note: \*\*\*p<0.05

The result shown in figure 2 found six out of nine path coefficients statistically significant. The study found that perceived usefulness ( $\beta=0.38$ ,  $p<0.05$ ) and perceived ease of use ( $\beta=0.13$ ,  $p<0.05$ ) have significant impact on behavioural intentions for utilising mobile banking technology. Hence, H1 and H2 were supported. Banks initiatives have significant impact on perceived ease of use ( $\beta=0.55$ ,  $p<0.05$ ), perceived self-efficacy ( $\beta=0.29$ ,  $p<0.05$ ) and perceived usefulness ( $\beta=0.14$ ,  $p<0.05$ ). Hence, H4a,

H4b and H4c were supported. It was also depicted that perceived self-efficacy has significant impact on perceived ease of use ( $\beta=0.14$ ,  $p<0.05$ ) although, the path from perceived self-efficacy to behavioural intentions ( $\beta=p<0.05$ ) was not found significant. It was also demonstrated by path coefficients that Government support and trust did not influence the behavioural intentions for using mobile banking technology which indicated that H5 and H6 were not supported.

**Figure 2. Results of Hypothesis Testing, p<0.05**





## Conclusions

The present study is conducted to acquire deeper insights of antecedents which influences behavioural intentions to embrace mobile banking for conducting transactions. The users prefer this technology as complex transactions can be completed by a simple tap on mobiles. The results substantiate the general fact in past literature (Puschel et al., 2010). In addition, it indicates that various bank customers are using this service as it offers the advantage of promptness in conducting transactions. The research validates the findings of past studies (Devi et al., 2012; Koksai, 2016) which confirm that perceived usefulness complements the adoption of innovative technologies.

Interestingly, the study came out with the fact that perceived self-reliance had significant impact on ease of use influencing behavioural intentions to employ cellular banking. The findings suggested that bank management should conduct different training programmes for increasing the familiarity of customers with different mobile applications.

It was also pointed out from the study that bank initiatives and trust have no significance in mobile banking acceptance which validates the results of past study (Singh & Srivastava 2018) done in Indian context. Moreover, it is also established by the research that Government support has not positively influence on mobile banking acceptance. The plausible justification of the finding is that internet connectivity is one of the prime requirements for using mobile banking technology. Despite of various initiatives taken by the Government; limited access of mobile network is one of the key barriers in mobile banking acceptance.

It is recommended that the banks should be proactive in formulating effective promotion strategies to enhance the awareness regarding various benefits the technology is providing to the end users. Besides, the Government is required to enhance the access of internet availability across the country. The concept of digital economy should be promoted to higher extent.

## Scope of future research

The present study is an effort to determine various antecedents impacting the behavioural intentions to utilise mobile banking in Rajasthan. The regional data was collected by employing convenience sampling method as it was difficult to generate random samples broadly for online forms used in the study. Hence, it is unjustified to generalise the findings of the study for the whole population of India. Based on this limitation, the research can be extended to other major cities of the country. In the

study, the moderating effect of gender, education and income were not considered which can be covered by future researchers.

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