ABSTRACT

Improving Supervised Learning Model in Fraud Detection using SMOTE

Farahsyifa Mutiara Khansa

15/386837/PA/17048

In the present-time financial transaction appliance has been widely used around the world. Various types of financial services offer practical solutions for managing finances. The growth of technology makes it easier for the human to do a financial transaction. The financial transaction that happens nowadays is presented not only in the form of debit or credit card but also in the form of mobile money. With mobile money, people can easily do a transaction such as withdrawals, debit, payment, and even transfer in various places with just using a simple tool which is their mobile phone. However, the easiness offered by services such as mobile money also opening a gap to those who want to commit certain crimes. By intercepting systems that contain someone's information, someone's information can be easily misused by the criminals to take an unnecessary advantage.

This research aims to find out the best method for solving fraud problems in the mobile money system while solving the imbalanced data problems that often have to face in the fraud datasets. In this research, the Oversampling method using SMOTE Algorithm will be used to solve the imbalanced problem. Afterward, three classification methods, Support Vector Machine, Naïve Bayes, and Decision Tree will be used to classify the mobile money fraud dataset. Then the classification performance will be evaluated by calculating the precision, recall, f1-score, accuracy, and the confusion matrix.

The results of this study indicate that the use of the Decision Tree classification model with SMOTE is the best compared to the two other classification models. With an average value of evaluation are 0,99 for the precision, 0,99 for the recall, 0,99 for the f1-score, and 0,99 for the accuracy value.

Keywords: Fraud Detection, Supervised Learning, SVM, Naïve Bayes, Decision tree, Oversampling, SMOTE, Mobile money