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## FACTOR ANALYSIS OF THE CAUSES OF INCORRECT EXPENDITURE OF GOODS AT THE WAREHOUSE OF PT DUNIA EXPRESS TRANSINDO

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### Abstract:

*PT Dunia Express Transindo is a service provider company "Total Logistics". One of the services provided is the warehouse division to manage all activities in it starting from the Inbound / Receipt of goods, Storage / Storage of goods, and Outbound / Expenditure of goods. In the process, there are problems found in the warehouse, namely errors in the Outbound process / Expenditure of goods in the warehouse, which results in internal impacts for the company, namely errors in the expenditure of goods causing re-delivery to customers. Also the external impact for the company is that the mis-expenditure of goods causes the level of customer trust to be reduced. Data collection is carried out by asking directly to field workers (warehouse staff and warehouse coordinators) and observing warehouse conditions directly. This study took data on the error of goods expenditure in December 2020 the number of goods 13 pcs and in January 2021 with the number of goods 96 pcs. From the root of the problem by using the fishbone diagram and causal method. It is known that the human factor is the most dominant factor due to lack of thoroughness, lack of knowledge and lack of communication. After analyzing the improvement plan using the 5w1h method, the application of the DUNEX Wms Dry application that has been made and socialization is carried out during the morning briefing. So that it can reduce the error of spending goods, speed up the previous report process 2 hours to 5 minutes, report damage previously 30 minutes to 3 minutes and make it easier to find out the items that have been colly.*

**Keywords:** Goods Expenditure Errors, Fishbone Diagrams, Applications

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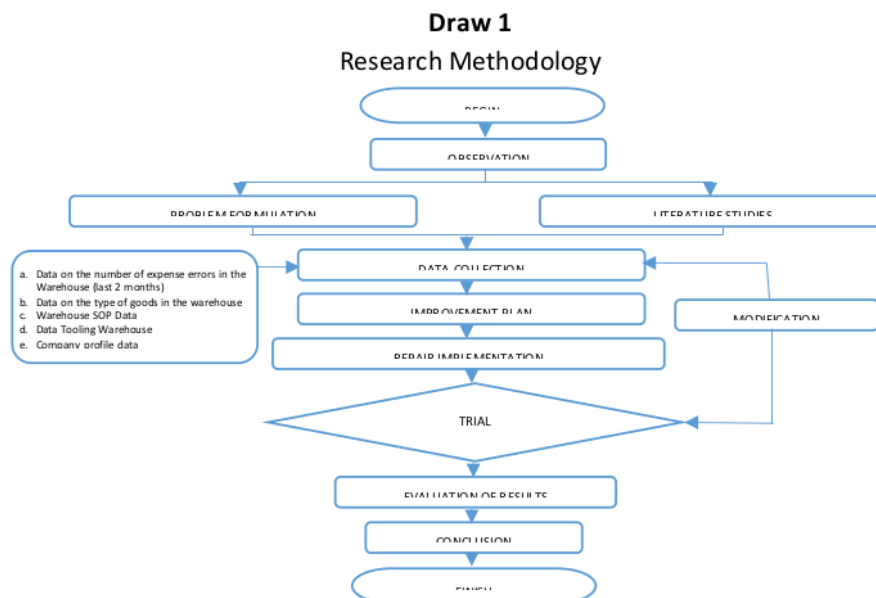
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## INTRODUCTION

PT Dunia Express Transindo (DUNEX) is a company engaged in the world of logistics which was established in 1990. The company's head office is located in Sunter, North Jakarta and has an area of 220,000 m<sup>2</sup>. This company has branch offices located in several regions to support the effectiveness of shipping goods. The company provides total logistics services that include *warehouse, trucking, export & import, and container depot*. PT Dunia Express Transindo has a trucking division which is a transporter service that is the 3rd party between the sender of goods and the recipient. The trucking division has 3 sub-divisions based on the type of vehicle service, namely box car delivery services, trailers, and car carriers. Sunter's box car sub-division has a high delivery activity as evidenced in 6 months, namely the period from September to February 2021, there were 19,099 *delivery order* volumes. Sunter's box sub-division has types of cars from L300 to tronton and overall has 240 truck units of various types. This is in order to fulfill the incoming delivery order. Most of the items that are loaded use a car box of various things because the box contains daily necessities such as food, oil, milk, medicine, and other basic necessities. In the delivery of box cars, there are return goods, namely goods that are rejected by the *customer*. In the period of September and February, there were 399 return items. Most of the goods that enter the return warehouse have damage to the outer packaging. Damage consists of scratched cardboard, faded cardboard color, folded cardboard, etc. Companies need to formulate this problem in order to reduce return goods that enter the return gurdang.

## METHOD

The research methodology aims to solve existing problems in a structured manner. The following is a *flowchart* of the research methodology:



## A. Warehouse Introduction

Draw 2  
Warehouse



(Source : *Company Profile DUNEX*)

As a service provider company "Total Logistics", PT Dunia Express Transindo has a *warehouse* division. *Warehouse* or *gudang* is a place to store goods, both raw materials that will be used in the manufacturing process and finished goods that are ready to be sent to customers (Juliana & Handayani, 2016). Warehousing activities at PT Dunia Express Transindo are not only *storage* activities, but also the process of handling goods starting from receiving goods / *inbound*, recording, inputting data, selection, sorting, labeling, packing / *packing*, to the process of issuing goods / *outbound*.

### 1. Methods of Storing Goods

#### a. FIFO (First *In First Out*) Method

The FIFO method in DUNEX is carried out with a system of goods that enter first, which is also issued first. FIFO systems are generally used for items that cannot last long or when stored for a long time will be damaged or reduced in quality, for example, such as food in a cold storage.

#### b. FEFO (First *Expired First Out*) Method

The FEFO method at DUNEX is carried out for the management of storage of goods by removing goods that have the nearest expiration period first. This is aimed at preventing expired goods from being stored in the warehouse. This method can be said to be a combination of the LIFO and FIFO methods, because even if the goods come first or at the latest, if they have a faster expiration period, they will be issued first.

#### c. LIFO (*Last In First Out*) Method

Unlike FIFO, in DUNEX this method is used for goods that enter last and goods that have a long expiration period will come out first. Due to the large demand for the expenditure of goods that entered the last time, it has a longer cadlarization

period than the goods that entered first. The LIFO method is also used for the purpose of the process of structuring goods, both the entry and collection of inventory items.

**B. Flowchart Research Methodology**

1. *Inbound/Receipt of Goods*

The process of receiving goods is the activity of physical receipt of goods from factories or distributors in accordance with ordering and delivery documents and in conditions that are in accordance with the requirements for handling goods.

2. *Storage of Goods*

Storage is the activity of putting barang to be stored in a designated place or placing goods in a waiting condition for ordered or prepared in the warehouse for processing its use or distribution. Pallet Storage is a storage system that is carried out using pallets (Ekoanindiyo & Wedana, 2012). The following is the pallet storage system used in Dunex, namely:

a. Block stacking

Block stacking is a stacking placed on the floor. Stacking usually consists of two blocks or stacking based on the safe limit of stacking that complies with the policy (Riski et al., 2017).

b. Single-deep selective pallet racks

Shelves are most often used in warehouses, because they have the advantage of easier and faster access than others. This rack has a FIFO (First In First Out) storage system so that the use of this rack will be very encouraging because the time spent will not be too long. However, this type of shelf takes up a lot of space so it makes the utilization of the warehouse small.

c. Double-deep Racks

Drive-in racks are storage media that have double racks, so that storage becomes more durable. This rack has a LIFO (*Last In First*) storage system (Ali, 2006). OutTends to have a large capacity, but it can only be accessed through one side.

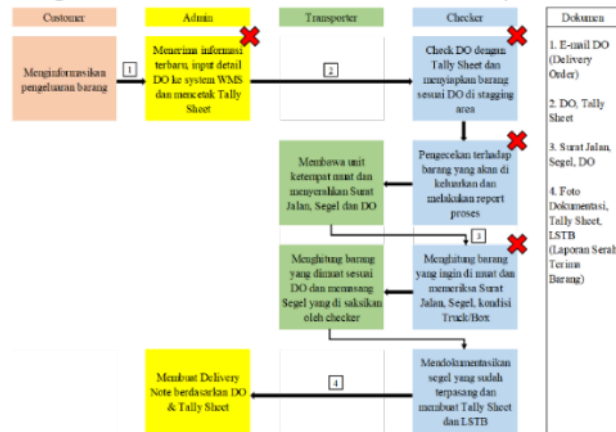
3. *Outbound/Goods Expenditure*

Goods expenditure is the activity of spending goods in the *warehouse* to the destination. *Picking* is the activity of physically searching for goods from shelves or storage pallets that are adjusted to the collection list document (Tally Sheet) (Lega Hardana, 2021).

**Draw 3**

Factor Analysis Of The Causes Of Incorrect Expenditure Of Goods At The Warehouse Of PT Dunia Express Transindo

Stages of the *Outbound Process / Goods Expenditure*



In figure 3 shows the stages of the *Outbound / Goods Expenditure* process starting from:

- The customer provides information to the dunex regarding the release of goods accompanied by an e-mail Delivery Order.
- The admin receives information on the placement of goods and processes the DO input to the *Warehouse Management System (WMS)* to make a Tally Sheet. DO and Tally Sheet printouts are given to the checker
- The checker receives and cheques the printed Tally Sheet and DO, then prepares the goods according to the DO and scans the LPN (License Plate Number) label on the item, then scans the LPN label on the shelf, through a handheld tool. Carry goods using hand pallets or fork lifts and reach trucks to be stored in the Staging Area.
- Checker calculates and checks the condition of the goods to be issued. If the condition of the goods is not fit to fit / damage, it will be returned in the storage area and made a news event of the damaged goods. If the goods are good, it will remain in the staging area for the report process.
- The transporter takes the unit to the loading place and hands the Road Letter and DO to the checker.
- The checker checks the Road Mail, Seals, and Truck/Box conditions. If the road letter, seal does not match then the checker will return the seal to be confirmed to the transporter section
- The transporter counts the loaded items and installs the Seal witnessed by the checker.
- The checker documents the pre-installed seals and creates a *Tally Sheet* and LSTB.
- Next the admin creates a *Delivery Note* based on the DO & *Tally Sheet*.

**C. Data Collection**

Below is data on the number of errors in the expenditure of goods in the warehouse. Where in 2 months (December 2020 – January 2021).

**Table 1**

Data on the number of errors in the expenditure of goods in the warehouse

No	Not	Item Code	Warehouse	Number of Items		Difference	Satuan	Types of Barang	Expired Data		Types of Errors
				Physical Expenditure of Goods	DO				Physical Expenditure of Goods	DO	
1	Desember 2020	63859	Warehouse D	1	1	0	Unit	Mattress			Wrong Size (180x200)
2	Desember 2020	70406	Surabaya Warehouse	9	3	6	Pieces	Food	Jun 29, 2021	June 29, 2021	Excess 6 pcs, It should be 3 pcs
3	Desember 2020	70406	Surabaya Warehouse	15	21	-6	Pieces	Food	Jun 29, 2021	June 21, 2021	Less 6 pcs, Should be 21 pcs
4	Januari 2021	70373	Surabaya Warehouse	2	12	-10	Pieces	Food	Oct 24, 2021	Oct 24, 2021	Less 10pcs, It should be 12pcs
5	Januari 2021	70373	Surabaya Warehouse	18	8	10	Pieces	Food	Oct 24, 2021	Oct 24, 2021	excess 10 pcs, It should be 8 pcs
6	Januari 2021	70196	Surabaya Warehouse	54	54	0	Pieces	Food	October 29, 2021	Oct 28, 2021	Incorrectly Expired Date August 29, Should Be Oct 28
7	Januari 2021	70195	Surabaya	22	22	0	Pieces	Food	Oct 28, 2021	Aug 29, 2021	Incorrectly Expired



Factor Analysis Of The Causes Of Incorrect Expenditure Of Goods At The Warehouse Of PT  
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Wareh ouse	Date Oct 28, Suppose d to be August 29
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Based on the data table detailing the error in the expenditure of goods in the warehouse, it can be concluded that for 2 (two) months at the end of 2020 and the beginning of 2021. The highest item expenditure error occurred in January 2021, namely 4 times the error in spending 96 pcs, followed by December 2020, which was 3 times the error in spending goods as much as 13 pcs. The total error in the expenditure of goods in December 2020 and January 2021 was 109 pcs, where each case there were similar types of errors and differences in types of errors, namely:

1. Gross expenditure error b due to wrong size of goods
2. expenditure of goods due to excess goods issued
3. Incorrect expenditure of goods due to lack of goods issued
4. Incorrect expenditure of goods due to incorrect expired date

**D. Logistic**

(Siagian, 2005) , logistics is defined as part of the supply *chain* process that functions to plan, implement, control effectively, efficiently the process of procurement, management, storage of goods, services and information starting from the *point of origin* to the *point of consumption* with the aim of meeting consumer needs.

**E. Warehouse**

Warehousing Management is a series of activities in planning, implementing and controlling as well as corrective actions for maintenance, distribution, stock removal, and recording as documents to support effectiveness and efficiency in efforts to achieve organizational goals (Yulianti, 2020).

**F. Fishbone Diagrams**

Fishbone Diagram is a method that explains the root causes of problems that categorize sources of causes based on the 7M principle, namely *man power, machines, methods, materials, media, motivation, money* (Gaspersz, 2002).

**G. 5W+1H Method**

5W+1H is used to design strategies to overcome problems in the company. 5W+1H analysis includes what means what the problem will be repaired, why means *why* repairs need to be made, where means *where* the location to make repairs is, when it means *when* corrective action is taken, who means *who* is responsible for the repair, and how does it mean



how the strategy to overcome the problem will be corrected (Somadi & Hidayat, 2019) .

#### H. Warehouse Management System

*Warehouse Management System* (WMS) is a system used in management that regulates the process of handling goods from receipt to delivery. The whole process is carried out using a certain system and is usually assisted by computerized devices, pallets, forklifts and high racks (Widianto & PRASTIWI, 2011).

#### I. Application

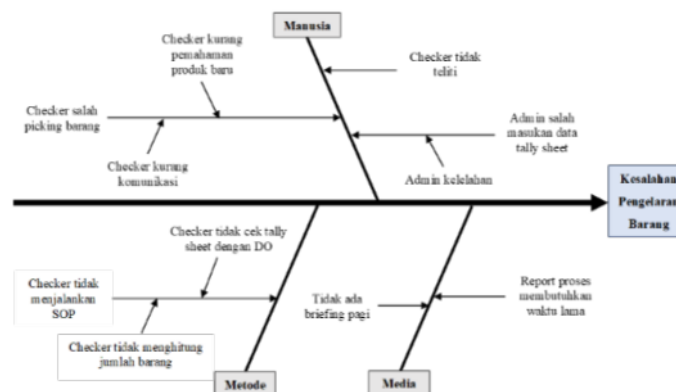
In terms of the definition of an application is a program that is ready to be used which is made to carry out a function for application service users and the use of other applications that can be used by a target to be targeted (Juansyah, 2015). According to the executive computer dictionary, application has the meaning of problem solving that uses one of the application data processing techniques that usually races on a desired or expected combination or expected data processing.

### RESULTS AND DISCUSSION

#### A. Problem Analysis

At this stage, the author will analyze the problems that occur in the expenditure error in the warehouse, so that the things that will be described in this chapter include an analysis of the factors causing the incorrect expenditure of goods and the improvement of the problem. The main factors that cause incorrect expenditure of goods, can be found out each of the causes and consequences by asking directly to field workers (warehouse staff and warehouse coordinators) and observing directly the condition of the warehouse. So the results of the analysis are placed into the causal method and fishbone diagram. By applying causation and fishbone diagrams, it is easier for the author to be able to find the root cause of the problem so that if the problem and cause are known for sure, then corrective actions will be easier to do. The following is a *fishbone* diagram that the author made to analyze the cause of the wrong expenditure of goods at the PT Dunia Express Tansido warehouse.

Draw 4 Fhisbone Diagram



Factor Analysis Of The Causes Of Incorrect Expenditure Of Goods At The Warehouse Of PT  
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Based on figure 4 fishbone diagrams of item discharge errors caused by:

- 1) Human Factors (*manpower/employee/warehouse staff*). Main factors: Lack of communication, lack of understanding of the product, wrong input, and wrong picking of goods
- 2) *Work-methode/standart operating procedure/SOP*). Main factors : Goods not checked, no documentation, no check DO with *Tally Sheet*
- 3) Material Factor (product variance). Main factors: Many variants of the same color and type of goods, the number of items issued
- 4) Media Factors (work environment, working time, *lay-out*). Main factor : Report process is still manual.

From the analysis of the factors that cause the error in the expenditure of goods above, as well as which factors are the most dominant that cause the error in the expenditure of goods, it can be seen that the Human Factor has a considerable role as the main cause of the occurrence of errors in the expenditure of goods. As for the Method Factor, it ranks next as the most dominant factor that causes errors in the expenditure of goods in this warehouse to occur. Based on the causal factors in the fishbone diagram analysis above, it will have an impact on the occurrence of existing problems (Asmoko, 2013). Thus, it is necessary to know the impact that occurs from the existing problem, so the author makes a table of the cause and effect of the problem.

**Table 2** Causal analysis

NO	SEBAB	AKIBAT
1	Tidak ada briefing pagi	Checker kurang pemahaman produk baru dan kurang komunikasi
2	Checker kurang pemahaman produk baru	Checker salah picking barang
3	Checker kurang komunikasi	Checker salah picking barang
4	Checker tidak teliti	Checker tidak menjalankan SOP
5	Checker tidak menjalankan SOP	Checker tidak cek tally sheet dengan DO dan tidak menghitung jumlah barang
6	Checker tidak cek tally sheet dengan DO	Barang yang dikeluarkan tidak sesuai dengan DO
7	Checker tidak menghitung jumlah barang	Barang yang dikeluarkan tidak sesuai dengan DO
8	Report proses membutuhkan waktu lama	Admin kelelahan
9	Admin kelelahan	Admin salah masukan data tally sheet

## B. Correction

This repair process uses the 5W-1H method which serves to understand and explain a problem in detail. Table 5W-1H is a table containing questions whose answers are considered basic in information collection or problem solving (Ferdiansyah, 2012). 5W-1H is a component of the basic questions of 5W, namely *What*, *Where*, *When* (when), *Why* (why), *Who* (who) and 1H namely *How* (how) (Ulfa & Wahyudi, 2016) . In this study, the explanations used in each question were as follows:

1. What is the purpose of the improvement plan? (*What*)
2. Why does a repair plan need to be carried out? (*Why*)
3. Where will the plan be carried out? (*Where*)
4. When will the repair plan be carried out? (*When*)
5. Who did the improvement plan? (*Who*)
6. How is the process of implementing the improvement plan carried out? (*d*)

The following can be known some of the factors that cause errors in shipping goods from the warehouse along with recommendations or repair efforts that must be carried out by the company to at least minimize the occurrence of errors in the production of goods from the warehouse.

## C. Improvement Implementation

1. Use of the App

Application users who will use this application are as follows:

- a. Have a *Warehouse Management System* account
  - b. Have an android phone, minimum android 5 and *a single core* processor of 1 Ghz.
  - c. Connect to the internet network
2. Application Tampilan and Filtur-Filtur Application

In its use, this application has a display and several features that function to support the process in the warehouse, including:

- a. Application Log in View

**Draw 5**  
*Log In Application*



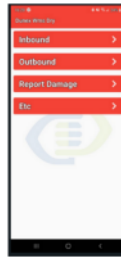
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To initiate access to the Dunex Wms Dry app

- 1) Open the Dunex Wms Dry app
- 2) A login display will appear with the sentence Wms Logistics and the slogan (*Go Beyond Logistics*)
- 3) Users must *log in* by entering the username and password on the form provided according to the instructions, the username and password are in the middle of the screen
- 4) Click the *log in* button under the *password* to enter the dashboard page

b. Dashboard View

**Draw 6** Application Dashboard



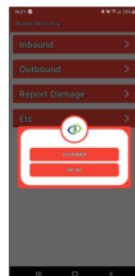
When you have logged in, the user will be directed to the *dashboard* page, at the top of the screen there is a sentence Dunex Wms Dry, namely the name of the application. During the dashboard page, users can choose which activity menu to do.

The activity menu options on the dashboard consist of:

- 1) *Inbound* (process of receiving goods)
- 2) *Outbound* (process of dispensing goods)
- 3) *Damage Report* (*Damage report* menu serves for *reports* and photos when damage items are found for making news events)
- 4) *Etc* (*et cetera* serves to find out the quantity and name of goods that have been colly or have been *packed*)

c. Dashboard View

**Draw 7** Inbound outbound menu *display 1*

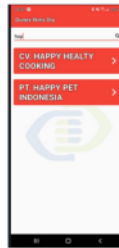


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In the *inbound outbound* menu , there is an option menu where users can choose based on the customer's name or DO number

**Draw 8**

Outbound onbound menu display



On the next page, users can enter the *customer's* name or DO number in the day. If the option appears, the user can choose the *customer* or DO number that they want to process.

**Draw 9**

*Outbouond 3 inbound* menu display



On this page, users can enter a *Delivery Note* (DN) in the future. *This Delivery Note* is on the Tally Sheet. If you enter the *Delivery Note* incorrectly, there is no option available in the application and cannot continue the process. If entering the *Delivery Note* correctly will be displayed, the user can select the *Delivery Note* they want to process.

**Draw 10**

Inbound *ountbound* menu display 4



Then the user is shown the display that contains:

- 1) Type is a description of what process will be carried out

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- 2) *Customer* is the name of the customer chosen
- 3) *Add photo* is a button to take photos via the cellphone camera directly
- 4) *Upload* is a button to send photos to the DUNEX WMS system
- 5) Menu i.e. back button to the start menu / *application dashboard*

**Draw 11**

Inbound outbound menu display 5



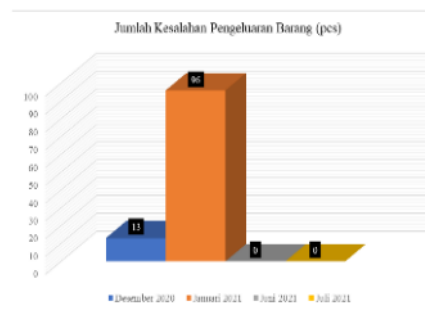
In the *add photo* button display, users can select photos with the cellphone camera directly, or open the gallery to select existing images.

**D. Evaluation of Repair Results**

1. Data on Item Expenditure Errors After Repairs

**Draw 12**

Diagram of the number of errors in goods after repairs at the warehouse of PT Dunia Express  
Transindo



on the diagram of the number of errors in the expenditure of goods after repairs in June 2021 to July 2021. Errors in the expenditure of goods can be from the number of 3 cases with the number of products 13 pcs in December 2020 and 4 cases with the number of products 96 pcs in January 2021. It can be prevented in June 2021 with the number of 0 cases and in July 2021 with the number of 0 cases.

This is because the application implementation of DUNEX wms dry runs well. Also socialization about SOPs, understanding of products, performance updates of all warehouse staff, and also the latest updates from customers. The following is the implementation of improvements made by the warehouse coordinator and researchers:

a. Morning Briefing

**Draw 13**

Morning briefing of PT. Trasindo Express World





The implementation of the briefing is carried out before starting work or in the morning, carried out by the warehouse coordinator as the leader of the morning *briefing* and all warehouse staff (D KHATAMI ALAMSYAH, 2018). This morning's briefing provides briefings before starting work, socialization about SOPs, and information about the work process. Training on customer products is also carried out during briefings carried out by all warehouse staff aimed at introducing new or existing products and special handling of an item.

b. DUNEX wms dry application

The implementation of the DUNEX wms dry application is carried out by checkers and warehouse admins. Here is a comparison after using the DUNEX wms dry application in the *inbound* or *outbound* process.

**Table 4**

Comparison after using the DUNEX Wms Dry application on *the outbound* process

Sebelum	Sesudah
 <ol style="list-style-type: none"> <li>1. Checker menastal manual dan mengecek expired date barang dengan DO</li> <li>2. Checker memberikan catatan manual kepada admin</li> <li>3. Admin mencatat tanggal dan jam expired date di excel</li> <li>4. Checker foto barang yang sudah di colly</li> <li>5. Checker mengirimkan gambar kepada admin melalui whatsapp</li> <li>6. Admin mengeslit dan meneposisikan gambar di excel</li> <li>7. Admin mengupload excel ke sistem WMS</li> </ol> <p>Dalam 1 DO checker dan admin dapat melakukan proses ini selama 2 jam.</p>	 <ol style="list-style-type: none"> <li>1. Checker memastikan foto expired date produk melalui aplikasi DUNEX Wins Dry, dan gambar otomatis tersimpan di sistem WMS</li> </ol> <p>Dalam 1 DO checker dapat melakukan proses ini selama 5 menit.</p>

Before using the DUNEX TWMS application, Dry admin and checker do a report process for 2 hours. This is due to the large number of processes carried out and usually in





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1 DO there are 35 pcs of goods depending on customer demand. One admin is in charge of handling five different customers, the admin must complete the report process of one customer and then the other customer. After using the DUNEX Wms Dry application, the report process can be done in just one process with a time of 5 minutes. Errors in the production of goods can be prevented with the DUNEX Wms Dry application security system, because in the process the user must enter the *Delivery Note* (DN) correctly. If the user enters the *Delivery Note* incorrectly, there is no option available on the application and cannot continue the process. Another advantage of using the DUNEX Wms Dry application is the *damage report* menu and Etc. The first advantage where on the Etc menu, without having to disassemble items that have been colly or have been packed. Users can find out how many items are and what are the names of items that have been colly or have been packed. The advantage of both *damage report* menus is that users can easily document when damage items are found for making news events. Here is before and after the application is created:

**Table 5**

Comparison after using the DUNEX Wms Dry application in the damage report menu

	
<ol style="list-style-type: none"><li>1. Checker foto barang yang damage</li><li>2. Checker mengirimkan gambar kepada admin melalui whatsapp dan memberikan keterangan nama, jumlah dan jenis kerusakannya</li><li>3. Admin mengedit dan memposisikan gambar di excel</li><li>4. Admin mengupload excel kesistem WMS</li><li>5. Admin mengisi data nama, jumlah dan jenis kerusakannya disistem WMS.</li></ol> <p>Pembuatan berita acara selama 30 menit</p>	<ol style="list-style-type: none"><li>1. Checker memasukkan foto barang yang damage lalu mengisi data nama, jumlah dan jenis kerusakannya melalui aplikasi DUNEX Wms Dry</li></ol> <p>Pembuatan berita acara selama 3 menit</p>

## CONCLUSION

The DUNEX Wms Dry application can reduce the error of discharging goods because in the process, it must enter the *Delivery Note* correctly. Morning briefings can reduce the mis-spending of goods caused by the human factor. Conducted for briefing before starting work, socialization about SOPs, information about the work process and introduction about the product. DUNEX Wms Dry application can help admins and checkers

To speed up the previous report process of 2 hours to 5 minutes, the previous damage report was 30 minutes to 3 minutes and made it easier to find out the items that had been collged.

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