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Determinants of Freight Forwarder Selection: A Decision-Making Model in Less-than-Container-Load (LCL) Shipping

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Abstract: Previous studies in logistics and freight transportation have largely focused on service quality, customer satisfaction, or operational efficiency, but limited attention has been given to understanding how key service attributes influence customers' behavioral intentions and final decisions in selecting freight forwarding services, particularly in the context of LCL shipping. This indicates a research gap in the existing literature on freight forwarding service selection. This study aims to develop a decision-making model for selecting freight forwarding services in Less-than-Container-Load (LCL) shipping by examining the influence of delivery time, price, and brand image on customers' intention to use and decision to use freight forwarding services. A quantitative research approach was employed with data collected from 200 exporters and SMEs in Semarang, Surabaya, and Jakarta that utilize LCL shipping services. The data were analyzed using Structural Equation Modeling (SEM). The results indicate that delivery time, price, and brand image have significant positive effects on both intention to use and decision to use freight forwarding services. Among the independent variables, brand image shows the strongest influence on intention to use, while delivery time has the strongest impact on decision to use. Furthermore, intention to use significantly mediates the relationships between delivery time, price, brand image, and the decision to use freight forwarding services. This study contributes to the logistics and supply chain management literature by providing an integrated decision-making model for freight forwarding service selection in LCL shipping and offering practical insights for logistics providers to improve service strategies that enhance customer intention and decision to use their services.

Keywords: freight forwarding, less-than-container-load (LCL) shipping, delivery time, brand image, intention to use.

INTRODUCTION

The rapid growth of international trade and global supply chains has significantly increased the importance of logistics services in facilitating the movement of goods across countries. Efficient logistics systems are essential for ensuring smooth distribution processes, reducing operational costs, and improving supply chain performance. Within this context, freight forwarding companies play a crucial role as intermediaries that organize transportation, coordinate shipping processes, and manage documentation for international trade transactions (Rodrigue et al., 2020).

The global logistics industry has experienced continuous growth in recent years due to the expansion of international trade and e-commerce activities. The demand for freight forwarding services has increased significantly as companies seek efficient and reliable logistics solutions to support their supply chain operations. One of the widely used shipping methods in international logistics is Less-than-Container-Load (LCL) shipping, where shipments from multiple shippers are consolidated into a single container to optimize container space utilization and reduce transportation costs (Notteboom et al., 2021). This system is particularly beneficial for small and medium-sized enterprises that do not have sufficient cargo volume to fill a full container load.

However, the increasing number of freight forwarding service providers has intensified competition within the logistics industry. Customers are now faced with numerous alternatives when selecting logistics service providers, making the decision-making process increasingly complex. Companies must evaluate several operational and perceptual factors before selecting a freight forwarder that best meets their logistics requirements (Thai, 2013).

One of the key factors influencing logistics service selection is delivery time, which reflects the reliability and punctuality of the shipping process. Timely delivery is considered one of the most critical dimensions of logistics service quality because it directly affects supply chain efficiency and customer satisfaction (Thai, 2013). In international shipping, delays in cargo handling, container loading, or vessel departure may lead to significant disruptions in business operations.

Another important factor in selecting freight forwarding services is price. In a competitive logistics market, customers tend to compare service prices among logistics providers to obtain cost-efficient transportation solutions. Previous studies have shown that competitive pricing and perceived value significantly influence customer decision-making in logistics services (Meidutė-kavaliauskienė et al., 2020).

In addition to operational and economic considerations, brand image also plays an important role in shaping customer perceptions toward logistics service providers. A strong brand image can enhance trust, credibility, and customer confidence in a company's service performance. In the logistics industry, brand reputation is often associated with reliability, professionalism, and service quality (Keller, 2013 ; Meidutė-kavaliauskienė et al., 2020)

In many service contexts, these factors do not directly lead to a final purchasing decision. Instead, they first influence customers' intention to use the service, representing their level of interest and willingness to consider a particular service before making a final decision (Ajzen, 1991). Intention plays a mediating role between customer perceptions and actual behavior, including the decision to use a logistics service provider.

The decision to use freight forwarding services represents the final stage of the customer decision-making process, where customers evaluate various service alternatives and select the provider that best meets their needs. In the context of LCL shipping, this decision may depend on a combination of operational efficiency, service cost, and the perceived reputation of the freight forwarding company.

Although previous studies have examined factors influencing logistics service selection, research that integrates delivery time, price, and brand image with intention to use

and decision to use freight forwarding services in LCL shipping remains limited. Therefore, this study aims to develop a decision-making model for freight forwarder selection in Less-than-Container-Load (LCL) shipping by analyzing the influence of delivery time, price, and brand image on intention to use and the final decision to use freight forwarding services.

The findings of this research are expected to contribute to the literature on logistics service selection and provide managerial insights for freight forwarding companies in improving service strategies and enhancing competitiveness in the logistics industry. Specifically, the results highlight the importance of optimizing delivery time performance, implementing competitive and transparent pricing strategies, and strengthening brand image through reliable service quality and customer relationship management to increase customers' intention and decision to use freight forwarding services.

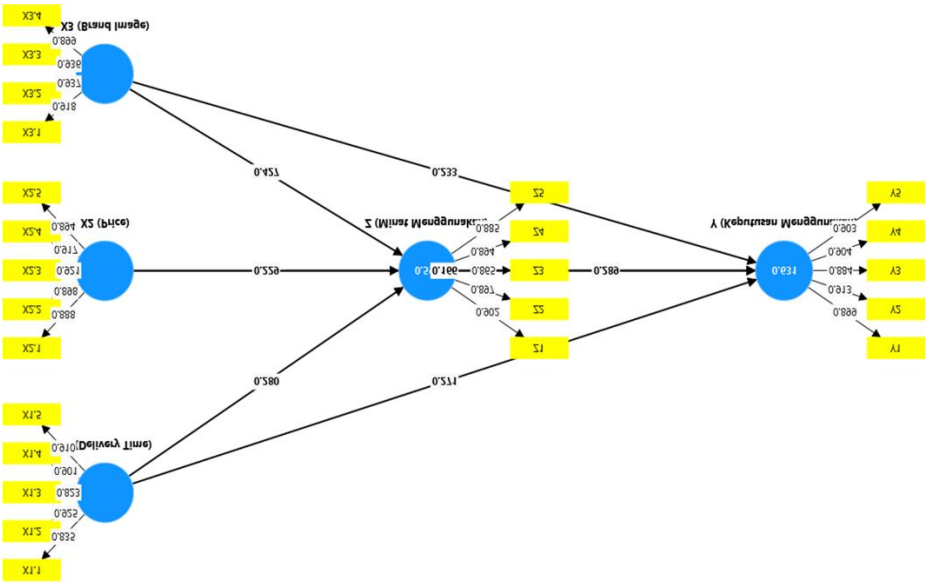
METHOD

This study employs a quantitative research approach to examine the decision-making model in selecting freight forwarding services for Less-than-Container-Load (LCL) shipments. The population consists of exporters and small and medium-sized enterprises (SMEs) in Semarang, Surabaya, and Jakarta that utilize LCL shipping services. The sample size was determined based on the recommendation of Sekaran & Bougie (2019), which states that the appropriate sample size for Structural Equation Modeling (SEM) analysis ranges between 5 to 10 times the number of research indicators. Since this study uses 36 indicators, the recommended sample size ranges from 180 to 360 respondents. In this study, questionnaires were distributed to 200 respondents, which meets the minimum sample requirement for SEM analysis. The respondents consisted of exporters and SMEs that utilize Less-than-Container-Load (LCL) freight forwarding services in Semarang, Surabaya, and Jakarta. The study applied purposive sampling, targeting respondents who have direct experience in selecting or using freight forwarding services for export shipments. This sampling technique was chosen to ensure that the respondents possess sufficient knowledge and experience related to logistics service selection, thereby improving the relevance and validity of the collected data. Data collection was conducted through the distribution of structured questionnaires to exporters and SMEs using LCL services, supported by secondary data obtained from relevant journals and books. The collected data were analyzed using Structural Equation Modeling (SEM) to examine the relationships between delivery time, price, brand image, intention to use, and the decision to use freight forwarding services.

RESULTS AND DISCUSSION

Outer Model

1. Validity Testing



Source: Research Results

Figure 1. Research Paradigm

Table 2. Validity Testing

Variable	Indicator	*Loading Factor*	Description
Delivery Time (X1)	X1.1	0.835	VALID
	X1.2	0.925	VALID
	X1.3	0.823	VALID
	X1.4	0.901	VALID
	X1.5	0.910	VALID
Price (X2)	X2.1	0.888	VALID
	X2.2	0.898	VALID
	X2.3	0.921	VALID
	X2.4	0.917	VALID
	X2.5	0.894	VALID
Brand Image (X3)	X3.1	0.918	VALID
	X3.2	0.937	VALID
	X3.3	0.936	VALID
	X3.4	0.899	VALID
Decision to Use (Y)	Y1	0.899	VALID
	Y2	0.913	VALID
	Y3	0.884	VALID
	Y4	0.904	VALID
	Y5	0.903	VALID
Intention to Use (Z)	Z1	0.902	VALID
	Z2	0.897	VALID
	Z3	0.865	VALID
	Z4	0.894	VALID
	Z5	0.885	VALID

The results of the validity test show that all indicators have loading factor values exceeding 0.70, indicating that each indicator contributes significantly to representing the corresponding construct. Therefore, all indicators across the variables are considered valid and are suitable for use in further analyses, including both the measurement model and the structural model.

2. Heterotrait-Monotrait Ratio (HTMT)

Table 2. Heterotrait-Monotrait Ratio (HTMT)Testing

	DELT	PRCE	BRIM	DECU	INTU
DELT	0.537				
PRCE					
BRIM	0.542	0.518			
DECU	0.695	0.619	0.690		
INTU	0.655	0.617	0.728	0.758	

The table above indicates that the Heterotrait–Monotrait Ratio of Correlation (HTMT) values for all constructs are below the recommended threshold of 0.90. This result suggests that adequate discriminant validity has been achieved, meaning that each construct is empirically distinct from the others. Therefore, the variables in this study can be considered valid and appropriate for further structural model analysis.

3. Reliability Testing

Table 3. Reliability Testing

	Cronbach's alpha	Composite reliability (rho_c)
DELT (X1)	0.927	0.945
PRCE (X2)	0.944	0.957
BRIM (X3)	0.942	0.958
DECU (Y)	0.942	0.955
INTU (Z)	0.934	0.950

Based on the reliability test results presented in Table 4, the Cronbach's Alpha values for all constructs in this study are greater than or equal to 0.70. This indicates that the measurement instruments demonstrate a satisfactory level of internal consistency. Therefore, it can be concluded that the research instruments employed in this study are reliable and suitable for further analysis.

Outer Model

1. Coefficient of Determination

Table 4. Coefficient of Determination Testing

	R-square	R-square adjusted
DECU (Y)	0.631	0.624
INTU (Z)	0.598	0.592

The coefficient of determination results show that the R-square value for Decision to Use (DECU) is 0.631, indicating that 63.1% of the variance in the Decision to Use variable can be explained by Delivery Time, Price, Brand Image, and Intention to Use. Meanwhile, the R-square value for Intention to Use (INTU) is 0.598, meaning that 59.8% of the variance in Intention to Use is explained by Delivery Time, Price, and Brand Image. These results indicate that the proposed model has a moderate explanatory power.

2. F-Square Test

Table 5. f-square Testing

Variable	F-Square
Delivery Time -> Decision to Use	0.115

Delivery Time -> Intention to Use	0.126
Price -> Decision to Use	0.046
Price -> Intention to Use	0.088
Brand Image -> Decision to Use	0.075
Brand Image -> Intention to Use	0.302
Intention to Use -> Decision to Use	0.091

The f-square test results indicate that Delivery Time has a small to moderate effect on both Decision to Use (0.115) and Intention to Use (0.126). Price shows a small effect on Decision to Use (0.046) and Intention to Use (0.088). Brand Image has a small effect on Decision to Use (0.075) but demonstrates a moderate effect on Intention to Use (0.302), indicating that Brand Image is the strongest predictor of customers' intention to use freight forwarding services. Meanwhile, Intention to Use has a small effect on Decision to Use (0.091). Overall, these results suggest that the variables in the model contribute meaningfully to explaining customer behavioral decisions.

3. GOF

Table 6. GOF Testing

	AVE	R-square adjusted
DELT (X1)	0.774	
PRCE (X2)	0.816	
BRIM (X3)	0.851	
DECU (Y)	0.811	0.624
INTU (Z)	0.790	0.592
Average	**0.808**	**0.608**

The Goodness of Fit (GoF) value obtained is 0.701, which is above the threshold of 0.36, indicating a large model fit. This result suggests that the overall model demonstrates a strong level of explanatory power and is able to adequately explain the relationship between the variables in this study.

Hypothesis Testing

Table 6. Hypothesis Testing

	Original Sample	Standart Deviation	T-Statistics	Pvalues (1 Tail)	Description
Delivery Time (X1) influences the Decision to Use (Y)	0.271	0.063	4,289	0.000	H1: Accepted
Delivery Time (X1) influences the Intention to Use (Z)	0.280	0.066	4,214	0.000	H2: Accepted
Price (X2) influences the Decision to Use (Y)	0.166	0.063	2,609	0.009	H3: Accepted
Price (X2) influences the Intention to Use (Z)	0.229	0.064	3,584	0.000	H4: Accepted
Brand Image (X3) influences the Decision to Use (Y)	0.233	0.053	4,362	0.000	H5 : Accepted
Brand Image (X3) influences the Intention to Use (Z)	0.427	0.073	5,863	0.000	H6 : Accepted
Intention to Use (Z) influences the Decision to Use (Y)	0.289	0.071	4,078	0.000	H7 : Accepted

Delivery Time (X1) influences Decision to Use (Y) through Intention to Use (Z)	0.081	0.028	2,939	0.003	H8: Accepted
Price (X2) influences Decision to Use (Y) through Intention to Use (Z)	0.066	0.024	2,740	0.006	H9: Accepted
Brand Image (X3) influences Decision to Use (Y) through Intention to Use (Z)	0.123	0.039	3,140	0.002	H10: Accepted

Discussions

1. Hypothesis 1

The statistical results show that Delivery Time has a positive and significant effect on the Decision to Use freight forwarding services ($\beta = 0.271$; $T = 4.289$; $p < 0.001$), indicating that H1 is accepted. This finding suggests that timeliness in logistics operations plays a crucial role in influencing customers' decisions to select a freight forwarder. On-time cargo delivery, punctual container loading, timely vessel departure, and clear timeliness information significantly enhance customer confidence in logistics service providers. In the context of LCL shipping, exporters and SMEs tend to prioritize service providers that demonstrate reliability in schedule management because delays can disrupt supply chains, production planning, and international trade commitments. This result aligns with the findings of Vinh & Minh (2023) who reported that delivery reliability and timeliness significantly influence customer decision-making in logistics service selection. Their study concluded that logistics service quality dimensions, particularly delivery performance, strongly determine customer choice in freight forwarding services.

2. Hypothesis 2

The hypothesis testing results show that Delivery Time significantly influences Intention to Use ($\beta = 0.280$; $T = 4.214$; $p < 0.001$), indicating that H2 is accepted. This finding implies that customers' perceptions of timeliness in logistics operations encourage their intention to utilize freight forwarding services. Indicators such as punctual cargo handling, accurate vessel schedules, and transparent timeliness information contribute to customers' interest in exploring freight forwarding services, requesting quotations, and comparing services with competitors. In the logistics industry, timeliness is considered one of the most critical service attributes because customers seek predictability and reliability in international shipping operations. These results are supported by Hui et al. (2025), who found that delivery reliability and timeliness significantly influence customers' behavioral intentions in logistics service usage. The study highlights that timely logistics performance increases customer trust and stimulates future service utilization intentions.

3. Hypothesis 3

The results indicate that Price has a positive and significant influence on the Decision to Use freight forwarding services ($\beta = 0.166$; $T = 2.609$; $p = 0.009$), confirming that H3 is accepted. This finding demonstrates that competitive and reasonable pricing strategies significantly influence customers' final decisions when selecting freight forwarding services. Indicators such as competitive prices, affordable rates, price-service compatibility, and flexible pricing schemes contribute to customers' perception of value. In logistics services, especially for SMEs and exporters using LCL systems, cost considerations are a key factor in choosing a service provider. Customers often compare freight rates among multiple logistics companies before making a decision. This result is consistent with the findings of Fai et al. (2019) who found that price competitiveness significantly affects customers' service selection decisions in logistics services.

4. Hypothesis 4

The hypothesis testing shows that Price significantly influences Intention to Use ($\beta = 0.229$; $T = 3.584$; $p < 0.001$), confirming that H4 is accepted. This result indicates that

customers' perceptions of reasonable and competitive pricing encourage their intention to use freight forwarding services. Indicators such as affordable pricing, pricing aligned with service benefits, and the availability of special pricing schemes stimulate customers' curiosity and willingness to explore logistics services. In the freight forwarding industry, pricing transparency and competitiveness are essential because customers often evaluate service providers based on cost efficiency. This finding is supported by Chotisarn & Phuthong (2025) who found that perceived price fairness significantly influences customer behavioral intentions in logistics services, including intention to use and repurchase intentions.

5. Hypothesis 5

The statistical results show that Brand Image significantly influences the Decision to Use freight forwarding services ($\beta = 0.233$; $T = 4.362$; $p < 0.001$), indicating that H5 is accepted. This finding indicates that the reputation and credibility of freight forwarding companies strongly influence customers' service selection decisions. Indicators such as a strong reputation, professional image, customer trust, and brand recognition influence customers' perception of reliability and service quality. In logistics services, brand image serves as a signal of operational capability and service consistency, particularly for exporters who depend on reliable freight forwarding partners. This finding aligns with Kustiani et al. (2022) who found that brand image significantly influences customer decision-making and service selection behavior in logistics and transportation services.

6. Hypothesis 6

The results indicate that Brand Image has the strongest influence on Intention to Use among the independent variables ($\beta = 0.427$; $T = 5.863$; $p < 0.001$), confirming that H6 is accepted. This result implies that customers are highly influenced by the reputation and professional image of freight forwarders when developing an intention to use their services. Indicators such as company credibility, professionalism, positive customer perception, and strong brand recognition increase customers' interest in seeking information, requesting quotations, and comparing logistics services. A strong brand image reduces perceived risk in international shipping transactions, which encourages potential users to consider the service provider. This finding is consistent with Rather & Camilleri (2019) who found that brand image significantly influences customer behavioral intentions in service industries, particularly intention to use and recommendation behavior.

7. Hypothesis 7

The results show that Intention to Use significantly influences the Decision to Use freight forwarding services ($\beta = 0.289$; $T = 4.078$; $p < 0.001$), indicating that H7 is accepted. This finding confirms that customers' behavioral intentions serve as a strong predictor of their actual service selection decisions. Indicators such as interest in gathering information, requesting price quotations, comparing services, and evaluating payment flexibility reflect customers' readiness to proceed toward actual service usage. When customers develop strong intentions toward a service provider, they are more likely to finalize their decision and establish a logistics partnership. This finding is supported by Ajzen's Theory of Planned Behavior and reinforced by Sürücü et al. (2020) who found that behavioral intention significantly influences purchase decisions in service industries.

8. Hypothesis 8

The mediation test shows that Intention to Use significantly mediates the relationship between Delivery Time and Decision to Use ($\beta = 0.081$; $T = 2.939$; $p = 0.003$), confirming that H8 is accepted. This result indicates that customers' perceptions of delivery timeliness not only directly influence their service decisions but also indirectly affect their decisions through the development of behavioral intentions. Reliable logistics operations, such as timely container loading, accurate shipping schedules, and clear information regarding delivery timelines, first stimulate customers' intention to use the freight forwarding service.

This intention subsequently leads to the final decision to utilize the service. These findings are consistent with Lin et al. (2023) who demonstrated that service performance attributes influence behavioral intention, which subsequently affects customer decision-making in logistics services.

9. Hypothesis 9

The mediation analysis indicates that Intention to Use significantly mediates the relationship between Price and Decision to Use ($\beta = 0.066$; $T = 2.740$; $p = 0.006$), confirming that H9 is accepted. This finding suggests that competitive pricing strategies first influence customers' intention to utilize freight forwarding services before ultimately affecting their final service decision. Customers who perceive prices as reasonable and aligned with service benefits tend to develop stronger interest in exploring the service, requesting price quotations, and comparing service providers. This intention subsequently leads to the final decision to select the freight forwarder. This finding is supported by Cahyanto et al. (2022) who found that perceived price value significantly influences behavioral intentions, which subsequently affect customer purchase decisions in logistics service markets.

10. Hypothesis 10

The med iation results indicate that Intention to Use significantly mediates the relationship between Brand Image and Decision to Use ($\beta = 0.123$; $T = 3.140$; $p = 0.002$), confirming that H10 is accepted. This finding demonstrates that the influence of brand image on customers' final service decisions occurs both directly and indirectly through behavioral intentions. A strong reputation, professional image, and customer trust toward freight forwarding companies stimulate customers' interest in exploring and evaluating logistics services. This interest subsequently evolves into a firm decision to use the service provider. The results are consistent with Rather et al. (2021) who reported that brand image significantly influences customer behavioral intentions, which ultimately drive purchasing and service usage decisions.

CONCLUSION

This study aims to develop a decision-making model for selecting freight forwarding services in the context of Less-than-Container-Load (LCL) shipping by examining the influence of delivery time, price, and brand image on customers' intention to use and decision to use freight forwarding services. The empirical results indicate that all proposed hypotheses are supported, demonstrating that operational, economic, and perceptual factors significantly influence customers' logistics service selection behavior. In particular, delivery time and price play an important role in shaping customers' perceptions of logistics service efficiency and cost effectiveness.

The findings further reveal that brand image has the strongest influence on customers' intention to use freight forwarding services. A positive brand reputation, professional image, and strong customer trust increase customers' willingness to explore logistics services, request price quotations, and compare alternative service providers. In addition, delivery time and price significantly affect customers' final decisions to use freight forwarding services, indicating that customers prioritize reliable logistics performance and competitive pricing when selecting service providers, particularly in LCL shipping where operational efficiency and cost control are critical for exporters and SMEs.

Finally, this study confirms that intention to use plays a significant mediating role between delivery time, price, brand image, and the decision to use freight forwarding services. Customers' perceptions of logistics service attributes first influence their behavioral intentions before ultimately leading to the final service selection decision. Conceptually, the proposed decision-making model contributes to the understanding of freight forwarder selection in LCL shipping by integrating operational factors (delivery time), economic factors

(price), and perceptual factors (brand image) within a behavioral framework that links intention to use and decision to use. The model clarifies the sequential decision process in which customers first evaluate service attributes, form behavioral intentions, and then make final service selection decisions**.** These findings contribute to the literature on logistics service selection and provide managerial implications for freight forwarding companies to enhance delivery reliability, maintain competitive pricing strategies, and strengthen brand reputation in order to improve customer attraction and decision-making in the increasingly competitive logistics industry.

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