

Level of Service Needs of Waveguide At The Port of Soekarno Hatta Makassar

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Abstract: The port is a very important node in the smooth flow of trade by sea, it is expected that the good service from the port authority. This research aims to determine (1) the factors that become obstacles in operational guidance at the port of Soekarno Hatta Makassar (2) the need of scouting personnel at the port of Makassar to the number of ship movements (3) the prediction of the number of scouting personnel required port Soekarno Hatta Makassar to year 2025. This research is a qualitative research by using simple regression model analysis technique to predict the variable Y to independent variable X, or determine the relationship between Y and X. The results show that (1) the supporting factors in the operational guidance at the port Soekarno-Hatta Makassar: Availability of guidance personnel in service, availability of scouting facilities, and ability of guiding personnel and condition of ship, (2) scouting personnel needs at port of Makassar is still sufficient (8) and supporting facilities are still in good category, 3) The forecasting will the number of scouting personnel to be in need at the port of Soekarno-Hatta Makassar until the year 2025 is still sufficient.

Keywords: Availability, Scouting, Port of Soekarno Hatta

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I. INTRODUCTION

Transportation is one of the most important sectors of activity in the interrelated needs of everyone. Transportation is also a system consisting of facilities and infrastructure, where transport services with safety assurance will provide certainty and calm for the traveler or the owner of goods, so that social economic activities of society can be protected (Jinca, 2011)

A port should have adequate facilities and infrastructure in loading and unloading activities at the port. As a transportation subsystem, the port is the node of the smoothness of sea and land transportation. Thus, the port is a watershed protected against storms, waves, and currents, so the vessel can hold movement, lean, throw anchor in such a way that loading and unloading on goods and passengers and freight movements can be carried out safely.

The port is an important node in the flow of trade and distribution of logistics in Indonesia as well as in the world. The data show eighty-five percent (85%) of world trade by sea, while trade in Indonesia is 90% by sea (Arianto Patunru et.al, 2007). The existence of such condition is expected to be a good service from the port authority (harbour-mastership) as the regulatory controller and *PT Pelabuhan Indonesia* (a company of Indonesian Port) as the controller of the ship's guidance services which will be anchored, leaned and departed from and to the port.

Scout personnels are expected to have the expertise and uphold the professionalism in doing the service to the ship visitors. Skill expertise in running or processing the motion of the ship is determined by the number of work experience, education and professional training waveguide. Guided professionalism should be maintained, even enhanced in the sense of being adapted to shipbuilding technology advances and procedural requirements that are constantly aligned with applicable regulations. Skilled personnel as well as adept at navigating or being called as a voyage. Expert predictors with specific expertise are given to those who know the importance of relative signals in their environment.

Management Branch Port IV of Makassar has the power of guiding personnel (human resource) as many as 8 people working concurrently top management and support staff. So that in certain conditions in maximizing the guidance services still carry out their duties and responsibilities.

Along with the rapid development of PT Pelabuhan Indonesia IV Makassar Branch activities, it is necessary to optimize the quality of ship service. In order to anticipate the development of globalization of world trade today. The operation of this fleet is a management effort in improving the quality of port service, especially ship service for guiding and delaying the ship to excellent service with zero waiting time.

From 2011-2016 data processing results show that in 2011 the flow of ship visits visiting the port of Soekarno Hatta Makassar recorded 5625 ship movement consisting of domestic and foreign ships. In 2012 as many as 5493 ship movements, in 2013 there was a significant decrease of 4255 ships movement, in 2014 as many as 4368 ship movement, in 2015 as much as 5487 ship movement and in 2016 as much as 5460 movement of ships.

This condition requires the service of scouting the ship become the spearhead of PT Pelabuhan Indonesia IV Makassar which is the beginning and end of the whole series of scouting services activities. In improving the ship's guidance service at this port, the supporter of human resources guiding the ship needs to get attention in its guidance. So that its role in guidance services at the port will provide maximum results and satisfy the users of guidance services.

The port provides facilities and services for the visitor's boat. In terms of service is divided into two groups, namely services for ships and services for logistics. One of the services for ships is the pilotage service which includes pilotage activities in assisting the shipmaster to navigate to carry out safety activities, providing information on the state of the waters (currents, winds, waves) of the most important for the safety of ships, passengers and cargo when entering the cruise line to the pier. Ship service operations include the activities of planning and execution of ship moorings directed to the utilization of mooring sites to be adapted to the type and type of vessel, the type of cargo to be dismantled or loaded, the use of optimal loading and unloading equipment and the selection of warehouses and conglomerates of logistics in accordance with Needs and smooth distribution of logistics in order to produce ship dispatch.

The scout is worthy of bearing the title as a professional in carrying out his main function by remembering that when as the officer or skipper of the ship concerned is the service user of the scouting, then becomes the intended service provider. As a scouting service provider, scout serves on the company's mandate, vision and mission. Bound with fellow employees and honor the symbol as a symbol of the company's personality.

II. METHODOLOGY

Location and Time of Research

The location of this research is PT Pelabuhan Indonesia IV (shareholder) Makassar branch of South Sulawesi, with a research period of 6 months from January-June 2016 covering the preparation phase, data collection, data analysis and preparation of research results.

Data analysis methods

In qualitative research the process of analysis and interpretation of data requires a way of thinking creatively, crisis and very carefully. Both processes are interrelated and very closely related.

According to Manurung Haymans (1990). Forecasting techniques can be grouped into two categories: quantitative and qualitative methods. Forms of quantitative forecasting can be used if it fulfills the following conditions ie the existence of information about the past such as: Such information can be quantified in the form of data. A simple regression model is used to predict the variable Y to the independent variable X, or determine the relationship between Y and X, namely:

$$Y = a + bX + \varepsilon$$

Information :

Y = The variable is not free

X = Independent variable

a = The intercept coefficient can be determined by the formula;

$$a = \frac{(\sum Yi) x (\sum Xi^2) - (\sum Xi) x (\sum XiYi)}{nx (\sum Xi^2) - (\sum Xi)^2}$$

b = The value of the coefficient of independent variables, with the following equation

$$b = \frac{nx \sum XixYi - \sum XixYi}{nx \sum Xi^2 - (\sum Xi)^2}$$

III. RESULTS AND DISCUSSION

Level of Service Guiding Ship at the Port of Soekarno-Hatta Makassar

One of the factors influencing the service level of ship scouting in all ports in Indonesia including in Soekarno-Hatta Port of Makassar is the number of pilot ships and including its personnel. With sufficient number of waveguide ships following its personnel, it will create zero waiting time. The number of pilot ships owned by the Port of Soekarno Hatta Makassar until 2016 as much as 6 pilot vessels. Meanwhile, the personnel of the scout ship of 8 persons can be seen in Table 1.

Table 1. The personnel of the scout ship

No.	Name of Personil	Call Name/Nomor
1	Abd. Afif	Pa Pa 1
2	A. Mustafa	Pa Pa 2
3	Handi Amir	Pa Pa 3
4	Heri Suparyo	Pa Pa 4
5	Adi	Pa Pa 5
6	Hoseo	Pa Pa 6
7	Sulhaji	Pa Pa 7
8	Sitangga	Pa Pa 8

Source: PT. Pelindo IV Makassar, 2017

The movement of ships in the Port of Soekarno-Hatta Makassar from 2002 up to 2016 can be seen in Table 2.

Table 2. Number of Ship Movements at Soekarno-Hatta Port of Makassar

No.	Year	Number of Ship Movements/Ship Visits
1	2002	4620
2	2003	4547
3	2004	4693
4	2005	4839
5	2006	4985
6	2007	5396
7	2008	5216
8	2009	5320
9	2010	5553
10	2011	5504
11	2012	5493
12	2013	4255
13	2014	4368
14	2015	4371
15	2016	4369

Source: PT Pelabuhan Indonesia Makassar, 2017

The table 2 shows the movement of ships at the Port of Soekarno Hatta Makassar in a fluctuating state. In 2007 to 2012 the movement of ships per year averaged 5,396 movements up to 54493, but increased although not significant by reaching the movement of 5553 movements in 2010. In 2013 it decreased to the lowest point of 4255. But in the year 2014 up to 2016 again increased even though only reached the number of 4371 ship movement per year. When compared with the year 2005 to the year 2006 which is in the movement of 4,839 to 4,985 movement of ship per year, decreased significantly. Then forecasting the movement of ships from 2017 to 2025 can be seen in Table 3.

Table 3. The forecasting Number of Ship Movements Year 2017 up to 2025

No.	Year	Number of Ship Movements/Ship Visits
1	2017	4767
2	2018	4750
3	2019	4734
4	2020	4717
5	2021	4700
6	2022	4683
7	2023	4667
8	2024	4650
9	2025	4633

Source: Results of the analysis, 2017

Based on data from Table 2, the researcher makes a forecast from 2017 up to 2025 that can be seen in Table 3 above. The average number of ship movements is at the lowest point of 4,633 in 2025 until the increase in movement reaches 4767 in 2017. Meanwhile, to measure the level of guidance services or to determine the performance of waveguide can be seen in Table 4.

Table 4. Number of Ship Movements per Year (2005 up to 2015)

No.	Year	Number of Ship Movements	Number of Estimated Ships	Average Ship Per Month
1	2002	4620	2310	192
2	2003	4547	2273	189
3	2004	4693	2346	195
4	2005	4839	2419	201
5	2006	4985	2492	207
6	2007	5396	2698	224
7	2008	5216	2608	217
8	2009	5320	2660	221
9	2010	5553	2776	231
10	2011	5504	2752	229
11	2012	5493	2746	228
12	2013	4255	2127	177
13	2014	4368	2184	182
14	2015	4371	2185	182
15	2016	4369	2184	182

Source: PT. Pelabuhan Indonesia IV Makassar, 2017

The table 4 shows that there is a decrease in the movement of ships, the estimated number of ships that enter each year will decrease as well as the number of ships leaned at the Port of Soekarno-Hatta on average per month, in 2002 with the movement of the ship reached 4,620 movements, the average of the estimated ship that is leaned is 2,310 assuming the ship is guided 2 times (in and out). While the average number of ships per month is 192 ships. The movement of the highest ship occurred in 2010 with the movement of 5,553 movements, then the estimated number of ships that leaned at the Port of Soekarno Hatta Makassar as many as 2676 ships. The average number of ships per month is 231 ships. The smallest ship movements occur in 2013 with a total movement of 4,255. The estimated number of ships that leaned at the port of Soekarno-Hatta Makassar as many as 2.127 ships and the number of ships per month averaged as many as 177 ships. Furthermore, in Table 5 will be described forecasting the movement of ships per year (2017 up to 2025).

Table 5. Forecasting Number of Ship Movements per Year (2017 up to 2025)

No.	Year	Number of Ship Movements	Number of Estimated Ships	Average Ship Per Month
1	2017	4767	2383	198
2	2018	4750	2375	197
3	2019	4734	2367	197
4	2020	4717	2358	196
5	2021	4700	2350	195
6	2022	4683	2341	195
7	2023	4667	2333	194
8	2024	4650	2325	193
9	2025	4633	2316	193

Source: Results of the analysis, 2017

Table 5 shows the forecast of the estimated number of ships to be leaned in Makassar Port, the highest occurring in 2017 reaching 2383 ships with an average number of ships per month as many as 198 ships. The existence of the number of ship movements that are not significant increase, enough to affect the average ship per month that leaned at the Port of Soekarno-Hatta Makassar. Ship movements are lacking, especially in this research because of the limitation of factors affecting the time factor of the ship's delay. In the following table will explain the average number of ships per day with the ratio of the number of ships/waveguides.

Table 6. Average Number of Ships per day (2005 up to 2015)

Year	Number of ship movements	The estimated number of ships	Number of ships Average monthly	Average Number of ships per day	Ratio The number of ships/waveguides
2002	4620	2310	192	6	6 : 8
2003	4547	2273	189	6	6 : 8
2004	4693	2346	195	6	6 : 8
2005	4839	2419	201	6	6 : 8
2006	4985	2492	207	6	6 : 8
2007	5396	2698	224	7	6 : 8
2008	5216	2608	217	7	7 : 8
2009	5320	2660	221	7	7 : 8
2010	5553	2776	231	7	7 : 8
2011	5504	2752	229	7	7 : 8

2012	5493	2746	228	7	7 : 8
2013	4255	2127	177	5	5 : 8
2014	4368	2184	182	5	5 : 8
2015	4371	2185	182	5	5 : 8
2016	4369	2184	182	5	5 : 8

Source: Results of the analysis, 2017

The table 6 shows that the number of ships that lean at the Port of Soekarno Hatta Makassar is also in a fluctuating condition even in the year 2013 up to 2016 decreased the average number of ships per day ie as many as 5 ships so that the ratio of the number of ships/wavers (personnel) also decreased Ie only needed 5 ships per day with the number of wagers or personnel as many as 8 people. This indicates that there are still enough warships to provide guidance to the ship to be leaned and also the availability of waveguides sufficient to provide services to the ship that will be anchored in the Port of Soekarno-Hatta Makassar. Furthermore, in Table 7, it will be explained the average forecasting of the number of ships per day (2017 up to 2025) to be leaned at Makassar's Soekarno-Hatta Port.

Table 7. Average Forecasting Number of Ships Per day (2017 up to 2025) which will be leaned at the Port of Soekarno-Hatta Makassar

Year	Number of ship movements	The estimated number of ships	Number of ships Average monthly	Average Number of ships per day	Ratio The number of ships/waveguides
2017	4767	2383	198	6	6 : 8
2018	4750	2375	197	6	6 : 8
2019	4734	2367	197	6	6 : 8
2020	4717	2358	196	6	6 : 8
2021	4700	2350	195	6	6 : 8
2022	4683	2341	195	6	6 : 8
2023	4667	2333	194	6	6 : 8
2024	4650	2325	193	6	6 : 8
2025	4633	2316	193	6	6 : 8

Source: Results of the analysis, 2017

The data in the table 7 shows that from 2017 up to 2025 the average number of ships per day is 6 ships, while the number of waveguides is not affected. This happens because in 2017 up to 2025 the number of ship movements decreased so that the forecasting estimation of the number of ships that are leaned included the forecasting of the average number of ships per month that decreased, so that the port of Soekarno-Hatta Makassar does not require the addition of pandu ships and pandunya. Further in Table 8, it will be explained the number of hours of guide service (from outside to the pier) with an average of 30 minutes per ship.

Table 8. Number of Service Hours (from Outside to pier) per month

Year	Number of ships Average monthly	Number of hours of guidance service per month (minutes)
2002	192	5760
2003	189	5670
2004	195	5850
2005	201	6030
2006	207	6210
2007	224	6720
2008	217	6510
2009	221	6630
2010	231	6930
2011	229	6870
2012	228	6840
2013	177	5310
2014	182	5460
2015	182	5460
2016	182	5460

Source: Results of the analysis, 2017

The table 8 shows that the number of hours of guidance service per month depends on the number of ships averaged per month in the Port of Soekarno-Hatta Makassar, the largest number of hours per month as in 2010 with the number of ships 231 units and the number of service hours of 6,030 minutes per month. The table 9 provides an overview of the number of hours of wizard service (from outside to pier) per month.

Table 9. The forecasting Clock Service Scout (from Outside to pier) per month

Years	Number of ships Average monthly	Number of hours of guidance service per month (minutes)
2017	198	5940
2018	197	5910
2019	197	5910
2020	196	5880
2021	195	5850
2022	195	5850
2023	194	5820
2024	193	5790
2025	193	5790

Source: Results of the analysi, 2017

Table 9 shows that the number of hours of guidance service per month (minutes) the highest achievement occurred in 2017 with the number of ships 198 fruit with the number of hours of guidance service of 5.940 minutes per month. Furthermore Table 10 is the number of hours of waveguide service (from outside to pier) averaging 30 minutes per day.

Table 10. Number of Service Hours (from Outside to pier) per day

Year	Average Number of ships per day	Number of hours of service per day (minutes)
2002	6	180
2003	6	180
2004	6	180
2005	6	180
2006	6	180
2007	7	210
2008	7	210
2009	7	210
2010	7	210
2011	7	210
2012	7	210
2013	5	150
2014	5	150
2015	5	150
2016	5	150

Source: Results of the analysis, 2017

Table 10 shows that the number of hours of guidance per day (minute) is also dependent on the number of ships lean at the Soekarno-Hatta Port of Makassar per day. In 2002 up to 2006 the number of ships that leaned an average of 6 ships. The service hours provided by the scout boat are 180 minutes and each boat takes 30 minutes of waveguide time. In 2007 up to 2012 the number of ships that leaned an average of 7 ships, then the time or number of guidance services per day (minutes) takes 210 minutes. While the year 2013 up to 2016 the number of ships that leaning as much as 5 ships per day, then the time required for guiding services of 150 minutes with service time of each ship for 30 minutes. Here is a picture of forecasting the movement of ships in the Port of Soekarno-Hatta Makassar in year 2017 up to 2025.

Table 11. The Forecasting of Ship Movement at the Port of Soekarno Hatta Makassar in 2017 up to 2025

Year	Average Number of ships per day	Number of hours of service per day (minutes)
2017	6	180
2018	6	180
2019	6	180
2020	6	180
2021	6	180
2022	6	180
2023	6	180
2024	6	180
2025	6	180

Source: Results of the analysis, 2017

The table 11 shows that from 2017 up to 2025 the number of ships with an average of 6 ships, the time or number of guiding services per day (minutes) takes 180 minutes with service time of each ship for 30 minutes. The forecast (for casting) for the year 2017 up to 2025 can be seen in Table 12.

Table 12. The Forecasting of Ship Movement in 2017 at the Port of Soekarno-Hatta Makassar

Year	Code year	Number of ship movements
	X	Y
2017	8	4767
2018	9	4750
2019	10	4734
2020	11	4717
2021	12	4700
2022	13	4683
2023	14	4667
2024	15	4650
2025	16	4633

Source: Results of the analysis, 2017

The forecasting is done by using a linear trend that produces a linear function form as follows:

$$Y = a + bX$$

$$a = 4901,93333$$

$$b = -16.775$$

Factors Cause Delay in Ships Guidance

There are several factors that cause the delay in guiding the ship, such as:

- a) **Natural factors.** Natural factors that occur at the port, including at the Port of Soekarno Hatta Makassar is a factor of sudden high waves with high waves can affect the speed of the ship in a change of motion. Similarly, the heavy current that occurs when the ship has been at the point of waveguide with an average distance of 10 to 30 nautical miles from the destination pier. Meanwhile, the next weather factor is the wind speed that is enough to give the effect of the speed of the ship to reach the pier. Good command from the skipper to waveguide is needed.
- b) **The condition of the ship.** The age of the ship is also a contributing factor to the delay in guiding the ship. The ship with old age affects the speed of the ship's track as well as the weight and load of the ship. The better the condition of the ship increasingly affect the speed as well as facilitate the waveguide to guide him to the pier.
- c) **Scouting.** The aids referred to in scouting are the number of scout motors and pilot ships owned by the port. The lack of a waveguide that is owned by the port can affect the movement of the ship so it can be a complaint from the shipping company as its customers. The more late the boat guidance the greater the cost incurred by the ship due to the long waiting time outside the pier. While the ship's engine should not be turned off. Adequacy scouting can affect the effectiveness and efficiency of ship guiding. The human resources of personil pilot also affect the ship's guidance. Skill ability, dexterity, speed and accuracy of a waveguide are needed. A good community between Master and a scout can speed up the pace of the ship to arrive at the pier. Next is a good pier condition can optimize the work of a waveguide to speed up the guiding of the ship until it arrives at the destination pier.

IV. CONCLUSION AND RECOMMENDATION

Conclusion

The various factors that support the operational guidance in the port of Soekarno-Hatta Makassar as follows: (1) Availability of guiding personnel in the service of the number of movement of ships processing motion at the Port of Makassar. (2) The availability of scouting facilities and vessel (pilot motor, tugboat to assist in berthing and unberthing) of 6 ships become the strength in every task service implementation at the port of Makassar, (3) ability of guiding person or professional personality source Human power working in ship-hunting services that will process ship berthing, unberthing, anchored and other motion movements will minimize the use of more maximal working time, (4) Ship condition, the age of the ship will make the activity in the guiding process easier and does not take much time.

The results of the analysis of scouting personnel needs on the port of Makassar to the number of ship movements, by looking at the movement of ships in the Port of Soekarno-Hatta Makassar from 2002 up to 2016 and the results of forecasting using the formula Least Square (Linear Trend) then the number of guiding personnel as much as 8) people and supporting facilities of 6 pieces are still sufficient, so the guiding service is still quite good.

The forecasting of the number of scouting personnel to be needed at the Soekarno-Hatta port of Makassar until 2025, is still sufficient with the number of personnel 8 people. Assuming that based on the calculation result through linear trend, it is found that the average movement of ships is 6 ships per day with the time spent 30 minutes in the process of ships movement on the port of Soekarno-Hatta Makassar.

The average movement of ships in every day from the results of data analysis, providing forecasting until the year 2025 is still sufficient, but if the expansion of the pier or mooring port there will be the addition of guiding personnel to serve the movement of the ship.

Recommendation

The suggestion in this research is: to PT Pelabuhan Indonesia IV (shareholder) Makassar in order to make the result of this research as a consideration in making policy of human resource improvement (scout personnel) in carrying out its duty and responsibility in guiding ships at the port of Soekarno-Hatta Makassar, as well as the adequacy of suggestions and guidance infrastructure so that guide services can be improved. For seafarers in general who will be the guiding force and who has become a guide on the scope of Indonesian Port (Pelindo), especially the region of Makassar, to make reference resources in improving its competence professionally in carrying out its duties and responsibilities in guiding on board. Then the policy in decision making in the government involved at the port of Soekarno-Hatta can make reference/reference data if there is addition or expansion of port especially in Makassar area.

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