

Full Length Research Paper

The mediating role of trust in the relationship between e-retailer quality and customer intention of online shopping

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This study aims to explore the role of trust in the relationship between e-retailer quality and customer's intention to shop online. System quality, information quality, and service quality were applied as e-retailer quality and antecedents to affect customer trust in e-retailer, and hence, intention to shop online was motivated. Data were gathered from a sample of 325 members of e-bookstore in Taiwan and was tested using the structural equation model. Results showed that trust played a critical mediating role between e-retailer quality and customer intention to shop online. Both system quality and service quality positively affected trust of e-retailer directly, and indirectly affected customer intention of online shopping. However, information quality revealed non-significant impact neither on trust perception of participants nor on their intention to shop online. The implications of these findings for both researchers and practitioners were discussed.

Key words: System quality, information quality, service quality, trust, e-retailer.

INTRODUCTION

In today's economy, the growth of electronic commerce (e-commerce) has opened up new paradigms, structures and strategies for business-to-consumer (B2C) e-commerce. Online retailers across the world are facing new opportunities and new challenges. Although the internet is widely accepted by user and has become a global communication medium facilitating business transaction, users are increasingly skeptical of doing business on the web. While firms are attempting to understand and measure online purchasing behavior and its impact on business, basic business principles still hold. The lack of the physical presence of the online retailer and the lack of physical interaction between retailer and customer render a unique context, in which trust is of paramount importance. The physical separation between online shop and the customer create a perception of insecurity on the Internet that provides unique challenges to online retailers to find ways in which to

initiate and develop customer relationships. Trust is the key of e-commerce creating much academic discourse in relation to security, promise fulfillment, and confidence (Lynch and Lundquist, 1996). The online retailer must develop a context of trust in order to promote transactions and foster customer loyalty. Although the role of trust in an economic exchange over the internet has received much attention from researchers, little has been known of the development of trust from a process point of view. As a result, the way in which trust may be gained and the impact trust has on online shopping outcomes are not yet well understood.

It is necessary to understand the major factors that will encourage people to commit to click the purchase button once they are online. Based on theoretical discussions and the mechanisms involved in creating trust, the central research question is: what are the factors that cause trust in B2C e-commerce that significantly impact a consumer's propensity to purchase online, and how can they be incorporated into a retailer's web site?

Further, existing literature on background theories of online trust, its antecedents and consequences are discussed. The conceptual framework and its associated

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hypotheses are described. Sample characteristics are outlined and the statistical results discussed. Implications and concluding remarks are then presented.

LITERATURE REVIEW

Trust in online shopping

Trust is defined as the expectation of the parties in a transaction, and the risks associated with assuming and acting on these expectations (Deutsch, 1958). Online shopping for customers refers to several types of consuming activities in which customers can electronically request information of products and services, and transaction activities wherever the internet is available. Trust is a significant prerequisite for purchasing online (Morrison and Firmstone, 2000; Urban et al., 2000), and is one of the main ingredients for relationship marketing (Morgan and Hunt, 1994).

Ang et al. (2001) proposed three dimensions of trust that were critical for enhancing the perception of trust on the internet. They were the ability of the online retailer to deliver a product or service in an efficient manner, the willingness of the online retailer to redress in order to meet the customer's satisfaction, and the presence of a privacy policy on the web site. Similarly, Gefen (2002) argued that the beliefs of integrity, ability, and benevolence were prerequisites to overall trust. In the case of e-commerce, integrity is the belief that the online retailer will adhere to the given rules or keeps his promises. To a certain degree, online retailer integrity relates to the privacy issue which affects a customer's trust perception. Hemphill (2002) argued that an online retailer should consider the privacy issues of personal information. The basic rule of ethics for an online retailer is to protect the confidentiality of a customer's personal information and prevent it from being divulged or sold to other parties. A number of surveys have found consistently high levels of customer concern about privacy in online activities (Clay and Strauss, 2000; Hoffman et al., 1999). Hoffman et al. (1999) noted that the main privacy concern of customers for online shopping is privacy violation and lack of confidentiality, which is defined as the misuse and lack of control of personal information subsequent to the transaction. The emerging technologies and marketing instrument make it easier to collect personal information from customers and share that information with third parties (Clay and Strauss, 2000). Therefore, there is a risk of loss of confidentiality, and confidentiality is a significant factor in building trust.

Ability is the belief about the skills and competence of the online retailer to provide good quality products and services. Accessibility of the information on a web site is instrumental to the establishment of online trust. Zhang et al. (1999) argued that broken links and meaningless images may relate to users' dissatisfaction with a web site interface. Likewise, ease of navigation was frequently

mentioned as a key to promote online trust. Egger (2001) proposed that the interface traits of the web site, the information content of the web site, and relationship management will affect online trust. Kim and Moon (1998) reported that the main clipart and overall color layout affected the trustworthiness of the web site. Therefore, the ability of online retailer to provide an easy to navigate mechanism and an easy to use interface will considerably facilitate customers to accomplish transaction activities and hence building their trust perception. Another critical aspect of creating trust is ensuring online security. This can be done by ensuring that the latest and strictest security technology is installed and kept up to date on the retailer's website.

Benevolence is the belief that the online retailer wants to be good to the customer regardless if a sale is made or not. Online e-commerce transactions include services provided by the retailer and several other trusted third parties such as banks, credit card companies, shipping companies, and companies providing online privacy security for the consumer. If the customer trusts the endorsing third party and there is a strong tie between the web site being shopped at and the third party, then this trust can be transferred (Li et al., 2001). Therefore, online shops need to ensure that they provide good customer service from different aspects. A retailer's web site plays a proxy role by supporting all transaction activities and by connecting the perception of trustworthiness of the customers. In sum, the prerequisites of online trust can be classified as online retailer competence, security, privacy, integrity, benevolence, and responsibilities. Online retailers should provide a quality web site to present customers with these properties so that customers are encouraged to purchase online. In this regard, online transactions mainly depend on information systems to provide sufficient information about the merchandise and to enable the transaction activities. A successful transaction basically depends on a successful information system. In addition, customers need services when they are making the transaction. This will enhance their confidence and eventually give them satisfaction. In short, the attitude behind the purchase is important because it drives behavior. Those functions of the web system that reinforce the perception of ability and competence, transfer a perception of integrity and show that the system is useful and friendly, enable a perception of trust by the customer. The retailer web system plays a critical role to portray the quality of the system, the quality of information, and the quality of service and consequently leads to the success of the web system (DeLone and McLean, 2003).

DeLone and McLean's information system success model (ISSM)

DeLone and McLean (1992) proposed a comprehensive framework to measure the success of an information

system that has been widely applied since its publication. A decade later, based on the empirical testing and theoretical discussions of researchers' findings, they updated their model to measure e-commerce success (DeLone and McLean, 2003). This updated model includes six interrelated dimension of information systems success. The key drivers are system quality, information quality, and service quality, while the outcomes are system use/intention to use, satisfaction, and net benefit.

Although ISSM is a convincing model to predict system utilization, the purpose of user's intention is focused on user's task, not on transaction activity. In the context of e-commerce, the primary system users are customers. Customers use the system to make buying decisions and execute business transactions. The transaction is risky unless the system is trustworthiness. In this regards, this study argued that trust should be implied to enhance customer's intention to shop online. System quality, information quality and service quality are to deliver confidence and inspire trust in the online transactions. System quality is defined as measuring the extent of usability, availability, reliability, adaptability, and response time all of which are valued by users of an e-commerce system. Information quality is measuring the quality of the e-commerce information. The information of a website should be personalized, complete, relevant, easy to understand, and it must also be secure so the customer perceives it as free of risk when doing any of the interactive transaction activities. Service quality is the measurement of overall support delivered by the service provider or online retailer. This dimension is especially critical in an e-commerce context, because poor user support will increase user's dissatisfaction and distrust of online retailer and eventually lead to the perception that there are no benefits to online shopping (DeLone and McLean, 2003).

A customers' perception of the technology of electronic communication and the internet is frequently a proxy for their trust (or lack of trust) in online shopping. The extent to which they trust the electronic system is likely to correlate with their overall trust regarding online shopping. When customers are assessing this trust factor, several issues arise in their minds. One issue is the expected competency of the electronic system. Customers use various performance measures such as network and download speed, navigability, reliability, connectivity and availability to evaluate electronic transactions (Lee and Turban, 2001). Their main concern in this regard is the reliability and security of the network. When customers are transmitting personal data over the internet, there are risks that unauthorized parties could intercept this information (Clay and Strauss, 2000). Therefore, customers' perception of modern computer technology and their perception of the technological competency of the web system are very important in their information processing behavior and perceived trust. When customers feel that an online shop shows poor system quality, they will be discouraged from using that particular web site.

Liu and Arnett (2000) identified service quality as prerequisite for web site success. They found from an empirical study that a quick response, assurance, empathy, and follow-up service are key variables that comprise the construct of service quality. In addition, service quality can also be assessed by the extent of online support capabilities, including the abilities to support frequently asked questions, customized site intelligence, and order tracking (Molla and Licker, 2001).

There is information asymmetry on the completeness of product information, as complete information about the quality of the product is difficult or impossible to obtain in a virtual environment (Ba, 2001; Klang, 2001). In electronic transactions, customers do not get the cues they can get in a shop by being there, or by talking to the salesperson (Lee and Turban, 2001). Thus, they cannot assess the quality of the shop and its products and services prior to making any transaction decision. However, a retailer web system can be assessed as a proxy. Under conditions of incomplete information as to the quality, customers frequently lack the trust to engage in online transactions (Ba, 2001). From these discussions, this study derives a conceptual model (Figure 1) and associated hypotheses:

H₁: There is a positive relationship between system quality and trust.

H₂: There is a positive relationship between information quality and trust.

H₃: There is a positive relationship between service quality and trust.

H₄: There is a positive relationship between trust and intention toward online shopping.

DATA COLLECTION

A personnel interview was used to collect data. Samples were selected from those who have shopping experience with books.com.tw. The online bookstore was selected because it is ranked the first place of online bookstore, is the first electronic bookstore in Taiwan which is founded in 1995, and currently has the most members of any online bookstore in Taiwan. Pretest was examined by three senior MIS lecturers and the pilot-testing was conducted with 50 experienced consumers of books.com.tw to modify the survey instruments, so as to make them easier to understand and better suited to the target context to ensure content validity. A total of 325 useable responses were obtained. Numerous demographic measures were used to characterize the samples. Among the areas investigated were genders, average time online hours/per day, education, age, and orders per month. Respondent's gender distribution showed that 44.3% were males (144) and 55.7% were females (181). Their average time online distribution showed that 16.3% (53) were in one hour or under, 22.8% (74) were in 1 to 2 h, 22.5% (73) were in 2 to 3 h, 14.8% (48) were in 3 to 4 h, and 23.7% (77) were in 4 h and above. Their education distribution showed that 2.2% (7) graduated from junior high or under, 18.2% (59) were high school graduates, 76.3% (248) were college graduates, and 3.4% (11) held graduate degrees. Their age distribution showed that 1.8% (6) were 15 years of age and under, 12.9% (42) were 16 to 20 years old, 40.3% (131) were 21 to 25 years old, 31.1% (101) were 26 to 30 years old, 9.5% (31) were 31

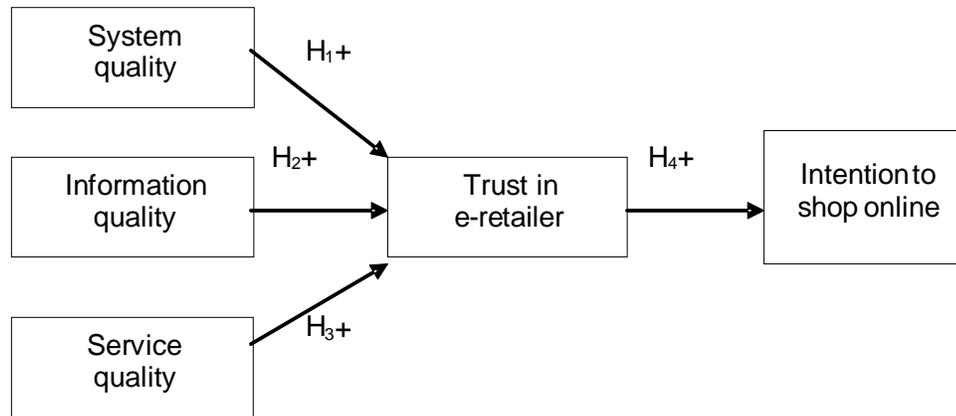


Figure 1. Conceptual model.

to 35 years old, 2.5% (8) were 36 to 40 years old, and 1.8% (6) were 40 years old and above. Their distribution of orders per month showed that 70.1% (228) had purchased once a month or under, 27.4% (89) for 2 to 5 times per month, 2.4% (8) for 6 times per month and above.

DATA ANALYSIS AND RESULTS

The measures used to operationalize the constructs in the research model were adapted from those in previous studies. Items related to system quality, information quality, and service quality were modified from ISSM (DeLone and McLean, 2003); trust was adapted from Gefen (2002), and Gefen and Straub (2003), and behavioral intention toward online shopping (DeLone and McLean, 2003) were measured on a seven-point Likert scale, '1' representing strongly disagree and '7' representing strongly agree.

Measurement model

The structural equation model (SEM) was used to analyze the relationship between variables and the total model fit. Data were analyzed using LISREL8.3. Construct reliability and convergent validity were assessed using factor loadings, composite reliability (CR), and variance extraction (VE).

According to Hair et al. (1998), item factor loadings should exceed 0.5 and be significant. All the loadings in this study exceeded 0.7. Furthermore, composite reliability measures the internal consistency of the items used to measure each factor and the extent to which the observed items explained the variance of each construct were determined. Bagozzi and Yi (1988) suggested that composite reliability should exceed 0.6, and that extracted variance should exceed 0.5. All the composite reliabilities in this study exceeded 0.7, and all the extracted variances exceeded 0.6, so the constructs

exhibited adequate reliability and convergent validity (Table 1).

Structural model

The overall fitness of the structural model was estimated in terms of various indices. Although the χ^2 statistic with degree-of-freedom of 118 (213.75, $p = 0.0000$) was significant, perhaps indicating inadequate fitness, the model cannot be rejected on this evidence alone because the χ^2 statistic is sensitive to sample size. Therefore, the ratio of χ^2 to the number of degrees-of-freedom (normed $\chi^2 = 1.81$) was determined: it should be less than two. GFI and AGFI were also considered to evaluate the fitness of the model; these values should equal to or exceed 0.9 and 0.8, respectively. NFI, NNFI and CFI are three other relevant indices whose values should exceed 0.9 for good overall fitness (Henry and Stone, 1994; Scott, 1994). RMR and RMSEA should be less than 0.1 and 0.08, according to Byrne (1998). Results show that GFI was 0.93, AGFI was 0.90, and others all exceeded 0.90; RMR and RMSEA were 0.047 and 0.05, respectively. These indices all confirm good overall fitness (Table 2).

The results of hypotheses testing present the standard coefficients of the causal paths (Figure 2). The standard coefficients and the associated t -values of the model paths were assessed to be significant except for the relationship between information quality and trust. System quality and service quality significantly affected trust; trust has positive effect on user's behavioral intention toward shopping on e-bookstore. Hence, three (H_1 , H_3 , H_4) of the four hypotheses concerning the causal paths were supported; only H_2 was not.

In addition, we tested the relationship between system quality, information quality, and service quality and intention to shop online respectively. No significant effect was found among these relationships. The lack of direct effect of e-retailer quality on customer's intention to shop

Table 1. Reliability and convergent validity.

Construct	Item	Loading (λ)	CR	VE
System quality	sq1. Interface friendly	0.71	0.84	0.58
	sq2. Ease of navigation	0.79		
	sq3. Response time	0.73		
	sq4. Reliability	0.81		
Information quality	iq1. Security	0.79	0.87	0.62
	iq2. Completeness	0.81		
	iq3. Relevancy	0.8		
	iq4. Privacy	0.75		
Service quality	ser1. Ability of fulfillment	0.75	0.88	0.64
	ser2. Responsiveness	0.81		
	ser3. Follow-up service	0.76		
	ser4. Focus on customer's need	0.87		
Trust	tr1. Ability	0.82	0.86	0.61
	tr2. Integrity	0.73		
	tr3. Benevolence	0.81		
	tr4. Overall trust	0.76		
Intention to shop on line	bi1. Willingness using the system shop online	0.78	0.75	0.61
	bi2. The probability of shopping online	0.78		

Table 2. Fit Indices for structural model.

Fit index	Research result	Recommended value
Chi-square	213.75 (p=0.0000)	p-value > 0.05
Normed chi-square	1.81 (df=118)	$1 \leq \leq 2$
RMSEA	0.05	≤ 0.08
GFI	0.93	≥ 0.90
AGFI	0.90	≥ 0.80
RMR	0.047	≤ 0.10
NFI	0.95	≥ 0.90
NNFI	0.97	≥ 0.90
CFI	0.98	≥ 0.90

online, but the significant indirect effect of their causal relationship has explored that trust played a critical and full mediating role between system quality, service quality, and customer's intention to shop online. Table 3 shows the direct, indirect, and total effects of these variables.

In sum, we tested the impact of key prerequisites that influence consumer trust in online shopping, which in turn affects the relationship intention to purchase online. The model results and hypothesis tests are shown in Figure 2. Some of the key findings from the data analysis are highlighted thus:

- i. System quality is the key determinant of trust and has a significant positive relationship with trust. Thus, H_1 is established. Within the concept of a user-friendly interface, ease of navigation, response time, and reliability are the most significant variables.
- ii. Service quality plays a significant positive role in trust. Thus, H_3 is established. Ability to fulfill online transactions, integrity, retailer's follow-up service, and their understanding of a customer's needs are most critical to service quality.
- iii. Trust has a significant positive influence on intention to purchase online. Thus, H_4 is established.
- iv. Trust plays the critical role and fully mediating

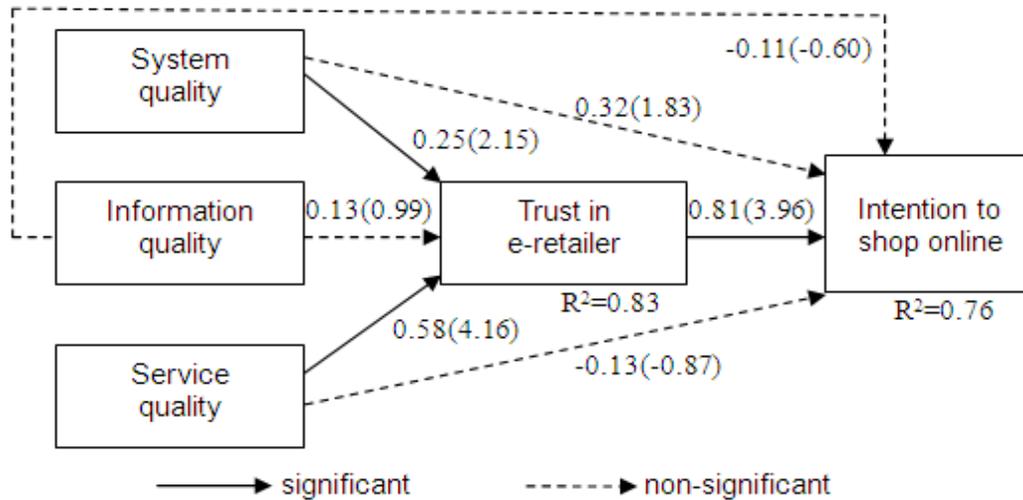


Figure 2. Path analysis.

Table 3. Direct, indirect and total effects of causal relationship.

Causal relationship	Direct effect	Indirect effect	Total effect
System quality→trust	0.25 (2.15)*	—	0.25 (2.15)*
Information quality→trust	0.13 (0.99)	—	0.13 (0.99)
Service quality→trust	0.58 (4.16)**	—	0.58 (4.16)**
Trust→intention	0.81(3.96)**	—	0.81 (3.96)**
System quality→intention	n.s.	0.20 (1.98)*	0.52 (2.76)**
Information quality→intention	n.s.	0.10 (0.93)	0.00 (-0.01)
Service quality→intention	n.s.	0.46 (2.92)**	0.34 (2.65)**

* =p<0.05, **=p<0.01, n.s. =non-significant.

variables between system quality, service quality, and intention to shop online. Online retailer’s system quality and service quality could enhance customer beliefs of e-retailer’s ability, integrity, and benevolence, and consequently the intention of shopping online.

DISCUSSION

The primary contribution of this paper is its attempt to assess the impact of trust on online shopping through an antecedent consequences approach. This research confirms that trust significantly affects customers’ intention to engage in online shopping, and that system quality and service quality play a critical role in fostering trust perception, and customer shopping intention was then been motivated.

Some discussions on the key prerequisites are presented thus:

i. System quality: the research revealed that system

quality is the key determinant of trust. A high quality operation can only arise from a system that promotes quality processes at all times in all transaction activities. As a proxy, the web system quality enhances the feeling that customers associate with these activities. When designing a retailer web site, system response time, ease of navigation, reliability, and the quality of the layout of the interface are credibility factors that can present the competence and expertise of the online store, and this in turn leads to the building of trust.

ii. Information quality: information quality was found to have no influence on the building of trust. Previous studies suggest that security, privacy, relevancy, and completeness are important to building trust (Gefen, 2002; Gefen and Straub, 2003; Lee and Turban, 2001; Liu and Arnett, 2000). However, the result of this study did not support that. This finding may be due to the payment option and the unique delivery mechanisms offered by book.com.tw which offers a lay-away plan where customer can make cash payments until the book is paid for, and then they can pick up the book in a

nearby 7/Even, which is a very common convenience chain store in Taiwan. This kind of payment and delivery system may avoid many customers from submitting a credit card number or any other private information online. The benefit of a strategic alliance with 7/Even gives customers a more flexible and convenient solution to accomplish their transaction without taking a risk with any of the security or privacy issues of online shopping. Therefore, information quality of security or privacy might not be the issue concerned by Taiwanese online shopper.

iii. Service quality: the research revealed that service quality is also the key determinant of trust. Service quality delivered by e-retailer that meets customer's expectations will foster trust belief. Online retailer should focus on customer's need, support customer with follow-up services, and presents the fulfillment of the promise with an efficient manner will increase customer's trust belief and eventually encourage online purchase behavior.

Limitations

Prior to discussing the implications of this research, it is necessary to recognize its limitations. Investigating the determinants and consequences of trust on the quality issues of a specific web system is relatively rare to management researchers. The discussed findings and their implications are obtained from one single study that examined e-bookstore and targeted a specific user group. Thus, caution must be taken when generalizing the findings and discussion to other types of online retailers or other market groups. In addition, operationalization of constructs and their indicators in the investigated model is basically drawn from relevant previous research. This approach has the merit of using established and validated measures and is critical to our confirmatory intention. However, the context of this study is different from previous studies especially on its alternative payment and delivery solutions, and eventually results in an insignificant relationship between information quality and trust. This limitation corresponds to the importance of measurements re-evaluation suggested by Straub (1989) and therefore strengthened its importance. Another limitation is the cross-sectional research design employed in this study. In any model in which causality is suggested, longitudinal studies provide for stronger inferences (Morgan and Hunt, 1994). Thus, the model tested in this paper can subsequently be tested in a longitudinal design.

IMPLICATIONS

The concept of trust is critical for it underlies the making of the online shopping environment. As such, it has implications for both academics and practitioners.

Theoretically, conceptualizing and modeling trust in online shopping helps to expand scholars' knowledge of interactive consumer behavior in this emerging discipline, and practically, the examination of causal relationship between these variables helps management as well. While previous research has proposed trust as an antecedent of behavioral intention to shop online (Morrison and Firmstone, 2000; Urban et al., 2000), this study identified it as a powerful mediating factor that connects system quality and service quality to customer's intention to purchase online. To establish trust, particularly in virtual environment, e-retailers need to reexamine the quality of their systems and services. According to our findings, retailer's website systems should provide friendly user interface which allows user to navigate easily, response to user quickly, and be accessed reliably. In addition, service quality should be rechecked from the first contact of customer to the end of transaction, and provide the follow-up services as well. The key is to focus on customer needs and fulfillment the promises retailer made. As the result, this study posits trust to be a credible belief of system quality and service quality that will influence a customer's intention toward purchasing online. The significant mediating influence power of trust was confirmed as an integral feature of the proposed model.

Conclusions

This paper aimed to provide a multivariate explanation of online trust. The aims were to objectively conceptualize trust in online shopping and assess the relationships between trust and its key antecedents and consequences. In this paper, we employed a quantitative modeling framework to develop a structural model that embodies the components of what stands for trust in online shopping. The study used data collected from members of books.com.tw to measure these constructs and to fit a series of structural equations that test the proposed model.

The findings reveal that system quality and service quality are relatively important in their effects on a consumer's trust in online shopping, while information quality is not. The results also show that trust in an online retailer is positively related to consumers' purchase intention. Marketers and managers should, therefore, take into careful consideration the prerequisites for the development of trust in online retailing. Trust takes a long time to build, can easily be destroyed, and is hard to regain. Also, since breaking trust gives rise to distrust, maintaining trust requires careful attention from management. Trust and quality go together. If online retailers want to have trust on a sustained basis, they must have quality on a sustained basis as well. In the end, trust based on quality is the most durable condition for building for company survival and success.

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