PROJECT SYNOPSIS (BTCS 703-18)

Credit Card Fraud Detection Using Machine Learning & Deep Learning Algorithm's

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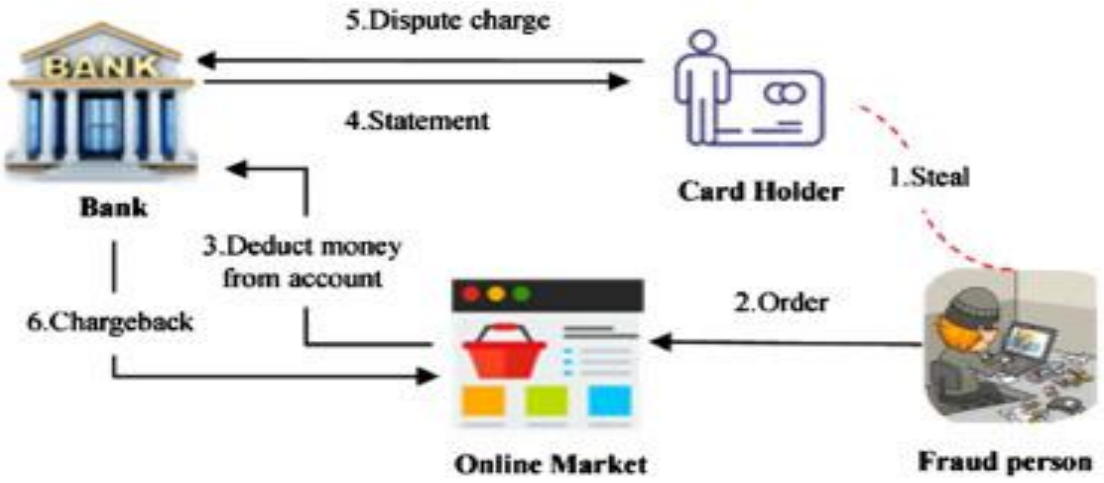
Table Of Content

1.INTRODUCTION

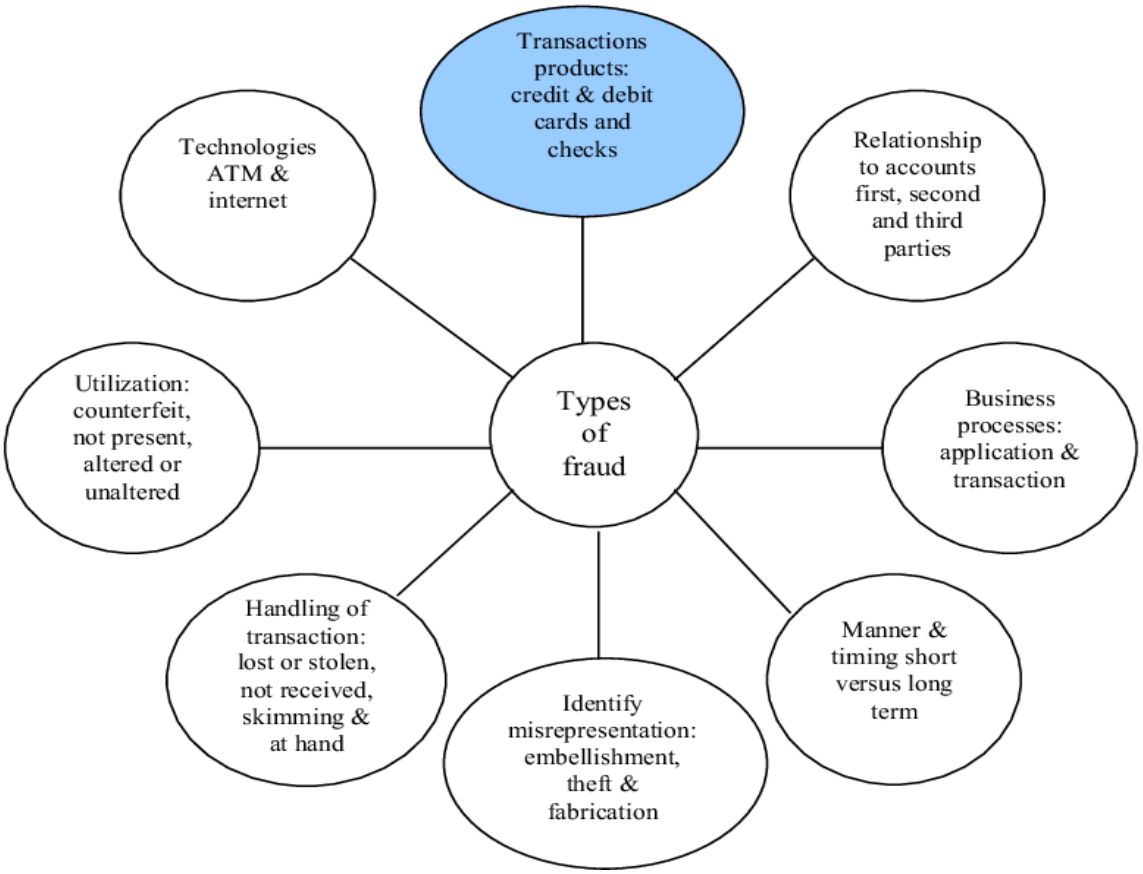
Credit cards are widely used due to the popularization of ecommerce and the development of mobile intelligent devices. The Credit Card Is a Small Plastic Card Issued to Users as a System of Payment. It Allows Its Cardholder to Buy Goods and Services Based on The Cardholder's Promise to Pay for These Goods and Services. Credit Card Security Relies on The Physical Security of The Plastic Card as Well as The Privacy of The Credit Card Number. Card-not-present transactions (i.e., online transaction without a physical card) is more popular, especially all credit card operations are performed by web payment gateways, e.g., PayPal and Alipay. Credit card has made an online transaction easier and more convenient.



However, there is a growing trend of transaction frauds resulting in a great loss of money every year. It is estimated that losses are increased yearly at double digit rates by 2020. Since the physical card is not needed in the online transaction environment and the card’s information is enough to complete a payment, it is easier to conduct a fraud than before. Transaction fraud has become a top barrier to the development of e-commerce and has a dramatic influence on the economy. Hence, fraud detection is essential and necessary. Fraud detection is a process of monitoring the transaction behavior of a cardholder in order to detect whether an incoming transaction is done by the cardholder or others. In 2018 Credit card fraud losses in London estimated US dollar 844.8 million.

Use of credit cards for online purchases has dramatically increased and it caused an explosion in the credit card fraud. As credit card becomes the most popular mode of payment for both online as well as regular purchase, cases of fraud associated with it are also rising. In real life, fraudulent transactions are scattered with genuine transactions and simple pattern matching techniques are not often sufficient to detect those frauds accurately. Implementation of efficient fraud detection systems has thus become imperative for all credit card issuing banks to minimize their losses. These frauds are classified as:

- Credit Card Frauds: Online and Offline
- Card Theft
- Account Bankruptcy
- Device Intrusion
- Application Fraud
- Counterfeit Card



Credit card fraud events take place frequently and then result in huge financial losses. Criminals can use some technologies such as Trojan or Phishing to steal the information of other people's credit cards. Therefore, an effective fraud detection method is important since it can identify a fraud in time when a criminal uses a stolen card to consume.

2. OBJECTIVE AND SCOPE OF THE PROJECT

2.1 Objective of the Project: -

The main objectives of the projects on credit card fraud detection system are to manage the details of credit card, transactions, datasets, files, prediction. It manages all the information about credit card, customers, prediction, credit card. The project is totally built at administrative end and thus only the administrator is guaranteed the access. The purpose of the project is to build an application program to reduce the manual work for managing the credit card, transactions, customers, datasets. It tracks all the details about the datasets, files, prediction.

Functionalities provided by Credit Card Fraud Detection System are as follows: -

- Credit Card Fraud Detection System also manage the customer details online for Files details, Prediction details, Credit Card.
- It tracks all the information of transaction, customers, files etc.
- Manage the information of transactions.
- It deals with monitoring the information and transactions of files.
- Manages the information of credit card.
- Manages the information of files.
- Integration of all records pf prediction.
- To increase efficiency of managing the Credit Card, Transactions.
- Editing, adding and updating of Records is improved which results in proper resource management of Credit Card data.
- Show the information and description of the Credit Card, Datasets.

2.2 Scope of the Project: -

Can be highly developed and reduce more fraud activities. Highly complexity can increase the detection of the irregular activities. We used supervised machine learning algorithms to detect credit card fraud transactions using real datasets. We use these algorithms to build classification using machine learning methods. We found key variables that lead to greater accuracy in detecting credit card mall fraudulent transactions.

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.

3.Feasibility Study of the Project:

After doing the project Credit Card Fraud Detection System, study and analyzing all the existing or required functionalities of the system, the next task is to do the feasibility study for the project. All projects are feasible - given unlimited resources and infinite time.

Feasibility study includes consideration of all the possible ways to provide a solution to the given problem. The proposed solution should satisfy all the user requirements and should be flexible enough so that future changes can be easily done based on the future upcoming requirement.

A. Economic Feasibility: -

This is a very important aspect to be considered while developing a project. We decided the technology based on minimum possible cost factor.

- All hardware and software cost has to be borne by the organization.
- Overall, we have estimated that the benefits the organization is going to receive from the proposed system will surely overcome the initial costs and the later on running cost for system.

B. Technical Feasibility: -

This included the study of function, performance and constraints that may affect the ability to achieve an acceptable system. For this feasibility study, we studied complete functionality to be provided in the system, as described in the System Requirement Specification (SRS), and checked if everything was possible using different type of frontend and backend platforms.

C. Social Feasibility: -

The aspect of study is to check the level of acceptance of the system by the user. This includes the process of training the user to use the system efficiently. The user must not feel threatened by the system, instead must accept it as a necessity. The level of acceptance by the users solely depends on the methods that are employed to educate the user about the system and to make him familiar with it. His level of Register Module: confidence must be raised so that he is also able to make some constructive criticism, which is welcomed, as he is the final user of the system

4. Significance of the Project

The primary significance in this project is to help users to well-organized every transaction and minimize the fraud detection. Credit card fraud detection is the process of identifying purchase attempts that are fraudulent and rejecting them rather than processing the order. There are a variety of tools and techniques available for detecting fraud, with most merchants employing a combination of several of them.

Due to Behavior and location analysis approach**,** there is a drastic reduction in the number of False Positives transactions identified as malicious by an FDS although they are actually genuine**.** The system stores previous transaction patterns for each u ser.

System Design of Credit Card Fraud Detection: -

In this phase, a logical system is built which fulfils the given requirements. Design phase of software development deals with transforming the client's requirements into a logically working system.

Normally, design is performed in the following in the following two steps:

1. Primary Design Phase: In this phase, the system is designed at block level. The blocks are created on the basis of analysis done in the problem identification phase. Different blocks are created for different functions emphasis is put on minimizing the information flow between blocks. Thus, all activities which require more interaction are kept in one block.

2. Secondary Design Phase: In the secondary phase the detailed design of every block is performed.

The general tasks involved in the design process are the following:

1. Design various blocks for overall system processes.

2. Design smaller, compact and workable modules in each block.

3. Design various database structures.

4. Specify details of programs to achieve desired functionality.

5. Design the form of inputs, and outputs of the system.

6. Perform documentation of the design.

7. System review.

3. User Interface Design: - User Interface Design is concerned with the dialogue between a user and the computer. It is concerned with everything from starting the system or logging into the system to the eventually presentation of desired inputs and outputs. The overall flow of screens and messages is called a dialogue.

The following steps are various guidelines for User Interface Design:

1. The system user should always be aware of what to do next.

2. The screen should be formatted so that various types of information, instructions and messages always appear in the same general display area.

3. Message, instructions or information should be displayed long enough to allow the system user to read them.

4. Use display attributes sparingly.

5. Default values for fields and answers to be entered by the user should be specified.

6. A user should not be allowed to proceed without correcting an error.

7. The system user should never get an operating system message or fatal error

5. What type of Tools and Technology Used?

5.1 Tools: -

Jupyter Notebook: - Jupyter Notebook is an open-source, web-based interactive environment, which allows you to create and share documents that contain live code, mathematical equations, graphics, maps, plots, visualizations**,** and narrative text. It integrates with many programming languages like Python, PHP, R, C#, etc.

5.2 Technology: -

- **Python: -** Python is a high-level, interpreted, interactive and object-oriented scripting language. Python is designed to be highly readable. It uses English keywords frequently where as other languages use punctuation, and it has fewer syntactical constructions than other languages.

- **Machine Learning:** - Machine learning (ML) is a type of artificial intelligence (AI) that allows software applications to become more accurate at predicting outcomes without being explicitly programmed to do so. Machine learning algorithms use historical data as input to predict new output values.

- **Deep Learning: -** Deep learning is a type of machine learning and artificial intelligence (AI) that imitates the way humans gain certain types of knowledge. Deep learning is an important element of data science, which includes statistics and predictive modeling.

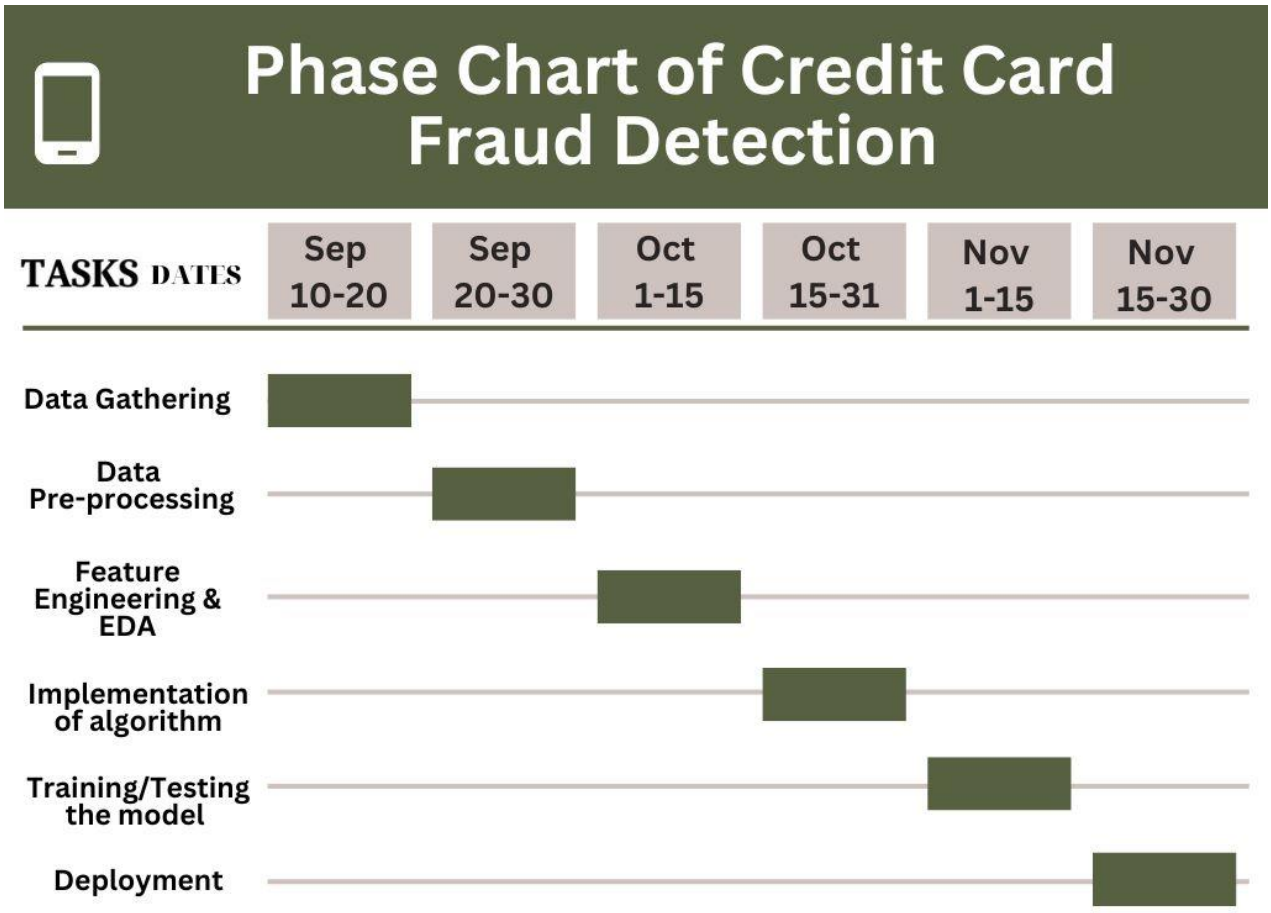
- **Flask:** - Flask is used for developing web applications using python, implemented on Werke and Jinja2. Advantages of using Flask framework are: There is a built-in development server and a fast debugger provided.

6. Process Description and Time Frame Required for various stages of Project Implementation

Process Description:

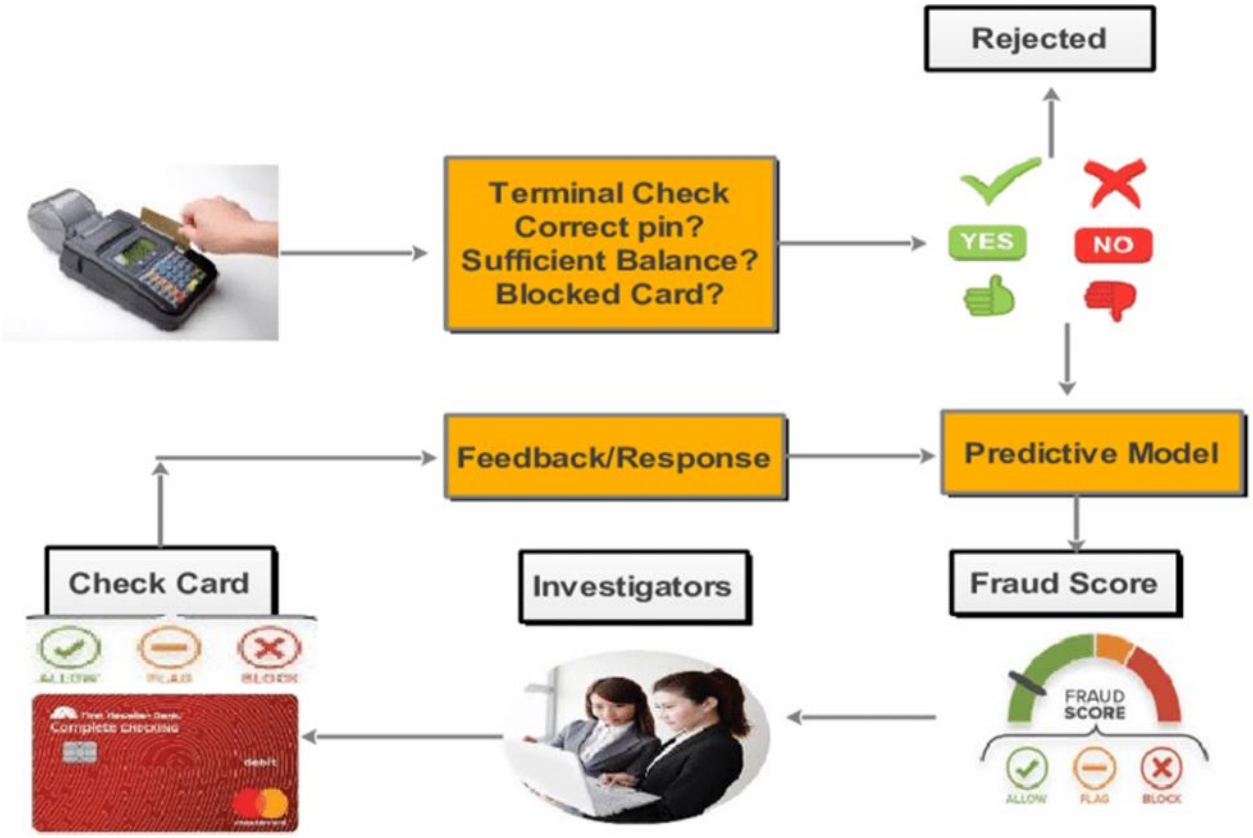
- **Data Gathering :** First Collect the data.
- **Data Pre-processing :** After collecting, load the dataset and prepare it.
- **EDA & Feature Engineering :** Then, impute missing values and perform data visualization.
- **Algorithm implementation :** Then, apply different- different ML & DL algorithms .
- **Training & Testing the model :** After that, train the model and test it. To check how much it's accuracy.
- **Deployment :** At the end, Creating its api using flask & then deploy it.

Time Frame Required for Various Stages:



7. What contribution would the project make?

Credit card fraud costs consumers and the financial company billions of dollars annually, and fraudsters continuously try to find new rules and tactics to commit illegal actions. Thus, fraud detection systems have become essential for banks and financial institution, to minimize their losses.



When we make any transaction while purchasing any product online — a good amount of people prefers credit cards. The credit limit in credit cards sometimes helps us me making purchases even if we don't have the amount at that time. but, on the other hand, these features are misused by cyber attackers. To tackle this problem, we need a system that can abort the transaction if it finds fishy. Here, comes the need for a system that can track the pattern of all the transactions and if any pattern is abnormal then the transaction should be aborted

8. Resources and Limitations

Resources: -

You will have to bear the cost of shipping in addition to losing the merchandise when an online payment is made for these transactions. If you choose to verify suspicious transactions by contacting the corresponding customers with an internal or an external team, that will also add to your cost, time, and effort.

Limitation of Project on Credit Card Fraud Detection System: -

Although I have put my best efforts to make the software flexible, easy to operate but limitations cannot be ruled out even by me. Though the software presents a broad range of options to its users some intricate options could not be covered into it; partly because of logistic and partly due to lack of sophistication. Paucity of time was also major constraint; thus, it was not possible to make the software fool proof and dynamic. Lack of time also compelled me to ignore some part such as storing old result of the candidate etc.

Considerable efforts have made the software easy to operate even for the people not related to the field of computers but it is acknowledged that a layman may find it a bit problematic at the first instance. The user is provided help at each step for his convenience in working with the software.

List of limitations which is available in the Credit Card Fraud Detection:

- The customer is often times extremely frustrated and goes to a competitor. All this value is not only lost, but now also handed to a competitor.

- The customer is a black mark, and may talk or post negatively about their experience on the merchant's site.

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