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INVENTORY INFORMATION SYSTEM
AT CV HASIL MANDIRI

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Abtract

CV Hasil Mandiri is a company engaged in the trade of goods and services. In the process of procuring goods, there are still some shortcomings, namely the head of the warehouse when controlling inventory has difficulty in checking the actual number of goods in the warehouse. If there is a shortage and excess inventory of goods, it can result in disruption of operational processes. In addition, the process of recording the calculation of the number of purchases/orders and requests for goods made by the Admin only uses a calculator based on the paper receipts obtained from the supplier. The process of submitting requests for goods that are lacking/empty is currently still in a manual way, namely the process only uses the usual form on the WhatsApp facility, therefore it will be very time consuming. Then the other obstacle is no system can print directly all related reports on a periodic basis. The solution to overcome the problems that exist in this study is to apply the Min-Max stock level method. This method can determine the amount of safety stock, min stock, max stock and quantity stock. The conclusion obtained in this study is that it can assist in the demand for the right number of goods, where the head of the warehouse when controlling the inventory of goods is easier to check the actual number of goods in the warehouse. In addition, it is hoped that by using the min-max method, there will be no more overstock or excess stock of goods so that the system can run more optimally so that all reporting processes become more efficient and faster in order to maintain stock availability.

Keywords : Inventory, ROP, Reorder Point, Safety Stock, Min-Max stock level

1. INTRODUCTION

The Rapid development of technology requires humans to do some of their work using computers so that the results to be achieved can be processed efficiently and quickly. Today's computer technology makes it easier for humans to carry out various data processing activities one of them is managing inventory using an information system [1],[2],[3].

In carrying out operational activities, Inventory data management is one of the important processes so that the amount of inventory in the warehouse can be controlled [4]. Inventories are assets available for sale in the form of company business activities, production or assembly work assets as well as in the form of raw materials used in the production process or providing services, Inventory also includes goods purchased and held for resale [5]. The right inventory management process can also produce accurate and useful information for company agencies in the existing inventory [6].

CV Hasil Mandiri is a company engaged in the procurement of goods and services that was established in 2019 in the city of Bandung. This company focuses on project work activities ranging from working on domestic water pumps such as housing to installing water pumps for industry.

Based on the initial data through the results of interviews with Mr. Saldi as the Head of the Warehouse explained that the inventory management process is first carried out by the Admin section. The stages of the inventory process are carried out from the start of goods entering and being received by the company, then stored and checking the number of goods, whether in accordance with the amount purchased or not. Meanwhile, the process of receiving goods is carried out when the supplier has sent the goods. The process of receiving this item will go through the checking stage, namely the number of goods. If the number of items received does not match the order, then an order is made to another supplier. Then after going through the checking stage, then the goods received will be stored by type and brand. These goods will later be resold based on the availability of goods or based on requests for goods from prospective buyers. In the ongoing procurement process, there are still some shortcomings, that is the head of the warehouse when

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controlling the inventory of goods has difficulty in checking the actual number of goods in the warehouse. If there is a shortage and excess inventory of goods, it can result in disruption of the operational process. The process of submitting requests for goods that are lacking/empty is currently still done manually, namely the process just use the usual form on the WhatsApp facility, then it will be very time consuming. Then another obstacle is that there is no system that can print directly all related reports on a periodic basis. The solution to overcome the problems that exist in this study is to apply the Min-Max stock level method. This method can determine the amount of safety stock, min stock, max stock and quantity stock.

Based on the description that has been explained, then the author plans to create an information system entitled "The Inventory Information System at CV Hasil Mandiri".

2. RESEARCH CONTENTS

The research method used is descriptive research method. Descriptive research method is a research method that aims to create a description, a description of the facts and information in situations where research is carried out systematically, factually and accurately [7].

The research concept framework shows the relationship to the concepts that will be measured and observed through the research that will be carried out. The presentation of the conceptual framework in the form of a diagram shows the relationship between the variables to be studied. The preparation of a good conceptual framework will provide clear information to researchers and can provide an overview of the selection of research designs that will be used [8]. The sequence of steps in this study can be seen in the following Figure 1.
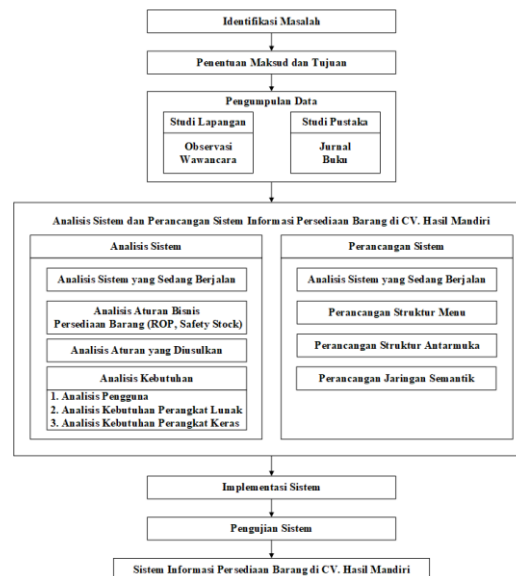

Figure 1. Research Framework Concept

A. Problem Identification

Based on the background of the problem that has been described, the problems that occur in the CV Hasil Mandiri can be concluded as follows :
1. The head of the warehouse when controlling inventory has difficulty checking the actual number of goods in the warehouse.
2. The administrative recording process carried out by the Admin takes quite a long time because it only uses a calculator calculation.
3. The process of submitting requests for goods that are lacking/empty is currently still done manually, namely the process just use the usual form on the WhatsApp facility, then it will be very time consuming.
4. There is no system that can print directly all related reports on a periodic basis.

B. Determination of Purpose and Objectives

The purpose of the research is to build a "Inventory Information System in CV Hasil Mandiri". While the aim of the research is :

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1. Assisting the Head of the Warehouse when controlling inventory in checking the actual number of goods in the Warehouse.
2. Assisting the Admin in the process of recording calculations on purchases and payments so you can save time and can make all reports on a periodic basis so that it does not cause excess or shortage of stock of goods.
3. Assisting the Admin in determining the number of items and the time of reordering.
4. Assist suppliers in the process and delivery time of goods.

C. Data Collection
The collection of processed data is by means of :
1. Field Study
   This is done by visiting the place where the research will be conducted, namely :
   1. Interview
      Interview is a question-and-answer activity in oral form to obtain information.
   2. Observation
      Observation is an observation activity carried out directly at CV Hasil Mandiri.
2. Literature Study
   At this stage the researcher collects data using literature study in the form of library literature and scientific journals and sites on the internet related to inventory.

D. Analysis of the Goods Procurement Information System at CV Hasil Mandiri
1. Planning Stage Analysis
At this stage the identification of the problems that have been described previously along with planning solutions for their solutions is carried out as follows :
a. For each category of goods will be calculated and determined how much the safety stock first.
b. In terms of when to reorder, the number of inventory items will first be checked, If the number of goods is below the safety stock, then immediately reorder the supplier, while the results of the ROP calculation are used as the number of items to be ordered.
c. To process data management so that it becomes more effective and efficient therefore created a web-based information system.

Inventory data to perform method analysis using item data 200 Watt Water Pump SANYO PH 236 AC in 2020 can be seen in table 1.

Table 1. Inventory Data 200 Watt Water Pump SANYO PH 236 AC in 2020

Periode	200 Watt Water Pump SANYO PH 236 AC			
	Fisrt Stock	In (Buy)	Out (Sell)	Last Stock
January	89	0	17	72
February	72	0	15	57
March	57	0	18	39
April	39	0	13	26
May	26	80	12	94
June	94	0	12	82
July	12	0	16	66
August	66	0	12	54
September	54	0	13	41
October	41	0	18	23
November	23	80	15	88
December	88	0	13	75
Total	**731**	**160**	**174**	**75**

2. Tahapan Pelaksanaan

Metode Min-Max Stock
This research method uses minimum and maximum inventory (Min-max). The working concept of the Min-max method is when the number of stock items is already at the minimum or safety stock. If the number of goods is below or near the safety stock, then immediately place an order back to the supplier. While the maximum concept is when the number of goods has reached the maximum limit of

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the provisions for procurement of goods in the company. So that when the time will set the number of Order Quantity of an item driven from the maximum and minimum stock. The steps in the stage of finding the Min-max calculation are :

- Determine *Safety Stock*
  Safety Stock is a proposed stock of safety items that should be held for emergencies for preparation if there is something unexpected regarding the supply of goods. Formula of Safety Stock (SS) = (Highest sales – Average purchases) x LT. Lead time (LT) is the average time required by suppliers during the process of goods being shipped.
- Determine *Min Stock*
  Min Stock is the minimum number of items at the time of ordering. The formula for Min stock = (Average purchases x LT) + SS.
- Determine *Max Stock*
  Max Stock is the amount of goods capacity that has reached to exceed the maximum limit of the provisions for procurement of goods in the company. The formula of Max stock = 2 x (Average purchases x LT) + SS.
- Reorder Point.
  Reorder Point formula = Max value – Min value.

With reference to data that explains that the results from the purchase and sale of the Sanyo brand 200 watt water pump in the period of 2020 min-max stock will be calculated. Meanwhile, for the determination of Lead time (LT) obtained as many as 1 (one), due to the purchase of goods back done per month.

Table 2. Inventory Data 200 Watt Water Pump SANYO PH 236 AC in 2020

Periode	200 Watt Water Pump SANYO PH 236 AC			
	First Stock	**In (Buy)**	**Out (Cell)**	**Last Stock**
January	89	0	17	72
February	72	0	15	57
March	57	0	18	39
April	39	0	13	26
May	26	80	12	94
June	94	0	12	82
July	12	0	16	66
August	66	0	12	54
September	54	0	13	41
October	41	0	18	23
November	23	80	15	88
December	88	0	13	75
Total	731	160	174	**75**
Average	**60,91667**	**13,33333**	**14,5**	**717**

It is known that the initial stock for 200 Watt Water Pump SANYO PH 236 AC in 2020 is 89 Pcs with lead time (L) = 1. By using the min-max stock method, calculations will be carried out, namely :

- Final stock results 2020 = (Total Purchases – Total Sales) + Initial stock results 2020
  $$= (160 – 174) + 89$$
  $$= 75 \text{ Pcs.}$$
- Safety Stock (SS) = (Maximum Sales – Average Sales) x Lead Time
  $$= (18 – 15) \times 1$$
  $$= 3 \text{ Pcs}$$
- Min stock = (Average Sales x L) + SS
  $$= (15 \times 1) + 3$$
  $$= 18 \text{ Pcs.}$$
- Max stock = 2 x (Average Sales x L) + SS
  $$= 2 \times (15 \times 1) + 3$$
  $$= 33 \text{ Pcs.}$$
- Reorder Point (Q) = Maximum – Minimum
  $$= 33 – 18$$
  $$= 15 \text{ Pcs.}$$

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From these results, the results obtained are converted into table form as follows :

Table 3. Min-Max Method Calculation Recapitulation

Types of goods	Last Stock	Safety Stock	Min Stock	Max Stock	ROP (Q)
200 Watt Water Pump SANYO PH 236 AC	75 Pcs	3 Pcs	18 Pcs	33 Pcs	15 Pcs

From the table above, it can be concluded that the amount in the stock from the end of 2020 obtained results that are too large when measured by safety stock processed by the min-max stock method. Therefore, the Warehouse Head must anticipate it so that overstock does not occur again in the following year. Get a number of (Q) or reorder as many as 15 pcs, so it doesn't exceed the maximum stock. In other words, this is still called natural. This data is an overall picture of the results of the calculation process using the min-max stock method it is hoped that the inventory process contained in CV Hasil Mandiri can run even better.

3. Checking Stages

To check whether or not the optimal value in determining the amount of final stock and demand for goods to suppliers, a number of tests will be carried out using the min-max stock level method with a plan to procure a 200 watt sanyo PH 236 AC water pump supply in 2020, which is in Table 4.

Table 4. Sanyo PH 236 AC 200 Watt Water Pump Inventory Data in 2020 with the Min-Max Stock Level Method

Periode	200 Watt Water Pump SANYO PH 236 AC			
	First Stock	In (Buy)	Out (Cell)	Last Stock
January	89	0	17	72
February	72	0	15	57
March	57	0	18	39
April	39	0	13	26
May	26	0	12	14
June	14	15	12	17
July	17	15	16	16
August	16	15	12	19
September	19	15	13	21
October	21	0	18	3
November	3	15	15	3
December	3	15	13	5
Total	**376**	**90**	**174**	**292**
Average	**31,33333**	**7,5**	**14,5**	**24,33333**

Known initial stock for 200 Watt Water Pump SANYO PH 236 AC in 2020 is 89 Pcs with lead time (L) = 1. By using the min-max stock method, calculations will be carried out, namely :

- Final stock results 2020 = (Total Purchases – Total Sales) + Initial stock results 2020
    = (90 – 174) + 89
    = 5 Pcs.
- Safety Stock (SS) = (Maximum Sales – Average Sales) x Lead Time
    = (18 – 15) x 1
    = 3 Pcs
- Min Stock = (Average Sales x L) + SS
    = (15 x 1) + 3
    = 18 Pcs
- Max Stock = 2 x (Average Sales x L) + SS
    = 2 x (15 x 1) + 3
    = 33 Pcs.
- Reorder Point (Q) = Maximum – Minimum
    = 33 – 18
    = 15 Pcs

From these results, the results obtained are converted into table form as follows :

Tabel 5. Hasil Rincian Perhitungan

Types of goods	Final Stock	Safety Stock	Min Stock	Max Stock	ROP (Q)
200 Watt Water Pump SANYO PH 236 AC	5 Pcs	3 Pcs	18 Pcs	33 Pcs	15 Pcs

From the table above, it can be concluded that after the stages of checking the inventory of the 200 Watt Sanyo PH 236 AC Water Pump using the min-max stock method, the final stock is 5 pcs, so that there is no overstock on inventory with a total procurement of 376 pcs per year. The number of orders to suppliers becomes efficient, which is 6 times with a total quantity of 90 pcs if the min-max stock method is applied in the company.

E. System Planning

Relation Schema

Relation scheme that will be built on the system based on data and application requirements are as follows:
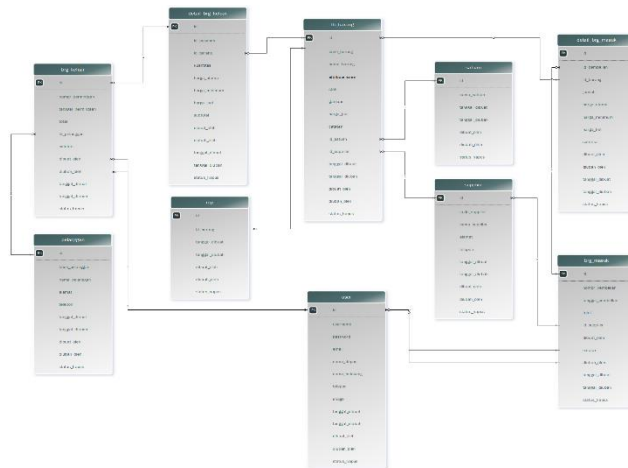
Figure 3. Relation Schema

3. RESULTS AND DISCUSSION

3.1 System Implementation

System implementation is the stage of putting the system so that it is ready to operate and has a purpose as a form of approval of the design modules, so that users can provide input to system developers[9].

3.2 Interface Implementation

The interface implementation stage is made based on the existing display in the program, so it can be seen as follows :
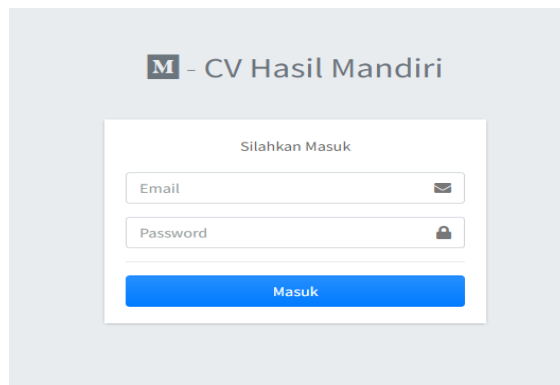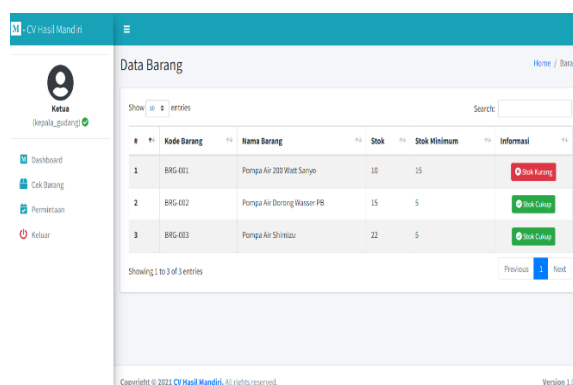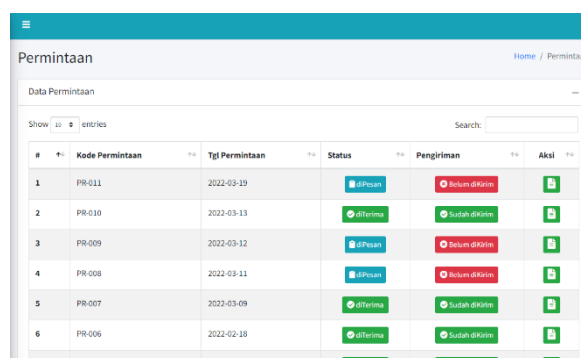

Figure 4. Display Login

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Figure 5. Display of the inventory plan

Figure 6. Display of Purchase

3.3 Testing

Testing this information system uses test data based on existing data on CV Hasil Mandiri. The system testing stage is carried out using the black box test method which focuses on the qualifications of how functional the system is running.

4. CLOSING

The conclusion obtained in this study is that it can help the need for demand for goods appropriately, where the head of the warehouse when controlling the inventory of goods is easier to check the actual number of goods in the warehouse. In addition, it is hoped that by using the min-max method, there will be no more overstock or excess stock of goods so that the system can run more optimally so that all reporting processes become more efficient and faster in order to maintain stock availability.

From the processes that have been implemented, there are still many shortcomings that will be evaluated and made improvements. Therefore, the researcher gives advice on using the system, namely by adding a barcode feature for recording goods to make it more efficient.

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