Design of Decision Support System Determination of Inventory Inventory Using Single Exponential Smoothing Forecasting Method

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Abstract. The development of information and communication technology at this time has touched all sides of life. Almost no side of human life is not touched by this information technology, which is more synonymous with the world of computerization. No exception also with the computerization that is popular in the corporate environment and government agencies. If in ancient times everything was still done manually. However, at this time all leaders and management have realized the importance of this information technology products that can facilitate them in carrying out the day-to-day corporate functions. Decision Making System of goods purchasing is one of the determinants of the accumulation of goods. If the decision is taken right then stockpiling of goods can be avoided. In this thesis the authors designed a web-based system that helps Management in making the decision of the purchase amount of goods. the system was developed by using Microsoft Visual Studio 2010 and using SQL Server database processing applications. The end result of system design is expected to help minimize the accumulation of goods.
1. Introduction

Many tools supported as DSS are actually science-based models that do not address basic issues and decision-making issues[1]. The Decision Support System can be used in a number of fields such as prefabricated prefinished volumetric construction[2], social justice[3], children with special needs[4], retinopathy identification[5], determining the best lecturer[6], and identification of male fertility[7]. The development of decision support systems follows the development of information and communication technology that has been used in a number of fields such as: understanding the level of soft skills[8], fostering character of children[9], and legal protection for children[10]. A number of studies in this field have been produced: Benchmarking problems with artificial neural networks[11], slack measurements on benchmarking processes[12], diversity problems[13], K-Means model optimization[14]. The purchase of goods is a routine activity that occurs in the company in increasing inventory. Appropriate decision making in purchasing goods can prevent losses to the company such as avoiding excessive stockpiling. Determination of purchase of goods can be done by analyzing sales data then, forecasting future sales to be able to determine the number of purchase of goods that are suitable.

Medan Permai Folding Gate is a company engaged in the sale and manufacture of iron doors. In its operational activities Medan Permai Folding Gate often experiences hoarding of goods because there is a mistake in determining the number of purchases of goods as appropriate as inventory. So far, the company has not been supported by applications that can analyze past sales data and present information on the appropriate purchase amount. For each item, the company needs an information system capable of presenting how much the purchase in the future so that stockpiling of goods can be avoided.

2. Related Works

Tratar et al. Has conducted research on Demand forecasting with four-parameter exponential smoothing[15]. Oliveira and Oliveira[6] have conducted research on Forecasting mid-long-term electric energy ARIMA consumption through bagging and exponential smoothing methods. Simple exponential smoothing is commonly used in predicting economic time series. This is because it calculates them quickly and generally provides accurate forecasts. On the other hand, its multivariate version received little attention due to the complications resulting from the estimate. Of course, standard multivariate maximum likelihood methods are influenced by numerical convergence and poor complexity issues, increasing with model dimensions[17].

3. Research Methodology

System Design can be seen in the following Context Diagram (figure 1).

Description:
1) The warehouse will provide data on goods owned by the company.
2) The sales department will provide sales statistics.
3) In making purchasing decisions, software uses single exponential smoothing forecasting.
4) The analysis process carried out by the system will produce a report on determining the purchase of goods to the leader.

4. Results and Discussion

To run applications that have been built requires software or hardware that supports. The hardware or software needed is as in the following picture:

A. Hardware (Hardware)
Here are the minimum hardware required:
1) Pentium IV 1.8 Ghz
2) 128 Mb memory
3) Empty capacity Hard Disk 2 GB
4) CD-RW / CD-Room.
5) 32MB VGA card.
6) Switch (Port as needed)
7) Mouse.
8) Keyboard.

Figure 1. Research Method

B. Software (Software)
The following is the minimum required software:
1) Operating System (Windows XP SP2)
2) Microsoft SQL Server 2005

The system design results can be seen in Figure 2.

Figure 2. System Design
5. Conclusion
The conclusions obtained after completing this research are as follows:

a. Systems designed using previous period sales data to determine future purchasing needs.

b. The computerized decision-making system proposed is a computerized based system that can present sales forecast data and the need to purchase goods automatically.

c. The application of the Single Exponential Smoothing method in the computerized system of decision making to determine the purchase of goods can reduce the occurrence of stockpiling.

d. By using a computerized decision-making system based on computerization, the calculation of the number of purchases of goods can be done quickly and accurately.

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