DETERMINANTS OF E-COMMERCE CUSTOMER SATISFACTION, TRUST, AND LOYALTY IN SAUDI ARABIA

Mustafa I. Eid
Department of Accounting & MIS
College of Industrial Management
King Fahd University of Petroleum and Minerals
meid@kfupm.edu.sa

ABSTRACT

Managing customer trust, satisfaction, and loyalty attitudes of e-commerce services is very important for the long-term growth of many businesses. Previous research has shown that e-retailers experience difficulty maintaining customer loyalty despite the recent rapid growth in Business to Customer (B2C) e-commerce applications. Numerous studies have empirically examined B2C e-commerce customer trust, satisfaction, and loyalty attitudes in various countries. Nevertheless, empirical research on these key constructs of e-commerce in developing Arab countries is generally limited. Thus, the main objective of this paper is to identify the factors that influence the extent to which Saudi consumers trust, are satisfied with, and are loyal towards B2C e-commerce. This study draws on previous research to build a conceptual framework which hypothesizes relationships between these three e-commerce constructs and their antecedents. A survey was conducted among B2C e-commerce customers in the eastern province of Saudi Arabia using a structured self-administered questionnaire. The findings of this study show that B2C e-commerce customer loyalty in Saudi Arabia is strongly influenced by customer satisfaction but weakly influenced by customer trust. The study limitations, implications, along with directions for further research are discussed.

Keywords: B2C e-commerce, e-retailer, customer trust, customer satisfaction, customer loyalty

1. Introduction

The Internet and Web development have been the most exciting developments in the field of information and communications technology in recent years. With increasing Internet access, the use of e-commerce services by the population is booming globally and locally in Saudi Arabia. The most recent estimate of e-commerce spending in Saudi Arabia (taken in 2010) is SR12 billion [The Arab Advisors Group 2009], the largest in the Arab world. According to [Wikipedia 2010], the currently estimated population of Saudi Arabia is around 28 million. It has been reported by the Arab Advisors Group [2009] that Saudi Arabia's IT sector is growing at a rate of 9.3%. Furthermore, the report showed that 3.5 million internet users or 14.26% of the Saudi population were engaged in e-commerce transactions. The results of the report indicate the country's emergence as an ideal market for e-commerce activities among the developing countries in the Middle East region.

At a global level, customer loyalty (e.g. customer retention) is generally very strongly related to the profitability and long-term growth of a firm [Reichheld 1995]. Small increases in customer retention rates can dramatically increase profit [Huffmire 2001]. Loyal customers visit their favorite websites twice as often as non-loyal customers, and loyal customers spend more money [Dialscore.com 2000]. According to analysts, 35 to 40% of e-commerce website sales revenue comes from repeat visitors [Rosen 2001]. As such, it is not surprising that customer loyalty has been found to be a critical asset for e-retailers. Reichheld and Schefter [2000] found that the high cost of acquiring new online customers could lead to unprofitable customer relationships for up to three years. Consequently, it is very useful to determine the key antecedents or factors that influence customer loyalty.

Previous research found that e-retailers experience difficulty maintaining customer loyalty despite the recent rapid growth in B2C e-commerce [Hoffman and Novak 2000]. Although there are certainly challenges shared by both traditional retailers and e-retailers, e-retailers face greater competition due to the fact that on the Internet a competitor is only a click away [Mithas, Ramasubbu, Krishnan, and Fornell 2007]. Therefore, attracting and retaining the attention of online shoppers who skim virtual shelves is not an easy task, and without a strong incentive for online shoppers to visit a website and without an anchor to keep customers on it, e-retailers may struggle retaining them in an increasingly competitive e-market. However, what can logically improve customer loyalty

though is maximizing customer satisfaction and trust. This study generally focuses on the empirical examination of customer loyalty, satisfaction, and trust in B2C e-commerce.

Acknowledging the importance of e-commerce customer retention, numerous studies have empirically examined consumer satisfaction, trust, and loyalty for B2C e-commerce services in various countries [Anderson and Srinivasan 2003; Park and Kim 2003; Flavia´n and Guinalı´u 2006; Cyr 2008; Kim, Donald, and Raghav Rao 2009]. Nevertheless, apart from the study by Kassim and Ismail [2009] empirical research on antecedents of e-commerce customer satisfaction, trust, and loyalty in developing Arab countries is limited. Thus, the motivation of this study is to determine key antecedents that influence e-commerce customer satisfaction, trust, and loyalty in Saudi Arabia. In addition, it aims to determine whether user interface quality, information quality, privacy, and security risk are direct antecedents of both customer trust and satisfaction, and indirect antecedents of loyalty in B2C e-commerce. The study also identifies the demographic characteristics that may influence Saudi consumer decisions towards the adoption of B2C e-commerce. Furthermore, it addresses the data analysis approach and sample size limitations of an earlier study conducted by the author [Eid and Al-Anazi 2008].

In what follows, the research questions and the significance of the study are discussed. The research questions are:

1. Do Saudi customers perceive B2C e-commerce website user interface quality, information quality, privacy, and security risk as key factors influencing satisfaction and trust?
2. Do Saudi customers perceive B2C e-commerce customer satisfaction and customer trust as key factors influencing customer loyalty?

A review of the literature revealed that, to date, no research has been conducted on the influence of customer satisfaction and trust on customer loyalty towards B2C e-commerce in a developing country such as the Kingdom of Saudi Arabia. Understanding the factors that influence e-commerce customer loyalty assists firm managers with focusing their efforts on key areas in their e-commerce businesses which contribute most to increasing customer retention. Thus, the results of this study will be relevant to various businesses providing e-commerce services in the Kingdom. From an academic perspective, this study provides insights that will improve our understanding of the impact of various factors related to e-commerce customer loyalty in the context of Saudi Arabia as one major developing country in the Middle East. The study will add value to the literature of e-commerce firstly in terms of improving our understanding of the impact of website user interface design, information quality, e-privacy, e-security on both variables e-satisfaction and e-trust. Secondly by comparing the relationships between e-satisfaction, e-trust, and e-loyalty in Saudi culture with international cultures.

The literature review section first examines existing literature on the relevant theories which provide the grounding for the proposed research model. Secondly, it provides a detailed discussion about hypothesized relationships between e-commerce customer satisfaction, trust, and loyalty and their antecedents to build a conceptual framework (theoretical research model). This is followed by the research method and data analysis and findings sections. The paper concludes with discussing the key findings and their implications, limitations, and suggesting future research directions.

2. Literature Review

2.1. Theoretical Background

The theory of reasoned action (TRA) [Fishbein and Ajzen 1975] explains the relationship between attitudes, intentions and behaviors. The TRA model posits that human beings make rational decisions based on the information available to them, and the best immediate determinant of a person's behavior is intent which is the cognitive representation of readiness to perform a given behavior [Ajzen and Fishbein 1980]. Accordingly, information quality provided by the B2C e-commerce website contents can greatly affect the intention to purchase. Also, if the information provided by the website is reliable and accurate, then this will increase online customer satisfaction and trust which will lead the customer to make the initial purchase. Thus customer satisfaction and trust in e-commerce websites can affect consumer retention or customer loyalty positively.

According to the TRA model, an individual’s belief towards a behavior is an immediate determinant of his or her intention to perform a behavior [Fishbein and Ajzen 1975]. Mayer, Davis, and Schoorman [1995] further extended the TRA theory to support the modeling of customer trust. In addition, based on the Technology Acceptance Model (TAM) [Davis 1989] and TRA theory, McKnight, Choudhury and Kacmar [2002] proposed a model of e-commerce customer trust. According to TAM, the intention to accept or use a new technology is determined by its perceived usefulness and perceived ease of use. In their model, Mcknight et al. posits that trusting beliefs (perceptions of specific vendor website attributes) leads to trusting intentions, which in turn influences trust-related behaviors.

Expectation-Confirmation Theory (ECT) was proposed by Oliver [1980] to study consumer satisfaction and repurchase behavior. The ECT theory states that consumers firstly form an initial expectation prior to purchase, and then build perceptions about the performance of the consumed product/service after a period of initial consumption. Next, consumers will decide on their level of satisfaction based on the extent to which their expectation is confirmed through comparing the actual performance of the product/service against their initial expectation of the performance. Consequently, satisfied consumers will form repurchasing intentions. Similarly, when customers have confirmed their expectation that an e-commerce website is trustworthy, they will be more motivated to repurchase from the same e-commerce website.

2.2. Factors Influencing Satisfaction, Trust, and Loyalty

Gummerus, Liljander, Pura and Van Riel [2004] define the user interface as the channel through which consumers are in contact with the e-service provider. Park and Kim [2003] found that the quality of the user interface affects the customer satisfaction directly, since it provides physical evidence of the service provider's competence as well as facilitating effortless use of the service. Because of its importance to customer satisfaction, Tan, Tung, and Xu [2009] identified fourteen key factors for developing effective B2C e-commerce websites. Also, Gummerus et al. [2004] suggested that the quality of a user interface is expected to affect trust directly. Similarly, Roy, Dewit, and Aubert [2001] found that ease of navigation, interface design, and user guidance affect consumer establishment of trust.

Srinivansan, Anderson, and Pannavolu [2002] proved that the interactivity aspect of e-commerce applications is strongly related to customer loyalty. Cyr [2008] investigated the effect of B2C e-commerce website user interface design factors (such as information design, navigation design, and visual design) on trust and satisfaction across three developed countries; Canada, Germany, and China. Cyr found these user interface design variables are key antecedents to website trust and website satisfaction across cultures. Also, Alam and Yasin [2009] found from their study in Malaysia that website user interface design is strongly related to customer satisfaction.

Product/service information quality is defined as the customer perception of the quality of information about the product/service that is provided by a website [Park and Kim 2003]. Website content quality has been argued to be an antecedent of online customer trust [Mcknight et al. 2002]. In addition, Park and Kim [2003] found that the information quality affects customer satisfaction directly. The study by Cyr [2008] found different results for different cultures. Cyr found that while information design significantly influences trust in Canada, but not in Germany and China, it significantly influences website satisfaction in all three cultures.

Kolsaker and Payne [2002] maintain that security reflects perceptions regarding the reliability of the payment methods used and the mechanisms of data transmission and storage. The lack of security as perceived by e-commerce consumers represents a risk and a main obstacle to the development of e-commerce [Dong-Her 2004]. Flavia´n and Guinal´u [2006] demonstrated that trust in the Internet is particularly influenced by the security perceived by consumers regarding the handling of their private data. Websites may increase consumer trust by decreasing perceived environmental risk or by raising security [Warrington, Abgrab, and Caldwell 2000].

Perceived privacy is defined as consumers' ability to control presence of other people in the environment during a market transaction or consumption behavior and the dissemination of information related to or provided during such transactions or behaviors to those who were not present [Goodwin 1991]. Flavia´n and Guinal´u [2006] demonstrated that trust in the Internet is particularly influenced by the privacy perceived by consumers regarding the handling of their private data. Privacy is a critical factor in acquiring potential online customers and retaining existing customers [Park and Kim 2003]. Thus, privacy can also be a critical factor in customer satisfaction of e-commerce services.

Customer trust can be defined as a set of beliefs held by an online consumer concerning certain characteristics of the e-supplier, as well as the possible behavior of the e-supplier in the future [Coulter and Coulter 2002]. Lee and Lin [2005] suggested that trust encourages online purchasing and affects customer attitudes towards purchasing from e-retailers. Loyalty contributes to the ongoing process of continuing and maintaining a valued and important relationship that has been created by trust [Chaudhuri and Holbrook 2001]. Cyr [2008] found website trust is strongly related to loyalty in Germany and China, but weakly related in the case of Canada. In addition, Kim et al. [2009] conducted a longitudinal study in the U.S and found that online customer trust is strongly related to loyalty.

Customer satisfaction is how satisfied a customer is with the supplied product/service. It is closely related to interpersonal trust [Geyskens, Steenkamp, Scheer, and Kumar 1996]. In line with earlier research [Zins 2001], it is expected that a higher level of customer satisfaction will lead to greater loyalty. However, the impact of satisfaction on customer loyalty is rather complex. Fisher [2001] believes that customer satisfaction accounts for only part of why people change product or service providers. Other studies have shown that customer satisfaction is a leading factor in determining loyalty [Anderson and Lehmann 1994]. Anderson and Srinivasan [2003] found that both trust and perceived value, as developed by the company, significantly accentuate the impact of satisfaction on e-

commerce loyalty. In a more recent study by Cyr [2008] it was found that website satisfaction is strongly related to loyalty in three countries: Canada, Germany, and China.

Generally, loyalty has been defined as the repeat purchasing frequency or the relative volume of same-brand purchasing. Oliver [1997] defines customer loyalty as a deeply held commitment to re-buy or re-patronize a preferred product/service consistently in the future, thereby causing repetitive same brand or same brand set purchasing, despite situational influences and marketing efforts having the potential to cause switching behavior. In e-commerce, loyal customers are considered extremely valuable. Today, e-retailers are seeking information on how to build customer loyalty. Loyal customers not only require more information themselves, but they serve as an information source for other customers. Building customer loyalty is one of the biggest challenges for B2C e-commerce. Several antecedents of customer loyalty have been proposed. Customer satisfaction and trust have been brought forward as a precondition for patronage behavior [Pavlou 2003] and the development of long-term customer relationships [Papadopoulou, Andreou, Kanellis, and Martakos 2001]. The study by Kassim and Ismail [2009] found that services quality and vendor's assurance to online customers in Qatar, contribute to building trust and satisfaction thereby improving customer loyalty. The present study predicts that both customer satisfaction and customer trust will correlate positively with customer loyalty in Saudi Arabia.

2.3. Characteristics of Saudi Arabia

Saudi Arabia is one of the most important markets in the developing Arab world with respect to the foreign e-retailers, even though the Internet user penetration rate in this country was relatively low 5% of the population in year 2003 (which is estimated to be around 1.4 million Internet users) [Sait, Al-Tawil, and Hussain 2004]. In year 2004, the penetration rate increased slightly to 6.8% (approximately 1.6 million Internet users) [Abdul-Muhmin and AL-Abdali 2004]. Then, the number of Saudi Internet users reached 3.5 million in 2009 [The Arab Advisors Group 2009] which represents a sharp increase in the user penetration rate, 23.8% over the five years from 2004 to 2009. This sharp rise in the number of Internet users over the past five years can be attributed to increasing purchase power of Saudi people and the development of the Saudi information and communications technology infrastructure as a result of the sharp rise in crude oil prices between 2004 and 2009. An additional reason for selecting Saudi Arabia is that a high level of cultural and social homogeneity prevails there. Almost 100 per cent of the Saudi population, 20 million according to a 2006 statistic speaks Arabic which is a member of the western branch of the Semitic Family of languages. It is the religious and literary language of Islam. In addition, almost all of the inhabitants are Muslim. The combination of common language and common religion has led to a common sense of heritage and cultural unity among the Saudis.

An Arab Advisors group [2009] report attributed the boom in e-commerce use to a substantial growth in the number of Internet users, many of whom have become familiar and confident with using credit cards for online transactions. Results also indicated a substantial increase in e-payment companies, the inclusion of new sectors such as airlines in e-commerce transactions, and the immense popularity of electronic interactive games. The document noted that the youth represents 50% of the Saudi population and that regional e-commerce has grown 300% in the past two years. According to the Arab Advisors group [2009] report, the Saudi government support was recognized as a key factor in domestic e-commerce growth. The Saudi Monetary Agency established the SADAD payment system which is a nationwide network that processes electronic payments from the population throughout the Kingdom. The payment system is backed by the Saudi government's commitment to support highly secured financial transactions over the Internet.

2.4. Demographic Differences in B2C E-Commerce Adoption

Many studies have been concerned with identifying the characteristics of online customers. Factors investigated in this respect have included demographics [Verchopoulos, Siomkos, and Doukidis, 2001], psychographics [Sin and Tse 2002], and attitudes [George 2002]. For example, Verchopoulos et al. [2001] found that adopters of Internet shopping in Greece have generally been young, highly, educated, high-income earning males who have previously used it. Sin and Tse [2002] found that adopters in Hong Kong have similar demographic profiles, in addition to being more time-conscious, self-confident, and heavier users of the Internet. In the case of Saudi Arabia, Abdul-Muhmin and AL-Abdali [2004] found that the adoption of B2C e-commerce is greater among older, highly educated, high-income respondents. Next, the research model and hypotheses will be described.

2.5. Research Model

This section discusses the conceptual research framework and related hypotheses based on the research questions and literature review. The research model hypotheses are listed below:

The perceived user interface quality construct is defined as the Saudi consumer perception of user interface quality. The TAM [Davis 1989] theory can be applied to embed the modeling of the relationship between user interface quality and the customer satisfaction of e-commerce websites. Perceived usefulness and perceived ease of

use of e-commerce websites can lead to accepting and satisfying intentions and then influence customer satisfaction behavior towards an e-commerce website. Thus, it can be hypothesized that:

H1a: An increase in perceived user interface quality (UIQ) will have a direct positive effect on customer satisfaction (ECS).

Following Mcknight et al. [2002] it can be hypothesized that perceived usefulness and perceived ease of use of an e-commerce website can lead to trusting intentions and then influence trust behavior in that e-commerce website. Accordingly, the TAM and TRA [Fishbein and Ajzen 1975] models are applied here to embed the modeling of the relationship between user interface quality attributes of e-commerce websites on trust in B2C e-commerce vendors. Thus, it can be hypothesized that:

H1b: An increase in perceived user interface quality (UIQ) will have a direct positive effect on customer trust (ET).

The perceived information quality construct is defined as the Saudi consumer perception of quality of information about products/services that are provided by a website. Based on the above discussion in the theoretical background section, the TRA theory can provide the theoretical ground for modeling the relationships between information quality and both customer satisfaction and trust in a B2C e-commerce context. If the information provided by the website is reliable and accurate, then this will increase online customer satisfaction and trust which will lead the customer to make the initial purchase. Thus, it can be hypothesized that:

H2a: An increase in perceived product/service information quality (IQ) will have a direct positive effect on customer satisfaction (ECS) behavior.

H2b: An increase in perceived product/service information quality (IQ) will have a direct positive effect on customer trust (ET) behavior.

The perceived security risk of the e-commerce website construct is defined as the Saudi consumer perception of security of an electronic commerce transaction. Security is basically an important factor usually taken into consideration by online customers. The TRA model can be applied here to support the modeling of the relationship between website security and both customer satisfaction and customer trust. A high level of security provided by an e-commerce website can lead to satisfying intensions which influences satisfaction behavior. The same argument may be applied here, in that a greater level of security and good security features provided by an e-commerce website can lead to trusting intensions which influences trust behavior. Thus, it can be hypothesized that:

H3a: As the perception of security risk (PSR) decreases, customer satisfaction (ECS) is expected to increase.

H3b: As the perception of security risk (PSR) decreases, customer trust (ET) is expected to increase.

The perceived privacy is defined as the Saudi consumer perception of ability to control the presence of other people in the environment. Privacy is another factor which is considered by most online customers. It is possible to apply the TRA model here to support the modeling of the relationship between website privacy and both customer satisfaction and customer trust. More privacy provided by an e-commerce website can lead to satisfying intensions which influences satisfaction behavior. Also, a greater level of privacy provided by an e-commerce website can lead to trusting intensions which influences trust behavior. Thus, it can be hypothesized that:

H4a: As the perception of privacy risk (PP) decreases, customer satisfaction (ECS) is expected to increase.

H4b: As the perception of privacy risk (PP) decreases, customer trust (ET) is expected to increase.

The perceived e-commerce customer satisfaction is defined as the Saudi consumer satisfaction with the provided e-commerce applications. The perceived e-commerce customer trust is defined as Saudi consumers' willingness to rely on an exchange partner in whom one has confidence. The perceived e-commerce customer loyalty is defined as the Saudi consumer willingness to visit e-commerce websites more frequently and keep purchasing. The ECT theory Oliver [1980] is used here to embed the modeling of the relationships between both customer satisfaction and customer trust with customer loyalty. Customer satisfaction and trust in e-commerce websites can affect consumer retention or customer loyalty positively. Thus, it can be hypothesized that:

H5: An increase in customer satisfaction (ECS) will have a direct positive effect on customer loyalty (ECL).

H6: An increase in customer trust (ET) will have a direct positive effect on customer loyalty (ECL).

The research model depicted in Figure 1 shows two key mediating variables influencing Saudi consumer loyalty towards B2C e-commerce; e-customer satisfaction and e-customer trust. Moreover, in order to gain insight into the factors influencing e-loyalty, we distinguish between four different antecedents. The research model depicts the hypothesized relationships. In the proposed research model, Saudi consumer loyalty is hypothesized and personalized to be influenced by Saudi consumer experiences with satisfaction and trust of a B2C e-commerce service. The nature of these experiences in turn is affected by the perceived user interface quality, the perceived product/service information quality, the perceived security risk, and the perceived privacy. The perceived user interface quality, information quality, security risk, privacy, customer satisfaction, trust, and loyalty are treated in the data analysis section as latent variables with multiple-scale measures.

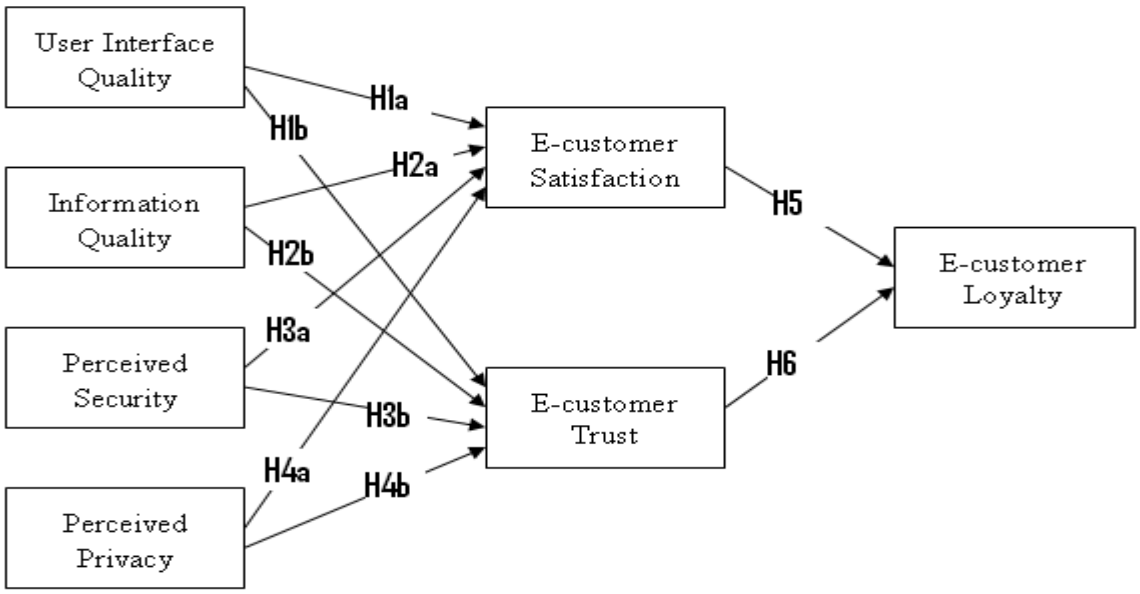

Figure 1: Research Model

3. Research Method

3.1. Measures

In a bid to test the research model and achieve the research objectives, a survey questionnaire was conducted among Saudi e-commerce customers in the eastern province of Saudi Arabia. The survey adopted a structured self-administered questionnaire instrument for data collection which reflected the conceptual framework depicted in Figure 1. To cater for the English and Arabic speaking respondents, the questionnaire comprised two columns, one written in Arabic and the other in English. In line with the research model in Figure 1, the questionnaire consisted of three parts. The first part included general questions pertaining to Saudi customer usage of B2C e-commerce. The second part aimed to seek Saudi e-commerce customer opinions to measure the study constructs in Figure 1 toward B2C e-commerce. Finally, the third part consists of responding Saudi e-commerce customer demographic characteristics, including age, gender, educational level, monthly income, and occupation.

Saudi consumer experiences with B2C e-commerce services were measured using a set of 31 scale items in the questionnaire (see Appendix A), adapted from prior studies but with slight modifications (see Table 1). All of the scale items were measured using a five-point Likert-type category-scaling format. For example, a five-point Likert-type scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree) was used to measure five constructs; UIQ, IQ, ECS, ET, and ECL. Whereas another five-point Likert-type scale (1 = Not Important At All, 2 = Not very important, 3 = Quite Important, 4 = Very Important, and 5 = Essential) was used to measure the PSR and PP constructs.

Although there have been some changes in the Saudi environment in the sense that the Kingdom now has a population census, it is still virtually impossible to draw probability samples for the majority of studies, including the present one. Consequently, most studies conducted in the Saudi environment have usually had to rely on convenience (non-probability) sampling procedure samples [Tuncalp 1988; Abdul-Muhmin 1998]. The use of a convenience sample was necessary in response to the problems of sampling prevalent in the Saudi environment. Such problems have been extensively documented in the literature [Tuncalp 1988; Yavas, Cavusgil and Tuncalp 1987].

Table 1 Construct Definitions and References

Construct	Definition	References
E-commerce User Interface Quality	Saudi consumer perception of user interface quality of an e-commerce service website	[Spiller and Lohse 1997; Van Riel et al. 2001; Park and Kim 2003; Gummerus et al. 2004]
E-commerce Information Quality	Saudi consumer perception of quality of information about products/services that are provided by a website	[Park and Kim 2003; DeLone and McLean 2003]
Perceived Security Risk	Saudi consumer perception of security of an e-commerce transaction	[Kolsaker and Payne 2002; DongHer 2004; Jones 2000]
Perceived Privacy	Saudi consumer perception of ability to control the presence of other people in the environment	[Goodwin 1991; Park and Kim 2003; Galanxhi-Janaqi and Fui-Hoon Nah 2004; Kelly and Erickson 2005]
E-commerce Customer Trust	Saudi consumer willingness to rely on an exchange partner in whom one has confidence	[Moorman 1993; Kolsaker and Payne 2002; Merrilees and Fry 2003]
E-commerce Customer Satisfaction	Saudi consumer satisfaction with the services provided	[Oliver 1997; Giese and Cote 2000]
E-commerce Customer Loyalty	Saudi consumer willingness to visit websites more frequently and keep purchasing	[Oliver 1997; Barroso Castro and Martı´n Armario 1999; Asuncio´n, Martı´n and Agustı´n 2004]

3.2. Data Collection

The survey sample comprised a random set of tertiary students from King Fahd University of Petroleum and Minerals (KFUPM) and working people coming from all parts of Saudi Arabia, but living in the eastern province of Saudi Arabia. The unit of analysis is the individual Saudi consumer who has experience with using B2C e-commerce services. To ensure generalization of the findings of this study, the questionnaires were administered based on convenience random sampling of KFUPM students and other subjects outside KFUPM. Of the 500 questionnaires distributed using the drop-off/pick-up method, 235 were picked-up resulting in a response rate of 43.6 %. Among the collected questionnaires, 17 were invalid resulting in 218 usable questionnaires. Table 2 lists an industry classification of e-commerce use by respondents. It shows that amongst the six investigated categories of e-commerce businesses the most popular for the respondents in Saudi Arabia are e-banking (75.7%), online airline ticket reservations (75.2%), online educational resources (51.8%), and trading of stocks (51.4%).

Table 2 Consumer Use of E-commerce Websites

Consumer Use of B2C E-Commerce Websites		Frequency	Percentage
E-Banking Services	Yes	165	75.7
	No	53	24.3
Booking of Airline Tickets	Yes	164	75.2
	No	54	24.8
Educational Resources	Yes	113	51.8
	No	105	48.2
Trading of Stocks	Yes	112	51.4
	No	106	48.6
Purchases of Books/Music/CDs/PCs	Yes	71	32.6
	No	147	67.4
Participation in E-Auctions	Yes	13	6.0
	No	205	94.0

Table 3 lists some descriptive statistics of the respondents' profiles (demographic characteristics) including age, gender, educational level, monthly income, and occupation. It shows that most of the respondents (71.6%) are students in KFUPM and that 28.4% are employees. As mentioned earlier, the students in KFUPM originated from different regions of Saudi Arabia. Similarly, large numbers of employees who work in the eastern province originated from different regions of Saudi Arabia since the eastern province is one of the labor intensive regions in

the Kingdom. Therefore, the sample can be considered a good representation of the population of Saudi Arabia. Also, 93.6% of the respondents are male, and the rest are female. The percentage of respondents with a monthly income of less than SR1000 is 45.5%. This is because most of the sample respondents, 71.6%, are students.

Table 3 Descriptive Statistics of Respondent Profiles

Measure	Item	Frequency	Percentage
Age	Less than 25	160	73.4
	25-40	53	24.3
	Greater than 40	5	2.3
Gender	Male	204	93.6
	Female	14	6.4
Educational Level	High school	14	6.4
	College graduate	184	84.4
	Graduate school	20	9.2
Monthly Income	less than 1000 SR	99	45.4
	1001 - 10000 SR	85	39.0
	10001- 20000 SR	26	11.9
	More than 20000 SR	8	3.7
Current Job	Student	156	71.6
	Employee	62	28.4

3.3. Data Analysis

For the purpose of data analysis, the Structured Equation Model (SEM) method has been adopted and the LISREL 8.5 program was utilized. The SEM method of data analysis is considered more appropriate to test the multi-level research model shown in Figure 1 since the SEM method applies multivariate analysis to the model in a holistic manner. SEM is a multivariate technique used to estimate a series of interrelated dependent relationships simultaneously [Hair, Anderson, Tatham, and Black 1998]. Basically, a structural equation model consists of two models: a measurement model and a structural model. The measurement model represents the used instrument (observed variables or items) to measure the latent variables which are the conceptual model constructs shown in Figure 1. The measurement model will be examined first for instrument validation, followed by an analysis of the structural model for testing relationships hypothesized in the research conceptual model depicted in Figure 1.

The overall fitness (validity of data to measure the latent variables) of the initial SEM can be assessed by employing the Goodness of Fit (GOF) indices. Several GOF indices are available to test the fitness of the SEM. If the GOF indices of the initial SEM could not reach the recommended levels, model refinements are required to improve the overall fitness. In this study, model refinements were performed by two methods. First, a systematic approach was used to eliminate low correlation paths and associated variables [Churchill 1979], and second, the interrelationship paths were revised or covariance error paths were added between the variables or latent factors. This method was needed to refine the SEM model with reference to the modification indices provided by the LISREL 8.5 program. After refinements, the model that performed well with regard to both GOF and the theoretical expectations was selected as the final SEM model.

3.4. Measures of Validity and Reliability

The measurement model for all seven constructs was assessed using confirmatory factor analysis (CFA) [Anderson and Gerbing 1988]. Appendix A, presents factor loadings of observed variables (the items/questions) used in the measurement model. All factor loadings exceeded 0.5. Four items in three constructs were deleted since they had loadings less than 0.5, indicating that the used items are strong measures of their associated constructs. The observed normative χ^2 for the measurement model was 316.64 (χ^2/df= 1.20; df = 294) which was smaller than 3 recommended by Bagozzi and Yi [1988]. Other fit indices include the goodness-of-fit index (GFI = 0.90) and comparative fit index (CFI = 0.97). They were very close or exceeding the recommended cut-off level of 0.9 [Bagozzi and Yi 1988]. The adjusted goodness-of-fit index (AGFI = 0.87) also exceeded the recommended cut-off level of 0.8 [Chau and Hu 2001].

The root mean square error of approximation (RMSEA = 0.019) is well below the cut-off level of 0.08 recommended by Browne and Cudeck [1993]. The combination of these results suggested that the measurement model exhibited a good level of model fit. Composite reliabilities and average variance extracted for each construct were also computed using the formulae [1]proposed by Fornell and Lacker [1981]. The results are shown in Table 4. The composite reliabilities were all above the recommended value of 0.7 suggested by Hulland [1999] thus

indicating acceptable internal consistency and reliability of the respective measures. Furthermore, the average variance extracted for each construct was above 0.5 indicating acceptable convergent validities [Smith and Barclay 1997]. Therefore, the measurement model demonstrated adequate convergent validity and reliability.

Table 4 Measure of Composite Reliability

Construct	Composite Reliability	Average Variance
Perceived User Interface Quality (UIQ)	0.860	0.723
Perceived Information Quality (IQ)	0.971	0.894
Perceived Privacy (PP)	0.989	0.948
Perceived Security Risk (PSR)	0.880	0.652
E-commerce Customer Satisfaction (ECS)	0.994	0.975
E-commerce Customer Trust (ET)	0.928	0.818
E-commerce Customer Loyalty (ECL)	0.864	0.684

[1]Composite reliability = $(\sum\lambda yi)^2/((\sum\lambda yi)^2 + Var(\varepsilon i))$ where $Var(\varepsilon i) = 1 - \lambda yi^2$, Average Variance $= \sum\lambda yi^2 / (\sum\lambda yi^2 + Var(\varepsilon i))$

3.5. Hypothesis Testing of the Structural Model

The second step was to examine the significance of each hypothesized path in the research model. The research model hypotheses were tested using ordinary least squares multiple regression equations provided by the LISRAL 8.5 computer program. The first equation tested the effects of each of the factors: UIQ, IQ, PSR, and PP on ECS. The results of the analysis are summarized in Table 5. The results show that UIQ and IQ are found to significantly influence ECS positively supporting H1a and H2a. However, the variables PSR and PP are found not influential in ECS, thus H3a and H4a are not supported. R^2 of the first equation is 0.62, which means most of the 62% of the variance in ECS is explained by UIQ and IQ variables.

The second equation tested the effects of each of the factors: UIQ, IQ, PSR, and PP on ET. The results in Table 5 show that the UIQ construct significantly influences ET, thus positively supporting H1b. The IQ latent variable does not significantly influence ET, thus H2b is not supported. The PSR and PP variables did significantly influence the ET construct, therefore supporting H3b and H4b respectively. R^2 of the second equation is 0.41 which means 41% of the variance in ET is mainly explained by the UIQ, PSR and PP variables. Also, the third equation tested the effects of both ECS and ET constructs on ECL.

Table 5 shows that ECS significantly influences ECL, thus positively supporting H5, while the ET construct is not influential in ECL. R^2 of the third equation is 0.53. Therefore, 53% of the variance in ECL is mainly explained by the ECS variable. A fourth regression equation was automatically generated to test the effects of each of the factors: UIQ, IQ, PSR, and PP on ECL. It was found that both UIQ and IQ significantly influence ECL. The β Coefficients are 0.3 and 0.62 respectively, and t-values are 2.42 and 4.05. R^2 of the fourth equation is 0.35 which means 35% of the variance in ECL is mainly explained by the UIQ and IQ variables. However, both PSR and PP were found to be not influential in ECL. Since UIQ and IQ are direct antecedents of ECS, and ECS was found to be a direct antecedent of ECL, then both UIQ and IQ can be considered indirect antecedents of ECL, and ECS can be considered to have a mediating effect between UIQ, IQ, and the ECL construct.

Table 5 Results of the Ordinary Least Squares Regression Analysis

Hypothesis	Independent Variable	Dependent Variable	β Coefficients and t-values	Hypothesis Test Result
H1a	UIQ	ECS	0.18(2.55)**	Supported
H2a	IQ	ECS	0.30 (3.30) ***	Supported
H3a	PSR	ECS	0.0062 (0.064)	Not Supported
H4a	PP	ECS	0.084 (0.79)	Not Supported
H1b	UIQ	ET	0.40 (2.85) ***	Supported
H2b	IQ	ET	- 0.11 (-0.85)	Not Supported
H3b	PSR	ET	- 0.35 (-1.67) *	Supported
H4b	PP	ET	0.88 (3.70) ***	Supported
H5	ECS	ECL	2.03(4.47)***	Supported
H6	ET	ECL	- 0.17 (-0.91)	Not Supported

* One-tailed probabilities: P < .05.
** One-tailed probabilities: P < .01.
*** One-tailed probabilities: P < .005.

The mediating assumption of each of the ECS and ET variables in the research model was tested using the approach outlined by Baron and Kenny [1986]. First a simple model was tested with direct paths between the UIQ, IQ, PSR, PP variables and ECL. This was then compared to the model when trust and satisfaction were added. Since the UIQ and IQ variables significantly influence ECL, and the R^2 value of 53%, which is the amount of variance explained in ECL by ECS, is 18% higher than the R^2 value of 35%, which is the variance in ECL explained by the UIQ and IQ variables, then ECS can be considered to play a partial mediator role between both UIQ and IQ, and the ECL construct. However, ECS plays no mediating role between the PSR and PP variables and ECL since PSR and PP do not influence either of the ECS or ECL variables. While ECS plays a partial mediator role between the UIQ and IQ variables and ECL, ET plays no mediating role between any of the UIQ, IQ, PSR, and PP variables and ECL since ET is found weakly related to ECL.

The generated correlation coefficients which represent the strength of the relationships between the study variables are shown in Table 6. It is obvious from Table 6 that the correlation coefficients of the relationships between the study variables which are found significant (as shown in Table 5) are all over 0.5. Furthermore, from Table 6, the correlation coefficient value of 0.707 between ET and ECS variables indicates these variables are strongly correlated since it is greater than 0.5. In addition, since that both PSR and PP are found to be strongly related to ET and weakly related to ECS, and ET is strongly correlated with ECS, then ET can play the mediator role between both PSR and PP and ECS.

Table 6 Correlation Matrix

	UIQ	**IQ**	**PS**	**PP**	**ECS**	**ET**	**ECL**
UIQ	1.000						
IQ	0.293	1.000					
PS	0.203	0.181	1.000				
PP	0.169	0.208	0.406	1.000			
ECS	0.752	0.808	0.231	0.290	1.000		
ET	0.677	0.172	0.825	0.632	0.707	1.000	
ECL	0.657	0.739	0.226	0.203	0.858	0.286	1

4. Discussion of Findings and Implications

4.1. Discussion of Findings

The results provide some support for the conceptual model presented in Figure 1. In particular, they support the premise that in Saudi Arabian culture, user interface quality and information quality of e-commerce services are important determinants of e-commerce customer satisfaction and also customer loyalty in B2C e-commerce markets. These results are in line with Park and Kim [2003] who found that the quality of the user interface and information quality of e-commerce services impact on e-commerce customer satisfaction directly. However, the study found that e-commerce service information quality does not impact e-commerce service trust, which contradicts with McKnight et al. [2002] who argued that website content quality is an antecedent of an online customer's trust.

While the perceived security risk and perceived privacy were found to be weak determinants of e-commerce service satisfaction, they were found to be strong determinants of e-commerce service trust. This means that perceived security risk and privacy in the perception of Saudi consumers are more important for e-commerce service trust but not for e-commerce service satisfaction. The user interface quality of e-commerce services factor was found to positively influence e-commerce service trust. This result is in line with the findings of Roy et al. [2001] who confirmed the influence of the e-commerce website user interface quality on customer trust. The information quality of e-commerce services was found to be a weak determinant of e-commerce service trust. This means that the quality of the user interface of e-commerce services in the perception of Saudi consumers is more important for an e-commerce service trust than the quality of information content. Also, the user interface quality and information quality of e-commerce services factors were found to significantly influence customer loyalty. This result supports the findings of Srinivansan et al. [2002] who found that the interactivity aspects of e-commerce applications are strongly related to e-commerce customer loyalty.

The study shows that customer satisfaction is a direct antecedent of consumer loyalty in B2C e-commerce. This finding is in agreement with the findings of previous research, which proved that higher levels of customer satisfaction will lead to greater customer loyalty [Anderson et al. 1994; Morgan and Hunt, 1994; Zins 2001]. The study also shows that e-commerce service trust is a weak determinant of consumer loyalty. That is, e-commerce service trust is an independent construct or concept of consumer loyalty in Saudi culture. This finding does not support the findings of a study by Flavia ń and Guinal ý ú [2006]. An explanation of the weak relationship between

e-commerce service trust and consumer loyalty could be that e-commerce service trust which is dependent on information security and privacy might be perceived by online Saudi customers as a standard and principle element of an acceptable e-commerce service. That is, regardless of how much an online customer trusts an e-commerce website, this will not affect his or her intention to keep doing business with that e-commerce service. However, information security, privacy, and trust are important for successful and effective e-commerce services. The findings show that for Saudi customers to be more loyal to the e-commerce business, they need to be impressed with the user interface quality and the provided information on the offered product/service, order customization, personalized Web pages, and valuable customer service and support provided by the e-commerce website. The identified weak relationship between trust and loyalty of Saudi B2C online customers corroborates the findings of Cyr [2008] who obtained a similar result for Canadian online B2C customers. However, Cyr found a strong relationship between trust and loyalty in the case of German and Chinese cultures. This means that like the Canadians who live in a developed country, Saudi online customers are not risk averse customers unlike the German and Chinese who were found to be risk averse. The findings indicate that different results of the relationship strength between trust and loyalty in B2C e-commerce vary by country regardless of the level of country development.

The weak relationships between the perceived security risk, perceived privacy, and customer satisfaction indicate that Saudi online customers consider these factors as indirect determinants for their satisfaction with e-commerce websites. However, e-commerce trust was found to play a complete mediating role between both perceived security risk and privacy and satisfaction. This implies that both the perceived security risk and perceived privacy influence satisfaction indirectly. Also, since user interface quality was found to be strongly related to trust, this means that Saudi online customers seem to consider the security symbols and features such as online payment processing and other privacy assurances as part of user interface quality aspects of e-commerce websites which may lead them to perceive the website as trustworthy. Thus, Saudi online customers were found to be trusting e-commerce websites based on the user interface features, and the level of security and privacy protection provided, but not information quality. Moreover, they are found to be satisfied with e-commerce websites based on the user interface features and information quality but not on the level of security and privacy protection provided. The study result with respect to the influence of user interface quality and information design on customer loyalty, which is found to be strong, is in line with Cyr's [2008] results in the case of Canadian customers (who are less risk averse similar to Saudi customers) but different from German and Chinese customers (who are high risk averse customers).

Qi and Yan [2009] found that Web experience, post purchase service, and brand effect significantly influencing the repeating consumer behavior in Mainland China and Hong Kong. This study finding with respect to the strong influence of user interface quality and information design on customer loyalty support the findings of the study by Fang and Qi and Yan assuming that Web experience is equivalent to user interface quality and the information provided to consumes in the post purchase service is equivalent to information quality. Apart from the studies by Cyr [200] and Fang and Li [2009], most studies on exploring the relationships between e-commerce trust, satisfaction, and loyalty and their determinants were conducted in single country or single culture. For example, the study finding of the strong influence of user interface quality on customer satisfaction is in line with the finding generated from the study by Alam and Yasin [2009] who found that website user interface design is strongly related to customer satisfaction in Malaysia. Thus, user interface quality of e-commerce websites is found a key determinant of trust and satisfaction, and loyalty in different cultures. Therefore, cultural values must be reflected in the design of e-commerce websites to achieve high level of customer trust, satisfaction, and loyalty. Examples of studies conducted on the cultural influence on the design of e-commerce websites include Singh and Baack [2004] and El-Said and Galal-edeen [2009].

In summary, the study's findings have answered the two study research questions and achieved its objectives. It represents one further step into testing the reality of the proposed theoretical research model in the context of the developing country of Saudi Arabia. The study's contribution to academia is in terms of confirming that user interface design quality and information quality are key factors for both customer satisfaction and loyalty for online customers in Saudi Arabia. Also, security and privacy issues and user interface design quality are key factors for trust in e-commerce websites. This research demonstrated the importance of design elements as they impact website satisfaction, trust, and e-loyalty for the Saudi online purchasing culture in a B2C e-commerce environment. The model as presented and tested demonstrates cultural diversity and is a reasonable starting point for future investigations. Also, while both trust and satisfaction are important precursors to success for online vendors, it appears these constructs vary across cultures regardless of the level of country development.

4.2. Implications for Practice

This study's findings have important practical implications for firms using e-commerce applications in Saudi Arabia. It should assist Saudi firms' managers to better understand what key factors/areas of e-commerce applications they ought to focus on in order to improve satisfaction, trust, and loyalty for online customers thereby

improving their e-commerce services and business success. For example, user interface design issues are important for developing e-commerce websites that can impact on customer satisfaction, trust, and loyalty of B2C e-commerce applications in Saudi Arabia. In addition, the study's finding that B2C e-commerce website user interface design quality strongly influences each of customer satisfaction, trust, and loyalty has practical implications for education too. It is expected that to achieve more successful IT education, educators should give more priority to courses of human computer interaction in general and to developing quality user interface design of e-commerce websites in particular.

4.3. Implications for Research

Because no study of this kind which examines this study's constructs and their relationships has existed in Saudi Arabia before, this study's insights will improve our understanding of the relationships between these constructs both globally and within Saudi Arabia. Also, comparing the relationships between e-satisfaction, e-trust, and e-loyalty in Saudi culture with international cultures will add more knowledge to the literature of e-commerce from an academic perspective.

5. Conclusions, Limitations, and Future Research Directions

5.1. Conclusions

This paper attempted to examine the determinants of each of the B2C e-commerce customer satisfaction, trust and loyalty in Saudi Arabia. A theoretical research model which hypothesizes the key factors influencing the three constructs is developed and statistically validated. The identified key factors are: the user interface quality, service information quality, security risk perception, and privacy perception. Both user interface quality and information quality of e-commerce websites were found to have a significant positive impact on consumer satisfaction. While it was found that user interface quality is strongly related to customer trust, information quality was not. It was also found that both perceived security risk and perceived privacy are strongly related to customer trust, but weakly related to customer satisfaction.

Furthermore, this study investigated whether customer satisfaction and trust play a significant mediating role on Saudi consumer loyalty in B2C e-commerce services. E-commerce customer satisfaction was found to significantly influence customer loyalty and to play the role of a partial mediator between each of the user interface quality and information quality constructs and customer loyalty. However, e-commerce customer trust was found to weakly influence customer loyalty. The user interface quality and information quality of e-commerce websites were found to be indirectly influencing Saudi e-commerce consumer loyalty. This emphasizes the importance of e-commerce service information content quality and user interface design in e-commerce application development. In addition, the level of security risk and privacy as perceived by e-commerce customers are important issues for customer trust and thus they are important to the development of B2C e-commerce in Saudi Arabia. Also, both the perceived security risk and perceived privacy influence satisfaction indirectly since trust was found to play a complete mediator role between each of the perceived security risk and perceived privacy and satisfaction. The user interface quality of e-commerce websites was found to significantly influence trust. This implies that Saudi online consumers perceive those e-commerce websites as trustworthy if they provide greater level of integrity, reliability and/or credibility in their user interface. This subsequently reduces consumers' concerns of privacy and helps to build online trust toward e-commerce websites.

Many studies have been concerned with identifying the characteristics of e-commerce customers. In this research, it was found that adoption of B2C e-commerce was higher among older, highly educated, and high-income respondents. In addition, from comparing the study findings with previous studies in other countries, it is obvious that consumer attitudes towards B2C e-commerce the developing country of Saudi Arabia are different from other international online consumers such as the Germans and Chinese with regards to trust in relation to loyalty but similar to other customers from the developed country of Canada. Thus, the level of country development is not significant with regards to online customer perceptions towards B2C e-commerce.

Although the research findings provide meaningful implications for both Saudi and international e-retailers in terms of highlighting the key factors/areas to focus on in e-commerce applications, this study is not without limitations.

5.2. Limitations and Future Research Directions

The sample largely employed male students, which may not be representative of the general population of B2C e-commerce consumers in Saudi Arabia. Also, the sample size is not large enough. Therefore, to increase validity and generalization of the study future studies should attempt a larger sample size with more responses from Saudi female e-commerce consumers. In addition, the present study has only covered the triangular cities of Dhahran, Khobar, and Dammam, which may limit the generalization of its findings. However, since the Saudi population is

culturally homogenous, the findings may be generalized to a limited extent to Saudi Arabia and the Gulf region. The present study has explained what makes Saudi consumers loyal towards B2C e-commerce.

For simplification reasons, factors such as Saudi customer value, Saudi purchasing culture, and government support and/or legislation for the protection of online customers, and customer support before and after the online purchase have been excluded from this study. Therefore, further studies may be carried out to investigate the effect of these factors on satisfaction, trust, and loyalty in Saudi Arabia. Also, future research to investigate the impact of the above suggested factors on trust, satisfaction, and loyalty across cultures in the Arabian Gulf offers opportunities for enhancing the online shopping in the Arabian Gulf region in general.

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APPENDIX A: Construct Measures

Construct	Scale Items	Loading
E-commerce Service User Interface Quality (UIQ)	A. The Web site is easy to use.	1
	B. The information on the Web site is not attractively displayed.	0.83
	C. The Web site is visually appealing.	0.5
	D. The Web site does not increase my search effectiveness.	0.73
E-commerce Service Information Quality (IQ)	A. The information on the Web site facilitates buying the products or services that it sells or markets.	1
	B. The Web site does not necessarily have to provide the up-to-date products and services information.	Deleted
	C. The Web site provides the relevant the products/services information.	0.92
	D. It is easy to complete the transaction on the Web site.	0.91
	E. The Web site presents information that is an easy to understand.	0.95
Perceived Security (PSR)	A. The Web site has mechanism to ensure the safe transmission of its users' information.	1
	B. The Web site has sufficient technical capacity to ensure that the data I send cannot be modified by hackers.	0.77
	C. Purchasing on the Web site will not cause financial risk.	0.65
	D. The electronic payment on the Web site is safe.	0.77
Perceived Privacy (PP)	A. The Web site abides by personal data protection laws.	1
	B. The Web site only collects user's personal data that are necessary for its activity.	0.78
	C. The Web site does not provide my personal information to others without your consent.	1.08
	D. I feel a safe when sending my personal information to the Web site.	1.05
	E. The Web site shows concern for privacy of its users.	0.93
E-Commerce Customer Satisfaction (ECS)	A. The performance of Web site meets my expectation.	1
	B. The Web site does not have sufficient experience in the marketing of the products and service that it offers.	0.94
	C. The Web site knows its users well enough to offer them products and services adapted to their needs.	1.13
	D. The Web site does not have the necessary resources to carry out its activities successfully.	0.86
E-Commerce Customer Trust (ET)	A. E-product/service provider is trustworthy and honest.	1
	B. E-product/service provider instills the confidence in his customers.	1.04
	C. E-product/service provider does not usually fulfill the promises and commitments he assumes.	0.61
	D. It is a problem to give the private information and the credit card number to the E-product/service provider.	Deleted
	E. The Web site does not behave opportunistically (e.g. gaining money illegally).	Deleted
E-Commerce Customer Loyalty (ECL)	A. I will continuously purchase from the Web site in the near future.	1.0
	B. I do recommend that others use the Electronic Commerce services.	0.74
	C. My preference for the Electronic Commerce would not willingly change.	0.71
	D. Changing my preference from the Electronic Commerce requires major rethinking.	Deleted

For UIQ, IQ, ECS, ET, ECL: 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, and 5 = Strongly Agree.
For PSR and PP: 1=Not Important at All, 2=Not Very Important, 3=Quite Important, 4=Very important, 5 = Essential