

Predicting Online Banking Adoption: Extension of Technology Acceptance Model with Psychographic factors

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Abstract

It has been noted that users' attitudes towards and acceptance of a new information system have a critical impact on successful adoption of information system. Online banking is a new technology based, cost efficient, convenient and time saving channel for the customers as compared to traditional bank branches. However, it has been observed that Indian banking customers are reluctant to adopt online banking services. This paper aims to empirically examine the psychographic factors that affect the adoption of online banking. Perceived Usefulness, Perceived Ease of Use, Trust, Social Norms, Computer Self-Efficacy, Personal Innovativeness, and Domain Specific Opinion Leadership were examined to determine if these factors are affecting online banking adoption. It integrates Technology Acceptance Model with important Psychographic variables and the proposed model showing the relationship between predictors and dependent variable is tested. The results can be useful for banks' decision makers to develop strategies that can increase the adoption of online banking.

Keywords :

Online Banking, Technology Acceptance Model (TAM), Consumer Behavior, Psychographics



Introduction

According to a report from Gartner, the overall Indian information technology (IT) spend is forecast to reach \$73.3 billion in 2015, up 9.4% from \$67.1 billion in 2014, making the country third-largest IT market in the Asia-Pacific by 2016 and second-largest by 2018, after China. At the same time, the implementation and use of computer and information technologies in organizations has become so pervasive that it is now considered a routine part of daily operations. As a result, the adoption and use of technology in organizational settings has become a topic of broad interest to researchers and practitioners in management and psychology (Morris, Venkatesh and Ackerman, 2005).

Today, through online banking, customers could conduct a wide range of banking services electronically, anytime and anywhere (Sonja and Rita, 2008). Online banking is defined as an internet portal, through which customers can use different kinds of banking services ranging from bill payment to making investments (Pikkarainen, Pikkarainen, Karjaluo and Pahnla, 2004). Online banking brings about speed, convenience and round-the-clock availability of banking services (Cheng, Lam and Yeung, 2006; Abu Shanab and Pearson, 2007). From the banks' perspective, online banking offers lower operating costs. The cost-conscious banks in the country have therefore actively considered use of the Internet as a channel for providing services.

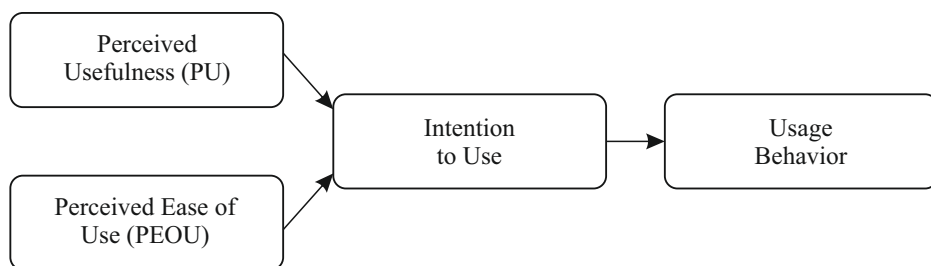
Despite of the advantages of online banking, recent views suggest that online banking may not achieve the levels of transformation as predicted (Cuevas, 1998; Canniffe, 2000). It has added a new dimension to different kinds of risks and issues like Legal and regulatory issues, and Security. However, according to Ives et al, (1983), success is not necessarily dependent of the technical quality of the system. Whether the system is regarded as good or bad depends on how the user feels about the system. Especially if the users do not rely on the system and its information their behavior toward the system could be negative (Pikkarainen, Pikkarainen, Karjaluo and Pahnla, 2004). Therefore, it becomes necessary to analyze what consumers feel about the online banking system and to what extent they are ready to adopt new technology.

Technology Adoption Model (TAM)

To assess the adoption scenario of IT application in the market, such as internetbanking, a lot of previous studies and research have carried out and various frameworks were proposed to identify the factors or determinants influencing the acceptance of technology in the consumer context (Alain Yee-Loong Chong, Keng-Boon Ooi, Binshan Lin and Boon-In Tan 2010). Since online banking is a type of technological innovation (Lin and Lee, 2005), existing studies on innovation adoption could be used in the study of online banking. One of the most common models used by researchers in the study of individual's adoption of technology is Technology Acceptance Model (TAM) (Davis, 1989).

According to this model (also known as basic model), system use (actual behavior) is determined by perceived usefulness (PU) and perceived ease of use (PEOU) relating to attitude toward use that relates to intention and finally to behavior. These two factors are of primary significance for adoption of online banking services (See Figure 1).

Figure 1 Technology Acceptance Model (Basic Version)



(Source : Davis, 1989)

Perceived usefulness is defined by Davis as “the degree to which a person believes that using a particular system would enhance his or her job performance” (Davis, 1989). Thus, for users of online banking, they will adopt the system if they believe the system will bring benefits such as reducing time spent on going to bank and improving efficiency (Rao et al., 2003). According to TAM, perceived ease of use is “the degree to which the prospective adopter expects the new technology adopted to be a free effort regarding its transfer and utilization” (Davis, 1989). Therefore, if users feel that online banking is easy to use and free of hassle, then the chances of them to use the system will be greater.

TAM has since been extended to Voice-mail and word-processors (Adams et al., 1992; Chin and Todd, 1995), spreadsheets (Mathieson, 1991), DBMS (Szajna, 1994), GSS (Chin and Gopal, 1995), and adaptive technology for the physically-challenged (Goette, 1995).

However, many research state that TAM itself is insufficient to explain users' decisions to adopt technologies, therefore they use TAM as a base model and extended the model by adding additional variables to the model depending on the types of technologies studied (Alain Yee-Loong Chong, Keng-Boon Ooi, Binshan Lin and Boon-In Tan 2010). For example, Pikkarainen, Pikkarainen, Karjaluoto and Pahlila, (2004) used perceived enjoyment, information on online banking, security and privacy along with quality of internet connection as additional variables. Gounaris and Koritos (2008) applied Perceived Characteristics of the Innovation (PCI) model in their online banking adoption study.

Based on existing studies, this study uses TAM as the base model and extends the model by including other variables which were required to be explored further and have not been studied so far. The notion that individual differences play a crucial role in the implementation of any technological innovation has been a recurrent research theme in a wide variety of disciplines including information systems, production, and marketing. Individual differences have been studied including demographic and situational variables, cognitive variables and personality trait variables. This study focuses on several psychographic factors and variables like gender, social norms, trust, domain specific opinion leadership, personal innovativeness and computer self-efficacy.

Literature Review

Perceived Usefulness (PU)

Perceived usefulness is defined by Davis as “the degree to which a person believes that using a particular system would enhance his or her job performance” (Davis, 1989). Similarly, Mathwick, Malhotra and Rigdon (2001) define perceived usefulness as the extent to which a person deems a particular system to boost his or her job performance. In other words, it refers to effectiveness at work, time saving and the relative importance of the system for the individual's work (Joaquin et al., 2009). Lee, Younghwa; Kozar, Kenneth A.; and Larsen, Kai R.T. (2003) conducted research on how much progress did TAM make for the past 18 years (i.e. from 1986 to 2003) consisting of 101 studies. They found significant relationship between Perceived Usefulness (PU) and Behavioral Intentions (BI) or Behavior (B) in 74 studies out of 101 and stated that PU is a stronger determinant of BI (or B), noting that users willingly use the system that has a critically useful functionality.

Perceived Ease of Use (PEOU)

According to TAM, perceived ease of use is “the degree to which the prospective adopter expects the new technology adopted to be a free effort regarding its transfer and utilization” (Davis, 1989). Therefore, if users feel that online banking is easy to use and free of hassle, then the chances of them to use the system will be greater. According to Lee, Younghwa; Kozar, Kenneth A. and Larsen, Kai R.T. (2003), only 58 studies (out of 101) showed a significant relationship between PEOU and dependent variables, indicating that PEOU is an unstable measure in predicting Behavioral Intentions. Further many studies found reasons

for that non-significance. For example, Subramanian (1994) asserted that, when systems used in studies are by their inherent nature relatively easy to use, PEOU has less or no impact on the IS acceptance decision. Igbaria et al. (1995) explained that the hard reality of organizations might put priority on the usefulness of computer systems rather than the pleasure brought by them. Finally, PEOU was found as a significant antecedent of PU, rather than a parallel, direct determinant of acceptance, and thus it can affect indirectly the acceptance through PU (Davis et al., 1992).

Trust

In online banking, Amin (2007) commented that trust is 'the heart of the system'. The concept however has been defined differently by different scholar disciplines (Sonja and Rita, 2008). For example, in the online banking literature, Mayer, Davis and Schoorman (1995) and Rousseau, Sitkin, Burt and Camerer (1998) defined trust as, 'a psychological state which leads to the willingness of customer to perform banking transactions on the internet, expecting that the bank will fulfill its obligations, irrespective of customer's ability to monitor or control bank's actions'. Sathye (1999) found that security and privacy concerns are identified as the "biggest obstacles" to the adoption of online banking in Australia. Trust is also more crucial and complex in internet banking than traditional banking due to its virtual environment. Thus, to complete the purchase transaction, customers have to trust the online business and online transaction of the bank. Without trust the consumer will avoid making any transaction online (Alain Yee-Loong Chong, Keng-Boon Ooi, Binshan Lin and Boon-In Tan, 2010). Jahangir and Begum (2008) found that consumers' trust on security and privacy are both important factors in influencing the adoption of online banking in Bangladesh.

Social norm

Social norm or normative pressure refers as the person's perception that most people who are important to her or him should or should not perform the behavior in question (Nysveen et al., 2005). Lu, Yu, Liu and Yao (2003) said that social influence is equivalent to subjective norms and defined it as individual's belief about whether significant others think that one should engage in a activity. Normative pressure is found to be important construct that bring the success of IS acceptance (Nysveen et al., 2005). Further, Amin et al. (2006) examined that the normative pressure has significant impact in the development of initial willingness to use SMS banking. Normative Pressure is also found significant in development of people's intention to use wireless finance (Kleijnen et al., 2004). In one of study conducted in Malaysia, Amin, H. (2009) found that social norm is an important driver for online banking acceptance. Tan et al. (2010) also found that social influence is significant predictor for online banking adoption.

Domain Specific Opinion Leadership

Online Banking is a relatively innovative behavior that is more likely to be adopted by innovators than by non-innovators. Domain Specific Opinion Leadership is a concept that is related to domain-specific innovativeness and domain specific measure of opinion leadership can be used as a proxy for domain specific innovation (Lassar et al, 2005). Opinion Leadership has been associated with early adopters of electronic shopping technology, such as videotext (Korgaonkar and Moschis, 1987). Lassar et al (2005) found that consumers who are internet opinion leaders are significantly more likely to adopt or utilize internet banking and Banks need to recognize and appreciate the importance of internet specific consumer innovation levels and their characteristics.

Personal Innovativeness

Personal Innovativeness refers to individuals' willingness to change (Hurt et al. 1977). Innovative individuals are more confident about performing new tasks or when entering new situations. Agarwal and

Prasad (1998b) defined Personal innovativeness in information technology as “the willingness of an individual to try out any new information technology.” Further, individuals with high Personal Innovativeness are more likely to seek out stimulating experiences and demonstrate more confidence in their capacity to use a new technology (Agarwal et al. 2000). Innovativeness in terms of the use of mobile technology has been found to lead to greater use of mobile technology services (Mort and Drennan 2007).

Computer Self Efficacy (CSE)

As a special application of the self-efficacy concept in the field of IS, CSE is commonly defined as one's judgment of his/her capability to use a computer (Compeau and Higgins, 1995). CSE exists at both the general computing behavior level and the specific computer task or application level (Marakas et al., 1998). General CSE (GCSE) refers to an individual's judgment of his or her ability to perform across multiple computer application. Domains specific CSEs refer to an individual's perception of efficacy in performing specific computer-related tasks within the domain of general computing. Research suggests that individuals who possess high CSE are more likely to form positive perceptions of IT (Venkatesh and Davis, 1996).

Gender

Because computing has developed a masculine image like the traditionally masculinized subjects such as mathematics, physics and engineering (Agosto, 2004; Gilbert et al., 2003), females tend to feel less comfortable with computers than males (Beyer, 2008; Frankel, 1990; Karsten and Schmidt, 2008; Lowe and Krahn, 1989). Thus, the masculine image of computers may lead many females to, consciously or unconsciously, avoid learning and using computers.

Methodology

The study aims to extend the Technology Acceptance Model by adding psychographic variables to it, which are found relevant based on literature reviewed and test the relationship between these independent factors and Intention to adopt Online Banking as dependent factor. Apart from Perceived Usefulness and Perceived Ease of Use, other factors like Social Norms, Trust, Domain Specific Opinion Leadership, Personal Innovativeness and Computer Self-Efficacy were hypothesized to have influence on adoption of Online Banking. Further, Gender is proposed to have differentiating effect on these independent factors and thus having an impact on adoption of Online Banking.

To test the proposed model, data were collected using a Questionnaire which was developed using the scale used in previous research. Questionnaires were distributed personally as well as through e-mails to the respondents in the age group of 20 to 40 years using the convenience sampling method, and effectively 152 questionnaires were found valid to be used for analysis. The sample profile is shown in Table I.

Table I : Sample Profile

		Frequency	Percent
Gender	Male	86	56.6
	Female	66	43.4
Education	Graduation	72	47.3
	Post Graduation	80	52.7
Marital Status	Married	88	57.9
	Unmarried	64	42.1

		Frequency	Percent
Employment Status	Self-Employed	30	19.7
	Service	83	54.6
	Housewife	04	2.6
	Student	35	23.0
Use of Online Banking	No	40	26.3
	Yes	112	73.3
Length of Internet Usage	less than 6 Months	2	1.3
	6-12 Months	8	5.3
	1-3 Years	26	17.1
	4-6 Years	44	28.9
	7 years or More	72	47.4
Usage Intensity (Per Week)	Less than 1 hours	2	1.3
	1-5 hours	50	32.9
	6-10 hours	28	18.4
	11-20 hours	22	14.5
	21-40 hours	50	32.9

The responses were collected on scale of Strongly Agree – 5 to Strongly Disagree -1 for all the variables in the model. The details about the scales used and their reliability are as given below.

Table II : Scale Items

Scale	No. of Items	Cronbach's Alpha	Adopted From
Perceived usefulness	6	0.851	TAM (Davis, 1989)
Perceived ease of use	5	0.819	TAM (Davis, 1989)
Trust	4	0.878	Pikkarainen et al.(2004)
Personal Innovativeness	3	0.771	Agarwal and Karahanna (2000)
Domain Specific Opinion Leadership	4	0.772	Lassar et al, (2005)
Social Norm	3	0.862	Amin et al. (2006)
General Computer Self-Efficacy	6	0.879	Marakas et al., (1998)
Intention to Use	5	0.871	TAM (Davis, 1989)

The original scale for Personal Innovativeness contained 4 items. However, one question which was negatively framed has to be dropped and the 3 item - scale is used for further data analysis. Following section of the paper illustrates the data analysis and testing of proposed relationships between the variables. The differentiating impact of Gender on all independent factors as well as on Intention to use

online banking is tested using independent sample t-test. To test the impact of independent factors on Intention to use online banking, following Regression equation is developed and tested using Multiple Regression Analysis.

$$IU = \alpha + \beta_1(PU) + \beta_2(PEOU) + \beta_3(TR) + \beta_4(PI) + \beta_5(OL) + \beta_6(SN) + \beta_7(CS) \dots\dots\dots (1)$$

Where, IU = Intention to Use PI = Personal innovativeness
 PU = Perceived Usefulness OL = Domain Specific Opinion Leadership
 PEOU = Perceived Ease of Use SN = Social norms
 TR = Trust CS = Computer Self – Efficacy
 α = constant and β_i = Co-efficient of Independent Factors

Results

To test the ability of Technology Acceptance Model and other Psychographic factors to predict the adoption of Online Banking, Regression Equation (Equation No 1) was formed with Intention to Use (IU) as dependent factors and Perceived Usefulness, Perceived Ease of Use, Trust, Social Norms, Domain Specific Opinion Leadership, Personal Innovativeness and Computer Self-Efficacy as independent factors (Predictors). The Results of the analysis are shown in Table I. The proposed Regression Model was adequate as the F-statistic = 52.011 (p-value = 0.000) was significant at the 5 percent level ($p < 0.05$). This indicates that the overall model was reasonable fit and there was a statistically significant relationship between predictor factors for online banking and consumer's intention to use online banking. Further, the results indicate that Perceived Usefulness, ($\beta = 0.341, p < 0.05$), Perceived Ease of Use ($\beta = 0.373, p < 0.05$), Social Norms ($\beta = 0.169, p < 0.05$), Personal Innovativeness ($\beta = 0.102, p < 0.1$) and Computer Self-Efficacy ($\beta = 0.111, p < 0.05$) were found to have a significant and positive relationship with consumer intention to use online banking. Meanwhile Trust ($\beta = -0.046, p > 0.05$) and Domain Specific Opinion Leadership ($\beta = -0.028, p > 0.05$) had no significant relationship with consumer intention to use online banking. Further, the most important predictor of Online Banking Adoption is Perceived Usefulness followed by Perceived Ease of Use, Social norms and Computer Self-Efficacy and Personal Innovativeness.

From Table II, it can be observed that the adjusted coefficient of determination (adjusted R^2) was .703, representing that 70.3 percent of variance in intention to use internet banking can be explained by the independent variables (adoption factors for online banking).

Effect of Gender

To determine whether Gender has any significant effect on predictors of TAM and other psychographic factors with reference to online banking adoption, independent sample t-test was conducted (Table – III). It assumed gender as independent variable and predictors of the regression model as dependent variables. It is observed that gender affects computer self- efficacy ($t = 4.339, p < .05$) and intention to use online banking services ($t = 3.296, p < .05$). While we do not find significant differences in terms of perceived usefulness and perceived ease of use; core factors of technology adoption model. It can be said that men and women perceive online banking equally useful and easy to use. Similar conclusions can be drawn in case of trust, social norm, domain specific opinion leadership and personal innovativeness. The insignificant effect of gender on these variables might be due to age group of respondents. According to Morris, Venkatesh and Ackerman, (2005) gender differences in technology perceptions become more pronounced among older people, but a unisex pattern of results may emerge among younger people. However, these results support what Beyer (2008) and Felzer (1985) have found; females typically display lower computer aptitude. It might be due to masculinized image of computing (Agosto, 2004; Gilbert et al.,

2003). Further, it is found that females are less likely to use online banking services compared to males that might be explained due to higher level of computer anxiety amongst females (Harrison et al., 1997; Igbaria and Chakrabarti, 1990; Morrow et al., 1986).

Table III : Regression Analysis

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	
	.847 ^a	0.717	0.703	0.41622	

ANOVA					
	Sum of D	f	Mean Square	F	Sig.
	Squares				
Regression	63.073	7	9.01	52.011	.000 ^a
Residual	24.947	144	0.173		
Total	88.02	151			

Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.179	0.218		.820	0.414
PU	0.341	0.055	0.373	6.165	0.000
PEOU	0.373	0.084	0.332	4.449	0.000
TR	-0.046	0.049	-0.055	-.942	0.348
PI	0.102	0.054	0.110	1.881	0.062
OL	-0.028	0.063	-0.028	-.448	0.655
SN	0.169	0.059	0.199	2.847	0.005
CS	0.111	0.050	0.128	2.220	0.028

a. Predictors: (Constant), CS, PU, SN, PI, TR, OL, PEOU

b. Dependent Variable: IU

Table IV : Regression Analysis for Effect of Gender

	Levene's Test		T-test	
	F	Sig.	t	Sig.
PU	0.983	0.323	0.932	0.353
PEOU	10.065	0.02	0.481	0.631
TR	2.963	0.087	1.331	0.185
PI	3.258	0.073	1.589	0.114
OL	1.344	0.248	0.891	0.374
SN	3.905	0.050	1.489	0.139
CS	0.134	0.715	4.339	0.000
IU	0.616	0.434	3.296	0.001

Managerial Implications

The study has empirically validated the proposed research model. All the hypotheses regarding the relationship between the variables are developed and tested by using multiple linear regression. Further the effect of Gender has been tested on Predictors of Online Banking Adoption as well as Intention to Use Online Banking. The results supported most of the developed hypothesized relationships. Perceived Usefulness, Perceived Ease of Use, Social Norms, Personal Innovativeness and Computer Self-Efficacy were found to have a significant and positive relationship with consumer intention to use online banking.

Perceived Usefulness

As mentioned earlier, perceived usefulness is found to be a significant determinant to predict the intention to use the internet banking. This is similar to the TAM model, which has been applied in other technology adoption studies; users will adopt a technology if they find it useful. Therefore, banks should try to let their customers know the advantages of using online banking when compared to traditional banking. Banks should further investigate the types of features which current bank users find useful or they will find useful and promote such features to encourage more customers to adopt online banking.

Perceived Ease of Use

Perceived Ease of Use is also found to have significant relationship with adoption of Online Banking. This finding is in line with previous research (Amin et al. ,2008). So, it is important for banks to have user-friendly website portal and navigation to various functions. Helping and educating customers about how to use various features on website can be an important move.

Social Norms

The result also indicated that social norm is an important driver for online banking acceptance. The result is confirmed with the study by Amin (2009), and Nysveen et al. (2005). In this case, an individual role model can provide a mechanism to encourage others to use online banking. To achieve this, it is important for the bank to train its customer to promote the use of online banking via word of mouth communication.

Computer Self-Efficacy

From the results it can be asserted that Computer Self-Efficacy gives more confidence to the users, which would in turn enhance their banking activity through online technology (Kalaiaarasi and Srividya , 2012). Technology exposure of the respondents may give them higher online efficacy and confidence over the technology equipped channel like online banking.

Personal Innovativeness

Personal Innovativeness found to have a significant and positive relationship with consumer intention to use online banking with $p = .062 < .1$. Thus, Individuals with high Personal Innovativeness are more likely to try and demonstrate more confidence while adopting Online Banking.

Conclusion

Users' attitudes towards and acceptance of a new information system have a critical impact on successful adoption of information system.

Online banking is a new technology based, cost efficient, convenient and time saving channel for the customers as compared to traditional bank branches. The study empirically examined the factors that affect the adoption of online banking. Results of the study implies that Perceived Usefulness, Perceived Ease of Use, Social Norms, Computer Self-Efficacy, and Personal Innovativeness, were found to have sufficient predictive ability with reference to adoption of online banking adoption. The results suggested that apart from base TAM constructs, Psychographic factors like Social Norms,

Computer Self Efficacy and Personal Innovativeness can be useful for banks' decision makers to develop strategies that can increase the adoption of online banking. The effect of Gender on these independent variables is not significant except Computer Self-Efficacy, rather Gender has direct effect on dependent variable i.e. intention to adopt Online Banking. The findings have strategic implications for managers of the Banks.

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