

ABSTRACT

UD Falsud Rental Motor is a motorcycle rental business that still manages rental data manually, causing several problems such as poorly organized historical data, difficulties in predicting motorcycle rental demand, and a high risk of recording errors. These problems make the decision-making process related to motorcycle unit availability less effective. Therefore, this study aims to implement the Least Square method in a web-based motorcycle rental demand forecasting system at UD Falsud Rental Motor. The Least Square method is used to forecast rental demand based on historical rental data trends. In addition, the Double Exponential Smoothing (DES) method is used as a comparison method to determine the accuracy level of the forecasting results. The system was developed using the Laravel framework and MySQL database, featuring historical data upload through Excel files, automatic forecasting calculations, visualization of forecasting results in the form of tables and graphs, and report generation in PDF format. The data used in this study consist of historical motorcycle rental data over 12 monthly periods, categorized into Small, Auto, and Big motorcycle types. Based on testing using the Mean Absolute Deviation (MAD), Mean Squared Error (MSE), and Mean Absolute Percentage Error (MAPE) parameters, the Least Square method produced better accuracy compared to the Double Exponential Smoothing (DES) method. The resulting MAPE value was below 10%, indicating that the forecasting accuracy falls into the very good category. The results of this study indicate that the system is capable of assisting the motorcycle rental demand forecasting process more quickly and effectively, thereby supporting decision-making related to motorcycle unit availability for future periods at UD Falsud Rental Motor.

Keywords: Least Square, Forecasting, Motorcycle Rental, Prediction, Laravel, Web-Based System.