Intensifying online loyalty! The power of website quality and the perceived value of consumer/seller relationship

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Abstract

Purpose – Stimulated by trends in group purchasing and online social communities, consumers are changing their shopping behavior and increasingly turning to websites for their shopping needs. The purpose of this paper is to investigate how website quality influences shopping websites to create value for the customer and promote loyalty among customers, as well as moderating effects of online shopping experience.

Design/methodology/approach – This study collected data from 275 respondents for testing against the proposed research model by means of the partial least squares (PLS) path modeling. ADANCO software was used to assess the reliability and validity of the measurement model, conduct an analysis of the goodness of model fit for the overall model, and test the hypotheses through structural modeling.

Findings – Empirical results demonstrate that system quality and electronic service quality (e-service quality) have a significant positive effect on the perceived value of consumer/seller relationship; the perceived value of the consumer/seller relationship has a significant positive effect on online loyalty; online shopping experience does not exert a moderating effect on the relationship between website quality and the perceived value of consumer/seller relationship.

Originality/value – This study applied the PLS path modeling approach using ADANCO variance-based structural equation modeling software to verify that website quality plays an important role in distinguishing a brand from other brands in e-tailing, making it an essential factor of a shopping website's business success. This study further verified that the amount of previous online shopping experience a consumer has does not interfere with the positive influence that website quality exerts on the perceived value of the consumer/seller relationship. The above indicates that it is imperative for website managers to adopt online shopping experience of consumers as a market segmentation variable so as to enhance website quality, increase the perceived value of consumer-seller relationships, and win consumer loyalty.

Keywords PLS path modeling, Perceived value, Online shopping experience, Website quality, ADANCO

Paper type Research paper

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1. Introduction

Compared with conventional physical retail channels, e-tailing enables consumers to shop and place orders with just a few clicks of the mouse, and pay via credit card or cash. The goods are delivered without time or geographical restraints and all of this can be accomplished without pressure from sales staff. Online shopping also reduces prices, saves time, and eliminates many of the physical difficulties involved in traditional shopping. These are all compelling reasons enhancing the willingness of consumers to shop online (Prindle, 2012; Hsieh and Tsao, 2013). One survey report indicated that online retail sales around the world increased by 22.2 percent between 2013 and 2014, exceeding 1.3 trillion USD. Further growth of 20.9 percent was also predicted for 2015 (eMarkete, 2014). The brand value of representative online retailer Amazon.com showed a 24 percent increase from 2014 to 2015, reaching 56.124 billion USD and enabling Amazon.com to surpass Walmart and rank seventh among the top ten brands in the world (Brand Finance, 2015). This demonstrates the increasing importance and development potential of the e-tailing industry in the future.

With the increasing scale of e-commerce, the updated DeLone and McLean information systems success model has become widely applied in various fields of research into e-commerce (DeLone and McLean, 2004), of which the subject of online shopping is most closely associated with consumers (Hsieh and Tsao, 2013). The creation of a website with good system quality, information quality, and electronic service quality (e-service quality) is a key to success in e-commerce. High-quality websites increase the willingness of users to use the e-commerce system and enhances satisfaction, thereby expanding markets and increasing sales volumes (DeLone and McLean, 2003, 2004). With the growing maturity of web-related software and hardware technology, managers of shopping websites should be aware of other factors that could influence the success of their enterprise (Corritore *et al.*, 2003). One such factor involves customer relationship management (CRM), which can greatly benefit the establishment, cultivation, and strengthening of long-term cooperative relationships with buyers. Moreover, improving the e-service quality can be of great benefit in increasing website brand equity (Tsao and Tseng, 2011). Another factor involves the online shopping experience of consumers, which influences their judgment of products and serves as an important reference variable for marketers conducting market segmentation (Park *et al.*, 2012). All these are also key success factors of shopping websites.

The concept of value has been widely discussed in marketing. Throughout the transaction process, buyers evaluate their gains using the efforts that the sellers have invested in maintaining their mutual relationship and weigh those gains against their own sacrifices to perceive the value of the relationship. If the gains are greater than the sacrifices, then positive relationship values are created, and such values can only be created through effort from both the seller and the buyer (Walter *et al.*, 2001). In the event that consumers perceive they have received more value of the consumer/seller relationship from a transaction (such as lowered costs, product innovation, high quality, or high image), they will value and cherish their cooperative relationship with the sellers and hope that the relationship can continue on a long-term basis. For sellers, the increasing value of the consumer/seller relationship raises the threshold before which the customers will go to another supplier. Once both parties establish a solid long-term relationship, the loyalty of the buyers will have a direct influence on the profits of the seller (Geiger *et al.*, 2012). Thus, creating high relationship value is crucial to maintaining long-term cooperation between both parties.

In both electronic and physical retail environments, one's shopping experience influences future repurchase behavior (Ling *et al.*, 2010). Previous studies have established that consumers without online shopping experience feel greater concern regarding the procedure of online shopping than those with online shopping experience. Enhancing the online shopping experience of consumers can thus reduce their perceived risk and increase purchase intention (Liebermann and Stashevsky, 2002; Soopramanien, 2011). The inferences above show that in an online shopping environment, the value of the consumer/seller relationship between the buyers and sellers and experience in online shopping both influence the future online shopping behavior of consumers. However, few studies have examined the impact of online shopping experience of the consumers on the influence of website quality on relationship quality. This study therefore aimed to confirm how companies can enhance website quality, relationship value, and consumer loyalty with regard to consumers with varying amounts of online shopping experience through the results of this study.

To address the research gaps mentioned above, this study used the updated D and M IS success model to investigate how shopping on websites influences the generation of consumer value and the subsequent loyalty of consumers.

2. Literature review and hypotheses development

2.1 Website quality

Website quality plays an important role in distinguishing a brand from other brands in e-tailing, making it an essential factor of a shopping website's business success (Shin *et al.*, 2013). The overall operations of a shopping website must display professionalism to attract and retain customers. Thus, researchers have presented a number of ways to determine website quality. On the basis of the literature review, this study can see that the measurement of website quality involves multidimensional constructs (Loiacono *et al.*, 2002). Nevertheless, researchers have emphasized various aspects, for which there has been no accord (Aladwani and Palvia, 2002). DeLone and McLean (2004) stated that good system quality, information quality, and e-service quality are compelling elements capable of attracting consumers to use e-commerce services (such as online shopping or financial services). Later, these three sub-constructs were widely applied in e-commerce markets (B2B and B2C) (DeLone and McLean, 2004; Hsieh and Tsao, 2013). This study therefore used these indices to measure website quality.

McKinney *et al.* (2002) defined system quality as the performance of websites as perceived by consumers through the retrieval and delivery of information. Kim *et al.* (2012) claimed that system quality is the level of satisfaction that users feel toward the technical and functional performance of shopping websites. Thus, system quality is the degree to which user satisfaction is created by websites through technical and functional support, including software and data (Gorla *et al.*, 2010). System quality is an essential condition of e-commerce systems. Usability, availability, reliability, adaptability, and response time (e.g. download time) are important indicators of website system quality (DeLone and McLean, 2004; Hsieh and Tsao, 2013). When shopping websites provide stable system quality, consumers will have a more pleasurable and fruitful time searching for, organizing, and passing on product information. Placing orders also becomes easier for them, which increases sales and the value of the seller (DeLone and McLean, 2004).

Information quality describes the value of information presented by websites as perceived by users (Qutaishat, 2012). McKinney *et al.* (2002) posited that information

quality is determined by the degree to which users can perceive and grasp the contents of a website. When the information provided displays completeness, ease of understanding, personalization, relevance, and security, users will feel that they have a greater grasp of the issues at hand, which will enhance their satisfaction (DeLone and McLean, 2003, 2004). In terms of marketing differentiation, information of higher quality in websites facilitates smooth execution and completion of transactions, thereby providing the shopping website in question with an image that is unique in the eyes of consumers and enables them to stand out among other websites (Kim and Niehm, 2009). As a result, managers of shopping websites offering good information quality will be able to attract consumers with a unique image. Furthermore, they will be able to enhance consumer understanding regarding products, enabling them to quickly make informed purchasing decisions and enjoy a pleasant shopping experience (Ahn *et al.*, 2004).

In recent years, e-service quality has become a dominant factor in the success of e-commerce (Santos, 2003). In a virtual environment, where there is no face-to-face contact, it is even more crucial for shopping websites to provide consumers with good service as reassurance while they search for information, make purchase orders, and await their orders by delivery (Ahn *et al.*, 2004). Various methods have been used to measure e-service quality in the past. For instance, Wolfinbarger and Gilly (2003) believed that the sub-constructs of customer service, security/privacy, website design, and fulfillment/reliability best reflected online e-tail quality (eTailQ). Francis (2009) indicated that electronic services should include account setup, online services, customer service, and security. Kim *et al.* (2006) established E-A-S-QUAL, which included nine dimensions: efficiency, fulfillment, system availability, privacy, responsiveness, contact, personalization, information, and graphic style. Previous investigations of e-service quality have, for the most part, gauged consumers' feelings during their service experiences but did not consider the after-sales service aspects of the product, such as the quality of after-sales communication and service recovery.

As a matter of fact, the measurement of e-service quality often involves many aspects of the interaction between corporations and consumers, including the overall experience gained by consumers from before the purchase until after encompassing information accessibility, order fulfillment, guidance in product use, personal privacy, after-sales services, and problem handling (Bhattacherjee, 2001; Zeithaml *et al.*, 2002; Parasuraman *et al.*, 2005). Parasuraman *et al.* (2005) claimed that e-service quality (e-SQ) broadly encompasses all phases of customer interaction with a website, defining it as the extent to which a website facilitates efficient and effective shopping, purchasing, and delivery. This study proposed the use of two scales to measure e-service quality. The first is the E-S-QUAL scale, which gauges the functional operation of shopping websites based on efficiency, system availability, fulfillment, and privacy. The other is the E-RecS-QUAL scale, which evaluates the performance of shopping websites when customers encounter problems or service failures, according to responsiveness, compensation, and contact.

2.2 The perceived value of the consumer/seller relationship

The perceived value of a relationship can be defined as the feelings of consumers aroused by comparing benefits and sacrifices from online retail activities in which shopping websites endeavor to establish a long-term relationship with the consumers by providing services that are valuable to them. Sellers strive to maintain long-term and stable relationships with buyers and receive regular orders, while buyers seek to

reduce their purchase costs through the aforementioned value-creation process and obtain innovative and reliable products (Ritter and Walter, 2012; Geiger *et al.*, 2012; Walter *et al.*, 2001). Butz and Goodstein (1996) claimed that the development of value within a relationship between buyers and sellers is founded on the buyers' belief that the seller can provide products or services capable of matching or even surpassing the buyers' expectations on a regular basis. Value in a relationship increases the net value for the buyers. A form of adhesiveness will then form between the two parties, which will give the sellers an edge over their competitors.

While shopping online, consumers must rely on the descriptions and photographs provided by the website to understand the product, for which they will place more emphasis on website system properties such as ease of use, easy of navigation, response time, and download time (Dickinger and Stangl, 2013). If shopping websites can provide clear layouts, systematic item categories, and a wide variety of selection, it will help consumers find bargains with less search and physical costs (Voss *et al.*, 2003; Overby and Lee, 2006; Luo *et al.*, 2012). For this reason, higher system quality can increase the utilitarian relationship values of shopping websites as perceived by consumers. In addition, good system quality will also enable consumers to easily find rare, unique, novel, and fun products as well as everyday living products. Upon finding such uncommon products, consumers will feel excitement, gratification, and a sense of achievement, which will further enhance their perceived hedonic value of the consumer/seller relationship (Overby and Lee, 2006; Lee *et al.*, 2009). Thus, this study posits:

H1. Higher system quality in shopping websites increases the perceived value of the consumer/seller relationship among consumers.

Supplying buyers with sufficient information for the purchase of products applicable to their needs is key to success in e-commerce (Gao *et al.*, 2012). Previous studies have revealed that when consumers obtain more complete product information from shopping websites, they tend to be better prepared for the decision-making process and more convinced that the information provided is applicable and sufficient for their needs (Lin, 2010). Li *et al.* (2001) advocated the use of interactive designs on shopping websites to attract attention to product-related information, thereby facilitating the evaluation of attributes and benefits. Information of higher quality can help consumers in the purchase of appropriate or difficult-to-find products more quickly and more efficiently (Chiu *et al.*, 2005). When a website displays information that is abundant, complete, relevant, and specific to the needs of consumers, website users perceive an enhancement of value in the form of convenience, speed, and enjoyment (Honeycutt *et al.*, 1998). Accordingly, a hypothesis is suggested:

H2. On shopping websites, information of higher quality increases the value of the consumer/seller relationship as perceived by consumers.

Parasuraman *et al.* (2005) indicated that when consumers evaluate e-service quality, they consider the performance of basic services provided by the website, such as whether they receive appropriate responses to their questions or deal with problems effectively after a purchase. Tsao and Tseng (2011) indicated that providing a high degree of fulfillment is an important aspect of service quality on shopping websites. They claimed that e-tailers should provide sufficient details on the purchased products as well as their return policy, estimated time of delivery, and the promised delivery time. Researchers have shown that making consumers feel that they can receive their

purchases on time and return them easily satisfies their expectations (such as high predictability, the fun of waiting for orders) and reduces the frustrations commonly associated with shopping (Ha and Stoel, 2009). This demonstrates that shopping websites capable of providing high-quality services throughout the shopping experience, make efforts to communicate after purchases and perform necessary recovery measures in the unfortunate event of service failure; they can enhance consumer confidence and their sense of security in the website, thereby strengthening the relationship between the two parties (Hsieh and Tsao, 2013; Luo *et al.*, 2012). Therefore, this study purports:

H3. Higher e-service quality in shopping websites increases the value of the consumer/seller relationship perceived by consumers.

2.3 Online loyalty

Researchers believe that online loyalty includes active WOM recommendations as well as the continued patronage of customers (Zeithaml *et al.*, 1996; Holloway *et al.*, 2005). Previous studies have shown that when consumers remember a pleasurable shopping experience on a shopping website, it increases their willingness to visit the website again (Hu and Chuang, 2012). Website shopping systems that are easy to use and respond to customer requirements swiftly enable customers to obtain the products they want quickly and easily. In addition, if websites provide information on a variety of products, deliver products quickly, and provide convenient return mechanisms, then consumers will experience more fun and excitement with regard to shopping (Overby and Lee, 2006; Kim *et al.*, 2012). Therefore, when consumers perceive more utilitarian and hedonic value during the process of shopping, they will demonstrate a preference toward that website for future purchases and even recommend it to friends and family through WOM and electronic WOM (eWOM). Thus, this study posits:

H4. Increasing the perceived value of a consumer's relationship with a shopping website increases their loyalty to that site.

2.4 Online shopping experience

Wan *et al.* (2012) proposed that the online shopping experience of using various Web-based decision support tools for searching, comparing, and analyzing products and services has a positive influence on the perception and evaluation of goods and word-of-mouth on the web. When consumers require additional information for online shopping, they first consider their previous online shopping experience, which is a type of internal information stored in the brain. Such information encompasses product performance, form of payment, delivery terms, service quality, and risk involvement and may influence their purchase intentions the next time they shop online (Ling *et al.*, 2010).

In general, consumers with more online shopping experience are better able to judge the benefits and risks of products (Soopramanien, 2011). In contrast, consumers with little or no online shopping experience may be more wary of risks such as the unauthorized use of their credit cards, leaked personal information, unsatisfactory purchases, or webpage errors. These all make inexperienced consumers more hesitant to shop online (Liebermann and Stashevsky, 2002; Soopramanien, 2011). Researchers have indicated that experienced online shoppers go online shopping more frequently; therefore, they tend to pay more attention to and rely more on high system quality.

Experienced consumers perceive the risk from shopping as relatively lower (Koyuncu and Lien, 2003). Hence:

H5. The positive influence of system quality on the value of the consumer/seller relationship is more pronounced among more experienced online shoppers than less experienced online shoppers.

Previous researchers have found that with the same external information, online shoppers with greater experience have greater heuristic capabilities, enabling them to select the information they need more efficiently. Furthermore, in a web environment filled with excessive information of poor quality, more experienced shoppers are better able to process the information (Chen *et al.*, 2009). To ensure effective information processing, the quality and quantity of information as well as the information-processing capabilities of consumers should be taken into consideration (Gao *et al.*, 2012). In other words, when there is too much information or inadequate information-processing capabilities, good information quality can help consumers to extract the information they need and alleviate the problem of information overload (Chen *et al.*, 2009). Previous researchers have mentioned that experienced online shoppers have greater heuristic and organizational capabilities, enabling them to mitigate the effects of information overload, while inexperienced online shoppers are more likely to be troubled by it (Chen *et al.*, 2009; Bernard and Makienko, 2011; Wan *et al.*, 2012). Thus, it is reasonable to expect that the quality of information on shopping websites play a greater role with regard to the value of the consumer/seller relationship perceived by less experienced shoppers than that perceived by more experienced shoppers. Thus:

H6. The positive influence of information quality on the value of the consumer/seller relationship is more pronounced among less experienced online shoppers than among more experienced online shoppers.

Online shoppers with less experience demand stronger guarantees of privacy and transaction security (Bernard and Makienko, 2011). OxIS (2005) indicated that experienced online shoppers have greater confidence and thus demand less in terms of transaction security. Other studies have revealed that when consumers have little or no actual experience, they believe that the e-tailers "should" meet their expectations (Holloway *et al.*, 2005). This shows that inexperienced shoppers place greater emphasis on service quality, such as efficiency, fulfillment, system availability, and privacy. The same study also determined that when experienced consumers encounter unpleasant experiences such as service failure or service recovery, they do not consider this as outside the realm of expectations. As a result, they are also more tolerant of the failures of service providers (Holloway *et al.*, 2005). Thus:

H7. The positive influence of e-service quality on perceived value of the consumer/seller relationship is stronger among less experienced online shoppers than among those with more experience in online shopping.

Figure 1 presents a conceptual model of this study based on the aforementioned literature and hypotheses.

3. Methods

3.1 Development of measures

System quality refers to the number of desired characteristics that a shopping website system possesses. In this study, this was measured using five question items regarding

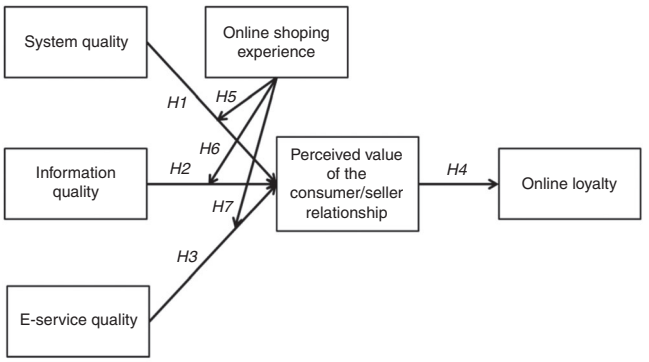

Figure 1.
Conceptual model

ease of use, download time, easy navigation, reliability, and response time. Information quality refers to the information content accessible from the shopping website. This was measured in terms of completeness, ease of understanding, timeliness, currency, and security (DeLone and McLean, 2003, 2004; Chiu *et al.*, 2007). E-service quality refers to the extent to which a website facilitates shopping, purchasing, and delivery (Parasuraman *et al.*, 2005). This construct was measured using the E-S-QUAL and E-RecS-QUAL scales proposed by Parasuraman *et al.* (2005). These two scales can measure not only the service quality perceived by consumers as they enjoy the basic functions of shopping websites, but also their feelings toward after-sales services and service recovery as it is performed by shopping websites in the event that there are problems after purchasing a product. The former gauges the knowledge of consumers regarding the basic functions presented in shopping website operations using four sub-constructs: efficiency, system availability, fulfillment, and privacy. Each sub-construct contained three question items. The latter inquired as to the degree of service expected by consumers when they have questions or encounter problems using three sub-constructs: responsiveness, compensation, and contact, each represented by two question items.

The perceived value of the consumer/seller relationship is defined as the overall assessment of consumers regarding the benefits and sacrifices of a relationship with a shopping website that has endeavored to establish a long-term relationship with the consumers by providing services that are valuable to them (Voss *et al.*, 2003; Overby and Lee, 2006; Ritter and Walter, 2012; Geiger *et al.*, 2012). This study measured the value of the consumer/seller relationship according to utilitarian value and hedonic value. Utilitarian value was measured using product diversity, need fulfillment, time saving, value for money, economic benefits, efficiency, and usefulness. Hedonic value was measured according to whether the consumer/seller relationship was pleasant, interesting, fun, enjoyable, exciting, simple, and a form of escapism (Voss *et al.*, 2003; Overby and Lee, 2006). Online loyalty refers to a long-term commitment to repurchase and positive attitudes toward the seller as well as the intention to recommend (Zeithaml *et al.*, 1996; Holloway *et al.*, 2005). This study measured online loyalty using eWOM and online repurchase intention based on six measurement items (Zeithaml *et al.*, 1996; Holloway *et al.*, 2005). Online shopping experience was quantified by the average number of times the subject went online shopping each year. With the exception of online shopping experience, each item was measured on a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree) (see Appendix 1).

3.2 Data collection and sample profile

The literature review above shows that the amount of online shopping experience influences the shopping skills and confidence of consumers and their capacity to bear risk, which in turn influences their online shopping behavior (Soopramanien, 2011; Wan *et al.*, 2012). As this study examines the influence of web quality on the shopping behavior of consumers from the perspective of their online shopping experience, all subjects in this study were consumers with online shopping experience in Taiwan. We adopted the questionnaire survey method based on the convenience sampling approach. The interviewers contacted a total of 324 subjects. Eliminating 49 invalid questionnaires, we obtained a total of 275 valid questionnaires. Structural equation modeling (SEM) stipulates a minimum number of samples.

Bentler and Chou (1987) claims that if the data conforms to normal distribution, then the number of samples need only be five times that of the number of variables; otherwise, the number of samples must be 15 times that of the number of variables. Loehlin (1992) suggested that there should be at least 100 samples and that 200 would be even better. Based on a rule of thumb, other researchers have also suggested that 200 samples is an important and basic threshold. With 275 valid questionnaires, the number of samples in this study met the requirements for statistical analysis.

Among the subjects, 129 (46.9 percent) were men, and 146 (53.1 percent) were women. The majority (188 subjects; 68.4 percent) was between 21 and 30 years of age; the second largest age group, comprising 66 individuals (24.0 percent), was 20 years old or younger. The subjects went online shopping an average of 7.375 times per year, with 129 subjects (46.9 percent) spending less than NTD 1,000 on each purchase, 112 subjects (40.7 percent) spending between NTD 1,001 and NTD 3,000 on each purchase, and the other 34 subjects (7.6 percent) spending over NTD 3,001 on each purchase.

4. Analysis and results

Partial least squares (PLS) is a widely accepted variance-based, descriptive, and prediction-oriented approach to SEM (Hair *et al.*, 2011, 2012; Ziggers and Henseler, 2016). The advantage of this approach is that the population distribution is not subject to restrictions, so both exploratory and confirmatory research can be conducted (Chin *et al.*, 2003; Lohmöller, 1989).

A PLS path model is composed of two parts. The structural part identifies the relationships between latent variables, while the measurement part indicates the relationships between latent variables and their observed or manifest variables. PLS defines weight relations that are used to estimate case values for the latent variables (Chin *et al.*, 2003), a feature that is not present in other SEM approaches. PLS focuses on maximizing the explanatory power that independent variables can have for the variance present in the dependent variables. Furthermore, formative and reflective constructs can be combined in one model when PLS is used for the analysis. PLS does not rely on distributional assumptions and is recommended for analyzing small-to-medium sized samples. Using ADANCO for PLS path modeling offers three advantages. First, the measurement model can be used to assess construct reliability and validity. Second, model fit can be verified via overall model assessment, and third, the structural model can be used for hypothesis testing (Henseler and Dijkstra, 2014; Ziggers and Henseler, 2016; Henseler *et al.*, 2016).

4.1 Reliability, validity, and overall model assessment

To increase the reliability and validity of the questionnaire, this study adopted the standard of eliminating items with factor loadings less than 0.5. In system quality, response time was deleted; in utilitarian value, we deleted product diversity; in hedonic value, simple and a form of escapism were deleted. This study used PLS path modeling, as implemented in ADANCO 2.0 software, to assess the reliability and validity of the measurement and test hypotheses (Henseler and Dijkstra, 2014).

The reflective measurement instruments were evaluated for reliability and validity through an assessment of how well they described their corresponding constructs (see Table I). As illustrated in Table I, internal consistency reliability was established for all reflective constructs because all Cronbach's α estimates were greater than 0.6 (ranging from 0.656 to 0.929) (Roberts and Wortzel, 1979; Fornell, 1992). Furthermore, composite reliability (ρ A; ρ_A) estimates ranged from 0.667 to 0.936. Although the estimate for contact (0.667) is slightly lower than the high standard value of 0.7 recommended by Dijkstra and Henseler (2015), it is still higher than the minimum cutoff score of 0.5 (Hair *et al.*, 1998). These results imply that all constructs complied with the requirement of high internal consistency.

Based on the reflective constructs' average variance extracted (AVE), there is evidence that the model has appropriate convergent validity. The AVE of all the unidimensional constructs ranged between 0.645 and 0.911, which is well above the criterion of 0.5 (Fornell and Larcker, 1981; Wetzels *et al.*, 2009) (see Table AII). The reflective constructs can thus be regarded as unidimensional. Regarding the assessment of discriminant validity, Henseler *et al.* (2015) and Voorhees *et al.* (2016) agreed that the heterotrait-monotrait (HTMT) ratio is a clearer and more rigorous approach than AVE-SV comparison. HTMT values significantly smaller than 1 show that all constructs satisfy discriminant validity requirements (Henseler *et al.*, 2016). The heterotrait-monotrait ratio of correlations is shown in Table AIII.

Next, this study verified the goodness of model fit via overall model assessment (Henseler *et al.*, 2014; Ziggers and Henseler, 2016). Indicators for the goodness of model

Construct	Indicators	Cronbach's α	Dijkstra-Henseler's ρ A	Average variance extracted (AVE)
System quality	4	0.858	0.860	0.702
Information quality	5	0.862	0.871	0.645
e-Service quality	18	0.934	0.936	(Not unidimensional)
Efficiency	3	0.775	0.790	0.688
System availability	3	0.865	0.865	0.788
Fulfillment	3	0.873	0.876	0.797
Privacy	3	0.910	0.911	0.847
Responsiveness	2	0.902	0.904	0.911
Compensation	2	0.802	0.808	0.834
Contact	2	0.656	0.667	0.743
Perceived value of the consumer/ seller relationship	11	0.922	0.923	(Not unidimensional)
Utilitarian value	6	0.895	0.899	0.657
Hedonic value	5	0.929	0.930	0.780
Online loyalty	6	0.920	0.922	(Not unidimensional)
eWOM	3	0.892	0.895	0.823
Online repurchase intention	3	0.920	0.920	0.863

Table I.
Measurement model assessment

fit include bootstrap-based exact test model fit and approximate model fit. Table II presents three sets of index data to show the goodness of model fit (SRMR, d_{ULS}, and d_G): original value, 95 percent bootstrap quantile (HI95) and 99 percent bootstrap quantile (HI99). Moreover, the SRMR of approximate model fit was 0.074. For the criteria of model fit, Henseler *et al.* (2016) suggested that the HI95 of SRMR, d_{ULS} and d_G should be greater than the original values, and the approximate model fit should be less than 0.08. Thus, the goodness of model fit in this study does not meet all of the criteria but is still acceptable (Henseler *et al.*, 2016).

4.2 Hierarchical construct models, structural model, and hypothesis testing

E-service quality, perceived value of the consumer/seller relationship, and online loyalty are second-order constructs. We referred to existing literature before adopting the reflective–reflective type approach to process second-order problems (Wetzels *et al.*, 2009; Ringle *et al.*, 2012). Thus, the hierarchical construct model was employed for model assessment and hypothesis testing (Wetzels *et al.*, 2009; Ringle *et al.*, 2012; Ziggers and Henseler, 2016). The statistics provided by the analysis results include the path coefficient, t-value, Sig., Cohen's f^2, R^2, and adjusted R^2, as outlined in Table III.

Goodness of model fit/values	Original value	HI95	HI99
SRMR	0.079	0.057	0.061
d_{ULS}	1.323	0.674	0.770
d_G	0.607	0.523	0.579

Table II. The goodness of model fit

Path	Coefficient (SE)	*t*-value	Sig.	Cohen's f^2
Second-order model				
e-Service quality				
e-Service quality → efficiency	0.751 (0.027)	27.906	***	1.291
E-Service quality → system availability	0.777 (0.034)	22.678	***	1.522
E-Service quality → fulfillment	0.793 (0.029)	27.705	***	1.692
E-Service quality → privacy	0.779 (0.032)	24.776	***	1.546
E-Service quality → responsiveness	0.796 (0.026)	31.037	***	1.725
E-Service quality → compensation	0.762 (0.031)	24.341	***	1.387
E-Service quality → contact	0.734 (0.029)	25.009	***	1.171
Perceived value of the consumer/seller relationship				
Perceived value → utilitarian value	0.908 (0.012)	75.419	***	4.704
Perceived value → hedonic value	0.869 (0.022)	38.980	***	3.092
Online loyalty				
Online Loyalty → eWOM	0.916 (0.014)	67.529	***	5.179
Online loyalty → online repurchase intention	0.927 (0.011)	86.559	***	6.125
Structural model				
System quality → perceived value (*H1*)	0.339 (0.072)	4.681	***	0.099
Information quality → perceived value (*H2*)	0.008 (0.070)	0.117	ns	0.000
E-Service quality → perceived value (*H3*)	0.399 (0.076)	5.217	***	0.111
Perceived value → online loyalty (*H4*)	0.655 (0.037)	17.764	***	0.751
R^2		0.429		
Adjusted R^2		0.427		

Notes: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Table III. Assessing the hierarchical construct models, structural model and hypothesis testing

As expected, system information and e-service quality were both positively and significantly correlated to the perceived value of the consumer/seller relationship ($\beta = 0.339$***; $\beta = 0.399$***). Thus, *H1* and *H3* are supported. However, the positive relationship between information quality and the perceived value of the consumer/seller relationship did not reach statistical significance ($\beta = 0.008$); therefore, *H2* is not supported. A positive and significant correlation existed between the perceived value of the consumer/seller relationship and online loyalty ($\beta = 0.655$***); therefore, *H4* is supported. Furthermore, the Cohen's f^2 of the paths supporting *H1*, *H2*, and *H4* are all greater than 0.02, which shows that the effect sizes of these paths are acceptable (Cohen, 1988).

4.3 Multigroup analysis and moderating effect testing

To further understand how online shopping experience interferes with the relationship between website quality and the perceived value of the consumer/seller relationships, we divided the subjects into two groups using the mean number of online purchases per year (mean = 7.375, SD = 4.951) as the demarcation. A total of 97 subjects had made more purchases in a year than the average and were thus assigned to the experienced online shopper group (mean = 13.083, SD = 3.877), whereas the inexperienced online shopper group comprised 178 subjects that had made fewer than average purchases (mean = 4.264, SD = 1.486).

This study then used an omnibus test of group differences, which allows for the testing of differences across more than two groups. By employing a standard PLS path modeling algorithm for each group, followed by the bootstrapping procedure, we derived the path coefficients and bootstrap standard error of the three sub-constructs of website quality as they apply to the perceived value of the consumer/seller relationship in the two groups (Henseler, 2007; Sarstedt *et al.*, 2011). On the basis of these estimates, we compared the model for high online shopping experiences and low online shopping experiences. The results are shown in Table IV.

Table IV shows the differences in three comparisons of path coefficient estimates for the two groups (high online shopping experience vs low online shopping experience), and provides the results of multigroup comparisons based on the approach used by Henseler (2007) and Sarstedt *et al.* (2011). The analysis shows that the difference between the path coefficients of the two groups are not significant; therefore, *H5-H7* are not supported. The results above imply that the positive influence of website quality on the perceived value of the consumer/seller relationship does not vary with the consumer's online shopping experience. This also means that improving system quality and e-service quality is crucial to creating value for the consumer/seller relationship, regardless of the consumer's level of online shopping experience.

Path/models	High ($n = 97$) Coefficient (SE)	Low ($n = 178$) Coefficient (SE)	|Difference|	*t*-value	Sig.
System quality → perceived value	0.422 (0.122)***	0.250 (0.077)**	0.172	1.253	ns
Information quality → perceived value	−0.079 (0.108)	0.076 (0.084)	0.155	1.120	ns
e-Service quality → perceived value	0.397 (0.148)**	0.448 (0.079)***	0.051	0.339	ns
Perceived value → online loyalty	0.653 (0.065)***	0.645 (0.047)***	0.008	0.101	ns
R^2	0.426	0.416	–	–	–
Adjusted R^2	0.420	0.413	–	–	–

Notes: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Table IV.
The results of multigroup comparisons

5. Discussion and conclusions

5.1 Research findings

Our results indicate that system quality has a significantly positive influence on the perceived value of the consumer/seller relationship. Therefore, if shopping websites provide a reliable, easy-to-use operating interface to enable the rapid loading of content, consumers will have greater confidence in their operations and help them to achieve the utilitarian goal of shopping. The aforementioned improvements also enable a more pleasurable online shopping experience (Overby and Lee, 2006). The positive relationship between information quality and perceived value of the consumer/seller relationship was not confirmed. In general, information content reflects the quality of products or services (Kim and Niehm, 2009). However, the quality and quantity of information required by consumers may vary with the type of product. For search goods, consumers can obtain more commercial information from external sources; however, for experience goods and credence goods, the amount of available information is somewhat scant (Nelson, 1970; Zeithaml, 1981). Clearly, the need for information quality is influenced by product type. This study did not consider the relationship between product type and information; therefore, the above explanations could account for our inability to establish a relationship between information quality and the perceived value of the consumer/seller relationship. As anticipated, the results of this study verified that in online shopping e-service quality also has a significantly positive influence on the perceived value of the consumer/seller relationship. Therefore, in both physical and virtual environments, efforts and improvements in service quality are essential to success in retailing. The enhancement of e-service quality can be achieved in two ways. One involves enhancing the quality of basic operations in the shopping website while fulfilling orders and maintaining customer privacy. The other involves improving services in the post-purchase stage, particularly in the performance of communication and service recovery in the event of service failure.

Researchers have found that increasing the perceived value of the consumer/seller relationship strengthens the loyalty of consumers toward the website. Increasing online loyalty can be achieved by making available a wide variety of their products and increasing the efficiency of placing orders, thereby generating more utilitarian value available through the process of shopping. Shopping online often involves a complete experience from the browsing to after-sales service. Providing a clear layout and systematized product categories enables consumers to place orders easily and derive pleasure through the discovery of novel products. Even if they lose track of time, the enjoyment that they receive during the shopping process will inspire even greater online loyalty (Luo *et al.*, 2012).

Finally, we found that the positive influence of system quality, information quality, and e-service quality on the perceived value of the consumer/seller relationship do not vary according to the online shopping experience of the consumers. This shows that the positive influence of website quality on the perceived value of the consumer/seller relationship is equally important no matter how much previous online shopping experience the consumer has. This is a new finding distinct from those found in previous research. The contribution of this study lies in the fact that it clarifies that the three constructs of website quality are relevant to increasing relationship value and customer loyalty. A more unique contribution is that this study employed ADANCO for PLS path modeling and analysis, thereby providing future studies with an alternative statistical technique for SEM.

5.2 Managerial implications

This study also has important implications for researchers as well as for website managers. In the construction of shopping websites, website managers should pay attention to design elements such as the layout of the webpages and the systematic categorization of products to facilitate browsing and searching. Quick downloading and responses are also important to achieve adequate system support (Luo *et al.*, 2012). In addition to regular maintenance to ensure stable operation of the system, practitioners should have backup plans in the event of system malfunction. We recommend that comprehensive data management and backups be made to enable rapid restoration of normal operations after system malfunction. Moreover, providing high-quality information that is timely, clear, relevant, and easy to understand is also essential to enhance the efficiency of searches and avoid information overload. To reduce the costs perceived by consumers before, during, and after shopping, it is important to reduce the monetary (compensated) and non-monetary (such as time, physical, and psychological costs) investments required by consumers. This can help to increase the perceived value of the consumer/seller relationship by enabling easy selection of products and on-time delivery, while facilitating the return of unsatisfactory products with fair compensation after service failure. Increasing the value of the consumer/seller relationship can help to achieve the goal of relationship marketing (Ravald and Gronroos, 1996; Yang and Peterson, 2004).

The revolving-door effect refers the phenomenon in which companies take great pains to attract new customers but lose their old customers. Payne (2002) estimated that the costs of enticing a new customer are approximately five times that of the costs to retain an old customer. With the objective of retaining old customers, we thus propose the following managerial implications for websites based on online shopping experience. Both experienced and inexperienced online shoppers value system quality and e-service quality in shopping websites, which means that if companies enhance the stability and availability of their website systems, as well as the quality of services during and after purchases, they can increase the perceived value of the consumer/seller relationship and create loyal customers who will become disseminators of positive WOM. In turn, this will entice more potential customers and bring steady long-term profits.

5.3 Limitation and future research

This study has a number of limitations. The samples collected in this study primarily comprised younger individuals and students under 30 years old. Consequently, the conclusions may be limited by the age and occupations of the sample population. However, surveys have also indicated that students are the target customers of many websites; young individuals like to pursue fashion and are more willing to spend a lot of time and money on shopping (Nielsen, 2010). This shows that while the results of this study are not necessarily applicable to all online customers, they may still reflect the consumption behavior of the main customer group and thus have practical and academic reference value. Next, researchers have proposed various constructs for the measurement of website quality; we referred to the system quality, information quality, and e-service quality proposed by DeLone and McLean (2004), but there may also be other important constructs that have been neglected. Researchers have presented varying contents for the perceived value of the consumer/seller relationship, which we measured using utilitarian and hedonic values based on the shopping process and may also be a limitation of this study (Voss *et al.*, 2003; Overby and Lee, 2006).

Future studies should also consider other online consumer groups to improve the generalizability of these findings. In addition, the distribution of consumers may vary with the country; therefore, we suggest that future studies select a variety of countries for study and include ethnic and cultural aspects in the analysis. This will provide the model of this study with wider reference value (Sia *et al.*, 2009). Although information content can reflect the quality of products and services (Kim and Niehm, 2009), the quantity and quality of information required by consumers may still depend on the type of the product. We suggest that future studies consider the possible moderating effect from product type when investigating information quality on websites (Nelson, 1970; Zeithaml, 1981). Over-service is another factor that must be considered. Dixon *et al.* (2010) stated that over-service incurs greater operating costs and may bring other adverse effects. Thus, determining an appropriate level of service that can satisfy customers is also worth further investigation. Finally, the personal traits of the consumers (such as involvement, perceived risk, and gender) may also influence their online shopping behavior, for which future research should include these variables as moderators for further study (Seock and Bailey, 2008; Martín *et al.*, 2011).

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Appendix 1

Construct	Indicators with anchors: 1 strongly disagree to strongly agree 7
System quality (SQ)	1. This shopping website has an interface that is easy to use
	2. The download time for text and images on this shopping website is short
	3. Navigation on this shopping website is easy
	4. This shopping website provides good and reliable operating functions
Information quality (IQ)	1. This shopping website provides complete shopping information
	2. The shopping information provided on this shopping website is easy to understand
	3. This shopping website provides the most opportune shopping information
	4. This shopping website provides the current shopping information
	5. This shopping website provides secure shopping information
E-service quality	
Efficiency (EFF)	1. This shopping website makes it easy to find what I need
	2. This shopping website makes it easy to get anywhere on the site
	3. Information at this shopping website is well organized
System availability (SA)	1. This shopping website always available for business
	2. This shopping website does not crash
	3. This shopping website does not freeze when I enter my order information
Fulfillment (FUL)	1. This shopping website delivers order when promised
	2. This shopping website makes item available for delivery within a suitable time frame
	3. This shopping website makes accurate promises about delivery of product
Privacy (PR)	1. This shopping website protects information about my Web-shopping behavior
	2. This shopping website does not share my personal information with other sites
	3. This shopping website protects information about my credit card
Responsiveness (RES)	1. This shopping website provides me with convenient options for returning items
	2. This shopping website handles product returns well
Compensation (COM)	1. This shopping website compensate me for problems it creates
	2. This shopping website compensates me when what I ordered does not arrive on time
Contact (CON)	1. This shopping website has customer service
	2. This shopping website offers the ability to speak to a live person if there is a problem
Perceived value of the consumer/seller relationship	
Utilitarian value (UV)	1. This shopping website enables me to purchase the products that fulfill my needs
	2. Shopping on this shopping website saves time
	3. The products on this shopping website are good value for money
	4. This shopping website provides economic benefits of products
	5. This shopping website enables me to shop efficiently
	6. This shopping website is useful to me

Table AI.
Operationalization of study constructs

(*continued*)

Construct	Indicators with anchors: 1 strongly disagree to strongly agree 7
Hedonic value (HV)	1. On this shopping website, I can not only purchase products but also have a pleasant shopping experience
	2. On this shopping website, I can not only purchase products but also have interesting shopping experience
	3. Shopping on this shopping website is fun
	4. On this shopping website, I can not only purchase products but also have an enjoyable shopping experience
	5. On this shopping website, I can not only purchase products but also have an exciting shopping experience
Online loyalty	
eWOM	1. Say positive things about this shopping website to the people
	2. Recommend this shopping website to someone who seeks you advice
	3. Encourage friends and relatives to do business with this shopping website
Online repurchase intention (ORP)	1. I would be willing to purchase from this shopping website again
	2. I would purchase from this shopping website again in the future
	3. I would be willing to increase the amount of shopping in this shopping website?

Table AI.

Appendix 2

Construct	Item	Mean	SD	Loading	Cronbach's α	Dijkstra-Henseler's ρ A	AVE
System quality (SQ)	SQ1	5.095	1.113	0.862	0.858	0.860	0.702
	SQ2	4.964	1.090	0.797			
	SQ3	5.276	1.045	0.872			
	SQ4	5.033	1.072	0.818			
Information quality (IQ)	IQ1	4.796	1.150	0.846	0.862	0.871	0.645
	IQ2	5.018	1.037	0.854			
	IQ3	4.815	1.152	0.783			
	IQ4	5.047	1.064	0.779			
	IQ5	4.720	1.264	0.748			
E-service quality (E-SQ)							
Efficiency (EFF)	EFF1	5.076	1.231	0.812	0.775	0.790	0.688
	EFF2	4.993	1.171	0.807			
	EFF3	4.836	1.094	0.869			
System availability (SA)	SA1	5.200	1.199	0.861	0.865	0.865	0.788
	SA2	5.156	1.215	0.923			
	SA3	5.240	1.117	0.878			
Fulfillment (FUL)	FUL1	5.367	1.181	0.867	0.873	0.876	0.797
	FUL2	5.047	1.271	0.899			
	FUL3	5.196	1.186	0.912			
Privacy (PR)	PR1	4.535	1.458	0.920	0.910	0.911	0.847
	PR2	4.476	1.522	0.932			
	PR3	4.469	1.451	0.910			
Responsiveness (RES)	RES1	4.287	1.362	0.952	0.902	0.904	0.911
	RES2	4.364	1.295	0.957			
Compensation (COM)	COM1	4.298	1.326	0.923	0.802	0.808	0.834
	COM2	4.167	1.438	0.904			
Contact (CON)	CON1	4.644	1.297	0.885	0.656	0.667	0.743
	CON2	3.935	1.483	0.839			
Perceived value of the consumer/seller relationship							
Utilitarian value (UV)	UV1	5.193	1.079	0.719	0.895	0.899	0.657
	UV2	5.233	1.103	0.801			
	UV3	4.887	1.142	0.843			
	UV4	4.880	1.069	0.815			
	UV5	5.066	1.062	0.854			
	UV6	5.113	1.073	0.826			
Hedonic value (HV)	HV1	4.811	1.169	0.887	0.929	0.930	0.780
	HV2	4.851	1.144	0.906			
	HV3	4.804	1.246	0.846			
	HV4	4.753	1.204	0.901			
	HV5	4.640	1.309	0.873			
Online loyalty (OL)							
eWOM	eWOM	4.673	1.160	0.878	0.892	0.895	0.823
	eWOM	4.666	1.219	0.927			
	eWOM	4.451	1.241	0.916			
Online repurchase intention (ORP)	ORP1	5.058	1.167	0.943	0.920	0.920	0.863
	ORP2	5.055	1.134	0.952			
	ORP3	4.738	1.129	0.891			

Table AII.
The reliability and validity analysis for the first-order constructs

Appendix 3

Table AIII. Discriminant validity: Heterotrait-monotrait (HTMT) ratio of correlations

Construct	1	2	3	4	5	6	7	8	9	10	11	12	13
1. System quality	–												
2. Information quality	0.776	–											
3. E-SQ_Efficiency	0.837	0.789	–										
4. ESQ_System availability	0.729	0.694	0.771	–									
5. E-SQ_Fulfillment	0.636	0.702	0.591	0.776	–								
6. E-SQ_Privacy	0.533	0.629	0.575	0.510	0.514	–							
7. E-SQ_Responsiveness	0.540	0.580	0.539	0.513	0.612	0.700	–						
8. E-SQ_Compensation	0.562	0.643	0.555	0.483	0.617	0.700	0.789	–					
9. E-SQ_Contact	0.650	0.715	0.704	0.603	0.644	0.654	0.760	0.813	–				
10. PV_Utilitarian value	0.733	0.632	0.729	0.617	0.616	0.555	0.576	0.557	0.566	–			
11. PV_Hedonic value	0.505	0.413	0.497	0.383	0.400	0.354	0.333	0.427	0.336	0.633	–		
12. OL_eWOM	0.544	0.445	0.492	0.454	0.403	0.447	0.465	0.452	0.467	0.589	0.534	–	
13. OL_Online repurchase intention	0.590	0.454	0.504	0.583	0.463	0.465	0.455	0.339	0.413	0.659	0.556	0.769	–

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