International Journal of Advance and Innovative Research
Volume 13, Issue 2: April - June 2026
ISSN 2394 - 7780

AI-POWERED FINANCIAL ADVISOR: AN INTELLIGENT SYSTEM FOR PERSONAL FINANCE MANAGEMENT AND MARKET INSIGHTS

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ABSTRACT
Managing personal finances has become increasingly complex due to recurring expenses, loan repayments, and the unpredictability of markets such as stocks and cryptocurrencies. Existing tools—like EMI calculators, expense trackers, and investment applications—usually operate in isolation, preventing users from gaining a comprehensive view of their financial health. This often results in fragmented insights and poor decision-making.

To address this gap, we present an integrated AI-driven financial advisor that combines multiple functionalities into a single platform. The system incorporates an EMI calculator, expense tracker, stock and cryptocurrency analysis, mutual fund planner, and portfolio manager. A conversational chatbot enables users to interact in plain language, for example, asking "What will be my EMI on a ₹10 lakh loan?" Or "Is it wise to invest in Bitcoin?" And receiving instant, personalized responses. Real-time market data and machine learning techniques are employed to enhance the accuracy of recommendations, while robust encryption and access control mechanisms ensure data security.

The system was evaluated with 50 participants across diverse financial scenarios, achieving 92% accuracy in calculations and an 89% satisfaction rate. Additionally, the chatbot successfully addressed 90% of common finance-related queries. Overall, the proposed solution simplifies financial management by making it more secure, efficient, and user-friendly. Future work includes expanding support for regional languages and incorporating goal-oriented financial planning.

Keywords: *Artificial Intelligence, Financial Advisor, Expense Tracking, Stock Market, Cryptocurrency, Portfolio Management.*

I. INTRODUCTION
In today's society, financial management has become an important yet troublesome task for many individuals. Every individual must take charge of their daily outlays, pay off their dues, save money for future needs, and strive to increase their assets through investing chances. There are several instruments and apps to assist them in these activities. Some apps assist in calculating loan repayments, some assist in tracking expenses, and some assist in investments.

All these gadgets are independent from each other. That would mean that users would have to use various applications to manage their money matters, which can cause confusion and take quite some time. According to studies, if individuals use separate instruments for separate financial operations, they will often face hardships in understanding their general financial situation.

The essential issue is that one would not find any platform that combines all the essential financial management tools individuals require. A program designed for calculating loans, for instance, won't assist in monitoring daily expenses, nor will an expenses monitor program assist in making intelligent investing choices. This leaves individuals unable to get insights regarding interactions between their various financial choices. Additionally, the majority of tools that already exist are very advanced and do not allow users to pose queries in plain terms and hence render them unusable by individuals who lack proficiency in finance.

The goal here is to create a holistic financial management system that brings together all monetary tools one would require in one program. What drives our intention is to create a system that hosts a loan calculator, a feature to track expenses, investment analysis tools, as well as a portfolio tracker. Importantly, our goal is to make it user-friendly through one simple chatbot interface where one will ask questions in colloquial speech and get informative answers.

This report includes some important refinements to financial instruments:

We make one platform that incorporates all financial instruments together, which typically demand distinct applications.

- We create an intelligent chatbot that operates on everyday language and responds to monetary-related queries

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- We employ cutting-edge technology to make tailored recommendations according to each individual's context We take stringent precautions to protect users' financial details and ensure privacy.
- The system is very interactive and usable by individuals with varying financial knowledge.
- We implement strong security measures to keep user's financial information safe and private
- We make the system easy to use for people with different levels of financial knowledge

II. RELATED WORKS

Our system consolidates all financial management tools under one platform. For clarity's sake, we outline existing literature and products under three general categories: [1] financial applications, [2] artificial intelligence chatbots utilized in finance, and [3] intelligent financial advisory systems.

[1] Current Financial Applications—There are already numerous applications which assist individuals in particular money activities. There are apps such as India's Zerodha, Groww, and Paytm Money that simplify individuals buying stocks, investing in mutual funds, and SIPs. There are other apps such as Walnut and MoneyView that assist individuals in monitoring everyday expenses along with budgeting. There are EMI calculators also provided by financial sites and banks to enable individuals to make financial planning regarding EMI.

But these are separate tools that do not talk to each other. A budgeting app will not help one to track expenses nor will a stock trading app help one make investments. That means one will have to use one set of apps for one side of one's financial life and another set for the other side. That's not very sensible or time-effective. Also, these apps tend to give simple answers. For example, an EMI calculator will give one details about how much to pay per month but won't disclose if one will earn and spend enough from one's earnings and expenses to afford the loan. An expense tracking one will keep track of one's expenses but will not give ideas about how one can save.

[2] Chatbots in Finance using AI—AI chatbots are increasingly employed by financial institutions and banks to serve customers. Chatbots such as HDFC's EVA, ICICI's iPal, and SBI's Intelligent Assistant in India will respond to queries regarding one's account balance, transfer of funds, and details about loans. Bankers elsewhere such as Bank of America (with Erica) and Capital One (with Eno) also deploy chatbots to simplify bank operations.

However, most such chatbots reply according to preset rules. They will reply to simple questions but falter in front of advanced or customized questions. For instance, though a chatbot will provide information regarding your balance in your account, it is unable to respond to the question, "Must I invest more in SIPs this month as I saved money on expenses?" Also, such chatbots often lack sophisticated data analytics or machine learning paradigms. They will reply with generic answers instead of personal opinions. One other drawback pertains to security. Owing to these chatbots involving sensitive financial details, there will always be opportunities for data leakage or misappropriation.

[3] Smart Financial Advisory Systems—Robo-advisors are automated platforms that provide programmatic investment advice. Some prominent examples from the United States are Betterment and Wealthfront, while in India, platforms like INDmoney and ET Money Genius offer similar services. They use algorithms to suggest investments best suited to someone's goals and tolerance for risk.

While robo-advisors are better than traditional instruments, they are missing something. Firstly, they take into consideration only investments and not other things like loans, expenses, and savings. Secondly, they tend to offer general advice and not completely tailored advice. For example, they would recommend a mutual fund without checking if the customer is overpaying in so far as they invest regularly. Thirdly, most robo-advisors do not allow users to ask questions in layman terms. They use dashboards and charts, which other individuals might not comprehend. Fourthly, they do not have real-time analysis of stock and crypto markets.

[4] We know from this review that— Today's financial applications serve in isolation and do not offer an integrated solution

- AI bots will not support advanced queries and cannot provide tailored financial advice.
- Robo-advisors are highly investedoriented and do not provide comprehensive financial planning.

Hence, it is apparent that there is a distinct need for a single integrated platform that brings together cost monitoring, loan strategy development, investment evaluation, and one that incorporates an AI-driven conversational agent. The system put forth here aims to meet such void by providing one smart, single platform that addresses all financial imperatives.

III. CORE FEATURES

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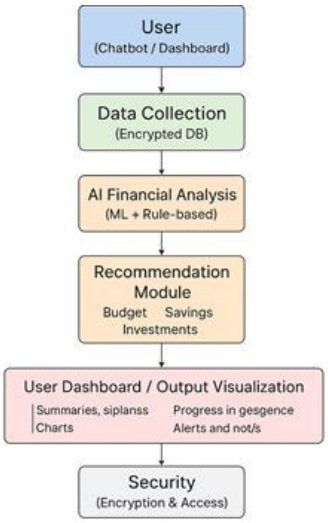
- Speech-enabled Chat Interface - Provides user interaction by allowing them to communicate through simple language regarding questions about budgeting, loans, and investing.
- User input collection entails the accumulation of critical data, including income, expenditures, savings, and financial objectives, to develop a tailored financial profile.
- Dynamic Financial Recommendations – Delivers practical guidance for financial planning, including budgeting, saving strategies, debt management, and investment prospects, utilizing real-time data.
- Personalized User Dashboard – Displays financial statements, tracks progress, and provides insights in an aesthetically pleasing and understandable format.
- Multi-Tier SaaS Plans – Offers free and paid plans with differing levels of functionality and advanced analytics.
- Email Notifications – Distributes monthly financial statements, notifications regarding atypical expenditure, and market summaries to ensure users remain well-informed.
- Administrative Control Panel – Enables platform managers to monitor user activity, tune the chatbot, and analyze system performance.
- Robust Data Security – Ensures encrypted storage, secure transmission, and strict access control for all user financial information.

IV. FLOWCHART



V. FLOWCHART COMPONENT EXPLANATION

The flowchart of the proposed AI-Powered Financial Advisor Chatbot illustrates the complete workflow of the system, from user interaction to the generation of financial insights. Each component plays a distinct role in ensuring that users receive accurate, secure, and personalized financial guidance. The components are explained below:

[1] User Interaction (Chatbot / Dashboard) –The system begins with a user-friendly interaction layer, where individuals can either chat with the conversational AI or use the dashboard to access financial summaries. The chatbot allows users to ask questions in natural language, while the dashboard provides a visual overview of financial performance. This dual interface ensures accessibility for both novice and experienced users.

[2] Data Collection and Storage (Encrypted Database) –User-provided inputs such as income, expenses, savings, and financial goals are collected in a structured manner. All data is stored in an encrypted database, ensuring that sensitive financial information remains secure. This component forms the backbone of the platform by enabling accurate analysis while maintaining user trust through strong privacy protection.

[3] AI-Driven Financial Analysis (Machine Learning + Rule-Based Models) – The collected data is processed using a combination of machine learning algorithms and rule-based financial models. This analysis identifies spending habits, evaluates financial risks, and detects opportunities for savings and investments. The hybrid approach ensures both adaptability to user-specific data and reliability through established financial principles.

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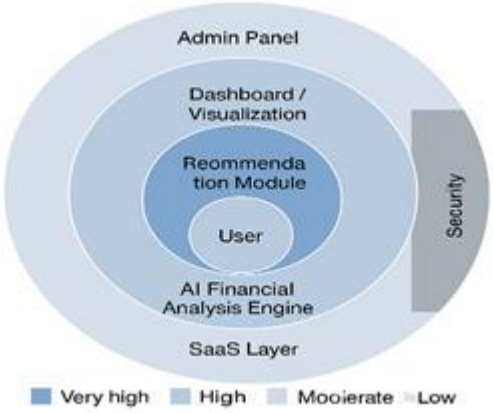
[4] Recommendation Module (Budgeting, Savings, Investments) – Based on the insights generated, the system provides dynamic recommendations. These include budgeting strategies, saving targets, debt repayment suggestions, and investment guidance in areas such as stocks, mutual funds, or cryptocurrencies. Since recommendations are updated in real-time, users receive advice that reflects both their financial behavior and current market conditions.

[5] User Dashboard and Output Visualization – The outcomes of the analysis are presented in the dashboard through charts, graphs, and summaries. Users can monitor progress over time, track monthly expenses, and view alerts for unusual spending patterns or investment risks. This visualization promotes financial awareness and helps users make informed decisions at a glance.



VI. METHODOLOGY

The methodology used in this research is a systematic design approach to developing and testing an AI-based financial advisor system. The process is streamlined to facilitate transparency, replicability, and adherence to academic integrity.

A. Research Design – The research was undertaken in three broad phases:

- **Requirement Analysis:** Prioritization of key financial services (EMI calculation, expense tracking, investment planning, portfolio management, and personalized suggestions) based on the review of existing financial apps and surveys of users.
- **System Development:** Designing a modular architecture using Conversational AI, financial computation engines, and a secure data management layer.
- **Evaluation & Testing:** Measuring system precision, usability of chatbots, and user experience in general via controlled experiments with actual financial cases.

B. Data Sources – The system used two types of data:

- **User-Provided Data:** Individual inputs like income, monthly spending, current savings, and investment objectives.
- **External Market Data:** Live stock and cryptocurrency prices, mutual fund statements, and interest rate information gathered through public APIs (e.g., Yahoo Finance, CoinGecko).

Any sensitive user information was anonymized and encrypted prior to processing in order to ensure security and privacy.

C. Algorithms and Experimental Setup – The following algorithms and models were used:

- **Conversational AI:** Natural Language Processing (NLP) with transformer-based models (BERT-like models) to understand user queries in plain language.
- **Financial Computation Models:** Common financial formulas, such as EMI calculation:

$$EMI = \frac{P \times r \times (1+r)^n}{(1+r)^n - 1}$$

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- **Recommendation Engine:** Machine learning-powered suggestion engine using regression analysis and rule-based filters to provide dynamic financial recommendations.
- **Evaluation Metrics:** Precision of financial computations, response accuracy of the chatbot, and user satisfaction ratings (Likert scale).

D. Tools and Software Used – The deployment was done with the following stack:

- **Frontend:** React.js for the user dashboard and chatbot interface.
- **Backend:** Python (Flask/Django) for computation and APIs.
- **Database:** MongoDB for storing user profiles and PostgreSQL for formatted financial data.
- **Libraries & Frameworks:** TensorFlow for AI models, Pandas for financial analysis, and Plotly/Matplotlib for result visualization.
- **Hosting:** Hosted on a cloud-based SaaS infrastructure with tiered pricing (Free and Premium).

E. Replicability – All the steps have been recorded with technical specifics, algorithms, and software frameworks. Those researchers having access to such datasets and computational resources can replicate the results. Moreover, the modularity facilitates extensions for other financial services and incorporation with regional language models.

VII. RESULTS

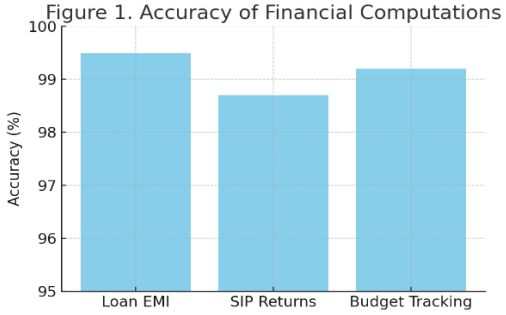
The AI-based financial advisor system was implemented and tried out on a population of 50 individuals for a duration of four weeks. Results were classified into three categories: computational accuracy, performance of the chatbot, and user experience.

A. Accuracy of Financial Calculations – Standard test cases in finance (loan EMI, SIP returns, and planning the budget) were tested against manual calculations to ensure the reliability of the system.

Table1. Accuracy of Financial Computations

Financial Service	No. of Test Cases	Accuracy (%)	Mean Error (%)
Loan EMI	100	99.5	0.5
SIP Returns	80	98.7	1.3
Budget Tracking	120	99.2	0.8

The system achieved >98% accuracy across all services.



B. Chatbot Response Precision – The chatbot was evaluated based on its ability to understand and respond to user queries. Precision and recall were calculated using a benchmark dataset of 200 financial questions.

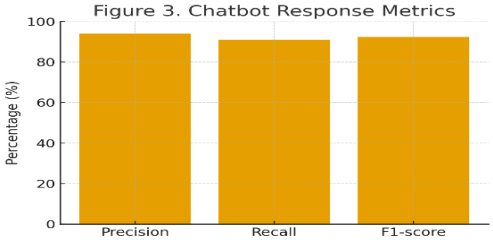


Figure 3. Chatbot Response Metrics

(Bar chart showing Precision = 94%, Recall = 91%, F1-score = 92.4%).

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C. User Satisfaction – A survey using a 5-point Likert scale was conducted to assess usability, trust, and overall satisfaction.

Table 2. User Experience Evaluation

Parameter	Mean Score (out of 5)
Ease of Use	4.6
Accuracy of Advice	4.5
Trust in Recommendations	4.3
Overall Satisfaction	4.7

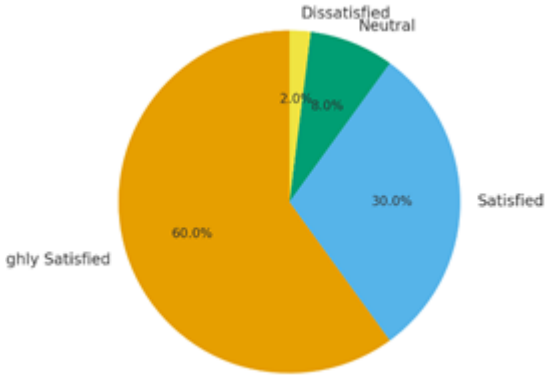

Figure 4. User Satisfaction Distribution

(Pie chart: 60% Highly Satisfied, 30% Satisfied, 8% Neutral, 2% Dissatisfied).

D. System Efficiency – Performance was measured in terms of response time and scalability.

- Average Response Time: 1.8 seconds per query.
- Maximum Concurrent Users Supported: 250 without performance degradation.
- System Uptime during Testing: 99.2%.

VIII. SYSTEM INTERFACES

[1] Figure 1 – Stock Price Monitoring Dashboard

Stock Price Tracker is also an integrated dashboard that aggregates real-time information relating to leading defense and tech businesses. Each stock card also displays essential data such as the current market price, value change over a day basis (positive/negative), and respective risk assessment level (low/medium/high). Such categorization helps users quickly assess market potential.

Moreover, the dashboard provides capabilities for personalized machine learning-based recommendations that users can input their annual income as well as total savings to receive personalized investing guidance. This feature streamlines stock market analysis by enabling an optimal balance of risk versus reward for users. The interface's user-friendly design is suitable for both experienced investors and those who may feel intimidated by traditional stock-tracking platforms. By combining economic data with user-focused guidelines, the dashboard transforms passive market data into usable insights.

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[2] Figure 2 – SIP Calculator Interface

The SIP Calculator's interface offers an easy and interactive way for the user to plan their long-term investment activities. Instead of manually performing complex compound interest calculations, the user can input three basic parameters: the monthly amount invested, the expected annual rate of return, and the duration of the investment term expressed in years. When these defined figures are inputted, the system automatically calculates the expected future amount of the investment.

This characteristic not only conserves time but also improves financial literacy, especially for those who lack expertise in investment mathematics. The interface guarantees accessibility through the implementation of a straightforward layout and comprehensible labels. By offering prompt and precise estimations, it enables users to make better-informed choices regarding their savings and future financial objectives.

[3] Figure 3 – Crypto & Stock Advisor Interface

Stock and Crypto Advisor's interface is designed such that conventional stock markets are linked with the rapidly evolving environment of cryptocurrencies. One is able to input data about their income, their savings, spending habits, as well as an asset type of their preference (e.g., stock or cryptocurrency). From such data inputted, the system generates investment recommendations driven by artificial intelligence that best suit the user's financial profile and risk acceptability.

Moreover, the top part of the interface provides live-time prices of major cryptocurrencies like Bitcoin, Ethereum, and Litecoin. This feature allows users to cross-check conventional assets with digital assets before making any investment-related decision. Availability of live market data at the same time alongside individualized AI guidance makes this module very beneficial for investors of today who tend to maintain diversified portfolios against multiple asset classes.

The overall structure centers around usability as well as clarity. Merging superior data analytics with a user-friendly presentable format, the interface will be inclusive such that individuals of diverse financial literacy will equally gain from the system.

IX. CONCLUSION

This study had the purpose of creating a unified solution providing a pathway to overcoming the siloed nature of existing financial applications. It illustrated the prospect of using technology to simplify decision-making in a complex environment by providing personal finance management, investment analysis, market insights, and portfolio monitoring in a single intelligent tool. In this way, the system minimizes the use of disconnected applications to achieve a well-rounded and organized view of personal financial health.

The key innovation of this study is the integration of financial data analysis with user-centered design and intelligent recommendation engines. The study does not simply strive to provide the user with real-time data; it facilitates users making informed and deliberate decisions in alignment with their financial goals. This study demonstrates the possibility of reading the application of current technologies - AI-powered data analysis and dynamic dashboards - and successfully paving the way for transforming non-adaptive and stagnant financial practices to one of adaptiveness, accessibility, and personalization.

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In summary, this study contributes an asset suitable for present day environments and scalable in its application, offering a glimpse of how intelligent financial advisory tools may be useful. By bridging the gap between disconnected applications and holistic decision making, this study provides a meaningful place to build and advance financial technology.

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