High Level Document (HLD)

Financial Crime Analysis

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**Abstract**

Financial institutions around the world are turning to data science to combat crime and manage compliance due to the changing nature of crime and a quickly expanding regulatory landscape.

The global financial crisis of 2008 altered the course of history. It had an impact not only on the financial industry, but also on other industries and enterprises around the world. The crisis exposed ineffective policies that resulted in severe fractures that threatened to bring the global financial system to its knees.

Technological advancements, and new capabilities to understand enormous volumes of data can help to analyze and formulate the best approach to identify flaws and appropriate interventions techniques to reduce financial crime.

AI, machine learning, and automation, among other advanced analytics and cognitive techniques, can help to filter out false positives and improve inefficiencies in existing investigation processes. Data and analytics have the potential to not only improve efficiencies and save operating costs, but also help identify intelligence-led and data-driven approaches to combating financial crime.

1. **Introduction**
   1. **Why this High-Level Design Document?**

The purpose of this High-Level Design (HLD) Document is to add the necessary detail to the current 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 a reference manual for how the modules interact at a 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:

security

reliability

maintainability

portability

reusability

application compatibility

resource utilization

serviceability

* 1. **Scope**

The HLD documentation presents the structure of the system, such as the 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.

* 1. **Definitions**
* Web App – A website used for user interactions
* IDE – Integrated Development Environment
* AWS – Amazon Web Services
* Python – A programming Language
* Flask – A web framework of python programming language

1. **General Description**
   1. **Product Perspective**

Financial institutions around the world are turning to data science to combat crime and manage compliance due to the changing nature of crime and a quickly expanding regulatory landscape.

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**Problem statement**

**Dataset**:

There are 3 datasets mentioned here: **alerts, transactions and accounts.**

Accounts dataset: Contains the information about all the bank accounts whose transactions are monitored.

Alerts dataset: Contains the transactions which triggered an alert according to AML guidelines. Transactions dataset: Contains the list of all the transactions with information about sender and receiver accounts.

Perform detailed analysis using a given dataset present your finding for AML based on the dataset and also suggest ways to identify or mitigate financial crime.

* 1. **Further Improvement**

Further we develop some more features like some prediction task to detect the what type of crime happening mores and implement some more features.

* 1. **Tools used**
* **Python (Flask)**: Flask is a web application framework written in Python. Armin Ronacher, who leads an international group of Python enthusiasts named Pocco, develops it. Flask is based on Werkzeug WSGI toolkit and Jinja2 template engine. Both are Pocco projects.
* **Database (MongoDB):** MongoDB is an open-source document database and leading NoSQL database. MongoDB is written in C++. This tutorial will give you great understanding on MongoDB concepts needed to create and deploy a highly scalable and performance-oriented database.
* **HTML:** HTML stands for Hyper Text Markup Language. HTML is the standard markup language for creating Web pages. HTML describes the structure of a Web page. HTML consists of a series of elements. HTML elements tell the browser how to display the content. HTML elements label pieces of content such as "this is a heading", "this is a paragraph", "this is a link", etc.
* **JavaScript:** JavaScript is the world's most popular programming language. JavaScript is the programming language of the Web.. JavaScript is easy to learn. This tutorial will teach you JavaScript from basic to advanced.
* **CSS:** CSS is the language we use to style an HTML document. CSS describes how HTML elements should be displayed. This tutorial will teach you CSS from basic to advanced.
* **Bootstrap**: Bootstrap is the most popular HTML, CSS, and JavaScript framework for developing responsive, mobile-first websites. Bootstrap is completely free to download and use.
* **Visual Studio Code:** Visual Studio Code is a source-code editor made by Microsoft for Windows, Linux and macOS. Features include support for debugging, syntax highlighting, intelligent code completion, snippets, code refactoring, and embedded Git.
* **Git/GitHub:** To sum up the difference between git vs GitHub: git is a local VCS software that enables developers to save snapshots of their projects over time. It's generally best for individual use. GitHub is a web-based platform that incorporates git's version control features so they can be used collaboratively.
* **Tableau :** Tableau is a Business Intelligence tool for visually analyzing the data. Users can create and distribute an interactive and shareable dashboard, which depict the trends, variations, and density of the data in the form of graphs and charts. Tableau can connect to files, relational and Big Data sources to acquire and process data. The software allows data blending and real-time collaboration, which makes it very unique. It is used by businesses, academic researchers, and many government organizations for visual data analysis. It is also positioned as a leader Business Intelligence and Analytics Platform in Gartner Magic Quadrant.
  1. **Constraints**

The Financial analysis web app must be user friendly and as automated as possible. Administrators should not be required to do anything besides the initial setup, and users should not be required to know any of the workings.

* 1. **Assumptions**

The main objective of the project is to development a web-based application for Financial Analysis which are going to help in Analysis the crimes rate in city, and many more things.

1. **Performance**

This web app application help in Financial analysis which are going to help in Analysis the crimes rate in finance, and many more things.

* 1. **Reusability**

The code is written in components that will reuse in any other place easily with no problem.

* 1. **Application Compatibility**

The application is compatible in desktop, mobile and any other system or operating system. 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 the Python code to ensure proper transfer of information.

* 1. **Resource utilization**

When any task is performed, it will likely use all the processing power available until that function is finished. The gateways are likely to use their processors the hardest when they are refreshing the Iptables, but this will depend largely on how many IP addresses are being implemented for IP Masquerading.

* 1. **Deployment**

For deployment we use GitHub and GCP (Google Cloud Platform).

Google Cloud Platform, offered by Google, is a suite of cloud computing services that runs on the same infrastructure that Google uses internally for its end-user products, such as Google Search, Gmail, Google Drive, and YouTube.

**Conclusion**

Perform detailed analysis using a given dataset present your finding for AML based on the dataset and also suggest ways to identify or mitigate financial crime.