

## APPLICATION OF VALUE STREAM MAPPING IN THE NVOCC FCL SERVICE PROCESS TO MINIMIZE DELAY IN SUBMISSION OF THE DOCUMENT (A CASE STUDY IN PT YUSEN LOGISTICS INDONESIA)

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### ABSTRACT

*PT Yusen Logistics Indonesia is a company engaged in the field of freight forwarding. Exporting goods using sea transportation modes with NVOCC FCL services system is a service it provides. Problems that occur in the process is delay in submission of the required documents for the overseas agent making process goods at port of destination. The use of the concept of lean service with value stream mapping (VSM) will facilitate the process of identifying activities that do not value-added is a waste through making current state map, so that process improvements can be made. At first, the processing of the document takes up to 240,171 seconds, but in fact most of the time are not value-added and only 2,661 seconds that value-added time with PCE of 1.11%. Having analyzed using VSM, it turns out there is some wastes in the document processing operations. The wastes that occurs in the process are waiting and excess processing. The concept of proposed improvement is described in the form of future state map, so that it can be seen how the image of the service process imposed later. The new process only takes as long as 1,170 seconds and the time that value-added is 810 seconds, so PCE becomes 69.23%.*

*Key words: Waste, Lean services, Value stream mapping, Logistics service.*

## 1. INTRODUCTION

### 1.1. Background

PT Yusen Logistics Indonesia is a service company engaged in the field of freight forwarding. Ronosentono (2006) has said that freight forwarding is executing the delivery of goods to a settlement document at the port of loading/unloading, by means of transportation from one or several places towards one or more destination. Whereas persons or legal entities that carry out the work referred forwarding freight forwarder.

Service exports of goods using sea transportation is commonly called the Ocean Freight Forwarding (OFF) is a service provided by PT Yusen Logistics Indonesia. The delivery process is done using a container. There are two methods of delivery are available, namely Full Container Load (FCL) and Less Container Load (LCL).

Non Vessel Operating Common Carrier (NVOCC) is a export service provided by PT Yusen Logistics Indonesia. Susilo (2008) has said that the NVOCC is a party to act as

if the carrier/liner that has a fixed sailing schedule but does not own or operate the vessel as well as the shipping line. There are two types of NVOCC in PT Yusen Logistics Indonesia, ie NVOCC FCL and LCL.

Besides having business customers who are users of services, PT Yusen Logistics Indonesia also has agents in several countries. The aim is to facilitate the process of service export/ import. Agent overseas instrumental care of the arrival of goods at the port of destination with the provisions in force in the country and make the process of delivery of goods to a consignee. Agent overseas requires some supporting documents for the smooth process of collection of goods at the port of destination. Documents required of them is the house bill of lading and the master bill of lading.

In the NVOCC FCL service process was still experiencing problems, namely delay in submission of the required documents overseas agent, caused by waste is still in the NVOCC FCL service process. Therefore, it is necessary to identify waste in the

NVOCC FCL service process using the concept of lean services with value stream mapping to eliminate waste in order to minimize the delay in submission of the documents.

## 1.2. Problem Statement

Based on this background, the formulation of the problem in this research is how to eliminate activities that are wastes on NVOCC FCL service process using the concept of lean services with value stream mapping?

## 1.3. Research Purpose

The purpose of this research is to know about how to eliminate activities that are wastes on NVOCC FCL services process using the concept of lean service with value stream mapping.

## 1.4. Benefit of Research

The benefits of this research is to minimize the delay in the process of post pre-alert to the concept created and maximize the service process at the NVOCC FCL.

## 1.5. Limitation of Problem

Limitation of problem in this research are as follows: 1) no cost analysis; 2) value stream mapping is made based on the conditions that exist today in accordance with the NVOCC FCL service process; 3) calculation of time to do the internal processes; 4) this study only identifies waste contained in NVOCC FCL service process that caused delays in submission of documents to the agent; and 4) research conducted only at the stage of making the concept of improvement and does not implement the concept of improvement in the company.

## 1.6. Assumption

The assumptions used in this study are as follows: 1) the labor and equipment available; and 2) the application system Global Distribution System (GDS) is not impaired.

## 2. THEORETICAL BACKGROUND

### 2.1. Waste

Gaspersz (2011) has said that waste is any activity that is non-value added in a process, which the activities were just using resources, but does not add value to the customer. There are nine types of waste that is always there in business and industry, namely: 1) **E** = Environmental, Health and Safety (EHS), the type of waste that occurs due to negligence in attention to matters relating to the principles of EHS; 2) **D** = Defect, the type of waste that occurs because of a default or failure of the products (goods/services); 3) **O** = Overproduction, the type of waste that occurs because of overproduction of the quantity ordered by the customer; 4) **W** = Waiting, the types of waste that occurs due to waiting for the next process; 5) **N** = Non employees utilizing knowledge, skills and abilities, the type of waste of Human Resources (HR) happens because they do not use the knowledge, skills, and abilities of employees optimally; 6) **T** = Transportation, the type of waste that occurs due to excessive transportation throughout the value stream; 7) **I** = Inventories, types of waste that occurs because of excess inventory; 8) **M** = Motion, the type of waste that occurs due to the movement more than it should be throughout the value stream; and 9) **E** = Excess processing, the type of waste that occurs because of the steps of a long process that should be throughout the value stream, or known as **E-DOWNTIME**.

### 2.2. Lean Services

Gaspersz in APICS Dictionary (2007) has said that lean as a business philosophy which aims to minimize the use of resources (including time) in various activities in the company, through the efforts of improvement and continuous improvement that focuses on the identification and elimination of non-value added activities in the design, production (for manufacturing) or operation (for services), and supply chain management customer related. Lean is applied to the whole company is referred to as a lean enterprise. Lean is applied to the field of manufacture is called lean

manufacturing, and lean is applied in the field of services is called lean services.

### 2.3. Value Stream Mapping

Gupta (2004) has said that the value stream mapping is the process flow from beginning to end that create value to customers of the products and services provided, including all activities that add value and which do not provide added value to customers, and provide the big map of a process and the opportunity to identify sources of waste.

Gaspersz has said, as quoted by Yansen and Bendatu (2013), that the most important part of analyzing a process using the principle of value stream mapping is to understand the difference between processes including value added activities, non-value added and non-value added but necessary. The following is an explanation of these three activities: 1) **Value added (VA)** is an activity that adds value to the product or service for the customer; 2) **Non-value added (NVA)** is an activity that does not add value to the product or service that can be eliminated; and 3) **Non-value added but necessary (NNVA)** is an activity that does not add value to the product or service, but need to do.

Rother and Shook (1999) has said that the stages in the use of value stream mapping principles that make the current state map which is a condition that is on the current process and make future state map as a concept of improvement.

## 3. RESEARCH METHOD

### 3.1. Object of Research

The object of research is focused on ocean export freight forwarding NVOCC FCL division at the beginning from the receipt of the final document shipping instruction from the customer through the process of post pre-alert or submission of documents to agent overseas.

### 3.2. Variable of Research

The variables in this study are all non-value added activities in the NVOCC FCL service process that will be eliminated, so that will

minimize delay in submission of documents to agents overseas.

### 3.3. Data Collection Method

Data collection would be performed using the methods: 1) **Observation** is data collection techniques by observing and calculating of process time and lead time using a stopwatch directly on the NVOCC FCL service process; 2) **Interview** is data collection techniques is done by way of question and answer directly to a reliable source such as the party that has the competence, knowledge, and experience in the areas of freight forwarding, particularly in the export division NVOCC FCL; and 3) **Literature study** is data collection techniques by reading and studying literature sourced from books and journals related to this research.

## 4. RESULT AND DISCUSSION

### 4.1. Result of Data Collecting

Data obtained from the observation is a groove on each NVOCC FCL service process, the calculation process time and lead time as well as input and output. Interview intended to strengthen the argument in the mindset of the research conducted by the person in charge NVOCC FCL especially in the export division. Input obtained is the final document shipping instruction, and the output is the master bill of lading and the house bill of lading.

### 4.2. Result of Data Processing

#### 4.2.1. Current State Map

Current State Map is an overview of the process of production/services that take place covering material and information flows within a company until then (Rother & Shook, 1999). In making the necessary current state map data associated with flow of the NVOCC FCL service process with the time taken in the process. Observation and calculation starting time of draft house of the bill of lading to the process of post pre-alert. The figure of the current state map on the NVOCC FCL PT Yusen Logistics Indonesia shown in Figure 1.

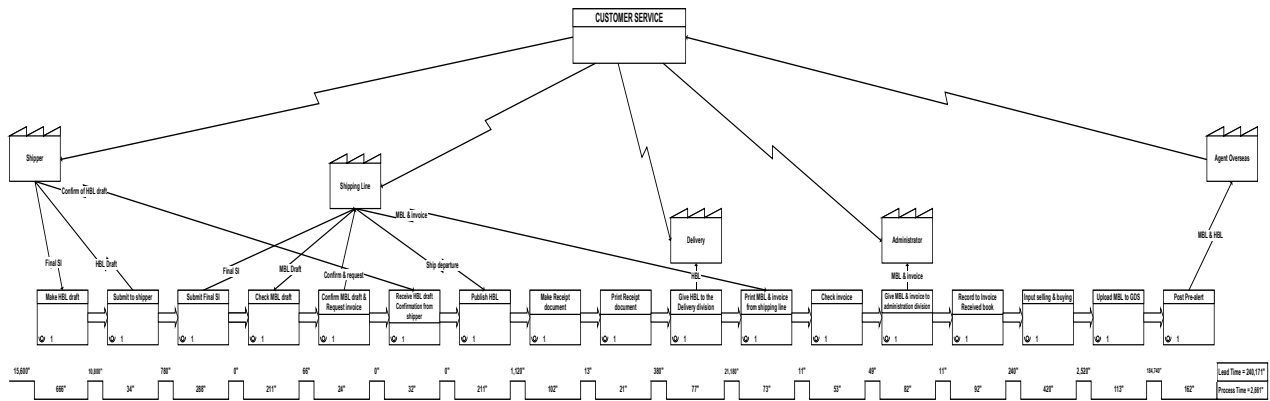


Figure 1. Current State Map

Based on the current state map, in this research activity used process mapping to identify the activity in the FCL NVOCC service process which are value added

activities, non-value added and non-value added but necessary, for more details in Table 1.

Table 1. Process Activity Mapping on the Current State Map

Activity	Time	Type of Activity					Annotation
		O	T	I	S	D	
Receive Final SI							
Time lag process	15,600						NVA
Make draft HBL	666						VA
Time lag process	10,800						NVA
Submit to customer	34						VA
Time lag process	780						NVA
Submit Final SI	288						VA
Time lag process	0						NVA
Check draft MBL	211						NNVA
Time lag process	66						NVA
Confirm draft MBL & request invoice	24						VA
Time lag process	0						NVA
Check confirmation of draft HBL	32						NNVA
Time lag process	0						NVA
Publish HBL	211						VA
Time lag process	1,120						NVA
Make receipt document	102						NVA
Time lag process	13						NVA
Print receipt document	21						NVA
Time lag process	380						NVA
Give HBL to delivery section	77						NNVA
Time lag process	21,180						NVA
Print invoice from shipping liner	73						NVA
Time lag process	11						NVA
Receive Invoice	53						NVA
Time lag process	49						NVA
Give invoice & MBL to administration section	82						NNVA
Time lag process	11						NVA
Writing to receipt of invoice book	92						NVA
Time lag process	240						NVA
Input selling & buying to GDS	420						NNVA
Time lag process	2,520						NVA
Upload MBL to GDS	113						VA
Time lag process	184,740						NVA
Post Pre-alert	162						VA
<b>Total</b>	<b>240,171</b>	<b>12</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>17</b>	

After learning activity as a value added, non-value added and non-value added but necessary, obtained total of value added current state map based process activity mapping amounted to 2,661 seconds, total of non-value added amounted to 237,510 seconds, and total of non-value added but necessary amounted to 822 seconds, so total of lead time amounted to 240,171 seconds. Process Cycle Efficiency (PCE) are as follows:

$$PCE = \frac{\text{Value Added Time}}{\text{Total Lead Time}} \times 100\%$$

$$PCE = \frac{2,661}{240,171} \times 100\% = 1.11\%$$

Based on calculations of Process Cycle Efficiency (PCE), the obtained results of 1.11%. Gaspersz (2011) has said that if the value of PCE is lower than 30% then the process can be said to be un-lean, so it can be seen that the NVOCC FCL service process there is still a non-value added activities that are classified as waste and cause delay in the process post pre-alert. The waste can be grouped as follows: 1) **Waiting** is a type of waste that occurs because of the wait. In this case the time lag is too long to wait activity and should be eliminated; and 2) **Excess Processing** is a type of waste that occurs due to excessive process, which do the actual work is not necessary.

#### 4.2.2. Future State Map

Based on identification in the current state map, it will make the concept of improvements to describe the future state map to eliminate non-value added activities are a waste of money. For more details can

be found in Figure 2, while the process of mapping activity in the future state map shown in Table 2.

After knowing the activity of value added, non-value added and non value added but Necessary, then be recalculated Process Cycle Efficiency (PCE) to determine the value of the concept of efficiency improvement that have been made. Process Cycle Efficiency (PCE) on the future state map is as follows:

$$PCE = \frac{\text{Value Added Time}}{\text{Total Lead Time}} \times 100\%$$

$$PCE = \frac{810}{1,170} \times 100\% = 69.23\%$$

#### 4.3. Discussion

Based on the calculation Process Cycle Efficiency (PCE) on the concept of future state map, the obtained result of 69.23%, bringing the total value of Process Cycle Efficiency (PCE) on a concept that has been created can be said to be lean because more than 30%. Thus the concept of improvements that have been raised can be used as a reference to make improvements to the NVOCC FCL service process in PT Yusen Logistics Indonesia. The improvements will improve the division's performance. The improvements will also enhance the company's overall performance if it is done in units of other services, because it is basically a waste often occurs at each unit that will reduce the quality of service to customers, both internal customers and external customers.

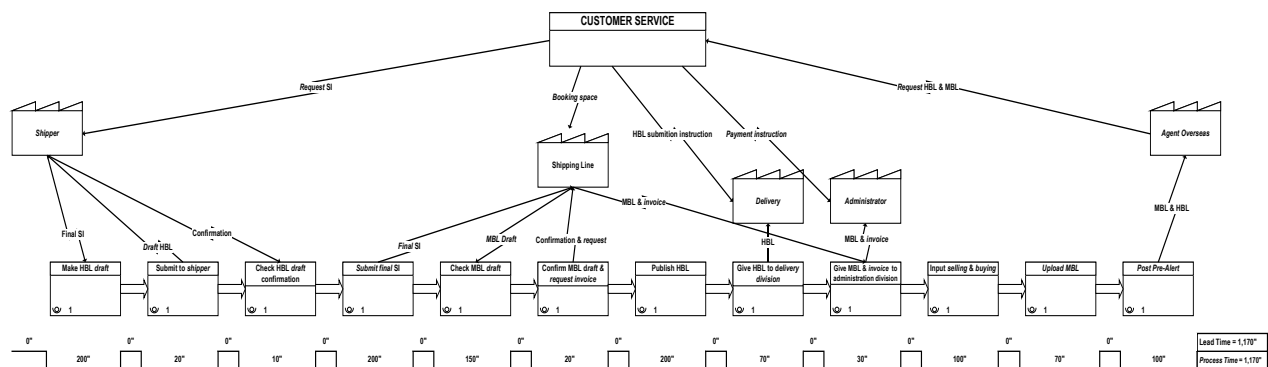


Figure 2. Future State Map

Table 2. Process Activity Mapping on the Future State Map

Activity	Time	Type of Activity					Annotation
		O	T	I	S	D	
Receive Final SI							
Time lag process	0						NVA
Make <i>draft</i> HBL	200						VA
Time lag process	0						NVA
Submit to <i>customer</i>	20						VA
Time lag process	0						NVA
Check confirmation of <i>draft</i> HBL	10						NNVA
Time lag process	0						NVA
Submit <i>final</i> SI to shipping liner	200						VA
Time lag process	0						NVA
Check <i>draft</i> MBL	150						NNVA
Time lag process	0						NVA
Confirm <i>draft</i> MBL & <i>request invoice</i>	20						VA
Time lag process	0						NVA
Publish <i>HBL</i>	200						VA
Time lag process	0						NVA
Give HBL to <i>delivery section</i>	70						NNVA
Time lag process	0						NVA
Give <i>invoice</i> & MBL to <i>administration section via e-mail</i>	30						NNVA
Time lag process	0						NVA
Input <i>selling</i> & <i>an buying</i> in GDS	100						NNVA
Time lag process	0						NVA
Upload MBL	70						VA
Time lag process	0						NVA
Post <i>Pre-Alert</i>	100						VA
<b>Total</b>	<b>1,170</b>	<b>9</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>	

## 5. CONCLUSION

Based on the results of the discussion can be concluded that by eliminating activities that are waste on the NVOCC FCL service process using the concept of lean services with value stream mapping is to: 1) create a Process Activity Mapping to identify activity that is a waste of the current state map; 2) identify the processes that are value added, non-value added and non-value added but Necessary; 3) calculates the Process Cycle Efficiency (PCE) on the current state map; 4) Make Future state map; and 4) to recalculate the PCE in the future state map. The results showed that significant changes in the PCE from 1.11% to 69.23%.

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