

Service quality and timeliness: Empirical evidence on the parcel delivery service in Indonesia**Prasadja Ricardianto^a, Indra Adhitya Kurniawan^a, Ikawati Ikawati^b, Tri Gutomo^c, Eduard Alfian Syamsa Sijabat^a, Anisa Mahadita^c, I Gusti Ngurah Agung Eka Teja Kusuma^d, Tateki Yoga Tursilarini^b, Sri Yuni Murtiwidayanti^b and Endri Endri^{e*}**^a*Institute of Transportation and Logistics Trisakti, Jakarta, Indonesia*^b*Badan Riset dan Inovasi Nasional, Yogyakarta, Indonesia*^c*Politeknik Transportasi Darat Indonesia-STTD, Indonesia*^d*Maharaswati University, Denpasar, Indonesia*^e*Universitas Mercu Buana, Jakarta, Indonesia***ABSTRACT***Article history:*

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The problems influencing the service quality of Lion Parcel Halim Perdana Kusuma Jakarta were that the delivery time needed to be by the delivery receipt and that there needed to be a complete list. This research aimed to know and analyze the service quality and the direct and indirect influence of delivery cost on customer satisfaction through timeliness. The population used in this research was the customers of Lion Parcel Halim Perdana Kusuma Jakarta, with a sample of as many as 139 respondents. The technique of data analysis used was Structural Equation Modelling with the approach of Partial Least Square. The key finding of this research was that customers considered the service quality of Lion Parcel could be better, making them dissatisfied with the quality of service delivered by Lion Parcel. Whereas the service quality and delivery cost directly influenced, timeliness and timeliness influenced customer satisfaction. It was also found that timeliness indirectly and significantly mediated the influence of service quality and delivery cost on customer satisfaction.

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1. Introduction

Lion Parcel is a logistics company providing both domestic and international delivery services. Support from many agents, couriers, and fleets enables people to connect regardless of time or distance. Delivery by air refers to carriage on a cargo airplane with no passengers. Airlines or cargo agents can be used for delivery. It can also be named palletted package delivery. The document, Air Bill, is needed for packing air cargo. Sending products by air has a relatively higher tariff than land or sea delivery service. Sending and carrying air cargo especially depends on the load capacity of the airline, including the cargo, cargo space, door size, and maximum floor load. Flight safety is prioritized when receiving air cargo, so the following factors must be considered in shipment receiving: holding capacity, weight, and cargo packaging.

Some problems influence the service quality of Lion Parcel. Namely, delivery time is not aligned with the delivery receipt, and there is no complete list. Service quality is important in creating customer satisfaction (Indrasari et al., 2022). In addition, it is closely related to making a profit for the company. The higher the company service quality, the higher customer satisfaction (Marina et al., 2023). An important aspect that should be paid attention to is the cargo delivery speed of other expedition companies. The practicality of merchandise delivery is the most significant. Complaints related to transportation delay, timeliness, and cargo delivery are the main factors influenced by the transportation mode used, either by air or land, as

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well as weather. The three factors will surely impact the cargo security and the arrival time at the destination. There are some problems in the delivery process, such as price changes without prior confirmation, frequent late delivery, untraceable package delivery, and frequently damaged packages while arriving at the destination.

Some research related to transportation identifies the perceived value of service quality of cargo delivery as a significant predictor of customer satisfaction (Ricardianto et al., 2023a; Simanjuntak & Pradana, 2022; Sin et al., 2022; Tang et al., 2022; Yaacob & Yaacob, 2022). According to Gulc (2021), some factors that determine the quality of delivery service include crucial, determining, result, autonomous and external factors. In addition to the timeliness of delivery, other factors are also highly considered, such as better delivery modes (He et al., 2023; Ricardianto et al., 2022). In the study, we will be able to fulfill customer desires through the expected level of service quality excellence and maintaining the level of excellence (Haudi et al., 2022; Martha et al., 2023). According to Karcz & Slusarczyk (2016), two factors influencing people to use courier services are speed and convenience. Data analysis, for example, uses Customer Satisfaction Index (CSI) to measure service quality to know customer satisfaction (Pagi & Pundissing, 2022).

In addition, there are also field surveys in Kuala Lumpur, Malaysia, related to response time and returnability, which influence customer satisfaction with online shopping, especially parcel (Bopage et al., 2019; Siali et al., 2018; Wahab & Khong, 2019). Especially parcel delivery service has become an important part of modern transportation systems, which increases expenses for internet, technology development, and changes in consumer needs (Abualrejal et al., 2022; Dwianto & Purnamasari, 2018; Li, 2002; Prameswari & Nawangsari, 2021). Whereas concerning parcel delivery service in Malaysia, Yee and Daud (2011) and Razik et al. (2018) have done research with case studies to measure customer satisfaction. The rapid growth of online purchasing is advancing along with providing home delivery services to achieve customer satisfaction (Uzir et al., 2021). According to Alkufahy et al. (2023), today's online shopping business thrives on creating positive customer behavioral attitudes to maintain satisfaction and increase profitable marketing relationships. Raed et al.'s (2023) research results show that employee job satisfaction consists of business success and work commitment and is also related to the value they add to the company. According to Wen & Wu (2022) the study, the multi-drone delivery mode saves shipping costs and increases shipping efficiency for logistics companies.

2. Literature Review

2.1. Customer Satisfaction

Theoretically, satisfaction is a feeling of pleasure from a job evaluation based on one's work performance (Huang & Yu, 2019; Kotler & Armstrong, 2018; Kotler & Keller, 2016). On the other side, customer satisfaction has long been acknowledged in marketing thoughts and practices as the main goal, where realization is important for all business activities (Deneke, 2015). In addition, Jasin et al. (2023) explained that the main key in the marketing field to achieve company goals is to know the market's needs and wants to provide customer satisfaction. Satisfaction results from a stronger desire and becomes a person's motivation to complete his work (Allen et al., 2019; Virgiawan et al., 2021; Riyanto et al., 2021). Based on the opinion of Lovelock and Wirtz (2011), satisfaction is the result of one's experience. Delivery of goods over several periods to minimize transportation costs and maximize customer satisfaction (Liang et al., 2023). Finally, after purchasing, satisfied customers will repurchase or provide recommendations to other customers (Marcysiak, 2021; Rita et al., 2019; Seminari et al., 2023; Samosir et al., 2023). Based on various dimensions of customer experience, which is the main factor for achieving satisfaction at express package companies (Cepeda-Carrión et al., 2023).

2.2. Service Quality

According to Zeithaml and Bitner (2011), the theory of service quality is about expectation and relying on the gap between passengers by using the dimensions of guarantee, empathy, reliability, response, and tangibles. The quality of service obtained by courier service customers must be the main variable in creating a sustainable service (Ejdys & Gulc, 2020). Service quality is a must for a company to retain and keep attaining consumers (Ricardianto et al., 2023b). Quality customer service through complex and competitive buying and selling, after-sales processes services, as well as continuing marketing contacts with consumers (Marcysiak, 2021), SERVQUAL method is used to evaluate and determine the attributes and quality level of parcel service (Aldatmaz et al., 2020). Huang and Yu (2019) explained that quality is a service for customer satisfaction. Several dimensions of reliability, complexity, social responsibility, responsiveness, and technical impact on courier service quality (Gulc, 2021; Ricardianto et al., 2020; Sunaryo et al., 2023).

2.3. Delivery Cost

In general, increasing business competitiveness and price as one of the criteria for adjusting profits is the easiest and fastest way to increase competitiveness (Endri et al., 2020). According to Seghezzi et al. (2022), delivery costs are transportation from the last courier hub to the end customer. Delivery Cost using trucks is more economical for longer distances from distribution centers and large volumes of goods delivered to one place (Sheth et al., 2019).

2.4. Timeliness

Timeliness is the main factor that measures the synchronization of production and its delay (Guo et al., 2022). According to Agnihotri et al. (2015), customers have high expectations, so timeliness is a significant variable in customer satisfaction. Opinion by Mangiaracina et al. (2019) explains some of the main factors that affect its cost, possibly due to failed deliveries and the density of customers in the delivery area. Time is one of the main dimensions in the delivery window and an important component of the transaction phase (Razani & Bin Azmi, 2022). In addition, according to Bogatyrev et al. (2022), load balancing can be done through nodes that connect various routes, increasing the timeliness when sending parcels.

This research aims to know and analyze the direct and indirect influences of service quality and delivery cost on customer satisfaction through timeliness in PT Lion Parcel Halim Perdana Kusuma. This research describes the relationship among variables as a model and hypotheses (Fig. 1).

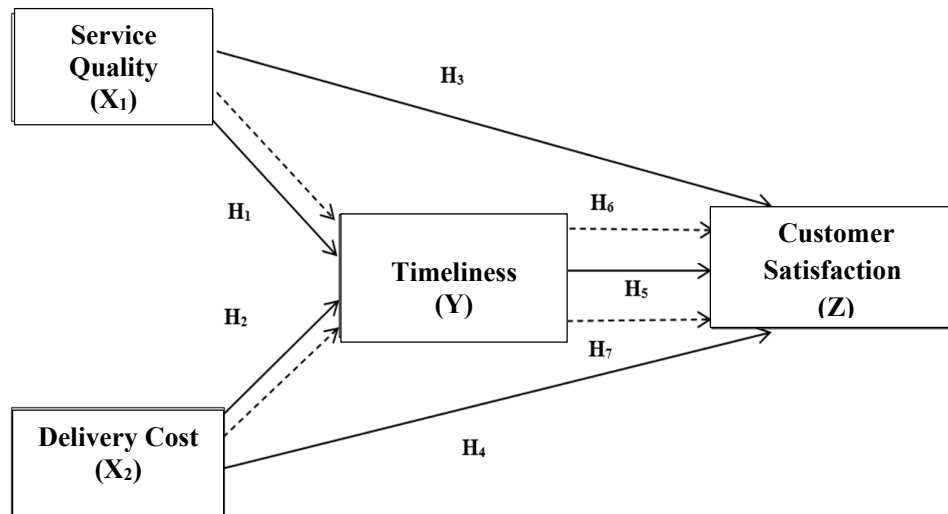


Fig.1. Conceptual Model

2.5. Hypotheses

H₁: Service quality directly contributes to timeliness.

H₂: Delivery cost directly contributes to timeliness.

H₃: Service quality directly contributes to customer satisfaction.

H₄: Delivery cost directly contributes to customer satisfaction.

H₅: Timeliness directly contributes to customer satisfaction.

H₆: Service quality indirectly contributes to customer satisfaction through timeliness.

H₇: Delivery cost indirectly contributes to customer satisfaction through timeliness.

3. Research Method

In this research, the population is the customers of PT Lion Parcel numbering as many as 211 people. The sample in this research is the consumers using the expedition service of Lion Parcel in 2022 as many as 139 respondents. The technique of data analysis used is Structural Equation Modelling (SEM) with the approach of Partial Least Square (PLS). SmartPLS 4 is a significant improvement of SmartPLS 3, with many new features and functionality improvements. In its operation, this research uses two exogenous variables; namely service quality (X₁) with five variable dimensions, namely communication, responsiveness, security, communication, and physical evidence; and delivery cost (X₂) with three variable dimensions, namely price range, price competitiveness, and price suitability. The intervening variable (Y) is timeliness with three dimensions: delivery service accuracy, cargo arrival timeliness, and price accuracy. Whereas customer satisfaction (Z), as an endogenous variable, uses three variable dimensions: satisfaction related to product attributes, service, and complaint. The data analysis uses the outer model, inner model, reliability test, and validity test with the reflective indicator evaluated using Average Variance Extracted (AVE), discriminant validity test using the value of cross-loadings. It is followed by a determination coefficient (R²), F_{square}, and hypothetical test. Maharani & Wahyuni (2021) and Putra & Antonio (2021) have done some research using SEM PLS, especially for delivery services.

4. Results and Discussion

4.1. Results of Partial Least Square Test

Validity and reliability tests are applied to 139 respondents of Lion Parcel customers for analysis, and the analysis result is used as a reference to obtain data. The factors influencing customer satisfaction include service quality, delivery cost, and timeliness as mediating variables are analyzed using Smart PLS 4.

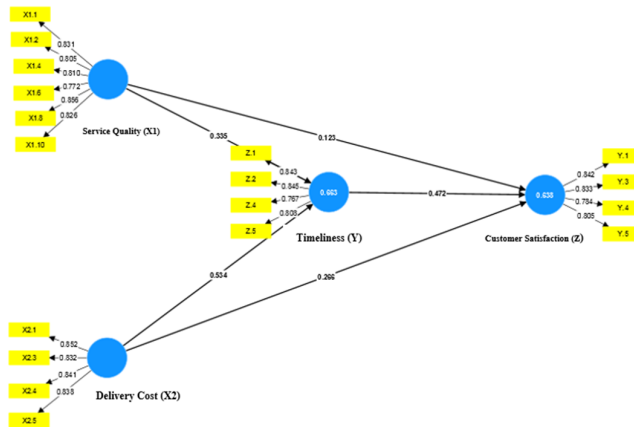


Fig. 2. Outer Model

4.2. Results of Validity and Reliability Tests

The result of the validity test (Table 1) shows that the four variables used in this research, namely service quality, delivery cost, timeliness, and customer satisfaction, have a loading factor of more than 0.7 in each question representing each variable. It shows that the variables fulfill the requirements to be studied. There are some invalid indicators such as X1.3 with a value of 0.666, X1.5 with a value of 0.680, X1.9 with a value of 0.665, X2.2 with a value of 0.699, X2.6 with a value of 0.646, Z.2 with the value of 0.688, Y.3 with the value of 0.689. So, such indicators must be removed. The testing is carried out again without indicators X1.3, X1.5, X1.9, X2.2, X2.6, Z.2, and Y.3. The removal of these indicators is to increase the values in the reliability and validity constructs, like Cronbach’s alpha, rho_a, composite reliability, and Average Variance Extracted (AVE) in order to make the results reliable.

Table 1
Outer Loadings

	Outer loadings
X1.1 ← Service quality (X1)	0.831
X1.2 ← Service quality (X1)	0.805
X1.4 ← Service quality (X1)	0.810
X1.6 ← Service quality (X1)	0.772
X1.8 ← Service quality (X1)	0.856
X1.10 ← Service quality (X1)	0.826
X2.1 ← Delivery cost (X2)	0.852
X2.3 ← Delivery cost (X2)	0.832
X2.4 ← Delivery cost (X2)	0.841
X2.5 ← Delivery cost (X2)	0.838
Z.1 ← Customer satisfaction (Z)	0.842
Z.3 ← Customer satisfaction (Z)	0.833
Z.4 ← Customer satisfaction (Z)	0.784
Z.5 ← Customer satisfaction (Z)	0.805
Y.1 ← Timeliness (Y)	0.843
Y.2 ← Timeliness (Y)	0.845
Y.4 ← Timeliness (Y)	0.767
Y.5 ← Timeliness (Y)	0.808

Table 2
Discriminant Validity

	Delivery cost	Customer satisfaction	Timeliness	Service quality
Delivery cost	0.841			
Customer satisfaction	0.726	0.816		
Timeliness	0.782	0.770	0.816	
Service quality	0.740	0.664	0.730	0.817

The sample test results show that the AVEs obtained by each variable are more than 0.5. Thus, they can be accepted.

Table 3
Cross Loadings

	Delivery cost	Customer satisfaction	Timeliness	Service quality
X1.1	0.642	0.554	0.639	0.831
X1.2	0.582	0.509	0.577	0.805
X1.4	0.538	0.532	0.598	0.810
X1.6	0.560	0.510	0.525	0.772
X1.8	0.622	0.537	0.599	0.856
X1.10	0.671	0.607	0.632	0.826
X2.1	0.852	0.605	0.709	0.678
X2.3	0.832	0.560	0.612	0.565
X2.4	0.841	0.634	0.676	0.652
X2.5	0.838	0.639	0.628	0.585
Z.1	0.632	0.842	0.685	0.614
Z.3	0.584	0.833	0.634	0.561
Z.4	0.528	0.784	0.562	0.447
Z.5	0.619	0.805	0.623	0.533
Y.1	0.695	0.648	0.843	0.654
Y.2	0.712	0.620	0.845	0.642
Y.4	0.595	0.615	0.767	0.541
Y.5	0.539	0.633	0.808	0.538

Table 3 shows that the values of each item in the statements of service quality, delivery cost, timeliness, and customer satisfaction give a quite significant value of cross-loading when comparing the variables in those statements.

Table 4
Reliability Test

	Cronbach's alpha	Composite Reliability (rho a)	Composite Reliability (rho c)	The average variance extracted (AVE)
Delivery cost	0.862	0.863	0.906	0.707
Customer satisfaction	0.833	0.837	0.889	0.666
Timeliness	0.833	0.836	0.889	0.667
Service quality	0.900	0.902	0.923	0.668

In Table 4, the test result shows that Composite Reliability and Cronbach's alpha have a reasonable value, with each variable having a value of more than 0.70. This indicates that the instrument's consistency and stability are excellent.

4.3. Results of Inner Model Test

The early step of structural model evaluation is checking the existence of inter-construct collinearity and the model's predictive ability. It continues to measure the model's predictive ability by using four criteria, namely determination coefficient (R²) and effect size (f²).

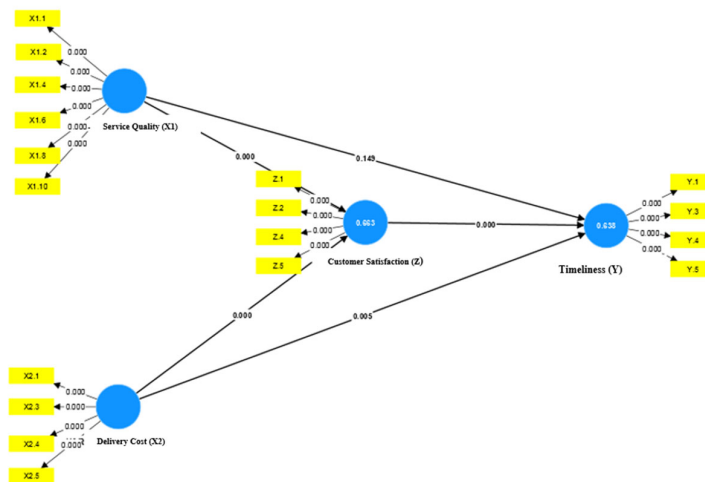


Fig.3. Inner Model or Structural Model

4.4. Results of Determination Coefficient and Effect Size (f²) Tests

The values of determination coefficient R² as big as 0.75, 0.50, and 0.25, respectively, indicate strong, moderate, and weak models. The influence of service quality and delivery cost variables on customer satisfaction is 0.638 (Table 5). So, the moderate model and R-Square Adjusted in path model II = 0.663 mean the ability of service quality, delivery cost, and timeliness variables in explaining customer satisfaction is 0.663.

Table 5

Determination coefficient R²_{Square}

	R-Square	R-Square Adjusted
Customer satisfaction	0.638	0.630
Timeliness	0.663	0.658

Table 6

Effect Size F²_{Square}

	Delivery cost	Customer satisfaction	Timeliness	Service quality
Delivery cost		0.064	0.383	
Customer satisfaction				
Timeliness		0.207		
Service quality		0.016	0.151	

4.5. Results of Hypothetical Test

The results of the Direct Influence Test

Table 7

Path Coefficient

Variable	Original Sample (O)	T - Statistics (IO/STDEV)	P Values
Service quality → Timeliness	0.355	3.842	0.000
Delivery cost → Timeliness	0.534	5.600	0.000
Service quality → Customer satisfaction	0.123	1.443	0.149
Delivery cost → Customer satisfaction	0.472	2.832	0.005
Timeliness → Customer satisfaction	0.346	4.348	0.000

4.6. Discussion

H₁. Service Quality and Timeliness

The influence of service quality variable on timeliness is found t_{Statistics} 3.842 with P_{Values} 0.000. So, statistically, H₁ is accepted. It can be concluded from the analysis above that the service quality variable positively and significantly influences timeliness. So, H₁ is accepted. The influence of service quality on timeliness must be well maintained so the company can maintain customer trust, build a good image, and improve productivity and business efficiency. This research supports the result of a study by Pranowo et al. (2022) that service quality influences timeliness. This study's results align with research by Ebrahimi and Tootoonkavan (2014) and Su et al. (2016) that service quality prioritizes needs and timeliness to meet customer expectations. The result of another research is similar in that the level of on-time delivery by suppliers increases along with the increase of sensitive factors of on-time delivery consumers (Qiao et al., 2022). Based on the analysis, service quality positively influences timeliness in transportation services.

H₂. Delivery Cost and Timeliness

The influence of delivery cost variable on timeliness is found t_{Statistics} 5.600 with P_{Values} 0.000. So, statistically, H₂ is accepted. It can be concluded from the analysis that the variable of delivery cost positively and significantly influences timeliness. So, H₂ is accepted. Delivery cost is also an important factor in on-time service because the height of the price can affect a customer's decision to use the service. If the delivery cost is too high, customers may find a cheaper alternative, although that delivery service is faster. Therefore, the company must balance fair delivery costs and good delivery timeliness to maintain customer trust, improve business efficiency and productivity, and make an optimum profit. This research supports the result of a study by Nainggolan and Gultom (2022) that delivery cost is simultaneously interrelated with timeliness. The finding of this study is that delivery cost positively influences timeliness in transportation services.

H₃. Service Quality and Customer Satisfaction

The influence of service quality variable on customer satisfaction is found t_{Statistics} 1.443 with P_{Values} 0.149. So, statistically, H₃ is rejected. The service quality variable has a positive but insignificant impact on customer satisfaction. Customers consider

the service quality of Lion Parcel as not so good, making them dissatisfied with the quality of service delivered by Lion Parcel to its customers. The result of the analysis is also in line with the finding of Prajongjai and Meenakorn (2022) in Thailand that service quality in the aspects of empathy and tangibles does not influence customer satisfaction in the parcel delivery service. The result of this study does not support the study done by Simanjuntak and Pradana (2022); Sin et al. (2022); and Yaacob and Yaacob (2022), stating that the variable of service quality significantly influences customer satisfaction in J&T Express.

The results of this study with insignificant results, only in line with the positive contribution of service quality to customer satisfaction (Marina et al., 2023). Other researches are not in line either because of service quality, according to Alfarisi et al. (2021), Kholdun et al. (2021), Meliyanih et al. (2021), Hidayati et al. (2023), and Jasin et al. (2023) positively and significantly influences customer satisfaction. According to Fulianto et al. (2021), service quality improvement happens in responsiveness and empathy based on the resulting average customer satisfaction. Indeed, the finding of this study has a positive but insignificant influence, different from the result of other research, which always influences customer satisfaction.

H₄. Delivery Cost and Customer Satisfaction

The influence of the delivery cost variable on customer satisfaction is $t_{\text{statistics}} = 2.832$ with $P_{\text{values}} = 0.005$. So, statistically, H_4 is accepted. The variable of delivery cost has a positive and significant influence on customer satisfaction. So, H_4 is accepted. The finding of this study supports the study done by Yuniar et al. (2021), stating that delivery cost has a positive and significant impact on customer satisfaction in J&T Express. The finding of this study is also in line with the study done by Athar et al. (2023), stating that delivery cost significantly influences customer satisfaction in delivery services, especially in Bima City, West Nusa Tenggara. The result of this analysis is in line with the finding of Faulina et al. (2021), explaining that delivery cost positively and significantly influences customer satisfaction. Thus, this research indicates that delivery cost has a positive and significant relationship with customer satisfaction.

H₅. Timeliness and Customer Satisfaction

The influence of the timeliness variable on customer satisfaction is found $t_{\text{in statistics}} = 4.348$ with $P_{\text{values}} = 0.000$. So, statistically, H_5 is accepted. The variable of timeliness has a positive and significant impact on customer satisfaction. So, H_5 is accepted. This research is in line with the study by Quintana et al. (2023) that the punctuality of delivery is the main thing because the punctuality of product delivery will be an important factor in increasing customer satisfaction. This finding is in line with the findings of Yuniar et al. (2021) and Razani and Bin Azmi (2022), stating that the variable of timeliness has a positive and significant impact on customer satisfaction in J&T Express. The finding of this study is also in line with the study of Athar et al. (2023), showing that delivery significantly impacts customer satisfaction in delivery services, especially in Bima City, West Nusa Tenggara. In general, this research supports the research carried out by Arroffi et al. (2021), explaining that delivery timeliness has a significant impact on customer satisfaction. Thus, the finding of this research shows that timeliness has a positive and significant relationship with customer satisfaction.

Indirect Influence Test Results

The analysis of structural equation modeling using a mediating variable is needed to know the existence of indirect influence and whether a mediating variable has an influence on the relationship between the independent variable and the dependent variable.

Table 8

Specific Indirect Effects

Variable	Original Sample (O)	T-Statistics (IO/STDEV)	P Values
Service quality (X1) → Timeliness (Z) → Customer satisfaction (Y)	0.252	3.376	0.001
Delivery cost (X2) → Timeliness (Z) → Customer satisfaction (Y)	0.158	2.839	0.005

H₆. Service Quality and Customer Satisfaction through Timeliness

With the value of $t_{\text{statistics}}$ of 3.376 and P_{values} of 0.001 as well as the coefficient of 0.252, it means timeliness can mediate positively and significantly between service quality and customer satisfaction. So, H_6 is accepted. There is a direct impact of service quality on customer satisfaction through timeliness, meaning that timeliness mediates the influence of service quality on customer satisfaction. The results of this study support research by Nainggolan and Gultom (2022) that timeliness in product delivery and affordable prices always improve the quality of customer service. The results of this research simultaneously support the analysis that service quality and delivery timeliness significantly influence customer satisfaction in the parcel delivery service (Monphetch, 2022; Pipatchokchaiyo & Meenakorn, 2022). It explains the indirect impact of service quality on customer satisfaction through timeliness, meaning that timeliness mediates the influence of service quality on customer satisfaction.

H₇. Delivery Cost and Customer Satisfaction through Timeliness

With the value of $t_{statistics}$ of 2.839 and P_{Values} of 0.005 as well as the coefficient of 0.158, it means timeliness mediates positively and significantly between delivery cost and customer satisfaction. So, H₇ is accepted. The finding of this study is in line with the study of Athar et al. (2023), showing that cost and timeliness simultaneously significantly impact customer satisfaction, especially in delivery services. It shows an indirect influence of delivery cost on customer satisfaction through timeliness, meaning that timeliness mediates the influence of delivery cost on customer satisfaction.

5. Conclusion

The influence of service quality on timeliness must be well maintained to enable the company to maintain customer trust, build a good image, and increase productivity and business efficiency. Delivery cost is also an important factor in on-time services because the cost height can influence customer decision to use the services. If the delivery cost is too high, customers may find cheaper alternatives, although the delivery service is faster. Therefore, a company must keep the balance between a reasonable delivery cost and good delivery timeliness to maintain customer trust, increase business efficiency and productivity, and make an optimum profit. Customers consider the service quality of Lion Parcel as not so good, making them dissatisfied with the quality of service delivered by Lion Parcel. The cost offered by Lion Parcel is still acceptable and quite affordable. Good delivery timeliness that impacts customer satisfaction becomes the main factor. Research combining four variables using service quality, delivery cost, timeliness, customer satisfaction, and cargo delivery service on parcel delivery is a novelty of the research, especially on the variable delivery cost and timeliness. It is expected to add to the treasures of further research.

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