ABSTRACT

The train is an efficient mass transportation mode widely used for intercity travel, including Semarang–Jakarta route. However, fluctuating passenger numbers due to various factors such as economic conditions, weather, and national holidays pose challenges for accurate forecasting. Inaccurate predictions can lead to an imbalance between capacity and demand, making it necessary to apply an appropriate forecasting method to address the issue. This study applies the Fuzzy Time Series Markov Chain method to forecast the number of train passengers on the Semarang–Jakarta route in 2023. The model is built by defining the universal set $U = [390, 1.980]$*, using 9 intervals with a length of 176.67, and constructing a* 9×9 *transition probability matrix to determine the highest probability for forecasting. Data processing is conducted using RStudio, and the model's accuracy is evaluated using the Mean Absolute Percentage Error (MAPE). The results indicate that the Fuzzy Time Series Markov Chain Method achieves a MAPE value of 13.23%, demostrating a good level of accuracy in forecasting passenger numbers. Based on these findings, this method is expected to support railway transportation planning and serve as a reference for future research.*

Keywords: *Fuzzy Time Series Markov Chain, Forecasting, Number of Passengers, Train*