

ABSTRAK

RANCANG BANGUN SISTEM OTOMATIS PENYIRAMAN SERTA MONITORING TANAMAN TERONG DAN KANGKUNG MENGUNAKAN ESP32 BERBASIS IOT

(2026 : 102 Halaman + 47 Gambar + 11 Tabel + Daftar Pustaka + Lampiran)

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Sistem penyiraman tanaman secara manual sering mengalami kendala dalam menjaga kelembapan tanah secara stabil, terutama ketika pengguna tidak dapat melakukan penyiraman secara rutin. Oleh karena itu, dibuat sebuah sistem penyiraman otomatis berbasis *Internet of Things* (IoT) menggunakan sensor *soil moisture* dan mikrokontroler ESP32 untuk membantu proses *monitoring* dan penyiraman tanaman secara otomatis. Metode yang dilakukan meliputi tahap perancangan sistem, pembuatan perangkat keras (*hardware*), pembuatan perangkat lunak (*software*), serta pengujian alat. Sistem ini menggunakan sensor *soil moisture* untuk membaca kondisi kelembapan tanah dan sensor DHT22 untuk membaca suhu lingkungan. Data hasil pembacaan sensor kemudian diproses oleh ESP32 untuk mengontrol pompa air secara otomatis sesuai dengan kondisi suhu dan kelembapan tanah. Selain itu, data *monitoring* ditampilkan melalui aplikasi *Blynk* sehingga kondisi tanaman dapat dipantau menggunakan *smartphone*. Hasil pengujian menunjukkan bahwa sistem dapat melakukan *monitoring* kelembapan tanah dan suhu lingkungan serta menjalankan proses penyiraman otomatis pada tanaman kangkung dan terong.

Kata Kunci: *Smart Garden, Internet of Things (IoT), ESP32, Soil Moisture Sensor, Blynk, Penyiraman Otomatis.*

ABSTRACT

DESIGN AND CONSTRUCTION OF AN AUTOMATIC WATERING AND MONITORING SYSTEM FOR EGGPLANT AND WATER KAMBANG PLANTS USING IOT-BASED ESP32

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Manual plant watering systems often experience difficulties in maintaining stable soil moisture, especially when users are unable to water plants regularly. Therefore, an Internet of Things (IoT)-based automatic watering system was designed using a soil moisture sensor and ESP32 microcontroller to assist the monitoring and automatic watering process. The method used in this project includes system design, hardware development, software development, and system testing. The system uses a soil moisture sensor to detect soil moisture conditions and a DHT22 sensor to measure environmental temperature. The sensor data are processed by the ESP32 to control the water pump automatically according to temperature and soil moisture conditions. In addition, monitoring data are displayed through the Blynk application, allowing plant conditions to be monitored using a smartphone. The test results show that the system is capable of monitoring soil moisture and environmental temperature while performing automatic watering on kale and eggplant plants. The system is also able to display monitoring data through the Blynk application, making plant monitoring easier.

Keywords: Smart Garden, Internet of Things (IoT), ESP32, Soil Moisture Sensor, Blynk, Automatic Watering System.