Journal of Internet Banking and Commerce

An open access Internet journal (http://www.arraydev.com/commerce/jibc/)

Journal of Internet Banking and Commerce, April 2012, vol. 17, no. 1
(*http://www.arraydev.com/commerce/jibc/*)

AN EMPIRICAL STUDY ON SERVICE QUALITY PERCEPTIONS AND CONTINUANCE INTENTION IN MOBILE BANKING CONTEXT IN INDIA

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Abstract

This paper examines the factors influencing the continuance decisions of the early adopters of m-banking services in Kerala, India. The study was designed in the

backdrop of the issues faced by the banks to attract more customers irrespective of the huge mobile penetration in the country. The study used constructs adopted from Technology Acceptance Model along with constructs of perceived service quality, perceived credibility and perceived risk to empirically establish the influence on satisfaction and continuance usage intentions. The study could find strong linkage between perceived service quality, satisfaction and continuance intentions. The study also confirmed that after adoption of the technology, the customer finds satisfaction in the quality parameters of the service. Perceptions about the risks involved in m-banking had adverse impact on service quality and satisfaction. Continuance intentions were found solely dependent on satisfaction in the m-banking context in Kerala.

Keywords: **Continuance intention, Satisfaction, perceived service quality, M-banking**

INTRODUCTION

The intervention of technological advancements in banking operations was in the backdrop of customer service initiatives of the recent past. In Indian context, computerization and mechanization of banks in the country started even in early 1980s. Since then banks have traveled a long way through various phases of technological initiatives starting from Automatic Ledger Posting Machines (ALPMs) to Total Branch Automation to ATMs to Internet Banking, etc. Today, banks are trying to offer their customers not just anytime banking but anywhere-anytime banking through appropriate application of developments in the information technology area. All these advancements are primarily aimed at providing better and more innovative services to customers. The latest step in this continuum was the introduction of mobile banking facilities to customers. M-banking services created a new, convenient and fast delivery channel for customers to enjoy banking services from anywhere, anytime. Mobile banking is defined as “a channel whereby the customer interacts with a bank via mobile device, such as mobile phone and Personal Digital Assistant (PDA)” (Barnes, and Corbitt, 2003).

The scope of mobile banking at present is restricted to balance enquiry, mini statement, fund transfer up to 50000/- a day, certain bill payments etc. (Mehak Chawla, 2011) The benefits such as ubiquity coverage, flexibility, interactivity, fast and greater accessibility (Sulaiman et.al, 2007, Turbanet.al, 2006, Laukkanen, 2007) makes m-banking superior to conventional banking channels. Even when m-banking adoption tendencies among customers were strong in other parts of the world, only 5% of all mobile subscribers are registered users of mobile banking in India and more significantly, only 0.5% of them are active mobile banking users. These are also primarily restricted to information-based services (Assocham, 2011). As per “Indian Telecom Services Performance Indicator Report” for the Quarter ending June 2011, published by Telecom Regulatory Authority of India, the total mobile subscribers in India were 851.7 million with a mobile penetration of 71.1%. These numbers are expected to grow even further and 100% penetration is expected by 2015 (Assocham, 2011). The explosive growth in penetration of mobile

phones underlined the possibility of delivering a large number of services in a cost effective, fast and seamless manner without physical access.

However, the poor linkage between mobile penetration and adoption of mobile value added services (MVAS) posed a matter of big concern to banks, developers and service providers. The growing adoption of information and communication advancements in banking services delivery make it necessary to analyze and identify the service quality perceptions of the customers in the m-banking context to evaluate the trends in its acceptance. To achieve competitive advantage, it becomes essential to make Strategic investments in IT infrastructure. The valid information regarding perceptions of the users regarding their acceptance or avoidance of this technology may supplement the information needed by the developers of mobile banking systems. While a growing body of literature exists, limited empirical evidence is available in this context in India (Thamarai Selvan et.al, 2011) about service quality perception and adoption trends of customers to mobile banking. This study was conducted in the backdrop of above observations.

Reserve Bank of India guidelines for m-banking state that, “Information Security is critical to the business of mobile banking services and its underlying operations. Therefore, the technology used for mobile banking must be secure and should ensure confidentiality, integrity, authenticity and non-repudiability.” These lines are reflective of possible concerns of the customer that have critical influence on their adoption tendencies. Besides security, fear of network failures resulting in failed transactions poses a serious impact on customer adoption trends (Paul Leishman, 2009). An exploration into linkage between m-banking service quality perceptions and customer adoption intentions are of paramount importance considering the reluctance exhibited by the customers in adopting this nascent service delivery channel.

LITERATURE REVIEW

The study was aimed to verify factors influencing continuance intentions of the early adopters of m-banking services. An elaborative review of existing and available literature in this context was conducted to narrow down the research area and to clearly define the research objective. Majority of studies about ‘intention to adopt’ were conducted based on research models and frameworks traditionally used within the information system literature. Among the different models that have been proposed, the Technology Acceptance Model (TAM) (Davis, 1989), adapted from the Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980) and its variations were widely used by various scholars for explaining technology adoption intentions (Gefen and Straub, 1997, Malhotra andGalletta, 1999, Moon and Kim, 2000, Mccloskey, 2004, Gu et.al, 2009, Yu & Fang, 2009, Chung & Kwon, 2009).

TAM points out that perceived ease of use and perceived usefulness affect the intention to use. Davis (1989) defines perceived ease of use as "the degree to which a person believes that using a particular system would be free from effort" and perceived usefulness as "the degree to which a person believes that using a particular system would enhance his or her job performance". Perceived ease of use also affects the perceived usefulness. The intention to use decides the real usage behavior.

However, doubt regarding sufficiency of both constructs of perceived usefulness (PU) and perceived ease of use (PEOU) in investigating user's technology acceptance (Mathieson, 1991 Hsu and Lu, 2004) was raised. Some scholars even suggested that there are other possible factors that might affect mobile banking adoption (Riquelme and Rios, 2010). Various efforts to extend the technology acceptance model (TAM) by incorporating constructs such as trust (Gu, et al., 2009; Luarn & Lin, 2005), perceived risk (Chung & Kwon, 2009, J. Donner, and C. A. Tellez,2008)], perceived uncertainty (Laukkanen,2007), perceived system quality (Kleijnen et.al,2004, Luarn, and. Lin,2005), relative advantage (Puschel and. Mazzon,2010), Personal Innovativeness(Hung et.al 2003) etc were found valid in the previous studies.

There were attempts to study technology adoption based on Diffusion of Innovation Theory by Rogers (1995) (Niina Mallat, 2006, Mallat et.al, 2008). Diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system. Diffusion of an innovation occurs through a five–step process such as knowledge, persuasion, decision, implementation, and confirmation. The characteristics that determine an innovation's rate of adoption were Relative advantage, Compatibility, Complexity, Trialability and Observability to those people within the social system (Rogers, 1995).

Technology Acceptance Model was later on extended on two occasions. In the first attempt (Venkatesh and Davis, 2000), perceived usefulness and usage intentions were explained in terms of social influence and cognitive instrumental processes. Social influence processes (measured using indicators of subjective norm, voluntariness, and image) and cognitive instrumental processes (measured using indicators of job relevance, output quality, result demonstrability, and perceived ease of use) were found significantly influencing user acceptance intentions.

The second phase of modification (Venkatesh and Bala, 2008) was done by introducing antecedents to perceived ease of use, namely, anchors and adjustments. Anchors represented general beliefs about computers and its usages and adjustments represented beliefs that are developed from direct experience. The anchors were measured using indicators of computer self-efficacy, perceptions of external control, computer anxiety, and computer playfulness. Adjustments were measured using indicators of perceived enjoyment and objective usability.

Another theory that attempted to explain adoption intentions and subsequent usage behavior was the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et. al., 2003). The theory holds that four key constructs namely performance expectancy, effort expectancy, social influence, and facilitating conditions are direct determinants of usage intention and behavior. In addition, variables such as gender, age, experience, and voluntariness to use, mediate the impact of above four key constructs on usage intention. Various scholars considered UTAUT as prominent and unified model in the stream of Information technology adoption research (Park et al, 2007, Carlsson et al., 2006).

Technology Acceptance Model for Mobile Services (Kaasinen, 2005) developed in line with TAM suggests that perceived ease of use, perceived value and trust affect the intention to use a mobile service. To move from an intention to use to real usage, the user has to take the service into use. This transition is affected by the perceived ease of adoption. Perceived value, perceived ease of use, trust and perceived ease of adoption need to be studied in order to assess user acceptance of mobile services.

The significance of service quality in banking service was dealt in detail by various researches. Service quality was explained in literature as the discrepancy between consumer's experiences and expectations (Gronroos 1984) as well as the discrepancy between consumers' perceptions and expectations' (Parasuraman et al. 1988). Service quality has been recognized as having the potential to deliver strategic benefits, such as improved customer loyalty and profitability (Cronin, 2003; Rust et al., 2001; Zeithaml, 2000) to the firm. Service quality also plays an important role in ensuring customer satisfaction (Al-Hawari and Ward, 2006).The intangible nature of services coupled with differences in individual customer characteristics complicate the issue of service quality evaluation and measurement. The most widely accepted model for measuring service quality was SERVQUAL (Parasuraman et al. 1988) based on gap between customer expectation and perceptions.

The emergence of internet and its widespread popularity resulted in the introduction of virtual market place instead of traditional physical ones. The banks also employed the Internet as an alternative service delivery channel. It has been pointed out that the introduction of e-banking services could offer both bankers and customers diverse benefits (Broderick & Vachirapornpuk, 2002). The interaction between the customer, and the bank's Web site or employees over the Internet enabled the bank to lower its operating and fixed costs by reducing the number of employees, branch offices, and other physical facilities while maintaining a high quality level of customer service. These cost benefits could make favorable conditions for the bank to provide customer services at lower fees.

The emergence of alternate channels for service delivery, the possibility of extending banking services without face-to-face contact between the bank employees and its customers (Wong (1998) became a reality. Mobile banking as an alternate customer interaction channel need to address the issues relating to the customer expectations concerning service encounter experiences and quality in delivery of service for developing intention to use from the customers. The acceptability of the alternate channels of service delivery will depend on the assessment of each channel and its contributions to the overall service quality Patricio et al. (2003).

The perceptions of the early adaptors are important parameter that determines the success of a new technology. The underlying assumption in diffusion theory is that a new idea is adopted very slowly during the early stages of its diffusion process. Then, if the innovation is perceived as relatively advantageous by its early adopters, its rate of adoption takes off when the early adopters share their favorable experiences regarding the innovation with potential adopters (Rogers, 1995). Hence, this study attempted to evaluate the perceptions of the early adaptors of mobile banking in the India to examine their continuance intentions and intention to promote the nascent service delivery channel.

THEORY DEVELOPMENT

The Model of Intention, Adoption, and Continuance (MIAC) (Cheung et.al, 2003) postulate the three stages in the acceptance of a new technology or application. This study is conceptualized to identify constructs relevant in each stages of the process.

The technology acceptance model proposed that constructs of "perceived usefulness" and "perceived ease of use" are two significant factors that determine the acceptance of a new technology or application. Perceived usefulness demonstrates the extent to which a person believes that using a particular application will result in usefulness or relative advantage when compared to other similar applications, while perceived ease of use explained the extent to which a person believes that using a particular system will result in easy execution of task to be performed (Davis, 1989).

Various empirical evidences are available in literature that demonstrates the ability of these constructs in explaining acceptance intentions of the customer. Studies conducted by Gefen and Straub,(1997) in e-mail adoption study, Md Gapar Md Johar et.al (2011) in E-commerce adoption, Chen et.al,(2002) in virtual store context, Koufaris and LaBarbera (2002) in internet consumer behavior, Amoako-Gyampah and Salam,(2004) in ERP implementation, Dahlberg et.al Oorni, (2003) in mobile payment adoption studies, Ching Mun Cheah et.al (2011) in mobile banking adoption, have identified the role of TAM variables in adoption of corresponding technologies. The influence of TAM variables in imparting customer satisfaction followed by continuance intentions were also proved (Hui Hwang et.al,2011, Soud Almahamid and Fisal Abu Rub,2011) . Hence, in this study both these constructs were considered relevant.

This study was attempted to understand the perceptions of the early adopters of mobile banking. Hence the role of perceived service quality in delivery of service merit due consideration. The initial perceptions about dimension which demonstrates service quality are of paramount importance both in imparting customer satisfaction and continuous usage (Lin and Wang, 2006; Wang and Liao, 2007). The service quality perceptions in m-banking have to be evaluated purely system oriented, as possibility of direct interaction with human involvement is absent. In such a context, service quality will be decided by system quality, network quality and information quality as suggested by the expert panel when consulted during the preliminary study.

M-banking process has to depend on the global network provided by various communication channel providers for offering services in a personalized manner to customers. The use of such an open public network develops scope for security concerns about the ability of the banks to securely store and protect their privacy and monetary information from hackers (Pavlou, et al., 2007). Privacy concerns are due to widespread presumption that while using a global communication channel, chances of leakage of personal information and disclosure to third parties are possible. Various researchers have noticed the significant relation between security concerns and intentions to use, in online contexts (Chen and Barnes, 2007; Hamlet and Strube, 2000; Hernandez and Mazzon, 2007). When security and privacy concerns of the customer are properly attended, credibility is achieved in the banking system (Adesina Aderonke and Ayo Charles, 2010).

The above constructs are assumed to develop favorable intentions in customers to adopt mobile banking services. The transformation from the intention stage to adoption stage largely depends on the feeling of satisfaction generated out of initial trial. The user experiences regarding the service forms a major yardstick to evaluate satisfaction about the usage of a technical service offer (Wilson & Sasse, 2004). User satisfaction is the result of subjective sum of the interactive experience (Lindgaard & Dudek, 2003) the customer have with the initial trial of the features of the service offer. In light of the above observations, the following hypotheses are proposed in this study.

H1: There exist significant relation between Perceived ease of use and satisfaction in the MB context
H2: There exist significant relation between Perceived Service Quality and satisfaction in the MB context
H3: There exist significant relation between Perceived Usefulness and satisfaction in the MB context
H4: There exist significant relation between Perceived Credibility and satisfaction in the MB context

Perceived risk (PR) is a critical factor that can influence choice decisions when evaluated, as the expectation of losses associated (Peter and Ryan) with the act of adopting the new technology. The psychological discomfort and anxiety caused by perceptions about risk are likely to devalue perceived usefulness of the e-service (Mauricio Featherman and Mark Fuller, 2003) and can adversely influence continuance intentions as well as satisfaction. Following hypotheses are proposed to verify the impact of perceived risk on other variables of interest in the study.

H5: There exists significant relation between Perceived risk and Perceived service quality in the MB context
H6: There exist significant relation between Perceived risk of use and satisfaction in the MB context
H7: There exists significant relation between Perceived risk and Continuance intentions in the MB context

Dabholkar et.al (2000) also found that customer satisfaction strongly mediated the effect of service quality on behavioral intentions. The power of perceived service quality to predict customer satisfaction (Anderson & Sullivan, 1993; Cronin & Taylor, 1992, 1994; Spreng & Mackoy, 1996; Woodside, Frey, & Daly, 1989) was empirically tested in prior studies. Therefore the following hypothesis is proposed

H8: There exists significant relation between Satisfaction and Continuance intentions in the MB context

The following theoretical model as illustrated in fig -1 was conceptualized as capable of explaining the continuance usage intentions of the customers in the m-banking context. The paths between each latent constructs are assumed as hypotheses to be tested in this study.

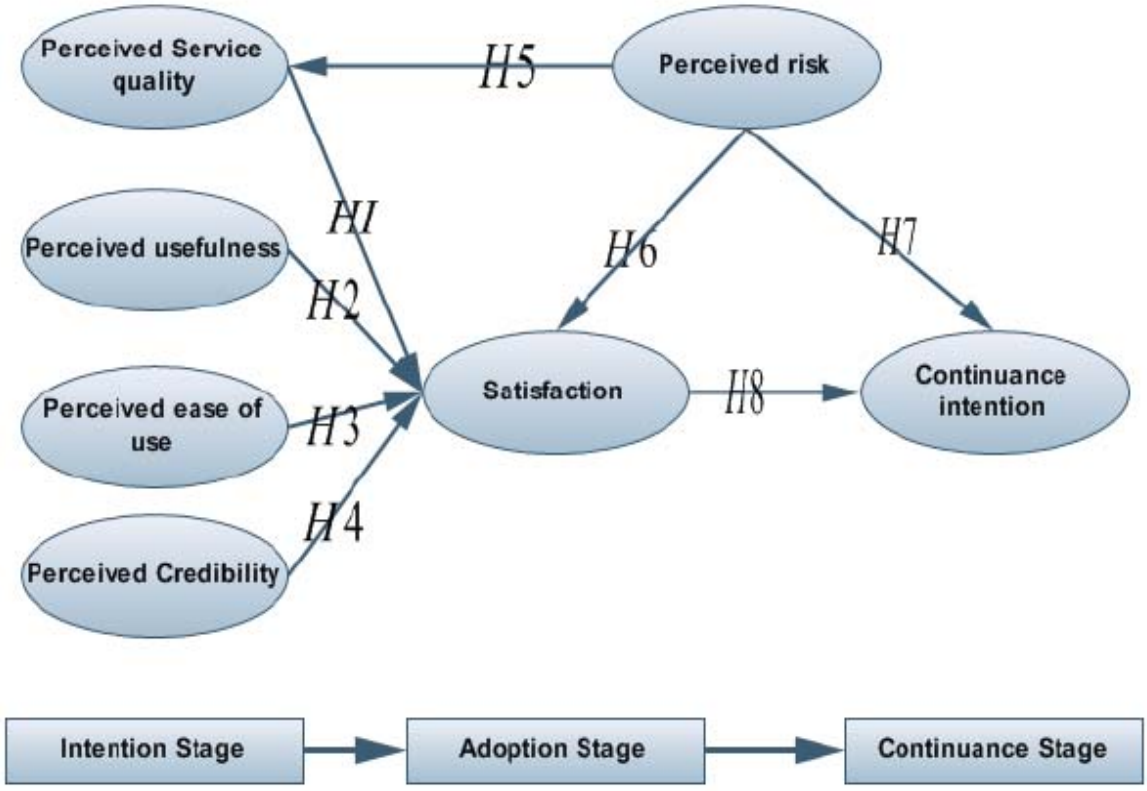

Fig -1 Research Model

THE EXPLANATION OF VARIABLES AND THEIR MEASUREMENT

The focus of every research lies in identifying the relationships between constructs proposed for study and how these constructs are measured. A construct is a conceptual term used to describe a phenomenon of theoretical interest to the researcher and which is not directly measurable (e.g. Customer satisfaction, trust etc).A measure is a quantifiable assessment to the degree where the respondent believes in the existence of the construct. The data for the respondent's agreement or disagreement is collected by means of questionnaire surveys in most of the studies.

This study focuses on analysis of relationships between variables that are abstract and not directly measurable. Hence, the concept of latent variables was adopted to explain the variables of interest. Latent variables (LV) can be considered "hypothetical constructs invented by researcher for the purpose of understanding a research area" (Bentler 1980). Since LVs are unobservable and cannot be directly measured, researchers use observable and empirically measurable indicator variables (also referred to as manifest variables (MVs)) to estimate LVs in the model. The connections between the constructs and indicators or measures are referred as epistemic relationships or "rules of correspondence" (Bagozzi, 1984).

Two basic types of relationships exist in causal modeling namely

- Reflective
- Formative

Constructs are usually viewed as causes of indicators, meaning that variation in a construct leads to variation in its indicators. Such indicators are termed ‘‘reflective’’ because they represent reflections, or manifestations, of a construct. The “formative” indicators are viewed as causes of constructs as construct is formed or induced by its indicators (Edwards and Bagozzi 2000). According to Chin (1998) the choice between measuring latent constructs with formative or reflective indicators should be based on the research objectives, the substantive theory for the latent construct, and the empirical conditions. The major constructs used in this study were

1. Perceived usefulness (PU)
2. Perceived ease of use (PEU)
3. Perceived service quality (PSQ)
4. Perceived Credibility (PC)
5. Perceived Risk (PR)
6. Satisfaction (SAT)
7. Continuance Intention (CI)

The following Table-1 explains the definition of various constructs used in the context of the study

Construct	Definition
PU	Degree to which a person believes that using a particular system would enhance his or her job performance (Davis, 1989)
PEU	Degree to which a person believes that using a particularly technology would be free of effort (Davis, 1989)
PSQ	Quality of service as perceived by the M-banking Customers formed from system quality (SQ),information quality(IQ) and network quality(NQ)
PC	Perception of protection of their transaction details and personal data against unauthorized access
PR	The perceived sense of risk concerning disclosure of personal and financial information (Tan & Teo, 2000)
SAT	Users' affect with (feelings about) M-banking use.
CI	Users' intention to continue using M-banking
SQ	Degree to which individuals perceive that the system is satisfying, in terms of transfer speed and reliability (Kleijnen, et al., 2004)
IQ	The capability of information output to benefit users in terms of accuracy, completeness and up to date nature [Ding and Straub 2008]
NQ	Degree to which the network benefit the used in terms of coverage and congestion

Table-1 Definitions of Constructs

In this study, except perceived service quality, all other constructs were measured using reflective indicators. Perceived service quality construct was measured using 6 formative indicators pertaining specific requirements related to system quality (SQ), network quality (NQ) and information quality (IQ).The indicators to measure each of the constructs were adopted from the previous studies after verifying the suitability in the contextual setting and wherever required, modification or new indicators were included in consultation with expert panel. Table -2 lists down the nature of construct and number of indicators used to measure each construct.

Construct		Nature	No. of .Indicators
PU		Reflective	4
PEU		Reflective	4
PSQ (Formative)	SQ+IQ +NQ	Formative	6 indicators to collect responses about 6 aspects of service like speed , reliability, accuracy, completeness, coverage and lack of network congestion
PC		Reflective	4
PR		Reflective	4
SAT		Reflective	4
CI		Reflective	4

Table-2 Indicators used for measurement

RESEARCH METHODOLOGY

The Research was conducted in two phases .The first phase was explorative in nature, ending with finalization of theory to be tested. A preliminary study was conducted in this stage by way of interviews with focus groups to specifically identify the relevant dimensions to be considered for measuring variables considered for the study.

A major observation made by the focus group was considered relevant in the questionnaire design. The focus group suggested that a detailed introduction about the study and the purpose of including each question or set of questions should be provided in the questionnaire in a noticeable manner. Also the respondents should be met in person and responses should be collected after clarifying all doubts about the purpose of the study. This step was done mandatorily to avoid misinterpretation of the questions that can produce biased results. Table-3 below lists down the list of indicators used to measure each constructs.

Construct		Indicators
PU		I could complete my banking tasks more quickly using MB
		I could perform banking business 24 hours/day using MB
		I find MB increased my efficiency and effectiveness in utilizing banking service
		MB helped me to know the state of my account faster
PEU		I could learn to use MB easily
		Instructions in the MB system were clear and understandable.
		I find MB system easy to use.
		I find the MB website as user-friendly
PSQ	S	I operations through MB were really fast
	Q	The systems used for MB were reliable
	I	I find the operations performed through MB were accurate and specific to
	Q	my request
		I find the operations performed through MB were complete without any breakage
	N	The MB services were available at all locations I needed
	Q	I never faced any congestion or difficulty in getting connected to my bank
PS		I feel my personal details were protected in MB
		I feel details of my financial transactions were not be revealed to anyone
		The security policies of MB gave me the feeling that money transactions using MB was safe
		The security policies of MB gave me the feeling that sending sensitive information to public channel may not harm me
PR		I feel MB will allow unauthorized person to access my personal information
		MB has the chance of data loss and fraud
		MB needs expertise or mistakes can happen
		MB are prone to signal failures and network congestion
SAT		Using the MB gave me a relaxed feeling
		I was comfortable with the procedures for using the MB
		I find MB offers best services in the most useful manner
		Overall I am satisfied with the concept of MB
CI		I intend to continue using MB to the extent of services offered through it
		My intentions are to continue using MB more than using any other alternative means
		I feel MB is best suited for my requirements

Table-3 Details of Indicators used to measure constructs

Data from 184 respondents was collected using a structured questionnaire. The questionnaire was in three parts. The first part explained the purpose of the study. The second part requested respondents to provide data related to their personal details. In the third section a detailed explanation about the inclusion of each set of questions was provided. The questions were designed as a closed – end questions, where the respondents have to make their response in a 5 point Likert scale, varying from "Strongly disagree" to "Strongly agree". The respondents were customers of various banks in Kerala state in India. A simple random sampling strategy was adopted. However on enquiry, if the sample was found not to have used mobile banking at least once, he/she was eliminated from the survey. To get usable responses of 184, a total of 268 persons were met.

DATA ANALYSIS

The purpose of this study was to analyze causal relationships between constructs mentioned above. SEM is a statistical technique for testing and estimating those causal relationships based on statistical data and qualitative causal assumptions. SEM is a confirmatory technique used to determine whether the model developed for the research is valid for data. SEM is a combination of factor analysis and multiple regression. The SEM can be divided into two parts. The measurement model is the part which relates measured variables to latent variables. The structural model is the part that relates latent variables among one another.

Analysis of the research model was done using PLS based software WarpPLS2.0. The choice of PLS was justified from two aspects. The first aspect was that PLS can accommodate both reflective and formative scales easily, compared to covariance structure analysis. The second aspect was that PLS does not require any priori distributional assumptions and relatively small sample size is acceptable (Chin et al. 2003). Another important feature of WarpPLS 2.0 was the inclusion of model fit indices. For assessing the model fit with the data, it is recommended that the P values for both the APC and ARS be both lower than .05; that is, significant at the .05 level. Also it is recommended that the AVIF < 5. The other features of WarpPLS2.0 are

- It estimates P values for path coefficients automatically and hence significance can be easily established.
- It estimates several model fit indices for checking whether data is well represented by the model.
- It enables evaluation of measurement model as well as structural model simultaneously
- The software allows users to view scatter plots of each of the relationships among LVs together with the regression curves that best approximate those relationships.
- It calculates variance inflation factor (VIF) coefficients for LV predictors associated with each LV criterion
- It pre-processes the data before SEM analysis and hence makes it easy to correct problems within the data, such as identical column names, columns with zero variance, and missing values.

Warp PLS 2.0 evaluates both measurement model as well as structural model simultaneously. The Path coefficients and associated p-values were obtained by running

Warp PLS 2.0 with a bootstrapping procedure. Boot strapping method of re-sampling was adopted due to the reason that it tends to generate more stable path coefficients with samples sizes more than 100 (Nevitt &Hancock, 2001). Various analysis algorithms used by Warp PLS are Warp3 PLS Regression, Warp2 PLS Regression, PLS Regression, and Robust Path Analysis. In this study Warp3 PLS Regression algorithm was used for analysis.

The validity and reliability criterion varies depending on nature of the construct. The various guidelines are illustrated in table-4. For evaluation of measurement indicators the loading / weights of the indicators should be more than 0.5 and the corresponding $p<0.001$ after estimation, or else the indicator is not considered relevant and are removed and re-estimated to obtain valid model. Causality assumptions were verified only on the basis of a valid model.

Sl.no	Consideration	Guideline (WarpPLS2.0)	
		Reflective constructs	Formative constructs
1	Cronbach alpha coefficient	>0.7	NA
2	Composite reliability	>0.7	NA
3	Average variance extracted	>0.5	>0. 5
4	Convergent validity	P values associated with the loadings be lower than .05; and that the loadings be equal to or greater than 0.5	VIF<5,all indicator weights should be with p<0.05
5	Discriminant validity	The square root of the average variance extracted should be higher than any of the correlations involving that latent variable	The square root of the average variance extracted should be higher than any of the correlations involving that latent variable

Table-4 various validity/Reliability criteria adopted in this study

The pre-processing of the data as part of Warp PLS 2.0 analysis confirmed the quality of data for further analysis with regard to missing values, zero variance etc. The estimated model with all path co-efficients and corresponding p values are illustrated in Fig-2 below.

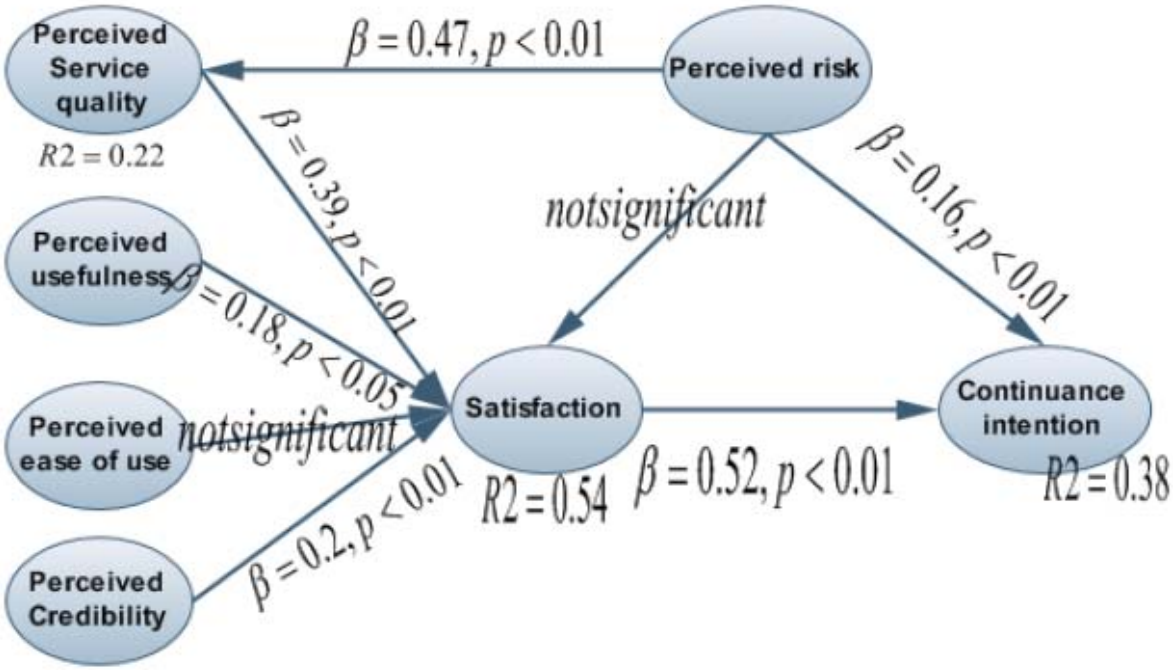

Fig-2 Estimated model

To assess the model fitness with the data, it was recommended that the p-values for both the average path coefficient (APC) and the average r-squared (ARS) be both lower than .05. In addition, it was recommended that the average variance inflation factor (AVIF) be lower than 5 (Ned Kock 2010). It was found that, all the three fit criteria were met (Table-5) and the model has acceptable predictive and explanatory quality as the data is well represented by the model.

Model fit indices and P values
APC=0.251, P=<0.001
ARS=0.382, P=<0.001
AVIF=2.207, Good if < 5

Table-5 Model fit Indices

All the factor loadings of the reflective indicators were found more than o.5 with p<0.01(Table-6).The formative indicators were with VIF<5 and p< 0.01 (Table-7).The Composite reliability, Cron bach alpha and Average Variance Extracted were above the threshold limits (Table-8).The square root of AVE of all constructs were found more than any of the correlations involving that latent variable (Table-9). All the above observations confirmed the reliability and validity of the constructs making it suitable to draw conclusions on causality.

	PR	PEU	PC	PU	SAT	PSQ	CI	P value
pr1	(0.836)	-0.055	0.109	-0.108	0.076	-0.158	0.134	<0.001
pr2	(0.867)	-0.122	-0.038	0.088	-0.054	-0.056	0.063	<0.001
pr3	(0.745)	0.066	-0.247	0.203	-0.049	0.201	-0.196	<0.001
pr4	(0.839)	0.122	0.150	-0.163	0.024	0.037	-0.025	<0.001
peu1	0.068	(0.822)	-0.292	0.155	-0.119	-0.102	0.148	<0.001
peu2	-0.029	(0.861)	-0.116	-0.026	0.131	-0.034	-0.075	<0.001
peu3	0.005	(0.843)	-0.135	0.023	-0.011	0.173	-0.101	<0.001
peu4	-0.043	(0.809)	0.560	-0.153	-0.008	-0.040	0.034	<0.001
pc1	0.004	0.111	(0.904)	-0.062	-0.066	-0.031	0.022	<0.001
pc2	0.007	0.080	(0.933)	-0.003	-0.033	-0.022	0.050	<0.001
pc3	-0.018	0.072	(0.888)	0.000	0.008	0.015	0.016	<0.001
pc4	0.010	-0.389	(0.616)	0.094	0.135	0.058	-0.131	<0.001
pu1	-0.054	-0.037	0.367	(0.784)	0.051	-0.179	0.146	<0.001
pu2	0.019	0.077	-0.104	(0.843)	-0.302	0.062	-0.006	<0.001
pu3	0.026	0.009	-0.159	(0.825)	-0.296	0.059	0.045	<0.001
pu4	0.011	-0.099	-0.157	(0.441)	1.040	0.091	-0.334	<0.001
sat4	0.444	0.341	-0.056	0.157	(0.582)	-0.125	0.084	<0.001
sat1	-0.146	-0.201	0.125	0.057	(0.783)	0.202	-0.157	<0.001
sat2	-0.159	0.080	-0.184	-0.075	(0.826)	-0.065	0.022	<0.001
sat3	-0.015	-0.123	0.100	-0.085	(0.873)	-0.036	0.065	<0.001
ci1	0.048	0.045	0.001	-0.165	0.080	-0.009	(0.916)	<0.001
ci2	-0.041	-0.029	0.030	0.015	-0.042	0.082	(0.941)	<0.001
ci3	-0.007	-0.015	-0.031	0.147	-0.036	-0.073	(0.935)	<0.001

Table-6 Factor loading of Reflective Indicators

psq1	0.000	0.000	0.000	0.000	0.000	(0.206)	0.000	<0.001	1.983
psq2	0.000	0.000	0.000	0.000	0.000	(0.220)	0.000	<0.001	2.176
psq3	0.000	0.000	0.000	0.000	0.000	(0.219)	0.000	<0.001	2.172
psq4	0.000	0.000	0.000	0.000	0.000	(0.215)	0.000	<0.001	2.043
psq5	0.000	0.000	0.000	0.000	0.000	(0.220)	0.000	<0.001	2.239
psq6	0.000	0.000	0.000	0.000	0.000	(0.210)	0.000	<0.001	2.013

Tables-7 Indicator weights of Formative Indicators

R-squared coefficients

PR	PEU	PC	PU	SAT	PSQ	CI
				0.542	0.224	0.380

Composite reliability coefficients

PR	PEU	PC	PU	SAT	PSQ	CI
0.893	0.901	0.907	0.823	0.854	0.900	0.951

Cronbach alpha coefficients

PR	PEU	PC	PU	SAT	PSQ	CI
0.840	0.854	0.858	0.709	0.769	0.867	0.922

Average variances extracted

PR	PEU	PC	PU	SAT	PSQ	CI
0.677	0.696	0.714	0.550	0.599	0.601	0.866

Table –8 Latent co-efficients of Various Constructs

Latent variable correlations

	PR	PEU	PC	PU	SAT	PSQ	CI
PR	(0.823)	0.679	0.684	0.665	0.510	0.458	0.423
PEU	0.679	(0.834)	0.743	0.688	0.565	0.504	0.435
PC	0.684	0.743	(0.845)	0.684	0.624	0.586	0.511
PU	0.665	0.688	0.684	(0.742)	0.597	0.542	0.445
SAT	0.510	0.565	0.624	0.597	(0.774)	0.638	0.600
PSQ	0.458	0.504	0.586	0.542	0.638	(0.776)	0.711
CI	0.423	0.435	0.511	0.445	0.600	0.711	(0.930)

Note: Square roots of average variances extracted (AVE's) shown on diagonal.

Table-9 Latent Variable correlations (all correlations P<0.001)

FINDINGS AND CONCLUSIONS

In this study, 8 hypotheses are tested using Structural equation modeling. 6 were found significant. The perceived ease of use and perceived risk was found not significantly related to satisfaction, rejecting the hypotheses H3 and H6 .The significant observations from analysis were

- The relation between Perceived service quality and satisfaction appears to be stronger (β=0.39) than the relation between Perceived credibility and satisfaction (β=0.2).
- The relation between Perceived risk and Perceived service quality appears to be more stronger (β=0.47) than the relation between Perceived risk and continuance intention (β=0.16)
- The relation between Satisfaction to Continuance intentions was strong (β=0.52) and significant.
- The study highlighted the importance of satisfaction and confirmed it as the strongest predictor of continuance intentions in customers.

The findings of the study produced some observations when compared with the results of prior TAM based studies of technology acceptance. Perceived usefulness was a stronger predictor of acceptance intention in TAM, than attitude (Davis et al. 1989; Taylor and Todd 1995), while satisfaction was the stronger predictor of continuance intention in this study than perceived usefulness. Surprisingly the perceived easiness to use was not at all a significant factor. This study was done by collecting responses of early adopters to mobile banking. The questionnaire was modified to capture the feelings of the respondents after their initial usage, in relation to indicators chosen. The significant factors such as perceived use and perceived ease of use represents solely cognitive beliefs formed potentially via second-hand information from referent others, popular media, or other sources and therefore influenced intentions as established in various previous studies. However after a usage experience, the importance of pre-assumed factors reduces and customer tend to evaluate the features on a more realistic, unbiased manner and make decisions on continuance usage.

The role of perceived risk even though not significantly influencing satisfaction(R squared=0.54) was found having serious influence on continuance decisions(R squared=0.38) and perceived service quality. Even after getting an exposure with the security features of the m-banking system the perceptions about possible risk continued to impart adverse feeling on the customer. The significant relation perceived credibility has with satisfaction was expected to counteract the impact of perceived risk. This was found true from the fact that perceived risk was having insignificant relation with satisfaction. The findings underline the condition that perceived service quality and satisfaction are essential pre-requisites for continuance decisions of the customer with mobile banking.

The perceived service quality emerged as the strongest predictor of satisfaction in this study. This observation was in tune with various other studies in the field of service quality and customer satisfaction (Anderson & Sullivan, 1993; Cronin & Taylor, 1992, 1994; Spreng & Mackoy, 1996; Woodside, Frey, & Daly, 1989).

LIMITATIONS OF THE STUDY

This study suffers from several limitations. This research was conducted within the context of the retail banking industry in a localized setting. It adds to the literature on continuance intentions of the early adopters of a new technical service delivery channel in banking. However, its results cannot be completely relevant or consistent when extended to all sections of the customers. The study was restricted to a specific geographic area belonging to a single state Kerala in India and therefore extrapolating the results to entire India may prove to be insignificant. A larger and more representative sample may give broader representation to the measurement of perceptions of the customer. The responses of the early adopters are basically considered for establishing linkage among various variables considered for the study. The initial perceptions are likely to be changed in course of repeated experience and hence the relevance of the study may be for a limited period.

The following are certain general limitations of this study:

1. The behavior of the customer while approaching them to fill the questionnaire was unpredictable.
2. Shortage of time was another constraint for the study.
3. There may be error due to bias of respondents.
4. Lack of customer awareness about real yardsticks for judgment was a major constraint.

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