

INTISARI

STUDI KOMPARATIF METODE *COUNTERFACTUAL* DAN *EXAMPLE-BASED* DALAM MENINGKATKAN *EXPLAINABILITY* PADA ANTARMUKA *DASHBOARD MONITORING* KARUNG PAKAN

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Perkembangan *Artificial Intelligence* (AI) telah mendorong pemanfaatan sistem prediksi untuk mendukung pengambilan keputusan, termasuk pada pengelolaan pakan ayam broiler. Namun, sifat *black-box* pada model *machine learning* dapat menurunkan pemahaman dan kepercayaan pengguna nonteknis terhadap hasil prediksi. Meskipun *Explainable Artificial Intelligence* (XAI) telah banyak diteliti, sebagian besar berfokus pada domain kesehatan dan finansial. Penelitian ini bertujuan membandingkan efektivitas metode *counterfactual* dan *example-based* pada dua variasi antarmuka XAI dibandingkan dengan antarmuka *baseline* tanpa XAI dalam meningkatkan *usability*, *understandability*, dan *trustworthiness* pada domain *smart farm*. Evaluasi dilakukan melalui eksperimen *within-subject* terhadap 21 partisipan yang menyelesaikan serangkaian tugas pada ketiga antarmuka. Hasil penelitian menunjukkan bahwa metode *counterfactual* paling efektif meningkatkan *usability* dan *trustworthiness*. Metode *example-based* memperoleh skor *understandability* tertinggi pada pengguna dengan peran administrasi. Temuan ini memberikan evidensi empiris efektivitas metode penjelasan XAI pada *dashboard* berbasis AI di domain *smart farming*.

Kata kunci: *Counterfactual explanation*, *example-based explanation*, *Explainable Artificial Intelligence* (XAI), *smart farm*, UI/UX.

ABSTRACT

A COMPARATIVE STUDY OF COUNTERFACTUAL AND EXAMPLE-BASED METHODS FOR IMPROVING EXPLAINABILITY IN FEED SACK MONITORING DASHBOARD INTERFACE

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The development of Artificial Intelligence (AI) has driven the adoption of predictive systems to support decision-making, including in broiler chicken feed management. However, the black-box nature of machine learning models can reduce non-technical users' understanding of and trust in prediction results. Although Explainable Artificial Intelligence (XAI) has been extensively studied, most research has focused on the healthcare and financial domains. This study aims to compare the effectiveness of counterfactual and example-based explanation methods across two XAI interface variations against a baseline interface without XAI in improving usability, understandability, and trustworthiness in the smart farming domain. The evaluation was conducted through a within-subject experiment involving 21 participants who completed a series of tasks using all three interfaces. The results show that the counterfactual method was the most effective in improving usability and trustworthiness, while the example-based method achieved the highest understandability scores among users with administrative roles. These findings provide empirical evidence regarding the effectiveness of XAI explanation methods in AI-based dashboards within the smart farming domain.

Keyword: Counterfactual explanation, example-based explanation, Explainable Artificial Intelligence (XAI), smart farm, UI/UX.