

Validating the Measurement Constructs Affecting the Technology Adoption in Indian Mobile Banking Industry

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Abstract

Mobile phones have undeniably brought a paradigm shift, affecting both the lives of people and the business environment. Today, mobile phone has permeated the lives of billions of people around the world; becoming for many an indispensable device. Moreover, adoption of mobile banking has significant impact on reducing costs and enabling change in retail banking. Factors influencing the intention to use or adopt mobile banking are very important and will play a vital role for mobile banking service providers. The proposed study focuses on a comprehensive set of potential factors that influence the adoption of mobile banking. The research model identifies appropriate factors and captures dependency relationships among these factors in the form of a number of hypotheses to be tested in this research.

This paper aims to design a scale with a high degree of reliability, validity, and dimensionality which helps to determine the appropriate technology adoption model based on the identified constructs, viz. Optimism (OPTI), Innovativeness (INNO), Insecurity (INSC), Discomfort (DISC), Perceived Usefulness (PU), Perceived Ease of Use (PEU), Perceived Risk (PR), Subjective Norms (SN), Attitude (ATTI), Behavioural Control (BC) and Behavioural Intention (BI). The data were collected through questionnaire survey from 201 respondents comprising software engineers, bank employees, professors, entrepreneurs. Confirmatory factor analysis was used to test the validity of the proposed measurement scale for all the identified constructs. This instrument helps bankers to determine and design their applications which will contribute to the knowledge of predicting customer intention.

Keywords: Technology Adoption Model (TAM), Technology Readiness Index (TRI), Technology Planned Behaviour (TPB), Mobile Banking, Mobile Technology, Confirmatory Factor Analysis

Introduction

The review of literature on adoption models in the area of mobile banking reveals that there is a growth in academic research examining the determinants of M-banking acceptance and its utilisation (Crabbe, Standing, Standing, & Karjaluoto, 2009; Donner & Tellez, 2008; Gu, Lee & Suh, 2009; Luarn & Lin, 2005; Mattila, 2003; Riquelme & Rios, 2010). Mitropoulos, Othonos and Douligeris (2013) provide a state-of-the-art approach to the development of an effective and secure web banking system. First, it presents the latest trends and advancements on web system development and operational requirements of e-banking environments. Then, it presents a prototype web banking system by providing its analysis and design based on the waterfall model through the use of workflow and UML diagrams, as well as its implementation approach based on web programming technologies such as active server pages and web services. The system development gives emphasis on security standards, by using SSL protocol, the security techniques that are provided by .Net framework, and a role-based access control (RBAC) model. At the end, a multi-perspective system evaluation, which is based on the balanced scorecard method, proves the high applicability and significant value of the proposed system.

Khan and Dominic (2014) reported that the use of online systems is emerging very rapidly in developing countries. Internet technology becomes a vital part of every business. Their study investigated the acceptance rate of an online system by the user to make their transactions online through the Internet using TAM and proposed a new

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model for the online system acceptance. The perceived ease of use was a new additive variable in the modified TAM.

Studies have been conducted in various countries to better understand consumers' attitudes toward this emerging mobile technology. For example, Mattila (2003) focused on the drivers and inhibitors of mobile banking services. A study by Sripalawat Thongmak, and Ngramyarn (2011) examined positive and negative factors affecting m-banking acceptance in Thailand. Subjective norms, perceived usefulness, perceived ease of use, and self-efficacy were considered as the positive factors, while device barrier, perceived risk, lack of information, and perceived financial cost as negative factors. They found that the positive factors have more influence than negative factors towards the acceptance of technology. Among the positive factors, subjective norm is the most influential factor in m-banking adoption in Thailand. Crabbe et al. (2009) examined the impact of social and cultural characteristics on m-banking adoption in Ghana. They showed that social and cultural factors in the form of perceived credibility, facilitating conditions, perceived elicitation and demographic factors play an important role in influencing adoption and sustained usage. In addition, perceived credibility and facilitating conditions also influence attitudes towards the technology. Barnes and Corbitt (2003); Barnes and Scornavacca (2005) suggest that recent innovations in telecommunications have enabled the launch of new access methods for banking services. One of these is; where by a customer interacts with a bank via a mobile device such as a mobile phone or personal digital assistant. For consumers in the developing countries, the appeal of m-banking may be less about convenience, but more about accessibility and affordability due to network coverage, quality connection, and costs (Donner & Tellez, 2008). Riquelme and Rios (2010) examined the factors influencing adoption of m-banking among current users of Internet banking. Moreover, adoption has significant impact on reducing costs and facilitating change in retail banking (Laukkanen & Lauronen, 2005). Cruz, Neto, Munoz-Gallego, and Laukkanen (2010) and Dasgupta, Paul, and Fuloria (2011) suggested that has great potential to provide reliable services to people living in remote areas where internet facility is limited. (Riquelme and Rios 2010) found that usefulness, social norms, and social risk are factors that influence the intention to adopt services the most. Services in India are still in then ascent stage, promising to be medium to reach the unbanked rural mass

which stands at 41%. The transaction volumes of which are very low (Chakrabarty, 2010). A study by A study by Safeena, Date, Kammani, and Hundewale (2012) found that mobile banking is the latest and most innovative service offered by the banks. The transformation from the traditional banking to e-banking has been a 'leap' change. The evolution of e-banking started from the use of Automatic Teller Machines (ATMs) and telephone banking (tele-banking), direct bill payment, electronic fund transfer and revolutionary online banking. This study determines the consumer's perspective on mobile banking adoption.

Selamat, Jaffar, and Ong (2009) examined the determinant factors and acceptance of information technology in the Malaysian banking industry. The Technology Acceptance Model (TAM) was employed to study the perceived usefulness, perceived ease of use, social pressure, perceived enjoyment and fun, as well as the perceived complexity of IT usage and acceptance of Malaysian bankers. The findings of this study indicated that perceived usefulness was the most influential factors in determining micro computer usage among bankers.

Yan, Nor, Shanab, and Sutanonpaiboon (2009) have examined the factors that influence the intention to use a mobile payment solution for mp3 downloading among university students. Drawing from the Technology Acceptance Model, Theory of Planned Behaviour and previous literatures, five factors were hypothesized to influence the intention use the payment solution, namely perceived usefulness, perceived ease of use, trust, perceived price level, and peer influence. Trust and peer influence were found to have significant effect on the intention to use the payment solution.

Chandio, Irani, Abbasi, and Nizamani (2013) extended the research on the technology acceptance model (TAM), which besides TAM's original predictors of perceived usefulness (PU) and perceived ease of use (PEOU), included trust (TR) as an additional belief factor to predict the behavioural intention (BI) to use an online banking information system (OBIS). The model was tested on a sample of 353 Internet users in Pakistan and highly significant paths were observed between the additional new factor of trust and the PU, followed by PU and BI. These findings suggest that inclusion of an additional factor within TAM extends its capability and validity to predict the individual's acceptance behaviour towards OBIS.

Aboelmaged and Gebba (2013) study aims at extending our understanding regarding the adoption of mobile banking through integrating Technology Acceptance Model (TAM) and Theory of Planned Behaviour (TPB). They found that a significant positive impact of attitude toward mobile-banking and subjective norm on mobile banking adoption. Surprisingly, the effects of behavioural control and usefulness on mobile banking adoption were insignificant. Furthermore, the regression results indicated a significant impact of perceived usefulness on attitude toward mobile banking while the effect of perceived ease of use on attitude toward mobile banking was not supported. Similarly, Safeena, Kammani, and Date (2013) used the integrated TAM and TPB model to determine the factors for the consumer acceptance of internet banking and investigated the influence of perceived usefulness, perceived ease of use, subjective norm, attitude and perceived behavioural control on use of IB among consumers.

AliSaleh and Khalil (2013) reported that the explosion of Internet usage and the great funding initiatives in electronic banking have taken the attention of researchers towards Internet banking. At the beginning, the conventional focus of Internet banking research has been on technological infrastructure, but this is now shifting to user-focused research. Although millions of dollars have been paid to invest in the Internet banking services, reports have shown that potential users may not use these services. A great deal of research has been conducted in various countries to determine the factors that influence acceptance of Internet banking. However, these studies have not taken into account emotional dimension that related to individuals' technology readiness. The authors reported that attitude, subjective norm and perceived behavioral control have a significant positive effect on individuals' intention to adopt the Internet/mobile banking service.

Guhr, Loi, Wiegard, and Breitner (2013) suggested that there is a high potential for mobile-payment services, but the mere existence of such services does not mean that the market is ready for them. M-payment services must add value to attract new users. The authors investigated how technology readiness (TR) influences customers' perception and acceptance of m-payment. Evaluation results based on an extended TAM model (TAM) show that user acceptance of m-payment differs influenced by constructs.

Reddy and Mallikarjuna (2013) examined the factors which will influence the adoption of net banking by using

technology acceptance model (TAM). They found that factors perceiving usefulness, ease of use, enjoyment, customer traits, self-efficacy, related advantage, credibility and trail ability significantly influenced customers' adoption towards usage of net banking.

Kumar et al. (2013) integrated Mcknight's web trust model with TAM in context of adoption of Internet banking. It identifies the antecedents of different types of trust and examines their relative role in building the trusting beliefs that in turn influence not only the adoption but also the level of adoption of Internet banking.

Alqasa, Isa, Norezam, and Zolait's (2014) study examined the ability and application of the theory of reasoned action (TRA) in explaining the use of banking system in Yemen. It investigated the impact of two theoretical variables (attitude and subjective norms), using a sample consists of university students, on individuals' intention to use banking services. The results of the study revealed a strong predictive power of the theory of reasoned action model to explain university students' behavioural intention to use banking services.

Jaradat and Mashaqba (2014) introduced a modified Technology Acceptance Model 3 (TAM3) to investigate key factors that affect individuals' intention to adopt and use mobile payment (M-payment) in Jordan. They used a questionnaire that was distributed to 475 undergraduate university students by using a proportional stratified random sample, and analysed by using a structural equation modelling (SEM). Results show that user's adoption and use of M-payment services can be anticipated from users' behavioural intentions, which are significantly affected by the following: perceived usefulness, perceived ease of use, subjective norm, image, output quality, self-efficacy, perceptions of external control, and playfulness. This study shows that there is a promising and bright future for M-payment services in Jordan as more than 62% of respondents said that they are willing to merchandise by using their mobile phones.

Two major impediments to consumers' adoption of mobile banking and mobile payment technologies are (1) concerns about security and (2) the possibility of hackers remotely accessing consumers' phones. Concerns about the security of the technology were the primary reason given for not using mobile payments 42%, and the second most common reason given for not using mobile banking 48% altogether

Mobile-based payments and commerce ecosystem are still at a nascent stage and hence, acceptance among merchants and customers is currently low but is bound to increase over a period of time though the mobile banking offers distinct benefits to bankers and customers as well, the actual usage is mistakes. If the process of mobile banking is to be repeated the banks will have to direct their marketing and promotional efforts using scientific principles.

Taking this into consideration, the present study focuses on a comprehensive set of potential determinants that influence the adoption of mobile banking. For this purpose, theory of planned behaviour (TPB), technology acceptance model (TAM), technology readiness index (TRI), and perceived risk was used to construct a conceptual model to study the adoption intention of mobile banking. It is important for mobile banking service providers to understand the factors influencing the intention to use or adopt mobile banking. Further, this study also validates the instrument by explaining the behavioural intentions from the user's perspective; the findings of this study not only help financial institutions to develop a more user-accepted mobile banking system, but also provide insight into the best way to promote new systems to potential users.

Constructs Used in the Research

- i. Optimism is defined as “a positive view of technology and a belief that it [technology] offers people increased control, flexibility, and efficiency in their lives” (Parasuraman & Colby, 2001, p. 34). It generally captures positive feelings about technology.
- ii. Innovativeness is defined as “a tendency to be a technology pioneer and thought leader” (Parasuraman & Colby 2001, p. 36). This dimension generally measures to what degree individuals perceive themselves as being at the forefront of technology adoption.
- iii. Discomfort is defined as “a perceived lack of control over technology and a feeling of being overwhelmed by it” (Parasuraman & Colby 2001, p. 41). This dimension generally measures the fear and concerns people experience when confronted with technology.
- iv. Insecurity is defined as a “distrust of technology and skepticism about its ability to work properly” (Parasuraman & Colby, 2001, p. 44). This dimension focuses on concerns people may have in face of technology-based transactions.
- v. 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, pp. 320).
- vi. 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” (Davis, 1989).
- vii. Attitude toward user acceptance of technology is defined as an individual's overall affective reaction (liking, enjoyment, joy, and pleasure) to use a technology (Davis, 1989; Taylor & Todd, 1995).
- viii. Subjective Norm (SN) or Normative Pressure (NP) is defined as a person's perception that most people who are important to her or him should or should not perform the behaviour in question (Fishbein & Ajzen, 1975).
- ix. Perceived behavioural control is defined as “the perceived ease or difficulty of performing the behaviour” (Ajzen, 1991, p. 188).
- x. Behavioural intention: The degree to which a person has formulated conscious plans to perform or not perform some specified future behaviour.

Research Methodology

Following are the stages involved in the research methodology in which the instruments for this research are developed and tested. The instrument development involved structured interviews followed by a pilot study. Rigorous statistical methods were used to assess and validate the constructs. The methods used were: content validity (using structured interviews), reliability (using Cronbach α) and confirmatory factor analysis (CFA) (for factor structure and initial validity).

Instrument Development

To ensure the content validity of the scales, the items selected necessarily represent the concept about which generalisations has to be made (Bohmstedt, 1970). The best way to ensure content validity is to select and adapt items from previously validated instruments. To the extent possible, we attempted to borrow items from prior research. The items and questions in the proposed questionnaire for the study have been adopted from the previous research; as mentioned earlier, the questionnaire has been pre-tested with the reputed experts (i.e. 10 experts from industry and 10 experts from leading b-schools). Table 1 shows the basis of instrument development and

also defines the constructs adopted for the study. The scales administered to collect the primary data as regards to various constructs used for the study are presented in table 1 below.

Table 1: TRAPB Constructs and Measurement Items

Sl. No.	Construct	No. of items
1	Optimism	10
2	Innovativeness	7
3	Insecurity	9
4	Discomfort	8
5	Perceived Usefulness	5
6	Perceived Ease of Use	4
7	Behavioural Control	6
8	Attitude	3
9	Subjective Norm	5
10	Behavioural intention	3
Total	10	63

Source: Compiled by author

Analysis and Validation of the Scales

This study used the analysed data in three stages. The first was based on an exploratory study which consisted of maintaining exclusively those items which enabled the

analysis of other dimensions or factors with a suitable degree of reliability or uni-dimensionality. The second stage was an exploratory factor analysis and the third the confirmatory study which discarded those items which did not enable suitable dimensionality for the entire construct of TRAPB constructs. In the above analysis the measurement properties of the TRAPB constructs were evaluated by assessing key components of construct validity. As per the guidelines of Bagozzi (1980) and Bagozzi and Phillips (1982), the following measurement properties are considered important for assessing the measures developed in this paper:

- Content validity
- Internal consistency of operationalisation (uni-dimensionality and reliability)
- Convergent validity
- Discriminant validity

Reliability Analysis

The reliability of the measurement scale in the survey was tested using Cronbach's alpha (α). Hair, Anderson, Tatham, and Black (1998) suggested that a value of 0.60 and higher is often considered the criterion for internally consistent established factors. Scales reliability is presented in Table 2.

Table 2: Reliability of the Measurement Instrument

	Initial Items	Item Dropped based on Experts Opinion	Mean Value (N=201)	S.D.	Range of Item to Item Correlation	Cronbach's Alpha (α) Score	% of Variance
Optimism (OPTI)	10	9	3.91	1.014	0.393** - 0.569**	.898	55.300
Innovativeness (INNO)	7	4	3.79	1.042	0.337** - 0.567**	.752	58.258
Insecurity (INSC)	9	4	3.93	1.073	0.337** - 0.567**	.707	53.438
Discomfort (DISC)	8	6	5.47	.801	0.268** - 0.637**	.811	51.772
Perceived Usefulness (PU)	5	5	3.96	.977	0.313** - 0.623**	.794	55.115
Perceived Ease of Use (PEU)	4	4	3.72	1.055	0.529** - 0.645**	.859	70.311
Perceived Risk (PR)	6	6	5.51	.796	0.276** - 0.649**	.826	53.699
Subjective Norms (SN)	3	3	3.47	1.190	0.580** - 0.757**	.842	76.156
Attitude (ATTI)	5	5	4.03	.936	0.469** - 0.683**	.868	65.860
Behavioural Control (BC)	3	3	1.072	1.072	0.448** - 0.473**	.720	64.229
Behavioural Intention (BI)	3	3	4.03	0.977	0.573** - 0.618**	.818	73.434
Total Items	63	52					

**Correlation is significant at 0.01 level (2-tailed), *Correlation is significant at 0.05 level (2-tailed).

From Table 2 it was found that all the identified constructs showing reliability above the cut off are Optimism (OPTI), Discomfort (DISC), Perceived Ease of Use (PEU), Perceived Risk (PR), Subjective Norms (SN), Attitude (ATTI), and Behavioural Intention (BI). These constructs show reliability > 0.8.

Result and Findings

Confirmatory Factor Analysis

The findings of the reliability tests were further supported by Confirmatory Factor Analysis (CFA) carried for all the constructs separately. CFA was used to assess the fit of the measuring items for describing the behaviour of the unobserved latent variables mentioned above. Confirmatory factor analysis (CFA) or a measurement model using AMOS 21 was employed for examining construct validity of each scale by assessing how well the individual item measured the construct (Ahire, Golhar, & Waller, 1996).

Measurement Scale for Attitude (Atti)

The CFA is conducted in two phases, initial value and final value as per the result generated for Attitude (Atti). The initial values are Cmin/df – 1.768, RMR – 0.013, GFI – 0.993, NFI – 0.992, and CFI – 0.982. At the initial phase, only the values of the model fit indices satisfy the given cut offs (RMR > 0.01, GFI, CFI < 0.9, Cmin/df > 0.5). Fig. 1 indicates final validated model for Attitude (Atti).

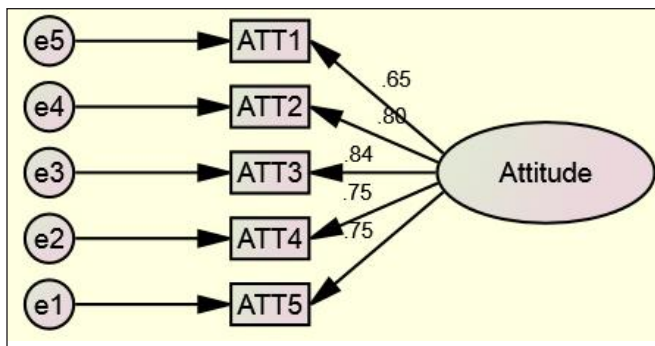


Fig. 1: Final Validated Model for Attitude (Atti)

Measurement Scale for Behavioural Control (BC)

The CFA is conducted in two phases, initial value and final value as per the result generated for Behavioural Control

(BC). From the literature three items were identified for this construct. All the three items were showing standardised regression weight above >0.5. This construct was not dropped on the basis of model fit indices because literature and experts’ opinion strongly support the need to measure the effect of the Behavioural Control (BC) constructs which was not studied earlier. Fig. 2 indicates final validated model for Behavioural Control (BC).

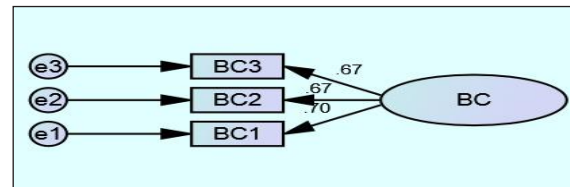


Fig. 2: Final Validated Model for Behavioural Control (BC)

Measurement Scale for Behavioural Intention (BI)

The CFA is conducted in two phases, initial value and final value as per the result generated for Behavioural Intention (BI). From the literature three items were identified for this construct. All the three items were showing standardised regression weight above >0.5. This constructs was not dropped on the basis of model fit indices because literature and experts’ opinion strongly support the need to measure the effect of the Behavioural Intention (BI) constructs which was not studied earlier. Fig. 3 indicates final validated model for Behavioural Intention (BI).

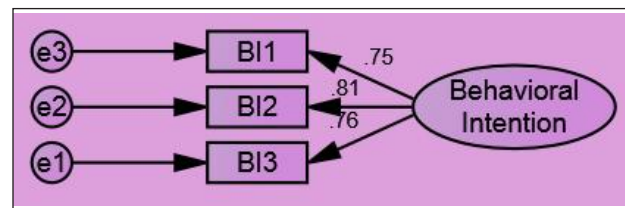


Fig. 3: Final Validated Model for Behavioural Control (BI)

Measurement Scale for Discomfort (DISC)

The CFA is conducted in two phases, initial value and final value as per the result generated for Discomfort (DISC). A total of 8 items were identified from the literature. The initial values for model fit indices are Cmin/df – 5.005, RMR – 0.057, GFI – 0.876, NFI – 0.793, and CFI – 0.824.

The initial values do not satisfy the cut off for the model fit indices (RMR > 0.01, GFI, CFI < 0.9, Cmin/df > 0.5). In step 1 the items loading less than 0.5 were dropped for item DISC 6 and 7. Hence based on the standardised regression weights, two items were dropped. The GFI value was modified to 0.938 from 0.876 and the CFI to 0.916 from 0.824 which is nearer to the suggested value of > 0.9 (Joreskog & Sorbom, 1989). Further the other fit indices viz., Cmin/df, RMR were also found to be satisfactory. As it was seen that further deletion of any item will not affect the output values and thus the nearby optimum value was achieved. Fig. 4 indicates final validated model for Discomfort (DISC).

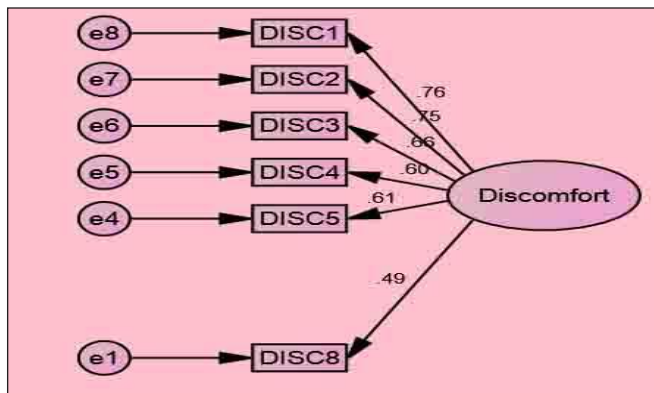


Fig. 4: Final Validated Model for Discomfort (DISC)

Measurement Scale for Innovativeness (INNO)

The CFA is conducted in two phases, initial value and final value as per the result generated for Innovativeness (INNO). Total 7 items were identified from the literature. The initial values for model fit indices are Cmin/df – 6.002, RMR – 0.167, GFI – 0.676, NFI – 0.593, and CFI – 0.624. The initial values do not satisfy the cut off for the model fit indices (RMR > 0.01, GFI, CFI < 0.9, Cmin/df > 0.5). In step 1 the items loading less than 0.5 were dropped, hence based on the standardised regression weights 3 items INNO1, INNO2, and INNO3 were dropped. The GFI value was modified to 0.999 from 0.676 and the CFI to 0.996 from 0.624 which is nearer to the suggested value of > 0.9 (Joreskog & Sorbom, 1989). Further the other fit indices viz., Cmin/df, RMR were also found to be satisfactory. As it was seen that further deletion of any item will not affect the output values and thus the nearby optimum value was achieved. Fig. 5 indicates final validated model for Innovativeness (INNO).

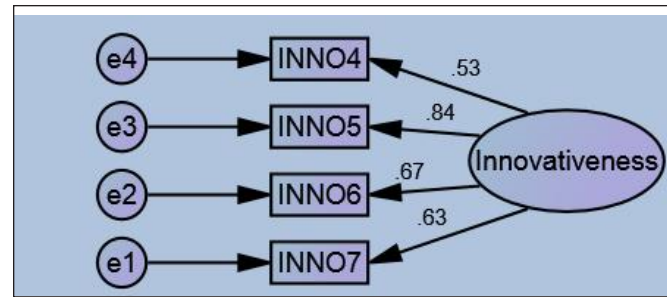


Fig. 5: Final Validated Model for Innovativeness (INNO)

Measurement Scale for Insecurity (INSC)

The CFA is conducted in two phases, initial value and final value as per the result generated for Insecurity (INSC). Total 9 items were identified from the literature. The initial value for model fit indices are Cmin/df – 4.235, RMR – 0.247, GFI – 0.875, NFI – 0.765, and CFI – 0.738. The initial values do not satisfy the cut off for the model fit indices (RMR > 0.01, GFI, CFI < 0.9, Cmin/df > 0.5). In step 1 the items loading less than 0.5 were dropped, hence based on the standardised regression weights 5 items INSC1, INSC2, INSC3, INSC4, and INSC9 were dropped. The GFI value was modified to 0.992 from 0.875 and the CFI to 0.990 from 0.738 which is nearer to the suggested value of > 0.9 (Joreskog & Sorbom, 1989). Further the other fit indices viz., Cmin/df, RMR were also found to be satisfactory. As it was seen that further deletion of any item will not affect the output values and thus the nearby optimum value was achieved. Fig. 6 indicates final validated model for Insecurity (INSC).

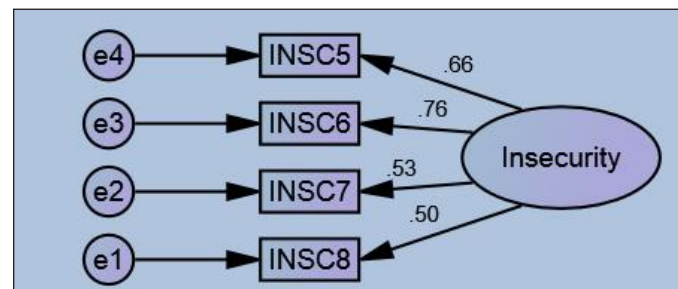


Fig. 6: Final Validated Model for Insecurity (INSC)

Measurement Scale for Optimism (OPTI)

The CFA is conducted in two phases, initial value and final value as per the result generated for Optimism (OPTI). A total of 10 items were identified from the literature. The

initial values for model fit indices are Cmin/df – 8.235, RMR – 0.159, GFI – 0.778, NFI – 0.735, and CFI – 0.739. The initial values do not satisfy the cut off for the model fit indices (RMR > 0.01, GFI, CFI < 0.9, Cmin/df > 0.5). In step 1 the items loading less than 0.5 were dropped, hence based on the standardised regression weights 1 item OPT7 was dropped. The GFI value was modified to 0.956 from 0.778 and the CFI to 0.990 from 0.739 which is nearer to the suggested value of > 0.9 (Joreskog & Sorbom, 1989). Further the other fit indices viz., Cmin/df, RMR were also found to be satisfactory. As it was seen that further deletion of any item will not affect the output values and thus the nearby optimum value was achieved. Fig. 7 indicates final validated model for Optimism (OPTI).

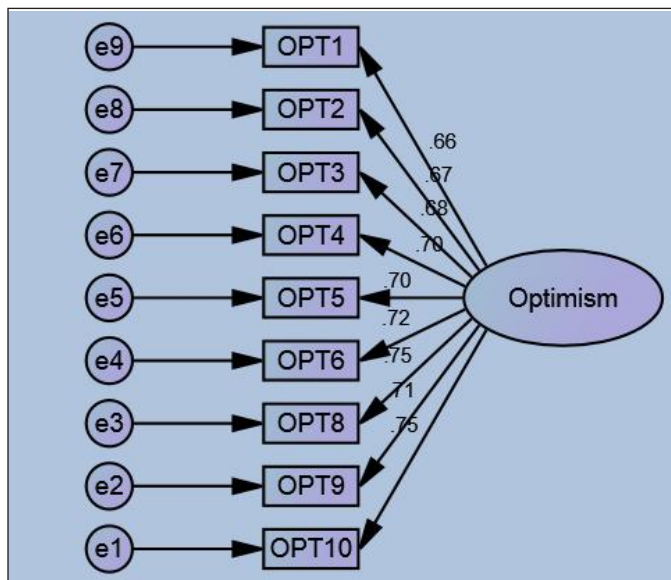


Fig. 7: Final Validated Model for Optimism (OPTI)

Measurement Scale for Perceived Ease of Use (PEU)

The CFA is conducted in two phases, initial value and final value as per the result generated for Perceived Ease of Use (PEU). Total 4 items were identified from the literature. The initial values are Cmin/df – 1.813, RMR – 0.019, GFI – 0.991, NFI – 0.990, and CFI – 0.995. At the initial phase, only the values of the model fit indices satisfy the given cut offs (RMR > 0.01, GFI, CFI < 0.9, Cmin/df > 0.5). Fig. 8 indicates final validated model for Perceived Ease of Use (PEU).

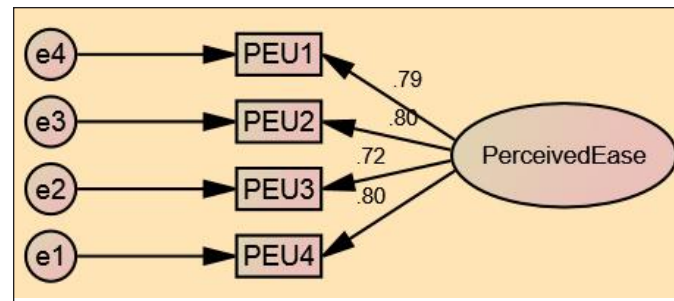


Fig. 8: Final Validated Model for Perceived Ease of Use (PEU)

Measurement Scale for Perceived Risk (PR)

The CFA is conducted in two phases, initial value and final value as per the result generated for Perceived Risk (PR). Total 6 items were identified from the literature. The initial values are Cmin/df – 2.792, RMR – 0.029, GFI – 0.958, NFI – 0.937, and CFI – 0.958. At the initial phase only the values of the model fit indices satisfy the given cut offs (RMR > 0.01, GFI, CFI < 0.9, Cmin/df > 0.5). Fig. 9 indicates final validated model for Perceived Risk (PR).

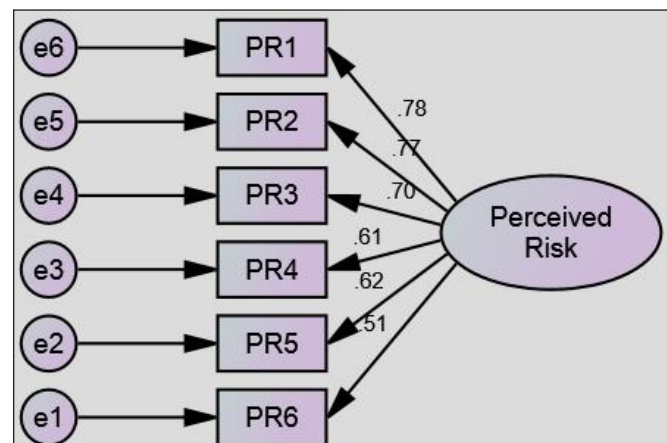


Fig. 9: Final Validated Model for Perceived Risk (PR)

Measurement Scale for Perceived Usefulness (PU)

The CFA is conducted in two phases, initial value and final value as per the result generated for Perceived Usefulness (PU). Total 5 items were identified from the literature. In step 1 items are dropped based on the loading values but for the identified construct all the items were loading above cut off, the Risk (PR). The initial values are Cmin/df – 7.301, RMR – 0.060, GFI – 0.827, NFI – 0.711, and

CFI – 0.894. Thus for this construct step 2 was followed in which covariance was drawn among the error term on same factors to improve the fit measures as suggested by the modification index resulting in higher modification values. The GFI value was modified to 0.979 from 0.7827 and the CFI to 0.978 from 0.894 which is nearer to the suggested value of > 0.9 (Joreskog & Sorbom, 1989). Further the other fit indices viz., Cmin/df, RMR were also found to be satisfactory. As it was seen that further deletion of any item will not affect the output values and thus the nearby optimum value was achieved. Fig. 10 indicates final validated model for Perceived Usefulness (PU).

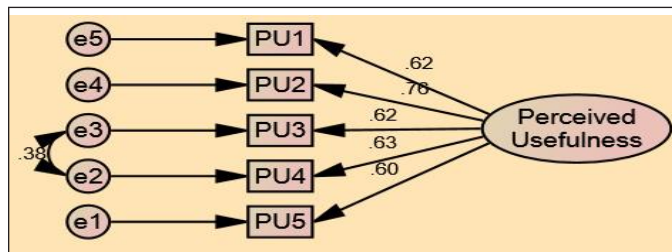


Fig. 10: Final Validated Model for Perceived Usefulness (PU)

Measurement Scale for Subjective Norms (SN)

The CFA is conducted in two phases, initial value and final value as per the result generated for Subjective Norms (SN) (BI). From the literature three items were identified for this construct. All the three items were showing standardised regression weight above > 0.5 . This construct was not dropped on the basis of model fit indices because literature and experts' opinion strongly support the need to measure the effect of the Subjective Norms (SN) constructs which was not studied earlier. Fig. 11 indicates final validated model for Subjective Norms (SN).

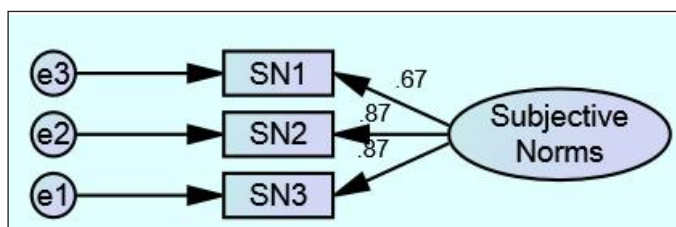


Fig. 11: Final Validated Model for Subjective Norms (SN)

Conclusions

This paper strives to contribute to the literature by developing, validating measuring scale for identified constructs Optimism (OPTI), Innovativeness (INNO), Insecurity (INSC), Discomfort (DISC), Perceived Usefulness (PU), Perceived Ease of Use (PEU), Perceived Risk (PR), Subjective Norms (SN), Attitude (ATTI), Behavioural Control (BC), and Behavioural Intention (BI). This paper tests the validity of the measurement scales which will enable the bankers to improve their mobile banking. The major contribution of the paper is the development of a set of constructs as well as a rigorously validated measurement instrument for collecting data in further studies. The confirmation process is according to the typical standards of scale development (Raghunathan *et al.*, 1999; Sethi & King, 1994; Anderson & Gerbing, 1988). The instrument developed in this paper is parsimonious and will be of use to researchers who could extend the previous studies of acceptance of mobile technologies and provide greater insights into mobile banking technologies on the basis of personal traits of technology readiness. This paper validates TRI measurement scale with banking context and also enriches generalisation of TRI integrated model which will make the decision maker to understand the consumer psychology towards technology adoption.

The findings from this research can be used by banks to improve mobile banking facilities and to identify those factors that can either contribute to the failure or success of the mobile banking industry and this could be further used for decision making. Several implications for researchers and banks can be drawn from the results of this research. From a theoretical point of view, this research will contribute to the knowledge of applying TAM to predict Customers' intention of new technology adoption. The other construct, investigate in this research will express the significance while explaining customer's behaviour intentions toward mobile banking. As for managerial applications, findings on technological personalities of optimism, innovativeness and security will encourage banks providing with additional insights. It will highlight the constructs that banks will be able to repel to provide more importance to mitigate customer worry and resistance about the technology use and hence encourage and expedite the adoption process.

References

- Adams, D. A., Nelson, R. R., & Todd, P. A. (1992). Perceived Usefulness, ease of use, and usage of information technology: A replication. *MIS Quarterly*, 227-247.
- Ahire, S. L., Golhar, D. Y., & Waller, M. A. (1996). Development and validation of TQM implementation constructs. *Decision Science*, 27(1), 23-56.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179-211
- Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: a review and recommended two step approach. *Psychological Bulletin*, 103(3), 411-423.
- Ajzen, I. (1987). Attitudes, traits, and actions: Dispositional prediction of behavior in personality and social psychology'. In: L. Berkowitz (Ed.) *Advances in Experimental Social Psychology*, 20, 1-63.
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs', NJ: Prentice-Hall
- Ajzen, I., & Fishbein, M. (2005). The influence of attitudes on behavior,' in: *Handbook of Attitudes and Attitude Change*, D. Albarracin, B.T. Johnson and M.P. Zanna (Ed.), Erlbaum, Mahwah, NJ.
- Ajzen, I., & Madden, T. J. (1986). Prediction of goal-directed behaviour: Attitudes, intentions, and perceived behavioural control. *Journal of Experimental Social Psychology*, 20, 453-474.
- Akturan, U., & Tezcan, N. (2012). Mobile banking adoption of the youth market: Perceptions and intentions. *Marketing Intelligence and Planning*, 30(4), 444-459.
- Ali Saleh, A-A., & Khalil, M. N. (2013). 'Influencing Factors on Behavioral Intention to Adopt Internet Banking Service'. *World Applied Sciences Journal* 22 (11), 1652-1656
- Alqasa, K. M, Isa, F, Norezam, S. O., & Zolait, H. (2014). The impact of students' attitude and subjective norm on the behavioural intention to use services of banking system. *International Journal of Business Information Systems*, 15(1), 105-122.
- Ashta & Arvind (2010). Evolution of Mobile banking Regulations. Retrieved from <http://ssrn.com/abstract=1583080>
- Bagozzi, R. P. (1980). *Causal Models in Marketing*. John Wiley & Sons, New York, NY.
- Bagozzi, R. P., & Fornell, C. (1982). Theoretical concepts, measurements, and meaning. *A Second Generation of Multivariate Analysis*, New York, NY, pp. 24-38.
- Barnes, S. J., & Corbitt, B. (2003). Mobile banking: Concept and potential. *International Journal of Mobile Communications*, 1(3), 273-288.
- Barnes, S. J., & Scornavacca, E. (2005). The strategic impact of wireless applications in NZ business. *Paper presented at the Hong Kong Mobility Roundtable*, Hong Kong
- Benoy C. S. (2011). Mobile banking: Opportunities and challenges in the India market discussion board. Retrieved from www.tele.net.in/discussion_borad/item/7732-mobile-banking-opportunities-and-challenges-in-the-India-market? [22.1.2013].
- Bhattacharjee, A. (2000). Acceptance of e-commerce services: the case of electronic brokerages. *IEEE Transactions on Systems, Man and Cybernetics*, 30(4), 411-420
- Bohmstedt, G. W. (1970). Reliability and validity assessment in attitude measurement. In *Attitude Measurement*, ed. G. F. Summers, pp. 80-99. Chicago: Rand . . McNally
- Busselle, R., Reagan, J., Pinkleton, B., & Jackson, K. (1999). Factors affecting internet use in a saturated-access population. *Telematics and Informatics*, 16(1-2), 45-58.
- Chakrabarty, K. C. (2010). Inclusive growth – Role of financial sector. Address at the National Finance Conclave 2010, KIIT University,
- Chan, S., & Lu, M. (2004). Understanding internet banking adoption and use behavior: A Hong Kong perspective. *Journal of Global Information Management*, 1(23), 21-43.
- Chandio, F. H., Irani, Z., Abbasi, M. S., & Nizamani, H. A. (2013). Acceptance of online banking information systems: an empirical case in a developing economy. *Behaviour & Information Technology*, 32(7), 668-680
- Cho, H. (2011). Theoretical intersections among social influences, beliefs, and intentions in the context of 3G mobile services in Singapore: Decomposing perceived critical mass and subjective norms. *Journal of Communication*, 61(2), 283-306 doi: 10.1111/j.1460-2466.2010.01532.x
- Churchill, G. (1979). A paradigm for developing better measures of marketing constructs. *Journal of Marketing Research*, 16(1), 64-73.

- Clark, & Adam. (2008). Mobile banking & switching'. Retrieved from www.mcom.co/nz/assets/Sm/163/.../criticalswitchingevents_whitepaper.pdf.
- Colby, C. L., & Parasuraman, A. (2003). Technology still matters: never mind the doomsayers: e-services are alive, well, and positioned for growth. *Marketing Management*, 12(4), 28-33.
- Crabbe, M., Standing, M., Standing, C. S., & Karjaluoto, H. (2009). An adoption model for mobile banking in Ghana. *International Journal of Mobile Communications*, 7(5), 515-543.
- Cruz, P., L. B. F., Neto, P. Munoz-Gallego, & Laukkanen, T. (2010). Mobile banking rollout in emerging markets: Evidence from Brazil. *International Journal of Bank Marketing*, 28(5) 342-371
- Curran, J., & Meuter, M. (2005). Self-Service technology adoption: Comparing three technologies. *Journal of Services Marketing*, 19(2), 103-13.
- Dabholkar, P. A. (1996). Consumer evaluations of new technology-based self-service operations: an investigation of alternative models. *International Journal of Research in Marketing*, 13(1), 29-51.
- Dasgupta, S., Paul, R., & Fuloria, S. (2011). Factors affecting behavioral intentions towards mobile banking usage: Empirical evidence from India. *Romanian Journal of Marketing*, 3(1), 6-28.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-340
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, 35(8), 982-1003.
- Dholakia, R. R., & Dholakia, N. (2004). Mobility and markets: Emerging outlines for m-commerce. *Journal of Business Research*, 57(12), 1391-1396
- Donner, J., & Tellez. (2008). Research approaches to mobile use in the developing world: A review of the literature. *The Information Society*, 24 (3), 140 -159
- Drexelius, K., & Herzig, M. (2001). Mobile banking and mobile brokerage – Successful applications of mobile business? *International management & Consulting*, 16(2), 20-23.
- Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes*. Fort Worth, TX: Harcourt Brace Jovanovich.
- Ensor, B., Montez, T., & Wannemacher, P. (2012). *The state of mobile banking 2*, Forrester Research, USA
- Fethi, C., Gumussoy, A. A., & Bayram, A. (2009) Predicting the behavioral intention to use enterprise resource planning systems. *An exploratory extension of the technology acceptance model management research news*, 32(7), 597-613
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.
- Gandhi, R. (2010). Calling a mobile banking: Financial inclusion in rural India. *Center for strategic and International studies*.
- Gefen, D., Karahanna, E., & Straub, D. W. (2003). Trust and TAM in online shopping: An integrated model. *MIS Quarterly*, 27(1), 51-90.
- Gong, M., Xu, Y., & Yu, Y. (2004). An enhanced technology acceptance model for web –based learning. *Journal of Information Systems Education*, 15(4), 365-374.
- Gu, J. C., Lee, S. C., & Suh, Y. H. (2009). Determinants of behavioral intention to mobile banking. *Expert Systems with Applications*, 3(9), 11605-11616.
- Gupta, B., Dasgupta, S., & Gupta, A. (2008). Adoption of ICT in a government organization in a developing country: An empirical study. *Journal of Strategic Information Systems*, 17(2), 140-154.
- Ha, S., & Stoel, L. (2009). Consumer e-shopping acceptance: Antecedents in a technology acceptance model. *Journal of Business Research*, 62(5), 565-571.
- Hair, J. F. J., Anderson, R. E., Tatham, R. L., & Black, W. C., (1998). *Multivariate data analysis* (5th ed.), Prentice Hall, Upper Saddle River, New Jersey.
- Khraim, H. S., Shoubaki, Y. E. A., & Khraim, A. S. (2011). Factors Affecting Jordanian Consumers' Adoption of Mobile Banking Services. *International Journal of Business and Social Science*, 2(2).
- Hoffman, D. L., Novak, T. P., & Peralta, M. (1999). Building consumer trust online. *Communication of the ACM*, 42 (4), 80-85
- Huang, E. (2008). Use and gratification in e-consumers. *Internet Research*, 18(4), 405-426.
- Huang, Lin, & Chuang. (2007). Elucidating user behavior of mobile learning a perspective of the extended technology acceptance model. *The Electronic Library*, 25(5), 585-598.
- Hung, S., Chang, C., & Yu, T. (2006). Determinants of user acceptance of the e-government services: the case of online tax-filing and payment system. *Government Information Quarterly*, 23(1), 97-122.
- ITU (International telecommunication Union), (2012). ICT Statistics newslog - m-banking. Retrieved

- from http://www.itu.int/ITU-D/ict/news_log/CategoryView,category,m-banking.aspx.
- Jaradat, M. I., & Mashaqba, M. (2014). Understanding the adoption and usage of mobile payment services by using TAM3. *Int. J. of Business Information Systems*, Vol.16, No.3, pp.271 – 296
- Jöreskog, K. G., & Sörbom, D (1989). LISREL7, a Guide to the Program and Applications. SPSS Publications.
- Karahanna, E., & Limayem, M. (2000), E-Mail and V-Mail Usage: Generalizing Across Technologies. *Journal of Organizational Computing and Electronic Commerce*, 10(1), 49-66.
- Khan, H., & Dominic, P. D. (2014). User acceptance of online system: a study of banking and airline sector. *Int. J. of Business Information Systems*, 16(4), 359-374.
- Kleijnen, M. H. P., de Ruyter, J. C., & Wetzels, M. G. M. (2004). Consumer Adoption of Wireless Services: Discovering the Rules, While Playing the Game. *Journal of Interactive Marketing*, 18(2), 51-61.
- Kuang-Ming Kuo, Chung-Feng Liu and Chen-Chung Ma (2013) “An investigation of the effect of nurses’ technology readiness on the acceptance of mobile electronic medical record systems”. *BMC Medical Informatics and Decision Making*<http://www.biomedcentral.com/1472-6947/13/88>
- Kumar, M, Sareen, M., & Helelne M (2013). Factors influencing the level of adoption internet banking: An integration of TAM and Web Trust Model. *Asian Journal of Management Research*, 4(1), 130-145
- Laukkanen, T., & Lauronen, (2005). Consumer value creation in mobile banking services. *International Journal of Mobile Communications*, 3(4), 325-338.
- Lee, J., Cerreto, F. A., & Lee, J. (2010). Theory of planned behavior and teachers’ decisions regarding use of educational technology. *Educational Technology & Society*, 13(1), 152–164.
- Leung, L., & Wei, R. (1998). Factors Influencing the Adoption of Interactive TV in Hong Kong: Implications for Advertising. *Asian Journal of Communication*, 8(2), 124-147.
- Li, S. C. S. (2003). Electronic newspaper and its adopters: Examining the factors influencing the adoption of electronic newspapers in Taiwan. *Telematics and Informatics*, 20(1), 35-49.
- Lin, C. H., Shin, H. Y., & Sher, P. J. (2007). Integrated technology readiness in to technology acceptance: The TRAM model. *Psychol. Mark.*, 2.
- Lin, C. (1998). Exploring personal computer adoption dynamics. *Journal of Broadcasting & Electronic Media*, 42(1), 95-103.
- Lin, C. A. (2004). Webcasting adoption: Technology fluidity, user innovativeness, and media substitution. *Journal of Broadcasting & Electronic Media*, 48(3), 446–465. [http://dx.doi.org/10.1207/s15506878jobem4803_64\(7\)](http://dx.doi.org/10.1207/s15506878jobem4803_64(7)) pp. 641-657
- Lin, C. A., & Jeffres, L. W. (1998). Factors influencing the adoption of multimedia cable technology. *Journalism & Mass Communication Quarterly*, 75(2), 341-352
- Liu, Y., & Li, H. X. (2010). Mobile internet diffusion in China: an empirical study. *Industrial Management & Data Systems*, 110(3), 309-324
- Luarn, P., & Lin, H.H. (2005). Toward an understanding of the behavioral intention to use mobile banking. *Computers in Human Behavior*, 21(6), pp. 873-891.
- Luo, X., Li, H., Zhang, J., & Shim, J. P. (2010). Examining multi-dimensional trust and multi-faceted risk in initial acceptance of emerging technologies: An empirical study of mobile banking services. *Decision Support Systems*, 49(2), 222-234.
- Mathieson, K. (1991). Predicting user intentions: Comparing the technology acceptance model with the theory of planned behavior. *Information Systems Research*, 2(3), 173-191.
- Mattila, M. (2003). Factors affecting the adoption of mobile banking services. *Journal of Internet Banking and Commerce*, 8(1), 149-160.
- Mehata, S (2012). Mobile banking in India does not need a one-size-fits-all solution.
- Meuter, M. L., Bitner, M. J., Ostrom, A.L., & Brown, S.W.(2005). Choosing among alternative service delivery modes: An investigation of customer trial of self-service technologies. *Journal of Marketing*, 69(2), 61-83.
- Mitropoulos, S, Othonos, C., & Douligieris C (2013). An effective and secure web banking system: development and evaluation. *Int. J. of Business Information Systems*, 12(3), 335-361
- Aboelmaged, M., & Gebba, T. R. (2013). Mobile Banking Adoption: An Examination of Technology Acceptance Model and Theory of Planned Behavior. *International Journal of Business Research and Development*, 2(1), 35-50.
- Moon, J.-W., & Kim, Y.-G. (2001). Extending the TAM for a world-wide-web context. *Information & Management*, 2, 217-230.

- Guhr, N., Loi, T., Wiegard, R., & Breitner, M. H. (2013). Technology readiness in customers' perception and acceptance of M (obile)-Payment: An empirical study in Finland, Germany, USA and Japan" 11th International Conference on Wirtschaft's informati (Leipzig, Germany), 1, 119-133.
- Jöreskog, K. G., & Sörbom, D. (1989). *Lisrel 7: A Guide to the Program and Applications*, (2nd ed.). SPSS, Chicago, IL.
- Nunnally, J. C. (1978). *Psychometric Theory*. McGraw-Hill Book Company, pp. 86-113, 190-255
- Parasuraman, A. (2000). Technology-Readiness Index (TRI): A multiple-item scale to measure readiness to embrace new technologies. *Journal of Service Research*, 2(4), 307-320
- Parasuraman, A., & Colby, C. L. (2001). *Techno-ready marketing: how and why your customers adopt technology*. New York: The Free Press
- Schierz, P. G., Schilke, O., & Wirtz, B. W. (2010). Understanding consumer acceptance of mobile payment services: An empirical analysis. *Electronic Commerce Research and Applications*, 9(3), 209-216 doi: 10.1016/j.elerap.2009.07.005
- Puschel, J., Mazzon, J. A., & Hernandez, J. M. C. (2010). Mobile banking: Proposition of an integrated adoption intention framework. *International Journal of Bank Marketing*, 28(5), 389-409.
- Safeena, R., Date, H., Kammani, A., & Hundewale, N. (2012). Technology adoption and Indian consumers: Study on mobile banking. *International Journal of Computer Theory and Engineering*, 4(6), 1020-1024
- Ram, S. (1987). A model of innovation resistance. *Advances in Consumer Research*, 14(1), 208-212
- Reddy, M. S., & Mallikarjuna, V. (2014). Consumer adoption of net banking in Tier-I II cities of Andhra Pradesh: An empirical study. *International Journal of Scientific Research* 3 (4), 269-272
- Riquelme, H. E., & Rios, R. E. (2010). The moderating effect of gender in the adoption of mobile banking. *The International Journal of Bank Marketing*, 28(5), 328-341.
- Rogers, E. M. (1995). *The Diffusion of innovations* (4th ed.). New York: Free Press.
- Safeena, R., Kammani, A., & Date, H. (2013). Assessment of Internet Banking Adoption: An Empirical Analysis. *Arabian Journal for Science and Engineering*, 39(2), 837-849. doi: 10.1007/s13369-013-0707-x
- Schepers, J., & Wetzels, M. (2007). A meta-analysis of the technology acceptance model: Investigating subjective norm and moderation effects. *Information and Management*, 44(1), 90-103.
- Selamat, Z., Jaffar, N., & Ong, B. H. (2009). Technology acceptance in Malaysian banking industry. *European Journal of Economics, Finance and Administrative Sciences*, 1(17), 143-155
- Sharma, A. (2011). Mobile banking as technology adoption and challenges. Retrieved from [www.zenithresearch.org.in/images/stories/Pdf 2011 \[4.2.2013\]](http://www.zenithresearch.org.in/images/stories/Pdf%202011%20%5B4.2.2013%5D.pdf).
- Sripalawat, J., Thongmak, M., & Ngramyarn, A. (2011). M-banking in metropolitan Bangkok and a comparison with other countries. *The Journal of Computer Information Systems*, 51(3), 67-76
- Sudha, S., Singh, D. K., Singh, M. K., & Singh, S. K. (2010). The forecasting of 3G market in India based on revised technology acceptance model. *International Journal of Next-Generation Networks*, 2(2), 61-68.
- Taylor, S., & Todd, P. (1995). Decomposition and cross-over effects in the theory of planned behavior: A study of consumer adoption intentions. *International Journal of Research in Marketing*, 12.
- Thulani, D., Kosmos, N., Collins, M., & Lyod, C. (2011). Adoption and use of sms/mobile banking services in Zimbabwe: An exploratory study. *Journal of Internet Banking and Commerce*, 16(2).
- Tsikriktsis, Nikos (2004). A technology readiness-based taxonomy of customers: A replication and extension. *Journal of Service Research*, 7(1), 42-52
- Venkatesh, V., & Divis, F. (2000). A theoretical extension of the technology acceptance model; four longitudinal studies. *Management science*, 46(2), 186-204
- Venkatesh, V. (2000). Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model. *Information systems research*, 11, 342-365
- Venkatesh, V., & Morris, M. G. (2000). Why don't men ever stop to ask for directions? Gender, social influence, and their role in technology acceptance and usage behavior. *MIS Quarterly*, 24(1), 115-139.
- Venkatesh, V., Morris, M., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425-78.
- Walczuch, R., Lemmink, J., & Streukens, S. (2007). The effect of service employees' technology readiness on technology and acceptance. *Information & Management*, 44(2), 206-215.

- Wang, Y., Buermann, W., Stenberg, P., Smolander, H., Häme, T., Tian, Y., Hu, J., Knyazikhin, Y., & Myneni, R. B. (2003). Hyperspectral remote sensing of vegetation canopy: Leaf area index and foliage optical properties. *Remote Sensing of Environment*, 85, 304-315
- Websites: <http://thefinancialbrand.com/23789/financial-marketing-mobile-banking-research-studies>.
- Wu, I. L., & Chen, J. L. (2005). An extension of Trust and TAM model with TPB in the initial adoption of online tax: an empirical study. *International Journal Human Computer Studies*, 62(6), 784-808.
- Yan, A. W., Nor, K. M., Shanab, E. A., & Sutanonpaiboon, J. (2009). Factors that affect mobile telephone users to use mobile payment solution. *International Journal of Economics and Management*, 3(1), 37-49.
- Yang, K., (2005). Exploring factors affecting the adoption of mobile commerce in Singapore. *Telematics and Informatics*, 22, 257-277.
- Yi, Y., Tung, L. L., & Wu, Z. (2003). Incorporating technology readiness (tr) Into tam: Are individual traits important to understand technology acceptance"? *In Proceedings of the DIGIT: 14 December 2003*. Seattle, USA: Association for Information Systems; 2003. Paper 2

