IJETRM

International Journal of Engineering Technology Research & Management
www.ijetrm.com

RELATIONSHIP BETWEEN INFORMATION TECHNOLOGY, SERVICE QUALITY, AND CUSTOMER SATISFACTION IN THE VIETNAMESE LOGISTICS SERVICE INDUSTRY

Vo Thi Ngoc Linh
Ho Chi Minh City University of Banking, Vietnam

Abstract
This study aims to determine the relationship between information technology, logistics service quality, and customer satisfaction in the Vietnamese logistics service industry. Data was collected through a survey of customers using logistics services in Vietnam, yielding 454 valid responses. The research results indicate that information technology positively impacts factors of logistics service quality, including personal communication quality, order execution, and information quality. Factors of logistics service quality positively influence customer satisfaction. This study provides managerial implications to enhance logistics service quality and customer satisfaction in the Vietnamese logistics service industry.

Keywords:
Information Technology, Logistics Service Quality, Customer Satisfaction

1. Introduction
Today, businesses are in a race to improve themselves to gain an edge over competitors in the global competitive environment. Therefore, they are striving to develop their information technology systems to be faster and more flexible, improving processes, making decisions faster and better. Developments in information technology allow companies to enhance service quality, provide the most innovative and accurate services to meet changing conditions and customer needs, which has become one of the essential needs of logistics sector companies to provide high-quality services (Gulc, 2017). Research by Civelek et al. (2022) has shown that information technology positively impacts logistics service quality. According to Jang et al. (2013), logistics service quality measures customers' perceptions of the logistics services provided to reflect the company's ability to provide services corresponding to the price. Logistics service quality is one of the important factors ensuring customer satisfaction and strengthening the competitive position of companies in the market, helping the Vietnamese logistics service industry attract investment and have many development opportunities, thereby improving the business efficiency of companies. Research by Uvet (2020), Hafez et al. (2021), Lin et al. (2023) has found that logistics service quality positively affects customer satisfaction.

The quality of logistics services in Vietnam has undergone significant positive changes in recent years. The annual growth rate of the industry averages from 14 to 16%, the number of logistics companies and the quality of logistics services are increasingly improving, making significant contributions to the total import-export turnover in 2022 reaching 730.2 billion USD, an increase of 9.1% compared to the same period in 2021. However, alongside the achievements, the logistics service industry in Vietnam also faces many challenges. The cost of logistics services is still high. Although domestic companies outnumber foreign companies, they only occupy about 30% of the market share, with the rest being foreign companies. Vietnamese companies mainly provide domestic logistics services, with limited financial and managerial capacity, serving only specific segments, lacking connectivity between different stages in the integrated logistics service chain. Although most logistics companies focus on applying information technology to their operations, the level and proficiency are still limited. Therefore, understanding the relationship between information technology, logistics service quality factors, and customer satisfaction is necessary for logistics companies to lay the groundwork for successful operations improvement.

2. Theoretical Foundation and Research Model
2.1. Information Technology
According to Sheikh and Rana (2011), information technology is a crucial resource for the logistics service industry if they intend to integrate systems with customers to enhance satisfaction and assist companies in improving operational efficiency and logistics service quality. According to Lai et al. (2007), information

iJETRM

International Journal of Engineering Technology Research & Management
www.ijetrm.com

technology solutions are indispensable for companies to strengthen and enhance customer service capabilities in logistics. Prahalad and Krishnan's research (1999) highlights information technology as one of the most critical resources in the logistics service industry.

2.2. Logistics Service Quality

According to Zeithaml and Bitner (2000), services can be defined as actions, processes, or methods of carrying out a task aimed at creating value for customers to satisfy their needs and expectations. Gronroos (1984) defines service quality as the process of evaluating customer quality based on the comparison of the service customers actually receive after using the service compared to their expectations before using the service. Parasuraman et al. (1985, 1988) define service quality based on the gaps between customer expectations, perceptions, and experiences when using the service. Saura et al. (2008) argue that logistics service quality is an assessment of necessary operational levels to provide services and streamline processes by creating service products. According to Jang et al. (2013), logistics service quality is a measurement tool for customer perception of logistics services provided to demonstrate the company's distribution capabilities in meeting the price expectations of customer services. Logistics service quality is one of the essential factors ensuring customer satisfaction and strengthening the competitive position of companies. Gaudenzi et al. (2020) suggest that logistics service quality comprises seven aspects: information quality, personal quality, order placement process, order accuracy, placement conditions, timeliness, and order discrepancy handling. Hafez et al. (2021) propose that logistics service quality includes information quality, product quality, product condition, delivery service, reverse logistics, and customer service. Synthesizing previous studies, logistics service quality encompasses the following key factors: personal relationship quality, order execution, information quality, and social responsibility.

2.3. Customer Satisfaction

Schneider and White (2004) argue that satisfaction primarily involves customers' emotional evaluation of service provision. Jeong et al. (2016) point out that satisfaction is related to customers spending a certain amount but effectively compensated during the purchasing process. Satisfaction occurs when consumers feel that past purchases and consumption, the expected benefits from brand products, or services meet consumer goals (Bergman & Klefsjo, 2010).

2.4. Proposed Research Model

Based on the synthesis of theoretical frameworks and review of related studies, the author intends to develop from the original model by Harash Sachdev et al. (2015) and Civelek et al. (2022), as these two models are directly relevant to the issue the author wants to investigate, namely information technology and service quality. Therefore, the proposed research model is as follows:
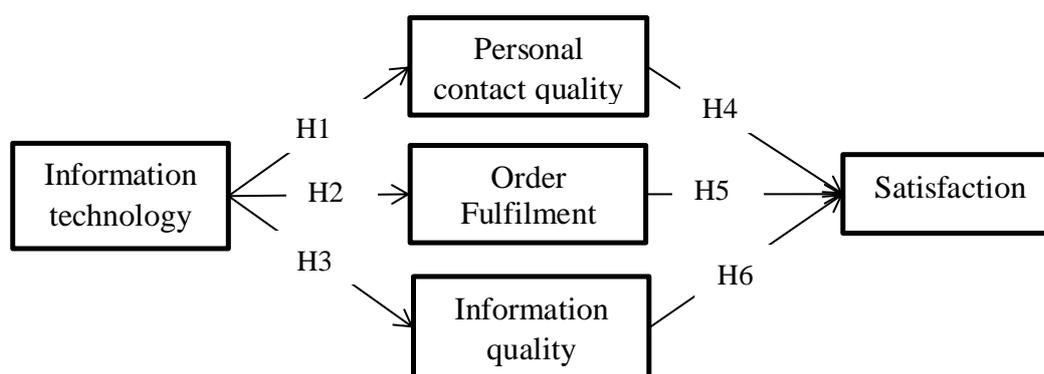

Figure 1. Proposed Research Model by the Author

Benjamin and Wigand (1995) found that facilitating collaboration between parties in logistics operations, providing better quality services by delivering communication and accurate information among supply chain partners, is one of the most significant impacts of information technology (IT) on logistics service quality. Founou (2002) argued that using IT in logistics enhances efficiency and competitiveness. Bienstock et al. (2008) highlighted that having a comprehensive IT system is one of the most critical factors in improving logistics service

IJETRM

International Journal of Engineering Technology Research & Management
www.ijetrm.com

quality. According to Tadejko (2015), logistics information systems contribute to the development of logistics activities. Research by Civelek et al. (2022) demonstrated the role of IT in enhancing logistics service quality. Therefore, the following hypotheses are proposed:

H1: IT positively impacts personal relationship quality.

H2: IT positively impacts order execution.

H3: IT positively impacts information quality.

Uvet (2020) identified the correlation between consumers and employees in perceiving logistics service quality, suggesting that customer satisfaction with logistics services is also influenced by the behavior and attention of logistics service employees. According to Gupta et al. (2022), personal relationship quality positively influences customer satisfaction in the case of logistics services.

Thus, the following hypothesis is proposed:

H4: Personal relationship quality positively impacts satisfaction.

Delivery time, issue resolution, and order problem-solving influence customer satisfaction (Mentzer et al., 1999). Daugherty et al. (1998) indicated that operational activities related to logistics services positively impact customer satisfaction. Gupta et al. (2022) demonstrated that order execution positively influences customer satisfaction.

Therefore, the following hypothesis is proposed:

H5: Order execution positively impacts satisfaction.

According to Uvet (2020), providing comprehensive information about logistics service offerings helps customers make informed decisions about which services to use and leads to customer satisfaction. High-quality information provided by logistics service providers can result in greater customer satisfaction.

Thus, the following hypothesis is proposed:

H6: Information quality positively impacts satisfaction.

3. Research Methodology

The study employs a mixed-method research approach, comprising qualitative research through in-depth interviews with experts and focus group discussions with experts, and quantitative research through a survey of customers who have used logistics services in Vietnam. The survey focuses on major economic areas spanning from North to South, including Hanoi, Hai Phong City, Da Nang City, Ho Chi Minh City, Binh Duong, and Can Tho. The scale used in this study is a Likert scale ranging from 1 to 5 (1: Very Dissatisfied, 2: Dissatisfied, 3: Neutral, 4: Satisfied, 5: Very Satisfied). The scale inherits from previous studies. To measure information technology, the scale is adapted from Aslan et al. (2018). The factors of logistics service quality are measured using a scale developed by Thai (2013). The satisfaction scale developed by Xiaofang Lin (2023) is used for measuring satisfaction. After distributing the survey questionnaires, 454 valid responses were collected. The collected data will be encoded, input, and analyzed using SPSS 25 and Amos 24 software.

4. Results of the Study

The characteristics of the formal study sample with a sample size of n = 454 observations are classified according to the type of company, the operating time of the company, and the industry in which the respondents work, as detailed in Table 1.

Table 1: Characteristics of the Formal Study Sample

Sample Characteristics		Frequency	Percentage (%)
Location of Operation	Ha Noi	99	21.8
	Hai Phong	56	12.3
	Da Nang	63	13.9
	Ho Chi Minh	104	22.9
	Binh Duong	80	17.6
	Can Tho	52	11.5
Duration of Business Operation	Under 3 years	62	13.7
	From at least 3 years to under 5 years	137	30.2
	From at least 5 years to 10 years	129	28.4
	10 years and above	126	27.8
Industry of Business Operation	Manufacturing	106	23.3
	Commerce	139	30.6
	Export, Import	112	24.7
	Multi-sectoral integration	97	21.4

IJETRM

International Journal of Engineering Technology Research & Management
www.ijetrm.com

The results of testing the reliability of the scale using Cronbach's Alpha coefficient show that the Cronbach's Alpha values for the scales of information technology, personal relationship quality, order execution, information quality, and satisfaction are 0.891, 0.832, 0.917, 0.935, and 0.889 respectively, all exceeding 0.6. Therefore, the scales ensure reliability.

Table 2. Evaluation Criteria for Confirmatory Factor Analysis (CFA) Results

Criterion	Value Analysis	Reference Value	Source
Chi-square/df	1,472	Chiquare/df < 3	Hair et al. (2010)
GFI	0,949	GFI > 0,8	Hair et al. (2010)
TLI	0,984	TLI > 0,9	Hair et al. (2010)
CFI	0,987	CFI > 0,9	Hair et al. (2010)
RMSEA	0,032	RMSEA < 0,08	Hair et al. (2010)

According to the results in Table 2, the indices such as: Chi-square/df is 1.472, which is less than 3; GFI is 0.949, which is greater than 0.8; TLI is 0.984, which is greater than 0.9; CFI is 0.987, which is greater than 0.9; and RMSEA is 0.032, which is less than 0.08. Therefore, the model fits the market data.

Table 3. Confirmatory Factor Analysis (CFA) Results

	Standardized Weights	Cronbach's Alpha	CR	AVE
Information technology		0.891	0.892	0.622
IT1				
IT2				
IT3				
IT4				
IT5				
Personal contact quality		0.832	0.832	0.553
PC1	0.769			
PC2	0.697			
PC3	0.74			
PC4	0.757			
Order fulfillment		0.917	0.917	0.735
OF1	0.835			
OF2	0.879			
OF3	0.867			
OF4	0.825			
Information quality		0.935	0.936	0.786
IQ1	0.822			
IQ2	0.904			
IQ3	0.908			
IQ4	0.902			
Satisfaction		0.889	0.889	0.668
ST1	0.828			
ST2	0.826			
ST3	0.793			
ST4	0.803			

The results in Table 3 show that all standardized weights are greater than 0.5, the composite reliability (CR) values of the factors are all greater than 0.7, and the average variance extracted (AVE) of the factors are all greater than 0.5. Thus, the results of the confirmatory factor analysis indicate that the model fits the data well.

iJETRM

International Journal of Engineering Technology Research & Management

www.ijetrm.com

Table 4. Hypothesis Testing Results

Hypothesis	Relationship	Standardized Regression Coefficient	P-value	Conclusion
H1	Information technology -> Quality of interpersonal relationship	0.115	0,035	Accepted
H2	Information technology -> Order fulfillment	0.232	***	Accepted
H3	Information technology -> Information quality	0.223	***	Accepted
H4	Quality of interpersonal relationship -> Customer satisfaction	0.249	***	Accepted
H5	Order fulfillment -> Customer satisfaction	0.467	***	Accepted
H6	Information quality -> Customer satisfaction	0.290	***	Accepted

The results of the linear structural model analysis indicate that information technology positively influences personal relationship quality ($\beta = 0.115$; $p < 0.05$), information technology positively influences order fulfillment ($\beta = 0.232$; $p < 0.05$), and information technology positively influences information quality ($\beta = 0.223$; $p < 0.05$). Thus, hypotheses H1, H2, and H3 are accepted.

Personal relationship quality positively influences satisfaction ($\beta = 0.249$; $p < 0.05$), order fulfillment positively influences satisfaction ($\beta = 0.467$; $p < 0.05$), and information quality positively influences satisfaction ($\beta = 0.290$; $p < 0.05$). Therefore, hypotheses H3, H4, and H5 are accepted.

5. Managerial Implications

The findings of this study have implications for logistics service providers seeking to enhance service quality and customer satisfaction.

Firstly, the application of information technology will help logistics service providers optimize costs, improve service quality, operational efficiency, and establish a significant position for logistics service providers in the Vietnamese market. Hence, Vietnamese logistics service providers need to invest more in the application and development of information technology. Companies should enhance the competency and skills of applying information technology in their logistics operations, allocate financial resources appropriately, and attract investment in information technology for logistics activities. Additionally, the government should enact policies to support and encourage companies in the research field to develop information technology applications according to international standards, thereby facilitating domestic logistics companies' access to advanced applications, suitable for their financial capabilities, to connect various links in the logistics process to ensure data security and shorten handling time.

Secondly, logistics service providers should invest in deploying customer relationship management systems. Moreover, frontline staff interacting directly with customers need to be trained in communication skills to increase customer satisfaction, providing convenience for customers in placing and handling orders. Furthermore, employee recognition is necessary to inspire them to provide higher quality services.

Thirdly, logistics service providers need to have binding regulations to increase responsibility for fulfilling orders as committed initially. Additionally, standards should be established and personnel trained, especially in specialized knowledge and professional handling, to support customers in the service delivery process.

Fourthly, logistics service providers need to grasp information and provide accurate, complete information to customers. Companies can develop their own order tracking applications, provide accounts for customers to easily access and monitor their order information.

REFERENCES

1. Benjamin, R., & Wigand, R. (1995). Electronic markets and virtual value chains on the information superhighway. *MIT Sloan Management Review*.

iJETRM

International Journal of Engineering Technology Research & Management
www.ijetrm.com

2. Bergman, B., & Klefsjö, B. (2010). *Quality from customer needs to customer satisfaction*. Studentlitteratur AB.

3. Bienstock, C. C., Royne, M. B., Sherrell, D., & Stafford, T. F. (2008). An expanded model of logistics service quality: Incorporating logistics information technology. *International Journal of Production Economics*, *113*(1), 205-222.

4. Civelek, M. E., Akoğlu, N., & Başaran, Y. (2022). The role of information technology in the effect of innovation capability on logistics service quality. *İşletme araştırmaları dergisi*, *14*(1), 249-265.

5. Daugherty, P. J., Stank, T. P., & Ellinger, A. E. (1998). Leveraging logistics/distribution capabilities: the effect of logistics service on market share. *Journal of Business logistics*, *19*(2), 35.

6. Founou, R. (2002). The role of IT in logistics competitive advantage or strategic necessity. 2nd Swiss Transport Research Conference.

7. Gaudenzi, B., Confente, I., & Russo, I. (2020). Logistics service quality and customer satisfaction in B2B relationships: a qualitative comparative analysis approach. *The TQM Journal*, *33*(1), 125-140.

8. Gil Saura, I., Servera Frances, D., Berenguer Contri, G., & Fuentes Blasco, M. (2008). Logistics service quality: a new way to loyalty. *Industrial management & data systems*, *108*(5), 650-668.

9. Grönroos, C. (1984). A service quality model and its marketing implications. *European Journal of marketing*, *18*(4), 36-44.

10. Gulc, A. (2017). Models and methods of measuring the quality of logistic service. *Procedia Engineering*, *182*, 255-264.

11. Gupta, A., Singh, R. K., Mathiyazhagan, K., Suri, P. K., & Dwivedi, Y. K. (2022). Exploring relationships between service quality dimensions and customers' satisfaction: empirical study in context to Indian logistics service providers. *The International Journal of Logistics Management*.

12. Hafez, L., Elakkad, E., & Gamil, M. (2021). A study on the impact of logistics service quality on the satisfaction and loyalty of e-shoppers in Egypt. *Open Journal of Business and Management*, *9*(5), 2464-2478.

13. Jang, H. M., Marlow, P. B., & Mitroussi, K. (2013). The effect of logistics service quality on customer loyalty through relationship quality in the container shipping context. *Transportation Journal*, *52*(4), 493-521.

14. Jeong, M. S., Cha, J. E., & Jang, D.-H. (2016). Impact of the service quality of horseback riding experience on customer satisfaction and loyalty-In case of Jangsu horse riding experience course. *Journal of Korean Society of Rural Planning*, *22*(2), 131-140.

15. Lai, F., Zhao, X., & Wang, Q. (2007). Taxonomy of information technology strategy and its impact on the performance of third-party logistics (3PL) in China. *International Journal of Production Research*, *45*(10), 2195-2218.

16. Lin, X., Mamun, A. A., Yang, Q., & Masukujjaman, M. (2023). Examining the effect of logistics service quality on customer satisfaction and re-use intention. *PloS one*, *18*(5), e0286382.

17. Mentzer, J. T., Flint, D. J., & Kent, J. L. (1999). Developing a logistics service quality scale. *Journal of Business logistics*, *20*(1.1999).

18. Prahalad, C. K., & Krishnan, M. S. (1999). The new meaning of quality in the information age. *Harvard business review*, *77*(5), 109-109.

19. Schneider, B., & White, S. S. (2004). Service quality: Research perspectives.

20. Sheikh, Z., & Rana, S. (2011). Role of third party logistics providers with advanced IT to increase customer satisfaction in supply chain integration. Society of Interdisciplinary Business Research (SIBR) 2011 Conference on Interdisciplinary Business Research.

21. Tadejko, P. (2015). Application of Internet of Things in logistics–current challenges. *Ekonomia i Zarządzanie*, *7*(4), 54-64.

22. Uvet, H. (2020). Importance of logistics service quality in customer satisfaction: An empirical study. *Operations and Supply Chain Management: An International Journal*, *13*(1), 1-10.

23. Zeithaml, V.A., & Bitner, M. (2000). Service Marketing. McGraw-Hill, New York.