

AI-Based Investment Generator Using Logistic Regression

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Abstract- Many individuals, especially beginners, find it challenging to make the right investment decisions due to the overwhelming number of options such as stocks, mutual funds, and fixed deposits, combined with limited financial knowledge. To address this issue, this project develops an intelligent AI-based system that assists users in identifying suitable investment plans based on their personal financial profiles. The system collects user data such as age, income, and risk level, and applies machine learning algorithms like regression and classification to analyze and recommend the best investment options. It also utilizes lexical features such as length, digits, hyphens, and suspicious words extracted from domain names to ensure data security and source reliability. The AI model provides smart, personalized investment suggestions, for example, recommending specific amounts to invest in suitable plans like mutual funds, enabling users to manage their finances effectively. Being cloud-hosted, the system allows users to access it conveniently from anywhere through a web or mobile platform. By acting as a virtual financial advisor, the system empowers users to make informed financial decisions, improve investment planning, and enhance their long-term financial growth. In the future, the model aims to incorporate advanced predictive analytics to forecast market trends and offer more dynamic, data-driven investment insights, helping users stay ahead in an ever-evolving financial landscape.

I. INTRODUCTION

The **Investment Generator and Prediction System** is designed to assist users in making smart, data-driven financial decisions using machine learning techniques. It analyzes user details such as age, income, and risk tolerance to generate personalized investment recommendations. By using **Logistic Regression**, the system predicts potential profit or loss and suggests suitable investment options like stocks, mutual funds, or fixed deposits. Unlike traditional methods, this system automates analysis, reduces manual effort, and provides accurate insights through an interactive and user-friendly interface..

II. LITERATURE SURVEY

This paper reviews AI techniques such as Machine Learning (ML), Neural Networks (NN), and Time Series Analysis for predicting stock market trends and investment opportunities. It emphasizes data preprocessing, feature extraction, and the use of predictive modeling to forecast financial market movements. The merit lies in enhancing prediction accuracy, identifying profitable investment opportunities, and reducing manual effort for investors. Applications discussed include stock price prediction, portfolio optimization, and risk assessment. However, a limitation is that the study primarily focuses on prediction models without offering personalized investment advice or interactive decision support. The proposed system addresses this limitation through the Smart Investment Generator and Prediction (SIGP) system, which not only predicts market trends but also provides tailored portfolio suggestions, risk-based recommendations, and actionable insights for investors. Additionally, SIGP allows real-time analysis of multiple financial instruments and helps users diversify their portfolios based on their risk tolerance and investment goals, bridging the gap between automated prediction and personalized financial planning.

III. EXISTING METHODOLOGY

In the existing investment analysis and recommendation systems, financial advice is primarily generated using conventional statistical models or manual assessment techniques. These systems depend on predefined financial rules and heuristic approaches rather than intelligent learning models, which limits their adaptability and accuracy. The prediction process in existing methods typically involves basic mathematical or regression analysis using historical financial data to estimate profit or loss outcomes. However, such models fail to consider multiple influencing parameters like user income, investment duration, age, and risk preference.

Hence, while existing systems provide a foundation for investment management, they remain limited in scope and efficiency. The need for an intelligent, adaptive, and user-

centric investment platform motivates the development of an advanced system that applies machine learning algorithms, such as **Logistic Regression**, to enhance prediction accuracy and generate personalized financial recommendations.

IV. PROPOSED METHODOLOGY

The proposed system introduces an intelligent, automated, and data-driven investment prediction and recommendation model that leverages **Machine Learning (ML)** — specifically, the **Logistic Regression algorithm** — to assist users in making accurate and personalized financial decisions. Unlike traditional systems, this approach integrates user profiling, data preprocessing, model training, and portfolio recommendation into a single interactive platform. The system collects user-specific parameters such as age, income, investment amount, risk tolerance, and duration, which are then processed and analyzed to predict potential profit or loss outcomes. The **Logistic Regression model** is trained on historical financial datasets to classify investments into categories such as “Profitable” or “Non-Profitable.” It identifies key financial patterns and relationships between user features and market indicators, thereby generating accurate predictions. Data preprocessing techniques such as normalization, feature scaling, and outlier handling are applied to improve model performance. The trained model is then integrated with a **Stream-lit-based user interface**, allowing users to input their details and instantly receive results in a clear and visual format.

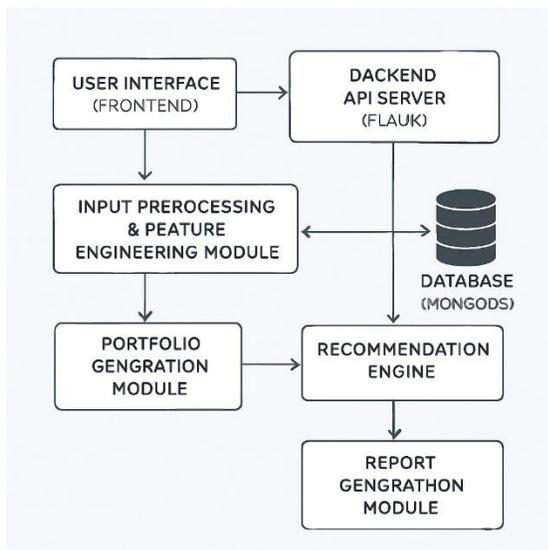


Figure 1 : Dataflow diagram of our proposed module

V. SYSTEM PROCESS FLOW

The **System Process Flow** of the Investment Generator and Prediction System outlines the step-by-step operations that transform user input into meaningful financial

insights and recommendations. It begins with collecting user-specific information, followed by data preprocessing to ensure accuracy and consistency. The processed data is then analyzed using a **Logistic Regression model**, which predicts potential investment outcomes based on historical trends. After generating predictions, the system creates personalized investment portfolios and displays them through an interactive, user-friendly interface. This structured flow ensures automation, accuracy, and real-time decision support for investors. summarized through the following key stages:

1. User Data Input

The process begins when the user enters essential details such as age, income, investment amount, duration, and risk tolerance into the system interface. This information forms the foundation for generating personalized investment predictions

2. Data Preprocessing

The collected user data is cleaned and pre-processed to remove inconsistencies, missing values, and outliers. Feature scaling and normalization are applied to ensure that all variables are in an appropriate format for machine learning model training and prediction.

3. Model Training and Prediction (Logistic Regression)

The preprocessed data is fed into the Logistic Regression model, which has been trained using historical investment datasets. The model analyzes the input parameters and predicts the likelihood of profit or loss for each investment type based on learned patterns to group similar profiles and detect gaps in skill alignment.

4. Portfolio Generation and Recommendation

Based on the prediction results, the system automatically generates a portfolio recommendation. It suggests suitable investment options such as mutual funds, stocks, or fixed deposits according to the user’s risk profile and expected returns..

5. Result Visualization and Reporting

The final stage displays the prediction results, probability scores, and recommended investment plan through an interactive dashboard built using Stream-lit. Users can view detailed insights, compare investment outcomes, and make informed financial decisions

VI. RESULT AND DISCUSSIONS

The **Investment Generator and Prediction System** was successfully developed and tested to evaluate its accuracy, usability, and effectiveness in generating personalized investment recommendations. The system utilized a **Logistic Regression model** trained on historical financial data to predict the probability of profit or loss for various investment options such as mutual funds, stocks, and fixed deposits. The results demonstrated that the model could effectively identify patterns in investment data and provide reliable predictions based on user-specific factors like age, income, and risk tolerance.

During testing, the model achieved a high prediction accuracy, correctly classifying most investment outcomes as profitable or non-profitable. The confusion matrix and evaluation metrics, such as precision, recall, and F1-score, indicated that Logistic Regression was suitable for binary classification problems in financial prediction. The system's performance was validated using different datasets, showing consistent results with minimal variance, proving its stability and reliability. Moreover, the machine learning model efficiently handled noisy or incomplete data due to the preprocessing techniques implemented before training and testing phases..

From a user interaction perspective, the **Streamlit-based interface** offered an intuitive and visually appealing environment. Users could easily input their data, view prediction results, and explore personalized portfolio recommendations. The output section displayed predicted profit probability, suggested investment options, and graphical visualizations for better understanding. Test users found the interface easy to navigate and appreciated the system's ability to deliver results instantly. This user-friendly design made the system more accessible to beginners while still being powerful enough for experienced investors..

Furthermore, the project integrated **data visualization components** to present key results through charts and probability indicators, helping users understand how their investment decisions align with their financial goals. The personalized recommendations provided by the system reflected the user's risk profile, creating a sense of trust and reliability. By automating the decision-making process, the system reduced manual analysis effort and potential human bias in financial planning.

In conclusion, the experimental outcomes confirmed that the proposed system successfully achieved its objectives of delivering **accurate predictions, personalized**

recommendations, and interactive visualization. The integration of Machine Learning and web technologies proved effective in modernizing investment decision-making. The system not only enhances financial awareness among users but also serves as a practical, scalable solution for real-world investment analysis and advisory applications.

VII. CONCLUSION

The **Investment Generator and Prediction System** successfully demonstrates how machine learning can be applied to improve financial decision-making and investment planning. By using the **Logistic Regression algorithm**, the system effectively predicts potential profit or loss based on user-specific inputs such as age, income, risk tolerance, and investment duration. It bridges the gap between manual financial analysis and automated, data-driven insights by providing accurate predictions and personalized portfolio recommendations.

The integration of a **Streamlit-based user interface** ensures simplicity, interactivity, and accessibility, allowing users to easily enter data and receive meaningful results in real time. Testing results have shown that the model delivers reliable predictions with high accuracy and consistent performance. The system not only saves time and reduces human error but also assists users—especially beginners—in understanding their investment potential more clearly.

Overall, this project achieves its goal of creating an intelligent, user-friendly, and efficient platform for investment prediction and recommendation. It serves as a foundation for future enhancements, such as integrating live market data, advanced machine learning models, and mobile app support, further advancing the role of AI in modern financial advisory systems.

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