

ABSTRACT

WATER QUALITY MONITORING SYSTEM FOR HYDROPONIC PLANTS BASED ON *INTERNET OF THINGS*

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The Internet of Things (IoT) technology is rapidly developing and influencing various aspects of life. This development specifically affects the agricultural sector, promoting collaboration between IoT and agricultural science, which are interdependent. Hydroponic farming systems are making the agricultural world more diverse. Since hydroponics primarily use water as the main growing medium, plants in hydroponics do not require soil or extensive land for cultivation. However, maintaining optimal water conditions, such as pH levels, volume, and temperature, poses a challenge for farmers if manual monitoring is required. Therefore, an automated water quality monitoring device is needed. In this research, the Arduino NodeMCU ESP8266 is used to implement the device design, supported by a pH sensor with 98.98% accuracy, a temperature sensor (DS18B20) with 98.54% accuracy, and an ultrasonic sensor (HC-SR04) with 94.6% accuracy. After implementing the device in a hydroponic water reservoir for 20 days, the researchers achieved a success rate of 90%. Blynk is used as a platform to connect the device with an Android smartphone or laptop, successfully displaying the readings from each sensor and providing notifications if the readings exceed the set limits. Hydroponic plants monitored for pH, temperature, and water level showed lush foliage, green leaves, and abundant roots, while plants without monitoring exhibited yellow/pale green leaves, stunted growth, and limited roots.

Kata kunci : *Internet of Things*, Blynk, Hydroponic, Monitoring.