

Monitoring Technology Acceptance for Banking Consumers in India

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Abstract: August 15th 1995 marked a new dawn in India's communications history, when Videsh Sanchar Nigam Ltd (VSNL) then a state owned Telecom Company introduced commercial Internet services. Till then Internet connectivity was available to only select few researchers and government officials through the ERNET or NICNET networks. The research approach employed in this study is qualitative which is in line with our purpose of our study. The purpose of this study is to explore the relationship between technology enabled banking processes and its acceptance among Indian Consumers. This is due to the fact that, there is not much information since internet banking is still at its increasing stage. This descriptive as well as empirical research study would therefore provide us with much information and insight so as to get deeper understanding of the issue at stake. It would help us to explore the underlying facts relevant to online banking.

Keywords: Technology Acceptance, Technological Innovations, E-Banking, E-Commerce

1. Introduction

August 15th 1995 marked a new dawn in India's communications history, when Videsh Sanchar Nigam Ltd (VSNL) then a state owned Telecom Company introduced commercial Internet services. Till then Internet connectivity was available to only select few researchers and government officials through the ERNET or NICNET networks. VSNL launched its "Gateway Internet Access Services" (GIAS) to Indian public in the form of shell and TCP/IP dial-up connections with a modest estimate of 20,000 connections in the first year of operations (Ghosh, 1995).

By mid nineties Indian government allowed private companies to enter the protected Telecom industry and issued licenses for offering a broad spectrum of telecom services which included Basic telephony services, Wire-less telephony (GSM/CDMA) services and Internet services. Seeing the immense potential that existed in the industry space many new players entered into the foray of offering telecom services. The main players were still the state owned Bharat Sanchar Nigam Ltd (BSNL) and Mahanagar Nigam Ltd (MTNL), followed by Private Indian owned companies (Reliance Infocomm, Tata Teleservices) and Foreign invested companies (Hutchison-Essar, Bharti Tele-Ventures, Escotel, Idea Cellular, BPL Mobile, Spice Communications). Together with the availability of affordable quality services and a huge pool of technically qualified techno-savvy urban population, Internet users soared from few thousands in mid nineties to 37 million users in 2006 (IMRB & IMAI, 2006). Figure 1.1 illustrates the growth of Internet users in India from 2000 – 2006.

2. E-Banking services for Indian Customers

E-banking initiatives by the Reserve Bank and the deployment of Core Banking Solutions has allowed Indian banks to offer a new banking „experience“ for their customers. Indian customers suddenly became at par with their counter parts in developed countries in terms of services obtained from their banks. Gone are the days of branch only banking – computerization allowed banks to

offer many new channels of delivery. Indian banks, particularly the new generation banks which started their operations after 1993, were the first to offer new channels of delivery like ATMs, Phone Banking, Internet Banking and Mobile Banking. The new generation banks did not have the branch network that public sector banks possessed and they also had to introduce some differentiator to the customers. New generation banks like ICICI Bank, HDFC Bank, UTI Bank and foreign banks like ABN Amro Bank and Citibank kicked the ATM revolution in India. ICICI Bank employed a very aggressive strategy of ATM deployment to counter its lack of branch presence across the country. ICICI's ATM count surged from 125 ATMs in January 2000 to 1200 ATMs by the end of 2002 (Srikanth & Padmanabhan, 2-Dec-2002). The bank also saw the impact of that deployment in the form exceptional growth in customers in the same period, customer base swelled to 5 million from 2 million. ATMs not only worked as an attraction for customers but also allowed banks to lower its transaction cost. ATMs as a delivery channels became a huge success, which prompted public sector banks also to invest in them. Customer acceptance of ATMs were very high, customers in semi-urban also welcomed this innovation with both hands. Efforts are being done to develop ATMs that could be deployed in rural markets, the multi-lingual ATM developed by IIT Chennai promises new market for this channel. Another major innovation that was introduced in India during the last decade is Internet banking which offered many new services to the customer (Rajneesh & Padmanabhan, 16-Sep-2002). ICICI Bank was the first bank in India which offered this delivery channel, by kicking off its online banking services in 1996. Other private sector banks like Citibank, IndusInd Bank and HDFC Bank and Times bank (now part of HDFC Bank) started offering internet banking services in 1999. SBI launched its internet banking services in July 2001. Other public sector banks like State Bank of Travancore, Bank of Baroda, Allahabad Bank, Syndicate Bank and Bank of India, also rolled their services during the same time. Although, the acceptance of internet banking is lower compared to that of ATMs, banks are expecting usage levels to go up as internet penetration in the country improves.

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Reserve Bank constituted a Working Group under the Chairmanship of S.R. Mittal. The working group came up with the "Report on Internet Banking" in 2006 (RBI, 2006). This report gave guidelines for offering internet banking services in India. It discussed the technical, legal, regulatory and supervisory aspects of internet banking. The Information Technology Act of 2000 took care of the legal aspects of electronic commerce in India that allowed banks to offer full suite of internet banking. Banks in India currently offer „Fully Transactional Websites“ to their customers. The customers could conduct variety of transactions through internet banking facility which includes: account summary, details of historical banking transactions, funds transfer, new service announcements, loan applications, bill payment, cheque book request, cheque status enquiry, stop cheque request, credit card payments/statement, facilities to contact account manager etc. Internet banking is the least cost delivery channel available for a bank; the working report suggests the following comparative costs for different channels – teller cost at Rs. 1 per transaction, ATM transaction cost at 45 paise, phone banking at 35 paise, debit cards at 20 paise and Internet banking at 10 paise per transaction. The main deterrent for acceptance of internet banking among customers is lack of confidence in the security. The committee recommended implementing latest security technology to safe guard internet banking infrastructure in a bank. The report estimates that round 1% of the 9 lakh internet users in India used Internet banking in 1998. A survey conducted by IMAI and IMRB (IMRB & IMAI, 2006) in September 2006, estimated around 37 million Internet users in India and the number of „active“ users is pegged around 25 million. The survey also estimates around 2.4 million E-Commerce users, which included internet banking users. As of 2007, around 4.6 million Indians are availing Internet banking services (Kothari, 2007). In contrast to internet banking, usage of Telephone Banking and Mobile banking is limited. Mobile banking is expected to pick-up once the mobile companies offer 3G services.

3. Technology Acceptance Model

The technology acceptance model (TAM) developed by Davis (1989) was adapted from TRA (Fishbein & Ajzen 1975). The objective of TAM is to provide an explanation of user's acceptance and usage behaviour across a variety of end-user computing technologies (Davis 1989; Davis et al., 1989). Among other technology acceptance and diffusion models TAM is arguably the approach most widely accepted and used by information system researchers. The main reason for the TAM's popularity is perhaps due to its parsimony, information system-specific support from several studies nature and empirical; (Mathieson et.al. 2001).

TAM postulated that user acceptance of a new technology is determined by their behavioral intention to use the systems which can be explained jointly by user's perception about the technology's usefulness and attitude towards the technology use (figure 2.3). Attitude is jointly influenced by two behavioral beliefs, perceived usefulness and perceived ease of use. Perceived usefulness is defined as the degree to which a person believes that using a particular system will enhance his or her performances while the perceived ease of

use is defined as the extent to which a person believes that using a particular system is free of effort. External variables, such as tasks, user characteristics, political influences, organizational factors are expected to influence technology acceptance behavior indirectly by affecting perceived usefulness and perceived ease of use (Schaaf, 2005). Further, perceived usefulness is influenced by perceived ease of use. Venkatesh and Davis (2000) proposed a second version of the TAM, which incorporates additional constructs regarding subjective norm and cognitive instrument process.

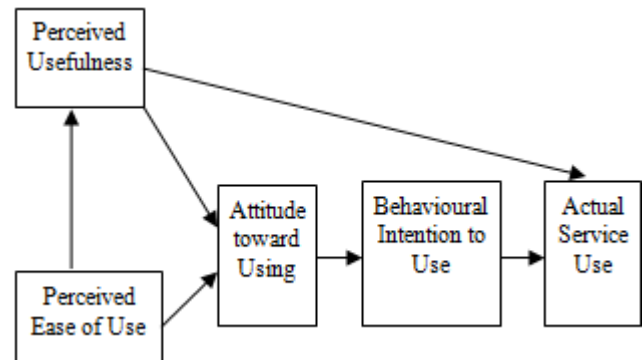


Figure 3.1: Technology Acceptance Model (Source Davis et al. (1989))

4. Literature Review

Gefen & Straub (1997) tried to examine the gender difference in perception and use of technology. They develop a model which extended from TAM and the model is tested in the context of e-mail usage. The study finding indicates the presence of difference in perception among men and women but not in use of e-mail.

Malhotra & Galletta (1999) tried to extend TAM taking into account the factor social influence. They developed a theoretical model and conducted a survey to test it. They found that social influence played an important role in technology adoption.

Jarvenpaa, Tractinsky, & Saarinen (1999) tried to examine the role played by consumer trust in adoption of Internet store in a cross-cultural setting. They studied the online shopping perception among Israeli and Australian customers using a model named Internet Customer Trust Model. They found that results of the cross-cultural study gave similar results indicating the generalizability of the model.

Van Slyke, Comunale, & Belanger (2002) tried examining the factors influencing the adoption of online shopping with special emphasis to the impact of trust. The results revealed that there is a positive impact of trust on the consumer's intention to conduct an online shopping activity.

Klopping & McKinney (2004) conducted a study by extending Technology Acceptance Model (TAM) with Task-Technology Fit (TTF) model to predict online shopping activity. When compared TAM/TTF model fared better than TAM.

McCoy & Fowler (2004) discussed about the information security awareness program undertaken at university of Missouri. The authors documented their efforts in creating and implementing a security awareness program along with the stumbling blocks they encountered during the process.

Zhou, Dai, & Zhang (2007) proposed a new model for study of online shopping. They named proposed model as Online Shopping Acceptance Model (OSAM) OSAM which is an extension of TAM model, is specifically developed to explain consumer acceptance of online shopping. They also provided research questions and hypotheses for conducting studies based on the proposed model.

5. Methodology

The research approach employed in this study is qualitative which is in line with our purpose of our study. This is due to the fact that, there is not much information since internet banking is still at its infant stage. The method would therefore provide us with much information so as to get deeper understanding of the issue at stake. It would help us to explore the underlying problem of technology acceptance of internet banking. Thus, qualitative approach is used to identify the basic factors affecting people’s attitude, feelings and thought for acceptance of e-banking and used to uncover the underlying motivations behind customer behaviour concerning it. However, during the interpretation and analysis, we shall be as much as possible remain neutral so as to reduce if not completely eliminated the influence of personal bias in the study.

The convenience sampling method is adopted for this study. This method uses non-probability sampling method in which participants are selected according to the experience individuals’ belief and therefore meet the requirements of the study.

Research Model

Based on the literature review and findings of the qualitative study conducted on a focus group, the researcher developed a research model indicating the acceptance of internet banking among customers. The model contained seven factors that the researcher posits to have an effect on internet banking acceptance. The research model developed is primarily based on the Technology Acceptance Model (TAM) (Davis et al., 1989). Research constructs and hypotheses posited are given below.

Perceived Usefulness (PB) and Perceived Ease of Use (PEOU)

PB and PEOU are constructs used in the Technology Acceptance Model (Davis et al., 1989). Davis defines PB as “the degree to which a person believes that using a particular system would enhance his or her job performance” Davis (1989). In the TAM model the construct PEOH is introduced as a major factor that determines acceptance of technology among users. Davis defines PEOH as “the degree to which a person believes that using a particular system would be free of effort” Davis (1989). PB and PEOH could be considered as important factors that forms user attitude towards use of technology. Therefore, the constructs PB and PEOH used in TAM could be said to be based on the Theory Reasoned

Action (Fishbein and Ajzen, 1975). An application which is perceived to be easier to use would be accepted more by users and in the same way users would only accept those applications they think would be more useful for them. Applying these construct in the internet banking context the researcher has come up with three hypotheses, viz;

- H1:** Perceived Benefit (PB) has a positive effect on the customer acceptance of online banking
- H2a:** Perceived Ease of Handling (PEOH) has a positive effect on the customer acceptance of online banking
- H2b:** Perceived Ease of Handling (PEOH) has a positive effect on the perceived usefulness of online banking

6. Data Analysis and Model Testing

Descriptive analysis

A survey was undertaken using web and paper based techniques. After discarding incomplete and vague responses 378 responses were taken for final analysis. Tables present the demographics related age, gender, marital status, educational qualification and the profession of respondents.

Gender of the Respondents

Table 6.1 Gender				
	Frequency	Percent	Cumulative Percent	
Valid	Female	87	23.01	23.01
	Male	291	76.99	100.0
	Total	378	100.0	

The respondents comprised of 291 males (76.99%) and 87 females (23.01%). The higher percentage of male respondents indicates that access to new technologies like internet or internet banking is adopted more by males than females. The gender pattern of a previous study conducted on E-commerce was 85% males and 15% females (IOAI, 2005).

Age of the Respondents

Table 6.2 AGE				
	Frequency	Percent	Cumulative Percent	
	>=15	0	0	0
	16-20	10	2.65	2.65
Valid	20-25	89	23.54	26.19
	26-30	102	26.98	53.17
	31-35	77	20.37	73.54
	36-40	43	11.37	84.91
	41-45	29	7.67	92.58
	46-50	15	3.97	96.55
	51-55	6	1.59	98.14
	56-60	4	1.06	99.20
	>=60	3	0.80	100
	Total	378	100	

Around 82.26% of the total respondents” fall in the age group 21-40 years. This indicates that internet adoption among youngsters and adults is high and most of the respondents are either single or married.

Table 6.3 Marital Status				
	Frequency	Percent	Cumulative Percent	
Valid	Single	192	50.8	50.8
	Married	167	44.18	94.98
	Separated	10	2.64	97.62
	Widowed	9	2.38	100.0
	Total	378	100.0	

Valid	Frequency	Percent	Cumulative Percent
Primary School	0	0	0
Secondary School	3	0.80	0.80
Bachelor's Degree	67	17.73	18.53
Master's Degree	129	34.12	52.65
Doctoral Degree	53	14.02	66.67
ACA, ACWA, ACS	117	30.95	97.62
Others	9	2.38	100.0
Total	378	100.0	

More than fifty percent of the Educational level of respondents was high – 17.73 % of the respondents had a graduate degree, 34.12% post graduate degree and 30.95% professional qualifications like ACA, ACWA or ACS. Since using internet requires specific skills higher educational level among respondents was expected.

Internet and Internet Banking Usage:

Table 6.5

How comfortable do you feel using the Internet?	Frequency	Percent	Cumulative Percent
Very uncomfortable	65	17.20	17.20
Somewhat uncomfortable	15	3.97	21.17
Neither comfortable nor uncomfortable	21	5.56	26.73
Somewhat comfortable	102	26.98	53.71
Very comfortable	175	46.29	100.0
Total	378	100.0	

More than 46% of the respondents revealed that they were feeling “Very Comfortable” while using internet. Similarly nearly 27%, of the respondents felt “Somewhat comfortable” while using Internet.

Table 6.6

How satisfied are you with your current skills for using the Internet Banking?	Frequency	Percent	Cumulative Percent
Very unsatisfied - I can't do most things I would like to do	34	8.99	8.99
Somewhat unsatisfied - I can't do many things I would like to do	42	11.11	20.12
Neither satisfied nor unsatisfied	22	5.83	25.95
Somewhat satisfied - I can do most things I want to do	191	50.6	76.55
Very satisfied - I can do everything that I want to	89	23.55	100.0
Total	378	100.0	

More than 50% of the respondents revealed that they were feeling “Somewhat satisfied” while using internet banking. Similarly nearly 24%, of the respondents felt “Very satisfied” while using Internet Banking.

Inferential Analysis

Constructs Reliability Testing (Cronbach’s alpha coefficient)

Table 6.7: Cronbach’s alpha coefficient

Constructs	Variable name	Cronbach’s alpha coefficient
Perceived Benefit	(PB)	0.858
Perceived Ease of Handling	(PEOH)	0.772

As seen from the table the Cronbach’s alpha coefficient for the constructs were near or above 0.70 which is a satisfactory figure for the current study. Cronbach’s alpha for constructs like Perceived Benefit and Perceived Ease of Handling is quite high. This construct was freshly developed for this study and results of the survey shows that it is having high internal consistency reliability. Table 4.16 gives the Cronbach’s alpha coefficients of the constructs used in final statistical analysis.

Table 6.8: Regression Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
1	(Constant)	3.662	.918	3.988	.000	
	PB	.372	.205	.646	1.819	.078
	PEOH	.484	.204	.728	2.379	.024

a. Dependent Variable: IBU

Discussion of hypothesis testing

Hypothesis H1: Perceived Benefit (PB) has a significant positive relationship with the consumer adoption of online banking ($\beta = 0.372$, $t = 1.819$ and $p \leq 0.078$). The result is expected and is a confirmation of Technology Acceptance Model postulate (Davis, 1989). Previous studies on internet banking also came with same findings (Pikkaraimes et al., 2004). It means that if a customer perceives internet banking as a useful service then he/she could start using it more.

Hypothesis H2a: Perceived Ease of Handling (PEOH) has a significant positive relationship with the consumer adoption of online banking ($\beta = 0.484$, $t = 2.379$ and $p \leq 0.024$). Again this result confirms that TAM model could be used to explain internet banking adoption among customers. From a practical viewpoint we could expect adoption of internet banking to increase when more and more customers feel that it is easy to use.

Testing of TAM (Technology Acceptance Model):

Table 6.9: Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1	(Constant)	.639	.602	1.061	.295
	PEOH	.952	.106	.825	8.996

a. Dependent Variable: PB

Discussion of hypothesis testing

Hypothesis H2b: Perceived Ease of Handling (PEOH) has a significant positive relationship with the Perceived Benefit of online banking ($\beta = .952$, $t = 8.996$ and $p \leq 0.000$). This hypothesis was framed to test the postulate of TAM model and expected it was found supporting. Therefore, the perception of ease of use of internet banking service should increase perception of usefulness among customers which in turn should result more usage of the service.

7. Findings and Conclusion

The objective of the study was to check if theoretical base of internet banking acceptance could be developed. In

particular, two theories in social psychology area were tested for their applicability in this study. One of the models tested was Technology Acceptance Model (TAM) (Davis, 1989), which is a widely used model for predicting technology adoption. Since its inception, the researchers were using TAM to predict technology in various settings across a number of countries. In this study two constructs in TAM namely Perceived Benefit and Perceived Ease of Handling are tested in the context of internet banking adoption. The results gave empirical evidence that the acceptance of internet banking was significantly influenced by the two constructs of the TAM. Results showed that the factors Perceived Benefit and Perceived Ease of Handling had positive influence on internet banking acceptance. The variable Perceived Ease of Handling also had a positive link with the variable Perceived Benefit indicating that ease of use meant more usefulness. Therefore it is concluded that objective of testing applicability of popular model in this study is also met.

8. Managerial Implications

Results of this study provide banking decision makers an insight into the perception about internet banking among Indian customers and that is the most important practical contribution of this study. Internet banking is gaining popularity in India and finding of this study allow banks to fine tune their internet banking product.

Banks could increase internet banking adoption by making their customer awareness about the usefulness of the service. It seen that from the study that the variable Perceived Benefit has a positive influence on internet banking use, therefore internet banking acceptance would increase when customers find it more useful. Banks should plan their marketing campaigns taking into consideration this factor. Proper marketing communications which would increase consumer attentiveness would result in better acceptance of technology in the banking processes. The variable Perceived Ease of Handling had a positive influence on internet banking use. That means customers would increase internet banking usage when they find it easier to use. Banks should therefore try to develop their internet banking site and interface easier to use. Banks could also consider providing practical training sessions for customers at their branches on usage of internet banking interface.

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