

ABSTRACT

Urban Farming is a concept of farming that implemented because of many farming areas have been converted to a settlement area, industrial area and urban area. The application of urban farming in a city will give a contribution for food security. But the reality, behind the ease and benefits by implementing the urban farming concept, the development of this concept in Indonesia is still only limited as a social community and not massive yet. Considering that people who lived in the city tend to use their time to work at the office and they don't have enough time to implement this concept.

To improve the development of urban farming concept in Indonesia, in this Final Project will be made an automatic watering system for urban farming plants. This system consists of a soil moisture sensor node, an MQTT broker and an actuator node to actuate a water pump. By utilizing WSN communication and MQTT protocol, if the system indicated that the plant is on a dry condition, then a sensor node (MQTT publisher) will send an order via MQTT broker to actuator node (MQTT subscriber) to activate a water pump to water the plant until it reach a humid condition. The MQTT broker that used in this system is Mosquitto MQTT broker. Each node used an IEEE 802.11 b/g/n standard SoC called ESP8266.

The system worked well from the tests that have been done. The soil moisture sensor worked as the datasheet described, the node still connected to the router until 120 meter in LOS condition and 40 meter in NLOS condition. Then from the QoS level 0 testing, 17 ms is the average delay when broker send data to subscriber with 63 Bytes/s of throughput and no packet loss. From the overall system performance test, sensor and actuator node cooperated well to monitor and water the plants automatically.

Keywords: Urban Farming, ESP8266, WSN, MQTT, QoS