ABSTRACT

In maintaining the temperature and humidity of tomato plants, many people do manual watering. Beside from requiring human time and effort, improper manual watering can hinder plant growth. This research aims to design a smart irrigation system based on the Internet of Things (IoT) using fuzzy logic. This system can operate independently in regulating watering according to plant conditions and can be monitored remotely using the blynk application. Data processing is based on soil moisture values between 60-80% and air temperature values between 24-28°C. The system utilizes YL-69 and DHT22 sensors to measure soil moisture and air temperature, which will be processed in the ESP32 using fuzzy logic. When the fuzzy logic processing is less than 30, the servo will close the water valve, while when the fuzzy logic processing is more than 30, the servo will open the water valve with an angle corresponding to the fuzzy logic value. Test results show that the system can operate with a fuzzy logic error value of 1.49% for soil moisture variation and 1,39% for air temperature variation. The error value for the YL-69 sensor is 2.21% and error value for the DHT22 sensor is 1.17%. The blynk application succesfully displays the programmed features to monitor plant conditions remotely.

Keywords : Smart irrigation, tomato plant, YL-69, DHT22, blynk.