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Scale Development for Measuring E-Service Quality in Banking

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***Abstract*—**This study examines several critical dimensions of e-service quality overlooked in the existing literature and proposes a model and instrument framework for measuring customer perceived e-service quality in the banking sector. The initial design was derived from a pool of instrument dimensions and their items from the existing literature review by content analysis. Based on focused group discussion, nine dimensions were extracted. An exploratory factor analysis approach was applied to data from a survey of 323 respondents. The instrument has been designed specifically for the banking sector. Research data was collected from bank customers who use electronic banking in a developing economy. A nine-factor instrument has been proposed to measure the e-service quality. The instrument has been checked for reliability. The validity and sample place limited the applicability of the instrument across economies and service categories. Future research must be conducted to check the validity. This instrument can help bankers in developing economies like India to measure the e-service quality and make improvements. The present study offers a systematic procedure that provides insights on to the conceptual and empirical comprehension of customer perceived e-service quality and its constituents.

***Keywords*—**Testing, instrument, e-service quality, factor analysis.

I. Introduction

CHANGING social trends and technological advancements, increased awareness of customer and demand for quality at affordable cost are the driving forces behind the customer preferences. In such an era of technology-enabled services, organizations have realized that their business profitability and growth is routed through enhanced focus on e-service quality. Further, in banking transactions, the Internet offers an interactive solution to its customers [22] and enables electronic services (e-service) to be at the forefront of technology priorities [29]. Most banks in developed and developing economies offer internet based services with various levels of complexity [3].

E-service quality is an area of research that has its own importance for business organizations and service firms to interact with customers in the electronic market place. Transaction efficiency and information efficiency are the two advantages of e-service quality [22] and the basic requirement for good performance of e-channel. The experience provided by e-service affects the trust and relationship with customers, therefore organizations must pay attention to this [32]. E-service quality can increase the competition among service firms [18] and help organizations achieve a higher level of service quality [36], [37]. E-service quality could be considered as one of the keys for gaining long-term advantages and for attracting more customers in this era of advanced technology and tough competition [18]. Better e-service quality is an essential tool for the success for any business organization, especially service organization [36]. The proper management of e-service quality or maintaining a high level of e-service quality is critical for increasing customer loyalty and satisfaction [4], [11].

In view of these technological improvements, this study focuses on issues of e-service quality in the service sector, especially for the banking industry. The main aim of this paper is to explore the dimensions of e-service quality from the customer's perspective. In this paper, the dimensions of e-service quality had been reported after making an extensive literature review. The main objectives of this paper are as follows.

1. To explore the dimensions of e-service quality in banking.
2. To development an instrument to measure the e-service quality.

II. Literature Review

The literature review has been elucidated in the following heads for the present research.

A. E-service quality
B. E-service quality measurement

A. E-Service Quality

Previously, service firms provided e-services for cost reduction [21]. It has been found that [21] firms increased their efficiency by providing services online, but the failure to focus on the needs and wants of customers resulted in a poor performance of electronic services. Therefore, many studies had been conducted on e-service quality to better understand its dynamics [7], [19], [26]. The quality of e-services has recently become an important and popular topic for research due to new advancements and growth of e-commerce. Various studies have offered a variety of conceptual definitions of e-services [26] because of its increased use for businesses and the importance of monitoring and measuring e-service quality in the virtual market place has been acknowledged. E-service quality can be defined as customer judgments and evaluation regarding the quality of e-service deliveries in the virtual marketplace [22]. It has been defined by [20], e-service quality

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as website interactions that facilitate an effective purchasing, shopping and delivery experience.

B. *E-Service Quality Measurement*

Past studies identified several dimensions for measuring e-service quality in different contexts. The development of an e-service quality instrument is required because it will help to measure and control the performance of online companies [33]. The existing literature shows that different dimensions of e-service quality are beneficial for different research contexts [22], [5], [14], [10]. In order to measure e-service quality, different approaches have been demonstrated [30], [2]. An e-service quality scale known as WEBQUAL was developed by [15] with 12 dimensions for measuring e-service quality. Consequently, E-S-Qual was developed by [20] with five broad dimensions. These five dimensions are usability, privacy, content, reliability and website aesthetic. E-service quality was measured using two groups, the Internet and non-internet purchasers by [33]. They found reliability was the most significant factor for the internet purchasers as compared to other factors.

III. Research Methodology

The review of literature revealed different 117 items to measure the e-service quality. A focused group discussion was conducted on 16 senior managers of State Bank of India to identify the items for measuring e-service quality in banking.

A. Items Generation and Refinement

After finalizing the items, the researcher provided a list of items, which was refined after focused group and requested their comments on these 33 items. Incorporating the views of 40 (academician, bank customer, IT expert) experts all items were retained. After deleting & modifying some items with the help of expert opinion.

B. Preliminary Questionnaire

After refining the items a preliminary questionnaire was developed with the demographic profile and 33 items under the different 9 dimensions. These questionnaires were distributed to 60 respondents to conduct the pilot testing.

C. Pilot Testing

Pilot test was conducted to further refine and check the reliability of items. To check the reliability inter-dimensional approach was used [24]. In pilot testing the result was evaluated by using Cronbach's reliability, the reliability score was found to be more than 0.7 and acceptable. The new instrument is considered to be reliable and demonstrates good consistency if the value of Cronbach's alpha is 0.60 and above [17].

D. Data Collection

Data was collected from bank customers in Utter Pradesh and Delhi-NCR, India. The purposive sampling method was used to select the respondents who meet the criteria of having used online banking services in the past six months. Data was collected between August 2013 and May 2014 through online questionnaires and personal contacts. For the personal contact approach, respondents were approached personally and the objectives of the study were explained to them in detail. Initially, 540 questionnaires were sent asking the respondents to give their perception on 5-point Likert scale from strongly disagree to strongly agree. From these 540 questionnaires, 362 (67.94%) were returned. Out of these 362, only 323 (89.22%) were used for further analysis. There were 39.31% people in the age group of 18-28 years, 42.11% in the age group of 29-39 years and remaining 18.58% in the age group of 40-50 years. 72.45% of the respondents were male and 27.55% were female out of which 57.89% were working and 33.13% non-working (may be students) and 8.98% self-employed. Of these 323 respondents, 8.67% had doctorate degrees, 39.32% had postgraduate degrees and 52.01% had graduate degrees.

E. Exploratory Factor Analysis

To identify the dimensions of scale the researchers conducted EFA by using Principal Component method with varimax rotation. 9 factors/dimensions were identified having Eigenvalue ≥ 1. The variance explained by these dimensions was 19.13, 16.54, 12.01, 7.26, 6.26, 6.13, 5.89, 4.12 and 3.12 percent respectively. The factor loading was found to be more than 0.5 in Table II. The KMO value 0.658, 0.72, 0.52, 0.59, 0.66, 0.712, 0.61, 0.742 and 0.651 respectively represents the adequacy of sample size for factor analysis. It may be noted that the KMO for personalization and security & trust was observed as 0.52 and 0.59 respectively, but on a closer observation it is found that the Low KMO value for these two dimensions is due to the small number of items (two) involved in formulation of this factor and thus it is acceptable [35]. The communalities value for the items ranges from 0.617 to 0.786, which support in retention of all the items as shown in Table I.

F. Reliability Analysis and Interpretation

High instrument reliability is necessary for consistent results [17]. Many methods are available to measure the reliability of an instrument. For example, the internal consistency method is considered the most effective measure for checking check instrument reliability [17]. This reliability in terms of internal consistency can be measured by determining the value of Cronbach's alpha [6]. The instrument is considered as reliable if the value of Cronbach's alpha is 0.60 or above [17]. The values for Cronbach's alpha are shown in Table II. The process of naming factors is not very scientific and is based on the subjective opinion of analyst [34].

IV. Implications

The present instrument has been prepared for the banking sector and reliability is based on data collected from Indian banking customers. Bank managers, to measure the level of e-service quality delivered by their bank can use the proposed instrument. The findings of the research may provide insights to other researches and academicians to make further studies or to explore new dimensions of e-service quality in banking as well as in other various electronic service organizations.

TABLE I
FACTOR STRUCTURE OF DIFFERENT ITEMS

Item	*Communalities*	*Factor Loadings*								
		F1	*F2*	*F3*	*F4*	*F5*	*F6*	*F7*	*F8*	*F9*
24x7 contact	0.633	-	-	-	-	-	-	-	0.6	-
Account updated	0.672	0.6	-	-	-	-	-	-	-	-
Accurate Promises	0.617	-	-	-	-	-	-	-	-	0.5
Answering	0.681	-	-	-	-	0.58	-	-	-	-
Bank promise to do something	0.723	0.8	-	-	-	-	-	-	-	-
Complete transaction	0.786	-	0.7	-	-	-	-	-	-	-
Logging	0.669	-	-	-	-	-	0.5	-	-	-
Customization	0.678	-	-	0.81	-	-	-	-	-	-
Degree of customization	0.654	-	-	0.57	-	-	-	-	-	-
delivery	0.625	-	-	-	-	-	-	-	-	0.5
Easy understanding	0.785	-	0.5	-	-	-	-	-	-	-
Find website	0.645	-	0.7	-	-	-	-	-	-	-
Guarantee	0.773	-	-	-	-	0.6	-	-	-	-
Handling	0.677	-	-	-	-	0.7	-		-	-
Information	0.653	-	-	-	-	-	-	0.8	-	-
Keep records	0.763	0.5	-	-	-	-	-	-	-	-
Live contact	0.717	-	-	-	-	-	-	-	0.8	-
Loading	0.699	-	-	-	-	-	-	0.7	-	-
Completion of transaction	0.665	-	-	-	-	-	0.6	-	-	-
Problem care	0.685	-	-	-	-	0.88	-	-	-	-
Quick Transaction	0.757	-	-	-	-	-	-	0.5	-	-
Representative online	0.711	-	-	-	-	-	-	-	0.5	-
Security	0.693	-	-	-	0.76	-	-	-	-	-
Skilful	0.709	-	0.51	-	-	-	-	-	-	-
Time	0.629	-	-	-	-	-	-	-	-	0.6
Trust	0.689	-	-	-	0.66	-	-	-	-	-
Truthful offerings	0.621	-	-	-	-	-	-	-	-	0.5
Understanding	0.661	-	-	-	-	-	0.5	-	-	-
Web site	0.705	-	-	-	-	-	-	0.6	-	-

TABLE II
VALUES CRONBACH'S ALPHA AND FACTOR NAME

Factors	*Cronbach's alpha*	*Factor Name*	*References*
F1	0.763	Reliability	[13], [28], [27], [1], [11], [23], [16]
F2	0.789	Ease of use	[32], [8], [1], [23]
F3	0.862	Personalization	[33], [9], [13]
F4	0.780	Security and trust	[28], [1], [13], [23], [16]
F5	0.830	Responsiveness	[25], [31], [1], [12], [13], [20], [16]
F6	0.813	Website aesthetic	[25], [30], [1] [23], [13]
F7	0.869	Efficiency	[9], [20]
F8	0.737	Contact	[20]
F9	0.796	Fulfillment	[20]

V. DISCUSSION AND CONCLUSION

The nine dimensions of e-service quality have revealed strong evidence of reliability and factor loading. It can be considered that the customer perceptions about e-service quality, is based on nine dimensions discussed above.

This instrument can be used to measure the level of customer's perception about the service quality of electronic services provided by the banks. By measuring the e-service quality, the overall picture of the same can be determined. Managers or senior level staff in organizations can take these indices to improve e-service quality.

The present research is an attempt to unfold the dimensions of e-service quality already present in the existing literature and subsequently propose a model for measuring e-service quality in banking through customer's perceptions.

Although the present research examines issues of e-service quality in all aspects, the focus has been confined to e-service quality in the banking sector. The data for the reliability of the instrument has been collected from electronic banking customers in India, which is a developing economy. There may be differences in the expectations of the customers if the responses were collected from a developed economy.

Future research may be conducted to check the validity of the proposed scale and replicate the same study in other economies.

APPENDIX

The following items had been asked from the respondents to assess the level of e-service quality delivered by banks while online service on a 5 point Likert scale where, 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree.

Reliability

1. Whenever the bank promises to do something, it does so.
2. The bank keeps my records accurately.
3. The account information is updated immediately as soon as the transaction is finished.

Ease of Use

1. I find the web site easy to use.
2. Web site/labels/menu items are easy to understand.
3. It would be easy for me to become skilful at using the site.
4. It is easy to complete a transaction through the Bank's websites.

Personalization

1. Bank has the ability to customize your use of the site.
2. The degree of customization that is available.

Security and Trust

1. It has a affiliations with security companies.
2. I trust e-services provided by the company.

Responsiveness

1. Bank takes care of problems promptly.
2. Bank is providing answers to my questions.
3. Bank site handles product returns well.
4. Bank site offers a meaningful guarantee.

Website Aesthetic

1. Easy completion of online transactions.
2. Easy logging on bank's online portal.
3. Easy understanding which button to be clicked for the next step.

Efficiency

1. Bank web site enables me to complete a transaction quickly.
2. Information at bank web site is well organized.
3. Bank web site loads its pages fast.
4. Bank web site enables me to get on to it quickly.

Contact

1. This site has customer service representatives available online.
2. It offers the ability to speak to a live person if there is a problem.
3. Bank has a 24x7 call center in case of any emergencies.

Fulfillment

1. Bank web site makes items available for delivery within a suitable time frame.
2. It sends out the items ordered.
3. It is truthful about its offerings.
4. It makes accurate promises about delivery of services and products.

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