

THE EFFECT OF E-SERVICE QUALITY ON PERCEIVED VALUE, SATISFACTION AND
LOYALTY: AN UPDATED E-SERVICE QUALITY SCALE FOR AN ONLINE SHOPPING
CONTEXT

By

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ABSTRACT

THE EFFECT OF E-SERVICE QUALITY ON PERCEIVED VALUE, SATISFACTION AND LOYALTY: AN UPDATED E-SERVICE QUALITY SCALE FOR AN ONLINE SHOPPING CONTEXT

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Good e-service quality is essential to keep customers shopping at an online store. Even though there are many measurements of e-service quality, there is room for improvement. Some issues include inaccurate indicators that did not properly reflect the construct, a lack of reliability, methodological issues such as inaccurate group of respondents who were not actual customers of an online site, and out-of-date measurements. To improve e-service quality measurement, several steps were taken by following scale development practices. After reviewing e-service quality literature and conceptually defining the construct, this study conducted eight focus groups to discover dimensions and scale items of the construct. Eight dimensions emerged: information quality, privacy protection, delivery system, ease of use, site functionality, customer service, customization, and multi-device compatibility. Two pilot tests using expert feedback and exploratory factor analysis were also conducted. Results from exploratory factor analysis showed that seven factors fit the data. Ease of use, site functionality, and customization did not appear as dimensions of e-service quality. New dimensions emerged from the EFA and include return process, multi-device compatibility, and omni-channel. For scale validation purpose, a confirmatory factor analysis with perceived value, satisfaction, and loyalty as dependent variables was conducted. Results confirmed all seven factors and e-service quality had positive relationships with all outcome variables. Theoretical contributions, managerial implications, and limitations were also discussed.

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CHAPTER 1. INTRODUCTION

Online retail sales are increasing. In 2017, global online retail sales reached 2.3 trillion dollars (EMarketer, 2018) while in the U.S. sales have reached 453.46 billion dollars, a 16 percent increase from the previous year (Digitalcommerce360, 2018). Statista (2018) has projected that by 2022, sales will surpass 700 billion dollars.

With increased demand for online shopping, providing good online service is essential to keep customers visiting and purchasing from these stores. E-service quality is important to marketers for a variety of reasons. E-service quality has been found to affect customer satisfaction toward online shopping sites, perceived value, and loyalty. This means that when customers perceive that they receive good services, they are more likely to repurchase products from the site and recommend the site to others. Therefore, it is essential that e-service quality is measured through consumers' perception that reflects their current evaluation of an online business's performance.

There are several existing e-service quality measurements (e.g., Barnes & Vidgen, 2002; Bauer, Falk, & Hammerschmidt, 2006; Cristobal, Flavián, & Guinaliu, 2007; Parasuraman, Zeithaml, & Malhotra, 2005; Swaid & Wigand, 2009; Wolfinbarger & Gilly, 2003; Yang, Jun, & Peterson, 2004). However, there is room for improvement. For example, some scale items do not accurately reflect a conceptual definition of the construct. To clarify, e-service quality is supposed to measure consumers' perception toward an online site's performance. However, some scales consist of items that test consumers' knowledge rather than their perception of a site. In addition, some scales lack reliability (Ladhari, 2010). Other studies were carried out without the perspectives of actual online customers (Janda, Trocchia, & Gwinner, 2002; Yang et al., 2004). Last but not least, most of the scales were developed more than ten years ago. There are

new aspects of online service that need to be considered such as multi-device compatibility and omni-channel integration.

The objective of this study is to improve upon e-service quality measurement so that it properly reflects current consumers' perception toward online shopping sites' performance. This study first reviewed previous research related to e-service quality. From the literature review, it appeared that there are at least six dimensions of e-service quality. To gain consumers' insights about their perception of online sites' performance and create scale items, eight focus groups were conducted. I also consulted two methodological experts and two topic experts to gain feedback on my focus group protocol and analysis. Eight dimensions emerged from the qualitative data. Methodological and topic experts were consulted again to ensure face validity. Two pilot tests were conducted through online survey with 420 online consumers. Results helped eliminate low factor-loading scale items.

These results were further examined by two additional data sets, one for exploratory factor analysis and one for confirmatory factor analysis (Worthington & Whittaker, 2006). This study will yield insightful results for managers of online shopping sites by analyzing the effect of e-service quality on perceived value, satisfaction and loyalty. It will also provide information about how each aspect of e-service quality affects perceived value, customer satisfaction and loyalty. Moreover, this study follows proper scale development procedures that can be used in the future by researchers who attempt to study e-service quality.

CHAPTER 2. LITERATURE REVIEW

What is Service Quality?

The service quality construct has been investigated for decades. In this section, I first reviewed a history of the service quality construct. Then, I presented two different views on how scholars interpret the construct and how it has evolved.

Previously, researchers have investigated the concept of service quality in an offline setting. Parasuraman, Zeithaml, and Berry (1988) differentiated perceived quality and objective quality, explaining that perceived quality is about an evaluation of service performance which is subjective and varies among different people. This consumer perception is different from objective quality which pertains to an actual feature or function of an entity. They argued that perceived quality of service is a function of a gap between consumers' expectation and perceived performance. To clarify, consumers form expectations about what should be offered by a service company and compare these expectations to their perceptions of service performance received from a company (Parasuraman et al., 1988).

While Parasuraman et al. (1988) viewed the construct as a form of satisfaction, Cronin and Taylor (1992) interpreted the construct as a form of attitude. Cronin and Taylor (1992) argued that there is confusion about whether service quality is a form of satisfaction or an attitude. They proposed an alternative measurement of service quality called "SERVPERF" which is a performance-only based scale and compared it to an original "SERVQUAL" scale created by Parasuraman et al. (1988), an expectation-performance based measurement in which they asked both consumers' expectations and perceptions of service performance. Cronin and Taylor concluded that service quality should be viewed as an attitude form that should be

measured through a performance-based only measurement and SERVPERF scale is superior in capturing service quality perceived by consumers. Moreover, results showed that service quality using SERVPERF measurement had an effect on satisfaction which in turn led to purchase intention.

To sum up, based on past research, service quality is evaluated from consumers' perspectives. There has been an argument about whether the operational definition of service quality defined in terms of scores based on the comparison between expectation and actual performance was reliable and valid. However, Cronin and Taylor (1992) found that service quality scale as a form of attitude was superior in reflecting consumers' perception toward service quality.

What is E-Service Quality?

Parasuraman et al. (2005) argued that service quality in an offline setting differed from online service quality in several respects. In an online shopping context, consumers must provide personal information when making a purchase, leading to consumers' concern about their private information (Udo, 2001). Moreover, consumers do not get their products immediately and have to wait for their order to be delivered. This has raised an issue on how well service providers deliver the products. In addition, consumers only see products virtually, so they may feel uncomfortable purchasing products that they do not have a chance to see and touch before. Therefore, to adequately capture consumers' perception toward e-service quality, e-service quality had to be redefined and explicated, and a new measurement needed to be developed.

Looking across several definitions of e-service quality, it seems that scholars have come to the same conclusion that e-service quality covers the whole consumption process from merely

surfing the site, purchasing, and receiving products. For example, Zeithaml (2002, p.135) referred to e-service quality as “the extent to which a Web site facilitates efficient and effective shopping, purchasing and delivery.” Consumers expect to gain good service throughout their total consumption period and e-service quality is consumers’ perception toward a service they have received. Zeithaml emphasized that the service should cover both before and after purchase activities. Santos (2003, p.235) defined e-service quality as “the consumers' overall evaluation and judgment of the excellence and quality of e-service offerings in the virtual marketplace.” Santos’s approach to e-service quality is in line with Cronin and Taylor (1992) in that it is not necessary to measure expectations and compare these to perceived performance. Performance-based measurement is enough to capture consumers’ perception of service quality. This means that a scale that measures e-service quality needs only to focus on consumers perception toward an online shopping site without having to compare their perceived performance to their expectations.

Parasuraman et al. (2005, p.217) defined e-service quality as “the extent to which a website facilitates efficient and effective shopping, purchasing, and delivery” and emphasized that website’s service should facilitate all aspects of the consumption process: pre-purchase, purchase, and post-purchase. These researchers proposed a 22-item scale called “E-S-QUAL” to measure consumers’ perception of e-service quality that covered four dimensions of this construct: efficiency, fulfillment, system availability, and privacy. They also proposed a second scale called “E-RecS-Qual” to capture customer service aspect when consumers encountered problems and had to contact employees of an online store.

Based on an e-service quality definition by Parasuraman et al. (2005) that emphasizes every aspect of the consumption process and focuses on consumers’ perception, I define e-

service quality as *a consumer's perception of the excellence of a site in facilitating the consumption process*. The focus of this current study is to investigate e-service quality in an online shopping context, to learn the whole process of service, and learn how a site delivers products to consumers and handles problems that arise. It is worth noting that the construct focuses on *consumers' perception* which is subjective, and it is not about their knowledge of a site or their expectation toward a site. In addition, I used the word “*site*”, not “website” to be applicable to multiple technologies and not limited to only a particular device. Moreover, *facilitating consumption process* in this definition covers all aspects from merely surfing a site, purchasing products, and handling of problems by employees of a site.

Existing E-Service Quality Scales

There are several existing e-service quality scales that investigate consumers' perception toward different types of e-commerce such as online shopping, online library, online banking, and financial services. It is worth noting that while most scholars agree upon the conceptual definition of e-service quality in that it should measure consumers' perception toward a site and cover the whole consumption process, dimensions of the construct in many scales differ and include from four to more than ten dimensions. The following section discusses e-service quality in different domains and identifies e-service quality dimensions emerged from these studies (See Appendix A for scale review).

A study of e-service quality in an online library context revealed four dimensions. O'Neill, Wright, and Fitz (2001) studied how students evaluated an online library and what aspects were considered important to them when using the service. Results revealed four dimensions of e-service quality in this context: contact, responsiveness, reliability, and tangibles. Some of the scale items are unique to an online library context, such as ability to locate journal

articles and books. The authors also compared means of student perceptions of performance and importance of each aspect and found that the perceived performance of online library indices were significantly lower than expectation indices. This means that students were not satisfied by the service they received.

While e-service quality in an online library context revealed four dimensions, e-service quality in an e-financial context revealed six dimensions (Sohn & Tadisina, 2008). Respondents with experience in electronic financial service participated in the study. Results showed six dimensions: trust, customized communication, ease of use, reliability, website contents and functionality, and speed of delivery. Ibrahim, Joseph, and Ibeh (2006) studied e-service quality in an e-banking context in the UK and results yielded six dimensions. The study adopted the importance-performance paradigm in which the researchers asked e-banking customers to rate both importance of each attribute and their perceived performance. Then, the gap was measured and a comparison mean importance scores and perceived performance was calculated. Results showed that e-banking service performance was poorer than importance indices, indicating that e-banking services need to improve their service quality to meet consumers' expectation.

Many scales measuring e-service quality in an online shopping context revealed that the construct consisted of four dimensions. For example, Cristobal et al. (2007) developed a perceived e-service quality scale called PeSQ. The researchers followed Cronin and Taylor's (1992) perspectives that the construct should be measured through perception only, not through an expectation-disconfirmation paradigm. Four dimensions were found: web design, assurance, customer service, and order management. Moreover, perceived e-service quality had an effect on satisfaction and loyalty. Barnes and Vidgen (2002) investigated the construct using a scale called WebQual 4.0 within online bookstores context. Results indicated that there were four dimensions

of e-service quality: Usability, design, information, trust, and empathy. These dimensions are similar to many e-service quality scales. The authors adopted an importance-performance approach in which they asked respondents to rate both importance and perceived performance of several online bookstore sites.

Yoo and Donthu's (2001) SITEQUAL scale also concluded that the construct had four dimensions: ease of use, aesthetic design, processing speed, and security. This scale can be used to predict attitude toward a site, purchase intention, and loyalty. ETailQ scale by Wolfinbarger and Gilly (2003) can also predict the same dependent variables as SITEQUAL. Wolfinbarger and Gilly (2003) pointed out that many studies focused on the website interface in general rather than specific functions of online shopping site. They emphasized that online shopping experience was unique and different from other types of websites such as entertainment and news sites.

Based on previous literature, there are two main approaches to assess e-service quality. First, following expectation-confirmation paradigm, researchers investigated consumer expectations about what a site should offer or what aspects consumers consider important. Then, perceived service performance is measured and compared with their expectation. E-service quality is then a function of a gap between expectation and performance. The second approach is a performance-only based in which researchers focus on perceptions of consumers without investigating their expectation. Researchers argued that perceived e-service quality is a form of attitude and should be assessed by performance-based measurement. Moreover, results supported a performance-based measurement as being superior than expectation-performance measurement (Cronin & Taylor, 1992). This current study's approach follows a performance-based measurement that treats the construct as a form of attitude, not satisfaction, as this approach has

been found to be superior to an expectation-performance measurement. Moreover, e-service quality is not satisfaction, but rather an antecedent of satisfaction.

There are some issues with existing scales that are worth noting. First, when conceptualizing e-service quality as a form of attitude that measures consumers' perception, scale items should reflect perceptual statements (e.g., this site is simple to use, employees are helpful, and this site deliver products quickly) rather test consumers' knowledge (e.g. asking if they know that a site has a particular service or function) to align with the theoretical definition of the construct. However, some measurement scales include knowledge items. For example, scale items from Janda et al. (2002, p.421) included "My online retailer offers products originating from foreign countries," and "My online retailer offers products not sold in the USA." Two scale items from Swaid and Wigand (2009, p.20) that test customers' knowledge are "Order confirmation and returns are confirmed within three days" and "Website addresses are included in all existing documentation publicity and advertising channels." Because these items test customers' knowledge of the site, they are inaccurate indicators of consumers' perception toward performance of online retailers.

Second, Ladhari (2010) reviewed literature related to the e-service quality construct and pointed out issues with e-service quality scales. For example, some e-service quality dimensions of existing scales lack reliability (e.g. Ibrahim et al., 2006; Yang & Jun, 2002) or used small sample sizes (e.g., Aladwani & Palvia, 2002; Ibrahim et al., 2006).

Third, some studies did not use actual online customers as the sample. For example, Loiacono, Watson, and Goodhue (2002) measured website quality of an online shopping site by asking students to think as if they were about to purchase a gift for a friend. Students were instructed to visit a site and evaluate the site's quality. However, Wolfinbarger and Gilly (2003)

pointed out that students of Loiacono et al.'s (2002) study did not actually purchase a product, so they could not evaluate purchase and post-purchase service quality. Students were not the website's current customers who actually shop from the store. Therefore, this can lead to an invalid measurement of e-service quality.

Finally, most scales were developed more than ten years ago and may not accurately represent current consumers' perception of online sites. There are new aspects of service that online retailers may offer. For example, consumers now access online sites through multiple devices such as mobile phone, tablet, and personal computer. To deliver a service that enhances better customer experiences, online sites should be improved to be compatible with all types of device.

After reviewing the themes of e-service quality in an online shopping context, there are at least six dimensions that emerged as main aspects of the construct. Based on the theoretical definition of the construct, e-service quality should cover the whole consumption process. I theorized the construct based on this consumption process which consists of pre-purchase, purchase, and post-purchase process. At least one dimension should represent each of the consumption processes. For example, during a pre-purchase process, consumers focus on receiving product information. Therefore, the first dimension to represent a service for a pre-purchase process is information quality. During a purchase process, consumers have to provide credit card and other personal information. Therefore, a service that represents a purchase process must be about privacy protection. During a post-purchase process, after consumers place an order, they are waiting for their order to be delivered. Therefore, a service that reflects a post-purchase process should be about delivery system. There are some dimensions that relate to

overall consumption process such as ease of use, site functionality, and customer service. The next section explains each of the themes more in detail.

Dimensions of E-Service Quality

Information Quality

Information quality is a consumer perception about how well a site provides important content (Collier & Bienstock, 2006; Loiacono et al., 2002; Swaid & Wigand, 2009). A conceptual definition of e-service quality covers facilitation to the whole consumption process. Information quality represents facilitation by a site during pre-purchase consumption process in which consumers search for information relevant to products before making purchase decision. Based on the literature review, consumers perceive that a site should provide up-to-date and accurate information about products (Loiacono et al., 2002). Moreover, the information should be easy to understand with enough details about products (Barnes & Vidgen, 2002). Consumers also pay attention to good pictures of products on a site that should accurately represent products they would receive (Yoo & Donthu, 2001).

I considered this dimension important to e-service quality as it represents pre-purchase process. Information quality also appears in several e-service quality scales such as Barnes and Vidgen (2002), Janda et al. (2002), Loiacono et al. (2002), Yang, Cai, Zhou, and Zhou (2005), Collier and Bienstock (2006), and Swaid and Wigand (2009). Research has also shown that information quality is an important aspect of e-service quality that influences consumers' satisfaction, purchase intention, and loyalty.

Privacy Protection

Privacy protection is defined as a consumer's perception that a site can keep their personal information confidential (Parasuraman, et al., 2005). This dimension reflects facilitation from a site during purchase process as consumers must provide their private information such as credit card and shipping address information before placing orders. Studies have shown that consumers are concerned that their personal information will be misused or hacked (Al Karim, 2003; Udo, 2001). Lallmahamood (2007) indicated that when customers perceived that a site is secure to use, they will be more likely to continue using the site. Therefore, privacy protection should be considered as one of the important aspects of e-service quality. This dimension also receives much attention from researchers as it appears in many eservice quality scales such as Yoo and Donthu (2001), Janda et al. (2002), Loiacono et al. (2002), Wolfinbarger and Gilly (2003), Yang et al. (2004), Parasuraman et al. (2005), Collier and Bienstock (2006), and Ibrahim et al. (2006).

Examples of scale items from existing measurements that represent this dimension include "I feel like my privacy is protected at this site," (Wolfinbarger & Gilly, 2003, p.189) "I trust the Web site administrators will not misuse my personal information," (Collier & Bienstock, 2006, p.272) and "I feel safe in my online transactions." (Yang et al., 2004, p.1174)

Delivery System

Delivery system is a consumer's perception on whether a site keeps its promises to get the product to customer on time and handle orders properly (Bauer et al., 2006; Wolfinbarger & Gilly, 2003). This dimension reflects e-service quality during post-purchase process. After consumers place an order, a site should make sure that products will reach customers on time

without any problems such as wrong items or damaged packages (Collier & Bienstock, 2006; Wolfinbarger & Gilly, 2003). Moreover, consumers perceive that online sites should provide quick delivery with available tracking information (Parasuraman et al., 2005; Swaid & Wigand, 2009).

Examples of e-service quality scale items for quality of delivery system include “It quickly delivers what I order,” (Parasuraman et al., 2005, p.231) “Order tracking details are available until delivery,” (Swaid & Wigand, 2009, p.20) “The product is delivered by the time promised by the company,” (Wolfinbarger & Gilly, 2003, p.188) “My orders from this e-retailer rarely contain the wrong items.” (Collier & Bienstock, 2006, p.273)

Ease of Use

Ease of use is defined as the extent to which consumers perceive that a site is simple to operate (Yang et al., 2004). This dimension reflects facilitation from a site that covers every consumption process. For example, during the pre-purchase process, consumers perceive that online sites should be user-friendly in which they can search for product information easily. During purchase process, online sites should provide an easy way to place online orders. Regarding post-purchase process, consumers should be able to contact employees easily.

Studies have investigated the impact of ease of use on online consumer behaviors. For example, Al Karim (2013) studied factors affecting online shopping behaviors and found that ease of purchasing had an impact on purchase decisions. Bilgihan, Kandampully, and Zhang (2016) also argued that ease of use can have an impact on customer experience toward a site. Venkatesh, Thong, and Xu (2012) studied factors affecting technology adoption and found that ease of use was one of the predictors predicting behavioral intention to use a technology. In Lin's

(2007) study, ease of use is part of website design dimension. Results indicated that website design has a positive effect on satisfaction.

Ease of use theme appears in many e-service quality scales such as Yoo and Donthu, (2001), Barnes and Vidgen (2002), Loiacono et al. (2002), Yang et al. (2004), Parasuraman et al. (2005), Collier and Bienstock (2006), and Sohn and Tadisina (2008). Examples of scale items from existing e-service quality measurements include “It is easy to search for information,” (Yoo & Donthu, 2001, p.13) “It enables me to complete a transaction quickly,” (Parasuraman et al., 2005, p.230) “I don’t get lost on this e-retailer’s Web site,” (Collier & Bienstock, 2006, p.272) “Scrolling through pages is kept to a minimum.” (Swaid & Wigand, 2009, p.20)

Site Functionality

Site functionality is the extent to which a site operates properly without problems and is always available (Collier & Bienstock, 2006; Yang et al., 2005). This dimension represents a service by a site that facilitates the whole consumption process. Consumers perceive that a site should perform well when they need to search for product information, place orders, or contact employees when problems arise. Online sites should load quickly without crashing or resulting in error pages (Collier & Bienstock, 2006). Moreover, consumers expect that a site should always be available (Parasuraman et al., 2005). However, the site functionality dimension appears in only some e-service quality scales and as part of other dimensions. For example, part of the user-friendliness dimension in Herington and Weaven (2009, p.1225) included “This site launches and runs right away” and “pages at this site do not freeze.” Their study also found that this user-friendliness dimension had a positive effect on satisfaction. Boshoff’s (2007) study found that speed is one of the dimensions of e-service quality. Scale items include “the website pages load fast,” “I am able to access the website quickly,” and “the website launches and runs right away,

p.114.” The researcher argued that the idea of loading speed did not gain much attention from researchers and that it should be considered as separate dimension, not as part of other dimensions. Scale items from existing measurements include “It loads its pages fast,” (Parasuraman et al., 2005, p.230) “This e-retailer’s Web site does not crash,” (Collier & Bienstock, 2006, p.273) and “The website is available all the time.” (Swaid & Wigand, 2009, p.20)

Customer Service

Customer service refers to a consumer’s perception on how well employees of a site deal with problems and answer inquiries (Collier & Bienstock, 2006; Swaid & Wigand, 2009). This dimension reflects facilitation by a site that covers every step of the consumption process. To clarify, when consumers have questions regarding products, employees of a site should be able to provide answers. When problems occur during a transaction process or after product delivery, employees should deal with problems promptly and properly with fair solution.

This dimension gains much attention from researchers and is included in most e-service quality scales (e.g., Bauer et al., 2006; Collier & Bienstock, 2006; Cristobal et al., 2007; Swaid & Wigand, 2009; Wolfinbarger & Gilly, 2003; Yang et al, 2004; Yang et al., 2005). Examples of scale items that represent customer service are “Inquiries are answered promptly,” (Wolfinbarger & Gilly, 2003, p.188) “In resolving my complaints the e-retailer gave me what I needed,” (Collier & Bienstock, 2006, p.273) and “When a customer has a complaint, it is dealt with rapidly.” (Cristobal et al., 2007, p.338)

Researchers have analyzed the effect of e-service quality on multiple consumer outcomes. These constructs include perceived value, likelihood of complaining, satisfaction

toward a site, attitude toward a site, purchase intention, site revisit intention, and loyalty. The most frequently tested constructs as outcome variables of e-service quality are perceived value, satisfaction and loyalty (Bauer et al., 2006; Collier & Bienstock, 2006; Cristobal et al., 2007; Janda et al., 2002; Parasuraman et al., 2005; Wolfinbarger & Gilly, 2003; Yang et al., 2004; Yang et al., 2005; Yoo & Donthu, 2001). To test nomological validity of the proposed scale, this current study focuses on perceived value, satisfaction toward a site, and loyalty as these three constructs have been supported by many studies that they are outcomes of e-service quality. Moreover, the explained variance of the effect of e-service quality on each of the outcome variables were high. For example, the effect of e-service quality on satisfaction is quite high in many studies, e.g. 40.7 percent in Collier and Bienstock (2006), 61 percent in Yang et al. (2004), and 65 percent in Bauer et al. (2006). Results of a study conducted by Wolfinbarger and Gilly (2003) found 56 percent of explained variance of the effect of e-service quality on loyalty. Bauer et al. (2006) studied the effect of e-service quality on perceived value and found a significant relationship with 63 percent of the total explained variance. Each construct is discussed in the next section.

Outcome Constructs Related to E-Service Quality

Perceived Value

Lee, Yoon, and Lee (2007) studied perceived value in a tourism context and examined the construct by conducting factor analysis. Results showed that perceived value consisted of three dimensions: functional, emotional, and overall value. Functional value pertains to an evaluation of a product on whether it is worth the money. Emotional value is the extent to which using a site can give consumers pleasure and joy. Overall value is about a summary of the whole consumption process if the service was worth their investment. This current study adopted the

perceived value scale from Lee et al. (2007) to test the effect of e-service quality on perceived value as this scale has gained high explained variance (61.06%) and satisfactory Cronbach's alpha (0.9). Moreover, this paper has gained more than 600 citations.

There are several studies that investigated relationships between service quality and perceived value. For example, Bauer et al. (2006) developed an e-service quality scale called "eTransQual" and tested the effects of e-service quality on perceived value and satisfaction in an online shopping context. The researchers found that e-service quality had a positive relationship with both perceived value and satisfaction. Kuo, Wu, and Deng (2009) studied mobile service and its effects on perceived value, satisfaction, and intention. Results showed that service quality had a positive effect on perceived value with the total explained variance of 46 percent. Lien, Wen, and Wu (2011) investigated e-service quality in Taiwan online shopping context. The outcome variables in this study included perceived value, satisfaction, and intention. Results indicated that e-service quality had a positive impact on all outcome variables. Based on the literature review, the following hypothesis is proposed:

H1: E-service quality has a positive relationship on perceived value (See figure 1 for a conceptual model).

Satisfaction

Satisfaction has its root in the expectation-disconfirmation theory proposed by Oliver (1980), who argued that a person forms an expectation about a product or service before using a product or receiving a service. Satisfaction is formed when a person compares their expectation with their perception of the product's performance. A person will be satisfied when performance meets expectation, confirming their pre-consumption expectation. Positive disconfirmation can

happen when performance is better than expectation whereas negative disconfirmation happens when consumers perceive that performance is worse than what is expected.

Chang, Wang, and Yang (2009) discussed two conceptualizations of satisfaction: transaction specific and cumulative satisfaction. Satisfaction that occurs after receiving a one-time service will be conceptualized as transaction specific satisfaction. However, when satisfaction is a function of repeated experiences that consumers receive from a service provider over time, it is an overall satisfaction or cumulative satisfaction. The current study attempts to measure overall customer satisfaction of those who have regularly purchased products from online sites.

Sivadas and Baker-Prewitt (2000) differentiated satisfaction and service quality by stating that service quality is an evaluation of a provider's performance whereas satisfaction is consumers' experiences after receiving a service. Therefore, they concluded that service quality is a predictor of satisfaction. Moreover, in referring to Iacobucci, Ostrom, and Grayson (1995), Sivadas and Baker-Prewitt stated that improving service quality that is not consistent with what consumers want may not result in higher satisfaction. Cho and Park (2001) emphasized the importance of satisfaction in e-commerce area and stated that satisfaction is a function of service quality which leads to repurchase intention. They also developed an index called "ECUSI" to specifically measure online customers' satisfaction. Carlson and O'Cass (2010) studied the effect of e-service quality on satisfaction, attitude toward a site, and intention to continue visiting a site within sport-related content sites. Results showed that e-service quality had a positive impact on satisfaction, attitude, and intention. In addition, satisfaction had a positive impact on attitude and intention. Based on previous literature, e-service quality has an impact on customer satisfaction. Therefore, the following hypothesis is proposed:

H2: E-service quality has a positive relationship on customer satisfaction.

Loyalty

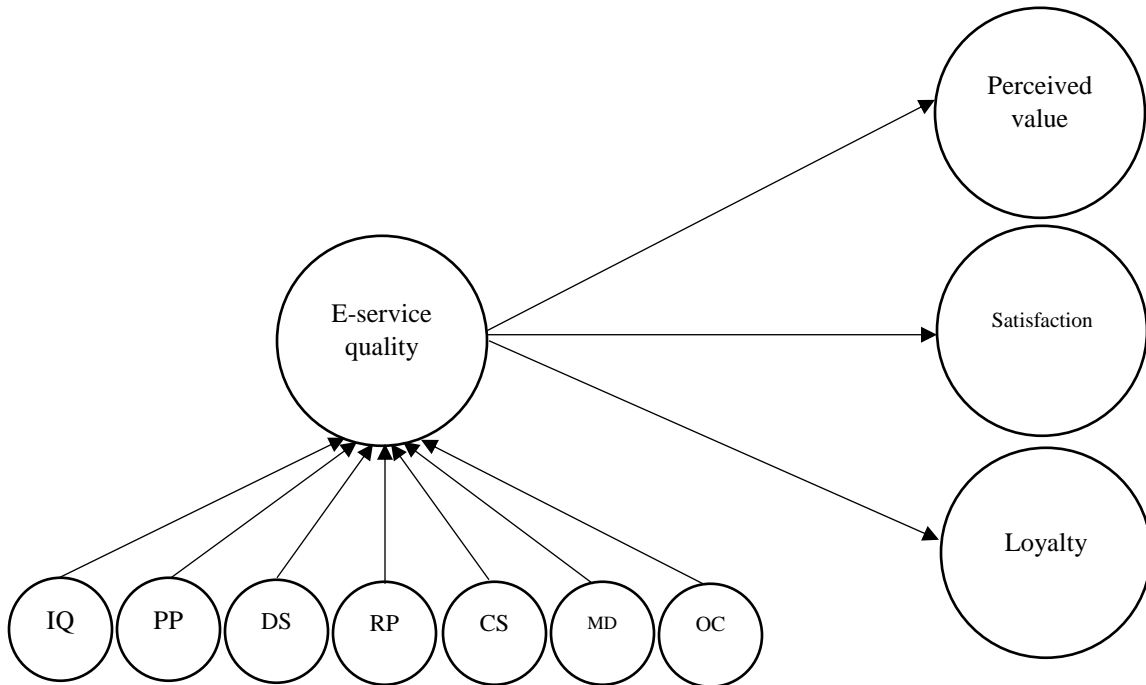
Bowen and Chen (2001) differentiate three approaches of measuring loyalty. The first approach considers loyalty as a repeat behavior. The authors argued that this approach failed to take into account the attitudinal aspect of customer loyalty. Dick and Basu (1994) also pointed out that this approach did not explain why customers engage in repeat behaviors such as repurchasing products from a particular brand. Bloemer and Kasper (1995) further analyzed this issue by distinguishing two types of loyalty: spurious and true brand loyalty. Spuriously loyal customers repurchase from a brand but have the potential to switch to other brands because of better offers while truly loyal customers will stick with the brand because of their commitment.

The second approach to measuring loyalty solely considers an attitudinal aspect such as customer commitment without taking the behavioral aspect into consideration. This means that loyal customers may feel committed to a brand do not necessarily regularly repurchase the brand. Bowen and Chen (2001) concluded that in order to fully understand and measure customer loyalty, researchers need to conceptualize loyalty as a multidimensional construct that includes both behavioral and psychological aspects of loyalty. Oliver (1999) referred to loyalty as "A deeply held commitment to rebuy or re-patronize a preferred product/service consistently in the future, thereby causing repetitive same-brand or same brand-set purchasing, despite situational influences and marketing efforts having the potential to cause switching behavior." (p. 34) Based on this definition, loyalty is conceptualized as a multidimensional construct comprising both psychological and behavioral aspects. This third approach is considered to be superior than the first two approaches and has been used in many studies.

There are several studies that investigate relationships between e-service quality, satisfaction, and loyalty. For example, Yoo and Donthu (2001) examined the effects of e-service quality on attitude toward a site, site equity, and site loyalty. Results indicated that e-service quality had a positive effect on all dependent variables. Wolfinbarger and Gilly (2003) studied e-service quality and its effects on satisfaction, attitude toward a site, and loyalty and found significant relationships. Based on literature, the following hypothesis is proposed:

H3: E-service quality has a positive relationship on loyalty.

Figure 1. A Conceptual Model



To sum up, there are at least six main dimensions of e-service quality. To improve an e-service quality scale that is current and can capture recent consumers' perception, qualitative research was conducted to gain fresh consumer insights about their perception toward online sites' performance. By conducting focus groups, I have gained wide range of responses and

unexpected themes have emerged as new potential dimensions of the scale. Quantitative research was also conducted to validate my proposed dimensions and test for nomological validity. The following section provides more details regarding methods for data collection and analysis.

CHAPTER 3. METHODS

According to Carpenter (2018) and Churchill (1979), steps for scale development include implementation of both qualitative and quantitative research. To inform the current study, I first reviewed the literature related to e-service quality. Then, I consulted topic and methodological experts on dimensions I proposed to gain feedback on dimensionality of the construct. Next, I created a focus group protocol. The protocol was reviewed by two methodological experts, two topic experts, and two consumers. After revising the protocol based on expert feedback, I conducted eight focus groups to identify e-service quality dimensions and scale items. After analyzing data, two pilot studies were conducted to determine whether items should be added to or deleted from the scale. The main survey was launched to apply exploratory factor analysis (EFA) to discover dimensionality and scale items. Finally, the scale was tested further with second round of survey data collection to apply confirmatory factor analysis (CFA) and validity tests. Each step is explained in detail in the following section.

Step 1: Focus Groups

After reviewing literature related to e-service quality, I proposed six dimensions based on the conceptual definition of the construct that e-service quality should cover the whole consumption process. These six dimensions consisted of information quality, privacy protection, delivery system, site functionality, ease of use, and customer service. Conducting focus groups would reveal dimensions and scale items of the construct. According to Morgan (1997), a focus group is a qualitative research approach that refers to an interview of a group of people with a moderator leading the discussion. Focus groups can yield valuable responses as respondents are encouraged to talk freely about a focused topic and a discussion can lead to unexpected responses that researchers have never thought of before (Kitzinger, 1995).

In developing a focus group protocol, I consulted with two topic experts and two methodological experts for suggestions. I also asked two online shoppers to read the protocol and identify any unclear questions. Eight focus groups were conducted with online consumers, age 18 and older, who regularly shop from online stores at least once a month. There were 61 respondents who participated in this study. During each focus group, one trained researcher served as a moderator and another researcher attended to observe the sessions and take notes.

Regarding data analysis, I analyzed focus group data by creating a rubric using previous e-service quality scales. I chose scale items that were best representative of each dimension I proposed. I adjusted some words in scale items to have the same language structure and fit with the purpose of this study. For example, I changed the word “website” to “site” throughout the rubric as I needed this scale to be widely applicable and not limited to specific technological devices. Moreover, scale items should reflect consumer’s perception, so I reworded some scale items that appeared to be testing knowledge and changed them to reflect perception items. For example, a scale item from Yang et al. (2004, p.1163) “Employees have the knowledge to answer my questions” is testing consumers’ knowledge whether they know if employees have knowledge. Therefore, I reworded this item to “Employees have useful knowledge that answers my questions” to measure consumer perception if they think the knowledge is useful.

Results

The rubric consisted of 46 scale items representing six proposed dimensions. Two coders separately coded the first focus group transcription as a pre-test for this coding process using the rubric. The coders were instructed that they could add new scale items when they saw any data that did not fit with the given rubric. After completing the coding, coders compared their analysis and had intense discussion on wording for new scale items. After achieving an agreement for the

first coding, coders separately coded the rest of transcriptions. Coders also counted for frequency of each theme that was referred to by respondents (See Table 1 for frequency).

Table 1. Frequency of Reference

Themes emerged from focus group analysis	Count
1. Information quality	458
2. Privacy protection	152
3. Delivery system	330
4. Ease of use	202
5. Site functionality	69
6. Customer service	359
7. Customization	133
8. Multi-device compatibility	20

WordStat software, a software for qualitative analysis, was also used to identify underlying themes and compare with results from manual coding. The software showed that information quality, privacy protection, delivery system, ease of use, and customer service were the main themes extracted from the data. This was in line with coders' analysis. However, site functionality did not appear to be one of the main themes. This result was somewhat consistent with coders' analysis that site functionality did not gain much attention from respondents.

However, I proposed two more dimensions that should be added into the scale: customization and multi-device compatibility. Customization refers to consumers' perception about how well a site can adjust in favor of consumers' taste and wants (Ghobadian, Speller, & Jones, 1994). This theme emerged when respondents were prompted to give suggestion to online shopping sites. For example, one respondent said, "I think it's always nice when you can customize how often they communicate with you or what types of emails they send, just so that you don't have to unsubscribe and get annoyed with a steady flow of emails you get." Examples of scale items regarding this dimension included "I can easily customize how this site

communicates with me,” “I can easily choose to unsubscribe from certain advertising e-mails from this site,” and “I can easily customize how I track my order.”

Multi-device compatibility is consumers’ perception about how well a site can be accessed through consumers’ choices of technology such as mobile phones, tablets, and personal computers (Bilgihan et al., 2016). Bilgihan et al. (2016) emphasized that online sites should give consumers several ways to access their site for a better user experience. Information from eMarketer and InternetRetailing also showed that e-commerce sales generated through mobile devices have increased every year. According to eMarketer (2018), sales made through mobile devices, including tablets have reached 1.8 trillion dollars worldwide and are projected to reach 3.5 trillion dollars in 2021. Mobile commerce sales in 2018 accounted for 63.5 percent of the total digital sales, compare with 52.4 percent in 2016. Therefore, even though this theme did not gain much attention from respondents, it will be essential in the near future and may emerge as a new dimension of e-service quality. The final scale items of e-service quality from focus groups consisted of 81 items, representing eight dimensions.

Step 2: Pilot Test and Expert Feedback

Pilot Test Method

Following recommended scale development procedures, a pilot test should be employed with about 100-200 respondents (Clark & Watson, 1995) to serve as a guideline for deleting low factor loading items (Carpenter, 2018). Therefore, I conducted a pilot test with online shopping consumers using a Qualtrics panel. Recruitment quota included about an equal amount of both genders. This gender quota is similar to statistics from International Monetary Fund (IMF) that in 2018, there are about 49 percent male Internet users and 51 percent female Internet users. Age

distribution followed statistics from Populationpyramid.net (2018) and Pew Research Center that in 2018, there are about 38.6 percent of Internet users in age 18-29, 24.6 percent of age 30-49, and 36.8 percent of age 50 and above.

Pilot Test Results

The final number of respondents with usable data consisted of 210 responses (See Table 2 for demographic information).

Table 2. Demographic Information of Pilot Test Participants ($N = 210$)

Demographic Information	N	Percentage
Age		
• 18-29	84	40.0%
• 30-49	53	25.2%
• 50 +	73	34.8%
Gender		
• Male	101	48.1%
• Female	105	50.0%
• Other	4	1.9%
Ethnicity		
• White	146	69.5%
• American Indian or Alaska Native	2	1.0%
• Black or African American	32	15.2%
• Hispanic or Latino	13	6.2%
• Asian	13	6.2%
• Native Hawaiian or Other Pacific Islander	1	0.5%
• Other (e.g. Biracial)	3	1.4%
Formal education		
• No formal educational credential	4	1.9%
• High school diploma or equivalent	53	25.2%
• Some college, no degree	66	31.4%
• Postsecondary non-degree award	3	1.4%
• Associate's degree	24	11.4%
• Bachelor's degree	37	17.6%
• Master's degree	16	7.6%
• Doctoral or professional degree	7	3.3%
Total family income		
• Less than \$25,000	59	28.1%
• \$25,000 - \$29,999	15	7.1%
• \$30,000 - \$39,999	26	12.4%
• \$40,000 - \$49,999	20	9.5%
• \$50,000 - \$59,999	23	11.0%
• \$60,000 - \$69,999	17	8.1%
• \$70,000 - \$79,999	9	4.3%
• \$80,000 - \$89,999	7	3.3%
• \$90,000 - \$99,999	8	3.8%
• \$100,000 or more	26	12.4%

I used two criteria in determining scale items to be retained for exploratory factor analysis. First, scale items that had factor loadings of less than 0.32 were deleted (Carpenter, 2018). Second, there must be no cross-loadings among items. I also added more items to factors that contained only a few scale items such as multi-device compatibility, ease of use, omni-channel, and return process.

Multi-device compatibility was a new dimension that I proposed, and it is supported by the pilot test result as one of the factors of e-service quality scale. However, there were only four scale items that loaded on this factor. This might not be a sufficient number of items to represent the dimension for future EFA (Carpenter, 2018). These four scale items included “This site properly adjusts to fit with my devices’ screens,” “This site can be easily accessed on multiple devices,” “This site is mobile-friendly,” and “The site’s mobile application functions well on my device.” Therefore, I added some new more items to represent multi-device compatibility aspect.

I reviewed the focus group data to inform the development of additional items. When reanalyzing focus group data, there were some interesting ideas and words from respondents that could be used to create new items. For example, some respondents mentioned that a site should be usable in every device. This is similar to the idea that a site can be easily accessed through multiple devices, but respondents added that it should also be usable. Therefore, a new scale is “this site is usable on all types of device.” Another respondent said, “A mobile website, so you can actually pull it up on your tablet or your phone. If the website is responsive or not.” This has led to a new scale item: this site is responsive through mobile access. A male respondent also stated, “sometimes it's frustrating when you're trying to look up something quick on your phone and the website's all jumbled and it's not good for the smaller screens.” Therefore, I created a new scale item: this site has an appropriate layout design for mobile access. Moreover, some

respondents needed a mobile access to be fast and easy, so I created two items: “accessing this site through mobile devices is fast” and “accessing this site through mobile devices is easy.”

Based on the results, omnichannel was a new dimension that emerged from the analysis. Omnichannel is about a site that seamlessly integrates online and offline stores to give customers a better shopping experience (Verhoef, Kannan, & Inman, 2015). Beck and Rygl (2015) explicated the concept of omnichannel and categorized an integration of online and offline channels into three categories: multi-channel, cross-channel, and omni-channel. Multi-channel marketing is when retailers provide more than one channel as contact points but there is no integration between channels. For example, consumers cannot order products online to pick them up at the store. For cross-channel marketing, partial integration exists. Some channels are integrated but not all. The last category is omni-channel marketing which employs a full integration. Consumers can choose to order products from any channels and pick them up at their choices of stores as well as return online orders at the physical store.

Verhoef et al. (2015) pointed out that online sites have to integrate multiple touchpoints to serve their consumers seamlessly and to gain better consumers' experiences. The researchers argued that this omnichannel marketing can affect brand performance. El Azhari and Bennett (2015) gave an overview of omni-channel marketing in both Europe and the U.S. and stated that some leading brands such as Sephora, Marks & Spencer, Nordstrom, and Adidas have already implemented omni-channel strategy.

Herhausen, Binder, Schoegel, and Herrmann (2015) questioned whether omni-channel marketing profits or hurts a brand. Their study concluded that online-offline integration actually helped the brand rather than hurt it. Herhausen et al. (2015) also studied the impact of online-offline integration, perceived service quality, and perceived risk on purchase intention. Results

showed that online-offline integration had a positive influence on purchase intention through perceived service quality. This means perceived service quality mediated the effect of online-offline integration on purchase intention. Thus, we conclude that online-offline integration affects perceived service quality. This finding led to a question as to whether online-offline integration is actually a part of perceived service quality. My focus group respondents indicated that online sites should offer such service that integrates online and offline stores. For example, one respondent said, “Sometimes you can even return it in store. You don’t have to send it back. If you order it and you don’t like it, you can go to the store that sells that product and then be able to return it and get your money back or get an exchange. I feel like that’s useful too.”

Focus group results of this current study regarding omni-channel were in line with a study by Piotrowicz and Cuthbertson (2014). They conducted six focus groups focusing on information technology. Results showed that respondents expected online sites to implement channel integration such that online and physical stores of a brand cooperate with each other and offer consumers a seamless transition. Juaneda-Ayensa, Mosquera, and Sierra Murillo (2016) also argued that today’s consumers utilize several channels to search for information to form their purchase decision and expect that a brand offers consistent service throughout various consumers’ touchpoints. Chatterjee’s (2010) study found that when consumers can order products online and pick up at the actual store, they will be more likely to repurchase from that site.

According to the analysis of this pilot test, there were only two scale items retained for online-to-offline integration dimension: “It is easy to pick up my orders at the store.” and “It is easy to return my orders at the actual store.” To the best of my knowledge, there are no omni-channel scales and no existing omni-channel dimension as part of e-service quality to serve as a

starting point for developing omni-channel scale items. According to Clark and Watson (1995), two scale items were not enough to represent a dimension. Thus, I intended to add more items to represent the dimension and these items were tested in the main survey. Omni-channel as a new dimension refers to consumers' perception that a site seamlessly integrates online and offline stores to give customers better shopping experience. This dimension reflects consumer perception about a site's performance in facilitating parts of consumption processes such as during pre-purchase period in which consumers search for information before making purchase decision or during post-purchase period when consumers encounter online order problems.

When looking at the qualitative data, there were some interesting ideas from respondents that helped inform new scale items for the dimension. For example, one respondent said, "I like it when they have an option to ship it to the store for free. I don't need to pay the shipping. I'm just going to go to the store at a time and get it." This has led to a new scale item: "This site makes it convenient to ship products to a physical store free of charge." Another respondent stated that sometimes it was frustrating that a site provided outdated information about products in a physical store. One female respondent also stated that she needed to be able to check if products were available at the nearest store. Therefore, I created a new scale item: this site provides up-to-date information about the inventory in a physical store.

Some respondents preferred to have employees at the actual store fix their online order problems. One respondent said, "I can't upload my credit numbers to the iTunes Store. So, I don't know which one to contact, to contact the Apple or just to contact the iTunes because when I went to the Apple store in East Lansing, they just told me that, "Oh. We don't actually handle this. You should contact iTunes store. I don't know that iTunes store is different from Apple." Therefore, two scale items were developed: "employees at a physical store can easily access my

online order information” and “employees at a physical store are helpful in solving my online order problems.”

Return process also emerged as a dimension from the pilot test analysis. As there is a lack of scale regarding return policy, I reviewed my focus group data to inform return process scale items. There were some interesting ideas from respondents that could be used to create return process scale items. For example, respondents stated that they needed a hassle-free return process. One respondent said “It doesn't make it super hard to check out. It doesn't have all these different steps. Everything is on the same page and you go through it. Returning stuff isn't a hassle.” This has led to a new scale item “Returning products is hassle-free.” Respondents also stated that they needed a quick process of returning products and getting their refunds. Therefore, two more scale items were developed: “the returning process is quick” and “it is fast to get refund for returned products.”

Many ease of use items were deleted because of low factor loadings and cross-loadings, resulting in only four remaining scale items. Therefore, I added some new scale items based on focus group data. These new scale items included “This site makes sure that I do not easily get lost while surfing,” “It easy to revisit a page that I just visited,” and “This site has an easy process to log on to my account.”

Expert Feedback

I also gathered expert feedback regarding my scale items from this pilot test. The experts consisted of three online shopping topic experts, one methodological expert, and three online shoppers. After they reviewed the scale items, I revised scale items accordingly. First, ten items were revised for simplicity. Second, according to one of the experts, 15 scale items were testing

consumers' knowledge rather than reflecting their opinions toward the shopping site. As stated earlier, e-service quality construct measures consumers' perception of the shopping site, not their knowledge. Therefore, I revised them to be opinion-based scale items. After the analysis, 65 scale items were retained, including 14 newly added scale items.

As I revised and added many scale items, I conducted another pilot test to ensure that these scale items contained at least 0.32 factor loading with no cross loading. Finally, I deleted 7 additional items with low factor loading (See Table 3 for scale items from pilot test analysis).

Table 3. Scale Items from Pilot Test Analysis

Information quality: how well a site provides important content to consumers.
1. Information on this site is easy to understand.
2. This site provides information at the right level of detail.
3. This site shows good pictures of the products.
4. Information on this site is up to date.
5. Information on this site is well organized.
6. This site provides detailed description about products.
7. Information on this site is accurate.
8. Information contained on this site is in an appropriate format.
9. The products that arrive are accurately represented on this site.
10. Discount information is regularly available.
Privacy protection: consumers' perception that a site is secure in keeping their personal information confidential.
11. This site assures me that other sites will not get my information.
12. This site keeps my personal information secure.
13. This site carefully protects my credit card information.
14. This site makes sure to protect information about my online shopping behaviors.
15. This site will not purposely misuse my personal information.
16. This site uses clear symbols to communicate that it is secure to use.
17. This site assures me that I will not be placed on mass-mailing lists.

Table 3. (cont'd)

Delivery system: consumers' perception on whether a site keeps its promises to get the product to customer on time and handle orders properly.
18. This site provides me with an accurate delivery date.
19. This site provides me with an accurate shipping time.
20. This site is committed to delivering orders within a designated time frame.
21. This site quickly delivers what I order.
22. It is easy to access an order confirmation after I place an order.
23. I can track my orders easily.
24. <i>My orders are delivered undamaged. (deleted)</i>
25. This site packages my order properly.
26. <i>My orders from this site rarely contain wrong items. (deleted)</i>
27. <i>My orders are rarely lost during shipping. (deleted)</i>
Return process: consumers' perception on how well a site manages their return system.
28. <i>This site has clearly stated return policies. (deleted)</i>
29. This site quickly sends me return labels.
30. It is easy to return products.
31. Returning products is hassle-free. (new)
32. Returning costs are reasonable.
33. The returning process is quick. (new)
34. It is fast to get refund for returned products. (new)
Ease of use: the extent to which consumers perceive that a site is simple to operate.
35. It is easy to navigate this site. (deleted)
36. It is easy to use search filter to find the products I am searching for on this site.
37. <i>It is easy for me to complete my transaction through this site. (deleted)</i>
38. Scrolling through pages is kept to a minimum.
39. This site makes sure that I do not easily get lost while surfing. (new)
40. It easy to revisit a page that I just visited. (new)
41. <i>This site has an easy process to log on to my account. (new) (deleted)</i>

Table 3. (cont'd)

Customer service: the extent to which a site is helpful in answering customers' questions and dealing with problems quickly and properly.
42. Employees of this site properly handle any problems that arise.
43. Employees of this site have useful knowledge to answer my questions.
44. Employees of this site are helpful in solving my problems.
45. It is easy to talk to a real person from this site.
46. Employees of this site are courteous to me when trying to resolve my problems.
47. It is easy to contact employees through the live chat function.
48. The outcome for solving my problems is fair.
49. This site is willing to respond to my questions.
50. This site has a good procedure for handling complaints.
51. This site shows a sincere interest in solving my problems.

Multi-device compatibility: the extent to which a site can be accessed through consumers' choices of technology.
52. This site is mobile-friendly.
53. This site can be easily accessed on multiple devices.
54. The site's mobile application functions well on my device.
55. This site is functional on all my devices. (new)
56. This site is responsive to mobile devices. (new)
57. This site has an appropriate layout design for mobile access. (new)
58. This site properly adjusts to fit with my devices' screens.
59. Accessing this site through mobile devices is fast. (new)
60. Accessing this site through mobile devices is easy. (new)

Omni-channel: consumers' perception that a site seamlessly integrates online and offline stores to give customers better shopping experience.
61. It is easy to physically pick up my orders if this site has a physical store near my home.
62. It is easy to return my orders if this site has a physical store near my home.
63. This site provides up-to-date information about the inventory available in a physical store. (new)
64. Employees at a physical store can easily access my online order information. (new)
65. Employees at a physical store are helpful in solving my online order problems. (new)

Step3: Exploratory Factor Analysis (EFA)

Sample Size

The main survey was launched through Qualtrics service. To determine the number of respondents, Carpenter (2018) and Osborne and Costello (2004) suggested a minimum of 5 respondents per 1 item. Moreover, Fabrigar, Wegener, MacCallum, and Strahan (1999) argued that under a poor condition in which factor loadings seem to be unstable and low, a study with less than 400 respondents may contribute to misleading results as data might not be enough for population parameter to be accurately estimated. As there were 65 items to be tested in the main survey, I would need at least 325 respondents. Moreover, I would need to account for nonresponse and incomplete responses. Carpenter (2018) and Williams et al. (2010) referred to Comrey and Lee (1992) who suggested that sample sizes of 500 are considered a very good number of respondents. Therefore, I recruited 500 respondents using Qualtrics research service. As I needed fresh memory from respondents, my target respondents had to be those who regularly purchase tangible products online at least once a month. I also used quota sampling as in the pilot test. I needed roughly equal number of male and female respondents. Based on Populationpyramid.net (2018) and Pew Research Center about Internet users, there were about 40 percent of Internet users with age range of 18-29, 25 percent of 30-49 years old, and about 35 percent of people with age of 50 or more. Therefore, age distribution was as the following:

Age 18-29 = 40 percent

Age 30-49 = 25 percent

Age 50+ = 35 percent

Respondents who completed the survey were compensated according to their survey panel membership.

Extraction Method

For data analysis, the most common method for identifying underlying dimensions of a construct when developing a scale is through exploratory factor analysis or EFA (Carpenter, 2018). EFA gives information about number of dimensions of a proposed scale. Moreover, factor loadings provide information about strength of each of the items' effect on the proposed scale (Fabrigar & Wegener, 2011). The two most common extraction methods for EFA are principle axis factoring (PAF) and maximum likelihood (ML) (Carpenter, 2018). Carpenter (2018) and Costello and Osborne (2005) provided guidelines for when it is appropriate to use each of the two methods. PAF is recommended when data are not normally distributed, and ML is used for normally-distributed data. As respondents responded to statements regarding their most frequent shopping site and most of the scale items were positive statements, the data were not normally distributed. Therefore, I used PAF as an extraction method.

Number of Factors

There are various methods to employ in deciding on the number of factors to retain. When analyzing number of factors that should be retained, most scholars argued that using a cutoff point of Eigenvalue of more than 1 can be misleading and should be avoided (Carpenter, 2018; Costello & Osborne, 2005). Fabrigar et al. (1999) suggested better approaches in determining number of factors which included scree test and parallel analysis (PA). A scree test is a graph that plots eigenvalues which can help researchers determine number of factors (Carpenter, 2018). Data points (dots) before a line becomes flat should be considered an

appropriate number of factors. Parallel analysis is another approach for determining number of factors (Carpenter, 2018). It compares eigenvalues of the current dataset with another random dataset. That is, when using syntax for parallel analysis, SPSS will randomly generate a dataset with the same number of variables and number of observations as in the current dataset. Factors are retained when eigenvalues of the current dataset exceed those in random dataset. Velicer (1976) proposed another method called “Minimum Average Partial” (MAP) to determine number of factors which consider a partial correlation matrix by calculating average squared correlations when factors are extracted out. When a square partial correlation hits the minimum coefficient value, the number of components are retained. As researchers recommend a combination of scree test, parallel analysis, and minimum average partial for determining number of factors, these three approaches were used for the survey data.

Rotation Method

There are infinite rotation orientations in finding the best solution to explain data for EFA (Fabrigar et al., 1999). Two rotation methods that are predominantly used by researchers are orthogonal and oblique rotation (Carpenter, 2018; Fabrigar et al., 1999). Orthogonal rotation is used when factors in dataset are presumably uncorrelated. On the other hand, oblique rotation such as Promax is recommended when there is potential that factors will be correlated (Carpenter, 2018). With e-service quality construct, factors are potentially correlated. For example, when consumers find inconsistency in information (information quality dimension) and employees cannot provide clear understanding (customer service), they may perceive that a site performs poorly. Therefore, I used Promax rotation as a rotation method.

Results

The total sample with complete data consisted of 525 respondents. Of the sample, about 48 percent were male, 52 percent were female, and only one respondent identified gender as other. Age of respondents ranged from 18-80 with a mean age of 42.64 (See Table 4 for EFA demographic information). As there were about 70 percent of respondents who identified Amazon as their most often shopping site in the pilot test, I set the quota for this EFA so that only about half of them were Amazon customers and the other half were other sites' customers. This is to gain diversity of the data. Out of 525 respondents, 55 percent indicated that their most often shopping site was Amazon, 10 percent Walmart, 10 percent Ebay, 3.4 percent Target, 2 percent Wish, other sites about 20 percent. These other sites included clothing sites such as Forever21, Fashionnova, Gap, American Eagle, Old Navy, and Romwe. They also identified department and beauty stores such as Kohl's, Nordstrom, Sephora, and Ulta. Their top three most frequently purchased products included clothing (44.8%), household items (32%), cosmetics (20%), electronics (17.7%), grocery and food (17.3%), shoes (14.6%), books (11.4%), games and toys (10.9%), vitamins and supplements (10%), pet products (8.8%), DVD and movies (7%), appliances and tools (5%), and jewelry (4.2%). Regarding devices used for surfing shopping sites, 45 percent of respondents surfed through personal computers, 48 percent through mobile phones, and 7 percent through tablets. Regarding devices used for purchasing products, 50 percent of respondents indicated that they purchased products through personal computers, 44 percent through mobile phones, and 6 percent through tablets.

Table 4. EFA Demographic Information (*N* = 525)

Demographic Information	N	Percentage
Age		
• 18-29	178	33.9%
• 30-49	153	29.1%
• 50 +	194	37.0%
Gender		
• Male	251	47.8%
• Female	273	52.0%
• Other	1	0.2%
Ethnicity		
• White	402	76.6%
• American Indian or Alaska Native	31	5.9%
• Black or African American	45	8.6%
• Hispanic or Latino	8	1.5%
• Asian	30	5.7%
• Native Hawaiian or Other Pacific Islander	2	0.4%
• Other (e.g. Biracial)	7	1.3%
Formal education		
• No formal educational credential	4	0.8%
• High school diploma or equivalent	109	20.8%
• Some college, no degree	135	25.7%
• Postsecondary non-degree award	1	0.2%
• Associate's degree	58	11.0%
• Bachelor's degree	158	30.1%
• Master's degree	52	9.9%
• Doctoral or professional degree	8	1.5%
Total family income		
• Less than \$25,000	95	18.1%
• \$25,000 - \$29,999	47	9.0%
• \$30,000 - \$39,999	63	12.0%
• \$40,000 - \$49,999	47	9.0%
• \$50,000 - \$59,999	59	11.2%
• \$60,000 - \$69,999	38	7.2%
• \$70,000 - \$79,999	42	8.0%
• \$80,000 - \$89,999	28	5.3%
• \$90,000 - \$99,999	24	4.6%
• \$100,000 or more	82	15.7%

SPSS software version 25 was used to conduct the EFA. According to this data set, Kaiser-Meyer-Olkin (KMO) index (KMO = 0.913) and Barlett's test ($\chi^2 = 13638.689$, $df = 630$, $p < 0.001$) showed that the data set was suitable for factor analysis following Williams, Onsman, and Brown's (2010) guidelines.

To explore number of factors to be retained, a combination of literature review, qualitative, and quantitative research needed to be taken into consideration. Literature review indicated that there are at least six dimensions of e-service quality construct. Focus group analysis reviewed eight dimensions, whereas results from a scree test showed that the construct consisted of seven dimensions: information quality, customer service, privacy protection, multi-device compatibility, delivery system, return process, and omni-channel. Parallel analysis using SPSS software indicated a nine-factor construct. Minimum average partial showed that seven factors should be retained. Therefore, the possible number of factors for this construct ranged from 6 to 9. Carpenter (2018) suggested to reanalyze data by fixing number of factors to be 5 – 10 factors. Results are compared to provide the best solution.

There were several item deletion criteria I used to determine number of factors and scale items to be retained. First, scale items with factor loadings of at least 0.32 were retained for future CFA. Second, there must be no cross-loadings problem among scale items. According to a recommendation by Matsunaga (2010), items with cross loadings of at least 0.2 or more away from the main factor loading will be retained. This is to ensure discriminant validity. Third, according to Hinkin (1995), respondents could get fatigued when facing too many scale items. Therefore, item redundancy was considered and items that best represented each of the dimensions were retained. Fourth, factors that were retained must present good reliability. After reanalyzing data with 5 – 10 factors, results showed that seven factors with 36 scale items were best to describe data. Cronbach' alpha for every dimension was also at least 0.7, showing good reliability (See Table 5 for EFA pattern matrix).

Table 5. EFA Pattern Matrix

Scale items	Factor						
	Multi-device	Omni-channel	Information quality	Return process	Customer service	Privacy protection	Delivery system
Accessing this site through mobile devices is easy.	.900	-.011	.038	.011	-.014	-.026	-.010
Accessing this site through mobile devices is fast.	.894	-.050	-.073	.030	.007	.027	-.010
This site is responsive to mobile devices.	.892	.034	-.012	-.020	-.007	.012	-.010
This site has an appropriate layout design for mobile access.	.854	-.024	.026	.003	.039	-.004	-.041
This site is mobile-friendly.	.802	.060	.000	-.020	-.006	-.004	.058
This site is functional on all my devices.	.801	.005	.034	-.008	-.026	-.015	.030
It is easy to return my orders if this site has a physical store near my home.	-.026	.883	.037	.072	-.040	-.028	-.035
It is easy to physically pick up my orders if this site has a physical store near my home.	.007	.878	.012	.013	-.052	-.048	.002
Employees at a physical store can easily access my online order information.	.004	.873	-.032	-.022	.072	.013	-.024
Employees at a physical store are helpful in solving my online order problems.	.006	.867	-.066	-.026	.019	.024	.034
This site provides up-to-date information about the inventory available in a physical store.	.021	.744	.037	-.035	.021	.057	.014
Information on this site is well organized.	.041	-.038	.765	.039	-.008	.041	-.094
This site provides information at the right level of detail.	-.027	.001	.763	-.008	-.039	.006	.049
Information contained on this site is in an appropriate format.	.031	-.052	.735	.011	-.020	.005	-.053
Information on this site is easy to understand.	-.015	-.012	.732	-.054	.094	-.029	.026
Information on this site is up to date.	.004	.029	.724	-.035	.072	-.003	.015
This site shows good pictures of the products.	-.028	.064	.685	.029	-.069	.011	.082
It is easy to return products.	-.017	.022	.029	.904	-.075	.013	-.050
Returning products is hassle-free.	-.038	.001	-.012	.882	-.027	.053	-.023
The returning process is quick.	-.023	-.005	.012	.874	-.002	-.053	.056
Returning costs are reasonable.	.053	-.017	-.067	.766	.030	.053	.027
It is fast to get refund for returned products.	.049	.002	.021	.667	.167	-.061	-.003

Table 5. (cont'd)

Scale items	Multi-device	Omni-channel	Information quality	Factor Return process	Customer service	Privacy protection	Delivery system
Employees of this site are helpful in solving my problems.	-.022	-.021	.013	-.064	.959	-.010	-.025
Employees of this site are courteous to me when trying to resolve my problems.	-.008	.029	.016	.007	.805	-.014	-.037
Employees of this site properly handle any problems that arise.	-.015	.024	-.042	.082	.787	.020	.025
Employees of this site have useful knowledge to answer my questions.	.023	.037	.005	-.060	.775	.034	.021
This site shows a sincere interest in solving my problems.	.022	-.057	.026	.103	.682	.001	.008
This site keeps my personal information secure.	.015	.020	.035	-.010	-.069	.866	-.023
This site carefully protects my credit card information.	.013	.000	.087	.023	-.040	.741	.010
This site will not purposely misuse my personal information.	-.020	-.061	-.087	.002	.097	.722	.094
This site makes sure to protect information about my online shopping behaviors.	.036	.023	-.005	-.002	.003	.702	-.001
This site assures me that other sites will not get my information.	-.046	.023	.015	.009	.046	.699	-.068
This site provides me with an accurate shipping time.	.005	-.009	-.047	-.056	-.007	.011	.878
This site is committed to delivering orders within a designated time frame.	.018	-.016	-.037	-.012	-.029	.018	.781
This site quickly delivers what I order.	-.010	.018	.095	.092	-.005	-.084	.691
This site provides me with an accurate delivery date.	.000	.003	.085	.009	.039	.052	.665
Percentage of variance	30.789	10.842	8.273	7.867	5.536	4.765	4.092
Eigenvalue	11.084	3.903	2.978	2.832	1.993	1.715	1.473
Cronbach's alpha	0.943	0.927	0.878	0.917	0.906	0.864	0.852

According to the EFA, seven factors with 36 scale items were retained. The first factor with highest eigenvalue was multi-device compatibility (eigenvalue = 11.084) and it accounted for 30.789 percent of the variance (Cronbach's alpha = 0.943). Factor two was omni-channel

with eigenvalue of 3.903 and it accounted for 10.842 percent (Cronbach's alpha = 0.927). Factor three was information quality with eigenvalue of 2.978, 8.273 percent of the variance (Cronbach's alpha = 0.878). Factor four was return process with eigenvalue of 2.832 and it accounted for 7.867 percent of the variance (Cronbach's alpha = 0.917). Factor five was customer service with eigenvalue of 1.993 and it accounted for 5.536 percent of the variance (Cronbach's alpha = 0.906). Factor six was privacy protection with eigenvalue of 1.715 and it accounted for 4.765 percent of the variance (Cronbach's alpha = 0.864). The last factor was delivery system with eigenvalue of 1.473 and it accounted for 4.092 percent of the variance (Cronbach's alpha = 0.852).

Discussion

EFA revealed that e-service quality consisted of seven factors: multi-device compatibility, omni-channel, information quality, return process, customer service, privacy protection, and delivery system. The total explained variance of the construct was 72.163 percent. The results regarding dimensions of e-service quality were somewhat different from the focus groups. For example, site functionality and ease of use did not appear to be a dimension of e-service quality. A possible explanation is that site functionality and ease of use should be basic features that every site should have. With today's advanced technologies, most sites are user-friendly and operate well so that consumers do not have to be concerned functionality. This is quite different from 10-15 years ago when technologies were being developed and ease of use and site functionality were of consumers' concern.

While customization received some attention from focus groups, it did not appear to be a dimension of e-service quality. This result was in line with Lee and Lin (2005) who found that personalization, such as recommendation based on customers' preferences, did not affect overall

service quality. It is possible that not everyone prefers recommendation system. According to focus groups, only some respondents preferred to have tailored recommendation system, some were annoyed by ineffective recommendation system.

EFA revealed that multi-device compatibility, omni-channel, and return process were three new dimensions of e-service quality, supporting results from the two pilot tests. However, these dimensions did not appear to be dimensions in other e-service quality scales. Return process appeared as a scale item of other dimension in previous scales. For example, return policy was part of responsiveness dimension of Bauer et al.'s (2006) scale. Swaid and Wigand (2009, p.20) included one item about return process as part of reliability dimension which is "Order cancellation and returns are confirmed within three days."

The next step of confirming scale items and dimensions emerging from the EFA is to conduct confirmatory factor analysis. The following section provides more details about data collection, results, and discussion.

Step 4: Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM)

After obtaining the results from EFA, 36 items were retained and another survey with improved scale and dependent variables (perceived value, satisfaction, and loyalty) was launched with 500 online respondents. Confirmatory factor analysis (CFA) using SPSS software was conducted. Structural equation modeling (SEM) was conducted by using SmartPLS software as Wong (2013) suggested that PLS be used when data are not normally distributed. CFA was used to validate results from EFA. It is essential that number of factors are specified before analyzing results. I used results from the EFA to indicate the expected number of factors which was 7 in

this current study. SEM was conducted to test effects of e-service quality on perceived value, satisfaction, and loyalty.

Validity Test

Convergent validity is a test to ensure that different indicators that measure the same factor are highly correlated (Hair, Hult, Ringle, & Sarstedt, 2016). To test for convergent validity, Sarstedt, Henseler, and Ringle (2011) suggested that average variance extracted (AVE) be more than 0.5. Reliability tests internal correlation among indicators of the same factor and a value of at least 0.7 has to be met to gain satisfactory reliability. This current study used these two criteria to assess convergent validity.

Discriminant validity is a test to ensure that different indicators measuring different factor are actually not correlated. To test for discriminant validity, cross-loading values of each indicator cannot load higher on other factors that they are not supposed to measure (Sarstedt et al., 2011). Moreover, cross loadings should be lower than main factor loadings at least 0.2 (Matsunaga, 2010). Fornell-Larcker criterion was also used to test for convergent and discriminant validity (Fornell & Larcker, 1981). To satisfy the criterion, square root of AVE has to be higher than 0.75 and also higher than correlations with other latent variables. Another measure to test for discriminant validity is called heterotrait-monotrait ratio (HTMT). According to Hair, Sarstedt, Ringle, and Gudergan (2017), values of HTMT have to be less than 0.85. These criteria were used in this study to test for discriminant validity.

Nomological validity is a test to investigate relationships among different constructs. When constructs that are supposed to be theoretically correlated are tested to be correlated, we can ensure nomological validity (Peter, 1981). Based on theory and previous literature related to

e-service quality, e-service quality is theoretically supported to have positive relationships with perceived value, satisfaction, and loyalty. The e-service quality scale developed in this study was also tested for nomological validity.

Measurements

The perceived value scale was adopted from Lee et al. (2007) which consisted of three dimensions: functional value, emotional value, and overall value. The satisfaction scale used in this study was adopted from Janda et al. (2002) which is based on a scale from Oliver (1980). This satisfaction scale showed high reliability of 0.97 in Janda et al.'s (2002) study. Loyalty is measured through two dimensions, conative and action loyalty. Items were adopted from Zhao and Huddleston (2012) (See Appendix B for Survey instrument).

Procedures

I recruited 500 respondents through Qualtrics service for CFA. To be eligible to participate the study, respondents have to regularly shop for tangible products online at least once a month. Respondents were asked to think about their most often purchase shopping site when completing the survey.

CHAPTER 4. RESULTS

The total sample with complete data consisted of 627 respondents. Of the sample, about 47.4 percent were male, 52.5 percent were female, and only one respondent identified gender as other. Age of respondents ranged from 18-80 with a mean age of 41.84 (See Table 6 for CFA demographic information). Out of 627 respondents, 60 percent indicated that their most frequent shopping site was Amazon, 11 percent Walmart, 8.29 percent Ebay, 2.87 percent Target, 2.39 percent Wish, other sites about 15 percent. These other sites included clothing sites such as Forever21, Fashionnova, American Eagle, Nike, and Romwe. They also identified department stores such as Macy's, Kohl's, Nordstrom, Sam's club, Best Buy, OfficeMax, and Ulta. Their top three most often purchase products included clothing (44.7%), household items (25%), electronics (20.6%), grocery and food (19.5%), cosmetics (15.6%), shoes (14.7%), games and toys (11.5%), books (9.7%), pet products (9.4%), jewelry (8.8%), DVD and movies (6.9%), vitamins and supplements (5.1%), and appliances and tools (2.9%). Regarding devices used for surfing shopping sites, 39.9 percent of respondents surfed through personal computers, 52.2 percent through mobile phones, and 8 percent through tablets. Regarding devices used for purchasing products, 45.6 percent of respondents indicated that they purchased products through personal computers, 46.6 percent through mobile phones, and 7.8 percent through tablets.

Table 6. CFA Demographic Information (N = 627)

Demographic Information	N	Percentage
Age		
• 18-29	206	32.9%
• 30-49	199	31.7%
• 50 +	222	35.4%
Gender		
• Male	297	47.4%
• Female	329	52.5%
• Other	1	0.2%
Ethnicity		
• White American	468	74.6%
• Hispanic or Latino	39	6.2%
• Black or African American	64	10.2%
• Native American or Alaska Native	9	1.4%
• Asian American	35	5.6%
• Native Hawaiian or Other Pacific Islander	1	0.2%
• Middle Eastern American	3	0.5%
• Other (e.g. Biracial)	8	1.3%
Formal education		
• No formal educational credential	10	1.6%
• High school diploma or equivalent	147	23.4%
• Some college, no degree	158	25.2%
• Postsecondary non-degree award	7	1.1%
• Associate's degree	68	10.8%
• Bachelor's degree	178	28.4%
• Master's degree	48	7.7%
• Doctoral or professional degree	11	1.8%
Total family income		
• Less than \$25,000	115	18.3%
• \$25,000 - \$29,999	57	9.1%
• \$30,000 - \$39,999	80	12.8%
• \$40,000 - \$49,999	62	9.9%
• \$50,000 - \$59,999	83	13.2%
• \$60,000 - \$69,999	39	6.2%
• \$70,000 - \$79,999	47	7.5%
• \$80,000 - \$89,999	27	4.3%
• \$90,000 - \$99,999	35	5.6%
• \$100,000 or more	82	13.1%

SPSS software version 25 was used for confirmatory factor analysis. Results from confirmatory factor analysis showed that e-service quality consisted of seven dimensions, confirming results from EFA (See Table 7 for pattern matrix and Appendix C for final scale items). The first factor with highest eigenvalue was multi-device compatibility (eigenvalue =

13.290) and it accounted for 36.917 percent of the variance (Cronbach's alpha = 0.942). Factor two was information quality with an eigenvalue of 3.738 and it accounted for 10.384 percent (Cronbach's alpha = 0.905). Factor three was omni-channel with eigenvalue of 2.890, 8.028 percent of the variance (Cronbach's alpha = 0.921). Factor four was return process with eigenvalue of 2.474 and it accounted for 6.873 percent of the variance (Cronbach's alpha = 0.923). Factor five was customer service with eigenvalue of 1.624 and it accounted for 4.512 percent of the variance (Cronbach's alpha = 0.917). Factor six was privacy protection with eigenvalue of 1.381 and it accounted for 3.837 percent of the variance (Cronbach's alpha = 0.866). The last factor was delivery system with eigenvalue of 1.295 and it accounted for 3.597 percent of the variance (Cronbach's alpha = 0.888). The total explained variance of the scale was 74.147 percent. Cronbach's alpha indices for dimensions were satisfactory with values of more than 0.7. Cronbach's alpha of perceived value, satisfaction, and loyalty construct were 0.939, 0.916, and 0.892, respectively.

Table 7. CFA Pattern Matrix

Scale items	Factor						
	Multi-device	Information quality	Omni-channel	Return process	Customer service	Privacy protection	Delivery system
This site is responsive to mobile devices.	0.923	-.071	.003	-.064	.046	.040	.005
This site has an appropriate layout design for mobile access.	0.870	.007	-.006	-.069	.046	-.017	.007
Accessing this site through mobile devices is fast.	0.855	.038	-.040	.071	-.010	-.020	-.052
Accessing this site through mobile devices is easy.	0.841	.029	-.018	.079	-.074	-.017	.007
This site is mobile-friendly.	0.833	.025	.031	.016	-.041	.022	-.012
This site is functional on all my devices.	0.807	-.010	.028	-.036	.019	-.005	.066
This site provides information at the right level of detail.	-.050	0.850	.034	.005	.037	-.083	.025
Information on this site is easy to understand.	.036	0.835	.003	-.083	.045	-.042	-.023
Information on this site is well organized.	-.009	0.788	.035	-.058	.037	.000	.007

Table 7. (cont'd)

Scale items	Factor						
	Multi-device	Information quality	Omni-channel	Return process	Customer service	Privacy protection	Delivery system
Information on this site is up to date.	.035	0.735	-.025	.066	-.075	.087	-.038
Information contained on this site is in an appropriate format.	-.013	0.721	-.038	.030	.045	.048	.009
This site shows good pictures of the products.	.026	0.678	.035	.046	-.078	.077	.043
Employees at a physical store can easily access my online order information.	-.004	.006	0.881	.002	-.022	-.016	.010
It is easy to return my orders if this site has a physical store near my home.	-.012	.023	0.874	.012	-.042	-.034	.026
Employees at a physical store are helpful in solving my online order problems.	-.002	-.036	0.849	-.004	.032	.054	-.001
It is easy to physically pick up my orders if this site has a physical store near my home.	-.022	-.020	0.834	.008	-.022	.048	-.016
This site provides up-to-date information about the inventory available in a physical store.	.044	.074	0.730	.001	.065	-.016	-.012
Returning products is hassle-free.	-.016	-.037	-.002	0.917	-.057	.061	.005
It is easy to return products.	-.005	-.025	.015	0.912	-.078	-.003	.084
The returning process is quick.	.022	-.038	.039	0.817	.035	.041	-.052
Returning costs are reasonable.	-.022	.034	-.020	0.772	.024	.009	.036
It is fast to get refund for returned products.	.017	.068	-.013	0.693	.194	-.116	-.045
Employees of this site are courteous to me when trying to resolve my problems.	.004	-.039	-.018	.025	0.876	-.029	.004
Employees of this site are helpful in solving my problems.	-.028	-.009	.019	.006	0.858	.033	-.025
Employees of this site have useful knowledge to answer my questions.	-.014	.035	.042	-.132	0.841	.018	.053
Employees of this site properly handle any problems that arise.	.034	.049	-.047	.097	0.709	.049	-.025
This site shows a sincere interest in solving my problems.	.010	.015	-.013	.161	0.698	-.001	.013
This site keeps my personal information secure.	-.053	.092	-.038	-.045	-.025	0.839	.050
This site makes sure to protect information about my online shopping behaviors.	.028	-.079	.131	-.021	.044	0.714	-.051
This site assures me that other sites will not get my information.	.022	.122	.013	.067	-.067	0.711	-.093

Table 7. (cont'd)

Scale items	Factor						
	Multi-device	Information quality	Omni-channel	Return process	Customer service	Privacy protection	Delivery system
This site carefully protects my credit card information.	-.002	.146	-.111	-.008	.000	0.699	.063
This site will not purposely misuse my personal information.	.022	-.120	.031	.043	.152	0.618	.038
This site provides me with an accurate delivery date.	.014	-.015	-.002	-.075	.006	.067	0.859
This site provides me with an accurate shipping time.	-.010	-.018	-.002	-.004	-.004	.058	0.838
This site is committed to delivering orders within a designated time frame.	.015	.036	-.039	.058	.019	-.057	0.786
This site quickly delivers what I order.	.006	.043	.057	.101	.008	-.099	0.700
Percentage of variance	36.917	10.384	8.028	6.873	4.512	3.837	3.597
Eigenvalue	13.290	3.738	2.890	2.474	1.624	1.381	1.295
Cronbach's alpha	0.942	0.905	0.921	0.923	0.917	0.866	0.888

Discriminant validity test using Fornell-Larcker criterion showed that square root of AVE of each of e-service quality factors were all higher than 0.75 and higher than correlations with other variables (See Table 8 for Fornell-Larcker test for discriminant validity). Moreover, HTMT ratio indicated that all values were less than 0.85, showing satisfactory discriminant validity (See Table 9 for HTMT test).

Table 8. Fornell-Larcker Test for Discriminant Validity

	Customer service	Delivery system	Information quality	Multi-device compatibility	Omni-channel	Privacy protection	Return process
Customer service	0.867						
Delivery system	0.526	0.866					
Information quality	0.493	0.544	0.82				
Multi-device compatibility	0.409	0.413	0.43	0.882			
Omni-channel	0.295	0.158	0.2	0.155	0.87		
Privacy protection	0.529	0.476	0.62	0.404	0.28	0.809	
Return process	0.627	0.538	0.46	0.361	0.32	0.45	0.874

Table 9. Heterotrait-Monotrait Ratio Test

	Customer service	Delivery system	Information quality	Multi-device compatibility	Omni-channel	Privacy protection	Return process
Customer service							
Delivery system	0.581						
Information quality	0.54	0.606					
Multi-device compatibility	0.439	0.45	0.465				
Omni-channel	0.308	0.167	0.205	0.154			
Privacy protection	0.591	0.535	0.7	0.445	0.308		
Return process	0.68	0.595	0.501	0.387	0.341	0.502	

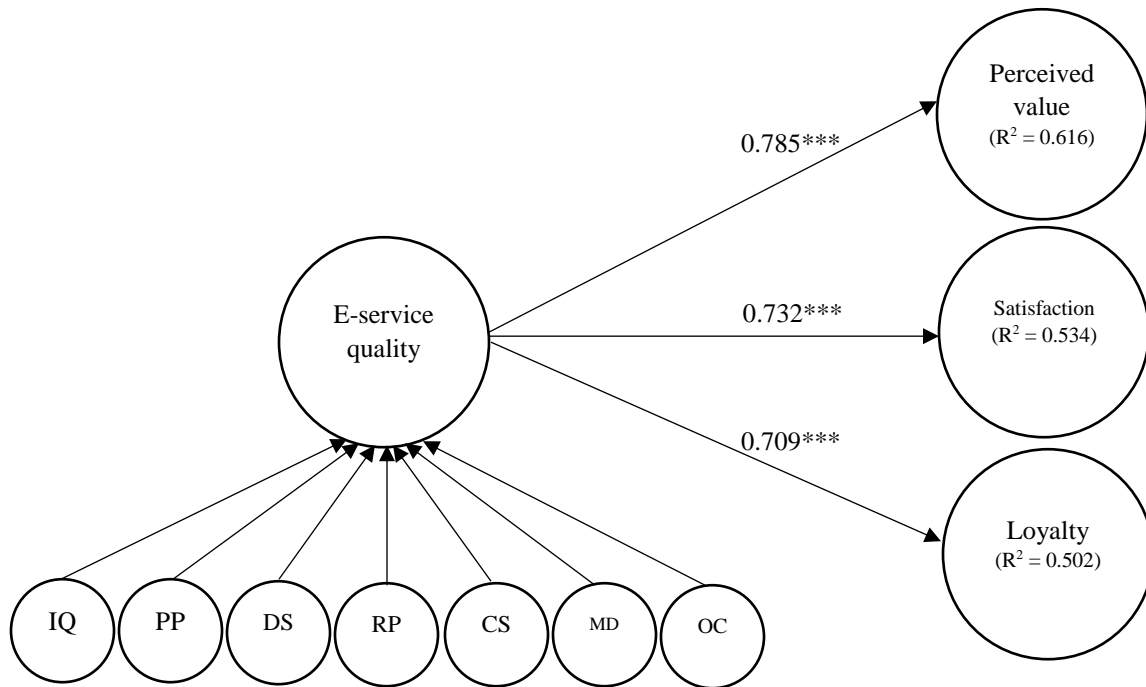
To test for nomological validity, structural equation model (SEM) using SmartPLS 3.0 software was conducted (See for procedures, Becker, Klein, & Wetzels, 2012). Based on previous literature, e-service quality had positive relationships with perceived value, satisfaction, and loyalty. Results from SEM supported all three hypotheses with p-value < 0.001 (See Table 10 for hypothesis testing and Figure 2 for a final model). Model fit indices included NFI (0.840) and SRMR (0.093) with Chi-square value of 288.871. SRMR index indicated a relatively good fit based on a suggestion by Matsunaga (2010). Even though normed fit index (NFI) in this study showed that it did not pass a cutoff point of at least 0.9, the index was approaching to 0.9.

Table 10. Hypothesis Testing

H	From	To	Path Coefficient	T-Value	Status
1	E-service quality	Perceived value	0.785	36.716***	Supported
2	E-service quality	Satisfaction	0.732	29.472***	Supported
3	E-service quality	Loyalty	0.709	29.977***	Supported

*significant at 0.05 level, ** significant at 0.01 level, *** significant at 0.001 level

Figure 2. A Final Model



Additional Analyses

I conducted additional analyses to determine the effect of dimensions on the three dependent variables. Results showed that information quality had a positive relationship only with perceived value. Privacy protection, delivery system, customer service, and multi-device compatibility had positive relationships with perceived value, satisfaction, and loyalty. Omni-channel had a positive relationship only with loyalty while return process did not have any relationships with all three outcome variables (See Table 11 for additional analyses).

Table 11. Additional Analyses

	Sample Mean (M)	S.D.	T Statistics	P Values
Customer service-> Loyalty	0.201	0.043	4.602	0.000***
Customer service -> Perceived value	0.185	0.04	4.61	0.000***
Customer service-> Satisfaction	0.235	0.042	5.577	0.000***
Delivery system-> Loyalty	0.098	0.041	2.425	0.015*
Delivery system-> Perceived value	0.189	0.035	5.363	0.000***
Delivery system-> Satisfaction	0.242	0.039	6.232	0.000***
Information quality-> Loyalty	0.049	0.046	1.077	0.282
Information quality-> Perceived value	0.119	0.042	2.825	0.005**
Information quality-> Satisfaction	0.08	0.046	1.729	0.084
Multi-device compatibility -> Loyalty	0.218	0.037	6.009	0.000***
Multi-device compatibility -> Perceived value	0.327	0.031	10.802	0.000***
Multi-device compatibility -> Satisfaction	0.284	0.037	7.766	0.000***
Omni-channel -> Loyalty	0.116	0.031	3.703	0.000***
Omni-channel -> Perceived value	0.015	0.024	0.619	0.536
Omni-channel -> Satisfaction	-0.03	0.027	1.104	0.27
Privacy protection-> Loyalty	0.277	0.041	6.7	0.000***
Privacy protection -> Perceived value	0.175	0.035	4.938	0.000***
Privacy protection -> Satisfaction	0.141	0.041	3.446	0.001***
Return process -> Loyalty	0.062	0.043	1.423	0.155
Return process-> Perceived value	0.065	0.038	1.765	0.078
Return process-> Satisfaction	0.025	0.038	0.664	0.507

*significant at 0.05 level, ** significant at 0.01 level, *** significant at 0.001 level

CHAPTER 5. DISCUSSION

Based on previous literature related to e-service quality, results of these studies indicated that this construct consists of at least six factors: information quality, privacy protection, delivery system, ease of use, customer service, and site functionality. However, based on the results of an exploratory factor analysis, I found that e-service quality consisted of seven factors: information quality, privacy protection, delivery system, return process, customer service, multi-device compatibility, and omni-channel. A confirmatory factor analysis supported that these seven factors were dimensions of e-service quality. Next, I will discuss the new dimensions that emerged as a result of these studies.

Three new dimensions of e-service quality emerged from this study; these included return process, multi-device compatibility, and omni-channel. For the return process, there are only a few existing scales that include return process in their scales, but return process appears to be part of other dimensions. For example, Bauer et al. (2006) included return policy as a part of responsiveness dimension. Swaid and Wigand (2009, p.20) has one item related to return process which is “Order cancellation and returns are confirmed within three days” and this item is under reliability dimension. According to additional analyses, the return process did not have any relationships with perceived value, satisfaction, and loyalty. The possible explanation is that when consumers shop from their most often shopping site, it means that they are already familiar with the site’s return policies and have realistic expectations about product quality. As they may engage in the return process only a few times or not at all, return process may be not important enough to have an effect on perceived value, satisfaction, and loyalty. However, return process should not be ignored as research has shown that flexible return policy could decrease consumers’ perceived risk (Wood, 2001).

To the best of my knowledge, multi-device compatibility does not appear to be a dimension in any of existing e-service quality scales. However, Bilgihan et al. (2016) argued that it was important to companies to allow several contact points for consumers to interact with the brands. They also stated that this multi-device compatibility could affect consumers' on-line experience. According to EFA and CFA, multi-device compatibility emerged as the first dimension of the e-service quality scale with high explained variance (30.8% in EFA and 36.9% in CFA). Moreover, multi-device compatibility had positive relationships with perceived value, satisfaction, and loyalty ($p < 0.001$). According to CFA results, about 60 percent of respondents surfed online sites and 54 percent purchased products through mobile devices. These results showed that multi-device compatibility is important to consumers when shopping online, contributing to perceived value, satisfaction and loyalty.

Omni-channel is also a new dimension that was not identified by any of the existing e-service quality scales. However, Verhoef et al. (2015) emphasized that companies with omni-channel strategies such as allowing customers to return online orders at a physical store or browsing products in a physical store but buying them online would benefit from gaining better consumers' experience. Moreover, Herhausen et al. (2015) argued that companies that integrated both online and offline channels would decrease consumers' perceived risk. Based on the additional analyses, omni-channel had a positive relationship with loyalty. This means that omni-channel is an important aspect that companies should pay attention to if they need to gain loyal customers. In the next paragraphs, I review the e-service quality dimensions that support those of previous studies.

Information quality is a dimension of e-service quality scale. This result supported previous studies (Barnes & Vidgen, 2002; Janda et al., 2002; Loiacono et al., 2002; Yang et al.,

2005; Collier & Bienstock, 2006; Swaid & Wigand, 2009). According to additional analyses, information quality was positively related to perceived value. This result supported Bauer et al.'s (2006) study who discovered that information quality was part of functionality/design dimension. Bauer et al. (2006) found that functionality/design had a strong relationship with perceived value. Moreover, Kuo et al. (2009) found that content quality dimension had a positive relationship with perceived value. However, information quality in this study was not related to satisfaction, contradicting previous studies (Janda et al., 2002). A possible explanation is that only information quality may not be enough to satisfy customers if other aspects of online sites fail to perform properly. Information quality was also not related to loyalty. Again, only accurate information may not be enough to make people loyal to the store if the store does not offer other good services.

Customer service is the fifth factor of e-service quality and supported previous literature (Bauer et al., 2006; Collier & Bienstock, 2006; Cristobal et al., 2007; Swaid & Wigand, 2009; Wolfinbarger & Gilly, 2003; Yang et al., 2004; Yang et al., 2005). Moreover, customer service had positive relationships with perceived value, satisfaction, and loyalty, supporting e-service quality literature. For example, Lee and Lin (2005) found that prompt service and employees' willingness to help customers had an effect on satisfaction which in turn affected loyalty. Swaid and Wigand (2009) found that customer service had a negative effect on likelihood to switch. This means that the better customer service a site provides, the less likely customers will switch to other sites.

Privacy protection is a sixth dimension of e-service quality scale and is consistent with previous work (Collier & Bienstock, 2006; Ibrahim et al., 2006; Janda et al., 2002; Loiacono et al., 2002; Parasuraman et al., 2005; Wolfinbarger & Gilly, 2003; Yang et al., 2004; Yoo &

Donthu, 2001). Similar to previous studies, privacy protection had positive relationships with perceived value, satisfaction, and loyalty. For example, Lin (2007) studied the effect of dimensions of e-service quality on satisfaction. The researcher called this dimension as *security* and found that security has a positive effect on satisfaction. Swaid and Wigand (2009) called this dimension as *assurance* and results showed that assurance had a positive relationship with loyalty.

Delivery system is the seventh dimension of e-service quality scale. This result supported previous studies (Collier & Bienstock, 2006; Parasuraman et al., 2005; Wolfinbarger & Gilly, 2003). Moreover, delivery system had positive relationships with perceived value, satisfaction, and loyalty, supporting previous research. For example, Chen, Tsai, Hsu, and Lee (2013) studied effects of e-service quality on perceived value and loyalty and found that quality of delivery (as part of their *outcome quality* dimension) had an impact on perceived value, which in turn led to customers' loyalty. Lee and Lin (2005) also found that on-time delivery had an impact on customer satisfaction.

Two dimensions from literature that did not emerge as dimensions of e-service quality were ease of use and site functionality. A possible explanation is that today's technologies have continuously improved, such that ease of use and site functionality are basic features and may be perceived as a default that every site should have. Consumers now can shop online easily with site minimum errors. Therefore, site functionality is more like basic functions of online shopping sites that consumers have expected.

This study tested nomological validity by conducting structural equation modeling. Results showed that e-service quality had a positive relationship with perceived value. Therefore, hypothesis 1 was supported. This was in line with several studies (Bauer et al., 2006; Kuo et al.,

2009; Lien et al., 2011). Hypothesis 2 was also supported as results indicated that e-service quality had a positive relationship with satisfaction. Previous literature found the similar results (Carlson & O'Cass, 2010; Cho & Park, 2001). Lastly, e-service quality had a positive relationship with loyalty, supporting hypothesis 3. This was in line with previous research (Wolfenbarger & Gilly, 2003; Yoo & Donthu, 2001). It is worth noting that even though SRMR indicated a relatively good fit, NFI did not pass a cutoff point of at least 0.9. I have retested a model with perceived value and satisfaction as a mediator of a relationship between e-service quality and loyalty. Results showed that when perceived value and satisfaction were a mediator, NFI value has improved ($NFI = 0.89$) and SRMR value has also improved ($SRMR = 0.081$) with the total explained variance of 57% on loyalty.

This study tested convergent and discriminant validity through factor loadings, cross-loadings, Fornell-Larcker criterion, and HTMT ratio. All values were satisfactory, showing good convergent and discriminant validity. Moreover, I rigorously reviewed literature related to e-service quality with careful examination. I proposed a conceptual definition with dimensions and scale items that properly reflect the conceptual definition of the construct. Therefore, I am confident that this e-service quality scale has construct validity. I also consulted topic and methodological experts to ensure that this scale has face validity.

CHAPTER 6. IMPLICATIONS AND LIMITATIONS

Theoretical Contributions

This study yielded several theoretical contributions. First, this study took multiple steps in improving e-service quality measurement based on proper practices of scale development (e.g., Carpenter, 2018; Churchill, 1979). The steps involved in this paper included a rigorous review of literature related to e-service quality construct, a qualitative research approach, expert feedback, pilot tests, and quantitative research for EFA and CFA with SEM. These steps were employed to ensure that the scale achieve face, construct, convergent, discriminant, and nomological validity. Reliabilities for each of the dimensions and constructs were also computed to ensure satisfactory reliability. Researchers who are interested in studying e-service quality can use this scale to further test its relationships with other constructs. With this valid and reliable scale, this study contributes to e-service quality theory.

In addition, this study tested relationships among e-service quality, perceived value, satisfaction, and loyalty. According to Kuhn (1970), one of the ways to help improve theories is to build knowledge based on existing theories and literature. As results of this study showed support for e-service quality literature, this study contributes to e-service quality theory. Moreover, study results emphasize the importance of a best practice for scale development. Following proper procedures, this study discovered new dimensions and scale items of e-service quality with high explained variance. Therefore, this study helped expand the knowledge about consumers' perception toward online shopping sites and its relationships with perceived value, satisfaction, and loyalty.

Managerial Implications

There are several managerial implications. First, results showed that e-service quality had positive relationships with perceived value, satisfaction, and loyalty. Therefore, online sites should monitor and take steps to improve any e-service quality dimensions that fall short to gain customers' perceived value, satisfaction, and loyalty. To be more specific, multi-device compatibility emerged as a main factor when consumers evaluated e-service quality and was positively related to perceived value, satisfaction, and loyalty. Therefore, online sites should insure that their system is compatible with any type of devices so that consumers can get the same shopping experience throughout different devices. In addition, results showed that omni-channel was positively related to loyalty. Companies may take this into consideration. To gain customers' loyalty, they need to integrate their service of both online and offline stores. Allowing customers to order products online and pick-up or return at the actual store can lead to customers' loyalty. Companies may advertise their several contact points to consumers to gain consumers' better experience and loyalty.

Customer service, privacy protection, and delivery system are all antecedents of perceived value, satisfaction, and loyalty. For customer service, companies need to ensure that employees have useful knowledge and can help customers solve problems. Moreover, they need to make sure that they have a secured system in which personal information of their customers will not be hacked and misused. Regarding delivery system, it is essential that companies deliver orders on time as promised. With these improved services, companies can gain better evaluation from customers and finally gain more loyal customers.

Limitations

There are some limitations of this study. First, results of this study may not be generalizable to the whole online shopping population. This is because respondents from this study were recruited only through Qualtrics research pool. Moreover, all of respondents live in the U.S. This means that they were evaluating online shopping sites that were available in the U.S. Other online shopping systems may yield different results. Future research may take different online shopping systems into consideration and test this scale to improve generalizability. Moreover, online shoppers in different cultures/countries may have different expectation and priorities regarding aspects of e-service quality. Future research may consider cultural differences when studying e-service quality cross-culturally. In addition, this study only asked respondents to evaluate their most frequent shopping site. It may be worth studying how consumers evaluate the second frequent shopping site or even the worst shopping site they have encountered. If results indicated that this e-service quality scale still held true (average values should be low on a 5-point Likert scale), it could yield a support for validity of the scale.

I made a concerted effort to capture current consumers' evaluation of online shopping sites and create scale items that are applicable to every type of devices. However, results from this study may not reflect consumers' perception toward online shopping sites in the future when new technologies emerge.

APPENDICES

APPENDIX A.

SCALE REVIEW

References	Context	Dimensions	Dependent Variables
Parasuraman, Zeithaml and Berry (1988)	Service and retailing organizations	responsiveness, assurance, reliability, tangibles, empathy	N/A
O'Neill, Wright, and Fitz (2001)	Online library service	Contact, reliability, responsiveness, tangible	N/A
Yoo and Donthu (2001)	Online shopping sites	Ease of use, aesthetic design, security, processing speed	Attitude toward the site, site loyalty, site equity, purchase intention, site revisit intention
Barnes and Vidgen (2002)	Internet bookstores	Usability, design, information, trust, Empathy	N/A
Janda, Trocchia, and Gwinner (2002)	Online shopping sites	Access, sensation, information, security, performance	Satisfaction, word-of-mouth, likelihood of future purchases, likelihood of complaining
Loiacono, Watson, and Goodhue (2002)	Book, CD, airline, hotel reservation	Information fit-to-task, tailored communications, ease of understanding, intuitive operations, visual appeal, innovativeness, trust, online completeness, relative advantage, response time, emotional appeal, consistent image	N/A
Wolfenbarger and Gilly (2003)	Online shopping sites	Security/privacy, fulfillment/reliability, website design, customer service	Satisfaction, attitude toward the site, loyalty
Yang, Jun, and Peterson (2004)	Online banking services	Ease of use, product portfolio, security, reliability, responsiveness, competence	Satisfaction
Parasuraman, Zeithaml, and Malhotra (2005)	Online shopping sites	Privacy, fulfillment, efficiency, system, availability	Perceived value, loyalty intention
Yang, Cai, Zhou and Zhou (2005)	Online sites	Usefulness of content, adequacy of information, usability, accessibility, interaction	Satisfaction
Bauer, Falk, and Hammerschmidt (2006)	Online shopping sites	Functionality/design, responsiveness, reliability, enjoyment, process	Perceived value, satisfaction, repurchase intention

SCALE REVIEW (CONT'D)

References	Context	Dimensions	Dependent Variables
Collier and Bienstock (2006)	Online shopping sites	Ease of use, information accuracy, privacy, order condition, timeliness, order accuracy, outcome fairness, design, functionality, procedural fairness, interactive fairness	Satisfaction, behavioral intention
Ibrahim, Joseph, and Ibeh (2006)	Online banking	Good queue management, targeted customer service, convenience/accuracy, accessibility/reliability, personalization, friendly/responsive customer service	N/A
Cristobal, Flavián, and Guinaliu (2007)	Online shopping sites	Assurance, order management, customer service, web design	Satisfaction, loyalty
Sohn and Tadisina (2008)	Online financial service	Customized communication, website contents and functionality, reliability, speed of delivery, trust, ease of use	N/A
Swaid and Wigand (2009)	Online shopping sites	Information quality, website usability, personalization, assurance, reliability, responsiveness	Loyalty

APPENDIX B.

SURVEY INSTRUMENT FOR CFA

What is your gender?

- ☐ Male
- ☐ Female
- ☐ Other
- ☐ Prefer not to answer

In what year were you born? (dropdown list)

How often do you purchase tangible products online?

- ☐ Less than once a month (screened out)
- ☐ Once a month
- ☐ Twice a month
- ☐ Three times a month
- ☐ Four times a month
- ☐ More than four times a month

What are the top three products that you most often shop for online?

On average, how much do you spend on shopping online per month?

- ☐ \$0 - \$50
- ☐ \$51 - \$100
- ☐ \$101 - \$150
- ☐ \$151 - \$200
- ☐ \$201 - \$250
- ☐ \$251 - \$300
- ☐ \$301 - \$350
- ☐ \$351 - \$400
- ☐ \$401 - \$450
- ☐ \$451 - \$500
- ☐ More than 500

How do you access online shopping sites? (Check all that apply)

- ☐ Personal computer
- ☐ Mobile phone
- ☐ Tablet
- ☐ Other (please specify)

Which device do you use most frequently for SURFING online shopping sites?

- ☐ Personal computer
- ☐ Mobile phone
- ☐ Tablet
- ☐ Other (please specify)

Which device do you use most frequently for PURCHASING products from online shopping sites?

- ☐ Personal computer
- ☐ Mobile phone
- ☐ Tablet
- ☐ Other (please specify)

Please identify an online shopping site that you most often purchase tangible products from.
(PLEASE IDENTIFY ONLY ONE SITE)

Regarding the site that you identified in the previous question, please indicate how much you agree or disagree with the following statements about your perception of the site's performance.

1. Information on this site is easy to understand.
2. This site provides information at the right level of detail.
3. This site shows good pictures of the products.
4. Information on this site is up to date.
5. Information on this site is well organized.
6. Information contained on this site is in an appropriate format.

7. This site assures me that other sites will not get my information.
8. This site keeps my personal information secure.
9. This site carefully protects my credit card information.
10. This site makes sure to protect information about my online shopping behaviors.
11. If you are reading this, please select “disagree” for the answer.
12. This site will not purposely misuse my personal information.
13. This site provides me with an accurate delivery date.
14. This site provides me with an accurate shipping time.
15. This site is committed to delivering orders within a designated time frame.
16. This site quickly delivers what I order.
17. It is easy to return products.
18. Returning products is hassle-free.
19. Returning costs are reasonable.
20. The returning process is quick.
21. It is fast to get refund for returned products.
22. Employees of this site properly handle any problems that arise.
23. Employees of this site have useful knowledge to answer my questions.
24. Employees of this site are helpful in solving my problems.
25. Employees of this site are courteous to me when trying to resolve my problems.
26. This site shows a sincere interest in solving my problems.
27. This site is mobile-friendly.
28. This site is functional on all my devices.
29. This site is responsive to mobile devices.
30. This site has an appropriate layout design for mobile access.
31. Accessing this site through mobile devices is fast.
32. Accessing this site through mobile devices is easy.
33. It is easy to physically pick up my orders if this site has a physical store near my home.
34. It is easy to return my orders if this site has a physical store near my home.
35. This site provides up-to-date information about the inventory available in a physical store.
36. Employees at a physical store can easily access my online order information.
37. Employees at a physical store are helpful in solving my online order problems.
38. If you are reading this, please select “disagree” for the answer.

Satisfaction

39. Based on all of my experience with this site, I feel very satisfied.
40. My choice to use this site was a wise one.
41. Overall, I am satisfied with the decision to use this site.
42. I think I did the right thing when I decided to use this site for making my purchase.
43. My overall evaluation of the services provided by this site is very good.

Perceived value (functional)

- 44. Visiting this site is reasonably priced.
- 45. Visiting this site is economical.
- 46. Compared to the online shopping expenses, I get reasonable quality from visiting this site.
- 47. Compared to other online shopping sites, this site is a good value for the money.
- 48. Visiting this site is a good quality online shopping.
- 49. While visiting this site, I receive a good service.

Perceived value (emotional)

- 50. Visiting this site gives me pleasure.
- 51. Visiting this site makes me feel better.
- 52. After visiting this site, my image of this site is improved.
- 53. This site is a destination that I enjoy.

Perceived value (overall value)

- 54. The choice to visit this site is the right decision.
- 55. I obtain good results from visiting this site.
- 56. Overall, visiting this site is valuable.
- 57. The value of visiting this site is more than what I expected.
- 58. This site is a place where I want to shop.

Loyalty (Conative loyalty)

- 59. I intend to continue shopping at this site over the next few years.
- 60. I would expend effort on behalf of this site to help it succeed.
- 61. I say positive things about this site to others.
- 62. I will recommend this site to someone who seeks advice.
- 63. I encourage friends to go to this site.
- 64. I intend to remain a customer of this site.

Loyalty (Action loyalty)

- 65. I would switch to a competitor if I experience a problem with this site. (reverse score)
- 66. I am not interested in advertisements from other sites.
- 67. I feel loyal to this site.
- 68. I love this site, even if I had had a bad experience, I would continue to shop here.
- 69. I am willing to pay a higher price for the products I currently receive from this site.
- 70. This site is always my first choice.
- 71. I am willing to 'go extra mile' to remain a customer of this site.
- 72. Even if this site was more difficult to reach, I would keep buying there.
- 73. I only buy from this site.
- 74. There are certain products I exclusively purchase at this site no matter what the price is.
- 75. I would not switch from this site under any circumstances.
- 76. If competitors' stores are more conveniently located I still shop at my selected store.

Please tell us about yourself.

Marital status:

1. Single 2. Married 3. Divorced/Widowed 4. Separated

Number of children _____

Your total family income

- ☐ Less than \$25,000
- ☐ \$25,000 – \$29,999
- ☐ \$30,000 – \$39,999
- ☐ \$40,000 – \$49,999
- ☐ \$50,000 – \$59,999
- ☐ \$60,000 - \$69,999
- ☐ \$70,000 - \$79,999
- ☐ \$80,000 - \$89,999
- ☐ \$90,000 - \$99,999
- ☐ \$100,000 - \$109,999
- ☐ \$110,000 - 119,999
- ☐ \$120,000 - \$129,999
- ☐ \$130,000 - \$139,999
- ☐ \$140,000 - \$149,999
- ☐ \$150,000 or more

How do you identify yourself?

- ☐ White American
- ☐ Hispanic or Latino
- ☐ Black or African American
- ☐ Native American or Alaska Native
- ☐ Asian American
- ☐ Native Hawaiians or Other Pacific Islander
- ☐ Middle Eastern American
- ☐ Other (please specify) _____

Formal education you have completed:

- ☐ No formal educational credential
- ☐ High school diploma or equivalent
- ☐ Some college, no degree
- ☐ Postsecondary non-degree award
- ☐ Associate's degree
- ☐ Bachelor's degree
- ☐ Master's degree
- ☐ Doctoral or professional degree

What is your current employment status?

- ☐ Employed full time (40 or more hours per week)
- ☐ Employed part time (up to 39 hours per week)
- ☐ Unemployed and currently looking for work
- ☐ Unemployed and not currently looking for work
- ☐ Student
- ☐ Retired
- ☐ Homemaker
- ☐ Self-employed
- ☐ Unable to work

APPENDIX C.

FINAL SCALE ITEMS

Dimension	Definition	Scale items	References
Information quality	how well a site provides important content to consumers	1.This site provides information at the right level of detail. 2.Information on this site is easy to understand. 3.Information on this site is well organized. 4.Information on this site is up to date. 5.Information contained on this site is in an appropriate format. 6.This site shows good pictures of the products	Swaid and Wigand (2009) Barnes and Vidgen (2002); Janda et al. (2002); Loiacono et al. (2002); Swaid and Wigand (2009) Parasuraman et al. (2005); Yang et al. (2005) Bauer et al. (2006); Cristobal et al. (2007); Sohn and Tadisina (2008); Swaid and Wigand (2009); Yang et al. (2005) Swaid and Wigand (2009) Janda et al. (2002); Yoo and Donthu (2001)
Privacy protection	consumers' perception that a site is secure in keeping their personal information confidential	1.This site keeps my personal information secure. 2.This site makes sure to protect information about my online shopping behaviors. 3.This site assures me that other sites will not get my information. 4.This site carefully protects my credit card information. 5.This site will not purposely misuse my personal information.	Bauer et al. (2006); Barnes and Vidgen (2002); Cristobal et al. (2007); Ibrahim et al. (2006); Loiacono et al. (2002); O'Neill et al. (2001); Wolfinbarger and Gilly (2003); Yang et al. (2005); Yoo and Donthu (2001) Parasuraman et al. (2005) Bauer et al. (2006); Collier and Bienstock (2006); Janda et al. (2002); Loiacono et al. (2002); Parasuraman et al. (2005); Sohn and Tadisina (2008); Yang et al. (2004) Bauer et al. (2006); Barnes and Vidgen (2002); Cristobal et al. (2007); Loiacono et al. (2002); Parasuraman et al. (2005); Wolfinbarger and Gilly (2003); Yang et al. (2005); Yoo and Donthu (2001) Loiacono et al. (2002); Yang et al. (2004); Collier and Bienstock (2006)

FINAL SCALE ITEMS (CONT'D)

Dimension	Definition	Scale items	References
Delivery system	consumers' perception on whether a site keeps its promises to get the product to customer on time and handle orders properly	1.This site provides me with an accurate delivery date. 2.This site provides me with an accurate shipping time. 3.This site is committed to delivering orders within a designated time frame. 4.This site quickly delivers what I order.	Bauer et al. (2006); Collier and Bienstock (2006); Parasuraman et al. (2005); Wolfinbarger and Gilly (2003) Bauer et al. (2006); Parasuraman et al. (2005) Bauer et al. (2006); Barnes and Vidgen (2002); Cristobal et al. (2007); Parasuraman et al. (2005); Wolfinbarger and Gilly (2003); Yang et al. (2004) Parasuraman et al. (2005)
Return process	consumers' perception on how well a site manages their return system	1.Returning products is hassle-free. 2.It is easy to return products. 3.The returning process is quick. 4.Returning costs are reasonable. 5.It is fast to get refund for returned products.	N/A N/A Swaid and Wigand (2009) N/A N/A
Customer service	the extent to which a site is helpful in answering customers' questions and dealing with problems quickly and properly	1.Employees of this site are courteous to me when trying to resolve my problems. 2.Employees of this site are helpful in solving my problems. 3.Employees of this site have useful knowledge to answer my questions. 4.Employees of this site properly handle any problems that arise. 5.This site shows a sincere interest in solving my problems.	Collier and Bienstock (2006) Collier and Bienstock (2006); Cristobal et al. (2007); O'Neill et al. (2001); Swaid and Wigand (2009); Wolfinbarger and Gilly (2003); Yang et al. (2004) Yang et al. (2004) Yang et al. (2004)
Multi-device compatibility	the extent to which a site can be accessed through consumers' choices of technology	1.This site is responsive to mobile devices. 2.This site has an appropriate layout design for mobile access. 3.Accessing this site through mobile devices is fast. 4.Accessing this site through mobile devices is easy. 5.This site is mobile-friendly. 6.This site is functional on all my devices.	N/A N/A N/A N/A N/A N/A

FINAL SCALE ITEMS (CONT'D)

Dimension	Definition	Scale items	References
Omni-channel	consumers' perception that a site seamlessly integrates online and offline stores to give customers better shopping experience	1. Employees at a physical store can easily access my online order information.	N/A
		2. It is easy to return my orders if this site has a physical store near my home.	N/A
		3. Employees at a physical store are helpful in solving my online order problems.	N/A
		4. It is easy to physically pick up my orders if this site has a physical store near my home.	N/A
		5. This site provides up-to-date information about the inventory available in a physical store.	N/A

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