

ABSTRACT

Medicines are an irreplaceable tool for health. The availability of medicines in health institutions is very important to meet the needs of the community. To maintain the availability of medicines needed by the community, health institutions need the ability to forecast future medicine needs based on previous medicine sales data. This study provides insights for designing a medicine sales forecasting system for the Mitra Sehati Primary Care Clinic (MSPC) using a hybrid demand forecast model. This model integrates ARIMA (Autoregressive Integrated Moving Average) as a statistical analysis method for linear data components and LSTM (Long Short-Term Memory Neural Network) for non-linear data components. The ARIMA-LSTM model was tested on medicine data collected from the clinic from 2020 to 2023. The testing was conducted by measuring the RMSE and MAPE values to determine the most accurate model. The results of the analysis showed that the ARIMA, LSTM, and Hybrid models were not significantly different, as all three models performed similarly. ARIMA(0,1,1) had an RMSE value of 240.751 and a MAPE of 10.3% with a computation time of 5.507 seconds, while the LSTM model has an RMSE value of 717.817 and a MAPE of 29.7% with a computation time of 6.958 seconds, and the Hybrid model has an RMSE value of 1282.547 and a MAPE of 79.2% with a computation time of 7.380 seconds. From these results, it can be concluded that the ARIMA-LSTM hybrid model is not significant enough to forecast drug sales at MSPC, and the drug sales forecasts from the three models are not yet effective because they are still far from the actual data. This is because the amount of data analysed is too small and there is high noise. Next, a prototype sales forecasting system for MSPC was designed using the selected model.

Keywords: Drug Sales, Demand Forecast, ARIMA, LSTM, RMSE, MAPE