

IMPLEMENTASI ALGORITMA *RANDOM FOREST* DAN *ISOLATION FOREST* UNTUK PREDIKSI PERFORMA DAN DETEKSI ANOMALI PADA *MONITORING* AYAM BROILER BERBASIS *WEBSITE* DENGAN METODE *AGILE*

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ABSTRAK

Ayam broiler merupakan penghasil utama protein sebagai pemasok utama kebutuhan pangan nasional. Namun kondisi ayam melalui *monitoring* pakan dan berat ayam masih menjadi masalah karena kurangnya pengetahuan mendalam mengenai pola data kesehatan ternak yang kompleks yang dapat menyebabkan keterlambatan dalam mendeteksi anomali kesehatan dan ketidakpastian estimasi hasil panen. Penelitian ini bertujuan membangun sistem *monitoring* berbasis *website* yang mampu memprediksi performa panen dan mendeteksi anomali secara dini menggunakan model *random forest* dan *isolation forest*. Pengembangan sistem dilakukan menggunakan metode *agile* dengan tahapan *plan, design, develop, test, deploy, review, dan launch* untuk memastikan fitur dapat diimplementasikan ke sistem yang sudah ada. Sistem mengintegrasikan algoritma *random forest regressor* digunakan untuk memprediksi nilai *Index Performance* (IP), sedangkan *isolation forest* diterapkan untuk mendeteksi anomali pada data harian ayam broiler. Hasil penelitian menunjukkan bahwa algoritma *random forest* mampu memprediksi performa dengan sangat baik, menghasilkan nilai *R2 Score* sebesar 91,35 %. Sementara itu, algoritma *isolation forest* terbukti efektif dalam mendeteksi anomali dengan akurasi 87,5 %, presisi 82,6 %, dan *recall* 95 %. Implementasi sistem ini berhasil menyediakan alat bantu *monitoring* yang akurat dan responsif untuk mendukung pengambilan keputusan pengguna. Penelitian ini memberikan kontribusi pada pemanfaatan model *random forest* dan *isolation forest* menggunakan data *time series*.

Kata Kunci: *Agile, Ayam Broiler, Deteksi Anomali, Isolation Forest, Monitoring, Random Forest.*

**IMPLEMENTATION OF RANDOM FOREST AND ISOLATION FOREST
ALGORITHMS FOR PERFORMANCE PREDICTION AND ANOMALY
DETECTION IN WEBSITE-BASED BROILER CHICKEN MONITORING
USING THE AGILE METHOD**

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ABSTRACT

Broiler chickens are the main source of protein as the primary supplier of national food needs. However, monitoring chicken feed and weight remains a problem due to a lack of in-depth knowledge about complex livestock health data patterns, which can lead to delays in detecting health anomalies and uncertainty in crop yield estimates. This study aims to develop a web-based monitoring system capable of predicting harvest performance and detecting anomalies early. The system development was conducted using the Agile method with the stages of plan, design, develop, test, deploy, review, and launch to ensure that the features could be implemented into the existing system. The system integrates a random forest regressor algorithm used to predict the Performance Index (PI) value, while isolation forest is applied to detect anomalies in daily broiler chicken data. The results show that the random forest algorithm is able to predict performance very well, producing an R2 Score of 91.35%. Meanwhile, the isolation forest algorithm proved to be effective in detecting anomalies with an accuracy of 87.5%, precision of 82.6%, and recall of 95%. The implementation of this system has succeeded in providing an accurate and responsive monitoring tool to support user decision making. This research also contributes to the science of website development by implementing the random forest algorithm for performance prediction and the isolation forest algorithm for anomaly detection. This research also proves that both models can be applied effectively in the animal husbandry industry.

Keywords: Agile, Anomaly Detection, Broiler chickens, Isolation Forest, Monitoring, Random Forest.