The Nexus between Post-Purchase Service Experiences in Online Shopping, Customer Satisfaction, and Customer Retention: An Evidence from Binh Duong Province of Vietnam

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24 March 2025

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Abstract

This study investigates how post-purchase service experiences affect customer satisfaction, and how customer satisfaction affects customer retention among online shoppers in Binh Duong province of Vietnam. Using surveys from 273 participants and Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4, the research finds that efficient returns, responsive support, and proactive issue resolution significantly impact customer loyalty. Results also show that positive post-purchase experiences lead to higher satisfaction and increased likelihood of repeat purchases. The study concludes that businesses should prioritize post-purchase service strategies to build consumer trust, enhance customer retention, and achieve sustainable growth in the competitive e-commerce market.

Key words: *Online shopping, Post-purchase service experiences, Customer satisfaction, Customer retention, Customer loyalty*

JEL Classification: L81; D12; M31

1. Introduction

Post-purchase service experiences have become a crucial factor in shaping customer retention in online shopping, particularly in the rapidly expanding e-commerce sector. These services encompass various customer support activities after a purchase, including order tracking, return policies, complaint resolution, and after-sales support, which can be provided either by the e-commerce platforms themselves or third-party logistics providers. While post-purchase services have always played a role in retail, their significance has grown considerably alongside the rise of digital commerce, where customer expectations for seamless and responsive support have intensified (Cao, Ajjan, & Hong, 2018). This trend was further amplified during the COVID-19 pandemic, as online shopping became the primary purchasing channel for many consumers, reinforcing the need for efficient post-purchase service management (UNCTAD, 2021).

Globally, research has demonstrated that high-quality post-purchase service experiences contribute significantly to customer satisfaction and long-term retention. For instance, Yee and Puttibarncharoensri (2024) found that post-purchase logistics service quality directly influenced customer loyalty in Yangon. Similarly, Rajendran, Wahab, Ling, and Yun (2018) emphasized that efficient return and complaint-handling processes are essential for maintaining online shoppers' trust. Revindran, Ragen, and Mahmud (2020) further highlighted that seamless post-purchase service interactions play a pivotal role in enhancing brand credibility and fostering repeat purchases.

In Viet Nam, the e-commerce sector has seen significant growth, with an estimated market value of $20.5 billion by the end of 2023, contributing nearly 8% to the country's total retail sales and consumer services revenue (Ministry of Industry and Trade of Vietnam, 2023). Within this dynamic landscape, Binh Duong, as one of the country's leading industrial and economic hubs, has experienced a surge in online shopping demand, increasing the necessity for reliable post-purchase service experiences (Vietnam E-commerce Association, 2025), drawing considerable interest from researchers and business management practitioners (Dam & Huynh, 2022; Ho & Huynh, 2022; Nguyen & Huynh, 2022, 2023; Phan & Huynh, 2023; Huynh & Vo, 2023; Huynh & Nguyen, 2024; Nguyen & Huynh, 2025). Binh Duong's rapid urbanization, strong industrial infrastructure, and strategic location near Ho Chi Minh City have made it a prime destination for business expansion, particularly in e-commerce and logistics (Nguyen, 2025). The province has a well-developed transportation network, including highways and industrial parks, facilitating

efficient goods movement (Binh Duong Department of Industry and Trade, 2024). Additionally, its high smartphone penetration rate, widespread internet access, and a tech-savvy population have fueled the growth of digital shopping habits (Statista, 2024). As businesses increasingly adopt digital transformation strategies, online platforms have expanded their presence in Binh Duong, catering to a rising middle-class consumer base that prioritizes convenience and service quality (Vietnam Briefing, 2024). However, despite the growing opportunities, businesses in the region continue to face challenges in ensuring customer satisfaction. Issues such as delayed returns, ineffective customer support, and inconsistent complaint resolution persist, affecting the overall post-purchase experience (Nguyen & Huynh, 2023). The intense competition among e-commerce platforms and logistics providers further pressures businesses to enhance their service quality to retain customers (Tran, 2022). Addressing these challenges is essential for sustaining long-term customer relationships and fostering loyalty in Vietnam's competitive e-commerce environment. By improving post-purchase services, businesses in Binh Duong can strengthen consumer trust and gain a competitive advantage in the evolving digital marketplace (Nguyen Le Hai Vi, 2018).

Despite the increasing importance of post-purchase service experiences in online shopping, there remains a lack of empirical research focusing specifically on Binh Duong. Existing studies on post-purchase services in Vietnam have primarily examined national-level trends or have been conducted in major metropolitan areas like Hanoi and Ho Chi Minh City, leaving a research gap regarding how these services impact customer retention in regional economic hubs such as Binh Duong. Given Binh Duong's rapid e-commerce growth and its role as an emerging logistics and industrial center, understanding consumer behavior and expectations regarding post-purchase services in this region is crucial.

Additionally, research on post-purchase service experiences in Vietnam often focuses on broader aspects of e-commerce satisfaction rather than the direct link between post-purchase service quality and customer retention (Hoang, Hoang, & Nguyen, 2022). While global studies have confirmed that after-sales services significantly influence customer loyalty, there is limited empirical evidence examining how this relationship manifests in Vietnam's evolving e-commerce ecosystem, particularly in fast-growing industrial provinces like Binh Duong (Tran, Ta, & Nguyen, 2022).

This study aims to fill this research gap by investigating the impact of post-purchase service experiences on customer retention in Binh Duong. The findings will provide localized insights to

help businesses refine their post-purchase strategies, improve customer satisfaction, and enhance long-term loyalty in the region's competitive digital marketplace. By addressing the specific challenges and service expectations of online shoppers in Binh Duong, this research will offer valuable recommendations for e-commerce platforms, logistics providers, and policymakers to optimize post-purchase services and sustain customer engagement in this fast-growing market.

The primary research problem addressed in this study is: How do post-purchase service experiences in online shopping influence customer retention in Binh Duong? This question seeks to explore the specific aspects of post-purchase services that contribute to customer loyalty and identify potential areas for improvement. Economic and cultural/social factors play a significant role in shaping consumer behavior in e-commerce, yet systematic comparisons of post-purchase logistics in emerging markets are lacking (Chauhan & Rambabu, 2017). By focusing on Binh Duong, an emerging market with unique economic and cultural characteristics, the objective of this study is to offer an in-depth understanding of how post-purchase service experiences affect customer retention. Additionally, this research will identify which dimensions of post-purchase services have the most significant impact on customer loyalty, thereby offering valuable insights for online retailers seeking to enhance their service quality and retain customers in this vibrant market (Rajendran et al., 2018).

The remainder of the paper is organized as follows. The next section delves into a comprehensive literature review, exploring existing research on e-commerce satisfaction and various post-purchase activities, with a particular emphasis on customer service, shipping, tracking, and returns. Following this, the research framework and hypotheses are detailed, highlighting the key aspects under investigation. The methodology section outlines the research design, data collection methods, and sampling techniques used in the study. This is followed by a thorough data analysis and presentation of the results. The final section discusses the implications of the findings, acknowledges the limitations of the study, suggests directions for future research, and concludes the paper.

2. Literature review

2.1. Theoretical background

The study of post-purchase service experiences in online shopping and their effect on customer retention encompasses several key theories and concepts. Central to this research are

customer satisfaction and loyalty, both of which are crucial for the long-term success of online retailers.

- **Expectancy-Disconfirmation Theory (EDT)**

  The Expectancy-Disconfirmation Theory (EDT), developed by Oliver (1980), posits that customer satisfaction is determined by the gap between expectations and actual performance. According to EDT, if post-purchase services such as shipping and customer support exceed customer expectations, this positive disconfirmation leads to higher satisfaction and increased loyalty. Conversely, if the services fall short of expectations, this negative disconfirmation results in dissatisfaction and potential loss of customer loyalty (Oliver, 1980). The application of this theory to e-commerce helps to understand how different elements of post-purchase service experiences influence customer behavior in the context of online shopping.

- **Service Quality Model (SERVQUAL)**

  The Service Quality Model (SERVQUAL), established by Parasuraman, Zeithaml, and Berry (1988), outlines five dimensions of service quality: tangibles, reliability, responsiveness, assurance, and empathy. These dimensions significantly impact customer perceptions and satisfaction. In the context of e-commerce, applying the SERVQUAL model helps to evaluate how effectively online retailers are delivering their post-purchase services. For example, reliability in delivering orders on time, responsiveness in addressing customer inquiries, and empathy in understanding and resolving customer issues are all critical factors that contribute to customer retention (Parasuraman, Zeithaml, & Berry, 1988).

- **Logistics Service Quality (LSQ)**

  Logistics Service Quality (LSQ) is a crucial concept in understanding customer satisfaction and retention in online shopping. LSQ refers to the effectiveness and efficiency of logistics activities that facilitate the movement and storage of goods from the point of origin to the point of consumption (Mentzer, Flint, & Hult, 2001). LSQ encompasses various dimensions, including timeliness, order accuracy, condition of goods, and information quality. High logistics service quality ensures that customers receive their orders promptly, accurately, and in good condition, thereby enhancing their overall shopping experience and encouraging repeat purchases (Rajendran et al., 2018). Understanding LSQ helps online

retailers identify key areas for improvement in their logistics operations to better satisfy and retain customers.

2.2. Review of previous research

The relationship between post-purchase service experiences and customer retention in online shopping has been explored in multiple studies. Cao et al. (2018) conducted an empirical study comparing post-purchase shipping and customer service experiences in China and Taiwan. This study employed a validated survey instrument with 384 respondents in China and 145 respondents in Taiwan to understand the role of post-purchase logistic services on customer satisfaction and future purchase decisions. The findings revealed that post-purchase shipping and tracking significantly influence customer satisfaction in both countries. Additionally, customer service was identified as the most significant factor for online shoppers in China, while return service was more important for shoppers in Taiwan. These insights underscore the necessity of providing high-quality post-purchase services to maintain customer satisfaction and foster loyalty in diverse cultural contexts (Cao et al., 2018). Moreover, Goyal and Deshwal (2022) conducted a qualitative study using NVivo software to analyze online post-purchase customer experiences in India. The study identified various factors influencing online post-purchase customer experience, such as delivery, return and refund policy, and customer support. These factors were found to significantly impact customer satisfaction and future purchase behavior, emphasizing the need for effective post-purchase services in online shopping (Goyal and Deshwal, 2022).

In Vietnam, Nguyen et al. (2022) conducted a survey with 300 respondents in Ho Chi Minh City to assess the influence of post-purchase services on customer retention in the online shopping sector. The study employed online questionnaires and SEM-PLS analysis to determine the effects of service quality, return policies, and customer support on customer retention. The findings indicated that service quality and customer support had significant positive effects on customer retention, with return policies playing a mediating role (Nguyen et al., 2022). Another study by Tran et al. (2023) in Hanoi explored the factors driving customer loyalty in e-commerce. With a sample size of 275 participants, the study found that factors such as delivery speed, after-sales service, and product return convenience significantly impact customer retention. These results suggest that enhancing post-purchase services is crucial for retaining customers in the competitive online shopping market (Tran et al., 2023).

While numerous studies on customer satisfaction and retention in the online shopping sector have been conducted in major cities across Vietnam, and abroad there is a noticeable gap in research specific to the Binh Duong area. This study aims to fill this gap by examining the relationship between post-purchase service experiences and customer retention in online shopping in Binh Duong, providing valuable insights for e-commerce businesses in this region.

2.3. Research model and hypothesis

This research follows the study by Cao, Ajjan, and Hong (2018); Hansen (2008); Xu and Jackson (2019); and Blut, Wang, and Schoefer (2016) to establish the connections between post-purchase service experiences and future purchase intention in the context of online shopping. The proposed conceptual framework includes four main independent variables (IVs): Customer Service, Shipping, Tracking, and Return Policy. These IVs lead to the mediating variable (MV): Customer Satisfaction, which subsequently affects the dependent variable (DV): Future Purchase Intention.

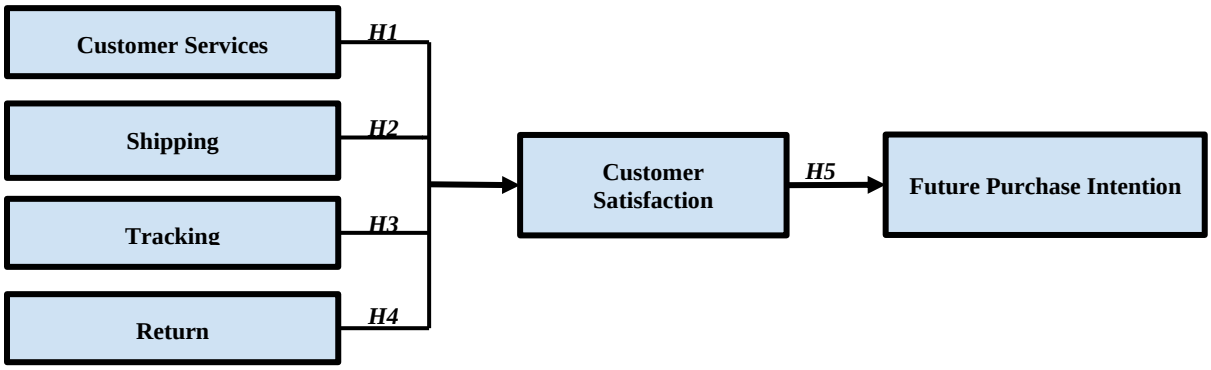

Figure 1. Research model, adapted from Cao, Ajjan, & Hong (2018).

The definition of all variables and hypotheses are presented as follows:

- ***Customer Service***

  Effective customer service, characterized by prompt responses and efficient issue resolution, significantly enhances customer satisfaction. When customers feel supported after a purchase, their trust in the retailer increases, leading to higher retention rates. Studies have demonstrated that responsive and empathetic customer service is crucial in maintaining customer satisfaction and loyalty. For instance, Xu and Jackson (2019) found

that quick and understanding responses to customer inquiries contribute to a positive customer experience, fostering loyalty and repeat purchases. Furthermore, Johnson and Karlay (2018) emphasized the importance of customer service representatives' ability to handle complaints efficiently, as this directly impacts customer retention and satisfaction. Additionally, research by Smith and Clark (2017) shows that companies investing in training their customer service teams to be more empathetic and responsive see a significant increase in customer satisfaction scores. This highlights the importance of equipping customer service representatives with the skills needed to address customer needs promptly and effectively.

H1: Customer Service positively influences Customer Satisfaction.

- ***Shipping***

  Reliable and timely shipping ensures customers receive their products as expected, which is crucial for satisfaction. Delays or issues with shipping can lead to dissatisfaction and damage the retailer's reputation. Efficient shipping processes have been found to significantly contribute to higher customer satisfaction and subsequent loyalty. For instance, Lee and Kim (2019) observed that prompt and accurate delivery significantly enhances the overall shopping experience, reinforcing positive customer perceptions. Similarly, Johnson and Clark (2020) identified that effective logistics management is a key determinant of customer satisfaction in e-commerce.

  H2: Shipping positively influences Customer Satisfaction.

- ***Tracking***

  Providing accurate and real-time tracking information reduces uncertainty and enhances the shopping experience. Customers value transparency about their order status, which helps alleviate anxiety and boost satisfaction. Research indicates that effective tracking systems are a vital component in improving customer satisfaction (Hansen, 2008; Chen et al., 2015).

  H3: Tracking positively influences Customer Satisfaction.

- ***Return Policy***

A hassle-free and flexible return policy increases customer confidence in making a purchase. It reduces perceived risk and can lead to higher satisfaction levels if returns are needed. Empirical evidence suggests that favorable return policies build trust and encourage customers to make repeat purchases (Blut et al., 2016; Amin & Tarun, 2020).

H4: Return Policy positively influences Customer Satisfaction.

- ***Customer Satisfaction and Future Purchase Intention***

  Satisfied customers are more likely to repurchase from the same retailer, as high satisfaction strengthens loyalty and contributes to long-term customer retention. The positive correlation between customer satisfaction and future purchase intention is well-documented in the literature. Oliver (1980) and Reichheld & Schefter (2000) emphasized that satisfied customers are more likely to develop a strong emotional bond with the brand, leading to repeat purchases and advocacy. Other studies by Anderson & Sullivan (1993), Fornell et al. (1996), Mittal & Kamakura (2001), and Boulding et al. (1993) also support the notion that higher customer satisfaction leads to stronger repurchase intentions and long-term loyalty.

  H5: Customer Satisfaction positively influences Future Purchase Intention.

3. Data and research methodology

3.1. Research design

The study used a quantitative research approach to examine the relationships between the factors. The quantitative approach was chosen because it allowed for the collection of numerical data through customer surveys, which were then statistically analyzed to test the proposed hypotheses H1 through H5. This approach supported the measurement of the independent variables—Customer Service (CS), Shipping (SP), Tracking (TR), and Return Policy (RT)—and their effects on the mediating variable Customer Satisfaction (SAT) and the dependent variable Future Repurchase Intention (FPI).

3.2. Data collection method

Primary data were collected through an online survey targeting online shoppers in Binh Duong. The survey questionnaire was constructed based on scales that have been validated from previous studies. The survey consisted of three main parts: (1) demographic information, (2) items

measuring observed variables. Each aspect was measured using a 5-point Likert scale (1 = Strongly disagree, 5 = Strongly agree) to capture participants' perceptions and attitudes.

The survey was distributed through online social media platforms and e-commerce forums to reach a diverse audience of online shoppers. To ensure clarity and cultural appropriateness, the questionnaire was initially designed in English, then translated into Vietnamese and back to check for accuracy. A pilot test was conducted with 30 participants to assess the reliability of the scale, to improve the questionnaire (if necessary). The final questionnaire is shown below.

Table 1. Independent variables

Code	Items	Source
Customer service (CS)		
CS1	I have received prompt service from the online stores.	Liu et al. (2008), Hsu (2008)
CS2	It is easy to find customer service numbers that I can call to ask questions.	
CS3	The online stores show a sincere interest in solving customer problems.	
CS4	I feel the online stores are always willing to help customers.	
Shipping(SP)		
SP1	The online stores I use deliver the product based on an agreed time.	Reibstein (2002), Hsu (2008)
SP2	I often receive my product within the expected time period.	
SP3	I often find shipping options that best fit me.	

SP4	I often receive free/discounted shipping.	
SP5	The online stores provide tracking ability during shipping.	
SP6	The online stores give me the flexibility to choose delivery dates.	
SP7	The online stores provide flexibility to reroute packages.	
Tracking (TR)		
TR1	Email or text notifications with a tracking number.	Liu et al. (2008)
TR2	The ability to track my shipment directly on the retailer's website.	
TR3	The ability to track my shipment with my mobile device.	
TR4	Send instant e-mail/text delivery alerts.	
Return (RT)		
RT1	It is easy to make returns/exchanges.	Hsu (2008)
RT2	The online stores have a clear returns policy.	
RT3	I often do not have trouble getting the returned item to the shipping company.	
RT4	I often do not have to pay a return shipping/restocking fee.	

Customer satisfaction (SAT)		
SAT 1	The services provided by the online store and sellers are very good.	comScore (2014), Reibstein (2002)
SAT 2	The online shopping store provides good customer service quality.	
SAT 3	My online shopping experience is satisfying.	
SAT 4	I am satisfied with my online shopping experience.	

Table 2. Dependent variables

Code	**Items**	**Source**
Future purchase intention (FPI)		
FPI1	I would like to use online stores as my first choice.	Reibstein (2002), Cao et al. (2018)
FPI2	I think using the service from online stores is a good choice.	
FPI3	I would like to be served by online stores.	

Table 3. Demographic variables

Variable	Code	Item	Measurement Scale
Gender	GEN	What is your gender?	1 = “Male” 2 = “Female”
Age	AGE	What is your age?	1 = “Under 18” 2 = “18-24 years” 3 = “25-34 years” 4 = “35-44 years” 5= “45 years and above”
Income	INC	What is your monthly income?	1 = "Below 5 million VND" 2 = "5-10 million VND" 3 = "10-15 million VND" 4 = "Over 15 million VND"
Employment Status	EMP	What is your current employment status?	1 = "Student" 2 = "Employed (full-time)" 3 = "Employed (part-time)" 4 = "Self-employed" 5 = "Unemployed" 6 = "Retired"

Education level	EDU	What is your highest level of education completed?	1 = “High School or below” 2= “College/University Graduate” 3 = “Postgraduate” 4 = “Other (please specify)”
Online shopping Frequency	FRE	How often do you shop online?	1 = "Daily" 2 = "Weekly" 3 = "Monthly" 4 = "Less than once a month"

3.3. Sampling technique and rationale

This study employed a convenience sampling technique due to its practicality in reaching online shoppers in Binh Duong through electronic channels. Convenience sampling is often used in exploratory research, particularly when the population is difficult to access or when time and resources are limited (Etikan, Musa, & Alkassim, 2016). However, it is important to acknowledge that this method has its limitations. The main limitation of convenience sampling is that it may not fully represent the entire population, leading to potential biases in the sample. For instance, the sample may overrepresent individuals who are easily reachable through online platforms while underrepresenting those who are less active or engaged with online shopping. As a result, the findings may not be generalizable to the broader population of online shoppers in Binh Duong.

Despite these limitations, convenience sampling was deemed appropriate for this study due to the focus on online shoppers in a specific region and the availability of participants through electronic means. However, it is important to address these limitations in future research. One way to improve the sampling technique would be to use random sampling or stratified sampling, which would ensure a more representative sample of the population by minimizing selection biases.

Stratified sampling, in particular, could be useful in ensuring that subgroups within the population (e.g., age groups, income levels, or shopping frequency) are proportionally represented in the sample. This would increase the external validity of the study's findings, making them more generalizable to the entire population of online shoppers in Binh Duong.

The minimum sample size for this study was determined based on the principle outlined by Hair et al. (2010), which suggests a sample size that is five times the total number of observed variables. Given that this study included 26 observed variables, a minimum of 130 responses was required. The final sample size of 273 responses exceeds this minimum requirement, ensuring sufficient statistical power to draw meaningful conclusions from the data.

3.4. Data analysis methods and tools

The model is evaluated using the PLS-SEM method. The author conducts analysis using SmartPLS 4 software by evaluating the measurement model and the structural model in turn. First, the author evaluates the measurement model to test the reliability, convergence and discrimination of the observed variables and factors in the model. The author conducts the analysis presented in the following table:

Table 4. Summary of measurement model evaluation criteria

Model type	**Criteria**	**Outcome variable**	**Sources**
Measurement model	Quality of observed variables of factors	Outer loading ≥ 0.7	Hair et al. (2013)
	Scale reliability	Cronbach's alpha ≥ 0.7 And Composite reliability ≥ 0.7	DeVellis (2012) Hair et al. (2013)

	Convergent Validity	Average variance extracted (AVE) ≥ 0.5	Hock and Ringle (2010)
	Discriminant Validity	HTMT ≤ 0.9	Henseler et al. (2015)

Next, the author conducts a structural model assessment to evaluate the research hypotheses, explanatory power, and the impact of various effects. The analyses performed by the author are presented in the following table:

Table 5. Summary of criteria for evaluating the structural model

Structural model	Collinearity of factor	VIF ≥ 5: collinearity is highly likely to exist, the model is severely affected 3 ≤ VIF < 5: the model may have collinearity VIF < 3: the model does not have collinearity	Hair et al. (2013)

	Evaluate the significance of direct and indirect impact relationships	P value ≤ 0.05 is a statistically significant relationship P value ≥ 0.05 is not statistically significant.	Hair et al. (2019)
	Coefficient of determination R^2	$0 \leq R^2 \leq 1$	Hair et al. (2017)
	Impact factor f^2 (Effect size)	$f^2 < 0.02$: the impact level is extremely small or has no impact. $0.02 \leq f^2 < 0.15$: small impact level. $0.15 \leq f^2 < 0.35$: average impact level $f^2 \geq 0.35$: high impact level	Cohen (1988)

4. Results and discussions

4.1. Descriptive data

Table 6. Descriptive statistics of demographic variables

Demographic variables	Values	Frequency	Percent
Gender	Male	112	41.0
	Female	161	59.0
Age	Under 18	6	2.2
	18-24 years	116	42.5
	25-34 years	112	41.0
	35-44 years	31	11.4
	45 years and above	8	2.9
Income	Below 5 million VND	22	8.1
	5-10 million VND	107	39.2

	10-15 million VND	104	38.1
	Over 15 million VND	40	14.7
Employment Status	Student	92	33.7
	Employed (full-time)	121	44.3
	Employed (part-time)	25	9.2
	Self-employed	26	9.5
	Unemployed	5	1.8
	Retired	4	1.5
Education level	High School or below	28	10.3
	College/University Graduate	210	76.9
	Postgraduate	35	12.8
Online shopping Frequency	Daily	12	4.4

	Weekly	233	85.3
	Monthly	17	6.2
	Less than once a month	11	4.0
Total		273	100.0

In terms of gender, women accounted for a higher proportion with 59% (161 people), while men accounted for 41% (112 people), reflecting the trend that women may participate in online shopping more in this area. In terms of age, the 18-24 age group (42.5%, 116 people) and 25-34 age group (41%, 112 people) accounted for the majority, showing that this is a young, dynamic customer group familiar with e-commerce, consistent with the characteristics of the technological population in Binh Duong. Average income is concentrated at 5-10 million VND (39.2%, 107 people) and 10-15 million VND (38.1%, 104 people), reflecting that the middle class is the main target of the study. In terms of employment status, full-time workers accounted for the highest proportion (44.3%, 121 people), followed by students (33.7%, 92 people), indicating strong participation from both the stable income group and the young group studying. The educational level was mainly university/college graduates (76.9%, 210 people), confirming that the research sample had a relatively high level of education, capable of evaluating service experiences in detail. Finally, the frequency of weekly online shopping was overwhelmingly dominant (85.3%, 233 people), illustrating that online shopping habits have become popular in Binh Duong, supporting the relevance of this study.

Table 7. Descriptive statistics of measured variables

Measurement variables	**Mean**	**Std. Deviation**

CS1	3.22	1.066
CS2	3.24	1.004
CS3	3.30	1.024
CS4	3.22	1.092
SP1	2.96	1.186
SP2	3.00	1.232
SP3	3.00	1.187
SP4	2.93	1.201
SP5	2.92	1.255
SP6	2.95	1.171
SP7	2.93	1.233
TR1	3.07	1.075
TR2	3.07	1.154
TR3	3.08	1.123

TR4	3.03	1.161
RT1	3.06	1.296
RT2	3.13	1.304
RT3	3.10	1.261
RT4	3.10	1.285
SAT1	3.39	0.998
SAT2	3.43	1.013
SAT3	3.36	1.013
SAT4	3.34	1.080
FPI1	3.67	0.804
FPI2	3.69	0.854
FPI3	3.64	0.806

The mean scores of the items ranged from 2.92 (SP5: ability to track during the delivery process) to 3.69 (FPI2: recommend friends/invite relatives to shop online), indicating that the overall response was moderate to quite positive (5-point Likert scale). The factors related to Future Repurchase Intention (FPI) had the highest mean scores (3.64-3.69), with low standard deviations

(0.804-0.854), indicating that customers in Binh Duong tend to continue shopping and promote the service if satisfied. Meanwhile, the items of Shipping (SP) recorded the lowest mean scores (2.92-3.00), with higher standard deviations (1.171-1.255), reflecting the unevenness in the delivery experience, which could be an area for improvement. Other factors such as Customer Service (CS) (3.22-3.30), Tracking (TR) (3.03-3.08), Return (RT) (3.06-3.13), and Satisfaction (SAT) (3.34-3.43) all scored at a fairly average level, indicating a general level of acceptance but there is still room for improvement in service quality.

4.2. Evaluation of the measurement model

4.2.1. Quality of observed variables for factors

Regarding the quality of the observed variables presented in Table 8, it shows that all 42 initial observed variables are of good quality with external loadings greater than 0.7 (Hair et al., 2013).

Table 8. Evaluation of the quality of observed variables

Coding	Outer loadings
CS1	0.859
CS2	0.839
CS3	0.860
CS4	0.868
FPI1	0.821

FPI2	0.815
FPI3	0.792
RT1	0.874
RT2	0.880
RT3	0.867
RT4	0.876
SAT1	0.840
SAT2	0.878
SAT3	0.833
SAT4	0.834
SP1	0.835
SP2	0.802
SP3	0.804
SP4	0.789

SP5	0.746
SP6	0.808
SP7	0.748
TR1	0.828
TR2	0.829
TR3	0.874
TR4	0.857

All 26 observed variables in the model achieved good quality, with Outer Loadings values exceeding the threshold of 0.7 (Hair et al., 2013), ranging from 0.746 (SP5) to 0.880 (RT2). This demonstrates that the measurement items were appropriately designed to reflect the respective aspects such as Customer Service (CS), Shipping (SP), Tracking (TR), Return (RT), Satisfaction (SAT), and Future Repurchase Intention (FPI). In particular, the variables in RT (0.867-0.880) and CS (0.839-0.868) had high and stable loadings, indicating that participants evaluated these aspects consistently. On the contrary, some variables in SP such as SP5 (0.746) and SP7 (0.748) have lower loadings, which may be related to the variation in transportation experience noted in the descriptive statistics table. This result confirms the suitability of the scale, allowing all observed variables to be retained for further analysis.

4.2.2. Evaluation of reliability and convergent validity

Table 9 presents the results of the internal consistency reliability analysis and convergent validity of the scale. Internal consistency reliability is assessed through the composite reliability (Rho_c) and Cronbach's Alpha value.

Table 9. Evaluation of reliability and convergent validity

Coding	Rho_c	Cronbach's Alpha	AVE
CS	0.917	0.879	0.734
FPI	0.851	0.737	0.655
RT	0.929	0.897	0.765
SAT	0.910	0.868	0.716
SP	0.921	0.900	0.626
TR	0.910	0.869	0.718

Based on the outer loading values in Hair et al. (2019), in Table 9, the outer loading values range from 0.851 (FPI) to 0.930 (RT), indicating that no observed variable has a value below 0.7, meaning all observed variables in the model are statistically significant. This demonstrates that the selected observed variables are good representatives of the latent factors, reinforcing the idea that the model can accurately reflect the theoretical concepts being studied.

In terms of reliability, according to Hair et al. (2019), the values of Composite Reliability (Rho_c) and Cronbach's Alpha in Table 9 range from 0.851 (FPI) to 0.929 (RT). The Cronbach's Alpha values range from 0.737 (FPI) to 0.900 (SP), and the Composite Reliability (Rho_c) values range from 0.851 (FPI) to 0.929 (RT), all exceeding the minimum threshold of 0.7. Specifically, RT (Cronbach's Alpha = 0.897, Rho_c = 0.929) and SP (Cronbach's Alpha = 0.900, Rho_c = 0.921) show very high internal consistency, indicating that the observed variables play an excellent role in measuring the latent factors.

Regarding convergent validity, the AVE values for all factors are greater than 0.5, ranging from 0.626 (SP) to 0.765 (RT), demonstrating that each latent factor explains at least 50% of the variance in the corresponding observed variables. Although SP has the lowest AVE (0.626), it still meets the criteria, ensuring the convergence of the measurement model.

In conclusion, the results from reliability and convergent validity indicate that the measurement model in this study is highly reliable and valid, contributing significantly to the next research steps.

4.2.3. Evaluation of discriminant validity

Next is the assessment of discriminant value, the results of the HTMT assessment are shown in the following table.

Table 10. Evaluation of discriminant validity

	CS	FPI	RT	SAT	SP	TR
CS	1					
FPI	0.513	1				
RT	0.540	0.625	1			
SAT	0.644	0.713	0.736	1		
SP	0.551	0.537	0.557	0.641	1	
TR	0.632	0.623	0.639	0.681	0.654	1

With all values being less than the threshold of 0.85, ranging from 0.513 (CS-FPI) to 0.736 (RT-SAT). This confirms that the dimensions in the model (CS, SP, TR, RT, SAT, FPI) are conceptually distinct, with no significant overlap. The highest relationship between RT and SAT (0.736) suggests that return policy is strongly associated with satisfaction, consistent with the theory that flexible return policy enhances customer experience. Conversely, a lower relationship such as CS-FPI (0.513) may imply that customer service indirectly influences repurchase intention through satisfaction, which needs to be further tested in the structural model.

4.3. Evaluation of the structural model

The results of the measurement model evaluation show that all observed variables and factors meet the evaluation index. This helps to retain all observed variables and perform the next analysis to evaluate the structural model.

4.3.1. Evaluate multicollinearity between factors

Table 11. Evaluate multicollinearity between independent variables

	AI	**CT**	**EU**	**PD**	**SP**	**SQ**
AI		2.729				
CT				1.000		
EU		3.209				
PD						
SP		2.392				

SQ		4.377				

The results show that the factor pairs EU - CT and SQ - CT are likely to have multicollinearity because they have VIFs ranging from 3 to 5. However, the author decided to keep them because the VIFs of these two pairs of variables have not exceeded 5.

4.3.2. Evaluation of the significance of direct effects

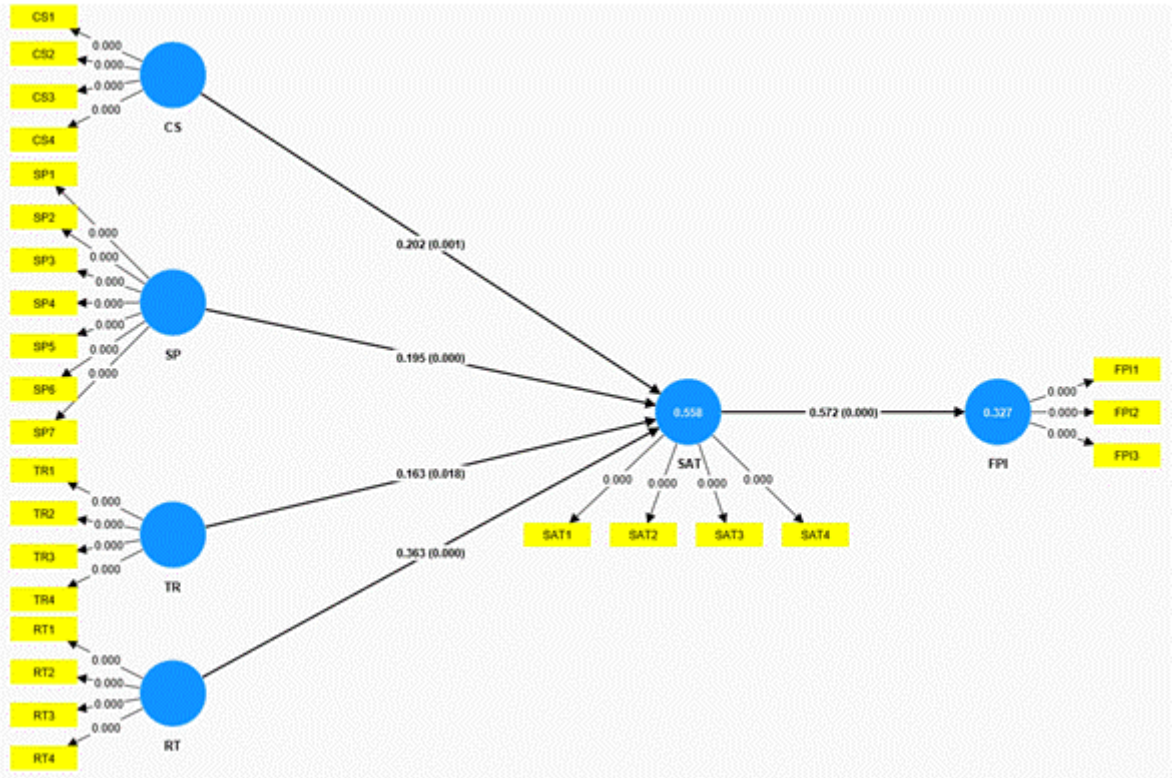

Figure 2. Structural Model

Table 12. Results of direct effect evaluation

Hypothesis		**Path coefficients (β)**	**P values**	**Conclusion**
H1	CS -> SAT	0.202	0.001	Accepted

H2	RT -> SAT	0.363	0.000	Accepted
H3	SAT -> FPI	0.572	0.000	Accepted
H4	SP -> SAT	0.195	0.000	Accepted
H5	TR -> SAT	0.163	0.018	Accepted
	CS -> SAT -> FPI	0.116	0.001	Accepted
	RT -> SAT -> FPI	0.207	0.000	Accepted
	SP -> SAT -> FPI	0.111	0.000	Accepted

All hypotheses were accepted ($p < 0.05$). The strongest direct effect was from satisfaction (SAT) to future purchase intention (FPI) ($\beta = 0.572$, $p = 0.000$), confirming that satisfaction is the determinant of repurchase intention, consistent with Oliver's (1980) study. Among the post-purchase factors, return policy (RT) had the largest effect on satisfaction (SAT) ($\beta = 0.363$, $p = 0.000$), followed by customer service (CS) ($\beta = 0.202$, $p = 0.001$), shipping (SP) ($\beta = 0.195$, $p = 0.000$), and tracking (TR) ($\beta = 0.163$, $p = 0.018$), indicating that return policy is the most important factor in Binh Duong. This result emphasizes the importance of improving post-purchase aspects to enhance customer satisfaction and retention.

4.3.3. Evaluation of the explanatory power of factors

To assess the explanatory power of independent variables for the dependent variable, it is necessary to rely on the R-square and f-square values (Hair et al., 2021). R-square indicates how much of the dependent variable is explained by the independent variable; therefore, there is no

threshold value to assess whether R-square is achieved or not. A high R2 means that the explanatory power of the independent variable for the dependent variable is high and vice versa.

In this study, the research results show that CT is the dependent variable with the highest explanatory power of the independent variables with the independent variables explaining 62% of the variance in the CT factor. In addition, the independent variables also explain up to 59.5% of the variance in the PD factor.

Table 13. Adjusted R-square value

Factor	R^2 adjusted
FPI	0.324
SAT	0.551

The adjusted R-square value of SAT is 0.551, meaning that 55.1% of the variance of satisfaction is explained by CS, SP, TR, and RT, while FPI has an adjusted $R^2 = 0.324$, indicating that 32.4% of the variance is explained by SAT.

Table 14. Results of effect size f-square

	f^2
CS -> SAT	0.058
RT -> SAT	0.182
SAT -> FPI	0.485

SP -> SAT	0.051
TR -> SAT	0.031

Table 14 on f-square shows that SAT → FPI has the largest effect size ($f^2 = 0.485$), while RT → SAT ($f^2 = 0.182$) is the most important post-purchase factor. Other factors such as CS ($f^2 = 0.058$), SP ($f^2 = 0.051$), and TR ($f^2 = 0.031$) have smaller effects, suggesting the need to focus on return policy to optimize customer satisfaction and retention in Binh Duong.

4.4. Discussion

The structural model analysis results showed that all hypotheses H1 to H5 were supported ($p < 0.05$), confirming that the post-purchase service factors—Customer Service (CS), Shipping (SP), Tracking (TR), and Return Policy (RT)—have a positive impact on customer satisfaction (SAT), which in turn is related to customer retention in Binh Duong. Specifically, Return Policy (RT) recorded the strongest impact coefficient on SAT with $\beta = 0.363$ ($p = 0.000$, $f^2 = 0.182$), confirming the prominent role of flexible return procedures in enhancing customer experience. This finding is consistent with Blut et al. (2016) and Wang et al. (2021), as they highlighted that convenient return policies build trust and increase satisfaction, especially in the Binh Duong context where consumers may prioritize minimizing shopping risks. Customer Service (CS) achieved $\beta = 0.202$ ($p = 0.001$, $f^2 = 0.058$), reflecting the importance of prompt and empathetic responses, consistent with Cao et al. (2018) and Xu and Jackson (2019), who found that effective customer service is a key driver of satisfaction. Delivery (SP) with $\beta = 0.195$ ($p = 0.000$, $f^2 = 0.051$) suggests that reliable delivery contributes to positive experiences, supporting the findings of Rajendran et al. (2018) that logistics quality, such as on-time delivery, is a determinant of online shopper satisfaction. Finally, Tracking (TR) has a weaker effect with $\beta = 0.163$ ($p = 0.018$, $f^2 = 0.031$), but is still consistent with Hansen (2008) who argues that accurate tracking information reduces anxiety and improves satisfaction. In particular, SAT has a strong effect on Future Repurchase Intention (FPI) with $\beta = 0.572$ ($p = 0.000$, $f^2 = 0.485$), explaining 32.4% of the variance in FPI (adjusted $R^2 = 0.324$), reinforcing Oliver's (1980) view that high satisfaction leads to loyalty.

Compared to previous studies, this result emphasizes that in Binh Duong, RT emerged as the dominant factor, while SP and TR, although important, showed unevenness (SP mean score: 2.92-3.00), similar to the logistics challenges noted by Rajendran et al. (2018) in developing markets.

5. Conclusion and implication

This study examined the impact of post-purchase service experiences on customer retention in online shopping within Binh Duong. Specifically, it analyzed the roles of Customer Service (CS), Shipping (SP), Tracking (TR), and Return Policy (RT) in influencing customer Satisfaction (SAT) and Future Purchase Intention (FPI). The findings indicate that all four factors positively affect customer satisfaction, with Return Policy (RT) having the strongest influence, followed by Customer Service (CS), Shipping (SP), and Tracking (TR). Furthermore, Satisfaction (SAT) emerged as the key driver of Future Purchase Intention (FPI), highlighting its crucial role in customer retention.

These results emphasize that online retailers in Binh Duong must prioritize improving post-purchase service experiences to enhance customer satisfaction and foster long-term loyalty. Given the growing e-commerce landscape in Vietnam, ensuring high-quality service in these areas can provide a competitive advantage and contribute to sustainable business growth. Specifically, to improve post-purchase service experiences and enhance customer retention, online retailers should simplify and increase transparency in return policies, offer free prepaid shipping labels, extend return periods, and implement instant refunds to build trust while introducing tiered return options for cost efficiency. Customer service can be improved by training support staff in communication and problem-solving, implementing multi-channel support (e.g., live chat, chatbots, hotlines, Zalo, and Messenger), using AI-driven chatbots for routine inquiries, and introducing priority support for frequent buyers. Reliable delivery should be ensured by partnering with reputable logistics providers, offering scheduled delivery time slots, and implementing a tiered shipping model where basic delivery is free while premium options come with a fee. Enhancing tracking systems through real-time tracking, automated notifications (SMS, email, in-app alerts), and leveraging third-party tracking solutions can improve customer confidence. Additionally, leveraging satisfaction through loyalty programs, referral incentives, and milestone-based rewards can further boost customer retention and repeat purchases, making online businesses more competitive in Vietnam’s growing e-commerce sector.

Despite these valuable insights, the study has limitations. The use of self-reported survey data introduces the possibility of response bias, while convenience sampling may not fully represent the diverse consumer base in Binh Duong. Moreover, as the study provides only a cross-sectional snapshot, it does not account for longitudinal changes in customer perceptions over time. Future research should address these limitations by employing qualitative methods, diversified sampling strategies, and longitudinal studies to develop a more comprehensive understanding of post-purchase service experiences.

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