

EXPLORATION OF INTERNET BANKING WEBSITE QUALITY IN INDIA: A WEBQUAL APPROACH

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Abstract. While success or failure of any e-vendor depends on many factors, its website plays a very important role. The evaluation of website quality in an e-Service setting is not solely a function of how well a particular site measures up to the ideal of “Websiteness” (ease of use and usefulness) but it also gives an insight into how the organization that hosts the site is perceived (company image) among its customers. Using WEBQUAL scale this study has made an attempt to assess internet banking website quality in India from customers’ perspective. An exploratory factor analysis, followed by a confirmatory factor analysis has been applied on data collected from 593 respondents in India using an online questionnaire. Findings demonstrate that there are some variations in WEBQUAL dimensions in the context of internet banking services in India.

Keyword: Website quality, Internet Banking, WEBQUAL, Structural Equation Modeling.

INTRODUCTION

While interacting with an e-service website, there could be numerous factors which may determine our intention to revisit the website. Website quality is one such influencing factor (Cyr, 2008; Ganguly, Dash and Cyr, 2009; Venkatesh & Johnson, 2002; Venkatesh & Ramesh, 2006). Website functions as a platform through which users can interact with their e-vendor. Literature in e-commerce suggests that website quality plays a critical role in affecting individual attitude and intention towards the e-vendor (Cyr, 2008; Ganguly, Dash, & Cyr, 2009). In the current era of information technology (IT), users usually experience any company’s or organization’s website quality before they decide about whether to entrust themselves to the e-vendor or not (Liu & Arnett, 2000). Thus, understanding users’/customers’ expectations from e-service websites and what they feel about the websites they use is becoming a very serious concern, especially in the web environment (Alhudaithy & Kitchen, 2009; Venkatesh & Ramesh, 2006). For any company, its continued success comes from two groups: new customers and repeat customers, and it costs more to attract new customers than to retain current customers. So, customer retention is more important than customer attraction. In the context of e-commerce, the key to customer retention can be assessed by his/her intention to revisit the same e-vendor’s website (Barnes & Vidgen, 2001). In recent years, few studies have focused on the measurement and evaluation of website quality, covering both, for general information seeking and for electronic commerce purposes (Cyr, 2008; Ganguly, Dash and Cyr, 2009; McKnight, Chaudhary, & Kacmar, 2002). Through theoretical and empirical investigations, there are several instruments available to evaluate website quality based on user/customer satisfaction. Some most widely used instruments are E-SERVQUAL (Zeithaml, Parasuraman, & Malhotra, 2002), Website Quality Function Deployment (Barnes & Vidgen, 2001), SITEQUAL (Yoo & Donthu, 2001) and WEBQUAL (Loiacono, Watson, & Goodhue, 2007). However, WEBQUAL has been developed and tested across twelve different websites in a developed country (three each for books, CDs, hotels and airlines industry). The objective of this study is to test the applicability of WEBQUAL instrument for assessing quality of internet banking websites (financial services industry) in an emerging economy like India.

This article has been divided into four sections. In the first section, literature based on website quality and its importance in internet banking has been reviewed. Next, second section briefly discusses the different scales for measuring website quality. Third section explains the research methodology adopted to assess the applicability of WEBQUAL scale in the context of internet banking websites in India. The fourth and final section discusses the results and findings of the study.

LITERATURE REVIEW

Internet Banking in India

Internet banking in India emerged in the mid nineties when the newly introduced private sector banks came up with a new business model revolving around a strong information technology (IT) backbone. Today, banking in India is not confined to physical branches where customers have to visit the branch in person to withdraw or deposit cash/cheque, make a request for account statements, and many other bank related activities. Through internet banking, most of the banking services (enquiry, transaction, etc.) can be done online at anytime and from anywhere. ICICI bank, a private-sector bank, was the first bank to offer the internet banking facility to their consumers in 1998. Since then, a large number of both private as well as government banks have opted for offering internet banking services. However, internet banking services are progressively turning into "need to have" rather than "nice to have". In the study by the Internet and Mobile Association of India (IAMAI, December 2005) it was found that many customers were not willing to do financial transactions through banks' internet websites because of reasons such as security concerns (43%), preference for face-to-face transactions (39%), lack of knowledge about transferring online (22%), lack of user friendliness (10%), or lack of the facility in the current bank (2%). A recent study on the internet users conducted by IAMAI (2009) found that only about 12% of the online users were using internet as their banking channel in 2009 as compared to 20% of the same in 2008. These figures show that a significant number of internet users are still reluctant to use internet banking services, and hence there is a need to understand the reasons for not using it.

Website and Internet Banking

In internet banking services, the users interact with the bank website to perform their transactions. It creates a platform where users perform a series of actions to complete their transactions successfully (Alhudaithy & Kitchen, 2009; Venkatesh & Ramesh, 2006). Lassar and Dandapani (2003) in their study of bank websites identified three factors which could affect users' perception about website quality: firstly, social presence is the degree to which a bank website conveys the virtual presence of the bank. Virtual banking websites usually communicate with the users in either of or a combination of the following ways: (a) feedback enquiries; (b) asking for immediate confirmation of data input by users; (c) asking several security related questions; (d) sending e-mail/SMS to users after completion of their transactions (Ganguly, Dash, & Cyr, 2009; Venkatesh & Johnson, 2002). Secondly, communication effectiveness shows the website's suitability to perform the tasks. The key problem of communication effectiveness stems from the expectation gap between the user and the bank. This gap is the result of users' expectations from the website and information available on the website (Mukherjee & Nath, 2003). This gap could also be affected by user's perception of the information, background and text color, navigation style and complexity of the website (Cyr, 2008; Ganguly, Dash, & Cyr, 2009). Thirdly, communication interface which refers to the action required by the users to navigate through the website. If the interface which in this context is the website is poorly structured, lacks security and clarity, and/or includes noise and distortion, then the transaction may be adversely affected (Ganguly, Dash, & Cyr, 2009). Therefore, website should provide content clearly in a way that is simple to navigate and has a low level of complexity.

Internet-based banking services offer advantages to the consumers by allowing them to access their bank accounts from any location and at any time of the day. It has been found that apart from the perceived ease of use and the perceived usefulness (Davis, 1989), users' acceptance of internet banking services also depends on its website features such as website connectivity, clarity of instructions, speed of upload and download, etc. (Agarwal & Venkatesh, 2002; Ndubisi & Sinti, 2006).

Measurement of Website Quality

Many researchers studying e-commerce have developed their own instrument for evaluating website quality from users' perspective (Barnes & Vidgen, 2001; Loiacono, Watson, & Goodhue, 2007; Yoo & Dontu, 2001; Zeithaml, Parasuraman, & Malhotra, 2002). In the context of internet-based services, Zeithaml, Parasuraman and Malhotra (2002) have developed an instrument, E-SERVQUAL, to measure the extent to which a website facilitates efficient and effective shopping, purchasing and delivery of any e-service. This scale has eleven dimensions of e-service quality: reliability, responsiveness, access, flexibility, ease of navigation, efficiency, assurance/trust, security/privacy, price knowledge, site aesthetics, and customization/personalization. But all these dimensions measure the overall online service quality, i.e., the overall process of conducting online buying service quality and not specifically website quality. Thus, they do not specifically evaluate the quality of medium/channel (website) through which customers interact.

Barnes and Vidgen (2001) have used the quality function deployment (QFD) as a framework for evaluating website quality by its users and developed an instrument to measure website quality. This scale was tested in the context of a cyber bookshop with small samples of size 46, 54 and 39 for three websites, respectively. The factor structure varied significantly across the three websites, which raises questions about the stability of its theoretical conceptualization.

Yoo and Dontu (2001) have developed and validated a scale, SITEQUAL, to measure the perceived quality of an internet shopping website. The scale has nine items with four factors – ease of use, aesthetic design, processing speed and security. The scale was validated using only 47 subjects, which has been considered as too narrow for evaluating website quality (Loiacono, Watson, & Goodhue, 2007).

Loiacono, Watson and Goodhue (2007) developed an instrument to know how consumers' perceptions of websites affect their buying behavior and specially their intention to revisit the website so as to better explain the consumer evaluation of websites. It has 36 items with 12 factors relating to website quality and also it exhibits strong measurement validity. It was tested in the context of twelve different websites – three each of books, CDs, hotels and airlines with a considerably large sample size of 377 students.

WEBQUAL SCALE

The basic root of WEBQUAL is grounded in the technology acceptance model (TAM). TAM is considered a suitable model to explain individual behavior concerning website acceptance and predict reuse/revisit intention because of its parsimony and its robustness in explaining computer technology and information technology usage behavior. TAM suggests that two beliefs, namely perceived usefulness and perceived ease of use, play mediating roles in affecting the users' intention to use internet banking (Davis, 1986). Perceived usefulness refers to the extent to which an individual believes that the use of new technology will be helpful in improving his/her job performance. It comes from the definition of the word "useful" which means "having a useful function". In the context of e-banking website, it refers to the individual's perceptions about specific website features such as provision of relevant information that fit the task and improve performance, provision of structured communication between buyers and sellers, provision of secure and safe environment, and the time taken to perform services (Davis, 1989). Perceived ease of use refers to the extent to which an individual believes that the use of new technology is free of effort. It comes from the definition of the word "ease" which means "freedom from difficulty or hardship or effort". In this context, it refers to the individuals' perceptions of the extent to which using the website was perceived to be free of effort i.e. physical and/or mental efforts required to understand the text, display and labels, and to handle the navigation process (Davis, 1989).

Besides, entertainment and complementary relationships are also added in the scale to enhance the measurement of website quality. Entertainment includes visual appeal to measure aesthetics aspect of a website, innovativeness to measure the creativity and uniqueness of website design, and emotional appeal to measure the individual emotional intensity of involvement with the website. Complementary relationships include the consistent image, i.e., the compatibility of the website image with the image of the firm/product, online completeness that measures the overall support of the website to perform almost all website related services/facilities online, and relative advantage which measures the advantage of using particular website over other ways of performing services/transactions. Table 1 shows the complete list of WEBQUAL dimensions and their definitions.

Table 1: WEBQUAL Dimensions

Factor	Dimension	Operational Definition
Perceived Usefulness	Information Fit to Task	The information provided meets task needs and improves performance
	Tailored Communication	Structured communication between buyer and seller
	Trust	Secure communication and information privacy
	Response Time	Time to get a response after a query or a request
Perceived Ease of Use	Ease of Understanding	Easy to read and understand
	Intuitive operation	Easy to operate and navigate
Entertainment	Visual Appeal	Aesthetics of website
	Innovativeness	Creativity and uniqueness of design
	Emotional Appeal	Individual emotional intensity of involvement with the website
Complementary Relationships	Consistent Image	Compatibility of the website image with the image of the firm/product it is advertising
	Online Completeness	Provision for all necessary transaction to be completed online
	Relative Advantage	Better option than other means of interacting with the company

Source: Adapted from Loiacono, Watson and Goodhue (2007)

WEBQUAL Vs. E-SERVEQUAL

WEBQUAL is an instrument employed to assess the users' general perception and belief about the quality of a website. It posits that quality of information in a website can be assessed by maintaining accuracy, precision, currency, timelines, reliability, completeness and relevance of a website. E-SERVQUAL is a multiple item scale for measuring customers' expectations and their perception of the service they received online. The E-SERVQUAL scores can be compared with the scores of the competitors to understand the service quality of the organization vis-a-vis similar organizations. E-SERVQUAL is considered as a well established instrument to measure service quality and can be applied to many domains including most of the areas of e-services (Parasuraman, Zeithaml and Malhotra, 2005). Here, the purpose is to measure the quality of e-service website (i.e. internet banking website) alone rather than whole e-service process as in E-SERVQUAL. For this reason, in this study WEBQUAL has been adopted to assess internet banking website quality.

RESEARCH METHOD

Data Collection

The data were collected through an online survey. There are several advantages of using online survey over traditional field based survey: (i) the sample is geographically distributed, (ii) sufficiently large sample size can be achieved in a short period of time; and (iii) the fact is that it costs much less than other traditional methods of data collection. Another major reason for appropriateness of online questionnaire was its obvious focus on online banking users. The questionnaires were sent to prospective respondents through e-mail. It was mentioned in both the e-mail and the questionnaire that participation in the study is voluntary. Few demographic details of the respondents were also collected.

A snowball sampling of online banking customers was done. It was made a pre-condition that respondents should have used internet banking at least once before. The reason behind this is that experienced users have a fair idea about the quality of their respective bank's internet banking website. If the users had access to internet banking services of more than one bank, they were asked to mention the name of the bank with which they transacted most. A total of five hundred and ninety three (593) filled questionnaires were received over a period of six months. Majority of the respondents were male (68.3%), which is consistent with IAMAI (2005). The age group of 19-45 years constituted a major portion (78.2%) of our sample which is similar to the Indian internet usage statistics of 85% (IAMAI report, 2005). The sample consisted of 36.5% graduates and 41.5% post-graduates, which is also supported by previous empirical studies in India (Prakash & Malik, 2008). Moreover, around 79.4% of respondents were using internet banking services for more than one year which affirms that our sample is appropriate for this study.

Measurement Instrument / Scale

Items for each of the constructs/factors have been selected from the original WEBQUAL scale to ensure the content validity of the scales. Most of the items in the WEBQUAL scale are taken from TAM; and one major advantage of using TAM scales is that they possess a well-validated measurement inventory (Davis, 1989; Venkatesh & Ramesh, 2006). It is quite possible that WEBQUAL can explain a considerable amount of website usability and information quality (tailored information and information fit to task). The questionnaire consists of two sections. The first section describes the nature of the study and asks the respondent to read the statements carefully and choose a score which best suits their experience of internet banking usage. For this purpose a seven point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree) is used. The second section asks the respondents to give their demographic details such as age, gender, education, duration and frequency (in a month) of internet banking usage.

In the first section, all thirty-six items in the questionnaire were adopted from WEBQUAL scale given by Loiacono, Watson and Goodhue (2007). No changes were made to the original WEBQUAL questionnaire. All items used in the questionnaire are presented in Appendix A.

Measurement

Since the objective of the study was to assess the validity of WEBQUAL in the context of internet banking services in India, exploratory factor analysis (EFA) followed by confirmatory factor analysis (CFA) was done. For this purpose, the sample has been divided into two equal (approximate) sub-samples of size 297 and 296. Sub-samples were selected randomly by selecting ~50 percent of the cases option in filtering algorithm using SPSS 16.0. The first sub-sample (size 297) has been used for EFA, and the second sub-sample (296) has

been used for CFA. The objective of EFA is to identify the underlying dimensions of WEBQUAL in current context. Next, a CFA has been done to validate the factor structure of the identified dimensions.

Exploratory factor analysis

An exploratory factor analysis using SPSS 16.0 was applied to the 36 items of WEBQUAL to identify the factors affecting the internet banking website quality evaluation in Indian context. Table 2 exhibits that Kaiser-Meyer-Olkin (KMO) value, measure of sampling adequacy, at 0.89 exceeds the recommended cut-off value of 0.6 and Bartlett's test of sphericity test also reached statistical significance at $p < 0.001$ (Hair et al., 2008). In accordance with the Hair et al. (2008) criterion, only those factors with Eigen values greater than 1 were retained for analysis.

Table 2: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	0.89
Bartlett's Test of Sphericity	Approx. Chi-Square
	4.51
	Degree of Freedom
	40
	Significance Level
	0.00

Table 3 shows the results of the factor analysis with varimax rotation based on principal component analysis extraction method. This resulted in eight factors explaining 73.29 percent of the variance. Out of the total 36 items, 28 items loaded adequately on eight factors. Out of eight dropped items, five items have factor loading less than 0.4 and three items, one each from emotional appeal, innovativeness, and visual appeal dimension of WEBQUAL have high cross-loadings. Eight identified dimensions are perceived ease of use (PEOU), information relevancy (IR), image-completeness congruence (ICC), aesthetics (AES), trust (TRUST), response time (RT), relative advantage (RADV), and innovativeness (INNOV).

Table 3: Rotated Component Matrix

Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8
EUDSTD2	.82							
INTUIT3	.78							
EUDSTD3	.76							
EUDSTD1	.73							
INTUIT2	.71							
INTUIT1	.69							
TAILOR1		.85						
TAILOR3		.82						
INFO2		.78						
INFO1		.72						
CONSIMG2			.83					
OLCOMP1			.76					
OLCOMP3			.76					
CONSIMG1			.67					
VISUAL1				.72				
EMOTION1				.72				
EMOTION2				.70				
VISUAL2				.67				
TRUST1					.79			
TRUST3					.77			
TRUST2					.75			
RESPO1						.86		
RESPO2						.85		
RELADV2							.77	
RELADV3							.74	
RELADV1							.45	
INNOV1								.86
INNOV4								.67

Extraction method: Principle component analysis with varimax rotation

In factor analysis, few WEBQUAL dimensions merged with other dimensions leading to the same underlying theoretical concept as in the original WEBQUAL scale. Perceived ease of use consists of two WEBQUAL dimensions—ease of understanding and intuitive operation. The second factor is labeled as ‘information relevance’ because it is a combination of two website quality dimensions namely tailored information and information fit to task. Similarly, third factor, labeled as image-completeness congruence, is a combination of two dimensions—consistent image and online completeness. The factors perceived ease of use and image-completeness congruence are conceptually similar to the second order constructs of the WEBQUAL scale. Another merged factor is labeled as ‘aesthetics’ as it comprises both visual appeal and emotional appeal of the bank website. For the measurement of survey scale reliability, scholars have used Cronbach alpha values. All factors in EFA have Cronbach alpha value greater than 0.70, which suggests that all factors have adequate scale reliability (Hair et al., 2008; Nunnally, 1978).

First order confirmatory factor analysis

To assess the measurement reliability and construct validity of identified factors, a CFA was done using AMOS 16.0. As shown in Figure 1, the measurement model consists of eight identified factors. These factors are shown with their measurement instruments and respective loadings. The co-variances among all eight factors are free to vary. First-order measurement model reflects adequate fit with chi-square (CMIN) value of 532.7 and 322 degree of freedoms resulting in chi-square to degree of freedom ratio (CMIN/df) of 1.75, which is less than the recommended value of 4 (Anderson & Gerbing, 1988; Hair et al., 2008). Seven other generally used model-fit indexes were also estimated to judge the model’s overall goodness of fit. Table 4 presents all eight estimated model fit indexes of first-order measurement model.

Table 4: Model Fit Indexes for Measurement Models and Structural Model

Model Fit Index	Recommended Value*	First Order Measurement Model	Second Order Measurement Model
Chi-square to degree of freedom ratio (CMIN/df)	4.00 or below	1.65	1.69
Goodness of fit index (GFI)	0.90 or above	0.91	0.90
Adjusted goodness of fit index (AGFI)	0.80 or above	0.86	0.84
Normed fit index (NFI)	0.90 or above	0.93	0.91
Incremental fit index (IFI)	0.90 or above	0.95	0.92
Comparative fit index (CFI)	0.90 or above	0.94	0.91
Root mean square residual (RMSR)	0.10 or below	0.08	0.08
Root mean square of error approximate (RMSEA)	0.07 or below	0.04	0.05
*Recommended values as suggested by Anderson and Gerbing (1988) and Hair et al. (2008)			

Figure 1: First-Order Measurement Model

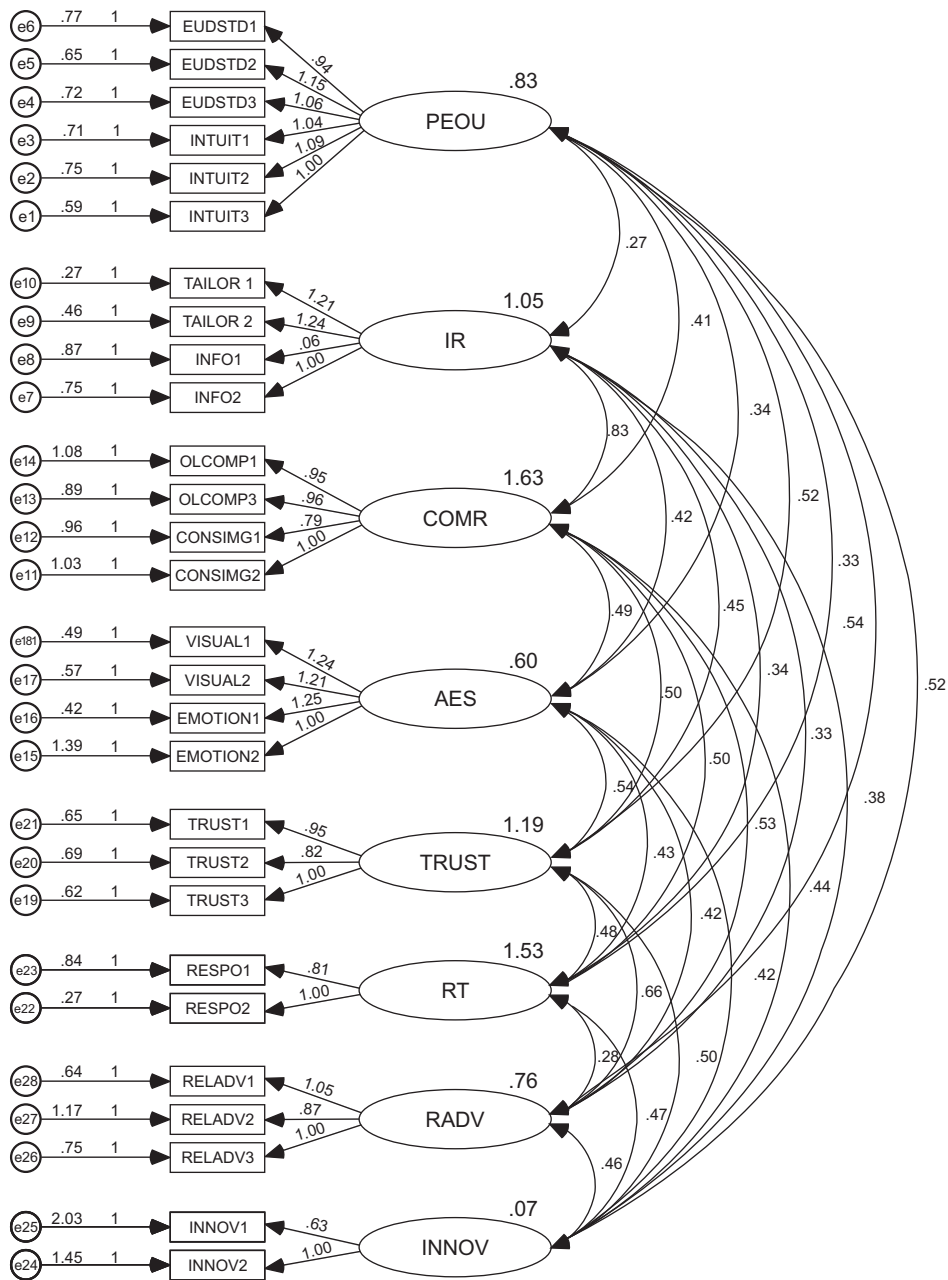


Table 5: Measurement Reliability of Items and Constructs

Construct	Item	Mean (S. D.)	λ	SMC	CR	A	AVE
Perceived ease of use	EUDSTD1	5.15 (1.23)	0.70	0.49	0.88	0.88	0.75
	EUDSTD2	5.30 (1.32)	0.79	0.62			
	EUDSTD3	5.06 (1.29)	0.76	0.57			
	INTUIT1	5.12 (1.27)	0.74	0.55			
	INTUIT2	5.14 (1.32)	0.75	0.56			
	INTUIT3	5.14 (1.19)	0.75	0.57			
Information relevancy	TAILOR1	4.61 (1.35)	0.92	0.85	0.89	0.89	0.82
	TAILOR3	4.51 (1.44)	0.88	0.77			
	INFO1	4.54 (1.36)	0.72	0.52			
	INFO2	4.79 (1.34)	0.76	0.58			
Image-Completeness congruence	CONSIMG1	4.78 (1.41)	0.72	0.51	0.84	0.84	0.76
	CONSIMG2	4.09 (1.63)	0.78	0.61			
	OLCOMP1	4.53 (1.61)	0.76	0.58			
	OLCOMP3	4.32 (1.55)	0.79	0.62			
Aesthetics	VISUAL1	5.39 (1.19)	0.81	0.65	0.83	0.82	0.74
	VISUAL2	5.35 (1.21)	0.77	0.60			
	EMOTION1	5.44 (1.17)	0.83	0.70			
	EMOTION2	5.43 (1.41)	0.54	0.30			
Trust	TRUST1	5.22 (1.31)	0.79	0.62	0.82	0.82	0.77
	TRUST2	5.54 (1.23)	0.73	0.53			
	TRUST3	5.54 (1.35)	0.81	0.66			
Response time	RESPO1	5.19 (1.36)	0.78	0.61	0.81	0.81	0.82
	RESPO2	5.23 (1.34)	0.86	0.75			
Relative advantage	RELADV1	5.26 (1.22)	0.73	0.54	0.72	0.72	0.68
	RELADV2	5.24 (1.32)	0.58	0.34			
	RELADV3	5.45 (1.23)	0.71	0.51			
Innovativeness	INNOV1	4.78 (1.44)	0.55	0.31	0.76	0.73	0.70
	INNOV3	4.88 (1.28)	0.84	0.71			

Note (Abbreviation): S.D. = Standard Deviation, λ = Standardized Factor Loading, SMC = Squared Multiple Correlation, CR = Composite Reliability, α = Cronbach Alpha, AVE= Average Variance Explained

Measurement Reliability

Fomell and Larcker (1981) emphasized both the reliability of each measurement item (indicator) and the reliability of each construct. The measurement reliability of measurement model was assessed through Cronbach alpha (α) and squared multiple correlations (SMC). Cronbach alpha is a measure to estimate construct reliability, while SMC is a measure to estimate indicator reliability. As mentioned in Table 5 above, Cronbach alpha values are greater than cut-off values of 0.70 (Hair et al., 2008), and all SMC values are greater than 0.30 (Bagozzi & Yi, 1988).

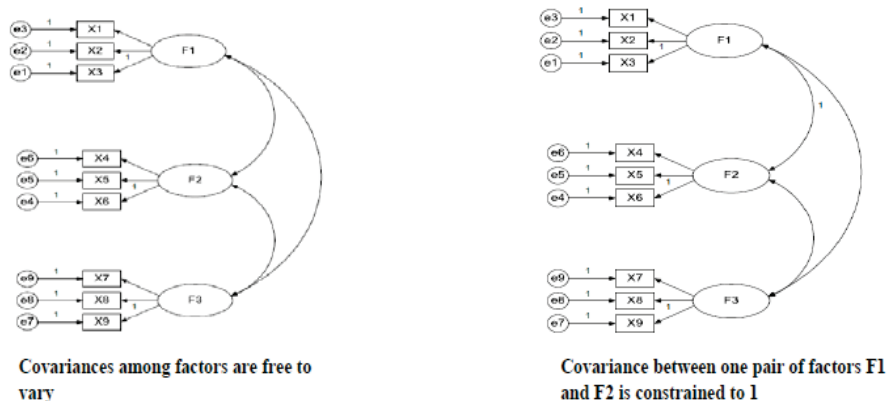
Convergent Validity

Convergent validity is defined as the degree to which items of measurement instrument correlate with items in the measurement instrument that are intended to measure the same construct. Hair et al. (2008) suggested three criteria to ensure convergent validity: standardized factor loading of each individual indicator should be greater than 0.50, the average variance explained value for each construct should be greater than 0.50, and composite reliability (CR) value for each construct should be greater than 0.70. As shown in table 5, first-order measurement model satisfies all three requirements. Therefore, this measurement model shows adequate convergent validity.

Discriminant Validity

It is a measure to test that the constructs intended to measure different theoretical concepts do not highly correlate with each other. There are two ways to ensure discriminant validity: Pair-wise construct comparison method (Anderson & Gerbing, 1988; Bagozzi & Philips, 1982; Bagozzi & Yi, 1988) and comparison of shared variance between factors with the square root of average variance explained by individual factors (Fornell & Larcker, 1981).

Fig. 2: Full vs. Collapsed model comparison for assessing discriminant validity



In pair-wise comparison method, we compare all 28 possible pairs for the 8 factors separately. For each pair, the chi-square value of the full model was compared with the chi-square value of the collapsed model (one pair of constructs was collapsed). More precisely, in the collapsed model, the model is same as the full model except that one pair of target factors was constrained to have a correlation of 1 (Figure 2). Anderson and Gerbing (1988) suggested that if the collapsed model is significant and its chi-square value is more than the values of the full model by four or more, then the free model reflects a better fit than the collapsed one. This indicates that collapsed factors are not measuring the same concept and hence increasing chi-square value i.e. collapsed factors are discriminant from each other. As shown in Table 6, for each possible combination of 28 collapsed models, chi-square value has increased by more than four and hence all factors are discriminant from each other.

Table 6: Pair-Wise Construct Comparison for Discriminant Validity

Model	χ^2 Value (df)	Model	χ^2 Value (df)
Original full model	532.7 (322)		
PEOU and IR	588.9 (323)	ICC and TRUST	560.4 (323)
PEOU and ICC	563.7 (323)	ICC and RT	549.7 (323)
PEOU and AES	579.3 (323)	ICC and RADV	548.6 (323)
PEOU and TRUST	569.1 (323)	ICC and INNOV	544.5 (323)
PEOU and RT	575.3 (323)	AES and TRUST	561.7 (323)
PEOU and RADV	554.4 (323)	AES and RT	560.8 (323)
PEOU and INNOV	571.0 (323)	AES and RADV	561.8 (323)
IR and ICC	565.7 (323)	AES and INNOV	557.8 (323)
IR and AES	563.2 (323)	TRUST and RT	563.9 (323)
IR and TRUST	570.4 (323)	TRUST and RADV	550.9 (323)
IR and RT	566.4 (323)	TRUST and INNOV	570.9 (323)
IR and RADV	571.2 (323)	RT and RADV	573.5 (323)
IR and INNOV	561.0 (323)	RT and INNOV	566.6 (323)
ICC and AES	553.5 (323)	RADV and INNOV	570.6 (323)

Note: χ^2 value= chi-square value, df = degrees of freedom

Besides, to ensure discriminant validity, Fornell and Larcker (1981) recommended the comparison of correlations among constructs with the square-root value of average variance explained. They suggested that to achieve discriminant validity, the diagonal value should be greater than the non-diagonal values. As Table 7 clearly shows, all eight factors are different from each other.

Table 7: Comparison of Inter-Construct Correlation for Discriminant Validity

Construct	PEOU	IR	ICC	AES	TRUST	RT	RADV	INNOV
PEOU	0.86							
IR	0.28	0.90						
ICC	0.35	0.63	0.87					
AES	0.48	0.52	0.49	0.86				
TRUST	0.52	0.39	0.35	0.63	0.88			
RT	0.28	0.27	0.32	0.45	0.36	0.90		
RADV	0.67	0.37	0.47	0.62	0.69	0.25	0.82	
INNOV	0.37	0.36	0.42	0.53	0.34	0.61	0.30	0.83

Note: PEOU=Perceived ease of use, IR=Information relevance, ICC=Image-completeness congruence, AES=Aesthetics, RT=Response time, RADV=Relative advantage, INNOV=Innovativeness (All correlations were significant at $p<0.001$)

Second-Order Confirmatory Factor Analysis

Second-order constructs represent the higher underlying concepts explained through first-order constructs, i.e. the first-order constructs are now acting as indicators for second-order constructs. Unlike the original WEBQUAL scale, in this study three second-order factors (perceived usefulness, entertainment, and complementary relationships) have been found. Here perceived ease of use is found to be a first-order construct. As shown in Figure 3, perceived usefulness (PU), entertainment (ENT) and complementary relationship (COMR) are formed by respective first-order constructs as suggested in WEBQUAL (Table 1 above). Second-order measurement model is evaluated by AMOS 16.0. AMOS output shows that the model is fit adequately with chi-square value of 558.69 and 330 degree of freedoms. As shown in Table 4, the values of other goodness of fit indices also suggest a satisfactory model fit. On comparing the chi-square statistics of first-order measurement model and second-order measurement model, the difference between the two chi-square statistics is found to be 25.97 (558.69 minus 532.72) for 8 (330-322) degrees of freedom, significant at $p < 0.001$. Thus, second-order factor model has also been found to equally fit with the given data as the ratio of increase in chi-square to increase in degree of freedom is 3.25 (< 4.00).

Researchers suggest that as higher-order factor models are more parsimonious, they should perform better on parsimony indexes like PRATIO, PNFI, and PCFI etc (Hair et al. 2008). AMOS output results of the model fit indices of both the models (see Table 4) show that the PRATIO, PNFI and PCFI values of the second-order factor model (0.95, 0.81 and 0.86 respectively) are greater than that of the first-order measurement model (0.91, 0.80 and 0.84 respectively). Since the second-order confirmatory factor analysis did not result in a significant decrease in the model fit statistics, it can be concluded that the hypothesized second-order model provided a good account for the correlations among the first-order factors.

Figure 3: Second-order measurement model

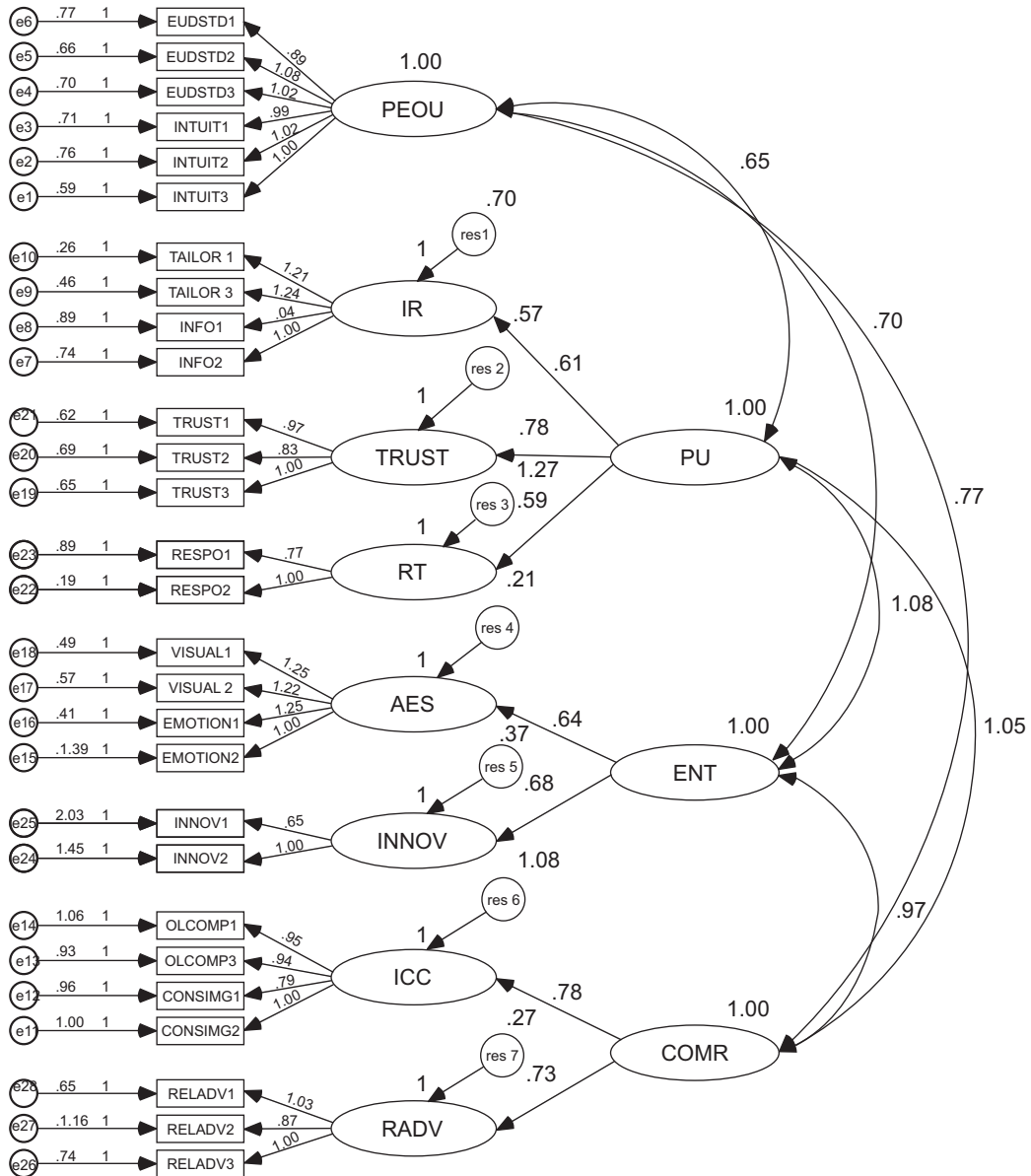


Table 8: Comparison of Parsimony Index

Parsimony Index	First-Order Measurement Model	Second-Order Measurement Model
PRATIO	0.91	0.95
PNFI	0.80	0.81
PCFI	0.84	0.86

Source: Hair et al. (2008)

DISCUSSION AND CONTRIBUTION

This study identified that the issue of website quality is one of the key attributes of online banking adoption and usage. Previous literature has empirically shown that several website features such as visual design, navigation design, information design and privacy and trust related issues of the website affect individual online purchase decisions among customers in western countries like Canada (Cyr, 2008). Researchers have also found that these constructs are significant predictors of trust in the context of online shopping in India (Ganguly, Dash and Cyr, 2009). This study has provided empirical evidence that evaluation of websites represents the generic mechanism through which e-vendors can affect users' reuse intention of an internet banking website. This is in accordance with the work of Dash and Saji (2006) for the Indian context, which pointed out that trust mediates the relation between website design and purchase intention.

The output of this work provides some interesting variations in WEBQUAL dimensions for the context of internet banking in India. From these it can be inferred that the higher order construct of perceived usefulness has dimensions information fit to task and tailored information merged into one. This can be attributed to both of them defining a level of customization of information, i.e. provision of relevant information to the customer in structured manner by the bank. For perceived ease of use, the dimensions ease of understanding and intuitive operation merge, indicating that for the given context, perceived ease of use is only a first-order construct. This may be attributed to the notion that if the customers can easily understand what they see and read, it becomes easy for them to navigate and carry out necessary operations. For entertainment, visual appeal and emotional appeal merge. This can be attributed to the aesthetics of the website being linked to the level of hedonic involvement by Indian customers. Likewise for complementary relationships, consistent image and online completeness merge together. This can be attributed to the efforts of the banks to be consistently seen as a facilitator of necessary online transactions. Thus, for the given context, we have just three second-order constructs instead of the original four. This disparity may be attributed to the change in context and the nature of the WEBQUAL scale which is highly context specific (Barnes & Vidgen 2001) and culture specific (Kim & Lee, 2006).

A limitation of the development of the WEBQUAL scale is that it involved only student respondents evaluating websites and not actual customers. The sample for this research consisted of actual customers—those that had at least one experience of internet banking. Thus, this research overcomes this drawback.

The study assumes significance in the light of the comments of Zeithaml et al. (2002) that now, more than low prices it is the service quality delivery through websites that is essential for success. Considering the website as the interactive medium for transaction, the point of contact and the representative face of the bank in the online context, the website and its quality assume a lot of significance. This research is made more worthwhile by the observations of Zeithaml et al. (2002) that the focus of the firms should now shift beyond just enabling transactions. The focus should be to incorporate all the encounters and cues the customers receive not just during the transactions but before and after as well. Thereby, websites and their quality assume huge significance in such scenarios where repeat purchases and loyalty are so important for marketers. This study makes an attempt to uncover and analyze the dimensions of website quality that are important for Indian internet banking customers.

Many researchers including Nitsure (2003) say that electronic banking is the next wave of tomorrow, and internet banking is the latest channel transforming the whole banking process. Many including Nitsure (2003) also point out that since the competitor bank is just a click away, the loyalty of the customer is on shaky ground. The customer may switch to the competitor in no time. Website quality in such an environment clearly becomes a serious concern for banks.

Implications

This study suggests that information quality, trust, etc. play a key role in ascertaining the web viewers' purchase-related intentions as well as assimilates much information related to website quality perceptions. For example, information quality is completely critical for both the information completeness and the ease of use (navigation) in online shopping context. Similarly, trust could completely affect the effect of information completeness on behavioral intentions in an emerging economy like India.

This study also offers a number of managerial implications. First, banking companies need to pay attention to how they can satisfy customers through online product/service presentations before they expect online transactions. Satisfaction with website information was a major determinant of e-customers' intention to purchase that brand. Banks should therefore pay attention to the information they provide their customers with and provide these tailored to their requirements and in a structured manner. Banks should ensure that the aesthetic aspects of the websites should be appealing enough to involve their customers emotionally. These results indicate the importance of visual design, navigation design, information design and communication for an online channel interface like website. This has been corroborated by many researchers (Ganguly, Dash, & Cyr, 2009).

In India, the early offering of internet banking gave a competitive edge to the private sector banks and then the public sector banks followed suit and tried matching the competition (Nitsure, 2003). The website quality could now be the real differentiator. This makes studying the various factors affecting website quality all the more important in the Indian internet banking context.

Limitations and scope for further research

Similar to most of the research in this area, this study is also not free of limitations. Although this study is confirmatory in nature, according to Barnes and Vidgen (2001), WEBQUAL scale is highly context specific; so it is very difficult to get common factors/dimensions when applying to any particular bank's website, since different dimensions may vary with respect to different internet banking websites. Besides, the inter-relationships between other factors have not been considered as most of the recent studies on website interactivity suggest. These includes factors like trust which have been proved to always have a positive impact on perceived usefulness (Dash & Saji 2007; Jiang et al. 2010). These limitations require the attention of researchers for further exploration and development of WEBQUAL scale. Further, researchers may undertake validating the above results using other popular scales. Researchers are encouraged to do a comparative analysis of similar scales for the measurement of website quality and provide a more meaningful insight into their differences and shed light on their relative advantages and disadvantages. An alternative scale by Aladwani and Palvia (2002) could be looked into.

Finally, this study suffered a chronic low response rate pervasive in online surveys. It is not clear how serious response bias was and to what extent such potential response bias affected our results and conclusions. Although we could have implemented a follow-up procedure, such a large-scale national survey added a significant amount of undue costs and the benefit of follow-up was not clear at that time. It is hoped in general that researchers pay attention to how to improve response rates for online surveys like the present one and provide effective strategies.

Conclusion

This study validated the WEBQUAL scale for the Indian context. It emphasized how the WEBQUAL scale could be effectively used to assess internet banking website quality based on the perspectives of Indian customers. Application of both exploratory and confirmatory factor analysis on responses obtained via an online questionnaire provided some interesting variations in WEBQUAL dimensions for the context of internet banking services in India.

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Appendix A: Measurement Scale (adopted from Loiacono et al. 2007)

Construct	Items
Information fit to task	The information on the Web site is pretty much what I need to carry out my tasks. (INFO1)
	The Web site adequately meets my information needs. (INFO2)
	The information on the Web site is effective. (INFO3)
Tailored information	The Web site allows me to interact with it to receive tailored information. (TAILOR1)
	The Web site has interactive features, which help me accomplish my task. (TAILOR2)
	I can interact with the Web site in order to get information tailored to my specific needs. (TAILOR3)
Trust	I feel safe in my transactions with the Web site. (TRUST1)
	I trust the Web site to keep my personal information safe. (TRUST2)
	I trust the Web site administrators will not misuse my personal information. (TRUST3)
Response time	When I use the Web site there is very little waiting time between my actions and
	The Web site loads quickly. (RESPO2)
	The Web site takes long to load. (RESPO3)
Ease of understanding	The display pages within the Web site are easy to read. (EUDSTD1)
	The text on the Web site is easy to read. (EUDSTD2)
	The Web site labels are easy to understand. (EUDSTD3)
Intuitive operation	Learning to operate the Web site is easy for me. (INTUIT1)
	It would be easy for me to become skilful at using the Web site. (INTUIT2)
	I find the Web site easy to use. (INTUIT3)
Visual appeal	The Web site is visually pleasing. (VISUAL1)
	The Web site displays visually pleasing design. (VISUAL2)
	The Web site is visually appealing. (VISUAL3)
Innovativeness	The Web site is innovative. (INNOV1)
	The Web site design is innovative. (INNOV2)
	The Web site is creative. (INNOV3)
Emotional appeal	I feel happy when I use the Web site. (EMOTION1)
	I feel cheerful when I use the Web site. (EMOTION2)
	I feel sociable when I use the Web site. (EMOTION3)
Consistent image	The Web site projects an image consistent with the company's image. (CONSIMG1)
	The Web site fits with my image of the company. (CONSIMG2)
	The Web site's image matches that of the company. (CONSIMG3)