

INFORMATION TECHNOLOGY IN PORT CONTAINER TERMINAL: AUTOMATION TALLY SYSTEM IMPLEMENTED IN TANJUNG PRIOK PORT

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Abstract: Information technology has become an important part of port management. Proper management of the port system is essential for more effective and efficient sea transport processes. This situation explains why the movement and container checking systems at the ports are given big priorities. Explain that information technology and its role in improving the operational system in port container terminal, this research will discuss about Implementation of information technology CCTV Automation Tally in container yard at Port of Tanjung Priok and the impact to the port service portion of effective loading and discharge the container from and to the vessel at Port of Tanjung Priok. CCTV Automation Tally Technology is a new technology first used in Indonesia. This research used research method descriptive with qualitative approach.

Keyword: Information Technology, Port Operations, Container, Efficient Transport, Port of Tanjung Priok

Introduction

Shipping, or the business of transport, is an essential means that facilitates international trading activities. Due to its cost-effective intermodal operations, most of the international trade in manufactured goods and an increasing share of commodities are transported through container shipping services in order to carry the large quantities of cargo. This container shipping service is mostly provided by liner shipping companies. (Hoffmann, Wilmsmeier, & Lun, 2017)

Maritime transport is at the core of international trade in merchandise. Approximately 80% of volume of goods exchanged in the world are transported via sea, in terms of their capability to carry a lot of cargo with a relatively low cost. (UNCTAD, 2008). Related to the high level of maritime transport utilization, the ship's design is also made to be larger in order to carry the big capacity as well, and with some variations (Nurtjahjo, Rianto; SE, 2016)

In recent times, the maritime industry has witnessed an evolution in port development, the use of information technology in it (Dobler, D. W., & Burt, 1996), this information technology functioned to improve the data accessibility in order to get an accurate data. (Whardana, n.d.)

In order to ensure the efficient delivery of goods, enterprises benefit from two or more modes of transport. Multimodal transportation is the transportation of goods performed with at least two different modes of transport. Enterprises engaged in multimodal transportation should be more cooperative, have a good and modern reloading equipment and new integrated IT systems. (Jarašūnienė, Batarlienė, & Vaičiūtė, 2016)

The influence of service innovation on competitive advantage and business performance has increased noticeably. Service innovation is an effective method for enhancing firm performance and ensuring long-term survival. (Ryu & Lee, 2017)

For the national development through ports, in addition to facilities and infrastructure at the ports that must be adequate, IT Systems also has an important role in its duty to process information related the goods from origin to destination (Sitorus et al., 2016)

A good and modern equipment with the new integrated IT systems has a very close relationship with the port service and port performance, they are still positively and highly affected by IT development. IT may have enhanced market accessibility and improved market logistics for transportation. (Nath & Liu, 2017). The good port performance can increase the total of Port throughput too. (Triyani, n.d.)

However, that IT access can have a positive impact on this service trade items only in countries with sufficiently high IT skill user. If the IT skill user are not sufficiently high, IT access will not produce significant positive effects on services trade. (Nath & Liu, 2017)

Ports are now regarded as a ‘service center’ (UNCTAD, 1999). Ports play an important role in sustainable supply chains through high operational and efficient logistics activities for the benefits of collaborative firms. (Compes Lopez, R. and Poole, chain: the case of Valencia, 20, & Journal, 3(1), n.d.)

The important thing about its service can not be denied and avoided by companies relating to shipping, because even their temporary storage service is such an important thing. (Umagapi et al., 2016)

We realize there are still many shortcomings in this writing due to limitations in terms of data and time is relatively short. We hope that this paper will inspire other parties, especially other domestic ports to pay more attention to the need for Information Technology in handling services at the port.

In order to make the research monitor easy, researchers propose of model below:

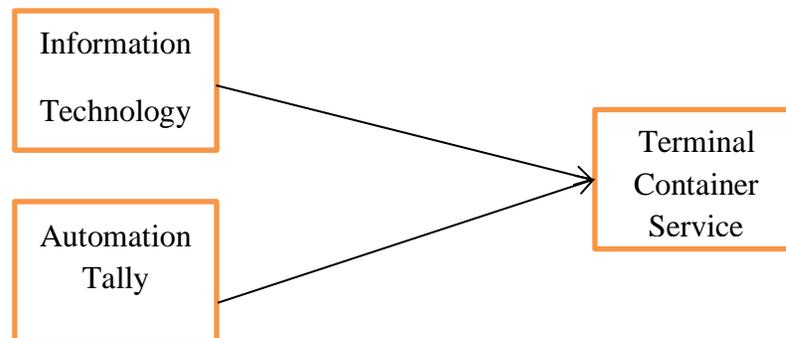


Figure 1. Model of Research

Method

The principal purpose of this research is to describe the technology in checking containers at the ports, and their impact on the effectiveness of shipping activities. To achieve this, the current study utilized methods Descriptive, which combines non-structured interviews with primary and secondary data analysis. After non-structured interviews, primary data and secondary data to determine whether existing Information Technology is actually implemented by Port, and the new automation tally system will be

implemented, and the features and benefits of this Automation Tally Implementation.

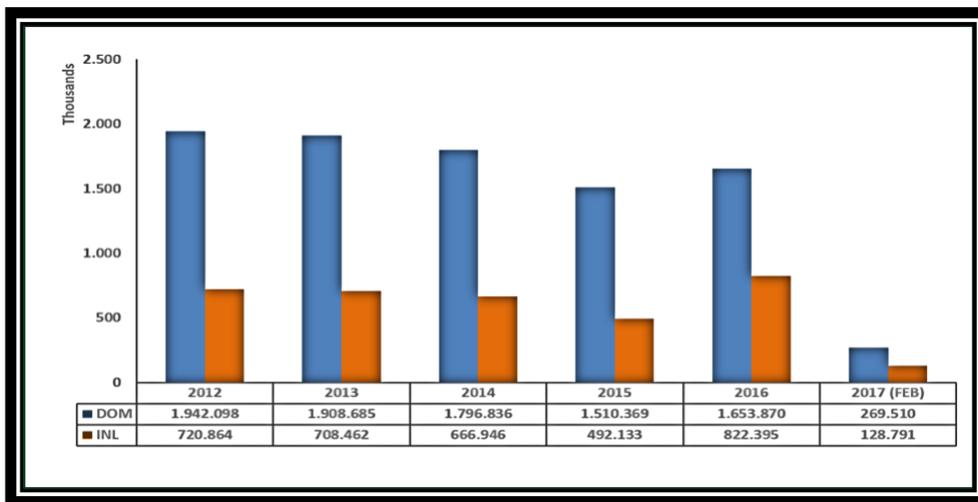
Discussion and Result

Port of Tanjung Priok

Port of Tanjung Priok were selected as the target in this research due to several reasons. Port of Tanjung Priok is the largest and the busiest port in Indonesia, located on coast of North Jakarta. The strategic location with a hinterland that is the area with the activity of trade and industry, making the Port of Tanjung Priok as the main port on the island of Java.

With the support of technology and modern amenities, Port of Tanjung Priok is able to service ships of the latest generation with a capacity of 4.000 TEUs (Annual Report IPC, 2016). Container flow at this port continues stable tend to increase every year, start from 2012 until February 2017 (Table 1).

Table 1. Container Flow Statistics



Source: Priok Port Report, 2017

Because of the large flow of container flows at the Port of Tanjung Priok, in need of a more adequate system for the creation of container loading and unloading efficiency as well as the transfer of containers, one of which has

been applied in the Port of Palembang, and will also be implemented in the Port of Tanjung Priok, Jakarta.

According to (Tongzon, 1995), terminal efficiency is measured by the amount of containers loaded and unloaded per berth hour. Inefficient of operation loading and unloading containers at ports will result in indirect costs. Inefficient loading and unloading activities can occurred due to several things, delays start, delays due to food breaks, delays due to equipment damage, and other events including handling and clearance declarations. Incoming ship queues, and ship to ship transfer activities due to low sead draft of the Port also caused delays to ship schedules.

Information Technology at the Port of Tanjung Priok

To meet the needs of information technology-based transactions that are an absolute necessity, the Port of Tanjung Priok has held cooperation with PT Telkom. This cooperation is realized through the Indonesia Logistic Community Service (ILCS) project based on information and communication technology in creating an integrated online platform.

Cooperation with PT Telkom for the development of Information and Communication Technology (ICT) in PT Pelabuhan Indonesia II (Persero) Environment covers the areas of operations, finance, technology and personnel fields. In addition, also for the development and partnership (strategic partnership) in the development of e-Trade Logistic National especially in supporting the implementation of Indonesia National Single Window.

Previously, the information technology system implemented in Tanjung Priok Port is still in In House area (a local seaport in Tanjung Priok). But with the ICT Project information system is valid on line to all branches in the environment of PT. Pelabuhan Indonesia II. The platform is expected to enable users of logistics services both at home and abroad to properly monitor and manage the movement of goods, documents and payments as well as manage

the user assets of services (such as ships, trucks, cargo, containers) easily and securely whenever and wherever to reduce logistics costs and time.

To monitor most of the port movement, currently Tanjung Priok Port has been equipped with 80 points of Closed Circuit Television (CCTV) facility from 60. In fact, there will be additional CCTV in 26 points again, so that 80 percent of port activities oriented to public service can be monitored by management.

Automation Tally in the Port

The findings to be implemented in Port of Tanjung Priok is the first to be used in Indonesia, so this is the first step of information technology implementation in Port Indonesia to improve the system for record and check the container at container yard.

Using the cost of approximately Rp. 300.000.000,00, this Automation Tally is an IT device to record the number of containers unloaded from the ship that was done by man manually on the edge of the dock or known as Whiskey, now it only needs a computer device from behind the control room that is connected with CCTV installed in Container Crane (CC).

The technology automation tally is suitable for use in Port of Tanjung Priok because currently Port of Tanjung Priok is the busiest Port in Indonesia. The flow of container in the port is very high, so expect the development of technology at container yard, in record or checking the container.

Operation Automation Tally uses 3 Monitors that are managed in Control Room by one officer. The 3 monitors are: Monitor 1 (on the left) for Preview of CCTV Container Crane 01, Monitor 2 (in center) for Preview of OPUS PDA, and Monitor 3 (on the right) for Preview of CCTV Container Crane 02. Actually, the number of monitors used is depend on the number of container cranes in the target implementation port.

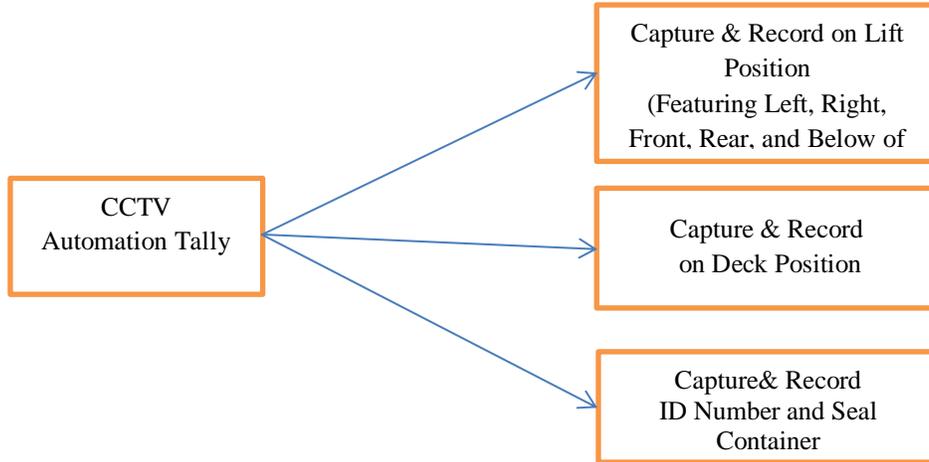


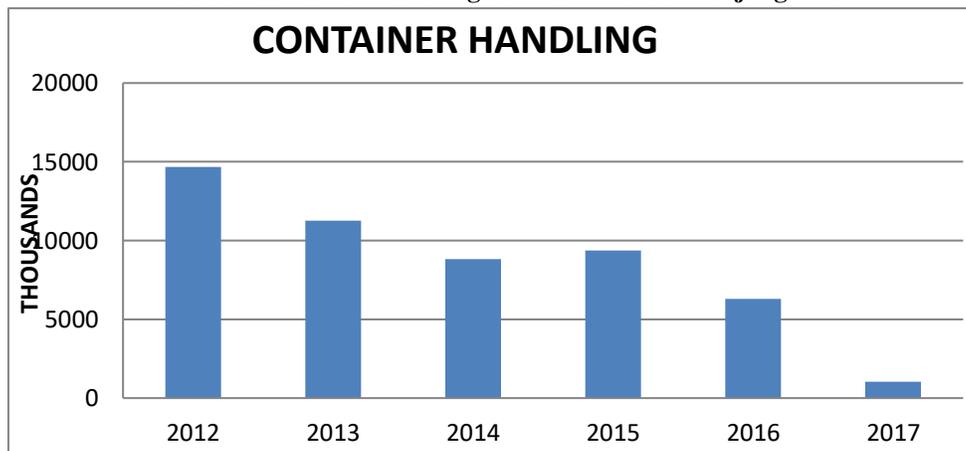
Figure 2. Automation Tally System Features

Table 2. Benefits of Implementation Automation Tally System

<p><u>SPEED</u></p> <ol style="list-style-type: none"> 1. Real Time Transactions 2. Reduce Time at Quay Transactions 	<p><u>SAFETY</u></p> <ol style="list-style-type: none"> 1. Reduce people at the quay area due to executing transaction by system (remote system)
<p><u>ACCURATE</u></p> <ol style="list-style-type: none"> 1. Accurate data due to entry data guided by CCTV & Camera 2. Provide report (include CDR – Container Damage Report) as a real time 	<p><u>LESS PAPER</u></p> <ol style="list-style-type: none"> 1. No need to print many paper for EIR and SP2. Directly send by system to who needs the container information.

Service at the Port

Table 3. Container Handling Service in Port of Tanjung Priok



Source: Priok Port Report, 2017

There are some services provided by Tanjung Priok port, one of them is Container Handling. In their activity for handling the container, Port of Tanjung

Priok provides the general types of equipment employed in container terminals, namely Quay Cranes, trucks, and Yard cranes.

From table above, the flow of container handling at Tanjung Priok Port in 2012 to February (2017) increased the largest number in 2012. It decreased in the most number by 2013. After this decreased and increased in stable amounts in the year 2014 and 2015.

In conjunction, this Autotally implementation can minimize the time spent in Container Handling activities in Port of Tanjung Priok. Port Service will also tend to improve, because information container conditions in Port, can be directly sent by system to those who need the information.

Conclusion

Regarding to the high exports and imports of goods through sea lanes, container ports are a key element for increasing the growth rate of trade and the economies of the countries, improving the quality and use of information technology is essential to facilitate the role of ports as a driver of economic success in the modern competitive environment.

This paper deals with an optimization container checking and report in a real container terminal. CCTV Autotomation Tally is the one technology which is used for Container Checking. With all its good impact for the development of the port, it is expected that CCTV Automation Tally can be implemented in all ports in Indonesia.

An efficient and modern port is an important component that determines ship accommodation and increased port throughput. Terminal container operations in modernized ports are also important to avoid delays and uncertainties, which is also helpful in improving sea transport connectivity

References

Compes Lopez, R. and Poole, N. (1998). Q. assurance in the maritime port logistics, chain: the case of Valencia, S. S. C. M. A. I., 20, & Journal, 3(1), P. 3.-44. (n.d.). Compes Lopez, R. and Poole, N. (1998). Quality assurance

- in the maritime port logistics chain: the case of Valencia, Spain. *Supply Chain Management: An International Journal*, 3(1), pp.33-44.
- Dobler, D. W., & Burt, D. N. (1996). (1996). *Purchasing and supply management: Text and cases*.
- Hoffmann, J., Wilmsmeier, G., & Lun, Y. H. V. (2017). Connecting the world through global shipping networks. *Journal of Shipping and Trade*, 2(1), 2. <https://doi.org/10.1186/s41072-017-0020-z>
- Jarašūnienė, A., Batarlienė, N., & Vaičiūtė, K. (2016). Application and Management of Information Technologies in Multimodal Transportation. *Procedia Engineering*, 134, 309–315. <https://doi.org/10.1016/j.proeng.2016.01.012>
- Nath, H. K., & Liu, L. (2017). Information and communications technology (ICT) and services trade. *Information Economics and Policy*. <https://doi.org/https://doi.org/10.1016/j.infoecopol.2017.06.003>
- Nurtjahjo, Rianto; SE, M. (2016). Dwelling Time, 220–228. Retrieved from <http://sbm.binus.ac.id/2016/04/14/dwelling-time/>
- Ryu, H.-S., & Lee, J.-N. (2017). Understanding the role of technology in service innovation: Comparison of three theoretical perspectives. *Information & Management*. <https://doi.org/10.1016/j.im.2017.08.003>
- Sitorus, B., Irgan, T., Sitorus, H., Ricardianto, P., Jenderal, S., Tinggi, S., & Transportasi, M. (2016). EVALUASI MANAJEMEN SISTEM INFORMASI DAN THE EVALUATION OF INFORMATION SYSTEMS MANAGEMENT AND PORT INFORMATION, 3(3), 367–378.
- Tongzon, J. L. (1995). Determinants of port performance and efficiency. *Transportation Research Part A*, 29(3), 245–252. [https://doi.org/10.1016/0965-8564\(94\)00032-6](https://doi.org/10.1016/0965-8564(94)00032-6)
- Triyani, D. (n.d.). CUSTOMER RELATIONSHIP MANAGEMENT CUSTOMER RELATIONSHIP MANAGEMENT AND PORT PERFORMANCE, 4(1), 59–74.
- Umagapi, B. W., Manajemen, S. T., Trisakti, T., Amonalisa, S., Manajemen, S. T., Trisakti, T., ... Trisakti, T. (2016). BONGKAR MUAT GENERAL CARGO THE DOCUMENTS SERVICE QUALITY AND THE SPEED, 3(3), 379–386.
- UNCTAD, (1999), Technical note: the fourth generation port. UNCTAD Ports Newsletter, 19, 9–12.
- UNCTAD (2008) The modal split of international goods transport. Transport Newsletter, UNCTAD/SDTE/TLB/MISC/2008/1.
- Whardana, F. T. (n.d.). G- TRANE INFORMATION SYSTEM AND EMPLOYEES ' PERFORMANCE AIR FREIGHT DEPARTMENT OF PT NISSIN TRANSPORT INDONESIA, 59–68.