ABSTRACT

Maritime transport enhances population mobility, particularly in areas inaccessible by land or air routes. The high usage of maritime transport services can be seen from the number of passengers arriving or departing from the port. The port authorities need information tools to anticipate uncertainty conditions and the efficiency of departures, so passenger number forecasting is conducted. This forecasting is related to time and location at various ports. One of the appropriate forecasting methods is GSTARIMA. GSTARIMA is a method used for forecasting time series data that has a relationship between time and location and exhibits heterogeneous characteristics. This study uses the GSTARIMA model to model and forecast the number of domestic shipping passengers at the main ports in Indonesia, namely Tanjung Priok Port, Tanjung Perak Port, Balikpapan Port, and Makassar Port. These ports were selected based on their highest capacity. This study uses location weighting, namely uniform weight, inverse distance, and cross-correlation normalization. The resulting model is a model with differencing (1), moving average order (1), and a spatial order limited to one, resulting in the formation of the GSTARIMA (0,1,1) model. This model has met the assumptions of white noise residuals and multivariate normality. In addition, the model produced the smallest sMAPE value with a inverse distance weight of 3.72%. Overall, the forecasting results for the number of domestic cruise passengers at major ports show good accuracy.

Keywords: Number of Passengers, Main Port, Uniform Weight, Distance Inverse Weight, Cross Correlation Normalized Weight, Forecasting, GSTARIMA, sMAPE.