Study of Container Dwelling Time in Indonesia: Current Condition & Challenge

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Abstract. As a preliminary research for further research related to the impact of reducing Dwelling Time (DT) to logistic cost, the general aim of this paper is to provide an overview of current condition of the DT in Indonesia and movements of containers that incorporates the various factors affecting the DT of containers in container terminals. This research based on secondary data of container handling process, the data used to identify process of the container in the container terminal. DT monitoring data of the container used to analyze the distribution of inter-arrival time, service time and dwell time of container. Based on data analysis The average of containers DT in Indonesia during 2017 is 4.07 days for not custom inspected container and 11.9 days for custom inspected container, the longest duration process is from stacking to custom clearance with duration of 69.7 hours or 47.82% of total container DT.

Keywords: dwelling time, container, port, logistics

1 Introduction

The global economic growth affects the international trade growth, especially for export and import activities. The total volume of container movement in the world is 171 million TEU in 2014 with an average growth of 5.3% [1]. The growth of exports and import affects the growth of world container transportation. Around 80% of world trade is carried out through sea transportation so that the port performance as the gateway to international trade is a major determinant of a country's competitiveness. Meanwhile, as a result of shipping competition in the world, shipping companies are trying to reduce transportation costs by increasing the size of the ship, to the maximum that can be operated or increase the frequency of shipcall at the port through increase the number of ships. Currently, the largest container ship operates are more than 19,000 TEU (MV CSCL Globe, 19,100 TEU, Asian-European trade route).

As a result of increasing container ship size and number of ships, container terminal should adapt with this development by increasing vessel access capacity, deepening port pool and channels, extending the quay, adding container ship supporting equipment, increasing container transfer capacity, increasing productivity of container handling, adding equipment for loading and unloading, expanding the container yard to accommodate more containers, speeding up inspection of containers which is one of the Dwelling Time (DT) components.

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The overall goal is to increase time efficiency and reduce the total cost of ships and containers at the port which part of logistics cost. Increasing ship service efficiency means minimizing TRT (Turn Round Time) of ships at the port. Increasing container time efficiency mean speeding up the process of containers movement in terminal to reduce the time.

The delivery speed of cargo is part of the main logistics indicators. Not many research has been carried out related to container transfer capacity efficiency, this is closely related to port management policies or export and import policies of a country. Especially in Indonesia, the government since 2008 has sought to reduce DT, the last instruction given is the maximum DT limit for 3 days. With this policy the container owner must move the container from the container terminal to the container depot after 3 days, the main goal is to reduce the logistics cost. This paper will identify the process and stages of containers in the terminal which can affect DT, the current condition of DT containers at some of the main container terminals in Indonesia, especially after the implementation of policies related to minimizing container DT.

Thus, it is expected to provide an overview of current condition of the DT in Indonesia and further studies related to the impact of DT policies that have been implemented to the stakeholders, namely container terminal operators, shipping companies, cargo owners, freight forwarders and container depots.

2 Literature Review

Before being transported to a terminal's mainland or being loaded onto a ship, containers are stacked inside the container yard. The duration of the container in the port area before transported with the next mode or the time calculated starting from a container is unloaded from the vessel until the container leaves the container yard through the port gate out is defined as DT [2]. The shorter the stacking time, the higher the potential use of the container yard (stated in TEU per hectare of yard area per year and the stacking height given). In theory, reducing the average stacking time of containers can be considered as an effective step to measure optimal throughput that can be handled at a terminal. Especially in container terminal which has limited container yard. Thus, the reduction in container stacking time has a big impact on the capacity of container yard that can increase the throughput handled.

However, given the fact that the stacking or storage area in the container terminal is used by the shipper and consignee of the cargo, container stacking time tends to be determined by them and has a tendency to increase. Especially when conditions of strong market growth in the container sector, this will increase the stacking time of the container and provide a density impact on the terminal. On the other hand, it will also reduce container stacking time and increase storage capacity in container yard.

Dwelling time analysis on research conducted for container terminal in the Middle East revealed that almost 80% of imported containers were processd during the first 18 days and more than 95% in 30 days. The percentage of container process checked in Port 1 rose steadily from day 1 to day 6, reaching the peak on day 9, where about 9% of the containers were being processd. On the other hand, almost 10% of the containers examined were being taken on day 8. More specifically, in Port 3, the average DT for unchecked containers was 10.3 days with a standard deviation of 5.3 days, whereas containers that passed customs averaged 2 additional days [3]. Figure 1 show DT distribution for container terminal in the Middle East:

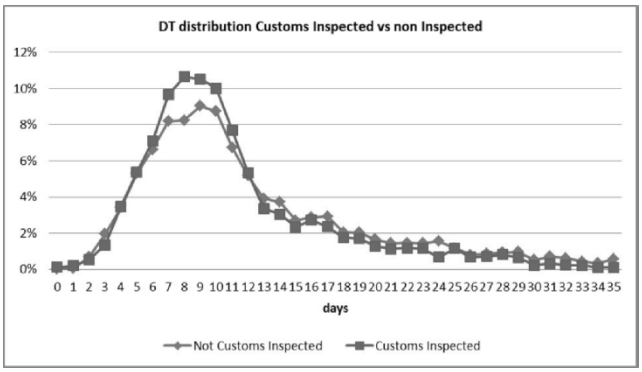

Fig. 1 DT Distribution for Container Terminal In The Middle East

Container DT may be influenced by several factors such as gate operations, availability, and efficiency of hinterland connections and customs regulations. The most important determinants of the DT based on the research conducted for container terminal in the Middle East show in Figure 1 were: 1) the day and month of discharge; 2) the port of origin; 3) the size and the type of container and; 4) the type of cargo transferred [3].

Another aspect related to container DT is the total time needed for documents process to release the container. But with the increasing level of information and paperless documentation procedures, this element has become less relevant. While at the port, container will experienced various processs [4]. Generally, the process determines the length of time for container import stay at the port can be divided by three phase, as follow:

1. Pre-clearance:
   a) Unloading from the ship;
   b) Stacking in container yard;
   c) Preparation draft import declaration;
   d) payment of duties and taxes.

2. Customs clearance:
   a) Move to inspection yard (red channel only);
   b) Move to temporary storage;
   c) Submit import declaration document;
   d) Channel assignment;
   e) Document verification;
   f) Clearence from customs.

3. Post – clearance:
   a) Remove of container;
   b) Loading into truck;
   c) Payment.

Figure 2, show movement of container and documents at port container terminal

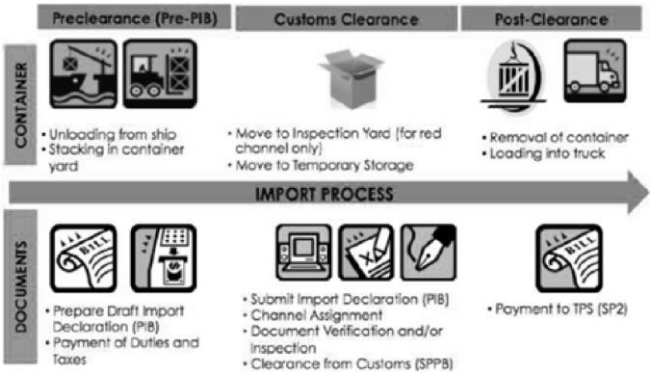

Fig 2. Movement of Container and Documents

Dwelling time related to the efficiency of port planning and operation. Based on another research conducted to reduce DT in Surabaya Container Terminal, the factors that cause DT are generally caused by two factors, namely the factor caused by the port itself and the factors caused by other stakeholders [5]. Factors caused by the port include:

1. Factor caused by the port:

a) Inadequate port capacity (container yard, gate);
b) Bad road condition in port area;
c) Low loading and unloading capability due to inadequate loading and unloading equipment;
d) Idle of loading and unloading equipment due to lack of maintenance;
e) Low loading and unloading productivity;
f) Regulatory restrictions on port operating hours, for example the rules for the sealing of dangerous goods and over dimensions cargo are only carried out during the day;
g) Inadequate of IT in port operations system;
h) Implementation of EDI (Electronic Data Interchange) which has not optimal;
i) Paper based documents process.

2. Factors caused by other stakeholders:

a) Lack of capacity of transfer cargo;
b) Long wait of document of custom clearance process especially for red channel container;
c) The difference of speed loading and unloading of ships compared to the capacity of trucks carrying cargo to the container yard;
d) Custom working hours;
e) Cargo inspection procedure;
f) Custom clearance proses and documents;
g) Limitation of transportation of goods hours;
h) Postponement of mobilization from trucks and stevedooring;
i) Postponement of loading and unloading plans.

The main factors that influence DT of import containers at the port is clearance process (pre clearance, custom clearance dan post clearance). Pre-clearance process contributes 52%, custom clearance 20% and post clearance 28% of total DT during container clearence process [6].

3 Methodology

In this section, the methodological framework applied in this research is presented. Figure 3, show the relations of economic - trade - container – ports and dwelling Time which is used as baseline of this research.

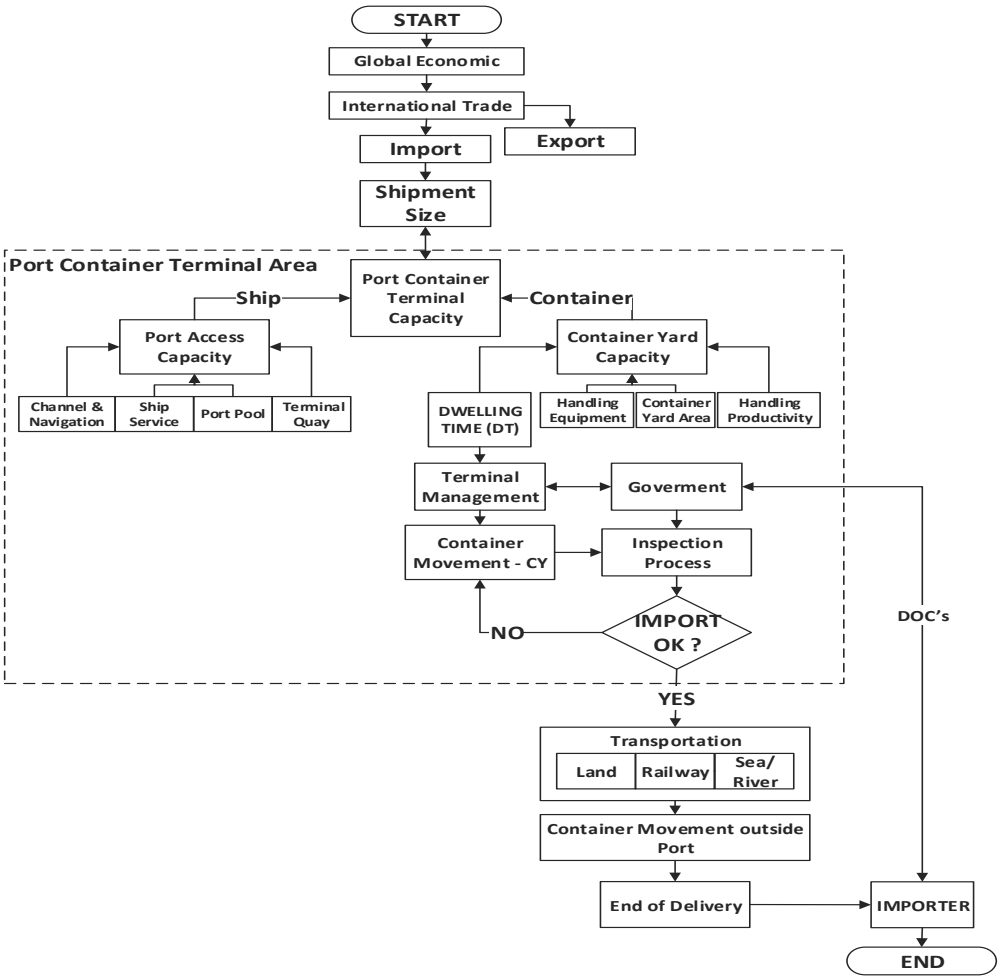

Fig 3. Relations Of Economic - Trade - Container - Ports - Dwelling Time

This research based on secondary data collected from port operator, Indonesia National Single Window (INSW) and Coordinating Ministry of Economic Affairs of the Republic of Indonesia. Container handling process data used to identify service diagram flow process of the container in the terminal. DT monitoring data of the container used to analyze the distribution of inter-arrival time, service time and dwell time of container.

4 Data Analysis

According to the Transportation Ministry data release in 2014, the average DT in Indonesia is 5.98 days. The dwelling time at Tanjung Priok is among the highest in Asia. In comparison, Singapore's dwelling time is only 1.5 days and Malaysia is three days, while loading and unloading containers in Thailand takes four to five days. The government has set a target of reducing the DT in Indonesia. The government's effort to improve container service at container terminal, which aims to reduce DT can be seen in Table 1.

Table 1 Timeline of The Government's Effort Reducing DT

2008 Integrated customs and port services through the National Single Window (NSW) system	**2010** Implementation of the Hub and Spoke Port system
2013 • E-cargo program (cargolink) • Autogate Program • Integrated Physical Examination Program by Quarantine and Customs • Yard Management • Trucking Management • Arranging access to and from the port • Rationalize YOR (yard occupancy ratio) • Port Operations 24/7 • Progressive application of container load rates at the port	
2014 • Program DO online • Program Single Payment	**2015** • Exclusion of obligations of the Surveyor Report for Priority line companies • Long stay container management • Reduction of trading conditions • Elimination of B / L and AWB requirements • in the process of publishing the Report • Surveyor • Bonded Logistics Center
2016 • Indonesia Single Risk Management • Integration Inaportnet	**2017** • Simplification trading system (Post Border)

Most of the problems in DT occurred because there were too many regulations and a long pre-clearance process. There are total of 74 pre-clearance regulations, the government managed to shift 60 of them online. The government target is to cut Indonesia's port dwell times to 3 days. In 2017 based on Indonesian National Single Window (INSW), which manage to handling customs documents, permits, and other documents relating to export,

import and logistics activities electronically. DT of 6 main ports (Port of Belawan, Tanjung Priok, Tanjung Mas, Tanjung Perak, Teluk Lamong, and Makassar) which operate 10 container terminal, the average of Indonesia DT during 2017 is 4.07 days with the following details can be seen in Table 2.

Table 2. DT Data of 6 Main Ports in Indonesia (Days)

No	Container Terminal	Jan 2017	Feb 2017	March 2017	Apr 2017	Mey 2017	Jun 2017
1	Belawan	2.94	3.01	3.28	3.28	4.03	3.89
2	JICT	3.98	3.6	3.3	4.27	4.58	4.32
3	KOJA	9.43	2.88	2.75	3.46	4.25	3.7
4	NPCT-1	3.79	3.09	3.15	0.374	4.18	4.31
5	Terminal 3	4.38	3.29	3.33	0.87	4.45	5.07
6	MAL	3.26	3.09	2.97	3.62	4.39	3.78
7	Semarang	5.8	5.32	0.97	3.98	6.82	6.54
8	Surabaya	4.37	3.22	3.49	4.24	5.36	4.11
9	Teluk Lamong	2.98	3.31	2.97	3.58	3.82	4.09
10	Makassar	1.13	0.84	6.22	0.82	1.52	0.83
	Average - National	**4.06**	**3.46**	**3.21**	**3.95**	**4.78**	**4.33**
No	**Container Terminal**	**Jul 2017**	**Aug 2017**	**Sep 2017**	**Oct 2017**	**Nov 2017**	**Des 2017**
1	Belawan	4.2	3.75	3.92	4.17	3.66	3.61
2	JICT	4.2	3.75	3.92	4.17	3.66	3.61
3	KOJA	4.16	3.84	4.07	3.72	3.64	4.59
4	NPCT-1	4.32	4.41	3.84	3.79	3.73	4.61
5	Terminal 3	3.79	3.31	3.93	3.58	3.28	4.58
6	MAL	4.25	4.15	4.38	3.64	3.82	4.35
7	Semarang	3.91	3.89	4.49	4.22	3.76	5.26
8	Surabaya	4.23	3.37	4.35	3.72	3.73	4.23
9	Teluk Lamong	5.2	4.67	4.55	4.16	4.29	4.47
10	Makassar	6.09	6.15	5.45	5.93	5.84	6.14
	Average - National	**4.86**	**4.25**	**4.32**	**3.68**	**3.77**	**4.37**

Based on Table 1 above, the longest DT during 2017 occurred in container terminal Surabaya (5 days) and the lowest DT occurred container terminal Makassar (0.89 days). The lowest DT in Indonesia occurred in March (3.21 days)

In this research container process divided into five phase, namely discharge to stacking, stacking to custom, custom to release order letter, release order to release notification letter, release notification letter to gate out. The longest process is from stacking to custom process with duration of 69.7 hours or 47.82% of total container DT and the shortest process is discharge to stacking with duration 0.37 hours or 0.25% (Table II).

Table 3 Container Process and Average Service Time

Process	Duration (hour)	Duration (%)
Discharge to Stacking	0.37	0.25%
Stacking to custom process	69.68	47.82%
Custom process to release order letter (SPPB)	17.21	11.81%
Release order to release notification letter (SP2)	31.41	21.56%
Release notification letter to gate out	27.03	18.55%
Total	145.7	100%

The customs channel also related to DT, out of a total 143,880 TEU containers handle at 6 main port in January, 68% are green channels, 15% are yellow channels, and 17% are red channels (Figure 3). Most of DT problem strongly related to red channel container, but it will impact to average DT in generally.

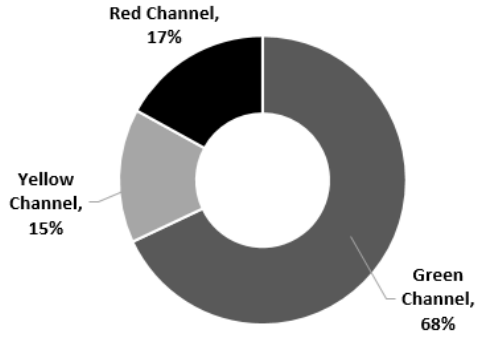

Fig 4. Number of Container by Channel

The average DT for red channel which need custom clearence inspection is 11.9 days. Compare to green channel container, the longest process is custom process to release order letter (SPPB) with duration of 145.34 hours or 48.12%.

Table 3 Red Channel Process and Average Service Time

Process	Duration (hour)	Duration (%)
Discharge to Stacking	0.37	0.12%
Stacking to custom process	101.91	33.74%
Custom process to release order letter (SPPB)	145.34	48.12%
Release order to release notification letter (SP2)	33.26	11.01%
release notification letter to gate out	21.18	7.01%
Total	302.06	100%

5 Conclusions and further research

The average of containers DT in Indonesia during 2017 is 4.07 days for not custom inspected container and 11.9 days for custom inspected container (red channel), the longest duration process is from stacking to custom clearance with duration of 69.7 hours or 47.82% of total container DT. The further research related to DT in Indonesia need to answer big question remain after the implementation of maximum (3 days) DT regulation in Indonesia. The first question is related to the target to minimize DT, namely the trade off between decreasing costs due to DT compared to costs to speed up DT and the second is how to measure the fairness of DT and its effects to stakeholders. Beside that, the movement of containers after exiting the gate out of the port (port to end user) needs to get attention, not just movement within the port which related to time efficiency and overall logistics costs.

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