ABSTRACT

Soybeans are the most widely comsumed source of vegetable protein and it is used as the main raw material for making tofu and tempeh. However, soybean needs are currently still being met from imports. The tool that used for soybean seeding is the germinator. Soybeans seed control using a germinator is still done manually, so we need a system that can monitor and control soybean seeding automatically.

In this final project, designed a system for controlling soil moisture and controlling light intensity from growth of soybean seeds. This system uses soil moisture YL-69 sensor to detect soil moisture and light intensity GY-30 sensor for detect light intensity on growth of soybean seeds. The two sensor connected to the ESP32 microcontroller. This system will be connected by Wifi so that the sensor data will be able to be sent to database Firebase and send to Whatsapp.

The result of implementing the system means that the system can run well. The test results for sending sensor data using the Firebase database obtained the highest average throughput value in the morning, which was 1382 bps. The lowest average delay obtained in the morning is 8.20 ms, this result is very good because it meets the ITU-T G.1010 standard, which is a delay of less than 2 seconds. The results of testing data transmission using Whatsapp obtained the highest average throughput value in the morning, which was 2759 bps, while the lowest average delay value was obtained in the afternoon, which was 16.09 ms, this result is very good because it meets with ITU-T G.1010 standard, which is a delay of less than 10 seconds.

Keyword: *Soybean*, *Internet of Things*, ESP32, *Soil Moisture YL-69, Light Intensity GY-30, Firebase, Whatsapp*