

# PREDICTION OF THE USE OF ELECTRIC LOAD IN THE MAHAKAM SYSTEM USING ARTIFICIAL NEURAL NETWORKS WITH BACKPROPAGATION ALGORITHM

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## ABSTRACT

Along with the increasing population in East Kalimantan, economic activities, community social activities and the increasing use of electrical equipment have caused the demand for electricity to become uncertain. Therefore, PLN UP3B as an electricity provider company in Indonesia, especially in East Kalimantan is required to meet the electricity needs in East Kalimantan. To meet these needs, PLN UP3B needs to predict the use of electricity loads. Prediction of the use of electrical loads needs to be done to determine future electricity needs to get a balance so that electricity needs are met appropriately. One method that can be used to predict is an Artificial Neural Network (ANN) using the Backpropagation algorithm. Therefore, in this study ANN was used to predict the use of electrical loads in the Mahakam System of East Kalimantan. The data used in this study is data on the use of electricity in the Mahakam System for the last six years with daily intervals, from January 2015 to December 2020 and uses data with a composition of 60% training data and 40% test data. This research was conducted using 11 test models, where the architecture contains 24 nodes in the input layer, 2-12 nodes in the hidden layer and 24 nodes in the output layer to determine the best prediction model. After doing research, it was found that model 1 using 2 nodes in the hidden layer as the best model with MSE of 0.002616 on training data and 0.004242 on testing data. The results of the study are in the form of the best prediction model for forecasting daily electrical loads and examples of prediction results from using the model. Thus, these results will be used as recommendations for PLN UP3B as an alternative electricity load prediction model for the next seven days.

**Keyword :**  
*Algoritma Backpropagation, Artificial Neural Networks, Electric Load*