ABSTRACT

Water is very important in our daily life. In agriculture, farmers usually water twice a day during normal times, but may need a lot of water to keep the soil moist. soil moisture suitable for potato plants ranges from 40% to 60% so that the plants can grow well. The *Internet of Things* (IoT) helps with irrigation by automatically adjusting the pumps. In developing IoT systems using the prototyping method, it allows quickly understanding needs and analyzing the results of system development. The IoT devices used in this system include Arduino microcontrollers, soil moisture sensors, and mobile applications as controllers for IoT devices. The *Internet of Things* (IoT) is used to control potato irrigation to maintain soil moisture between 40% and 60%. The study designed a monitoring system for potato plants using the GPRS/GSM module and the DS18B20 sensor for soil temperature, as well as the YL-69 sensor for soil moisture. Sensor testing was carried out by comparing conventional measuring devices, and it was found that the average error for the DS18B20 sensor was 0.77% and for the YL-69 sensor was 0.017%. The sensor was placed in the middle of 3 potato plants and produced readings close to those of the DS18B20 (19.1°C) and YL-69 (60%) sensors. The DS18B20 and YL-69 sensors are also capable of covering 3 potato plants. The QoS delay results show an average delay value of 389ms with a range of values between 247ms to 279ms.

Keywords: *Internet of Things*, IoT, Microcontrollers, Potatoes