DEVELOPMENT OF AN INSTRUMENT TO MEASURE INTERNET BANKING SERVICE QUALITY IN INDIA

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ABSTRACT

This paper attempts to develop a reliable and valid instrument of measuring Internet banking service quality in India, and also analyses the impact of Internet banking service quality dimensions on the Overall Internet Banking Service Quality and customer satisfaction. Given the exploratory nature of this research, extant literature survey, focus group discussion and expert interviews were used to develop a battery of Internet banking service quality items. A sample of 1350 Internet banking customers of private sector, public sector and foreign banks was surveyed in the Delhi Metropolitan Area. Results of exploratory factor analysis (EFA) revealed five dimensions— Security/Privacy, Reliability, Efficiency, Responsiveness, and Site Aesthetics. This five dimensional model arrived through EFA was validated through a confirmatory factor analysis (CFA). The proposed research model shows acceptable fit indices. Impact of these dimensions on the Overall Internet Banking Service Quality and customer satisfaction are analysed using multiple regression technique. Findings indicate that all dimensions carry significant impact on the Overall Internet Banking Service Quality perceptions and customer satisfaction. However, Security/Privacy and Efficiency dimensions carry the maximum impact on the Overall Internet Banking Service Quality and satisfaction respectively.

Keywords: Internet Banking, Service Quality, Banking, India, Online Service Quality.

INTRODUCTION:

Internet is emerging as a powerful channel for banks to receive instructions and deliver products and services to their customers. This form of banking is known as Internet banking (Reserve Bank of India, 2001). There are two ways in which banks offer Internet banking – one is that existing physical bank provides services through its website and offers Internet banking as an addition to its traditional delivery channels. The second one is the Virtual or Internet-only bank. As there is no Internet-only bank in India till date, therefore, this research study focuses on existing physical banks offering Internet banking services.

The incredible growth of Internet is changing the way corporations conduct business with consumers (Siu and Mou, 2005). It has not only created opportunities for businesses to reach out to consumers directly but also allows consumers an immediate access to the electronic markets. The impact of Internet on the economic growth and business performance has been the subject of many studies in the past (Venkatraman, 2000). However, most of the online service providers find it difficult to manage service quality in electronic markets because of lack of exposure to this new medium of business operations and their limited knowledge of online consumer behaviour (Mols, 2000). The banking industry is no exception. Today, all the private, public sector and foreign banks in India are offering their services over Internet.

Internet banking is both convenient and time saving in comparison to traditional retail banking experience (Siu and Mou, 2005). Customers' expectations and perceptions of Internet services have been constantly changing; therefore, service quality in electronic markets is becoming an important issue.

Information technology has transformed the functioning of businesses, the world over. It has bridged the gaps in terms of the reach and coverage of systems and has also enabled better decision-making based on latest and accurate information, reduced costs and overall improved efficiency. In the Indian context, the financial sector in general and banking in specific has been a major beneficiary from the inroads made by information technology. A paradigm shift in banking operations has been brought in by the tremendous advances in technology and the aggressive infusion of information technology in recent years. Information technology has emerged as a strategic resource for achieving higher efficiency, control of operations, productivity and profitability in banking operations. Therefore, banks in India are increasingly embracing information technology to meet the increasing customer expectations and face the galloping competition.

The financial sector has developed rapidly in terms of size, industry structure and the variety of consumer and business-to-business products and services particularly over the last decade and a half in India. The Indian financial sector has been transformed from one based on traditional bank activities to a more open, effective and competitive system which is able to offer a wide range of products and services. Reforms in the banking sector coupled with technological developments are the main forces influencing the Indian banking sector's development. These developments motivated banks to be aware of future trends in order to survive and compete effectively. Technology has played an extraordinary role on the growth of service delivery options and a deep effect on service marketing (Bitner et al., 2000). Banks are increasing their technology based service options so as to develop sustainable competitive advantage and this increase in technology adoption has resulted in: reduced costs, the creation of value added services for customer, the facilitation of their employees' jobs and ultimately, the provision of self-service options for customers.

According to Mouawad & Kleiner (1996), providing excellent customer service plays a vital role in an organisation's success and failure in the present day profusely competitive business scenario. Customer perceptions and preferences of service quality carry a substantial impact on a bank's success. Banks in India are increasingly using technology to deliver their regular services to the customer. Examination of quality issues of banks' Internet banking services are necessary owing to their potential influence on: attractiveness, customer retention, positive word-of-mouth, and maximizing competitive advantages (Santos, 2003).

Therefore, this research attempts to gain insights into the dimensions of service quality in Internet banking, customers' performance perceptions of service quality attributes and dimensions, and explores the relationship and impact of these service quality dimensions on the Overall Internet Banking Service Quality and customer satisfaction. The output of the proposed study will certainly be of help for practitioners to manage and market Internet banking services effectively.

The rest of the paper is organized as follows: Section 2 presents the literature survey on service quality, service quality in Internet banking, and relationship of service quality and customer satisfaction. Research objectives are presented in Section 3. Survey location, target respondents, survey instrument and sampling are discussed in Section 4 on research methodology. Empirical results of exploratory and confirmatory factor analyses, and multiple regression analysis along with sample profile are presented in section 5. This is followed by a discussion on the outcomes of the study in Section 6. Finally, managerial implications and future directions are presented in Section 7.

LITERATURE SURVEY:

SERVICE QUALITY:

The global trend toward the service quality was first started in the 1880s when businesses began realizing that quality of product was no more sufficient to sustain a competitive advantage (Van der Wal et al., 2002). Service quality is significantly related to profitability (Buzzell and Gale, 1987; Rust and Zahorik, 1993), customer satisfaction (Bolton and Drew, 1991; Boulding et al., 1993), customer retention, (Reichheld and Sasser, 1990), and competitive capabilities (Oliveir et al., 2002). With the increasing importance of services and growing competition both consumers and managers should pay special attentions to the service quality (Tai, 1994).

Customer perceived service quality has been theoretically represented as consisting of two dimensions. Parasuraman et al. (1985; 1988) distinguish a process and an outcome dimension, whereas Gronroos (1984) makes a distinction between functional and technical quality. According to Gronroos (1984), the process or functional quality refers to "how" the service is delivered, while the outcome or technical quality refers to "what" customers receive, the benefits of using the service. This study focuses on 'how banks in India are delivering services over Internet' i.e. the 'process' or 'functional' quality of Internet banking services and not on the 'technical' or 'outcome quality'. Henceforth, throughout this paper, 'service quality' shall be used to refer to the 'functional' or 'process' quality.

Parasuraman et al. (1985) identified ten determinants of service process quality that were further distilled them into five dimensions: tangibles, reliability, responsiveness, assurance, and empathy, and as a result SERVQUAL model came into being (Parasuraman et al., 1988). It has been tested and validated across various service industries and countries: the health sector (Carman, 1990; Headley and Miller, 1993; Lam, 1997; Kilbourne et al., 2004); fast food (Lee and Ulgado, 1997); telecommunications (Van der Wal et al., 2002); retail chain (Parasuraman et al., 1994); banking (Lam, 2002; Zhu et al., 2002); information systems (Jiang et al., 2000); and library services (Cook and Thompson, 2001).

Parasuraman et al. (1988; 1991) defined service quality as "the difference between customer expectations of service to be received and perceptions of the service actually received". This approach to measuring service quality is popularly referred as "disconfirmation paradigm". Several studies in the past reported poor "fit" for the disconfirmation model in certain settings. This led into criticism of the SERVQUAL scale (Parasuraman et al., 1988), by an increasing number of researchers on several grounds, such as, the use of gap scores, the measurement of expectations, positively and negatively worded items, the generalizability of its dimensions, and the defining of a baseline standard for good quality (Cronin and Taylor, 1992; Brown et al., 1993).

In order to overcome the shortcomings of SERVQUAL, Cronin and Taylor (1992) developed SERVPERF scale for measuring service quality and claimed it to be efficient in comparison with the SERVQUAL scale. The major difference between these two scales is that SERVQUAL operationalises service quality by comparing the perceptions of the service received with expectations, while SERVPERF maintains only the perceptions of service quality. Several researchers in the past have used performance-only scores and reported it superior to disconfirmation approach to measure service quality (for example, Dabholkar et al., 1996; Ekinci and Riley, 1998; Frochot and Hughes, 2000; Janda et al., 2002; Getty and Getty, 2003; Caro and Garcia, 2007; Wilkins et al., 2007). Therefore, this study employs only performance scores to measure Internet banking service quality.

SERVICE QUALITY IN INTERNET BANKING:

Jun and Cai (2001) defined Internet banking as the use of Internet as a delivery channel for banking services which include opening a deposit account, transferring funds, electronic bill presentment and payment. They identified seventeen dimensions service quality in Internet banking grouped in three categories customer service quality, online systems quality, and banking service product quality. Joseph et al. (1999) uncovered six dimensions of internet banking service quality: convenience and accuracy, feedback and complaint management, efficiency, queue management, accessibility and customization. Broderick and Vachirapornpuk (2002) observed the member usage patterns, as a participant, in an Internet banking community. They identified 3 elements carrying the most immediate impact on service evaluation: cues in the service setting, key events in the service encounters, and the level and nature of customer participation.

Siu and Mou (2005) examined the customers' service quality perceptions in Internet banking in Hong Kong and identified four key dimensions - credibility, efficiency, problem handling and security. Jayawardhena (2004) developed a battery of 21 items to assess service quality in e-banking by transforming the original SERVQUAL scale. Their study revealed five quality dimensions: access, web site interface, trust, attention and credibility. Loonam and O'Loughlin (2008) explored customer perceptions of internet banking and e-service quality from a user-based perspective within an Irish context by assessing the uses and gratifications sought by online users, and investigated their impact on effective web design and the E-SQ dimensions deemed focal to premium usage.

Literature regarding Internet banking service quality per se is scare in the Indian context. Unnithan and Swatman (2001) studied the key change drivers in the evolution of the banking sector, and the shift towards Internet banking in Australia and India. They reported that India, in comparison to Australia, can be characterized as having weak infrastructure, low PC penetration, developing security protocols and consumer reluctance in rural sector. In a theoretical study, Rao and Prathima (2003) found that as compared to the banks abroad, Indian banks offering online services still have a long way to go. Although several researchers have found that Internet banking is fast gaining popularity in India (Gupta, 1999; Pegu, 2000), there has to be sufficient number of users and infrastructure in place to reach a critical mass. Malhotra and Singh (2006) found that only 48% of the commercial banks operating in India as on March-end 2005 offer Internet banking.

Khan et al. (2009) conducted a research study (the only empirical study on service quality dimensions in internet banking in Indian context till date) to evaluate the service quality of Internet banking services in India from customer's perspective. They developed a battery of 26 items which were condensed to seven quality dimensions: reliability, accessibility, user friendliness, privacy/security, efficiency, responsiveness and fulfillment. The impact of these seven dimensions on the Overall Internet Banking Service Quality was empirically tested, and all the dimensions except user friendliness and fulfillment were found statistically significant.

Based on the extant literature review presented above, we propose the following hypothesis:

H1: Internet Banking Service quality dimensions have a positive effect on the Overall Internet Banking Service Quality.

SERVICE QUALITY AND CUSTOMER SATISFACTION:

According to Kotler (2000), satisfaction is a person's feelings of pleasure or disappointment resulting from comparing a product's perceived performance (or outcome) in relation to his or her expectations. Researches in the past suggest that service quality and satisfaction are distinct constructs (Bitner, 1990; Bolton and Drew, 1991; Parasuraman et al., 1988). The difference is that perceived service quality is a form of attitude, a long-run overall evaluation, whereas satisfaction is a transaction-specific measure. According to Cronin and Taylor (1992), the distinction between consumer satisfaction and service quality is important to practitioners and researchers alike because service providers need to know whether their objective should be to have consumers who are "satisfied" with their performance or to deliver the maximum level of "perceived service quality".

Parasuraman et al. (1988) proposed that higher levels of perceived service quality result in increased customer satisfaction. Hurley and Estelami (1998) reported that while service quality and satisfaction are distinct constructs, a causal relationship exists between the two, and that perceptions of service quality affect feelings of satisfaction which, in turn, influence future purchase behaviour. Lassar et al. (2000) investigated the impact service quality on customer satisfaction in private banking by using the SERVQUAL and the technical/functional models. They reported that customer satisfaction is a multidimensional construct, and its dimensions will be differentially impacted by the service quality dimensions.

Customer satisfaction in the online environment is referred as "e-satisfaction". Yang et al. (2001) proposed that the potential benefits of Internet can be realized through high standards of e-service quality. Several studies in the past have paid much attention to the close relationship between service quality and customer satisfaction (for example, Bitner et al., 1990; Parasuraman et al., 1988). Grönroos (1984), Parsuraman et al. (1985), Johnston (1995), and others have investigated the key determinants of service quality and whether it consequently results in satisfaction or not. Al-Hawari and Ward (2006) demonstrated that service quality caries a significant impact on customer satisfaction which in turn affects the financial performance of banks. Dina et al. (2004) found that majority of previous studies view the dimensions of e-service quality as antecedents of e-satisfaction.

Therefore, following hypotheses are proposed:

H2: Internet banking service quality dimensions have a positive effect on customer satisfaction

H3: Overall Internet Banking Service Quality has a positive effect on customer satisfaction

RESEARCH OBJECTIVES:

The aim of this study is:

- To explore the dimensions of service quality in Internet banking
- To analyse the impact of Internet banking service quality dimensions on the Overall Internet Banking Service Quality
- To examine the impact of Internet banking service quality dimensions on customer satisfaction
- To analyse the impact of Overall Internet Banking Service Quality on customer satisfaction

RESEARCH METHODOLOGY:

SURVEY LOCATION:

'Survey' method was employed to collect the data with the help of a structured questionnaire. According to a survey conducted by IMRB and IAMAI in March 2011, Delhi is the second largest Internet using city in the country with 5 million active Internet users after Mumbai at 6.2 million users. In another study conducted by IAMAI (2006) on 'Online Banking', second largest Internet banking user base are reported from Delhi. Both of these nationwide researches support well the choice of the NCT of Delhi with sufficiently large (second largest) population of Internet users as well as those who are using Internet banking services in India. Therefore, the National Capital of Delhi has been chosen to conduct the survey of Internet banking customers in this study.

TARGET RESPONDENT

While targeting the customers, following variables are considered as characteristics of the respondents.

i. Retail Banking customers
ii. Above 18 years of age (both males and females)
iii. Hands on experience in internet banking,
iv. Have used Internet banking service at least once during the previous three months
v. Residents of the NCT of Delhi.

SURVEY INSTRUMENT:

A non-disguised and structured questionnaire was used to gather data from the target respondents. Before the survey administration, the pre-test questionnaire was pilot tested on a sample of 10 respondents in the real survey settings i.e. at select banks' branches in the NCT of Delhi. During pre-testing, items that appeared to be problematic and ambiguous were reworded and refined. 26, 15 and 19 Internet banking service quality items were borrowed from three previous research studies undertaken in the USA (Jayawardhena, 2004), Hong Kong (Siu and Mou, 2005) and Saudi Arabia (Sohail and Saikh, 2008) respectively. This resulted into an initial pool of 60 Internet banking service quality items. With the help of focus group discussions, these 60 items led to the development of a final battery of 22 items. Each respondent was asked to rate these 22 items indicating his/her evaluation of Internet banking experience on a five-point Likert scale (from 1= strongly disagree to 5= strongly agree). Two more items, one each for measuring Overall Internet Banking Service Quality and customer satisfaction (rated on 5-point Likert scale), and five questions regarding the respondent's gender, age, education, household income and occupation were also included.

SAMPLING AND SAMPLE SIZE:

Mixed sampling design was employed to select a large sample of Internet banking customers in the NCT of Delhi. Stratified sampling procedure was used to select the sample of banks, followed by area sampling to select the sampling area and bank branches for the survey. Scheduled Commercial Banks, operating in India, were divided into three strata (or categories)—Private banks, Public Sector banks and Foreign banks. A sample of 3 banks from each one of the Private and Public sector banks strata was drawn using lottery method of simple random sampling procedure. Next, lottery method for simple random sampling was applied to select three sample areas from each zone (East, West, North, South and Central zones). Further, one branch of each sample bank in each sample area has been selected using lottery method of simple random technique.

Sampling frame of banks' customers who have transactional exposure of Internet banking was neither available nor the banks were ready to provide the contact details of their Internet banking customers because of security and privacy reasons. Thus, all the customers visiting a sample bank branch (on the days of survey) were requested to participate in the survey. To maintain uniformity in the geographic coverage as well as bank representations, it has also been decided to distribute the respondents into uniform numbers across zones, bank categories and banks. 1350 usable questionnaires were obtained for the final analysis (270 questionnaires from each zone and 450 questionnaires each from Private, Public sector and Foreign banks). Resulting sample distribution is shown below in table 1.

TABLE 1: SAMPLE DISTRIBUTION—ZONE AND BANK WISE

Zone	Private Banks			Public Sector Banks			Foreign Banks			Total
	HDFC	ICICI	Axis	SBI	PNB	IDBI	Citibank	HSBC	Standard Chartered	
South	30	30	30	30	30	30	30	30	30	**270**
North	30	30	30	30	30	30	30	30	30	**270**
East	30	30	30	30	30	30	30	30	30	**270**
West	30	30	30	30	30	30	30	30	30	**270**
Central	30	30	30	30	30	30	30	30	30	**270**
Total	**150**	**150**	**150**	**150**	**150**	**150**	**150**	**150**	**150**	**1350**

EMPIRICAL RESULTS

SAMPLE PROFILE:

Table 2 exhibits the demographic profile of the sample. Out of 1350 respondents, approximately 73% of the respondents are males and 27% are females. Majority of the respondents (43.3%) are in the age group of 26-35 years, followed by 23.3% and 20% Internet banking customers in the age groups of 18-25 years and 36-45 years respectively. This indicates that youth and middle aged users, being technology savvy, are the main drivers of growth of Internet banking services. Whereas, those falling in higher age groups still prefer conventional branch banking as the lowest number of respondents (3.3%) fall in the age group of 61+ years, followed by the age group of 46-60 years with second lowest 10 % respondents.

TABLE 2: DEMOGRAPHIC PROFILE OF THE SAMPLE

S. No.	Variable	Categories	Response
1	**Gender**	Female	27.1%
		Male	72.9%
2	**Age Group**	18-25 years	23.3%
		26-35 years	43.3%
		36-45 years	20.0%
		46-60 years	10.0%
		61+ years	3.3%
3	**Occupation**	Service	48.0%
		Business	27.0%
		Self employed professional	12.7%
		Student	7.3%
		Housewife	4.0%
		Other	1.0%
4	**Educational**	Upto 12th standard	10.7%
		Some college (including Diploma) /	52.0%
		Post Graduate and above	37.3%
5	**Income Group**	Rs. 90,000-2,00,000	9.3%
		Rs. 2,00,001-5,00,000	46.6%
		Rs. 5,00,001-10,00,000	29.7%
		Rs. 10,00,000+	14.4%
6	**Location**	North Delhi	20.0%
		South Delhi	20.0%
		Central Delhi	20.0%
		East Delhi	20.0%
		West Delhi	20.0%
7	**Bank Category**	Private Banks	33.3%
		Public Sector Banks	33.3%
		Foreign Banks	33.3%

Base1350

Maximum respondents (48%) are engaged in service occupation, followed by business persons and self employed professionals at 27% and 12.7% respectively. Although the number of housewives who are using Internet banking services (4%) only stands next to Other' category (1%), given their number in the national demography, it presents a huge opportunity to be seriously explored for the banking strategists. It is clear that education plays an important role in the adoption of technology based services like Internet banking, as majority of the customers surveyed, fall in 'Some college' (52%) and 'Post graduate and above' (37.3%) categories. On the basis of Income Group, maximum of the respondents (46%) fall in the '2-5 lacs' category, followed by '5-10 lacs' category at 29.7%.

EXPLORATORY FACTOR ANALYSIS:

Exploratory Factor Analysis (EFA) is conducted using SPSS 17.0 version on the performance perceptions data collected from 1350 respondents on 22 Internet banking service quality variables using 5 point Likert scale.
The Bartlett test of sphericity is a statistical test for the presence of correlations among the variables and it assesses the overall significance of the correlation matrix. In this study, the correlations, when taken overall, are significant at the .01 level (see Table 3). Another measure to quantify the degree of intercorrelations among the variables and the appropriateness of factor analysis is the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (MSA). This index ranges from 0 to 1 and the values above 0.50 are acceptable (Hair et al., 2005). Results indicate that the set of 22 variables collectively meets the necessary threshold of sampling adequacy meritoriously with an MSA value of 0.853. These all measures indicate that the variable set is appropriate for factor analysis.

TABLE 3: KMO AND BARTLETT'S TEST

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.853
Bartlett's Test of Sphericity	Approx. Chi-Square	27801.470
	df	231
	Sig.	.000

Cronbach's alphas for the scale items are calculated to ensure that they exhibit satisfactory levels of internal consistency. Table 4 shows the calculated values of Cronbach's alpha for all the 22 items together as well as for each one of the service quality dimensions extracted in the EFA. All of them are above the cut-off point (0.7) recommended by Nunnally and Bernstein (1994).

TABLE 4: RELIABILITY ANALYSIS

Factor	Cronbach's Alpha
Security/Privacy	.951
Reliability	.920
Efficiency	.948
Responsiveness	.939
Site Aesthetics	.852
Overall Cronbach's Alpha = .868	

In order to ensure the content validity of the scale, initial pool of items is generated from previous validated scales which are further purified with the help of focus group discussions of Internet banking customers having hands-on experience and expert panel of academicians. Convergent validity of the instrument is examined using the correlation between Overall Internet Banking Service Quality item and the sum of performance scores across all items. The Pearson correlation coefficient of 0.857 ($p<.01$) supports the convergent validity of the measuring instrument. Discriminant validity of the measures is assessed on the basis of constructs correlations. Table 5 indicates that none of the constructs correlations exceed the criterion of (0.9 and above) recommended by Hair et al. (2005). Therefore, empirical support exists for the discriminant validity of the measures.

TABLE 5: CONSTRUCTS CORRELATIONS

	1	2	3	4	5
Security/Privacy	1				
Reliability	.222**	1			
Efficiency	.118**	.024	1		
Responsiveness	.116*	.103**	.160**	1	
Site Aesthetics	.067*	.043	.229**	.372**	1

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

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

Principal components analysis is used to capture most of the scale items into minimum number of factors possible. Varimax orthogonal rotation procedure is used to obtain a simplified factor structure and increase generalisability of the research findings (Hair et al., 2005). Widely used latent root criterion is employed to decide the number of factors to be retained for further analysis. Therefore, only the factors having eigenvalues greater than 1 are considered significant. As a result, five factors (F1, F2, F3, F4 and F5) are retained with eigen values ranging between 5.43 to 2.29 (see table 6). The five factors retained represent 80.8% of the variance of the 22 variables.

TABLE 6: RESULTS FOR THE EXTRACTION OF COMPONENT FACTORS

Factor	Eigen Value	% of Variance	Cumulative % of Variance
F1	5.432	24.690	24.690
F2	3.812	17.329	42.019
F3	3.493	15.877	57.896
F4	2.745	12.478	70.375
F5	2.293	10.421	80.796

Further, factor loadings of the 22 variables (X1 to X22) on the retained five factors are exhibited in table 7. Only those items with a factor loading of ±0.50 or higher (ignoring signs) are considered significant (Hair et al., 2005). The factor loadings of all variables are above 0.80 which indicates their high correlation with the respective factors.

TABLE 7: FACTOR LOADINGS (ROTATED FACTOR MATRIX)

Scale Item		Factor				
		F1 (Security/ Privacy)	F2 (Reliability)	F3 (Efficiency)	F4 (Responsiveness)	F5 (Site Aesthetics)
P1	I feel secure in providing sensitive information (e.g. credit card details) for online transactions	.855				
P2	Web site of Bank X is equipped with adequate security features	.862				
P3	Bank X does not share my personal information with others	.866				
P4	Bank X secures information regarding my internet banking activities	.879				
P5	Bank X is honest concerning its online transaction services	.897				
P6	Web site of Bank X makes appropriate statements concerning the completion of transactions	.874				
P7	Bank X does not misuse my personal information	.882				
P8	Bank X keeps accurate records of my account transactions		.839			
P9	Bank X delivers the service		.874			

	exactly as promised					
P10	Bank X always provides the service at the promised time		.883			
P11	The Web site pages do not freeze once I enter my transaction information		.867			
P12	If there is a mistake, Bank X can make it right quickly and effectively		.860			
P13	Navigating within Bank X's Web site is very easy			.956		
P14	Web site of Bank X loads its pages fast			.883		
P15	It is quick and easy to complete a transaction on the Web site of Bank X			.899		
P16	Finding what I need is simple and easy on the Web site of Bank X			.953		
P17	Bank X is prompt in responding to my queries/requests by e-mail or other means				.949	
P18	Web site of Bank X contains answers to frequently asked questions				.873	
P19	In case of problems I can speak with a person (through telephone or in person at a branch) at Bank X				.950	
P20	Web site of Bank X contains relevant information explained in an easy to understand language					.801
P21	Web site of Bank X is visually attractive					.875
P22	Web site of Bank X is updated regularly					.879

Extraction Method: Principal Component Analysis;
Rotation Method: Varimax with Kaiser Normalization;
Rotation converged in 5 iterations.

After arriving at the satisfactory factor solution, next is to name each of the factors. Factor F1 is made of seven variables X1 to X7 which relate to the customers concern regarding the security and privacy issues they encounter or experience while banking online. Therefore, factor F1 is named as 'Security/Privacy'. Similarly factor F2 is related to the dependability and accuracy of the bank in online transactions. It includes variables five variables X8 to X12 and is suitable labeled as 'Reliability'. Variables X13, X14, X15 and X16 deal with the easy of navigation, loading of web page, completion of transaction and ease of search respectively. These variables relate to the efficiency aspect of performing online banking transactions and are grouped in factor F3 which is named as 'Efficiency'. Factor F4 includes variables X17, X18 and X19 which relate to the banks response to customer queries/requests, frequently asked questions and personalized assistance respectively. Therefore, F4 is meaningfully labeled as 'Responsiveness'. The last factor F5 deals with the web site content (X20), visual appeal (X21) and regular updation (X22) and is suitably named as 'Site Aesthetics'.
Therefore, 22 Internet banking service quality items resulted into five factors: Security/Privacy, Reliability, Efficiency, Responsiveness and Site Aesthetics.

CONFIRMATORY FACTOR ANALYSIS:

The five-dimension model of Internet banking service quality resulted in the EFA is further validated through Confirmatory Factor Analysis (CFA) using AMOS 16.0. The assessment of model fit is done by using the criteria recommended by Schumacker & Lomax (2004), Hu and Bentler (1999), and Hair et al. (1995). The fit criteria against each index and the 5-dimensional model estimated values are depicted in the table 8.

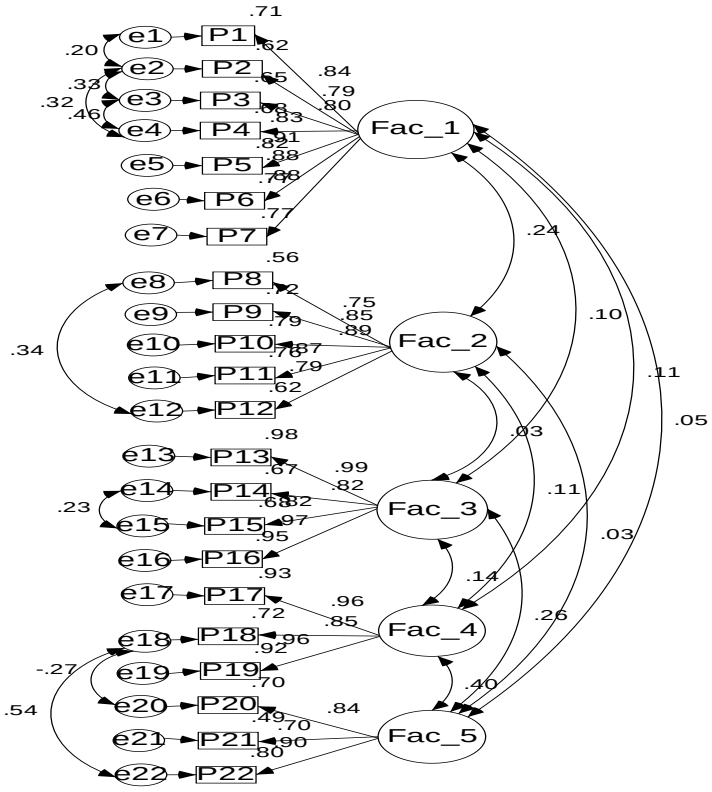
TABLE 8: GOODNESS OF FIT INDICES

Goodness of fit indices	Fit Criteria*	5-Dimension Model
χ^2/df (Normed Chi-square)	≤5	4.166
GFI (Goodness-of-fit index)	≥.90	.948
AGFI (Adjusted goodness-of-fit index)	≥.90	.932
CFI (Comparative fit index)	≥.90	.978
NFI (Normed fit index)	≥.95	.972
TLI (Tucker-Lewis index)	≥.95	.974
RMSEA (Root mean square error of approximation)	≤.06	.048

** Criteria recommended by Schumacker & Lomax (2004), Hu and Bentler (1999), and Hair et al. (1995)*

A model is said to be fulfilling the criteria of goodness of fit, if it satisfies certain values. For example, the value of normal chi-square should be less than or equal to 5. Based on these values, estimated value for the model is 4.166 (refer table 4.12) which satisfies the required condition. Similarly, the required value of root mean square error of approximation (RMSEA) should be less than 0.06. Against this value, the estimated model value is 0.048 which highly validates the result. Similarly, rest all model fit indices (GFI, AGFI, CFI, NFI and TLI) for the 5-factor model indicates that the model fits well in representing the dataset of 22 Internet banking service quality items. Regression weights between items and factors variables are shown in path diagram (see figure 1).

FIGURE 1: PATH DIAGRAM



IMPACT OF SERVICE QUALITY DIMENSIONS:

The impacts of five service quality dimensions on the Overall Internet Banking Service Quality and customer satisfaction, and that of Overall Internet Banking Service Quality on the customer satisfaction were examined with the help of multiple regression technique.

SERVICE QUALITY DIMENSIONS ON OVERALL INTERNET BANKING SERVICE QUALITY:

Multiple regression technique is employed to test the following set of hypotheses:
H1a: Security/Privacy has a positive effect on the Overall Internet Banking Service Quality

H1b: Reliability has a positive effect on the Overall Internet Banking Service Quality
H1c: Efficiency has a positive effect on the Overall Internet Banking Service Quality
H1d: Responsiveness has a positive effect on the Overall Internet Banking Service Quality
H1e: Site Aesthetics has a positive effect on the Overall Internet Banking Service Quality
Results presented in Table 9 indicate that all the five service quality dimensions carry significant impact on the Overall Internet Banking Service Quality and thus support hypotheses H1a, H1b, H1c, H1d, and H1e. Five dimensions together explain 70.9% variance in the Overall Internet Banking Service Quality. All the Variance Inflation Factor (VIF) values indicate the absence of multi-collinearity. Security/Privacy has the greatest impact (ß=.452, p<.01) on the Overall Internet Banking Service Quality, followed by Reliability (ß=.404, p<.01) and Efficiency (ß=.378, p<.01) dimensions.

TABLE 9 REGRESSION RESULTS: SERVICE QUALITY DIMENSIONS ON OVERALL INTERNET BANKING SERVICE QUALITY

Dimension	Standardized Beta (ß)	t-value	Sig.	VIF
Security/Privacy	.452	30.755	.000	1.000
Reliability	.404	27.519	.000	1.000
Efficiency	.378	25.773	.000	1.000
Responsiveness	.339	23.125	.000	1.000
Site Aesthetics	.291	19.844	.000	1.000

Dependent Variable: Overall Internet Banking Service Quality
F=659.197 (sig. at p<.01), adj. R^2=.709

SERVICE QUALITY DIMENSIONS ON CUSTOMER SATISFACTION:

Multiple regression technique is employed to test the following set of hypotheses:
H2a: Security/Privacy has a positive effect on the customer satisfaction
H2b: Reliability has a positive effect on the customer satisfaction
H2c: Efficiency has a positive effect on the customer satisfaction
H2d: Responsiveness has a positive effect on the customer satisfaction
H2e: Site Aesthetics has a positive effect on the customer satisfaction
Regression analysis of service quality dimensions on customer satisfaction reveals that all of them carry a significant impact (refer Table 10). Therefore, results support hypothesis H2a, H2b, H2c, H2d, and H2e. As all the VIF values are equal to 1, no multi-collinearity has been observed. Efficiency (ß=.425, p<.01), Security/Privacy (ß=.245, p<.01), and Responsiveness (ß=.216, p<.01) are more important in comparison to other dimensions in influencing Customer Satisfaction. All the five dimensions together explain 40.2% variance in customer satisfaction.

TABLE 10 REGRESSION RESULTS: SERVICE QUALITY DIMENSIONS ON CUSTOMER SATISFACTION

Dimension	Standardized Beta (ß)	t-value	Sig.	VIF
Security/Privacy	.245	11.639	.000	1.000
Reliability	.201	9.567	.000	1.000
Efficiency	.425	20.177	.000	1.000
Responsiveness	.216	10.268	.000	1.000
Site Aesthetics	.277	13.145	.000	1.000

Dependent Variable: Customer Satisfaction
F=182.465 (sig. at p<.01), adj. R^2=.402

OVERALL INTERNET BANKING SERVICE QUALITY ON CUSTOMER SATISFACTION:

Multiple regression technique is employed to test the following hypothesis:
H3: Overall Internet Banking Service Quality has a positive effect on customer satisfaction
Overall Internet Banking Service Quality was regressed on customer satisfaction (refer Table 11). Results reveal that Overall Internet Banking Service Quality carries a significant impact (ß=.595, p<.01) on overall satisfaction and accounts for 35.3% variance. Thus, results support hypothesis H3.

TABLE 11 REGRESSION RESULTS: OVERALL INTERNET BANKING SERVICE QUALITY ON CUSTOMER SATISFACTION

Dimension	Standardized Beta (ß)	t-value	Sig.
Overall Internet Banking Service Quality	.595	27.153	.000

Dependent Variable: Customer Satisfaction
F=737.294 (sig. at p<.01), adj. R^2=.353

DISCUSSION:

One of the main objectives of this study is to develop a scale to measure Internet banking service quality. With the help of exploratory and confirmatory factor analyses 22 items captured in five dimensions are uncovered in this study. Internet banking service quality scale constitutes five dimensions: Security/Privacy, Reliability, Efficiency, Responsiveness and Site Aesthetics. 'Security/Privacy' deals with the internet users' concerns about—how secure they feel in online transactions and how their privacy has been taken care of by their respective banks. 'Reliability' relates to 'how dependably and accurately banks are providing online services'. 'Efficiency' is about 'how quickly and easily customers can perform online banking transactions. 'Responsiveness' refers to 'how banks respond to customers' complaints and queries'. 'Site Aesthetics' is about the visual appeal, web site content and its updation. When compared with previous studies (conducted in the domain of e-services in-general and particularly in Internet banking) conducted so far in other parts of the world, it is found that the five dimensions uncovered in this study appear most frequently on the scales developed to measure e-service quality.
Khan et al. (2009) uncovered seven dimensions to measure quality of Internet banking services in India. They did not confirm their 7-factor model using confirmatory factor analysis. Moreover, the selection and refinement of scale items are not done using prescribed procedures of qualitative research. Therefore, their research stands very weak on the scientific procedures used for scale development. However, four out of five dimensions—Security/Privacy, Reliability, Efficiency and Responsiveness identified in this study are same as reported by Khan et al (2009). In addition to these four dimensions, Khan et al. reported three more dimensions—accessibility, user friendliness, and fulfillment.
Three items—'the web pages do not freeze after you have put in all your information', 'the bank's site performs the service right at the first time', and 'the bank's site provide information about the transactions and products' included in Accessibility, User-Friendliness and Fulfillment in Khan et al. (2009). Whereas, all these three items relate better to the dependability and accuracy in Internet banking services and thus better mapped in this study on reliability dimension. Two items—'the bank is easy to approach and contact' and 'the bank authority care to listen to your queries and meet your personal needs' relate to the prompt response to customer queries/complaints and easy of personal contact are better condensed on Responsiveness dimension in this study. Similarly, 'quick online confirmations' and 'regular updation of bank's website' are more justifiably included in the Efficiency and Site Aesthetics dimensions respectively. Therefore, a comparative analysis of items captured in aforementioned three additional dimensions by Khan et al. and their inclusion in the present study reveals that the items on a particular dimension are more justifiably included in the present study, thus makes it a more meaningful scale to measure customer perceived Internet banking service quality.

MANAGERIAL IMPLICATIONS AND FUTURE DIRECTIONS:

Internet banking service quality constitutes five dimensions and 22 service quality attributes. Banking practitioners will remain well advised on the constructs of service quality in Internet banking. Moreover, they can very well use this five dimension Internet banking service quality model to measure the service quality and therefore can effectively manage their resources. Although this model is valid and reliable, practitioners are cautioned to first test its applicability in other parts of the country because of socio-economic and cultural diversities. All the dimensions carry significant impact on Overall Internet Banking Service Quality and

customer satisfaction. However, practitioners should also pay special attention to Security/Privacy dimension as being the most important determinant in the Overall Internet Banking Service Quality. They should also device more efficient ways to deliver Internet banking services as customer satisfaction is most impacted by the Efficiency dimension as compared to rest of the dimensions.

A more rigorous research methodology, such as a structural equation modeling technique should be employed to examine the causal relationships, rather than simple associations, between online service quality dimensions, consumers' perceived Overall Internet Banking Service Quality, and their satisfaction by employing. Bankers' perspectives regarding Internet banking service quality should also be addressed in future researches to better understand the problem domain. Impact of service quality and customer satisfaction on customer loyalty can also be examined using structural equation modeling.

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