

## THE EFFECT OF WAREHOUSE MANAGEMENT SYSTEM ON THE DISTRIBUTION OF THE ELECTROLUX PRODUCTS IN PT. CEVA LOGISTICS

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**Abstract.** Ceva Logistics is the world's largest pure play contract-based logistics company, focusing on 6 sectors: automotive industry, tires, electronics, fast moving consumer goods (FMCG), industrial and printing, and media. The purpose of this study is to determine the effect of warehousing management systems on the smoothness of distributions. Data analysis methods used were Simple Linear Regression Analysis, Correlation Coefficient Analysis and Hypothesis Test (correlation test). Analysis results and the discussion showed that there was a correlation between the warehousing management system and the smooth distribution shown by the simple linear regression equation,  $Y = 3.94 + 0.84X$ , meaning that every change in one unit of the variable score  $X$  would be followed by a change in the  $Y$  score of 0.84 times  $X$  in the 3.94 constant. Hypothesis test results show that the  $t$ -value is 5.10 while the value of the table is 1.701. It means  $t_{count} > t_{table}$ , which is  $5.10 > 1.71$ , because  $t$  count is greater than  $t$  table then  $H_0$  is rejected and  $H_a$  is accepted. This means that there is a significant and strong influence between the warehousing management system on the smoothness of distributions.

**Keywords:** Management, Warehouse, Storage, Warehouse Management System, Distribution.

### A. Introduction

The dynamics of global economic growth currently require economic actors involved in any field to improve their ability in facing competition, both competition in the field of warehousing service providers and transportation services in distributing products to consumers in a timely manner. PT. CEVA focuses on 6 sectors, such as: automotive, tires, electronics, fast moving consumer goods (FMCG). Industries often found problems when distributing goods.

Warehouse is a place to store goods, both raw materials that will be used in the manufacturing process, and finished goods that are ready to send. Warehousing is not only about the storage of goods, but also the process of handling goods from receipt of goods, recording, storage, selection, and sorting of labelling to the process of shipping goods (emadwiandr, 2013).

Warehouse is a facility for cargo storage, so It has the role of a distributor. Therefore, the warehousing system can be said to be effective and efficient if it is able to meet the speed of the process from receiving, storage, to delivery (Rizaldy, 2015).

The limited storage warehouse capacity at PT. CEVA Logistics led to accumulation of goods. Accumulation stack of goods causes damage to packaging and goods and difficulties in warehouse activities, such as: operators having difficulty operating forklifts, and using a forklift or hand pallet that might damage the packaging, and for some problems that often occurred in shipping goods such as packaging and product damage and delay in delivery of goods. The delay in the distribution of goods might be related to the process in the warehousing management system that still did not follow Standard Operating Procedures (SOP), and Management Functions that had not been maximized, such as Planning and Supervision (Kunci, n.d.).

To find out how the company managed on time distribution to the seller and to determine the frequency of sending certain quantities of goods to daily operations (Karundeng, 2018), a system was used in managing the process of handling goods from receipt to delivery. The entire

process was carried out using certain systems which were assisted by computerized devices, pallets, forklifts, and high shelves.

The main problem in this research was the effect of warehouse management system on the smooth distribution of electrolux products at PT. CEVA Logistics. The study was conducted with quantitative approaches, this study used primary data obtained through questionnaires with company employees and secondary data such as company profile data, administrative data, and the company's commercial database as a trigger to understand problems that arose in the company. Data analysis was performed to determine: to find out and analyze the warehouse management system at PT. Ceva logistics, to find out and analyze the distribution of electrolux products at PT. Ceva logistics, To find out and analyze the effect of warehouse management systems on the smoothness of distribution of electrolux products at PT. Ceva logistics.

## 1.1 LITERATURE REVIEW

### 1.1.1 Previous research

Distribution System Analysis

Analysis of the logistics distribution system of Indomaret outlets in Semarang City by **PUTRI MUTIARA BENA** (Bena, n.d.)

Distribution Implementation Analysis

Analysis of logistics distribution performance on the supply of goods from the distribution center to Indomaret outlets in Semarang City by **AFRIDEL CHANDRA** (Chandra, 2013).

### 1.1.2 Logistics Management

According to Council of Logistics Management (CLM) definition of logistics is “that part of the supply chain process that plans, implements, and controls the efficient, effective flow and storage of goods, services, and related information from the point of origin to the point of consumption in order to meet customers’ requirements (Larson & Halldorsson, 2004).

“Logistics management is the activity of the flow of goods which is divided into two namely managerial activities and activities in general operational. Managerial activities of logistics include planning, organizing and monitoring, while logistics operational activities include procurement, recording, storage, distribution, maintenance and deletion of goods, both goods to be sold to consumers with the aim of meeting customer needs and equipment that is an inventory for the company” (Utami, N., & Sitorus, 2015).

The basic concept of logistics is to improve the efficiency and effectiveness of various business operations, such as transportation, warehousing and storage, order processing, material handling and many other activities. Once logistics was used in rotation with several terms, including physical distribution and logistics business, but nowadays Logistics Management (LM) is the most commonly used term by various groups (Wudhikarn, 2018). Logistics Management is identified as an important concept for several industries.

Logistics management includes information about the company, namely logistics activities with fundamentals value added features, such as on time and place accuracy (Nilsson & Waidringer, 2004).

Based on these definitions it can be said that logistics management covers several areas where managerial responsibilities are handled.

### 1.1.3 Warehouse Management System

A warehouse management system (WMS) is a database driven computer application to improve the efficiency of the warehouse by directing cutaways and to maintain accurate inventory by recording warehouse transactions. The systems also direct and optimize stock based on real-time information about the status of bin utilization (Ramaa, 2012). During production, the warehouse management system will track the product (Ruiz, 2011).

The Warehouse Management System itself is the main key in the supply chain, where the main goal is all the processes that occur in it such as sending, sending, receiving (storing), moving (moving) and picking (picking) in the Warehouse Management System.

**Tabel I. Variabel Warehouse Management System (X)**

| Variable                          | Dimension | Indicators          | Measurement scale |
|-----------------------------------|-----------|---------------------|-------------------|
| Warehouse Management System (WMS) | Tangible  | Computer Use        | Likert scale      |
|                                   |           | Pallet Availability | Likert scale      |
|                                   |           | Forklift Use        | Likert scale      |
|                                   |           | Rack Use            | Likert scale      |

### 1.1.4 Distribution

Distribution management is developing a strategy in line with the company's vision and mission, based on various decisions relating to physical and non-physical goods in order to achieve company goals and be in certain environmental conditions and in accordance with the needs and desires of consumers (Kodrat, 2009: 20) in (Teori & Praktik, n.d.).

Distribution describes all the logistics involved in sending a company's product or service to the right place, at the right time, for the lowest cost (Boakye, 2013). Distribution is the main contributing logistics activity (Giaglis, 2004).

**Tabel II. Distribution Smoothness Variable (Y)**

| Variable            | Dimension   | Indicators     | Measurement scale |
|---------------------|-------------|----------------|-------------------|
| Smooth Distribution | Tangible    | Facility       | Likert scale      |
|                     |             | Stock          | Likert scale      |
|                     | Reliability | Transportation | Likert scale      |
|                     | Assurance   | Communication  | Likert scale      |

## B. Method

### 1.2 Simple Linear Regression Formulation

In this case the independent variable / independent variable is X and the dependent variable / related variable is Y, using the following equation:

$$Y = a + bX$$

$$a = \frac{(\sum Y_i)(\sum X_i^2) - (\sum X_i)(\sum X_i Y_i)}{n \sum X_i^2 - (\sum X_i)^2} \quad b = \frac{n \sum X_i Y_i - (\sum X_i)(\sum Y_i)}{n \sum X_i^2 - (\sum X_i)^2}$$

In order to find out the correlation between warehouse management system and the smoothness of distribution, the writer used a simple linear regression analysis tool.

Information:

Y = Subject / Value in the predicted dependent variable.

a = price of Y if X = 0 (constant)

b = direction number or regression coefficient

X = Subject of an independent variable that has a certain value

n = Amount of data

### 1.3 Correlation coefficient

Correlation coefficient is a tool to determine the degree of correlation between the independent variable (X) with the dependent variable (Y):

Information:

$$r = \frac{n(\sum XY) - (\sum X)(\sum Y)}{\sqrt{\{n(\sum X^2) - (\sum X)^2\} \{n(\sum Y^2) - (\sum Y)^2\}}}$$

r = Correlation Coefficient

X = Independent Variable

Y = Dependent Variable

n = Number of Samples

Σ = Amount of Data

**Tabel III. Interpretation of Correlation Coefficients**

| Coefficient Intervals | Correlation Level |
|-----------------------|-------------------|
| 0,00 – 0,199          | Very low          |
| 0,20 – 0,399          | Low               |
| 0,40 – 0,599          | Is                |
| 0,60 – 0,799          | Strong            |
| 0,80 – 1,000          | Very strong       |

### 1.4 Hypothesis testing

This test was done by comparing the magnitude of the t-count value to the table. Hypothesis Formulation used the initial hypothesis with p (rho), as the following:

H0:  $\rho = 0$ , meaning that there is no influence between the variable X and the variable Y.

Ha:  $\rho \neq 0$ , meaning that there is an influence between the variable X and the variable Y.

To find the value of t arithmetic and to test the hypothesis the following formula was used:

$$t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$$

Whereas to find the value of t table, the t distribution table was used:

$\alpha = 0.05$ ; dk = n-2

Information:

t = tcount which is further consulted with ttable

r = Correlation Coefficient

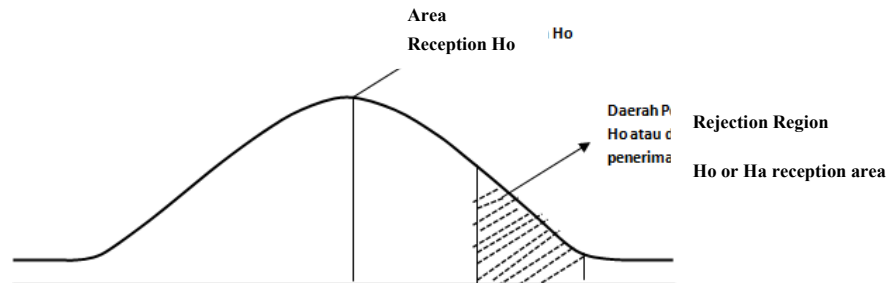
n = Amount

Sample Conditions:

If  $t_{count} > t_{table}$ , then  $H_a$  is accepted and  $H_o$  is rejected, meaning that there is a correlation between variable X and Y.

If  $t_{count} < t_{table}$ , then  $H_a$  is rejected and  $H_o$  is accepted, meaning there is no correlation between variable X and variable Y.

**Picture I. Normal Distribution Curve of Hypothesis Test**



### C. Discussion and Result

**Tabel IV. Recapitulation of Variable X (Warehouse Management System)**

| No.   | Statement                                                                             | SA  | A   | D | DA | SD | $\Sigma$ | Weight | —   |
|-------|---------------------------------------------------------------------------------------|-----|-----|---|----|----|----------|--------|-----|
|       |                                                                                       | 5   | 4   | 3 | 2  | 1  |          |        |     |
| 1     | The company has a warehouse management system.                                        | 13  | 17  | 0 | 0  | 0  | 30       | 133    | 4,4 |
| 2     | The warehouse management system has been running effectively.                         | 18  | 12  | 0 | 0  | 0  | 30       | 138    | 4,6 |
| 3     | Implementing a warehouse management system helps achieve company goals.               | 15  | 13  | 2 | 0  | 0  | 30       | 133    | 4,4 |
| 4     | The number of pallets in the warehouse is sufficient to store inventory.              | 18  | 12  | 0 | 0  | 0  | 30       | 138    | 4,6 |
| 5     | Pallet is always in good condition and maintained.                                    | 12  | 16  | 2 | 0  | 0  | 30       | 130    | 4,4 |
| 6     | There is maintenance, routine maintenance and repair of forklifts.                    | 13  | 15  | 2 | 0  | 0  | 30       | 131    | 4,4 |
| 7     | The use of forklifts is in accordance with SOP regulations.                           | 15  | 13  | 2 | 0  | 0  | 30       | 133    | 4,4 |
| 8     | Forklift inspection before operation.                                                 | 12  | 17  | 1 | 0  | 0  | 30       | 131    | 4,3 |
| 9     | There are shelving arrangements for each type of item.                                | 13  | 17  | 0 | 0  | 0  | 30       | 133    | 4,4 |
| 10    | The warehouse clerk must know the layout of the goods with almost the same packaging. | 17  | 13  | 0 | 0  | 0  | 30       | 137    | 4,6 |
| Total |                                                                                       | 146 | 145 | 9 | 0  | 0  | 300      | 1337   | 4,5 |

Source: Questionnaire results (processed by the author)

Information:

SA = Strongly Agree

A = Agree

D = Doubtful

DA = Disagree

SD = Strongly Disagree

Based on the warehouse management system variable data above, it could be seen the highest first statement that read "The warehouse management system so far has been running effectively", seen from the weight and average results of research calculations of 138 (4.6) and

there was the second highest statement it read "The warehouse clerk must know the layout of the goods with almost the same packaging" as seen from the weight and average of 137 (4.5). This showed that the warehouse management system had been running effectively so far as one of the solutions to improve the smoothness of distribution of goods and the warehouse officer must have known the layout of goods with almost the same packaging that had an impact on the productivity of the smoothness of distribution of goods. From the overall results of the respondents' opinions in table IV.5 namely regarding the warehouse management system, most of them stated "strongly agree" in the amount of 146 (48.67%), then respondents who stated "agree" were of 145 (15%) and respondents who expressed doubt- doubtful of 9 (3%), meaning that the warehouse management system at PT. CEVA Logistics had been operating effectively.

**Tabel V. Recapitulation of Variable Y (Smooth Distribution)**

| No.   | Statement                                                                                       | SA | A   | D  | DA | SD | $\Sigma$ | Bobot | –   |
|-------|-------------------------------------------------------------------------------------------------|----|-----|----|----|----|----------|-------|-----|
|       |                                                                                                 | 5  | 4   | 3  | 2  | 1  |          |       |     |
| 1     | There are adequate facilities for the distribution of goods.                                    | 9  | 17  | 4  | 0  | 0  | 30       | 125   | 4,2 |
| 2     | There is maintenance and care for warehouse facilities.                                         | 11 | 16  | 3  | 0  | 0  | 30       | 128   | 4,3 |
| 3     | There is care and protection for supplies in the warehouse.                                     | 9  | 14  | 6  | 1  | 0  | 30       | 121   | 4,0 |
| 4     | Availability of inventory card to record and find out the amount of inventory in the warehouse. | 9  | 17  | 2  | 2  | 0  | 30       | 123   | 4,1 |
| 5     | Examination of the amount of inventory both in the system and actual.                           | 12 | 17  | 1  | 0  | 0  | 30       | 131   | 4,4 |
| 6     | Combine shipping with different destinations.                                                   | 8  | 19  | 3  | 0  | 0  | 30       | 125   | 4,2 |
| 7     | Enough vehicles to distribute products.                                                         | 8  | 21  | 1  | 0  | 0  | 30       | 127   | 4,2 |
| 8     | Ordering of goods is done online.                                                               | 11 | 18  | 1  | 0  | 0  | 30       | 130   | 4,3 |
| 9     | There are reports about problems in the distribution of goods.                                  | 5  | 6   | 14 | 5  | 0  | 30       | 101   | 3,4 |
| 10    | The company builds good relations with <i>customers</i> .                                       | 11 | 18  | 1  | 0  | 0  | 30       | 130   | 4,3 |
| Total |                                                                                                 | 93 | 163 | 36 | 8  | 0  | 300      | 1241  | 4,1 |

Source: Questionnaire results (processed by the author)

Information:

SA = Strongly Agree

A = Agree

D = Doubtful

DA = Disagree

SD = Strongly Disagree

Based on the recapitulation data above, it could be seen that the smoothness of the distribution variable was more focused on the statement that read "There is an examination of the amount of inventory both in the system and actual", seen from the weight and average results of research calculations of 131 (4.4). This showed that there was an inspection of the amount of inventory both in the system and actual so that the distribution of goods ran smoothly.

From the overall results of respondents' opinions in table IV.26 regarding the smoothness of distribution, most of them that stated "agree" in were 163 (54.33%), then for respondents who stated "strongly agree" the number was 93 (31%), respondents who expressed "doubt" were 36 (12%) and for respondents who expressed doubt were 8 (2.67%), this means that the distribution was smooth at PT. CEVA Logistics and had been running smoothly.

#### **D. Conclusion**

1. Warehouse management system of PT. CEVA Logistics shows that most companies agree with an optimal warehouse management system. Managing a warehouse management system that has been made effective is one solution to improve management in warehouses and coupled with checking the number of product purchases both in the system and making it possible to distribute products.
2. The lowest value in the definition of a warehouse management system that reads "Pallet is always in good condition and well maintained" and states about the smooth distribution of variables that read "There are reports of problems in the distribution of goods", show the need to improve the smoothness of distribution of products.
3. The effect of the warehouse management system on the smoothness of distribution of Electrolux products at PT. Logistic CEVA based on the results of hypothesis testing obtained the value of tcount of 5.0920 and the value of t table is 1.701. The value of  $t_{count} > t_{table} = 5.0920 > 1.701$ . Because tcount is greater than ttable, then  $H_0$  is rejected and  $H_a$  is accepted, there is positive correlation between variable X (warehouse management system) on variable Y (current distribution) which is equal to 0.6934.

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