

Online Service Quality: Scale Development and Validation

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Abstract:

It is accepted that service quality is important to the success of all service industries. In order to remain competitive businesses are increasing and improving their online service. With the popularity of the internet, innovation in technology and the changing needs of customers, online services have been undergoing tremendous transformation. Investigating of quality issues of online services is necessary because of their potential influence on: attractiveness, customer retention, positive word of mouth and maximizing competitive advantage. Business model of online services spread rapidly despite of these, there are very few efforts devoted to the area of online service quality. This empirical research paper identified important dimensions and gave validated model for measuring online service quality and they will be beneficial to businesses in effective service quality management of their e-business.

Keywords: Service Quality, Online Services, Technology, CFA, Validity, Reliability.

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1.Problem Statement:

Growth of internet-based services has changed the manner in which firms and consumers interact. Online service is becoming increasingly important not only in determining the success or failure of e-commerce, but also in providing consumers with a superior experience with respect to the interactive flow of information (Yang et al., 2001; Santos, 2003).The notion of online service has been increasingly recognized by both researchers and practitioners as being one of the key determinants in successful e-commerce. Service quality is one of the main factors

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that determine the success or failure of electronic commerce (Santos 2003). It is essential to identify and validate important dimensions related to online services for measuring service quality of online services.

2. Objectives of the Study:

- 1) To study difference between applications of SERVQUAL and SERVPERF model.
- 2) To identify important dimensions for measuring service quality of online services.
- 3) To develop model for measuring online service quality.

3. Literature Review on Service Quality:

During the past few decades, service quality has become a major area of academic investigation. Gummesson (1979) was one of the first to suggest that the concept of service quality was strongly related to perception and trust. Gronroos (1982) then introduced the notion of “total service quality” as being the perception by a customer of the difference between the expected service and the perceived service.

Many researchers gave definition of service quality. Service quality refers to the difference between customer expectations of what a firm should provide (i.e. expectations) and the perceived service performance (Parasuraman et al., 1988). Gefen (2002) defined service quality as the subjective comparison that customers make between the quality of service that they wish

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to receive and what they actually get. Service quality is viewed as an organizational asset and a key determinant of corporate marketing and financial performance (Yasin et al., 2004).

A popular definition of service quality proposed by Parasuraman et al. (1988) is “conformance to customer specifications” – that is, it is the customer’s definition of quality that matters, not that of management.

Service quality is recognized as a driver of corporate marketing and financial performance (Buttle, 1996). Service quality has potential to deliver strategic benefits, such as improved customer retention rates, even as it enhances operational efficiency and profitability (Zeithaml et al., 2000). Service quality is viewed as an organizational asset and a key determinant of corporate marketing and financial performance (Yasin et al., 2004). Service quality impacts on customer satisfaction which in turn affects the financial performance of banks (Al-Hawari et al., 2009).

SERVQUAL Vs. SERVPERF

Two main conceptualisation approaches towards service quality have been identified in literature. The first is based on disconfirmation (SERVQUAL) while the second is based on Cronin and Taylors’ (1994) SERVPERF (performance only) model.

Parasuraman et al. (1988) provided a definition of service quality. They defined service quality as ‘a global judgment, or attitude, relating to the superiority of the service’, and explicated it as involving evaluations of the outcome (i.e., what the customer actually receives from service) and process of service act (i.e., the manner in which service is delivered). In line with the propositions put forward by Smith and Houston (1982), Parasuraman et al. (1985, 1988) posited and operationalized service quality as a difference between consumer expectations of ‘what they

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want' and their perception of 'what they get.' Based on this conceptualization and operationalization, they proposed a service quality measurement scale called 'SERVQUAL'.

Parsuraman et al. (1985, 1988) have conducted well-known studies to uncover key service quality attributes that significantly influence the customers' perception of overall service quality. They initially identified ten determinants of service quality based on a series of focus group interview sessions, these attributes were (Parsuraman et al., 1985): tangibles, reliability, responsiveness, competency, courtesy, communication, credibility, security, access and understanding the customer. Parasuraman et al. (1988) later distilled these ten dimensions into five by using a factor analysis. These five dimensions are :Reliability –the ability to perform the promised service dependably and accurately, Responsiveness, Assurance, Empathy and Tangibles.

Cronin and Taylor (1992) introduced a service quality model based only on perception and not expectations as in the previous models.

- Expectations seem to be of lesser importance as comparison standards in e-commerce and customers appear to use experience based norms (Santos, 2003).
- Yang and Jun's (2002) study revealed that the majority of customers tended not to have a clear conception of what expectations they held for online services.

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- Despite the conceptual arguments regarding service quality, it is generally agreed in the literature that service quality is a multi-level and multi-dimensional concept that might mean different things to different people (Mersha and Adlakha, 1992; Dabholkar et al., 1996; Brady and Cronin, 2001).
- In addition, Lassar et al. (2000) examined the effects of service quality on customer satisfaction in private banking by using two well-known measures, the SERVQUAL and the technical/functional quality. They found that the technical/functional quality dimensions clearly outperformed the SERVQUAL dimensions in explaining the variance of customer satisfaction. Lassar et al. (2000) suggested that the technical/functional quality based model is better for service quality when customers are actively involved or highly interested in service delivery.

In online services also customers are actively involved and highly interested in service delivery so in this case technical/functional quality based model is better compare to SERVQUAL.

Definition of Online Service Quality:

Many researchers studied online service quality and define online service quality in different ways. Zeithaml et al. (2000) stated that online services are web services that are delivered through the internet. In online service, the customer's interaction or contact with the service providers is via technology, such as their web sites. Ghosh et al. (2004) conceptualized online service as an interactive information service. Rowley (2006) defined online service as deeds, efforts, or performances whose delivery is mediated by information technology. De Ruyter et al. (2001) defined it as an interactive, content-centered, and internet-based customer service that is

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driven by customers and integrated with the support of technologies and systems offered by service providers, which aim at strengthening the customer-provider relationship.

Online service quality can be defined as the overall evaluations and judgments of customers regarding the excellence and quality of online service delivery in the virtual marketplace (Santos, 2003). One of the definitions of online service quality has been conceptualized by Zeithaml et al. (2000). Their study stated that internet service quality is the extent to which a web site facilitates efficient and effective shopping, purchasing, and delivery of products or services.

Literature Review on Online Service Quality Dimensions:

Business and academic researchers have been attempting to conceptualize and measure online service quality, but the issue has not been examined as a whole. Because e-commerce is a recently emerging field, little academic literature in this field has addressed in-depth online service quality.

Several conceptual and empirical studies have attempted to address the key dimensions of service quality directly or indirectly related to online services. Summary of these studies is given in the table 1.

Table 1: Literature Review on Online Service Quality

Sr. No.	Title of Research Paper	Author Name	Online Service Quality Dimensions
1.	A confirmatory factor analysis of the end-user computing satisfaction instrument.	Doll and Torkzadeh (1988)	Content, accuracy, format, ease of use, timeliness.
2.	What makes commercial web	Dholakia and	Frequency of changes, number of

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	pages popular?- an empirical investigation of web pages effectiveness.	Rego (1998)	links to and from the web site, complexity and extensiveness, number of pictures, enhancements and number of advertising banners of other firms.
3.	A user-based design process for web sites.	Abelse et al. (1999)	Use, content, structure, linkage, search and appearances.
4.	Exploring the factors associated with web site success in the context of electronic commerce.	Liu and Arnett (2000)	System use, system design quality, information quality and playfulness.
5.	A proposal to assess the service quality of online travel Agencies: an exploratory study.	Kaynama and Black (2000)	Content and purpose, accessibility, navigation, design and presentation, responsiveness, background and personalization & customization.
6.	An integrative approach to the assessment of e-commerce quality.	Barnes and vidgen (2000)	Usability, design, information, trust, and empathy.
7.	E-satisfaction: an initial examination	Szymanski and Hise (2000)	Convenience, site design, and financial security.
8.	Developing a scale to measure the perceived quality of an internet shopping site (sitequal).	Yoo and Donthu (2001)	Ease of use, aesthetic design, processing speed, security.

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9.	A conceptual framework for understanding e-service quality: implications for future research and managerial practice	Zeithaml et al. (2001)	Access, ease of navigation, efficiency, flexibility, reliability, personalization, security/privacy, responsiveness, assurance/trust, site aesthetics and price knowledge.
10.	Service quality and e-commerce: an exploratory analysis.	Cox and Dale (2001)	Accessibility, communication, credibility and appearance.
11.	Expectation and rankings of web site quality features: results of two studies on user perceptions.	Zhang and von Dran (2001)	Information content, enjoyment, privacy, user empowerment, visual appearance, technical support, navigation, organization of information, credibility, and impartiality.
12.	Taking the pulse of internet pharmacies.	Yang et al. (2001)	Ease of use, content, accuracy of content, timeliness of response, aesthetics and privacy.
13.	Key dimensions of business-to-consumer websites.	Ranganathan and Ganapathy (2002)	Information content, design, security and privacy.
14.	Webqual: a measure of web site quality.	Loiacono et al., (2002)	Ease of use, usefulness, entertainment, complementary relationship, customer service.
15.	Customer loyalty in e-commerce: an exploration of	Srinivasan et al. (2002)	customization, contact interactivity, care, community, convenience,

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	its antecedents and consequences		cultivation, choice, and character
16.	Consumer perceptions of internet retail service quality.	Janda et al (2002)	Performance, access, security, sensation and information quality.
17.	Consumer perception of e-service quality: from internet purchase and non-purchase perspectives.	Yang and Jun (2002)	Reliability, access, ease of use, personalisation, security, credibility and responsiveness.
18.	Dimensions of e-quality.	Madu and Madu (2002)	Performance, features, structure, aesthetics, reliability, storage capacity, serviceability, security and system integrity, trust, responsiveness, product/service differentiation and customization, web store policies, reputation, assurance and empathy.
19.	Developing and validating an instrument for measuring user-perceived web quality.	Aladwani et al. (2002)	Specific content, content quality, appearance and technical adequacy.
20.	Understanding quality of service for web services	Mani and Nagarajan (2002)	Availability, accessibility, integrity, performance, reliability, regulatory and security.
21.	E-service quality: a model of virtual service quality dimensions.	Santos (2003)	Ease of use, appearance, linkage, structure and layout, content, reliability, efficiency, support,

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			communication, security and incentives.
22.	Service quality dimensions of internet retailing: an exploratory analysis.	Yang et al. (2003)	Responsiveness, credibility, ease of use, reliability, convenience, communication, access, competence, courtesy, personalization, continuous improvement, collaboration, security/privacy and aesthetics.
23.	Etailq: dimensionalizing, measuring and predicting etail quality.	Wolfenbarger and Gilly (2003)	Web site design, reliability/fulfillment, privacy/security and customer service.
24.	Assessing service quality on the web: evidence from business-to-consumer portals.	Gounaris and Dimitriadis (2003)	Customer care and risk reduction benefit, information benefit and interaction facility benefit.
25.	A service quality frame work for web based information system.	Tan et al. (2003)	Access, ease of navigation, efficiency, flexibility, reliability, personalization, security/privacy, responsiveness, assurance/trust, site aesthetics, quality of information.
26.	Online service quality dimensions and their relationships with satisfaction: a content analysis of customer reviews of securities brokerage	Yang and Fang (2004)	Reliability, responsiveness, competence, ease of use, security and product portfolio.

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	services.		
27.	Comfort your online customer: quality, trust, and loyalty on the internet.	Ribbink et al. (2004)	Assurance, ease of use, e-scape, responsiveness and customisation.
28.	Critical service quality encounters to the web: an exploratory study	Sweeney and Lapp (2004)	Instructions and explanations, structural design and layout, navigation system, depth, correctness/currency, presentation appropriateness, control and speed.
29.	Customers' perceptions of online retailing service quality and their satisfaction.	Jun et al., (2004)	Reliable, access, ease of use, attractiveness, security, credibility.
30.	Measuring customer perceived online service quality: scale development and managerial implications.	Yang et al., (2004).	Reliability, access, ease of use, attentiveness, security and creditability.
31.	E-s-qual: a multiple-item scale for assessing electronic service quality.	Parasuraman et al. (2005)	Efficiency, availability, fulfillment, privacy.
32.	A model of web site quality assessment.	Moustakis et al. (2006)	Relevance, usefulness, reliability, specialization, architecture, navigability, efficiency, layout and animation.
33.	Quality of electronic services: conceptualizing and testing the hierarchical model.	Fassnacht and Koese (2006)	Graphics quality, clarity of layout, attractiveness of selection, information quality, ease of use,

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			technical quality, reliability, functional benefit and emotional benefit.
34.	Service quality in multichannel services employing virtual channels	Sousa and Voss (2006)	Virtual fulfillment, efficiency, system availability and privacy
35.	Perceived e-service quality: measurement Validity and effects on consumer satisfaction and web site loyalty.	Cristobal et al. (2007)	Web design, customer service, and assurance and order management.
36.	Buying environment characteristics in the Context of e-service.	Kim et al. (2009)	Convenience, customization, information, communication, web appearance and entertainment value.
37.	Measuring service quality in e-retailing.	Collier and Bienstock (2009)	Process, outcome and recovery.
38.	The antecedents and consequents of relationship quality in internet shopping.	Chung and Shin (2010)	Convenience, site design, informativeness and security.

The table 1 shows 92 online service quality dimensions which were identified from the literature review in online service quality area. Content analysis is performed to comprise the selected online service quality dimensions. Experts in a content domain categorized dimensions based on their similarity to construct definitions. Here, experts are presented with construct definitions without titles and are asked to match items with a corresponding definition. Here, 92 online service quality dimensions were comprised in 8 online service quality dimensions using content analysis. For content analysis, suggestions of experts of services marketing area and operational

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definition of all dimensions were used. The table 2 shows list of online service quality dimensions with same operational definition.

Table 2: Online Service Quality Dimensions:

Sr. No.	Name of Online Service Quality Dimension	Sr. No.	Name of Online Service Quality Dimension
1	Access	47	Interaction Facility Benefit
2	Accessibility	48	Interactivity
3	Appearance	49	Knowledge
4	Assurance	50	Linkage
5	Attentiveness	51	Navigation
6	Availability	52	Number Of Pictures
7	Care	53	Performance
8	Character	54	Personalization
9	Choice	55	Playfulness
10	Clarity Of Layout	56	Processing Speed
11	Communication	57	Product Portfolio
12	Community	58	Quality Of Information
13	Competence	59	Regulatory And Security
14	Complementary Relationship	60	Relevance
15	Complexity And Extensiveness	61	Reliability
16	Contact	62	Reputation
17	Collaboration	63	Responsiveness
18	Convenience	64	Search
19	Correctness/Currency,	65	Security And Creditability
20	Credibility	66	Security And Privacy
21	Cultivation	67	Security And System Integrity
22	Customer Care	68	Sensation
23	Customer Service	69	Serviceability
24	Customization	70	Site Aesthetics
25	Depth	71	Site Design
26	Design And Presentation	72	Specific Content
27	Ease Of Navigation,	73	Storage Capacity
28	Ease Of Use	74	Structure

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29	Efficiency	75	Support
30	Empathy	76	System Availability
31	Enhancements	77	System Design
32	Entertainment	78	System Use
33	Features	79	Technical Adequacy
34	Financial Security	80	Technical Quality
35	Flexibility	81	Technical Support
36	Format	82	Timeliness Of Response
37	Frequency Of Changes	83	Timeliness
38	Fulfillment	84	Trust
39	Graphics Quality	85	Usability
40	Impartiality	86	Use
41	Information Benefit	87	Usefulness
42	Information Content	88	User Empowerment
43	Information Quality	89	Virtual Fulfillment
44	Information	90	Visual Appearance
45	Informativeness	91	Web Design
46	Integrity	92	Web Store Policies

Table 3: List of Online Service Quality Dimensions with Same Operational Definition

Online Service Quality Dimensions	Other Online Service Quality Dimensions With Same Operational Definition
Information Quality	Content, Information Quality, Quality of Information, Relevance, Timeliness and Decision Making.
Website Design	Aesthetics, Quality of Layout, Sense of Beauty, Site Design and Content, Website Design, Website Interface, Format, Enjoyment, User Experience, Graphics Quality and User

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	involvement.
Ease of Use	Convenience, Ease of Navigation, Ease of Use and User Friendliness.
Reliability	Speed, Reliability, Efficiency and Accessibility.
Security And Privacy	Trust, Risk Reduction Benefits, Privacy and Security, Assurance and Credibility.
Interactive Interrogation	Interaction, Interactive Interrogation, Feedback, Responsiveness and Customer Care.
Personalization/Customization	Specialty Information, Attention, Personalization/Customization, Preferential Treatment, Customization, Individualization and Understanding the Customer.
Entertainment	Diverse Features, Supporting Services

After grouping dimensions into groups, proper names were given to the group of dimensions after taking help of experts. Definition of all online service quality dimensions is given in the following table:

Table 4: Online service quality dimensions

Sr. No.	Dimension	Description
1.	Information Quality	Information quality dimension is related to ability to provide sufficient, real time & accurate information and valid hyperlink for accessing information to users.
2.	Website Design	This dimension includes visually appealing and well-designed web pages, fonts in proper size and color, well labeled hyperlink and easy browsing of online services.
3.	Ease of Use	This dimension makes search out, navigation and connectivity to other website very easy.
4.	Reliability	Reliability of online services means the ability of it to provide services

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		as per commitment. This dimension includes provide correct services at first time to users and accessibility of online services from anywhere and 24 * 7 hours.
5.	Security And Privacy	Privacy involves the protection of personal information and security involves protecting users from the risk of fraud and financial loss from the use of credit cards or other financial information.
6.	Interactive Interrogation	This dimension provides opportunity and ability to share opinions & information; and ask problem or query about products and services on it. This dimension also includes facilities of electronic complaint form.
7.	Personalization/ Customization	This dimension is related to ability to provide customized or personalized services to users.
8.	Entertainment	Entertainment includes connectivity with social networking websites and availability of news room and chat room.

4. Research Methodology:

4.1 Scale Development and Instrument:

This research followed the scale development framework that was established by Menor and Roth (2007).

This study developed a measurement instrument for online service quality and that was mainly based on the perceived service quality scales proposed by various researchers in the area of online, e-commerce internet banking and web portal service quality.

After completion of literature review, the questionnaire with 42 items and 8 dimensions representing online service quality was prepared.

Next, a pretest of the questionnaire was conducted to assess face validity or content validity of measurement scales. Face validity can be evaluated by a group of judges, sometime experts, who read or look at a measuring technique and decide whether in their opinion it measures what its name suggests. Here, continuous-scale agreement exercise used to know correspondence between each item a presumed construct using Likert scale. In the continuous-scale agreement exercise, judges evaluated the correspondence between each item and a

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presumed construct using Likert scale (Hardesty & Bearden, 2004). After being reviewed by five academics, the questionnaire was revised. They all provided valuable feedback. Some items were further reworded, added or deleted.

Next, the questionnaire with 39 items and 8 dimensions representing online service quality was filled by 50 online service users who used online banking in last four weeks to ensure reliability of the scale. Here participants gave answer and critique and made review of the given questionnaire. Several modifications were made based on the feedback of pilot test. The final questionnaire had 39 items and 8 dimensions representing online service quality.

4.2 Sampling Design:

Online banking was selected as a sample industry, because it is very service-intensive; its services involve complicated processes; it is an emerging and fast growing service sector; and customers are very sensitive to banking service quality. Online banking users of State Bank of India, Bank of Baroda, HDFC bank and ICICI bank were taken as respondents in this study. These banks were selected on the basis of their market capitalization.

In this study total target population is unknown and sampling frame is not available so non-probability sampling technique was used. Judgmental sampling, a form of convenience sampling was used to identify respondents for the study because here a judgment was taken by researcher that maximum number of online banking users of selected banks were easily got at branches of selected banks. To ensure that the Instrument reached the target, a filter question was asked at the beginning of the questionnaire as to whether respondent was using online banking facility of the selected Indian public or private sector banks. Respondents were also asked to focus on the online banking services they use most often. Only those answering affirmatively proceeded to respond to the remaining questions. Respondents who answered in the negative were not included in the study.

400 online banking users were selected for measuring service quality of online services and convenience sampling method was used for collecting data.

5. Data Analysis:

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Confirmatory factor analysis was used for validating the model. SPSS and AMOS were used for data analysis in this research.

5.1 Items Deleted

In the online service quality model, some indicators were loaded on the constructs that they were not supposed to represent and some residual covariance of the indicators representing different constructs were released in order to improve the model fit. There were 39 items in the questionnaire and retained items in the scale were 24. Detail of retained items are given in the appendix.

5.2 Assessment of Reliability

Reliability was gauged via the standardized Cronbach's alpha coefficient (Cronbach, 1951). Hair et al. (2007) recommended that 0.6 Cronbach's alpha value is deemed the lower limit of acceptability. After reexamining each dimension and deleting items based on the SPSS recommended criteria, Cronbach alpha was computed for each distinct construct of online service quality. The final Cronbach's alpha coefficients of all items range from 0.601 to 0.762 (see table 5), suggesting good internal consistency among items within each construct and the reliability of the constructs. Moreover, the combined scale reliability for the 24 items of online service quality is 0.790. The high alpha value of the combined scale indicates that both the reliability and the convergent validity of the scale were met (Parasuraman et al., 1991). Cronbach's alpha scores were shown in table 8 indicated each scales used in this study exhibited strong internal reliability.

Table 5. Reliability of the Scale

Sr. No.	Dimension Name	Cronbach's Alpha Scores
1.	Information Quality	0.635
2.	Website Design	0.695
3.	Ease of Use	0.646
4.	Reliability	0.705
5.	Security and Privacy	0.643
6.	Interactive Interrogation	0.601
7.	Personalization/Customization	0.762
8.	Entertainment	0.696
9.	Reliability of Overall Scale	0.790

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5.3 Assessment of Validity

Validity is an extent to which research is accurate. Validity of a scaling procedure implies that the data must be unbiased and related to the construct being measured. Content/face and construct validity were measured for validating the model.

5.3.1. Content Validity

The degree to which the measure spans the domain of the construct's theoretical definition is defined as the construct's content validity (Rungtusanatham, 1998). The online service quality dimensions were identified from literature and content validity of the instrument used in the present study is ensured by professionals of online service area and academicians of marketing area.

5.3.2. Construct Validity:

Construct validity is the extent to which a set of measured items actually reflects the theoretical latent construct thus it deals with the accuracy of measurement (Hair, 2007). Construct validity can be established by empirically assessing uni-dimensionality of constructs (O'Leary-Kelly & Vokurka, 1998). Confirmatory Factor Analysis (CFA) provides better control for assessing uni-dimensionality. In this research study, convergent and discriminant validity were assessed using confirmatory factor analysis.

5.3.2.1. Convergent Validity

The items that are indicators of a specific construct should coverage or share a high proportion of variance in common, known as convergent validity (Hair et al., 2007). In this study convergent validity was measured using the following methods:

- 1) Analysis of factor loading
- 2) Construct reliability

In the case of high convergent validity, high loading on a factor would indicate that they converge on some common point and factor loading more than 0.5 indicates good convergent validity (Hair et al., 2007). The factor loading of all the items of the online service quality scale are given in the table 6. The values of factor loading for all the items are near to or greater than 0.5 and it indicates good convergent validity of the scale.

High construct reliability indicates that internal consistency exists, meaning that the measures all consistently represent the same latent construct. The rule of thumb for construct reliability estimate is that 0.6 or higher suggests good construct reliability. Table 6 shows that for all constructs related to online service quality, value of construct reliability is greater than 0.6 and it indicates good construct reliability.

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Table 6. Factor loading values for all items of online service quality scale

Online Service Quality Dimensions	Statements	Factor Loading	AVE Values	CR Values
Information Quality	IQ1	0.680	0.439	0.610
	IQ3	0.645		
Website Design	WB2	0.679	0.427	0.748
	WB5	0.663		
	WB6	0.667		
	WB7	0.601		
Ease of Use	EU2	0.588	0.417	0.681
	EU3	0.673		
	EU4	0.672		
Reliability	RE3	0.667	0.445	0.707
	RE4	0.680		
	RE5	0.655		
Security and Privacy	SC1	0.667	0.403	0.770
	SC3	0.635		
	SC4	0.697		
	SC5	0.585		
	SC6	0.581		
Interactive Interrogation	II1	0.620	0.416	0.681
	II3	0.640		
	II6	0.673		
Personalization/Customization	P4	0.514	0.583	0.720
	P5	0.950		
Entertainment	E1	0.69	0.527	0.690
	E2	0.76		

5.3.2.2. Discriminant Validity:

Discriminant validity is the extent to which a construct is truly distinct from other constructs thus, high discriminant validity provides evidence that a construct is unique and captures some phenomena other measures do not (Hair et al., 2007). Discriminant validity is assured if a measure does not correlate very highly with other measures from which it is

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supposed to differ (O’Leary-Kelly and Vokurka, 1998). Accordingly to Fornell and Larcker (1981) discriminant validity is established if the AVE is larger than the squared of correlation coefficient of each constructs. In table 7 shown that the AVE value is larger than the squared of correlation coefficient of each constructs so it can be concluded that all the constructs of online service quality scale supported discriminant validity.

Table 7: Discriminant Validity Analysis

Online Service Quality Dimensions	I	II	III	IV	V	VI	VII	VIII
I. Interactive Interrogation	0.42							
II. Website Design	0.24	0.43						
III. Ease of Use	0.08	0.35	0.46					
IV. Personalization/ Customization	0.05	0.06	0.02	0.58				
V. Security and Privacy	0.26	0.30	0.27	0.01	0.40			
VI. Reliability	0.21	0.16	0.13	0.06	0.11	0.45		
VII. Information Quality	0.31	0.37	0.21	0.06	0.33	0.22	0.48	
VIII. Entertainment	0.31	0.36	0.27	0.008	0.36	0.50	0.28	0.527

*Bold number represents AVE values of the constructs.

5.3.3.3. Model Fit:

To check model fit online service quality model Chi Square/df statistic, Tucker Lewis Index (TLI) value and Comparative Fit Index value (CFI) were used (Table 8).

Table 8. Model fit indices

Type of Model Fit Index	Model Fit Index	Values
Absolute Fit Index	Chi-square/df	1.664
Relative Measure Indices	Comparative Fit Index (CFI)	0.892
	Tucker Lewis Index (TLI)	0.902

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In this research, Chi-square/df was used as an absolute fit index. As per Hu and Bentler (1999), value of Chi-square/df less than 2 indicate good model fit. For the model of online service quality Chi-square/df value was 1.584 and it indicates good model fit.

As per Hair et al. (2007), Tucker Lewis Index (TLI) value and Comparative Fit Index value (CFI) near to 0.9 indicates good model fit. The TLI and CFI values for the online service quality model were near to 0.9 and these values were indicating good model fit.

The goodness-of-fit indices suggested that the factor structure of the proposed eight constructs was well-established and it was concluded that online service quality comprises the facets of (1) Information quality, (2) Website design, (3) Ease of use, (4) Reliability, (5) Security and privacy, (6) Interactive interrogation, (7) Personalization/ Customization and (8) Entertainment.

5.4. Research Model

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Figure 1: Validated Research Model

6. Conclusion of the Study

This research identifies important online service quality dimensions. These dimensions were: (1) Information quality, (2) Website design, (3) Ease of use, (4) Reliability, (5) Security and privacy, (6) Interactive interrogation, (7) Personalization/Customization, (8) Entertainment. This research also gave validated model for measuring online service quality.

7. Implications of the Study

A pool of indicators for the antecedent factors of online service quality stood out, acting as a guide for online service provider to improve their online service quality.

8. Future Research:

It would be interesting and beneficial to use this model for measuring online service quality of different types of online services.

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APPENDIX A

Items of Online Service Quality

Online Service Quality Dimensions	Statements
Information	This online service provides sufficient and real time financial information.

Halvadia, N. & Patel, S. (2019). Online Service Quality: Scale Development and Validation. *Global Journal of Research in Management*, 9(1), 62-83
<https://search.proquest.com/openview/d87b45538def3fcd4a3637b8b8d4520c/1?pq-origsite=gscholar&cbl=2030941>

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Quality	All information provided by this online service is accurate.
Website Design	Website of online service provider is visually appealing.
	All the hyperlinks are well labeled.
	Design of online service provider's website enables me to complete my online transaction quickly.
	It is fun to browse and see what can be found on website of online service provider.
Ease of Use	Website of online service provider allows searching out something very easily in it.
	It is very easy to navigate from one page to other page in website of online service provider.
	This online service provides easy connectivity with website of other service providers.
Reliability	This online service provider performs the service correctly at the first time.
	This online service provider offers its services on 7 days and 24 hours.
	The website of online service provider allows accessing it from anywhere.
Security and Privacy	This online service gives feeling of security in providing sensitive information (e.g. credit card number) for online transaction on it.
	The privacy policy and security mechanism of this online service are good.
	This online service informs customer when any online transaction is finished.
	This online service has easy options for cancelling any online transactions.
	This online service protects online transaction data and bank information.
Interactive Interrogation	When problem occurs, this online service gives guidance.
	This online service allows exchanging opinion regarding services provided by it with other customers using discussion forum available on it.
	This online service provides electronic complain form.
Personalization/ Customization	This online service gives personalized response to queries.
	This online service gives feeling of unique customer.
Entertainment	This online service allows sharing its information on social networking websites.

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<https://search.proquest.com/openview/d87b45538def3fcd4a3637b8b8d4520c/1?pq-origsite=gscholar&cbl=2030941>

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	This online service allows me to interact with other customers of it using chat room.
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