



DOI: <https://doi.org/10.38035/jemsi.v6i6>
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Increasing Import and Export Tonnage Through Sustainable Services and TMS Utilization

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Abstract: This study analyzes the effect of service continuity and the use of Transportation Management System (TMS) on increasing import and export tonnage at PT DHL Global Forwarding Indonesia. As part of DHL Global, the company focuses on providing consistent service and implementing TMS technology to improve operational efficiency. The results show that service continuity increases customer loyalty, while TMS contributes to operational optimization and cost savings, which together drive an increase in import and export tonnage. This study provides important insights to strengthen the company's operational performance and competitive position in the global market.

Keyword: Service Continuity, Transportation Management System, TMS, Import Tonnage, Export Tonnage, PT DHL Global Forwarding Indonesia

INTRODUCTION

In an increasingly competitive era of globalization, logistics companies are required to continue to improve efficiency and quality of service in order to maintain competitiveness. PT DHL Global Forwarding Indonesia as part of the DHL global network seeks to optimize import and export activities through continuity of service and the use of Transportation Management System (TMS) technology. Excellence in global networks, customer loyalty, and the application of advanced technology are the company's main strengths in meeting large-scale logistics needs.

Increasing import and export tonnage is the main focus because tonnage illustrates the operational capacity and efficiency of services that a company is able to provide. As an indicator of operational success, increasing tonnage not only shows volume growth, but also becomes a measure of the effectiveness of consistent service continuity and technology-based management. Therefore, this study aims to analyze the effect of service continuity and the use of TMS on increasing tonnage at PT DHL Global Forwarding Indonesia.

One of the main strategies implemented by PT DHL Global Forwarding Indonesia is the use of Transportation Management System (TMS). TMS is a technological device designed to improve operational efficiency through planning, implementing, and optimizing transportation

operations. The implementation of TMS not only allows companies to improve supply chains and save transportation costs, visibility, but also to improve overall performance, including increasing import and export tonnage which are key indicators of success in the freight forwarding industry (DHL, nd)

However, increasing the value of TMS cannot be achieved by relying on technology alone. It requires a comprehensive strategy, careful implementation, and the ability to continuously update and improve existing systems (DHL, nd). This shows that in addition to the implementation of technology, service continuity also plays an important role in ensuring operational stability and customer satisfaction. Customers who receive consistent and reliable service tend to be more loyal and increase their business volume with the company, which ultimately contributes to increasing the tonnage of import and export goods (DHL, nd).

In this context, this study aims to explore how service continuity and TMS usage affect the increase in import and export tonnage at PT DHL Global Forwarding Indonesia. Through this study, it is expected to gain a deeper understanding of the factors that influence operational efficiency and how companies can optimize the use of technology to achieve their strategic goals. This study is also expected to provide practical contributions to PT DHL Global Forwarding Indonesia and other companies in the same sector, in developing more effective strategies to increase competitiveness in the global market.

Literature Review

1. Continuity of service

Continuity is the principle of continuity in every work activity carried out based on the results of evaluations from time to time. The principle of continuity is also called the principle of continuity (Analius Giawa, Rukoyah, 2021) . In responding to increasingly competitive market developments, companies continue to improve the quality of service continuously in order to strengthen the fundamentals of business skills. (Zai et al., 2022)

Service is an activity or series of invisible activities (cannot be felt) that occurs due to interaction between consumers and employees or other rights. Provided by service providers with the aim of solving problems for clients or consumers (Prasetijowati et al., 2023)

The service function is very important because service is distributing service capacity to customers which must be useful to provide maximum satisfaction to customers, because in distributing a service it must be done in accordance with the role of the service provider (Lembaga et al., 2021)

The principle of continuity in service is very relevant for PT DHL Global Forwarding in increasing export and import tonnage. By continuously improving the quality of service, the company can manage logistics more efficiently, resolve customer issues quickly, and increase customer satisfaction. This improvement allows the company to handle larger volumes of goods, which has a direct impact on increasing export and import tonnage, as well as strengthening their competitiveness in the global market.

2. Use of transportation management system (TMS)

The Transportation Management System is the right tool to streamline the process of shipping goods and make it easier for business actors to manage and optimize transportation operations by land, air, and sea (Pelayaran & Puspitasari, 2024)

TMS integrates functionalities such as route optimization, real-time tracking, load planning, and predictive analytics to improve the efficiency of logistics operations for organizations of all sizes and scales (small, medium, and large) (LLP & DC, 2024)

Highlighting the role of TMS in improving supply chain visibility, reducing operational costs, and enhancing delivery performance. Advanced functionalities including automated decision-making enabled by AI and machine learning further enhance TMS capabilities, enabling more efficient and responsive logistics operations (LLP & DC, 2024)

It can be concluded that the Implementation of TMS Overall, TMS supports the increase in import and export tonnage by providing an efficient solution for planning, implementing, and monitoring transportation operations. This allows PT DHL Global Forwarding Indonesia to better manage the flow of bulk goods, improve the reliability and speed of delivery, and reduce operational costs.

3. Import and Export Tonnage of PT DHL Global Forwarding Indonesia

The increase in import and export tonnage is one of the main indicators of increasing operational capacity, measured through tonnage, which is the result of optimizing logistics processes and utilizing appropriate technology such as TMS.

Tonnage is the weight of the goods to be shipped or the capacity of the goods to be deposited in the same export destination country. (Ulva & Darno, 2019) The basic idea of tonnage measurement is to determine the capacity and collection of levies from a ship which then developed into proof of ship ownership and nationality of the ship. In 1969, a convention was held on ship tonnage measurement to create measurement rules that could eliminate differences in ship tonnage measurement results. The results of the convention are known as TMS 1969 (Tonage Measurement of Ship), this rule applied internationally in 1982 which was then ratified by the Unitary State of the Republic of Indonesia in 1989. (Mustafa et al., 2024)

The definition of import is the purchase of goods from abroad or can also be called the entry of goods from abroad. High import activities can have positive impacts and can also have negative impacts. Import activities will have a negative impact if the imported goods are semi-finished goods, raw materials, or capital goods because they can increase domestic production. Import activities must be balanced with exports. (Triyawan & Mutmainnah, 2021)

Definition of Export is the sale of goods from within the country to abroad. Trade transactions between one country and another will occur when exporting. Increased consumption of a country, additional development in a country, and production efficiency are caused by exports. Export is the activity of selling goods from within the country to residents abroad. The main role of a country's development is export (Triyawan & Mutmainnah, 2021)

By maintaining a balance between imports and exports, PT DHL Global Forwarding Indonesia can optimize tonnage utilization, improve operational efficiency, and support national economic growth through more effective international trade.

It can be concluded that by utilizing TMS and maintaining service continuity, PT DHL Global Forwarding Indonesia can manage the increase in import and export tonnage efficiently. This not only increases customer satisfaction.

Tables and Figures

The table is presented as follows:

Table 1. Measurement of variables

Variables	Operational definition	Goods	Source
Continuity of Service	Continuity is the principle of continuity in every work activity carried out based on the results of evaluations from time to time. The principle of continuity is also called the principle of continuity.	<ol style="list-style-type: none"> 1. Flexibility of Service 2. Service Quality Level 3. Cost Efficiency 4. Accuracy, Accuracy & Delivery Time 5. Operational Efficiency 6. Continuity of Service 	(Analius Giawa, Rukoyah, 2021).
Use of Transportation Management System (TMS) Technology	Transport Management System is a logistics platform designed to simplify the process delivery.	<ol style="list-style-type: none"> 1. Transportation Visibility 2. Operational Efficiency 3. Order Management 4. Transportation Planning 5. Transportation Execution 	(Voyage & Puspitasari, 2024)

Variables	Operational definition	Goods	Source
Increase in Export and Import Tonnage	The tonnage of a ship is the amount of space expressed in volume, where the volume of enclosed space on board a ship is expressed in tonnage.	1. Monthly/Annual Tonnage Volume 2. Tonnage Growth 3. Shipping Capacity	(Mustafa et al., 2024)

Hypothesis

Hypothesis is an important part of research that needs to be designed from the beginning of the research. Because, the hypothesis is a temporary answer to the research question that is expected to be a guideline in the research flow. (Tanod et al., 2019)

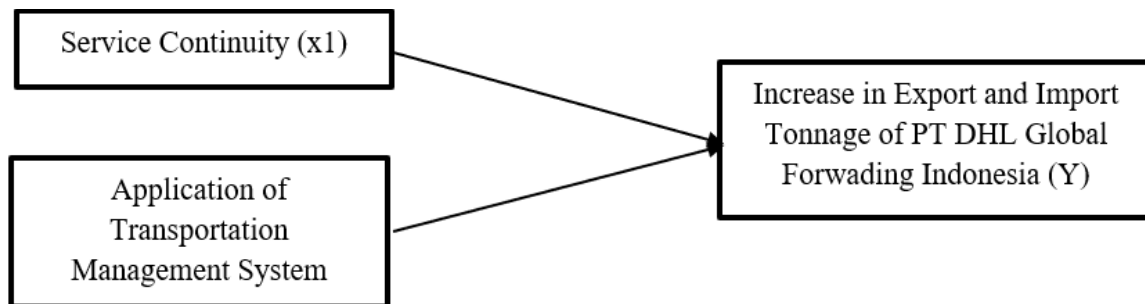


Figure 1. Conceptual Framework

Based on the image it can be concluded that:

- H1: There is a positive influence of service contracts (X1) on increasing export and import tonnage of PT DHL Global Forwarding Indonesia (Y).
- H2: There is a positive influence of the use of Transaction Management System (TMS) technology (X2) on increasing export and import tonnage of PT DHL Global Forwarding Indonesia (Y).

METHOD

This study uses a quantitative approach with a quantitative descriptive method. The design of this study aims to identify and analyze the effect of service continuity and the use of Transportation Management System (TMS) technology on increasing export and import tonnage at PT DHL Global Forwarding Indonesia. The quantitative approach was chosen because it allows objective measurement and statistical analysis needed to understand the relationship between variables.

The analysis stages applied involve the Structural Equation Model-Partial Least Square (SEM PLS) approach processed using SmartPLS 4 software. The SEM PLS method was chosen because of its ability to confirm the theory while explaining the relationship between latent variables that cannot be measured directly, but through relevant indicators. Ghozali (2018) explains that the PLS method provides flexibility in describing and analyzing latent variables comprehensively.

Data Collection Methods

The data used by researchers comes from primary data sources obtained directly. Primary data sources refer to information obtained through interviews, observations, or the use of questionnaires to individuals (Sekaran & Bougie, 2016) . The type of data used is primary data taken using a questionnaire using a google form.

This research was conducted at PT. DHL Global Forwarding Jakarta by involving employees working in the area. The research instruments used are as follows:

1. Questionnaire: This instrument is provided in hardcopy or softcopy (Google Form) containing measurement indicators in the form of statements that must be filled in by respondents. The questionnaire is distributed to customers who use PT. DHL Global Forwarding Jakarta either directly in physical form or through a digital platform. Before filling out the questionnaire, respondents will be given an explanation of how to fill it in, guarantee of confidentiality of personal data, research objectives, and consent to participate in the survey.
2. Interview: In addition to the questionnaire, interviews were also conducted to strengthen the data analysis. This interview uses open-ended questions that can be done directly or via Google Forms, with the aim of gaining deeper insights that may not be revealed through the questionnaire.

This methodology is designed to ensure that the data collected and analyzed can provide accurate diagrams that show the correlation between the factors studied, as well as support the conclusions generated from this study.

Data Analysis Methods

By utilizing the Partial Least Square (PLS) approach, data analysis was carried out using SmartPLS software version 4. PLS is one of the Structural Equation Modeling (SEM) solution methods which in this case is more than other SEM techniques. SEM has a higher level of flexibility in research that connects theory and data and is able to perform path analysis with latent variables, so it is often used by researchers who focus on social sciences. *Partial Least Square* (PLS) is a fairly powerful analysis method because there are not many underlying assumptions. In addition, normal data distribution is not required. multivariate (indicators with categorical, ordinal, interval to ratio can be applied to the same model), therefore a large sample size is not required. (Ghozali, 2018) .

Partial Least Square (PLS) can not only confirm the theory, but also clarify whether there is a relationship between hidden variables. In addition, PLS is also used to confirm the theory, so in prediction-based research, PLS is more suitable for analyzing data. *Partial Least Square* (PLS) can also be used to explain whether there is a relationship between latent variables. Partial Least Square (PLS) can analyze constructs built with reflective and formative indicators simultaneously. This cannot be done by covariance-based SEM because it will be an unidentified model. The selection of the Partial Least Square (PLS) method is based on the consideration that in this study there are 4 latent variables formed by reflective indicators and variables measured by the second-order factor reflexive approach. The reflexive model assumes that constituent or latent variables affect indicators, where the causal relationship of the construct to the indicator or manifest (Ghozali, 2018) , so confirmation of the relationship between latent variables is needed.

RESULTS AND DISCUSSION

Convergence Validity Test

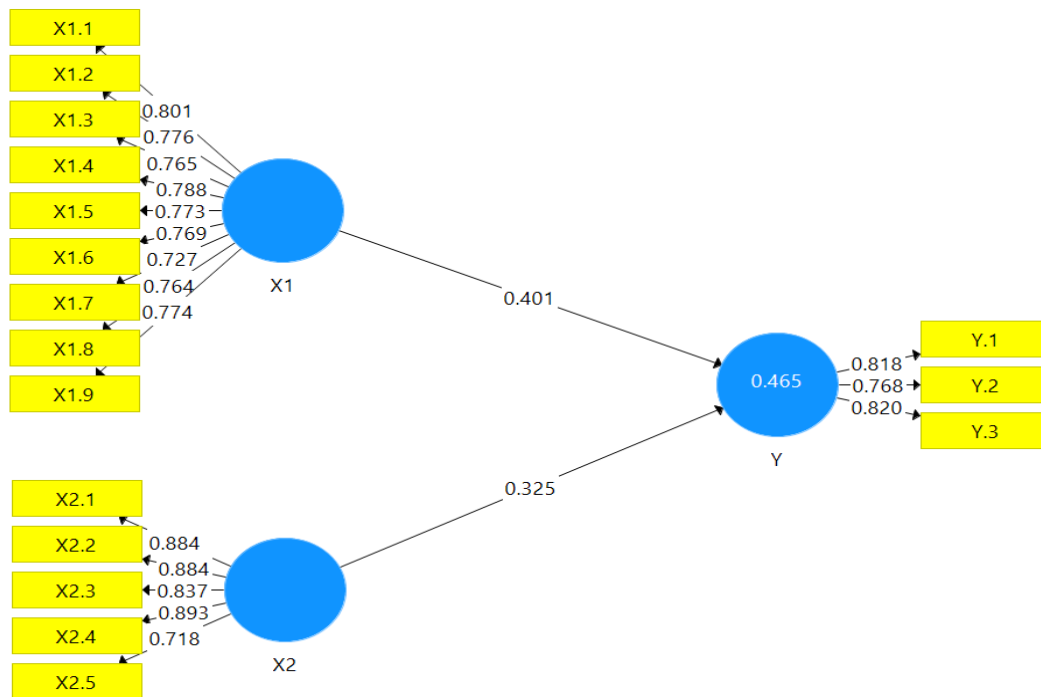


Figure 2. Validation Test

Table 2. Convergence Validity Test

	X1	X2	You
X1.1	0.801		
X1.2	0.776 years		
X1.3	0.765 years		
X1.4	0.788 years		
X1.5	0.773		
X1.6	0.769 years		
X1.7	0.727		
X1.8	0.764		
X1.9	0.774 years		
X2.1		0.884	
X2.2		0.884	
X2.3		0.837	
X2.4		0.893	
X2.5		0.718	
Y.1			0.818
Y.2			0.768 years
Y.3			0.820

The results of the convergent validity test indicate that there are value loading factors for each indicator in three constructs: Service Continuity (X1), Use of Transportation Management System Technology (X2), and Increased Export and Import Tonnage (Y). All loading factor values are above 0.7, which is a common threshold for convergent validity. This means that each indicator has a strong contribution to the construct being measured. Overall, these results indicate that each indicator can be relied on to measure its respective construct with good convergent validity.

AVE Test

Table 3. Ave Test

	Track	Caption
Continuity of Service	0.594 years	Legitimate
Utilization of Transportation Management System Technology	0.715	Legitimate
Increase in Export and Import Tonnage	0.643	Legitimate

The results of the Average Variance Extraction (AVE) test show that each variable in the model has an AVE value higher than 0.5 which is the minimum threshold for convergence validity. The results show that all variables have met the valid requirements for the AVE test because their values are above 0.5.

HTMT Discrimination Validity Test

Table 4. Validation Test

	X1	X2	Y
X1			
X2	0.842		
Y	0.783	0.775 years	

The HTMT table above shows that all HTMT values < 0.9, so it can be stated that all constructs are valid in terms of the validity of the discriminant power based on the HTMT calculation.

Fornell Larcker Criteria Discrimination Validity Test

Table 5. Fornell Larcker Criteria Discrimination Validity Test

	X1	X2	Y
X1	0.771		
X2	0.764	0.846	
Y	0.649	0.631	0.802

Based on the table above, all AVE roots (Fornell-Larcker Criteria) of each construct are greater than their correlation with other variables. Since all latent variables of the AVE Root value > their correlation with other constructs, the discriminative validity requirements in this model have been met, as listed in the table above.

Cross-Loading Values between Variables

Table 6. Cross-loading Values between Variables

	X1	X2	Y
X1.1	0.801	0.617	0.539
X1.2	0.776 years	0.508 years	0.481
X1.3	0.765 years	0.599	0.449
X1.4	0.788 years	0.614	0.518
X1.5	0.773	0.650	0.569 years
X1.6	0.769 years	0.593	0.538
X1.7	0.727	0.601	0.406
X1.8	0.764	0.517	0.445
X1.9	0.774 years	0.590	0.518
X2.1	0.627	0.884	0.548 years
X2.2	0.651	0.884	0.493
X2.3	0.656	0.837	0.542 years

	X1	X2	Y
X2.4	0.688	0.893	0.601
X2.5	0.604	0.718	0.467
Y.1	0.528	0.488	0.818
Y.2	0.442	0.468	0.768 years
Y.3	0.579 years	0.555	0.820

In the table above, it can be seen that the crossloading value has a greater result compared to the indicator on the latent variable indicated by the underlined value results. Thus, the cross-loading test has met the prerequisites.

Cronbach's Alpha Value and Composite Reliability

Table 7. Cronbach's Alpha Value and Composite Reliability

	Alpha Cronbach	rho A	Composite Reliability
X1	0.915	0.918 years	0.930
X2	0.899	0.906	0.926
Y	0.724	0.731	0.844

The results show that each construct is measured using multiple items, with Cronbach's Alpha, rho_A, and Composite Reliability (CR) displayed for construct reliability. Overall, the table results show that all measured constructs have adequate reliability values, with Cronbach's Alpha, rho_A, and Composite Reliability values above the recommended threshold (rho_A > 0.7, CA > 0.7, and CR > 0.7). This indicates that these constructs are reliable for use in research.

R-Square Value

Table 8. R-Square Value

	R Square	Adjusted R Squared
Y	0.465	0.455

Based on the results of the R-square value table, the R-square result was 0.465 or 46.5%. These results indicate that the variation in the Increase in Export and Import Tonnage (Y) can be explained by the independent variables in the model studied, namely Service Continuity (X1) and Utilization of Transportation Management System Technology (X2).

Hypothesis Testing

Table 8. Hypothesis Testing

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ((O/STDEV))	P Value
X1 -> Y	0.401	0.391	0.108	3,724	0.000
X2 -> Y	0.325	0.319	0.114	2,848	0.005

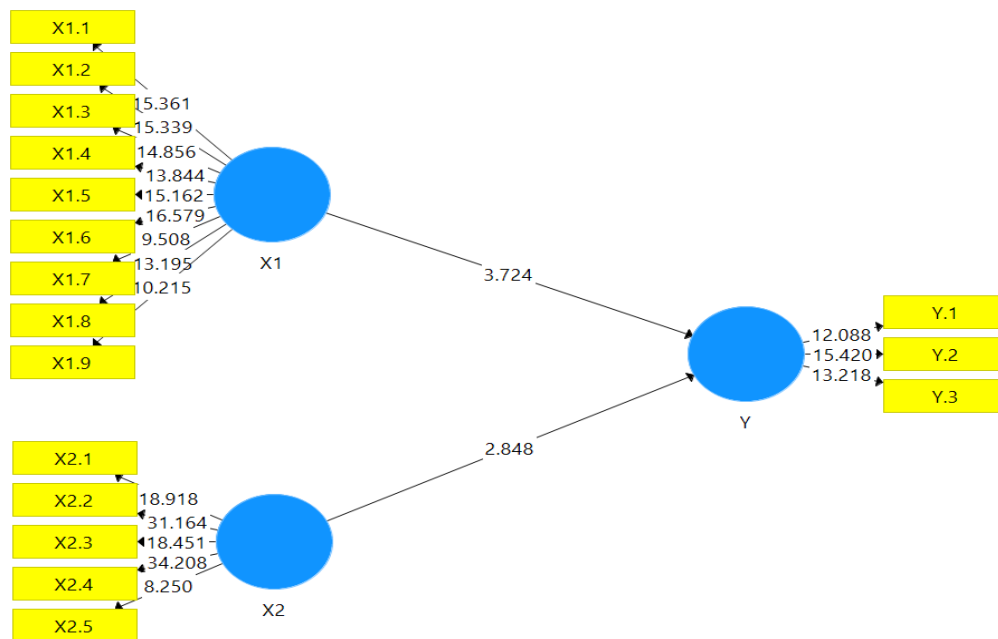


Figure 3. Hypothesis Testing

Based on the results of the hypothesis test table, all independent variables in this study have a significant relationship to the dependent variable studied, namely the Increase in Export and Import Tonnage (Y). Continuity of Service (X1) has a p-value of 0.000 <0.05 and a t-statistic value of 3.724 > 1.96, therefore it can be concluded that the relationship between Continuity of Service and the Increase in Export and Import Tonnage is significant and with a positive relationship direction of 0.401. In addition, the Utilization of Transportation Management System Technology (X2) has a p-value of 0.005 <0.05 and a t-statistic value of 2.848 > 1.96, therefore it can be concluded that the relationship between Transportation Management System Technology and the Increase in Export and Import Tonnage is significant and with a positive relationship direction of 0.325.

CONCLUSION

Based on the results of the study, all independent variables in this study have a significant relationship to the dependent variables studied, namely the Increase in Export and Import Tonnage (Y). Continuity of Service (X1) Thus it can be concluded that the relationship between Continuity of Service and the Increase in Export and Import Tonnage is significant and with a positive relationship direction of. In addition, the Utilization of Transportation Management System Technology (X2) has a value, therefore it can be concluded that the relationship between Transportation Management System Technology and the Increase in Export and Import Tonnage is significant and with a positive relationship direction of.

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