
Factors Affecting the Service Quality of E-Commerce Platforms in the Period of COVID-19 in Vietnam

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Abstract: During the COVID-19 pandemic, people's health and the global economy have been severely affected. The Vietnamese government has issued requirements on social distancing, movement restrictions, etc. to minimize the impact of disease spread. This has had a great impact on changing people's habits. Vietnamese consumers have switched from shopping at traditional markets to increasingly using e-commerce to purchase goods and services to meet the needs of daily life. This has made the growth rate of e-commerce in Vietnam very fast. E-commerce platforms such as Shopee, Lazada, Tiki have had outstanding growth in the number of users, the number of orders. Therefore, the service quality of e-commerce platforms greatly affects consumers' experience and usage decisions. From that, it can be affirmed that determining the factors affecting the service quality of e-commerce platforms is essential. This article identifies and evaluates the factors affecting service quality of e-commerce platforms in the context of COVID-19 in Vietnam. We have developed and tested a model of factors affecting service quality of e-commerce platforms in Vietnam. The main contribution of this study is to examine six determinants of service quality in Vietnamese e-commerce platforms. The study identifies and evaluates key influencing factors: payment methods, ease of use, security and reliability.

Keywords: E-commerce, Service Quality, COVID-19 in Vietnam, E-commerce Platforms

1. Introduction

In 2018, e-commerce in Vietnam continued to develop comprehensively with a growth rate of over 30% according to the EBI report [24]. At the same time, the "E-economy SEA 2020" report by Google, Temasek, and Bain & Company [9] showed that e-commerce in Vietnam increased by 46% year on year. By 2025, Vietnam's digital economy will reach US\$52 billion, ranking third in Southeast Asia.

However, the global economy has been severely affected by the COVID-19 pandemic since the beginning of 2020. The COVID-19 epidemic has severely and deeply affected people's lives on a global scale. In Vietnam, the government has introduced emergency measures to prevent and control the COVID-19 epidemic, such as asking people to stay at home and limiting going out unless necessary. This seriously affects business operations in general. But for the e-commerce sector, it is a good opportunity.

In Vietnam, many e-commerce platforms have been used by consumers to make online purchases. E-commerce platforms recorded significant growth. According to Decision Lab's Q1/2021 Report [4], Shopee has now become the most popular platform, used by more than half of online shoppers in Vietnam, followed by Tiki and Lazada. Last year, according to Vietnam E-commerce and Digital economy Agency, Ministry of Industry and Trade, the e-commerce market grew by 18% in the country, reaching \$11.8 billion and accounting for 5.5% of total sales retail number [6]. Thus, online shopping on e-commerce platforms has now become a habit for Vietnamese consumers. The explosion of e-commerce and the shift of consumers' shopping habits from offline to online is also a great challenge for service quality control for e-commerce platforms.

Therefore, improving the service quality of e-commerce

platforms is an essential thing. In this article, the authors have researched and analyzed the factors affecting the service quality of e-commerce platforms in Vietnam. From there, the paper has made recommendations to improve service quality to help further promote online business activities of e-commerce platforms in the Vietnamese market.

2. Literature Review and Hypothesis Development

2.1. E-commerce Platform

E-commerce is the conduct of commercial transactions through the internet, communication networks, and other electronic devices [22]. In other words, e-commerce is the buying and selling of products or services through the Internet and other electronic devices. E-commerce includes all activities such as transactions, purchase and sale, payment, ordering, advertising, and delivery. To conduct e-commerce transactions, there are many different business models. In particular, the e-commerce platform is one of the options chosen by many sellers and buyers. The E-commerce

platform is an e-commerce website that allows traders, organizations, and individuals who are not the owners of that website to conduct business activities [25]. This is one of the most popular forms of online business in the current period. The e-commerce platforms are established as a tangible and practical solution for consumers. This model creates a convenient online shopping environment for sellers and buyers.

2.2. Service Quality

Service quality is the extent to which a service meets the needs and expectations of customers. Lewis and Mitchell [3], Edvardsson, Thomasson and Ovretveit [10] argue that service quality is meeting customer expectations and is their perception when they have used the service. According to Parasuraman et al. [1], Lewis and Mitchell [3], service quality can be defined as the difference between customers' expectations of the service and the perceived service. If expectations are greater than performance, then perceived quality will be less satisfying and hence customer dissatisfaction will occur. Many factors affect service quality. Table 1 below summarizes these influencing factors.

Table 1. Summary of factors influencing service quality.

Factor	Explanation	Source
Reliability	Cronin and Taylor [5] studied the concepts, measurement methods of service quality and the relationship with satisfaction, thereby giving the SERVPERF model. SERVPERF scale is interested in how customers perceive the service, including Reliability. Lee and Lin [17] developed a model to examine the relationship between e-commerce service quality and overall service quality, between customer satisfaction and purchase intention. This study has shown that e-commerce (B2C) service quality includes reliability. Duong Thi Dung, Vu Huyen Trang [7]; Ha Nam Khanh Giao and Le Minh Hieu [13] also confirmed that reliability has a positive impact on service quality.	Cronin and Taylor [5]; Duong Thi Dung, Vu Huyen Trang [7]; Ha Nam Khanh Giao and Le Minh Hieu [13]; Lee and Lin [17]
Responsiveness	Customer satisfaction and loyalty is an important factor determining the vitality and longevity of the business. To understand that information, businesses need to understand the important response information of customers. Le Van Huy [16], Lee and Lin [17] examined the relationship between responsiveness and service quality of e-commerce platforms. The results show that responsiveness has a positive effect on the service quality of e-commerce platforms. Zeithaml et al. [31] suggested that as the responsiveness of online retailers increases or decreases, the customer's evaluation of service quality also increases or decreases.	Lee and Lin [17], Zeithaml et al [31]; Le Van Huy [16]
Payment methods	The technical infrastructure for electronic payments has made significant progress. Therefore, electronic payment services have undergone many changes to create convenience and better meet the needs of customers. Xiaoying Guo et al [12]; Nguyen To Uyen [21] said that when shopping online when consumers have many choices of payment methods, it will have an impact on service quality. Franzak [11] asserts that payment methods have a positive impact on service quality and customer satisfaction.	Xiaoying Guo et al [12]; Nguyen To Uyen [21]; Franzak [11]
Ease of use	Duong Thi Hai Phuong [8], in her research, gave the following factors: information about the company and products, ease of use, perceived risks, perceived benefits, the purchasing experience, and intention. online shopping decision to measure e-commerce service quality. Research on factors affecting the intention to buy clothes online of young people in urban areas of Tay Ninh province by Vo Trung Hieu [27] also shows that ease of use has a great influence on the online shopping intention of customers.	Duong Thi Hai Phuong [8], Vo Trung Hieu [27]
Delivery performance	On-time delivery is a huge concern for businesses today. Because we humans cannot control the risks that occur during transportation, such as traffic jams, weather effects, etc. However, delivery performance affects buyers' psychology. According to Alam and Yasin [2], delivery is the time it takes for a package to go from the distribution center to the customer. Liu et al [19] showed that delivery performance has a significant influence on customer satisfaction. Similarly, Alam and Yasin [2] also found that delivery performance positively affects service quality.	Alam and Yasin [2]; Liu et al [19]
Security	On the Internet, personal information security is becoming more and more important in online transactions, especially e-commerce transactions. Lee & Turban [18]; Vijayasarathy & Jones [26]; Yang & Yun [30]; Szymanski & Hise [23]; Zeithaml et al [32]; Wolfenbarger & Gilly [29]; demonstrated that personal information security has a positive impact on service quality. Nguyen Thi Mai Trang [20]; Vu Huy Thong and Tran Mai Trang [28] both pointed out that personal information security is considered the factor affecting customer satisfaction when shopping online. Ensuring personal information is secure directly affects the level of risk at the time of transaction and helps to improve satisfaction with e-commerce services.	Lee & Turban [18]; Vijayasarathy & Jones [26]; Yang & Yun [30]; Szymanski & Hise [23]; Zeithaml et al [32]; Wolfenbarger & Gilly [29]; Nguyen Thi Mai Trang [20]; Vu Huy Thong and Tran Mai Trang [28]

Quantitative research is prefaced with the identification of scales for the main concepts of the research. The topic uses a quantitative research method by using individual interview techniques through questionnaires to collect information. From the results of quantitative research, the service quality of e-commerce platforms includes six factors which are: (1) Reliability, (2) Responsiveness, (3) Payment methods, (4) Ease of use

of use, (5) Delivery performance, (6) Security. As the above factors have been summarized, the authors propose a research model including six hypotheses about the factors affecting the service quality of e-commerce platforms in Vietnam. Compared with previous studies, this framework is considered to be a more comprehensive and integrated research framework and thus provides an additional voice to the literature.

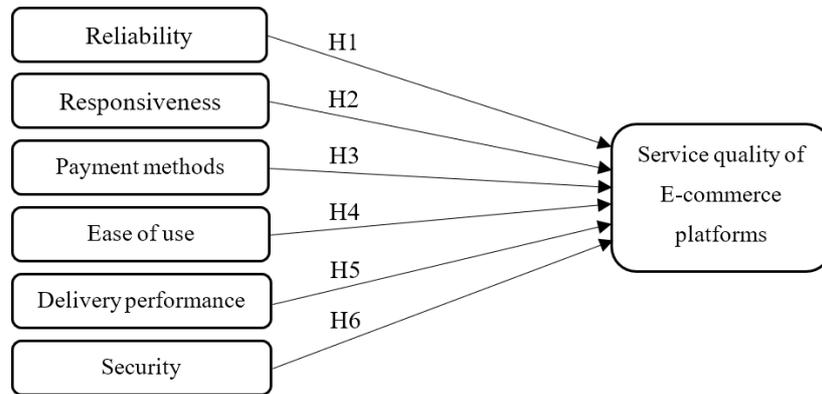


Figure 1. Research Model (authors).

Hypothesis 1 (H1): Reliability has a positive effect on the service quality of e-commerce platforms.

Hypothesis 2 (H2): Responsiveness has a positive effect on the service quality of e-commerce platforms.

Hypothesis 3 (H3): Payment methods have a positive effect on the service quality of e-commerce platforms.

Hypothesis 4 (H4): Ease of use has a positive effect on the service quality of e-commerce platforms.

Hypothesis 5 (H5): Delivery performance has a positive impact on the service quality of e-commerce platforms.

Hypothesis 6 (H6): Security has a positive impact on the service quality of e-commerce platforms.

3. Research Methodology

3.1. Data and Sample

According to Hair et al [14, 15], the general rule for the minimum sample size in exploratory factor analysis is five times the number of observed variables and the number of samples suitable for multivariate regression analysis is also five times the number of observed variables.

In this study, the authors give the number of variables to be estimated as 24, so the research sample will be 120 consumers. The source of the data is secondary data. Secondary data is referenced from the internet, scientific press, e-book, website, etc. To provide information and data on factors affecting the service quality of e-commerce platforms.

To ensure quality, this study distributed more than 300 non-probability convenience sampling questionnaires through online survey submission. Survey results are checked for validity: Answer the questions fully, and fill in the information relevant to the study. 311 questionnaires were returned but only 290 were validated for the next analysis (93.25%); 6.75% of invalid survey votes are discarded.

3.2. Analytical Methodology

3.2.1. Data Collection Methods

The survey questionnaire was distributed to people in

Hanoi, Ho Chi Minh City, and Da Nang city through the form of online voting via Facebook, zalo, and email,... The questionnaire consists of 28 questions related to seven factors. One factor is a dependent variable, the other six are independent variables. Observed variables are measured with a Likert scale (1 point is "strongly disagree", 2 points is "disagree". 3 points is "no opinion", 4 points is "agree", and 5 points is "strongly agree").

3.2.2. Data Analysis Methods

The authors used SPSS software to analyze the 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 the reliability tests, 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 prior 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 the analysis process by performing Linear Regression Analysis to test the validity of six

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

4.1. Reliability Test

Table 2 shows the results of the reliability test. The result is favorable because all Cronbach Alpha coefficients of factors including Reliability (0.867), Responsiveness (0.877), Ease of use (0.845), Payment methods (0.911), Delivery performance (0.793), Security (0.916), and Service quality of E-commerce Platforms are much greater than 0.8 which is the good value of factor reliability test.

Table 2. Reliability statistics.

Measures	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
Reliability			
TC1	.723	.827	.867
TC2	.744	.819	
TC3	.725	.826	
TC4	.676	.846	
Responsiveness			
PH1	.730	.843	.877
PH2	.700	.855	
PH3	.739	.840	
PH4	.767	.829	
Ease of use			
SD1	.726	.783	.845
SD2	.556	.853	
SD3	.695	.797	
SD4	.753	.771	
Payment methods			
TT1	.790	.888	.911
TT2	.833	.872	
TT3	.810	.880	
TT4	.759	.898	
Delivery performance			
GV1	.609	.739	.793
GV2	.628	.730	
GV3	.613	.737	
GV4	.569	.760	
Security			
BM1	.794	.896	.916
BM2	.820	.886	
BM3	.842	.878	
BM4	.776	.902	
Service quality of E-commerce Platforms			
DV1	.802	.825	.882
DV2	.819	.819	
DV3	.801	.826	
DV4	.564	.912	

The data in Table 2 shows that 6 factors of service quality of e-commerce platforms have sig coefficients greater than 0.6 and sig all less than 0.005. Therefore, these factors have a reliable database. Therefore, these six factors are used in factor analysis (EFA).

4.2. 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	6
SD4	.811					
SD3	.762					
SD1	.751					
SD2	.749					
TT2		.751				
TT3		.710				
TT4		.646				
TT1		.573				
BM1			.769			
BM3			.768			
BM2			.758			
BM4			.657			
PH1				.750		
PH4				.739		
PH3				.736		
PH2				.699		
TC1					.784	
TC3					.770	
TC2					.727	
TC4					.616	
GV4						.779
GV2						.686
GV3						.626
GV1						.540

Above is the rotation matrix table of the observed variables. The results show that all variables ensure the standard loading coefficient, so they are accepted and no variable is loaded on two different factors at the same time and no observed variable is alone. From Table 3 we can keep all items because their factor loadings are greater than 0.5. After implementing the EFA of independent variables, 24 variables can be shortened into 6 factors.

- 1) Reliability by TC1, TC2, TC3, TC4.
- 2) Responsiveness by PH1, PH2, PH3, PH4.
- 3) Ease of use by SD1, SD2, SD3, SD4.
- 4) Payment methods TT1, TT2, TT3, TT4.
- 5) Delivery performance by GV1, GV2, GV3, GV4.
- 6) Security by BM1, BM2, BM3, BM4.

EFA analysis for the independent variable

Table 4. EFA analysis results for the independent variable.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.938
	Approx. Chi-Square	4708.877
Bartlett's Test of Sphericity	Df	253
	Sig.	.000

From 6 factors in the scale, the authors conduct an exploratory factor analysis. In which, the KMO coefficient (Kaiser-Meyer-Olkin) is an index used to consider factor relevance. The ratio of KMO must reach a value of 0.5 or

more ($0.5 \leq KMO \leq 1$) is a sufficient condition for factor analysis to be appropriate. In the table above, the KMO index = 0.938 satisfies the conditions, so factor analysis is appropriate for the research data set.

Regarding the correlation analysis, Sig Pearson's correlation of independent variables TC, PH, SD, TT, GV, and BM with dependent variable DV is less than 0.05. Thus, there is a linear relationship between these independent variables and the dependent variable DV. The independent variable SD and the dependent variable DV have the strongest correlation with the coefficient r of 0.718 and the independent variable GV with the loading coefficient of 0.423. The pairs of independent variables have a fairly strong correlation with each other, so

there is a possibility of multicollinearity.

4.3. Regression Analysis Results

Table 5. Model Summary.

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.841 ^a	.707	.701	.48980

a. Predictors: (Constant), BM, GV, SD, TC, PH, TT

b. Dependent Variable: DV.

The regression model with an adjusted R^2 value of 0.701 is considered a good model in the range (0.5, 1).

Table 6. Regression Results.

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.088	.182		.481	.631		
	TC	.331	.051	.120	2.582	.003	.482	1.863
	PH	.058	.052	.053	1.111	.267	.461	1.543
	SD	.296	.051	.270	5.841	.000	.484	1.968
	GV	-.115	.060	-.086	-1.910	.057	.508	1.970
	TT	.455	.055	.435	8.252	.000	.372	1.633
	BM	.170	.054	.161	3.116	.002	.388	1.471

a. Dependent Variable: DV

b. Predictors: (Constant), BM, TT, GV, SD, PH, TC.

The Sig value of the independent variables TC, SD, TT, and BM is less than 0.05 independent variables have an impact on the independent variable. The variables PH and GV have Sig values greater than 0.05, so these two independent variables do not affect the independent variable. So two variables PH and GV reject the hypothesis of these two variables.

The VIF column is used to check for multicollinearity. Theoretically, if VIF is less than 10, multicollinearity will not occur. However, research models using the Likert scale have shown that $VIF < 2$ will not have multicollinearity between the independent variables. Here, the coefficients of magnification of variance are all less than 2, so there is no multicollinearity.

The regression coefficients of the variables TC, PH, SD, TT, and BM are all greater than 0, so these variables all have the same effect as the dependent variable. Based on the magnitude of the normalized regression coefficient Beta, the order of the level of impact from the strongest to the weakest of the independent variables on the dependent variable DV is $TT(0.435) > SD(0.270) > BM(0.161) > TC(0.120)$.

Corresponding to the variable that has the strongest impact on the dependent variable is payment methods, the second most influential variable on service quality is the ease of use variable, the third impact variable is security and the fourth impact variable is reliability.

5. Discussion

According to the test results, the theoretical model

achieves compatibility with the data and three out of six hypotheses about the relationship of concepts in the theoretical model are accepted. This study shows that payment methods have a great influence on the service quality of e-commerce platforms during the COVID-19 period. Currently, electronic payment is an important part of e-commerce, it helps to improve the efficiency of use and increase the satisfaction of e-commerce users in the digital era. With the rapid development of the internet, the e-commerce platforms' electronic transactions have met the needs of customers. However, the e-commerce payment system still has technical problems, so it is necessary to ensure that the electronic payment system always operates stably in terms of technology, improves its ability to serve customers, and fulfills its commitments. service connection... On the other hand, to increase the popularity of electronic payment, e-commerce enterprises need to build more campaigns to promote the electronic payment system through mass communication. Along with that is a guide to use to create word-of-mouth effects to increase the level of social influence on the acceptance of electronic payments.

On the other hand, e-commerce platforms need to improve the security of customers' information. According to this study, security is a factor that is not appreciated by customers. Therefore, it is necessary to improve the security of customer data. At the same time, businesses need to commit to customers about security, and the terms of service need to be more detailed and specific. Especially must commit to customers not to provide information to third parties.

In this study, ease of use is also a factor that customers do not appreciate. Therefore, e-commerce platforms need to improve service quality. For example, the interface needs to be improved to be more user-friendly. Even consumers of all ages can access and use the services of e-commerce platforms most easily.

Moreover, to improve the service quality of e-commerce platforms, websites also need to create customer trust by always keeping their promises. E-commerce platforms can create reliability with customers by ensuring the product is from the origin and providing the correct service from the beginning. Because through the survey results, consumers' assessment of reliability is still limited.

6. Conclusion and Implication

The study has built and tested a model of factors affecting service quality of e-commerce platforms during the COVID-19 period and has identified four factors affecting the level of influence from strong to weak: payment methods; ease of use; security; reliability affects the service quality of e-commerce platforms. Here are some recommendations for business managers' solutions from research results.

Payment methods: Protecting consumers from errors through efficient data retention, transaction privacy and security, and competitive payment services that ensure equal access and rights of all customers. Ensuring safety, security, and transparency on fee policy, fee structure, and fees will help customers better understand and grasp the advantages and disadvantages of each form. From there, they feel safer, more convenient, and more comfortable when using online payment services. However, to develop payment methods, businesses can add payment methods by integrating payment tools such as Momo, and Zalopay... to expand and facilitate users.

Ease of use: Businesses need to design user-friendly websites and mobile application interfaces, easy to understand and use. Even non-tech-savvy people find it easy to use. From there, consumers or sellers will easily operate and use e-commerce platforms to conduct online transactions.

Security: In the age of information technology, collecting user information is essential for every business to function better. Businesses need to develop strict privacy terms for platform users. On the other hand, e-commerce platforms need to be serious and methodical in building an information security system for businesses. Within the enterprise, enterprises need to establish an information system based on three factors: confidentiality, integrity, and availability. Every business needs to reassess its network security and defenses against cyberattacks.

Reliability: In the process of using e-commerce platforms, if the customer encounters difficulties and does not receive the expected value in advertising and commitment, the customer's impression of the platform becomes worse. Therefore, the platform management team needs to do their best, commit to customers most sincerely and professionally during the use of the platform, and always put the interests of customers first. Maintain a professional customer service network, so that customers feel the closest care and attention.

Customer care service via the 24/7 call center needs to ensure fast and accurate support.

Appendix: Questionnaires

Service quality of E-commerce Platforms

DV1 Service quality is a measure of customer satisfaction during service consumption.

DV2 Improving service quality for e-commerce platforms is considered very important.

DV3 Service quality of e-commerce platforms affects customer loyalty.

DV4 You feel that the service quality of e-commerce platforms is not good enough, you need a solution to solve it.

Reliability

TC1 I believe products on e-commerce platforms have a clear origin.

TC2 I believe e-commerce platforms always provide the correct service from the start.

TC3 I believe I received the correct item, as described, ordered on e-commerce platforms.

TC4 I believe that e-commerce platforms always create the best conditions for customers.

Responsiveness

PH1 E-commerce platforms support customers very well when customers have problems.

PH2 E-commerce platforms provide customer support with very useful information.

PH3 E-commerce platforms respond to customers quickly.

PH4 E-commerce platforms support customer care very enthusiastically.

Ease of use

SD1 Easy login to e-commerce platforms.

SD2 Recover your account quickly when you forget your password.

SD3 Easily learn how to shop online when buying on e-commerce platforms.

SD4 Easy to use, shop, and search.

Delivery performance

GV1 Delivery service on e-commerce platforms is very prestigious and rich.

GV2 Delivery services on e-commerce platforms always deliver on time.

GV3 Delivery service on e-commerce platforms always ensures the quality of products to consumers.

GV4 Delivery service fees of e-commerce platforms are not expensive.

Payment methods

TT1 Transaction methods of e-commerce platforms are diverse.

TT2 Convenient transaction method of e-commerce platforms.

TT3 Effective e-commerce platforms transaction method.

TT4 I am satisfied with all payment methods of e-commerce platforms.

Security

BM1 My credit card information will be kept confidential by e-commerce platforms.

BM2 My account is protected when participating in e-

commerce platforms.

BM3 Transaction and shopping information are confidential.

BM4 I have the right to suggest changes or updates to the protection policy for my information.

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