

EFFECTIVENESS OF CONTAINER HANDLING AND DWELLING TIME**REDUCTION: CASE AT JAKARTA INTERNATIONAL CONTAINER
TERMINAL COMPANY, INDONESIA**

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Abstract: Auto Gate System is an automated system designed to simplify the process of receiving and shipping goods at the TPKS gate. Terminal Booking System is a system provided to schedule the receipt and delivery of containers carried out by the owner of the goods to be able to issue an E-Ticket. The purpose of this study is to analyze the effect of using the auto gate system and terminal booking system on increasing the effectiveness of loading and unloading and reducing dwelling time at PT JICT. This research uses quantitative methods through questionnaires to 65 PT JICT employees. The analysis test used is SmartPLS 4 with the Structural Equation Modeling (SEM) analysis method. The results of this study are the use of the auto gate system and terminal booking system has a positive impact on increasing the effectiveness of loading and unloading and reducing dwelling time at PT JICT.

Keywords: *Auto Gate System, Terminal Booking System, Dwelling Time*

1. Introduction

According to (Peraturan Pemerintah RI, 2008) “concerning Shipping, a port is a place consisting of land and or waters used for business and government activities. It is also used as a place for ships to lean, up and down passengers, or loading and unloading goods, and as a terminal and berth for ships equipped with shipping safety and security facilities and port support activities. The port can also be used as a place for intra and intermodal transportation. Ports include everything related to the implementation of port functions to support the smooth, safe and orderly flow of ship traffic; safety and security of sailing; intra and intermodal movements; and national and regional economic growth by considering regional spatial planning”.

(Kholfi et al., 2019) “With an area of 604 hectares, Tanjung Priok Port is the largest port in Indonesia, with a capacity of 5.51 million Twenty Foot Equivalent Units (TEUs) per year. It is the largest port in Indonesia, with a capacity of 5.51 million Twenty Foot Equivalent Units (TEUs) per year”.

(Kholfi et al., 2019) “The temporary storage facilities (TPK) connected to the DJBC TPS Online system include Jakarta International Container Terminal (JICT), which holds 40% of the total number of TEUs in Tanjung Priok; KOJA holds 25%, New Priok Container Terminal One (NCT1) holds 24%, PT Pelindo II (PLDC) holds 6%, and PT Mustika Alam Lestari (MAL0) holds 5% TEUs”.

PT Jakarta International Container Terminal carries out loading and unloading of containers for both export and import. JICT's affiliated company was first established in 1999. PT Pelindo and Hutchison Ports, Hong Kong, are JICT's shareholders. Despite owning shares in a foreign company, JICT, which is fully operational in Indonesia, must remain subject to and

comply with Indonesian law. Likewise, Jakarta International Container Terminal must comply with Indonesia's legal system when implementing CSR programs (PT JICT, 2024).

One of the problems at the port of PT JICT is the hoarding of goods caused by the lengthy process of loading and unloading containers at the port. The level of dwelling time that occurred at JICT port in October 2014 reached 5.1 days and according to data from 2018-2021 the average dwelling time still reached 3.24 days. (Fadillah & Tyaswati, 2024), not yet in accordance with the dwelling time target at PT JICT, which is 3 days.

Various kinds of solutions have been carried out to reduce dwelling time and minimize the accumulation of goods at the port of PT JICT, namely by implementing the auto gate system (AGS) and terminal booking system (TBS). Auto gate system (AGS) is a container service system at the Gate that checks and documents the physical condition of containers automatically through a computer system without involving Gate officers. In addition, the terminal booking system (TBS) schedules the receipt or acceptance of containers and the delivery or shipment of containers at TPKS.

2. Literature Review

Auto Gate System

Auto Gate System is an automated system designed to simplify the process of receiving and shipping goods at transaction gates. With advanced technology and user-friendly features, this system not only improves operational efficiency but also strengthens port security. The excellent features of the Auto Gate System ensure that every step in the process of receiving and shipping goods runs smoothly and is well coordinated. The management of incoming and outgoing goods becomes more effective and efficient due to its more structured and organized arrangement. Overall, Auto Gate System provides a comprehensive solution to improve productivity and security in port operations. (Hamid et al., 2018; Kholfi et al., n.d.).

Terminal Booking System

Terminal Booking System (TBS) by (PT JICT, 2024) Terminal Booking System is a system provided by PT JICT to schedule the receipt and or delivery of containers that must be carried out by the owner of the goods or the party authorized to be able to issue an E-Ticket. The legal basis for the Terminal Booking System is the Decree of the Head of the Tanjung Priok Main Port Authority Office Number HK.206/1/16/OP.TPK-23 concerning the Implementation of the Terminal Booking System (TBS) at the PT JICT Terminal at Tanjung Priok Port dated February 28, 2023.

According to (Zenda Fathur Rifqi, 2023) Terminal Booking System (TBS) is a system that allows the scheduling of receiving or receiving containers and shipping or shipping containers at TPKS. The purpose of TBS implementation is to digitize and simplify or streamline operational procedures at TPKS. On the other hand, TBS helps planners make land planning and reduce truck congestion in the CY (Container Yard). Service users, in the implementation of TBS, can carry out all their activities online, from the booking process to payment.

Effectiveness

According to (Siagian, 2019) "The utilization of resources, facilities, and infrastructure in a certain amount that is consciously determined in advance to produce a number of goods for the services of the activities carried out is known as effectiveness. Effectiveness shows success

in terms of achieving the goals set. If the results of the activity are closer to the target, it means that the activity is more effective”.

Loading and Unloading

Unloading activities are unloading goods from the ship using cranes and ship slings to the nearest land by the ship called the dock. Then, from the dock, the goods are loaded and organized using forklifts to the nearest warehouse determined by the port syahbandar. While loading activities are the opposite activities, loading and unloading operations from / to the ship.

According to (Soewedo, 2016) Marine cargo consists of general cargo (unpackaged cargo) or cargo put into containers. The cargo of a sea vessel can also be break bulk or containerized goods.

(Djamaluddin et al., 2023; Rasyid, 2016) “Loading and unloading operators as regulated in article 2 of the Minister of Transportation Regulation No. PM. 60 Year 2014 is an operation to transport goods from and to ships at the port, including stevedoring, cargodoring, and receiving/delivery. Loading and unloading operators at the port are carried out by companies that have a business license and are established specifically for loading and unloading goods and use loading and unloading equipment that is fit for operation, guarantees work safety, and is carried out by workers who must have a certificate of competence”.

Dwelling Time

(World Bank, 2011) “Dwelling time is the time calculated from when the container is unloaded and lifted from the ship to when the container exits through the main door of the port terminal”. According to (Manalytics, 1976) “dwelling time is the average time a container is at a port terminal and waiting for the next activity to take place. The dwelling time variable is measured in days.

3. Research Methods

The research method is one of the important factors in carrying out research, where in essence, the research method is a scientific way to obtain data and achieve the objectives of a particular research. Research methods are research concepts that produce data and the objectives of the research. Therefore, it is important to use the right research method. Based on the concept used, this research applies quantitative methods. According to (Sugiyono, 2021) “Quantitative research is a research method based on the philosophy of positivism, which is used to examine certain populations or samples. Data collection is carried out using research instruments, and data analysis is carried out quantitatively statistically with the aim of testing predetermined hypotheses”.

According to (Sugiyono, 2021) “population is the entire generalization area that includes objects or subjects that have a certain number and characteristics determined by the researcher to study and draw conclusions”. According to Djaali (2020), population is all research units or units of analysis whose characteristics will be investigated or studied. This population can be divided into two types, namely the sampling population and the target population. According to the previously mentioned opinion, the population of this study were employees of the planner and control section at PT JICT, totaling 65 people. Based on the population determined to determine the sample in this study, we used a saturated sample, namely the entire population that has been determined will be the sample in this study, namely employees of the planning and control division at the Jakarta International Container Terminal company.

Table 1

Measurement Variable

Variable	Operational Definition	Source
Auto Gate System	Auto Gate System is an information technology-based automated system used to manage and monitor the process of receiving and shipping goods at transaction gates, especially in a port environment or logistics area. The system involves the use of sophisticated hardware and software to automatically detect, identify, and record the data of each incoming and outgoing item.	(Immanuel, 2015; Pramesti et al., 2020)
Terminal Booking System	Terminal Booking System (TBS) is a system provided by PT Jakarta International Container Terminal (JICT) to organize and schedule the receipt and delivery of containers at the port terminal.	(Zenda Fathur Rifqi, 2023)
Loading and Unloading Effectiveness	Loading and unloading effectiveness is a performance measure of the process of moving goods from ship to land (unloading) and from land to ship (loading) at the port.	(Amalia et al., 2020)
Dwelling Time	Dwelling time is the duration of time measured from when a container is unloaded from a ship at a port terminal until the container leaves the port terminal through the main gate.	(Ricardianto et al., 2018; Sahara & Wulandari, n.d.)

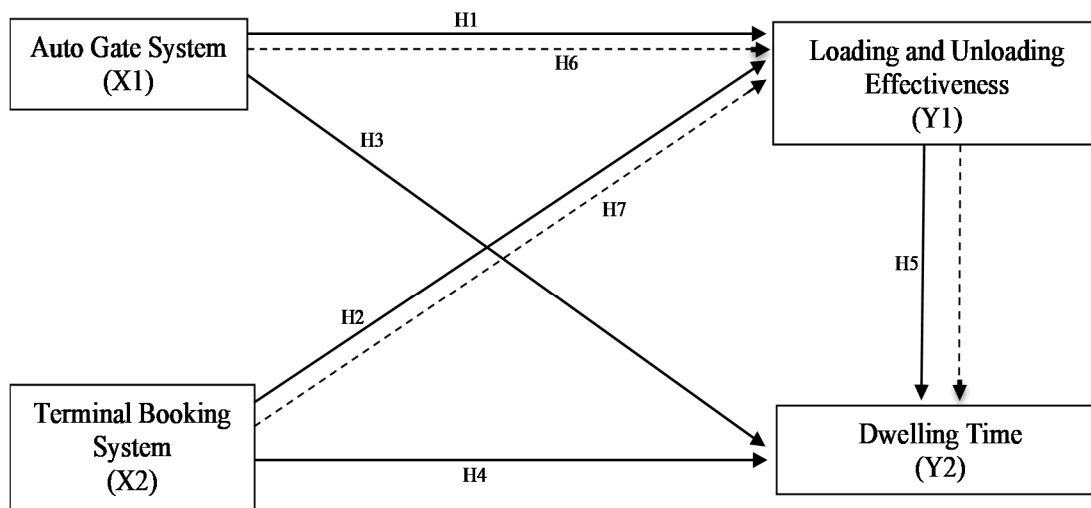


Figure 3.1. Reserch model

The creation of research problems, which have been expressed as statement sentences, calls for a temporary solution, which is the hypothesis. The following can be concluded about the hypothesis based on the conceptual framework mentioned above:

H1: It is suspected that there is a positive effect of auto gate system technology directly on the effectiveness of loading and unloading at PT JICT.

H2: It is suspected that there is a positive effect of terminal booking system technology directly on the effectiveness of loading and unloading at PT JICT.

H3: It is suspected that there is a positive effect of auto gate system technology directly on reducing dwelling time at PT JICT.

H4: It is suspected that there is a positive effect of terminal booking system technology directly on reducing dwelling time at PT JICT.

H5: It is suspected that there is a positive effect of loading and unloading effectiveness directly on reducing dwelling time.

H6: It is suspected that there is a positive effect of auto gate system technology indirectly on reducing dwelling time through the effectiveness of loading and unloading.

H7: It is suspected that there is a positive effect of terminal booking system technology indirectly on reducing dwelling time through the effectiveness of loading and unloading.

4. Results and Discussion

Related to this research, an overview of the results of the research data analysis is presented. The purpose of this data analysis is to determine the level of service of the Auto gate system (variable X1), Terminal Booking system (variable X2), Loading and Unloading Effectiveness (variable Y1) and, Dwelling time (variable Y2). Data collection was carried out through distributing questionnaires to 65 respondents who were JICT employees, who

were selected based on the sample determined in this study. This sample was selected using the saturated sample method, with company employees as the target sample population.

a. Outer Model

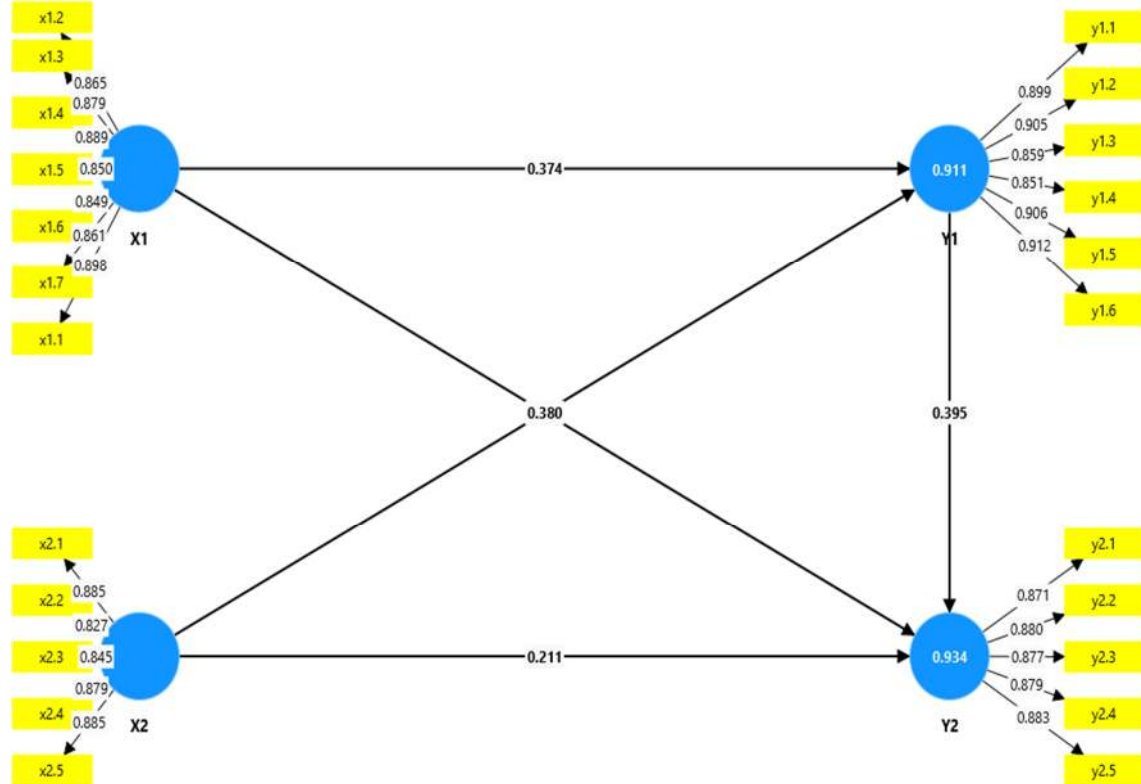


Figure 4. a. 1 Outer Model

Source: Processed by researchers using SmartPLS 4, Data processed (2024)

b. Convergent Validity (Outer Model)

The outer loading value, also known as the loading factor, is used to evaluate convergent validity. If an indicator's outer loading value is greater than 0.7, it is deemed to exhibit significant convergent validity. The outer loading values of each indicator on the research variables are listed below.

Tabel 2

Outer Loading Construct

NO	VARIABLE	INDIKATOR	OUTER LOADING
1	Auto Gate System	X1.1	0.898
		X1.2	0.865
		X1.3	0.879
		X1.4	0.889
		X1.5	0.850
		X1.6	0.849
		X1.7	0.861

2	Terminal Booking System	X2.1	0.885
		X2.2	0.827
		X2.3	0.845
		X2.4	0.879
		X2.5	0.885
3	Loading and Unloading Effectiveness	Y1.1	0.899
		Y1.2	0.905
		Y1.3	0.859
		Y1.4	0.851
		Y1.5	0.906
		Y1.6	0.912
4	Dwelling Time	Y2.1	0.871
		Y2.2	0.880
		Y2.3	0.877
		Y2.4	0.879
		Y2.5	0.883

Figure Table Convergent Validity

Source: Processed by researchers using SmartPLS 4, Data processed (2024)

Based on table no. 2, it can be concluded that this study consists of 4 variables, namely “use of auto gate system” (X1), “use of terminal booking system” (X2), “effectiveness of loading and unloading” (Y1), “dwelling time” (Y2). The four variables show significant results with a loading factor value > 0.7 . From the results listed in table 2, it can be seen that all indicators in this research variable have an outer loading value > 0.7 . The data shows that all indicators can be considered valid and can be used in research, and can be analyzed further.

c. Construct Reliability and Validity

Reliability test is a tool to measure a questionnaire that has indicators of variables. The reliability test and construct validity aim to evaluate the extent to which the research instrument is reliable. Table 3 illustrates that Cronbach's Alpha and Composite Reliability for each variable meet the standards with numbers > 0.60 . These results indicate that the reliability of the research data is acceptable. It should be noted that the composite reliability value is higher than the Cronbach's Alpha value. This shows that all variables in the study meet the relevant requirements for the level of reliability required as the basis for the Structural Equation Model (SEM) analysis using SmartPLS 4 software. The results of measuring the validity and reliability of the Measurement Model below show that the data collection tools used in this study are valid and reliable.

Table 3

Processing value composite reliability

Variable	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Auto Gate System	0.947	0.947	0.956	0.758
Terminal Booking System	0.915	0.916	0.937	0.747
Loading and Unloading Effectiveness	0.947	0.948	0.958	0.791
Dwelling Time	0.926	0.926	0.944	0.771

Figure Table Construct Realibilty and Validity

Source: Processed by researchers using SmartPLS 4, Data processed (2024)

d. Test Determination

The impact of some independent latent variables on the dependent latent variable, and whether or not there is a substantive effect, can be evaluated using changes in the R-Square value. R Square values greater than 0.75, 0.50, and 0.20 indicate strong, moderate, and weak models, respectively. The PLS R-Square findings show how much of the constructs' variance the model can account for. The outcome of utilizing SmartPLS 4 to calculate the R-square value is shown in Table 4.

Table 4

Value R-Square

	<i>R-square</i>	<i>R-square adjusted</i>
Efektivitas Bongkar Muat	0.911	0.908
Dwelling Time	0.934	0.931

Figure Table Value R-Square

Source: Processed by researchers using SmartPLS 4, Data processed (2024)

From table 4 it can be concluded that the R-Square value for the variable “loading and unloading effectiveness” (Y1) is 0.911 and the R-Square value for the variable “dwelling time” (Y2) is equal to 0,934.

From table 4 it can be concluded that the R-Square value for the “loading and unloading effectiveness” variable (Y1) is 0.911 and the R-Square value for the “dwelling time” variable (Y2) is 0.934.

The loading and unloading efficacy variable's R-Square value is 0.911, while the dwelling time variable's is 0.934, as can be observed from the data presentation in table 4 above. The acquisition of this value indicates that the goodness of fit evaluation, which is based on the Q-

Square value, may be used to explain the percentage of service user satisfaction by accounting for the timeliness and quality of the service. Similar to the coefficient of determination (R-Square) in regression analysis, the Q-Square value indicates how well the model fits the data; the larger the Q-Square, the better. The following are the outcomes of the Q-Square value calculation:

$$\begin{aligned} \text{Q-Square (Y1)} &= 1 - (1 - R1) \\ &= 1 - (1 - 0.911) \\ &= 1 - 0.089 \\ &= 0.911 \end{aligned}$$

$$\begin{aligned} \text{Q-Square (Y2)} &= 1 - (1 - R1) \\ &= 1 - (1 - 0.934) \\ &= 1 - 0.066 \\ &= 0.934 \end{aligned}$$

From the calculation above, the Q-Square value is 0.911 for the loading and unloading effectiveness variable and 0.934 for the dwelling time variable. This value indicates that most of the diversity in the research data can be explained by the research model, which is 91.1% and 93.4%. Meanwhile, only about 8.1% and the remaining 6.6% are explained by other factors that are beyond the scope of this research model.

e. Test Goodness of Fit

Goodness of fit evaluates the extent to which a model or equation can accurately explain variations in the data. The higher the model fit, the better the model fits the data, and the results are considered more reliable.

Table 5

Model Fit

	<i>Saturated model</i>	<i>Estimated model</i>
SRMR	0.043	0.043
d_ ULS	0.508	0.508
d_ G	1.273	1.273
Chi-square	365.150	365.150
NFI	0.813	0.813

Figure Table Model Fit

Source: Processed by researchers using SmartPLS 4, Data processed (2024)

From Table 5, it can be seen that the SRMR value has met the value number by obtaining a value from the category must be below 0.080, then the value in d_ ULS obtained a value of 0.508, the d_ ULS condition must be above 2.000, indicating that the model fits the data for the d_ G value obtained a value of 1.273 and the criterion of 1.273 from d_ G must be above 0.900, indicating the size of the model fit descriptively the data can be accepted and fit, it can be concluded that the model alignment or criteria The relationship between constructions can be tested.

f. Hypotesis Testing

Structural model testing is a method used to clarify the relationship between variables in a study. To test the correctness of the proposed hypothesis, we can check the statistical significance of the t-statistic and p-value. The smaller the p-value, the stronger the evidence for the hypothesis.

If the p-value is less than the set significance level (0.05), the hypothesis can be rejected. Conversely, if the p-value is greater than the significance level (0.05), the hypothesis can be accepted.

Table 6

Path Coefficients (Mean, STDEV, T-Statistic)

Variable	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
X1 -> Y1	0.374	0.372	0.107	3.496	0.000
X1 -> Y2	0.380	0.378	0.073	5.206	0.000
X2 -> Y1	0.593	0.594	0.106	5.576	0.000
X2 -> Y2	0.211	0.211	0.099	2.124	0.034
Y1 -> Y2	0.395	0.397	0.101	3.900	0.000
X1 -> Y1 -> Y2	0.148	0.147	0.056	2.626	0.009
X2 -> Y1 -> Y2	0.234	0.237	0.077	3.034	0.002

Source: Processed by researchers using SmartPLS 4, Data processed (2024)

1. H1 accepted: The results showed a significant relationship between the use of the auto gate system (X1) and the effectiveness of loading and unloading (Y1). The direction of the relationship can be seen from the resulting research p value, which is 0.000, which means it does not exceed the predetermined standard (<0.05). The interpretation found is that the more effective the use of auto gate system technology at PT. JICT, it will be followed by an increase in the effectiveness of loading and unloading at the port of PT. JICT.
2. H2 accepted: The results showed a significant relationship between the use of auto gate system (X1) and dwelling time (Y2). The direction of the relationship can be seen from the resulting research p value, which is 0.000, which means it does not exceed the predetermined standard (<0.05). The interpretation found is that the more effective the use of auto gate system technology at PT JICT is, the lower the dwelling time at the port of PT JICT will be.
3. H3 is accepted: The results showed a significant relationship between the use of terminal booking system technology (X2) and the effectiveness of loading and unloading (Y1). The direction of the relationship can be seen from the resulting research p value, which is 0.000, which means it does not exceed the predetermined standard (<0.05). The interpretation found is that the more effective the use of terminal booking system technology at PT. JICT, it will be followed by an increase in the effectiveness of loading and unloading at the port of PT. JICT.
4. H4 is accepted: The results showed a significant relationship between the use of terminal booking system technology (X1) and dwelling time (Y2). The direction of the relationship can be seen from the resulting research p value, which is 0.034, which means it does not exceed the predetermined standard (<0.05). The interpretation found is that the more effective the use of terminal booking system technology at PT. JICT, it will be followed by a decrease in dwelling time at the port of PT. JICT.

5. H5 is accepted: The results showed a significant relationship between loading and unloading effectiveness (Y1) and dwelling time (Y2). The direction of the relationship can be seen from the resulting research p value, which is 0.000, which means it does not exceed the predetermined standard (<0.05). The interpretation found is that the higher the effectiveness of loading and unloading at PT JICT, it will be followed by a decrease in dwelling time at the port of PT JICT.

6. H6 is accepted: The results showed a significant relationship between the use of auto gate system technology (X1) and dwelling time (Y2) through loading and unloading effectiveness (Y1). The direction of the relationship can be seen from the resulting research p value, which is 0.009, which means it does not exceed the predetermined standard (<0.05). The interpretation found is that the more effective the use of auto gate system technology at PT JICT, which is followed by an increase in the effectiveness of loading and unloading at PT JICT, can indirectly affect the decrease in dwelling time at PT JICT.

7. H7 accepted: The results showed a significant relationship between the use of terminal booking system technology (X2) and dwelling time (Y2) through the effectiveness of loading and unloading (Y1). The direction of the relationship can be seen from the resulting research p value, which is 0.002, which means it does not exceed the predetermined standard (<0.05). The interpretation found is that the more effective the use of auto gate system technology at PT JICT, which is followed by an increase in the effectiveness of loading and unloading at PT JICT, can indirectly affect the decrease in dwelling time at PT JICT.

5. Conclusion

Based on the problems that have been formulated by researchers, the results of the analysis and hypothesis testing that have been carried out regarding the analysis of the impact of using the auto gate system and terminal booking system on the effectiveness of loading and unloading and dwelling time at PT Jakarta International Container Terminal (PT JICT). The results showed that the auto gate system variable had a positive and significant effect on the loading and unloading effectiveness variable. This means that the more effective the use of auto gate system technology at PT JICT, the effectiveness of loading and unloading at PT JICT will increase. The results showed that the terminal booking system variable had a positive and significant effect on the loading and unloading effectiveness variable. It means that the better the implementation of the terminal booking system technology at PT JICT, the effectiveness of loading and unloading at PT JICT will increase. The results showed that the auto gate system variable had a positive and significant effect on the dwelling time variable. It can be interpreted that the more effective the use of auto gate system technology at PT JICT, the dwelling time rate at PT JICT will decrease. The results showed that the terminal booking system variable had a positive and significant impact on the dwelling time variable. This means that the better the implementation of the terminal booking system technology at PT JICT, the dwelling time at PT JICT will decrease.

The results showed that the loading and unloading effectiveness variable had a positive impact on the dwelling time variable. It means that the higher the effectiveness of loading and unloading at PT JICT, the dwelling time rate at PT JICT will decrease. The results showed that the auto gate system variable had a positive and significant impact on the loading and unloading effectiveness variable which indirectly had a positive and significant impact on the dwelling time variable. This means that the more effective the use of auto gate system technology at PT JICT, the effectiveness of loading and unloading at PT JICT will increase, which can indirectly

affect the decrease in dwelling time at PT JICT. The results showed that the terminal booking system variable had a positive and significant impact on the loading and unloading effectiveness variable, which indirectly had a positive and significant impact on the dwelling time variable. This means that the better the implementation of the use of the terminal booking system at PT. JICT, the effectiveness of loading and unloading at PT. JICT will increase, which can indirectly affect the decrease in dwelling time at PT JICT.

6. Implications

Based on the above conclusions, there are several implications that need to be considered, namely the importance of increasing the use of auto gate system technology and terminal booking system at PT JICT which has a positive and significant effect on the effectiveness of loading and unloading and reducing dwelling time at PT JICT. So based on the research conducted, the researcher can conclude that the more effective the use of auto gate system technology and the better the implementation of the use of terminal booking system technology at PT. JICT, the effectiveness of loading and unloading at PT. JICT will increase, also the dwelling time figure at PT. JICT will also decrease. Therefore, it is hoped that PT. Jakarta International Container Terminal can increase the effectiveness of using auto gate system technology and improve the implementation of using terminal booking system technology.

7. Research Limitation

Based on the researcher's experience in conducting this research, there are a number of limitations that can be considered by future researchers to improve the quality of this research. In this study there are several weaknesses that can be improved, developed, or improved in the next research. The limitation that we experienced was a very limited time, which was carried out from April 2024 to August 2024. The next limitation is the limited number of respondents, namely only 65 people, which may not be enough to better represent the population in this study. Furthermore, collecting the questionnaires was a challenge because it took quite a long time to get the results of the questionnaires needed because the respondents were quite difficult to contact. In addition, the variety of responses from respondents in data collection was a challenge, as some of them may not fully express their true opinions due to differences in perceptions, assumptions, and understanding. This research has provided us with insights as well as experiences, but it is important to acknowledge these limitations and challenges. In the future, future research should consider these factors to produce a better study.

References

- Amalia, R., Trisakti, I., Kamaludin, A. G., & Tabah, A. A. (2020). Efektivitas Pengiriman Barang di Terminal Peti Kemas (TPK) Koja The Effectiveness of Goods Delivery at Koja Container Terminal (Vol. 6, Issue 1). <https://journal.itltrisakti.ac.id/index.php/jmbtl>
- Djamaluddin, A., Paotonan, C., & Dewi, M. (2023). ANALISIS PENGARUH PRODUKTIVITAS BONGKAR MUAT TERHADAP DWELLING TIME DI TERMINAL PETIKEMAS NEW MAKASSAR. *Movere Journal*, 5, 178–184. <https://doi.org/10.53654/mv.v5i02.372>
- Fadillah, A., & Tyaswati, A. (2024). Perbandingan Kinerja pada PT Jakarta International Container Terminal dengan PT New Priok Container Terminal One. *Jurnal Penelitian Transportasi Laut*, 25(2), 93–107. <https://doi.org/10.25104/transla.v25i2.2291>

- Hamid, E., Chong Gee, L., Bahaman, N., Anawar, S., Ayob, Z., & Abdul Malek, A. (2018). Implementation of Intelligent Automated Gate System with QR Code-An IOT System to Help Gate Management. In IJACSA) International Journal of Advanced Computer Science and Applications (Vol. 9, Issue 10). www.ijacsa.thesai.org
- Immanuel, R. (2015). OPTIMALISASI AUTO GATE SYSTEM DALAM KELANCARAN KELUAR MASUKNYA TRUK DI PT. JAKARTA INTERNATIONAL CONTAINER TERMINAL. 2.
- Kholfi, Y., Direktorat, H., Bea, J., & Cukai, D. (2019). DAMPAK AUTO GATE SYSTEM (AGS) TERHADAP PERCEPATAN KONTAINER DI PELABUHAN TANJUNG PRIOK.
- Manalytics. (1976). Methodology for Estimating Capacity Of Marine Terminals.
- Peraturan Pemerintah RI. (2008). UNDANG-UNDANG REPUBLIK INDONESIA NOMOR 17 TAHUN 2008 TENTANG PELAYARAN.
- Pramesti, S., Safitri, S. M. I., Sirait, D. P., Wibisono, G., & Simarmata, J. (2020). The Implementation of the Auto Gate System as A Facilitator of the Flow of Goods at Container Terminal (A Study at Operating Terminal 3 Ocean Going, Tanjung Priok Port). Journal of Physics: Conference Series, 1573(1). <https://doi.org/10.1088/1742-6596/1573/1/012032>
- PT JICT. (2024). About JICT. <https://www.jictcsr.com/tentang-jict/>
- Rasyid. (2016). Hukum dan Bisnis Pada Perusahaan Pelayaran. Pustakabaruperss.
- Ricardianto, P., Suhalis, A., & Sirait, D. P. (2018). Integrasi antara Dwelling Time dan Bongkar Muat Peti Kemas Pelabuhan Tanjung Priok Integration Between Dwelling Time and Loading-Unloading at Tanjung Priok Port. 05(03). <https://doi.org/10.25292/j.mtl.v5i2.237>
- Sahara, S., & Wulandari, T. (n.d.). Analisis Terhadap Dwelling Time dalam Upaya Meningkatkan Throughput Lapangan Penumpukan Pada Pelabuhan Tanjung Priok.
- Siagian, S. P. (2019). Manajemen Sumberdaya Manusia. Bumi Aksara.
- Soewedo, H. (2016). Penanganan Muatan Kapal.
- Sugiyono. (2021). Metode Penelitian Pendidikan: (Kuantitatif, Kualitatif, Kombinasi, R&D dan Penelitian Pendidikan (A. Nuryanto, Ed.). Alfabeta.
- World Bank. (2011). Economic Premise. World Bank Group. www.worldbank.org/economicpremise
- Zenda Fathur Rifqi. (2023). PENGARUH TERMINAL BOOKING SYSTEM (TBS), YARD OPERATION PLAN (YOP), TURN AROUND TIME (TRT) TERHADAP EFEKTIVITAS OPERASIONAL PT PELINDO TERMINAL PETI KEMAS SEMARANG.