Development of an IoT-Based Chili Plant Watering Monitoring System Using ESP 32 and a Soil Moisture Sensor

(Case Study: Millennial Farmers in Sleman)

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ABSTRACT

This research aims to apply Internet of Things (IoT) technology to agriculture, specifically to improve the efficiency of watering chili plants, which is currently still done manually. Using an ESP32 microcontroller, this system monitors soil moisture, temperature, and other environmental conditions, and automates the watering process. This research proposes an IoT-based watering system that allows farmers to monitor and control crop conditions through a Smart Farming application, which supports both automatic and manual settings. Test results show that the system functions well, activating the irrigation pump when soil moisture falls below a specified threshold. Thus, this system is expected to reduce farmers' workload, increase yields, contribute to the development of IoT technology in the agricultural sector, and encourage the adoption of smarter and more sustainable farming methods.

Keywords: Automatic chili plant watering, Internet of Things (IoT), ESP32 microcontroller, Android Studio, Firebase