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## Proposal to Improve Warehousing Activities and Warehouse Arrangement of Clothing Stores Using The Lean Warehousing Method

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**Abstract:** Maysara Clothing Store Warehouse is a storage place for fashion products of various types and colors. There are several problems in the process of shipping goods where there are often product inconsistencies that reach consumers. This caused complaints from consumers. This research aims to provide suggestions for improvements in terms of the process of warehousing activities and warehouse arrangement owned by the Maysara Clothing Store. The problem-solving approach method used is lean warehousing. The lean warehousing method is a method that can be used to find out what types of activities have the potential to cause waste. The most common type of waste that occurs in the Maysara Store warehouse is waste. Improvement proposals that can be applied to reduce this type of waste are in the form of implementing 5S in all warehouse areas, making standard work instructions in every warehousing activity, and arranging the warehouse by adding lighting points in the warehouse area and the work area of Toko Maysara warehouse employees.

**Keyword:** Lean Warehousing, Value Stream Mapping, Warehousing Activities.

### INTRODUCTION

The arrangement of a neat, clean, and comfortable work environment is a priority in carrying out trade or commercial activities. This affects work efficiency and productivity. The role of the warehouse function is one part of a series of logistics systems in which there is the movement of goods through the supply chain process to the final consumer. The smoothness and stability of warehousing operations are greatly influenced by a series of activities that are effective, efficient, and reliable with continuous improvement in

performance. The running of a series of activities must be carried out consistently to shorten the lead time required by customers (Taqwanur, 2021).

The Maysara Clothing Store warehouse is used to store many fashion products of various types and colors. Goods or products that are stored cleanly and neatly will have good quality, and make it easier to find and pick up products. Based on this, the process of warehousing activities must be carried out properly so as to reduce waste of time and complaints from other parts of the goods or products taken. The current condition of the Maysara Clothing Store Warehouse is a lack of neatness and arrangement, inappropriate placement of products, so that the work environment becomes uncomfortable. The occurrence of several problems in the process of shipping goods, improper layout of goods is a form of warehousing activities that must be avoided during warehousing activities at the Maysara Clothing Store Warehouse. If this can be avoided, it will have an impact on reducing waste or waste of warehousing activities so that it can increase the effectiveness of the warehouse.

The application of the concept of lean warehousing has been widely used in various industries. The concept of lean warehousing is a concept that in its application requires stability, systemic sustainability and improvement measurement involving all employees. The concept is to reduce waste starting from the upstream part to the downstream part of the supply chain. With the application of the concept of lean warehousing, it can increase the value of every warehousing activity and have an impact on improvements in the company's internal and external environment (Ibrahim & Prasetyawan, 2020).

Research related to the application of lean warehousing has been applied to one of the logistics service provider companies in 2018. The results of the application of the lean concept to warehousing activities in the company are able to increase productivity from 5 pallets/manhour to 34 pallets/manhour (Widodo & Fardiansyah, 2018). The application of the concept of lean warehousing in book printing companies to improve the performance of warehouse activities can make the time to receive goods in the warehouse faster (Bestari & Fatma, 2020).

The impact of the current warehouse arrangement in the Maysara Clothing Store Warehouse which is still lacking, results in frequent delivery of inappropriate or incorrect products. The incidence of incorrect product delivery can be seen in Table 1 below.

**Table 1. Shipping Non-Conformance Data**

Type of Complaint	Number of Products Complained About in 2023 (Pcs)						
	January	February	March	April	May	June	Total
Mislabeled Products	50	42	12	28	67	59	258
Disagreement in the Number of Goods Delivered	34	42	58	63	70	70	337
Products shipped not compliant	74	54	88	92	47	61	416

Based on Table 1, it can be seen that the number of complaints about mislabeled products is 258 products, the number of non-conformities in the number of goods delivered is 337 products, and the products sent are not suitable as many as 416 products. In this study, it will map the current conditions to find out what activities are wasteful, eliminate these activities so that they can reduce the number of complaints that often occur.

## **METHOD**

The research process for the improvement plan for warehousing activities and warehouse arrangement of the Clothing Store is generally qualitative and quantitative, where in the process of collecting data is carried out in depth, then developed from pre-existing

research theories and a number of measurements are carried out (Tanisri, et al., 2023). The framework of thought used as a guide for the research process can be seen in Figure 1 below.

### **Figure 1. Framework of Thought**

The framework of thought in Figure 1 begins with the frequent misdelivery of products. The actual current condition will be mapped using Value Stream Mapping (VSM) and also Lean Warehousing. Based on this mapping, it will be possible to find out what activities can be the cause of the greatest waste (Fhadillah, et al., 2020). After knowing the biggest type of waste, the next step is to make a proposal for improvements that can be applied in the Maysara Clothing Store warehouse.

#### **Value Stream Mapping (VSM)**

Value Stream Mapping is a method used in the lean transformation process before entering the waste elimination stage. The stages of Value Stream Mapping are divided into two types, namely Current State Mapping and Future State Value Stream Mapping. Current State Mapping is used to get an overview of the flow of the production process and information process from the beginning of the order process to the delivery process to consumers (Yola, et al., 2017). All information obtained will be mapped in a simple image that includes input and output, process, to delivery to consumers. This Value Stream Mapping can be used as a tool to assess and find waste that can occur (Tambunan, et al., 2017).

The depiction of VSM in the Maysara Clothing Store warehouse starts from the process of receiving receipts, searching for products, picking up products, carrying out data input processes, packaging, to the delivery process to consumers. Each of these processes will include a process time so that you can know which process has the most process time.

#### **Lean Warehousing**

Lean Warehousing is one of the methods that can be used in the process of identifying waste in the process of warehousing activities. The application of lean focuses on increasing efficiency by reducing waste or activities that do not have added value through radical continuous improvement by flowing products (materials, work in processes, output) and information using a pull system (Rido, et al., 2020).

Waste in Japanese is anything that has no value, so waste can be interpreted as something that customers don't want to pay. There are seven known types of waste including; over production, defects, unnecessary inventory, inappropriate processing, transportation, waiting, unnecessary motion (Afif & Sudarto, 2022). Waste identification can be done based on identification from non-value added activities and interviews with the company. This description is used in implementing potential improvements (Putra, 2023).

The waste identification process in this study was by disseminating written questions to eight employees who interacted directly with all warehousing activities in the Maysara Clothing Store's warehouse. The list of written questions is distributed as shown in Figure 2 below.

<b>LIST OF QUESTIONS FOR WASTE IDENTIFICATION</b>						
<i>Filling Instructions:</i>						
You are requested to answer the questions in the table by marking (√) in the columns that correspond to the actual event.						
1 = Never Happened (for one year 0 events)						
2 = Rare (for a year maximum 1 incident)						
3 = Frequent (over 12 events in a year)						
4 = Always Happens (at least 1 incident per day)						
No	Types of Waste	Question	Frequency of occurrence			
			1	2	3	4
1	<i>Over production</i>	Has there ever been too much of the goods produced?				
2	<i>Defects</i>	Has there ever been an error when shipping the product (late, wrong product, inappropriate quantity)?				
3	<i>Unnecessary Inventory</i>	Has there ever been a buildup of products waiting to be processed to the next process/activity?				
4	<i>Inappropriate Processing</i>	Has there ever been a waste of inappropriate processes (use of tools that are not in accordance with capacity, there is a mismatch between processes and work procedures, differences in work methods among employees)?				
5	<i>Excessive Transportation</i>	Has there ever been an excess of transportation processes when carrying out warehousing activities?				
6	<i>Waiting</i>	Has there ever been an incident of waiting (employees are unemployed/inactive) for a long time in the process in the warehouse?				
7	<i>Unnecessary Movement</i>	Has there ever been an unnecessary movement/activity in warehousing activities?				

**Figure 2. Written Questions for Waste Identification**

**Fishbone Diagram**

Fishbone diagrams or often referred to as cause-and-effect diagrams, can be used as a tool to identify problems and determine the source of the cause of the problem (Pribadi, et al., 2023). The preparation of the fishbone diagram is based on the results of the answers to written questions addressed to warehouse employees of the Maysara Clothing Store to describe the root cause of the problem of waste that occurs (Apriliana & Astuti, 2018).

**Analysis of 5 W+1 H**

The 5W + 1H analysis is a method used to find the factors that cause waste to then make improvements (Rizki, et al., 2023). The preparation of the 5W + 1H analysis was carried out by compiling several questions related to what, who, where, when, why, and how related to the waste that occurred (Wijaya, 2023).

## RESULTS AND DISCUSSION

### Current State Value Stream Mapping

The depiction process of current state value stream mapping is the result of actual conditions from direct observation and data collection of warehousing activity processes (Zulfikar & Rachman, 2020). In this value stream mapping, it is depicted with a process flow that starts from the right side (Nursanti & Musfiroh, 2017). The current state value stream mapping in the Maysara Clothing Store warehouse is seen in Figure 3 below.

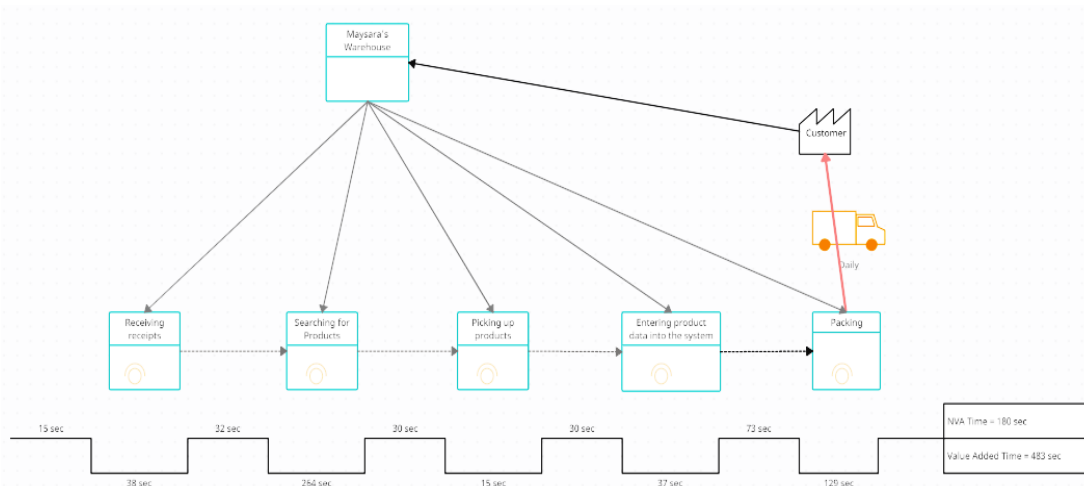


Figure 3. Current State Value Stream Mapping Maysara Clothing Store Warehouse

Figure 3 shows the value stream mapping (VSM) of activities in the warehouse of the Maysara Clothing Store which starts from warehouse employees receiving receipts (sales orders) from the first floor through the receipt receipt counter. The required processing time is 38 seconds. The operator or employee is looking for the product listed on the receipt. The processing time required to conduct a search for the product is 264 seconds. After the location of the product is found, employees pick up the product. The process of picking up products often uses tools such as ladders or hand pallets if the products needed are in hard-to-reach areas. The time required for the process of picking up the product is 15 seconds. Products that have been taken from the storage location, are brought by employees to the computer desk for the process of inputting the product data into the system. The process aims to cut the stock in the system. The processing time for the activity lasted for 37 seconds. The next activity is the packaging process. Packaging activities are carried out by employees with a process time of 129 seconds. Based on the value stream mapping, the activity that requires the longest process time is the process of searching for products, while the activity that has the fastest process time is the process of picking up products.

### Waste Identification

Based on Figure 2, the list of written questions asked to the employees was collected and summarized as a result of the answers from the employees. The results of the data collection can be displayed as shown in Table 2 below.

Table 2. Waste Identification Data Recap

Types of Waste	Respondent/Resource Person Score								Total	Weight	Score	Rangking
	1	2	3	4	5	6	7	8				
Over Production	2	2	3	2	2	1	2	3	17	0.112	1.901	6
Defects	4	3	4	3	4	4	4	3	29	0.191	5.533	1
Unnecessary Inventory	2	3	3	3	3	3	2	3	22	0.145	3.184	4

<i>Inappropriate Processing</i>	3	3	3	3	3	3	3	2	23	0.151	3.480	3
<i>Excessive Transportation</i>	2	2	1	1	2	2	1	1	12	0.079	0.947	7
<i>Waiting</i>	3	3	3	3	2	2	3	2	21	0.138	2.901	5
<i>Unnecessary Movement</i>	4	4	3	4	3	4	3	3	28	0.184	5.158	2
	Total								152	1		

The results of the waste identification in Table 2 can be seen that seven types of waste occurred during warehousing activities in the Maysara Clothing Store warehouse. Waste identification is carried out by providing weights and scores based on a priority scale from the warehouse owner of the Maysara Clothing Store.

The rarest type of waste is excessive transportation. This type of waste encompasses warehousing activities related to excessive transportation processes. In waste transportation, there is a repetitive process, namely the process of returning inappropriate goods taken by the picker operator to the storage rack. This causes a waste of time in the picking process.

The type of waste that gets the most value is defects. In this waste defect, torn product packaging was found. Defects in torn product packaging are caused by the process of picking up products by employees, products are put together using rubber, and employees or picker operators are not careful in picking up the product so that the product packaging is torn. Products sent to consumers are often found to have the wrong products on the label, inconsistencies in the number of goods sent, and products sent that do not match the orders from consumers.

### **Fishbone Diagram of Defective Waste Types**

The results of the collection and also the processing of the identification of the type of waste that occurs can be drawn as a result that the type of waste that must be eliminated first is the type of waste defect. The preparation of fishbone diagrams was carried out by conducting interviews and also focus discussion groups. The results of the interview and discussion were obtained the cause of defect waste as seen in Figure 3 below.

**Figure 3. Diagram Fishbone**

Based on the fishbone diagram shown in Figure 3, it can be seen that the causes of defect waste come from human factors (man), method (method), material, and environment (environment). The human factor is the cause of the products sent not in accordance with the



demand from consumers. The factor of operators who do not carry out their duties carefully at the time of picking up products is the root of the problem. The waste of defects related to the discrepancy in the number of shipments is caused by the method factor where there is no standard procedure related to the delivery process, and the recording process has not used an integrated system. Plastic packaging used as a product wrapper is easily torn which has an impact on the unprotected product during the shipping process. This is the cause of the material used in the plastic packaging that wraps the product. Environmental factors also have an influence on the occurrence of wrong or confused product labels. The work environment area of employees or warehouse operators of the Maysara Clothing Store is dimly lit, which is one of the causes of warehouse operators mislabeling products.

**5W + 1H Analysis**

The identification process to find out the wastage that occurs in the value stream is carried out by 5W+1H analysis (Soenaryo, et al., 2015). The application of 5W + 1 H in the Maysara Store warehouse as can be seen in Table 3 below.

**Table 3. 5W + 1H Analysis**

<i>Factor</i>	<i>Issue</i>	<i>What</i>	<i>When</i>	<i>Where</i>	<i>Who</i>	<i>Why</i>	<i>How</i>
<i>Man</i>	Products shipped are not compliant	Operators are not meticulous	In the process of picking up products	Warehouse area	Warehouse operators	Product placement is not neat and has not been classified according to the type of product	Applying 5S to the warehouse area
<i>Method</i>	Mismatch of product delivery quantity	Data recording has not used an integrated system	In the process of picking up and delivering products	Warehouse area	Warehouse operators	There is no standard procedure related to the shipping process	Drafting work instructions or standard procedures
<i>Environment</i>	Mislabeled products	Poor room lighting and dim work environment	On the product labeling process	Warehouse area	Warehouse operators	Lack of lighting points in the work area	Providing additional lighting points in the work area
<i>Material</i>	The plastic packaging wrapping the product is damaged	Product packaging is easy to tear	In the packaging and storage process	Warehouse area	Warehouse operators	The plastic packaging used does not use stronger materials	Replacing the type of plastic packaging with thicker or stronger material

The results of the analysis using the 5W + 1H method found that there were four improvement actions that could be carried out in the warehouse area of the Maysara Clothing Store. Improvements that can be made from a human perspective are to apply 5S to the Maysara Clothing Store area, so that it is able to create a warehouse area and work environment that is clean, neatly organized, and organized consistently. Improvements that can be made in terms of work methods are compiling work instructions and standard

procedures in each process and warehousing activity in the Maysara Clothing Store warehouse. Improvements in terms of the working environment are to add lighting points in the warehouse area, so that employees or warehouse operators on duty are able to see the products in their storage areas clearly. Improvements that can be made in terms of materials related to the type of plastic packaging that wraps the product. Changing the specifications of the type of product packaging material can be done by adjusting the needs, so that the risk of torn or damaged packaging is no longer found in product packing and storage activities.

## CONCLUSION

The biggest type of waste that occurs is the type of defect waste where products from the Maysara Clothing Store often have inconsistencies. Activities that cause these non-conformities include products that are not delivered according to orders, quantities that are not sent in accordance with demand, errors in product labeling, and product packaging that is often damaged. Recommended improvement proposals based on data processing are implementing 5S in all warehouse areas of the Maysara Clothing Store, compiling standard work instructions in each process and warehousing activity, adding lighting points in the warehouse area and work area, and replacing the type of plastic packaging material with thicker and less easily damaged materials.

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