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DECREASE INVENTORY INACCURATE BY PDCA APPROACH A CASE STUDY IN INDONESIAN'S RETAIL COMPANY

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ABSTRACT

Inventory accuracy is one indicator of the success of managing the distribution warehouse as part of the supply chain. One way to reduce the level of inventory accuracy is low is to use continuous improvement that is applied to all parts of the process in the distribution warehouse. The continuous improvement system used must be able to solve the problems that arise in the operational activities. This research will use the Plan Do Check Action (PDCA) method then the results will be analyzed by Cause and Effect Analysis method. Inventory data in 2017 shows a high level of inaccurate compared to the tolerance limits set by the company. To be able to support the implementation of the Plan Do Check Action (PDCA), it is very necessary to have an effective teamwork and involve all parts of the operational system in the distribution warehouse, therefore primarily the distribution warehouse needs to first examine its ability to carry out operational processes.

KEYWORDS: *Plan Do Check Action, Cause and Effect Analysis method.*

I. INTRODUCTION

The development of supply chain management in Indonesia is growing rapidly, this is also evident from the increasing regularity in the management of distribution warehouses as part of the supply chain process. Accuracy in recording the availability of goods both systemically coupled with physically managed in the field becomes very important to maintain the

continuity of operational processes in the distribution warehouse and its effect on overall corporate profits. The accuracy of inventory records is a prerequisite for inventory management, scheduling, production and ultimately sales.[3]

In an activity there will definitely be risks besides the benefits or benefits obtained as well as the presence of a DC (Distribution Center) which actually causes problems in terms of stock level and handling. One of them is to maintain the accuracy of a product that must rotate quickly and precisely, certainly can not be denied handling products with different product characteristics in 1 (one) system and distribution requires extraordinary effort.

ABC Company as one of the companies with distribution warehouses has 3 major parts, namely the receiving, inventory and delivery sections. In the inventory section, the company still found a large inaccurate inventory level where there is a difference in the recording quantity with the physical quantity of goods managed in the field, the constraint is the impact of the implementation of the receiving section that goes into managing the distribution warehouse. Later these obstacles will certainly have an adverse effect on the delivery as the final part of the completion of the operational process.

This study will analyze the operational processes in the distribution warehouse, especially in the inventory section, so it is expected that problems arising in ABC companies can be solved using control methods that can reduce the level of inaccurate inventory and be able to find the factors that influence the occurrence of inaccurate problems for the next period. in order to achieve the success and benefits expected by the company.

The method to be used is the Plan Do Check Action (PDCA) then the results will be analyzed by the Cause and Effect Analysis method.

II. Literature Review

2.1 Inventory accuracy and Inventory Management

Problems that often arise from inventory management activities are wrong in manual calculations where there is excess inventory (more than needed inventory) or shortage of inventory (inventory is less than what is needed). then we need ways to overcome these obstacles.

Therefore we need inventory management which are systems for managing inventory. How inventory items can be classified and how accurate inventory records can be maintained. Then,

inventory control is observed in the service sector. The purpose of inventory management is to determine the balance between inventory investment and customer service. The company will never achieve a low-cost strategy without good inventory management.[3]

So it can be interpreted that inventory management as a way of managing inventory of goods in a company that is regulated by the grouping and recording so that the data information that is owned can be maintained truthfully.

2.2 Plan Do Check Action (PDCA)

PDCA (Plan-Do-Check-Action) or often also called Deming Circle / Deming Cycle / Wheel, Shewhart Cycle, control circle / cycle, and PDSA (Plan Do Study Act) is a four-step iterative management method used in business processes for continuous control and improvement of processes and products.[6]

The four phases contained in PDCA (Plan-Do-Check-Action) are

1. Plan: identify and analyze problems.

Identifying the problem in more depth, several ways can be used to examine, among others, Drill Down, Cause and Effect Diagrams, and the Why to be able to help find the root of the problem. After these steps are carried out, the problem can be measured and resolved more precisely by gathering all the information needed to estimate more targeted problem solving.

2. Do: develop and test potential solutions.

At this stage, several steps are carried out, including making possible corrective steps, choosing the most appropriate corrective steps, using Impact Analysis to be analyzed, implementing pilot projects on a small scale, using small groups, or only being carried out on certain more specific parts, or use other experiments that are expected to be more appropriate to solve problems, or goods.

3. Check: measure the effectiveness of testing the previous solution and analyze whether the step can be improved.

The stages in which the corrective steps are tested for success, and record the success achieved that will help repair. The process or stages of "Do and" Check "may be repeated which will depend on the results of small-scale experiments that have been done before, or depending on the scope of the area or type of goods used as research and then merged from

the results of improvements. If the time and cost required exceeds the capacity to repeat these steps, then all steps can be completed.

4. Act/ Action: implement an overall improved solution.

The last stage is to carry out the implementation of the solutions they have. But the PDCA Cycle steps will not just stop. PDCA Cycle is part of continuous improvement, repetition of all stages from the beginning will be very necessary to reach problems in other areas.[4]

The advantages of using the PDCA cycle include

1. To facilitate the mapping of the authority and responsibility of an organizational structure unit,
2. Using as a work pattern and point of view in improving a process or system in an organization
3. Used as a benchmark for solving and controlling problems in a structured and systematic manner
4. Be a continuous improvement step in the implementation of work processes
5. Eliminating waste in the workplace and increasing productivity and increasing efficiency.[5]

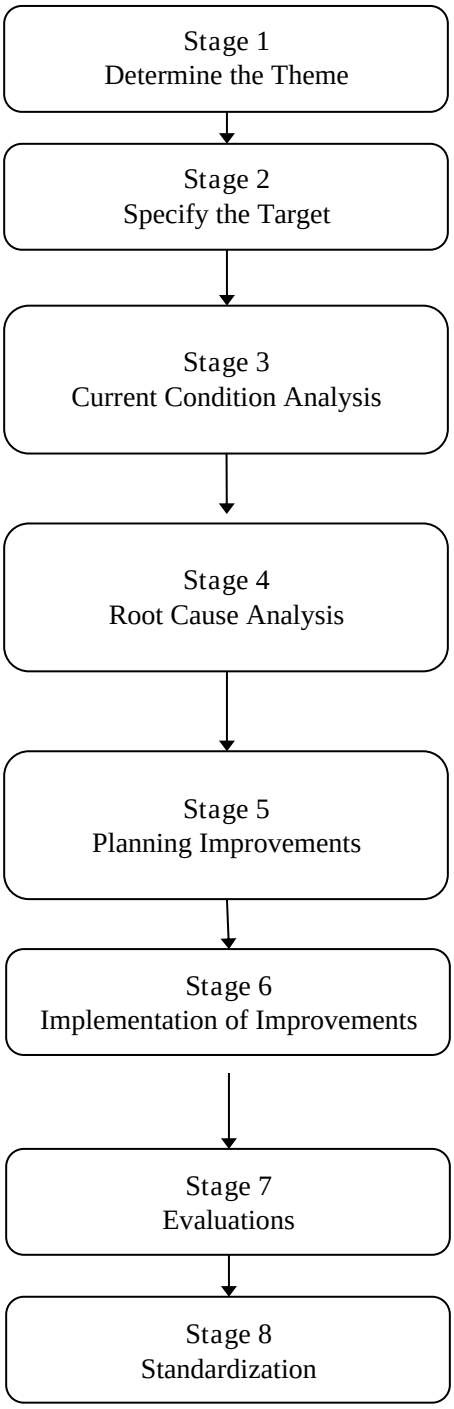
III. Research Methodology

To be able to find the root of the problem and solve the problem, a proper research methodology is needed to be applied

1. Determination of the theme and phenomenon of the problem at hand
2. Determine the target of achievement to be achieved
3. Do an analysis of the latest conditions
4. Boot cause failure analysis
5. Create improvement plan
6. Implementation of improvements
7. Checking and testing the results obtained, and what the resulting impact
8. Standardization Determination of the theme and phenomenon of the problem at hand
9. Determine the target achievement that will be achieved
10. Do an analysis of the latest conditions
11. Root cause failure analysis
12. Create improvement plan
13. Implementation of improvements

14. Conduct checks and tests of the results obtained, and what the resulting impact
15. Standardization

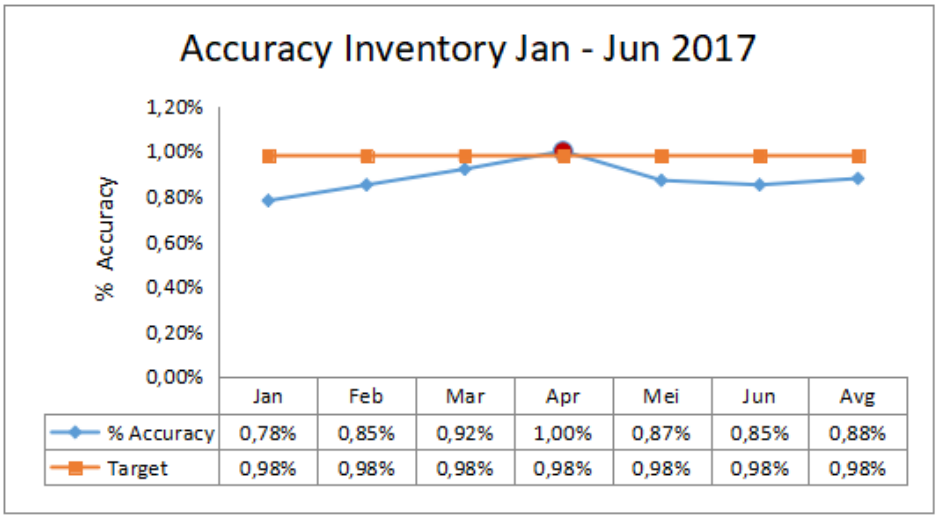
The figure below is a sequence of steps in doing research from step 1 to step 8. Every steps is a concept of PDCA cycle that must be done in sequence to ensure good research results.[1]



IV. RESULT AND DISCUSSION

4.1 Determine the Theme

The first step is to determine inaccurate data in the distribution center inventory data



The accuracy data was obtained from the 2016 inventory distribution data report. It is known that the level of accuracy has decreased since March which is a phenomenon of this study. After that the calculation is done using pareto from the accuracy data to find out what type of innacurate needs improvement.

Table 1: Pareto inaccurate inventory distribution center.

Classification	Total Item	% Item	Sum of Loss Accuracy (unit)	%Loss Accuracy (unit)
Wrong Location	207	27%	6.408	52%
Wrong Pack Size	75	10%	863	7%
Wrong Packaging	128	17%	1.232	10%
Wrong Delivery	149	20%	1.602	13%
Goods Intransit	32	4%	246	2%
etc	170	22%	1.973	16%
Grand Total	**761**	**100%**	12.342	**100%**

Based on the results of checking the data, it can be seen that the most influential factor in the inaccurate occurrence at the stock distribution center is the wrong location with a contribution of 207 of the total items and 52% of the contribution of the loss accuracy.

4.2 Set Target

In this research, the target achievement is 50% of this improvement according to the SMART Method: Specific, Measurable, Achievable, Realistic, Time Bound.

4.3 Existing Conditions Analysis

The discovery of several conditions that are thought to be the cause of the problem, namely the misplacement of goods, is illustrated in the following table

Table 2: 4M + 1W analysis.

No	What Should Be Happened	What Actually Happened	4M + 1E	Improvement Opportunity / Note
1	Goods in correct location	Misread goods location	Human	Training
2	Goods complete identity	Wrong goods identity	Supplier	Standardization
3	RF read location command	Manual input location data	Method	Standardization
4	Appropriate floor plan	Unproper racking	Method	Standardization
5	Supportive work locations	Disorganized	Environtment	Standardization

4.4 Root Cause Failure Analysis

From the discovery of the current conditions then traced the root of the problem in more depth that lies behind the problem

Table 3: Root cause failure analysis.

No	Failure Mode	WHY 1	WHY 2	WHY 3	4M/IE
1	Misread goods location	No training	Operator is out of focus	No review	Human
2	Wrong goods identity	Supplier error	Mishandled		Supplier
3	Manual input location data	Development unsupport			Method
4	Unproper racking	Business develops	Location is inadequate		Method
5	Disorganized	Work location is not set			Environment

4.5 Create Improvement Plan

After finding out more in detail the main causes of the problem, corrective steps are taken which include the root of the problem, the subject of the repairs, the corrective steps and the time and place of repairs.

Table 4: 5W + 1W analysis.

What	Why	How	Who	Where	When
No training	Human development	Knowledge training	Operational team	Learning center	July 2017
Supplier error	For good coordination	Standardization	Merchandising team	Head quarter	Aug 2017
Development unsupport	More effective results	Standardization	It team	Head quarter	July 2017
Location is inadequate	Additional handle items	Standardization	Operational team	Distribution center	Aug 2017
Work location is not set	Additional workers	Standardization	Operational team	Distribution center	July 2017

4.6 Implementation & Improvement

At this stage the implementation of repairs carried out namely:

1. Training development

Provision of training materials includes basic material and inventory systems as part of the management and handling of stock items in the distribution center. The level of workers' positions as training participants is regulated based on priority material needs, which later on the above positions will distribute knowledge to each of their smaller groups.

2. IT development

Minimizing the manual input process by the operator by applying a barcode system that can be scanned (scanned) using Hand held digital, can be the choice of implementing a technology system so that the operational flow can be more computerized. Automatic settings starting from the ordering system to the distribution process will increase the effectiveness and efficiency in the distribution center).

3. Layout standardization

Changes to the layout (layout of the DC (Distribution Center) can be used as an alternative handling problems because with special arrangements for the items at risk will automatically

limit the space or location where the items are located and when obstacles occur can be handled more quickly with the right.

4. Determining work station

Workspace arrangements are expected to increase self-awareness and discipline for workers, supporting facilities will create a sense of responsibility towards the management and maintenance of the work area.

4.7 Evaluations

By doing PDCA Cycle as an improvement, it has resulted in a change of 52% failure caused by misplaced goods location in distribution centers, this result exceeds the estimated target of 50% of the total 52% of the failure. So it is proven that the application of the PDCA cycle has reduced inaccurate stock inventory failure.

4.8 Standardization

Standardization is done to keep the results of improvement in order to stay awake. Standardization can be standard operating procedures and work instructions.[1]

V. CONCLUSION

1. The use of the concept of PDCA cycle, is one of the ways that is very helpful in determining the results of improvements to be achieved from solving the problem at hand
2. The use of the right concept of PDCA cycle is proven to reduce the level of inaccurate in stock inventory to more than 50% of the total inaccurate that occurs in stock inventory, and certainly has an impact on the cost efficiency of the failure process
3. Creating standards that make the whole work process more effective and more structured

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