

Customer self-service systems: The effects of perceived Web quality with service contents on enjoyment, anxiety, and e-trust

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Abstract

Trust (integrity, benevolence, and ability) is the central dimension of e-commerce systems adoption. Based on customer self-service systems and human–computer interaction logics, affective variables are important research issues to fully understand the relationship between information systems development and e-trust. In this paper, the effects of the perceived Web quality with service contents on e-trust, mediated by the website user's affective variables (enjoyment and anxiety), are tested and discussed ($n=325$). Flow, social contract, social cognitive, resource allocation, and trust theories are discussed in the paper to support the proposed hypotheses. Theoretical and practical implications of these findings are also discussed.

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1. Introduction

E-commerce trust (e-trust) is the central dimension of e-commerce systems adoption, which is one of the most important aspects of e-commerce customer relationship management (e-CRM) [34,60,82]. Given that retailers' online sales for the 2005 holiday season has increased 25% from the previous year [17], e-CRM and e-trust should be investigated further as the strategic mechanism not only for the pure online companies but also for the hybrids [80]. Even though there are a lot of research endeavors to explain the e-trust mechanism, such as the

relationships of trust with the main antecedents and technology acceptance variables [34], assurance mechanism [36,75], size and reputation [44], transaction risk [4,31,73], social presence and network [33,49], cross-cultural investigation [45], willingness to purchase [9,32], and Internet user's information privacy concerns [60], one of the main questions in building e-trust is how to build and design the website to enhance the trust of a potential online customer [75]. Although the influence of a website's structural assurance on system trust was supported by the previous studies [34,75], how this relationship is developed based on the website user's affective reactions of the system is a missing block of our knowledge.

As Gefen et al. [34] argued, an e-commerce consumer is a company's customer as well as website system user. Thus, there should be both customer's and

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system user's perspectives in building e-trust via website function and assurance mechanism. The possible explanation for the role for an e-commerce customer's perspective is the self-service mechanism [67,79]. Parasuraman [71] argued the growing importance of self-service as a fundamental shift in the nature of service. Self-service technologies, such as an e-commerce website, ATM, or kiosk, are examples of marketplaces in which no interpersonal contact is required between buyer and seller. It is likely that the technological aspect of many recent self-service options has a unique effect on consumer perceptions of these self-service encounters [67]. Dabholkar [19] found that enjoyment and control are the most influential attributes to the evaluations of self-service technologies. Meuter et al. [67] also found that some customers perceive frontline employees as a nuisance to be avoided, leading to less loyalty and trust, increasing switching behavior. Meuter et al. [67,p,59] argued, "*self-service technologies may provide a way for customers to avoid this declining service and produce and consume on their own, at their own convenience,*" emphasizing the technology interface design to support this convenience. The interpretation of website function and e-trust based on self-service logic is a very interesting approach, because the absence of human contact has been interpreted only as a negative aspect of e-commerce, such as risk perception, rather than as a positive aspect in the previous information systems (IS) studies (e.g., [4,31]). Based on self-service logic, a website can influence the positive side of consumer's affect via enjoyment and increased control [79].

Another possible explanation for the role for a system user's perspective is the affective reactions based on human–computer interaction logic. While most existing models or theories in IS focus on the cognitive and behavioral aspects of human decision-making processes and individual level reactions to using technologies in organizations and other contexts, the influence of affect (mood, emotion, feelings) is traditionally neglected [96,88]. Affect is defined as the feeling of joy, elation, pleasure, depression, disgust, displeasure, or hate associated by an individual with a particular act [91]. Based on the in-depth literature review of psychology, marketing, organizational behavior, and other fields, Sun and Zhang [88] called for more attention to affect-related factors in the human–computer interaction research. They argue that some of deficiencies of existing theories and models in explaining users' behavior (including online consumer behavior) may be due to the ignorance of affective variables in the model. Li and Zhang [55] showed that affective reactions have

been paid less attention, compared with cognitive beliefs in the IS literature on online consumer behavior. Li and Zhang [55] also called for more research effort in investigating the role that affect-related constructs play in online consumer behavior. Although there are empirical studies that provide evidence for the influence of affective reactions toward intention or behavior (e.g., [52]), there is no empirical or theoretical linkage between affect and e-trust in the IS literature. Thus, the relationships between affect and other groups of factors, such as e-trust, deserve more attention. Specifically, e-CRM and personalized IS should not neglect this potentially important but rarely investigated relationships.

Based on the self-service systems and human–computer interaction insights, affective variables, such as perceived enjoyment and system anxiety, are the target perspectives in this study. Perceived enjoyment, the extent to which the activity of using a computer system is perceived to be personally enjoyable in its own right aside from the instrumental value of the technology [21], increases shopping intentions [39,21]. System anxiety, the apprehension or fear that results when an individual is faced with the possibility of using IS [37], negatively affects system adoption [41,42,37]. Thus, these positive (enjoyment) and negative (anxiety) effects of affect on e-trust would be important empirical findings in this study.

Web design [57] and Web quality [3,54,47] are also suggested as important antecedents to online consumer behavior. Beliefs about website's perceived information load, content (product/service offered by an e-store), context (effectiveness of the website's interface), and information privacy guarantee positively influence one's attitude toward using this website [59,12,60]. One of the important aspects of perceived Web quality based on structural assurance mechanism is the information privacy on the website [60]. Gillmor [35] points out that the fundamental problem in Internet privacy is not the disclosure of sensitive information by itself. Consumers will not object to e-commerce companies gathering and analyzing data about their consumers with the intent of serving them better. As long as the consumers provide the information voluntarily and with full *control*, their privacy is not being violated. The privacy concern occurs when the e-commerce website does not provide their privacy policies effectively or conceal these policies altogether, thus the consumer loses their control over how that information is being used. Malhotra et al., [60] argued that, unlike traditional media, the Internet provides a variety of means for consumers to control personal

information that is stored in an e-store's database. Based on the empirical test with 742 household samples, they showed that online consumers consider it most important to be aware of and to have direct control over personal information stored in e-store's databases. Therefore, website or customer self-service systems should make sure that their consumers can easily check what type of information is collected, whether the information is correct, and how this information is used in and outside the organization. In addition, consumers should be allowed to control the information in the e-store's database easily. With these functions and service from the website of an e-store, mass-customization and e-CRM service would be effectively implemented. An important aspect of information privacy and control on the Web, which is not investigated and explained in the previous IS literature, is the relationship between the website's enhanced customer service/privacy and the online consumer's positive affect (enjoyment) as well as negative affect (anxiety), influencing the customer's e-trust. Thus, it is important to test the relationships among the perceived Web quality with service contents and other affective variables as well as e-trust in the customer self-service IS.

This research has three primary objectives: (1) to investigate the influence of the perceived Web quality with service contents on affective variables of e-commerce customers and e-trust of the self-service systems; (2) to test how affective variables (enjoyment and anxiety) of system users influence multi-dimensional e-e-trust, based on the human–computer interaction insight; and (3) to test the positive and negative mediation effects of affects in the relationships between perceived Web quality and e-trust, based on the theories in IS, marketing, and psychology.

The presentation of this paper is as follows. Section 2 presents the theoretical foundations of this research model and the hypotheses. Section 3 outlines the research methodology and measures. Section 4 describes the data analysis and results. Section 5 discusses the study's limitations and its implications for researchers and practitioners. Section 6 concludes the paper.

2. Research model and hypotheses

Fig. 1 presents the conceptual framework from which the proposed model is formed. The perceived Web quality with service contents would influence affective reaction variables in the model. Affective reaction toward interacting with an object (website) is a person's subjective perception or judgment about

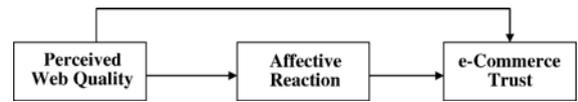


Fig. 1. Conceptual framework of the research model.

whether such interaction will change his or her core affect or his or her emotion toward the object [88]. Affective reaction variables would also influence multi-dimensional e-trust constructs [50,5]. Forgas [29] explained “affect infusion” as the process whereby affectively loaded information exerts an influence on and becomes incorporated into judgmental process, entering into the judge’s deliberations and eventually coloring the judgmental outcome. This model tests the affect infusion to e-trust, which is not studied in the previous IS studies. Furthermore, the direct influence of the perceived Web quality on e-trust, with other connections, would show the partial or full mediation effects of affect on e-trust in the model.

Fig. 2 presents the proposed research model. As discussed earlier, perceived enjoyment and anxiety are used as the positive and negative affects in the model. System anxiety is an important dimension of affective reaction in this model, since perception of losing control in the e-commerce transaction (e.g., privacy concerns or technical errors) is mostly related to system anxiety, rather than perceived enjoyment. Mayer et al. [64] defined trust as the willingness of a party (trustor) to be vulnerable to the actions of another party (trustee) based on the expectation that the other (trustee) will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party (trustee). This definition of trust shows the potential linkage between the perceived Web quality with service contents and e-trust. Gefen [32] also provided a multi-dimensional construct combining specific constructs of e-trust: integrity, benevolence, and reliability. Integrity is the perception that the trusted party adheres to accepted rules of conduct, such as honesty and keeping promises [63]. Benevolence is the perception that the trusted party, aside from wanting to make a legitimate profit, wants to do good to the customer. Ability is the perception about the skills and competence of the trusted party. Gefen [32] developed and validated these three dimensions of e-trust, and Gefen and Straub [33] recently found that social presence has positive effects on integrity ($\beta=.21, p<.01$) and benevolence ($\beta=.41, p<.01$), but not on ability. Gefen [32] also found that the vendor’s integrity and benevolence affect overall trust and purchase intentions, while the ability of vendor directly affect window-shopping intentions. These

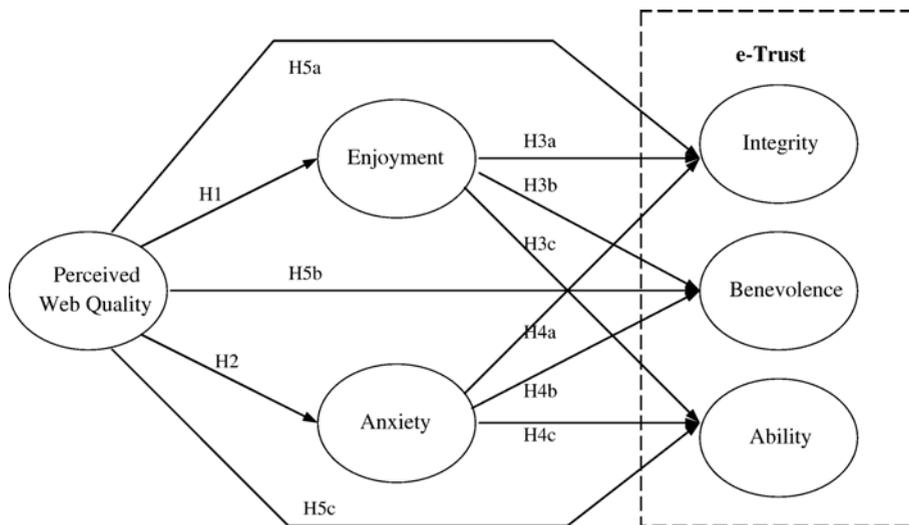


Fig. 2. Proposed research model.

findings reinforce that e-trust is a multi-dimensional construct and that further investigation among the other affective variables and multi-dimensional e-trust is meaningful.

It is important to distinguish between an affective trait and state, since this distinction has been widely discussed in psychology, consumer research, and social psychology [88]. Trait reflects the static aspect of information processing that impacts a broad range of variables and is empirically confirmed to be a predictor of the average level of mood, a prolonged affective state [96]. Affective state can be theorized as being a product of variables such as stimuli reception context and individual difference [61], and as varying over time and as having more dynamic influence on individual's behavior [84]. In IS literature, computer playfulness [95] and personal innovativeness in IT [1,2] can be categorized as an affective trait, while perceived enjoyment [21,97] and computer anxiety [37,90] can be categorized as an affective state. This study focuses on the website user's subjective perception about the perceived Web quality and its relationship to affective state or mood rather than affective trait or static characteristics. Thus, we used enjoyment and anxiety in the model as an affective state or reaction to the website in the model. Zajonc [98] argued that affect (e.g., enjoyment and anxiety) and cognition (e.g., trust dimensions) are separate but partially dependent systems. Therefore, this study includes the perceived Web quality, system anxiety, and perceived enjoyment as the antecedents of multi-dimensional e-trust, and investigates these complex relationships.

2.1. Perceived Web quality

Aladwani and Palvia [3] provided user-perceived Web quality measures based on the scale development study. They defined perceived Web quality as the users' evaluation of a website's features meeting users' needs, reflecting overall excellence of the website. Based on the exploratory factor analysis, they provided four dimensions of perceived Web quality: technical adequacy, content quality, specific (service) content, and perceived quality. We define the perceived Web quality with service contents as the user's (online consumer's) perception on the customer service and privacy based on the website interface and functions. We argue that the perceived Web quality with service contents (e.g., customer service and privacy contents) of self-service technologies, such as an e-commerce website, can positively influence a consumer's perception of enjoyment of the system and shopping behavior [19,79,81]. Liang and Lai [57] found that the quality of e-store design has an effect on the customer purchase decision. Swan and Rosenbaum [89] found that there are features of a website's interface that play a role in the social construction of trust as people explore a website. In applying flow theory and the technology acceptance model [20,94], Koufaris [52] found that website factors affect the consumer's emotional responses, such as shopping enjoyment. Empirical evidence has been provided to show that companies can enhance the customer service by behaving ethically, such as by letting users know what information they collect, how they will collect, and for what purposes they will use

that information [18]. We argue that website effectiveness, in providing this customer service/privacy information, can enhance online consumer's intrinsic motivation. Midha and Nemati [68] also suggested that consumer empowerment, which can be supported by the e-store's customer self-service, would reduce the information privacy concerns and enhance the trust in company. By supporting the self-service functions in the website, e-stores can enhance the positive side of the consumer's affect. Thus, the perceived Web quality with service contents, such as customer service, policies, and privacy, will positively influence online consumer's perceived enjoyment. We hypothesize that;

H1. Perceived Web Quality with Service Contents will have a positive effect on Perceived Enjoyment.

We also argue that high perceived Web quality with service contents can reduce a consumer's anxiety about the system with the increased control of the system [79,19]. There are several studies showing that consumers regard the release of personal information as a risky transaction because they become vulnerable to a company's potential opportunistic behaviors [69,53]. Smith et al. [86] showed that there are several dimensions of an individual's concern about organizational information privacy practices: collection, errors, secondary use, and unauthorized access. Among them, errors can be linked to the anxiety of losing control and making mistakes in the system use. Social cognitive theory [6] suggests that this emotional tension is a negative mechanism that can impede performance. There are several studies on self-service technologies, suggesting that negative affect toward technology may negatively influence the extent to which consumers interact with technology-based services and products [71,77]. However, there is no study that investigates how the company's website service to secure this information is related to the online consumers' (system users') concerns on their system use. Thus, we hypothesize that;

H2. Perceived Web Quality with Service Contents will have a negative effect on System Anxiety.

2.1.1. *Enjoyment*

The first relationship between affect and trust is the linkage of perceived enjoyment (affective state) and e-trust. Perceived enjoyment is the extent to which the activity of using a computer system is perceived to be personally enjoyable in its own right aside from the instrumental value of the technology [21]. Sun and Zhang [88] argued that there are several marketing

studies that show affective reaction, such as emotion or enjoyment [13] and valence of experience [14], influences cognitive perceptions related to integrity, such as perceived risk [13] and perceived product quality [14]. Mattila and Wirtz [62] also showed that consumer's initial affective reaction leads them to mood consistent information, which is related to cognitive perception of integrity. Perceived enjoyment influences various aspects of cognitive information processing, such as customer loyalty and promotions [26,101], which can be linked to integrity. These findings suggest that there is a potential relationship between affective reactions and integrity dimension of e-trust, since risk and quality dimensions are consistently included in the trust model in IS literature (e.g., [45]). Gefen and Straub [33] also suggest that perceived hedonic and social needs of a consumer can influence e-trust. Koufaris [52] argued that rather than using a multi-dimensional flow construct, a simple construct like enjoyment explains online consumers' behavior better. Thus, we hypothesize that;

H3a. Perceived Enjoyment will have a positive effect on Integrity in e-Trust.

Hedonic IS, such as a website of e-tailors, aiming to provide self-fulfilling rather than instrumental value to the user, are strongly connected to home activities such as online consumer behavior [22]. Hedonic IS focus on the fun and benevolence aspects of using IS, and encourage prolonged rather than productive use. Thus, perceived enjoyment is a stronger determinant of intention to use than perceived usefulness in hedonic IS adoption [22]. Perceived enjoyment is recently gaining a lot of interest from IS community because of the hedonic nature of Internet and Web-based systems (e.g., [97,85]). In explaining flow and cognitive absorption, Agarwal and Karahanna [1] explained that dimensions of flow with intrinsic motivation include a sense of being in control and a loss of self-consciousness, which can be related to benevolence dimension of e-trust. Thus, we hypothesize that;

H3b. Perceived Enjoyment will have a positive effect on Benevolence in e-Trust.

Flow theory suggests that positive affective reactions (enjoyment) encourage more mental resources to be allocated to the task or to the interaction with the technologies of interest [1,88], which can be linked to the ability dimension of e-trust. High arousal with temporal dissociation makes individuals perceive themselves as possessing ample time to complete a task [1], and this perception of control would result in increase of

ability dimension of e-trust in the self-service IS. Yi and Hwang [97] revealed that perceived enjoyment influences computer self-efficacy of Web-based IS, which is related to the perceived control ability of a system user. Hwang [40] also showed that enjoyment can be successfully applied to the self-control ability in the enterprise system implementation. Thus, this study hypothesizes that;

H3c. Perceived Enjoyment will have a positive effect on Ability in e-Trust.

2.1.2. Anxiety

The second relationship between affect and trust is the linkage of system anxiety (affective state) and e-trust. System anxiety, the apprehension or fear that results when an individual is faced with the possibility of using IS [37], is one of the relatively frequently studied affective reactions toward using IT [88]. In 1996, the United Nations Commission on International Trade Law (UNCITRAL) developed the model law on e-commerce and recommended it for adoption in all member nations. This law recognized that errors are easily made in the course of e-commerce transactions, even in the case of the popular website such as Amazon.com. This law seeks to protect individuals who make technical or legal mistakes in entering into electronic contracts regarding products or services online, such as material errors in the electronic information. We can imagine the electronic agent that does not give the customer an opportunity to prevent the error or hitting the wrong key by technical mistake in placing an order on the website, which results in system anxiety in e-commerce.

Grazioli and Jarvenpaa [36] found that perceived risk and trust determine the consumer's attitude toward online purchase, which subsequently affected willingness to purchase and actual purchase behavior. Size and reputation of the Internet stores, related to anxiety of the system, were found to influence the consumer assessments of the store's trustworthiness, perceived risk or integrity, and willingness to patronize the store [44]. Consumer risk perceptions (anxiety and security) were found to be the main predictors of online purchase behavior [92], and anxiety about transaction security negatively impact online purchase intention [58]. Ba and Pavlou [4] found that trust mitigates information asymmetry by reducing transaction-specific risks, which eventually generated price premiums for reputable sellers. Empathy and assurance, related to integrity of trust, were the only variables in SERVQUAL that predicted channel satisfaction [23]. Ranganathan and

Ganapathy [76] also found that security or anxiety is the most important factor that discriminates between shoppers who had high and low purchase intentions. These findings in IS literature suggests the negative relationship between system anxiety and integrity dimension of e-trust. Thus, we hypothesize that;

H4a. System Anxiety will have a negative effect on Integrity in e-Trust.

In the IS research domain, there are many studies regarding the relationships between uncertainty (risk or security) and e-trust or online consumer behavior. Liang and Huang [56] argued that there are two different uncertainty perceptions in online consumer behavior: product uncertainty and process uncertainty. Anxiety can be conceptualized as the process uncertainty perception of online service users. This process uncertainty perception will reduce the benevolence dimension of e-trust, since transaction process involves a lot of relationships and interactions between customer and sellers. Liang and Huang [56] found that experienced shoppers are more concerned about the uncertainty in electronic shopping, suggesting that unhappy experience, or process uncertainty, in the online transaction can increase the concerns on the relationships or doing good to customers. Wired lifestyle and benevolent culture of customer-seller relationships were found to be the most important predictors of online purchase behavior [7]. Thus, we hypothesize that;

H4b. System Anxiety will have a negative effect on Benevolence in e-Trust.

Resource allocation theory [93] argues that lower levels of system anxiety can be related to anxiety reduction by directing some of the attentional resources to an off-task activity, which increases the effort required to accomplish tasks or increase the e-trust. Social cognitive theory [6] also argues that anxiety reduction will increase computer self-efficacy that can be related to the overall e-trust of completing the transaction. A lot of IS literature supports the negative relationship between anxiety and computer self-efficacy (e.g., [90,28]), suggesting the importance of the relationship between anxiety and ability dimension of e-trust. Specifically, self-service IS suggests that ability dimension of e-trust can be enhanced by the increased self-control or self-efficacy, influenced by reduced system anxiety. Hackbarth et al. [37] found that both hedonic needs (playfulness) and computer anxiety are significant mediators of the effect that system experience has on perceived ease of use, one of the important antecedents of ability dimension of e-trust. These

negative effects of anxiety on ease of use and system perception are stronger and wider than the positive effects by hedonic needs [37]. Thus, we hypothesize that;

H4c. System Anxiety will have a negative effect on Ability in e-Trust.

The perceived Web quality with service contents reflects the structural assurance (e.g., customer service information, customer policies, privacy, and dispute details) of the website. Structural assurance is an assessment of success due to safety nets such as legal resources, guarantees, and regulations that exist in a specific context [65]. Gefen et al. [34] explained that institution-based trust antecedents, such as structural assurances, are the most powerful antecedents to integrity of e-trust. Using a unidimensional e-trust, Gefen et al. [34] found that the effects of structural assurance ($\beta = .37, p < .05$) on e-trust are higher than the other antecedents, such as calculative and knowledge based antecedents. Privacy concerns (control and awareness) of online consumers are also negatively related to integrity dimension of online trust [60]. Given the positive relationship between structural assurance and integrity dimension, we hypothesize that;

H5a. Perceived Web Quality with Service Contents will have a positive effect on Integrity in e-Trust.

Pennington et al. [75] found that structural assurance with self-reported vendor guarantees affect system trust ($\beta = .31, p < .05$), while the other mechanisms, such as third party seals and customer ratings, showed insignificant relationship to trust. Self-reported vendor guarantees assume that the vendor has a caring and good intention towards customers, which is related to benevolence of e-trust. McKnight et al. [66] also found that perceived website quality positively influences the overall trust including benevolence. Specifically, we investigate the relationship between perceived Web quality based on the self-report vendor guarantees and benevolence dimension of e-trust. We hypothesize that;

H5b. Perceived Web Quality with Service Contents will have a positive effect on Benevolence in e-Trust.

Social contract theory [24,27] argues that norm-generating micro-social contracts must be grounded in informed consent, buttressed by rights of exit voice with the control. For example, social contract theory suggests that a firm's collection of personally identifiable data in the self-service systems is perceived to be fair only when the consumer is granted control over the

information and the consumer is informed about the firm's intended use of the information [60]. An equitable exchange involving a long-term relationship (loyalty and trust) should be accompanied by shared understanding about contractual terms and self-control over the course of the relationship, which should be based on the ability of confirming these controls by vendors [60]. Thus, we argue that the perceived Web quality with service contents (customer service and privacy) would influence the ability dimension of e-trust. This study hypothesizes that;

H5c. Perceived Web Quality with service Contents will have a positive effect on Ability in e-Trust.

3. Method

The online survey with undergraduate business students in the northern region of the U.S. was implemented with 325 students who voluntarily participated in the experiment. The participants are students who are taking an introductory MIS course from 2004 to 2005. We gave a bonus point, added to the participants' final exam score, as an incentive to participate in this experiment. The experiment was conducted in an Internet classroom, as suggested by Gefen [32]. Students were approached in an Internet-connected classroom, where each student had his/her own PC. After the short explanation on the online purchasing processes by the instructor, the students were asked to navigate to www.amazon.com, and go through the procedure of purchasing a book without actually submitting the purchase transaction. There was no guideline for navigation, because we hope to give the students the free and voluntary experiences of the website. Next, the students were asked to complete the experimental instrument of an online survey based on their experiences with the website. The main objective of this experiment was to refresh the participants' memory without manipulating the participants or creating trust. It took around 20 min for the participants to navigate the website and 25 min to complete the survey. Table 1 shows the sample demographics ($n = 325$) of this study. The participants are young (22.36 years) undergraduates who mostly (94%) experienced e-commerce purchase on the Web. Male and female are almost the same proportion in the sample, and most of them (86%) use Internet more than 4 h in a week.

All of the measurement items are adapted and revised from the previous research, such as perceived Web quality measures, affective variables in IS adoption, and online trust, as we explained in the hypotheses section (see the detailed instrument items in the Appendix 1). In

Table 1
Sample demographics ($n=325$)

Demographics		Percentage of respondents
Age		22.36 years (S.D. 3.18 years)
Gender	Male	44%
	Female	56%
e-commerce purchase experience	Yes	94%
	No	6%
Internet use hours in a week	Less than 4 h	14%
	4–20 h	65%
	More than 20 h	21%

the pilot test, we collected the valid items with more than .70 composite reliability (Cronbach's alpha) and more than .50 item-to-total correlations [70]. Based on the pilot test results with these criteria, we excluded two items in perceived Web Quality and one item in system anxiety. All the questionnaire items used a 5-point Likert-type scale where 1 = completely disagree, 3 = neither agree nor disagree, and 5 = completely agree. The perceived Web quality with service contents was adapted and revised from Aladwani and Palvia [3]. After the validation of items with the initial data set, three items out of the original five items remained in the final analysis. The perceived enjoyment was adapted from Davis et al. [21] with three items. The system anxiety (state) was adapted from Hackbarth et al. [37] with three items. The online trust constructs were adapted from Gefen [32], including benevolence, integrity and ability dimensions. All of instruments for each construct composed of more than three items in the model.

4. Analysis and results

The proposed model and hypothesis testing was conducted using PLS (Partial Least Squares) Version 3.0 [15] and AMOS 6.0 to test the measurement model because PLS and AMOS can be regarded as complementary. Whereas covariance-based SEM tools such as LISREL and AMOS use a maximum likelihood func-

tion to obtain parameter estimates, the component-based PLS uses a least squares estimation procedure, allowing reflective latent constructs, while placing minimal demands on measurement scales, sample size, and distributional assumptions [15]. PLS reports internal composite reliability and average variance extracted (AVE) for content validity and discriminant validity. Based on covariance analysis, like LISREL, AMOS is more confirmatory in nature and it provides various overall goodness-of-fit indices to assess model fit for convergent validity [11].

SEM is a flexible and powerful extension of the general linear model. Like any statistical method, it features a number of assumptions. These assumptions should be met or at least approximated to ensure trustworthy results. A good rule of thumb is 15 cases per predictor in a standard ordinary least squares multiple regression analysis [87]. Since SEM is closely related to multiple regression in some respects, 15 cases per measured variable in SEM is reasonable. Consequences of using smaller samples include more convergence failures (the software cannot reach a satisfactory solution), improper solutions (including negative error variance estimates for measured variables), and lowered accuracy of parameter estimates and, in particular, standard errors — SEM program standard errors are computed under the assumption of large sample sizes. Thus, our sample size of 325 is more than the minimum number of sample size, 270 (i.e., 18 items multiplies by 15), for the AMOS estimation procedures.

Table 2 shows the internal consistency reliabilities and correlations among constructs based on PLS analysis. As recommended, the internal consistency reliabilities were all higher than .7 without exception (the minimum was .82), and the diagonal elements (square root of the variance shared between the constructs and their measures) were all higher than .707 (the minimum was .77) and also higher than correlations between target constructs and other constructs without exception.

Table 2
Internal consistencies and correlations of constructs

Construct	ICR	Web quality	Enjoyment	Anxiety	Integrity	Benevolence	Ability
WebQuality	.82	.77					
Enjoyment	.94	.32	.92				
Anxiety	.91	-.17	-.22	.88			
Integrity	.89	.30	.31	-.30	.86		
Benevolence	.90	.35	.23	-.15	.54	.87	
Ability	.87	.32	.32	-.32	.50	.38	.83

Note. Diagonal element is the square roots of AVE and should be larger than the off-diagonal and $>.707$ for the convergent and discriminant validities. Internal Consistency Reliability (ICR) should be larger than .70.

Table 3
Factor structure matrix of loadings and cross-loadings

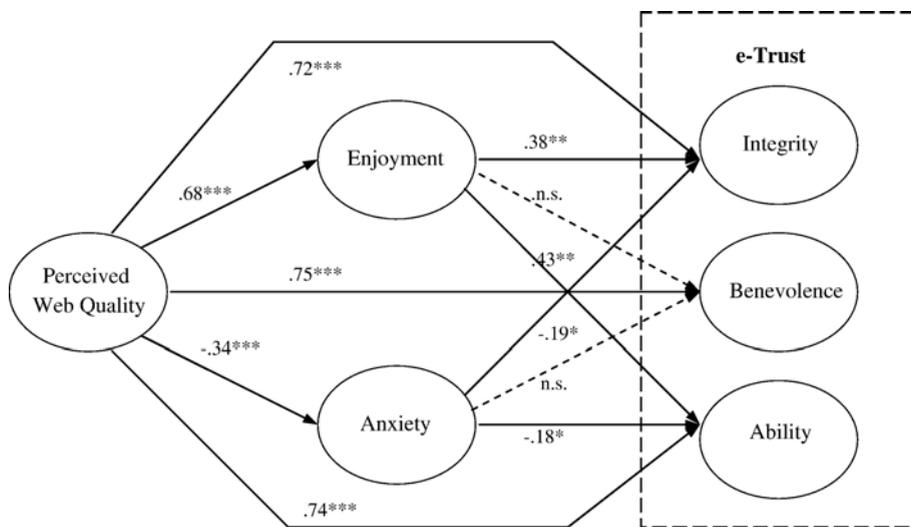
	Web quality	Enjoyment	Anxiety	Integrity	Benevolence	Ability
WebQuality1	0.809***	0.230	-0.115	0.228	0.293	0.203
WebQuality2	0.755***	0.263	-0.215	0.260	0.281	0.309
WebQuality3	0.753***	0.249	-0.040	0.189	0.227	0.199
Enjoyment1	0.290	0.928***	-0.199	0.327	0.210	0.329
Enjoyment2	0.289	0.923***	-0.245	0.231	0.164	0.256
Enjoyment3	0.305	0.902***	-0.162	0.283	0.249	0.298
Anxiety1	-0.073	-0.137	0.823***	-0.214	-0.096	-0.209
Anxiety2	-0.168	-0.188	0.940***	-0.319	-0.154	-0.324
Anxiety3	-0.195	-0.241	0.881***	-0.232	-0.146	-0.284
Integrity1	0.270	0.299	-0.254	0.864***	0.367	0.415
Integrity2	0.237	0.244	-0.221	0.861***	0.467	0.433
Integrity3	0.256	0.248	-0.280	0.847***	0.553	0.440
Benevolence1	0.325	0.216	-0.186	0.501	0.887***	0.305
Benevolence2	0.285	0.187	-0.064	0.381	0.820***	0.298
Benevolence3	0.300	0.194	-0.140	0.513	0.903***	0.382
Ability1	0.260	0.227	-0.378	0.431	0.297	0.848***
Ability2	0.164	0.241	-0.215	0.350	0.265	0.819***
Ability3	0.341	0.337	-0.181	0.455	0.369	0.834***

Note. (***) $p < .001$) Loadings on their respective constructs are highlighted and more than .707.

Table 3 presents the factor structure matrix of the study variables that was developed by PLS and SPSS. Demonstrating strong convergent and discriminant validity, all items exhibited high loadings ($>.707$) on their respective constructs, without exception (the minimum was .753), and no item loaded higher on other constructs than the one it was intended to measure,

without exception. Collectively, the psychometric properties of the constructs were considered excellent.

Since the primary interest of the study is to test the theoretical relationships (i.e., structural regression paths) hypothesized in the theory model, the structure model were tested using AMOS 6.0. The result of the structure model assessment is presented in Fig. 3.



Note. * $p < .05$, ** $p < .01$, *** $p < .001$; Chi-square=238.073, RMSEA=.055, NFI=.920, TLI=.947, CFI=.958, GFI=.923, AGFI=.891

Fig. 3. AMOS test of proposed model.

Table 4
Summary of model fit indices

Model fit	Suggested value	Structure model
Chi-square		238.073
Chi-square significance	$p \leq .05$.000*
Chi-square/d.f.	<5.0	1.984*
RMSEA [38]	$\leq .06$.055*
NFI [48,51]	>.90	.920*
TLI [38]	$\geq .96$.947
CFI [8]	$\geq .90$.958*
GFI [46]	>.80	.923*
AGFI [46]	>.80	.891*

Note. * satisfy the suggested value.

Supporting H1, perceived Web quality had a significant positive effect on enjoyment. Supporting H2, perceived Web quality had a significant negative effect on anxiety. Supporting H3a and H3c, enjoyment had significant positive effects on integrity and ability dimensions of e-trust. Supporting H4a and H4c, anxiety had significant negative effects on integrity and ability dimensions of e-trust. However, enjoyment and anxiety did not show the effects on benevolence, not supporting H3b and H4b. Supporting H5a–c, perceived Web quality had significant effects on all three dimensions of e-trust. All of hypotheses are supported by the data analysis of AMOS, except for the effects of enjoyment and anxiety on benevolence (H3b and H4b).

The goodness-of-fit indices provide empirical evidence of the degree of correspondence between the proposed model and the standardization data [48]. The Root Mean Square Error of Approximation (RMSEA) index takes into account the error of approximation in the population, which ranges from 0 to 1, with zero indicating no error. Typically, the RMSEA index is lower than .08 for a good fit and lower than .06 indicates an excellent fit [10]. The following standards to assess model fit are generally accepted: the Normed Fit Index (NFI) greater than .90 [48,51], the Tucker–Lewis Index (TLI) greater than or equal to .96 [38], the Comparative Fit Index (CFI) greater than or equal to .90 [8], the Goodness of Fit Index (GFI) greater than .80, and the Adjusted Goodness-of-Fit Index (AGFI) greater than 0.80 [46]. As shown in Table 4, The RMSEA, NFI, CFI, GFI, and AGFI fit indices surpass the suggested value for a good model. TLI (.947) is also close to the suggested value of .96. Overall, the goodness-of-fit indices successfully support the proposed model.

5. Discussion

Before we discuss the results and findings in this study, we admit that there are several limitations in this

study. First, we used the undergraduate student samples in the data collection. Obviously, undergraduate students are not the only potential e-commerce consumer. However, students are one of the major book buyers on the Internet and show the typical pattern of online consumer behavior [32]. The generalizability of this study's result should be further validated with the different types of samples in future research. Second, this study used only one famous online retailer website, Amazon.com, rather than multiple websites in the test. However, Amazon.com has a lot of trust mechanism and contents that can be tested in the experiment of users' perceptions in this study. Furthermore, we carefully followed Gefen's [32] experimental design, which used also Amazon.com as a target website, to enhance the validity and comparability of the results. Future research should be followed with the different websites and e-commerce model, such as an online auction marketplace [74] or information searching websites [16].

Third, the current study includes only one of the four dimensions of Aladwani and Palvia's [3] perceived Web quality, specific content, and excludes the other dimensions. Although we selected only the perceived Web quality with service contents because this study focuses on the online consumer's perception on the customer service/privacy based on the website interface and functions, we concur that this can be raised as a potential limitation of the study. The potential relationships among the other dimensions of perceived Web quality, such as technical adequacy, content quality, and perceived quality, and the constructs in this study are out of the range of the current study and should be investigated in future research. Fourth, we did not include the control variables in this study (e.g., type of books, price, and previous experience with Amazon.com), which are expected to potentially influence the result. Given that the online consumer's e-trust is influenced by these control variables, the interpretation of the results should be limited. Future study should investigate these important control variables with the proposed model in this study. Finally, the causality between trust and anxiety can be arguable. Although we theorize that anxiety has a negative effect on e-trust, it can be argue that e-trust can reduce the system anxiety. Given that this study depends on the cross-sectional test with the causality based on the theoretical assumption, future study can investigate these causal relationships with the longitudinal test analysis.

The findings in this study clearly show the important role of affective reactions on the e-trust development. The model and results show that, in addition to the direct effects of enjoyment and anxiety on e-trust, there are

partial mediating effects of affect in the relationship between perceived Web quality with service contents and e-trust. Specifically, the mediation effects of enjoyment and anxiety on integrity as well as ability dimensions of e-trust are supported, while the effects of enjoyment and anxiety on benevolence are not supported.

There are several academic implications based on these findings. First, the perceived Web quality with service contents is empirically supported as an important antecedent of e-trust and affective reactions in the customer self-service IS domain. As suggested in the self-service systems literature (e.g., [64]), customer's perceived enjoyment and control of the self-service systems are an important mechanism to enhance perceived service satisfaction or trust. Website service is an effective methodology to influence the enjoyment and control, as well as reduce the anxiety of the system. Structural assurance [34] and social contract theory [24] clearly support the relationship between website quality and trust mechanism. This is the first empirical study to add affective reactions (enjoyment and anxiety) as mediators in these relationships, using the self-service systems logic. Based on the results of this study, positive side of affect to build e-trust, without human contact in the sales process, should be investigated further in IS research. Customer self-service and consumer behavior literature also suggests the importance of positive affective reaction in developing e-trust. More research should be followed regarding how to increase the enjoyable feeling or mood in the process of online purchase (e.g., moderating effects of advertisement and customer feedback on the website), as well as the alternative antecedents of perceived enjoyment and anxiety. For example, Chung and Tan [16] showed that there are three main antecedents of perceived playfulness of the website: cognitive aspect, website characteristics, and motivation for searching. In addition to website characteristics, studied in this paper, cognitive and motivational antecedents, such as cognitive absorption [1] and personal innovativeness in IT [2], should be investigated further to make the model complete, since customer self-service system would be influenced by not only affective factors but also cognitive or motivational factors.

Second, this study is the first empirical test to link affective reactions to e-trust in the IS literature. To respond to the call for the investigation of the influence of affect on IS and human–computer interaction variables [88,99], this study emphasized the role of affects (enjoyment and anxiety) to explain e-trust, one of the most important variables in online consumer

behavior. The findings of this study show that, as suggested by Zhang and Li [99], affective reactions should be further investigated to completely understand the consumer's behavior, particularly in the e-trust development process. Flow theory [1] and resource allocation theory [93] helped to understand these relationships between affect and trust. A lot of current literature on hedonic systems (e.g., [22,85]) in IS and e-commerce domains also supports these relationships. Given the complex relationships among cognition, anxiety, and environmental factors based on the social cognitive theory, further investigation in these complex relationships should be followed. For example, other cognitive variables, such as computer self-efficacy, can be included in the model to increase the variance of the affective variables.

Third, the findings of this study show the effects of enjoyment and anxiety on integrity as well as ability dimensions of e-trust. However, the model does not show the effects of enjoyment and anxiety on benevolence. Interestingly, several trust literature (e.g., [4,25,30,72]) suggests that there are two dimensions of trust: (1) credibility (ability, competence, reliability, honesty, or integrity) and (2) benevolence (good will trust). Furthermore, Ganesan [30] and Pavlou [72] empirically showed that there are two distinct constructs that have different relationships with other variables: credibility and benevolence. Although we adopted a three-dimensional view of e-trust based on the Mayer et al. [64] and Gefen [32], a two-dimensional view of buyer–seller trust also suggests that competence and integrity often collapse under the umbrella of seller credibility, while benevolence has been examined separately because of its exclusive buyer–seller nature [72]. Credibility (integrity and ability) describes a buyer's expectations about a seller's transactional behavior, while benevolence is a buyer's confidence in a seller's goodwill and caring intention [78]. Thus, our findings suggest that benevolence is a more complex dimension of e-trust and is more directly influenced by perceived Web quality with service contents rather than mediated by negative affective reactions such as anxiety. One of possible explanation of this finding is that, as benevolence is focusing on buyer–seller relationship and goodwill trust, the perception of this trust is influenced directly by the sensitive perception of website quality with service contents, rather than mediated by affective reactions in the trust building process. More research on this topic would be beneficial.

The model and results of this study clearly show some practical implication for IS designers and e-commerce managers. One of possible implications for

website designers would be the guidance that enhancing the enjoyable experience, as well as reducing anxiety of website functions, should be emphasized to increase e-trust. For example, Lands' End's several innovative functions on their website, such as "My Virtual Model", "My Personal Shopper", and "Shop with a Friend", focus on the enjoyable shopping experience in the online purchasing process. "My Virtual Model" is a visualization of the customer on which selected merchandise could be displayed; "My Personal Shopper" employs a sophisticated modeling tool to make personalized recommendations based on responses to a few questions; "Shop with a Friend" permits friends to shop together from different locations on the Lands' End website [43]. This study supports possible relationships among these enjoyable shopping experiences and the increased online trust. Another possible implication for IS developers is the inclusion of affective consideration in the system development lifecycle [100,40]. One easy way to enhance affective reactions, such as increased enjoyment and decreased anxiety in the human-computer interaction, is the seller-guaranteeing customer privacy content based on structural assurance, as suggested by Pennington et al. [75] and confirmed by this research. Furthermore, this website content develops the e-trust, the most important aspect of e-commerce success.

6. Conclusion

The results of the study point out the partial mediating effects of enjoyment and anxiety in the relationship between perceived Web quality and e-trust, based on the IS, marketing, and psychology literature. Flow theory, social contract theory, social cognitive theory, resource allocation theory, and trust theory are successfully integrated in the model. The overall hypotheses in this study are supported by the relatively large number of data set ($n=325$). Research on e-trust is an important issue to practitioners, such as website designers, and researchers. The enhanced customer loyalty supported by the high perceived Web quality with service contents would be related not only to e-trust, but also to a company's short-term, as well as long-term, performance [60,83]. Future research can include the additional antecedents of enjoyment and anxiety, such as social or cultural factors, in the model to make our understanding complete. The research model and empirical findings in this paper would be valuable to e-commerce designers and researchers, who hope to understand and enhance e-trust mechanism with the e-commerce systems and e-CRM environment.

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Appendix A. Instrument Items (Note *: deleted items in the pilot test)

Perceived Web Quality with Service Contents:

In [Amazon.com](#)'s web site, one can easily find information related to customers' policies (e.g., privacy and dispute details).

In [Amazon.com](#)'s web site, one can easily find details about products and/or services.

In [Amazon.com](#)'s web site, one can easily find information related to customer service.

* In [Amazon.com](#)'s web site, one can easily find contact information (e.g., email addresses, phone numbers, etc.).

* In [Amazon.com](#)'s web site, one can easily find firm's general information (e.g., goals, owners).

Perceived Enjoyment:

I would find using [Amazon.com](#) to be enjoyable.

Using [Amazon.com](#) would be pleasant.

I would have fun using [Amazon.com](#).

Systems Anxiety:

It scares me to think that I could cause to destroy a large amount of information by hitting the wrong key in [Amazon.com](#).

I hesitate to use [Amazon.com](#) for fear of making mistakes that I cannot correct.

[Amazon.com](#) is somewhat intimidating to me.

* I feel apprehensive about using [Amazon.com](#).

Benevolence:

I expect that [Amazon.com](#) has good intentions toward me.

I expect that [Amazon.com](#)'s intentions are benevolent.

I expect that [Amazon.com](#) is well meaning.

Integrity:

Promises made by [Amazon.com](#) are likely to be reliable.

I do not doubt the honesty of [Amazon.com](#).

I expect that [Amazon.com](#) will keep promises they make.

Ability:

[Amazon.com](#) understands the market they work in.

[Amazon.com](#) knows about products.

[Amazon.com](#) knows how to provide excellent service.

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