

***HOUSEHOLD ELECTRICITY CONSUMPTION PREDICTION SYSTEM
BASED ON IOT USING THE LSTM METHOD***

Supervised by Arvita Agus Kurniasari, S.ST., M.Tr.Kom

Fathur Rachman Hakim

Study Program of Informatics Engineering

Majoring in Information Technology

ABSTRACT

Household electricity consumption in Indonesia continues to rise, reaching 130,433.10 GWh in 2024, or approximately 42.59% of total national electricity consumption. Prepaid electricity customers often face the risk of sudden power outages as they are unable to plan or predict when their token will be depleted based on their consumption patterns. This study designs and implements an IoT-based household electricity consumption prediction system using the Long Short-Term Memory (LSTM) method and a Flutter mobile application named Siwatt. The monitoring device is built using an ESP8266 microcontroller and a PZEM-004T sensor to read electrical parameters in real-time via the MQTT protocol. Two LSTM models were trained for hourly and daily predictions, yielding MAPE values of 26.818% and 9.337%, respectively. Black-box testing confirmed that all application features functioned as expected, making this system an adaptive solution for prepaid users to plan their electricity token purchases more timely.

Keywords: *IoT, LSTM, Household Electricity Consumption Prediction, ESP8266, PZEM-004T, Flutter*