PLANT MONITORING SYSTEM DESIGN USING ESP 32 BASED ON IoT IN INDOOR HYDROPONIC AGRICULTURE

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ABSTRACT

Currently, agricultural land in Indonesia, especially in urban areas, has begun to decline, this is because agricultural land has been converted into industrial land and residential areas. To overcome these problems, one effective way is using the hydroponic utilization method. Hydroponics is a way of growing crops without using soil media as a growing medium, but using water that contains nutrients that plants need. hydroponics requires extra supervision to produce quality plants. There are several parameters in hydroponics, namely nutrient content, pH level in water, water temperature, room temperature, ambient humidity, and monitoring visually using a camera, to provide convenience in monitoring, this study designed a hydroponic monitoring system using ESP 32 based on IoT in indoor farming. Making a monitoring dashboard using node-red with the MQTT protocol. The tool made in this study succeeded in displaying readings from the TDS sensor, pH sensor, DS18B20 sensor, Ultrasonic Sensor to measure water level, and DHT11 sensor, with a success rate of 100% based on 15 experiments carried out for each sensor. The indoor hydroponic monitoring system tool is made capable of visually displaying monitoring using the ESP32 Cam microcontroller.

Keywords *: Hydroponics, Internet of Things, ESP-32, Node-red, MQTT*