

ABSTRAK

RANCANG BANGUN SISTEM MONITORING DISTRIBUSI BUAH DARI PETANI KE PEDAGANG BERBASIS *INTERNET OF*

THINGS

(Dutha Relanda : 2025: *XII + 73 Pages + Appendices*)

Distribusi buah merupakan tahapan penting dalam rantai pasok agrikultur yang memerlukan pengawasan ketat, terutama terhadap suhu, untuk menjaga kesegaran dan kualitas buah. Penelitian ini bertujuan untuk merancang dan membangun sistem monitoring distribusi buah berbasis Internet of Things (IoT) yang mampu memantau suhu, kelembapan, getaran, dan lokasi secara real-time selama proses pengiriman dari petani ke pedagang. Sistem ini menggunakan mikrokontroler NodeMCU ESP32 yang terintegrasi dengan sensor suhu dan kelembapan DHT11, sensor getaran SW-420, serta modul GPS Ublox Neo-6M. Data yang diperoleh dari sensor dikirimkan melalui koneksi Wi-Fi ke platform monitoring berbasis website (Cayenne), sehingga pengguna dapat melakukan pemantauan secara jarak jauh melalui smartphone atau komputer. Pengujian menunjukkan bahwa sistem dapat mendeteksi kondisi lingkungan secara akurat dan memberikan informasi real-time, serta membantu mencegah kerusakan buah akibat suhu tinggi, kelembapan berlebih, atau guncangan selama pengiriman. Sistem ini dinilai efektif dan fungsional dalam mendukung kegiatan distribusi buah yang lebih berkualitas, efisien, dan terpercaya.

Kata Kunci: IoT, Monitoring Distribusi Buah, NodeMCU ESP32, Sensor DHT11, Sensor GPS, Real-Time Monitoring

ABSTRACT

DESIGN AND DEVELOPMENT OF A FRUIT DISTRIBUTION MONITORING SYSTEM FROM FARMERS TO TRADERS BASED ON THE INTERNET OF THINGS

(Dutha Relanda : 2025: XII + 73 Pages + Appendices)

Fruit distribution is a crucial stage in the agricultural supply chain that requires strict monitoring, particularly of temperature, to maintain the freshness and quality of the produce. This study aims to design and develop a fruit distribution monitoring system based on the Internet of Things (IoT), capable of monitoring temperature, humidity, vibration, and location in real time during transportation from farmers to traders. The system utilizes a NodeMCU ESP32 microcontroller integrated with a DHT11 sensor for temperature and humidity, an SW-420 sensor for vibration detection, and a Ublox Neo-6M GPS module for location tracking. Sensor data is transmitted via Wi-Fi to a web-based monitoring platform (Cayenne), allowing users to monitor the conditions remotely using smartphones or computers. Testing results indicate that the system accurately detects environmental conditions and provides real-time information, helping to prevent fruit damage due to high temperatures, excessive humidity, or strong vibrations during delivery. This system is proven to be effective and functional in supporting a more reliable, efficient, and high-quality fruit distribution process.

Keywords: IoT, Fruit Distribution Monitoring, NodeMCU ESP32, DHT11 Sensor, GPS Sensor, Real-Time Monitoring