IDENTIFICATION OF SUSPICIOUS SALE AGENTS USING MACHINE LEARNING TECHNIQUES: A STUDY BASED ON PRODUCT SALES ON TELCO COMPANY

Chulaxshan Gunasegaram

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Abstract

During the last decade, machine learning technology has accelerated the development of Predictive analytics, Anomaly detection, and forecasting. There are more than thousands of telecommunication companies in the world. And they earn a massive amount of revenue per year (million/ trillion) through providing multiple services to customers. In order to give effective service to customers, the company has its own service centers (internal agents), and companies have appointed external sales agents and give targets to them on monthly basis. Based on the target achievement, their commission will be paid. When a person or agent makes false activations/sales in order to obtain a high commission, it is identified as fraud. The total cost of sale fraud is approx. 4.3Mn per year. Hence, the detection of fraudulent sale agents is a challenging problem in the telco industry. The traditional approach for fraud detection is known as a rule-based engine. Detection of external fraud agents is the most prominent compared with internal agents. In this paper, focuses on identifying the external fraud sale agents by using supervised machine learning techniques, and GridsearchCV is used to find the best hyper-parameter. Also, model performance will be evaluated by the confusion matrix and ROC curve. This approach helps to calculate the best accuracy, precision, recall, and F1 score.

Keywords – *Fraud, Agents sales, Machine learning (ML), Decision tree (DT), Random forest, Ada boost, XG boost, Gradient boost, Naïve Basie, Support vector machine, K-nearest neighbor, Neutral Network, ROC, Feature selection, Imbalance data, Preprocessing*