SALES AND PURCHASING MANAGEMENT INFORMATION SYSTEM AT KOPERASI XYZ

Rury Gusta Fery[1], Sri Nurhayati. [2]
[1] Study Program Informatics, Computer Sistem[2]
Faculty of Engineering and Computer Science Indonesia Computer University
Jl. Dipatiukur 112-114 Bandung
E-mail: rury44@yahoo.com[1], sri.nurhayati@email.unikom.ac.id[2]

ABSTRACT

Koperasi Bersama Jaya is one of the cooperatives engaged in the sale and purchase of goods and savings and loans that are in the city of Batam. The process that occurs is the decline in the level of demand from consumers that resulted in the target of the plan that has been made too far slip, and in making the chairman of the cooperative plan only see the sales report from the previous month from the head of the business unit added more in the purchase of goods to be purchased must be appropriate with what has been planned. This results in if the goods purchased in accordance with the previously planned warehouse conditions are more full that result if the demand falls then it can cause losses due to goods accumulate and goods can become damaged.

Based on existing problems at Koperasi Bersama Jaya, then needed a sales and purchasing management information system. The purpose of developing this system to facilitate the determination of sales targets and how much goods are left in the warehouse which will then be purchased to suppliers. The method used for sales forecasting is the single moving average. As for the method of mapping management using PDCA (Plan, Do, Check, Action).

Based on the results of research and testing can be concluded that the built system can facilitate the chairman of the cooperative and the head of the unit suppy and procurement of basic needs in determining sales targets and how many items will be purchased.

Keywords : Management Information System, single moving average, pdca,safety stock

1. INTRODUCTION

Cooperatives are one form of legal business in Indonesia. According to Law number 25 of 1992 Cooperative is a business entity consisting of individuals or legal entities with the bases cooperative activities based on the principle of cooperation as well as people's economic movement based on family principles. Koperasi Bersama Jaya is one of the cooperative that runs the program savings and loans and the sale of goods, Koperasi Bersama Jaya was established in early 2016 in the city of Batam. Lending and borrowing activities engaged in deposits, lending, and investment from the member, while the sale of cooperative business activities have come from outside the capital which means the consumer or the buyer in the cooperative can come from non-members and members.

From interviews with Jusuf Nababan, chairman of the cooperative to determine the amount of sales targets, calculation of costs for sales and profit targets of sales made through meetings held every month with the heads of the business services unit and head unit supply and procurement of groceries. The determination of the sales target is based on reports from the previous month sales transaction reports, the report damaged goods from the warehouse, and a return of consumer reports. After the determination of the sales target will be made to the calculation of costs to be incurred is the cost of the booking to the supplier, the selling price of goods per unit. The booking fee is calculated based on, loading and unloading costs and administrative costs. But there are constraints on the target process of selling goods the month of September 2016 until December 2016 where sales of goods dropped drastically due to his lack of consumer demand. Auto sales targets missed too much and as a result of lower sales of goods which were some of the goods were damaged warehouse. Until now, the plan issued by the chairman of the cooperative that amount or a predetermined sales target is still limited to these estimates occurred because the chairman of the cooperative see the amount of goods sold by the sales transaction reports.

More over in the case of the purchase of goods to the supplier, based on interviews with Raymon Nababan as the head of the unit supply and provision of basic needs before making the purchase must be made approval of the budget by the treasurer, who then can do the purchase process. At the time of purchase will sign kegudang goods will be made to the recording process of incoming goods. After the recording of incoming goods, then it will do the reporting process incoming goods and then handed over to the chairman of the cooperative and head of business services unit. But the purchase of goods must be based on a target that has been determined by the chairman of the cooperative,

Based on the problems existing in the Koperasi Bersama Jaya we need a model of management how

to specify the target sales forecasting techniques using Single Moving Average and monitor inventory by using safety stock while mapping methods of management using PDCA (Plan, Do, check, Action).

Objective Management Information System sales and purchases as follows:

1. Chairman of the cooperative helps define the target sales of goods.
2. Assist the head unit and the provision of basic food supply in the purchase amount of goods that do not accumulate in warehouse.

2. CONTENTS RESEARCH

2.1 Base Theory

2.1.1 Management

management is making plans in order to achieve the purpose of an activity in all matters thoroughly and conduct supervision and guidance so that goals can be achieved.

Five most important management functions are derived from the earliest classifications of managerial functions are:

1. Planning or the plan is to select or specifies an organizational goals and create strategies program policies and standards needed to achieve a goal.
2. Organizing or the organization of which include:

a. Assign resources and activities required for the purpose can be achieved.

b. Design and development of an organization or group that will work to bring these matters to the destination.

c. Delegating the necessary authority to individuals to carry out their duties.

3. Staffing or conducting the preparation is recruiting aims to develop and put and provide guidance to employees in the work environment to be productive and profitable.
4. Leading or direct is to make the workers do what they want and need them to do.

controlling or supervision is to find and implement ways and means to ensure that the plan has been established in accordance with what has been made, [5]

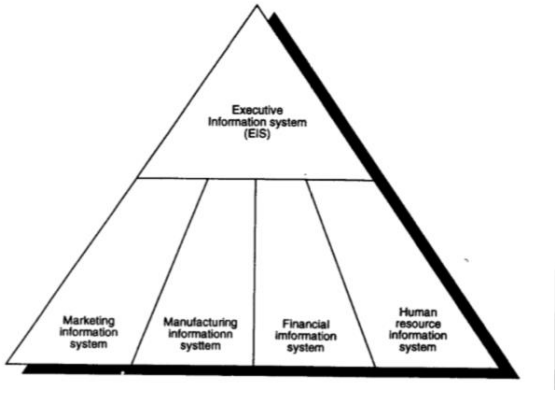
2.1.2 Management Information System

Management information systems (management information system) or abbreviated SIM is the use of information systems used by organizations to menadapatkan appropriate information needed by all levels of management. As according to some experts who formulate as follows: According to Josep F.Kelli SIM is the combination of human resources and resource-based computer that will produce a collection of storage, communications, and the use of data for purposes of efficient operations management and business planning.

According to Gordon B. Davis SIM is a system of human / machine integrated to provide information to support the operation, management and decision-making within an organization.

, The value of information resulting from the use of computers in management information system is difficult to count the money.

The management information system is described as a pyramid in which a layer consisting essentially of information for processing the transaction. [1]



Picture 1 Pyramid Information Systems

2.1.3 Forecasting Method Single Moving Average

Single moving average method uses an average of all the data forecasting. This moving averages used to predict the next period [2]. The formula for a single moving average can be seen in the following equation:

$$S = t + 1\,\frac{Xt+Xt-1....+Xt-n+1}{n} \qquad (1)$$

Where :

S = the value of the forecast for the next period$t + 1$

Xt = actual value / actual period t

N = period moving average

Moving average for a period of time t is the arithmetic mean of the latest k observation. In a moving average, a given load equal to each observation. Each new data included in the average available, and the earliest data is discarded. This model does not handle or seasonal trend very well. Although better than the simple average method.

2.1.4 Mean Square Error (MSE)

Calculating the forecasting error is used to determine the accuracy of forecasting results that have been made to the actual data. There are many models to perform the calculation of forecasting error. The method used to calculate the forecast error (forecast error) is a method of MSE (Mean Squared Error). MSE is the average of the difference of squares of the values predicted by the observed. MSE is used to generate an error that is showing how big differences in the estimation of destinations. This makes it different because of the randomness in the data or because it does not contain a more accurate estimate [3]. The formula to calculate the MSE can be seen in the following equation 2:

$$MSE = \frac{\Sigma(At-Ft)2}{n} \quad (2)$$

Where :

At = The actual data in period t

Ft = Result forecasting in period t

n = number of forecast period involved

2.1.5 Safety Stock

Security or safety stock inventory serves to protect on error predicting demand during lead time. Inventories of security work when deman actually greater than the average value. To get an idea of how uncertain demand during the lead time, companies need to collect data to get distribution [4]. The formula to find the value of safety stock can be seen in Equation 3.

$$\text{safety stock} = Z \text{x sdl} \quad (3)$$

Where,

Z = service level (the company's ability to service requests or translated from management decisions)

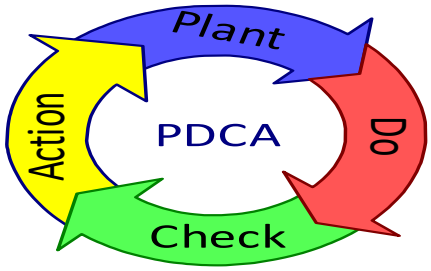
Sdl = determined from ketikdakpastian request provided it can be seen in Figure 2.

variabel	konstan	variabel
Permintaan	Sdl = Sd x $\sqrt{(l)}$ *Safety Stock* ditentukan oleh ketidakpastian permintaan.	Sdl = $\sqrt{(d^2 \text{ x } Si^2 + l \text{ x } sd^2}$ *Safety Stock* ditentukan oleh interaksi dua ketidakpastian.
konstan	Tidak diperlukan *safety stock*, situasi deterministik ($S_R = 0$).	Sdl = d x sd *Safety Stock* ditentukan oleh ketidakpastian *lead time*.

Picture 2 The interaction between demand and leadtime in the determination of safety stock

2.2 PDCA Management Method

This management method is a method for continuous process improvement efforts (continues process improvement). This method makes a plan in action, action that has been planned, checking whether the action goes in accordance with the goals set then act in accordance with what has been planned that. Step into a deming cycle and will continue to be done to improve the quality of management. As in the image below:



Picture 3 PDCA cycle

The explanation of the stages in the PDCA cycle is as follows:

1. Make a plan (Plan)

Make a plan and set specifications and standards with excellent quality. Then give directions to all parts of the management of the quality of the product.

2. Implement the plan (Do)

The plan that has been prepared and will be implemented either set of small scale and distribution of tasks to each personnel equitably and in accordance with the capacity. In carrying out the plans that have been made should be checked so that all the planning carried out properly so that the objective can be achieved.

3. Check of the results achieved (Check)

Checking in this case is whether the implementation is in accordance with what has been planned. Then compare the quality of the result set. Kegagaan check the data and find the cause of kegagaglannya.

4. Action (Action)

Adjustments are made when deemed necessary, based on the results obtained at this stage of check. Make adjustments related to the new rules in order to avoid the same problem or create a new plan for the next repair.

2.3 Analysis Problem

Based on the results of interviews have been conducted with Jusuf Nababan as chairman of the cooperative at the Koperasi Bersama Jaya stated that at this time the cooperative still has some constraints as follows:

1. When planning the amount or a predetermined sales targets still occur due to the extent these estimates in determining the amount of the sales target just look at the amount of goods sold by the previous month's sales transaction reports.
2. When planning the chairman of the cooperative never see the rest of the stock of goods which are in warehouse.
3. When making a purchase of goods to the supplier shall be in accordance with a predetermined plan so that when the goods are received the

remaining stock of goods which are automated warehouse will increase.

2.4 Analysis of Business Rules To Be Built

The following business rules proposed for Koperasi Bersama Jaya:

1. Determination of the amount of the sales target is based on a method of forecasting methods of single moving average.
2. After getting the results of forecasting, will make a purchase based on the results of forecasting.
3. The president does not need to calculate how much it costs to be incurred over the planning that has been made simply by entering the booking fee as well as the chairman of the cooperative can change the selling price of goods if needed.
4. Head of unit supply and procurement of groceries and treasurer can see the planning data, remaining stock, ordering costs, storage costs, and total costs to be incurred.
5. If a budget shortfall then treasurer of the planning can print data with the calculation of the total cost and then submitted to the chairman of the cooperative.
6. If the treasurer has not made the approval of the reservation goods to the supplier can not be done.
7. After performing the approval of the treasurer of the head unit supply and procurement of groceries can place an order to the supplier and purchasing data will be stored in accordance with the number of planning.
8. Origin until dikoperasi and unloaded the officer did not need to record what goes in and create labels on each item.
9. The label will be automatically printed when the goods arrive and head of the supply unit to update the data of purchase, if the items have an expiration date then the head unit input supply and provision of basic needs such expiration date, while goods that do not have expiration labels on the expiration date just vacated.
10. Head of unit supply and procurement of groceries to check and record the type of goods and the number of units of goods that are damaged or expired through a form that can be printed in the information system.
11. Head of unit supply and procurement of groceries will update the inventory when discovered when checking the goods are damaged or expired.
12. If the warehouse goods are damaged or expired and management information systems to provide information of the goods of the warehouse and count how many losses due to defective goods or the expiry.
13. Head of unit supply and procurement of basic foods do not need to tell the head of the union for services if there are damaged or expired goods from the warehouse because the information about the inventory will be automatically updated.
14. Head of business service unit can directly conduct transactions without waiting for a report from the head unit of goods in the supply and procurement of groceries because the inventory has been updated when the head unit supply and provision of basic needs to update the inventory.
15. When conducting a business transaction services head unit can select the number of members who are transacting which will then be stored into the system.
16. If the consumer wants to return an item that is damaged or expired and head of business services unit returns just look for the number of sales transactions and update the transaction data and why.
17. Head of business services unit immediately notify the head of the unit supply and procurement of goods if the goods are returned by consumers.
18. Head unit check supply and procurement of basic food items in warehouse.
19. If the warehouse goods are not available then the refund money back to the customer and transaction data based on the number of transactions returns will be deleted but the data returns will still be recorded.
20. If the goods in warehouse available, the number of stocks to be reduced and the consumer will get a new item.
21. If the consumer returns the goods over the next day it can not be serviced.

2.5 Management Sales Planning

Analysis of sales planning process management using the PDCA cycle in a cooperative joint victory can be seen as follows:

1. PLAN

This stage is where the chairman of the cooperative will set sales targets, in determining sales targets. In setting sales targets chairman of the cooperative see the number of items sold in the previous period. His example in this regard is planning in September 2016 and the goods are planning sales of premium rice following the month of September 2016:

Table 1 Sales Planning Month September 2016

No.	Name of goods	Unit	Purchase price	Selling price	Procurement planning
1	Sanford 240ml	box	13000	13500	800
2	Sanford 600ml	box	26700	27500	800
3	Sanford 1200ml	box	26700	27500	300
4	Premium Rice	box	8300	9,500	1700
5	Sugar	box	12250	13000	1600

2. DO

This phase will be carried out execution phase of the plan that has been created that is sold to consumers. Based on sales data recap premium rice in September 2016 (Appendix F) shows that targeting is too large and not appropriate sales targets even missed very much, and therefore requires a calculation to determine the sales target is to do forecasting. In this forecasting method that will be used in accordance with the smallest MSE calculation (Appendix F) by comparing the three methods of forecasting that is single moving average, Single exponential average, and weight moving average, then conclude to that method of forecasting for sales planning by using a single moving average. The results of the forecast are as follows:

Table 2 Forecasting Premium Rice Using Single Moving Average

Single Moving Average			
No.	Month	Sales Data	Forecasting Results
1	July	731	-
2	August	1140	-
3	September	957	936

3. CHECK

This stage is the stage of evaluation, which will do a comparison of the premium rice sales planning activities that occur with ditetapkan.Result evaluation planning that has been obtained between stages do and the Plan as follows:

1. Based recap rice sales in september 2016 that the amount of rice that sold for 957kg far from the targets set in the amount of 1700kg this is due to the determination of the amount of the target only see items that were sold in the previous period.

2. At the stage Do if using forecasting the process of determining the sales target it will be better due to the use of the calculation. For example, the following comparison is data using the comparison results with the specified forecasting:

Table 3 Planning Data Comparison

Premium Rice Planning September 2016	Premium Ric Sales Forecasting Results September 2016	Actual Data Premium Rice September 2016
1700	936	957

4.ACTION

This stage is the stage to follow up the results of the evaluation, the chairman of the cooperative must make decisions based on the results obtained. In this case they are planning sales, superbly performed activities not in accordance with a predetermined plan, and lead to missed targets too far. And that is why in planning the next sale will be used forecasting methods single moving average.

2.6 Purchasing Management

PDCA analysis process purchases in management information systems sales and purchases on the Koperasi Bersama Jaya can be seen as follows:

1. PLAN

This stage is where the head unit and the provision of basic food supply will make purchases on the planning, in the purchase of items purchased must be in accordance with the target that has been planned and set. His example in this case is the purchase of goods in September 2016 and is the premium rice with data purchases of goods and remaining stock in september 2016:

Table4 Target Planning Month September 2016

Name of goods	Unit	Number of Items Coming	Remaining Stock
Premium Rice	kg	1700	42

2. DO

This phase will be carried out ekseskusi phase of the plan that has been created which make the purchase to the supplier. Based on the data recap premium rice purchase in September 2016 menuntujukkan that the purchase of premium rice was in accordance with what has been planned and set. Here are the recaps premium rice purchasing data and a recap of the sales made during the period of September 2016 can be seen in Table 5:

Table 5 Data Recap Premium Rice Purchases And Sales

Name of goods	Unit	Number of items Buy	Total Goods Sold	Remaining Stock
premium rice	kg	1700	957	785

Based on the above data it is known that the amount of goods sold amounted to only 957kg. When compared to what was planned premium rice are piled at 743kg and plus the remaining stock in the previous month See Appendix F) of 42kg and it can be concluded that the accumulation of sizeable.

For that the planning process will then be carried purchase will use forecasting as in table 2, but due to the results of forecasting itself is not necessarily accurate then the need for monitoring of inventory for inventory control in order to avoid shortages of premium rice. Monitoring inventory requires a reference to determine what a safe limit of goods that should be available in warehouse using safety stock. Application of the method is the process of calculating safety stock inventory safe limits must be

available in warehouse next period and reorder point. Calculation of safety stock can be seen in equation 2. The following is the calculation of safety stock of rice pemium month of September 2016 as follows:

The number of premium rice forecasting september 2016 (d)

= 936/30 = 31,2kg

The standard deviation of the number of forecasting september (sd)

= 31.2 / 10 = 3,12kg

Lead time (l) = 2 days

The standard deviation of leadtime (sl) = 2/10 = 0.2

Service level (z) = 90% in normal form inverse = 1.2816

The solution:

Sdl = sd x √ (l)

= 3.12 x √2

= 4.4123

safety stock = Zx Sdl

= 1.2816 x 4.4123

= 5,65480kg or rounded 6kg / day

Once you know what the safe limit per day, the next step is determining how much of premium rice should be purchased.

Based on the data of the premium rice sales forecasting average september goods to be sold per day is 6kg / per day, the data is the data we can determine the number of purchases by means of forecasting results and reduced the remaining stock plus the safety stock. However, because the purchase is made only one time in planning the security of inventory results will be multiplied by the number of days in the month or the period. So safety stock for the needs of premium rice during september for 6kgx30hari = 180kg. The following number of purchases of premium rice to be purchased to the supplier can be seen in Table 3.6.

Table 6 Total Premium Rice Will booked

Name of goods	Forecasting Results	Remaining stock	safety stock	Amount Dipersan
premium rice	936	42kg	180kg	1074kg

Based on the number of purchases tabel.6 for premium rice in september 2016 based on the results of forecasting and reduced the remaining stock plus the safety stock is as much as 1074kg.

3. CHECK

This stage is where the evaluation will compare the activities of the purchase of goods that have been done. Here are the results obtained from the evaluation of the comparison between the phases do and plan:

1. Based on the report of premium rice stocks of goods purchased too much as a result of the purchase on the basis of ongoing plans right mengakibat buildup.

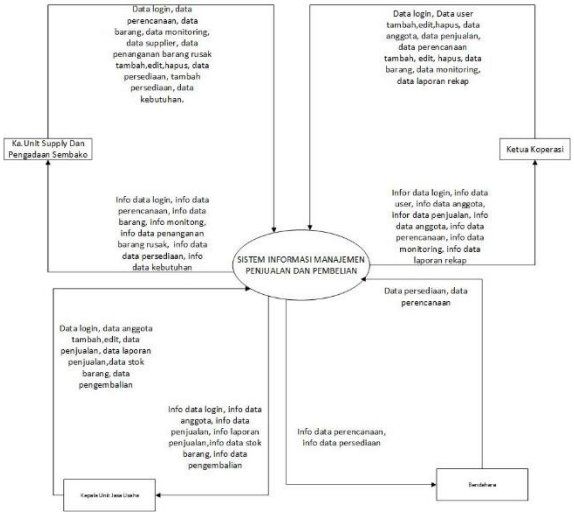
2. At the stage Do if the purchase of goods using the results of forecasting methods of monitoring activity is needed because the stuff is not necessarily accurate forecasting. As the calculations at the stage Do if using security inventory count and calculate the number of items to be purchased, it is expected to reduce the accumulation in the warehouse and in consumer demand can be met.

4. ACTION

This stage is the follow-up results of the evaluation, which is where the chairman of the cooperative will be decided based on the results obtained. In this case the chairman of the cooperative will have to decide whether by way of a safety measure inventory count and get the number of items to be purchased are acceptable or not.

2.7 Context Diagram

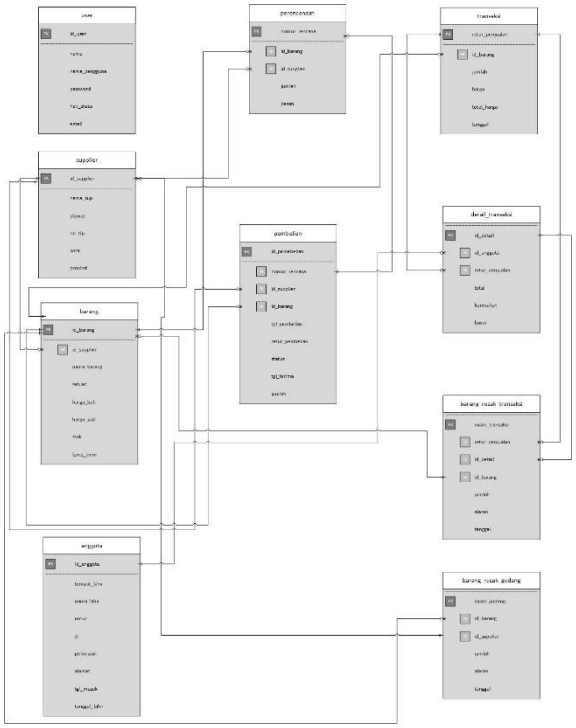
Context diagram is a model to describe the overall fantasize that the data used to be implemented in the data flow into or out of the system.



Picture 4 Context Diagram

2.8 Relation Table

A relation scheme overview of the database system between two or more tables. The series of data on the basis of sales and purchases SIM application described in Figure 5.



Picture 5 T**able Relationships**

2.9 System Testing

Tests conducted system aims to discover any errors or deficiencies that exist in the system that has been created. Testing is done to mengtahui whether the system has been created can be met their performance goals have been designed.

The tests used the new system is a black box testing methods. Black box testing focuses on testing functional requirements informasi.Rencana system testing to be done is to test the system constructed black box and beta. Testing management information system in cooperative sales and purchases together jaya test data based on data provided from some of the data that has been given.

a Conclusion Testing Black Box

Based on the test results of each process contained in the software are built with test samples that have been made, to result in the conclusion that every process on software built was correct in accordance with the functionality. Filtering their fault the provision of an error message to every process that occurs is a good and sufficient maximum. As well as the output (output) produced in accordance with expectations.

b Beta testing

Beta testing is done at this stage is to evaluate the system superbly made by means of an interview to the system users. The interview will be concluded whether the system created to meet the wishes of the user and the destination.

Interviews were conducted for system users which comprises part of the chairman of the cooperative, the head unit supply and procurement of food, Kapala business services unit, and treasurer. This research was conducted at the Koperasi Bersama Jaya order to mengahui extent to which the system is built to be a solution and resolving issues that have been described previously.

c Conclusion Beta Testing

Based on testing betas above, it can be concluded that:

1. Manajamen information systems sales and purchases so there needs to be further development of the interface to be more attractive and easy to use.
2. The information system manamejem built need for the development of financial management, personnel and staffing because of the existing financial system which dibangum still incomplete, the members of which are not integrated on the system due to the unavailability of savings and loan system were built and the lack of staffing system disistem built .

3. CLOSING

Based on the results impelemntasi and testing that has been done in this thesis, it can be concluded as follows:

1. The information system is built is already able to facilitate the planning department to determine how many items to be purchased or ordered to suppliers to meet consumer demand.
2. These information systems are built already can facilitate the procurement of goods in determining how much stuff you have to buy and how many items are still left in the barn.

The suggestions for the development of management information systems sales and purchases on the Koperasi Bersama Jaya is as follows:

1. Management information systems necessary to pengmbangan more of the interface make it more attractive and easier to use.
2. The information system manamejem built need for the development of financial management, personnel and staffing because of the existing financial system which dibangum still incomplete, the members of which are not integrated on the system due to the unavailability of savings and loan system were built and the lack of staffing system disistem built ,

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