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Integrated Port Time Control for Shipping Companies at Tanjung Priok Port, Jakarta, Indonesia

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ABSTRACT

The purpose of this study was to determine the factors that affect the Integrated Port Time (IPT) in order to reduce the operating costs of shipping companies at Tanjung Priok Port, Jakarta. Controllable and uncontrollable Integrated Port Time is influenced by five variables, namely the availability of docks, shipping lane conditions, document services, guidance services, and loading-unloading productivity. As the busiest port in Indonesia, the target to maximize ship utility through operational cost savings is very hard to achieve. This study focuses on the factors that affect IPT in domestic terminal 3 of Tanjung Priok Port Jakarta in particular, related to how IPT can contribute to the efficiency of operations of national companies in general, if the duration can be shortened. This study uses the path analysis method with a total sample of 70 people from the operational team and the crew of the Temas shipping company. The results of this study prove that document services, guidance services, shipping lane conditions, dock availability, and loading-unloading productivity have a positive and significant impact altogether on the Integrated Port Time of ships operated by Temas Shipping at Tanjung Priok port, Jakarta. The findings of this study will be useful to cut down Temas Shipping's operational costs and multiply ship utility.

Key Words: Ship Queue Length, Dock Availability, Shipping Flow Conditions, Document Services, Guidance Services, Loading-Unloading Productivity

A. Introduction

Transportation in waters using ships is in principle the same as land transportation and air transportation, in the way in increasing the value and utility of the goods being transported. An efficient transportation system allows for increasing space and time utility. Temas Shipping is a privately owned cargo container shipping company that operates throughout Indonesia. In an effort to support the government's program, namely economic equality in Indonesia, Temas Line serves the Sea Toll Road, namely the T1, T11, and T17 routes and also serves the Papua Area route from 2018 until present. As time goes by Temas Line, which is now 32 years old, has become one of the companies that has a fairly large market potential in Indonesia, supported by the number of vessels it has.

With so many routes operated by several regions such as the Sumatra Region, Kalimantan Region, Sulawesi and Papua Region, and the Pendulum Region on the Temas Line, there are often quite a lot of ship queues which result in the accumulation of ships at ports, whilst Jakarta and Surabaya are the busiest ones with 43 calls for Jakarta and 40 calls for Surabaya. Another impact of the high IPT in Jakarta is the delay in goods arriving at the port of destination, which can result in complaints from customers. Jakarta has a 24 hour IPT standard, however, in reality it is very difficult to achieve the standard time. Many factors affect the high IPT rate in a port, both controllable and uncontrollable ones. The length of loading and unloading activities due to the lack of loading and unloading equipment at the port and the lack of maximum capability of the equipment owned are one of the causes of the high IPT rate. In addition, the readiness of the load also affects the length of time the ship stays at a port because the ship must operate with a standard load factor of at least 70 percent for the company to make a profit. If the cargo has not reached 70 percent, then the ship must dock in the ship's berth area until the cargo exceeds or equals 70 percent. Another factor that cannot be controlled by the company is the large number of ships to be served, both the ship going in and out of the port. The waiting time for guiding ships and long delays, the temporarily state activities that must be prioritized, and the condition of the container field that has reached its maximum capacity further add to the long duration of IPT in ports.

Several problems relating to the deficiencies in the port operation have been identified from both controllable and uncontrollable factors. The controllable factors, encompasses; (1) The IPT target has not been achieved due to the existing operational standards, (2) The lack of loading and unloading equipment at the dock and (3) The requirement standard loading cargo to reach 70 percent. While, as to the uncontrollable, the identification includes: (1) The delay

in ship departure, (2) The time utility that was not yet on target, (3) The number of ships queuing to dock, (4) The contemporary prioritized ship docking, (5) The full capacity of container yard due to the joining operation with other vessels, and (6) The long guidance waiting times. The following table exhibits the data of the number of ships staying at the port and the IPT at the Tanjung Priok port of Jakarta from the time arrival until the ship leaves the anchor location (Time Departure) during the 2020 period.

Table 1 Vessel Call and Integrated Port Time

Period	Total Call	Portstay (hour)	Standard (hour)	Target (%)
January	32	55	24	44
Febuary	39	66	24	36
Maret	42	42	24	57
April	38	61	24	39
May	40	51	24	47
June	40	52	24	46
July	41	37	24	65
August	43	51	24	47
September	38	49	24	49
October	42	42	24	57
November	32	42	24	57
December	38	40	24	60

The Table 1 shows that many ships docking at ports exceed IPT standards. Several strategies to reduce the high number of IPT in ports, for example, are to consider the allocation of ships to berths, assignment of dock cranes to ships and the use of integrated computing (Meisel & Bierwirth, 2006).

Several characteristics of the ship queing and the factors that affect waiting time for ships have been studied quite a lot in Indonesia, such as research conducted at the Port of Tanjung Perak, Surabaya (Perdana, Pujiraharjo, & Wijatmiko, 2018). In his research, (Pratama, Heitasari, & Praditha, 2019) used a discrete simulation method with findings related to IPT savings, boat rental costs savings, and increased utility. Research by (Indriyati & Ardian, 2021) at Pertamina Port, Semarang shows the high waiting time at the port as one

of the obstacles to IPT. The long waiting time includes the terminal time, marine time and, fuel distribution. In previous research (Wibowo, 2010), revealed that the variables of the demand for guiding boats, the readiness of loading-unloading equipment, loading-unloading productivity at the dock, ship arrival time, document processing time had a significant influence on the ship waiting time.

The purpose of this study is to find out and analyze which variables mostly contribute to changes in the Integrated Port Time, as well as the impact that may follow as Temas Shipping lower its IPT level. Based on the review of several previous studies, this research differs from Wibowo's research in the way that it has four variables including the demand for guiding boats, the readiness of loading and unloading equipment, loading and unloading productivity at the dock, and document processing time. There are differences that are not yet examined, namely the readiness of loading and unloading equipment, ship arrival time, and ship waiting time. Several previous studies also used different terminology, so the concept of the variable studied was also different.

Literature review

Document Service

Document service is the administrative process and completeness of other supporting documents for ships to dock at a port (Suyono, 2007). The document service in this study is a document that must be completed by an agent or shipping company in terms of the ship's docking process at the harbormaster's office. The quality of document service according to (Umagapi, Amonalisa, & Lesmini, 2016)) plays an important role in waiting time for ships because when the process of incoming ship documents is faster and more efficient, then it will shorten its waiting time. Studies by found that administrative checks had been fulfilled but were hampered due to the physical inspection of ships that did not meet the requirements. Document services in the context include: document service procedures, employee performance and service facilities.

Guidance Service

Guidance service is a ship's service to be guided by using a tug boat to dock so that the ship can move on safely, orderly, and quickly. The guidance service in this study is the pilotage of the ship when the ship arrives to dock and leave to sail safely, and quickly at Tanjung Priok Port. The work of guiding a ship doesn't require just human resources but special skills for the

services of anchoring, mooring, piloting tug and water vessels. Punctuality of berthing at the dock is an assessment of ship piloting services. Guidance based on (KM RI, 2002) is an activity in assisting the captain of the ship, so that navigation can be carried out safely, orderly and smoothly by providing information about the condition of local waters which is important for the safety of the ship and its environment. The provision of guidance service facilities can affect the reduction of waiting time which in turn has an impact on reducing costs that have been detrimental to consumers (Andrianto, Wicaksono, & Anwar, 2017). Another study by (Purnomo & Ario, 2009) states that it is necessary to rejuvenate, add a tugboat fleet and rent a scouting fleet from the private sector to fulfill customer service. Research at the Tanjung Priok Port shows that guidance services and ship loading and unloading equipment facilities are not optimal (Hadi, 2010). In addition, research by (Sesotyo, 2018) explains that a system is needed to assist tug guidance services such as notification of ship arrivals and calculation of tug guidance services.

Shipping Lane Conditions

Shipping lane is an area called line 1 waters, or the area for ships waiting to enter the dock, which has a function as a route for ships to enter or leave the port. The condition of the shipping lane is the condition of the lane that the ship can maneuver to dock safely and quickly at the port. The three dimensions are tides, ship traffic, and ship size. Research related to the conditions of the previous shipping lane by (Suharjo & Suharyo, 2014), has been carried out at the East Surabaya Shipping Line, risk mitigation is carried out by implementing routine patrols and installing port lane signs, providing training to rescue people on board and securing the port area so that unauthorized parties can not enter the port area. Meanwhile, in the West and East Surabaya shipping lanes, (Ulfa, 2018) conducted monitoring of emergency conditions on ships with a system of software with an android application that was applied to water police mobile devices. The results of other studies (Efrianto, 2019; Indrawan, Widada, & Hariadi, 2017) show that the uneven depth in the shipping lane area makes incoming ships have to be more careful. In that port, the pool must be dug deeper and the shipping lane must be expanded. Another research at Nagan Port, Aceh (Suhariyadi, 2016)) revealed that for port operational safety, the dock minimum depth is 12 meters at low tide.

Dock Availability

Availability of dock is the readiness of the dock for ships to be docked with complete

facilities so that ships can dock safely, orderly, and quickly. The availability of the wharf in this study is a condition where the pier to be docked by the ship is available properly, safely, and quickly to accommodate the ships that will dock at the port of Tanjung Priok. The three dimensions of the variables are the number of dock, the physical condition of the dock, and the dock facilities. The results of previous research by (Selasdini, Barasa, & Wartono, 2018), at the South dock of Batu Ampar Harbor Batam suggested that to overcome the lack of loading-unloading equipment the management may develop and increase equipment in the new development area. At the port of Samarinda, (Aviva, 2010) proposed to expand the area of docking.

Loading-unloading Productivity

Productivity of loading and unloading is the number of containers that can be unloaded or loaded per ship within a certain time. The productivity of loading and unloading in this study is the speed or performance when the ship carries out loading and unloading activities at the port which is measured by the box ship per hour. In this study, loading and unloading productivity is the total score of the measurement obtained from the questionnaire on loading and unloading productivity indicated by workforce performance, loading-unloading equipment, and the availability of container yards. The three dimensions of the variables are loading and unloading workforce performance, container yard availability and loading and unloading equipment performance.

Previous research by (Vicrihadi, Sembiring, & Ayutia, 2021) at Terminal 3, Tanjung Priok Port, concluded that the disruption of loading and unloading activities of containers will affect the length of time and greatly affect the operational efficiency of the ship. Meanwhile, another study at the Cigading Port, West Java, (Afandi, Untung, Marina, & Majid, 2021) found that there was an effect of loading and unloading productivity on satisfaction through mediation of port performance. In another research (Sitorus & Nahry, 2016) with the application of the design of the container loading and unloading operational system at JICT and TTL, they proposed that land transportation system combined with magnetic technology and the proposed system is environmentally friendly practice that ensure the operation will work more safely. At the Berlian Surabaya dock, according to (Gunawan & Sianto, 2017) the group of port workers, loading and unloading equipment, full empty ratio, total container weight, and loading and unloading process time are main predictors of loading and unloading productivity.

Integrated Port Time

Integrated Port Time (IPT) is the time the ship berths in a port which is scored from the ship arriving at the berth area in a port until the ship departs from the anchored area in a port, in this context, the Tanjung Priok port, Jakarta. In this research, IPT indicators consist of waiting time to guide on boards, berthing time, and loading and unloading time using. Several studies related to IPT explain that psychological problems related to working time during voyages are shorter than the time staying in port (Oldenburg, Felten, C., Hedtmann, & Jensen, 2020; Oldenburg & Jensen, 2019). Another problem is that the effect of short navigation during the length of stay in the port and port congestion is very visible on the bio-fouling and fuel consumption of ships on the way home (Tsugane, Kaneko, & Ito, 2010). The three dimensions of the IPT variable are waiting time guide on board, waiting time for berthing and loading and unloading time.

Hypothesis

H1: Document Service (X1) contributes to Integrated Port Time (Y)

H2: Guidance Service (X2) contributes to Integrated Port Time (Y)

H3: Shipping Lane Conditions (X3) contribute to Integrated Port Time (Y)

H4: Dock Availability (X4) contributes to Integrated Port Time (Y)

H5: Loading and Unloading Productivity (X5) contributes to Integrated Port Time (Y)

H6: Document Services (X1), Guidance Services (X2), Shipping Lane Conditions (X3), dock Availability (X4), Loading-Unloading Productivity (X5) simultaneously contribute to Integrated Port Time (Y).

We assume that Document Services (X1), Guidance Services (X2), Shipping Lane Conditions (X3), Dock availability (X4), Unloading Productivity (X5) contribute to Integrated Port Time (Y) and can lower the operational costs of national shipping companies in Indonesia.

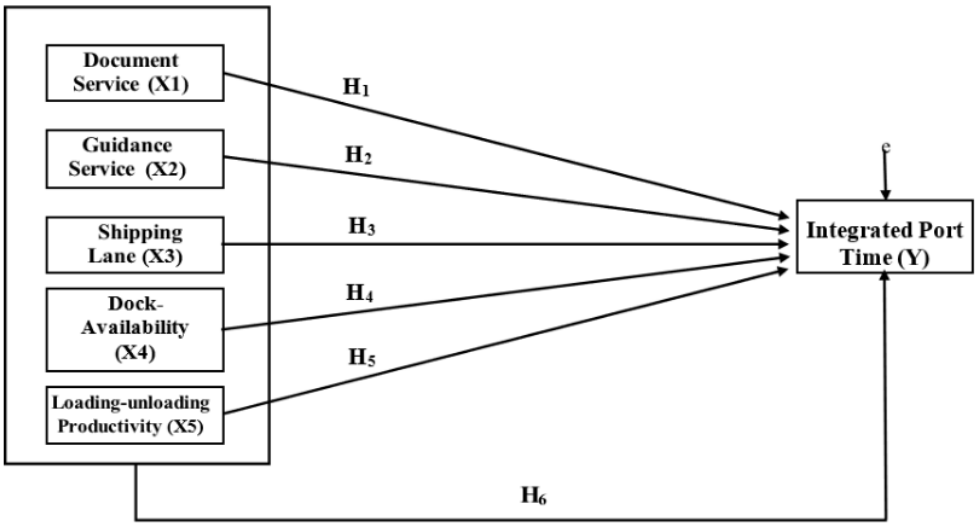

Figure 1 Research Design

B. Research Method

This study uses the path analysis method with 70 samples of respondents from PT Temas Shipping as a shipping line operator, PT Temas Port as a loading and unloading company and ship crew from PT Temas Shipping, PT Pelindo operational employees, Port Authority, in Jakarta. Path analysis is used to analyze the pattern of relationships between variables with the aim of knowing the direct or indirect effect of a set of independent variables (exogenous) on the dependent variable (endogenous). Research was conducted in domestic terminal 3 Tanjung Priok Port, Jakarta. The 70 respondents with less than five years of service experience were 43 percent, followed by respondents with more than five year experience, which covered 34 percent, and finally respondents with more than 10 years of service experience, which was 23 percent. The description of the results of this study is the score of the questionnaire about all the variables. The first step of testing the data obtained is the assumption test, including the validity test, and the reliability test, then followed up with the t test and F test. Several previous studies have used the path analysis method on shipping companies (Mahmoudi & Mollaei, 2014; Ricardianto et al., 2021; Shu, Daamen, Ligteringen, & Hoogendoorn, 2012).

C. Results and Discussion

Description of Variables

Document Service

A total of 33 respondents or 47.2 percent of 70 respondents stated that the Document Service at the harbormaster's office when the ship was about to dock was very good. The process for the flow of ship docking documents is simple and employees at the harbormaster service office and port authorities are good at work, so that the document service has met the expectations of shipping companies and can lower the score of Integrated Port Time at the Tanjung Priok port in Jakarta.

Guidance Service

A total of 28 respondents from 70 respondents or 40.1 percent cumulatively stated that the Guidance Service when the ship was about to dock was quite good. The guidance service has met the expectations of shipping companies so that it is able to shorten the Integrated Port Time at the Tanjung Priok port in Jakarta. However, the harbormaster must also accommodate all inputs from respondents in making improvements because there are still 40.1 percent of respondents saying that the guidance service when the ship will dock has not maximized the ship's IPT at the Tanjung Priok port, Jakarta.

Shipping Lane Condition

A total of 37 respondents or 52.8 percent of the 70 respondents stated that the condition of the shipping lanes through which the ship was going to dock was very good, then it can be concluded that the conditions of shipping lanes have met the expectations of shipping companies, meaning that it can shorten the duration of IPT at the Tanjung Priok port in Jakarta. However, the harbormaster must also accommodate all inputs from respondents in making improvements because there are still 22.8 percent of respondents stating that the condition of the shipping lanes when the ship will dock has not met expectations to maximize the Integrated Port Time. The waiting time for ships to be served in or out of shipping lanes is quite good. The ship scouts and tug officers in charge of bringing ships in and out have performed faster and more alert in serving ships that are going in and out of shipping lanes, however they must still prioritize safety and security aspects.

Dock Availability

As many as 43 respondents or 61.4 percent of 70 respondents stated that the availability of docks for berths was very good. Based on this fact, it can be concluded that the availability of the dock has met the expectations of shipping companies, then it can reduce the score of IPT

at the Tanjung Priok port in Jakarta. However, PT Pelindo and the Unloading Company (PBM) must also accommodate all input from respondents in making improvements because there are still 14.4 percent of respondents saying that the availability of the dock when the ship docks has not met expectations to maximize the Integrated Port Time at Tanjung Priok port, Jakarta.

Loading and Unloading Productivity

A total of 40 respondents from 70 respondents or 57.1% cumulatively stated that the productivity of loading and unloading ships when docking was not quite good. The loading and unloading productivity has not met the expectations of the respondents because more than 50 percent, to be precise 57 percent of the 70 respondents stated that loading and unloading productivity was not good enough (on average). So that there is a need for improvements from loading and unloading companies to commit improvement in supporting the expectations of loading and unloading service users. The flow and placement of the container yard blocks are not appropriate and well structured, so in this case it is necessary to improve the port operator of PT PT Pelindo 2 and the loading and unloading company. PT Temas Line should also innovate and develop the performance of the container yard so that the flow and placement of container blocks can be well structured and aligned to the other supporting aspects.

Hypothesis testing

Contribution of Document Services, Guidance Services, Shipping Lane Conditions, Availability of Dock, and Loading and Unloading Productivity to Integrated Port Time

Table 1 R Square X on Y simultaneously

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.885[a]	.784	.767	1.287

a. Predictors: (Constant), Loading-Unloading Productivity, Dock Availability, Document Service, Guidance Service, Shipping Lane Condition

b. Dependent Variable: Integrated Port Time

The R^2 value of 0.784 means that the diversity of data that can be explained by the model is 78.4 percent. Thus, the research model has a high predictive ability on the behavior of the dependent variable which is characterized by a high coefficient of determination which is above 50 percent.

The F-Test of Loading-Unloading Productivity, Dock Availability, Document Services, Guidance Services, Shipping Lane Conditions to Integrated Port Time

Table 2 Anova (F test) X on Y Simultaneously

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	385.107	5	77.021	46.488	.000[b]
	Residual	106.036	64	1.657		
	Total	491.143	69			

a. Predictors: (Constant), Loading-Unloading Productivity, Dock Availability, Document Service, Guidance Service, Shipping Lane Condition

b. Dependent Variable: Integrated Port Time

From the F test, the Sig value is 0.000, where the Sig 0.000 value is less than 0.05, then the path analysis coefficient is significant. Thus, the independent variables have a significant effect altogether on the dependent variable.

Variable t-test: Loading and Unloading Productivity, Dock Availability, Document Services, Guidance Services, Shipping Lane Conditions to Simultaneous Integrated Port Time

Table 3 Coefficients (t_{test}) X on Y simultaneously

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-6.040	2.641		-2.287	.026
	Document Service	-.685	.272	-.575	-2.517	.014
	Guidance Service	.467	.100	.381	4.664	.000
	Shipping Lane Cond	.919	.241	.860	3.809	.000
	Dock Availability	.227	.078	.177	2.913	.005
	Loading-unloading Productivity	.270	.054	.343	5.043	.000

a. Dependent Variabel: Integrated Port Time

The value of Sig = 0.000 is smaller than 0.05, then the path coefficient is significant. Thus, each independent variable contributes positively and significantly altogether to the dependent variable. The direct contribution of Document Services to IPT is indicated by the Beta value.

Path Analysis Test Results

Path Analysis results can be described simultaneously which explains the contribution of the independent variables to the dependent variable (Figure 2).

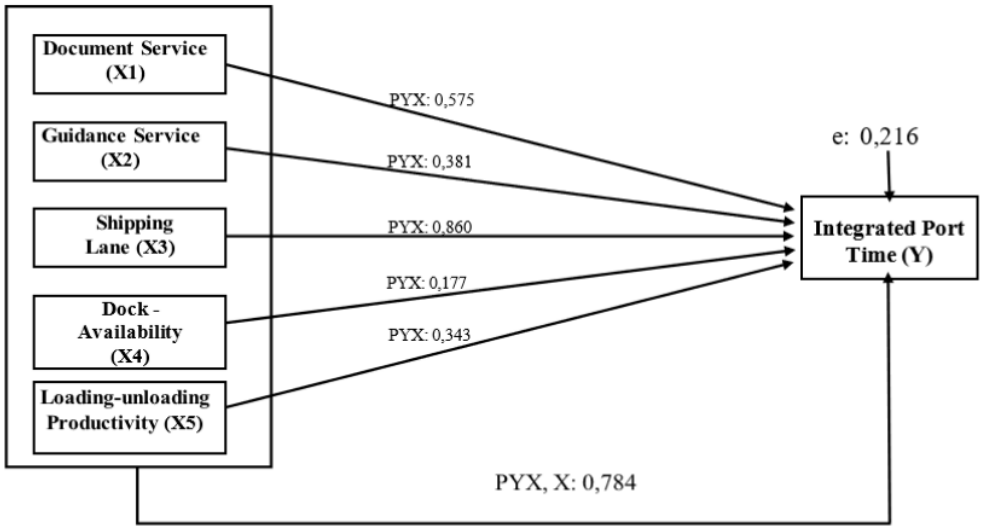

Figure 2 Path Analysis Diagram

Discussion

Document Services Contribute Positively and Significantly on Integrated Port Time

Based on the results of the analysis, the document service variable contributes to IPT by 0.575 or 57.5%. The results of the linear regression of document services that contribute to IPT are 0.685 with a significance of 0.14. This means that the better the service when the Temas Shipping agent prepares and processes the docking documents at the harbormaster's office, the faster the ship can dock. Thus, it can cut IPT. In order to optimize the capabilities, expertise, knowledge, and performance of document service officers at the harbormaster's office and port authority, training should often be held to improve the quality of human resources at the

harbormaster's office and port authority. They must simplify the regulation of ship docking documents to make it more practical to improve performance and more innovative for the development of the Inaportnet system which is currently running well. This will eventually establish a one-stop service so that there is good coordination between port service users and interested stakeholders. The results of this study are in accordance with previous research conducted by (Haryadi, 2020) where document services have a positive effect on Integrated Port Time of the object researched.

Guidance Services Contribute Positively and Significantly on Integrated Port Time

Based on the results of the analysis, the service integration variable contributes to IPT by 0.381 or 38.1%. The results of the linear regression of guidance services contribute to IPT of 0.467 with a significance of 0.000. This means that the better the service and expertise of ship guidance and the better the quality of tugboats to serve ships operated by PT Temas Shipping, the faster the process of getting in and out of ships to dock and automatically shortening the IPT. In the guidance service variable, there needs to be an improvement in terms of the ability of the scout officers and the performance of the tugboats so that they can serve ships going in and out the dock safely, and quickly. The results of this study are in line with previous research conducted by (Andrianto et al., 2017; Perdana et al., 2018) where guidance services have a positive effect on IPT of the object researched.

Shipping Lane Conditions Contribute Positively and Significantly on Integrated Port Time

Based on the results of the analysis, the shipping lane conditions contributed to the IPT of 0.860 or 86.0%. The linear regression coefficient of shipping lane conditions is 0.919 with a significance value of 0.000. This means that the more smoothly and the less obstacles in the shipping lane when the ships move in and out of the dock, the faster the process of getting in and out of the ship from and to the dock. It will consequently reduce the IPT degree. Shipping lanes need to revitalize shipping lanes and port pools, apply port regulations correctly and maximize existing pilotage to anticipate an increase in ship visits in the future. The results of this study are in accordance with previous research conducted by(Perdana et al., 2018) where the condition of the shipping lane has a positive effect on IPT of the object researched.

Dock Availability Contributes Positively and Significantly on Integrated Port Time

Based on the results of the analysis, the dock availability contributed to the IPT variable of 0.177 or 17.7%. The linear regression coefficient of dock availability to IPT is 0.227 with a significance of 0.005. This shows that the availability of the dock directly affects the length of the ship's IPT in a port. If the dock is full or cannot accommodate the number of ships that will dock, the ship cannot immediately dock and must wait for the previous ship to complete loading and unloading activities to dock. On the other hand, if the dock is properly available and equipped with appropriate facilities in accordance with existing regulations, the ship can immediately dock safely and immediately. This can speed up the IPT performance. For this reason, it is necessary to add additional dock support facilities in accordance with port regulations, increase the number of docks to anticipate the increase in ship visits. The results of this study are in accordance with previous research conducted by (Perdana et al., 2018) where the availability of docks has a positive effect on IPT performance.

Loading-Unloading Productivity Contributes Positively and Significantly on Integrated Port Time

Based on the results of the analysis, loading and unloading productivity contributes to IPT by 0.343 or 34.3%. The linear regression of loading and unloading productivity to IPT is 0.270 with a significance of 0.000. This means that the better the loading and unloading productivity, the better the IPT level of the ships operated by Temas Shipping. Productivity of loading and unloading is the main activity carried out by ships when they are in a port. Based on the fact, loading and unloading activities must be made more effective and efficient while still prioritizing work safety and security. To increase loading and unloading productivity, it is necessary to maximize the performance of the loading and unloading workforce (TKBM) and continue to maintain the loading and unloading equipment in order to achieve the box ship per-hour (BSH) target. While prioritizing work safety, the company must also manage the flow and placement of container blocks to reduce unwanted operational constraints and increase container capacity in the container yard. The results of this study are in accordance with previous research conducted by (Haryadi, 2020; Wibowo, 2010) where loading and unloading productivity has a positive effect on IPT performance. According to (Indriyati & Ardian, 2021) the greater waiting time at the port is one of the most obstacles to IPT.

Document Services, Guidance Services, Shipping Lane Conditions, Dock Availability, Loading-Unloading Productivity simultaneously Contribute Positively and Significantly on Integrated Port Time

Based on the results of the analysis, the variables of document services, guidance services, shipping lane conditions, dock availability, loading and unloading productivity contribute simultaneously to IPT by 0.784 or 78.4%. The path coefficient of the variables is 0.784 with a significance of 0.000. This means that the better the performance of document service, integration services, shipping lane conditions, dock availability, Loading-unloading productivity, the more they will affect IPT. The results of this study are in line with previous research by (Wibowo, 2010), which shows that the independent variables -demand for guidance boats, the performance of loading and unloading equipment, loading and unloading productivity at the dock, ship arrival time and document processing time have an influence on waiting time of the ship.

By strengthening the IPT performance, Temas Shipping may enhance its operational efficiency, due to; (1) the less consumption of fuel while in port, (2) The lower fuel costs, (3) Other cost reduction, (4) Increasing the number of calls, (5) raising teus capacity, (6) Reducing the lead time for delivery of goods and (7) Efficient and effective loading and unloading time at the port, so that it can serve the next ship to dock.

D. Conclusion

Based on the results of the study and the discussion, the conclusion will be highlighted as follows. The document service during the ship docking at the harbormaster's office is perceived fairly good in performance while the process for the flow of ship docking is also simple. This finding may become one of the aspects to better the IPT performance. Guidance services at the Port of Tanjung Priok was perceived good and this will shorten the IPT. This variable has met the expectations of the shipping companies, however, the harbormaster must also accommodate all inputs from respondents in making improvements because there are still 40.1% of respondents saying that it has not optimally met their expectations.

The performance of shipping flow was perceived good by the shipping companies and consequently, it lessens the time of port stay, but however, there are still 22.8% of respondents saying that the condition of the shipping flow has not fully met their expectations to maximize the IPT at the port, then the harbormaster must work hard to make some improvements accordingly. The waiting time for ships to be served in or out of shipping lanes was perceived

as fairly good, however, the ship guides and tow officers must work faster and more alert in serving ships that are going in and out of shipping lanes, but still prioritizing safety and security.

The availability of docks has met the expectations of shipping companies then it may lessen the duration of IPT, however, PT Pelindo and also the loading and unloading company (PBM) must also accommodate all inputs from respondents in making improvements because there are still 14.4% of respondents respond unfavorably. The condition of docks is sturdy and safe for boats to dock on. It was perceived as quite good by the shipping companies, however, the port operator, PT Pelindo, must accommodate all feedbacks from respondents to continue improve the existing dock facilities to ensure the security and safety of port service users and to reduce Integrated Port Time to be effective and efficient.

The loading and unloading productivity has not met the expectations of the respondents because more than 50 percent, to be exact, 57 percent of the 70 respondents stated that loading and unloading productivity was not good enough. So that there is a need for improvements in order to support its productivity. The flow and placement of the container yard blocks are not appropriate and well structured, so in this case there needs to be improvements from both parties. PT Pelindo as the port operator and Temas Port as the loading-unloading company should work hand in hand to make some innovation to develop the container yard so that the flow and placement of blocks containers can be well structured and arranged properly. The duration of loading and unloading activities has not been in accordance with the ship's mooring plan. Respondents have just perceived it with only good enough criteria, so there needs to make some improvements from port operators and the loading-unloading company.

E. References

Afandi, A., Untung, S., Marina, S., & Majid, S. A. (2021). The Influence of Ship Service Quality and Loading-Unloading Productivity on Port Performance and Its Implications for Customer Satisfaction (Study on Cigading II Terminal). *Advances in Transportation and Logistics Research, 4*, 150-165.

Andrianto, Y., Wicaksono, A., & Anwar, M. R. (2017). Analisis kinerja pelayanan pemanduan kapal terhadap waktu tunggu (waiting time) di pelabuhan Tanjung Perak. *IPTEK Journal of Proceedings Series*, *3*(5).

Aviva, D. (2010). Analisa Optimasi Dermaga di Pelabuhan Samarinda Dengan Pendekatan Model Antrian Untuk Mengantisipasi Kenaikan Permintaan. *Jurnal Eksis*, *6*(1), 1100 – 1266.

Efrianto, D. (2019). Evaluasi Master Plan Terminal Petikemas Semarang Ditinjau Dari Alur Pelayaran. *Jurnal Sains Dan Teknologi Maritim*, *19*(2), 121-130.

Gunawan, H., & Sianto, M. E. (2017). Analisis faktor-faktor yang berpengaruh terhadap produktivitas bongkar muat kontainer di Dermaga Berlian Surabaya (studi kasus PT. Pelayaran Meratus). *Widya Teknik*, *7*(1), 79-89.

Hadi, W. (2010). Analisis Jumlah Kapal di Dermaga Pelabuhan Tanjung Priok Berdasarkan Nilai Layanan Kapal Pandu. *LOGISTIK*, *3*(1), 43-51.

Haryadi, D. (2020). *Pengaruh Pelayanan Administrasi Kapal, Dan Kegiatan Bongkar/Muat Terhadap Optimalisasi Integrated Port Time (IPT) di PT Varia Usaha Bahari Gresik*. [Doctoral dissertation] STIA dan Manajemen Kepelabuhanan Barunawati Surabaya).

Indrawan, R. P., Widada, S., & Hariadi, H. (2017). Kajian Batimetri Perairan Teluk Nuri dan Perairan Teluk Batang Untuk Penentuan Alur Pelayaran di Pelabuhan Teluk Batang, Kabupaten Kayong Utara, Kalimantan Barat. *Journal of Oceanography*, *6*(1), 236-245.

Indriyati, R., & Ardian, B. (2021). Pengaruh Pengendalian Integrated Port Time (IPT) terhadap Kelancaran Kegiatan Bongkar Muat di PT. Pertamina (Persero) Regional IV Semarang. *Saintara: Jurnal Ilmiah Ilmu-Ilmu Maritim*, *5*(2), 8-14.

KM RI. (2002). *Keputusan Menteri Perhubungan Republik Indonesia Nomor 24 KM Tahun 2002 tentang Penyelenggaraan Pemanduan*. Jakarta : Kementerian Perhubungan Republik Indonesia.

Mahmoudi, M. M., & Mollaei, E. (2014). The effect of business process re-engineering factors on organizational agility using path analysis: Case study of ports & maritime organization in Iran. *Asian Economic and Financial Review*, *4*(12), 1849.

Meisel, F., & Bierwirth, C. (2006). Integration of berth allocation and crane assignment to improve the resource utilization at a seaport container terminal. *Operations Research Proceedings 2005*, (pp. 105-110). Springer, Berlin, Heidelberg.

Oldenburg, M., Felten, C., Hedtmann, J., & Jensen, H. J. (2020). Physical influences on seafarers are different during their voyage episodes of port stay, river passage and sea passage: A maritime field study. *Plos One*, *15*(4), e0231309.

Oldenburg, M., & Jensen, H. J. (2019). Stress and strain among merchant seafarers differs across the three voyage episodes of port stay, river passage and sea passage. *PloS One*, *14*(6), e0217904.

Perdana, F. A., Pujiraharjo, A., & Wijatmiko, I. (2018). Karakteristik antrian kapal dan faktor-faktor yang mempengaruhi waktu tunggu kapal (waiting time) di Pelabuhan Tanjung

Perak. *Rekayasa Sipil*, *11*(3), 166-177.

Pratama, I. L., Heitasari, D. N., & Praditha, A. (2019). Analisis Skenario Penambahan Frontal Frame pada Jetty 1 untuk Menurunkan Integrated Port Time (IPT) di Integrated Terminal ABC. *INOBIS: Jurnal Inovasi Bisnis Dan Manajemen Indonesia*, *2*(4), 559-572.

Purnomo, A., & Ario, T. (2009). Meningkatkan Kinerja Pelayanan Pemanduan Guna Terciptanya Pelayanan Jasa Kapal yang Optimal di Divisi Kepanduan PT. Pelabuhan Indonesia II (Persero) Cabang Tanjung Priok. *LOGISTIK*, *2*(2), 38-48.

Ricardianto, P., Prastiama, R., Thamrin, M., Agusinta, L., Abdurachman, E., & Perwitasari, E. P. (2021). The Ship's Crew Performance of Indonesian National Shipping Companies. *International Journal of Research in Commerce and Management Studies*, *3*(3), 52–66.

Selasdini, V., Barasa, L., & Wartono. (2018). Pengaruh Ketersediaan Utilisasi Alat Bongkar Muat Pelabuhan Terhadap Kinerja Produktivitas di Pelabuhan Batu Ampar Batam. *Meteor STIP Marunda*, *11*(2), 29-32.

Sesotyo, D. S. (2018). *Sistem Pelayanan Jasa Pandu Tunda dii PT. Pelabuhan Bukit Prima*. [Doctoral dissertation] Universitas Pembangunan Nasional" Veteran" Yogyakarta.

Shu, Y. Q., Daamen, W., Ligteringen, H., & Hoogendoorn, S. P. (2012). AIS data based vessel speed, course and path analysis in the Botlek area in the port of Rotterdam. *IWNTM 2012: Proceedings of the International Workshop on next Generation of Nautical Traffic Model, Shanghai, China*, (pp. 64-72).

Sitorus, I. R. I., & Nahry, N. (2016). Analysing Operational System of Container Loading-Unloading in JICT Jakarta and Port of Lamong Bay Surabaya. *Proceedings of the 19th International Symposium of FSTPT Islamic University of Indonesia, 11-13 October 2016*, 226–235.

Suhariyadi, A. (2016). Analisa Kelayakan Alur Pelayaran (Studi Kasus Pelabuhan Nagan). *AGREGAT*, *1*(1), 7–15.

Suharjo, B., & Suharyo, O. S. (2014). Penilaian Risiko Kecelakaan Kapal Berlayar di Alur Pelayaran Timur Surabaya Dengan Metode Formal Safety Assessment (FSA). *JOURNAL ASRO*, *2*, 1-14.

Suyono, R. P. (2007). *Shipping Pengangkut Intermodal Ekspor Impor Melalui Laut*. Jakarta: PPM.

Tsugane, M., Kaneko, H., & Ito, K. (2010). A Study on the Effect of Hull Fouling Due to the Long Port Stay-II. In *The Journal of Japan Institute of Navigation* (Vol. 122).

Ulfa, M. (2018). *Coast Panic-Sistem Pemantauan Kondisi Darurat pada Alur Pelayaran*

Barat dan Timur Surabaya Menggunakan Teknologi LORAWAN. [Doctoral dissertation] Institut Teknologi Sepuluh Nopember.

Umagapi, B. W., Amonalisa, S., & Lesmini, L. (2016). Bongkar Muat General Cargo the Documents Service Quality and the Speed. *Jurnal Manajemen Transportasi*, *03*(03), 379–386.

Vicrihadi, A., Sembiring, H. F. A., & Ayutia, Y. (2021). Analysis of The Operational Performance of Loading and Unloading Containers at Operating Terminal 3 Port of Tanjung Priok. *Advances in Transportation and Logistics Research*, *4*(3), 352-362.

Wibowo, H. (2010). *Analisis Faktor-Faktor yang Mempengaruhi Waktu Tunggu Kapal di Pelabuhan Tanjung Emas Semarang*. [Doctoral dissertation]. Universitas Diponegoro.

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