APPLICATION OF THE SINGLE MOVING AVERAGE (SMA) METHOD FOR FORECASTING SALES OF HORDEN IN UMI NALA'S SHOP BUSINESS

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ABSTRACT

Along with the current development, the business world has developed quite rapidly in the world of commerce. Therefore we need a good and mature strategy to be able to overcome all the obstacles that exist in the business world. The Umi Nala store is a business that is engaged in trading with the main activity of buying and selling Horden such as Horden, magic com, gas stove, plates, pans, and others. At this time, the Umi Nala Store Business still uses manual methods in the process of recording sales by recording them into the sales ledger, so that data storage is less effective and the risk of data loss is very large. At the moment, the Umi Nala Shop Business is experiencing a problem where the business cannot estimate the number of sales precisely so that the resulting sales are uncertain. By forecasting Horden sales using the Single Moving Average (SMA) method, this can make it easier for owners to determine sales targets. This system is built using Visual Basic 2010 and MySQL as the database. This research produces an information system to facilitate efforts in determining sales targets in the future.

INTRODUCTION

Currently, technology has an important role in trading. Information systems are very much needed by current shop owners, because information systems can help in making the necessary decisions and so that shop owners can immediately take corrective actions on stock supplies, so that demand can be fulfilled[1].

In this case, the Umi Nala Store has a problem in planning the supply of curtains, the demand data and the supply of curtains at the Umi Nala Store, it can be seen that the amount of demand with the amount of stock of curtains is often unbalanced. Sometimes the number of requests is more than the number of curtains provided, and also often the number of curtains provided is more than requested. This happened because the Umi Nala Store ordered curtains supplies without any planning. Therefore, a forecasting method is needed to be able to analyze further demand and make the stock inventory system effective at the Umi Nala Store[2].

Forecasting is a method for estimating a value in the future using past data. Forecasting can also be interpreted as the art and science of predicting future events,

while forecasting activity is a business function that seeks to estimate the sales and use
of a product so that the products can be made in the right quantity, therefore forecasting requires calculations that accurate so we need accurate forecasting[3].

There are basically two general approaches to addressing all decision models to identify future consumer needs so that shop owners are able to keep up with consumer demand.

The purpose of forecasting a single moving average is to eliminate or reduce randomness (random ness) in a time series. This goal can be achieved by averaging multiple values in the data together, by means of which positive and negative errors are possible and can be removed or eliminated Assauri[4].

The single moving average method or also abbreviated as SMA is one of the most efficient moving average methods in the calculation process. Single Moving Average is a method of forecasting by taking a group of observed values, then looking for the average as a forecast for future periods[5].

The special characteristics of the Moving Average Method, namely;

1. To determine the forecast in the future period requires historical data for a certain period of time. For example, with a 3 month moving average, the forecast for the 5th month is only made after the 4th month has finished / ended. If the month moving averages the 7th month can only be created after the 6th month ends.

2. The longer the moving average is, the more noticeable the effect of smoothing is in the forecast or the resulting smoother moving average. The mathematical equation for single moving averages is as follows:

$$Mt = Ft + 1 \qquad (1)$$

$$= \frac{Yt + Yt - 1 + Yt - 2 + \cdots + Yt + n - 1}{n} \qquad (2)$$

Information:
Mt = Moving Average for period t
Ft + 1 = Forecast for the period t + 1
Yt = real value for period t
n = The number of limits in the moving average[6].

METHOD

In conducting this research, it is necessary to create a research framework, so that this research will be focused. The research framework is as follows:
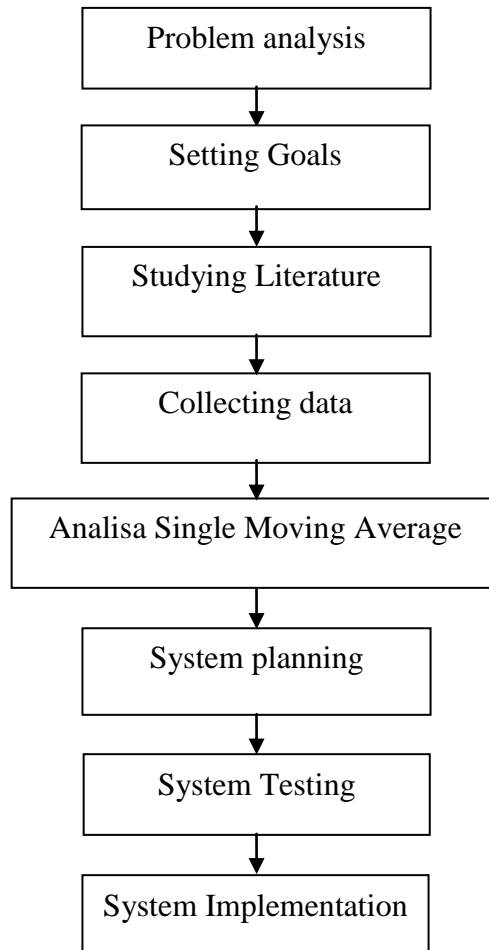
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│        Setting Goals         │
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Imange 1 Research Framework

Based on the research framework described above, the discussion of each stage in the research can be described as follows:

1. Problem Analysis
   Problem Analysis is the first step in analyzing the problem of selling Horden at Umi Nala Stores.
2. Goal Setting
   Based on the understanding of the above problems, then it is necessary to determine the objectives to be achieved in this study.
3. Studying literature
   This research was conducted to complement and reproduce the concepts, theories that support the problem solving of sales predictions at Umi Nala Stores.
4. Collecting Data
   collect data obtained from Umi Nala Shop.

5. Single Moving Average Analysis
   After the data is collected, data processing will be carried out to adjust the condition of the data obtained, then the data received will be processed using the Single Moving Average method.
6. System Design
   After processing the data and methods, the forecasting system is designed at this stage.
7. System Testing
   At this testing stage, testing is carried out by testing the system capabilities.
8. System Implementation
   At the implementation stage, this is carried out from the test results of each of the sales inventory forecasting assessment criteria

RESULT AND DISCUSSION
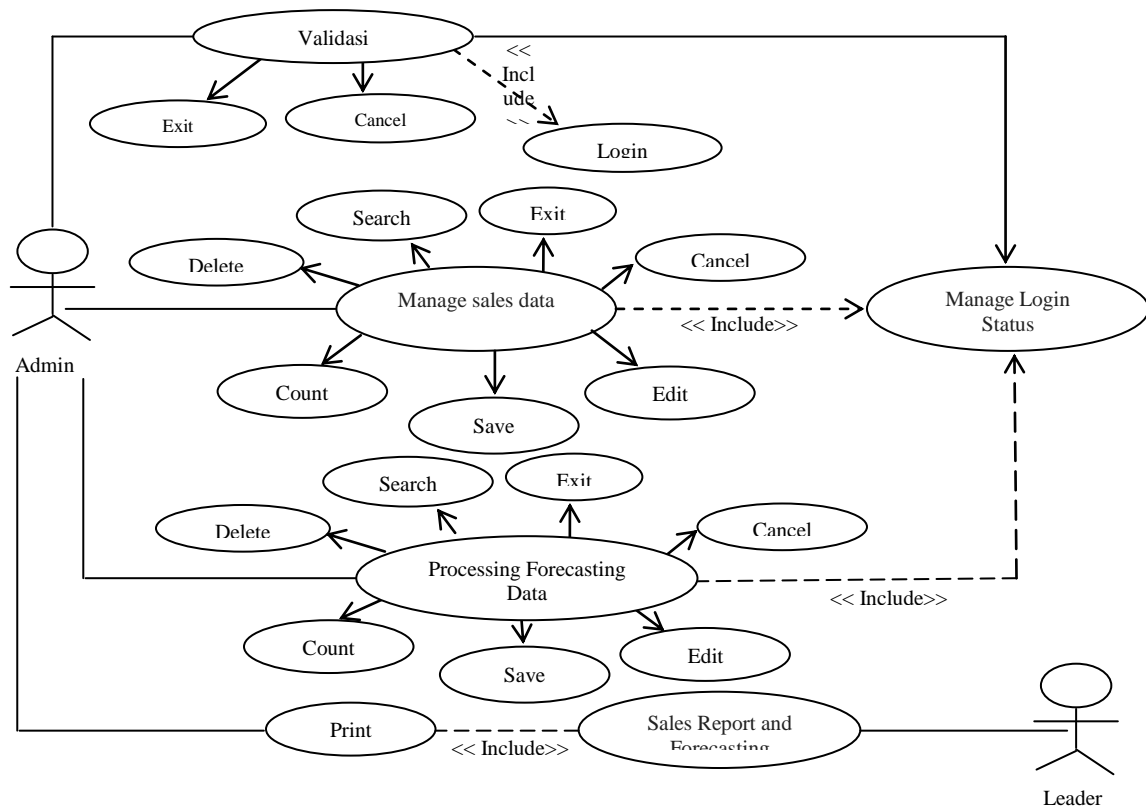
Image 1. Use Case Diagram of Proposed System Design at Umi Nala Store

There are several activities that occur when running this system, namely the login process, the process of inputting data on sales of goods stock, the process of data input for forecasting Stock Sales of Goods.

1. Use Case Login Scenarios

Use Case Name	: Login
Actor	: Admin
Purpose	: Get access to system usage
Description	: This use case is used for the login process

Table 1. Use Case Login Scenarios

Admin	System
1. Select the login menu.	
	2. Displays formlogin.
3. Fill in the login form.	
	4. Processing login, if it fails it will give notification and if successful it will enter the main menu

1. Use Case Scenarios for Sales Data

Use Case Name	: Sales Data
Actor	: Admin
Purpose	: Enter data and attributes of Horden sales stock.
Description	: This use case is used by the admin to enter sales data for Horden

Table 2. Use Case Scenarios for Sales Data

Admin	System
1. Selecting the Sales menu	
	2. Display Sales data set, save form, calculate, edit, cancel, delete, find and exit sales data
3. Fill out the form to save the Horden sales stock data	
	4. Processing of Horden sales stock data storage
5. Choose the action to calculate the sum of the Horden sales stock data	
	6. Processing the sum of the Horden sales stock data
7. Select the Horden sales stock data edit action.	
	8. Processing of editing stock sales data for Horden

Table 2. Use Case Scenarios for Sales Data

9. Selecting the action to cancel the Horden sales stock data	
	10. Processing canceled inputting of Horden stock sales data
11. Selecting the action to delete Horden sales stock data.	
	12. Processing of deleting the Horden sales stock data that has been inputted
13. Choose the action to find Horden sales stock data	
	14. Processing of Horden sales stock search data that has been inputted
15. Chose an exit action from the Horden Stock sale form	
	16. Processing out of Horden stock sales form

3. Use Case Data Forecasting Scenarios

Use Case Name   : Forecasting Data
Actor   : Admin
Purpose   : Enter forecasting data for the next week's Horden stock sales process.
Description: : This use case is used by Admin to enter Horden sales stock forecasting data.

Table 3. Use Case Data Forecasting Scenarios

Admin	System
1. Select the Forecasting menu	
	1. Display forecasting set data, save form, calculate, edit, cancel, delete, find and exit Forecasting data
2. Fill out the form to store data for forecasting Horden sales stock	
	3. Processing of Horden sales stock forecast data storage
4. Choose the action to calculate the sum of forecasting data of Horden's sales stock.	

Table 3. Use Case Data Forecasting Scenarios

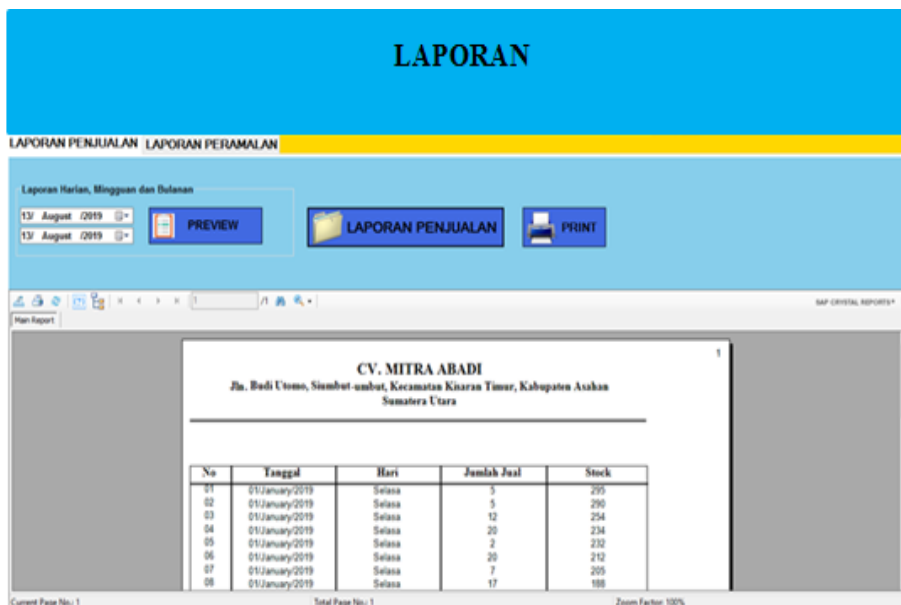|	
	5. Processing Horden sales stock forecast data summation.
6. Choose the data edit action Forecasting Horden stock sales.	
	7. Processing of editing data Horden stock sales forecasting
8. Choose the action of data cancel forecasting stock sales of Horden.	
	9. Processing canceled input of Horden stock forecast data
10. Choose the action to clear data. Forecasting the Horden sales stock.	
	11. Processing of deleting data for forecasting Horden sales stock that has been inputted
12. Choose the action to find data. Forecasting Horden sales stock	
	13. Processing search data for forecasting Horden sales stock that has been inputted
14. Chose an exit action from the Horden Sales Stock Assessment Forecasting form	
	15. Processing exit from the Horden Sales Stock Forecasting form.
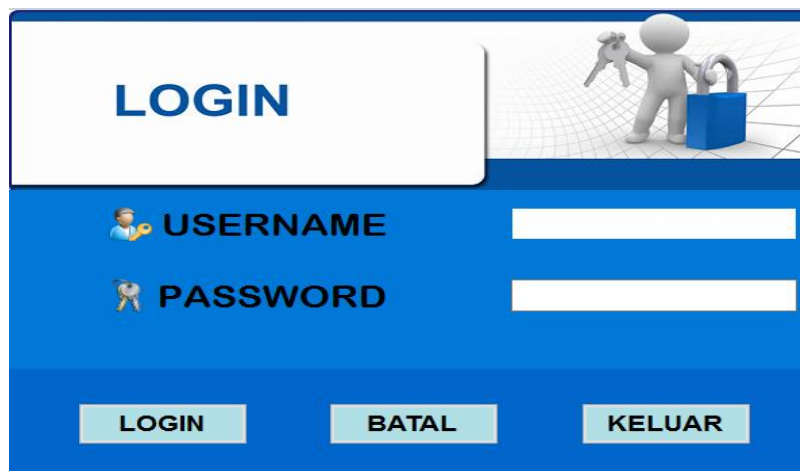
Image 2. Display Login Form

Image 3. Display Sales Data Input

Image 4. Display of Forecasting Data

Image 5. Reports

CONCLUSION

From the results of the tests carried out, it can be concluded that by applying the Single Moving Average (SMA) Method for Forecasting Sales of Horden at Umi Nala's Shop Business, With this system will be able to help and facilitate the Umi Nala Store in determining how many purchases of stock items in the next period.

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