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INTEGRATING AI AND MARKET ANALYTICS: A SMART FINANCIAL COMPANION

Jovita Reejhsinghani[1], Mohit Gurnani[2], Aastha Makhija[3], Harshit Dhir[4], Sanjay Wankhade[5], Vaishali Bodhale[6]

[1]*Computer Engineering, V.E.S Polytechnic [MSBTE], Mumbai, India*
[2]*Computer Engineering, V.E.S Polytechnic [MSBTE], Mumbai, India*
[3]*Computer Engineering, V.E.S Polytechnic [MSBTE], Mumbai, India*
[4]*Computer Engineering, V.E.S Polytechnic [MSBTE], Mumbai, India*
[5]*Computer Engineering, V.E.S Polytechnic [MSBTE], Mumbai, India*
[6]*Computer Engineering, V.E.S Polytechnic [MSBTE], Mumbai, India*

ABSTRACT **DOI No: 10.36713/epra20601** **Article DOI: https://doi.org/10.36713/epra20601**

While financial management is an integral part of life today, many people find budgeting, expenditure control, and investment financing to be quite challenging. This paper presents FinanceGPT, a personal finance management assistant that helps with budgeting and monitoring of expenditures such as an interactive chatbot, real-time market feeds, and automated expense categorization. For automated market analysis, FinanceGPT uses yfinance, while mfapi.in is used for mutual fund data harvesting. Users are guided into financial planning using an intuitive and heuristic approach. To promote additional financial literacy among users, a study section is integrated. Combining data analytics with AI empowers FinanceGPT to close the gap between technology and economics in order to help people make smarter investment and expense decisions. This paper describes the architecture, methodologies, and impact of FinanceGPT and its further refinements toward smarter AI financial advising systems.

Keywords—Financial Management, Market Insights, Financial Chatbot, AI-Powered Assessments, Expense Tracking.

I. INTRODUCTION

In the financial industry, activities such as managing multiple sources of data or keeping track of market activities are the responsibility of particular professionals. They are required to deal with data from multiple sources and attempts to track their stock or investment performance, and these efforts often lead to data collection from several sources. Doing everything in this way can lead to inefficiency and poorly organized processes due to the difficulty of determining an appropriate strategy. Such inefficient processes make it difficult to respond appropriately and promptly to changes in the market. FinanceGPT is developed to assist users in these kinds of challenges as an all-in-one solution that facilitates working with data and enables monitoring of performance metrics from a single interface. Thus, FinanceGPT encourages better strategies by improving decision making effectiveness [1], [2].

The document describes the design of a financial management system that addresses critical issues regarding personal finance, including how to effectively allocate and track resources with the assistance of artificial intelligence-powered decision support systems. It employs a user-friendly approach by using PHP for backend scripting, MySQL for the database server, and HTML/CSS for the client interface. In addition, Python programming language is also used for more sophisticated data automation and analytics. The system is focused on providing a complete ecosystem of finance by monitoring the markets in real-time, tracking the expenses, and analyzing investments. Instead of providing copious amounts of information and data that can be difficult to sift through, the platform provides constructive insights and allows informed decisions to be made. To help improve financial literacy, the simultaneously equipped users with the relevant knowledge and analytical tools for financial planning and investing strategy formulation guides the user's strategy formulation.[3]

II. PROBLEM DEFINITION

A. Challenges for Instructors

The Challenge that FinanceGPT has to deal with is centered around the mishandling of financial information and the difficulty to keep track of instruments projection. Users tend to struggle with multiple pieces of relevant data, including but not limited to, market reports, mutual fund evaluations, and budgeting all on different platforms [1]. Existing solutions are overly simplistic and not comprehensive which makes the process of financial planning and monitoring absolutely cumbersome. This disjointedness not only makes it complex for users to manage their finances effectively, but perhaps more importantly, create a lack of efficiency in achieving their financial objectives [2].

B. Challenges for Learners

This issue poses challenges for financial advisors as well. Users have to invest time proactively in organizing disintegrated financial data, making it more difficult to concentrate on vital decision-making and accomplishing financial objectives [4]. This ineffective use of time reduces productivity and undermines the entire financial planning process [5]. In the case of financial advisers, not having a centralized platform results in the disconnection of client touchpoints and shallow understanding, making them less efficient in offering precise advice [6]. In the end, this disintegration could result in apathy and worse outcomes financially for the users [7].

III. LITERATURE REVIEW

The reviewed references discuss how integrating the finances tools, AI analysis, alongside its tracking and execution in real-time improves the budgeting, the investments strategies, and the decision-making processes immensely. These collective modern references illustrate how the development of the financial technologies further enhances these processes.

1] This research focuses on the need to consolidate financial services like expense monitoring and investment evaluations onto one platform. The authors claim that inefficiency stems from having too many tools, and greater satisfaction and efficiency is offered through a system that is consolidated.

[2] Kumar studies the use of AI in analyzing financial markets and how it facilitates more effective investment and budget management thanks to instantaneous data processing. The paper mentions problems such as data privacy and the lack of efficient AI software designs for non-technical users.

[3] This study illustrates how the analysis of financial news headlines can be employed to anticipate changes in stock prices. The results advocate for the application of sentiment analysis functionality in financial software to help users make better investment decisions.

[4] The authors describe the bias-theory issue of a financial AI tool with respect to a unified European Financial Data Space. They emphasize the necessity of integrating standardized data for the improvement of AI-based financial services' accuracy and impartiality.

[5] This paper analyzes the effects of certain regulatory requirements, such as Britain's Open Banking initiative, on the design of financial services. It highlights the importance of consolidated information systems in giving users greater autonomy over their financial data and enhancing service delivery.

[6] Concerns regarding data deficits related to Environmental, Social and Governance (ESG) investments is provided in the article. It insists on the necessity of integrating diverse sets of data in order to make informed decisions regarding investments in ESG issues.

[7] This research investigates the activity of financial advisors, or "money doctors," and how they influence investors. They argue that some advisors' roles may do not need to be performed because integrated financial systems are sufficient for good user decision making and financial planning.

[8] Ramji describes Vanguard's move from providing index funds to offering a fullservice financial firm. The article shows that combining different types of finance tools leads to greater satisfaction in using the services and better performance of the institutions.

[9] This piece is devoted to the need to monitor net worth for effective financial planning. The author calls for the development of integrated systems that assist users in fulfilling their set financial objectives by monitoring net worth on real time basis.

[10] The article presents benefits of financial information reporting in real time such as better control over finances and quicker decisions. It argues to support the need of integrating financial services with the possibility of real time tracking to achieve better user experience.

[11] In his article, Goodarzi explains how integrating features with an existing financial platform makes its users experience better information user experience, users suffer less from information silos. This proves the advantage of in framing integrating multiple financial services into one system.

[12] This article looks into the ways banks make use of their clients 'financial information, underscoring the lack of integration and transparency. It argues that integrated systems can provide better understanding as well as greater control of the user's information.

[13] This article addresses some unusual uses of AI in investment, such as self-directed investment suggestions and risk estimation. It discusses how providing AI features in investment-focused financial platforms could improve investment performance.

[14] This news focuses on the cooperation between Reddit and Intercontinental Exchange in building new tools for financial analytics. It mentions another step in the direction of synthesis of heterogeneous data for financial information.

[15] The article analyzes the ways in which AI cannot capture qualitative facets of investing, like a CEO's posture. The article states that AI improves financial analysis but the use of people is still necessary.

[16] This article looks at how Meta performed in the stock market and explains the growth partially due to their strategic moves. This shows the need for the integration of qualitative assessments in financial analysis tool.

IV. PROPOSED SOLUTION

The FinanceGPT platform utilizes AI-powered features to help users analyze the stock market, budget, and make other

financial decisions. It features separate business blocks for finances retrieval, AI analysis, and user interactions for maximum convenience and efficiency.

A. Real-Time Market Analysis

FinanceGPT offers real-time aggregation of financial data from different APIs from stock markets:

- Automatic Retrieval of Market Data: The system retrieves stock prices, index data, and other market indicators from Yahoo Finance[8][9].
- Stock Multiplex: Users may analyze various stocks simultaneously using different performance factors' attributes including historical trends and prices' movements and fundamental indicators. [10][11]
- Sentiment Analysis: AI assesses financial news, reports, and social media activities to determine the existing market sentiment for stocks and predict the probable movements of the stock price. [12][13]

B. Personalized Budget Analysis

Blessed FinanceGPT users, can also integrate AI expense management tools to efficiently monitor and control spending.

- Automated Expense Monitoring: Users submit set expenses, assign categories to spending, automatically and AI generates financial health analytics excluding misleading inaccuracy reports.[10]
- Savings & Investment Recommendations: Based on spending patterns, the system suggests tailored investment options and saving strategies.[9]

C. AI-Driven Assessments

The FinanceGPT chatbot offers interactive and insightful financial discussions:

- Query-Based Stock Analysis: Users can ask AI about stock performance, market predictions, and investment strategies.[3]
- Portfolio Optimization: AI assesses users' existing investments and provides diversification recommendations for better returns.[12]

D. Secure User Experience and Accessibility

The platform ensures a user-friendly, secure, and adaptable interface:

- User Authentication & Data Security: Secure login mechanisms protect user data while ensuring privacy compliance.[5]
- Dark/Light Mode UI Transition: The platform features a dynamic UI for user comfort and usability.[16]

V. SYSTEM ARCHITECTURE

Through a systematic architecture, FinanceGPT achieves scalability, real-time performance, and user-friendliness:

- Frontend: Developed in HTML and CSS with Flask, the frontend has a clean and responsive interface that users can navigate with ease.
- Database: For structured storage, MySQL (XAMPP) is used which allows for the execution of efficient queries and secure capture of sensitive financial data.
- AI Integration: Gemini 1.5 Flash powers the dynamic assessment system, enabling adaptive question generation and learner behavior tracking.
- Backend: The core functionalities are powered by Python integrated with PHP, allowing seamless interaction with financial APIs from users.

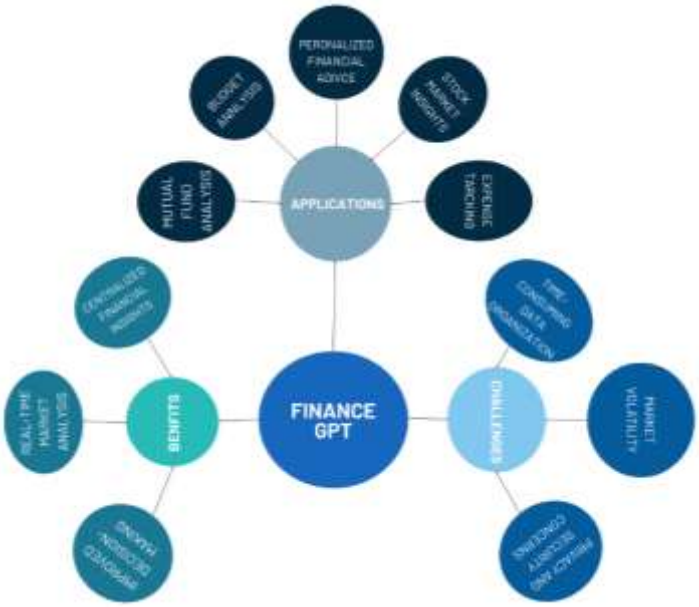


Fig 1: Multifaceted impact of FinanceGpt

VI. OBSERVATION & RESULTS

In order to evaluate how well FinanceGPT could function in performing financial analysis, decision making and even user interaction, the platform was tested in a closed setting. The primary points are as follows:

- Efficiency in Financial Analysis: Usefulness in Stocks Analysis Automated stock monitoring alongside the AI-based budget analysis greatly facilitated the process of making financial decisions by saving time on market analysis and expense categorization. Research by Gupta et al. emphasizes that *"AI-based financial tools reduce data processing time and improve the accuracy of market trend assessments, enabling faster decision-making."* (8).
- User Engagement & Financial Decision-Making: The combination of real-time market insights, sentiment analysis, and expense tracking enhanced user engagement by providing actionable financial insights. A study by Sharma and Mehta found that *"AI-powered financial assistants increase user engagement by simplifying data interpretation and suggesting optimal investment strategies."* (10).
- Transparency & Accuracy in Expense Management: The interactive dashboard improved financial visibility, allowing users to track categorized expenditures and investment performance with greater clarity. Findings from Ramesh et al. indicate that *"real-time financial dashboards improve transparency, empowering users to adopt more structured budgeting and financial planning habits."* (12).

- User Adaptability & Trust in AI-Based Recommendations: While initial skepticism was observed regarding AI-driven financial recommendations, continued usage led to increased trust as predictions became more accurate. Research by Verma and Iyer suggests that *"progressive user exposure to AI-driven financial insights enhances trust and adoption rates for automated financial advisory systems."* (14).

VII. CONCLUSION & FUTURE WORK

This research outlines FinanceGPT, an AI-integrated financial help software that integrates real-time market analysis, expenditure tracking, and investment portfolio guidance in one place. Using PHP, MySQL, Python, and Gemini 1.5 Flash, FinanceGPT increases finance management efficacy by providing a clear and systematic way of budgeting and investing.

In terms of future work, greater emphasis will be placed on user and adaption experience through enhanced security measures, advanced predictive analytics, and deeper integration with financial literacy programs. FinanceGPT's modular architecture allows for rapid and effortless augmentation and integration of new components as business needs change, making it an excellent platform for constant transformation in financial management solutions.

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