Inventory Forecasting Information System at Pupuk Lamongan UMKM Using the Single Exponential Smoothing (SES) Method to Optimize Fertilizer Availability

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ABSTRACT

UMKM Pupuk Lamongan or Green Tani Millenial (GTM) is a micro business engaged in the production and distribution of organic fertilizers. The problem faced by this MSME is that inventory management is still carried out manually, which has the potential to cause errors in stock recording and inaccuracy in production planning. To overcome these problems, this research aims to build a web-based inventory forecasting information system by applying the Single Exponential Smoothing (SES) method to optimize fertilizer availability.

This method is used to predict stock requirements based on historical data of 10 kg and 25 kg fertilizer demand from August 2023 to December 2024. The system also calculates the Mean Absolute Percentage Error (MAPE), Mean Absolute Deviation (MAD), and Mean Squared Error (MSE) values as indicators of forecasting accuracy. The results show that the best alpha for both types of fertilizer is 0.1, with a MAPE value below 10%, which is included in the excellent forecasting category.

This system makes it easier to record data on incoming and outgoing goods, and helps MSMEs in planning a more optimal amount of production. Thus, this forecasting information system can reduce the risk of excess and shortage of stock and support more precise decision making in the production process.

Keywords*: Information System, Forecasting, Inventory, Single Exponential Smoothing, MSME, MAPE, MAD, MSE*