ABSTRACT

The Mangudu Building is the building that contributes the largest electricity usage to the Telkom Education Foundation substation. The Mangudu Building, or also known as the manufacturing building, is one of the buildings owned by the Faculty of Industrial Engineering, Telkom University. This building is one of the supporting buildings for students to carry out practicum activities. Based on records carried out in September 2022, based on the existing specifications for the electronic equipment used in the Mangudu building, there is an opportunity for the amount of electrical energy used to be 97,656 Watts if all electronic equipment is turned on simultaneously. With the large number of electronic equipment used and the large amount of electrical power used, there will be opportunities for waste and ineffective and inefficient use of electrical energy if there is no monitoring process for the use of electronic equipment in the Mangudu building. Based on the problems previously explained, in this final project it is necessary to carry out a monitoring system design process for the use of electrical energy, especially for electronic equipment in the Mangudu building, by utilizing Internet of Things technology. The process of monitoring electronic equipment is carried out on lights, air conditioners, sockets and machinery. This system design will use relays, DHT11 sensors, PIR sensors, LDR sensors, and ACS712 sensors. Relays are used as automatic switches that can disconnect and connect electricity in a circuit based on given logic commands. The DHT11 sensor is used to measure temperature and humidity in a room. The PIR sensor is used to detect the presence or absence of human movement in the room, which is used as a reference as to whether or not the use of air conditioning and power outlets is still needed. Meanwhile, the LDR sensor is used to detect lighting conditions in a room, which is used as a reference as to whether or not the use of room lights is still needed. The ACS712 sensor is used as a sensor that can read the amount of electric current used in electronic equipment. All monitoring processes will be processed using NodeMCU ESP8266. Next, logical commands will be created using the Arduino IDE application. Meanwhile, to carry out logical commands, you will use the Telegram application chat bot. In testing the system created, the results obtained were that the relay could disconnect and connect the electricity flow with NodeMCU and Telegram Chat Bot, while the

average percentage error value for the DHT11 sensor was 1.29% and the accuracy level for the DHT11 sensor was 98.71%. , while the average percentage error value for the ACS712 sensor is 2.85% and the accuracy level for the ACS712 sensor is 97.15%, while the PIR sensor and LDR sensor can detect actual human movement and room lighting.