

ABSTRAK

Peternakan ayam di Indonesia, khususnya skala rumah tangga dan komersial kecil, masih banyak mengandalkan sistem manual untuk pemberian pakan, penyediaan air minum, dan pembersihan kotoran, sehingga membutuhkan tenaga kerja yang besar dan kurang efisien. Penelitian ini bertujuan untuk merancang *smart system* pada kandang ayam menggunakan mikrokontroler ESP32 berbasis *Telegram Chatbot*, guna mengotomatisasi sistem pemberian pakan dan minum serta pembersihan kotoran ayam yang dapat dipantau dan dikendalikan melalui *smartphone*. Metode penelitian yang digunakan adalah metode *prototype*, dengan tahapan *communication*, *quick plan*, *modeling quick design*, *construction of prototype*, serta *deployment*, *delivery and feedback*. Sistem dirancang dengan memanfaatkan sensor *load cell* dan modul HX711 untuk mendeteksi berat pakan, sensor ultrasonik untuk mendeteksi ketersediaan pakan, *water level sensor* untuk memantau volume air minum, serta motor servo, relay, dan pompa mini sebagai aktuator, yang seluruhnya terintegrasi dengan *bot Telegram* sebagai antarmuka notifikasi dan kontrol. Hasil pengujian menunjukkan bahwa sensor *load cell* memiliki rata-rata *error* sebesar 0,99%, *water level sensor* memiliki waktu respon rata-rata 1,8 detik, dan sistem pembersih kotoran mampu menurunkan bobot kotoran hingga di bawah 120 gram. Pengujian integrasi selama tiga hari berturut-turut membuktikan sistem dapat menjalankan perintah secara stabil tanpa penundaan berarti. Dapat disimpulkan bahwa prototipe *smart system* kandang ayam berbasis ESP32 dan *Telegram Chatbot* ini berfungsi dengan baik dalam mengotomatisasi pemberian pakan, minum, dan pembersihan kotoran, serta memberikan notifikasi secara *real-time* kepada pengguna.

Kata Kunci: *Smart System, ESP32, Telegram Chatbot, Internet of Things, Kandang Ayam Otomatis, Load Cell, Water Level Sensor*

ABSTRACT

Chicken farming in Indonesia, particularly at the household and small commercial scale, still largely relies on manual systems for feeding, providing drinking water, and cleaning waste, which requires a large workforce and is relatively inefficient. This study aims to design a smart system for chicken coops using an ESP32 microcontroller based on a Telegram Chatbot, in order to automate the feeding and watering system as well as the manure cleaning process, which can be monitored and controlled through a smartphone. The research method used is the prototype method, consisting of the stages of communication, quick plan, modeling quick design, construction of prototype, and deployment, delivery and feedback. The system was designed using a load cell sensor and HX711 module to detect feed weight, an ultrasonic sensor to detect feed availability, a water level sensor to monitor drinking water volume, and a servo motor, relay, and mini pump as actuators, all of which are integrated with a Telegram bot as the notification and control interface. The test results show that the load cell sensor has an average error of 0.99%, the water level sensor has an average response time of 1.8 seconds, and the manure cleaning system is able to reduce the manure weight to below 120 grams. A three-day consecutive integration test proved that the system was able to execute commands stably without significant delay. It can be concluded that this ESP32 and Telegram Chatbot-based smart chicken coop prototype functions well in automating feeding, watering, and manure cleaning, while providing real-time notifications to the user.

Keywords: Smart System, ESP32, Telegram Chatbot, Internet of Things, Automatic Chicken Coop, Load Cell, Water Level Sensor