ABSTRACT

Indonesia is known as an agricultural country that has very large areas of land so that local people can use it as a livelihood. As Indonesia's population continues to increase, it is likely that there will be a decline in agricultural production and food shortages in the future. One of the solutions offered is the development of an agricultural model that does not require land as a planting medium. Hydroponics is a method of cultivating plants that uses soil-free media. In hydroponic cultivation, the term verticulture is also known, which is a system for maintaining or cultivating plants in a vertical pattern. Vegetable plants that can be cultivated hydroponically are Pakcoy plants. This research will design an automatic monitoring and watering system using internet of things technology to make it easier for farmers to monitor and water automatically. This system will use the NodeMCU ESP-32 which sends data to the platform via the internet, where in this research the Telkom IoT Platform will be used. In this research, using the RTC DS3231 module as a watering scheduler, where the watering time is 2 hours apart and the watering interval is 10 minutes, the PZEM-004T sensor is used to measure electricity use, and the pH-4502 sensor is to measure the pH value of plant nutrients. The IoT-based automatic monitoring and watering system can work well, by getting an accuracy on the PZEM-004T sensor of 97.61%, accuracy of the pH-4502 sensor for acidic solutions of 96.76%, neutral solutions of 98.43%, alkaline solutions of 95.04%, along with good plant growth so that by using this system you get an electricity tariff of IDR 1,752.42.

Keywords: *Hydroponic, Internet of Things,Watering Interval, Agricultural, Verticulture*