ABSTRACT

This final project discusses the design and implementation of an IoT-based dashboard system for monitoring electrical energy consumption on Sub Distribution Boards (SDB) at PT Astra Otoparts. The system is designed using Node-RED as the data acquisition platform, utilizing the Modbus TCP/IP protocol to communicate with kWh meters installed on selected panels (SDB 1, 2, 24, and 25). The collected data is processed and stored in a MySQL database, then visualized through a web-based dashboard built with React.js. The architecture of this system follows a three-tier model comprising presentation, logic, and data layers. Through real-time and historical monitoring features, the system enables users to observe energy consumption patterns per panel, providing accurate insights that support operational efficiency and data-driven decision-making. The implementation results show that the system can operate both online and offline, and is able to display data with 100% accuracy based on testing with 12 sample data points from panel SDB 1. This proves that the system is capable of stable data acquisition and visualization.

Keywords: Dashboard IoT, Node-RED, Modbus TCP/IP, kWh Meter, MySQL, React.js