Asian Journal of Aquatic Sciences, December 2022. Vol 5, Issue (3) 440-446 e-issn: 2716-4608
p-issn: 2655-366X

ANALYSIS OF THE INFLUENCE OF SHIP SCHEDULING, GUIDELINE SERVICES, WEATHER, AND LOADING EQUIPMENT READINESS ON SHIP WAITING TIME IN PORT

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ABSTRACT

The purpose of this study was to determine the effect of ship scheduling factors, guide service, weather, and the readiness of loading and unloading equipment on ship waiting time at the port. This type of research is descriptive and quantitative, conducting field research through observation and interviews to obtain research data. This research was conducted on officers at the port of Merak. The sampling technique in this study was random sampling, with a sample size of 100 ship officers at the Merak port. The results showed that ship scheduling had a significant positive effect on ship waiting time, guide services had a significant positive effect on ship waiting time, the weather had a significant positive effect on ship waiting time.

Keywords: Ship Scheduling, Guide Service, Weather, Waiting Time.

I. INTRODUCTION

Transportation is one of the most important components for everyday life, both in terms of individuals and to support economic activity in an area [1]. High-quality development transportation facilities are needed to meet daily needs. Sea transportation is very important for the country's transportation as well as driving the economic progress of a country [2]. The port is the most important means for the sea area. The use of this ship as a link between international islands and between continents, especially countries using sea shipping, is the main gateway for shipping lanes for ships carrying basic needs, which increases revenue in the area [1].

Until the port as an important place in building a maritime foundation [1]. In addition to the expansion of the port industry, there is also a port information system that enables the operation of shipping services, compiles and provides information and management systems for ships that need to be positioned properly and are expected to be on time. The port can be defined as a place that functions as a berth for ships and other sea transportation, a place for goods, animals, passengers to get on and off before boarding the ship or after completion, for importing from ships [3].

When entering the port, many actions must be done when the ship arrives. Ships travel from water to port, and each other, from port to water, which will require facilities, including warehouses, transportation facilities, etc [4]. The ship docking system refers to a first-come, first-served basis, but in some types of ships must be loaded first, for example, the ship is not big enough when it is to be deployed, and there are small ships. large queues to prioritize service when the ship is big enough and you don't have to wait in line (priority service) [5].

Received : 15 October 2022
Accepted : 25 November 2022

The waiting time for ships according to the Director General of Sea Transportation's Order No.: UM.002/38/18/DJPL-11 of 2011 concerning working conditions, the length of time since the application for mooring is submitted after completion. How many factors can affect the waiting time of the ship [6]. Navigating a fleet is an experimental activity to help, provide advice and information to the captain about the state of the oceans in his country. This is one of the things that must be considered in order to operate safely, orderly and efficiently for the safety of ships and the port environment [7].

The process of unloading and loading is the workforce for loading and unloading equipment in carrying out loading and unloading duties from or on ships and ports [8]. High loading and unloading efficiency is expected to increase loading and unloading productivity. The current shipping and unloading system is based on export regulations and FIFS service first on board first served.

Arrangements for ships to dock greatly affect shipping, as ships scheduled to arrive earlier are more likely to be late, have delays due to natural and other factors. This kind of cargo can arrive on time; this can result in a change in ship waiting time, so there must be a way to cut off currents that provide waiting time, because all of that will affect everyone who uses services at sea.

Another factor that affects ship-waiting time is the weather. In the case of unpredictable weather conditions, when the weather is cloudy, the loading and unloading activities will be stopped to extend the ship's mooring at the port.

According to [9] states that ready to unload and load equipment, ship arrival time and costs all have a significant positive effect on ship waiting time, which means it is faster in preparation for loading and unloading, and setting up equipment, that is small ship waiting time (bed waiting time).

The novelty of this research is the addition of test vessels based on recommendations from previous studies. This research aims to determine the impact of shipping, logging services, costs, and loading and unloading equipment while waiting for the ship at the port. In accordance with the elaboration above, the researcher concocted the title analysis of the influence of ship scheduling factors, guidance services, weather, and readiness of loading and unloading equipment on ship waiting time at the port

2. RESEARCH METHOD

Method

This research is a descriptive quantitative research. [10] States, certain scientific research methods provide data with additional purposes and applications. The method used in the quantitative approach. [11] Stating that definitive research is research that uses observation, interviews or interviews about the current situation of the subject we are investigating. Using questionnaires and the like we collect data to test for hypotension or answer questions. In this study, the researcher will explain what actually happened in the situation being studied.

This research was conducted on ship crews in the port of Merak. The sampling technique in this study was random sampling so that in this study a sample of 100 crewmembers were obtained at the Merak port.

Data analysis for this study was carried out using Planned Parenting (PLS). PLS is a structural equation design (SEM) with a variation or modeling based method. The purpose of PLS-SEM is to develop theory or build theory (predictive learning). PLS is used to find out whether there is a relationship between hidden variables (predictions). PLS is a powerful research method because it does not use existing

data and models, and the number of samples is small [12].

3. RESULT

Outer Model Analysis

Validity test

Validity test is used to measure the accuracy/validity of a question. In the following research, validation analysis was carried out using the convergent method and AVE. The analysis is based on the accuracy of the sample which tests the sample and its sample indicators, on the correlation between the item/category scores determined by the PLS.

The number of individual assumptions is considered high when there is a correlation greater than 0.7 with a standard deviation. But according [13] for studies at the start of forecast development, loading costs of 0.5 to 0.6 were considered sufficient.

Table 1. Validity Test Results

Variabel		Outer Loading	AVE	Keterangan
Penjadwalan Kapal (X1)	X1.1	0.855	0.700	Valid
	X1.2	0.862		Valid
	X1.3	0.791		Valid
Jasa pemanduan (X2)	X2.1	0.771	0.537	Valid
	X2.10	0.672		Valid
	X2.11	0.649		Valid
	X2.12	0.780		Valid
	X2.2	0.726		Valid
	X2.3	0.647		Valid
	X2.4	0.739		Valid
	X2.5	0.710		Valid
	X2.6	0.729		Valid
	X2.7	0.837		Valid
	X2.8	0.786		Valid
	X2.9	0.721		Valid
Cuaca (X3)	X3.1	0.886	0.668	Valid
	X3.2	0.850		Valid
	X3.3	0.731		Valid
	X3.4	0.794		Valid
Kesiapan Alat Bongkar (X4)	X4.1	0.769	0.670	Valid
	X4.2	0.791		Valid
	X4.3	0.807		Valid
	X4.4	0.840		Valid
	X4.5	0.880		Valid
Waiting time (Y)	Y.1	0.816	0.539	Valid
	Y.2	0.703		Valid
	Y.3	0.589		Valid
	Y.4	0.769		Valid
	Y.5	0.745		Valid
	Y.6	0.685		Valid
	Y.7	0.717		Valid
	Y.8	0.782		Valid
	Y.9	0.777		Valid

Reliability Test

Reliability Test. Two types of reliability in this study were applied, namely the Cronbach Alpha test and the Composite Reliability test. Cronbach Alpha measures a low (low) dependency value. The data proved to be reliable when the data had Cronbach's alpha > 0.7. Joint dependency measures the reliability of the actual change. Data is said to be very reliable if it has a combined reliability score of > 0.7.

Test Convergent Validity after modification.

Below is a comparison diagram of the PLS SEM model after the label does not meet the requirements for factor loading is removed, in the diagram it can be seen that the label contains a signal for each variable. not less than 0.6, so that the analysis is

continued in the discriminant validity test (Figure 1).

Table 2. Reliability Test Results

	Cronbach's Alpha	Composite Reliability
Weather (X3)	0.833	0.889
Scouting services (X2)	0921	0.933
Unloading Tool Readiness (X4)	0.876	0910
Ship Scheduling (X1)	0.785	0.875
Waiting Time (Y)	0892	0913

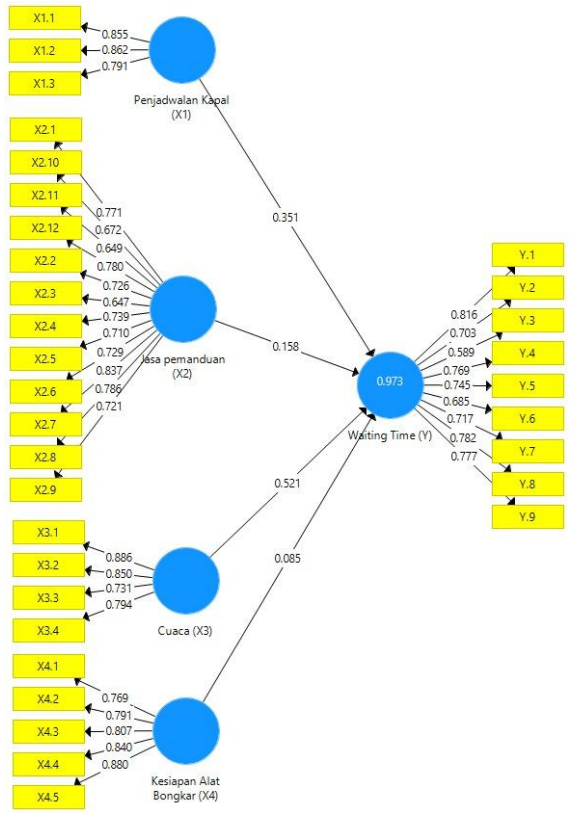

Figure 1. Test Convergent Validity

R-Square test

The coefficient of determination R-Square is applied to measure the amount of endogenous activity influenced by other variables. Based on the data analysis applied using the PLS system, the R-Square value is obtained as shown in the following data.

Table 3. R-Square Test

	R Square	R Square Adjusted
Waiting Time (Y)	0.973	0.972

Based on the test results, the R-Square score for waiting time is 0.973, which means that waiting time is influenced by weather, pilotage services, unloading equipment readiness, ship scheduling by 97.3% and 2.7% for others influenced by variables that have not been explained in the this research.

Hypothesis Test

Analysis/hypothesis testing can be determined by t-statistics and variance. Compute a numerical estimate for the 5% alpha by comparing t count with t table. So the rule to accept or reject the H0 concept is rejected when t-number > t is read. To reject/accept the hypothesis, the probability of accepting Ha is used if the p value < 0.05 (Table 4).

4. DISCUSSION

Effect of Ship Scheduling on Waiting Time.

The results of testing the model of the effect of ship positioning on waiting time show a p-value of 0.000 that is less than 0.05. In addition, the t-statistic value is 8.989 which is better than 1.660 and the beta value is 0.351. So that from the explanation above it will show that ship, scheduling has a significant positive effect on ship waiting time. Based on the conditions in the field, it turns out that the arrival time of the ship affects the waiting time for the ship (waiting time berth) because ships that dock especially in the morning can speed up loading and unloading activities at night, the arrival of ships at night loading and unloading activities are slow due to several factors, namely several loading and unloading equipment at the port are still conventional, the level of labor sleepiness is high, dark

conditions that slow down the performance of workers in the field compared to the morning. So ships arriving in the morning can speed up the loading and unloading of cargo and reduce waiting time for ships at the port (waiting time beth) at the port. The results of this study are in line with research conducted by [14].

Table 4. Hypothesis Test

	Original Sample (O)	Sample Means (M)	Standard Deviation	T Statistics (|O/STDEV|)	P Values
Weather (X3) -> Waiting Time (Y)	0.521	0.514	0.044	11,817	0.000
Scouting service (X2) -> Waiting Time (Y)	0.158	0.167	0.055	2,856	0.004
Unloading Equipment Readiness (X4) -> Waiting Time (Y)	0.085	0.081	0.041	2.105	0.036
Ship Scheduling (X1) -> Waiting Time (Y)	0.351	0.351	0.039	8,989	0.000

The effect of guide services on waiting time

The results of testing the hypothesis of the effect of scouting services on waiting time, it is shown that the p-value of 0.004 is smaller than 0.05. Moreover, the t-statistic value of 2,856 is greater than 1,660 and the beta score is 0,158. From the information above, it can be seen that pilot service has a positive effect on ship waiting time. ship service application as a guide for ships that will be hanging in the port. The need for guide boats to direct ships to be placed in deep waters so as not to touch or sink in shallow waters. This research is in line with research conducted by [15]

Effect of weather on waiting time.

The results of testing the hypothesis of the effect of weather on waiting time show that the p-value is 0.000 which is smaller than 0.05. In addition, the t-statistic value of 0.044 is greater than 1.660 and the beta score is 0.521. Therefore, from the explanation above it will show that the weather has a significant positive effect on the ship's waiting time. Based on the conditions in the field, it appears that the weather will affect the waiting time for ships (waiting time berth) because good weather can speed up loading and sun cargo thereby reducing ship-waiting time. bed), if the weather is bad the loading and unloading of cargo will be stopped because the cargo can be damaged, thus prolonging the waiting time for the ship and the Jamrud Terminal. The results of this study are in accordance with research conducted by [16, 9].

Effect of Unloading Equipment Readiness on waiting time

The results of the analysis of the influence of the Preparation Tool Load model on waiting time show that the p-value is 0.036 which is smaller than 0.05. Moreover, the t-statistic value is 2.105, which is better than 1.660 and the beta score is 0.085. Therefore, from the information above it can be seen that the provision of equipment for loading cargo has a very positive effect on waiting time for ships. According to the conditions at the stadium, the preparation for loading and unloading of goods affects the waiting time for the ship (waiting time berth) because before the ship docks at the port it finishes providing equipment for loading and unloading and when the ship anchors the equipment is finished. Prepare the smooth loading and unloading of cargo according

to plan. This research is in accordance with Widyawati's research [9].

5. CONCLUSION

From this study, it can be concluded that ship schedules have a positive effect on waiting time, management services have a positive effect on waiting time, and Weather e has a very positive effect on ship waiting time. Delivery Preparation has a very positive effect on waiting time. With an R-Square score for waiting time of 0.973, it means that waiting time is influenced by weather, pilot service, Prepared Equipment Delivery, Estimated Delivery of 97.3% and another 2.7% is influenced by changes not explained in this study.

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