

Fin Guard AI : Smart Finance Tracker & Expense Predictor

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Abstract - Managing personal finances is a common challenge for students and young individuals due to limited income and unplanned expenses. Many existing finance management applications mainly focus on recording transactions but do not provide proper financial analysis or intelligent suggestions. Because of this, users often find it difficult to understand their spending habits and manage their savings effectively. To solve this problem, this paper presents FinTrack: Smart Finance Tracker with AI Insights, a simple and intelligent finance management system that helps users track income, expenses, and savings in an organized way. The system allows users to categorize expenses, monitor their balance, set financial goals, and receive overspending alerts. It also provides graphical reports such as pie charts to help users understand their spending patterns easily. In addition, the system includes an AI-based assistant that analyzes financial data and provides useful financial suggestions and budgeting advice. The system is developed using HTML, CSS, and JavaScript for the frontend, Python for backend and AI processing, and SQL for database management. The main objective of this system is to help users manage their money more efficiently and develop better financial planning habits.

Key Words : Artificial Intelligence, Personal Finance Management, Expense Tracking, Financial Insights, AI Chat Assistant, Smart Budgeting, Expense Analysis

1. INTRODUCTION

In today's digital world, managing personal finances has become an important skill, especially for students and young individuals who often have limited income and multiple expenses. Many people spend money on daily needs, entertainment, education, and online services, but they rarely keep proper records of their financial activities. As a result, it becomes difficult to understand spending patterns, control unnecessary expenses, and achieve financial goals. Poor financial management can lead to overspending and lack of savings, which affects long-term financial stability. With the growth of financial technology, several digital applications have been developed to help individuals track their expenses and manage their money. These applications generally allow users to record transactions, categorize expenses, and view simple reports. However, many existing systems only provide basic financial tracking and lack intelligent features that help users analyze their financial

behavior. They do not offer personalized suggestions, goal-based financial planning, or intelligent insights that can guide users toward better financial decisions. This creates a need for a smarter financial management system that can not only track expenses but also analyze financial data and provide meaningful recommendations.

Artificial Intelligence (AI) has recently become an important technology in many fields, including finance. AI can analyze large amounts of data, identify patterns, and generate insights that help users make informed decisions. By integrating AI with personal finance management systems, it is possible to develop smarter tools that help users understand their spending behavior and improve their financial habits.

To address these challenges, this research proposes FinTrack: Smart Finance Tracker with AI Insights, a system designed to help users monitor, analyze, and manage their personal finances more effectively. The proposed system enables users to record their income and expenses, categorize transactions, and maintain financial records similar to a simple accounting system. In addition to basic finance tracking, the system allows users to set financial goals and track their progress toward achieving them.

The system also uses Artificial Intelligence to analyze spending patterns, detect overspending in specific categories, and provide personalized financial suggestions. Furthermore, the application presents financial data through charts and graphical reports, which make it easier for users to understand their spending behavior. The system may also provide basic insights related to investment options such as stocks and SIPs to encourage better financial planning.

The FinTrack system is developed using HTML, CSS, and JavaScript for the frontend interface, Python for backend processing and AI-based analysis, and SQL for database management. By combining finance tracking, goal management, AI insights, and data visualization, the proposed system aims to improve financial awareness and support better financial decision-making.

2. LITERATURE REVIEW

[1] Yahyaa et al., introduced SmartSave AI, a goal-based personal finance management tool designed to help users manage their money more effectively. The system allows users to record their income, track expenses, and set savings goals through a simple and easy-to-use interface developed using Python and Streamlit. One of the main features of the system is its ability to automatically categorize expenses and analyze spending behavior. Based on this analysis, the platform provides budget suggestions in natural and easy-to-understand language, which helps users plan their finances more efficiently. The system also helps users identify their spending patterns and improve their savings habits over time. During evaluation, users reported better awareness of their financial activities and found it easier to manage their expenses and savings. However, the system mainly focuses on expense tracking and goal management, while advanced financial analytics and broader financial planning features are not fully explored.

[2] Wang et al., presented an AI Finance Tracker designed to help individuals manage their personal finances more effectively through intelligent analysis and personalized recommendations. The proposed system aims to simplify financial decision-making by providing users with clear insights into their spending habits and financial behavior. The platform analyzes user financial data using Artificial Intelligence and machine learning techniques to generate personalized budgeting advice and strategic financial recommendations. It also predicts future spending patterns based on historical financial data, helping users plan their finances more efficiently and maintain long-term financial stability. By offering customized suggestions and easy-to-understand insights, the system encourages users to develop better financial habits and make informed financial decisions. However, the study mainly focuses on personalized budgeting and spending analysis, while advanced financial planning features and broader financial investment insights are not extensively explored.

[3] Dadhe et al., presented a system titled Smart Financial Insights: AI-Driven Financial Insights for Next-Generation Financial Forecasting, which focuses on improving stock market prediction using modern technologies such as Artificial Intelligence, Machine Learning, and blockchain. The study highlights that traditional statistical models often struggle to capture the complex behavior of financial markets. To overcome this limitation, the authors developed an AI-based prediction system that analyzes historical stock market data using machine learning algorithms. The system also incorporates sentiment analysis of financial news and social media to better understand market trends and improve prediction accuracy. In addition, blockchain technology is used to securely store financial data and AI-generated predictions, ensuring transparency and preventing data manipulation. The platform provides a user-

friendly dashboard that allows users to visualize stock market data and perform interactive financial analysis in real time. Although the proposed system improves prediction accuracy and data security, challenges such as data privacy, computational efficiency, and market volatility still remain important areas for future research.

[4] Saini et al., studied AI-Powered Personal Finance Management Applications that use artificial intelligence to improve budgeting and financial planning. The system analyzes user spending patterns and provides AI-based insights to help users manage their finances more effectively. These insights assist users in allocating resources properly, maintaining financial discipline, and making better investment decisions. However, the study mainly focuses on budgeting support and basic financial guidance, while advanced predictive financial analytics are not deeply explored.

[5] Brilliantov and Mandrikova et al., explored Smart Budgeting with AI, focusing on how artificial intelligence can improve personal finance management. The study explains that AI can convert simple financial tracking into an intelligent system that actively guides users in managing their money. By analyzing financial data, the system provides AI-driven insights that help users make better budgeting decisions and improve their overall financial outcomes. The research shows that AI-based budgeting tools can support users in understanding their financial habits and making more effective financial plans. However, further improvements are needed to enhance prediction accuracy and expand advanced financial analysis features.

[6] Katy et al., discussed AI-Powered Personal Finance Management: Transforming Budgeting and Savings in the Digital Age. The study highlights how modern finance applications use Artificial Intelligence technologies such as machine learning, predictive analytics, and natural language processing to improve personal financial management. These technologies help provide real-time financial insights, detect spending patterns, and assist users in budgeting and saving more effectively. The research emphasizes that AI-based finance tools can support better financial decision-making and improve financial awareness among users.

[7] Agarwal et al., proposed an AI-Powered Personal Finance Assistant designed to enhance financial literacy and personal financial management. The system addresses the limitations of traditional finance tools that rely on static budgeting and lack personalization. By using Artificial Intelligence, the proposed assistant analyzes user financial data and provides personalized insights along with a comprehensive financial overview. The study demonstrates that AI-based financial assistants can help users better understand their financial behavior and make more informed financial decisions.

[8] Bashshar et al., presented Artificial Intelligence-Driven Personal Finance Solution, which focuses on improving

personal finance management through the use of Artificial Intelligence technologies. The study explains that many individuals face difficulties in manually tracking their income, expenses, and savings, which often leads to poor financial planning and limited financial awareness. Traditional financial tools mainly rely on manual data entry and static budgeting methods, making it difficult for users to clearly understand their financial behavior. To address this issue, the proposed system uses AI techniques to analyze financial data and provide real-time insights along with predictive financial analysis. The system helps users monitor their spending patterns, manage budgets more efficiently, and receive intelligent financial suggestions for better decision-making. The research highlights that AI-driven finance solutions can make financial management more efficient, user-friendly, and helpful for maintaining long-term financial stability.

[9] Challoumis et al., examined how Artificial Intelligence can enhance financial literacy and improve personal money management. The study explains that AI-driven budgeting and expense tracking tools can analyze large amounts of financial data to provide useful insights into an individual's spending behavior. These intelligent systems help users understand their financial habits, plan budgets effectively, and make better financial decisions. The research also highlights that AI-powered financial platforms can support users in developing stronger financial awareness and improving long-term financial stability by offering personalized recommendations and automated financial analysis.

[10] Davitaia et al., discussed Intelligent Finance: The Evolution and Impact of AI-Driven Advisory Services in FinTech, focusing on how Artificial Intelligence is transforming financial advisory services. The study explains that AI systems can analyze large volumes of both structured and unstructured financial data to generate meaningful insights and support better financial decision-making. By using advanced data analysis techniques, AI-driven platforms can understand user behavior, financial patterns, and individual financial goals. Based on this analysis, the systems provide personalized financial advice tailored to each user's financial profile. The research highlights that AI-based advisory services help individuals and investors manage their finances more effectively by offering data-driven recommendations, improving financial planning, and supporting smarter investment and budgeting decisions. The study concludes that the integration of AI in financial services is playing an important role in improving the efficiency, accuracy, and accessibility of financial advisory systems.

3. METHODOLOGY

The proposed system is an AI-based smart finance tracking platform developed using Python for backend

processing, HTML, CSS, and JavaScript for the user interface, and MySQL for database management. The system begins by allowing users to register and securely log in, after which they can access a personalized financial dashboard. Users can record their income and daily expenses by entering transaction details such as amount, category, date, and description. All financial data is securely stored in the database and processed by the system to generate summaries of total income, total expenses, and current balance. The platform includes a dashboard module that provides a clear overview of the user's financial status through summarized information and recent transaction history. A goal tracking module allows users to set financial goals such as saving for a car, house, or personal expenses. Users can enter a target amount and update their savings progress, while the system automatically calculates the completion percentage and remaining amount.

Additionally, the system analyzes stored financial data to identify spending patterns and generate smart financial insights, helping users understand their spending behavior and improve their money management. The application also provides organized financial records and reports that allow users to monitor their expenses and plan budgets effectively. The entire system is designed to provide a simple, intelligent, and secure platform for managing personal finances through automated tracking, data analysis, and user-friendly digital interaction.

FLOW CHART

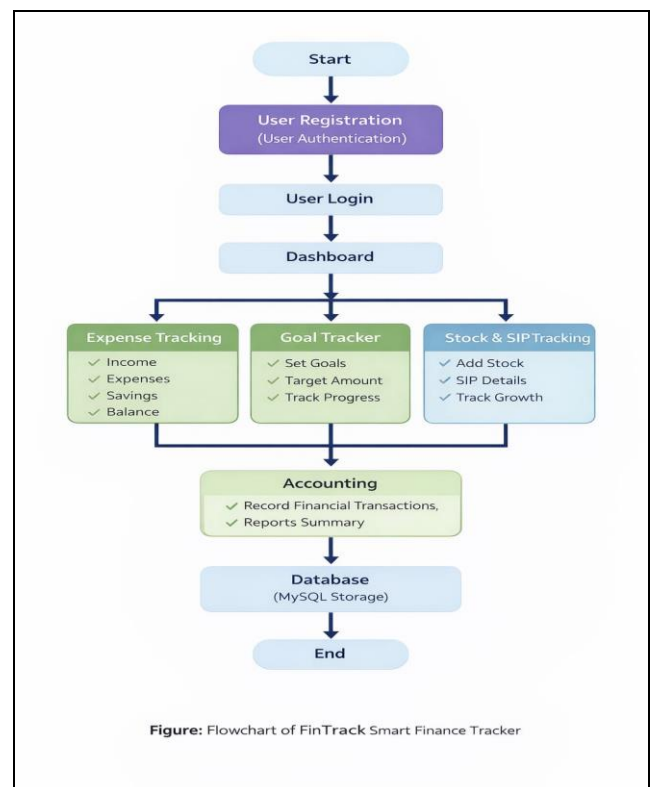


Figure: Flowchart of FinTrack Smart Finance Tracker

Fig. 1 shows the flowchart of system

4. WORKING

The system begins with the registration module, where new users create an account by providing basic details such as name, email, and password. After successful registration, users can securely access the system through the login module, which verifies their credentials and redirects them to their personalized financial dashboard.

The dashboard displays important financial information such as total income, total expenses, savings, and the current balance, allowing users to quickly understand their overall financial status. Users can add their income and daily expenses by entering details such as amount, category, and date. Whenever a new transaction is recorded, the system automatically updates the expense records, savings amount, and remaining balance.

All financial transactions are securely stored in the database, and the dashboard continuously updates to reflect the latest financial data. The system also includes a goal tracker module, where users can set financial goals such as saving money for personal needs or future investments. Users can enter a target amount and track their savings progress, while the system calculates the percentage of goal completion.

In addition, the platform provides Stock and SIP tracking features that allow users to record and monitor their investment activities. Users can add details of their stock investments and systematic investment plans (SIP), and the system helps them keep track of their investment growth. Overall, the system integrates expense tracking, savings management, goal planning, and investment monitoring into a single platform. By presenting financial data in a clear and organized dashboard, the system helps users manage their finances efficiently and make informed financial decisions.

5. SYSTEM REQUIREMENT

Software Requirements

- Python (Backend Development)
- HTML, CSS, JavaScript (Frontend Development)
- Web Browser (Microsoft Edge / Google Chrome)
- MySQL Database Server
- Code Editor (PyCharm / Visual Studio Code)

Libraries Used

- Flask – Used as a lightweight Python web framework to develop the backend of the application and manage routing between pages.
- Flask-MySQLdb – Used to connect the application with the MySQL database for storing and retrieving financial transaction data.

5. IMPLEMENTATION AND RESULT

Step 1: Register to the portal

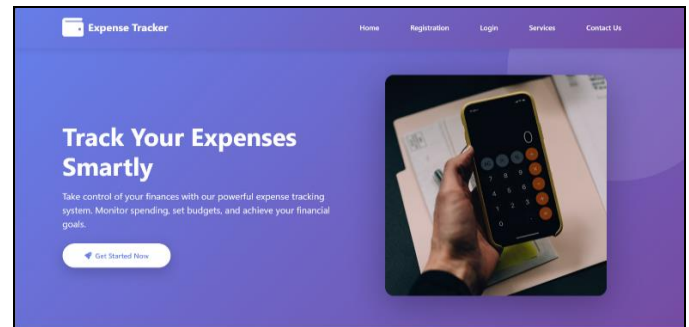


Fig. 2 shows the main dashboard

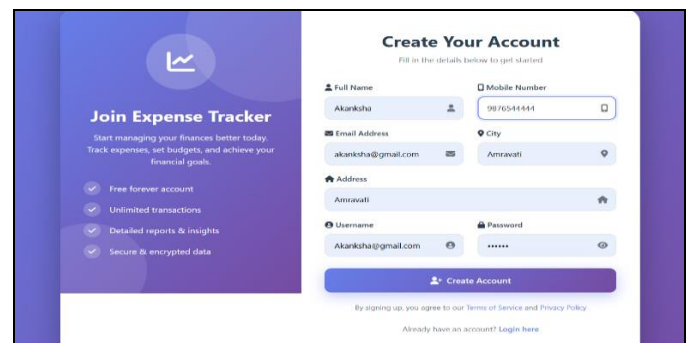


Fig. 3 Show a Registration Page

This module allows new users to create an account in the system. The user enters basic details such as name, email ID, and password in the registration form. The system validates the entered information to ensure that all required fields are filled correctly. After successful validation, the user data is securely stored in the MySQL database. Once the registration process is completed, the user can proceed to the login page to access the FinTrack platform and use its financial management features.

Step 2: Login Page

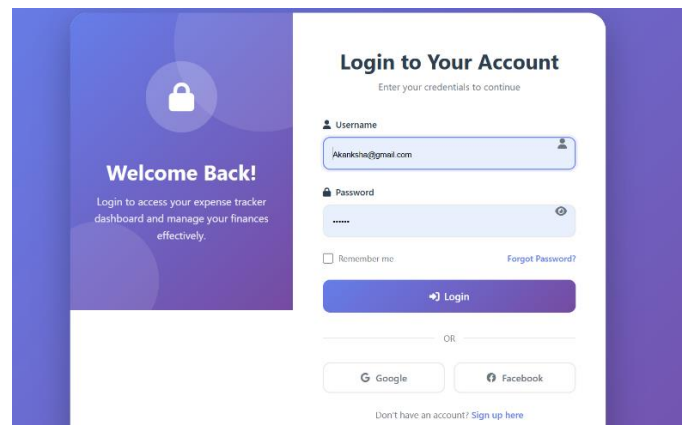


Fig. 4 shows login page

After registration, users can login by entering corresponding email id and password.

Step 3: How it work

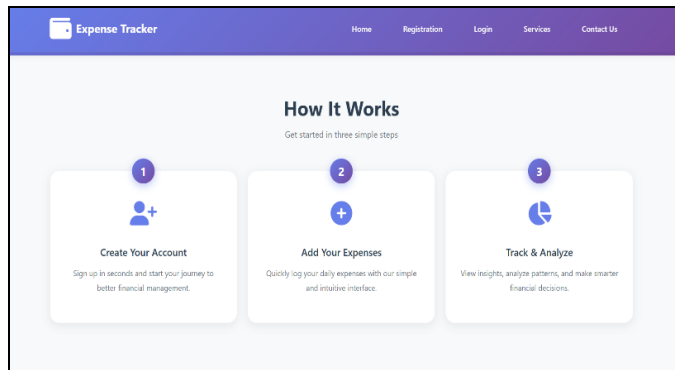


Fig. 5 Working

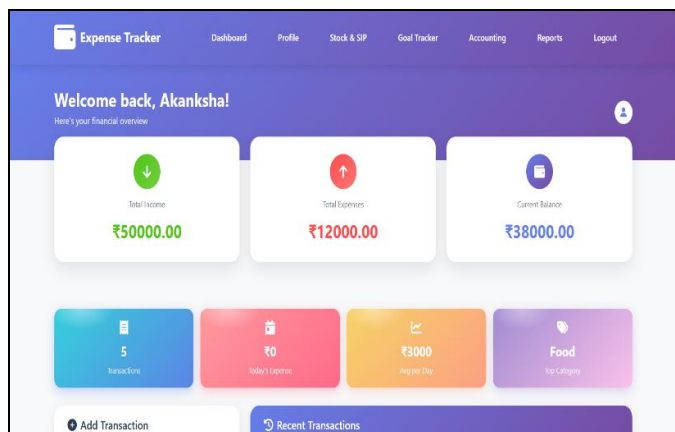


Fig. 6 shows Dashboard

The dashboard gives users a clear view of their finances by showing total income, expenses, and current balance. It also highlights recent transactions and goal progress, helping users quickly understand their financial situation.

Step 4: Add Expenses

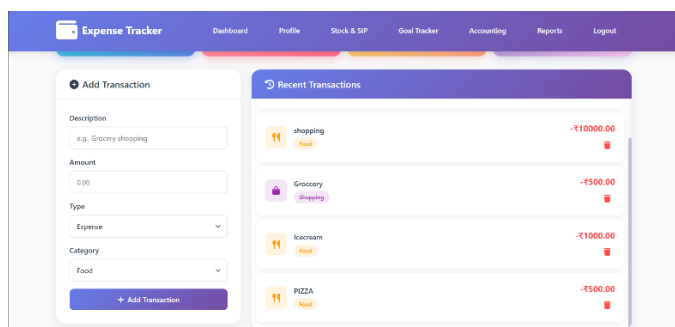


Fig. 7 Add Transaction

The Add Transaction feature allows users to enter details such as description, amount, type (income or expense), and category. After submission, the information is sent to the backend and stored in the database. The system then updates the transaction records and dashboard, helping users easily track their income and expenses.

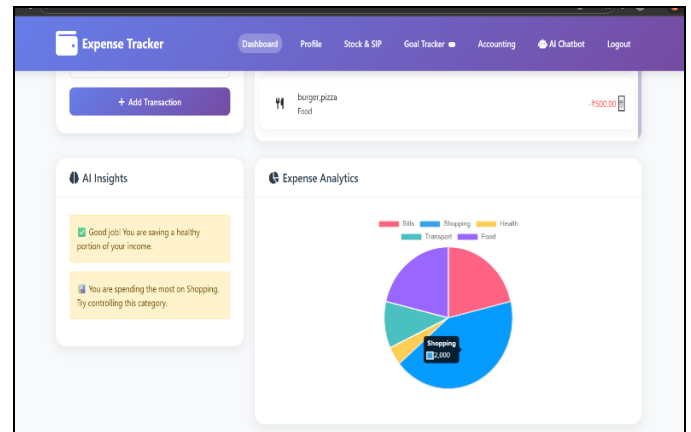


Fig. 8: Expense Distribution Pie Chart

The Pie Chart is used to visually represent the distribution of expenses across different categories. It fetches transaction data from the database and displays it in a graphical format, making it easier for users to understand their spending patterns. This visualization helps users quickly identify which categories consume the most of their budget.

Step 5: Stock and SIP :

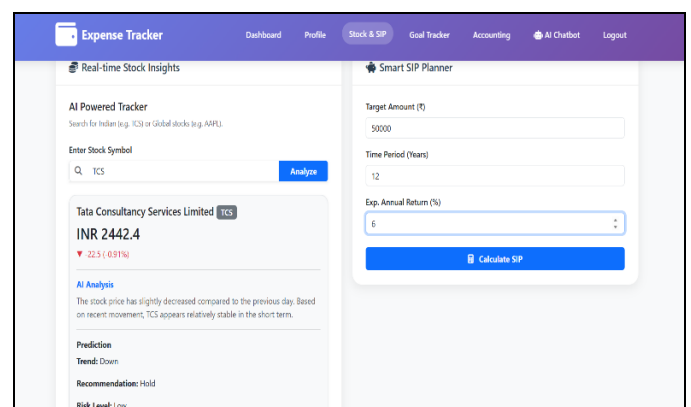


Fig. 9 Stock and SIP

This module helps users keep track of their stock investments and SIP (Systematic Investment Plans) in an easy way. Users can add details such as the investment name, amount invested, and date. The system stores this information in the database and shows it on the dashboard, allowing users to monitor their investment activities along with their overall financial management.

Step 6: Goal Tracker

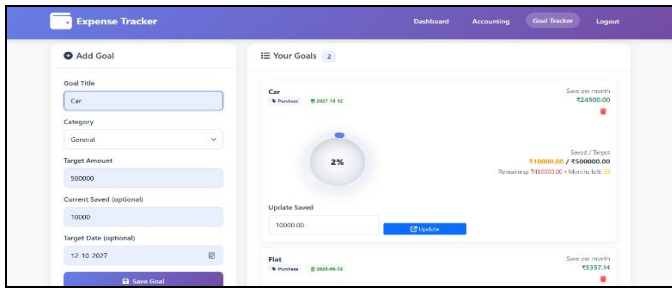


Fig. 10 Goal Tracker

This module allows users to set and track their financial goals. Users can enter details such as goal name, target amount, saved amount, and target date. The system automatically calculates the percentage of goal completion and displays the progress, helping users understand how close they are to achieving their financial goal.

Step 7: Accounting

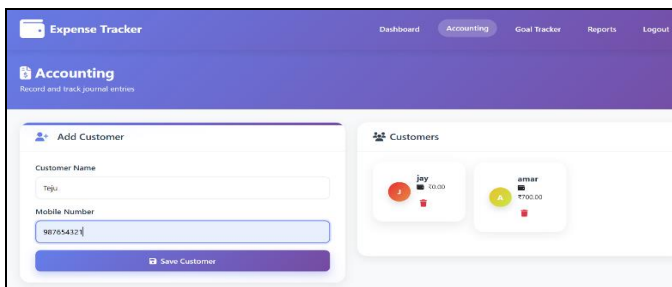


Fig. 11: Accounting and Financial Records Interface

This module helps users manage and track financial transactions between individuals. The user enters the customer name and mobile number, after which the system displays all transactions related to that person. It shows details such as who paid whom, the amount transferred, and the transaction date. This helps users easily keep track of money given or received and maintain clear financial records.

Step 9: AI Finance Assistant

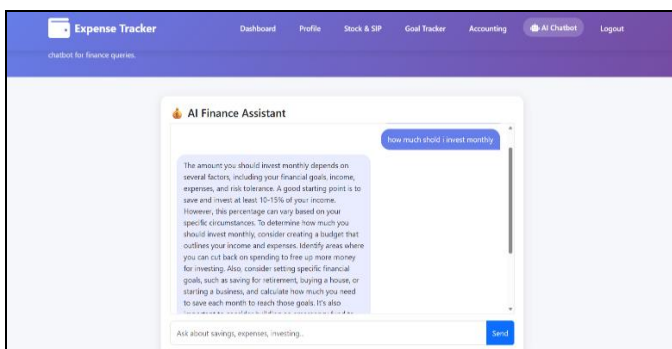


Fig. 12: AI Finance Assistant

The AI Finance Chat Assistant provides a conversational interface that allows users to ask finance-related questions within the application. It helps users understand their spending patterns, budgeting strategies, and general financial management queries. The assistant uses artificial intelligence and natural language processing to generate responses and guide users with useful financial information, making the system more interactive and user-friendly.

RESULT

The FinTrack – Smart Finance Tracker with AI Insights system was successfully developed and tested to evaluate its ability to manage personal financial data and provide intelligent insights. The system allows users to register, log in securely, and record their daily income and expenses through a simple web-based interface.

During testing, the system successfully stored user financial data in the MySQL database and processed it using the backend developed in Python. The application was able to categorize expenses such as food, travel, shopping, and bills, allowing users to easily track where their money was being spent.

The AI-based analysis module processed historical financial data and generated useful insights such as identifying high spending categories, calculating monthly expenses, and suggesting better budgeting practices. These insights helped users understand their spending habits and encouraged better financial planning.

The dashboard successfully displayed financial summaries using graphical representations such as charts and spending statistics. This visualization helped users quickly analyze their financial activities without manually calculating totals. Performance testing showed that the system handled multiple expense entries efficiently and updated financial summaries in real time. The results indicate that the proposed system improves financial awareness and provides an easy way for users to monitor and manage their personal finances.

Overall, the implementation of the FinTrack system demonstrates that integrating expense tracking with AI-based analysis can significantly enhance financial management and help users make better financial decisions.

6. CONCLUSIONS AND FUTURE SCOPE

The FinTrack – Smart Finance Tracker with AI Insights system was developed to make personal finance management easier and more organized for users. Many people face difficulties in tracking their daily expenses and understanding where their money is being spent. This system helps users record their income and expenses,

categorize transactions, and monitor their financial activities through a simple dashboard. The system stores financial data in a database and analyzes it to generate useful financial insights. By observing spending patterns, users can understand their financial habits and identify areas where they are spending more money. The graphical representation of data through charts and summaries helps users understand their financial information in a clear and simple way. This system shows how a simple finance tracking application combined with basic AI analysis can help users improve their financial planning and money management habits.

In the future, the system can be improved by adding more advanced features to make the application more intelligent and useful. The application can be connected with bank accounts and digital payment platforms so that transactions are recorded automatically, reducing manual work for users. More advanced artificial intelligence algorithms can be added to provide financial predictions and personalized budgeting suggestions based on user spending behavior. The system can also include investment and savings suggestions to help users plan their financial future more effectively. The application can be expanded to mobile platforms so users can manage their finances anytime and anywhere. Additional security features such as data encryption and secure login methods can also be implemented to protect user financial data. With these improvements, the system can become a more advanced and intelligent personal finance management system in the future.

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