HIGH LEVEL DESIGN

Money Laundering Prevention

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Document Version Control

Date Issued	Version	Description	Author
23/02/2022	1.0	Initial HLD – V1.0	Rohit P
15/03/2022	1.1	Deployment, Containers, KPI – V1.1	Rohit P
31/03/2022	1.2	Final HLD – V1.2	Rohit P

Contents

Abstract

Money laundering refers to the conversion or "laundering" of money which is illegally obtained, so as to make it appear to originate from a legitimate source.
Money laundering is being employed by launderer's world wide to conceal criminal activity associated with it such as drug/arm trafficking, terrorism and extortion. But in simple terms it is the conversion of Black money into white money. This work discusses the implementation of a prevention system that will be able to predict any kind of fraudulent transactions happening in day to day activities.

1 Introduction

1.1 Why this High Level Design?

The purpose of this High-Level Design (HLD) Document is to add the necessary details to the curennt project description to represent a suitable model for coding. This document is also intended to help detect contradictions prior to coding, and can be used as reference manual for how the modules interact at high level

The HLD will:

- Present all of the design aspects and define them in detail
- Describe the user interface being implemented
- Describe the hardware and software interfaces
- Describe the performance requirements
- Include design features and the architecture of the project
- List and describe the non-functional attributes like

1) Security
2) Reliability
3) Maintainablity
4) Portability
5) Reusability
6) Application compatibility
7) Resource utilization
8) Serviceability

1.2 Scope

The HLD documentation present the structure of the system, such as database architecture, application - architecture (layers), application flow (Navigation) and technology architecture. The HLD uses non-technical to mildly technical terms which should be understandable to the administrators of the system.

2 Data Requirements

2.1 Product Perspective

The Money Laundering Prevention system is a machine learning based prediction model which will help us to detect fraudulent transactions if any and take necessary actions to avoid them.

2.2 Problem Statement

To create an AI solution for detection of fraudulent transaction and to implement the following use case

- To detect abnormal transaction and take preventive action
- To detect trend in the data to evaluate and come with a plan to stop fraudulent action

2.3 Proposed Solution

The solution proposed here is an application which will help to get the transaction details in just few clicks. The predicted outcome can be used to prevent the misuse of any money which is a step closer to high economic growth of the respective country. Also this can be used by the financial company employees to communicate and further investigate about the customer history and behavior
Users will add their file in a CSV format and they will be able to download a new file with a prediction generated from ML algorithms.

2.4 Further Improvements

More Advanced ML/DL algorithms can be applied to better understand the relationship between the data in order to avoid any mis-classification from the system

2.5 Data Requirements

Data Requirement depends completely on our use case

- We need a proper CSV files with the 10 columns for the predictor to work correctly
- For training, we need the 11 columns
- Data types of the columns should be proper as mentioned in our code for validation purpose
- prediction data cannot be more than 200 MB in Size.
- Any changes in the data should be properly communicated with the development team so the flow of the programming can be changed/adjusted

2.6 Tools used

2.7 Constraints

The web app must be user friendly and should give the output in a desirable format to the users

2.8 Assumptions

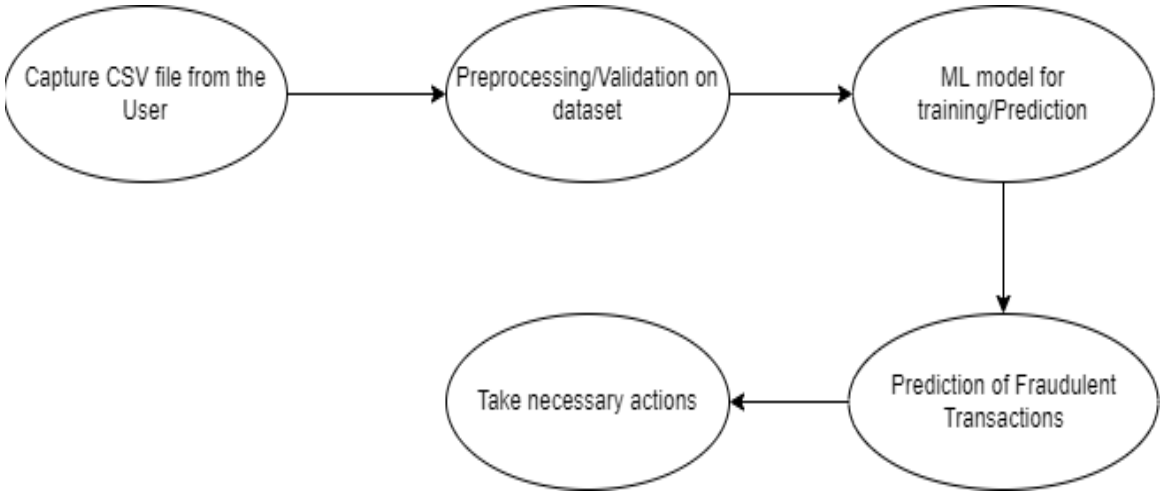
The main assumption of this project is that the user will give the proper file as an input and appropriate ML model should be applied on that data to get the desirable outcomes
It is also assumed that all the aspects of this project have the ability to work together in the way designer is expecting

3. Design Details

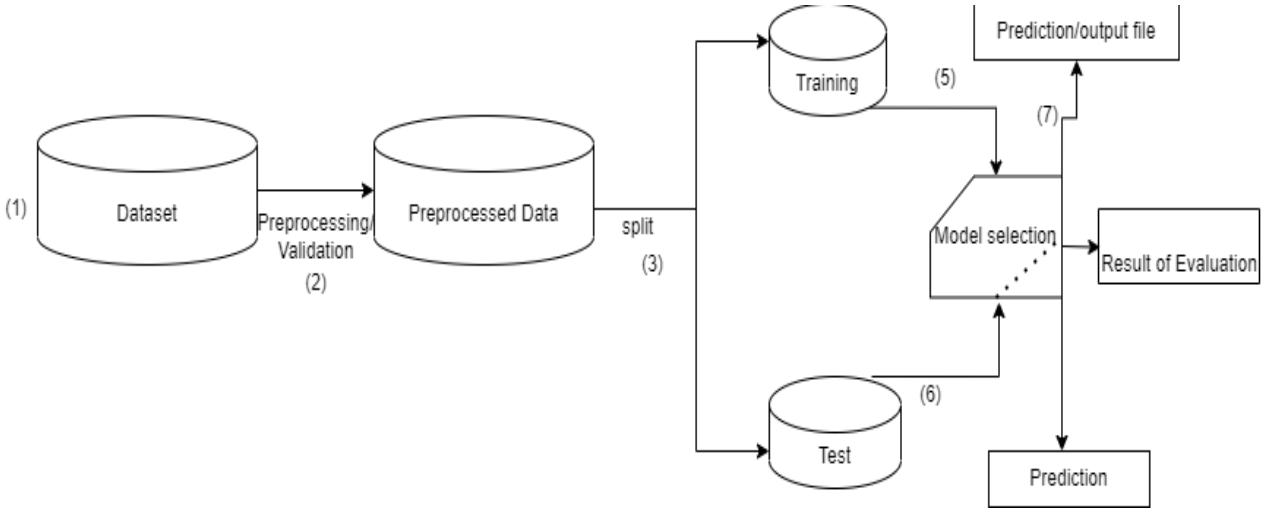
3.1 Process Flow

To Identify the fraudulent transaction, we use the ML approach
Below is the flow of the project

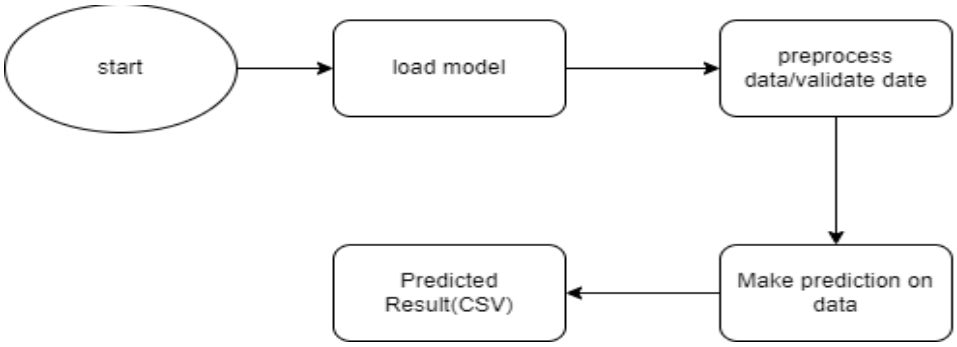
Proposed Methodology



3.1.1 Model training and Evaluation



3.1.2 Model Deployment



3.2 Event log

The system should log all the process so that we know what process is going on internally

Initial Step-by-Step description

- The system identifies at what step logging is required
- The system should be able to log each and every system flow
- Developer can choose logging method. You can choose database logging/file logging as well
- Sytem should not hang even after using so many loggings. Logging just because we can easily debug issues so logging is mandatory to do

3.3 Error handling

If an error is encountered, an explaination will be displayed as to what went wrong.

An error will be defined as anything that falls outside the normal and intended usage

4 Performance

The performance is measured with help of the scoring(f1) factor in the ML algorithms. Code has been written considering performance from user point of view. Timing factor also plays role in order to determine the performance of the entire flow

4.1 Reusability

The code written and the components used should have the ability to be reused with no problems

4.2 Application Compatibility

The different components for this project will be using Python as an interface between them. Each component will have its own task to perform, and it is the job of python to ensure proper transfer of information

4.3 Resource Utilization

When any task is performed, it will likely use all the processing power available until that function is finished

4.4 Deployment

5. KPI (Key Performance Indicators)

1) Time and workload reduction to identify fraudulent cases

2) To detect any irregularites and take quick action to avoid future losses

3) Taking adequated information of the transactions

4) Send the predicted outcomes to respective financial department

5) Amount involved in and out transaction

6) Type of transaction involved in fraudulent cases

6. Conclusion

The Money Laundering Prevention system is an application which will help prevent money losses in future and can add some value to economic gain of the country. Early stage identification of fraudulent cases are required to avoid any losses in terms of financial concepts.

7. References

1) https://en.wikipedia.org/wiki/Money_laundering