JOURNAL OF INTERNET COMMERCE
2017, VOL. 16, NO. 1, 104–126
http://dx.doi.org/10.1080/15332861.2017.1283927

Routledge
Taylor & Francis Group

Developing a Website Service Quality Scale: A Confirmatory Factor Analytic Approach

Asad Ahmad and Mohammed Naved Khan

Department of Business Administration, Aligarh Muslim University, Aligarh, Uttar Pradesh, India

ABSTRACT

The surge in online consumers and their preference to buy over the Internet is nudging marketers to embrace e-commerce, but mere online presence without distinct user experience may not help attract and retain customers. Research suggests that website service quality is a determining factor in Internet buyer behavior. Several measurement tools have been used in the context of developed economies to measure e-service quality. The very few empirical researches in emerging economies, including India, motivated the researchers in the present study to refine the WEBQUAL 4.0 scale developed by Barnes and Vidgen (2002) to measure the service quality at shopping websites. The present study employs tools like SPSS 20.0 and AMOSS 20.0 to analyze the data through exploratory factor analysis and confirmatory factor analysis. Study results suggest a 14-item WEBQUAL four factor (*Ease of Use, Information Quality, Reliability*, and *Empathy*) scale that is appropriate for Indian settings.

KEYWORDS

E-commerce; India; refined WEBQUAL; website service quality

Introduction

The Internet is gradually metamorphosing from being only a communication medium into a marketing channel as well. The Internet user base has swelled from 2.92 billion in 2014 to 3.42 billion in 2016 (Internet Live Stats 2016a). Online social media offers an attractive platform for marketers to promote and sell their products and services (Biswas and Krishnan 2004; Sharma and Sheth 2004; Weis 2010; Hajli 2014). The Internet is empowering consumers to search and purchase products and services through the medium of the virtual world. The phenomenal growth in netizens and their tendency to purchase through the virtual world route is making retailers realize that e-commerce platforms with their unique enabling environment can help serve consumers better (Longstreet 2010). Although countries with developed infrastructure had first mover advantage vis-a-vis online shopping, emerging economies like India are also catching up fast.

Electronic commerce (popularly known as e-commerce) is a common model which uses information and communication technologies to do any

CONTACT Asad Ahmad asad7babar@gmail.com Department of Business Administration, Aligarh Muslim University, Aligarh-202002 (UP), India.

form of business transaction as well as information exchange (Gefen 2000). During the last decade, e-commerce-based solutions have registered tremendous growth, and online service providers have been quick to grab the opportunities to have a better grip on their customers (Li and Suomi 2007).

Among emerging economies, India has witnessed tremendous growth in online commerce. Currently, the total number of Internet users in India stands at 462 million and is ranked second in terms of Internet users after China (Internet Live Stats 2016b). According to a joint study by Internet and Mobile Association of India (IAMAI) and Boston Consulting Group (BCG), the projected e-commerce market in the year 2018 shall be around 75 billion USD (Shah, Jain, and Bajpai 2015). Globalization and the increasing number of Internet users are contributing to the emergence of a highly competitive online marketplace. Hence, the quality of service (i.e., e-service) rendered at the online platforms has become an important factor in gaining competitive advantage (Santos 2003; Yang, Jun, and Peterson 2004). It is necessary that e-retailers deliver superior service quality to their online patrons to build customer e-loyalty (Connolly 2008). To build e-loyalty, e-retailers have shifted focus from *pre-* to *post*-purchase stages (Lee and Whang 2001; Rabinovich and Bailey 2004; Cristobal, Flavián, and Guinalíu 2007; Rauyruen and Miller 2007; Ramanathan 2011).

There is a growing realization among e-retailers that something must be done about the *quality* of their websites. The absence of human interaction in e-service delivery has aggravated the matter (Cox and Dale 2001; Grigoroudis et al. 2008; Leonidio, Montezano, and Carvalho 2011). Technology can never replace certain aspects of human interaction like courtesy, friendliness, helpfulness, care, commitment, flexibility, and cleanliness. Hence, to tackle their absence, e-retailers should employ web-based tools and offer better user experience to satisfy their consumers (Zeithaml 2002; Van Iwaarden et al. 2004; Cyr, Head, and Larios 2010; Cebi 2013; Ahmad, Rahman, and Khan 2016). Website quality plays an important role in weaving and communicating the *right* image of e-retailers in the backdrop of cultural differences (Robbins and Stylianou 2003; Flavián, Guinalíu, and Gurrea 2006; Nantel and Glaser 2008; Deng and Poole 2012; Cebi 2013). E-service quality has the potential to deliver in both strategic terms and also contribute to operational efficiency and profitability (Zeithaml 2002; Cronin 2003). A vital task of e-retailers is that they must understand ways to make the customers loyal to their websites (Reichheld and Schefter 2000; Kim and Stoel 2004; Bauer, Falk, and Hammerschmidt 2006). In fact, it is the distinctiveness in service offered by e-retailers which holds the potential to attract and retain the consumers, and transform them into *loyal* customers (Oliveira, Roth, and Gilland 2002; Li and Suomi 2007; Lu, Zhao, and Wang 2010; Othmani and Bouslama 2015).

Globally, researchers have shown interest in investigating online consumer behavior (Park and Jun 2003; May So, Danny Wong, and Sculli 2005; Haque et al. 2007; Cho and Jialin 2008; Hashim, Ghani, and Said 2009; Hasan 2010; Ahmad and Khan 2015; Ahmad et al. 2016). In the context of online platforms, website quality has been found to be an influencing factor determining Internet buyer behavior (Childers et al. 2002; Tamimi, Rajan, and Sebastianelli 2003; Fogg et al. 2003; Cheung et al. 2003; Constantinides 2004; George 2004; Lavie and Tractinsky 2004; Bottomley and Doyle 2006; Lorenzo, Gomez, and Molla 2007; Van Schaik and Ling 2009; Cyr et al. 2010; Deng and Poole 2012; Cebi 2013; Ahmad et al. 2016). In virtual markets, researchers have acknowledged the vital role of perceived service quality (Lu et al. 2010; Othmani and Bouslama 2015).

To measure the e-service quality being delivered at the online platforms, researchers have suggested several tools like PIRQUAL (Francis and White 2002), WEBQUAL 4.0 (Barnes and Vidgen 2002), E-S-QUAL and E-Res-QUAL (Parasuraman, Zeithaml, and Malhotra 2005), eTransQual (Bauer et al. 2006), e-SELFQUAL (Ding, Hu, and Sheng 2011), and modified eTailQ scale (Ahmad et al. 2016). Use of scales designed in the context of developed economies for understanding the behavior of consumers in emerging economies like India is a matter of concern (Ahmad et al. 2016). WEBQUAL 4.0 is considered to be one of the most widely accepted and validated scales to measure service quality (Barnes and Vidgen 2005; Tarigan 2009; Oztekin 2011; Medyawati and Mabruri 2012; Goswami 2013; Shahin, Khazaei Pool, and Poormostafa 2014; Khoiriyah and Subriadi 2016). Thus, the present study attempts to refine and validate the original 22-item three factor (i.e., usability, information quality, and service interaction quality) WEBQUAL 4.0 scale in Indian context.

Literature review

Services over the Internet provide innovative substitutes to online consumers. E-service is actually web services delivered via the Internet (Zeithaml, Parasuraman, and Malhotra 2000). Motivations like convenience, cost effectiveness, and control over service processes are some factors which encourage e-consumers (Bateson 1985; Dabholkar 1996; Meuter et al. 2000; Goswami 2013; Ahmad and Khan 2015). In comparison to traditional services, e-services are different in terms of human interactions, courtesy, cordiality, comfort, and cleanliness which cannot be made available online (Cox and Dale 2001; Leonidio et al. 2011). The characteristics of services being intangible and heterogeneous makes it difficult to measure service quality (Parasuraman, Zeithaml, and Berry 1985). Zeithaml and colleagues (2000) defined e-service quality as the extent to which a website enables efficient and effective shopping, purchasing, and delivery of products and services.

The satisfaction of consumers is based on the comparison of the expected and perceived level of service (Loiacono, Watson, and Goodhue 2000). The services provided are thought to be of excellent quality if the perceived level is more than that of the expected service level (Parasuraman et al. 1985). The research domain dealing with quality of the services being offered on the Internet (i.e., e-service quality) has drawn the attention of marketers and researchers alike (Goswami 2013). The Internet provides marketers with an opportunity to provide customized products and services to their consumers using the feedback of the customers (Rowley 2006).

The quality of information and entertainment play a vital role in the evaluation of websites (Ducoffe 1996; Richard 2005). Consumers browse the Internet in search of information and enjoyment (Katerattanakul 2002). Factors like hedonism and utilitarian value contribute significantly to website quality (Wolfinbarger and Gilly 2001; Bauer et al. 2006). However, online shoppers do worry about factors like security, privacy, delivery, and inability to touch and feel the product (Swinyard and Smith 2003; George 2004; Zhou, Dai, and Zhang 2007). Trust and perceived risk play an important role in consumers' intention to transact online (Mitchell 2001; Lim 2003; Corbitt, Thanasankit, and Yi 2003; Smith and Sivakumar 2004; Boksberger, Bieger, and Laesser 2007; Chang 2008; Akinci, Atilgan-Inan, and Aksoy 2010; Hsu, Hung, and Tang 2012; Janita and Miranda 2013). Negative word-of-mouth also plays a vital role in the consumer decision process to shop online (East, Hammond, and Wright 2007; Cheung and Lee 2008; Bambauer-Sachse and Mangold 2011; Verhagen, Nauta, and Feldberg 2013).

Measurement of website service quality

With the growing popularity of the Internet and e-commerce, academicians and marketers have realized the importance of website quality. Measurement scales developed by various researchers that deal with service and website service quality are presented in Table 1. Zeithaml and colleagues (2000) developed an 11-dimension e-SQ scale to measure e-service quality. Yoo and Donthu (2001) came up with SITEQUAL scale to measure the service quality of Internet shopping websites. Parsuraman and colleagues (2005) developed the E-S-QUAL and E-Res-QUAL scale using the e-SQ scale. These studies provided impetus to other researchers in developing scales like PIRQ-UAL (Francis and White 2002), Webqual (Loiacono, Watson, and Goodhue 2002), eTailQ (Wolfinbarger and Gilly 2003), eTransQual (Bauer et al. 2006), and e-SELFQUAL (Ding et al. 2011). Udo, Bagchi, and Kirs (2008) developed a scale named e-SERVPERF keeping in view the expectations and perceptions of Internet consumers. The E-SELFQUAL scale was developed by Ding and colleagues (2011) to measure e-service quality and its effect on customer satisfaction. The E-merQUAL scale (Janita and Miranda

Table 1. Major scales for measuring website service quality.

Scale	Author/Year	Factors studied	Study focus
E-SQ	Zeithaml et al. (2000)	Reliability, responsibility, access, flexibility, ease of navigation, efficiency, assurance/trust, security, price knowledge, site aesthetics, customization/personalization	Service quality of online shopping sites
WebQualTM	Loiacono, Watson, and Goodhue (2000)	Informational fit to task, interactivity, trust, response time, design appeal, intuitiveness, visual appeal, innovativeness, flow, integrated communication, business process, substitutability	Website quality
SITEQUAL	Yoo and Donthu (2001)	Ease of use, aesthetic design, processing speed, and security	E-retailers website quality
WEBQUAL 4.0	Barnes and Vidgen (2002)	Website usability, information quality, and service interaction	Website quality
PIRQUAL	Francis and White (2002)	Web Store Functionality, Product attribute description, ownership conditions, delivered products, customer service, and security	E-retailing quality
ETAILQ	Wolfinbarger and Gilly (2003)	Website design, reliability, privacy/ security, and customer service	E-tail quality
E-S-QUAL and E-Res-QUAL	Parsuraman et al. (2005)	Efficiency, system availability, fulfillment, privacy, responsiveness, compensation, and contact	E-service quality
eTransQual	Bauer et al. (2006)	Functionality/Design, enjoyment, process, reliability, and responsiveness	Service quality in e-shopping
SERVPERF	Udo et al. (2008)	Service convenience, perceived risk, and website content	Perceived e-service quality
E-PS-QUAL	Connolly et al. (2010)	Efficiency, ease of completion, system availability, privacy, contact, and perceived public value	Government website service quality
E-SELFQUAL	Ding et al. (2011)	Perceived control, service convenience, customer service, and service fulfillment	Online service quality and consumer satisfaction
E-merQUAL	Janita and Miranda (2013)	Reliability and privacy, efficiency, value-added services, and information usefulness	Service quality of B2B e-market places

Source: Prepared by researchers.

2013) was developed to study the service quality dimensions in B2B e-marketplaces.

Barnes and Vidgen (2002) developed WEBQUAL 4.0, which is a commonly used scale to measure the website quality of online shopping sites. The WEBQUAL scale is based on the widely accepted SERVQUAL scale developed by Parasuraman, Zeithaml, and Berry (1988). Barnes and Vidgen started developing the WEBQUAL scale in the year 1998, and the first version of the scale, WEBQUAL 1.0, was developed in the year 2000. Over the years, the scale was refined iteratively, leading to different versions of the scale (i.e., WEBQUAL 2.0 [2001], WEBQUAL 3.0 [2001], and WEBQUAL 4.0 [2002]). The WEBQUAL scale comprises three main dimensions: *Usability, Information*

Table 2. Advantages of WebQual 4.0.

Author(s)/Year	Advantages
Barnes and Vidgen (2005)	Scale relies on various information systems sources and thus can be effectively employed for assessing such systems.
Tarigan (2009)	Scale uses consumers' perceptions in determining overall rating of e-commerce websites.
Levis et al. (2008)	It is well-structured and aids in exploring the service quality by relying on the consumer's voice.
Oztekin (2011)	It supports the decision-making process by transmuting the qualitative assessments of the consumers into quantitative metrics.
Medyawati and Mabruri (2012)	The scale dimensions have been formulated with several iterations based on the perceptions of the website's end user.
Al-Manasra et al. (2013)	The scale has been used in the evaluation of various sites like that of universities, online auction sites, online book stores, and government portals. Thus, it is a good scale to measure e-service quality.
Goswami (2013)	The scale has helped the marketers in better designing of the websites which affect the interaction perceptions of the users.
Hengki (2014)	Here, the scale is the final version of the WebQual scale, which helps in evaluating the service quality of various e-commerce websites.
Shahin et al. (2014)	WebQual is based on the expectations and perceptions of the users, and also measures user satisfaction with various websites.
Hasanov and Khalid (2015)	It is useful in measuring the quality of Internet commerce websites.

Source: Prepared by researchers.

Quality, and *Service Interaction Quality*. It is one of the most interesting scales by research judgment owing to its four versions (Tarigan 2009). It facilitates marketers in transforming qualitative assessments into quantitative measures (Oztekin 2011). The scale has been criticized on the ground that it does not focus on websites, and its only focus is on the experience of the Internet users (Chen and Chang 2010). The scale also fails to be a scale of general use (Liu and Goodhue 2008). The scale is transaction-specific and hence fails to capture the overall service quality (Connolly, Bannister, and Kearney 2010). Irrespective of the criticism, it has been widely used by researchers in the studies related to website service quality (Park and Baek 2007; Tarigan 2009; Levis, Brady, and Helfert 2008; Chen and Chang 2010; Leonidio et al. 2011; Medyawati and Mabruri 2012; Goswami 2013; Al-Manasra et al. 2013; Hengki 2014; Shahin et al. 2014; Rahayu and Andika 2014; Hasanov and Khalid 2015). Table 2 provides a brief summary of the advantages of the WEBQUAL 4.0 over other scales.

Research methodology

Scale development

A pilot study was conducted, and respondent feedback was used to edit and modify the content, and rephrase the scale items wherever required. Responses were generated from online shoppers using a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The researchers

Table 3. WEBQUAL 4.0 scale.

Item	Dimension	Code
I find the site easy to learn to operate	USABILITY	US1
My interaction with the site is clear and understandable		US2
I find the site easy to navigate		US3
I find the site easy to use		US4
The site has an attractive appearance		US5
The design is appropriate to the type of site		US6
The site conveys a sense of competency		US7
The site creates a positive experience for me		US8
Provides accurate information	INFORMATION	IN1
Provides believable information		IN2
Provides timely information		IN3
Provides relevant information		IN4
Provides easy to understand information		IN5
Provides information at the right level of detail		IN6
Presents the information in an appropriate format		IN7
Has a good reputation	SERVICE INTERACTION	SI1
It feels safe to complete transactions		SI2
My personal information feels secure		SI3
Creates a sense of personalization		SI4
Conveys a sense of community		SI5
Makes it easy to communicate with the organization		SI6
I feel confident that goods/services will be delivered as promised		SI7

Source: Barnes and Vidgen (2002).

subsequently refined the 22-item, three factor WEBQUAL 4.0 scale (Table 3) suggested by Barnes and Vidgen (2002).

Sample

Fifty percent of India's population is younger than 25 years of age (Heslop 2014). This is also reflected in the profile of Internet users in India with as much as 75% of them falling in the age band of 15–24 years (Statista.com 2013). Globally, students tend to be active users of the Internet, prefer online platforms to perform various activities, and are considered to represent behavioral patterns of non-students (Yoo and Donthu 2001; Jones 2002; Guth, Schmidt, and Sutter 2007; Abeler, Becker, and Falk 2014). The respondents in the present study too were graduate and post-graduate students of a university funded by the federal government of India. Such universities in India primarily cater to students with roots in the burgeoning market-friendly middle class strata of the society (Heslop 2014). Further, the middle class is considered to be representative of the entire population (Shabnam 2012). Thus, the sample may be deemed to be representative of the population of interest.

Data collection

A structured questionnaire was used to collect data from graduate and post-graduate students who were actual online shoppers. Researcher-controlled

Table 4. Profile of respondents.

Characteristic	Frequency
Educational background	
Commerce & Management	98
Engineering & Technology	72
Age	
15–20 years	31
21–30 years	119
>30 years	20
Gender	
Male	97
Female	73
Family income (per month, INR)	
Less than 30,000	43
30,00–50,000	97
More than 50,000	30
Device used to access Internet	
Laptop/Desktop	76
Mobile/Tablets	94

sampling was employed for data collection. The researchers made it a point to personally administer pen-and-pencil-based questionnaires to students at different locations in the university campus. The presence of researchers helped in clearing doubts (if any), resulting in better quality of responses (Strange et al. 2003; Dornyei and Taguchi 2010). A total of 190 questionnaires were administered, of which 185 were completed and returned. Of these, 170 were fit for further analysis, resulting in a response rate of 89%. Table 4 provides a summary of the profile of respondents.

Findings

Exploratory factor analysis

Exploratory factor analysis (EFA) was performed using SPSS 20. The factor extraction was based on the principal component analysis with varimax rotation and Kaiser Normalization. The scale refinement process was performed through repeated iterations, and items with low factor loadings (<0.4) were dropped (Kline 1994; Büyüköztürk et al. 2004; Metin et al. 2012), resulting in a refined scale of 14 items. The rotated component matrix resulted in the extraction of four variables: *Ease of Use, Information Quality, Reliability*, and *Empathy*. It is to be noted that the original WEBQUAL 4.0 scale comprised three dimensions, but in the present study, EFA resulted in four factors relevant for determining the website service quality. The correlation of the factors within the variables was established through the Bartlett's Test of Sphericity (BTS). A practical level of common variance for the scale items was shown by the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy. The KMO was found to be 0.736, which is greater than the suggested value of 0.6 (Khan and Adil 2013).

Table 5. Results of factor analysis.

Statements	Factor Loadings	Construct Reliability
Ease of use		
Operating the website is easy for me	.852	.819
Interaction with the website is clear to me	.848	
Navigation is easy on this website	.692	
Using the website is easy for me	.752	
Information quality		
Information provided by the website is believable	.955	.960
I get timely information on the website	.955	
Information on the website is relevant	.914	
Reliability		
Website has a good reputation	.598	.773
I feel safe while completing my transactions	.803	
I feel secure about my personal information	.815	
Website is trustworthy	.767	
Empathy		
Website conveys a sense of community	.851	.737
Website creates a sense of personalization	.627	
It is easy to communicate with the organization	.881	
KMO: 0.736, BTS = 1,610.742, Total Variance Explained: 71.1%		

Note. Extraction method: principal component analysis; Rotation method: Varimax with Kaiser Normalization; rotation converged in five iterations.

The Cronbach's alpha values for all four variables were found to be in the acceptable range of 0.737 to 0.960. The first variable (Ease of Use), represented by four items, had an alpha value of 0.819. The second and third variables (Information Quality and Reliability), each represented by three-item and four-item scales, had alpha values of 0.960 and 0.773, respectively. The fourth variable (Empathy), comprising three items, had an alpha value of 0.737. Thus, the scale was found to be reliable with Cronbach's alpha values of more than 0.6 for all four variables (Hair et al. 1998; Kerlinger and Lee 2000; Khan and Adil 2013). The EFA results are presented in Table 5.

Confirmatory factor analysis (CFA)

The results of EFA have certain inherent limitations. For instance, items which load on more than one variable cannot be described, although they correlate statistically (Ahire, Golhar, and Waller 1996; Khan and Adil 2013). CFA is a recommended procedure to overcome the limitations of the EFA (Lee 2008; Khan and Adil 2013). Thus, using AMOSS 20, CFA was performed on the four factors (Ease of Use, Information Quality, Reliability, and Empathy). The item loadings on each factor were specified, and the hypothesized measurement model (Measurement Model) was then tested for model fit.

The loadings of the items for the four variables are given in Figure 1 and Table 6. The scale items loaded onto their respective factors, and all the

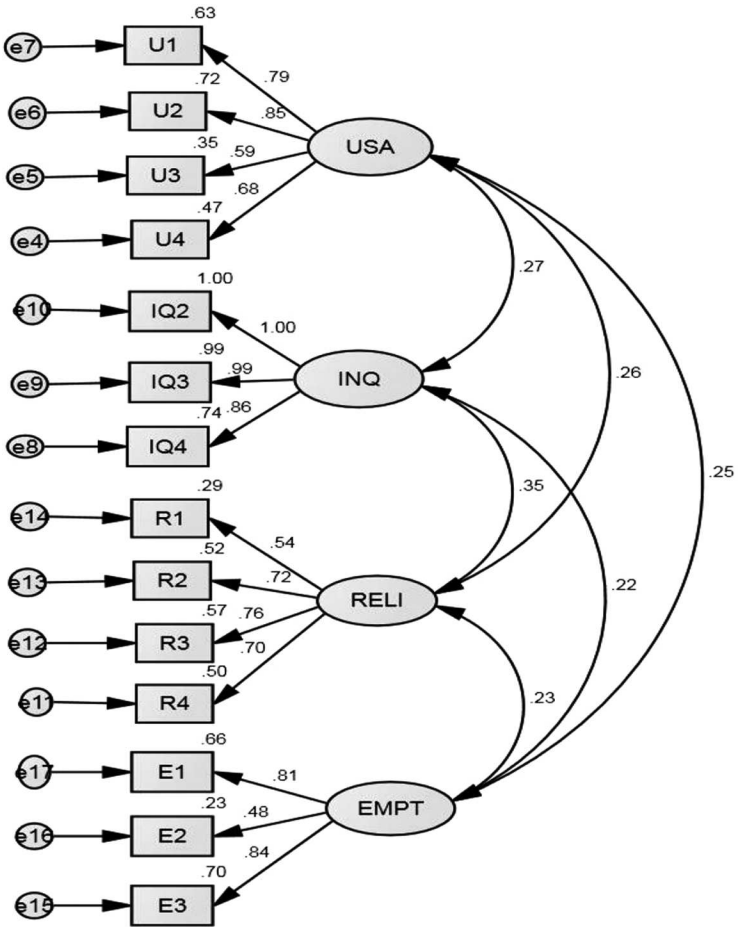

Figure 1. Measurement model.

Table 6. Standardized regression weights (CFA).

	Estimate
U4← USA	.682
U3← USA	.593
U2← USA	.850
U1← USA	.794
IQ4← INQ	.863
IQ3← INQ	.994
IQ2← INQ	.999
R4← RELI	.705
R3← RELI	.755
R2← RELI	.719
R1← RELI	.542
E3← EMPT	.835
E2← EMPT	.476
E1← EMPT	.812

Table 7. Fit indices of measurement model (CFA).

Fit index	Recommended values*	Observed values
CMIN/DF	<3.0	1.835
GFI	0.90	0.907
AGFI	0.90	0.862
NFI	0.90	0.922
CFI	0.90	0.962
RMSEA	<0.070	0.070

Source: Hu and Bentler (1998); Hooper, Coughlan, and Mullen (2008); Hair et al. (2010); Malhotra and Dash (2011).

loadings were within the acceptable range (i.e., >0.4) suggested by Ryu, Han, and Jang (2010). To assess the measurement model, the researchers used the methodology suggested by Gerbing and Anderson (1988). The summary of the accepted and observed values for the fit indices is presented in Table 7. The overall model fit indices show that except for AGFI, goodness-of-fit measure was within the acceptable range.

The GFI, CFI, and NFI values were higher than the desired minimum value of 0.9, with CMIN/DF = 1.835 and RMSEA = 0.070. The value of AGFI was found to be slightly lower than the minimum desired value of 0.9. Chi-square measure was found to be in the acceptable range with a significant value of 130.311 and 71 degrees of freedom (df) ($p < .05$).

To measure the validity of the scales, a look at average variance extracted (AVE) has been suggested by several researchers (Fornell and Larcker 1981; Hair et al. 2010). For the present study, the researchers have also applied the measure of AVE to assess the discriminant and convergent validity of the scale. Except for *Reliability*, where the value was 0.470, AVE values for all remaining variables were above 0.5, indicating adequate convergent validity (Adil, Akhtar, and Khan 2013; Fornell and Larcker 1981; O'Leary-Kelly and Vokurka 1998; Hair et al. 2010; Khan and Adil 2013). The results of the scale validity (Table 8) indicate adequate discriminant validity, as the square root of AVE (diagonal values highlighted in Table 8) for each construct is greater than inter-construct correlation (Adil, Akhtar, and Khan 2013; Fornell and Larcker 1981; O'Leary-Kelly and Vokurka 1998; Hair et al. 2010; Khan and Adil 2013).

The composite reliability (CR) for each factor ranged from 0.761 to 0.968. Thus, the values were quite satisfactory, being higher than the desired value of 0.70, indicating adequate scale reliability (Fornell and Larcker 1981; Hair et al. 2010; Malhotra and Dash 2011).

Table 8. Reliability and validity.

	CR	AVE	RELI	USA	INQ	EMPT
RELI	0.777	0.470	**0.685**			
USA	0.823	0.542	0.263	**0.736**		
INQ	0.968	0.910	0.349	0.274	**0.954**	
EMPT	0.761	0.528	0.233	0.251	0.255	**0.726**

Discussion

The Internet is being widely used by marketers to interact with customers. Thus, the Internet-based services accessed by the customers are of major concern. Marketers are not only interested in acquiring customers in today's competitive environment, but also in retaining them by delivering a memorable experience (Li and Suomi 2007). The basic strategy to attain this goal is to provide improved service quality to the online customers. E-commerce is expected to dominate the business landscape in the years to come, and thus researchers have emphasized the need to develop valid and reliable scales to measure website quality (Porter 2001; Loiacono et al. 2002; Constantinides 2004; Bottomley and Doyle 2006; Cyr et al. 2010; Ahmad and Khan 2015; Ahmad et al. 2016). It is in this context that researchers in the present study have attempted to measure and explore various dimensions of website service quality. As already explained, researchers employed the modified and refined version of the WEBQUAL 4.0 scale suggested by Barnes and Vidgen (2002). The original WEBQUAL 4.0 scale comprised three dimensions: *Usability*, *Information Quality*, and *Service Interaction Quality*. Analysis of the study data yielded a refined scale comprising four factors: *Ease of Use, Information Quality, Reliability*, and *Empathy* (Table 9). Alterations in such scales are not new in this type of research (Connolly et al. 2010). The four-factor scale

Table 9. Dimensions examined in selected studies.

Dimensions	Selected studies
Ease of Use	(DeLone and McLean 1992; Zeithaml et al. 2000; Yoo and Donthu 2001; Madu and Madu 2002; Barnes and Vidgen 2002; Gefen et al. 2003; Kim and Stoel 2004; Park and Baek 2007; Tarigan 2009; Levis et al. 2008; Smith and Eroglu 2009; Connolly et al. 2010; Sumak et al. 2011; Chen and Tseng 2012; Chow et al. 2012; Li, Tan, and Xie 2012; Chen and Chang 2010; Leonidio et al. 2011; Medyawati and Mabruri 2012; Al-Manasra et al. 2013; Hengki 2014; Shahin et al. 2014; Rahayu and Andika 2014; Hasanov and Khalid 2015)
Information Quality	(Davis, Bagozzi, and Warshaw 1992; Loiacono, Watson, and Goodhue 2000; Venkatesh and Davis 2000; Barnes and Vidgen 2002; Francis and White 2002; Park and Baek 2007; Tarigan 2009; Levis et al. 2008; Chen and Chang 2010; Liu et al. 2010; Leonidio et al. 2011; Pai and Huang 2011; Chow et al. 2012; Medyawati and Mabruri 2012; Chen and Tseng 2012; Janita and Miranda 2013; Goswami 2013; Al-Manasra et al. 2013; Hengki 2014; Shahin et al. 2014; Rahayu and Andika 2014; Hasanov and Khalid 2015)
Reliability	(Zeithaml et al. 2000; Loiacono, Watson, and Goodhue 2000; Yoo and Donthu 2001; Francis and White 2002; Barnes and Vidgen 2002; Wolfinbarger and Gilly 2003; Yang et al. 2004; Parsuraman et al. 2005; Bauer et al. 2006; Park and Baek 2007; Tarigan 2009; Levis et al. 2008; Sangeeta Sahney 2008; Chen and Chang 2010; Connolly et al. 2010; Kim et al. 2011; Leonidio et al. 2011; Medyawati and Mabruri 2012; Khare et al. 2012; Goswami 2013; Janita and Miranda 2013; Al-Manasra et al. 2013; Hengki 2014; Shahin et al. 2014; Pappas et al. 2014; Rahayu and Andika 2014; Hasanov and Khalid 2015)
Empathy	(Parasuraman et al. 1988; Gronroos et al. 2000; Li et al. 2012; Barnes and Vidgen 2002; DeLone and McLean 2003; Lin 2007; Park and Baek 2007; Tarigan 2009; Levis et al. 2008; Chen and Chang 2010; Leonidio et al. 2011; Medyawati and Mabruri 2012; Goswami 2013; Al-Manasra et al. 2013; Hengki 2014; Shahin et al. 2014; Rahayu and Andika 2014; Hasanov and Khalid 2015)

Source: Prepared by researchers.

comprising usability, information quality, reliability, and empathy, suggested by Park and Baek (2007), closely resembles the present scale.

Ease of use

Ease of Use (EOU) is the degree of an individual's belief that using a system would be free from any difficulty (Cao, Zhang, and Seydel 2005). It is an important factor that determines the behavioral intention of the individual using the Internet (Davis 1989). Prior studies have shown that the effect of EOU diminishes as familiarity with the information system increases. Enhanced EOU has the potential of improving website performance and thereby generating positive views in the minds of users (Lu et al. 2003). It boosts the efficiency of using the services and hence is a vital determinant of the service quality (Ribbink et al. 2004).

Information quality

Information quality is a measure of the perceived output of a website from the consumers' perspective (Lin 2007). Internet users' perception of the capability of the website increases if they find quality information (Pai and Huang 2011). Thus, the information provided must be accurate and relevant (Cao et al. 2005). Characteristics like accuracy, completeness, up-to-date information, and the style of presentation have been found to be important factors determining the perceived information quality (DeLone and McLean 2003; Lin 2007). The website developers must have the ability to deliver tailored information through their websites (Loiacono, Watson, and Goodhue 2007). There exists a positive relationship between the usability of websites and the information quality (Venkatesh and Davis 2000; Cao et al. 2005; Pai and Huang 2011).

Reliability

Reliability is the extent to which online buyers believe in the credibility of the website, and it has been found to be the top concern of Internet buyers (Wolfinbarger and Gilly 2003). Perceived reliability is an important factor in determining consumer behavior in the context of online environment, and once Internet users perceive that reliability has been compromised, no purchase will be made (Cao et al. 2005). Shopping over the Internet is considered to be risky, hence reliability of websites plays an important role in the consumer decision-making process (Pappas et al. 2014).

Empathy

Empathy refers to the care and individualized attention delivered to online buyers at Internet portals. It includes customized information (through

e-mail) and personal attention provided to consumers (Lin 2007). It is the manifestation of response mechanisms that helps in enhancing the communication quality of websites (Cao et al. 2005). Empathy includes availability dimensions like e-mail, chat rooms, bulletin boards, mailing lists, frequently asked questions, and multiple-language options (Chen 2001; Cai and Jun 2003). Empathy has also been found to be an important factor in determining the service quality of websites (Ahn, Ryu, and Han 2007; Goswami 2013; Di Fatta, Musotto, and Vesperi 2016).

Conclusion and recommendations

Marketers active in the digital world must be aware of the factors that influence consumers' dispositions toward e-shopping. They must strategize on satisfying online consumers by identifying and prioritizing their interests and concerns. Marketers also must work on improving the interactivity and fun elements of the medium. In this context, a significant contribution of the present study is that it presents a refined, validated, reliable, and shorter scale to measure website quality of online shopping websites. This study also adds to better understanding of WEBQUAL 4.0 from the point of view of its applicability in Indian settings. In order to gain competitive advantage, online players must focus on four factors: Ease of Use, Information Quality, Reliability, and Empathy. The results of the present study are also expected to provide valuable insights to the academicians from the point of view of better conceptualization of the refined scale.

Limitations and future research suggestion

As researcher-controlled sampling was employed, the study findings should be generalized with caution. Future researchers must validate the present study's findings using a more representative probability-based sample. The geographical extent of the study was limited to the student respondents from a central university located near the national capital of India. This too may restrict the generalizability of the study results. The present study is based on the website quality of online shopping sites. Thus, future researchers may validate the findings in the context of other types of Internet sites. Furthermore, researchers can extend and improve the proposed scale by including other relevant website-specific factors derived from the literature.

References

Abeler, J., A. Becker, and A. Falk. 2014. Representative evidence on lying costs. *Journal of Public Economics* 113:96–104. doi:10.1016/j.jpubeco.2014.01.005.

Adil, M., A. Akhtar, and M. N. Khan. 2013. Refinement of Internet banking service quality scale: A confirmatory factor analysis approach. *International Journal of Services and Operations Management* 14 (3):336–54. doi:10.1504/ijsom.2013.052094.

Ahire, S. L., D. Y. Golhar, and M. A. Waller. 1996. Development and validation of TQM implementation constructs. *Decision Sciences* 27 (1):23–56. doi:10.1111/j.1540-5915.1996.tb00842.x.

Ahmad, A., and M. N. Khan. 2015. Mapping online buyer behavior: A critical review of empirical studies. *Pacific Business Review International* 8 (2):37–48.

Ahmad, A., O. Rahman, and M. N. Khan. 2016. Consumer's perception of website service quality: An empirical study. *Journal of Internet Commerce* 15 (2):125–41. doi:10.1080/15332861.2016.1144442.

Ahn, T., S. Ryu, and I. Han. 2007. The impact of web quality and playfulness on user acceptance of online retailing. *Information & management* 44 (3):263–75. doi:10.1016/j.im.2006.12.008.

Akinci, S., E. Atilgan-Inan, and S. Aksoy. 2010. Re-assessment of E-S-Qual and E-Recs-Qual in a pure service setting. *Journal of Business Research* 63 (3):232–40. doi:10.1016/j.jbusres.2009.02.018.

Al-Manasra, E., M. Khair, S. A. Zaid, and F. TaherQutaishat. 2013. Investigating the impact of website quality on consumers' satisfaction in Jordanian telecommunication sector. *Arab Economic and Business Journal* 8 (1):31–37. doi:10.1016/j.aebj.2013.11.004.

Bambauer-Sachse, S., and S. Mangold. 2011. Brand equity dilution through negative online word-of-mouth communication. *Journal of Retailing and Consumer Services* 18 (1):38–45. doi:10.1016/j.jretconser.2010.09.003.

Barnes, S. J., and R. T. Vidgen. 2002. An integrative approach to the assessment of e-commerce quality. *Journal of Electronic Commerce Research* 3 (3):114–27.

Barnes, S. J., and R. Vidgen. 2005. The eQual approach to the assessment of e-commerce quality: A longitudinal study of Internet bookstores. *Web Engineering* 1:161–81. doi:10.4018/978-1-59140-432-3.ch007.

Bateson, J. E. 1985. Self-service consumer: An exploratory study. *Journal of Retailing* 61 (3):49–76.

Bauer, H. H., T. Falk, and M. Hammerschmidt. 2006. eTransQual: A transaction process-based approach for capturing service quality in online shopping. *Journal of Business Research* 59 (7):866–75. doi:10.1016/j.jbusres.2006.01.021.

Biswas, A., and R. Krishnan. 2004. The Internet's impact on marketing: Introduction to the JBR special issue on "Marketing on the web—Behavioral, strategy and practices and public policy." *Journal of Business Research* 57 (7):681–84.

Boksberger, P. E., T. Bieger, and C. Laesser. 2007. Multidimensional analysis of perceived risk in commercial air travel. *Journal of Air Transport Management* 13 (2):90–96. doi:10.1016/j.jairtraman.2006.10.003.

Bottomley, P. A., and J. R. Doyle. 2006. The interactive effects of colors and products on perceptions of brand logo appropriateness. *Marketing Theory* 6 (1):63–83. doi:10.1177/1470593106061263.

Büyüköztürk, Ş., Ö. E. Akgün, Ö. Özkahveci, and F. Demirel. 2004. The validity and reliability study of the Turkish version of the motivated strategies for learning questionnaire. *Educational Sciences: Theory & Practice* 4 (2):207–39.

Cai, S., and M. Jun. 2003. Internet users' perceptions of online service quality: A comparison of online buyers and information searchers. *Managing Service Quality: An International Journal* 13 (6):504–519.

Cao, M., Q. Zhang, and J. Seydel. 2005. B2C e-commerce web site quality: An empirical examination. *Industrial Management & Data Systems* 105 (5):645–61. doi:10.1108/02635570510600000.

Cebi, S. 2013. A quality evaluation model for the design quality of online shopping websites. *Electronic Commerce Research and Applications* 12 (2):124–35. doi:10.1016/j.elerap.2012.12.001.

Chang, H. H. 2008. Intelligent agent's technology characteristics applied to online auctions' task: A combined model of TTF and TAM. *Technovation* 28 (9):564–77. doi:10.1016/j.technovation.2008.03.006.

Chen, K. 2001. *The impacts of cyber-interactivity on business web sites quality*. Proceedings of the 32nd Annual Conference of the Decision Sciences Institute, San Francisco, CA.

Chen, H. R., and H. F. Tseng. 2012. Factors that influence acceptance of web-based e-learning systems for the in-service education of junior high school teachers in Taiwan. *Evaluation and Program Planning* 35 (3):398–406.

Chen, L. S., and P. C. Chang. 2010. Identifying crucial website quality factors of virtual communities. *Proceedings of the International MultiConference of Engineers and Computer Scientists 2010* (vol. 1, pp. 487–92).

Cheung, C. F., W. B. Lee, W. M. Wang, K. F. Chu, and S. To. 2003. A multi-perspective knowledge-based system for customer service management. *Expert Systems with Applications* 24 (4):457–70. doi:10.1016/s0957-4174(02)00193-8.

Cheung, C. M., and M. K. Lee. 2008. Online consumer reviews: Does negative electronic word-of-mouth hurt more? *AMCIS 2008 Proceedings*, 143.

Childers, T. L., C. L. Carr, J. Peck, and S. Carson. 2002. Hedonic and utilitarian motivations for online retail shopping behavior. *Journal of Retailing* 77 (4):511–35. doi:10.1016/s0022-4359(01)00056-2.

Cho, H., and S. K. Jialin. 2008. Influence of gender on Internet commerce: An explorative study in Singapore. *Journal of Internet Commerce* 7 (1):95–119. doi:10.1080/15332860802004394.

Chow, M., D. K. Herold, T. M. Choo, and K. Chan. 2012. Extending the technology acceptance model to explore the intention to use Second Life for enhancing healthcare education. *Computers & Education* 59 (4):1136–1144.

Connolly, R. May 2008. Website service quality in Ireland: An empirical study. *International Conference on Web Information Systems and Technologies*. Springer Berlin Heidelberg (pp. 321–32).

Connolly, R., F. Bannister, and A. Kearney. 2010. Government website service quality: a study of the Irish revenue online service. *European Journal of Information Systems* 19 (6):649–67. doi:10.1057/ejis.2010.45.

Constantinides, E. 2004. Influencing the online consumer's behavior: The web experience. *Internet Research* 14 (2):111–26. doi:10.1108/10662240410530835.

Corbitt, B. J., T. Thanasankit, and H. Yi. 2003. Trust and e-commerce: A study of consumer perceptions. *Electronic Commerce Research and Applications* 2 (3):203–15. doi:10.1016/s1567-4223(03)00024-3.

Cox, J., and B. G. Dale. 2001. Service quality and e-commerce: An exploratory analysis. *Managing Service Quality: An International Journal* 11 (2):121–31. doi:10.1108/09604520110387257.

Cristobal, E., C. Flavián, and M. Guinalíu. 2007. Perceived e-service quality (PeSQ) measurement validation and effects on consumer satisfaction and web site loyalty. *Managing Service Quality: An International Journal* 17 (3):317–40. doi:10.1108/09604520710744326.

Cronin Jr., J. J. 2003. Looking back to see forward in services marketing: Some ideas to consider. *Managing Service Quality: An International Journal* 13 (5):332–37. doi:10.1108/09604520310495813.

Cyr, D., M. Head, and H. Larios. 2010. Colour appeal in website design within and across cultures: A multi-method evaluation. *International Journal of Human-Computer Studies* 68 (1):1–21. doi:10.1016/j.ijhcs.2009.08.005.

Dabholkar, P. A. 1996. Consumer evaluations of new technology-based self-service options: An investigation of alternative models of service quality. *International Journal of Research in Marketing* 13 (1):29–51. doi:10.1016/0167-8116(95)00027-5.

Davis, F. D. 1989. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly* 319–340.

Davis, F. D., R. P. Bagozzi, and P. R. Warshaw. 1992. Extrinsic and intrinsic motivation to use computers in the workplace1. *Journal of Applied Social Psychology* 22 (14):1111–1132.

DeLone, W. H., and E. R. McLean. 1992. Information systems success: The quest for the dependent variable. *Information Systems Research* 3 (1):60–95.

Delone, W. H., and E. R. McLean. 2003. The DeLone and McLean model of information systems success: A ten-year update. *Journal of Management Information Systems* 19 (4):9–30.

Deng, L., and M. S. Poole. 2012. Aesthetic design of e-commerce web pages—Webpage complexity, order and preference. *Electronic Commerce Research and Applications* 11 (4):420–40. doi:10.1016/j.elerap.2012.06.004.

Di Fatta, D., R. Musotto, and W. Vesperi. 2016. Analyzing e-commerce websites: A quali-quantitive approach for the user perceived web quality (UPWQ). *International Journal of Marketing Studies* 8 (6):33. doi:10.5539/ijms.v8n6p33.

Ding, D. X., P. J. H. Hu, and O. R. L. Sheng. 2011. e-SELFQUAL: A scale for measuring online self-service quality. *Journal of Business Research* 64 (5):508–15. doi:10.1016/j.jbusres.2010.04.007.

Dornyei, Z., and T. Taguchi. 2010. *Questionnaires in second language research: Construction, administration, and processing (* 2nd ed.). New York: Routledge.

Ducoffe, R. H. 1996. Advertising value and advertising on the web. *Journal of Advertising Research* 36 (5):21–35.

East, R., K. Hammond, and M. Wright. 2007. The relative incidence of positive and negative word of mouth: A multi-category study. *International Journal of Research in Marketing* 24 (2):175–84. doi:10.1016/j.ijresmar.2006.12.004.

Flavián, C., M. Guinalíu, and R. Gurrea. 2006. The role played by perceived usability, satisfaction and consumer trust on website loyalty. *Information & Management* 43 (1):1–14. doi:10.1016/j.im.2005.01.002.

Fogg, B. J., C. Soohoo, D. R. Danielson, L. Marable, J. Stanford, and E. R. Tauber. June 2003. How do users evaluate the credibility of web sites? A study with over 2,500 participants. *Proceedings of the 2003 Conference on Designing for User Experiences* (pp. 1–15). ACM.

Fornell, C., and D. F. Larcker. 1981. Structural equation models with unobservable variables and measurement error: Algebra and statistics. *Journal of Marketing Research* 18 (3):382–88. doi:10.2307/3150980.

Francis, J. E., and L. White. 2002. PIRQUAL: A scale for measuring customer expectations and perceptions of quality in Internet retailing. In *2002 Marketing educators' conference: Marketing theory and applications*, ed. K. Evans and L. Scheer, vol. 13, 263–270.

Gefen, D. 2000. E-commerce: The role of familiarity and trust. *Omega* 28 (6):725–37. doi:10.1016/s0305-0483(00)00021-9.

Gefen, D., E. Karahanna, and D. W. Straub. 2003. Trust and TAM in online shopping: An integrated model. *MIS Quarterly* 27 (1):51–90.

George, J. F. 2004. The theory of planned behavior and Internet purchasing. *Internet Research* 14 (3):198–212. doi:10.1108/10662240410542634.

Gerbing, D. W., and J. C. Anderson. 1988. An updated paradigm for scale development incorporating unidimensionality and its assessment. *Journal of Marketing Research* 25 (2):186–92. doi:10.2307/3172650.

Goswami, S. 2013. Measuring customer satisfaction on WebQual dimension for online banking: An empirical study. *Paradigm* 17 (1–2):25–36. doi:10.1177/0971890720130104.

Grigoroudis, E., C. Litos, V. A. Moustakis, Y. Politis, and L. Tsironis. 2008. The assessment of user-perceived web quality: Application of a satisfaction benchmarking approach. *European Journal of Operational Research* 187 (3):1346–57. doi:10.1016/j.ejor.2006.09.017.

Grönroos, C., F. Heinonen, K. Isoniemi, and M. Lindholm. 2000. The NetOffer model: a case example from the virtual marketspace. *Management Decision* 38 (4):243–252.

Guth, W., C. Schmidt, and M. Sutter. 2007. Bargaining outside the lab—A newspaper experiment of a three-person ultimatum game. *The Economic Journal* 117 (518):449–69. doi:10.1111/j.1468-0297.2007.02025.x.

Hair, J. F., R. E. Anderson, R. L. Tatham, and C. William. 1998. *Multivariate data analysis*. 5th ed. Upper Saddle River, NJ: Prentice-Hall.

Hair, J. F., R. E. Anderson, B. J. Babin, and W. C. Black. 2010. *Multivariate data analysis: A global perspective*. Vol. 7. Upper Saddle River, NJ: Pearson.

Hajli, M. 2014. A study of the impact of social media on consumers. *International Journal of Market Research* 56 (3):387–404. doi:10.2501/ijmr-2014-025.

Haque, A., S. A. Mahmud, A. K. Tarofder, and A. Z. H. Ismail. 2007. Internet advertisement in Malaysia: A study of attitudinal differences. *The Electronic Journal of Information Systems in Developing Countries* 31 (9):1–15.

Hasan, B. 2010. Exploring gender differences in online shopping attitude. *Computers in Human Behavior* 26 (4):597–601. doi:10.1016/j.chb.2009.12.012.

Hasanov, J., and H. Khalid. 2015. The impact of website quality on online purchase intention of organic food in Malaysia: A WebQual model approach. *Procedia Computer Science* 72: 382–89. doi:10.1016/j.procs.2015.12.153.

Hashim, A., E. K. Ghani, and J. Said. 2009. Does consumers' demographic profile influence online shopping? An examination using Fishbein's Theory/Est-Ce Que Le Profile Démographique Des Consommateurs Influence Les Achats En Ligne?: Une Expertise En Utilisant La Théorie de Fishbein. *Canadian Social Science* 5 (6):19.

Hengki, R. 2014. Analysis quality Dino tour travel management website using WebQual 4.0. International Conference on Engineering and Technology Development (ICETD) at Bandar Lampung University, Indonesia, October 27–28.

Heslop, L. 2014. Understanding India: The future of higher education and opportunities for international cooperation. British Council India. *ACA Conference*. Bordeaux.

Hooper, D., J. Coughlan, and M. Mullen. 2008. Structural equation modelling: Guidelines for determining model fit. *Electronic Journal of Business Research Methods* 6 (1):53–60.

Hsu, T. H., L. C. Hung, and J. W. Tang. 2012. The multiple criteria and sub-criteria for electronic service quality evaluation: An interdependence perspective. *Online Information Review* 36 (2):241–60. doi:10.1108/14684521211229057.

Hu, L. T., and P. M. Bentler. 1998. Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychological Methods* 3 (4):424. doi:10.1037//1082-989x.3.4.424.

Internetlivestats.com. 2016a. Internet users by country. http://www.internetlivestats.com/internet-users-by-country/.

Internetlivestats.com. 2016b. Internet users in India. http://www.internetlivestats.com/internet-users/india/ (accessed April 17, 2016).

Janita, M. S., and F. J. Miranda. 2013. Exploring service quality dimensions in b2b e-marketplaces. *Journal of Electronic Commerce Research* 14 (4):363–86.

Jones, S. 2002. *The Internet goes to college: How students are living in the future with today's technology*. Washington, DC: Pew Internet & American Life Project.

Katerattanakul, P. 2002. Framework of effective web site design for business-to-consumer internet commerce. *INFOR: Information Systems and Operational Research* 40 (1):57–70. doi:10.1080/03155986.2002.11732641.

Kerlinger, F. N., and H. B. Lee. 2000. Survey research. *Foundations of Behavioral Research*, 599–619.

Khan, M. N., and M. Adil. 2013. Data analysis techniques in service quality literature: Essentials and advances. *Serbian Journal of Management* 8 (1):95–112. doi:10.5937/sjm8-3469.

Khare, A., A. Khare, and S. Singh. 2012. Attracting shoppers to shop online—Challenges and opportunities for the Indian retail sector. *Journal of Internet Commerce* 11 (2):161–185.

Khoiriyah, R., and A. P. Subriadi. 2016. A review on user perception of desktop and mobile service website using WebQual and user experience approach. *IPTEK Journal of Proceedings Series* 2 (1):D301.

Kim, M. J., N. Chung, and C. K. Lee. 2011. The effect of perceived trust on electronic commerce: Shopping online for tourism products and services in South Korea. *Tourism Management* 32 (2):256–265.

Kim, S., and L. Stoel. 2004. Apparel retailers: website quality dimensions and satisfaction. *Journal of Retailing and Consumer Services* 11 (2):109–117.

Kline, P. 1994. *An easy guide to factor analysis*. London: Routledge.

Lavie, T., and N. Tractinsky. 2004. Assessing dimensions of perceived visual aesthetics of web sites. *International Journal of Human-Computer Studies* 60 (3):269–98. doi:10.1016/j.ijhcs.2003.09.002.

Lee, H. L., and S. Whang. 2001. Winning the last mile of e-commerce. *MIT Sloan Management Review* 42 (4):54.

Lee, N. 2008. Developing and validating an instrument to assess performance of public sector organisations: A case study of Malaysian schools. *Measuring Business Excellence* 12 (3):56–75. doi:10.1108/13683040810900403.

Leonidio, U. D. C., R. M. D. S. Montezano, and F. A. D. Carvalho. 2011. Evaluation of perceived quality of the website of an online bookstore: An empirical application of the Barnes and Vidgen model. *JISTEM-Journal of Information Systems and Technology Management* 8 (1):109–30. doi:10.4301/s1807-17752011000100006.

Levis, M., M. Brady, and M. Helfert. 2008. Website design quality and form input validation: An empirical study on Irish corporate websites. *Journal of Service Science and Management* 1 (1):91–100. doi:10.4236/jssm.2008.11009.

Li, H., and R. Suomi. 2007. Evaluating electronic service quality: A transaction process based evaluation model. The European Conference on Information Management and Evaluation (ECIME 2007), Montpellier, France, September 20-21.

Li, Y. N., K. C. Tan, and M. Xie. 2002. Measuring web-based service quality. *Total Quality Management* 13 (5):685–700. doi:10.1080/0954412022000002072.

Lim, N. 2003. Consumers' perceived risk: Sources versus consequences. *Electronic Commerce Research and Applications* 2 (3):216–28. doi:10.1016/s1567-4223(03)00025-5.

Lin, H. F. 2007. The impact of website quality dimensions on customer satisfaction in the B2C e-commerce context. *Total Quality Management and Business Excellence* 18 (4):363–78. doi:10.1080/14783360701231302.

Liu, B. Q., and D. L. Goodhue. January 2008. An exploration of the hygiene and motivator aspects of WebQual constructs in predicting website reuse. Proceedings of the 41st Annual Hawaii International Conference on System Sciences. IEEE, Waikoloa, Big Island, Hawaii.

Liu, I. F., M. C. Chen, Y. S. Sun, D. Wible, and C. H. Kuo. 2010. Extending the TAM model to explore the factors that affect intention to use an online learning community. *Computers & Education* 54 (2):600–610.

Loiacono, E. T., R. T. Watson, and D. L. Goodhue. 2000. WebQualTM: A website quality instrument. Working Paper 2000-126-0, University of Georgia, Athens, GA.

Loiacono, E. T., R. T. Watson, and D. L. Goodhue. 2002. WebQual: A measure of website quality. *Marketing Theory and Applications* 13 (3):432–38.

Loiacono, E. T., R. T. Watson, and D. L. Goodhue. 2007. WebQual: An instrument for consumer evaluation of web sites. *International Journal of Electronic Commerce* 11 (3): 51–87. doi:10.2753/jec1086-4415110302.

Longstreet, P. January 2010. Evaluating website quality: Applying cue utilization theory to WebQual. *43rd Hawaii International Conference on System Sciences (HICSS)* (pp. 1–7). IEEE.

Lorenzo, C., M. A. Gomez, and A. Molla. 2007. Website design and e-consumer: Effects and responses. *International Journal of Internet Marketing and Advertising* 4 (1):114–41. doi:10.1504/ijima.2007.014800.

Lu, J., C.-S. Yu, C. Liu, and J. E. Yao. 2003. Technology acceptance model for wireless Internet. *Internet Research* 13 (3):206–22. doi:10.1108/10662240310478222.

Lu, Y., L. Zhao, and B. Wang. 2010. From virtual community members to C2C e-commerce buyers: Trust in virtual communities and its effect on consumers' purchase intention. *Electronic Commerce Research and Applications* 9 (4):346–60. doi:10.1016/j.elerap.2009.07.003.

Madu, C. N., and A. A. Madu. 2002. Dimensions of e-quality. *International Journal of Quality & Reliability Management* 19 (3):246–58.

Malhotra, N. K., and S. Dash. 2011. *Marketing research: An applied orientation.* 6th ed. Noida, India: Pearson.

May So, W. C., T. N. Danny Wong, and D. Sculli. 2005. Factors affecting intentions to purchase via the Internet. *Industrial Management & Data Systems* 105 (9):1225–44. doi:10.1108/02635570510633275.

Medyawati, H., and A. Mabruri. 2012. Website quality: Case study on local government bank and state own bank in Bekasi City. *Procedia-Social and Behavioral Sciences* 65:1086–91. doi:10.1016/j.sbspro.2013.02.121

Metin, M., G. K. Yilmaz, K. Coskun, and S. Birisci. 2012. Developing an attitude scale towards using instructional technologies for pre-service teachers. *Turkish Online Journal of Educational Technology-TOJET* 11 (1):36–45.

Meuter, M. L., A. L. Ostrom, R. I. Roundtree, and M. J. Bitner. 2000. Self-service technologies: Understanding customer satisfaction with technology-based service encounters. *Journal of Marketing* 64 (3):50–64. doi:10.1509/jmkg.64.3.50.18024.

Mitchell, V. W. 2001. Re-conceptualizing consumer store image processing using perceived risk. *Journal of Business Research* 54 (2):167–72. doi:10.1016/s0148-2963(99)00086-7.

Nantel, J., and E. Glaser. 2008. The impact of language and culture on perceived website usability. *Journal of Engineering and Technology Management* 25 (1):112–22. doi:10.1016/j.jengtecman.2008.01.005.

O'Leary-Kelly, S. W., and R. J. Vokurka. 1998. The empirical assessment of construct validity. *Journal of Operations Management* 16 (4):387–405. doi:10.1016/s0272-6963(98)00020-5.

Oliveira, P., A. V. Roth, and W. Gilland. 2002. Achieving competitive capabilities in e-services. *Technological Forecasting and Social Change* 69 (7):721–39. doi:10.1016/s0040-1625(01)00188-3.

Othmani, L., and N. Bouslama. 2015. Perceived quality of a virtual community and its components: An exploratory investigation. *Journal of Internet Social Networking & Virtual Communities*. Advance online publication. doi:10.5171/2015.888628

Oztekin, A. 2011. A decision support system for usability evaluation of web-based information systems. *Expert Systems with Applications* 38 (3):2110–18. doi:10.1016/j.eswa.2010.07.151.

Pai, F. Y., and K. I. Huang. 2011. Applying the technology acceptance model to the introduction of healthcare information systems. *Technological Forecasting and Social Change* 78 (4):650–660.

Pappas, O., A. G. Pateli, M. N. Giannakos, and V. Chrissikopoulos. 2014. Moderating effects of online shopping experience on customer satisfaction and repurchase intentions. *International Journal of Retail & Distribution Management* 42 (3):187–204. doi:10.1108/ijrdm-03-2012-0034.

Parasuraman, A., V. A. Zeithaml, and L. L. Berry. 1985. A conceptual model of service quality and its implications for future research. *The Journal of Marketing* 49 (4):41–50. doi:10.2307/1251430.

Parasuraman, A., V. A. Zeithaml, and L. L. Berry. 1988. SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing* 64:12–37.

Parasuraman, A., V. A. Zeithaml, and A. Malhotra. 2005. ES-QUAL: A multiple-item scale for assessing electronic service quality. *Journal of Service Research* 7 (3):213–33. doi:10.1177/1094670504271156.

Park, C., and J. K. Jun. 2003. A cross-cultural comparison of Internet buying behavior: Effects of Internet usage, perceived risks, and innovativeness. *International Marketing Review* 20 (5):534–53. doi:10.1108/02651330310498771.

Park, H., and S. Baek. July 2007. Measuring service quality of online bookstores with WebQual. *International Conference on Human-Computer Interaction* (pp. 95–103). Springer Berlin Heidelberg.

Porter, M. E. 2001. *Strategy on the Internet. Harvard Business Review* 63–78.

Rabinovich, E., and J. P. Bailey. 2004. Physical distribution service quality in Internet retailing: Service pricing, transaction attributes, and firm attributes. *Journal of Operations Management* 21 (6):651–72. doi:10.1016/j.jom.2003.11.004.

Rahayu, N. W., and D. D. Andika. June 2014. Assessing the quality of rail ticket reservation systems: Cases from Indonesia. *2014 International Conference on Computer and Information Sciences (ICCOINS)* (pp. 1–5). IEEE.

Ramanathan, R. 2011. An empirical analysis on the influence of risk on relationships between handling of product returns and customer loyalty in e-commerce. *International Journal of Production Economics* 130 (2):255–61. doi:10.1016/j.ijpe.2011.01.005.

Rauyruen, P., and K. E. Miller. 2007. Relationship quality as a predictor of B2B customer loyalty. *Journal of Business Research* 60 (1):21–31. doi:10.1016/j.jbusres.2005.11.006.

Reichheld, F. F., and P. Schefter. 2000. E-loyalty: Your secret weapon on the web. *Harvard Business Review* 78 (4):105–13.

Ribbink, D., A. C. Van Riel, V. Liljander, and S. Streukens. 2004. Comfort your online customer: Quality, trust and loyalty on the Internet. *Managing Service Quality: An International Journal* 14 (6):446–56. doi:10.1108/09604520410569784.

Richard, M. O. 2005. Modeling the impact of Internet atmospherics on surfer behavior. *Journal of Business Research* 58 (12):1632–42. doi:10.1016/j.jbusres.2004.07.009.

Robbins, S. S., and A. C. Stylianou. 2003. Global corporate web sites: An empirical investigation of content and design. *Information & Management* 40 (3):205–12. doi:10.1016/s0378-7206(02)00002-2.

Rowley, J. 2006. An analysis of the e-service literature: Towards a research agenda. *Internet Research* 16 (3):339–59. doi:10.1108/10662240610673736.

Ryu, K., H. Han, and S. Jang. 2010. Relationships among hedonic and utilitarian values, satisfaction and behavioral intentions in the fast-casual restaurant industry. *International Journal of Contemporary Hospitality Management* 22 (3):416–32. doi:10.1108/09596111011035981.

Sahney, S. 2008. Critical success factors in online retail-An application of quality function deployment and interpretive structural modeling. *The International Journal of Business and Information* 3 (1):144–163.

Santos, J. 2003. E-service quality: A model of virtual service quality dimensions. *Managing Service Quality: An International Journal* 13 (3):233–46. doi:10.1108/09604520310476490.

Shabnam, S. 2012. The Indian middle class, the state and development: An enquiry into the broad claims of shifts in neo-liberal India. *Inclusive: A Journal of Kolkata Centre for Contemporary Studies (KCCS)* 1 (1).

Shah, A., N. Jain, and S. Bajpai. 2015. India@digital. Bharat Creating a $200 billion internet economy. BCG Group publication, AIMAI. http://www.bcgindia.com/documents/file180687.pdf

Shahin, A., J. Khazaei Pool, and M. Poormostafa. 2014. Evaluating and ranking hotels offering e-service by integrated approach of Webqual and fuzzy AHP. *International Journal of Business Information Systems* 15 (1):84–104. doi:10.1504/ijbis.2014.057966.

Sharma, A., and J. N. Sheth. 2004. Web-based marketing: The coming revolution in marketing thought and strategy. *Journal of Business Research* 57 (7):696–702.

Smith, D. N., and K. Sivakumar. 2004. Flow and Internet shopping behavior: A conceptual model and research propositions. *Journal of Business Research* 57 (10):1199–1208. doi:10.1016/s0148-2963(02)00330-2.

Smith, R. J., and C. Eroglu. 2009. Assessing consumer attitudes toward off-site customer service contact methods. *The International Journal of Logistics Management* 20 (2):261–277.

Statista.com. 2013. Distribution of Internet users in India as of September 2013, by age group. http://www.statista.com/statistics/272394/age-distribution-of-internet-users-in-india/ (accessed November 22, 2014).

Strange, V., S. Forest, A. Oakley, and Ripple Study Team. 2003. Using research questionnaires with young people in schools: The influence of the social context. *International Journal of Social Research Methodology* 6 (4):337–46. doi:10.1080/1364557021000024749.

Šumak, B., M. Heričko, and M. Pušnik. 2011. A meta-analysis of e-learning technology acceptance: The role of user types and e-learning technology types. *Computers in Human Behavior* 27 (6):2067–2077.

Swinyard, W. R., and S. M. Smith. 2003. Why people (don't) shop online: A lifestyle study of the Internet consumer. *Psychology & Marketing* 20 (7):567–97. doi:10.1002/mar.10087.

Tamimi, N., M. Rajan, and R. Sebastianelli. 2003. The state of online retailing. *Internet Research* 13 (3):146–55. doi:10.1108/10662240310478178.

Tarigan, J. 2009. User satisfaction using Webqual instrument: A research on stock exchange of Thailand (SET). *Jurnal Akuntansi dan Keuangan* 10 (1):24.

Udo, G. J., K. K. Bagchi, and P. J. Kirs. 2008. Assessing web service quality dimensions: The E-SERVPERF approach. *Issues in Information Systems* 9 (2):313–22.

Van Iwaarden, J., T. Van Der Wiele, L. Ball, and R. Millen. 2004. Perceptions about the quality of web sites: A survey amongst students at Northeastern University and Erasmus University. *Information & Management* 41 (8):947–59. doi:10.1016/j.im.2003.10.002.

Van Schaik P., and J. Ling. 2009. The role of context in perceptions of the aesthetics of web pages over time. *International Journal of Human-Computer Studies* 67 (1):79–89. doi:10.1016/j.ijhcs.2008.09.012.

Venkatesh, V., and F. D. Davis. 2000. A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science* 46 (2):186–204.

Verhagen, T., A. Nauta, and F. Feldberg. 2013. Negative online word-of-mouth: Behavioral indicator or emotional release? *Computers in Human Behavior* 29 (4):1430–40. doi:10.1016/j.chb.2013.01.043.

Weis, A. H. 2010. Commercialization of the Internet. *Internet Research* 20 (4):420–35. doi:10.1108/10662241011059453.

Wolfinbarger, M., and M. C. Gilly. 2001. Shopping online for freedom, control, and fun. *California Management Review* 43 (2):34–55. doi:10.2307/41166074.

Wolfinbarger, M., and M. C. Gilly. 2003. eTailQ: Dimensionalizing, measuring and predicting etail quality. *Journal of Retailing* 79 (3):183–98. doi:10.1016/s0022-4359(03)00034-4.

Yang, Z., M. Jun, and R. T. Peterson. 2004. Measuring customer perceived online service quality: Scale development and managerial implications. *International Journal of Operations & Production Management* 24 (11):1149–74. doi:10.1108/01443570410563278.

Yoo, B., and N. Donthu. 2001. Developing a scale to measure the perceived quality of an Internet shopping site (SITEQUAL). *Quarterly Journal of Electronic Commerce* 2 (1):31–45.

Zeithaml, V. A. 2002. Service excellence in electronic channels. *Managing Service Quality: An International Journal* 12 (3):135–39. doi:10.1108/09604520210429187.

Zeithaml, V. A., A. Parasuraman, and A. Malhotra. 2000. Conceptual framework for understanding e-service quality: Implications for future research and managerial practice. Working Paper No. 00-115. Marketing Science Institute, Cambridge, MA.

Zhou, L., L. Dai, and D. Zhang. 2007. Online shopping acceptance model: A critical survey of consumer factors in online shopping. *Journal of Electronic Commerce Research* 8 (1):41.