

The Impact of Technology Based Self Service Banking Service Quality on Customer Loyalty

Rajiv Sindwani*, Manisha Goel**

ABSTRACT

The technology based self service banking (TBSSB) refers to banking services availed by customers using electronic banking channels, without any interaction with bank employees. This paper examined the impact of TBSSB service quality dimensions on customer loyalty. A survey was conducted to collect data from customers of different banks, using a questionnaire. The sample size of 414 was divided into two sub-samples of equal size. The dimensions (factors) were identified by conducting an exploratory factor analysis (EFA) on first sub-sample using SPSS 16.0 software. Factor structure was confirmed by conducting confirmatory factor analysis (CFA) using AMOS 20.0 software on the second sub-sample. The proposed TBSSB SQ-Customer Loyalty conceptual model was tested for uni-dimensionality, reliability, and validity. Four proposed hypotheses were tested using structural equation modelling (SEM) with the help of AMOS 20.0. Out of four TBSSB service quality dimensions, Personalisation is the only dimension that is found to have positive significant effect on customer loyalty. This study will guide banks about the critical technology based banking factors that need to be focussed upon for increasing customer loyalty.

Keyword: Technology Based Self Service Banking, Exploratory Factor Analysis, Confirmatory Factor Analysis, Structural Equation Modelling, Customer Loyalty

INTRODUCTION

With time, almost every bank in India has started offering technology based self service banking services to its customers. The most popular form of TBSSB includes ATM banking, Internet banking, mobile banking and tele banking. TBSSB is a win-win situation for banks and their customers. For the banks, the benefits are in form of lower cost of transaction and lesser customer load on branches. For the customers, TBSSB provides value to customers by providing 24 x7 banking from any place. As core banking services offered by banks are almost similar, banks are trying to differentiate themselves from other banks on other parameters for enhancing customer loyalty. Measuring service quality and studying its impact on customer loyalty has become a key interest area of managers and researchers, as it influences performance and profitability of the organisation (Hallowell, 1996; Al-Hawari, Ward & Newby, 2009; Seth, Deshmukh & Vrat, 2006). In the banking sector, studies to find impact of service quality on customer loyalty has been conducted in both traditional as well as in automated banking context.

Research on automated banking service quality is given due importance as it is found to have effect on customer loyalty (Al-Hawari, Hartley & Ward, 2005; Santos, 2003). Most of the studies on technology based self service banking quality covers only one of the automated banking channels. Focus of these studies is either on Internet banking or on ATM banking.

In this technology era, customers are using more than one automated banking channel to avail services. So, limiting research to only one channel will not present the overall picture of technology based banking. To get the comprehensive picture, in the present study broad attributes related to all channels of technology based self service banking (TBSSB) service quality are grouped into dimensions and their impact on customer loyalty is examined.

LITERATURE REVIEW

Automated Banking Service Quality

“Automated service quality” is defined as the customer’s overall evaluation of the services provided through

* Assistant Professor, Department of Management Studies, YMCA University of Science and Technology, Faridabad, Haryana, India. E-mail: rajiv_sindwani@yahoo.co.in

** Associate Professor, Department of Management Studies, YMCA University of Science and Technology, Faridabad, Haryana, India. E-mail: singla_manisha@rediffmail.com

electronic channels, such as the Internet, telephone and ATMs (Santos, 2003). Joseph, McClure and Joseph (1999) investigated the role that technology plays in Australian banking and its impact on the delivery of perceived service quality. They identified the six factors of e-banking service quality: convenience/accuracy, feedback/complaint management, efficiency, queue management, accessibility, and customisation. Jun and Cai (2001) developed 17 dimensions of e-banking service quality: product variety/diverse features, reliability, responsiveness, competence, courtesy, credibility, access, communication, understanding the customer, collaboration, continuous improvement, content, accuracy, ease of use, timeliness, aesthetics, and security. They suggest that both e-banks and traditional banks offering e-banking services should focus on responsiveness, reliability, and access dimensions. Broderick and Vachirapornpuk (2002) constructed a model of perceived service quality in Internet banking. They identified the following five key elements that are regarded as central influences on perceived service quality: customer expectations of the service, the image and reputation of the service organisation, aspects of the service setting, the actual service encounter, and customer participation. They further noted that among these elements, service setting and customer participation have the most immediate impacts on service evaluation. Al-Hawari *et al.* (2005) conducted study to establish the critical determinants of automated service quality by including attributes of three main banking services channel (ATM, telephone banking and Internet banking) along with attributes corresponding to two additional dimensions of perceived price and core service. The paper proposed a conceptual model of automated banking services quality. Mäenpää, (2006) based on open-ended exploratory interviews, an extensive literature review, and quantitative analyses, developed seven dimensions of Internet banking service quality: convenience, security, status, auxiliary features, personal finances, investment, and exploration. The researcher further suggested that banks offering e-banking services need to focus more on the growing consumer cluster of youngsters, who are viewed as the prospects of tomorrow. Ombati, Magutu, Nyamwange and Nyaoga (2010) established that there is a direct relationship between technology and service quality in the banking industry. Auta (2010) empirically examined the impact of e-banking in Nigeria's economy. He explored the major factors responsible for internet banking based on respondents' perception on various e-banking applications. He

provided a framework of the factors which were taken to assess the e-banking perception. Factor analysis results indicated that security, user friendly, queue management, accessibility, time factor and fund transfer are major factors. Out of total respondents, about 88% agreed that e-banking is convenient and flexible way of banking and it also has various transaction related benefits. Kumbhar (2011) found service quality dimensions as system availability, e-fulfillment, accuracy, efficiency, security, responsiveness, ease to use, convenience, cost effectiveness, problem handling, compensation, and contact. Ganguli and Roy (2011) conducted a research on undergraduate students of a university in the Massachusetts state of the USA and identified four generic service quality dimensions in the technology-based banking services – customer service, technology security and information quality, technology convenience, and technology usage easiness and reliability.

Customer Loyalty

As per Oliver (1999), customer loyalty is a deeply-held commitment to re-buy or re-patronize a preferred product/service consistently in the future despite situational influences and marketing efforts having the potential to cause switching behaviour. Singh and Sirdeshmukh (2000) define customer loyalty as a “behavioural intention to maintain an ongoing relationship with a service provider.”

The effect of service quality dimensions on loyalty has also been tested for different services (Zeithaml, Berry & Parasuraman, 1996; Parasuraman, Zeithaml & Malhotra, 2005). In case of automated banking services also, the impact of service quality on customer loyalty has been studied by researchers (Suleiman, Mat, Adesiyan, Mohammed & ALekam, 2012; Ariff, Yun, Zakuan & Ismail, 2013; Asgari, Ahmadi, Shamlou, Farokhi & Farzin, 2014). Most of the automated banking studies took into consideration the effect of single technology like ATM banking, Internet Banking etc. on loyalty. Despite positive speculation in the literature, exploration of the relationship between TBSSB service quality and loyalty is needed. In this paper to examine the effect of technology based self service banking quality on customer loyalty, following four hypotheses were tested:

H1: Convenience has a direct positive effect on customer loyalty

H2: Reliability & Security has a direct positive effect on customer loyalty

H3: Responsiveness has a direct positive effect on customer loyalty

H4: Personalisation has a direct positive effect on customer loyalty

METHODOLOGY

A questionnaire was developed to study the impact of TBSSB service quality on customer loyalty. It covered 20 items (attributes) related to TBSSB service quality attributes and 6 items related to customer loyalty as shown in Table 1.

TBSSB service quality attributes are identified and adapted from important studies on automated service quality, which include Joseph et al. (1999); Joseph and Stone (2003); Ibrahim, Joseph and Ibeh (2006); Doll and Torkzadeh (1988); Van Riel, Liljander and Jurriens (2001); Yang, Jun and Peterson (2004); Ganguli and Roy (2011); Al-Hawari (2011); Sahadev and Purani (2008); Meuter, Ostrom, Roundtree and Bitner (2000); Bauer, Hammerschmidt and Falk (2004); Ho and Lin (2009); Narteh (2013); Sureshchandar, Rajendran and Anantharaman (2002); Katono (2011); Yen and Lu (2008); Loonam and O’Loughlin (2008); Coulter and Coulter (2002); Bitner, Brown and Meuter (2000); Ribbink et al. (2004); Herington and Weaven (2007); Kim and Lim (2001); Chen and Hitt (2002); Parasuraman et al. (2005); Dabholkar and Bagozzi (2002); Kumbhar (2011);

Table 1: TBSSB service quality and customer loyalty attributes

S. No.	Attribute No.	Attribute Name
1	A1	TBSSB services are able to conduct error free transactions every time
2	A2	TBSSB services are available 24 x 7 (7 days, 24 hours)
3	A3	TBSSB give directions to new users
4	A4	I receive prompt responses to my requests while using TBSSB
5	A5	TBSSB provides consistent services
6	A6	TBSSB provides customer feedback services
7	A7	TBSSB acknowledges me by name
8	A8	TBSSB provides the precise and sufficient information I need
9	A9	TBSSB provides product offerings according to my preferences
10	A10	TBSSB services provides accurate records of all transactions that have taken place
11	A11	I feel secure that my personal information will not be shared with third party in using TBSSB
12	A12	Financial transactions done using TBSSB are secure
13	A13	TBSSB services are cost effective
14	A14	TBSSB services are easy to use
15	A15	TBSSB has adequate menu options for everyday banking needs
16	A16	Elements of security are incorporated in TBSSB by bank and I am made aware of them
17	A17	TBSSB services have a user-friendly system
18	A18	TBSSB gives me more freedom of mobility
19	A19	When problems occur, the TBSSB system guides me to solve them
20	A20	TBSSB is less time consuming as compared to branch banking
21	L1	I would say positive things about my bank to other people
22	L2	I would encourage friends and relatives to do business with my bank
23	L3	I expect to do more business with my bank in future
24	L4	I would consider my bank as my first choice for banking services
25	L5	I would recommend my bank to someone who seek my advice
26	L6	I will remain with the same bank even if bank fees increase marginally

Dilijonas, Kriksciunien, Sakalauskas and Simutis (2009) and Parasuraman (2000).

Customer loyalty items are finalised on the basis of Al-Hawari *et al.* (2009); Zeithaml *et al.* (1996); Dabholkar, Shepherd and Thorpe (2000); Ganesh, Arnold and Reynolds (2000); Johnson, Gustafsson, Andreassen, Lervik and Cha (2001); Van Riel *et al.* (2001); Caruana (2002); Reichheld (2003); Kim, Park and Jeong (2004); Aydin and Ozer (2005); Collier and Bienstock (2006); Olorunniwo and Hsu (2006); Ganguli and Roy (2011).

Convenience sampling method was used to collect data from the customers of different banks in Delhi and NCR region with the help of self-administered paper-based questionnaires. Customers who are above 18 years of age and use at least one mode of electronic banking were part

of the survey.

Out of 600 distributed questionnaires, 440 were received back. Only 414 from 440 responses were usable. The TBSSB items were measured using a five-point scale, ranging from strongly disagree to strongly agree. Customer loyalty items were measured using a five-point scale ranging from extremely unlikely to extremely likely. The collected data was analysed using EFA, CFA and SEM.

DATA ANALYSIS AND RESULTS

Collected data of 414 respondents were split into two sub-samples of equal size. Sub-sample 1 was used for exploratory factor analysis and sub-sample 2 for confirmatory factor analysis.

Table 2: Rotated factor matrix for TBSSB service quality and Customer loyalty

<i>Factor Name</i>	<i>Items</i>	<i>Factor Loadings</i>	<i>Cronbach's Alpha</i>
Convenience	TBSSB is less time consuming as compared to branch banking	0.703	0.889
	TBSSB services are easy to use	0.752	
	TBSSB services are available 24 x 7 (7 days, 24 hours)	0.708	
	TBSSB gives me more freedom of mobility	0.784	
	TBSSB services have a user-friendly system	0.768	
	TBSSB has adequate menu options for everyday banking needs	0.596	
Reliability and Security	Elements of security are incorporated in TBSSB by bank and I am made aware of them	0.699	0.919
	I feel secure that my personal information will not be shared with third party in using TBSSB	0.809	
	TBSSB services are able to conduct error free transactions every time	0.856	
	TBSSB provides consistent services	0.816	
	Financial transactions done using TBSSB are secure	0.791	
Responsiveness	TBSSB give directions to new users	0.685	0.800
	TBSSB provides customer feedback services	0.633	
	I receive prompt responses to my requests while using TBSSB	0.643	
	When problems occur, the TBSSB system guides me to solve them	0.726	
Personalisation	TBSSB acknowledges me by name	0.751	0.875
	TBSSB provides product offerings according to my preferences	0.855	
	TBSSB provides the precise and sufficient information I need	0.824	
Customer Loyalty	I would say positive things about my bank to other people	0.881	0.894
	I would encourage friends and relatives to do business with my bank	0.771	
	I expect to do more business with my bank in future	0.691	
	I would consider my bank as my first choice for banking services	0.786	
	I would recommend my bank to someone who seek my advice	0.678	
	I will remain with the same bank even if bank fees increase marginally	0.790	

Exploratory Factor Analysis (EFA)

Prior to determining the underlying factor structure, the data were examined to check its appropriateness for factor analysis. The KMO value was found to 0.84, which was higher than the recommended minimum of 0.6 (Kaiser, 1974) indicating that the sample size was adequate for applying factor analysis. Also, the value of the test statistic for sphericity (Bartlett, 1954) was large. Bartlett's test of sphericity was significant, supporting the factorability of the correlation matrix and the associated significance level was extremely small (0.000). Principal Axis Factoring method was used for factor extraction, under the restriction that the eigen value of each generated factor was more than one (Malhotra & Birks, 2007). Variables having factor loadings of at least 0.5 (Hair, Black, Babin, Anderson & Tatham, 2006) were included in the analysis. In the initial exploration, two variables 'TBSSB services provides accurate records of all transactions that have taken place' and 'TBSSB services are cost effective' were deleted as they were having factor loadings of < 0.5 . The resulting factors satisfactory explained 69.582 percent of the total variance. The extracted factors were then rotated using Varimax rotation method. These rotated factors with their variable constituents and factor loadings are given in Table 2. Reliability of the factors was calculated using the Cronbach's alpha and values are shown in Table 2. A Cronbach's alpha value of greater than or equal to 0.7 is considered acceptable for the factor to be reliable (Hair *et al.*, 2006). In our case all the factors had satisfactory value of Cronbach's alpha as shown in Table 2. Taking into consideration variables covered under various factors and relevant literature, TBSSB service quality factors are named as Convenience, Reliability and Security, Responsiveness, and Personalisation. Six variables were loaded on factor 1 and were all related to "Convenience". The second factor has five variables which were all related to "Reliability and Security". Third factor has four variables related to "Responsiveness". The fourth factor has three items related with the "Personalisation" and finally all six items from L1 to L6 were loaded significantly on a single factor named as Customer loyalty.

Confirmatory Factor Analysis (CFA)

To confirm the factor structure found during EFA, Confirmatory factor analysis (CFA) using AMOS 20.0 software was conducted. There are specific measures that

can be used to test the model fit in CFA. As per Hair, Black, Babin & Anderson (2010) using three to four fit indices provides sufficient evidence of model fit. The researcher needs to report at least one incremental index and one absolute index, in addition to the chi-square value and the associated degrees of freedom (df). So, reporting the chi-square value and degrees of freedom, the Comparative Fit Index (CFI) or Tucker-Lewis Index (TLI), and the Root Mean Square Error of Approximation (RMSEA) will usually provide adequate unique information to evaluate a model. The fit indices values and acceptable fit criterion of the measurement model are as follows: Chi-square= 363.655, degrees of freedom (df) = 242, Chi-square/df = 1.503(< 3), CFI = 0.964(> 0.95), RMSEA=0.049(< 0.05), TLI=0.958(> 0.95). All of the statistical values of the final measurement model indicated that the model fitted well in representing the data. In addition, all the variables were found to have a significant factor loading on the related factor. Taken together, the measurement model confirmed the structure constituting four factors of TBSSB service quality and one factor of Customer loyalty. Confirmatory factor analysis was also performed on the entire data set of 414 responses. The Goodness of fit indices indicated that the model fits the data well.

Uni-dimensionality, Reliability and Validity of the model

Uni-dimensionality

The dimensionality of the model was tested during EFA by reviewing the loadings of the factors. Each item had a significant loading on the intended factors and no significant loading on another factor was found. The scales were, therefore, found to be uni-dimensional (Hair *et al.*, 2010).

Reliability

The reliability of the model was checked through Cronbach's alpha (Hair *et al.*, 2010). The value of Cronbach's alpha coefficient for all the factors were found to be above the lower limit threshold of acceptability of 0.7 (Hair *et al.*, 2006). The reliability coefficient values for the factors are as follows: Convenience (0.889), Reliability and Security (0.919), responsiveness (0.8), Personalisation (0.875) and Customer loyalty (0.894). The value of Cronbach's alpha for the TBSSB service

quality and Customer loyalty instrument is 0.872, showing that the instrument is reliable. Moreover, Composite reliability (CR) and Average Variance Extracted (AVE) of all the factors are higher than the acceptable limit of 0.70 and 0.5 respectively (Fornell & Larcker, 1981; Hair *et al.*, 2010) as shown in Table 3, supporting the reliability of the instrument.

Table 3: Reliability and Convergent Validity metrics

	<i>Composite Reliability</i>	<i>Average Variance Extracted</i>
Convenience	0.912	0.636
Reliability & Security	0.930	0.726
Responsiveness	0.829	0.550
Personalisation	0.917	0.787
Customer Loyalty	0.909	0.628

Validity

Validity was established in this study by establishing the face validity, convergent validity and discriminant validity.

Face validity was established by taking the attributes (items) in the study from the existing literature and adapting them to suit the requirements of the instrument.

Convergent validity defines the degree to which items of a given construct measure the same latent construct (Fornell & Larcker, 1981; Hair *et al.*, 2010). Convergent validity was assessed by examining the average variance extracted (AVE) and factor loadings of the constructs as suggested by Fornell and Larcker (1981). All the variables had significant factor loadings onto the respective latent constructs. Moreover, the average variance extracted (AVE) for each construct is greater than 0.50 as shown in Table 3, further supporting the convergent validity of the constructs.

Discriminant validity, according to Fornell and Larcker (1981), is a measure of the extent to which latent factors are distinct, i.e. they should not correlate so highly to seem to measure the same underlying dimension (Siekpe, 2005). Fornell and Larcker (1981) state that discriminant validity can be assessed by comparing the average variance extracted (AVE) with the corresponding inter-construct squared correlation estimates. In Table 4, diagonal elements in the correlation matrix of constructs are the square root of the AVE values and off-diagonal elements represent inter-construct correlations. The diagonal elements are greater than the off-diagonal, supporting the discriminant validity of the constructs.

Impact of TBSSB Service quality Dimensions

Table 4: Discriminant Validity

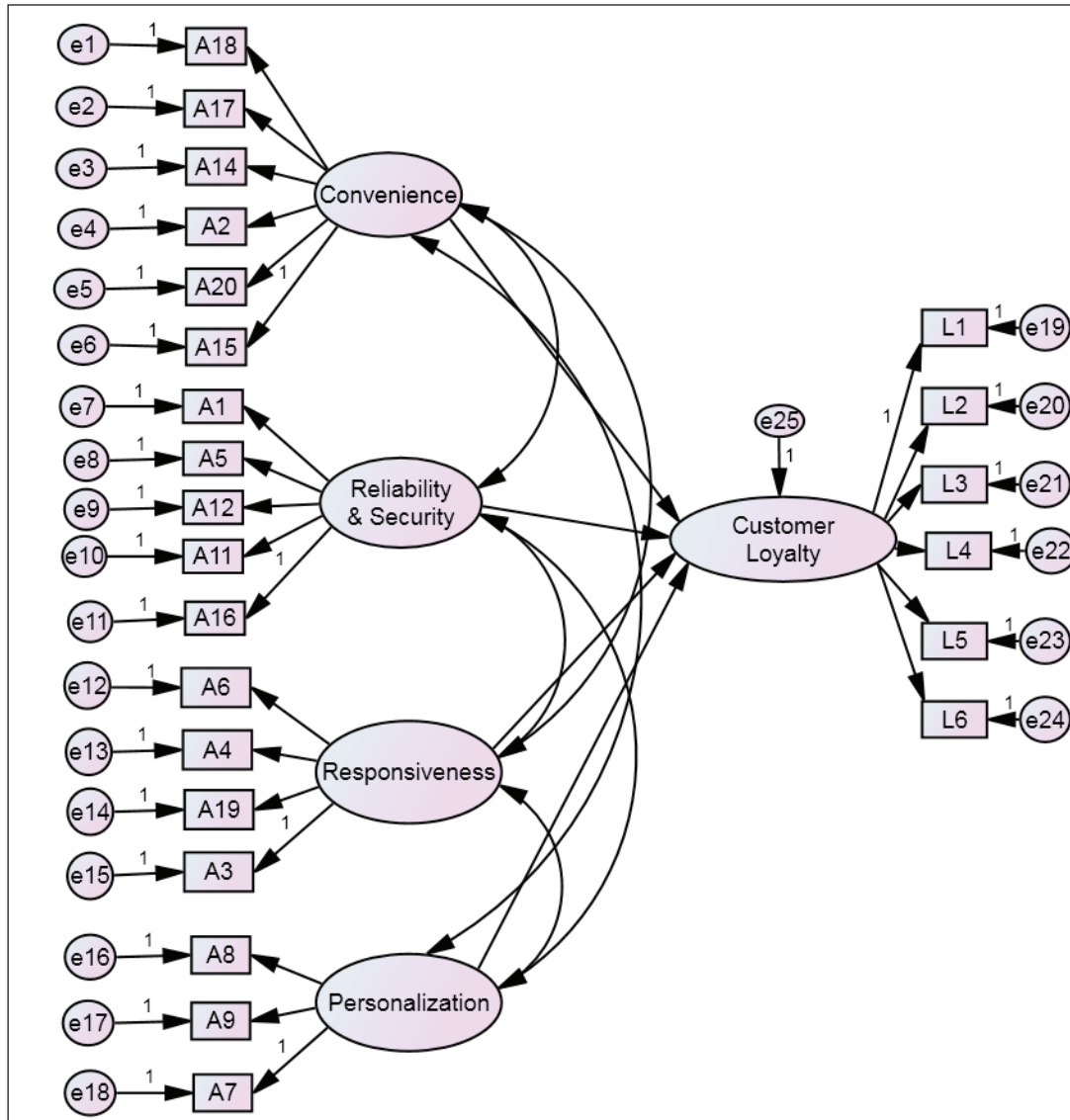
	<i>Customer Loyalty</i>	<i>Reliability & Security</i>	<i>Responsiveness</i>	<i>Personalisation</i>	<i>Convenience</i>
Customer Loyalty	0.792				
Reliability & Security	0.258	0.852			
Responsiveness	-0.044	0.019	0.741		
Personalisation	0.651	0.239	-0.049	0.887	
Convenience	0.333	0.420	-0.018	0.346	0.797

Table 5: Standardised Regression Weights and the Significance Level for Hypothesised Paths

<i>Relation between Constructs</i>	<i>Standardised Regression Weights</i>	<i>Significance Level</i>
Convenience → Loyalty	0.094(NS)	0.176
Reliability & Security → Loyalty	0.075 (NS)	0.259
Responsiveness → Loyalty	-0.014 (NS)	0.820
Personalisation → Loyalty	0.599***	***

NS implies "not significant"; ***Implies significant at $p < 0.001$

Figure 1: Model Showing Relationship between TBSSB Service Quality Dimensions and Customer Loyalty



on Customer Loyalty

The proposed structural model is shown in Fig. 1. The overall fit indices and acceptable fit criterion for the proposed structural model were as follows: Chi-square= 363.655, degrees of freedom (df) = 242, Chi-square/df = 1.503(<3), CFI =0.964(>0.95), RMSEA=0.049(<0.05), TLI=0.958(>0.95). All of the statistical values of the structural model indicated a good model fit. Hypotheses were tested by using the structural equation modelling (SEM) using AMOS 20.0.

Examination of the path coefficients (standardised regression weights) and the significance level between the constructs in the model were used to test the hypotheses. The analysis in Table 5 shows that Personalisation was the only dimension having positive significant effect on customer loyalty. Thus, hypothesis H4 was supported. Convenience, Reliability & Security, and Responsiveness dimensions have non-significant relation with customer loyalty. Therefore, H1, H2, H3 were not supported.

CONCLUSION

In this paper, the impact of TBSSB service quality dimensions on customer loyalty is examined. To study the impact, key dimensions of TBSSB service quality and customer loyalty are explored by conducting study on 414 Indian retail banking customers using structured questionnaire. Data sample of 414 was split into two equal sub-samples. Sample 1 is used for EFA to identify dimensions and sample 2 is used for CFA to confirm factor structure with the help of SPSS 16.0 and AMOS 20.0 software respectively. Analysis revealed and confirmed four dimensions of TBSSB service quality, named as Convenience, Reliability and Security, Responsiveness, Personalisation and one dimension of Customer loyalty. Four hypotheses are tested to investigate the relationship between TBSSB service quality and Customer Loyalty using structural equation modelling (SEM) with the help of AMOS 20.0 software. Result of hypotheses testing shows that Personalisation dimension has a positive significant relationship with customer loyalty. But, the relation of Convenience, Responsiveness, and Reliability & Security dimensions with customer loyalty is not significant. So, it can be concluded that the overall TBSSB service quality has a weak influence on customer loyalty.

A bank may enhance customer loyalty by either further improving various attributes covered under Convenience, Reliability & Security, and Responsiveness dimensions or come up with more new attributes which competing banks are not presently offering and which are difficult to replicate. So it has become essential for banks to upgrade themselves with new technology related attributes for better quality of service, which will lead to increased customer loyalty. The findings of the study may act as input for banks, so that they may focus on those aspects of technology based self service banking which may enhance customer loyalty, ultimately resulting higher profitability.

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