PEMODELAN JUMLAH PENUMPANG KERETA API MENGGUNAKAN MODEL SARIMA, VARIASI KALENDER *SEASONAL* ARIMAX DAN *HYBRID* SARIMA-FTSMC

ABSTRAK

Salah satu jenis angkutan darat yang bisa digunakan adalah kereta api. Kereta api mempunyai beberapa kelebihan dibandingkan jenis angkutan darat lainnya. Akibatnya kenaikan jumlah penumpang kereta api setiap tahun dipengaruhi oleh beberapa kelebihan tersebut. Hal tersebut seringkali menjadi permasalahan dan kendala yang dihadapi PT. Kereta Api (Persero) karena keterbatasan kapasitas angkut yang tidak seimbang. Fluktuasi jumlah penumpang kereta api dapat dimodelkan dengan model runtun waktu yaitu model *Seasonal Autoregressive Integrated Moving Average* (SARIMA). Selanjutnya diperkenalkan model *hybrid* SARIMA dengan *Fuzzy Time Series Markov Chain* (FTS MC), dan *Seasonal Autoregressive Integrated Moving Average with Exogenous Variable* (SARIMAX). Pada penelitian ini dimodelkan jumlah penumpang kereta api yang memiliki variasi kalender yaitu dari periode Januari 2012 hingga Desember 2019. Berdasarkan tingkat akurasinya, model *hybrid* SARIMA-FTSMC memberikan nilai akurasi paling kecil dibandingkan model lainnya.

Kata kunci: SARIMA, SARIMAX, *hybrid* SARIMA-FTSMC, Jumlah Penumpang Kereta Api, Tingkat Akurasi.

THE MODELING OF THE NUMBER OF TRAIN PASSENGER BY USING SARIMA, SEASONAL ARIMAX WITH CALENDAR VARIATION AND THE HYBRID OF SARIMA-FTSMC

ABSTRAK

One type of land transportation that usually used is the train. Trains have several advantages over other types of land transportation. As a result, the increasing number of train passengers per year is influenced by this several advantages. This condition is often to be a problem and obstacle for PT. Kereta Api (Persero) due to the imbalance of limit transport capacity. The number of passenger requests is much greater than the available seat capacity. Fluctuations in the number of train passengers can be designed by time series model, called the Seasonal Autoregressive Integrated Moving Average (SARIMA) model. Furthermore, SARIMA hybrid model Fuzzy Time Series Markov Chain (FTSMC) and the Seasonal Autoregressive Integrated Moving Average with Exogenous Variable (SARIMAX) was introduced. In this study, the number of train passengers with a calendar variation is modeled from January 2012 to December 2019. Based on the level of accuracy, the hybrid SARIMA-FTSMC model provides the smallest accuracy value compared to other models.

Keywords: SARIMA, SARIMAX, hybrid SARIMA-FTSMC, Number of Train Passengers, Accuracy Level.