

INTISARI

Dalam perkembangan jaman yang serba canggih ini, telekomunikasi menjadi salah satu hal yang diperhatikan oleh masyarakat. Keinginan manusia untuk selalu mudah terhubung satu sama lain menjadi tuntutan yang harus dipenuhi oleh perusahaan jasa operator penyedia kartu seluler yang ada. Persaingan antar *provider* telekomunikasi pun tidak mungkin terelakkan lagi, keinginan untuk menguasai market membuat *provider* harus dapat bersaing satu sama lain dengan berbagai strategi yang dapat menarik pengguna untuk menggunakan jasa *provider* tersebut. Dengan melakukan prediksi jumlah konsumen, *provider* dapat mengambil langkah dalam strategi apa yang harus digunakan untuk tidak kalah dengan jasa operator lain.

Untuk melakukan prediksi jumlah *user* pengguna jasa operator atau *customer base* maka digunakanlah metode peramalan *time series*. Model *time series* yang digunakan dalam penelitian ini adalah *Naïve*, *Simple Average*, *Double Moving Average*, *Exponential Smoothing*, *Holt's Exponential Smoothing*, dan *ARIMA (1, 1, 1)*. Disisi lain, jumlah *customer base* yang diprediksi tersebut dapat dipengaruhi oleh berbagai faktor luar, dimana faktor-faktor seperti jumlah pengguna *SIM card* dan *quality network* dapat menyebabkan ketidakpastian pada sistem ini. Untuk mengelola adanya ketidakpastian tersebut, maka digunakanlah model usulan peramalan kombinasi *Bayesian Network* dan *Holt's*. Model *Bayesian Network* digunakan untuk mengelola ketidakpastian yang terjadi, sedangkan model *Holt's* digunakan untuk memprediksi jumlah *customer base* dengan menggunakan *historical data* yang ada.

Berdasarkan hasil pengujian dari beberapa metode peramalan, metode *time series Naïve adjusted for trend* dengan nilai MAPE sebesar $6,58 \times 10^{-2}\%$ dan tingkat kesesuaian pola sebesar 85,71% merupakan model peramalan yang *preferable* dibandingkan dengan metode *time series* lainnya ataupun metode kombinasi *Bayesian Network* dan *Holt's*, hal ini dipengaruhi oleh tingkat kompleksitas model lain dan *just cost* untuk melakukan peramalan.

Kata kunci: *customer base*, operator, peramalan, *Bayesian Network*, *Holt's*, *Naïve*

ABSTRACT

With the development of era that was all about technology, telecommunication became one thing that the public was concerned with. The social communities who had tendency to always be easily connected to each other were demanding that telecommunication service companies could provide these kinds of things. Competition among telecommunication companies became inevitable, the desire to dominate the market made the companies should be able to compete against one another with the strategies that could attract customer to use their products and services. Predicting the number of users could allow those companies to determine which strategies should be used so that it wouldn't lose to their rivals.

To be able to predict the number of users who used the products and services, or also called customer base, this study would use time series forecasting methods. The time series model that was used in this study were Naïve, Simple Average, Moving Average, Double Moving Average, Exponential Smoothing, Holt's Exponential Smoothing, and ARIMA (1, 1, 1). On the other hand, the predicted number of customer base could be affected by some various external factors, where these factors, such as the number of users and the quality network of SIM card, could cause uncertainty on this system. To manage such uncertainty, the used of forecasting combination models of Bayesian Network and Holt's was proposed for this study. Bayesian Network model was used to managed the uncertainty that occurred in the system, while Holt's model was used to predict the number of customer base by using historical data.

Based on the result from some forecasting methods, time series method Naïve with adjusted for trend with MAPE $6.58 \times 10^{-2}\%$ and conformity of data pattern 85.71% is the preferable forecasting method compared to other time series method or combination method of Bayesian Network and Holt's, this is because in building a model for forecasting simplicity and cost should be considered.

Keywords: customer base, telecommunication, forecasting, Bayesian Network, Holt's