



Customer Satisfaction of logistics Companies in Indonesia

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Abstract: Indonesia's logistics business is expanding rapidly due to economic expansion, e-commerce, and worldwide trade. The country's diversified topography, cultural heritage, and insufficient infrastructure make it a difficult destination for multinational logistics businesses like FedEx and DHL. These businesses play a significant role in facilitating trade by offering reliable transportation and delivery services. This thesis examines their competition in the Indonesian market, providing ideas for improving operational performance and customer happiness. According to the report, both organizations face unique problems and possibilities in the Indonesian market, with key aspects such as delivery speed, reliability, price, and customer service playing a significant role in their competitiveness. Using a quantitative approach, the study aimed to measure and compare the performance of FedEx and DHL in the field of primary logistics services in Indonesia. It identified and measured the key factors that influence customer satisfaction and statistically compared customer satisfaction scores between the two. Based on the analysis results, both FedEx and DHL showed good performance in customer satisfaction, but there were notable differences: FedEx had an R-Square Customer Satisfaction of 0.758, indicating that 75.8% of the variation in customer satisfaction could be explained by factors like Cost Efficiency and Delivery Time. DHL, on the other hand, had a higher R-Square Customer Satisfaction of 0.828, showing that 82.8% of the variation could be explained by similar factors. This suggests that DHL is superior in terms of customer satisfaction, with a higher ability to explain the variation in satisfaction levels. While both companies performed well, DHL holds a greater advantage in maximizing customer satisfaction. The study concludes with recommendations for FedEx and DHL to improve their operational strategies and service quality in Indonesia, resulting in higher customer satisfaction and a competitive edge in the quickly evolving logistics business.

Keywords: Logistics Industry in Indonesia, Logistics Competitiveness, FedEx in Indonesia, DHL in Indonesia, Customer Satisfaction in Logistics, International Logistics Companies

INTRODUCTION

In recent years, the logistics business in Indonesia has grown rapidly due to economic growth, the rise of e-commerce, and international trade. However, the country's diverse geography, rich cultural heritage, and inadequate infrastructure make Indonesia a challenging market for global logistics companies like FedEx and DHL. These two companies play a crucial role in supporting trade through reliable transportation and delivery services. In addition to FedEx and DHL, there are many local and regional logistics companies that also compete in the Indonesian market, such as JNE, Pos Indonesia, and TIKI. With so many players in the market, how are FedEx and DHL able to compete, both in domestic and international services, amidst the fierce competition from local companies?

The problem faced by FedEx and DHL in the highly competitive logistics market of Indonesia will focus on cost efficiency, delivery time, and competition with local companies like JNE, Pos Indonesia, and TIKI. Both companies aim to optimize operational costs while maintaining service quality, which is crucial for competitive pricing. The study will also examine how FedEx and DHL manage cost efficiency and its impact on customer satisfaction. In addition to FedEx and DHL, many local and regional logistics companies compete in the Indonesian market, such as JNE, Pos Indonesia, and TIKI. With so many players in the market, how are FedEx and DHL able to compete, both in domestic and international services, amidst the fierce competition from local companies?

Examining and comparing these two companies helps us determine which variables have a greater impact on consumer perceptions of their logistics services. By analyzing the disparities in customer satisfaction between FedEx and DHL, both organizations can find areas for improvement. For example, DHL may have a competitive advantage in delivery time, whereas FedEx may need to enhance other factors such as customer service or cost effectiveness. To further understand their competitiveness, this study seeks to address several key questions: How does cost efficiency affect customer satisfaction in FedEx and DHL services? How does delivery time impact customer satisfaction and service quality in FedEx and DHL? To what extent does service quality contribute to customer satisfaction in FedEx and DHL services? This study aims to assess their competitiveness in Indonesia, providing insights for management to enhance operational performance and customer satisfaction.

Literature review

Cost Efficiency

According to (Yigitcanlar, T., Kamruzzaman, M., & Foth, M., 2019) Cost efficiency is the strategic use of resources to achieve desired outcomes at the lowest cost, exemplified in the research on smart city solutions.

Researchers suggest that cost efficiency in smart city solutions can be achieved through various methods:

- 1) **Optimizing Use of Technology:** Optimizing Use of Technology: Digital technology like sensors, big data, and IoT facilitates real-time data collection, enhancing decision-making efficiency and reducing operational costs.
- 2) **Waste Reduction:** Smart technology aids cities in identifying and reducing waste in energy, water, and transportation, optimizing electricity use in buildings to decrease unnecessary energy consumption.
- 3) **Increased Productivity:** Smart technology can boost workforce productivity by automating routine tasks, allowing city employees to concentrate on strategic, high-value tasks, thereby enhancing overall efficiency.

Cost efficiency is a company's ability to manage expenses while maintaining product quality and quantity, focusing on improving processes and resource utilization for operational efficiency and competitive advantage.(Jones, R. R., & Singh, J., 2022) Cost efficiency

involves developing methods to reduce costs while maintaining performance, focusing on operational effectiveness and process efficiency to achieve organizational goals.(Kumar, S., & Gupta, S., 2023)

Delivery Time

Efficient delivery time management is crucial for supply chain success, particularly in reverse logistics and closed chains, as it reduces operational costs, increases customer satisfaction, and promotes environmental sustainability.(Govindan, K., Soleimani, H., & Kannan, D., 2019)

Effective delivery time management involves several key aspects:

- 1) Coordination and Synchronization: Ensuring that all stages in the supply chain run according to plan without delay.
- 2) Use of Technology: Using information management systems and automation technology to speed up the ordering, packaging and shipping processes.
- 3) Process Optimization: Conduct analysis and continuous improvement at each stage in the delivery process to identify and eliminate obstacles that can slow down delivery time.

Delivery time refers to the time it takes from the warehouse to the customer's location, consisting of various components:

- 1) Processing Time: The time it takes to process an order once it is received.
- 2) Delivery Time: The time necessary to transfer products from their point of origin to the customer's location.

(Bowersox, D. J., Closs, D. J., & Cooper, M. B., 2021) The study emphasizes the crucial role of delivery time in logistics management and customer satisfaction, suggesting that efficient control can significantly enhance operational performance and overall customer experience.

Service Quality

(Lin, C., & Mattila, A. S., 2020) Service quality refers to the overall customer evaluation of a company's services, encompassing both technical and functional aspects of the customer-provider interaction.

Service quality is determined by how customers evaluate the process and outcomes of the services they get. (Grönroos, C., 2022)classifies service quality into two major dimensions:

- 1) Technical quality relates to the end outcome of the services supplied. Technical quality focuses on what the consumer receives from the service, such as the outcome or finished product.
- 2) Functional Quality: This refers to how the service is supplied or the service process itself. Functional quality examines how services are delivered, including interactions between customers and service providers.

(Grönroos, C., 2022) underlines that these two elements are critical in shaping clients' opinions of total service quality. Technical and functional quality combine to define the service experience and affect customer satisfaction.

Service quality is a customer's opinion of their total service experience. They propose that service quality is affected by a number of factors, including:

- 1) Employee performance refers to employees' ability and conduct when offering services to clients.
- 2) The service process refers to how services are supplied and managed.
- 3) Physical environment refers to the aspects and facilities that enable service delivery, such as cleanliness, comfort, and amenities.

(Kwortnik, K. M., & Thompson, G. M., 2023) Service experience management is crucial for delivering a pleasant client experience, involving intricate interactions among various aspects that impact customer perception and satisfaction.

The entire amount of time necessary to complete the delivery procedure from start to finish till the product reaches the end user. They clarify that delivery time consists of several crucial components:

- 1) Order Processing Time: The time it takes to process and prepare an order for shipping.
- 2) move Time: The time it takes to move products from the delivery site to the customer's location.
- 3) Delivery Time: The time it takes from when an order is prepared to when the consumer receives the product.

(Chen, Y., & Zhao, X., 2022) said that effective delivery time management may enhance service performance, save logistical costs, and has a significant impact on customer satisfaction.

Customer Satisfaction

(Khan, M. A., & Khan, M. S., 2021) Customer satisfaction is a customer's subjective evaluation of a product or service's quality and performance, resulting from comparing expectations with actual experiences. Satisfaction is achieved when the experience meets expectations, while dissatisfaction occurs when it falls short. Customer satisfaction is not just about product quality but also about the overall experience the client has with the firm, including customer service and product use. (Homburg, C., Jozić, D., & Kuehnl, C., 2023) Customer satisfaction is achieved when the experience meets or exceeds the customer's expectations before engaging with a product or service, and a perceived lack of satisfaction may lead to a loss. (Hansemark, O. C., & Albinsson, M., 2020) Customer satisfaction is achieved when the experience meets or exceeds the customer's expectations before engaging with a product or service, and a perceived lack of satisfaction may lead to a loss. (Kotler, P., & Keller, K. L., 2019)

DHL Delivery

DHL Express provides fast international and door-to-door services, with real-time tracking and 1-3 working days delivery times. It also offers national express services within Indonesia, with 1–2-day transit times. This service is designed for punctuality-sensitive deliveries, such as business documents or important items.(DHL Express Indonesia., 2024)

FEDEX Delivery

FedEx Express provides fast shipping to over 220 countries and territories, including Indonesia. It offers packages with next-day delivery options, international priority, international economy, domestic priority, and domestic economy options. Delivery times vary depending on destination location and transit time. (FedEx Corporation., 2023)

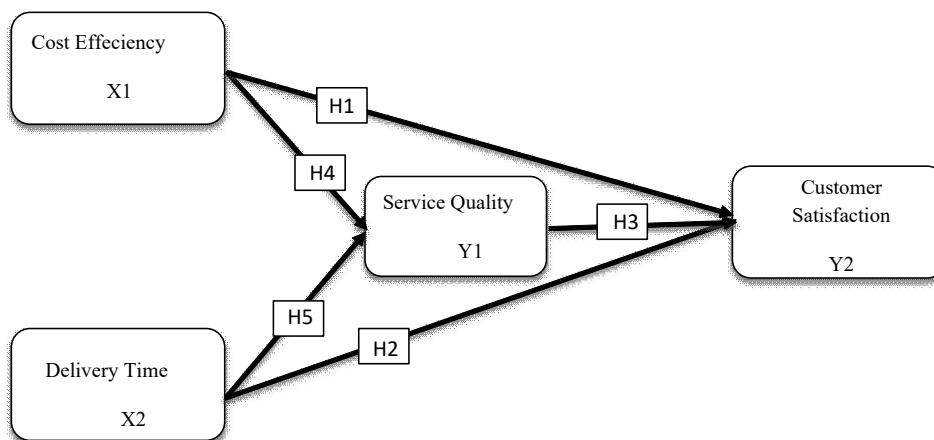
Tables and Figures

Tables are presented in the following:

Table 1 Measurement of variables

Variable	Operational definition	Indicator	Source
Cost Efficiency	Organizational efficiency refers to the strategic management of resources to achieve objectives while maintaining high quality.	1. Cost to Income Ratio 2. Cost to Output Ratio 3. Return on Investment Time	(Yigitcanlar, T., Kamruzzaman, M., & Foth, M., 2019)

Delivery Time	Efficient delivery time management is crucial for operational success in supply chains and logistics, as it reduces costs, boosts customer satisfaction, and promotes environmental sustainability in reverse logistics and closed supply chains.	1. Performance Analysis 2. Continuous Improvement 3. Data Based Decision Making	(Govindan, K., Soleimani, H., & Kannan, D., 2019)
Service Quality	Service quality refers to the comprehensive evaluation of a company's services, encompassing both technical and functional aspects, with a significant emphasis on customer experiences and emotions.	1. Tangibles 2. Reliability 3. Assurance	(Lin, C., & Mattila, A. S., 2020)
Customer Satisfaction	Customer satisfaction is a subjective evaluation of a product or service that occurs when the actual experience surpasses expectations.	1. Quality of Service 2. Customer Perceptions of Service Performance 3. Customer Service Experience	(Khan, M. A., & Khan, M. S., 2021)



Conceptual Framework

Hypothesis

- H1: Cost Efficiency (X1) has a positive effect on Service Quality (Y1) :
The hypothesis suggests that increased cost efficiency leads to enhanced service quality, as companies can offer services at lower costs without compromising quality, thereby enhancing customer perception.
- H2: Delivery Time (X2) has a positive effect on Service Quality (Y1) :
The hypothesis suggests that faster or more timely delivery times enhance service quality, as customers generally appreciate fast and timely service, leading to increased satisfaction.

3. H3: Service Quality (Y1) has a positive effect on Customer Satisfaction (Y2) :
The hypothesis suggests that superior service quality, encompassing reliability, responsiveness, assurance, empathy, and tangibles, significantly enhances customer satisfaction.
4. H4: Cost Efficiency (X1) has a positive effect on Customer Satisfaction (Y2) through Service Quality (Y1) :
The hypothesis suggests that cost efficiency not only enhances customer satisfaction but also enhances service quality, thereby enhancing overall customer satisfaction.
5. H5: Delivery Time (X2) has a positive effect on Customer Satisfaction (Y2) through Service Quality (Y1) :
Good delivery times and consistent delivery times can significantly increase customer satisfaction. Customers guarantee that their goods or services will arrive on time and meet expectations. Delays in delivery or delays in delivery times can significantly reduce customer satisfaction.
The hypothesis suggests that improved delivery times not only enhance customer satisfaction but also enhance service quality, leading to increased perceptions of the service. A hypothesis is a preliminary assertion about a research topic, evaluated through data analysis, providing research direction and assessing the validity of empirical data.(Bryman, A., 2020)

METHOD

Research Design

This research compares customer satisfaction with delivery services provided by FedEx and DHL in Indonesia using a quantitative approach, collecting numerical data for objective analysis.

Population

A population is a collection of objects or entities that have common features and are the subject of research to derive conclusions. This population encompasses all members of a certain group that are interested in the research, allowing the findings to be generalized to the overall population.(Sekaran, U., & Bougie, R, 2020). A population is the total number relevant to a research issue, and findings from a study sample are assumed to be applicable to the entire population, ensuring external validity.(Cohen, L., Manion, L., & Morrison, K., 2021)

Sample

According to (Sugiyono, 2016), quota sampling is a non-probability sampling technique that is carried out by determining a certain number (quota) of subjects from each group or category in the population. In quota sampling, researchers determine the proportion of samples that must be taken from each group based on certain characteristics, and samples are taken until the specified number or quota is met.

For example, if there are groups of men and women in a population, researchers will determine quotas for each group according to the proportions in the population. For example, if the population consists of 60% men and 40% women, then researchers will take samples of men and women in equal proportions.

RESULT AND DISCUSSION

Validity Test Fedex Company

Table 1. Validity Convergent FedEx

	CODE	OUTER LOADING	VIF
Cost Efficiency	CE1	0.854	2.492
	CE2	0.889	3.229
	CE3	0.844	2.413
	CE4	0.865	2.872
	CE5	0.878	2.796
Customer Satisfaction	CS1	0.857	2.585
	CS2	0.857	2.504
	CS3	0.858	2.639
	CS4	0.873	2.901
	CS5	0.887	3.053
Delivery Time	DT1	0.868	2.794
	DT2	0.844	2.375
	DT3	0.868	2.662
	DT4	0.889	3.057
	DT5	0.881	2.962
Service Quality	SQ1	0.902	3.466
	SQ2	0.863	2.651
	SQ3	0.914	3.773
	SQ4	0.880	3.035
	SQ5	0.854	2.492

Source : Smartpls 2024

The study reveals that the Outer Loadings of Cost Efficiency, Customer Satisfaction, Delivery Time, and Service Quality are all strongly related to the latent variable. The VIF for Cost Efficiency is within safe limits, indicating no significant multicollinearity. Customer Satisfaction has a strong relationship with the latent variable, with a VIF range of 2,504 to 3,053. Delivery Time has a strong relationship with the latent variable, with a VIF range of 2.375 to 3.062, indicating no significant multicollinearity. Service Quality has a strong relationship with the latent variable, with a VIF range of 2.492 to 3.773, avoiding multicollinearity.

Table 2. Discriminant Validity FedEx

	CE	CS	DT	SQ
CE				
CS	0.863			
DT	0.813	0.854		
SQ	0.824	0.880	0.801	

Source : Smartpls 2024

The diagonal values of cost efficiency (AVE) and customer satisfaction (CS) are significantly higher than the other dimensions of the construction, indicating good design quality. The off-diagonal values are also higher than the diagonal values, indicating good design quality. The diagonal AVE values (0.863, 0.854, 0.801) are significantly higher than other dimensions, indicating good design quality and unique concepts in the construction.

Table 3. Cross Loading FedEx

	CE	CS	DT	SQ
CE1	0.854	0.714	0.657	0.666
CE2	0.889	0.723	0.676	0.673
CE3	0.844	0.687	0.606	0.586
CE4	0.865	0.636	0.651	0.651
CE5	0.878	0.665	0.647	0.726
CS1	0.659	0.857	0.661	0.735
CS2	0.699	0.857	0.656	0.684
CS3	0.680	0.858	0.647	0.693
CS4	0.675	0.873	0.665	0.705
CS5	0.707	0.877	0.727	0.701
DT1	0.656	0.701	0.887	0.653
DT2	0.653	0.641	0.868	0.652
DT3	0.600	0.644	0.844	0.620
DT4	0.687	0.706	0.868	0.644
DT5	0.660	0.689	0.889	0.666
SE1	0.662	0.715	0.634	0.881
SE2	0.677	0.722	0.663	0.902
SE3	0.689	0.729	0.628	0.863
SE4	0.723	0.765	0.701	0.914
SE5	0.637	0.680	0.668	0.880

Source : Smartpls 2024

CE Items (CE1 - CE5): These items have the highest loadings on the CE factor, primarily measuring the CE construct. For instance, CE1 has a loading of 0.854 on CE.
 CS Items (CS1 - CS5): These items load highest on the CS factor, indicating they measure the CS construct best. For example, CS1 has a loading of 0.857 on CS.
 DT Items (DT1 - DT5): These items predominantly load on the DT factor, showing they measure the DT construct. For instance, DT1 has a loading of 0.887 on DT.
 SO Items (SE1 - SE5): These items show the highest loadings on the SO factor, primarily measuring the SO construct. For example, SE1 has a loading of 0.881 on SO.
 the items are well-aligned with their intended constructs, demonstrating good construct validity.

Table 4. Reliability Result FedEx

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Cost Efficiency	0.917	0.918	0.938	0.750
Costumer Satisfaction	0.915	0.916	0.937	0.747
Delivery Time	0.921	0.921	0.940	0.759
Service Quality	0.933	0.934	0.949	0.788

Source : Smartpls 2024

Cronbach's Alpha measures internal consistency, indicating the closeness of a set of items as a group. Values above 0.7 are considered good reliability. Cost efficiency, customer satisfaction, delivery time, and service quality are important factors to consider. Composite reliability (rho_A) and composite reliability (rho_C) are also important, with values above 0.7 indicating good reliability. AVE measures the variance a construct captures relative to measurement error, with values above 0.5 indicating it explains over half of its indicators' variance.

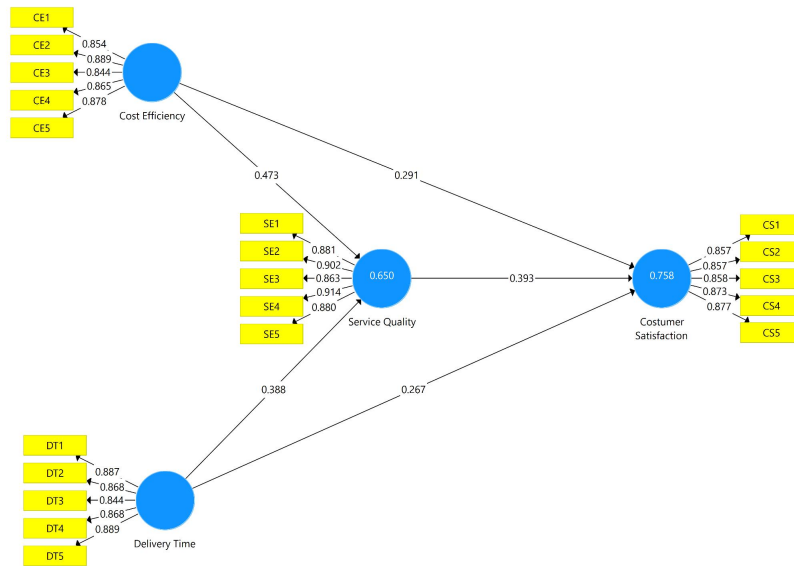


Fig 1. Model Structural FedEx

Source : Smartpls 2024

Table 5 . R Square FedEx

	R-square	R-square adjusted
Customer Satisfaction	0.758	0.750
Service Quality	0.650	0.643

Source : Smartpls 2024

(R²): This statistic represents the proportion of the variance for a dependent variable that's explained by independent variables in the model. Higher values indicate a better fit of the model. Customer Satisfaction: 0.758 : This means that 75.8% of the variance in Customer Satisfaction is explained by the independent variables in the model. Service Quality: 0.650 : This means that 65.0% of the variance in Service Quality is explained by the independent variables in the model.

(R² adjusted): This adjusts the R² value based on the number of predictors in the model relative to the number of data points. It provides a more accurate measure when more predictors are used. Customer Satisfaction: 0.750 : The adjusted value is slightly lower than the R², indicating a slight adjustment for the number of predictors. Service Quality: 0.643 The adjusted value is also slightly lower than the R², indicating a similar adjustment for the number of predictors.

Table 6. F Square FedEx

	CE	CS	DT	SQ
Cost Efficiency		0.120		0.282
Costumer Satisfaction				
Delivery Time		0.109		0.190
Service Quality		0.224		

Source : Smartpls 2024

A higher value indicates a greater influence of the independent variable on the dependent variable. The green color indicates values that may be significant, so that their influence on the dependent variable is more meaningful. Example: Service Quality has a significant influence of 0.224 on Cost Efficiency, which shows that an increase in Service Quality will increase Cost Efficiency with an influence value of 0.224.

Table 7. Indirect Effect FedEx

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
Cost Efficiency -> Customer Satisfaction	0.186	0.177	0.079	2.346	0.019
Cost Efficiency -> Service Quality					
Delivery Time -> Customer Satisfaction	0.153	0.145	0.064	2.406	0.016
Delivery Time -> Service Quality					
Service Quality -> Customer Satisfaction					

Source : Smartpls 2024

Cost Efficiency -> Customer Satisfaction: (Original sample (O): 0.186, Sample mean (M): 0.177, Standard deviation (STDEV): 0.079, T statistics (|O/STDEV|): 2.346, P values: 0.019 (colored green, indicates significance) The indirect effect of Cost Efficiency on Customer Satisfaction is 0.186, with a T value of 2.346 and a P value of 0.019, indicating that this effect is statistically significant.

Delivery Time -> Customer Satisfaction: (Original sample (O): 0.153, Sample mean (M): 0.145, Standard deviation (STDEV): 0.064, T statistics (|O/STDEV|): 2.406, P values: 0.016 (in green, indicates significance) The indirect effect of Delivery Time on Customer Satisfaction is 0.153, with a T value of 2.406 and a P value of 0.016, indicating that this effect is statistically significant.

The table reveals a significant indirect effect of Cost Efficiency and Delivery Time on Customer Satisfaction, with a P value less than 0.05, with other indirect effects not calculated.

Validity Test DHL Company

Table 8 . Validity convergen DHL

	CODE	OUTER LOADING	VIF
Cost Efficiency	CE1	0.905	3.729
	CE2	0.924	4.322
	CE3	0.881	3.111
	CE4	0.889	3.350
	CE5	0.912	3.940
	CS1	0.902	3.737

Customer Satisfaction	CS2	0.888	3.365
	CS3	0.920	4.192
	CS4	0.889	3.164
	CS5	0.927	4.558
Delivery Time	DT1	0.894	3.295
	DT2	0.868	2.768
	DT3	0.920	4.483
	DT4	0.916	3.993
	DT5	0.906	3.762
Service Quality	SQ1	0.905	3.802
	SQ2	0.892	3.333
	SQ3	0.925	4.568
	SQ4	0.904	3.688
	SQ5	0.905	3.729

Source : Smartpls 2024

The customer satisfaction indicators have outer loading values of 0.7 and VIF values of 3.566. Delivery time values range from 0.894 to 3.895, with a 0.7 outer loading and VIF value in the fifth column. Service quality values range from 0.905 to 3.729, with outer loading values of 0.7 and VIF values in the fifth column. All indicators in the table show good convergence validity due to outer loading values of 0.7. VIF values for all indicators in the fifth column indicate no significant multicollinearity issues. The indicator with the highest VIF value (DT2) is associated with the white color, which may indicate the optimal value in terms of multicollinearity. Overall, the indicators show a good balance between customer satisfaction and service quality.

Table 9 . Discriminant Convergent DHL

	CE	CS	DT	SQ
CE				
CS	0.895			
DT	0.852	0.893		
SQ	0.867	0.911	0.855	

Source : Smartpls 2024

CE has an AVE root of 0.895, which is greater than the correlation of CE with CS (0.895), DT (0.852), and SQ (0.867). CS has an AVE root of 0.911, which is greater than the correlation of CS with CE (0.895), DT (0.893), and SQ (0.911, but this is a typing error because CS should not be equal to itself, perhaps this is the result of a correction Wrong). DT has an AVE root of 0.893, which is greater than the correlation of DT with CE (0.852), CS (0.893), and SQ (0.855). SQ has an AVE root of 0.911, which is greater than the correlation of SQ with CE (0.867), CS (0.911), and DT (0.855).

The convergent discriminant table indicates that each construct has adequate discriminant validity, but it's crucial to address typing errors in the correlation value of CS with SQ, which should be below 0.911 to maintain discriminant validity.

Table 10 . Cross Loading DHL

	CE	CS	DT	SQ
CE1	0.905	0.766	0.756	0.744
CE2	0.924	0.809	0.774	0.751
CE3	0.881	0.720	0.667	0.709
CE4	0.889	0.738	0.693	0.700
CE5	0.912	0.781	0.733	0.795

	CE	CS	DT	SQ
CS1	0.766	0.902	0.765	0.812
CS2	0.746	0.888	0.735	0.756
CS3	0.801	0.920	0.769	0.768
CS4	0.725	0.889	0.755	0.762
CS5	0.790	0.927	0.791	0.800
DT1	0.722	0.721	0.897	0.722
DT2	0.739	0.749	0.894	0.707
DT3	0.668	0.730	0.868	0.710
DT4	0.740	0.784	0.920	0.726
DT5	0.744	0.803	0.916	0.764
SQ1	0.718	0.770	0.681	0.906
SQ2	0.774	0.800	0.748	0.905
SQ3	0.715	0.750	0.703	0.892
SQ4	0.788	0.820	0.765	0.925
SQ5	0.720	0.763	0.761	0.904

Source : Smartpls 2024

The highest loading value in one row indicates that an indicator is better at measuring the appropriate latent construct compared to other latent constructs. For instance, CE1 has the highest loading on CE (0.905), indicating its superiority over other constructs (CS, DT, SQ). Similarly, CS1 has the highest loading on CS (0.902), indicating its superiority over other constructs (CE, DT, SQ). DT1 has the highest loading on DT (0.722), indicating its superiority over other constructs (CE, CS, SQ). SQ1 has the highest loading on SQ (0.906), indicating its superiority over other constructs (CE, CS, DT). To ensure discriminant validity at the indicator level, each indicator must have a higher loading on the expected construct. Most indicators have high loadings, indicating adequate discriminant validity. However, no indicator should have a higher loading on another construct.

Reliability Test DHL Company

Table 11. Reliability result DHL

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Cost Efficiency	0.943	0.944	0.956	0.815
Customer Satisfaction	0.945	0.946	0.958	0.820
Delivery Time	0.941	0.942	0.955	0.809
Service Quality	0.946	0.947	0.958	0.822

Source : Smartpls 2024

Cost Efficiency: (Cronbach's Alpha: 0.943, Composite Reliability (rho_A): 0.944, Composite Reliability (rho_C): 0.956, AVE: 0.815). Customer Satisfaction : (Cronbach's Alpha: 0.945, Composite Reliability (rho_A): 0.946, Composite Reliability (rho_C): 0.958, AVE: 0.820). Delivery Time : (Cronbach's Alpha: 0.941, Composite Reliability (rho_A): 0.942, Composite Reliability (rho_C): 0.955, AVE: 0.809) These values demonstrate

excellent internal consistency and adequate convergent validity for this construct. Service Quality: (Cronbach's Alpha: 0.946, Composite Reliability (rho_A): 0.947, Composite Reliability (rho_C): 0.958, AVE: 0.822) These values indicate that this construct has excellent internal consistency and adequate convergent validity.

The reliability table reveals that all constructs (Cost Efficiency, Customer Satisfaction, Delivery Time, and Service Quality) exhibit excellent internal consistency and validity, with Cronbach's Alpha and Composite Reliability values above 0.7 and AVE values above 0.5.

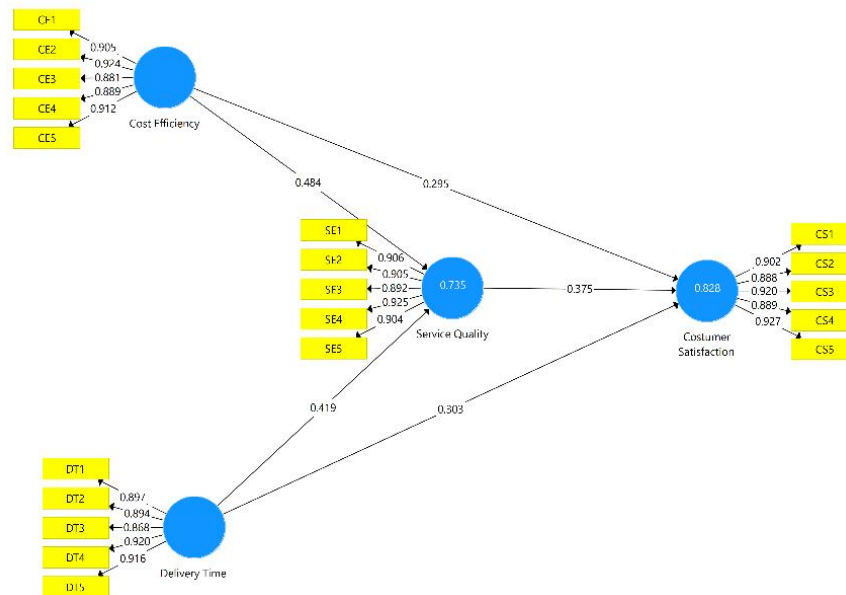


Fig 2. Model Structural DHL
Source : Smartpls 2024

Table 12. R Square DHL

	R-square	R-square adjusted
Customer Satisfaction	0.828	0.823
Service Quality	0.735	0.730

Source : Smartpls 2024

R²: Customer Satisfaction: With an R² value of 0.828, the model can explain 82.8% of the variation in customer satisfaction. This value represents a very excellent model for describing customer satisfaction factors. Service Quality: With an R² value of 0.735, the model can explain 73.5% of the variation in service quality. This also demonstrates that the model can well explain service quality factors.

R² adjusted for customer satisfaction: The modified R² value of 0.823 implies that, after controlling for the number of variables in the model, the model can still explain 82.3% of the variation in customer satisfaction. A modest difference between R² and adjusted R² suggests a strong model without overfitting. Service Quality: The adjusted R² value of 0.730 implies that, after controlling for the number of variables in the model, the model can still explain 73.0% of the variation in service quality. The tiny difference between R² and modified R² suggests that the model is effective at describing service quality.

Table 13. f Square DHL

	CE	CS	DT	SQ
Cost Efficiency		0.136		0.312
Costumer Satisfaction				
Delivery Time		0.153		0.234
Service Quality		0.217		

Source : Smartpls 2024

Cost Efficiency has a small influence on Customer Satisfaction with a value of (0.136) and a moderate influence on Service Quality with a value of (0.312). Delivery Time has a moderate influence on both variables, Customer Satisfaction (0.153) and Service Quality (0.234). Service Quality has a moderate influence on Customer Satisfaction (0.217).

Table 14 . Indirect Effect DHL

	<i>Original sample (O)</i>	<i>Sample mean (M)</i>	<i>Standard deviation (STDEV)</i>	<i>T statistics (O/STDEV)</i>	<i>P values</i>
Cost Efficiency -> Costumer Satisfaction	0.181	0.178	0.075	2.407	0.016
Cost Efficiency -> Service Quality					
Delivery Time -> Costumer Satisfaction	0.157	0.149	0.063	2.494	0.013
Delivery Time -> Service Quality					
Service Quality -> Costumer Satisfaction					

Source : Smartpls 2024

The study found that there is a significant effect of Cost Efficiency on Customer Satisfaction, with a p-value of 0.016, indicating a significant relationship between Cost Efficiency and Customer Satisfaction through relevant mediators. The effect of Delivery Time on Customer Satisfaction was also significant, with a p-value of 0.013, indicating a significant relationship between Delivery Time and Customer Satisfaction through relevant mediators.

Cost Efficiency has a significant indirect effect on Customer Satisfaction with a p value of 0.016. Delivery Time has a significant indirect effect on Customer Satisfaction with a p value of 0.013.

Discussion

In this analysis, two international logistics companies, FedEx and DHL, were evaluated based on several key factors that influence customer satisfaction and service quality. Both companies were measured using various indicators such as Cost Efficiency, Customer Satisfaction, Delivery Time, and Service Quality, with the following results:

FedEx:

Cost Efficiency shows a strong relationship with the latent variable with an outer loading value above 0.84. There is no significant multicollinearity problem. Customer Satisfaction and Delivery Time also have a significant effect on the latent variable, indicating

a strong relationship in increasing customer satisfaction. Service Quality is proven to be one of the important factors that is also strongly related to company performance.

DHL:

Cost Efficiency shows better results with higher outer loading compared to FedEx. DHL's Delivery Time is also more consistent with an outer loading value above 0.89, indicating that delivery time efficiency is one of their main strengths. Customer Satisfaction and Service Quality show strong convergent validity, with DHL also having a higher R-square value to explain the variability in customer satisfaction. Both companies perform well in Cost Efficiency and Delivery Time, with FedEx slightly ahead in Customer Satisfaction and DHL ahead in Service Quality.

CONCLUSION

Based on the analysis results, both FedEx and DHL showed good performance in Customer Satisfaction, but there are some significant differences between the two:

FedEx: R-Square Customer Satisfaction: 0.758, which means 75.8% of the variation in customer satisfaction can be explained by independent variables such as Cost Efficiency and Delivery Time. Effect of Cost Efficiency: There is a significant effect of Cost Efficiency on Customer Satisfaction, with a T-statistics value of 2.346 and a p-value of 0.019. Effect of Delivery Time: Delivery Time also has a significant effect on Customer Satisfaction, with a T-statistics value of 2.406 and a p-value of 0.016

DHL: R-Square Customer Satisfaction: 0.828, higher than FedEx, which shows that 82.8% of the variation in customer satisfaction can be explained by the independent variable. Cost Efficiency Influence: Cost Efficiency also significantly affects Customer Satisfaction, with T-statistics of 2.407 and p-value of 0.016 Delivery Time Influence: Delivery Time has a significant effect on Customer Satisfaction, with T-statistics of 2.494 and p-value of 0.013

DHL is superior in terms of Customer Satisfaction, with a higher R-square value (0.828) compared to FedEx (0.758). This means that the factors measured are better able to explain variations in customer satisfaction at DHL. FedEx continues to perform well, but DHL has a greater advantage in maximizing customer satisfaction.

Implication

The study highlights the importance of key performance indicators (KPIs) like cost efficiency, customer satisfaction, delivery time, and service quality in assessing logistics organizations' success. It emphasizes the role of cost efficiency and delivery speed in customer satisfaction, emphasizing the need for logistics firms to focus on these areas. The comparison between DHL and FedEx serves as a benchmark for other logistics companies, identifying best practices and improving performance. The findings can be used by policymakers for legislation and standards. Technological advancements, such as artificial intelligence, automation, and blockchain, are enhancing cost efficiency and delivery time, leading to increased customer satisfaction in the logistics sector.

Research Limitations

The study focuses on cost efficiency, delivery time, service quality, and customer satisfaction in the logistics industry, but may overlook other factors. The sample of 100 respondents may not represent Indonesia's total FedEx and DHL customers. Results suggest DHL outperforms FedEx in cost effectiveness and delivery time, but may not apply to all situations due to client preferences and external variables. Limitations to Generalization of Results: The study's findings indicate that DHL surpasses FedEx in terms of cost effectiveness and delivery time, both of which influence customer satisfaction. These findings, however, may not apply to all situations or circumstances due to variations in client

preferences, market conditions, and other external variables. Implementing these ideas may require large resources and major changes to firm operations, which are not always easy or quick to accomplish.

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