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## INVESTAI: CONNECTING WITH FUTURE GAINS

*A CPI powered Webapp*

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**Abstract:** This project embarks on a transformative journey to redefine investment guidance through the innovative web application, "InvestAI." In a world where financial literacy remains a pivotal asset, the project aims to bridge the knowledge gap and empower individuals to make informed decisions about their financial future. commencing with an overview of the prevailing challenges in financial understanding, this project introduces the comprehensive features of InvestAI. Anchored in artificial intelligence, the application offers personalized investment plans by analyzing user preferences, risk tolerance, and financial goals. The project unfolds in stages, progressing from foundational educational modules to virtual investment simulations and real-time market insights. It explores how InvestAI's user-friendly interface and advanced algorithms contribute to making the intricacies of investment accessible to users with varying levels of financial expertise. Moreover, the project investigates the potential impact of InvestAI on risk management, market trends, and economic indicators. By providing users with up-to-the-minute information, the application aims to ensure that individuals are well-equipped to adapt their investment strategies as needed. The user-centric design principles of InvestAI are emphasized, highlighting its commitment to financial inclusion.

### I. INTRODUCTION

In the contemporary financial landscape, the imperative for accessible and sophisticated investment guidance has become increasingly pronounced. In response to this exigency, the "InvestAI" project emerges as a cutting-edge web application meticulously crafted to empower individuals with the requisite knowledge and tools essential for astute investment decisions. "InvestAI" addresses this by providing users, irrespective of their financial acumen, with a meticulously designed interface that harnesses the power of advanced artificial intelligence. The application stands as a beacon for personalized investment plans, dynamically adapting to user preferences, risk tolerances, and financial goals.

The introductory phase of this project navigates through the contemporary challenges in financial literacy, underscoring the crucial role of accessible and insightful investment guidance. The ethos of "InvestAI" lies in its commitment to democratizing financial knowledge, realized through a seamless amalgamation of educational modules, virtual simulations, and real-time market insights. This project's trajectory is purposefully designed to unveil the transformative potential of "InvestAI" in the realm of investment guidance. Far beyond being a mere application, it represents a conduit to financial empowerment—a bridge connecting individuals with the nuanced and strategic aspects of investment. This introduction sets the stage for an exhaustive exploration of "InvestAI," delineating its features and functionalities, and accentuating its pivotal role in reshaping the contours of investment guidance within the professional and layman spheres alike.

## II. LITERATURE SURVEY

The application of various machine learning (ML) techniques in predicting inflation has been explored by several researchers. For instance, Simionescu utilized artificial neural networks (ANNs) and support vector machines (SVMs) to forecast inflation in Romania from Q1 2008 to Q4 2021. Similarly, Maldeni and Mascrenge employed a machine learning ensemble, including random forest (RF), ANNs, extreme gradient boost (XGBoost), support vector regression (SVR), k-nearest neighbors (kNN), and linear regression (LR), asserting its competitive accuracy compared to traditional methods. In a different approach, Barkan et al. applied the hierarchical recurrent neural network (HRNN) algorithm to predict disaggregated components of the Consumer Price Index (CPI). Salisu and Isah [2] used linear time-series algorithms like autoregressive integrated moving average (ARIMA) and fractionally integrated versions (ARFIMA) for forecasting US inflation from 1957 to 2017. Additionally, Özmen, Yılmaz, and Weber [3] utilized MARS and LR techniques to predict natural gas consumption for residential users.

The integration of real-time data from sources like Yahoo Finance APIs has become a cornerstone in modern investment tools. This allows users to access up-to-the-minute information, enabling more informed and timely decision-making. The utilization of such APIs ensures that investment platforms provide users with the most accurate and current market conditions.

Predictive analytics has emerged as a powerful component in investment tools, allowing users to forecast future trends. By analyzing historical data and patterns, these tools can provide valuable insights into potential market shifts. This forward-looking capability assists investors in adapting their strategies proactively, aligning their decisions with anticipated market conditions.

Data visualization techniques, particularly through Python libraries, have become instrumental in conveying complex financial information. Platforms utilize scatter plots and bar graphs to present historical data in visually compelling ways, aiding users in understanding patterns and trends. Visual representations not only enhance comprehension but also provide a quick and intuitive means of interpreting vast datasets

## III. PROPOSED SYSTEM:

The envisioned system for "InvestAI" represents a sophisticated fusion of historical data analysis and real-time insights, leveraging cutting-edge algorithms with a primary emphasis on the Facebook Prophet algorithm for robust time series forecasting. Employing Python as the central programming language and integrating Streamlit for the user interface, this system is meticulously crafted to redefine investment guidance through a data-driven approach.

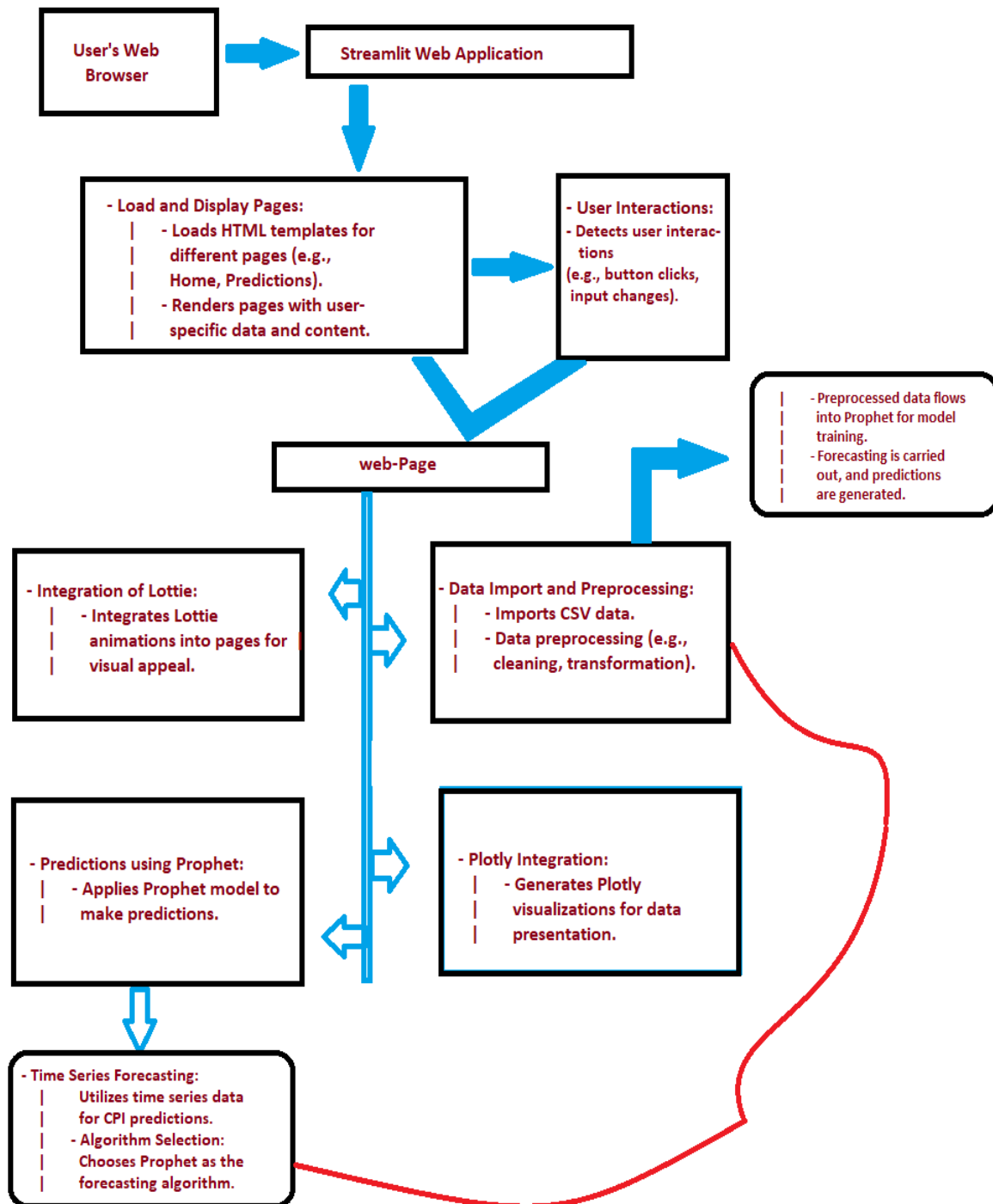


Fig. Architecture Diagram

In terms of data requirements, the system will draw insights from historical market data to discern patterns and trends, establishing a solid foundation for predictive modeling. Concurrently, real-time API data integration ensures the system remains agile and responsive to the latest market information, allowing for dynamic adaptation to evolving financial landscapes. This algorithm, designed to accommodate seasonality, holidays, and special events, serves as the linchpin for capturing the nuanced dynamics of financial data and providing accurate predictions for informed decision-making. In summary, the proposed system synthesizes the findings of this survey to propel the current state of CPI powered financial analysis forward. Through the incorporation of cutting-edge technologies, optimization of real-time processing, and an expanded integration with macro-economic indicators, the proposed system aims to establish a more robust and adaptable framework for sector selection and stock predictions. Its global perspective and at the core of the system lies the Facebook Prophet algorithm, The user interface, developed using Streamlit, offers an intuitive and interactive platform for users to explore and interpret investment insights seamlessly. The integration of these technologies within a unified framework aims to provide a comprehensive system that empowers users with a sophisticated tool for making well-informed investment decisions. Ethical considerations, such as

transparency in data sources and compliance with regulatory frameworks, underscore the commitment to responsible and trustworthy financial practices, enhancing the system's credibility in the dynamic landscape of investment decision-making.

#### IV. FUTURE WORK

In contemplating the future trajectory of "InvestAI," researchers and practitioners alike can channel their efforts toward refining real-time processing mechanisms tailored for investment data, aligning with the critical importance of timeliness in financial decision-making. A dedicated exploration into the swift adaptation of models to the most recent market information, akin to the Consumer Price Index (CPI) data, holds immense potential to elevate the efficacy of the system amidst dynamically changing market conditions. This avenue of inquiry serves as a cornerstone for advancing the platform's responsiveness and relevance. Furthermore, a prospective avenue for future research lies in the examination of integrating InvestAI's strategies with a spectrum of macro-economic indicators. This approach aims to cultivate more inclusive financial models, offering a nuanced understanding of the intricate interplay between various economic factors. Exploring correlations between InvestAI's predictive insights and elements such as interest rates, GDP growth, and unemployment rates could afford a more comprehensive and holistic approach to market analysis. In parallel, the potential integration of blockchain technology and cryptocurrency into investment portfolios emerges as a promising avenue for exploration within the realm of "InvestAI." This endeavor could revolutionize asset management and trading practices, aligning with the dynamic landscape of emerging financial technologies. Moreover, it becomes imperative to investigate the impact of global economic shifts, geopolitical events, and the evolving dynamics of emerging markets on investment performance. Understanding these influences is vital for developing resilient and adaptive investment strategies that can navigate the complexities of a globalized financial landscape. In the context of rapid advancements in financial technology, continuous exploration into regulatory frameworks and ethical considerations surrounding novel investment instruments becomes paramount. This commitment ensures that "InvestAI" operates within a robust and trustworthy financial ecosystem, fostering credibility and user trust. These proposed directions underscore the importance of continuous exploration and adaptation within the field of investment. By remaining at the forefront of innovation and responsive to the evolving complexities of the financial landscape, "InvestAI" strives to uphold its commitment to providing cutting-edge and relevant insights for informed decision-making.

#### V. CONCLUSION

In the culmination of this project, "InvestAI" emerges as a groundbreaking solution poised to redefine the landscape of investment guidance. With a dedicated focus on democratizing financial knowledge and fostering empowerment, this web application integrates sophisticated algorithms, historical data analytics, and real-time insights to reshape the dynamics of financial decision-making. Its meticulously designed interface, encompassing educational content, is at its core, "InvestAI" leverages the potency of artificial intelligence, notably exemplified by the Facebook Prophet algorithm. This empowers the platform to deliver personalized investment plans and dynamic time series forecasting, ensuring adaptability to the complexities of the ever-evolving financial landscape through real-time API data integration. Looking ahead, the proposed system envisions the future of investment, offering avenues for real-time adaptation, seamless integration with macro-economic indicators, and potential exploration of blockchain technology. The system's unwavering commitment to ethical considerations and regulatory compliance solidifies its stature as a trustworthy and responsible financial companion. "InvestAI" transcends its role as a web application; it epitomizes a conduit towards financial empowerment. By furnishing users with state-of-the-art tools and insights, the project establishes the groundwork for informed decision-making, transcending barriers of financial expertise. This journey is not a conclusion but an ongoing commitment to innovation, adaptability, and the continual evolution of investment guidance in the ever-changing landscape of the global economy. "InvestAI" stands as a beacon, illuminating the path toward a more informed, secure, and empowered financial future for individuals across diverse backgrounds.

## VI. REFERENCES

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Title: A Machine Learning Approach to Inflation Prediction Based on CPI.

In the proceedings of the Sixth International Congress on Information and Communication Technology (ICICT 2021) in London, Volume 2, held by Springer Singapore, this research by R. Maldeni and M.A. Mascenghe delves into a machine learning approach for predicting inflation based on the CCPI (Consumer Confidence Price Index). The study, presented in 2021, is a valuable contribution to the exploration of advanced techniques for inflation prediction.

2. A.A. Salisu, K.O. Isah

Title: Predicting US Inflation: Evidence from a Novel Approach.

Published in the Economic Modelling journal in 2018, this work by A.A. Salisu and K.O. Isah introduces a fresh perspective

on predicting inflation in the United States. The researchers employ a novel approach, providing evidence that enriches the discourses on inflation prediction methodologies.

3. A. Özmen, Y. Yılmaz, G.W. Weber

Title: Natural Gas Consumption Forecast Using MARS and CMARS Models for Residential Users.

Explored in the Energy Economics journal in 2018, A. Özmen, Y. Yılmaz, and G.W. Weber present a study forecasting natural gas consumption for residential users. The research employs MARS (Multivariate Adaptive Regression Splines) and CMARS (Cubist Multivariate Adaptive Regression Splines) models, offering insights into energy consumption predictions.

4. G. Filis

Title: Macro Economy, Stock Market, and Oil Prices: Examining Cyclical Fluctuations.

This study by G. Filis examines the cyclical fluctuations among macroeconomics, the stock market, and oil prices. Explored in 2018. The author investigates meaningful relationships among these economic factors, contributing to a deeper understanding of their interconnected dynamics.