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Analysis Of The Effect Of Equipment Performance (Crane) On Ship Loading And Unloading Work Time At Koja Tanjung Priok Container Terminal

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Abstract: Loading and unloading equipment (cranes) have an important role in the smooth process of loading and unloading ships at a container terminal, therefore measuring the level of performance of tools (cranes) in loading and unloading at a container terminal is very necessary. the main topic of this study is to analyze the performance of the crane being tested to find out whether there is an effect on loading and unloading work at the Koja Container Terminal, the analysis method uses simple linear regression and correlation coefficient to determine the influence between the level of crane performance on loading and unloading work time which is indicated by a simple linear equation, namely: y = 34.419+(-0.591x) means that the coefficient regression x of -0.591x states that for every 1% addition in value to Variable X (Crane Performance), the Y variable (loading and unloading work time) will decrease by -0.591, at a constant of 34.419. The result of the correlation coefficient is - 0.857, meaning that the relationship between the variables X and Y is negative and moderate, therefore the influence of the performance level of crane C on loading and unloading work time Y is 73.44% while 26.56% is influenced by several other factors, In testing the hypothesis, the results 〖- t〗 _count = - 5.251 and 〖- t〗_table - 2.223 Ha are accepted and Ho is rejected, it can be interpreted that there is a significant negative relationship between crane performance and ship loading and unloading work time at the Koja Container Terminal.
Keywords: *crane performance, box/crane/hour, berth working time, simple linear regression,SPSS*

Introduction

The development of the method of transporting goods with a container system has caused many countries in the world to create special ports (pelsus) or special terminals (tarsus) for container handling. In Indonesia, container handling started around 1970 and so far the annual growth rate is very high. The busiest port in Indonesia is Tanjung Priok port, about 54.2% of cargo is transported by container. One of the efforts to manage containers efficiently and integratedly is loading and unloading containers at the port which has been carried out by PT Pelindo. .(Anita &; Asmadewa, 2017). International trade consists of the export and import of goods from one country

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to another or from one region to another. The means of transportation are very important for the growth of the country's industry and commerce, and without the support of transportation, the growth of trade is impossible.

In order to speed up all loading and unloading operations at the container terminal, it is natural that a busy container terminal needs well-functioning loading and unloading equipment. However, the loading and unloading process does not always go as smoothly as expected; Sometimes there are various obstacles that greatly hinder the process of loading and unloading activities, which can cause delays in loading and unloading from or to the ship.

In carrying out terminal operations so that activities at the terminal run smoothly, of course, a good communication system must also be needed between field employees and employees in the terminal. *control tower.* Currently, KSO Koja Container Terminal uses the N-Gen system used at the Koja Container Terminal KSO location where N-Gen is a new system implemented by KSO Koja Container Terminal, before using the N-Gen system Koja Container Terminal KSO uses a system called NAVIS. N-Gen is made by the company *Hutchinson Port* where the company is the parent of KSO Terminal Petikemas Koja which collaborates with PT. Pelindo (Port of Indonesia). With the new system that has been implemented, it will minimize the occurrence of misunderstandings between one party and another (Suparyanto and Rosad (2015 et al., 2020). In carrying out loading and unloading operations, KSO TPK Koja has equipment, namely 7 units of Quay Container Crane (QCC) which is used to carry out container loading or unloading operations on the edge of the pier, 25 units of Rubber Tyred Gantry Crane (RTGC) which is used to stack containers when the container is already in the Container Yard (CY), 48 units of Head Trucks used to transport containers from the dock to the stacking field or from the stacking field to the dock, and 3 units of Reach Staker.

Literature Review

Performance according to Prawirosentono (1999) Performance is the result of work that can be achieved by a person or group in an organization, in accordance with their respective authorities and responsibilities, in order to achieve the goals of the organization concerned legally, not violating the law and in accordance with morals and ethics.

Transportation The delivery and rerouting process during this process cannot be separated from the need for supporting equipment for a smooth transfer process according to the desired schedule. The tools used for this moving, transporting and moving process may differ depending on: (Suparyanto and Rosad (2015 et al., 2020)

1. The shape of the object to be moved.
2. The distance between one place and another.
3. The purpose of the object to be moved.

A port is a place consisting of land and waters with clear boundaries, used as a place of government and economic activity. The development of international trade through the maritime industry, the process of transporting goods by sea is also

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developing dynamically. With the increase in international trade by sea, as well as the development of science and technology, considering the increasing number and types of goods, greatly affect the means of transportation, including port service facilities and facilities to support the handling of ships and goods. (*Factors Inhibiting Unloading Activities*, n.d.).

According to Government Regulation No. KM 21 of 2007 Article 1 paragraph 1, concerning Ports, a port is a location consisting of land and water with certain limits used for government and economic activities, as well as a place for ships to dock, dock, get on and off passengers, and load and unload goods. The port can also be used as an intra- and intermodal transportation route. (Shipping et al., 2015).

The function of the port according to Asiyanto in (Safrianda et al., 1377) argues that the function of the port is to provide services to ships in their activities to unload and lift cargo (goods and people) and also provide other services needed to ships, such as fresh water and even fuel, etc.

Container Terminal according to D.A Lasse (2012: 169), the Container Terminal has a stacking field (Container Stocking Yard at the dock directly opposite the ship. Container terminals also have other stacking fields, such as Container Depots.

Loading and Unloading according to Da Lasse (2012) Loading and unloading is the activity of transporting goods from ships to land or vice versa. Container loading and unloading equipment includes ship operations, haulage, lift on lift off, receip, and delivery. Container loading and unloading activities can be carried out at conventional terminals or at special container terminals. Loading and unloading at conventional terminals is usually for domestic shipping using semi-container ships, while loading and unloading containers at special container terminals is intended for export-import activities and uses full container vessels.

Method

Analysis method with simple linear regression and correlation coefficient to determine the effect between crane performance levels on loading and unloading work time shown by a simple linear line equation. In this study using two variables, namely, Crane Performance, and Ship loading and unloading work time. Research variables are an attribute or trait or value of people from objects, or activities that have certain variations determined by researchers and then drawn conclusions. There are two sources of data used in this study, namely primary data, the basic data used in this study are the results of direct observations and interviews on employees working at TPK KOJA. Secondary data, this data is obtained from the KOJA Container Terminal Operation Support section in the form of Ship Performance data and ship loading and unloading data. Data collection techniques are by observation / observation and library research. By analyzing data using correlation methods, specifically methods of finding deep relationships of a situation.

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Discussion and Result

Overview of the Research Object

Container Terminal Profile

Terminal Petikemas Koja (TPK Koja) was established at the end of 1995, located in Tanjung Priok, Jakarta in the form of operational cooperation (KSO) between PT. (Persero) Pelabuhan Indonesia II and PT. Humpus Container Terminal (HTP). The construction of TPK Koja began in early 1995, trial activities began in 1997. In May 1999, share ownership moved from PT. Humpus Terminal Container to PT. Ocean Terminal container (OTP) and by the end of 2002, it is expected that all facilities are available.

Koja Container Terminal strives fully to increase maximum customer satisfaction by continuing to maintain good relations with its customers in order to maintain long-term mutually beneficial relationships with various purposes. Koja Container Terminal is fully focused on customer needs, and demands and constantly strives to anticipate future needs and needs.

As the third terminal in Jakarta, Koja container terminal is expected to support existing container terminals to handle the increasing excess flow of goods.

Services provided by Koja Container Terminal

1. Container loading and unloading activities
2. Container Receving and Delivery
3. Behandle Services
4. Transhipment

Infrastructure

Dock:

1. Pier length 650 M
2. Pier width 40 M
3. Pool depth 14 M

Area: 32.78 Ha

1. Buildup area: 21.80 Ha
2. Import stacking capacity: 7,560 TEUs
3. Export stacking capacity: 7,696 TEUs
4. Reefer stacking capacity: 310 Plug

Superstructure

Equipment:

1. 7 (seven) QCC (Quay Container Crane) units;
   2 units of Super Post Panamax type, 2 units of *Post Panamax type, 3 units of Panamax* type.
2. 25 units of RTG (*Rubber Tyred Gantry*).
3. 48 units of *head trucks*.
4. 60 Trailer *Chassis Units*
5. 3 *Reachstacker Units.*

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Ship loading and unloading procedures

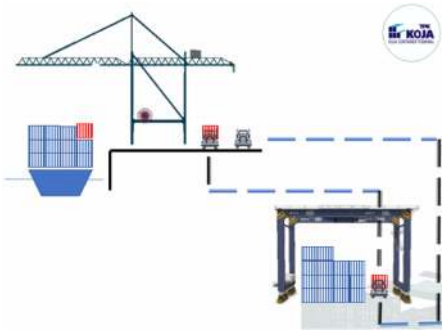

Figure 4. 1 Process of unloading and loading containers
(source: KOJA Container Terminal Yard Planner Section)

Unloading / Import Procedure:

1. After the ship planner receives the documents of the ship's meeting results and posts the EDI / Baplie of Import containers, then make a Crane Working Program (CWP), print the results of posting profiles, Bayplan unloading and Crane Working Program for Unloading activities.
2. Operation Control receives a copy of the unloading Bay Plan for monitoring Unloading activities in accordance with CWP.
3. Field department, receive and study documents (BayPlan / BP, Crane Working Program / CWP and Profile unloading) then prepare personnel &; equipment, and inform the Control.
4. QCC operators carry out container unloading according to CWP and Unloading Order at BP, in coordination with Solo and Whiskey. Whiskey checks the seal and condition of the container, creates a CDR if there is damage, Up-Date the container with a Hand Held Terminal (HHT).
5. If there is a problem, the RTG Operator assisted by the Field Supervisor informs the control.
6. RTG operators stack containers in the field, up-date containers with VMT, monitored by Control.
7. The Report on the Results of Operation Activities per shift and Time Sheet that has been verified by the authorized officer is submitted to the Operations Staff to make a report on the results of work.
8. RBM creation.
9. Billing Invoice Generation.

Load/Export Procedure

1. The Field Operations Officer receives and studies documents (CSL &; Profile load BP load) from the Control, then prepares personnel and tools, and informs the Control.
2. The RTG Operator receives the Job List from Control and sends the containers to the Dock in the order, and Up-Date the containers with VMT.

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3. QCC operators carry out loading on ships according to BP loading, coordination with Solo. Solo Up-Date the position of the container with HandHeld Terminal according to the actual position on board, monitored by Control.
4. Make reports on Operating Activity Results (HKO) per shift and Time Sheet per ship, HKO: in the form of GBP (Gross Berth Productivity), VOR (Vessel Occupation Ratio), QCR (Quay Crane Rate).
5. Field Planning checks data on all export containers in a computer system tailored to specific requests from shipping lines.
6. Ship Planning makes a Loading Bay Plan based on the loading profile provided by the "shipping line" adjusted to the conditions of stacking export containers in the field whether it is in accordance with the loading profile given by the "shipping line". If it is not appropriate, the Ship Planning informs it to S/L.
7. Ship Planning makes the Bayplan fit for the ship then Ship Planning submits the Bayplan load to the "shipping line/chief officer" for verification.
8. "Chief Officer" verifies (acc) the Bay Plan muaShip Planning revises the Bay Plan load and makes CWP for loading activities, then PPG Staff archives a copy of the Bay Plan load. Operations Control receives a copy of the loaded Bay Plan for distribution to the relevant departments
9. RBM report generation.
10. Invoice generation.

Data Analysis and Discussion

Loading and Unloading Service Performance

Crane Productivity (Box Crane Hour, BCH)

It is the ability of one container crane to produce containers in one hour.

Table Box Crane Hour

Moon	ship	YEAR 2022			Achievement (%)	Total B/M
		Box Crane hour (BCH)				
		Target	**Realization**	Difference		
January	45	26	28,63	2,63	110%	50.484
February	39	26	29,82	3,82	115%	44.114
March	48	26	32,31	6,31	124%	48.684
April	47	26	25,54	-0,46	98%	53.934
May	38	26	29,78	3,78	115%	47.884
June	50	26	31,23	5,23	120%	53.271
July	52	26	25,43	-0,57	98%	52.990
August	57	26	28,36	2,36	109%	52.404
September	50	26	34,91	8,91	134%	43.053
October	40	26	26,24	0,24	101%	47.154
November	46	26	24,94	-1,06	96%	50.115
December	46	26	28,04	2,04	108%	45.904

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Total	558	26		33,23		589991
Average	46,5	26	28,77	2,77	111%	49165,92

source: KOJA Container Terminal (processed by author)

Based on the table above, it can be seen that the average BCH target in 2022 set by the KOJA Container Terimnal is 26 boxes / cranes / Hour. This figure is obtained from the results of the previous year and is predicted for a year. In this data, it can be seen that the average realization of box/crane/hour *in 2022 is 27.85* boxes/crane/hour , which exceeds the target set by Koja Container Terminal with a difference of 1.86 *boxes/crane*/hour.

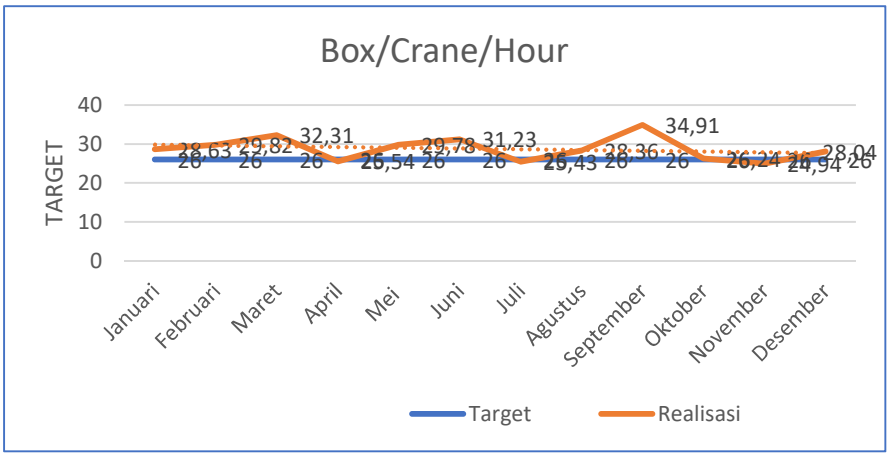
From the table above, it can be concluded that the level of crane performance in September increased or exceeded the target of 30.07 boxes/crane/hour *with a difference of -4.07* boxes/crane/hour. From this increase, there are factors that affect the achievement of tool work results such as periodic maintenance of tools *(cranes*), thus facilitating the loading and unloading process of containers and good and sunny weather during loading and unloading so as to facilitate the process of loading and unloading activities.

In November there was a decrease or not achieved the target, the decline in crane performance in December was 24.96 boxes / crane / hour *with a difference of 1.04* boxes / crane / hour. From this decrease, factors that can make the crane performance target not achieved such as less than optimal tools in loading and unloading which often experience delays or damage to the equipment, and bad weather factors such as strong winds when loading and unloading containers, and the ability of the operator during the loading and unloading process can also affect the decrease or increase in equipment performance.

Throughput is the total flow of containers at a port expressed in units of *TEUs (TwentyFoot Equivalent Unit system)* in one year. Total Container in box count (Throughput) is generated from the performance of the crane in loading and unloading at the Koja Container Terminal for one year with a total box of 589,991 boxes with an average of 49,165 boxes. From the table above, we can see that the throughput results in 2022 at the Koja Container Terminal look unstable, the throughput in April was the highest at 53,934 boxes. While throughput in September was the lowest with an average of 43,053 boxes

Then the author also presents data on the level of Crane Productivity performance into a graph that is used to compare targets with the results of their achievements in the 2022 period.

Figure 4. 2 Box/Crane/Hour Graphics



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From the graphic above, the BCH target at the Koja Container Terminal is the same, which is 26 *boxes/crane/hour* in 2022. Meanwhile, the realization of the *box / crane / hour* produces different numbers every month. It can be seen that the highest number of BCH realizations in 2022 was in September by producing 30.07 boxes/crane/hour or with a difference of *4.07 boxes/crane/hour,* while the non-achievement of the target was seen in November getting a result of 24.96 *boxes/crane/hour with a difference of -1.04* boxes/*crane*/hour *from the target.*

Waktu kerja Bongkar Muat atau Berth Working Time

*Berth Working Time (*BWT) is the loading and unloading time while the ship is at the dock.

Table Berth Working Time

Moon	BT (Hours)	BERTH WORK TIME		Difference
		Target (Hours)	Real (Hours)	
January	20,23	19,43	18,14	-1,29
February	24,70	18,99	17,32	-1,67
March	17,34	17,34	14,95	-2,39
April	37,26	22,16	19,28	-2,88
May	20,33	19,90	17,78	-2,12
June	19,39	16,72	16,17	-0,55
July	20,33	17,51	17,97	0,46
August	18,29	15,98	15,89	-0,09
September	16,41	15,01	13,78	-1,23
October	23,79	20,83	20,99	0,16
November	23,54	18,50	20,13	1,63
December	19,31	17,43	16,63	-0,80
Total	260,93	219,80	209,03	-10,77
Average	21,74	18,32	17,42	-0,90

***Source**: Terimnal Petikemas Koja, (processed by the author)*

Based on table 4.3, it can be interpreted that the total average target of *Berth Working Time* from January to December in 2022 is 219.80 hours (219 hours 80 minutes), with an average target for 12 months of 18.32 hours (18 hours 32 minutes). This figure is obtained from the target number of *Berth Working Time* ships that carry out loading and unloading from January to December in 2022 at the Koja Container Terminal.

While the Total Realization amounted to 209.02 hours (209 hours 2 minutes), with an average for 12 months of 17.42 hours (17 hours 42 minutes). This figure is obtained from the average number of ship realizations after carrying out loading and unloading activities.

There are factors that affect the amount of *Berth Working Time*, namely: unfavorable weather, good crane speed, skills / abilities of operators who are competent enough to operate the tool, etc.

The author also presents Berth working time data in the form of graphs so that it can be easier to see and compare from January to December in 2022.

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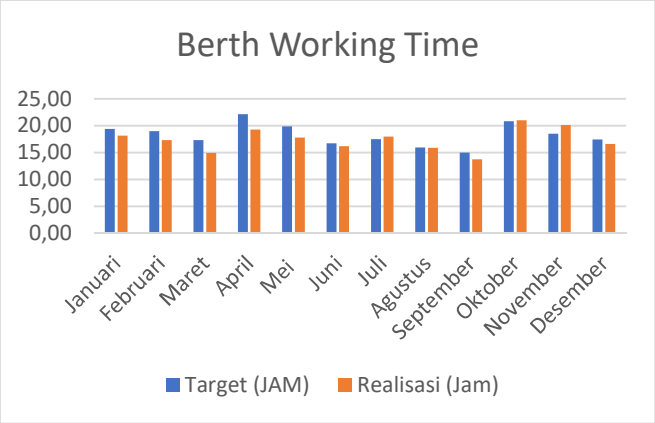
Figure Berth Working Time Chart



From the graphic image above, it can be seen that the target loading and unloading work time in the 2022 period, the average realization produced is quite good as seen in April when loading and unloading work can be completed before the target is set.

Simple linear regression

Table Simple Linear Regression

Moon	Crane Performance (X)	working time (Y)	X^2	Y^2	XY
January	28,64	18,14	820,25	329,06	519,53
February	29,83	17,32	889,83	299,98	516,66
March	32,31	14,96	1043,94	223,80	483,36
April	25,55	19,28	652,80	371,72	492,60
May	29,78	17,78	886,85	316,13	529,49
June	31,23	16,17	975,31	261,47	504,99
July	25,43	17,98	646,68	323,28	457,23
August	28,37	15,90	804,86	252,81	451,08
September	34,91	13,78	1218,71	189,89	481,06
October	26,25	20,99	689,06	440,58	550,99
November	24,95	20,13	622,50	405,22	502,24
December	28,05	16,64	786,80	276,89	466,75
Sum	345,30	209,07	10037,60	3690,82	5955,98

Based on the table above it can be concluded that:

n = 12 (month)

$\sum X = 345{,}30$

$\sum Y = 209{,}07$

$\sum X2 = 10037{,}60$

$\sum Y2 = 3690{,}82$

$\sum XY = 5955{,}98$

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Simple Linear Regression Analysis

Used to measure the magnitude of the influence of variable X, namely the level of crane performance on variable Y, namely loading and unloading performance with the following formula equation:

$$\boldsymbol{y = a + bX}$$

Information:
X = independent variable value (BCH)
Y = Bound Variable Value (BWT)
a = constant number
b = Regression Coefficient
Values a and b can be calculated by:

$$a = \frac{(\Sigma Y)(\Sigma X2) - (\Sigma X)(\Sigma XY)}{n(\Sigma X2) - (\Sigma X)2}$$

$$a = \frac{(209{,}07)(10037{,}60) - (345{,}30)(5955{,}98)}{12\ (10037{,}60) - (345{,}30)2}$$

$$a = \frac{2098561{,}03 - 2056599{,}89}{120451{,}2 - 119232{,}09}$$

$$a = \frac{41961{,}14}{1.219{,}4}$$

$$a = 34{,}419$$

$$b = \frac{n\ (\Sigma XY) - (\Sigma X.\Sigma Y)}{n(\Sigma X2) - (\Sigma X)2}$$

$$b = \frac{12\ (5955{,}98) - (345{,}30)(209{,}07)}{12\ (10037{,}60) - 119232{,}09}$$

$$b = \frac{71471{,}28 - 72191{,}87}{120449{,}52 - 119232{,}09}$$

$$b = \frac{-720{,}59}{1217{,}43}$$

$$b = -0{,}591$$

Table Coefficients with SPSS 23.0 calculation

Coefficientsa

Type		Unstandardized Coefficients	
		B	Std. Error
1	(Constant)	3441,976	325,357
	KInerja Crane	-0,591	0,112

a. Dependent Variable: Ship Loading and Unloading Work Time

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http://proceedings.itltrisakti.ac.id/index.php/altr

Based on the calculation above, the results of a simple linear regression equation are obtained as follows:

$$y = a + bX$$

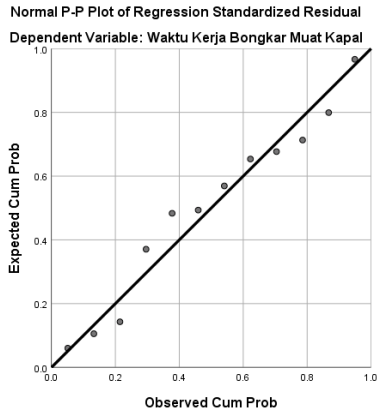
$$y = 34,419 + (-0,591x)$$

From the equation above, it can be interpreted that the constant / consistent value of variable Y (loading and unloading work time) is 34.419, while regression *X (Crane Performance) of -0.591 states that every addition of 1% value to Variable X* (Crane Performance*), then variable Y (loading and unloading work time) will decrease by - 0.591%.*

Linearity Test Analysis

Koja Container Terminal data for the 2022 period in the effect of crane performance on loading and unloading work time (Berth Working Time) is then processed using SPSS 23.0. Then we get the graph below.

Figure P-Plot Regression of Crane Performance with Loading and Unloading Working Hours Time



From the graph above, it is explained that the variables used are declared to be normally distributed. This can be seen by the position of the points around the diagonal line. The position of the data points in the direction follows the diagonal line and there is no plot whose position is too far from the diagonal line and tends to approach the diagonal line, so overall this data can be said to be linear.

Correlation Coefficient Analysis (r)

The Correlation Coefficient is a measuring tool to determine whether or not the relationship between variable X (Crane Performance) and variable Y (Ship Loading and Unloading Work Time). It can be calculated with the following formula:

$$r = \frac{\sum XY - \sum X . \sum Y}{\sqrt{\text{n} \sum X^2 - (\sum X)^2} \sqrt{n \sum Y^2 - (\sum Y)^2}}$$

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r = Correlation Coefficient
n = Number of samples
x = lvariable free (Crane Performance)
y = related variable (Ship B/M Uptime)

$$r = \frac{n.\sum XY - \sum X.\ \sum Y}{\sqrt{\text{n. } \sum X^2 - (\sum X)^2}\ \sqrt{n\sum Y^2 - (\sum Y)^2}}$$

$$r = \frac{12\ .\ (5955{,}98) - (345{,}30)(209{,}07)}{\sqrt{12\ (10037{,}60) - 119232{,}09}\ \sqrt{12\ (3690{,}82) - 43710{,}26}}$$

$$r = \frac{71471{,}76 - 72191{,}87}{\sqrt{(120451{,}2 - 119232{,}09)}\ \sqrt{44289{,}84 - 43710{,}26}}$$

$$r = \frac{-720{,}11}{\sqrt{1219{,}11}\ - \sqrt{579{,}58}}$$

$$r = \frac{-720{,}11}{\sqrt{34{,}91}\ - \sqrt{24{,}07}}$$

$$r = \frac{-720{,}11}{840{,}28}$$

$$\boldsymbol{r = -0{,}857}$$

Table Correlations counts with SPSS 23.0 calculations

Correlations

		Kinerja Crane	Ship Loading and Unloading Working Time
KInerja Crane	Pearson Correlation	1	-.857
	Sig. (2-tailed)		.000
	N	12	12
Ship Loading and Unloading Working Time	Pearson Correlation	-.857	1
	Sig. (2-tailed)	.000	
	N	12	12

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Table Correlation Coefficient InterpretationCorrelation Coefficient Interpretation

Coefficient Interval	Relationship Level
0,00 – 0,199	Very low
0,20 – 0,399	Low
0,40 – 0,599	keep
0,60 – 0,799	Strong
0,80 – 1,000	Sanga strong

Source: *Sugiyono, (2015: 184)*

The table above explains the magnitude of the correlation value obtained a value of r = -0.857 where the number shows there is an influence between variable X (Crane Performance).

Determinant Coefficient Test or Determinant Coefficient

To measure how much contribution or influence variable X has on the rise and fall of variable Y with the formula:

$$KP = (r)^2 \; x \; 100\%$$
$$= (0{,}857)^2 \; x \; 100\%$$
$$= \mathbf{73,44}\%$$

From the calculation above, it can be interpreted that the amount of contribution or influence of variable X (Crane Performance) to variable Y (Loading and Unloading Work Time) is 73.44% while 26.56% is influenced by several other factors.

Test the hypothesis

This analysis is used to test the significant effect between variable X (Crane Performance) and variable Y (Working Time to load, where the formula used is to use a one-way test.

Initial hypothesis

1) Ho : p = 0 means that there is no influence between variable X (crane performance) and variable Y (ship loading and unloading work)
2) Ha : p = 0 means that there is an influence between variable X (crane performance) and variable Y (ship loading and unloading work warku)

Formulation of hypotheses using search and $t_{hitung} t_{tabel}$

If the value is positive:t_{hitung}

1. If then Ho is accepted and Ha is rejected, meaning that there is no significant influence of variables X and Y.$t_{hitung} < t_{tabel}$
2. If then Ho will be rejected and Ha accepted, meaning a significant influence of variables X and Y.$t_{hitung} > t_{tabel}$

If the value is Negativet_{hitung}

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1. If then Ho will be rejected and Ha accepted, meaning a significant influence of variables X and Y.$- t_{hitung} < - t_{tabel}$
2. If then Ho is accepted and Ha is rejected, meaning that there is no significant influence of variables X and Y.$- t_{hitung} > - t_{tabel}$

Account: t_{hitung}

$$t_{hitung} = \frac{r.\sqrt{n} - 2}{\sqrt{1} - r^2}$$

$$t_{hitung} = \frac{0{,}857.\sqrt{12} - 2}{\sqrt{1} - 0{,}734}$$

$$t_{hitung} = \frac{2{,}709{,}83}{0{,}516}$$

$$t_{hitung} = \ 5{,}2519$$

Calculation (test table):t_{tabel}

$$t\ tabel\colon\ (a/2)\ ; df = n - k$$

$$t\ tabel\colon\ (a/2)\ ; df = n - k$$

$$(0{,}05/2)\ ; df = 12 - 2$$

$$(0{,}025)\ ; df = 10$$

$\boldsymbol{t\ tabel : -2{,}228}$ (based on distribution table t)

Table Coefficients t with SPSS 23.0 Calculation

Coefficientsa

type		t	Sig.
1	(Constant)	10,579	0,000
	KInerja Crane	-5,251	0,000

a. Dependent Variable: BWT

Comparison with $t_{hitung} t_{tabel}$

Based on the significance value from the table above, a significance value of 0.000 0.05 is obtained so that it can be concluded that variable X (<*Crane Performance*) has a significant effect on variable Y (Loading and Unloading Work Time).

While the value of t obtained a value of –5,251 2,228 so that it can be concluded that variable X (Crane Performance) negatively affects variable Y (Loading and Unloading Time).$t_{hitung} < t_{tabel} -$

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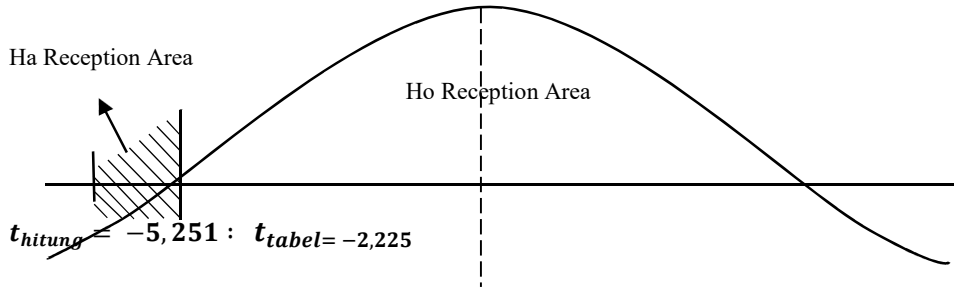
Conclusion

Because it is - $-t_{hitung} < -t_{tabel}$**5,251 - 2,223 <**then ha is accepted and Ho is rejected, it can be said that there is a negative relationship between loading and unloading work time and crane performance at the Koja Container Terminal.

Kuvra the results of the hypothesis test can be described as below. The curve shows the normal distribution of one point (*one tail)* because the previous hypothesis did not know the direction of the regression of the effect between crane performance *(box / crane / hour)* and ship loading and unloading work time (*Berth Working Time).*

Figure Hypothesis Test Curve (one Tail)



Based on the curve figure above that Ha is accepted and Ho is rejected, which is = $-t_{hitung} < -t_{tabel}$ **- 5.251 - 2.223 <**The shaded area is the area of rejection of Ho or acceptance of Ha. Therefore, it can be stated that the hypothesis put forward by the author has proven correct.

Conclusions

Based on the results of data analysis calculations and calculations that have been carried out in the previous chapter related to the effect of crane performance on ship loading and unloading work time at the Koja Container Terminal, the conclusions in this study are as follows:

1. Based on the analysis of the performance of the Tool (Crane) (box/crane/hour) for the 2022 period from January to December as a whole with an average of 28.77 boxes/cranes/hour. The highest value was in September of 34.91 boxes / cranes / hour due to regular maintenance of equipment (cranes), thus facilitating the loading and unloading process of containers and good and sunny weather during loading and unloading so as to facilitate the process of loading and unloading activities, while the lowest value was in November which was 24.94 boxes / cranes / hour. The rise and fall of crane performance every month has not been fully achieved, there are several months less than the target that has been set, allegedly due to unfriendly weather factors, discipline from operators in carrying out tasks and readiness on the tool.

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2. Based on the analysis of Ship Loading and Unloading Working Time for the 2022 period from January to December, the average number *of working hours* is obtained from the average value of ship visits that want to load and unload at the Koja Container Terminal in the 2022 period. It is known that the highest average amount of loading and unloading work time realization that can be interpreted as exceeding the target was in November, which was 20.13 (20 hours 13 minutes), exceeding the average target of 18.50 (18 hours 50 minutes) and getting a time difference of -1.63 (1 hour 63 minutes) can be interpreted as a bad figure because the loading and unloading time is longer than the specified time. While the lowest average realization of loading and unloading work time can be interpreted as less than the target in April, which is 19.27 (19 hours 27 minutes) less than the average target of 22.16 (22 hours 16 minutes) with a difference of 2.88 (2 hours 88 minutes), it can be interpreted that the figure is very good because the loading and unloading process is faster than the predetermined target time. The slow loading and unloading work time is suspected by factors: bad weather factors, lack of operator discipline in the crane control process, and the presence of equipment (crane) that is damaged or under repair.
3. There is an influence on the performance of the tool (crane) on loading and unloading work time at the Koja Container Terminal, from the calculation of the correlation coefficient of -0.857. With a determining coefficient of . In the hypothesis test, the results were = - 5.251 and - 2.223.73,44%$- t_{hitung} - t_{tabel}$

From the above results it can be concluded that = - 5.251 - 2.223. Ha accepted and Ho rejected, it can be interpreted that there is a significant negative relationship between $- t_{hitung} < - t_{tabel} <$*crane performance and* ship loading and unloading work time at the Koja Container Terminal.

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