

Chapter 5

Data Mining for Secure Online Payment Transaction

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ABSTRACT

The fraud detection method requires a holistic approach where the objective is to correctly classify the transactions as legitimate or fraudulent. The existing methods give importance to detect all fraudulent transactions since it results in money loss. For this most of the time, they have to compromise on some genuine transactions. Thus, the major issue that the credit card fraud detection systems face today is that a significant percentage of transactions labelled as fraudulent are in fact legitimate. These “false alarms” delay the transactions and creates inconvenience and dissatisfaction to the customer. Thus, the objective of this research is to develop an intelligent data mining based fraud detection system for secure online payment transaction system. The performance evaluation of the proposed model is done on real credit card dataset and it is found that the proposed model has high fraud detection rate and less false alarm rate than other state-of-the-art classifiers.

INTRODUCTION

Electronic society make the life more convenient and easy, the use of online mode of payment in banking system is one of the most essential parts of our daily life. “Electronic payment system is a combination of commerce and technology”. This idea which allows payment process to be performed across a computer network (electronically) is not a new thing. It has been proposed in 1980. But the electronic payment system officially started at the 1997 and until present an enormous number of different payment techniques developed by researchers. Many of these methods entered to the market but they were not so successful since the consumers didn’t get satisfaction. An electronic payment system is conducted in “different electronic commerce categories such as Business to business, business to customer, customer

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to business and customer to customer”. To participate in the electronic payment system the “costumer and the merchant should access the internet” also in other side; their bank accounts (costumer and the merchant) should be at the banks which have connection to the internet. Electronic payment is “much powerful, convenient and portable”. Among all variety of payment systems “credit card is more popular and become the most convenient and essential instrument” to conduct electronic payment due to the following features (Jithendra, 2011):

- They allow making purchase without carrying a lot of cash.
- They allow making purchases without being worry about local currency.
- They allow convenient ordering by email.
- They are simple and comfortable.

Credit cards are “convenient and flexible method of payment”. Credit card is a small plastic card that can be used either in physical or virtual way (Ngai et al., 2011). In a physical way, “the cardholder (costumer) handover his/her card physically to a merchant for making a payment”. While in virtual way, only some important and confidential information about a card such as “card number, expiration date and secure code” is required for making transactions, and there is no need to present the physical card. Usually “such purchases are normally done on the Internet or over the telephone”. Credit cards are not the panacea that we might hope for, because by increasing the number of transactions which have been done through credit card, “the fraudsters’ activities are also increased significantly”. Among the all type of fraud, financial fraud is more dangerous and frightening, because it costs hundreds of millions of dollars per year in damages and hurts hundreds of millions of people. According to “publisher of payments industry newsletter”, global credit card fraud cost \$12.4 billion in 2015 (Bloomberg, 2015). Unfortunately, no one is completely safe from being defrauded. As the credit card is the easiest and popular method in payment industry, so “it is considered as a good place to make a fraud because in a short time fraudsters can earn lots of money”. To commit the fraud, “in case of offline payment” which using credit card physically, fraudsters must steal the credit card itself to make fraudulent transactions, while in the case of “online payment “which can occur over phone or internet, fraudsters must steal card’s information only (Ramanathan, 2012). Thus, “a secured banking system requires high speed authentication machines” that let legitimate transactions to pass easily, while detect the fraudulent transaction which attempt by others. The most popular and trusted technique in credit card fraud detection is Data mining technique, because “millions of transactions are handled every day and to process such a huge amount of data human assessing is inefficient”. According to a survey in 2015, “the five best fraud detection companies” are listed in Table 1 (Top Credit Card Processors, 2015).

Table 1. Credit card fraud detection: best fraud detection services (July 2015)

Rank	Name of Company	Year Founded
1	Ethoca Limited	2003
2	Norse Corporation	2010
3	Facility Management Advisors	2009
4	MaxMind	2002
5	Kount	2007

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