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The Effectiveness of Container Transfers at Temporary Storage Area in Tanjung Priok Port

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Abstract

This study aimed to know the difference between PT X and PT Y in the effectiveness of container transfer at Temporary Storage Area in Tanjung Priok Port. The study used documentation methods with secondary data. The samples were 2 companies with a 24-month observation period taken by census technique. The data then were analyzed using descriptive statistics and inferential statistics t-test. The results showed that there were significant differences in the number of containers that were successfully moved by PT X and PT Y. There was also a significant difference in the time of container transfer between PT X and PT Y. In conclusion, there was significant difference in the number of containers that have been successfully transferred and the time of the containers transfer between PT. X and PT. Y.

Keywords: effectiveness, transfer, time, container

Introduction

Strategic issues in the field of transportation in Indonesia are the low productivity of the port, limited infrastructure and superstructure, port operations that are not well structured and high logistics costs. As a result, the transfer of LCL (less than container load) containers to the temporary storage area (*TPS: Tempat Penimbunan Sementara*) is not optimally implemented because it is still relatively slow in terms of time. The number of LCL containers transferred also has not been optimal yet. Lack of accuracy in container placement can also impede the service of container transfer activities at the port. Moreover, there is unused time or wasted time during the ongoing container transfer activities. In short, all service elements are not provided maximally. In addition, the limited time to move the LCL container to the *TPS* caused financial losses for *TPS* service users.

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Containerization in container form is a very significant change in the sea transport system. Due to the existence of containerization, there are changes from various aspects such as changes in trade patterns, shipping routes, the design and size of the ships, the function and size of loading and unloading equipment, customs procedures, and port technology. Goods owner also tends to choose containers to transfer their goods because it is more secure, safe, and has more capacity.

The container is a box made of metal which contains items commonly called as general cargo sent by sea (Amir MS, 2007). The container is the latest cargo unit packaging which was introduced in 1960 and started with a size of 20 feet (twenty feet container). In general, containers are made from materials such as steel, aluminum, and polywood or FRP (fiberglass reinforced plastics) (Kramadibrata, 2002).

The container needs to be transferred from one place (ship) to another place (shelter) in the form of receiving and delivery. That process is done by transferring the cargo from the *TPS* to the vehicle at the door of *TPS* (Suyono, 2007). In addition, the container also needs to be unloaded. According to Sudjatmiko (2007), loading/unloading activity is an activity of transferring goods from one place to another. It can also be said to unload the goods from the ship to the dock before transferred to the warehouse or vice versa. Unloading service providers are companies that carry out loading and unloading activities such as stevedoring, cargodoring, as well as receiving and delivery).

In loading/unloading activity as well as in container transfer, a temporary storage area is needed. In the Regulation of the Directorate General of Customs and Excise Number PER-28/BC/2013, *Tempat Penimbunan Sementara* (Temporary Storage Area), hereinafter abbreviated as *TPS*, is a building and/or field or other similar places in customs area to stockpile goods while waiting for loading or the expenditure. Origin *TPS* is *TPS* in the Customs Area where the unloading process is. This is the origin place of the imported goods before they are

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submitted by PLP to be stockpiled. Meanwhile, destination *TPS* is the *TPS* where the imported goods proposed by PLP will be stockpiled. *Pindah Lokasi Penimbunan* or *PLP* (Storage Transfer) is a transfer of storage site for imported goods which have not been completed their customs obligations. In short, *PLP* is a transfer of goods from Origin *TPS* to the Destination *TPS* in the supervision area of Customs Office. The Online System of Temporary Storage Area, hereinafter abbreviated as Online *TPS* System, is an Electronic Data exchange system between the Customs Office and TPS for data relating to the import and export of goods to and from *TPS* and other administrations. The Online System of Temporary Storage Area, hereinafter called as Online TPS System, is a system of Electronic Data Exchange between the Customs Office and TPS for data relating to the entry and expenditure of goods to and from TPS and other administrations. The level of use of Yard Occupancy Ratio, hereinafter called as YOR, is the comparison between the number of stacking field uses and the available stacking field (ready for operation) calculated in tons/day or m^3/day units. The Usage Level of Warehouse (Shed Occupancy Ratio), hereinafter abbreviated as SOR, is the ratio between the amount of stacking space used and the available stacking place calculated in tons/day or m^3/day. The transfer of goods/containers can also be called as overbrengen. The four general stages in the overbrengen activities are as follows: (1) processing the application documents for overbrengen; (2) withdrawal of containers from Container Terminal to the *TPS* (delivery); (3) dispensing the cargo from the container into the CFS warehouse (unloading).

According to Subandi (2007), container terminal is an area of container storage, as well as loading and unloading facilities, on a large scale. The container port is a kind of port which specializes in logistics shipping services. The logistics in the container port have been packaged in the form of containers (Wibowo, in Maryanie and Sutopo, 2011). The container port at least has to be equipped with supporting facilities such as moorings, docks, stacking fields, and

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loading/unloading equipment in order to make the loading/unloading process is able to run smoothly (Salim, in Maryanie and Sutopo, 2011).

The cargo transfer from ships to land transport vehicles either through warehouses or not is called as unloading activities. Meanwhile, an activity of transferring cargo from land vehicles or warehouses to ship is called loading (Lasse, 2014). Either through warehouses/fields or directly to the ship or land vehicle, both activities mentioned above are called loading and unloading. In the framework of loading and unloading activities, mechanical equipment such as cranes is used. The cranes are quayside gantry crane and rubber tyred yard gantry crane. Quayside gantry crane stands and walks on rails at the hipgir dock with a power source from power plants on land or diesel machine in order to help the operation of the ship. Rubber tyred yard gantry crane is the heaviest field crane that serves container transfer activities both for quay transfer operations and for receipt/delivery operations. There are two types of rubber tyred yard gantry crane. They are those that run on wheels (rubber tyred gantry crane) and those that run on rails with steel wheels (rail-mounted yard gantry crane) (Lasse, 2014).

According to Triatmodjo (2008: 19), the container loading and unloading process require several facilities as follows: (1) the dock is the mooring needed to dock the ship. Considering the large size of the container ships, the pier has to be long and deep. The pier length is between 250m and 350m while the depth is from 12m to 15m. It depends on the size of the ship; (2) apron is the area between the ship's ramps and *Marshaling Yard*, with a width of 20-50 meters. At this apron, container loading and unloading equipment are placed. The equipment is gantry cranes, railroad tracks and trailer truck roads, and others; (3) *marshaling yard* is used to temporarily place the container to be loaded onto the ship. Field width is approximately 20-30% container yard; (4) *container yard* is a container stacking field that contains a full container load (FCL) and empty containers that will be shipped. The stacking method can reduce the container yard area; (5) container freight station (CFS) is a warehouse provided for goods transported in Less Than

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Container Load (LCL); (6) the watchtower is used to supervise all places, to regulate and to direct all activities in the terminal; (7) a maintenance workshop is used to repair empty containers that will be returned; (8) other facilities such as electric power sources are used to refrigerated special containers, fuel supply, fresh water supply, lighting for night work, equipment for cleaning empty containers as well as loading and unloading equipment, and high voltage electricity to operate the faucets.

Morlok (2015: 65) stated that the container port activities are the transfer of goods from land transportation to sea transportation with a full container transport system. The activities are as follows: (a) the container (*Peti Kemas* or *PK*) is transported by land transport (trailer) to the port which then is transported by rubber tyred gantry (RTG) before placed in the stacking field; (b) by using RTG, the *PK* is appointed and organized to wait for its carrier; (c) after the carrier arrive and is ready at the dock, the *PK* from the stacking field is lifted by RTG. Then, it is placed on the head truck (HT) raised to the dock's apron of the ship; (d) by using a gantry crane, the *PK* is lifted from HT and put into the ship; (e) after the goods are transported to the ship, the ship leaves the pier to the destination country or region.

The loading and unloading process in Indonesian ports, in general, can be described as follows: (1) the container is unloaded on the ship to be lifted by a gantry crane; (2) the gantry crane carries the container along the portal (stevedoring); (3) the container is placed on the head truck; (4) the container is transported by the head truck to the stacking field; (5) Rubber Tired Gantry (RTG) transports and organized containers in order to make the containers well arranged on the field (cargodoring); (6) the container is transported and placed on land transportation namely trailer to be delivered (delivery) and vice versa (Soeharto, in Maryanie and Sutopo, 2011). Based on these stages, it is noted that half of the time of the total stages is spent only on the process of transferring logistics from the

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dock to the stacking field which is commonly called as a cargodoring process (Indonesia Logistics Association in Maryanie and Sutopo, 2011).

Due to such conditions, the effectiveness of containers transfer becomes very important. Effectiveness is the utilization of resources, facilities, and infrastructure in a certain amount which is consciously set beforehand to produce a number of goods for services carried out (Siagian, 2007). Effectiveness related to the problem of how to achieve the goals or results obtained, the usefulness/ benefits of the results obtained, the level of function of the elements or components, and the problem of the level of the user (Muhidin, 2009). Effectiveness can be considered as doing the right things (Drucker, in Handoko, 2009). It also can be considered as a measure that states the extent to which goals or objectives (quality, quantity and time) have been achieved. It is also a form of assessments made with respect to individual achievement and group organization. It is expected to get the closer to the achievement in order to be more effective in the assessment results (Komariah & Tratna, 2007). Effectiveness can also be defined as achieving the goals according to the expectation (Adair, 2008). At last, usability and effectiveness support the objectives (Sejathi, 2011).

According to Talley (2007: 34), the economic performance of ports can be evaluated for its effectiveness. This is indicated by its findings in the form of choice variables or indicators of port performance effectiveness related to the objectives of operational effectiveness as follows: (1) the average *port charge* per item flow in tons; (2) the average level of the loading process of the ship. For example, the number of tons unloaded on a ship per hour of load time; (3) the average level of the unloading process of the ships. For example, the number of tons unloaded on a ship per hour of unloading time; (4) the average cargo service level for port vehicle such as tons of cargo loaded per port vehicle per hour of load time; (5) the average level of unloading services for port vehicle such as tons of cargo unloaded per port vehicle per hour of unloading time; (6) the average time per day to enter the port lane at allowable depth and width dimensions (a port

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channel accessibility indicator); (7) the average time percentage per day entering the port harbor at the permissible depth and width dimensions (port berth accessibility indicator); (8) the average time per day of the port lane opens for navigation (port channel reliability indicator); (9) the average time percentage per day of port harbor opens for ships docked (port berth reliability); (10) the average time percentage per day of port entrance (port entrance gate) is open for land vehicles (entrance gate reliability indicator); (11) the average expectation of possible damage to the ship when it is in the port; (12) the average expectation of possible loss of ship equipment in port; (13) the average expectation of possible damage to the vehicle in port; (14) the average expectation of possible damage to the vehicle in port; (15) the average expectation of possible loss of vehicle equipment in port; (16) the average expectation of possible cargo damage in port; and (17) the average expectation of possible cargo loss in port. Thus, the effectiveness of container transfer is the use of container transfer activities according to the specified target with indicators of time and facilities.

Some previous studies relevant to this study were studies conducted by Witjaksono *et al* (2016). The results of previous studies showed that the storage time is still high or in an average of 6 days or more. This long storage period was resulting in increased shipping costs. It also affected the density level of the container stacking field. The average waiting time of the containers was long due to the inspection and process of required documents in the terminal stacking area, especially for imported goods. The results of Barnabas and Nirmalawati (2012) also presented the equipment as part of labor facilities and productivity that requires skills greatly determined the loading and unloading system which had implications for the effectiveness of loading and unloading at Pantolan Port. In addition, the results of Prasetyo and Setiono's study (2011) showed the importance of good loading and unloading facilities of PT Pelindo III Tanjung Perak Branch Surabaya at Jamrud Utara Terminal. Facilities had a key role in ensuring the

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continuity and smoothness of sea transportation in order to increase work productivity. Thus, the following hypotheses were set:

H_1: How big is the difference in the number of LCL containers transferred to the destination *TPS*.

H_2: How big is the time difference in LCL transfer between destination *TPS*s.

Method

This study used the documentation method with secondary data. The samples were 2 companies with the observation period of 2016-2017 consisting of 24 months. The data were obtained using census techniques. Data were analyzed using descriptive statistics and inferential statistics or t-test.

The lowest number of PT X containers was 107 while the highest number was 744. The data range value was 637 with the average (mean) score of 307.42. The mode = 375, median = 43.00, standard deviation = 148,905, and variance of 22172.601. This means that the average number of containers successfully transferred to PT X is 10.25 containers (307.42: 30 days). Meanwhile, in PTY, the lowest number of containers was 24 while the highest was 340. The data range was 316 with the average (mean) score of 151.75. The mode = 24, median = 105.50, standard deviation = 106.664, and variance of 11377.152. This means that the average number of containers successfully transferred to PT Y was 5.06 containers (151.75: 30 days).

The lowest container transfer time of PT X was 10 while the highest time was 308. The data range score was 298 with the average (mean) score of 127.88. The mode = 29, median = 104.50, standard deviation = 98.322, and variance of 9667.245. Thus, to transfer the average of 307.42 containers per month (see: Table 4.1), it took 0.42 day (127.88 days: 307.42) or 10.08 hour (0.42x24hours) for 1 unit container. Meanwhile, the lowest score for PT Y was 18, while the highest score was 1744. The data range was 1726 with the average (mean) score of

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308.75. The mode = 18, median, 105.50, standard deviation – 434. 642 and variance of 188913.326. Thus, in order to move an average of 151.7 containers (see Table 4.2) per month, it took 0.49 days (151.75 days: 308.75) or 11.76 hours (0.49x24) for 1 unit of container.

The difference in the number of containers successfully transferred by PT X and PT Y in 2016 – 2017 seen from the t_{score} of 6.147 > t_{table} for df = 23 at the error rate (α) 0.05 (5%) of 1.713. Thus, H_0 is rejected and H_1 is accepted. In other words, there was a significant difference between the number of containers that have been successfully transferred by PT X and PT Y. Meanwhile, the difference in the container transfer time between PT X and PT Y can be seen from the value of t_{score} of 2.324 > the value of t_{table} for df = 23 at the error level (α) 0,05 (5%) of 1.713. Thus, H_0 is rejected and $H_1$is accepted because there was a significant difference in the time of container transfer between PT X and PT Y.

Discussion and Result

The results of this study indicated the number of containers that have been successfully transferred between the destination TPS at Tanjung Priok Port for PT X per month was minimum of 107 containers and maximum of 744 containers with the average of 307.42 per month. The minimum number of containers successfully transferred by PT Y was 24 containers and the maximum number of 340 containers with the average of 151.75 per month. Thus, from the average number, it can be inferred that PT X managed to transfer more containers than PT Y.

The results of this study also presented the accumulation of container transfer time of PT X every month was minimum of 10 days and the maximum transfer time was 308 days with the average of 127.88 days per month. Thus, in order to transfer the average of 307.42 containers per month, it took 0.42 days (127.88 days: 307.88) or 10.08 hours (0.42x24 hours) for 1 container unit. Meanwhile, the minimum transfer time of PT Y per month was 18 days and the

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maximum transfer time was 1744 days with the average of 308.75 days per month. Thus, in order to move the average of 151.7 containers per month, it took 0.49 days (151.75 days: 308:75) or 11.76 hours (0.49x24) for 1 container unit. Judging from the container transfer time, PT X has faster transfer time (10.08 hours) compared to PT Y (11.76 hours).

The results of this study empirically showed a significant difference in the number of containers that were successfully transferred by PT X and PT Y with an statistical attention of $t_{score} = 6.147 > t_{table} = 1.713$. This result was in accordance with the results of the descriptive analysis which showed that the number of containers successfully transferred by PT X (7378 containers) was more than PT Y (3642 containers).

In addition, the results of this study also empirically showed a significant difference in the time of container transfer of PT X and PT Y with the score of $t_{score} = 2.324 > t_{table} = 1.713$. This result is in accordance with the results of the descriptive analysis which stated that the container transfer time of PT X (3068 days, 10.08 hours/ container) is shorter than PT Y (7410 days, 11.76 hours/ container).

The findings of this study were in line with the results of a study by Witjaksono *et al* (2016) which presented that high storage time with the average of 6 days or more were resulting in increased shipping costs and also affected the level of container stacking field (YOR). However, compared to the results of the study by Witjaksono *et al* (2016), the findings in this study were relatively better in terms of time because they only required a container transfer time with the duration of 10.08 to 11.76 hours.

In general, this empirical fact indicates that PT X had a better container transfer performance than PT X. PT. X was more effective (number of containers moved) and efficient (time of transfer) in container transfer activities compared to PT Y. It also showed the management of PT X was more professional in providing container transfer services compared to the management of PT Y. This condition

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confirms that PT Y needs to be more professional, effective and efficient in providing container transfer services in order to have the potential to compete. At the same time, PT X not only needs to maintain the container transfer that has been achieved but also needs to increase its effectiveness and efficiency in providing container transfer services in order to maintain their performance and to have superior competitiveness. The results of the study conducted by Witjaksono *et al* (2016) also showed that the high storage time is still on the average of 6 days or more. It caused an increase in freight costs. It also affected the level of container stacking field (YOR).

Conclusion

In conclusion, PT X managed to transfer containers more than PT Y managed to do. Likewise, the container transfer time of PT X was faster than PT Y. There was a significant difference in the number of containers that have been successfully transferred by PT X and PT Y. There was also a significant difference in the time of container transfer of PT X and PT Y.

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