

# Fraud Disclosures in Credit Card Activities

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**Abstract-**Development of communication technologies and ecommerce has made the credit card as the most common technique of payment for both online and regular purchases. So, security in this system is highly expected to prevent fraud transactions. In this, Many people are trying novel techniques to detect and prevent such frauds. This paper uses a Neural network based unsupervised learning technique. Credit card fraud detection is the process of identifying purchase attempts that are fraudulent and rejecting them rather than processing the order. Payment cards are easy to use because you only need to transmit a few simple numbers to the bank in order to identify your account and authorize the transaction. It is vital that credit card companies are able to identify fraudulent credit card transactions so that customers are not charged for items that they did not purchase. Such problems can be tackled with Data Science and its importance, along with Machine Learning, cannot be overstated. This project intends to illustrate the modelling of a data set using machine learning with Credit Card Fraud Detection. The Credit Card Fraud Detection Problem includes modelling past credit card transactions with the data of the ones that turned out to be fraud. This model is then used to recognize whether a new transaction is fraudulent or not. Our objective here is to detect 100% of the fraudulent transactions while minimizing the incorrect fraud classifications. Credit Card Fraud Detection is a typical sample of classification. In this process, we have focused on analysing and pre-processing data sets as well as the deployment of multiple anomaly detection algorithms such as Local Outlier Factor and Isolation Forest algorithm on the PCA transformed Credit Card Transaction data.

**Keywords-** Credit card, Fraud, Detection, Analysing, PCA.

## I. INTRODUCTION

One of the major concerns for financial institutions is fraud. As the number of transactions is increasing, it is also increasing the chances of fraud. But now, financial institutions can keep track of scams and frauds in a better way by using the analytical tools to analyse the big data.

Credit card fraud will remain at the top of the list of financial scams. There has been an improvement in the detection of these types of fraud because of the development of algorithms. Anomaly detection is much easier now with higher accuracy. The losses from the scams are promptly minimized by the detection alert received at real-time by the companies about the anomalies in financial purchases. Unusual patterns in trading data are identified using various machine learning tools. Financial institutions are alerted, and the anomalies are taken for further investigation. There are many other types of fraud also which are detected by understanding the pattern of the data which seems to be suspicious and many insurance companies are using several clustering algorithms to segregate the data and understand the cluster pattern of information.

Fraud detection involves monitoring the activities of populations of users in order to estimate, perceive or avoid objectionable behaviour, which consist of fraud, intrusion, and defaulting. This is a very relevant problem that demands the attention of communities such as machine learning and data science where the solution to this problem can be automated. There are not the only challenges in the implementation of a real-world fraud detection system, however. In real world examples, the massive stream of payment requests is quickly scanned by automatic tools that determine which transactions to authorize.

Machine learning algorithms are employed to analyse all the authorized transactions and report the suspicious ones. These reports are investigated by professionals who contact the cardholders to confirm if the transaction was genuine or fraudulent.

## II. LITERATURE REVIEW

1. Credit Card Fraud Detection System using Smote Technique and Whale Optimization Algorithm- Sahayasakila.V, D. Kavya Monisha, Aishwarya, Sikhakolli Venkata visalakshiseshasai Yayasawi

SMOTE (Synthetic minority oversampling technique) is a machine learning technique used for classification of data.

The kaggle datasets are trained by using the SMOTE technique. SMOTE technique is used to solve data imbalance problems.

This technique is mainly used to differentiate the fraud transactions from the original transactions done by the card holders.

## 2.A Study of Credit Card Complaints By Ting Pen

What do consumers complain about?

Cardmembers' biggest issues were billing disputes, account closures, and fraud (including identity theft and embezzlement)

The top three issues that credit cardholders complained the most about were billing disputes, identity theft / fraud / embezzlement, and account closing / cancellations.

3. Debit, credit card frauds on rise, ATM scams down: NCRB-Shuja Asrar

Fraudulent credit and debit card transactions surged for the second straight year in 2021, while ATM-related fraud has declined, a report released by the National Crime Records Bureau (NCRB) showed.

According to the data, 3,432 cases of credit and debit card frauds were filed from across India in 2021, up nearly 20% from the year-earlier. In 2020, such frauds increased by over 70%. In just two years, credit and debit card-related frauds nearly doubled. In 92 days, India lost Rs 128 crore in card, online fraud -CHETHAN KUMAR, Times of India

Just 92 days between October 1, 2019 and December 31, 2019, saw cybercriminals make away with nearly Rs 128 crore in frauds relating to debit and credit cards and net banking. Scheduled banks reported six cases every minute, to record a whopping 21,041 cases in the quarter ending December 31. This is followed by 6,117 credit card frauds involving Rs 19.7 crore.

### III. PROBLEM IDENTIFICATION

Frauds are everywhere — wherever a transaction is involved but credit card fraud is probably the most known case. It can be as primitive as stealing or using stolen case through credit cards every day. According to a Nilson Report in 2010, the amount of global fraud was USD 7.6 billion and is expected to cross a whopping USD 31 billion in 2020. In the UK alone fraudulent transactions losses were estimated at more than USD 1 billion in 2018.

Credit card fraud comes in many different shapes and forms, including fraud that involves using a payment card of some description, and more. The reasons for credit card fraud also vary. Some are designed to obtain funds from accounts, while others wish to obtain goods for free. Furthermore, it is very important to understand that credit card fraud is inwards, to aggressive forms such as account takeover, counterfeiting. Credit card frauds have always existed but the magnitude is only growing recently due to increasing online transactions taking place closely to identity theft.

Credit card fraud can take place when cards are misplaced or stolen, mails are diverted by means of criminals, employees of a commercial enterprise steal some consumer information. Fraud can take place when cards are misplaced or stolen, mails are diverted by means of criminals, employees of a commercial enterprise steal some consumer information.

How is credit card information usually stolen:

**Skimming:** Scammers place a card skimmer, which is a device that is kept on the credit card swiping machine. This device will take in your credit card information when your card is swiped for an actual purchase.

**Dumpster diving:** When you discard your bills or documents with your full credit card number on them. Thieves can retrieve these details and commit fraud.

**Hacking:** Thieves can hack companies with whom you have had transactions or firms that perform credit card processing activities. They will then engage in data breaches.

**Phishing:** Phishing includes the persuading of consumers to provide their sensitive data by tricking them by the scammers.

Some examples of credit card fraud

1. Counterfeit and skimming frauds
2. Card not received fraud: Customers not receiving their cards
3. Card not present fraud
4. Lost and stolen credit card fraud
5. Incorrect card application fraud

### IV. ROPOSED IDEA

Machine learning models can recognize unusual credit card transactions and fraud. The first and foremost step involves collecting and sorting

raw data, which is then used to train the model to predict the probability of fraud. The solutions offered by machine learning for credit card fraudulent detection involve:

Classifying whether credit card transactions are authentic or fraudulent using algorithms such as logistic regression, random forests, support vector machines (SVMs), deep neural networks along with auto encoders, long short term memory (LSTM) networks, and convolutional neural networks (CNNs). Predicting whether it is the card holders or the fraudsters using the credit cards through credit card profiling. Using outlier detection methods to identify considerably different transactions (or 'outliers') from regular credit cards transactions to detect credit card fraud.

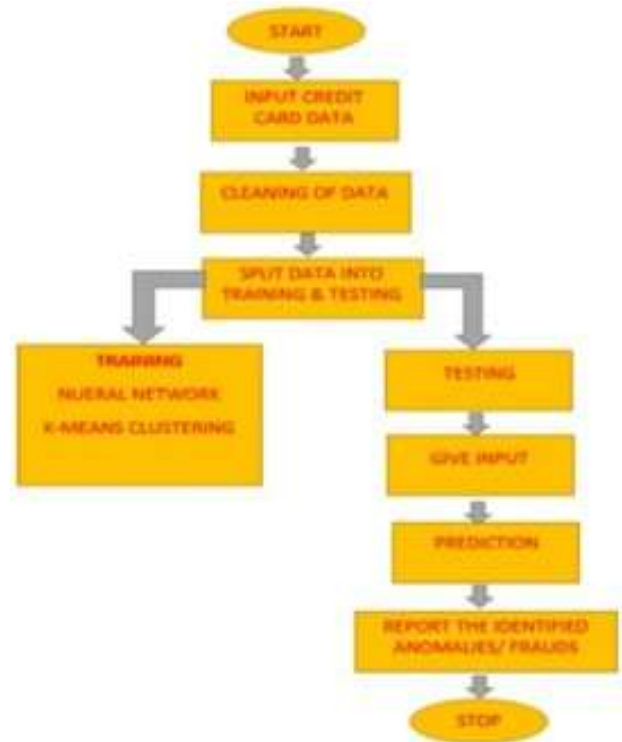


Figure 3: Logic regression model

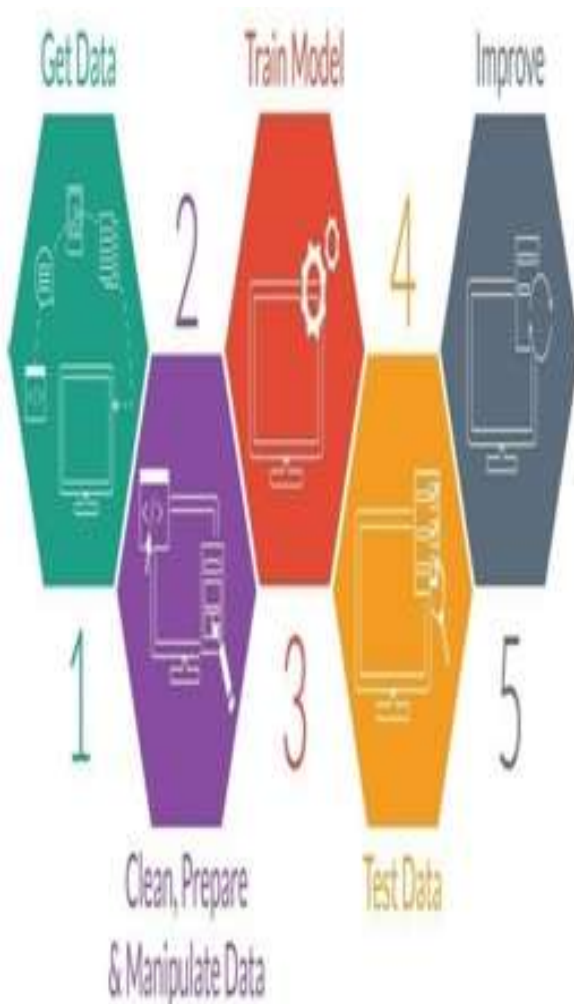
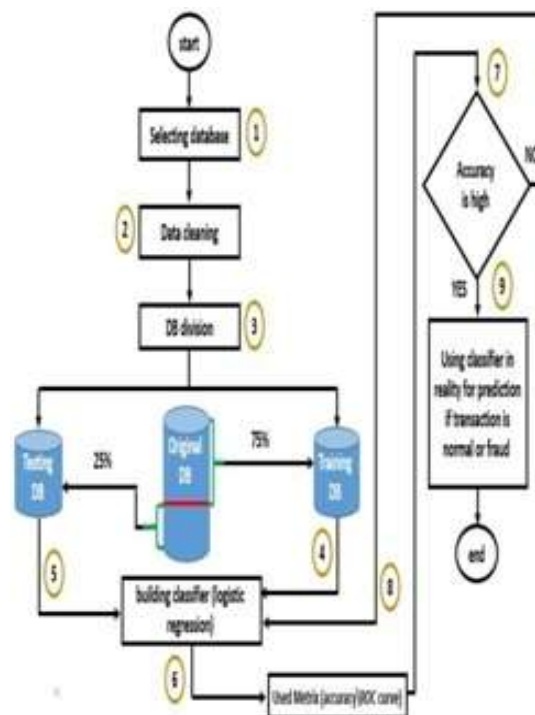


Figure 1: Architecture flow



Evaluation:

Credit Card Fraud Detection Once the Machine Learning-driven fraud protection module was integrated, it started tracking the transactions. Whenever a user requests a transaction, it is being processed for some time. Depending on the level of predicted fraud probability, there are 3 kinds of possible output:

- If the probability is less than 10%, the transaction is allowed
- If the probability is between 10% and 80%, an additional authentication factor (e.g. a one-time SMS code, a fingerprint, or a secret question) should be applied.
- If the probability is more than 80%, the transaction is frozen, so it should be processed manually.

#### V. CONCLUSION

Credit card fraud is an act of criminal dishonesty. This paper has various machine learning algorithms. All these techniques are tested based on accuracy and precision. We have selected supervised learning technique Random Forest to classify the alert as fraudulent or authorized. This classifier will be trained using feedback and delayed supervised samples. Next it will aggregate each probability to detect alerts. Further we proposed a learning to rank approach where alerts will be ranked based on priority. The suggested method will be able to solve the class imbalance and concept drift problem. Future work will include applying semi-supervised learning methods for classification of alerts in fraud detection systems.

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