

ABSTRACT

Financial fraud poses significant threats to businesses, impacting revenue, financial reporting accuracy, and overall company reputation. To combat this issue, researchers have explored various methods, with artificial intelligence (AI) and machine learning (ML) techniques showing promising results. In particular, unsupervised methods like anomaly detection using Robust Random Cut Forest (RRCF) have gained attention due to their ability to identify rare or unusual events. This paper presents a case study on developing a fraud detection system for Company XYZ in Indonesia. The study's focus lies in financial transaction fraud, a type of corporate fraud, and leverages unsupervised learning techniques for anomaly detection. RRCF is used as the primary method due to its superior accuracy in detecting anomalies.

The research begins with a comprehensive literature review on financial fraud detection methodologies, emphasizing the potential of unsupervised learning for future research. Subsequently, the system requirements are gathered through semi-structured interviews, ensuring the system aligns with user needs.

The architecture of the proposed fraud detection system involves creating a service that connects to the existing system through an API. The RRCF algorithm is utilized to create a model from historical financial transaction data, enabling the system to detect anomalies in real-time.

The experimental results demonstrate the effectiveness of the RRCF method, with an average of 29 potential fraud cases detected in 1000 experiments. The system's stability is illustrated by a standard deviation of 13.06, showcasing consistent performance in identifying anomalies. From the results of user evaluation, the accuracy of the detection carried out was 99.3% with a precision of 62.5%.

Keywords: *financial transaction, fraud, system design, robust random cut forest, rrcf*