

RANCANG BANGUN SMART HOME BABY MONITORING BERBASIS IOT

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ABSTRAK

Keterbatasan waktu orang tua saat bekerja atau beraktivitas di luar rumah sering menimbulkan kekhawatiran dalam mengawasi bayi. Hal ini melatarbelakangi penelitian Rancang Bangun Smart Home Baby Monitoring Berbasis IoT, yaitu sistem yang memungkinkan orang tua memantau kondisi bayi secara real-time meski tidak berada di lokasi. Sistem dikembangkan dengan metode Rapid Application Development (RAD) dan terdiri dari satu unit ESP32 sebagai server serta dua unit Wemos D1 Mini sebagai node sensor. Node pertama menggunakan sensor PIR HC-SR501 dan KY-037 untuk mendeteksi gerakan dan suara bayi, sedangkan node kedua menggunakan DHT11 dan MQ-2 untuk memantau suhu ruangan dan asap. Data dikirim ke ESP32 melalui WiFi lokal, diteruskan ke MQTT Broker untuk monitoring, dan ke Telegram Bot untuk mengirim notifikasi saat terdeteksi kondisi yang perlu diwaspadai. Hasil pengujian menunjukkan seluruh sensor berfungsi baik, komunikasi data berjalan lancar, dan notifikasi terkirim secara real-time. Sistem ini diharapkan menjadi solusi praktis bagi orang tua dalam mengawasi bayi dari jarak jauh.

Kata kunci: Internet of Things, Smart Home, monitoring bayi, ESP32, Wemos D1 Mini.

**DESIGN AND DEVELOPMENT OF AN IOT-BASED SMART HOME BABY
MONITORING SYSTEM**

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ABSTRACT

Limited time due to work or other activities outside the home often leaves parents worried about keeping an eye on their baby. This concern led to the development of an IoT-Based Smart Home Baby Monitoring System, designed to let parents monitor their baby's condition in real time without being physically present. Built using the Rapid Application Development (RAD) method, the system consists of an ESP32 as the main server and two Wemos D1 Mini units as sensor nodes. The first node uses a PIR HC-SR501 and a KY-037 sensor to detect the baby's movement and sound, while the second node uses a DHT11 and an MQ-2 sensor to monitor room temperature and smoke. Data is sent to the ESP32 via a local WiFi network, forwarded to an MQTT Broker for monitoring, and to a Telegram Bot that sends notifications whenever a condition requiring attention is detected. Testing results show that all sensors function properly, data communication runs smoothly, and notifications are delivered in real time. The system is expected to serve as a practical solution for parents to monitor their babies remotely.

Keywords: *Internet of Things, Smart Home, baby monitoring, ESP32, Wemos D1 Mini.*