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SISTEM PENYIRAMAN TANAMAN BERBASIS IOT MENGGUNAKAN SOIL MOISTURE PADA KEBUN DESA PETODANAN BARU,

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80 + xiv halaman / 31 gambar / 15 tabel / vi lampiran / 10 pustaka (2019 - 2025)

ABSTRAK

Desa Petodanan Baru di Kecamatan Batang, Kabupaten Batang merupakan wilayah dengan karakteristik lahan kering yang cocok untuk budidaya komoditas seperti tomat. Tanaman tomat memerlukan kadar air yang tepat dalam media tanam agar dapat tumbuh secara optimal. Permasalahan yang dihadapi petani adalah kesulitan dalam mengontrol kadar air, karena kelebihan atau kekurangan air dapat menghambat pertumbuhan atau menyebabkan kerusakan akar. Penelitian ini bertujuan untuk merancang dan mengimplementasikan sistem penyiraman tanaman berbasis Internet of Things (IoT) menggunakan sensor kelembaban tanah (soil moisture) yang mampu memberikan air secara otomatis sesuai kebutuhan tanaman, memantau kelembaban tanah, serta memungkinkan kontrol penyiraman jarak jauh. Metode yang digunakan dalam penelitian ini meliputi observasi langsung di lokasi kebun, wawancara dengan pihak Dinas Pangan dan Pertanian Kabupaten Batang, serta studi kepustakaan. Pengembangan sistem mengikuti model Waterfall melalui lima tahapan utama, dan sistem diuji menggunakan metode White Box, Black Box, serta User Acceptance Testing (UAT). Hasil pengujian UAT menunjukkan bahwa sistem ini diterima dengan baik oleh pengguna, terutama petani dan pejabat terkait. Fitur-fitur utama seperti login, tampilan beranda, riwayat penyiraman, ekspor data, dan penghapusan data dinilai informatif dan mudah digunakan. Sistem ini terbukti dapat meningkatkan efisiensi penyiraman dan layak untuk diimplementasikan lebih luas di sektor pertanian lahan kering.

Kata Kunci : *Sistem Penyiraman Tanaman Berbasis IoT, Arduino, Waterfall, IoT*

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IOT-BASED PLANT WATERING SYSTEM USING SOIL MOISTURE IN PETODANAN BARU VILLAGE GARDEN,

Under the guidance Devi Sugianti, M.Kom. and Widiyono, S.T., S.Kom., M.Kom.

80 + xiv pages / 45 pictures / 15 tables / vi attachments / 10 references (2019 - 2025)

ABSTRACT

Petodanan Baru Village, located in Batang District, Central Java Province, is characterized by dry land, making it suitable for cultivating dryland crops such as tomatoes. Tomato plants require precise water levels for optimal growth, and both under- and over-watering can negatively affect plant health, including root rot. This study aims to design and implement an Internet of Things (IoT)-based irrigation system utilizing soil moisture sensors to provide water according to the tomato plant's needs, monitor soil moisture levels, and enable remote control of irrigation. The research methods include direct field observation, interviews with the Department of Food and Agriculture of Batang Regency, and literature studies. The system was developed using the Waterfall model, encompassing five main stages: Requirement Analysis, System Design, Implementation, Integration and System Testing, and Operation and Maintenance. The system was evaluated through White Box testing to verify code functionality, Black Box testing to assess system features, and User Acceptance Testing (UAT) to gather feedback from end-users, particularly local farmers. The UAT results, including input from the Head of the Agricultural Office, indicated that the system was well-received. Core features such as login, dashboard display, irrigation history, data export, and secure data deletion were considered user-friendly and functional. This IoT-based irrigation system successfully meets user needs and demonstrates strong potential for broader implementation in dryland agriculture.

***Keywords** : IoT-Based Plant Watering System, Arduino, Waterfall, IoT*