

Abstract

PT Telekomunikasi Indonesia, Tbk. Is Information and Communication Technology (ICT) company that offers the biggest service and telecommunication network in Indonesia. Its biggest core business and revenue come from offering PSTN (Public Switched Telephone Network) service or cable telephone (fixed wireline). But, new telecommunication technology implementation and development, GSM (Global System for Mobile) and CDMA (Code Division Multiple Access), make many PSTN subscribers switch to GSM and CDMA services and finally make the number of PSTN subscribers fluctuates in high uncertainly. So, it is needed a system that can forecast the number of PSTN subscribers. Forecast approach that many people use is quantitative method with time series method subcategory.

Forecasting process will be done by using computation technique based on evolution and genetics or called Evolutionary Computation (EC). One of EC algorithms that can used for finding solution in forecasting is Grammatical Evolution (GE). GE can give solution to forecast nonlinear data pattern more accurately because of using Backus Naur Form (BNF) grammar definition in mapping genotype to phenotype. Solution that will be finds in this time series data forecasting is the best function which has closest pattern with historic data characteristic of PSTN subscriber. Then, this selected function will be used to forecast the number of PSTN subscribers in next n-periods. Forecast accurate will be count by using Mean Absolute Percentage Error (MAPE) formula. GE system will find the most accurate function by evolution process that uses evolution parameters. For getting GE system that can give the most optimal forecasting function, testing of BNF, GE parameters combination, and forecasting result accurate calculation, definition will be done.

Based on observation that has be done, it is known that forecasting with system based *Grammatical Evolution* can generate function which has the most adaptive of others konvensional forecasting method such as Linear Regression(LR) and Moving Average(MA), because it's uses BNF definition with non linearitas behaviour. Beside that, MAPE defining is the most important component in GE system because grammar that is used in BNF determines the possibility of development solution pattern.

Key word: forecasting, time series data, Evolutionary Computation (EC), Grammatical Evolution (GE).