Customer perception toward electronic commerce systems in Vietnam

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C H R O N I C L E	A B S T R A C T
	Customer perceptions is considered to be one of the key factors determining the success of an enterprise e-commerce system. This study analyzed and pointed out the factors affecting customer perceptions for e-commerce systems in Vietnam through a combination of studies on factors affecting customer perceptions. From that, the authors also made a number of recommendations for Vietnamese enterprises in promoting customer perceptions about e-commerce systems. At the same time, the paper also proposes further research issues.

1. Introduction

The mainstays of history have been defined by the great leaps of human technology that touch all aspects of our way of life. These technologies, such as steam, electricity, and computers, are usually classified as a general-purpose technology (GPT) because of their profound effect on the economy and society. Electronic commerce (e-commerce) has only been used for a few commercials, but now it's clear that the consequences will be enormous and deserve a place among the GPTs of history. The First Industrial Revolution was constructed on steam, the second on electricity and the third on computing. We are on the brink of the Fourth Industrial Revolution, or Industry 4.0, driven by a combination of GPTs including artificial intelligence, virtual reality, connectivity, cloud computing and the Internet of Things (IoT) and e-commerce systems (Jovanovic & Rousseau, 2005). In the current economy, businesses are facing difficult to predict and respond to the rapidly changing demand of the market. In a competitive environment, the e-commerce systems are not only the dominant success, but also determine the survival of the enterprises. In Vietnam, e-commerce is currently an attractive field. It has attracted many people's attention and it has become one of the business forms that contributed greatly to economic development. In recent years, the mobile device connected to the internet, bank cards are growing rapidly in number. Therefore, Vietnam's e-commerce is entering a booming period with revenue of more than US $ 4 billion in 2015 and is expected to reach US $ 10 billion by 2020. However, Vietnam e-Commerce and Digital Economy Agency also said that e-commerce revenue in Vietnam is still low and only higher than Indonesia with US $ 2.6 billion in 2014. Along with e-commerce, e-commerce systems are developing and have great prospects in the future. Enterprises applying e-commerce and information technology are increasing in quantity and quality (Parasuraman et al., 1988). However, they still have not created trust and brand image for consumers for many reasons: Vietnamese purchasing habits, e-payment in Vietnam have not really developed, the customers' believes are not high, consumers are not satisfied with e-commerce systems of businesses. Therefore, this article aims to study the basic factors affecting customer perception of e-commerce systems of enterprises.

2. Literature Review and Hypothesis Development

There are many studies in the world about customer perception of products and services of businesses. Typically, there are studies of concepts, the role of customer perception, the study of the relationship between customer perception and the business activities of the businesses, with business performance results, research on conditions and factors affecting customer perception of products and services of enterprises. According to Hanna and Wozniak (2017), perception is the process of selecting, organizing, and interpreting sensations into a meaningful whole. In particular, sensation refers to the immediate response of senses such as sight, hearing, smell, taste and touch to stimuli such as light, color, sound. Perception is that process, the stimulants are chosen, organized and interpreted. Leon and Joseph (2018) also suggested that perception is the process by which an individual uses information to create a meaning picture of the world by selecting, organizing and interpreting. Accordingly, we can define customer perceptions of e-commerce system as the process of user selecting, organizing and explaining stimulants from the system to have a complete view of the whole e-commerce system. With the research of Solomon (2016), customer perception is formed by receiving the input information of the transaction process and using products and services through different senses, including sight, hearing, smell, taste and touch. Receptors receive stimuli from the external environment, organize and explain them to form perceptions. The customer perception process takes place in three main stages: receiving stimulants, explaining stimulants and responding to stimulants (Michael, 2016).

- Receiving stimulants: Stimulators are received through receptors. These agents draw attention to the people who are affected by it.

- Interpreting stimulants: After being received through receptors, the brain organizes and arranges these stimuli and explains it to give the most comprehensive meaning to the target.

- Reaction to stimulants: People have a view of the impact factors; the impact object will react to that object. From that form the perception.

According to Reidenbach and Reginald (2006), customer perception is formed based on information and market signals. Customer perception not only evaluates the products of businesses, but also the products of competitors. Understanding how customers evaluate their products against competitors will help businesses plan the most competitive strategies. A good customer perception means that the product of the business is worthy: If the product or service of the business is not worthy of what the customer spends to have them, the ability of the customer to continue buying is difficult. The perceived value is the driving force that determines customers' trade-offs.

Perceptive customer perceptions: It requires a process of reviewing and evaluating options. The perceived of customers is based on realistic and reasonable assumptions. Reidenbach and Reginald (2006) identified perceived value as a good strategic measure. For an information technology system, business capturing the perception of customers can improve the information system more effectively, in accordance with the needs and satisfaction of users. For a business website, a good customer perception helps to increase website visits, thereby increasing the number of products purchased through the system. A good customer perception also helps businesses indirectly market for their website through the current customers of the business. From there, we can give the role of customer perception for e-commerce system and for businesses as follows: Customer perception helps businesses grasp the customers' needs and interests, improve customer satisfaction thereby attracting more potential customers. Customer perception helps increase the brand value of the business, increase the ability of customers to buy again by creating more loyal customers. Thereby creating a more competitive advantage in the market.

2.1 Factors affecting customer perceptions towards e-commerce systems

The following summarizes the recent particular researches about the factors affecting customer perceptions towards e-commerce systems. Thus, customer perceptions for e-commerce system have not been studied, but there are quite a lot of researches on customer perceptions, customer satisfaction, customer loyalty towards the system information, e-commerce system, etc. implemented. Davis (1989) studied customer perceptions of usability, ease of use and user acceptance of information technology. This research has developed a model with two specific variables, the sense of usability and the feeling of ease of use. Davis (1989) carried out two studies with 152 users and 4 applications. The results show that ease of use and usability (including reliability and customization) had impacts on user acceptance of information technology. This result is consistent with the view of Radner (1975) that the system needs to be "easy to use" and the user "does not need to be highly qualified". Baasandulam and Kuo-Chung (2012) studied factors affecting customer satisfaction when buying online of Mongolian aviation. The study surveyed 138 passengers based on three Mongolian airlines, MIAT Mongolian airline, AeroMongolia, Eznis Airways. The majority of those surveyed were between the ages of 21 and 35, and 47.1% of those surveyed were students. The analysis showed that there were three important factors that influence customer satisfaction with the online ticketing system of Mongolian airlines, including: good site navigability, various interactive tools, fast and accurate payment authentication. Kumbhar (2011) studied factors affecting customer satisfaction with electronic banking system in India. Data were collected from 200 public and private clients in the city of Satara of Maharashtra between May and August 2010. The study used the Likert scale to survey and analyze data using SPSS 19.0, which outlines the key factors affecting customer satisfaction with the electronic banking system. From here we can also draw a few factors that affect customer perception of an overall e-commerce system such as: well organized and structured system, easy to follow categories and operation, meet the demands of many customers and the peace of mind of customers when using the system.

Hung et al. (2014) studied factors affecting customers' trust and satisfaction with e-commerce system, a case study at Muachung.vn system of Vietnam. The found 5 factors of service quality affecting customer satisfaction with Muachung.vn system including: ease of use, attractiveness and creativity of the system interface, accurate handling of activities, the system often develops new functions and is safe and secure. Kim et al. (2008) developed a theoretical framework describing the trust-based decision-making process a consumer uses when making a purchase from a given site, tested the proposed model using a Structural Equation Modeling technique on Internet consumer purchasing behavior data collected via a web survey, and considered the implications of the model. The results of the study show that Internet consumers' trust and perceived risk had strong impacts on their purchasing decisions. Consumer disposition to trust, reputation, interoperability concerns, security concerns, the ability to customize of the website, and the company's reputation, had strong effects on Internet consumers' trust in the website. Interestingly, the presence of a third-party seal did not strongly influence consumers' trust. Shahriari (2014) concentrated on different factors influencing e-banking customers' loyalty in India and concluded that service quality, trust, reliability, ease to use and satisfaction factors had various effects on customer perception. Quan and Duc (2014) investigated different factors influencing customers' trust in e-commerce websites in Vietnam and reported that e-commerce had positive influence on customers' trust through information on the website interface, website reliability, and organization's policies.
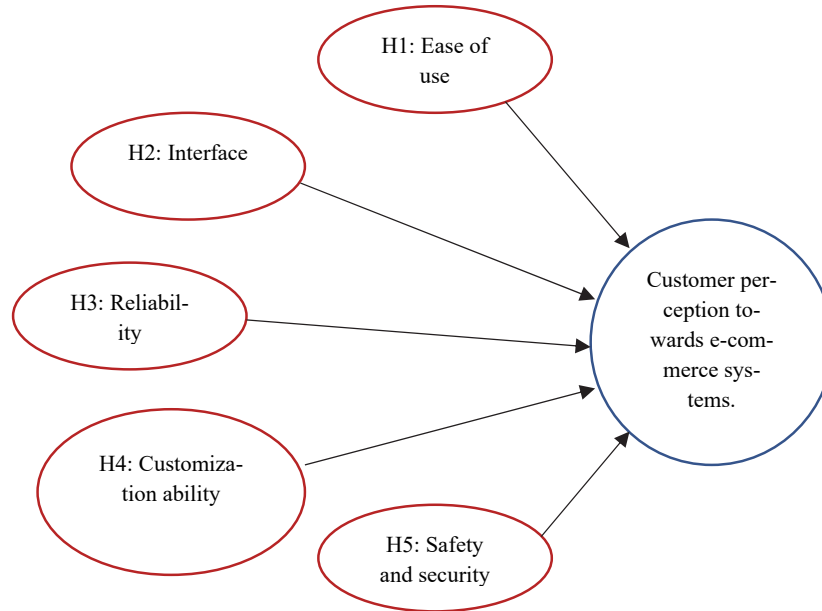

Fig. 1. Research Model (authors)

Fig. 1 demonstrates the proposed study of this paper. As these factors are summarized above, the authors propose a research model of the factors affecting for consumer perception for e-commerce systems in Vietnam including five hypotheses about the success factors for consumer perception towards e-commerce systems in the Vietnam companies. Compared to previous studies, this research framework is considered as more comprehensive and integrated one and thus providing one more voice for literature.

Hypothesis 1 (H1): Ease of use has positive impact on customer perception towards e-commerce systems.
Hypothesis 2 (H2): Interface has positive impact on customer perception towards e-commerce systems.
Hypothesis 3 (H3): Reliability has positive impact on customer perception towards e-commerce systems.
Hypothesis 4 (H4): Customization ability has positive impact on customer perception towards e-commerce systems.
Hypothesis 5 (H5): Safety and security has positive impact on customer perception towards e-commerce systems.

3. Research Methodology

3.1. Data and Sample

This study used primary data through questionnaire survey from August 2019 to November 2019. Respondents were senior managers of firms located mostly at Hanoi (Northern), HoChiMinh (Southern) and Danang city (Central). The questionnaire included multi-items designed to measure factors (Appendix). Each item was measured by 5 point Likert scale: 1 (strongly disagree) to 5 (strongly agree). Questionnaires were administered to 500 customers are using e-commerce systems in Vietnam. However, there were 315 returned questionnaires and valid to next analyses. Characteristics of the survey data are described in the Table 1.

Table 1
Characteristics of the survey data (N = 315) (summarized by authors from survey)

Data Characteristics	Frequency	Percentage (%) of respondents	Data Characteristics	Frequency	Percentage (%) of respondents
- Distributed by location			*- Occupational status*		
Hanoi	119	38%	Students	72	23%
HoChiMinh city	91	29%	Employee	198	63%
Danang	78	25%	Free labor	45	14%
Others	27	8%	*- Monthly income (USD)*		
- Gender			Less than 500 USD	93	30%
Male	123	61%	500 - 1000 USD	99	31%
Female	192	39%	More than 1000 USD	123	39%
- Age of the Respondent			*- Education background*		
Less than 20 years	45	14%	High school graduated	150	48%
21 – 40 years	210	67%	Graduated	102	32%
More than 40	60	19%	Post-graduated	63	20%
			Total (respondents)	315	100

3.2. Analytical Methodology

Authors used SPSS software to analyze collected data through 3 steps. Firstly, Cronbach's Alpha coefficients are used for testing the reliability of scales, the test determines the internal consistency or average correlation of items in a survey instrument to gauge its reliability. When it comes to reliability test, the data are considered to be reliable if Cronbach's Alpha coefficients are greater than 0.7. Secondly, Exploratory Factor Analysis (EFA) is used to uncover the underlying structure of a relatively large set of variables. EFA is a technique within factor analysis whose overarching goal is to identify the underlying relationships between measured variables. The authors perform this analysis because there is no priori hypothesis about factors or patterns of measured variables. In this test, all items which have Factor Loading greater than 0.5 will be kept. Finally, we finish analysis process by performing Linear Regression Analysis to test the validity of five hypotheses. The main purpose of regression analysis is used to describe the relationship among variables and predict the value of one variable given the values of the others.

4. Results and Discussion

4.1. Reliability Test

Table 2 shows results of the reliability test. The result is favorable because all Cronbach Alpha coefficients of factors including Easy to use (0.931), Interface (0.935), Reliability (0.960), Customization ability (0.0.939), Safety and security (0.866), and Customer perception (0.884) are much greater than 0.7 which is the standard acceptable value of factor reliability test.

Table 2
Reliability statistics

Measures	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
Easy to use			
F11	.760	.847	
F12	.779	.843	
F13	.666	.869	0.882
F14	.730	.854	
F15	.655	.871	
Interface			
F21	.885	.927	
F22	.857	.912	0.935
F23	.855	.913	
F24	.896	.900	
Reliability			
F31	.913	.947	
F32	.883	.952	
F33	.877	.953	0.960
F34	.853	.957	
F35	.920	.946	
Customization ability			
F41	.819	.935	
F42	.900	.893	0.939
F43	.907	.885	
Safety and security			
F51	.680	.851	
F52	.818	.741	0.866
F53	.743	.815	
Customer perception			
Y1	.822	.791	
Y2	.780	.829	0.884
Y3	.721	.882	

3.2. Exploratory Factor Analysis

EFA is performed orderly for independent variables and dependent variable based on our model. Firstly, all measured items of independent factors are put in EFA, the results are illustrated in Table 3.

Table 3
Exploratory Factor Analysis for independent variables

| | Rotated Component Matrix[a] | | | | |
| | Component | | | | |
	1	2	3	4	5
F31	.845				
F32	.818				
F33	.801				
F34	.808				
F35	.865				
F11		.909			
F12		.841			
F13		.847			
F14		.749			
F15		.842			
F21			.692		
F22			.801		
F23			.800		
F24			.830		
F41				.819	
F42				.845	
F43				.864	
F51					.796
F52					.918
F53					.875

From Table 3 we can keep all items since their factor loadings are greater than 0.5. After implementing the EFA of independent variables, 20 variables can be shortened into 5 factors.

• Easy to use: identified by F11, F12, F13, F14 and F15.
• Interface: identified by F21, F22, F23 and F24.
• Reliability: identified by F31, F32, F33, F34 and F35.
• Customization ability: identified by F41, F42, and F43.
• Safety and security: identified by F51, F52, F53.

Three last items are put into EFA for analyzing underlying factors of dependent variable. Table 4 indicates favorable result because only one factor is extracted. We conclude that "Customer perception" factor is identified by three items Y1, Y2 and Y3.

Table 4
Exploratory Factor Analysis for dependent factor

| | Component |
	1
Y1	.923
Y2	.914
Y3	.901

3.3. Regression Analysis Results

Table 5 shows regression results, in which five independent variables were regressed against one dependent variable. Correspondingly, all hypotheses were estimated by looking at P value of each variable.

Table 5
Regression Results

Hypothesis	Relationship between 5 independent variables and "Customer perception"	F-statistic	Adjusted R^2	VIF	Standardized Coefficient	Critical ratio	p-value
H1	Easy to use			1.304	.288	3.911	.000
H2	Interface			1.987	.198	2.116	.037
H3	Reliability	33.153	0.607	1.492	.355	3.768	.000
H4	Customization ability			1.484	-.088	-1.080	.283
H5	Safety and security			1.597	.282	4.244	.000

From Table 5, we can see that six variables jointly have significant impact on "Customer perception" because the F-statistic is very high (33.153). Besides, adjusted R2 indicates that five independent variables can explain 60.7% of the variation of dependent variable. There is no multicollinearity phenomenon because all of VIF statistics are pretty smaller than 4 (rule of thumb).

Hypothesis 1: The first hypothesis states that easy to use has a positive impact on customer perception towards e-commerce systems. We can see that the p-value is pretty small (0.000<0.05), so that the relationship is strongly supported. This result is consistent with customer perception that has been studied in the past, typically in studies of Davis (1989), Hung et al. (2014) and Shahriari (2014). In order for customers to have a good perception, the e-commerce system needs to be easy to use, the content of information is concise and easy to understand, easy to get acquainted with new customers. Research by Baasandulam and Kuo-Chung (2012) also argues that the system needs a good site navigability. Kumbhar (2011) suggested that the system should be well organized and structured and easy to monitor categories and activities.

Hypothesis 2: The second hypothesis assumes that the Interface of e-commerce system positively influences Customer perception towards e-commerce systems. The relationship is significant because p-value is less than 0.1 (p = 0.037). This result is consistent with findings of Hang (2014) determining the positive impact of the attractiveness and creativity of the interface for customer perception of e-commerce system. Similarly, Tabaei et al. (2011) also pointed out that system interface design and brand identity on the system are critical determinants of Customer perception towards systems. Quan and Duc (2014) have shown that the content on the system interface can enhance customer perception for e-commerce systems.

Hypothesis 3: This hypothesis supposes that the Reliability of e-commerce systems can affect positively to Customer perception towards that systems. The results in Table 5 shows that this hypothesis is validated because p-value is less than 0.05 (p-value = 0.000). The coefficient of relationship between Reliability of e-commerce systems and Customer perception is 0.355. This finding has been pointed out by some previous researches include studies of Shahriari (2014) and Quan and Duc (2014). In study of Tabaei et al. (2011), instant customer support as well as the quick implementation of functions will strongly affects to customer perception towards e-commerce systems in a positive way. Based on research of Hang (2014), correct handling of operations allows the systems working more efficiently can positively affect customer perceptions on systems. Kim et al. (2008) in study of consumer decision-making model in electronic commerce have pointed out that the quick interaction with customers is the factor affecting customer perception of e-commerce system. In report of Baasandulam and Kuo-Chung (2012), a variety of interactive tools is an essential factor make up the reliability to Promote customer perception towards e-commerce systems

Hypothesis 4: This hypothesis proposes a positive relationship between Interactive ability and customer perception towards e-commerce systems. But the result does not support this hypothesis because the p-value is much larger than 0.05 (p = 0.283). This finding is controversial and conflict with some previous findings. Hung et al. (2014) stated that e-commerce systems often develop new functions that positively impact customer perceptions about the system. Other studies of Kumbhar (2011) and Kim et al. (2008) also explored the relationship between factors the ability to meet the needs of many customers and easily change according to customer requirements and customer perception towards e- commerce systems. However, in Vietnam's context, many customers are concerned that frequently changing functions and developing new functions will affect systems that are difficult to use, operate unstably and fail to ensure safety of the system.

Hypothesis 5: Last hypothesis in this research states that safety and security have positive impact on Customer perception towards e-commerce systems. We can see that the p-value is pretty small (0.000<0.05), so that the relationship is strongly supported. In general, the hypothesis is supported with the coefficient of relationship is 0.2.82. The result is consistent with researches of Shahriari (2014), Hung et al. (2014) and Tabaei et al. (2011). In study of Kumbhar (2011), the peace of mind of customers when using the system has strong link with customer perception on systems. Kim et al. (2008) stated that the security of customer information provided on systems is necessary requirement for customer perception. Furthermore, Baasandulam and Kuo-Chung (2012) showed a positive link between quick and accurate payment authentication and customer perception towards systems. Table 6 shows the summary of hypothesis estimation of this research. Overall, out of five hypotheses, four hypotheses (H1, H2, H3, H5) are supported on the basic of three significant level of P-value.

Table 6
Summary of hypothesis estimation

Hypotheses	Estimated results
Hypothesis 1 (H1): Ease of use has positive impact on customer perception towards e-commerce systems	Supported
Hypothesis 2 (H2): Interface has positive impact on customer perception towards e-commerce systems	Supported
Hypothesis 3 (H3): Reliability has positive impact on customer perception towards e-commerce systems	Supported
Hypothesis 4 (H4): Customization ability has positive impact on customer perception towards e-commerce systems	Rejected
Hypothesis 5 (H5): Safety and security has positive impact on customer perception towards e-commerce systems	Supported

4. Conclusion and Implication

The main conclusion of this study was to examine five factors affecting customer perceptions of e-commerce systems in Vietnamese companies. The results have shown that easy to use systems, interface of systems, reliability of systems and safety and security had positive impacts on customer perception towards e-commerce systems. From the result, is expected to contribute to both academics and students. For academics, this study has provided an additional empirical evidence of the determinants of customer perceptions towards e-commerce systems. First of all, this research proposes that customers have good perceptions for systems that are easy to use, convenient for individual needs. For that reason, when developing e-commerce systems, companies ought to pay attention to the navigation, organization and structure of the system. The purpose of this is to ensure the most convenient process for customers to use the system. The presentation of content and information on the website should be brief and easy to understand, especially for new customers to use the system. Another requirement is that the navigation on the system between modules, functions, pages, between the home page and the internal page needs to be easy to control. This will increase customer perception, thereby improving customer satisfaction for e-commerce systems and for businesses.

The second result of this study was to indicate that the interface of the e-commerce system is one of the motivations for the customer's perception of the system. From there, companies should focus on designing the interface and content of the system. This is not an easy requirement, it needs to create the unique appeal and creativity of the interface, not rigid, imitate and especially pay attention to brand identity features on the whole interface of the system.

Thirdly, this study pointed out that the reliability of the system has a very positive effect on customer perceptions on e-commerce systems. Therefore, companies need to build a system with high reliability. The main functions of the system need to be implemented quickly and accurately. An e-commerce system should have many interactive tools aimed at quickly responding to customer requests. Customer services should also be well organized to increase the reliability of e-commerce systems.

Finally, this article emphasizes that safety and security have a great impact on customer perceptions. This is the main concern of customers when conducting e-commerce transactions. To improve customer perceptions of e-commerce systems, companies should focus on issues related to system safety and security. A system needs to ensure the security of personal information of customers and especially the absolute security for online payment transactions. This will create commercial transactions occur quickly and accurately. And all of the above is to create peace of mind for customers when using the system.

This is a fact that this study has some limitations and the authors expect it can be improved by future research. The first is the sampling taking place in three major cities Hanoi, Da Nang and Ho Chi Minh City of Vietnam. Therefore, the results may be limited in this sample set. There may be more differences if further studies can expand the sample in the larger context, taking data from many other cities. Second, customer perceptions of e-commerce systems are a major area of research. This research has only found a few internal factors that can affect innovation within an organization. Future research can develop this model to test the impact of some external factors on customer perceptions on e-commerce systems of Vietnamese companies. Finally, a questionnaire that contains a number of questions using the 5-point Likert scale may not have complete information on the factors studied. Future studies may implement other data collection methods to obtain data from more sources.

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Appendix: Questionnaires

Customer perception for e-commerce systems (Y)
Y1 - Convenience and ease of use of the system
Y2 - The favorite when using the system
Y3 - Satisfying customer needs
Easy of use (F1):
F11 - Well organized and structured system
F12 - Easily track categories and activities
F13 - Content is brief and easy to understand
F14 - Easy to get acquainted with new customers
F15 - Good site navigability
Interface (F2):
F21 - Interface design of the system
F22 - Content on the system interface
F23 - Attraction and creativity of the interface
F24 - Brand identity on the website
Reliability (F3):
F31 - Quick customer support
F32 - Correct handling of operations
F33 - Performs quick functions
F34 - Interact quickly with customers
F35 - Various interactive tools
Customization ability (F4):
F41 - The system frequently develops new functions
F42 - The system meets the demands of many customers
F43 - Easy to change according to customer requirements
Safety and security (F5):
F51 - Customer peace of mind when using the system
F52 - The security of the information that customers provide on the system
F53 - Verify payment quickly and accurately