

ABSTRACT

Design and Construction of an IoT-Based Hydroponic Plant Monitoring Tool Utilizing Liquid Fertilizer from Waste

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*Indonesia as an agricultural country faces the challenge of limited agricultural land due to increasing urbanization. The hydroponic system is the right alternative to overcome this problem, especially for the cultivation of plants such as lettuce (*Lactuca sativa*). This research aims to design and build an Internet of Things (IoT)-based hydroponic plant monitoring tool that utilizes liquid fertilizer from organic waste as a plant nutrient content. The method used includes making liquid fertilizer through fermentation of household waste with EM4 and molasses, as well as designing an ESP32 microcontroller-based system connected to various sensors (pH, TDS, DHT11 and RTC) as well as an ESP32 Camera module, LCD for real-time monitoring and Blynk which will send data value notifications from sensors via smartphone. This research is expected to support farmers in creating smart agricultural systems and enable farmers to utilize waste for environmentally friendly liquid fertilizer. The results obtained show that the system can work well in monitoring hydroponic plants and sending data in real-time to Blynk.*

Keywords : *Blynk, DHT11, ESP32, Hydroponics, Internet of Things, pH, TDS.*