

CONSUMERS' PERCEIVED USEFULNESS AND BARRIERS TOWARDS E-BANKING SERVICES IN STRUCTURAL EQUATION MODELING

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ABSTRACT

The banking industry in the developing countries focusses on "Paper free transactions" or green channel counter, which means all the maintenance or transactions or exchanges of information, documents, and money, can be transferred electronically through electronic networks rather than paper documents and currencies. In this scenario, electronic banking services play a vital role which facilitates electronic fund transfer, bill payments of utility transfer, etc., through electronic networks using electronic gadgets.

The study made an attempt to explore the perceived usefulness and barriers on formation of customer attitude towards adoption of e-banking services using Structural Equation Model approach. The convenience sampling technique was adopted to gather the sample data, who have the bank accounts in Private and Public sector banks. The primary data was analyzed through Structural Equation Model. The findings of the study revealed that, perceived usefulness plays a major role in customer attitude and adoption of e-banking services rather than perceived barrier. However, the effect of perceived barrier can be removed by offering appropriate awareness, infrastructure and training programmes to the potential user to improve percentage of users adopting electronic banking services.

Keywords: Perceived Usefulness, Perceived Barriers, Customer Attitude, Perceived Effectiveness.

INTRODUCTION

The remarkable developments in technology and the aggressive infusion of information technology had brought in a paradigm shift in banking operations. The banking industry in global commerce has been undergone various transformation in the recent decades. The electronic era created its impact on banking industry also. For the banks, technology has emerged as a strategic resource for achieving higher efficiency, control of operations, productivity and profitability. The tremendous advances in technology and the aggressive infusion of information technology had brought in a paradigm shift in banking operations. For the banks, technology has emerged as a strategic resource for achieving higher efficiency, control of operations, productivity and profitability. The e-banking technology enables the customers to avail banking services 'anywhere, anytime, anyway' at their option (Balwinder and Pooja, 2009). This has prompted the banks to embrace technology to meet the increasing customer expectation and face the tough competition. Now-a-days both private and public sector banks delivering most of its services through electronic networks to their customers, but still there are few customers who don't have awareness or hesitate to make use of electronic banking services such as mobile banking and internet banking instead of traditional banking. The Gen X and Gen Y people are familiar with electronic gadgets, hence it's very much easy for them to learn and adopt electronic banking services in their day-to-day activities. E-Banking enables access of banking services are accessible 24x7 (Kamalam and Murugaiyan, 2016). Internet banking is the version of E-banking, which uses the Internet as a delivery channel for banking services and offers opening a deposit account, transferring funds, electronic bill presentment and payment, etc. (Jun and Cai, 2001).

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

There is lot of literatures available on the print and electronic media related to the customer satisfaction towards the e-banking services offered by various banks, but very few researches were available which explores the impact of perceived usefulness and barriers related to the adoption of the e-banking services in Indian context. The information technology has entirely renovated the banking business. The success of Internet banking depends upon the elegant website of a bank (Kaushal, 2012). Internet banking became very attractive to customers and lots of banks because the technology is being accepted by them and they can now understand and have information about the complex products (Sathye, 1999). Bill Gates (2008) in his speech quoted that "banking is essential, banks are not", which means the technology may disappears the traditional banks in future. In adoption of e-banking services, the customer attitude plays a vital role. The customer attitude towards e-banking services will be based on perception towards its usefulness and barriers.

Relationship Between Perceived Usefulness and Customer Attitude Towards E-banking Services.

Davis et al., (1992) studied "consumers' perceptions regarding the outcome of the experience' is known as perceived usefulness. In other words, perceived usefulness denotes that the individual's discernment towards the new technology, whether the use of that technology will improve his/ her performance or not (Davis, 1993). Similarly, Mathwick et al., (2001) defined perceived usefulness as the extent to which a person deems a particular system to boost his or her job performance.

Pikkarainen et al. (2004) applied TAM in Finland and they found perceived usefulness as a determinant of actual behavior which encouraged the user of the twenty-first century banking to use more innovative and user-friendly self-service technologies that give them greater autonomy in performing banking transactions, in obtaining information on financial advices, and in purchasing other financial products. However, Gerrard and Cunningham (2003) proposed the perceived usefulness of the e-banking technology may be depends on the online services provided by the bank namely verifying bank balances, applying for a loan, utility bills payment, inter/intra bank fund transfer and obtaining information on investment schemes such as PPF / RD/ mutual funds, etc.

Researchers argued that perceived ease of use means the perceived potential advantages of using particular technology by a person. Rogers (1962) stated that the term 'perceived ease of use' means that 'the degree to which an innovation is perceived not to be difficult to understand, learn or operate'. He also added that it is the degree to which customers /consumers recognize a new product or service as superior than its available alternatives. Zeithaml et al. (2002) observed similar viewpoint towards perceived easy of use and mentioned that the degree to which an innovation is easy to understand or use could be considered.

According to Hernandez and Mazzon (2007), proposed consumers' attitude has a robust, straight, and affirmative effect on consumers' intentions to actually use the new technology or system. Perceived Ease of Use and Perceived Web Security as independent variables, Perceived Usefulness and Attitude as intervening variables, and Intention to Use as the dependent variable. The results provide support of the extended TAM model and confirm its robustness in predicting customers' intention of adoption of Internet Banking (Cheng et al., 2006).

Usage of e-banking services by the customers are influenced by type of account, age group and occupation/ profession, academic qualification, level of convenience/ usefulness, and security & trust, whereas the slow transaction speed is the most negatively influenced factor in e-banking adoption (Agarwal et al., 2009). There are extensive evidences proving the significance of effect of perceived usefulness on adaptation intention (Chen and Barnes, 2007; Guriting and Ndubisi, 2006). Hence

the following hypothesis can be formulated like.

Hypothesis 1 : Perceived Usefulness of Do E-banking Services have Positive Impact on Customer Attitude.

Relationship between Perceived barriers and Customer attitude towards e-banking services.

There has also been rapid growth in the adoption of the e-banking / internet banking services among bank customers, but there has been considerable number of bank customers who still carry out the banking transaction in the traditional way. Thus, it seems that for some customers some factors cause resistance, thereby delaying or even preventing the adoption of Internet banking service.

Consumer resistance to innovations has been explained through different barriers that inhibit or even prevent the adoption of an innovation. Consumer resistance to innovations consists of functional barriers and psychological barriers. Usage, value and risk barriers constitute functional barriers, whereas tradition and image barriers refer to psychological barriers. Functional barriers are likely to arise if consumers perceive considerable changes from adopting an innovation, while psychological barriers are often caused by conflict with consumers' prior beliefs (Ram and Sheth 1989).

Lancaster (1966) noted that attitude is the driver of consumer utility or attributes. Triandis (1979) described attitude as an individual's positive or negative behavior towards innovation adaptation. Triandis further explained that attitude portrayed the perceptions of usefulness of electronic banking, adaptation features, bank electronic features, risk and privacy, and personal preferences. The importance of security and privacy for the acceptance of online banking has been noted in many banking studies (Hernandez and Mazzon, 2007; Chen and Barnes, 2007). To be more precise, lack of privacy and security were found to be significant obstacles to the adoption of online banking (Chen and Barnes, 2007; Sathye, 1999).

Ming-Chi Lee, 2009 in his paper stated that several merits of online banking may form a positive factor named perceived benefit, and the negative factors may influence perceived risk namely financial, security/privacy, performance, social and time risk as barriers. The results of their study indicated that the intention to use online banking is mostly affected by the security/ privacy risk, and financial risk, whereas it is positively affected mainly by perceived benefit, attitude and perceived usefulness. Thus, the relationship can be hypothesized as,

Hypothesis 2 : Perceived Barriers to E-banking Services have Negative Impact on Customer Attitude.

Impact of Perceived barriers on Perceived usefulness

The results also indicate that psychological barriers are even higher determinants of resistance than usage and value, which are constructs related to ease-of-use and usefulness determining acceptance in the traditional technology acceptance model. Moreover, the findings highlight the role of self-efficacy in bank customers' risk perceptions to internet banking. Both functional and psychological barriers arising from service, channel, consumer and communication related means end chains inhibiting Internet banking adoption (Tuire Kuisma et al, 2007). Thus it can be rewritten as,

Hypothesis 3 : Perceived Barriers to E-banking Services have Negative Impact on Perceived Usefulness.

Relationship between Perceived usefulness and E-banking adoption

TAM (Davis, 1989; Davis et al., 1989) model suggests that customer adaptation behavior is determined by the intention to use a particular system, which in turn is determined by the perceived usefulness and perceived ease of use of the system. Liao and Cheung (2002) utilized an alternative research approach which assumes that customer adaptation is determined by intention to perform the behavior. Somali et al. (2009) mentioned that the Internet connectivity, the online banking awareness and its benefits, the social influence and computer self-efficacy have substantial effects on the perceived usefulness (PU) and perceived ease of use (PEOU) of online banking acceptance.

There is an association between Consumer attitudes toward the usefulness of and willingness to use Internet e-retail banking. The most important attributes of perceived usefulness are expectations of accuracy, security, network speed, user-friendliness, user involvement and convenience. (Liao and Cheung, 2002). Tan and Teo (2000) suggested that the perceived usefulness is an important factor in determining adaptation of innovations.

Hypothesis 4: Perceived usefulness has positive impact on adoption of e-banking services.

Relationship between Perceived barriers and E-banking adoption

The degrees of risk that customers perceive and their own tolerance of risk tacking are factors that influence their purchase decision (Nasri, 2011). On another hand, introducing a new technology may involve both benefits and risks to the user, and before deciding to adopt the technology, the individual may want to weigh risks and benefits. Electronic banking services will not be an exception to this general rule. A larger perception of risk will reduce the perceived benefit of the technology (Horst, Kuttschreuter, and Gutteling, 2007).

Cruz et al., (2009), identified that those customers reporting both functional and psychological resistance to Internet banking are more dissatisfied with the information and guidance offered by the e-banking service provider compared to those with only psychological resistance or no resistance to the innovation. Communication strategies to reduce and overcome different kinds of resistance to Internet banking are proposed.

Education, trust and resistance to change also have significant impact on the attitude towards the likelihood of adopting online banking (Sabah Abdullah Al-Somali, 2009). Sohail and Shanmugham (2003), accessibility of Internet, awareness of e-banking, and customers' reluctance to change are the factors that significantly affected the usage of e-banking. Thus, the new hypothesis is:

Hypothesis 5: Perceived barriers to E-Banking services have negative impact on adoption of e-banking services.

Relationship between Customer Attitude and E-banking adoption

The individuals before buying a product or service, they used to analyze the benefits and risks associated with such product or service, similarly while thinking about adopting e-banking services also they may analyze the usefulness and risks associated with it. Alsajjan and Dennis (2010), has mentioned that customer attitude plays an important role in adoption of electronic banking services. They also have quoted that the trust and perceived usefulness has potential role in e-banking adoption. Hence it is derived that,

Hypothesis 6: Customer attitude impacts Adoption of e-banking services.

Relationship between E-banking adoption and perceived effectiveness.

Customers after adopting the e-banking services, they will evaluate its effectiveness in terms of its accuracy of the information, transaction speed, user friendliness, convenience, availability of various features, etc. hence the hypothesis was framed to verify the linkage between the adoption of e-banking and perceived effectiveness of the same. Therefore,

Hypothesis 7 : Adoption of e-banking services has positive impact on perceived effectiveness.

Measurement Scale Development

The primary data for the research was collected through survey method of data collection, and the data collection instrument used was structured questionnaire. The structured questionnaire used in this research was divided in to five sections. The first section of the questionnaire encompasses the questions linked to

demographic profile of the respondents. The nominal and ordinal scale of measurement was used in this section and few dichotomous questions were also included.

The second section of questionnaire encompasses the questions associated to perceived usefulness, which was measured through five indicators such as comfortability, perceived easy of use, trust and security, social influence, and internet experience. The third section of the instrument consists of questions related to Perceived barriers through five indicating variables namely infrastructural barriers, technical barriers, security barriers, social and cultural barriers and personal barrier. The fourth section of the questionnaire contains the questions connected to customer attitude with two indicating variables such as Interest to learn, and Intention to use. The fifth section of the instrument consists of variables related to perceived effectiveness of the e-banking services. The sections from two to five were measured through ordinal scale with Likert five point agreement scale i.e. 1-Strongly disagree, 2- Disagree, 3 - Neutral, 4- Agree and 5- Strongly Agree.

The survey was conducted among the customers of the private and public sector banks in Chennai city of Tamil Nadu state, India. The sample size of the survey is 473, wherein 500 questionnaire was distributed in the proportion of 250 each in private and public sector banks, but only 473 (Private - 233 and Public - 242) valid questionnaire was collected back from the respondents. The convenience sampling technique was used to choose the respondents from the population.

Research Variables

The data collection instrument is divided into 5 segments such as perceived usefulness, perceived barriers, customer attitude, adoption of e-banking services, and perceived effectiveness. Each segment was measured through indicating variables and it was summarized in table 1.

Table 1. Research variables of the model with indicators

S. No	Latent variables	Indicators
1	Perceived Usefulness	Comfortability, Perceived easy of use, Trust and security, social influence, and internet experience.
2	Perceived Barriers	Infrastructural barriers, technical barriers, Security barriers, Social and Cultural barriers and personal barrier.
3	Customer Attitude	Interest to learn, Intention to use.
4	Adoption of E-banking services	Frequency of use, mode of access, Purpose of use
5	Perceived Effectiveness	Convenience, Time consumption, Processing Speed, Cost and accuracy.

Reliability and Validity of Research

Reliability and validity of the questionnaire plays a critical role in deciding the accuracy of the results of the analysis. The standard questionnaire is the one which can give similar kind of results on same kind of situation in different places and at different time. The structured questionnaire used in this research was tested for its reliability and validity through the pilot study results. The Cronbach alpha reliability coefficient was found for each scale in order to measure the reliability of the questionnaire and was presented in table 2. The convergent validity and discriminant validity also found through the computation of CR, AVE, MSV and ASV etc., and it was tabulated in table 3. The content validity of the instrument was verified through the panel of experts from academic and industry and appropriate modifications were done before the main study.

Table 2. Scale Reliability Statistics

Sl. No.	Scale	Cronbachs Alpha
1	Perceived Usefulness Scale	0.861
2	Perceived Barrier scale	0.769
3	Customer Attitude scale	0.827
4	E-banking Adoption Scale	0.901
5	Perceived Effectiveness Scale	0.792

Table 3. Scale Validity Statistics

Sl. No	Measure	Recommended value	Value	Remarks
1	Construct Reliability / Composite Reliability (CR)	CR > 0.7 (Nunnally, 1978) and CR > AVE	0.83	Good
2	Average Variance Extracted (AVE)	AVE > 0.5 (Fornell and Larker, 1981)	0.65	Good
3	Maximum Shared Variance (MSV)	MSV > AVE (Hair et al, 2006)	0.75	Good
4	Average Shared Squared Variance (ASV)	ASV > AVE (Hair et al, 2006)	0.69	Good

The scale validity (i.e. convergent and discriminant validity) of the data collection instrument was presented in table 3. Since the chosen measures falls within the range of recommended values, it is concluded the scales used in the data collection instrument has the presence of Convergent validity and Discriminant validity.

Research Model Development

The research model was developed based on the literature survey to examine the interrelationship among the chosen variables and it was depicted in Figure 1.

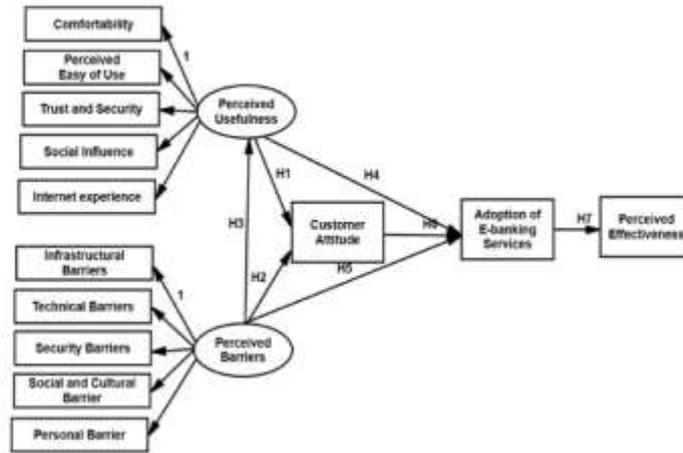


Figure 1. Interrelationship among the variables

The main paths were mentioned with H₁, H₂, H₃... etc., to represent the hypothetical relationship, which has to be verified using the Structural Equation Modeling (SEM) approach.

Assessment of Model Fit

The research model was drawn using IBM AMOS 23.0 software package, and the primary data was entered in to the IBM SPSS 22.0 software package and loaded into the research model for further analysis. The research model with unstandardized regression coefficient was presented in figure 2.

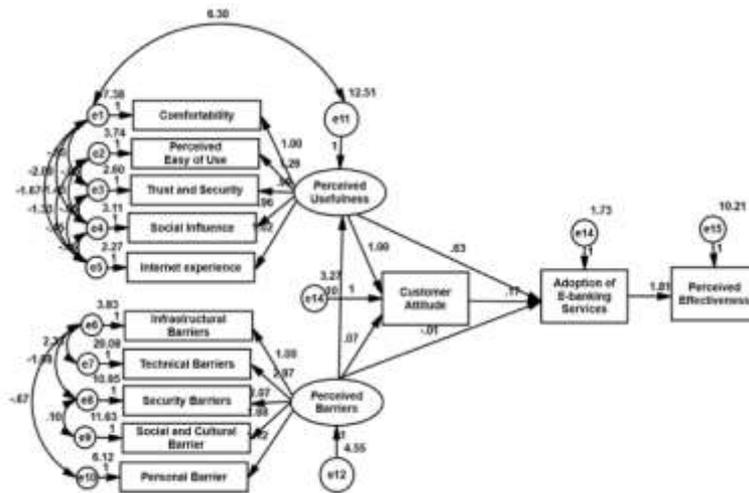


Figure 2. Research model with Unstandardized Regression coefficients

The fitness of the proposed research model with the collected data can be assessed using the model fitness indices and it was shown in table 3.

Table 3. Abstract of the Model Fitness statistics

S. No	Model Fitness Indices	Value	Remarks
1	Chi-Square / Degrees of Freedom	2.286	2 to 5 Marsh and Hocevar (1985), since the computed value is lesser than 5, it is found to be fit.
2	GFI (Goodness of Fit Index)	0.929	> 0.90 Joreskog and Sorbom (1984), the index is found to be fit.
3	AGFI (Adjusted Goodness of Fit Index)	0.917	> 0.90 Tanaka and Huba (1985), the AGFI is also found to be fit.
4	CFI (Comparative Fitness Index)	0.963	> 0.90 Bentler (1990), the model fitness is valid
5	NFI (Normative Fitness Index)	0.968	> 0.95 Bollen (1989), found to have good fit.
6	TLI (Tucker-Lewis Index)	0.961	> 0.95 Bentler and Bonett (1980), found to have absolute fit.
7	RMSEA (Root Mean Square Error of Approximation)	0.033	< 0.08 Browne and Cudeck (1993), since the model index is lesser than 0.08 it is valid.
8	RMR (Root Mean Square Residuals)	0.049	< 0.08 (Hair et al. 2006), found to have good fit.

The research model developed was tested using structural equation model approach. In order to interpret the results of the SEM model, eight model fitness indices were used. From the table 3, it is clearly identified that all the chosen model fitness indices falls within the range of suggested values, therefore it is proved that the research model is fit.

Results and Discussion

The observed variables are loaded into the latent variables and the interrelationship among the variables was tested using SEM path analysis. Figure 3 presents the research model based on standardized regression coefficients of the hypothesized paths. The interrelationship between perceived usefulness and customer attitude is represented by the hypothesis H1 with the resulted path coefficient percentage (89%), which indicates robust relationship, whereas the H2 represents hypothesized path relationship between perceived barriers and customer attitude with 4%, which indicates the influence of customer attitude.

The perceived barriers has 6% relationship with perceived usefulness. The perceived usefulness has about 63% relationship with adoption of e-banking services and it is represented by H4, whereas the perceived barriers negatively influence the adoption of e-banking services with -1%. The customer attitude has 22% relationship with H6. The interrelationship between adoption of e-banking services and perceived effectiveness with H7 and having 87% strong relationship.

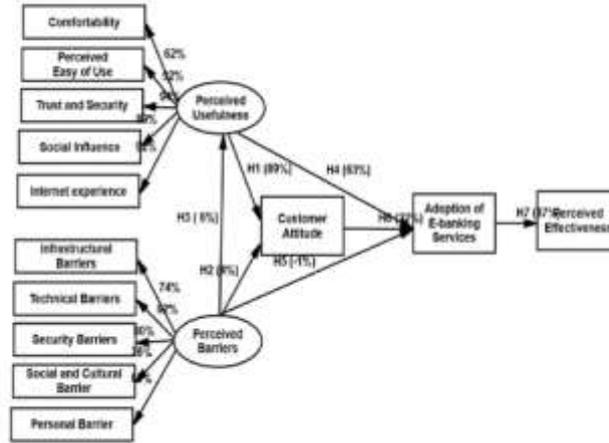


Figure 3. Research model with Standardized Regression coefficients

Conclusion

The research model developed was tested using the Structural Equation Modeling and through the analysis it was found that all the hypothetical relationship was significant and the model is found to be fit. Adoption of e-banking is the need of the hour to manage the demonetization of higher value of currency notes such as Rs.500 and Rs.1000 in India. The Prime Minister of India also requested the citizens of India to welcome currency free India i.e. digital India, in order to fight against corruption and black money. This transformation will definitely have temporary hardship to the poor and economically backward people, they need to be trained to use the technology and the state and central government should provide infrastructure (i.e. smart mobile phone, laptop with internet connection) and appropriate training with the help of volunteers and Non-profit organizations.

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