**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.

**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.

**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.

**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)

**5. Project Deployment**

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

**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.