ABSTRAK

Purhendi Bayu Basuki. 2025. Prototipe Sistem Monitoring Keamanan Ruangan Arsip Berbasis Internet of Things (IoT) Menggunakan Aplikasi Blynk. Skripsi. Program Studi Teknik Informatika, Fakultas Teknik, Universitas PGRI Madiun. Pembimbing (I) Erni Untari, S.Pd., M.Pd. (II) Slamet Riyanto S.T., M.M

Sistem keamanan ruangan arsip merupakan kebutuhan penting untuk mencegah potensi ancaman seperti kebakaran dan akses tidak sah. Penelitian ini bertujuan untuk merancang dan membangun prototipe sistem monitoring keamanan ruangan arsip berbasis *Internet of Things* (IoT) menggunakan mikrokontroler ESP32, sensor suhu DHT11, sensor asap MQ-2, dan sensor gerakan PIR, serta aplikasi Blynk sebagai antarmuka pemantauan secara real-time. Metode pengembangan sistem yang digunakan adalah *prototyping*, dengan tahapan pengumpulan kebutuhan, desain, pembuatan, evaluasi, dan penyempurnaan prototipe. Hasil pengujian menunjukkan bahwa sistem berhasil membaca data dari ketiga sensor secara akurat dan mengirimkan data ke aplikasi Blynk dengan waktu respons rata-rata kurang dari 2 detik. Notifikasi berhasil dikirim ke perangkat pengguna dalam waktu 1–2 detik setelah kondisi berbahaya terdeteksi. Sensor DHT11 dapat merespons peningkatan suhu secara bertahap, sensor MQ-2 memberikan notifikasi saat nilai gas melebihi ambang batas 400 ppm, dan sensor PIR efektif mendeteksi gerakan hingga jarak 4 meter. Selain itu, pengujian menunjukkan bahwa sistem bekerja stabil dalam jangkauan Wi-Fi lokal dan mampu beroperasi secara berkalnjutan selama 8 jam tanpa gangguan. Pengembangan sistem ke depan dapat diarahkan pada penambahan fitur identifikasi pengguna sah, kontrol otomatis, penambahan jenis sensor, serta pengembangan aplikasi khusus.

Kata Kunci: *Internet of Things* (IoT), Keamanan Arsip, ESP32, Blynk, Sensor DHT11, MQ-2, PIR.

ABSTRACT

Purhendi Bayu Basuki. 2025. *Prototype of an IoT-Based Archive Room Security Monitoring System Using the Blynk Application. Information Technology Study Program, Faculty of Engineering,* Universitas PGRI Madiun. *Advisor (I)* Erni Untari, S.Pd., M.Pd. *Co-Advisor (II)* Slamet Riyanto, S.T., M.M.

Archive room security is essential to prevent potential threats such as fire and unauthorized access. This study aims to design and develop a prototype of an archive room security monitoring system based on the Internet of Things (IoT) using the ESP32 microcontroller, DHT11 temperature sensor, MQ-2 gas sensor, and PIR motion sensor, with the Blynk application as a real-time monitoring interface. The system was developed using the prototyping method, which includes stages of requirement gathering, design, prototype development, evaluation, and refinement. The test results indicate that the system successfully reads data from the three sensors accurately and transmits it to the Blynk application with an average response time of less than 2 seconds. Notifications are sent to the user's device within 1–2 seconds after a hazardous condition is detected. The DHT11 sensor responds well to gradual temperature increases, the MQ-2 sensor triggers alerts when gas values exceed 400 ppm, and the PIR sensor effectively detects motion up to a distance of 4 meters. Additionally, the system operated stably within the local Wi-Fi range and continuously functioned for 8 hours without interruption. Future developments may include the integration of user identification features, automated responses, additional sensor types, and the development of a custom monitoring application.

Keywords: Internet of Things (IoT), Archive Security, ESP32, Blynk, DHT11 Sensor, MQ-2, PIR.