ABSTRACT

In the digital era, suspicious transactions in bank accounts have a serious impact on the interests of merchants and bank customers. Fraud detection is one of the efforts to prevent fraud that is overcome by detecting suspicious patterns from a transaction. In this study, a fraud detection was developed using the Random Forest algorithm on bank transaction datasets that have been processed by the Solve Ease Fraud Investigation System (SEFIS) application. The Random Forest algorithm is used because several cases conducted by previous researchers have shown that the Random Forest algorithm can manage fraud detection problems well. The main contribution to this study is the application of machine learning with the Random Forest algorithm model to bank transaction data, especially in Indonesia, to detect fraud that occurs comprehensively. The dataset used is a bank transaction dataset that has been processed by the Solve Ease Fraud Investigation System (SEFIS) application with unbalanced data characteristics. For each imbalanced data, we handle the data balancing using Random Undersampling (RUS). We conducted a trial by comparing the data that was balanced using RandomUndersampling with the results Accuracy = 0.9927, Precision = 0.9799, Recall = 0.9949, Specificity = 0.9999, F1-Score = 0.9873 and data that was not balanced with the results Accuracy = 0.9986, Precision = 0.9947, Recall = 0.8732, Specificity = 0.9999, F1-Score = 0.9300.

Keywords: *Fraud Detection, Bank, Random Forest, Random Under Sampling, Imbalanced Data*