

ABSTRAK

RANCANG BANGUN INKUBATOR TELUR PUYUH BERBASIS IOT MENGUNAKAN ESP32 UNTUK MONITORING SUHU DAN KELEMBAPAN DI PETERNAKAN DESA UPANG JAYA

(Aandari 2026: 75 halaman)

Penetasan telur puyuh memerlukan suhu dan kelembapan yang stabil agar proses penetasan dapat berlangsung dengan baik. Namun, pengaturan suhu dan kelembapan secara manual cukup sulit dilakukan secara terus-menerus. Oleh karena itu, penelitian ini bertujuan untuk merancang dan membangun inkubator telur puyuh berbasis Internet of Things (IoT) menggunakan ESP32 yang dapat memantau suhu dan kelembapan secara real-time melalui aplikasi Blynk. Sistem ini menggunakan ESP32 sebagai mikrokontroler utama, sensor DHT21 untuk membaca suhu dan kelembapan, relay sebagai pengendali lampu pijar, DC fan, dan ceramic mist maker. Data suhu dan kelembapan dikirim ke aplikasi Blynk sehingga dapat dipantau melalui telepon pintar. Pengujian dilakukan menggunakan 90 butir telur puyuh. Hasil pengujian menunjukkan bahwa sistem mampu menjaga suhu inkubator pada kisaran 37–39°C dan kelembapan pada kisaran 60–80% RH. Dari 90 butir telur yang diuji, sebanyak 30 butir berhasil menetas. Jumlah telur yang tidak menetas dipengaruhi oleh beberapa kali pemadaman listrik selama proses inkubasi sehingga kondisi suhu dan kelembapan di dalam inkubator tidak selalu stabil. Berdasarkan hasil pengujian tersebut, dapat disimpulkan bahwa alat yang dirancang mampu bekerja sesuai fungsinya dalam memantau suhu dan kelembapan secara real-time serta membantu pengguna memantau kondisi inkubator dari jarak jauh melalui aplikasi Blynk.

Kata kunci: inkubator telur puyuh, Internet of Things (IoT), ESP32, DHT21, DC fan, Blynk

ABSTRACT

DESIGN AND DEVELOPMENT OF AN INTERNET OF THINGS (IoT)- BASED QUAIL EGG INCUBATOR USING ESP32 FOR TEMPERATURE AND HUMIDITY MONITORING AT A QUAIL FARM IN UPANG JAYA VILLAGE

(Aandari 2026: 75 pages)

Quail egg incubation requires stable temperature and humidity to ensure that the hatching process can proceed properly. However, manually regulating temperature and humidity continuously is relatively difficult. Therefore, this research aims to design and develop an Internet of Things (IoT)-based quail egg incubator using an ESP32 that can monitor temperature and humidity in real time through the Blynk application. The system uses the ESP32 as the main microcontroller, a DHT21 sensor to measure temperature and humidity, and relays to control an incandescent lamp, DC fan, and ceramic mist maker. Temperature and humidity data are transmitted to the Blynk application, allowing them to be monitored via a smartphone. Testing was conducted using 90 quail eggs. The test results showed that the system was able to maintain the incubator temperature within the range of 37–39°C and humidity within the range of 60–80% RH. Of the 90 eggs tested, 30 eggs successfully hatched. The number of unhatched eggs was influenced by several power outages during the incubation process, which caused the temperature and humidity conditions inside the incubator to be unstable at certain times. Based on the test results, it can be concluded that the developed device was able to function as intended in monitoring temperature and humidity in real time and assisting users in remotely monitoring the condition of the incubator through the Blynk application.

Keywords: quail egg incubator, Internet of Things (IoT), ESP32, DHT21, DC fan, Blynk