FACTORS AFFECTING THE SATISFACTION OF CUSTOMERS BUYING FOOD WITH LAST-MILE DELIVERY SERVICE ON E-COMMERCE PLATFORM IN VIETNAM

Le Thi Hong Nhung[1)], Le Mai Phuong[2)], Nguyen Thi Huyen[3)]
[1,2,3)]*Academy of Finance, Hanoi, Vietnam*
lethihongnhung28102003@gmail.com
mphuongcustoms@gmail.com
huyen22722@gmail.com

ABSTRACT

The study aims to explore specific factors that affecting the satisfaction of customers buying food with last-mile delivery service on e-commerce platform in Vietnam. The authors develop a research model consisting of 5 independent variables: service capacity of the transport unit, complaint and refund policy, freight cost, the factor about delivery staff, the form of goods upon receipt. The research apply simple random sampling method then conduct data analysis after collecting a sample size of 295 by SPSS 2.0 software. The research model explains 60.9% of the overall relationship of the above 5 factors with the satisfaction of last-mile delivery service when purchasing food. Implications and recommendations for further research are also discussed. The authors also propose some solutions to boost customer satisfaction when buying food for last-mile delivery services on the e-commerce platform.

Keywords: Food, last mile delivery, online purchase, satisfaction.

ABSTRAK

Penelitian ini bertujuan untuk mengeksplorasi faktor-faktor spesifik yang mempengaruhi kepuasan pelanggan yang membeli makanan dengan layanan pengiriman last-mile pada platform e-commerce di Vietnam. Penulis mengembangkan model penelitian yang terdiri dari 5 variabel bebas: kapasitas pelayanan unit angkutan, kebijakan komplain dan refund, biaya angkut, faktor petugas pengiriman, bentuk barang setelah diterima. Penelitian menggunakan metode simple random sampling kemudian melakukan analisis data setelah terkumpul sampel sebesar 295 dengan software SPSS 2.0. Model penelitian menjelaskan 60,9% dari keseluruhan hubungan 5 faktor di atas dengan kepuasan pelayanan pesan antar jarak jauh saat membeli makanan. Implikasi dan rekomendasi untuk penelitian selanjutnya juga dibahas. Penulis juga mengusulkan beberapa solusi untuk meningkatkan kepuasan pelanggan saat membeli makanan untuk layanan pengiriman jarak jauh di platform e-commerce.

Kata Kunci: Makanan, last mile delivery*, pembelian online, kepuasan.*

1. INTRODUCTION

Societies are undergoing significant changes in the age of globalization, and they are approaching the complexity of modern society socio-cultural and socio-economic (Yusoff *et al*., 2020). In recent years, the rise of e-commerce platforms has changed the shopping behavior of goods in general and food in particular of customers. In this technological era, almost every business relies on the online platform to reach its customers to provide a wide range of goods and services (Dhingra *et al*., 2020). With a growth rate of 20%/year, Vietnam is ranked by eMarketer in the top 5 e-commerce growth countries in the world. Accordingly, with the continuous increase in the size of online shopping participants, many businesses have chosen e-commerce as the largest gateway to reach customers via the Internet (Yusoff *et al*., 2020).

Logistics is one of the high-growth fields in the world, especially after the Covid-19 pandemic, consumer behavior changes, so this issue needs to be studied more. The new era of consumer-centric supply chain management highlights the benefits of placing the consumer at the core of strategy development and operational design (Esper *et al*., 2020).

Recent changes in e-commerce translate into opportunities beyond online sales for all types of retailers, allowing retailers to meet the needs of diverse customer segments (Tang & Zhu, 2020).

Customer satisfaction with delivery services has a tremendous impact on the logistics industry, so this topic becomes the concern of many academics and businesses around the globe. Logistics service quality has been shown to have a positive impact on customer satisfaction (Suresh *et al*., 2020). Besides, many people believe that the quality of logistics services can become the reason for enterprises to prevail in the competition (Akıl, S & Ungan, 2021). However, the current literature on e-commerce logistics service quality is insufficient (Choi *et al*., 2019).

In Vietnam, there have been studies on the factors affecting customer satisfaction with last-mile delivery. In which, the studies are mainly divided by region (mainly focusing on Hanoi and Ho Chi Minh City), a few are divided by specific industry (most are textile industry). The scale of the online food delivery industry in Vietnam in the period 2016-2020 has a growth rate of about 96.8%/year, supported by the trend during the pandemic, then is forecast to gradually decrease to 35.8%/year in the period of 2021-2025, but still a rapid growth rate when compared to other sectors. The size of the online food delivery market in Vietnam is forecasted to reach $2.7 billion by 2025. According to a report from Market Report, Vietnam's online food delivery market is considered to have strong growth in recent years and has not shown signs of cooling down. This is an attractive market, and needs more research.

Realizing that customer satisfaction with food delivery services via e-commerce platforms is an important topic that needs more attention. The authors decided to choose the topic "Factors affecting the satisfaction of customers buying food with last-mile delivery service on e-commerce platforms in Vietnam" to carry out research, in order to analyze the factors affecting the satisfaction of food customers with last-mile delivery services on e-commerce platforms in Vietnam, contributing to providing data for logistics businesses so that they can improve services, satisfy customers so that they can survive in a tough competitive environment.

The authors define specific objectives: (1) Building a theoretical basis for affecting customer satisfaction with last-mile delivery services on Vietnamese e-commerce platforms; (2) Measure the impact of last-mile delivery services on customer satisfaction on Vietnamese e-commerce platforms; (3) Proposing solutions in line with the development trend of shipping businesses and e-commerce platforms to create customer satisfaction when buying food with door-to-door delivery service on Vietnamese e-commerce platforms.

2. THEORETICAL FRAMEWORK

2.1 E-Commerce Last-Mile Logistics

The phrase "Last-mile" was first widely used in the telecommunications industry to describe the difficulty of connecting households and retail end-users to the network. Then, this term has the same meaning in the field of Logistics and Supply Chain Management.

Last-mile delivery has drawn the attention of researchers and stakeholders due to the rise of business-to-consumer (B2C) deliveries. Lindner (2011) postulates that last-mile delivery refers to a set of last activities in the delivery cycle, which involves a series of activities and processes conducted for the delivery process from the last transit point to the final drop point of the delivery chain. The e-commerce surge has indirectly

perfected the concept of last-mile delivery in the Logistics sector. The research of Gevaers (2009) shows that the previous definition of the terminology "the last mile" is not exhaustive and proposes that "the last mile may be defined as the final leg in a business-to-consumer delivery service whereby the consignment is delivered to the recipient, either at the recipient's home or at a collection point" (2011) (Figure1). Last-mile delivery has a direct impact on the customer experience and the competitiveness of enterprises.

Figure 1. Basic structure of a supply chain and the position of last-mile

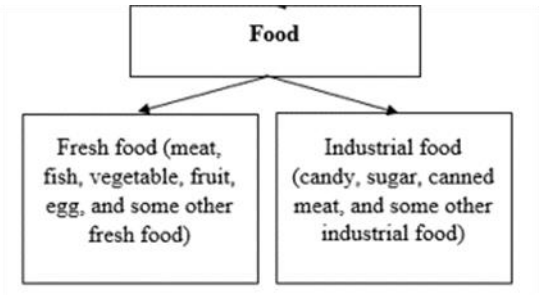
Source: De Smedt & Gevaers (2009)

Along with the explosion of the Fourth Industrial Revolution and E-commerce, last-mile delivery plays a crucial role in order fulfillment (Esper *et al.* 2003; Boyer *et al.* 2009) and customers' purchasing decisions (Xing *et al.,* 2010). The customers do not care about the process of transporting and distributing goods, but high or low delivery costs, fast or slow delivery speed, whether delivery time is office hours or all day, how many days to receive the goods and whether there is delivery notice or not.

2.2 Food

There are multiple definitions of food. The book called "Food Additives" (Mai *et al*., 2012) is written: "Food is natural products in a raw, single form, or processed or complex; must be edible and satisfy the requirements of the human: provide nutrients; be safe for health; create delicious sensations; consistent with habits and traditions." According to the book named "Food and Beverage Service, 9th Edition" Cousins *et al.* (2014), food can include a wide range of styles and cuisine types (these can be classified by country, type of cuisine, or a particular specialty). In conclusion, food is a necessity to maintain human existence and development, which is consumed directly by humans through eating. Food can be divided into two main groups: fresh food with ingredients containing a large quantity of water (60-70%) and industrial food, which is known as processed food, whose portion contains little water.

Figure 2. Classification of food



Source: Cousins *et al*. (2014)

2.3 Customer satisfaction

Customer satisfaction is a top goal for the creation of sustainable growth in organizations (Afework, 2013) because customers are a key factor determining the success of businesses. More particularly, customer satisfaction is shown as the result of a cognitive and affective evaluation, where some comparison standard is compared to the actually perceived performance. If the perceived performance is less than expected, customers will be dissatisfied. On the other hand, if the perceived performance exceeds expectation, customers will be satisfied (Chi Lin, 2003).

Jiang and Rosenbloom (2005) suggest that delivery has an impact on overall customer satisfaction because determining the level of customer satisfaction depends on the stages of

online retail checkout and after delivery. Factors such as on-time delivery (Heim and Sinha, 2001), price, and total delivery time (Fisher *et al*., 2016) have been named as antecedents to customer satisfaction and loyalty to an electronic retailer. Besides buying more, they also work as a network to reach other potential customers by sharing experiences (Hague & Hague 2016). In other words, customer satisfaction is a principal component of a business strategy as well as customer retention and product repurchase. When customers are satisfied, customers tend to rebound and recommend to others. As a result, businesses can not only consume more products but also affirm their position in the harsh market.

2.4 Hypothesis development and proposed research model

Parasuraman and partners (1985) found that the external appearance that customers can see affects the customer's perception of the image of the delivery business. Wu *et al.* (2015) show there is a relationship between consumers' emotions and levels of involvement when perceiving products' appearances. The findings of the study clearly show that product appearance plays a significant role in consumer responses to consumer products. Therefore, we propose the hypothesis as follows:

H1: The product appearance has a positive impact on the satisfaction of customers buying food with last-mile delivery service on e-commerce platform.

The extent to which products are able to attain to the needs and desires of customers is reported to refers to as product and service quality (Suchánek *et al*., 2015). Petr Suchanek *et al.* (2011) also shows the supplier that can respond better will make customers feel more satisfied. The offering of products that have been tailored to meet customer needs or make suggestions to improve customer experience as a key factor for the next use of the product. More directly related, research by (Iberahim, 2016) has shown that on-time delivery, the right address, and several other factors such as the ability to provide full information to customers with delivery progress have a great influence on customer satisfaction. Hence, we develop the hypothesis as follows:

H2: Service capacity of the transport unit has a positive impact on the satisfaction of customers buying food with last-mile delivery service on e-commerce platform.

Providing service with politeness and respect for customers, which is reflected in the professional level to evaluate service effectiveness with customers - research by Lee and Lin (2005) has implied, this has a strong influence on customers' online shopping through e-commerce platforms. Therefore, we propose the hypothesis as follows:

H3: The factor about delivery staff has a positive impact on the satisfaction of customers buying food with last-mile delivery service on e-commerce platform.

According to Nguyen Thu Ha & Gizaw (2014), when studying the buying behavior of a private label, it has been shown the purchase decision increases when customers perceive the cost that they have to pay to purchase products is appropriate. Price plays an important factor affecting the decision to choose brandings, stores and products to use, especially with products that are used frequently (Faith và Awgu, 2014). Hence, we develop the hypothesis as follows:

H4: Freight cost has a positive impact on the satisfaction of customers buying

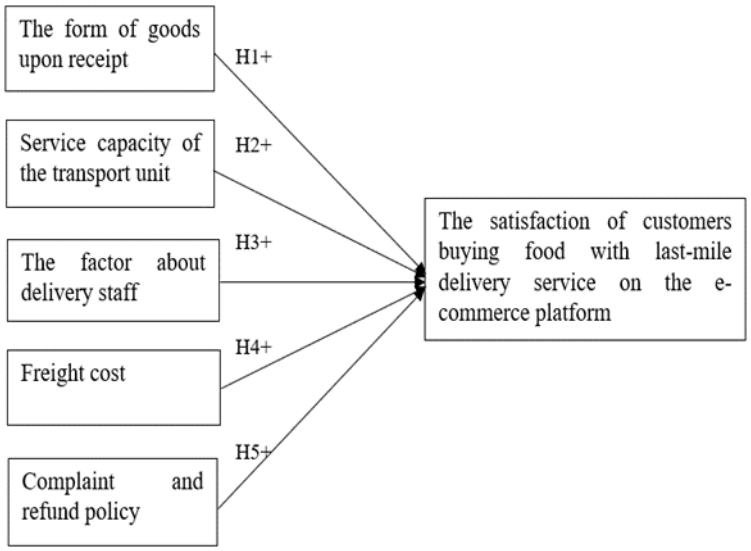
food with last-mile delivery service on e-commerce platform.

On e-commerce floor, customers' perception of risk has an inverse relationship with their attitudes, whereby return and complaint policies will reinforce trust and satisfaction (Jarvenpaa et al., 2000). According to a survey of Loureiro and Umberger (2007), up to 91% of interviewees answered that the return policy of online shopping services is an important factor determining their consumption. In addition, the feedback is reflected in how the service provider and performer is willing to help customers with a positive, enthusiastic and responsible attitude and serve quickly and promptly (model SERVQUAL by Parasuraman *et al*., 1988) and the study carried out by (Zeithaml, 2000) have shown that feedback is the pivotal factor in determining service quality related to electronics. Therefore, we propose the hypothesis as follows:

H5: Return and complaint policies have a positive impact on the satisfaction of customers buying food with last-mile delivery service on e-commerce platform.

Based on the theoretical framework and research hypotheses, the proposed research model is as follows:

Figure 3: Proposed research mode



3 RESEARCH METHODS

3.1 Data Collection

This is survey-based research, and we conducted a convenient sampling survey in which the data was collected through both online and offline. The samples in servey mostly in the age of 18-28. Because in Vietnam, gen Z is regarded as the generation that shapes the trend and they frequently buy food online (Decision Lab). The survey questionnaire includes three parts. The first part consits of demographic questions, such as their age, gender, professional situation, monthly consumption. The second part focuses on the frequency of food purchases via e-commerce platforms, and the last part covers questions on the factors affecting the satisfaction of customers buying food with last-mile delivery service on e-commerce platform.

3.2 Measure

Table 1. Measures

Measures	Symbol	Measurement criteria	Source
The form of goods upon receipt	HT1	Packaging ensures aesthetic value	Wu *et al.* (2015)
	HT2	Clean form of food preservation	
	HT3	The product is fully attached with the shipping unit's information	
Service capacity of the transport unit	NL1	Delivery on time as expected	Iberahim *et al.* (2016), proposal of the authors' team
	NL2	Delivery to the right address	
	NL3	Item delivered intact	
	NL4	Regular and accurate updates on the delivery progress of orders	
	NL5	Ability to fulfill orders with special requirements (e.g. time, distance, etc.)	
The factor about delivery staff	NV1	Delivery staff wears the correct uniform	Lee & Lin (2005), proposal of the authors' team
	NV2	Delivery staff polite attitude to customers	
	NV3	Delivery staff are always ready to listen to customer feedback	
	NV4	Delivery staff handle situations quickly/promptly that arise	
Freight cost	CP1	Calculate freight rates clearly and understandably for each type of goods	Proposal of the authors' team
	CP2	Have a reasonable delivery price	
	CP3	There are preferential pricing policies (discount codes, free shipping codes, incentives according to membership levels, etc.)	
Complaint and refund policy	KN1	There are clear rules for making complaints	Loureiro & Umberger (2007), proposal of the authors' team
	KN2	There are clear instructions for making complaints	
	KN3	Resolve complaints quickly	
	KN4	Complaints policy brings many benefits to customers	
The satisfaction of customers buying food with last-mile delivery service on the e-commerce platform	HL1	You are satisfied with the last-mile delivery process for the food item	Proposal of the authors' team
	HL2	You will continue to buy food on the e-commerce platform because of the preferential policies/ customer service/ prices	
	HL3	You will continue to use the delivery service for food orders	

3.3 The Sample

The survey yielded 306 responses. After removing 11 surveys that provided unreliable information, the team obtained 295 valid answers, corresponding to 96,41%. The researchers used simple random sampling method combine with 5-point Likert scales for each measure, anchored on "Strongly disagree" and "Strongly agree". According to Hair *et al.* (2014), the ratio of observations to an analytical variable should be 5:1 or 10:1 is reasonable. In this study, the questionnaire has 21 questions using the 5-degree Likert scale, corresponding to 21 observed variables, so these 295 valid answer sheets are used as data for the study.

Table 2. Summary of research samples

Criterion		Quantity (people)	Percentage (%)	Criterion	Quantity (people)	Percentage (%)
Gender	Male	63	21.4	Age	Under 18	2	0.7
					18-24	237	82.2
	Female	232	78.6		24-28	52	17.7
					Over 28	4	1.4
Occupation	Student	209	70.8	Monthly consumption	Under 3 million VND	32	10.8
	The office group moves less	45	15.2		3 – 6 million VND	199	67.5
	The office group moves a lot	9	3.1		6 - 10 million VND	58	19.7
	Heavy work group	2	0.7		Over 10 million VND	6	2
	Freelance labor	30	10.2				

Source: Compiled from survey

From the above table of statistical analysis of demographic frequencies, the ratio of male:female participating in the survey is approximately 79:21. The age group participating in the survey is concentrated in the age group of 18-24, accounting for 82,2%. The majority of respondents are students with 70,8% of respondents. In terms of monthly consumption, the group accounted for the most is 199 people corresponding to 67,5%, with a spending level of 3-6 million VND/ month.

The survey also shows that 86.8% of the respondents have ever had experienced buying food on e-commerce platform and the remaining 13.2% answered “Never” to the question “Have you ever bought food on an e-commerce platform?”. In terms of frequency, 56.2% of survey participants, corresponding to 144 people who have the frequency of buying food through e-commerce platforms 4 times/month; 35.6% equivalent to 91 people using delivery services on the e-commerce platform with food items 4-8 times/month; the remaining 8.2% corresponds to 21 respondents saying that they have a frequency of more than 8 times/month.

4 RESULTS AND DISCUSSION

4.1 Analysis results

4.1.1 Measure reliability and validity

To evaluate reliabilities and validities of the measures, exploratory factor analysis (EFA) was carried out and Cronbach alpha (α) were determined. According to the proposed research model, there are 5 scales on the factors affecting last-mile delivery on the e-commerce platform and 1 scale on customer satisfaction with food purchases for last-mile delivery on the e-commerce platform measured by a total of 22 observed variables. Reliability should be evaluated by the variable-total correlation coefficients and Cronbach's Alpha**.**

Table 3. Descriptive statistics of variables

Analytical variables	Factors	Indicators	Mean	SD
The factors affecting last-mile delivery on the e-commerce platform	The form of goods upon receipt	HT1	3.99	0.793
		HT2	3.94	0.719
		HT3	3.95	0.763
	Service capacity of the transport unit	NL1	4.01	0.918
		NL2	3.94	0.896
		NL3	3.95	0.935
		NL4	4.06	0.890
		NL5	3.98	0.875
	The factor about delivery staff	NV1	3.54	0.806
		NV2	3.36	0.804
		NV3	3.51	0.820
		NV4	3.75	0.721
	Freight cost	CP1	3.97	0.882
		CP2	4.00	0.909
		CP3	4.03	0.843
	Complaint and refund policy	KN1	3.98	0.833
		KN2	3.40	1.048
		KN3	3.48	1.062
		KN4	3.37	1.019
Satisfaction of customers buying food products with last-mile delivery on e-commerce platforms	Satisfaction with last-mile delivery service with food items on the e-commerce platform	HL1	3.95	0.785
		HL2	3.96	0.844
		HL3	3.88	0.835

Source: Data analysis (2023).

According to Table 3, The "Freight cost" has the highest average of 4, which indicates that food customers are very concerned about how much they pay for the last-mile delivery service. The indicator with the highest average is CP3 (4.03), which shows that support policies on last-mile delivery costs are of great interest. Other factors such as: "Service capacity of the transport unit" (M=3.988), "Form of goods upon receipt" (M=3.96) all have above-average mean score.

Regarding "Satisfaction of customers buying food products with last-mile delivery on e-commerce platforms", said the average appropriate score, about 3.93. In particular, the HL2 indicator has an average score of up to 3.96, which proves that preferential policies, customer service, and price have a strong impact on customer satisfaction for last-mile delivery of food items.

Table 4. Measurement reliability

	Coefficient of correlation of total variables	**α if the variable is excluded**		**Coefficient of correlation of total variables**	**α if the variable is excluded**
α: 0.926			α: 0.666		
HT1	0.799	0.936	CP1	0.425	0.640
HT2	0.887	0.866	CP2	0.483	0.564
HT3	0.867	0.878	CP3	0.529	0.504
α: 0.889			α: 0.834		
NV1	0.694	0.880	KN1	0.669	0.788
NV2	0.713	0.873	KN2	0.669	0.774
NV3	0.823	0.830	KN3	0.696	0.777
NV4	0.804	0.842	KN4	0.595	0.820
α: 0.909			α: 0.923		
NL1	0.818	0.878	HL1	0.884	0.852
NL2	0.725	0.898	HL2	0.836	0.894
NL3	0.783	0.886	HL3	0.812	0.914
NL4	0.736	0.895			
NL5	0.786	0.885			

Note: α: Cronbach alpha's Coefficient
Source: Data analysis (2023)

Cronbach's Alpha test results show that one variable, HT1, has a Corrected Item-total Correlation coefficient greater than Cronbach's alpha coefficient of the scale (0,936>0,926) so this variable needs to be removed. All measures have Cronbach's alpha coefficient > 0.6. The remaining correlation coefficients of the variable-total (Corrected Item-total Correlation) are greater than 0.3 and are consistent with these scales. Thus, it can be assessed that the above are good and suitable measurement scales to conduct EFA analysis with 20 indicators.

4.1.2 Exploratory factor analysis (EFA)

The purpose of this step is to reduce the number of observed variables, remove unnecessary variables, and keep only those variables that are really meaningful to the model.

4.1.2.1 EFA for independent variables

Table 5. KMO & Bartlett test and total variance results

KMO. coefficient		0.762
	Chi-Square	2829.550
Bartlett's test	DF	153
	Sig.	0.000

Factor	**Eigenvalue**		
	Total	**% Variance**	**% accumulated**
The form of goods upon receipt	3.676	20.421	20.421
Service capacity of the transport unit	3.021	16.782	37.203
The factor about delivery staff	2.696	14.976	52.179
Freight cost	1.844	10.245	73.198
Complaint and refund policy	1.939	10.774	62.953

Source: Data analysis (2023)

Analysis by SPSS shows that the KMO test results = 0.762 > 0.5 satisfy the requirements for performing EFA, factor analysis is suitable with the research data. Bartlett test results: Sig = 0.000 < 0.05, showing that the variables are correlated with each other on the overall scale, so EFA can be performed (Table 4). The EFA results show that there are 5 groups of factors with 20 observed variables. The total cumulative variance of these 5 groups reached 73,198%, showing that the factor explained 73,198% of the variability of the data (Table 4). We have the following rotation factor matrix table:

Table 6. Rotation Matrix

	Component				
	1	2	3	4	5
NL1	0.886				
NL5	0.868				
NL3	0.862				
NL4	0.830				
NL2	0.820				
NV3		0.906			
NV4		0.898			
NV2		0.833			
NV1		0.821			
KN2			0.840		
KN3			0.832		
KN1			0.829		
KN4			0.752		
HT3				0.966	
HT2				0.963	
MG3					0.803
MG2					0.785
MG1					0.716

Source: Data analysis (2023)

According to the results in Table 5, all variables have Factor loading coefficient > 0.5, which means it has practical significance, so it is suitable for the scale. After the analysis, we can re-affirm 5 groups of factors affecting the formation of last-mile delivery service for food items on the e-commerce platform as follows:

- Factor 1 is The form of goods upon receipt, including the following 2 variables:
  - HT2: Clean form of food preservation.
  - HT3: The product is fully attached with the shipping unit's information.

- Factor 2 is Service capacity of the transport unit, including the following 5 variables:
  - NL1: Delivery on time as expected
  - NL2: Delivery to the right address
  - NL3: Item delivered intact
  - NL4: Regular and accurate updates on the delivery progress of orders
  - NL5: Ability to fulfill orders with special requirements (e.g. time, distance, etc.)

- Factor 3 is The factor about delivery staff, including the following 4 variables:
  - NV1: Delivery staff wears the correct uniform
  - NV2: Delivery staff polite attitude to customers
  - NV3: Delivery staff are always ready to listen to customer feedback
  - NV4: Delivery staff handle situations quickly/promptly that arise

- Factor 4 is Freight cost, including the following 3 variables:
  - MG1: Calculate freight rates clearly and understandably for each type of goods
  - MG2: Have a reasonable delivery price
  - MG3: There are preferential pricing policies (discount codes, free shipping codes, incentives according to membership levels, etc.)

- Factor 5 is Complaint policy, including the following 4 variables:
  - KN1: There are clear rules for making complaints
  - KN2: There are clear instructions for making complaints
  - KN3: Resolve complaints quickly
  - KN4: Complaints policy brings many benefits to customers

4.1.2.2 EFA for the dependent variable

Table 7. KMO and Bartlett test

KMO. coefficient		0.744
Bartlett's test	Chi-Square	689.520
	DF	3.00
	Sig.	0.000

Source: Calculation results using SPSS software

The results of EFA showed that there was 1 group multiplied by 3 observed variables. We have the component matrix table as follows:

Table 8. Component matrix table

	Component
	1
HL1	0.951
HL2	0.929
HL3	0.915

Source: Calculation results using SPSS software

As can be seen from table 6, the KMO test results = 0.820>0.5, satisfying the requirements for performing EFA, factor analysis was appropriate with research data. Bartlett test results: Sig = 0.000 < 0.05, for variables that are correlated with each other on the overall scale, EFA can be performed. One main component reflects the satisfaction with last-mile delivery service with food items on the e-commerce platform as follows:

- HL1: You are satisfied with the last-mile delivery process for the food item
- HL2: You will continue to buy food on the e-commerce platform because of the preferential policies/ customer service/ prices
- HL3: You will continue to use the delivery service for food orders

4.1.3 Linear regression analysis

Linear regression analysis by Enter method with 5 independent variables HT, NL, NV, KN, MG and dependent variable HL gave the results as Table 9.

Table 9. Coefficientsa

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-0.406	0.285		-1.421	0.156		
HTtb	0.089	0.040	0.084	2.214	0.028	0.929	1.076
NLtb	0.710	0.036	0.731	19.780	0.000	0.976	1.024
NVtb	0.076	0.041	0.069	1.872	0.062	0.979	1.021
MGtb	0.099	0.036	0.104	2.768	0.006	0.938	1.067
KNtb	0.130	0.039	0.122	3.338	0.001	0.990	1.010

Source: Calculation results using SPSS software

The regression equation with the normalized Beta coefficient has the following form:
HL= 0,084*HT + 0,731*NL + 0,069* NV + 0,104*CP + 0,122*KN

Table 10. Analysis of variance ANOVA regression equation

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	102.180	5	20.436	92.393	0.000[b]
Residual	63.923	289	0.221		
Total	166.103	294			

Source: Calculation results using SPSS software

Table 11. Regression analysis synthesis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.748[a]	0.615	0.609	0.4703045	1.907

Source: Calculation results using SPSS software

The regression result yielded a corrected R2 value of 0.609 with a value of 60.9% the variation of HL is explained by 5 independent variables HT, NL, NV, KN, MG; the model has no autocorrelation (DW=1.907) and no multicollinearity (VIF<2). At the same time, the test Sig values of all 5 factors are <0.05 significantly, indicating that the factors included in the model are consistent and statistically significant at 5%. Thus, the hypotheses H1, H2, H3, H4, H5 are accepted.

4.2 Discussion

The authors conduct data analysis after collecting a sample size of 295, with 5 independent variables, 1 dependent variable and 20 observed variables. The data analysis process is as follows: The variable-total correlation coefficient and Cronbach's Alpha coefficient were used to test the reliability of the scale. The test results show that the scale proposed by the author is good and the variables are suitable for the scale. The EFA is then used to identify the factors that affecting with last-mile delivery on e-commerce platforms. The results considering the correlation between variables are very good. After analyzing EFA, the results show that there are 5 groups of factors of the independent variable and 1 factor of the dependent variable with a total of 20 observed variables and all variables are assessed as being in accordance with the scale.

The authors use the linear regression method to construct the dependent variable regression equation and independent variables to test the correlation and suitability of the model. The results of the analysis show that all 5 hypotheses are accepted. This result is consistent with similar studies that has been conducted before in other countries, although there are differences in the degree of impact due to demand, culture, etc.

5. CONCLUSION, LIMITATIONS, AND IMPLICATIONS

5.1 Conclusion

The study developed and verified a model of factors affecting the satisfaction of customers buying food with last-mile delivery service on e-commerce platforms in Vietnam with 5 factors representing the degree of influence from strong to weak: Service capacity of the transport unit, Complaint and refund policy, Freight cost, The factor about delivery staff, The form of goods upon receipt. The research model explains 60.9% of the overall relationship of the above 5 factors with the satisfaction of last-mile delivery

service when purchasing food. This means, the better service capacity of the transport unit, complaint and refund policy, freight cost, the factor about delivery staff and the form of goods upon receipt, the more satisfied consumers will feel with last-mile delivery service when buying food on the e-commerce platform in Vietnam.

5.2 Limitations

The research on this subject has achieved certain results, but there are still some limitations due to the authors' theoretical knowledge, time and resource constraints, social research capabilities, and other factors. First, this study only focuses on the factors affecting last-mile delivery from the consumer's perspective, but it did not study the perspectives of e-commerce companies and third-party logistics service providers. Second, although the authors have tried to use a coherent writing style in the process of making the questionnaire to carry out survey, the content and wording of the questionnaire may be misleading, affecting the accuracy of the answer because of the certain geographic and cultural dispersion. Third, besides the independent variables given in the research model, in fact, there are many other factors influencing the satisfaction of customers buying food on Vietnamese e-commerce floors that have not been considered in the study. Fourth, the proposed recommendations are only qualitative, not tested on the degree of completion.

We admit that the data obtained are cross-sectional and hypothetical because of the use of stated preference surveys. Future research can expand the research scope across the provinces and cities of the country over a long period, and change the sampling method and the number of samples so that the sample is sufficiently representative. In addition, further studies need to add other up-to-date factors. Finally, subsequent research can delve into the impact of particular factors mentioned in this study, thereby finding and developing more detailed and updated recommendations for the business.

5.3 Implication

To boost customer satisfaction when buying food for last-mile delivery services on the e-commerce platform in Vietnam, the authors propose some of the following solutions:

For government: The Government should promulgate policies to promote the growth of e-commerce, simultaneously, perfect the legal framework, and create favorable conditions. Products sold on the e-commerce floor must comply with the Food Safety Law and other relevant laws.

For the sellers: Sellers on the e-commerce floor need to choose shipping units that are suitable for geographical distances and product characteristics. Food is a relatively specific industry with requirements for preservation in complex conditions and fast delivery, thereby sellers on the e-commerce floor should choose delivery units with express delivery services to meet the customers' immediate needs. Simultaneously, they should refer to the feedback from customers who have chosen the delivery service of that transport unit. The authors recommend that vendors can use the form of crowdsourcing transportation, integrating with Grab, Ahamove, and Lalamove partners to ensure the best ability to transport goods as well as limit risks.

For the e-commerce platforms: The e-commerce platform has to act as a bridge between manufacturers, vendors, transport units, and consumers. Moreover, it needs to make specific regulations and policies on responsibilities and privileges between entities.

For shipping units:

- *Firstly,* shipping units need to improve their own capacity by expanding their network of operations, providing a full range of bags, containers, preservation tools for each type of food. Supplementing urgent delivery forms, delivery forms with special requirements to meet all customer needs. At the same time, it is also necessary to update green logistics solutions to keep up with the requirements and trends of the times.

- *Secondly,* regularly update, check and supplement complaint and refund policies to suit the changing needs and satisfy the maximum requirements of customers. Complaint and return policy is the basis for customers to feel secure to use the unit's services. Therefore, having a clear policy that benefits customers when problems occur during delivery is essential.

- *Third,* at present, freight cost is still high, so the transport units need to optimize the process, minimize unnecessary costs while adding promotion policies, offering vouchers, loyalty mode to reduce delivery fees, thereby attracting more customers and drivers to stick with the transport unit.

- *Fourth,* transport units need to strictly control over delivery staff. It is necessary to have a track list of their work history and have specific standards for their profession. Through customer feedback and reviews to have penalties, warnings, exclusions for violations and rewards for achievement milestones to boost the morale and serious working attitude of the delivery staff.

- *Fifth,* products delivered to consumers need to be guaranteed in terms of form. If the product shows signs of spillage, breakage, or disturbance outside the norm, the transport unit can launch cargo insurance packages, decisions deducted on the commission received by delivery drivers to ensure the interests of customers and improve the quality of their services. At the same time, clearly provide information of the delivery unit to promptly receive communication and handle incidents from customers reflecting.

For the consumers: Consumers need to comply with the regulations on the e-commerce platform. Before making a consumption decision, they need to understand the regulations and scrutinize purchased products and shipping services. After purchasing, it is necessary to objectively evaluate the quality of products and shipping services with a view to providing all necessary information for the next customer and e-commerce specialist.

Consumers need to comply with the regulations on the e-commerce platform. Before making a consumption decision, they need to understand the regulations and scrutinize purchased products and shipping services. After purchasing, it is necessary to objectively evaluate the quality of products and shipping services with a view to providing all necessary information for the next customer and e-commerce specialist.

REFERENCES

Akıl, S., & Ungan, M. C. (2022). E-commerce logistics service quality: customer satisfaction and loyalty. *Journal of Electronic Commerce in Organizations (JECO), 20*(1), 1-19. https://doi.org/10.4018/JECO.292473

Bubner, N., Bubner, N., Helbig, R., & Jeske, M. (2014). Logistics trend radar, Delivering insight today. Creating value tomorrow. *DHL Customer Solutions & Innovation.*

Choi D, Chung CY, Young J. Sustainable Online Shopping Logistics for Customer Satisfaction and Repeat Purchasing Behavior: Evidence from China. Sustainability. 2019; 11(20):5626. https://doi.org/10.3390/su11205626

Dhingra, S., Gupta, S., & Bhatt, R. (2020). A study of relationship among service quality of E-commerce websites, customer satisfaction, and purchase intention. *International Journal of E-Business Research (IJEBR), 16*(3), 42-59. https://doi.org/10.4018/IJEBR.2020070103

Esper, T. L., Castillo, V. E., Ren, K., Sodero, A., Wan, X., Croxton, K. L. & Goldsby, T. J. (2020). Everything old is new again: The age of consumer-centric supply chain management. *Journal of Business Logistics, 41*(4), 286-293. https://doi.org/10.1111/jbl.12267

Faith, D. O. & Agwu, E. (2018). A review of the effect of pricing strategies on the purchase of consumer goods. *International Journal of Research in Management, Science & Technology*, *2*(2), 88-102.

Fisher, M., Gallino, S., & Xu, J. (2016). The value of rapid delivery in online retailing. *Available at SSRN 2573069. https://doi.org/10.2139/ssrn.2573069*

Gevaers, R., Van de Voorde, E., & Vanelslander, T. (2009). Characteristics of innovations in last-mile logistics-using best practices, case studies and making the link with green and sustainable logistics. *Association for European Transport and contributors, 1*, 21.

Gevaers, R., Van de Voorde, E., & Vanelslander, T. (2011). Characteristics and typology of last-mile logistics from an innovation perspective in an urban context. *City distribution and urban freight transport: Multiple perspectives,* (1), 56-71. https://doi.org/10.4337/9780857932754.00009

Hague, P., & Hague, N. (2016). *Customer Satisfaction Survey: The customer experience through the customer's eyes.* London: Cogent Publication.

Hayashi, K., Nemoto, T., & Visser, J. J. (2014). E-commerce and city logistics solution. *City logistics: Mapping the future,* 55-78.

Heim, G. R., & Sinha, K. K. (2001). Operational drivers of customer loyalty in electronic retailing: An empirical analysis of electronic food retailers. *Manufacturing & Service Operations Management, 3*(3), 264-271. https://doi.org/10.1287/msom.3.3.264.9890

Iberahim, H., Taufik, N. M., Adzmir, A. M., & Saharuddin, H. (2016). Customer satisfaction on reliability and responsiveness of self service technology for retail banking services. *Procedia Economics and Finance, 37, 13-20. https://doi.org/10.1016/S2212-5671(16)30086-7*

Jarvenpaa, S. L., Tractinsky, N., & Vitale, M. (2000). Consumer trust in an Internet store. *Information Technology and Management, 1*, 45-71. https://doi.org/10.1023/A:1019104520776

Jiang, P., & Rosenbloom, B. (2005). Customer intention to return online: price perception, attribute-level performance, and satisfaction unfolding over time. *European journal of marketing*, *39*(1/2), 150-174. https://doi.org/10.1108/03090560510572061

Keeney, R. L. (1999). The value of internet commerce to the customer. *Management Science*, *45*(4), 85-161. https://doi.org/10.1287/mnsc.45.4.533

Lee, G. G., & Lin, H. F. (2005). Customer perceptions of e-service quality in online shopping. *International journal of retail & distribution management*, *33*(2), 161-176. https://doi.org/10.1108/09590550510581485

Lin, C. C. (2003). A critical appraisal of customer satisfaction and e-commerce. *Managerial Auditing Journal*, *18*(3), 202-212. https://doi.org/10.1108/02686900310469952

Lindner, J. (2011). Last mile logistics capability: A multidimensional system requirements analysis for a general modelling and evaluation approach. *Technical University of Munich.*

Loureiro, M. L., & Umberger, W. J. (2007). A choice experiment model for beef: What US consumer responses tell us about relative preferences for food safety, country-of-origin labeling and traceability. *Food policy*, 32(4), 496-514. https://doi.org/10.1016/j.foodpol.2006.11.006

Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1985). A conceptual model of service quality and its implications for future research. *Journal of Marketing*, *49*(4), 41-50. https://doi.org/10.1177/002224298504900403

Suresh, S., & Vasantha, S. (2021). WITHDRAWN: Influence of logistics service quality among customer satisfaction using IOT based techniques. https://doi.org/10.1016/j.matpr.2020.11.764

Petr Suchánek,Jiří Richter, Maria Králová. (2015). Customer Satisfaction, Product Quality and Performance of Companies. *Review of Economic Perspectives*, *14*, 329-344. https://doi.org/10.1515/revecp-2015-0003

Tang, W., & Zhu, J. (2020). Informality and rural industry: Rethinking the impacts of E-Commerce on rural development in China. *Journal of Rural Studies*, *75*, 20-29. https://doi.org/10.1016/j.jrurstud.2020.02.010

Thu Ha, Nguyen. Ayda Gizaw, (2014). *Factors influence consumer purchase decisions of Private Label Food Products* (Bachelor thesis in in Business Administration, School of Business, Society and Engineering).

Tyan-Yu Wu, Yen Hsu & G.A. Lee (2015) The effect of product appearances on consumer emotions and behaviors: a perspective of involvement, *Journal of Industrial and Production Engineering*, *32*(8), 486-499. https://doi.org/10.1080/21681015.2015.1077352

Wilson, N., & Christella, R. (2019). An empirical research of factors affecting customer satisfaction: A case of the Indonesian e-commerce industry. *DeReMa Jurnal Manajemen*, *14*(1), 21-44. https://doi.org/10.19166/derema.v14i1.1108

Yo, P. W., Kee, D. M. H., Yu, J. W., Hu, M. K., Jong, Y. C., Ahmed, Z., ... & Nair, R. K. (2021). The influencing factors of customer satisfaction: A case study of Shopee in Malaysia. *Studies of Applied Economics, 39*(12). https://doi.org/10.25115/eea.v39i12.6839

Yusoff, H., Alomari, M. A., Latiff, N. A., & Hamzah, W. M. A. F. W. (2020). Evaluation on customer satisfaction in using e-commerce platforms: Malaysia as a case study. *International Journal of Engineering Trends and Technology*, 32-37. https://doi.org/10.14445/22315381/CATI3P205

Zeithaml, V. A. (2000). Service quality, profitability, and the economic worth of customers: what we know and what we need to learn. *Journal of the academy of marketing science, 30*, 362-375. https://doi.org/10.1177/009207002236911