Project Architecture

Money Laundering Prevention System

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1. Introduction

This document provides a comprehensive overview of the architecture and design considerations for the **Money Laundering Prevention System**. It details the system's key components, their interactions, and the technologies used to build and deploy the solution.

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2. System Architecture

The system follows a **modular and layered architecture**, ensuring scalability, maintainability, and ease of modification. The core components include:

- **User Interface (UI):**
  - Facilitates user interaction through a user-friendly interface.
  - Allows input of relevant data and displays results.
- **Application Layer:**
  - Acts as the intermediary between the UI and backend components.
  - Handles data validation and manages workflow.
- **Back-End Services:**
  - Performs essential tasks like data ingestion, transformation, validation, model training, and prediction.
- **Machine Learning Model:**
  - Analyses input data to predict potential money laundering activities.
  - Utilizes trained models, algorithms, and statistical techniques for accuracy.
- **Data Storage:**
  - Stores input data, predictions, and other relevant information.
  - Utilizes NoSQL databases or file storage systems.

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3. Communication Protocols

To ensure seamless communication and data exchange between components, the system employs the following protocols:

- **HTTP/HTTPS:** Facilitates communication between the UI, Application Layer, and Backend Services.
- **RESTful APIs:** Enables standardized and stateless communication across different system components.
- **Database Protocols:** Ensures efficient data storage and retrieval from the database.

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4. Technologies and Frameworks

The project utilizes the following technologies and frameworks:

Front-End:

- HTML, CSS, JavaScript, Bootstrap, and Jinja2 for a responsive and interactive user interface.

Back-End:

- **Programming Language:** Python
- **Web Framework:** Flask (for handling application logic and HTTP requests)

Machine Learning:

- **Library:** Scikit-learn (for model training and prediction)

Data Storage:

- **Database:** MongoDB (NoSQL database for storing structured and unstructured data)

Data Processing:

- **Libraries:** Pandas, NumPy (for data manipulation and preprocessing)

Data Visualization:

- **Libraries:** Matplotlib, Seaborn, Pandas (for visualizing insights and data trends)

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5. Project Deployment

The project is deployed on **Streamlit**, providing a seamless and interactive web-based experience.

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6. Conclusion

This document outlines the architecture and design considerations for the **Money Laundering Prevention System**. It highlights the system's key components, interactions, and the technologies used. By following this structured architecture, the system ensures **scalability, maintainability, and flexibility**, serving as a valuable reference for the development team throughout the implementation process.