Asia Pacific Journal of Information Systems
Vol. 26 No. 3 (SEPTEMBER 2016), 393-426

ISSN 2288-5404 (Print) / ISSN 2288-6818 (Online)
http://dx.doi.org/10.14329/apjis.2016.26.3.393

Antecedents of Online Shopping Success : A Reexamination and Extension

Young Sik Kang[a], Jeoungkun Kim[b], Jinyoung Min[c,*]

[a] *Associate Professor, School of Business Administration, Myongji University, korea*
[b] *Associate Professor, School of Business, Yeungnam University, korea*
[c] *Assistant Professor, School of Business, Chosun University, korea*

ABSTRACT

The qualities of the technological artifact of online shopping websites and the overall support delivered by the service provider through the website are generally agreed to be crucial elements in creating customer satisfaction and loyalty. However, a lack of consensus exists on how those qualities are related to each other, what they consist of, and how they can be conceptualized. Based on relevant literature and using a servicescape framework as a theoretical lens, we divide online shopping website qualities into information and system qualities and argue that both factors affect service quality. We conceptualize each of the three types of quality as a second-order formative construct comprising its most salient quality dimensions: information quality consisting of reliability, understandability, currency, and relevance; system quality consisting of usability, availability, and responsiveness; and service quality consisting of efficiency and fulfillment. Our model of how information, system, and service qualities are related to one another and to customer satisfaction and loyalty is then tested empirically with a data set of 570 online shopping customers. Our integrated model reconciles the seemingly contradictory conceptualizations of previous researchers and provides an effective way to create customer satisfaction and loyalty.

Keywords: Online Shopping Success, Servicescape Framework, Website Quality, System Quality, Information Quality, E-Service Quality

Ⅰ. Introduction

In a traditional retail environment, what serves a customer best is typically achieved by managing the service environment and frontline employees, which are the points of contact in a physical setting, and the delivery of high-quality service (e.g., Baker et al., 1994; Donovan and Rossiter, 1982; Hartline and Ferrell, 1996). In an online shopping context, a website replaces these service environments and

This work was supported by 2016 Research Fund of Myongji University.
*Corresponding Author. E-mail: saharamin@chosun.ac.kr Tel: 82622306812

frontline employees as the means of serving consumers (Bitner et al., 2000; Cenfetelli et al., 2008; Zeithaml et al., 2002). Customer retention in that case is achieved by the consistent delivery of a high-quality online shopping website and services (Cenfetelli et al., 2008; Collier and Bienstock, 2006; DeLone and McLean, 2004; Devaraj et al., 2002; McKinney, Yoon and Zahedi, 2002; Parasuraman et al., 2005).

However, the dimensions of quality that are considered important for generating consumer retention in human-to-human interactions within a physical environment cannot simply be replicated in human-to-website interactions in a space of physical absence by imitating physical shopping and service environments. For example, empathy, the consumers' perception that service personnel are giving them individualized attention and have their best interests at heart, has worked well in providing high-quality service in traditional retail environments but becomes insignificant in an online shopping environment (Gefen, 2002).

To address this issue, a number of information systems (IS) and marketing studies have suggested different sets of aspects of websites and services that serve consumers best in online shopping settings (e.g., Collier and Bienstock, 2006; Parasuraman et al., 2005; Wolfinbarger and Gilly, 2003) and investigated their links to consumer satisfaction and loyalty (e.g., Bauer et al., 2006; Cenfetelli et al., 2008; Devaraj et al., 2002; Gefen, 2002). However, many of these researchers' findings differ significantly regarding what constitutes the qualities of websites and how to construct them even within the boundaries of online shopping. Thus, in addition to studying those aspects of quality that can serve consumers best, investigating how to capture those aspects of quality in the most effective way in the context of online shopping can improve efficient communication among scholars and practitioners. Therefore, we examine the following research questions in this article: (1) How should we conceptualize the various dimensions of quality in an online shopping environment? (2) How are these types of quality related to one another? (3) How do they operate to engender consumer satisfaction and loyalty?

Ⅱ. Disagreements in Previous Research Regarding Antecedents of Online Shopping Success

Many researchers have attempted to determine the factors that engender consumer satisfaction in online shopping. This user satisfaction perspective typically separates website quality into information and system qualities, thereby distinguishing between content quality (i.e., information quality) and content-delivery system quality (i.e., system quality) (Delone and McLean, 2003; DeLone and McLean, 2004; McKinney et al., 2002). Regarding delivery quality, researchers have noted that it is misleading to measure system effectiveness solely by the direct delivery qualities conveyed by an online shopping website without also considering indirect delivery quality (i.e., service quality) generated by the site's overall support of online shopping (Pitt et al., 1995), particularly given that customers are demanding support from their online service providers (e.g., Cenfetelli et al., 2008; Devaraj et al., 2002; Gefen, 2002; Parasuraman et al., 2005). Therefore, although researchers' exact terms may vary, they seem to agree that the e-service quality of online shopping and the information quality and system quality of its website are the most significant types of quality that online shopping providers should consider to ensure consumer satisfaction and the resulting business suc-

cess (Delone and McLean, 2003; Liu and Arnett, 2000; McKinney et al., 2002; Molla and Licker, 2001; Parra and Ruiz, 2009; Swaid and Wigand, 2009; Yang et al., 2005). However, other than identifying those three elements—information, system, and e-service—as important aspects of quality that will support online shopping success, the previous literature does not agree on three important issues.

First, the literature has not yet resolved which set of specific dimensions can most effectively capture each type of quality in the context of online shopping. The selected dimension set used to measure website information quality and system quality varies greatly among previous studies. As shown in <Appendix A>, the potential for confusion caused by this lack of agreement is magnified by the fact that what is identified as a single dimension in some studies may include two or more dimensions identified in other studies and that similar dimensions are sometimes given different names. These differences are due in part because the target contexts of those studies vary considerably, from online shopping for specific goods (e.g., online bookstores) to the e-tailing of a variety of goods on a single site. The resulting potential for confusion could be diminished by a clearer consensus on which dimensions best constitute the information quality and system quality of online shopping websites across many different circumstances of online shopping.

In measuring e-service quality, the issue is somewhat different. Because SERVQUAL, designed by Parasuraman, Zeithaml and Berry (1988) to address the people-delivered service quality of a company, has been widely adopted in the field of marketing, most researchers have based their e-service quality dimensions on SERVQUAL constructs (e.g., Deveragj et al., 2002; Gefen, 2002; Cenfetelli et al., 2008; Swaid and Wigand, 2009). Among these is E-S-QUAL, developed by Parasuraman et al. (2005) specifically for measuring e-service quality in an online context through various scale-development steps using a means-end framework as a theoretical foundation. Although E-S-QUAL has demonstrated both a good deal of internal and external validity and a strong effect on overall perceptions of e-service quality (Parasuraman et al., 2005), it has limitations in addressing the online shopping context, as it does not separate consumers' direct interactions with a website from the overall service provided by the online shopping environment. Therefore, the central issue for measuring e-service quality is not resolving significant disagreements regarding the dimensions of e-service quality in an online shopping context but refining extant e-service quality dimensions to better align with that context.

Second, there is currently no scholarly consensus on how to model the conceptualization and measurements of quality dimensions. Some researchers have argued that information quality, system quality, and service quality are lower-level variables that can be measured by multiple indicators that address a single dimension (Devaraj et al., 2002; Gefen, 2002; Janda et al., 2002; Liu and Arnett, 2000; Ranganathan and Ganapathy, 2002). Others, however, have suggested that these indicators can be better represented by multiple variables that each address a single dimension constructed by multiple indicators (Bauer et al., 2006; Cenfetelli et al., 2008; McKinney et al., 2002; Wolfinbarger and Gilly, 2003). For instance, while many studies agree that the reliability of the information in the online shopping context should be included as a dimension for measuring information quality, the ways in which they measure that reliability have been diverse; Molla and Licker (2001), for example, measure information quality as an single indicator, while McKinney et al. (2002)

model it as a construct that measures trustworthiness, accuracy, and credibility. These different measurements demonstrate that conceptualizations of a dimension of quality can vary in depth and breadth depending on whether the target dimension is an indicator or a construct. Given that the appropriateness of a theory for the specific context is what determines the right level of abstraction for a construct (Hair et al., 2005), this inconsistency can be seen as evidence of a lack of an adequate theoretical framework for conceptualizing constructs in the context of online shopping.

In addition, some researchers have built their constructs in a composite manner (Cenfetelli et al., 2008; Collier and Bienstock, 2006), while others have done so in a reflective manner (Bauer et al., 2006; McKinney et al., 2002; Negash et al., 2003). Because this misspecification can cause bias in the estimates and thus affect the interpretation of the research (Jarvis et al., 2003), this specification issue is also one that needs to be resolved.

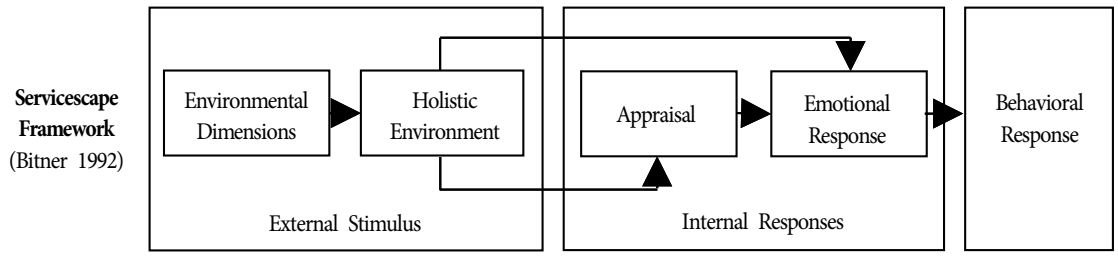
Third, the relationships among these three forms of quality suggested by previous researchers are sometimes contradictory. Some scholars have suggested that the three are not interrelated (Delone and McLean, 2003; Liu and Arnett, 2000; Molla and Licker, 2001), while others have suggested that website information quality and system quality operate as parts of e-service quality (Swaid and Wigand, 2009).

Taken together, this lack of consensus on how to conceptualize and model the three types of quality in an online shopping context not only hinders the correct prediction of which specific aspects of quality in online shopping bring consumers back to a provider, but also impedes building a normal science around this issue. Therefore, it is essential to solve this issue first and then delve into how they affect the consumers' satisfaction and loyalty.

Ⅲ. Theoretical Framework: Servicescape Framework

How consumers perceive a service environment and its quality is well depicted by the servicescape framework (Bitner, 1992), which emphasizes the impact of the physical environment in which a service is delivered. The servicescape framework is rooted in environmental psychology (Donovan and Rossiter, 1982; Turley and Milliman, 2000), which draws heavily on Mehrabian and Russell's (1974) stimulus-organism-response (S-O-R) paradigm. In this paradigm, the external environmental stimulus (S) causes an internal response in an individual organism (O), which in turn elicits a behavioral response (R) (Donovan and Rossiter, 1982). When individuals encounter environmental stimuli, they first become aware of separate external stimuli, then perceive a total configuration of stimuli that influences their internal responses to the environment (Holahan, 1982), and finally demonstrate either approach or avoidance behavioral responses (Donovan and Rossiter, 1982). Approach responses are considered positive behaviors, such as a desire to stay in a particular facility, whereas avoidance responses would include not wanting to stay in a facility.

The servicescape framework, which operates as a refined version of the S-O-R paradigm by distinguishing internal responses as cognitive and emotional responses, describes the mechanism through which the user of a service receives external stimuli from the physical environment, such as ambient conditions, space, signs, symbols, and artifacts; cognitively and emotionally responds to them, represented as appraisal and satisfaction; and engages in certain



<Figure 1> Synthesis of Theoretical Frameworks for the Research Model

behaviors, such as spending money or returning to a shop (Bitner, 1992). When this framework is adopted to the online shopping experience, the environment with which consumers interact becomes the website, the representational interface that users actually see and hear in a computer system (Moran, 1981). The external stimulus thus comes from the website with which consumers interact (Mummalaneni, 2005; Tam and Ho, 2005). In this context, the servicescape framework describes how online consumers confront each specific dimension of the online shopping website, perceive them on a more holistic level, appraise and emotionally respond to them, and engage in e-commerce-related behaviors. <Figure 1> depicts the synthesis of these theoretical frameworks. We adopt this theoretical framework as a basis for consolidating and extending existing measures in the context of online shopping.

Ⅳ. Research Model and Hypotheses

To build the research model and hypotheses described in this section, we start by building a measurement model of information quality, system quality, and e-service quality in the context of online shopping. To do so, we first we build and conceptualize each type of quality in terms of specific relevant dimensions according to the measurement development procedure suggested by Segars (1997). Then we examine the relationships among these dimensions and build a research model to explain how they create consumer satisfaction and loyalty.

4.1. Selection of Dimensions for Information, System, and E-service Qualities

To define *information quality* and *system quality*, we first examined the conceptual and operational definitions of each dimension and measurement used in the previous literature. Second, we excluded dimensions that were too specific to generalize across online shopping environments (such as Web store policies and storage capability) or too heuristic and overarching to be categorized as one of the quality dimensions (such as entertainment and performance). Third, we grouped and synthesized dimensions identified by earlier research that had similar meanings. As shown in <Table 1>, the dimensions used in the previous literature to address information quality fall into the following five dimensions based on consumers' perceptions about information: (1) reliable, (2) easy to comprehend, (3) up-to-date, (4) pertinent to a consumer's purchase decision, and (5) personalized. We refer to these five dimensions as *reliability*, *understandability*, *currency*, *relevance*,

<Table 1> Information Quality Dimensions in Previous Literature

Reliability: concerned with how accurate, dependable, and consistent the information is	
As Variables	Reliability: trustworthy, accurate, and credible (McKinney et al., 2002; Pearson et al., 2012)
	Accessibility: access and security of data (Webb and Webb, 2004)
As Indicators	Reliability (Molla and Licker, 2001)
	Security (Delone and McLean, 2003)
	Accuracy (Hou, 2012; Kim and Niehm, 2009; Liu and Arnett, 2000; Molla and Licker, 2001)
	Completeness (Delone and McLean, 2003; DeLone and McLean, 2004; Liu and Arnett, 2000; Molla and Licker, 2001; Ranganathan and Ganapathy, 2002)
	Information format integrity (Hou, 2012)
	Credibility (Hou, 2012)
Understandability: concerned with how easy the information is to comprehend	
As Variables	Understandability: clear in meaning, easy to understand, and easy to read (McKinney et al., 2002)
	Representational quality: understandability, interpretability, and consistency of data (Webb and Webb, 2004)
As Indicators	Ease of understanding (Delone and McLean, 2003)
	Comprehensiveness and understandability (Hou, 2012; Molla and Licker, 2001; Pearson et al., 2012)
Currency: concerned with how current the information is	
As Variables	Timeliness: current and continuously updated (McKinney et al., 2002)
As Indicators	Up-to-dateness (Kim and Niehm, 2009; Molla and Licker, 2001)
	Currency (Molla and Licker, 2001)
	Timeliness (Kim and Niehm, 2009; Molla and Licker, 2001)
Relevance: concerned with how pertinent the information is for a consumer's purchase decision	
As Variables	Relevance: applicable, related, and pertinent (McKinney et al., 2002)
	Adequacy: sufficient, complete, and necessary topics (McKinney et al., 2002)
	Perceived usefulness: informative and valuable (McKinney et al., 2002)
	Scope: wide range and variety of topics (McKinney et al., 2002)
	Content: the presence of information relevant to the users (Gonzalez and Palacios, 2004)
As Indicators	Relevance (Delone and McLean, 2003; DeLone and McLean, 2004; Kim and Niehm, 2009; Liu and Arnett, 2000; Molla and Licker, 2001; Pearson et al., 2012)
	Price information (Liu and Arnett, 2000);
	Informative (Kim and Niehm, 2009)
	Practicality (Hou, 2012)
	Adequacy (Pearson et al., 2012)
	Scope (Pearson et al., 2012)
Personalization: concerned with how personalized the information is	
As Indicators	Personalization (Delone and McLean, 2003; Liu and Arnett, 2000; Ranganathan and Ganapathy, 2002)
	Content personalization (Liu and Arnett, 2000)

and *personalization*, respectively.

In the same manner, we categorized *system quality* in terms of four dimensions that identify certain website system characteristics, as presented in <Table 2>: (1) visual and experiential organization, (2) correct technical functioning, (3) timely operation, and (4) privacy. These dimensions are referred to here as *usability*, *availability*, *responsiveness*, and *privacy*, respectively.

For our conceptualization of *e-service quality*, we adopted E-S-QUAL for its strong validity and effectiveness and further refined it by using the service quality framework introduced by Rust and Oliver (1994). Their service quality framework theorizes service quality in terms of three categories: service environment, service delivery, and service outcome. The first of these categories, service environment, which in the servicescape framework is addressed as the quality of the external stimulus, can be represented by website quality. The second category, service delivery, can be related to what consumers note during consumer-website interactions and how efficient it is (Choudhury and Karahanna, 2008; Devaraj et al., 2002). The third category, service outcome, is related to what the consumer is left with after service delivery.

In an effort to refine E-S-QUAL, we first matched four of the dimensions of E-S-QUAL – system availability, privacy, efficiency, and fulfillment – to this categorization of the service quality framework, as shown in <Table 3>.

It should be noted that the website quality dimensions identified above are immediately encountered in an online shopping environment, while e-service quality is related to the overall support provided by that environment. Distinguishing website quality from e-service quality thus is essential to conceptualizing website quality and service quality as separate values. Therefore, service environment categories that address the website in online shopping environment should be eliminated when measuring e-service quality to avoid redundancy in meaning. The importance and relevance of the remaining two service quality categories, service delivery and service outcome, to e-service quality is noted by other studies on online shopping (Devaraj et al., 2003; Fassnacht and Koese, 2006; Pavlou et al., 2007; Wolfinbarger and Gilly, 2003). We therefore selected *efficiency* and *fulfillment,* which are related to service delivery and service outcome, respectively, as the relevant dimensions of e-service quality to be measured. The fact that out of the four E-S-QUAL dimensions, efficiency and fulfillment have the strongest impact on overall perceptions of e-service quality (Parasuraman et al., 2005) strengthens the rationale for using these two to measure e-service quality.

4.2. Conceptualization of Information, System, and E-service Quality

To reconcile disagreements in the current literature regarding how to best conceptualize information, system, and e-service quality in an online shopping context, we first conceptualized each dimension as a latent variable rather than a single indicator. This is because they are not single specific properties that are directly observable with complete accuracy but rather consumers' perceptions about an online shopping environment and its quality. In this case, conceptualizing these dimensions as latent variables with multiple indicators better guarantees their validity and reliability (Churchill, 1979).

Second, we determined whether each quality should be conceptualized as a first-order or second-order construct. Using the lens of the servicescape framework, a specific stimulus of the environ-

<Table 2> System Quality Dimensions in Previous Literature

Usability: concerned with the pragmatics of how a user perceives and interact with online shopping website	
As Variables	Usability: simple layout, easy to use, well organized, and clear design (McKinney et al., 2002)
	Usability: easy to learn to operate, interaction is clear and understandable, easy to use, attractive appearance, appropriate design, sense of competency, and positive experience (Barnes and Vidgen, 2002)
	Usability: language, layout and graphics, information architecture, user interface and navigation (Bai et al., 2008)
	Navigation: adequate links, clear description for links, easy to locate, easy to go back and forth, and a few clicks (Gonzalez and Palacios, 2004; McKinney et al., 2002)
	Representational Delight: interface aspects of the Web site with which the user comes into contact (Kim, Lee, Han and Lee, 2002)
	Interactivity: Customized product, create list of items, change list of items, and select different features (McKinney et al., 2002)
	Interactivity: provides quick feedback, gives a variety of alternatives for solving the problem, and has natural and predictable screen changes (Negash et al., 2003)
As Indicators	Visual appearance and system architecture (Molla and Licker, 2001)
	Site design (Szymanski and Hise, 2000)
	Reasonable structure (Hou, 2012)
	Navigability (Hernández et al., 2009)
Availability: concerned with the correct technical function of online shopping website	
As Variables	Availability: always available, launches right ways, does not crash, and does not freeze (Parasuraman et al., 2005)
	Reliability: consistency of performance and dependability (Webb and Webb, 2004)
	Accessibility: site is easily identifiable and accessible to the users (Gonzalez and Palacios, 2004)
As Indicators	Quick error recovery and precise operation and computation (Liu and Arnett, 2000);
	Reliability and 24-hour availability (Delone and McLean, 2003)
	stability of software and hardware (Hou, 2012; Molla and Licker, 2001)
Responsiveness: concerned with website offering timely responses to consumer	
As Variables	Access: Response and load quickly (McKinney et al., 2002)
	Access: Availability of the system when customers try to retrieve information, along with the ease of using the interface to contact people needed for support (Negash et al., 2003)
As Indicators	Response time (Delone and McLean, 2003; Hou, 2012)
	Rapid accessing (Liu and Arnett, 2000)
	Speed (Gonzalez and Palacios, 2004; Hernández et al., 2009)
Privacy: concerned with website being secure and protective of one's privacy	
As Variables	Privacy/Security: feeling protected and safe, trustable, adequate security features, and reputable (Ha and Stoel, 2009)
	Security/Privacy: adequate security features, feeling safe and protected (Kim, Jin and Swinney, 2009)
	Structural Firmness: Internal stability and external security; safety of Internet business from internal bugs and external threat (Kim et al., 2002)
As Indicators	Security (Liu and Arnett, 2000)

<Table 3> E-S-QUAL Dimensions Categorized by the Rust and Oliver (1994)'s Framework

		E-S-QUAL	
		Dimension	Definition
Service quality framework by Rust and Oliver (1994)	Service environment	System availability	The correct technical functioning of the site
		Privacy	The degree to which the site is safe and protects customer information
	Service delivery	Efficiency	The ease and speed of accessing and using the site
	Service outcome	Fulfillment	The extent to which the site's promises about order delivery and item availability are fulfilled

ment becomes a dimension of information quality and system quality that later forms a more holistic perception about that environment; information quality and system quality as a whole are more abstract and holistic conceptions that are constructed by the specific dimensions. On the other hand, each dimension of e-service quality is an appraisal that in the servicescape framework is an immediate cognitive response to an environmental stimulus and affects an emotional response; dimensions of e-service quality are specific rather than more abstract and holistic conceptions. Since the level of the abstraction used to define the construct determines the order level of the construct (Jarvis et al., 2003), we theorized each dimension of information and system quality as a first-order construct that together form the information and system quality constructs as second-order constructs. On the other hand, each dimension of e-service quality was theorized as a first-order construct that separately operates as a single e-service quality.

Third, we suggest that the way the specific first-order constructs conceptualize the second-order constructs – information quality and system quality – is conducted in a composite rather than reflective manner. The literature on formative and reflective constructs suggests that the misspecification of formative constructs as reflective constructs causes significant Type I errors (Jarvis et al., 2003; Petter et al., 2007). Therefore, it is critical to build constructs in the correct form for the study findings to be valid. According to the decision rules for determining whether a construct is formative or reflective (Jarvis et al., 2003), it is rather clear that information quality and system quality are formative constructs. First, it is apparent that these dimensions define quality rather than are manifestations of quality. Second, a change in the value of one of the dimensions is not necessarily expected to be associated with a change in all the other dimensions. For example, a change in the value of the currency dimension of information quality does not necessarily mean that the value of the understandability dimension also changes: i.e., how current the information is does not necessarily reflect how easy it is to understand. Third, the dimensions are not expected to have the same antecedents and consequences. For instance, system responsiveness might be caused by state-of-the-art technology, but this technology does not necessarily also generate increased system usability. Therefore, information quality and system quality serve as formative second-order constructs.

4.3. Modeling Relations Among Information, System, and E-service Quality

As noted earlier, some researchers have modeled information quality, system quality, and e-service

quality as not affecting one another (Delone and McLean, 2003; Liu and Arnett, 2000; Molla and Licker, 2001), while in other studies, information quality and system quality operate as aspects of e-service quality that affect the whole notion of e-service quality in online shopping (Swaid and Wigand, 2009). We argue that these three types of quality are related to each other in that information and system quality affect e-service quality.

First, according to the servicescape framework, consumers' perception of external stimuli from the service environment elicits a cognitive appraisal of service quality (Baker et al., 1994; Reimer and Kuehn, 2005): consumers of online shopping interact with a website and as a result of that interaction form their perceptions about e-service quality (Bitner et al., 2000; Cenfetelli et al., 2008; Zeithaml et al., 2002).

Second, when we examine the relationships among the dimensions of information quality, system quality, and e-service quality, it is apparent that information quality and system quality affect e-service quality. For example, reliable, understandable, current, and relevant information enables consumers to engage in online shopping more efficiently and is more likely to fulfill their shopping needs (Kuruzovich et al., 2008), and thus online information is a supporting element of the fulfillment activities (Rayport and Sviokla, 1995). The same is true for the relationship between system quality and e-service quality. For instance, if a website is not well organized and does not offer timely responses to consumers' requests, e-service quality cannot achieve efficiency and fulfillment. Therefore, we posit Hypotheses 1a, 1b, 2a, and 2b as follows:

H1a: The perceived information quality of an online shopping website has a positive effect on consumers' perceptions of the efficiency of e-service quality regarding online shopping.

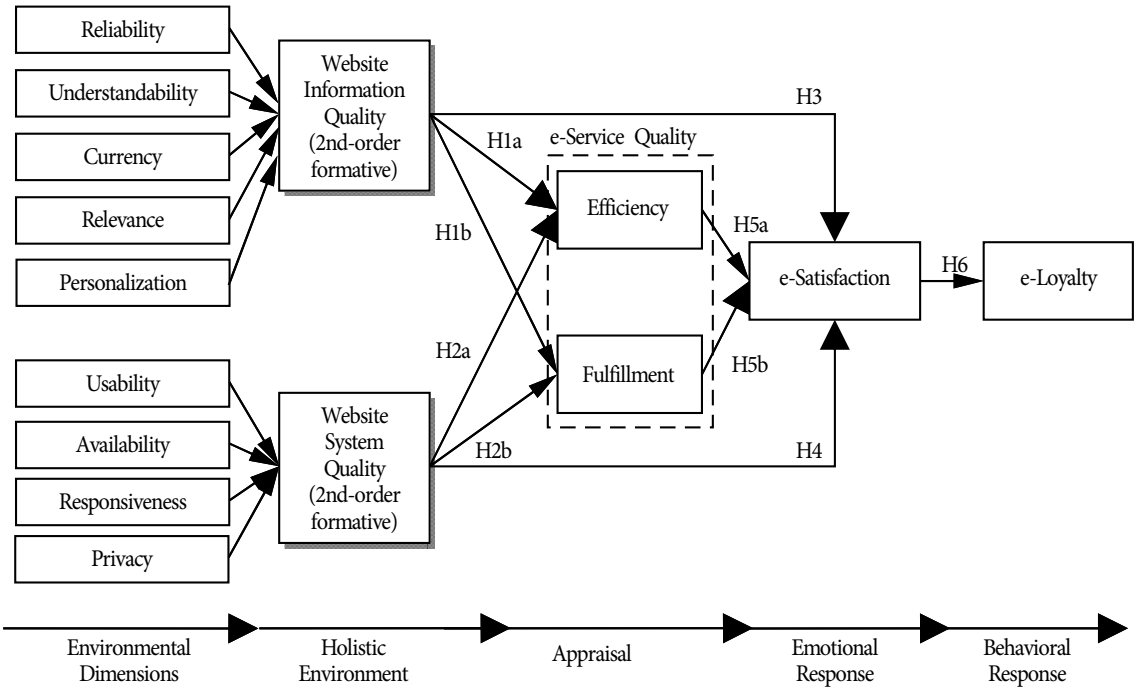
H1b: The perceived information quality of an online shopping website has a positive effect on consumers' perceptions of the fulfillment of e-service quality regarding online shopping.

H2a: The perceived system quality of an online shopping website has a positive effect on consumers' perceptions of the efficiency of e-service quality regarding online shopping.

H2b: The perceived system quality of an online shopping website has a positive effect on consumers' perceptions of the fulfillment of e-service quality regarding online shopping.

4.4. Predicting E-satisfaction and E-loyalty with Information, System, and E-service Quality

In the context of online shopping, satisfaction can be defined as consumers' affective reaction to their cognitive appraisal of e-service quality performance (Cenfetelli et al., 2008). The perceived servicescape elicits this emotional response (Bitner, 1992), and the effect of the perceived service environment on emotional responses such as affect, pleasure, and satisfaction have been examined in many studies (Baker and Cameron, 1996; Donovan and Rossiter, 1982; Ryu and Jang, 2007; Wakefield and Blodgett, 1996). In the context of online shopping, McKinney et al. (2002) suggested that website information quality and system quality are key contributors to satisfaction, and DeLone and McLean (1992) identified information quality and system quality as the antecedents of user satisfaction. Similar evidence is found in other studies (Bai et al., 2008; Shin et al., 2013).



<Figure 2> Research Model

Therefore, we expect that if consumers highly rate the perceived quality of a website system and the information it delivers, they will feel more satisfied with online shopping. Hence, we posit Hypotheses 3 and 4:

H3: The perceived information quality of an online shopping website has a positive effect on consumers' e-satisfaction.

H4: The perceived system quality of an online shopping website has a positive effect on consumers' e-satisfaction.

Various researchers have found that perceived e-service quality (cognitive appraisal) is followed by satisfaction (an emotional response) (Cenfetelli et al., 2008; Gounaris et al., 2010; Udo et al., 2010; Wolfinbarger and Gilly, 2003). That is, if consumers give the perceived e-service quality delivered by an online shopping environment a high rating, they are likely to be more satisfied with that environment in general. Hence, the following hypotheses are posited:

H5a: Online shopping consumers' perception of the efficiency of e-service quality has a positive effect on consumers' e-satisfaction.

H5b: Online shopping consumers' perception of the fulfillment of e-service quality has a positive effect on consumers' e-satisfaction.

It is generally believed that satisfied consumers will continue to visit the corresponding online shopping website. As explained by the servicescape

framework, their emotional response is then followed by a behavioral response (such as deciding to purchase again at the website) as consumers seek to maintain or increase their level of satisfaction (Bagozzi, 1992; Gounaris et al., 2010). Consistent with the extant literature that links e-satisfaction with e-loyalty (Anderson and Srinivasan, 2003; Chang and Chen, 2009; Yang and Peterson, 2004), we posit Hypothesis 6:

H6: Online shopping consumers' satisfaction (e-satisfaction) has a positive effect on their loyalty (e-loyalty).

Ⅴ. Measurement Validation

Before testing the relationships proposed in the research model using a cross-sectional survey, we first performed a series of tests, including an expert survey, to verify the appropriateness of our model (Segars, 1997).

5.1. Measurements

The measures for the research constructs used in this study were adopted from validated instruments from the IS and marketing literature on online shopping success. The dimensions of efficiency developed by Parasuraman et al. (2005) consist of cognitive beliefs regarding (i) online shopping, such as the perceived effort and ease of use in terms of purchasing, and (ii) a website, such as its perceived processing speed. Since the measurements of beliefs regarding a website are redundant with the measurements of website quality, items that ask about the former are not appropriate for measuring the efficiency of e-service. On the other hand, Devaraj et al. (2003) defined efficiency in online shopping as a cognitive belief regarding the effort required to search for the best deal and the ease with which a transaction is completed. Our definition of efficiency as a combination of perceived effort and ease of use regarding online shopping is consistent with the insights of both earlier definitions. As for e-loyalty, four ascending stages of brand loyalty have been proposed based on the cognition-affect-conation pattern: cognitive loyalty, affective loyalty, conative loyalty (or behavioral intention), and action loyalty (Oliver, 1999). Although action loyalty is ideal, it is difficult to observe and often equally difficult to measure (Yang and Peterson, 2004). To resolve this problem, most researchers employ the conative or behavioral intention measure (Gefen, 2002; Parasuraman et al., 2005; Zeithaml et al., 1996). Following extant practices, we also define e-loyalty as behavioral intention and thus adopt the behavioral intention measure. Each question of the surveys in this study was measured on a seven-point Likert-type scale, ranging from one (strongly disagree) to seven (strongly agree).

5.2. Testing Operationalization of Information and System Quality

To test whether the selected dimensions for determining information quality and system quality were indeed adequate, we conducted two processes: one to collect qualitative insights, another to provide quantitative support. To gather qualitative insights, we asked two IS researchers and two online shopping practitioners to select key dimensions of the online shopping experience based on their widespread use, representativeness, and relevance within the online shopping context without disclosing our selected dimensions for information quality and system quality. The results confirmed the appropriateness of our categorization of information quality and system

<Table 4> Demographic Profile of Expert Survey Respondents

	1st Survey (*n*=47)		2nd Survey (*n*=30)	
	Frequency	Percent	Frequency	Percent
Gender				
Men	37	78.7	24	80
Women	10	21.3	6	20
Age				
30-39	28	59.6	18	60
40-49	17	36.2	11	36.7
50+	2	4.2	1	3.3
Degree				
Ph.D	15	31.9	14	46.7
Master's	32	68.1	16	53.3

quality.

Second, we performed expert surveys using the Delphi method (Okoli and Pawlowski, 2004) to verify the content validity of our chosen dimensions. The survey was taken by 47 respondents who were either online shopping practitioners with relevant master's degrees or scholars with doctoral degrees in IS or marketing; their demographic profile is displayed in <Table 4>. The questionnaire asked these expert respondents to judge whether each measurement selected for each dimension of information quality and system quality adequately represented the corresponding quality using a seven-point Likert-type scale from 1 (strongly disagree) to 7 (strongly agree). Answers ranging from "strongly disagree" to "slightly disagree" were categorized as "inadequate," while answers ranging from "slightly agree" to "strongly agree" were categorized as "adequate." The "not sure" answers, which were neutral and could not be categorized as either "adequate" or "inadequate," were discarded. This part of the study was conducted in two rounds. After e-mailing questionnaires to respondents, the results of the first round were shared with all participants for their review and a second round was conducted to see if any of the participants changed their answers after reviewing the results of the first round. At the time of the second round, 17 respondents who participated in the first round were not available, and thus answers from the second round included just those of the 30 remaining respondents.

In both rounds of the survey, the experts deemed most of the system and information quality dimensions adequate. However, in the first round, a relatively high percentage of respondents expressed doubt about whether personalization was an adequate dimension of information quality, a ratio that even increased in the second round. To further investigate the adequacy of personalization, a series of t-tests were performed after subtracting 4 from the original Delphi responses. The test results summarized in <Table 5> supported the exclusion of the personalization dimension as an aspect of information quality. Our reasoning was that although personalization saves the cognitive resources of online shopping consumers and affects their repurchase intentions at the end, it does not always operate for the consumers' benefit in that it also tends to produce a larger set of shopping items for consumers to consider and thus increase consumers' overall product

<Table 5> Expert Survey and *t*-test Results for Construct Content Validity

Construct		Mean	Mean Difference	t-value	Decision
1st Survey (*n*=47)					
Information Quality	Reliability	6.40	2.40	19.21	N/A
	Understandability	5.64	1.64	9.51	N/A
	Personalization	4.09	0.09	0.43	N/A
	Currency	6.00	2.00	15.41	N/A
	Relevance	5.85	1.85	10.22	N/A
System Quality	Usability	5.70	1.70	10.12	N/A
	Availability	6.06	2.06	18.93	N/A
	Privacy	5.13	1.13	4.68	N/A
	Responsiveness	6.06	2.06	15.35	N/A
2nd Survey (*n*=30)					
Information Quality	Reliability	6.50	2.5	23.92	A
	Understandability	5.83	1.83	12.04	A
	Personalization	3.73	-0.27	-0.82	D
	Currency	5.97	1.97	11.61	A
	Relevance	6.10	2.10	11.99	A
System Quality	Usability	5.97	1.97	13.32	A
	Availability	6.20	2.20	16.87	A
	Privacy	4.67	0.67	1.98	A
	Responsiveness	5.70	1.70	7.22	A

Note: * D: doubtful, A: acceptable

evaluation cost (Zhang et al., 2011). Given that personalization does not seem to have an immediate effect on consumers' perceptions of information quality and the results of the Delphi test, we reconceptualized information quality as composed of reliability, understandability, currency, and relevance, eliminating personalization for further analysis. <Appendix B> provides the operational definitions, measurement items, and sources for the constructs used for the rest of this analysis.

5.3. Testing Operationalization of E-service Quality

To verify our choice of efficiency and fulfillment as e-service quality dimensions and excluding privacy and availability from E-S-QUAL, a PLS analysis was performed to evaluate whether privacy and availability could serve as direct antecedents to overall e-service quality in the same fashion as efficiency and fulfillment. As expected, the effect of availability (path = 0.070) was not significant, and privacy (path = 0.175) had a significant but weaker effect on overall e-service quality than efficiency (path = 0.205) and fulfillment (path = 0.475). These results support those

of Parasuraman et al. (2005) and imply that efficiency and fulfillment but not privacy and availability are adequate dimensions for measuring e-service quality.

5.4. Pilot Test

To identify possible problems with wording, content, format, procedures, and the psychometric properties of the scales (Straub, 1989), we conducted a pilot test with 85 undergraduate and graduate students and interviews with three of those participants for richer feedback. Cronbach's alpha of all the scales was acceptable, with the lowest being understandability at 0.78 (Nunnally, 1978). All other alpha coefficients were at least 0.87. The Cronbach's alpha results and participants' feedback suggested no serious concerns regarding the study questionnaire.

Ⅵ. Survey Administration and Sample

To enhance the study's relevance and generalizability, we targeted actual online buyers. To avoid respondents' responding to their perceptions of multiple websites, we asked them to explicitly indicate the online shopping website they had used most recently before answering the main questionnaire and to think about that website when answering the rest of the questions.

Data collection was conducted in two rounds. During the first round, the questionnaire was distributed to 300 undergraduate business students at two leading universities under the administration of two class instructors and to 100 company employees by five informants in a company we contacted in Korea. Small gifts were given to the respondents for their participation. We obtained 371 responses, from which we discarded 12 incomplete responses and 63 responses that indicated no experience with online purchasing within the previous three months so as to minimize the respondents' retrospective bias. This resulted in a final data set of 296 responses consisting of 198 undergraduate students and 98 company employees.

During the second round, we gathered responses from 200 undergraduate engineering students from two other universities and from 200 employees of a global bank and a leading credit card company. As in the first round of data collection, we asked two university instructors and two company informants to gather responses. In this round, we obtained 386 responses. Similar eliminations resulted in an analysis sample of 274.

To determine whether to conduct a separate analysis on each sample or on one merged sample, we performed Chow's (1960) test to see whether the coefficients in all possible regression models were the same for the samples from two separate rounds. In all cases, the Chow statistic did not exceed the critical value. Wilk's lambda, which measures the difference between the two samples, was 0.956 (p = 0.063). Based on Chow's test statistic and Wilk's lambda, we determined the results from the two samples were not significantly different. Second, two separate data analyses were performed on the student and company employee groups in each round, and similar results were obtained. Therefore, the results led us to pool the samples rather than test the research model on each sample or group within the samples. In summary, a total of 570 responses were used for further analysis. <Table 6> presents the demographic profile of the respondents.

<Table 6> Demographic Profile of Respondents

Item	Category	Frequency	Percent	Cumulative Percent
Gender	Male	298	52.3	52.3
	Female	272	47.7	100.0
Age	19 – 25 years	318	55.8	55.8
	26 – 30 years	146	25.6	81.4
	31 – 35 years	59	10.3	91.7
	36 – 40 years	37	6.5	98.2
	> 40 years	10	1.8	100.0
Occupation	Undergraduate students	335	58.8	58.8
	Company employees	235	41.2	100.0
Education	High school graduates	15	2.6	2.6
	University students	329	57.7	60.3
	Bachelor's degree	198	34.8	95.1
	Advanced degree	28	4.9	100.0
Frequency of online purchases per month	Less than 1	116	20.4	20.4
	1 to below 2	240	42.1	62.5
	2 to below 3	113	19.8	82.3
	3 to below 4	58	10.2	92.5
	4 to below 5	16	2.8	95.3
	5 to below 6	7	1.2	96.5
	More than 6	20	3.5	100.0

Ⅶ. Research Results

7.1. Measurement Model

The properties of our research model were assessed following a two-step measurement and structural approach (Chin, 1998a). We assessed the measurement properties using covariance-based structural equation modeling (SEM), LISREL. The structural properties were assessed using partial least squares (PLS) SEM due to identification problems that occur when testing formative second-order models with covariance-based SEM (Jarvis et al., 2003).

First, we assessed the reliability and validity of the measurement model using an internal consistency and confirmatory factor analysis (CFA). The measurement properties are reported in <Table 7>. All reliability measures are 0.8 or higher, well above the recommended level of 0.70, indicating adequate internal consistency (Bagozzi and Yi, 1998).

In the case of two formative constructs – reliability and availability – the weights rather than the loadings of measurements should be considered in testing their validity (Petter et al., 2007). The weights of the six formative items ranged from 0.348 (t-value = 173.226) to 0.361 (t-value = 121.915). The results show that all formative measures contributed substantially to their corresponding constructs. In addi-

<Table 7> Measurement Properties

First-order Construct	Item	Weight	Factor Loading	*t*-value	Cronbach's α	Composite Reliability
Reliability (Formative)	InR1	0.348		173.226	N/A	N/A
	InR2	0.357		145.758		
	InR3	0.358		136.590		
Understandability (Reflective)	InU1		0.754	20.000	0.837	0.844
	InU2		0.875	24.601		
	InU3		0.778	20.845		
Currency (Reflective)	InC1		0.855	24.141	0.880	0.880
	InC2		0.839	23.510		
	InC3		0.834	23.294		
Relevance (Reflective)	InRe1		0.881	26.102	0.917	0.918
	InRe2		0.913	27.643		
	InRe3		0.870	25.583		
Usability (Reflective)	StU1		0.874	26.001	0.930	0.931
	StU2		0.943	29.434		
	StU3		0.893	26.907		
Availability (Formative)	StA1	0.360		131.356	N/A	N/A
	StA2	0.361		121.915		
	StA3	0.352		151.688		
Responsiveness (Reflective)	StR1		0.797	22.440	0.910	0.914
	StR2		0.917	28.051		
	StR3		0.931	28.432		
Privacy (Reflective)	StP1		0.857	24.621	0.894	0.895
	StP2		0.859	24.699		
	StP3		0.863	24.868		
Efficiency (Reflective)	SvE1		0.910	27.009	0.854	0.864
	SvE2		0.898	26.443		
	SvE3		0.665	17.322		
Fulfillment (Reflective)	SvF1		0.886	26.475	0.927	0.928
	SvF2		0.901	27.232		
	SvF3		0.913	27.832		
e-Satisfaction (Reflective)	ES1		0.867	25.736	0.923	0.925
	ES2		0.724	19.674		
	ES3		0.905	27.640		
	ES4		0.895	27.147		
	ES5		0.822	23.657		
e-Loyalty (Reflective)	EL1		0.843	24.689	0.928	0.929
	EL2		0.923	28.672		
	EL3		0.910	27.951		
	EL4		0.752	20.775		
	EL5		0.819	23.581		

Note: $^{*}p < 0.5$, $^{**}p < 0.01$, $^{***}p < 0.001$.

<Table 8> Measurement Model Fit Statistics with Reflective Measures

Chi-square	d.f.	Chi-square/d.f.	GFI	AGFI	NFI	CFI	RMSEA	SRMSR
1246.84	482	2.586	0.886	0.859	0.977	0.987	0.053	0.044
Recommended value		≤ 3.0	≥ 0.90	≥ 0.80	≥ 0.90	≥ 0.92	≤ 0.07	≤ 0.10

<Table 9> Correlations of Latent Reflective Variables†

Variable	InU	InC	InRe	StU	StR	StP	SvE	SvF	ES	EL
Understandability	**0.80**									
Currency	0.49	**0.84**								
Relevance	0.59	0.45	**0.89**							
Usability	0.47	0.23	0.41	**0.90**						
Responsiveness	0.41	0.32	0.43	0.43	**0.88**					
Privacy	0.42	0.25	0.38	0.38	0.58	**0.86**				
Efficiency	0.50	0.38	0.46	0.49	0.55	0.51	**0.83**			
Fulfillment	0.37	0.20	0.35	0.35	0.46	0.41	0.53	**0.90**		
e-Satisfaction	0.52	0.34	0.53	0.41	0.49	0.45	0.59	0.55	**0.85**	
e-Loyalty	0.46	0.37	0.45	0.42	0.47	0.45	0.54	0.47	0.77	**0.85**
Mean	4.94	5.06	4.97	4.70	4.60	4.62	4.93	4.82	4.86	4.65
S.D.	0.97	1.07	1.03	1.16	1.19	1.15	1.06	1.32	1.04	1.07

Note: Diagonal elements are the square roots of AVEs. These values should exceed the interconstruct correlations for adequate discriminant validity. This condition is satisfied for each construct.

tion, we tested the indicators of formative constructs for possible multicollinearity. In all cases, the variance inflation factor was below the 2.0 level, suggesting the validity of the formative constructs (Petter et al., 2007).

Second, the overall model fit of the measurement model was assessed with seven common model fit indices. As shown in <Table 8>, except for GFI (0.888), which is slightly lower than the cutoff value 0.9, all model fit indices exceeded their recommended level, indicating an acceptable level of measurement model.

Third, for convergent validity, we examined the average variance extracted (AVE) for reflective constructs. AVE ranging from 0.644 to 0.810, over the cutoff value of 0.5 (Fornell and Larcker, 1981), indicate convergent validity of the measurement (see <Table 9>). For all constructs, the square roots of the AVE were greater than the correlations with other constructs, indicating a satisfactory level of discriminant validity (Fornell and Larcker, 1981).

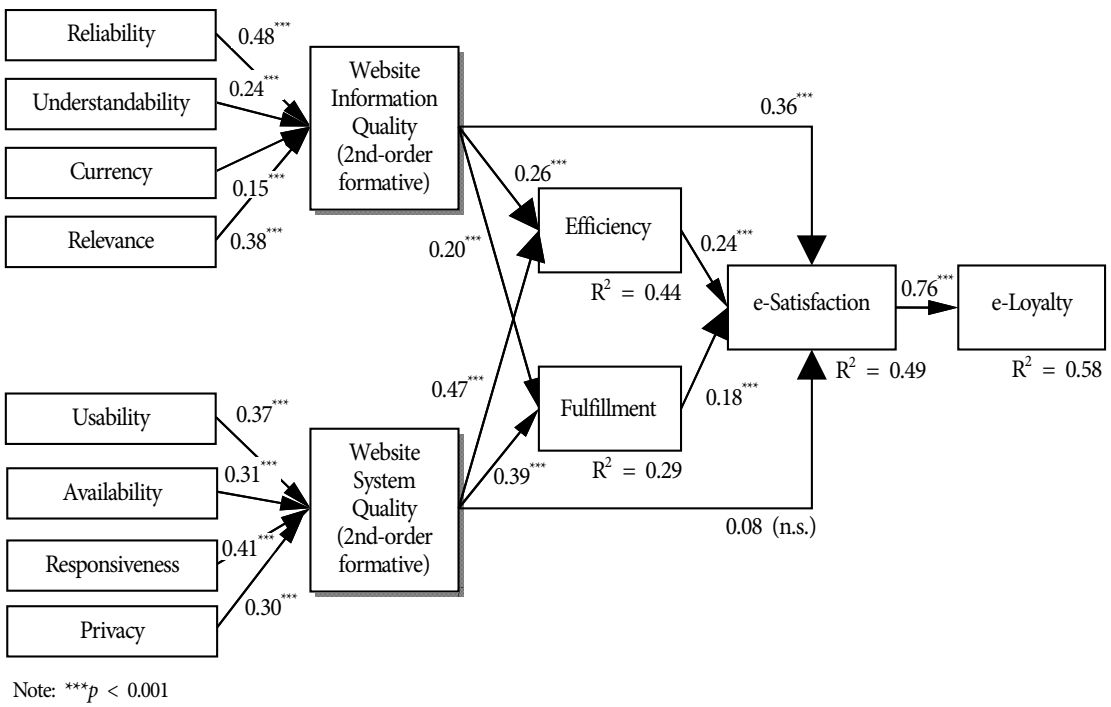
Finally, we examined the possible presence of common method variance in two ways. First, we performed Harman's one-factor test (Podsakoff and Organ, 1986). In this test, common method bias exists when one general factor explains the majority of the covariance in the interdependent and dependent variables or when a single factor emerges from the analysis. The hypothesized model (c2 = 1114, d.f. = 398, $p < 0.001$, RMSEA = 0.056) fit the data significantly better than did the one-factor model (c2 = 9241, d.f. = 434, $p < 0.001$, RMSEA = 0.189).

Second, to explicitly decompose the variances that are explained by measurement items and by the common method factor, we employed a single common method factor approach. We added a common method factor into the structural model, then calculated each indicator's variance that can be substantively explained by the principal construct and the method (see Liang et al. (2007) for a detailed description of the procedure). As shown in <Appendix C>, the results indicated that the average substantively explained variance of the indicators is 0.734, while the average method-based variance is 0.004. The ratio of substantive variance to method variance was t184:1. Furthermore, many method factor loadings were insignificant. Given the small magnitude and insignificance of method variance, we conclude that common method bias is unlikely to be a serious concern for our study.

7.2. Structural Model

The results of the structural model confirmed the contributions of the individual first-order dimensions on their corresponding second-order formative constructs. It is important to note that for formative second-order constructs, weights, not loadings, of their first-order constructs should be considered (Chin, 1998b). As shown in <Figure 3>, all the information quality dimensions showed strong and significant weights, ranging from 0.150 to 0.483, and all system quality dimensions also displayed strong and significant weights, ranging from 0.308 to 0.522.

The overall results of the analysis are shown in <Figure 3>. All the suggested paths are significant except the relationship between website system quality and e-satisfaction. Therefore, all the hypotheses except H4 are supported.



<Figure 3> Research Results

7.3. Power Analysis

We conducted power analyses to further strengthen the results. Although the sample size greatly exceeded the recommended minimum of forty (ten times the largest number of structural paths running into a structural model construct (Chin et al., 2003), researchers have warned against simply applying the rule of thumb of generic PLS sample size (Marcoulides and Saunders, 2006). Therefore, we performed a power analysis by using Cohen's (1988) power table for a multiple regression analysis. Our tests demonstrated adequate statistical power, as the power values for separate regression models exceeded 0.90.

Ⅷ. Discussion

Based on theoretical reasoning, this study attempts to build a scholarly consensus on how to conceptualize website information quality, system quality, and e-service quality in the context of online shopping. It finds that certain information quality and system quality dimensions form consumers' perceptions of overall website information quality and system quality. Reliability, understandability, currency, and relevance are shown to serve as formative dimensions of website information quality, with reliability playing a particularly important role. Similarly, usability, availability, responsiveness, and privacy are found to serve as formative dimensions of system quality, with responsiveness having the strongest impact. These findings suggest that in an environment such as online shopping, where the provider lacks the tangible properties of a physical setting, consumers' perceptions of the reliability of the provided information and responsiveness of the system are the most important factors that determine their opinion regarding e-service quality and their satisfaction with their online shopping experience. Particularly interesting is the finding that what consumers are most concerned with regarding system quality is how fast a website responds to them rather than its proper technical functioning or organization.

In addition, our findings confirm the effects of information quality and system quality on online consumers' cognitive appraisal of online shopping (i.e., its efficiency and fulfillment of e-service quality). Particularly, system quality is found to be more important than information quality in shaping consumers' perceptions of efficiency (path = 0.44 vs. 0.28) and fulfillment (path = 0.38 vs. 0.21), and efficiency (path = 0.24) is shown to be a more important antecedent of satisfaction than fulfillment (path = 0.18). This implies that the efficiency of online shopping is realized not by reducing consumers' cognitive effort but by reducing their interactive effort and that this efficiency should not be sacrificed for any other aspect of service quality.

Especially worth noting is that the finding that system quality affects e-service quality but does not have a direct effect on a consumer's satisfaction: system quality matters, but only through consumers' perceptions of e-service quality. As noted earlier in this section, this provides further evidence that what matters the most to consumers is not how their surrounding environment is constructed and operates but what they get and feel from their immediate interaction with that environment. In this sense, our study explains why information quality and the efficiency and fulfillment of service quality significantly affect a consumer's satisfaction while system quality does not have a direct effect on that satisfaction.

8.1. Limitations and Future Research

This study has several limitations. First, as the respondents of our study are relatively young and most have college educations, the results may be affected by this idiosyncratic characteristic of the sample. Recent studies, however, report that the typical online buyer is relatively young and college-educated (Cenfetelli et al., 2005; McKinney et al., 2002; Song and Zahedi, 2005), like those in our sample, and that there is no significant difference in online shopping attitudes between respondents aged 20 to 29 and those aged over 40 (Hashim, Erlane and Said, 2009). Therefore, we can conclude that the potential bias from our respondents' particular properties would be negligible.

Second, our conceptualization of e-service quality based on E-S-QUAL did not go through a verification process, as did that of information quality and system quality. This decision was made because E-S-QUAL stands out for its strong external and internal validities among other e-service quality measures (Parasuraman et al., 2005) and adopting and refining well-established extant measures is needed for building a normal science (Segars, 1997). Scholars who wish to develop new e-service quality measures, however, might consider applying multiple scale development processes from the ground.

For future study, given that technology users are heterogeneous individuals who have various and different needs (Lamb and Kling, 2003), scholars might consider individual differences that make individual consumers evaluate and react differently to online shopping environments. For example, users' past use experiences have been shown to weaken the effects of their website evaluations on their loyalty behaviors (Kim et al., 2005). Therefore, future studies are needed to investigate the moderating effects of individual differences on online shopping environment and their transaction behaviors.

8.2. Implications for Practice

This study offers several implications for practice. First, the results offer managers of online shopping several insights on how to design websites to maximize their benefits. As technology develops, various features can be embedded in websites to produce better online shopping experiences. Yet these findings suggest that before being seduced by the state-of-art technological features, managers should cautiously assess which quality dimensions they can improve and whether those features are really necessary to create consumer satisfaction and future purchases. Our study provides a set of important quality dimensions that can guide such assessment. Moreover, our findings offer some useful insights on what to focus upon when resources for enhancing websites are limited. For example, if a system designer must choose one priority when designing a website, that priority should be features that can provide timely responses to users' requests. In addition, because website information reliability and relevance are here revealed as playing particularly important roles in improving consumer satisfaction, managers might install a Web content management system (CMS) to reduce the possibility of consumers' receiving wrong and misleading information and to effectively manage information pertinent to consumers' purchase decisions.

Second, a marketing manager attempting to improve customer satisfaction should consider the importance of the quality of website information as well as such traditional marketing factors as price and use that information to collaborate with website designers to create better online marketing programs.

Third, although the effect of fulfillment on consumer satisfaction is less than that of efficiency, its effect is significant and should not be underestimated. For example, the Federal Express Corporation and UPS have created consumer value by allowing consumers to track packages through the companies' websites. By supporting fulfillment activities such as order delivery with website information and its systems, online vendors can create and sustain value that is critical to retaining consumers.

Finally, our findings suggest that managers should not treat information quality, system quality, and service quality as independent, unrelated, and separate features of online shopping. Without this insight, managers may have the false idea that information, systems, and service can be separately planned and developed and not realize that the impact of failure in one area can be magnified throughout the entire customer relationship.

8.3. Implications for Research

This study advances theoretical development in the areas of website information quality, system quality, and e-service quality in the context of online shopping. First, by providing a robust conceptualization of website information quality, system quality, and e-service quality, the study builds consensus on their measurement model. Based on the framework for service quality proposed by Rust and Oliver (1994), we have refined extant e-service quality measures by defining specific dimensions that are related to website quality. We argue that this refinement is effective for identifying and measuring adequate e-service quality dimensions in the context of online shopping. Furthermore, to the best of our knowledge, our study is the first to construct a rich conception of information quality and system quality in such a parsimonious way by conceptualizing website information quality and system quality as second-order formative constructs. Since our attempt at consensus building was conducted under a rigorous framework that can embrace the entire process of consumers' perceiving and responding to environmental stimuli and through valid statistical tests, we believe the model we have established is robust and solid.

Second, the results of this study add a deeper understanding of how qualities of a website influence e-service quality, consumer satisfaction, and consumer loyalty to the existing literature (e.g., Kang and Lee, 2010). Particularly, the study newly establishes the relationship between information quality, system quality, and e-service quality based on a strong theoretical foundation. In the context of traditional IS, the parallel operation of these three constructs, although without any interrelationship among them, has been previously suggested (e.g., DeLone and McLean, 2003; Pitt et al., 1995). However, our theoretical foundation and research model posit that website information quality and system quality influence consumers' appraisals of the services delivered by online shopping, a reconceptualization that better addresses how to drive online shopping success.

References

[1] Anderson, R. E., and Srinivasan, S. S. (2003). E-satisfaction and e-loyalty: A Contingency Framework. *Psychology and Marketing, 20*(2), 123-138.

[2] Bagozzi, R. P. (1992). The Self-regulation of Attitudes, Intentions, and Behavior. *Social Psychology Quarterly, 55*(2), 178-204.

[3] Bagozzi, R. P., and Yi, Y. (1998). On the Evaluation of Structural Equation Models. *Academy of Marketing Science, 16*(1), 74-94.

[4] Bai, B., Law, R., and Wen, I. (2008). The Impact of Website Quality on Customer Satisfaction and Purchase Intentions: Evidence from Chinese Online Visitors. *International Journal of Hospitality Management, 27*(3), 391-402.

[5] Baker, J., and Cameron, M. (1996). The Effects of The Service Environment on Affect and Consumer Perception of Waiting Time: An Integrative Review and Research Propositions. *Journal of the Academy of Marketing Science, 24*(4), 338-349.

[6] Baker, J., Grewal, D., and Parasuraman, A. (1994). The Influence of Store Environment on Quality Inferences and Store Image. *Journal of the Academy of Marketing Science, 22*(4), 328-339.

[7] Barnes, S. J., and Vidgen, R. T. (2002). An Integrative Approach to the Assessment of E-Commerce Quality. *Journal of Electronic Commerce Research, 3*(3), 114-127.

[8] Bauer, H. H., Falk, T., and Hammerschmidt, M. (2006). Etransqual: A Transaction Process-Based Approach for Capturing Service Quality in Online Shopping. *Journal of Business Research, 59*, 866-875.

[9] Bitner, M. J. (1992). Servicescapes: The Impact of Physical Surroundings on Customers and Employees. *Journal of Marketing, 56*(2), 57-71.

[10] Bitner, M. J., Brown, S. W., and Meuter, M. L. (2000). Technology Infusion in Service Encounters. *Journal of the Academy of Marketing Science, 28*(1), 138-149.

[11] Cenfetelli, R. T., Benbasat, I., and Al-Natour, S. (2005). Information Technology Mediated Customer Service: A Functional Perspective. *Proceedings of the 26Th International Conference on Information Systems*, 725-739.

[12] Cenfetelli, R. T., Benbasat, I., and Al-Natour, S. (2008). Addressing the What and How of Online Services: Positioning Supporting-Services Functionality and Service Quality for Business-To-Consumer Success. *Information Systems Research, 19*(2), 161-181.

[13] Chang, H. H., and Chen, S. W. (2009). Consumer Perception of Interface Quality, Security, and Loyalty in Electronic Commerce. *Information and Management, 46*(7), 411-417.

[14] Chin, W. W. (1998A). Issues and Opinions on Structural Equation Modeling. *MIS Quarterly, 22*(1), vii-xvi.

[15] Chin, W. W. (1998B). The Partial Least Squares Approach to Structural Equation Modeling, In: G. A. Marcoulides (Eds.), *Modern Methods for Business Research*. Lawrence Erlbaum Associates, London, pp. 295-336.

[16] Chin, W. W., Marcolin, B. L., and Newsted, P. R. (2003). A Partial Least Squares Latent Variable Modeling Approach for Measuring Interaction Effects: Results from a Monte Carlo Simulation Study and an Electronic-Mail Emotion/Adoption Study. *Information Systems Research, 14*(2), 189-217.

[17] Choudhury, V., and Karahanna, E. (2008). The Relative Advantage of Electronic Channels: A Multidimensional View. *MIS Quarterly, 32*(1), 179-200.

[18] Chow, G. C. (1960). Tests of Equality Between Sets of Coefficients in Two Linear Regressions. *Econometrica, 28*(3), 591-605.

[19] Churchill, G. A. (1979). A Paradigm for Developing Better Measures of Marketing Construct. *Journal of Marketing Research, 16*(1), 64-73.

[20] Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences, 2Nd Ed.* Hillsdale, Nj: Lawrence Erlbaum Associates.

[21] Collier, J. E., and Bienstock, C. C. (2006). Measuring Service Quality in E-Retailing. *Journal of Service Research, 8*(3), 260-275.

[22] Delone, W. H., and Mclean, E. R. (1992). Information Systems Success: The Quest for the Dependent Variable. *Information Systems Research, 3*(1), 60-95.

[23] Delone, W. H., and Mclean, E. R. (2003). The Delone and Mclean Model of Information Systems Success: A Ten-Year Update. *Journal of Management Information Systems, 19*(4), 9-30.

[24] Delone, W. H., and Mclean, E. R. (2004). Measuring E-Commerce Success: Applying the Delone and Mclean Information Systems Success Model. *International Journal of Electronic Commerce, 9*(1), 31-47.

[25] Devaraj, S., Fan, M., and Kohli, R. (2002). Antecedents of B2C Channel Satisfaction and Preference: Validating E-Commerce Metrics. *Information Systems Research, 13*(3), 316-333.

[26] Devaraj, S., Fan, M., and Kohli, R. (2003). E-Loyalty - Elusive Ideal or Competitive Edge? *Communications of the ACM, 46*(9), 184-191.

[27] Donovan, R. J., and Rossiter, J. R. (1982). Store Atmosphere: An Environmental Psychology Approach. *Journal of Retailing, 58*(1), 34-57.

[28] Fassnacht, M., and Koese, I. (2006). Quality of Electronic Services: Conceptualizing and Testing Hierarchical Model. *Journal of Service Research, 9*(1), 19-37.

[29] Fornell, C., and Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research, 18*(1), 39-50.

[30] Gefen, D. (2002). Customer Loyalty in E-Commerce. *Journal of the Association for Information Systems, 3*, 27-51.

[31] Gonzalez, F. J. M., and Palacios, T. M. B. (2004). Quantitative Evaluation of Commercial Web Sites: An Empirical Study of Spanish Firms. *International Journal of Information Management, 24*(4), 313-328.

[32] Gounaris, S., Dimitriadis, S., and Stathakopoulos, V. (2010). An Examination of the Effects of Service Quality and Satisfaction on Customers' Behavioral Intentions in E-Shopping. *Journal of Service Marketing, 24*(2), 142-156.

[33] Ha, S., and Stoel, L. (2009). Consumer E-Shopping Acceptance: Antecedents in a Technology Acceptance Model. *Journal of Business Research, 62*(5), 565-571.

[34] Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., and Tatham, R. L. (2005). *Multivariate Data Analysis, Sixth*. Prentice Hall.

[35] Hartline, M. D., and Ferrell, O. C. (1996). The Management of Customer-Contact Service Employees: An Empirical Investigation. *Journal of Marketing, 60*(4), 52-70.

[36] Hashim, A., Erlane, K. G., and Said, J. (2009). Does Consumers' Demographic Profile Influence Online Shopping?: An Examination Using Fishbein'S Theory. *Canadian Social Science, 5*(6), 19-31.

[37] Hernández, B., Jiménez, J., and Martín, M. J. (2009). Key Website Factors in E-Business Strategy. *International Journal of Information Management, 29*(5), 362-371.

[38] Holahan, C. J. (1982). *Environmental Psychology*. New York: Random House, Inc.

[39] Hou, Z. (2012). Quality Evaluation Model Study of B2C E-Commerce Website, In: D. Zeng (Eds.), *Advances in Control and Communication*. Springer Berlin Heidelberg, pp. 39-47.

[40] Janda, S., Trocchia, P. J., and Gwinner, K. P. (2002). Consumer Perceptions of Internet Retail Service Quality. *International Journal of Service Industry Management, 13*(5), 412-431.

[41] Jarvis, C. B., Mackenzie, S. B., and Podsakoff, P. M. (2003). A Critical Review of Construct Indicators and Measurement Model Misspecification in Marketing and Consumer Research. *Journal of Consumer Research, 30*(2), 199-218.

[42] Kang, Y. S., and Lee, H. (2010). Understanding the Role of an IT Artifact in Online Service Continuance: An Extended Perspective of User Satisfaction. *Computers in Human Behavior, 26*(3), 353-364.

[43] Kim, H., and Niehm, L. S. (2009). The Impact of Website Quality on Information Quality, Value, and Loyalty Intentions in Apparel Retailing. *Journal of Interactive Marketing, 23*(3), 221-233.

[44] Kim, J., Jin, B., and Swinney, J. L. (2009). The Role of Etail Quality, E-Satisfaction and E-Trust in Online Loyalty Development Process. *Journal of Retailing and Consumer Services, 16*(4), 239-247.

[45] Kim, J., Lee, J., Han, K., and Lee, M. (2002). Businesses as Buildings: Metrics for the Architectural

Quality of Internet Business. *Information Systems Research, 13*(3), 239-254.

[46] Kim, S., and Stoel, L. (2004). Dimensional Hierarchy of Retail Website Quality. *Information and Management, 41*, 619-633.

[47] Kim, S. S., Malhotra, N. K., and Narasimhan, S. (2005). Two Competing Perspectives on Automatic Use: A Theoretical and Empirical Comparison. *Information Systems Research, 16*(4), 418-432.

[48] Kuruzovich, J., Viswanathan, S., Agarwal, R., Gosain, S., and Weitzman, S. (2008). Marketspace or Marketplace? Online Information Search and Channel Outcomes in Auto Retailing. *Information Systems Research, 19*(2), 182-201.

[49] Lamb, R., and Kling, R. (2003). Reconceptualizing Users as Social Actors in Information Systems Research. *MIS Quarterly, 27*(2), 197-236.

[50] Liang, H., Saraf, N., Hu, Q., and Xue, Y. (2007). Assimilation of Enterprise Systems: The Effect of Institutional Pressures and the Mediating Role of Top Management. *MIS Quarterly, 31*(1), 59-87.

[51] Liu, C., and Arnett, K. P. (2000). Exploring the Factors Associated With Web Site Success in the Context of Electronic Commerce. *Information and Management, 38*(1), 23-33.

[52] Marcoulides, G. A., and Saunders, C. (2006). PLS: A Silver Bullet? *MIS Quarterly, 30*(2), 3-4.

[53] Mckinney, V., Yoon, K., and Zahedi, F. M. (2002). The Measurement of Web-Customer Satisfaction: An Expectation and Disconfirmation Approach. *Information Systems Research, 13*(3), 296-315.

[54] Mehrabian, A., and Russell, J. A. (1974). *An Approach to Environmental Psychology*. Cambridge, Ma: MIT Press.

[55] Molla, A., and Licker, P. S. (2001). E-Commerce System Success: An Attempt to Extend and Respecify the Delone and Mclean Model of IS Success. *Journal of Electronic Commerce Research, 2*(4), 131-141.

[56] Moran, T. P. (1981). The Command Language Grammar: A Representation for the User Interface of Interactive Computer Systems. *International Journal of Man-Machine Studies, 15*(1), 3-50.

[57] Mummalaneni, V. (2005). An Empirical Investigation of Web Site Characteristics, Consumer Emotional States and On-Line Shopping Behaviors. *Journal of Business Research, 58*(4), 526-532.

[58] Negash, S., Ryan, T., and Igbaria, M. (2003). Quality and Effectiveness in Web-Based Customer Support Systems. *Information and Management, 40*(8), 757-768.

[59] Nunnally, J. C. (1978). *Psychometric Theory*. New York: Mcgraw-Hill.

[60] Okoli, C., and Pawlowski, S. D. (2004). The Delphi Method as a Research Tool: An Example, Design Considerations and Applications. *Information and Management, 42*(1), 15-29.

[61] Oliver, R. L. (1997). *Satisfaction: A Behavioral Perspective on the Consumer*. New York: Mcgraw-Hill.

[62] Oliver, R. L. (1999). Whence Consumer Loyalty? *Journal of Marketing, 63*, 33-44.

[63] Parasuraman, A., Zeithaml, V. A., and Berry, L. L. (1988). SERVQUAL: A Multiple-Item Scale for Measuring Consumer Perceptions of Service Quality. *Journal of Retailing, 64*(1), 12-40.

[64] Parasuraman, A., Zeithaml, V. A., and Malhotra, A. (2005). ES-QUAL: A Multiple-Item Scale for Assessing Electronic Service Quality. *Journal of Service Research, 7*(3), 214-233.

[65] Parra, J. F., and Ruiz, S. (2009). Consideration Sets in Online Shopping Environments: The Effects of Search Tool and Information Load. *Electronic Commerce Research and Applications, 8*(5), 252-262.

[66] Pavlou, P. A., Liang, H., and Xue, Y. (2007). Understanding and Mitigating Uncertainty in Online Exchange Relationships: A Principal-Agent Perspective. *MIS Quarterly, 31*(1), 105-136.

[67] Pearson, A., Tadisina, S., and Griffin, C. (2012). The Role of E-Service Quality and Information Quality in Creating Perceived Value: Antecedents to Web Site Loyalty. *Information Systems Management, 29*(3), 201-215.

[68] Petter, S., Straub, D., and Rai, A. (2007). Specifying Formative Constructs in Information Systems Research. *MIS Quarterly, 31*(4), 623-656.

[69] Pitt, L. F., Watson, R. T., and Kavan, C. B. (1995). Service Quality: A Measure of Information Systems Effectiveness. *MIS Quarterly, 19*(2), 173-187.

[70] Podsakoff, P. M., and Organ, D. (1986). Self-Reports in Organizational Research: Problems and Prospects. *Journal of Management, 12*(4), 531-544.

[71] Ranganathan, C., and Ganapathy, S. (2002). Key Dimensions of Business-to-Consumer Web Sites. *Information and Management, 39*(6), 457-465.

[72] Rayport, J. F., and Sviokla, J. J. (1995). Exploiting the Virtual Value Chain. *Harvard Business Review, 73*(6), 75-85.

[73] Reimer, A., and Kuehn, R. (2005). The Impact of Servicescape on Quality Perception. *European Journal of Marketing, 39*(7/8), 785-808.

[74] Rust, R. T., and Oliver, R. L. (1994). Service Quality - Insights and Managerial Implications from the Frontier, In: R. T. Rust ,R. L. Oliver (Eds.), *Service Quality: New Directions in Theory and Practice*. Thousand Oaks, Ca: Sage, pp. 1-19.

[75] Ryu, K., and Jang, S. (2007). The Effect of Environmental Perceptions on Behavioral Intentions Through Emotions: The Case of Upscale Restaurants. *Journal of Hospitality and Tourism Research, 31*(1), 56-72.

[76] Santos, J. (2003). E-Service Quality: A Model of Virtual Service Quality Dimensions. *Managing Service Quality, 13*(3), 233-246.

[77] Segars, A. (1997). Assessing the Unidimensionality of Measurement: A Paradigm and Illustration within the Context of Information Systems Research. *Omega, International Journal of Management Science, 25*(1), 107-121.

[78] Shin, J. I., Chung, K. H., Oh, J. S., and Lee, C. W. (2013). The Effect of Site Quality on Repurchase Intention in Internet Shopping Through Mediating Variables: The Case of University Students in South Korea. *International Journal of Information Management, 33*(3), 453-463.

[79] Song, J., and Zahedi, F. M. (2005). A Theoretical Approach to Web Design in E-Commerce: A Belief Reinforcement Model. *Management Science, 51*(8), 1219-1235.

[80] Straub, D. W. (1989). Validating Instruments in MIS Research. *MIS Quarterly, 13*(2), 147-169.

[81] Swaid, S. I., and Wigand, R. T. (2009). Measuring the Quality of E-Service: Scale Development and Initial Validation. *Journal of Electronic Commerce Research, 10*(1), 13-28.

[82] Szymanski, D. M., and Hise, R. T. (2000). E-Satisfaction: An Initial Examination. *Journal of Retailing, 76*(3), 309-322.

[83] Tam, K. Y., and Ho, S. Y. (2005). Web Personalization as a Persuasion Strategy: An Elaboration Likelihood Model Perspective. *Information Systems Research, 16*(3), 271-291.

[84] Turley, L. W., and Milliman, R. E. (2000). Atmospheric Effects on Shopping Behavior: A Review of the Experimental Evidence. *Journal of Business Research, 49*(2), 193-211.

[85] Udo, G. J., Bagchi, K. K., and Kirs, P. J. (2010). An Assessment of Customers' E-Service Quality Perception, Satisfaction and Intention. *International Journal of Information Management, 30*(6), 481-492.

[86] Wakefield, K. L., and Blodgett, J. G. (1996). The Effect of the Servicescape on Customer's Behavioral Intentions in Leisure Service Settings. *The Journal of Services Marketing, 10*(6), 45-61.

[87] Webb, H. W., and Webb, L. A. (2004). SiteQual: An Integrated Measure of Website Quality. *The Journal of Enterprise Information System, 17*(6), 430-440.

[88] Wixom, B. H., and Todd, P. A. (2005). A Theoretical Integration of User Satisfaction and Technology Acceptance. *Information Systems Research, 16*(1), 85-102.

[89] Wolfinbarger, M., and Gilly, M. C. (2003). eTailQ: Dimensionalizing, Measuring and Predicting Etail Quality. *Journal of Retailing, 79*(3), 183-198.

[90] Yang, Z., Cai, S., Zhou, Z., and Zhou, N. (2005). Development and Validation of an Instrument to Measure User Perceived Service Quality of Information Presenting Web Portals. *Information and Management, 42*(4), 575-589.

[91] Yang, Z., and Peterson, R. T. (2004). Customer Perceived Value, Satisfaction, and Loyalty: The Role of Switching Costs. *Psychology and Marketing, 21*(10), 799-822.

[92] Yoo, B., and Donthu, N. (2001). Developing a Scale to Measure the Perceived Quality of an Internet Shopping Site (SiteQual). *Quarterly Journal of Electronic Commerce, 2*(1), 31-46.

[93] Zeithaml, V. A., Berry, L. L., and Parasuraman, A. (1996). The Behavioral Consequences of Service Quality. *Journal of Marketing, 60*(2), 31-46.

[94] Zeithaml, V. A., Parasuraman, A., and Malhotra, A. (2002). Service Quality Delivery Through Web Sites: A Critical Review of Extant Knowledge. *Journal of the Academy of Marketing Science, 30*(4), 362-375.

[95] Zhang, T., Agarwal, R., and Lucas, J. H. C. (2011). The Value of IT-Enabled Retailer Learning: Personalized Product Recommendations and Customer Store Royalty in Electronic Markets. *MIS Quarterly, 35*(4), 859-881.

<Appendix A> Summary of Studies on Website Quality Dimensions

Research	Proposed Quality Dimensions	Context
Szymanski and Hise (2000)	Convenience, merchandising, site design, financial security	e-tailing
Liu and Arnett (2000)	Information quality, learning capability, playfulness, system quality, system use, service quality	Commercial website in e-commerce
Molla and Licker (2001)	E-commerce system quality dimensions (reliability of the system, system accuracy, flexibility, online response time, 24-hour availability, page loading speed, etc) Content quality dimensions (accuracy, up-to-datedness, comprehensiveness, understandability, completeness, timeliness, reliability, relevance, currency, content personalization, etc)	Online shopping
Barnes and Vidgen (2002)	Usability, design, information, trust, empathy	Internet bookstore
Ranganathan and Ganapathy (2002)	Information content, design, security, privacy	B2C websites
McKinney et al. (2002)	Information quality dimensions (relevance, timeliness, reliability, scope, perceived usefulness), System quality dimensions (access, usability, navigation, interactivity)	Online shopping
Santos (2003)	Incubative dimensions (easy of use, appearance, linkage, structure and layout, content), Active dimensions (reliability, efficiency, support, communication, security, incentives)	e-commerce in general
DeLone and McLean (2004)	E-commerce system quality (system responsiveness, scalability, ease of navigation, privacy, etc), E-commerce information quality (accuracy, relevance, understandability, currency, content personalization, etc.)	e-commerce in general
Kim and Stoel (2004)	Informational task-to-fit, tailored communication, online completeness, relative advantage, visual appeal, innovativeness, emotional appeal, consistent image, easy of understanding, intuitive operations, response time, trust	Apparel websites
Webb and Webb (2004)	Website Service quality (reliability, responsiveness, assurance, empathy, tangibility), Information quality (accessibility, contextual, representational, intrinsic)	B2C e-commerce
Gonzales and Palacios (2004)	Accessibility, speed, navigability, site content	e-commerce for commercial, educational, and non-profitmaking organizations
Parasuraman et al. (2005)	E-S-QUAL (Efficiency, fulfillment, system availability, privacy), E-RecS-QUAL (responsiveness, compensation, contact)	Online stores
Bai et al. (2008)	Usability (language, layout and graphics, information architecture, user interface and navigation) Functionality (purchase information, service/products information, destination information, quality of information, contact information)	Chinese online customers
Kim and Niehm (2009)	Accuracy, timeliness, relevance, informative	Apparel online shopping

<Appendix A> Summary of Studies on Website Quality Dimensions (Cont.)

Research	Proposed Quality Dimensions	Context
Hernández et al. (2009)	Navigability, accessibility, content, speed	Online market
Hou (2012)	Information quality (Accuracy of the information, information format integrity, practicality, comprehensive information, information update rate, information credibility) System Quality (transaction security, easy to use, response time, system stability, website structure reasonable, system function)	B2C e-commerce websites
Pearson et al. (2012)	Information quality (relevance, understandability, reliability, adequacy, scope, usefulness)	e-commerce sites in general

<Appendix B> Survey Items

All scale measures are based on a seven-point Likert scale, using "strongly agree" and "strongly disagree" anchors.

Reliability is defined as the consumer's perception that the information is reliable. Items were derived from McKinney et al. (2002).

		mean (std dev)
InR1	This website provides me with trustworthy information.	5.04 (1.16)
InR2	____ provides me with accurate information.	4.73 (1.15)
InR3	____ provides me with credible information.	4.83 (1.14)

Understandability is defined as the consumer's perception of how easy the information is to comprehend. Items were derived from McKinney et al. (2002).

		mean (std dev)
InU1	____ provides information that is clear in meaning.	4.86 (1.12)
InU2	____ provides information that is easy to understand.	5.02 (1.08)
InU3	____ provides information that is easy to read.	4.93 (1.14)

Currency is defined as the consumer's perception of the degree to which the information is up to date. Items were derived from Wixom and Todd (2005).

		mean (std dev)
InC1	____ provides me with the most recent information.	5.20 (1.18)
InC2	____ produces the most current information.	5.11 (1.20)
InC3	The information from ____ is always up to date.	4.87 (1.18)

Relevance is defined as the consumer's perception of how pertinent the information is to his/her purchase decision. Items were derived from McKinney et al. (2002).

		mean (std dev)
InRe1	____ provides me with information applicable to my purchase decision.	5.00 (1.11)
InRe2	____ provides me with information related to my purchase decision.	5.02 (1.11)
InRe3	____ provides me with information pertinent to my purchase decision.	4.90 (1.11)

<Appendix B> Survey Items (Cont.)

Usability is defined as the extent to which the website is well organized. Items were derived from McKinney et al. (2002).

		mean (std dev)
StU1	____ has a simple layout for its contents.	4.68 (1.25)
StU2	____ is well organized.	4.74 (1.23)
StU3	____ has a clear design.	4.67 (1.22)

Availability is defined as the correct technical functioning of the website. Items were derived from Parasuraman et al. (2005).

		mean (std dev)
StA1	____ does not crash.	4.62 (1.43)
StA2	Pages at ____ do not freeze after I enter my order information.	4.83 (1.25)
StA3	____ is always available for business.	4.57 (1.36)

Responsiveness is defined as the degree to which the website offers timely responses to requests from the consumer. Items were derived from McKinney et al. (2002), and Yoo and Donthu (2001).

		mean (std dev)
StR1	____ quickly responds to my requests.	4.60 (1.33)
StR2	____ quickly loads all the text and graphics.	4.61 (1.28)
StR3	____'s processing speed is fast.	4.60 (1.27)

Privacy is defined as the degree to which the website is safe and protects customer information. Items were derived from Parasuraman et al. (2005).

		mean (std dev)
StP1	____ protects information on my web-shopping behavior.	4.57 (1.24)
StP2	____ does not share my personal information with other websites.	4.47 (1.32)
StP3	____ protects information about my payment.	4.80 (1.22)

Efficiency is defined as the extent to which the consumer's shopping effort is conserved through online shopping activities. Items were derived from Devaraj et al. (2003) and Parasuraman et al. (2005).

		mean (std dev)
SvE1	____ enables me to complete a transaction quickly.	4.92 (1.17)
SvE2	I did not have to spend too much effort to complete a transaction on ____.	4.97 (1.20)
SvE3	____ makes it easy to find what I need.	4.90 (1.23)
SvE4	____ *makes it easy to get anywhere in the site.**	4.76 (1.23)

<Appendix B> Survey Items (Cont.)

Fulfillment is defined as the extent to which the website's promises about order delivery and item availability are fulfilled. Items were derived from Wolfinbarger and Gilly (2003) and Parasuraman et al. (2005).

		mean (std dev)
SvF1	____ delivers orders by the time promised by the company.	4.83 (1.40)
SvF2	____ makes accurate promises about delivery of products.	4.85 (1.36)
SvF3	____ quickly delivers what I order.	4.78 (1.49)
SvF4	____ *sends out the items ordered.**	5.66 (1.04)

e-Satisfaction is defined as the contentment of the consumer with respect to his/her prior purchasing experiences with the website. Items were derived from Oliver (1997).

		mean (std dev)
ES1	I am sure it was right to make my most recent online purchase at ____.	4.94 (1.18)
ES2	I have truly enjoyed purchasing from ____.	4.92 (1.18)
ES3	My choice to purchase from ____ was a wise one.	4.91 (1.12)
ES4	I am satisfied with my most recent decision to purchase from ____.	5.04 (1.21)
ES5	I am happy I made my most recent online purchasing at ____.	4.48 (1.21)

e-Loyalty is defined as attitudinal behavioral intention to conduct more business with the online vendor. Items were derived from Zeithaml et al. (1996).

		mean (std dev)
EL1	I'll say positive things about ____ to other people.	4.53 (1.18)
EL2	I'll recommend ____ to someone who seeks my advice.	4.59 (1.23)
EL3	I'll encourage friends and others to do business with ____.	4.50 (1.17)
EL4	I'll consider ____ to be my first choice for future transactions.	4.73 (1.27)
EL5	I'll do more business with ____ in the coming months.	4.92 (1.20)

* Dropped due to low factor loading.

<Appendix C> Common Method Bias Analysis

Construct	Indicator	Substantive Factor Loading (R1)	$R1^2$	Method Factor Loading (R2)	$R2^2$
Website Information Quality	Reliability	0.727***	0.529	0.096	0.009
	Understandability	0.889***	0.790	-0.049	0.002
	Currency	0.730***	0.533	-0.111	0.012
	Relevance	0.768***	0.590	0.041	0.002
Website System Quality	Usability	0.892***	0.796	0.098	0.010
	Availability	0.607***	0.368	-0.084*	0.007
	Responsiveness	0.807***	0.651	0.020	0.000
	Privacy	0.793***	0.629	-0.020	0.000
Efficiency	SvE1	0.915***	0.837	-0.004	0.000
	SvE2	1.010***	1.020	-0.115**	0.013
	SvE3	0.706***	0.498	0.131**	0.017
Fulfillment	SvF1	0.937***	0.878	-0.010	0.000
	SvF2	0.942***	0.887	-0.009	0.000
	SvF3	0.925***	0.856	0.019	0.000
e-Satisfaction	ES1	0.837***	0.701	0.053	0.003
	ES2	0.834***	0.696	-0.047	0.002
	ES3	0.940***	0.884	-0.024	0.001
	ES4	0.923***	0.852	-0.016	0.000
	ES5	0.841***	0.707	0.030	0.001
e-Loyalty	EL1	0.817***	0.667	0.054	0.003
	EL2	0.986***	0.972	-0.073	0.005
	EL3	0.967***	0.935	-0.064	0.004
	EL4	0.856***	0.733	-0.031	0.001
	EL5	0.777***	0.604	0.117**	0.014
Average		0.851	0.734	0.000	0.004

Note: $*p < 0.5$, $**p < 0.01$, $***p < 0.001$.

◆ About the Authors ◆

Young Sik Kang

Young Sik Kang is an Associate Professor at Myongji University. He received Ph.D. degree in MIS from Korea Advanced Institute of Science and Technology (KAIST) Business School, M.S degree in Industrial Engineering from Pohang University of Science and Technology (POSTECH), and B.S. degree in Industrial Engineering from Korea University. His research interests include process mining and business process analytics. His works have been published in journals such as International Journal of Information Management, Computers in Human Behavior, Journal of Information Science, and Expert Systems with Applications. He recently published a book titled 'Process Mining for Business.'

Jeoungkun Kim

Jeoungkun Kim is an Associate Professor of Business Administration Department at Yeungnam University. He earned his Ph.D. from KAIST. His area of interests include social influences on online user behaviors, innovative technology diffusion, and IT applications in financial industries.

Jinyoung Min

Jinyoung Min is an Assistant Professor in the College of Business at Chosun University. She received her Ph.D. in management engineering from Korea Advanced Institute of Science and Technology. Her research interests include social dynamics in social media, and human computer interaction. Her work has been published in Computers in Human Behavior, International Journal of Information Management, Journal of the Association for Information Science and Technology, etc. Jinyoung Min is a corresponding author and can be contacted at: saharamin@chosun.ac.kr

Submitted: April 16, 2016; Accepted: July 5, 2016