Architecture Design

Investment Prediction

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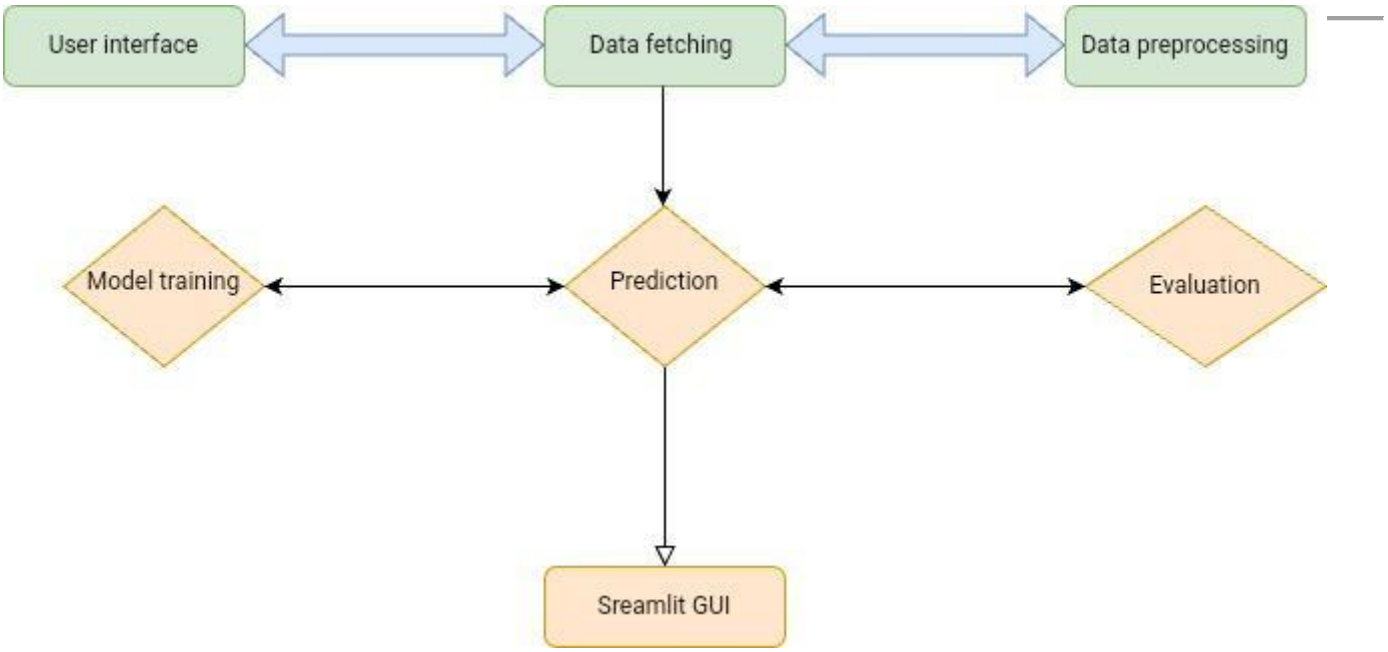
Date	Version	Description	Author
14th March 2024	1.0	Introduction, Architecture and deployment	Sudip Joshi
15th May 2024	1.1	Final Version of Complete Architecture	Sudip Joshi

Architecture Design: Investment Prediction System

The architecture of a stock price investment app encompasses several layers and components that work together to deliver a seamless and efficient user experience The Investment Prediction System is designed to analyze historical foreign direct investment (FDI) data for India and predict future investment trends. The system utilizes data processing techniques, machine learning algorithms, and visualization tools to provide insights into FDI patterns and assist in investment decision-making.



System Components

1. **Data Collection and Preprocessing**

- **Data Sources:** The system fetches historical FDI data from external sources like government databases or financial institutions using APIs.
- **Data Cleaning:** Preprocessing involves handling missing values, removing duplicates, and converting data into a suitable format for analysis.
- **Data Transformation:** Features such as FDI growth rates, sector-wise investments, and proportion of FDI by sector are derived from the raw data.

2. **Machine Learning Model**

- **Algorithm Selection:** The system employs machine learning algorithms, such as LSTM (Long Short-Term Memory), to analyze historical FDI trends and make predictions.
- **Model Training:** Historical FDI data is used to train the machine learning model, which learns patterns and relationships to forecast future FDI trends.
- **Model Evaluation:** The model's performance is evaluated using metrics like mean squared error (MSE) to assess prediction accuracy.

3. **Visualization and Dashboarding**

- **Data Visualization:** Tools like Matplotlib and Tableau are used to create visual representations of FDI trends, growth rates, sector-wise investments, and other key metrics.
- **Dashboard Creation:** Interactive dashboards are designed to display real-time and historical FDI data, providing users with intuitive insights and analysis capabilities.
- **Key Performance Indicators (KPIs):** KPIs such as total FDI growth rate, sector-wise FDI growth rate, FDI inflow/outflow ratio, and FDI concentration index are visualized to track investment performance.

4. **Deployment and Integration**

- **Web Application:** The system can be deployed as a web application using frameworks like Flask or Django, allowing users to access FDI predictions and insights through a user-friendly interface.
- **API Integration:** APIs are implemented to enable data retrieval, model predictions, and dashboard updates in real-time.
- **Database Integration:** Integration with databases (e.g., PostgreSQL) is established for storing historical and real-time FDI data, model parameters, and user preferences.

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1. **Data Collection:**

- Fetch historical FDI data from external sources.
- Clean and preprocess the data to prepare for analysis.

2. **Feature Engineering:**

- Derive relevant features such as FDI growth rates, sector-wise investments, and proportion of FDI by sector.

3. **Model Training:**

- Train the LSTM machine learning model using historical FDI data.
- Optimize model hyperparameters and validate model performance.

4. **Prediction and Analysis:**

- Make predictions on future FDI trends based on the trained model.
- Analyze predicted trends and identify key investment opportunities.

5. **Visualization and Dashboarding:**

- Create interactive dashboards using tools like Tableau to visualize FDI trends, KPIs, and sector-wise analysis.
- Incorporate drill-down capabilities for detailed exploration of data.

6. **Deployment and Integration:**

- Deploy the system as a web application accessible to users.
- Integrate APIs for real-time data updates, model predictions, and dashboard refresh.

- Ensure seamless integration with databases for data storage and retrieval.

Conclusion

The development and launch of the stock price investment app mark a significant milestone in empowering individual investors with the tools, resources, and information they need to make informed investment decisions. Throughout this project, we've focused on delivering a user-centric, technically robust, and secure application that meets the evolving needs of modern investors .