RESEARCH ARTICLE

Logistics Factors Affecting the Efficiency of Transportation Services and Customer Satisfaction of a Freight Company in Suphan Buri Province

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Abstract

This research explores the impact of logistics factors on transportation service efficiency and customer satisfaction for a freight company in Suphan Buri Province, utilizing a survey of 400 customers based on Taro Yamane's method with a 95% confidence level. Data analysis involved frequency, percentage, mean, standard deviation, and multiple regression. Results show that logistics factors — service provision, transportation, and logistics communication — strongly influence transportation efficiency, with a 63% predictive power. Transportation efficiency, combined with factors like customer service and communication, significantly affects customer satisfaction, with a 60% predictive power, both statistically significant at

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the 0.05 level. Recommendations include investing in real-time tracking and automated communication systems to improve transparency and service reliability. The company should also offer ongoing staff training to better meet customer needs and optimize transportation routes to reduce delays. Enhancing logistics communication through proactive updates and establishing feedback channels can build customer trust. Collaborating with local stakeholders may further streamline service delivery and boost long-term customer satisfaction, giving the company a competitive advantage.

Keywords: Logistics factors; Efficiency of transportation services; Customer satisfaction

1. Introduction

Transportation is considered a crucial service industry that plays a vital role in daily life, supporting various tasks and activities. Since ancient times, transportation has been essential for moving people, animals, or goods from one place to another. It is closely linked with other logistics activities within industries, such as consumer goods, where transportation costs are included in the price of goods and services throughout the distribution channels or the supply chain (Apipratayasakul, 2013). Transportation is highly significant in sales and distribution, both domestically and internationally, as it adds value to goods and services, allowing consumers in remote areas to access products they need. Transportation enables the efficient movement of goods from the production source to the market, and the transportation costs are embedded in the price of goods and services at every stage—from raw materials to production, from producers to intermediaries, from intermediaries to retailers, and finally to consumers. In Thailand, there are four major types of transportation: air, rail, sea, and land transport, with trucking being the most popular mode for domestic transportation. Land transportation by truck is advantageous as it can reach both large and small consignors and consignees more effectively than other modes. However, the survival of logistics and freight management companies depends on several key factors, including routes, vehicles, equipment, terminals, as well as other considerations like operators and regulations (Phrommetchit, 2019).

The freight company in Suphan Buri Province was established in 2008 and has been operating since then. The company engages in the repair and trade of various types of trucks, including ten-wheel trucks, dump trucks, and six-wheel trucks with cranes. Currently, the company collaborates with leading companies such as Nam Sin Insurance for vehicle maintenance and CRC Thai Watsadu Co., Ltd. for freight services.

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Transportation is a critical factor in delivering goods from the production source, through intermediaries, to the market. It plays a significant role in logistics, comparable to other aspects. In 2019, the transportation and warehousing business was affected by economic changes, including the COVID-19 pandemic, which began in 2019. This pandemic caused people to stay home and rely on online shopping for convenience and to minimize contact, thus highlighting the crucial role of transportation businesses in meeting these demands. The freight company in Suphan Buri Province provides reliable, fast, and safe delivery services for goods purchased from CRC Thai Watsadu Co., Ltd., ensuring that the products reach the customers safely. The company adheres to its service mission by providing cost-effective, simple, and efficient services, instilling driving discipline in drivers to reduce accidents, and maintaining strong partnerships with customers to achieve mutual business growth and a solid foundation. This commitment to service aims to enhance customer satisfaction, which in turn positively affects the image of both the selling company and the freight company in Suphan Buri Province.

For these reasons, the researcher is interested in studying the logistics factors that affect transportation service efficiency and customer satisfaction in a freight company in Suphan Buri Province. The research findings will be presented to management to improve the logistics service quality of the company, ensuring it meets customer needs and achieves the highest levels of satisfaction and loyalty.

2. Research Objectives

1. To study logistics factors affecting the efficiency of transportation services for customers of a freight company in Suphan Buri Province.

2. To study how transportation service efficiency impacts customer satisfaction with the freight company in Suphan Buri Province.

3. To study logistics factors that influence customer satisfaction with the freight company in Suphan Buri Province.

3. Literature Review

3.1 Concepts of Logistics

Panomyong (2016) defines logistics as the management of the supply chain, encompassing processes from planning, execution, and control to the efficient and effective movement of goods, services, and related information from the point of origin to the point of consumption, according to customer requirements. This includes considerations for reverse logistics. Similarly, Mimesakun (2021) describes logistics as a part of the supply chain process involving the movement and storage of goods from one location to another, with operational planning and control of forward and reverse

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flows to achieve minimal costs while meeting customer needs. Jirotkulkit (2022) also defines logistics as a business process involving the movement and storage that facilitates the flow of goods from the point of raw material procurement to the point of final consumption, alongside information flow, to achieve the business objectives of customer satisfaction at an appropriate cost. From these definitions, logistics can be summarized as a process focusing on activities related to production planning, movement, storage, distribution of goods and services, and delivery from producers to consumers. The development of a transportation system should aim to ensure quality, standards, and efficiency while remaining competitive in cost. This study focuses specifically on the logistics processes involved in transportation operations.

3.2 Concepts of Transportation Efficiency

Maichan (2017) defines transportation efficiency as the successful execution of activities that achieve desired outcomes and targets while minimizing the consumption and loss of various resources, ensuring the lowest possible cost ratio for inputs while meeting organizational objectives in a timely and beneficial manner. Efficiency is derived from factors related to personnel, budget, materials, equipment, and management to achieve accurate, timely, and satisfactory results for the organization. Similarly, Phra Mahakanathip Junsanga (2018) describes transportation efficiency as the ability to perform tasks and responsibilities accurately, quickly, and on time, utilizing knowledge, skills, and available resources to the fullest extent, ensuring the highest level of customer satisfaction while achieving the organization's goals. The level of efficiency in operations depends on various factors. From these definitions, transportation efficiency can be summarized as the methods and approaches used in operations to achieve success, including the procurement and utilization of resources in a quality manner to meet defined objectives.

3.3 Concepts and Theories of Customer Satisfaction

Srihapol (2013) defines customer satisfaction as an internal feeling that varies among individuals, depending on how each person anticipates and expects certain things. If expectations are high and well met, satisfaction is high; conversely, if expectations are unmet, disappointment or dissatisfaction may result, depending on the level of expectation. Similarly, Intasen et al. (2017) describe satisfaction as a feeling of fulfillment when one's needs are met, leading to happiness, enthusiasm, commitment to work, morale, and eventually effective and successful outcomes. Noontong et al. (2019) also define satisfaction as an internal feeling that varies among individuals, depending on how they anticipate and expect certain things. High expectations met with good responses result in high satisfaction, while unmet expectations lead to disappointment or dissatisfaction, depending on the level of expectation. From these definitions, satisfaction can be summarized as an internal

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feeling that varies among individuals, depending on how they anticipate and expect certain outcomes. If expectations are high and well met, satisfaction is high.

4. Methods

4.1 Population and Sample

The population of this study consists of customers of a freight company in Suphan Buri Province, with an unknown exact number. The sample size was calculated using Taro Yamane's (1973) table, with a 95% confidence level and a 5% margin of error, resulting in a sample of 400 individuals. Data were collected using convenient sampling.

4.2 Data Collection Instruments

This study utilized a questionnaire as the data collection tool, consisting of both closed-ended and open-ended questions. The questionnaire was divided into five sections:

Section 1: Personal information of respondents, including gender, age, occupation, income, education level, and frequency of service usage, with a checklist format (6 items).

Section 2: Questions related to logistics factors of the freight company in Suphan Buri Province, covering customer service, transportation, and logistics communication (11 items).

Section 3: Questions on the efficiency of transportation services provided by the freight company in Suphan Buri Province (6 items).

Section 4: Questions regarding customer satisfaction with the freight company's services in Suphan Buri Province (6 items).

Section 5: Open-ended questions for suggestions.

Each response was rated on a scale of 1 to 5, where 5 indicates "strongly agree," and 1 indicates "strongly disagree." The interpretation of average scores is as follows: 4.21–5.00 (strongly agree), 3.41–4.20 (agree), 2.61–3.40 (neutral), 1.81–2.60 (disagree), and 1.00–1.80 (strongly disagree). The questionnaire was validated for content accuracy using the Item Objective Congruence (IOC) index, with all items scoring above 0.50. Reliability was assessed using Cronbach's alpha coefficient, which ranged from 0.87 to 0.95 across different sections, and the overall questionnaire reliability was 0.97, indicating high reliability suitable for the study (Vanichbuncha, 2010).

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4.3 Statistical Analysis

The study utilized both descriptive and inferential statistics to analyze the data. Respondents' demographic information, including gender, age, education level, occupation, and income, was analyzed using frequency and percentage. The levels of agreement on logistics factors, transportation service efficiency, and customer satisfaction were assessed using mean and standard deviation. For inferential statistics, multiple regression analysis was employed to examine the impact of logistics factors on transportation service efficiency and customer satisfaction within the freight company in Suphan Buri Province. Additionally, simple regression analysis was used to determine how transportation service efficiency directly influences customer satisfaction.

5. Results

5.1 Analysis of Demographic Data

The analysis revealed that the majority of respondents were female (244 respondents, 61.00%). Most were aged between 20-30 years (179 respondents, 44.75%), with a bachelor's degree (245 respondents, 61.25%). The predominant occupation was business owner/trader (108 respondents, 27.00%), and the most common income range was 20,001 - 30,000 baht per month (176 respondents, 44.00%).

5.2 Analysis of Logistics Factors of the Freight Company in Suphan Buri Province

The analysis showed that the overall level of agreement on logistics factors was high, with an average score of 4.40. When analyzed by category, all factors were rated highly, with the highest average score for customer service, followed by logistics communication and transportation.

5.3 Analysis of Transportation Service Efficiency of the Freight Company in Suphan Buri Province

The analysis of transportation service efficiency revealed a high level of agreement, with an overall average score of 4.24. When analyzed by individual items, all were rated highly, with the highest average score for the company's speed in delivering goods as promised, followed by accuracy in delivering goods to the specified location. The lowest score was for the company's adherence to all delivery details.

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5.4 Analysis of Customer Satisfaction with the Freight Company in Suphan Buri Province

The analysis of customer satisfaction revealed a high level of agreement, with an overall average score of 4.36. When analyzed by individual items, all were rated highly, with the highest average score for customers' confidence and trust in the company's transportation services, followed by overall satisfaction with the service. The lowest score was for satisfaction with communication regarding transportation.

5.5 Analysis of Logistics Factors Affecting Transportation Service Efficiency of the Freight Company in Suphan Buri Province

The analysis of logistics factors affecting transportation service efficiency was conducted using multiple regression analysis under the following conditions:

Multicollinearity was checked, ensuring that the independent variables were not highly correlated. Collinearity Statistics showed Tolerance values between 0.38 - 0.48 (greater than 0.10) and Variance Inflation Factor (VIF) values between 2.07 – 2.65 (less than 10), indicating no multicollinearity issues. The independence of errors was verified, with the correlation coefficient between independent variables ranging from 0.66 – 0.74 (not exceeding 0.80). The Durbin-Watson value was 1.97, falling within the acceptable range of 1.50 – 2.50 (Vanichbuncha, 2010).

Table 1 Results of logistics factors affecting the transportation service efficiency of a freight company in Suphan Buri Province.

Logistics Factors	Transportation Service Efficiency			t	p
	B	SE	β		
Constant (a)	0.27	0.15		1.81	0.07
Customer Service	0.44	0.05	0.40	8.13	0.00*
Transportation	0.20	0.05	0.21	4.40	0.00*
Logistics Communication	0.26	0.04	0.27	6.19	0.00*
Adjust R Square = 0.63, R = 0.80, R Square = 0.63, Durbin–Watson = 1.97					

* $p < 0.05$

Table 1 reveals independent variables that can predict the dependent variable. The analysis results show that logistics factors, including customer service, transportation, and logistics communication—independent variables—significantly impact the transportation service efficiency of the freight company in Suphan Buri Province, with statistical significance at the 0.05 level and a predictive power of approximately 63.00% (Adjusted R Square = 0.63).

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5.6 Results of the Analysis on the Impact of Transportation Service Efficiency on Customer Satisfaction with the Freight Company in Suphan Buri Province

The analysis of how transportation service efficiency impacts customer satisfaction with the freight company in Suphan Buri Province was conducted using Simple Regression Analysis under the following conditions:

To check for Multicollinearity, the independent variables must not be intercorrelated. The Collinearity Statistics provided two values: the Tolerance value was 1.00, greater than 0.10, and the Variance Inflation Factor (VIF) was 1.00, less than 10, indicating no Multicollinearity issues. Additionally, the independence of residuals was confirmed with a correlation coefficient between independent variables of 0.69, which does not exceed 0.80. The Durbin-Watson statistic was 1.74, within the acceptable range of 1.50 – 2.50 (Vanichbuncha, 2010). After testing these conditions, the dataset met the specified criteria, allowing for the analysis of how transportation service efficiency impacts customer satisfaction with the freight company in Suphan Buri Province.

Table 2 Results of the analysis on the impact of transportation service efficiency on customer satisfaction with the freight company in Suphan Buri Province.

Transportation Service Efficiency	Customer Satisfaction			t	p
	B	SE	β		
Constant (a)	1.36	0.12		11.16	0.00
Transportation Service Efficiency	0.70	0.03	0.77	24.36	0.00*
Adjust R Square = 0.60, R = 0.77, R Square = 0.60, Durbin–Watson = 1.74					

According to Table 2, the researcher identified independent variables that can predict the dependent variable. The analysis revealed that transportation service efficiency, as an independent variable, has a significant impact on customer satisfaction with the freight company in Suphan Buri Province. This variable can predict customer satisfaction with statistical significance at the 0.05 level, with a predictive power of approximately 60.00% (Adjusted R Square = 0.60).

5.7 Results of the Analysis on Logistics Factors Affecting Customer Satisfaction with the Freight Company in Suphan Buri Province

The analysis of logistics factors affecting customer satisfaction with the freight company in Suphan Buri Province was conducted using Multiple Regression Analysis under the following conditions:

To check for Multicollinearity, the independent variables must not be intercorrelated. The Collinearity Statistics provided two key values: the Tolerance

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values ranged between 0.38 - 0.48, which are above 0.10, and the Variance Inflation Factor (VIF) values ranged between 2.07 – 2.65, which are below 10. This indicates that there are no Multicollinearity issues, or in other words, the independent variables are not highly correlated with each other. Additionally, the independence of residuals was confirmed, with the correlation coefficients between independent variables ranging from 0.66 – 0.74, which do not exceed 0.80. The Durbin-Watson statistic was 1.90, falling within the acceptable range of 1.50 – 2.50 (Vanichbuncha, 2010). After testing these conditions, it was concluded that the dataset meets the required criteria, allowing for the analysis of logistics factors affecting customer satisfaction with the freight company in Suphan Buri Province.

Table 3 The results of the analysis on logistics factors affecting customer satisfaction with the freight company in Suphan Buri Province.

Logistics Factors	Customer satisfaction			t	p
	B	SE	β		
Constant (a)	0.29	0.14		5.81	0.00
Customer Service	0.44	0.05	0.44	8.14	0.00*
Transportation	0.08	0.04	0.09	1.84	0.06
Logistics Communication	0.28	0.04	0.33	7.13	0.00*
Adjust R Square = 0.60, R = 0.77, R Square = 0.60, Durbin–Watson = 1.90					

* $p < 0.05$

From Table 3, the researcher identified independent variables that can predict the dependent variable. The analysis results show that logistics factors, specifically customer service and logistics communication—both independent variables—significantly impact customer satisfaction with the freight company in Suphan Buri Province. These variables can jointly predict customer satisfaction with statistical significance at the 0.05 level, with a predictive power of approximately 60.00% (Adjusted R Square = 0.60).

6. Discussion

The research on logistics factors affecting transportation service efficiency and customer satisfaction for B&C Truck Logistics Co., Ltd. reveals several key insights. First, logistics factors such as customer service, transportation, and logistics communication significantly influence the transportation service efficiency of the company. This impact is due to the company's consistent provision of care and advice, which leads to appropriate service procedures. As a result, employees are courteous, enthusiastic in their service, and responsible for the safe handling and transport of goods. Additionally, the company effectively plans and prepares for vehicle usage in distribution and implements modern information systems to facilitate efficient transportation. These efforts reduce delays and promptly meet customer demands,

which aligns with the findings of previous studies by Yujuy and Pisitkasem (2017) on logistics management factors in tourist transportation services in Bangkok, as well as Muenjai's (2019) research on logistics activities in the floriculture industry in Nakhon Nayok Province.

Moreover, the research shows that transportation service efficiency significantly impacts customer satisfaction. The company's improvements in transportation speed to meet deadlines and its accuracy in delivering goods to specified destinations have positively influenced customer satisfaction. These results are consistent with the research by Kawicha et al. (2021), which highlighted the effect of logistics efficiency on the satisfaction of fruit exporters in Thailand.

Furthermore, the study indicates that logistics factors, particularly customer service and logistics communication, play a crucial role in enhancing customer satisfaction. The company's consistent customer care, careful handling of goods before transportation, and integration of information systems for convenience and speed in service delivery contribute to higher levels of customer satisfaction. These findings are in line with the research by Kamolkittiwong and Suwannasap (2022), which found a strong correlation between logistics factors and satisfaction with private freight services among online clothing store operators in Bangkok. Similarly, Boonmalert's (2017) study on logistics service industries in Thailand also supports the importance of transportation and distribution logistics factors in driving customer satisfaction, with a particular emphasis on the readiness, convenience, and speed of logistics services.

7. Recommendations

To improve the operations of the freight company in Suphan Buri Province, several recommendations can be made. The company should tailor its transportation services to meet specific customer needs, ensuring a proactive approach in resolving customer issues and creating a positive impression for future service interactions. Careful management of transportation processes is essential to guarantee that goods are delivered in perfect condition without any damage. Additionally, the establishment of a robust logistics communication system is crucial, as it would enable quick and accurate information flow across various departments, effectively meeting customer needs and enhancing operational efficiency in cost management and response. To further enhance service efficiency, the company should implement detailed shipping procedures, with strict verification of accuracy and quality control measures in place to ensure that transportation operations are carried out efficiently. This attention to detail will contribute significantly to the overall operational efficiency of the company. Incorporating advanced information systems is also recommended to facilitate easier communication with customers during the transportation process. This would enhance both convenience and speed in service delivery, ultimately leading to

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greater customer satisfaction. By focusing on these areas, the company can improve its logistics operations, increase efficiency, and better meet customer expectations, resulting in higher levels of satisfaction and loyalty.

Author Contributions: SW contributed to the conceptualization, data collection, and analysis of the study. SS provided supervision, developed the methodology, and oversaw the review and editing of the manuscript. LS was responsible for the literature review, data interpretation, and preparation of the original draft. All authors collaborated closely to ensure the integrity and quality of the research.

Conflicts of Interest: The authors declare that there is no conflict of interest regarding the publication of this paper.

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