

Assessment of Customer Satisfaction with the Quality of Logistics Services

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ABSTRACT : *In the highly competitive environment nowadays, for a business to survive and develop, achieving a high level of customer satisfaction is essential, as it is the most effective way to attract and retain customers. Competition in Vietnam's logistics industry is becoming increasingly fierce, particularly with an annual growth rate of 14–16% and its ranking among the top 10 out of 50 emerging markets. Customer satisfaction in the logistics industry is a critical measure that determines a firm's competitiveness and survival, focusing on meeting expectations regarding speed, reliability, and cost. This study evaluates the understanding of customer satisfaction regarding the quality of logistics services. The study employs a research model examining the relationship between logistic service quality and customer satisfaction. Using Exploratory Factor Analysis (EFA), five components of service quality were identified as influencing customer satisfaction with logistics services, including: reliability (on-time and complete delivery, responsibility (quick handling of issues), assurance, tangibles (physical facilities and equipment), and sympathy.*

Key factors: *Customer Satisfaction, Quality of Logistics Services, Exploratory Factor Analysis.*

I. INTRODUCTION

Since Vietnam officially joined the World Trade Organization in 2007, policymakers and business leaders have become increasingly aware of both the opportunities and challenges of expanding business and economic activities on a global scale. In this context, the logistics service sector is considered a key factor in achieving strategic objectives [1].

In recent years, logistics services in Vietnam have experienced strong growth, making a significant contribution to the country's economic development. According to statistics from the Ministry of Industry and Trade, logistics services contribute approximately 15–20% of the national GDP (equivalent to around 12 billion USD) [2]. Vietnam currently has about 1,000 enterprises operating in the logistics sector, of which Vietnamese enterprises account for an overwhelming 98% [3]. However, most of these are small and medium-sized enterprises, holding around 25% of the market share, while foreign-invested enterprises dominate a larger portion of the market [4].

Competition in Vietnam's logistics industry is becoming increasingly fierce, particularly with an annual growth rate of 14–16% and its ranking among the top 10 out of 50 emerging markets [5]. Customer satisfaction in the logistics industry is a critical measure that determines a firm's competitiveness and survival, focusing on meeting expectations regarding speed, reliability, and cost. Therefore, in order for Vietnamese logistics service enterprises to survive and develop, they must gradually improve and enhance the quality of their logistics services in order to increase customer satisfaction, attract new customers, retain existing ones, and improve business performance.

II. THEORETICAL FRAMEWORK

Many scholars argue that the SERVQUAL scale is relatively lengthy because it requires customers to evaluate service quality from two perspectives: expectations and perceived performance. This dual assessment can sometimes cause confusion for respondents when making simultaneous evaluations [6], [7], [8].

Among the critical viewpoints, James J. Cronin Jr. and Steven A. Taylor notably modified the SERVQUAL scale into the SERVPERF scale [9]. This revised model retains the dimensions and observed

variables of SERVQUAL but eliminates the expectation component, focusing solely on customers' perceived performance of the service they receive.

In this view, service quality is defined entirely by what customers actually perceive. Cronin and Taylor argued that perceived performance best reflects service quality. According to the SERVPERF model:

Service quality = Perceived performance level.

The SERVPERF scale also consists of five dimensions and 22 measurement items, similar to the perceived service quality component of SERVQUAL, but without including the expectation-based measurement.

According to Valarie A. Zeithaml and Mary Jo Bitner, customers perceive and evaluate services based on both perceived service quality and satisfaction levels [10]. Customers' perceptions of services are always considered in relation to their expectations. Because customer expectations continuously change and tend to increase over time, their perceptions of service also vary accordingly.

As a result, evaluations of service quality and satisfaction today may differ from those in the future, meaning that service quality assessment standards must also evolve. When perceived service quality exceeds expected quality, customers are highly satisfied.

Perceived service quality is therefore a key factor influencing customer satisfaction. Customers perceive service quality based on five dimensions: reliability, assurance, responsiveness, empathy, and tangibles. Customer satisfaction is influenced by factors such as service quality, product quality, price, as well as situational and personal factors.

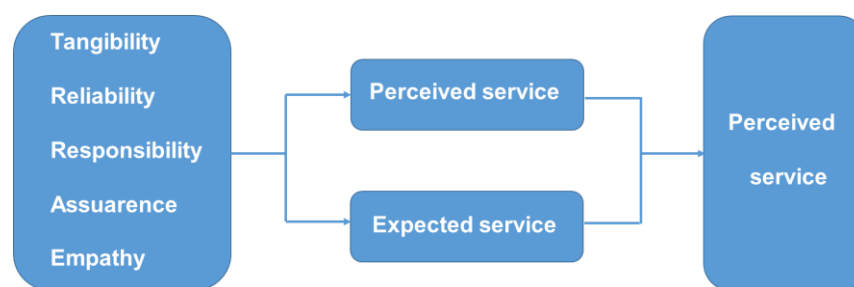


Fig 1. Customer Satisfaction and Services Quality

I.MATERIAL AND METHOD

The study employs a combination of qualitative and quantitative research methods. The qualitative research includes comparative methods, group discussions, and expert consultation methods to collect opinions and information for designing the preliminary measurement scale. The quantitative research consists of a pilot study and an official study. The pilot study is conducted to refine the measurement scales and questionnaire before carrying out the official research.

Research Hypotheses

H1 (+): The ability to perform promised services accurately will enhance customer satisfaction.

H2 (+): Professional knowledge and a positive service attitude will enhance customer satisfaction.

H3 (+): Good equipment, transportation facilities, communication, and employee presentation will enhance customer satisfaction.

H4 (+): Willingness to support customers and provide prompt services will enhance customer satisfaction.

H5 (+): Care and attentive customer service will enhance customer satisfaction.

The sample size was determined based on Hair et al. [11], which recommends at least five samples for each observed variable. The author selected a sample size of 250 respondents. The survey subjects include directors, department managers, and experts in the logistics sector. The sampling method used is non-probability sampling, and respondents were selected randomly from the target customer group.

The preliminary survey results from 60 questionnaires indicate that the Cronbach's Alpha coefficients of all factor groups were above 0.6, and the item-total correlation coefficients of the observed variables within

each group were greater than 0.3. Therefore, 31 observed variables representing 5 independent variables and 1 dependent variable satisfied the reliability requirements and could be applied in the official study.

III. RESULTS

Demographic characteristics

The descriptive statistics of the survey sample indicate that female respondents accounted for 58.8% of the surveyed customers, which was higher than male respondents at 41.2%. Customers aged between 25 and 45 years old accounted for the highest proportion at 56.4%. This was followed by customers under 25 years old at 16.4%, and those aged between 46 and 60 years old at 14%. Customers over 60 years old represented a lower proportion, accounting for only 13.2%.

Most surveyed customers held a university degree, accounting for 55.2%. This was followed by customers with vocational or college qualifications at 32.8%. Customers with a high school education consisted of 16 respondents, accounting for 6.4%. Customers with postgraduate qualifications represented a very small proportion at only 5.6%.

The surveyed customers worked in various sectors. Office employees accounted for the largest proportion at 44.8%; government officials and public employees represented a considerable proportion at 19.2%; workers accounted for 14%; and students represented 10%. Other occupational groups, such as homemakers and freelance workers, accounted for 6.8% of the respondents. Retired customers represented the lowest proportion, accounting for only 5.2%.

The surveyed customers generally had relatively high income levels. Most respondents earned between VND 10 –12 million per month, with 108 respondents accounting for 43.2%. Customers earning between VND 13–15 million accounted for 38.8%. Those with an income above VND 15 million consisted of 15 respondents, corresponding to 12.4%. Customers earning below VND 5 million represented the lowest proportion at 5.6%.

Testing the Reliability of the Measurement Scale

Table 1 presents the results of the scale reliability testing. The reliability assessment of the research model shows that the Cronbach's Alpha coefficients ranged from 0.893 to 0.948 (Table 2). Compared with the acceptable threshold of 0.6, all observed variables in the measurement scales satisfied the required standard. In addition, all item-total correlation coefficients were greater than 0.3. The Cronbach's Alpha if Item Deleted values of all 29 observed variables were lower than the overall Cronbach's Alpha coefficients; therefore, no variables were removed.

Table 1. Results of Factor Analysis and Reliability Testing

Variables	Number of observed variables	Cronbach's Alpha	Factor loading coefficient	Extracted variance
Tangibility	5	0.941	0,819; 0,823; 0,820; 0,796; 0,763;	80,257%
Reliability	6	0.912	0,823; 0,833; 0,811; 0,819; 0,821; 0,792	
Responsibility	5	0.951	0,845; 0,817; 0,813; 0,785; 0,793	
Assurance	6	0.939	0,813; 0,815; 0,823; 0,787; 0,795; 0,773	
Empathy	4	0.932	0,832; 0,841; 0,812; 0,797	
Customer's Satisfaction	3	0.896	0,911; 0,921; 0,903	81,325%

Correlation Coefficient Analysis

Before conducting multiple linear regression analysis, a correlation analysis was performed to examine the relationships between the independent variables and the dependent variable, as well as among the independent variables within the research model.

The correlation results show that all variables are interrelated, and all five independent variables are significantly correlated with customer satisfaction. Among them, the strongest correlation is observed for the responsibility variable with a coefficient of 0.628, while the weakest correlation is found in the tangibles variable with a coefficient of 0.535. All correlations are statistically significant at a 95% confidence level.

Therefore, it can be concluded that these independent variables are suitable for inclusion in the regression model to explain customer satisfaction. In summary, after performing Pearson correlation testing, all independent variables satisfy the required conditions for further regression analysis.

Table 2. Results of Correlation Coefficient Analysis

		Customer's Satisfaction	Reliability	Assurance	Tangibility	Responsibility	Empathy
Customer's Satisfaction	Pearson's r	1	0.541**	0.578**	0.535**	0.629**	0.543*
	Sig. (2-tailed)		0.000	0.000	0.000	0.000	0.000
Reliability	Pearson's r	0.541**	1	0.457**	0.493**	0.417**	0.527**
	Sig. (2-tailed)	0.000		0.000	0.000	0.000	0.000
Assurance	Pearson's r	0.578**	0.457**	1	0.481**	0.565**	0.471**
	Sig. (2-tailed)	0.000	0.000		0.000	0.000	0.000
Tangibility	Pearson's r	0.535**	0.493**	0.481**	1	0.593**	0.573**
	Sig. (2-tailed)	0.000	0.000	0.000		0.000	0.000
Responsibility	Pearson's r	0.629**	0.417**	0.565**	0.593**	1	0.571**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000		0.000
Empathy	Pearson's r	0.543**	0.527**	0.471**	0.573**	0.571**	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	

** significant at 5%

Exploratory Factor Analysis (EFA)

The results of Exploratory Factor Analysis indicate that five factors were extracted from the independent variables. The Kaiser-Meyer-Olkin (KMO) measure reached 0.641 ($0.5 < \text{KMO} < 1$), and Bartlett's Test of Sphericity was significant at 0.000 (< 0.05), indicating that the data are suitable for factor analysis. The factor loadings of all observed variables were greater than 0.5, confirming that the EFA results are appropriate.

For the customer satisfaction scale (dependent variable), the KMO value was 0.77 (greater than 0.5), and Bartlett's Test was also significant at 0.000 (< 0.05), indicating that the dependent variable achieved convergent validity.

Regression Analysis

Table 3 shows that the multiple linear regression model is appropriate for the dataset (Adjusted R Square = 0.632, indicating that the independent variables explain 63.2% of the variation in the dependent variable. All tolerance values are greater than 0.6 and all VIF values are less than 2; therefore, multicollinearity is not a serious issue among the variables in the multiple regression model.

Table 3. Regression Analysis

	Unstandardized regression coefficient		Standardized regression coefficient	t	Sig.
	Coefficient	Standard Error	Coefficient		
Intercept	0.179	0.211		0.848	0.002
Reliability	0.228	0.07	0.119	3.708	0.000
Assurance	0.238	0.061	0.229	3.706	0.000
Tangibility	0.121	0.057	0.088	1.725	0.000
Responsibility	0.32	0.075	0.322	4.829	0.031
Empathy	0.088	0.017	0.226	1.22	0.027

$F = 36.512$, ** significant at 5%

$\bar{R}^2 = 0.632$

The t-values and significance levels in the multiple regression model indicate that all five independent variables have an effect on customer satisfaction regarding logistics service quality at a 95% confidence level ($p\text{-value} < 0.05$). Therefore, hypotheses H1, H2, H3, H4, and H5 are accepted at the 95% confidence level.

The ANOVA analysis results show an F-statistic value of 36.512 with a significance value of Sig < 0.05 . Thus, the multiple regression model satisfies the evaluation conditions and goodness-of-fit tests.

The regression test results indicate that all five factors have a positive impact on customer satisfaction with logistics service quality at express delivery enterprises in Hanoi. Among these factors, responsibility has the strongest influence on customer satisfaction, followed by assurance. The third factor is empathy, then tangibles, and finally reliability.

Customer's satisfaction (Y) = $0.179 + 0.228 \times \text{Reliability} + 0.238 \times \text{Assurance} + 0.121 \times \text{Tangibility} + 0.32 \times \text{Responsibility} + 0.088 \times \text{Empathy}$.

Regarding responsibility, the responsibility factor has the strongest impact on customer satisfaction with the logistics service quality, with a Beta coefficient of 0.32 and a mean value of 3.780. This shows that customers evaluate responsibility at an average level. Therefore, to improve customer satisfaction, logistics enterprises should provide complete service information on its website, promptly resolve all customer complaints, and respond to customer feedback in a constructive and receptive manner.

Regarding assurance, the assurance factor has the second strongest impact on customer satisfaction with the sales activities, with a Beta coefficient of 0.238 and a mean value of 3.641. This shows that customers rate assurance at a moderate level. Therefore, to enhance assurance, the logistic staffs should resolve customer complaints quickly and accurately, provide enthusiastic customer service, demonstrate professionalism, and handle services efficiently and promptly.

Regarding reliability, the reliability factor has the third strongest impact on customer satisfaction with the logistics service quality, with a Beta coefficient of 0.228. Customers also rated this factor as fairly reliable, with a mean score of 3.525 for the reliability scale. The observed variables within the reliability factor all have mean values ranging from 3.512 to 3.59 indicating that customers generally evaluate positively in terms of reliability. Therefore, logistic enterprises should consistently maintain its credibility with customers, prioritize customers' interests, and avoid errors during the service delivery process.

Regarding tangibles, the tangible factor has the fourth strongest impact on customer satisfaction with the logistics service quality, with a Beta coefficient of 0.121 and a mean value of 3.412. This indicates that customers evaluate the tangible aspects at an average level. Therefore, logistic enterprises should further invest in physical facilities, upgrade cargo cranes and modern equipment, and invest in additional road freight transport vehicles in order to improve the quality of logistics services.

Regarding empathy, the empathy factor has the smallest impact on customer satisfaction with the logistics service quality, with a Beta coefficient of 0.088 and a mean value of 3.412. This indicates that customers evaluate empathy at a moderate level. Therefore, to enhance empathy, logistic enterprises should demonstrate greater concern in addressing customer requests, be willing to respond to or reasonably resolve customers' special needs, respect customers' time, and consider customers' interests as the guiding principle in all actions.

IV. Difference test

The Levene's test results for variance by gender show a significance value of $\text{Sig} = 0.321 > 0.05$. Therefore, it can be concluded that there is no statistically significant difference in customer satisfaction with the logistics service quality among respondents of different genders.

The Levene's test for variance across age groups yielded a significance value of $\text{Sig} = 0.713 > 0.05$, indicating that the variances among age groups are homogeneous. The ANOVA test result shows a significance value of $\text{Sig} = 0.172 > 0.05$. Thus, it can be concluded that there is no statistically significant difference in customer satisfaction with the logistics service quality among respondents from different age groups.

The Levene's test results for variance among educational-level groups show a significance value of $\text{Sig} = 0.514 > 0.05$, indicating equal variances among the groups. The ANOVA test result shows a significance value of $\text{Sig} = 0.136 > 0.05$. Therefore, it can be concluded that there is no statistically significant difference in customer satisfaction with the logistics service quality among respondents with different educational levels.

The Levene's test results for variance among income groups show a significance value of $\text{Sig} = 0.312 > 0.05$, indicating that the variances between the groups are homogeneous. The ANOVA test result shows a significance value of $\text{Sig} = 0.040 < 0.05$. Therefore, it can be concluded that there is a statistically significant difference in customer satisfaction with the logistics service quality among respondents from different income groups.

V. CONCLUSION

Based on the research results and the obtained regression equation, customer satisfaction regarding the logistics service quality is affected by five service quality factors, ranked from strongest to weakest impact as follows: (1) Responsibility; (2) Assurance; (3) Reliability; (4) Tangible facilities; (5) Empathy. These findings serve as the basis for proposing managerial implications.

First, businesses should always listen to customers' opinions and provide prompt and appropriate feedback. Enterprises need to consistently value customers' needs, particularly legitimate needs related to the services they provide.

Second, businesses should always pay attention to assurance in their operations. This factor may come from employees' behavior, the ability to create a sense of safety, build trust, and possess sufficient knowledge to answer customers' questions. To achieve this, enterprises need to focus on employee training, especially staff who interact directly with customers.

Third, to strengthen reliability, enterprises must deliver services exactly as initially committed. For each business plan, enterprises should assign key operational personnel to monitor the entire process and provide risk warnings so that timely corrective measures can be taken until the order is fully completed, thereby increasing customer trust.

Fourth, to improve tangible facilities, businesses should intensify brand promotion and build an image of a green, clean, and well-organized working environment. At the same time, they should establish a standardized code of conduct for employees in their interactions with both internal and external customers.

Finally, to enhance empathy toward customers—especially large and frequent users of the service—businesses should implement deferred payment policies for these key clients. In addition, enterprises should consider sharing any additional costs incurred by customers due to objective factors arising during the use of logistics services.

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