A customer loyalty formation model in electronic commerce

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ABSTRACT

Traditional commerce has been converted to modern or Electronic Commerce (E-commerce) by new technologies. The advantages of this transformation are less process time, cost, errors and mistakes for sellers and buyers. Companies lose their Electronic Customers (E-customers) due to the competitive business environment on the Internet. In this respect, Electronic Trust (E-trust), Electronic Satisfaction (E-satisfaction) and Electronic Loyalty (E-loyalty) play vital roles. In addition, acquiring new loyal customers requires time and money. In this research, a conceptual framework has been presented that shows E-loyalty formation based on E-trust and E-satisfaction. The model, which was formed based on the literature review, has been improved by factor analysis and the effect of every construct has been determined by regression analysis. The direct and indirect effects of organizational, technological and customer factors on E-loyalty were calculated by path analysis. The results show that technological factors have the most effect on E-satisfaction and the organizational factors have the most effect on E-trust.

1. Introduction

The frequent purchasing over a period of time with satisfaction toward a subject is defined as loyalty (Keller, 1993). Loyalty contains attitudinal and behavioral aspects. Jacoby and Chestnut (1978) conceptualized loyalty and discussed the behavioral aspects with a focus on repurchase. The result of the decision making process for buying relates to the behavioral aspect of loyalty while the emotional aspect is disregarded in this domain of research. Experts should pay attention to real loyalty, which is based on commitment, and fake loyalty, which is derived from inertia (Dick and Basu, 1994). Loyal customers have commitment and attachment toward the seller, and are hardly attracted by the other alternatives or more attractive options. Willing to pay more, higher buying intent, and resistance to switch are the important loyal customer characteristics (Shankar, Smith and Rangaswamy, 2003). In this research, loyalty is defined as customer commitment and favorable attitude toward an online retailer, which leads to repurchase behavior. Satisfaction is defined as the pleasurable fulfillment accumulated over multiple transaction experiences, which comes from overall evaluation of the online retailer, while trust is defined as the confidence or belief that the merchant will not take advantage of the customer's vulnerability.

2. Related works

In the previous studies, E-satisfaction has frequently been mentioned as the main factor in the formation of E-loyalty (Anderson and Mittal, 2000; Eriksson and Vaghult, 2000). Despite the relation between satisfaction and loyalty, some experts have mentioned that in some cases, more than 50% of satisfied customers switch to another alternative (Jones and Sasser, 1995). To fill this gap, some scholars considered the importance of the role of E-trust in the formation of loyalty (Singh and Sirdeshmukh, 2000). The relationship between E-trust, E-satisfaction and E-loyalty is an important issue in online purchasing and E-commerce (Park and Kim, 2003). Long-time customer commitment, in other words, loyalty, brings long-term profit to the online sellers (Reichheld, Markey, and Hopton, 2000b). Some researchers believe that a close relationship between the buyer and seller shows a customer's E-satisfaction and satisfied customers are more loyal (Anderson and Srinivasan, 2003). Rechheld and Schefter focused on the role of E-trust to create E-loyalty. They mentioned that when a customer trusts the online retailer and discloses personal details it enables online companies to personalize their services and websites based on such information. In this situation, sellers are more familiar with the customer's needs and demands and can provide proper services and products accordingly (Reichheld et al., 2000b). Rexha, Kingshott, and Aw (2003) examined the sequence in the relation between E-trust, E-satisfaction and E-loyalty. Gummerus, Liljander, Pura, and Riel (2004) presented a model of E-loyalty, which showed the effect of E-trust on E-satisfaction and then E-loyalty. Table 1 shows the factors that the other researchers have mentioned in their studies.

In the different researches, different aspects of loyalty were considered. Lee et al. (2009) studied E-satisfaction based on the quality of system, service and information. Chang and Chen (2008) discussed customer interface quality based on system customization, interactivity and convenience. These factors have been considered in the technological group factors. Belief in benevolence, integrity, competence,

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Table 1
Critical factors in E-trust, E-satisfaction and E-loyalty.

Authors	Factors discussed by other researchers
Helander and Khalid (2000)	Usability, security, credit card security, easy return/exchange methods, price, detailed descriptions of items, secure personal information, pictures of merchandise, and simple to search.
Yu, Hsi, and Kuo (2002)	Customer orientation, market orientation, inter-functional coordination, competitor orientation, customization, service quality, number of service, communication, cooperation, collaboration, reliability, interaction, relationship, satisfaction, trust, and loyalty.
Corbitt, Thanasankit, and Yi (2003)	Site quality, degree of trust, market orientation, technical trustworthiness, and user's web experience.
Chan, Wolfe, and Fang (2003)	Product quality, delivery time, quantity, price/cost, and process transparency.
Gunasekaran and Ngai (2004)	In this paper the author classifies EC development risk in three main parts: 1 — technical factors, 2 — organizational factors, and 3 — environmental factors.
Kearns (2005)	Strategy types: defender, prospector, analyzer, or reactor–prospector and risk level.
Oppong, Yen, and Merhout (2005)	People, processes, culture, E-service trends, customer-oriented trends, employee megatrends, organizational trends, general technology trends, enterprise technology trends.
Thirumalai and Sinha (2005)	Product selection, website performance, customer support, ease of ordering, on-time delivery, product information, on-time delivery, price, and shipping and handling.
Hong and Zhu (2006)	Web functionalities, web spending, use of EDI, greater partner, perceived obstacles and systems
Lai (2006)	Responsiveness, reliability, security, credibility, competence, courtesy, access, communication, understanding the customer and tangibles.
Saadé and Kira (2007)	Ease of use in information technologies, using the technology acceptance model (TAM) and effect of previous computer experience on anxiety.
Chang and Chen (2008)	Including customization, customer interface quality, convenience and character, interaction, contributes to generating E-loyalty.
Lee, Choi, and Kang (2009)	Privacy, customer, expertise, low cost, ease, evaluation, strategy, services, speed, delivery, stability, security, variety, payment, plenty and low price
Chiou, Lin, and Perng (2010)	(1) responsiveness (RS), (2) ease of use (EU), (3) fulfillment (FF), (4) personalization (PL), (5) individualized attention (IA), (6) visual appearance (VA), (7) information quality (IQ), (8) trust (TT), and (9) security/privacy (SP)
Lu, Tsao, and Charoensiriwath (2011)	Retail price, manufacture services and competitive advantages
Qin (2011)	Private enterprises, trust sharing, government and family culture

perceived usefulness and ease of use were in Palvia's E-satisfaction model (Palvia, 2009). These subjects relate to customer group factors. Lai (2006) investigated the effect of organization responsiveness, empathy and assurance in E-commerce. These factors were placed in the organizational group factors. In this research, expedited paying with ease, buying 24 h and 7 days, using complementary systems, analyzing customer information, service and product information, providing language option, comparing and search facility, information and system quality and personalization of web features were the factors that influence E-satisfaction. The other technological factors, such as customer feedback facilities, complaint and follow-up facilities, customer bulletin boards, security of information and privacy were considered in the E-trust part of the framework. Perceived usefulness and ease of use are factors, which come out from the Technology Acceptance Model (TAM) (Gefen et al., 2003; Palvia, 2009). These two factors are in the customer group factors. Principle of least effort theory expresses that human beings, animals and even well design machines like to choose the least effort to achieve the goal. Convenience is the important issue in this theory (Egghe and Lafouge, 2006). Fast and easy payment is the factor that has been considered based on this theory. The aforementioned factors are samples of the classification of factors

in this research based on the literature review and interviews with experts. Table 2 shows the classification of factors based on E-trust and E-satisfaction in three groups — technological, organizational and customer.

3. Model and hypotheses development

Looking at these factors allows us to delve deeper into the nature of the factors and based on their effects the conceptual framework formed. Fig. 1 shows the research conceptual framework.

3.1. Technological factors

Technology is defined as the science or knowledge that puts into practical use in order to solve problems or invent useful tools. Technology refers to the characteristics and the abilities of the system, hardware and software in order to achieve a goal. Technology in E-commerce encompasses all aspects of the system, information, procedures and security and it is the main difference between traditional and online commerce (Al-Qirim, 2007). Technological factors can improve the efficiency of the business in the online environment. The technological

Table 2
Factors that influence E-satisfaction and E-trust.

|	Technology factors	Organization factors	Customer factors
E-satisfaction	System quality(9 items)	Customer segmentation	Perceived site quality
	Information quality(5 items)	Customize products	Customer experience in E-commerce
	Personalized web feature	Fast response to customer inquiries	Less time transaction
	Language options	Variety of goods and services	Perceived usefulness
	Search and comparing facilities	Rewards and discounts (2 items)	Perceived ease of use
	Product and service information		
	Using other systems(5 items)		
	Collecting and analyzing customer information		
	Fast and easy payment		
	Buying and selling 24 h and 7 days		
E-trust	Customer bulletin board	Clear shopping process	Perception of hardware and software reliability
	Security of information and privacy	Money back warranty	Perception of risk (10 items)
	Customer feedback facility	Contact interactivity	Perceived market orientation
	Complaint and follow up facility	Organizational reputation	Positive referrals from friends
		Guaranty policy	Belief in integrity
		Selling high regarded brands	Belief in competence
		Contribution with well known company	
		Tailored advertisement and promotion	
		Fast and safe delivery	
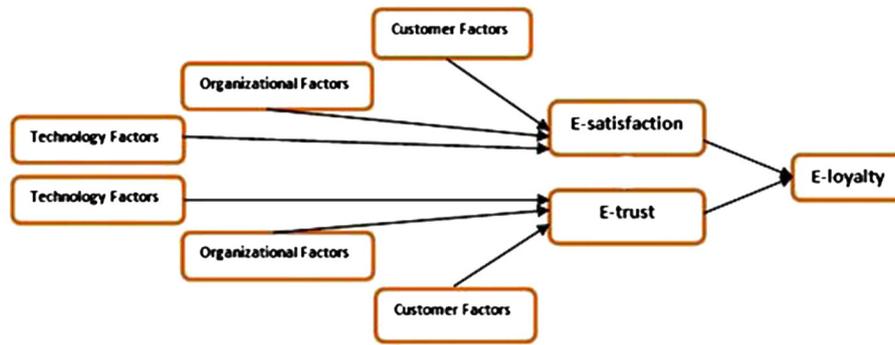
Fig. 1. E-loyalty conceptual framework.

factors were categorized into two groups. Safa and Ismail (2013) classified technological factors based on their effects on E-satisfaction and E-trust. The first group comprises the factors that influence E-satisfaction; these factors will be named Tec-sat factors in the framework. The second group consists of the factors that influence E-trust; these factors will be named Tec-tru factors in this research. Table 2 shows the classification of the factors clearly.

H1. Technological factors have a positive effect on E-customer satisfaction.

H2. Technological factors have a positive effect on E-customer trust.

3.2. Organizational factors

Rapid changes and uncertainty have led to a reassessment of direction, focus of companies and consideration of how customers learn and collaborate with new technology in online commerce. The factors that relate to the organizational aspects, characteristics or policies are defined as organizational factors. The mission and vision of the companies influence their policies. Undoubtedly, the main aim for most companies is to retain and increase the number of loyal customers. To determine the position of the organization in the marketplace, customers should trust them and be satisfied with deals (Yu et al., 2002). Molla and Licker (2005) believed that the organizational factors play a vital role in the success of E-commerce in the online environment. Some organizational factors influence E-trust and some factors influence E-satisfaction. The factors which relate to organization and influence E-satisfaction will be named Org-sat factors and the factors that influence E-trust will be named Org-tru factors in this research.

H3. Organizational factors have a positive effect on E-customer satisfaction.

H4. Organizational factors have a positive effect on E-customer trust.

3.3. Customer factors

Customers are one of the important entities in E-commerce and their perceptions about online companies change based on their previous experiences. Customers' belief, perceptions and mind set encourage them to use E-commerce (Hernández, Jiménez, and Martín, 2010). Some of these factors affect customer trust and some of them influence customer satisfaction, which will be named Cus-tru and Cus-sat in this model, respectively. Fig. 1 shows the conceptual framework.

H5. Customer factors have a positive effect on E-customer satisfaction.

H6. Customer factors have a positive effect on E-customer trust.

As mentioned in the literature review, trust and satisfaction influence E-loyalty either sequentially or in parallel.

H7. Customer E-satisfaction has a positive effect on customer E-loyalty.

H8. Customer E-trust has a positive effect on customer E-loyalty.

4. Research methodology

The most important steps in statistical analysis are recognizing the type of data (nominal, ordinal or interval), distribution of samples (normal or non-normal), the number of variables or groups and their status (depending or independent). Based on the above information, scholars can choose the proper statistical tests (HabibporGetabi and SafariShali, 2006). The type of data in this research are interval, and normality was examined with both numerical (kurtosis and skewness) and graphical methods (histogram graph). The measures of kurtosis between -1.629 and 0.39 and skewness between -1.429 and 0.691 change. The changes are between -2 and $+2$. Therefore, the distribution of samples is normal. Two kinds of hypotheses are usually considered in research. First, is relational, which shows the relation between one or several variables or groups, and, second, is causal, in which some variable(s), factor(s) or group(s) influence other depending variable(s) or group(s) (Landau and Everitt, 2004).

5. Data collection

The customers of online companies who had at least several online purchasing experiences were research samples. A questionnaire was provided by means of Likert scale and the participants were requested to fill out the questionnaires based on their experiences in online shopping. In addition, the electronic forms of the same questionnaire were sent to other participants' email. The number of participants was 273 which 19 questionnaires were discarded due to incomplete responses or giving the same rating to all questions. Finally, 254 questionnaires were considered for data analysis.

6. Demography

Table 3 depicts the demographic analysis of participants. The female and male participants are relatively equal with (48.4%) female and (51.6%) male. The most participants were between 30 and 39 (54.8%), followed by 20–29 (17.8%), 40–49 (25.7%) and (1.7%) above age 50. The level of education among participants was relatively high. Most of the participants were familiar with E-commerce and had three times experiences in the Internet shopping per month. The demographic of participants shows a variety in terms of online shopping experience, education, and age with almost equal representation of gender.

7. Data analysis

Data suitability was examined using the Kaiser–Meyer–Olkin (KMO) measure of sampling test. The measure of KMO test for all constructs

Table 3
Demography of participants.

Demography	Category	Frequency	Percent
Gender	Male	131	51.6
	Female	123	48.4
Age	20–29	45	17.8
	30–39	139	54.8
	40–49	65	25.7
	50 above	5	1.7
Occupation	University students	125	49.2
	Company employees		
	PHD	48	18.9
Education	Master	85	33.5
	Bachelor	121	47.6
Number of EC use	1	40	15.7
	2	47	18.5
	3	58	22.8
	4	46	18.1
	5	38	14.9
	6	11	4.4
	7	6	2.4
	8	4	1.6
	1	40	15.7
	9 above	4	1.6

Table 4
Factors reduction.

Variables	Extraction	Part of model
Money back warranty	0.475	Trust–organization factors
Organizational reputation	0.369	Trust–organization factors
Selling high regarded brands	0.468	Trust–organization factors
Contribution to well-known company	0.433	Trust–organization factors
Advertisement and promotion	0.451	Trust–organization factors
Perception of hardware and software reliability	0.419	Trust–customer factors
Belief in competence	0.489	Trust–customer factors

was more than 0.5 and Bartlett's test confirmed the constructs and data in terms of sphericity and adequacy (Habibpor and Safari, 2008). The reliability shows the stability of measures in different conditions (Nunnally, 1978). To determine the amount of error in every construct the Cronbach's alpha test was applied. The constructs with a higher Cronbach's alpha are more reliable in terms of internal compatibility among variables. The Cronbach's alpha for technological, organizational and customer factors was 0.845, 0.724 and 0.835, respectively. There are different definitions for interpreting Cronbach's alpha. Brown believed that 0.8 is the minimum acceptable value of this test (Brown, 1983). More generally, Nunnally considered 0.7 or above as the minimum

measure for Cronbach's alpha test (Nunnally, 1978). In this research, the measures of Cronbach's alpha for all constructs are close to Brown's recommendation and more than Nunnally's standard. Therefore, the reliability of the measures is satisfactory.

7.1. Factor analysis

In the exploratory factor analysis (EFA), scholars are interested in exploring the underlying or hidden dimensions that lead to correlations among the collected variables. However, in the confirmatory factor analysis (CFA), the researchers' interest is to test whether the correlations between variables are in line with the research hypotheses. Therefore, EFA deals with theory building and CFA with theory testing (Gaur and Gaur, 2006). The conceptual framework of the research is created based on the concept of the factors collected from the literature of review, interviews with experts, and the data collected via a questionnaire in which a Likert scale is used. In this research, CFA was applied to confirm the research framework and make a better fitting structure. IBM SPSS Statistics version 20 was used for data analysis. Principal Component Analysis (PCA) was used for extraction of the variables for which their measure in the communalities table and in the extraction column is less than 0.5. The extraction column shows the amount of variance that is common with the other variables' variance. In other words, the variance and effects on variance of a particular variable by all factors are shown in the communality table (Gaur and Gaur, 2006). Variables with more than 50% (more than 0.5) common variance with the other variables are suitable for factor analysis and should not be omitted (HabibporGetabi and SafariShali, 2006). Table 4 shows the variables that were omitted from the model in this step.

Now, the variables in the model have more consistency toward the main factors (technology, organization and customer). The factor loading shows the relations between the factors and variables produced by FA for each combination of observed variables. In other words, the factor loadings assist in recognizing which variables are associated with the particular factors (Gaur and Gaur, 2006). However, the factor loadings obtained from extraction do not present a clear image of the framework. It is important to identify the variables that load on different factors. Rotated factors help scholars to interpret the model better. Rotations help to realize a pattern of factor loading by maximizing high correlations and minimizing low ones. To obtain better results, the research framework is divided in two parts — the E-satisfaction section and the E-trust section. Factor reduction was applied based on the rotated table measures for the first part in one round and for the second part in two rounds to attain a model fit. In the next step, regression analysis was applied to determine the effect of each variable on E-satisfaction and E-trust.
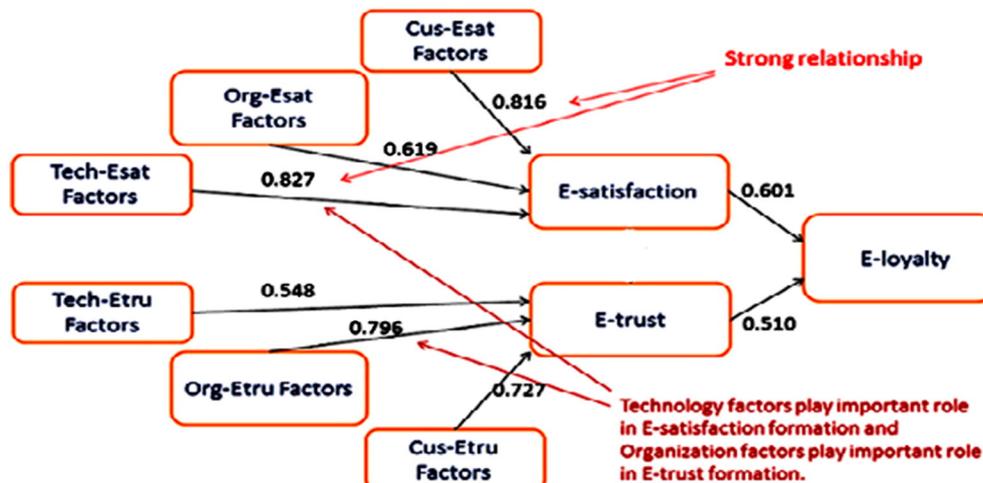

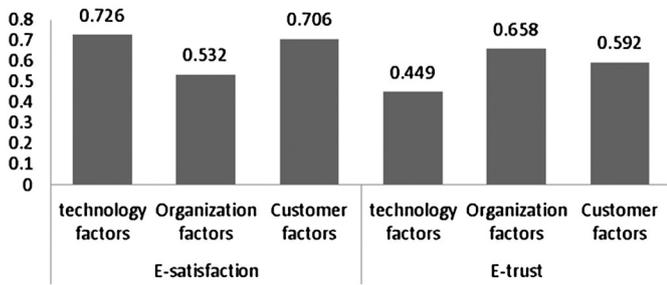**Fig. 2.** The results of regression analysis.

Fig. 3. The results of path analysis.

Table 5
The results of statistical analysis.

	Hypothesized relationship			R	F	Conclusion
H1	Technological factors	→	E-satisfaction	0.827	40.975	Supported
H2	Organizational factors	→	E-satisfaction	0.619	29.033	Supported
H3	Customer factors	→	E-satisfaction	0.816	50.738	Supported
H4	Technological factors	→	E-trust	0.548	34.328	Supported
H5	Organizational factors	→	E-trust	0.796	68.366	Supported
H6	Customer factors	→	E-trust	0.727	35.169	Supported
H7	E-satisfaction	→	E-loyalty	0.601	69.371	Supported
H8	E-trust	→	E-loyalty	0.510	56.631	Supported

F-test is significant at 0.000.

7.2. Regression analysis

Multi Linear Regression (MLR) helps to understand the effect of several independent variables on one dependent variable (Elliott and A. Woodward, 2007). In this research, the independent and dependent variables are quantitative. The main aim of MLR is to predict the effect of technological, organizational and customer variables (independent variables) on E-satisfaction and E-trust (dependent variable). Fig. 2 shows the results of regression analysis based on the research framework.

Co-linearity shows the effect of other independent variables on one independent variable. High co-linearity reveals that there are strong relations between the independent variables. Tolerance shows the linear relationship between independent variables (Kerr, Hall, and Kozub, 2002). The tolerance of variables changes between 0 and 1. The minimum and maximum of tolerance are 0.039 and 0.831 respectively, which means that there is no co-linearity among the variables in different constructs. Variance Inflation Factor (VIF) as another measure shows co-linearity (VIF = 1 / tolerance). Fig. 2 shows that the technological factors have the most effect on E-satisfaction and that organizational factors have the most effect on E-trust.

7.3. Path analysis

E-trust and E-satisfaction are moderating variables in the conceptual framework. Path analysis was applied to determine the direct and indirect effects of technological, organizational and customer factors on E-loyalty. Fig. 3 shows the different overall effects of the independent variables on the dependent variable when considering the moderators. The measures in the path analysis demonstrate that the technological factors, which influence E-satisfaction, have the most effect on E-loyalty. It also shows that the customer factors, which influence E-satisfaction, have the second most effect on E-loyalty and that the organizational factors that influence E-trust have the third most effect on E-loyalty.

8. Discussion and conclusion

Today, there are a huge number of transactions per hour for some businesses and the use of technology like E-commerce is indispensable. Reduction of time, cost, mistakes and errors, disadvantages of paper money and clearance in the E-commerce encourage firms and their customers to use E-commerce. However, online companies lose their customers because of the competitive business environment and E-customers are an important asset for all firms. Conversely, acquiring new loyal customers requires a lot of time and money. In this respect, E-satisfaction and E-trust play vital roles in the formation of E-loyalty.

The important aspect of this study is derived from the inclusion of different dimensions of technological, organizational and customer factors. Factor analysis helped to make a better model and regression analysis revealed that there are strong relationships between technological group factors and E-satisfaction (R = 0.827, Sig- = 0.000), organizational group factors and E-trust (R = 0.796, Sig- = 0.000) and also between E-satisfaction and E-loyalty (R = 0.601, Sig- = 0.000).

The results of path analysis showed that the technological group factors that influence E-satisfaction have the most effect (overall effect = 0.726) on E-loyalty; customer group factors, which influence E-satisfaction, have the second most effect (overall effect = 0.706) on E-loyalty, and, finally, organizational group factors, which influence E-trust, have the most effect (overall effect = 0.658) on E-loyalty. Table 5 shows the effect of all constructs on the E-satisfaction, E-trust and E-loyalty.

9. Limitations and future research

Generalization of the findings is one of the important aspects in every research. Non-complete random sampling was applied for data collection, because of the restrictions concerning access to online customers in the research environment. The generalization should be increased in the new research. International E-commerce is another aspect with particular characteristics that can improve the quality of this research. In this research, local E-commerce variables have been considered in the model. New technologies, such as voice and touch recognition devices, increase the ease of use and influence E-satisfaction. These subjects can also be new research aspects. Anxiety among some old and non-educated people was observed when participating in E-commerce. This subject can also be considered for future research. In spite of the above limitation, this study sheds some light on E-loyalty formation and describes the effects of technological, organizational and customer factors on E-satisfaction and E-trust in the form of a conceptual framework.

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