



Major Project

Title : Cloud Based Intelligent Financial Analytics App
FinVista

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Colour Code:

Synopsis: **Red**

Mid term: **Orange**

End Term: **Purple**

Note: The Following presentation will have all the content of the later.

The technical concepts for a Cloud-Based Expense Tracking App include :-

- ❖ **Cloud infrastructure** - Amazon Web Service (AWS) , Google Cloud Platform (GCP), or Microsoft Azure.
- ❖ **Database management**- A cloud-based database, such as SQL or NoSQL databases.
- ❖ **API integration**-The app integrates with various financial institutions and payment platforms using APIs to fetch transaction data.
- ❖ **Security measures**- To give the security for safety & real-time updates technologies like Web Sockets or server-sent events to provide real-time updates for expense tracking, ensuring that users see changes immediately.
- ❖ **Cross-platform development**- Flutter enables the development of a single codebase for both iOS and Android, reducing development effort.
- ❖ **User interface design**- Interface using Flutter's widgets and components to provide a seamless user experience.
- ❖ **Data analysis tools**- Tableau, Plotly, Matplotlib, ggplot2, looker & Excel to offer users insights into their spending habits and financial trends.
- ❖ **Data synchronization**- Various platforms for synchronized & backup, compliance with regulations, and more.

These elements collectively enable the app to securely and efficiently track and manage expenses while providing a user-friendly experience.

Technical Concepts (Algorithm) Used

Important algorithmic factors for a cloud-based application that tracks expenses:

- 1. Processing API Data:** Algorithms for effectively obtaining and handling financial data through APIs from different organizations.
- 2. Cost Classification:** Using transaction data, machine learning classification methods are used to classify costs.
- 3. Updates in real time:** Real-time changes in user interfaces can be implemented using WebSockets or Server-Sent Events methods.
- 4. Analyzing Data:** To get insight into spending patterns, use statistical analysis and machine learning models (clustering, regression).
- 5. Security Procedures:** Algorithms for user access control and data security through encryption and authentication.



Problem Statement

The problem is the need for an efficient, accessible, and secure expense tracking solution in a digital world. Existing methods are often manual, lack real-time updates, and don't offer cloud-based accessibility. We aim to develop a user-friendly Cloud-Based Expense Tracker App using Flutter to address these challenges.



Area of application

- ❖ **Personal Budgeting:** People may control their own personal budgets and learn more about their spending patterns.
- ❖ **Business Outlays:** Spending connected to the business may be tracked and managed by freelancers and small enterprises.
- ❖ **Managing Travel Expenses:** Tracking and organizing vacation spending is simple for travelers.
- ❖ **Budgeting in real time:** Real-time budgets may be created and tracked by users for quick financial choices.
- ❖ **Combined Expense Monitoring:** Teams, families, and roommates may work together to track shared spending for transparency.
- ❖ **Data Analysis and Insights:** Enable users to gain valuable insights into their financial behaviour through data visualization and analysis tools.
- ❖ **User Authentication:** Implement secure user authentication to protect user accounts and financial data.

Dataset And Input Format

➤ Dataset Considerations:

1. **Transaction Information:** Add important fields such as source, category, description, date, and amount.
2. **Details about the user:** Gather fundamental user information for monitoring and customisation.
3. **Various Transactions:** For thorough testing, simulate different transaction types (revenue, spending, transfers).
4. **Reasonable Values:** For genuine user scenarios, provide the dataset with quantities and descriptions that are realistic
5. **Scalability:** Ensure the dataset can scale for testing and future feature expansion.

Input Format

➤ Input format:-

1. **CSV (Comma-Separated Values)** : It is the input format for ease, arrange data in rows and columns & add headers to make interpretation easier.
2. **JavaScript Object Notation, or JSON**: Provide data in a hierarchical, organized way managing
3. **Schema for Databases**: Create tables for users and transactions. Create connections to enable effective data
4. **Formats for API Integration**: Conform to the API documentation; JSON or XML is typically used. Make sure it works with other banking institutions.
5. **Sample Entry**: For testing purposes and reference, create a sample transaction entry in both CSV and JSON formats.

Literature Review

Survey 1-

Title : “Expense Tracker - A Smart Approach to Track Everyday Expense”

Journal : International Journal of Engineering Research & Technology (IJERT)

Methodology : They created a daily cost management system with the intention of using a computerized system that minimizes paperwork and organizes data to simply and efficiently monitor employees' daily expenses.

Advantages

- The electronic technology streamlines the daily spending monitoring procedure by drastically reducing paperwork.
- Makes it possible to track employees' daily spending in real time.

Disadvantages

- One potential drawback of implementing an automated spending monitoring system might be the initial setup fees.
- A drawback of relying too much on technology is the possibility of malfunctions or system outages.

Survey 2 -

Title : “Analytical expense management system”

Journal : International Conference on Networked Digital Technologies, NDT

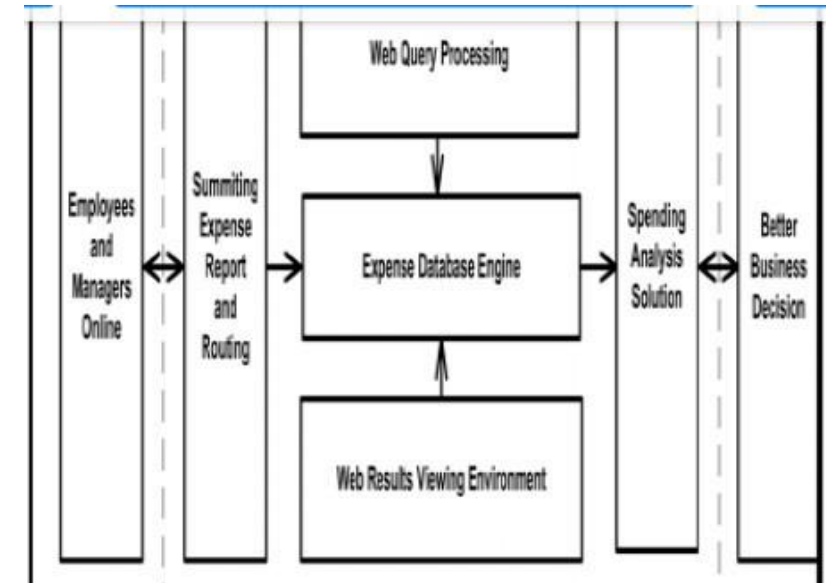
Methodology: They compile spending information and could offer totals. The result is similar to what is provided by an excel sheet. The basis of AI research was put out by [McCarthy and associates] in 1955: AI aims to provide machines with characteristics that, if manifested, would resemble those of humans.

Advantages :

- Offers thorough totals and facilitates effective examination of spending trends.
- Uses advanced automation based on 1955 AI concepts.

Disadvantage :

- The efficiency of AI determines the system's correctness.



Survey 3-

Title : “Research on the Development of Hospital Intelligent Finance Based on Artificial Intelligence”

Journal : Advanced Computational Intelligence for Clinical Medical Information Processing Research

Methodology: Artificial Intelligence” on the use of artificial intelligence (AI) in the creation of intelligent finance systems in the context of hospitals is probably the article's main topic. This might involve using AI to healthcare organizations' overall financial management, forecasting, budgeting, and financial analytics.

Advantage: AI helps healthcare companies manage their finances more effectively.

Disadvantage: Hospital finance departments may have to pay a large initial cost to implement AI.

Survey 4 -

Title: "Mobile Data Science"

Journal: Mobile Data Science and Intelligent Apps: Concepts, AI-Based Modeling and Research Directions

Methodology: Concentrate on the nexus between data science and mobile technologies. The applications, difficulties, and developments in the subject of mobile data science are probably covered by the writers. It includes a number of things, including machine learning, data analysis, and the use of data science methods designed especially for mobile platforms. The Digital Object Identifier (DOI) that has been supplied is linked to scholarly publications to provide a reliable connection.

Advantage : The functioning of mobile apps is improved by the integration of data science.

Disadvantage: Privacy of user data is an issue raised by mobile data science.

Survey 5 -

Title : "Black-box" systems

Journal: BioGecko Vol 12 Spl Iss 01 2023 ISSN NO: 2230-5807

Methodology: It claims that because most AI-based systems are "black-box" systems, practical implementation of AI lags and falls short of its potential.

Advantage:

- Black-box systems are excellent at managing complicated tasks on their own.

Disadvantage:

- Restricted openness on the decision-making procedure.

Survey 6 -

Title : “Cloud-Based Smart Contract Analysis in FinTech Using IoT-Integrated Federated Learning in Intrusion Detection”

Journal: Educational and Research Institute Based on the Data Management for Internet-of-Things) Chennai 600095, India

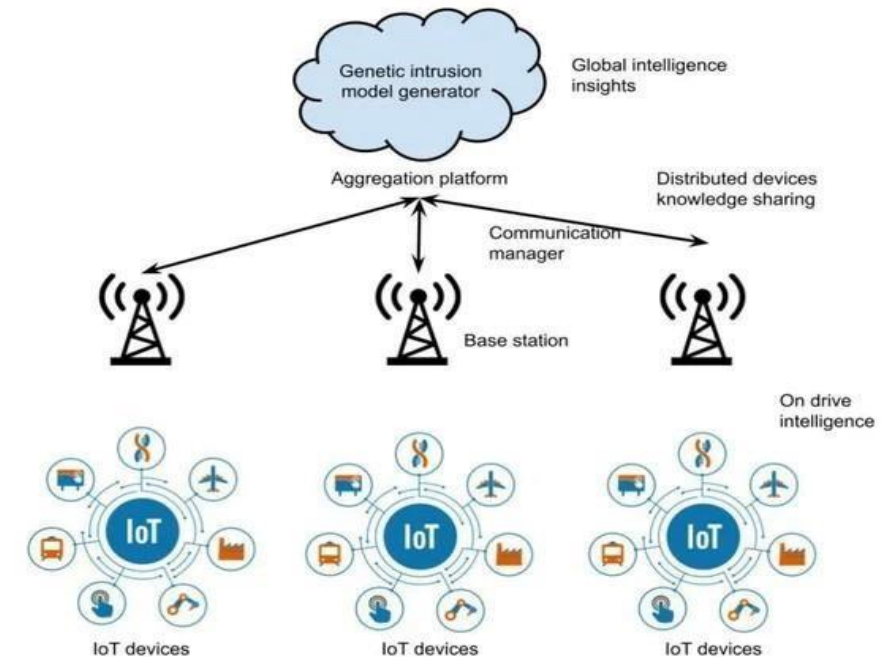
Methodology: The integration of many technologies, such as cloud computing, smart contracts, federated learning, and the Internet of Things (IoT), for intrusion detection. Cloud-hosted smart contracts that are automated and self-executing are the subject of cloud-based smart contract study.

Advantages :

- Intrusion detection security is improved via federated learning integration.
- Smart contracts housed in the cloud are self-executing and automated.

Disadvantages:

- It is difficult to integrate IoT, federated learning, cloud computing, and smart contracts.
- Security precautions could not always allay worries.
- Intrusion detection in real time may have latency problems.



Survey 7 -

Title : "Complexity of the Analysis of Financial Cloud Based on Fuzzy Theory in the Wisdom of Sustainable Urban Development"

Journal: Complexity Problems Handled by Advanced Computer Simulation Technology in Smart Cities 2021

Methodology: The Fuzzy theory advises that financial cloud analysis take uncertainties or imprecise information into account. Furthermore, an emphasis on the social and environmental dimensions of financial technology is shown by the use of these principles within the framework of sustainable urban development.

Advantages : Financial cloud analysis uncertainties are successfully handled using fuzzy theory. Fuzzy theory is used to provide a more thorough study.

Disadvantages: Fuzzy theory implementation might result in more complicated computations.

Survey 8-

Title : "Forecasting in financial accounting with artificial intelligence – A systematic literature review and future research agenda"

Journal: A Life in the Day, Academia Revista Latinoamericana de Administración, Academic and Library Computing Advances in Mental Health and Intellectual Disabilities & Advances in Mental Health and Learning Disabilities

Methodology: The writers could look at previous studies to offer information about how AI methods are currently applied to financial accounting forecasting. This might use techniques like neural networks, machine learning algorithms, or other AI-driven strategies.

Advantage : The accuracy of financial accounting forecasting is improved by AI techniques.

Disadvantage: The volume and quality of data that is available to AI techniques is crucial.

Swot Analysis

❖ **Strengths:**

- **Accessibility and Convenience:** The app's cloud-based nature allows users to access their financial data from anywhere with an internet connection, offering unmatched convenience.
- **Real-Time Updates:** Users can receive real-time updates on their expenses, enabling them to make immediate financial decisions and maintain accurate records.
- **Automation:** Automation features reduce manual data entry, improving efficiency and accuracy in expense tracking.
- **Data Security:** Cloud-based systems can offer robust security measures, such as data encryption and authentication, enhancing data security.

❖ **Weakness:**

- **Data Privacy Concerns:** Users may have concerns about the privacy and security of their financial data in a cloud-based app.
- **Learning Curve:** Users who are not tech-savvy may find the app's features and functions challenging to understand.
- **Internet Dependency:** Users require a consistent internet connection for full functionality, which can be a limitation in areas with poor connectivity.

❖ Opportunities:

- **Market Growth:** The increasing digitization of finance and the need for better expense management create a substantial market opportunity.
- **Integration with Financial Services:** Integrating the app with banking and financial services could enhance its utility and value.
- **International Expansion:** Expanding the app's services to international markets can lead to significant growth and user acquisition.

❖ Trusts:

- **Competition:** The market for expense tracking apps is highly competitive, with established players and new entrants constantly vying for market share.
- **Regulatory Changes:** Evolving financial regulations could impact the app's data handling and security practices.
- **Data Breaches:** The app could be vulnerable to data breaches, potentially leading to data loss or privacy concerns.
- **Economic Downturn:** Economic downturns may reduce the demand for such apps as individuals and businesses cut expenses.

Objectives

❖ Main Objective

To make an expense tracker app which is Cloud based using AI features to empower individuals and organizations with the tools they need to harness the power of financial data and provide users with real-time access to comprehensive financial data analysis.

❖ Sub Objective

With its smooth integration with financial institutions, real-time insights, and machine learning-based trend prediction, FinVista hopes to completely transform the financial analytics space. The program places a high value on intelligent spending classification, customisable reporting, and easy-to-use navigation & provides a complete solution for effective, safe, and perceptive spending tracking with its strong security measures, cross-platform accessibility, and collaborative features.

Methodology

The methodology would normally include a number of crucial phases in order to create a cloud-based, intelligent financial analytical app with AI capabilities. Here's a overview of the workflow of the app :-

- ❖ **Project and Stakeholder Definitions:** Assign stakeholders, goals, and objectives to the project.
- ❖ **Analysis of Requirements:** Examine the app's business and user needs.
- ❖ **Data Collection and Integration:** Gather and combine financial information from several sources.
- ❖ **AI Model Creation:** Select AI systems and develop financial analysis models.
- ❖ **Configuring Cloud Infrastructure:** Choose and set up a cloud hosting platform. UX/UI Design and
- ❖ **Development:** Create components for the app and design an easy-to-use interface.
- ❖ **Implementing and Testing Security:** Put security measures in place and carry out exhaustive testing.
- ❖ **Implementation, Education, and Ongoing Enhancement:** Launch the application, teach users, and iterate to keep improving it.

Reference Software Model

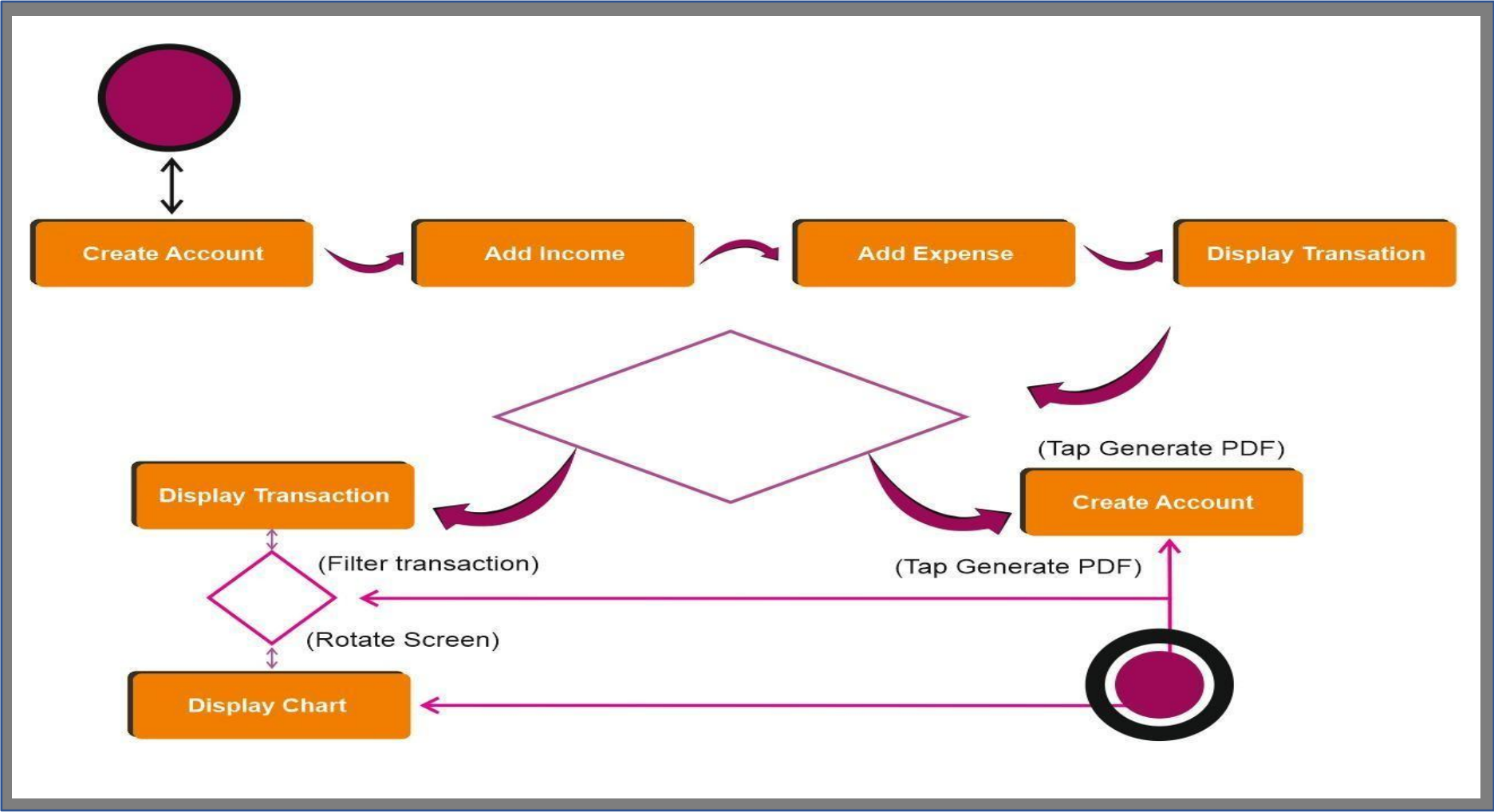


Fig : 1 Software model of the mobile application: FinVista

Steps

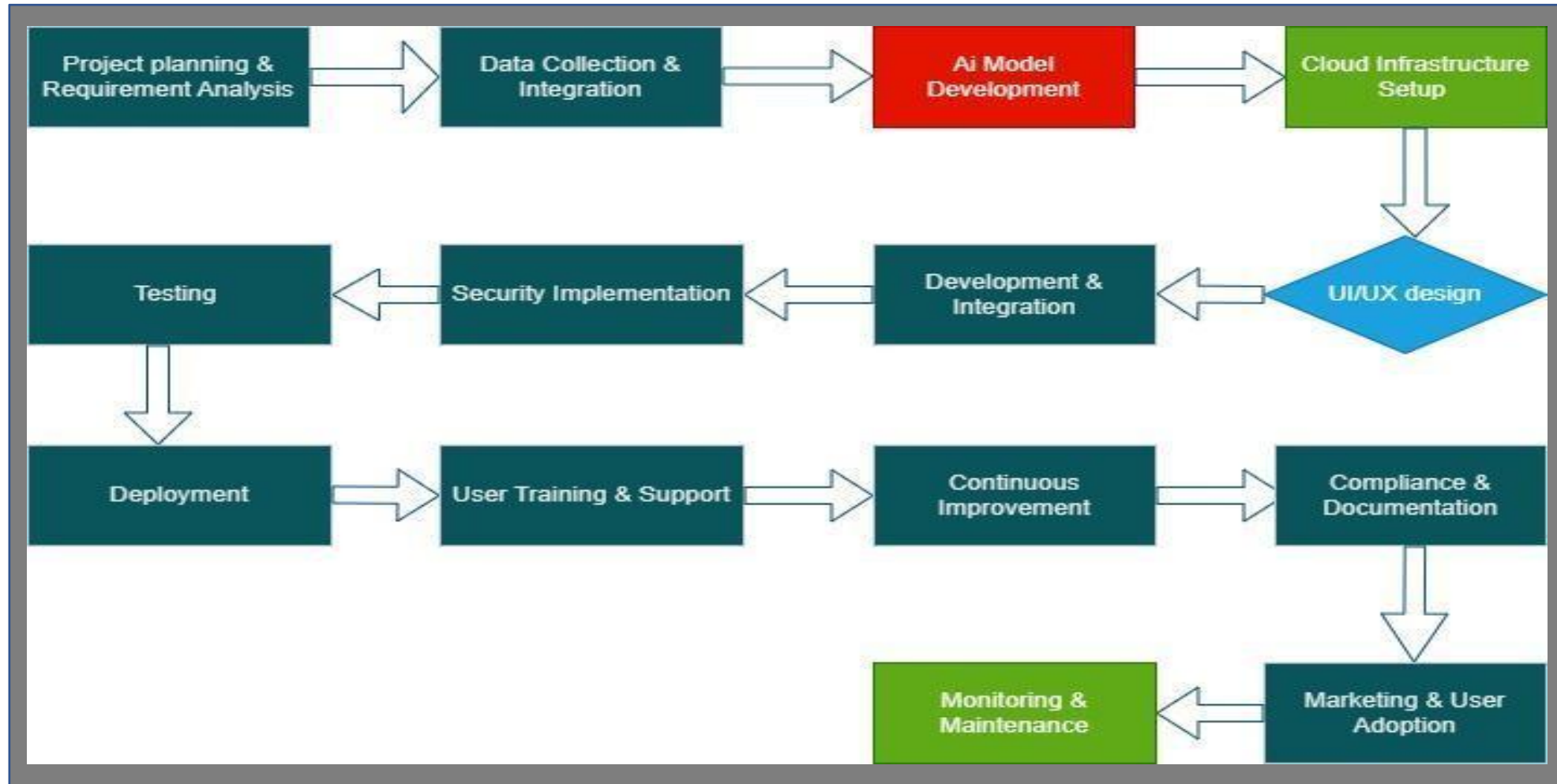
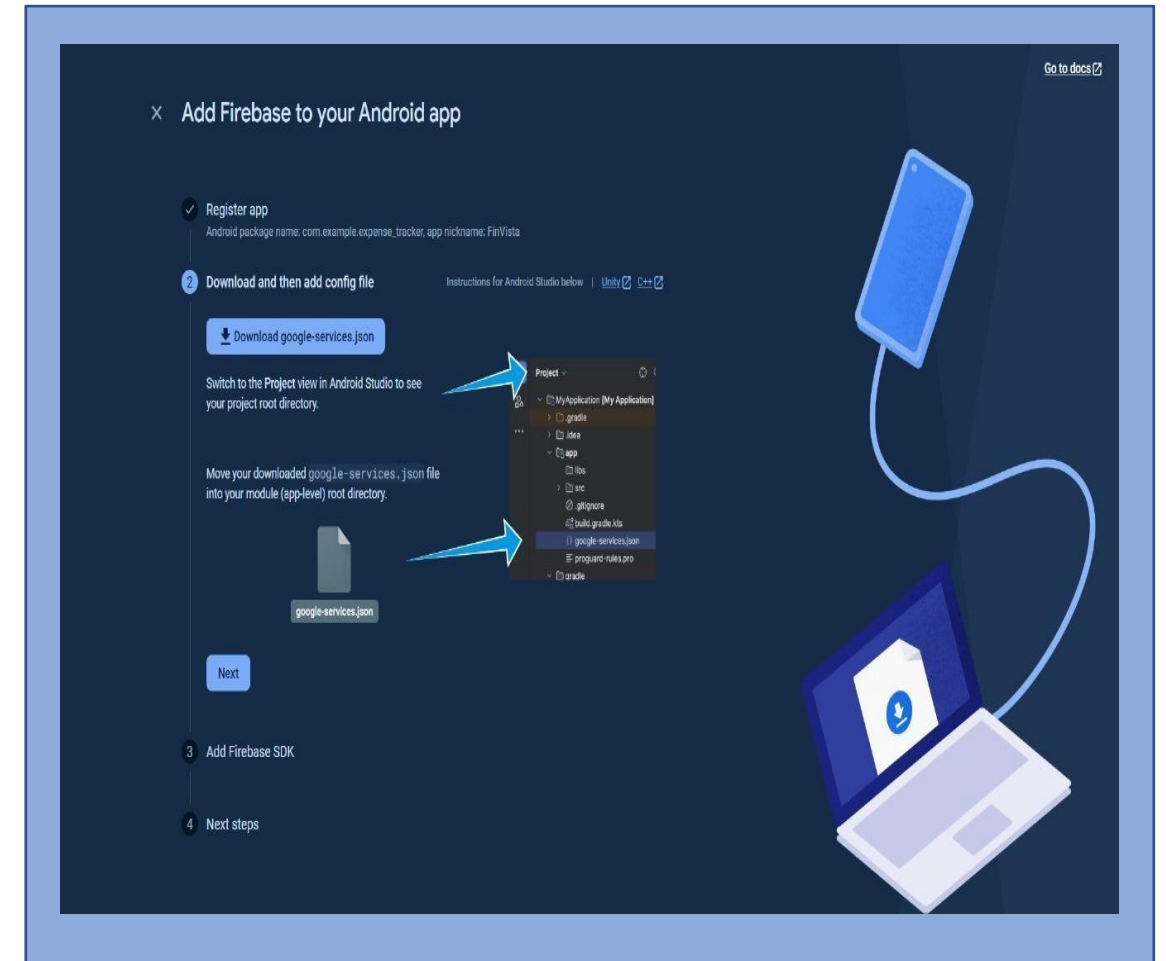
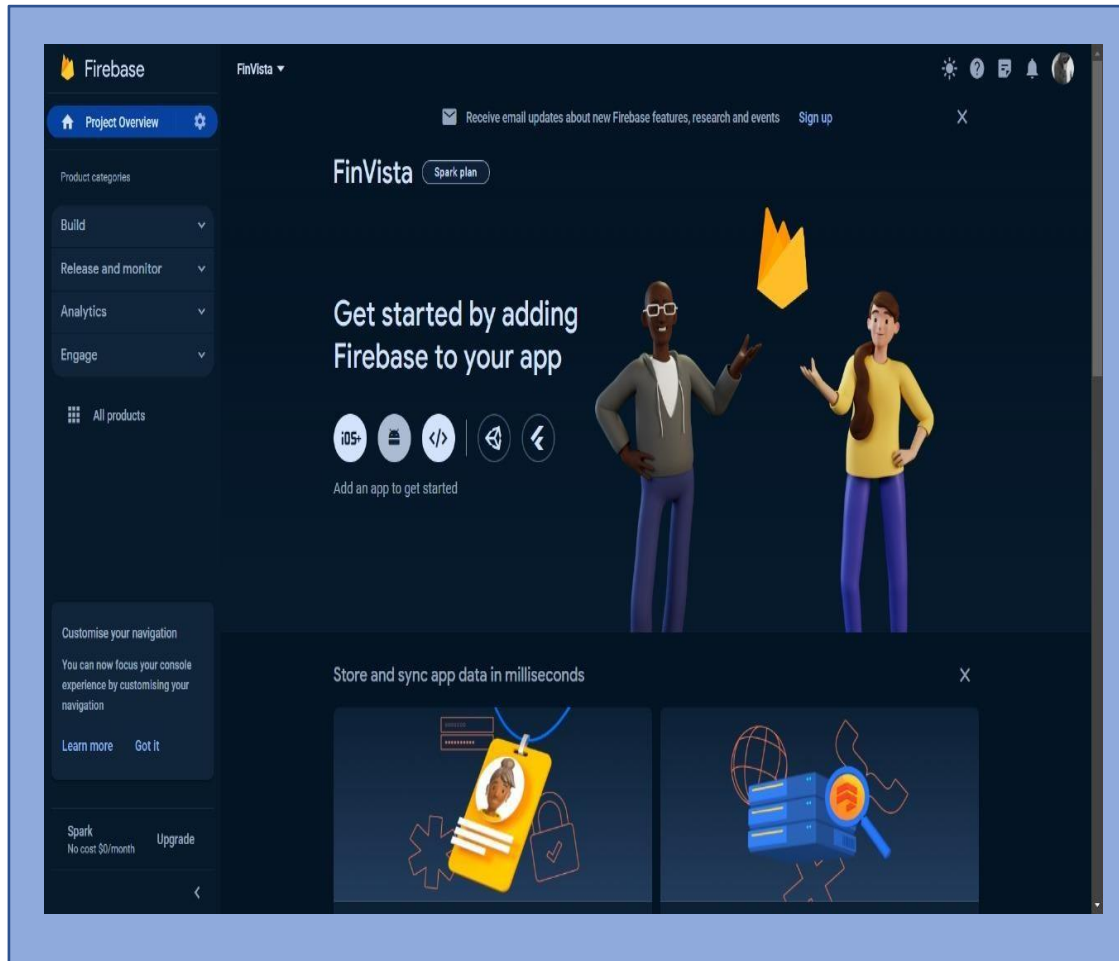


Fig :2 Workflow of the mobile application:FinVista

Working Model

FinVista creation overview :-



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Requirement Analysis (SRS) Link :

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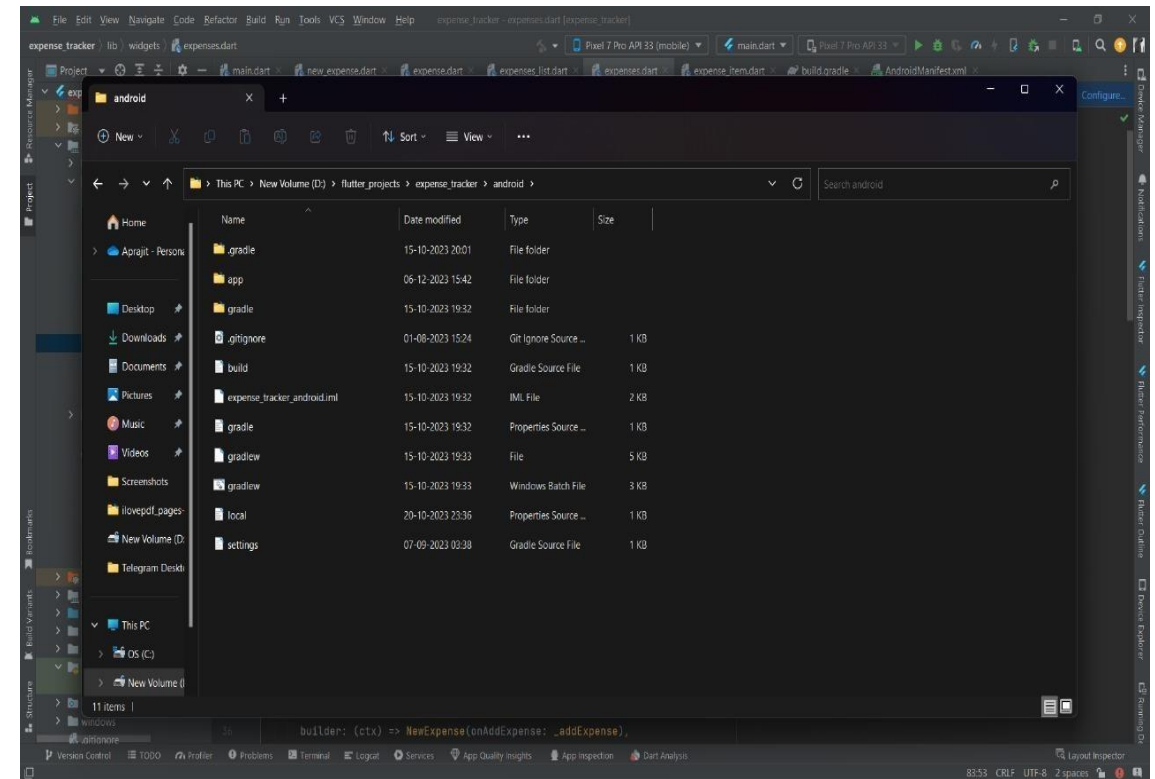
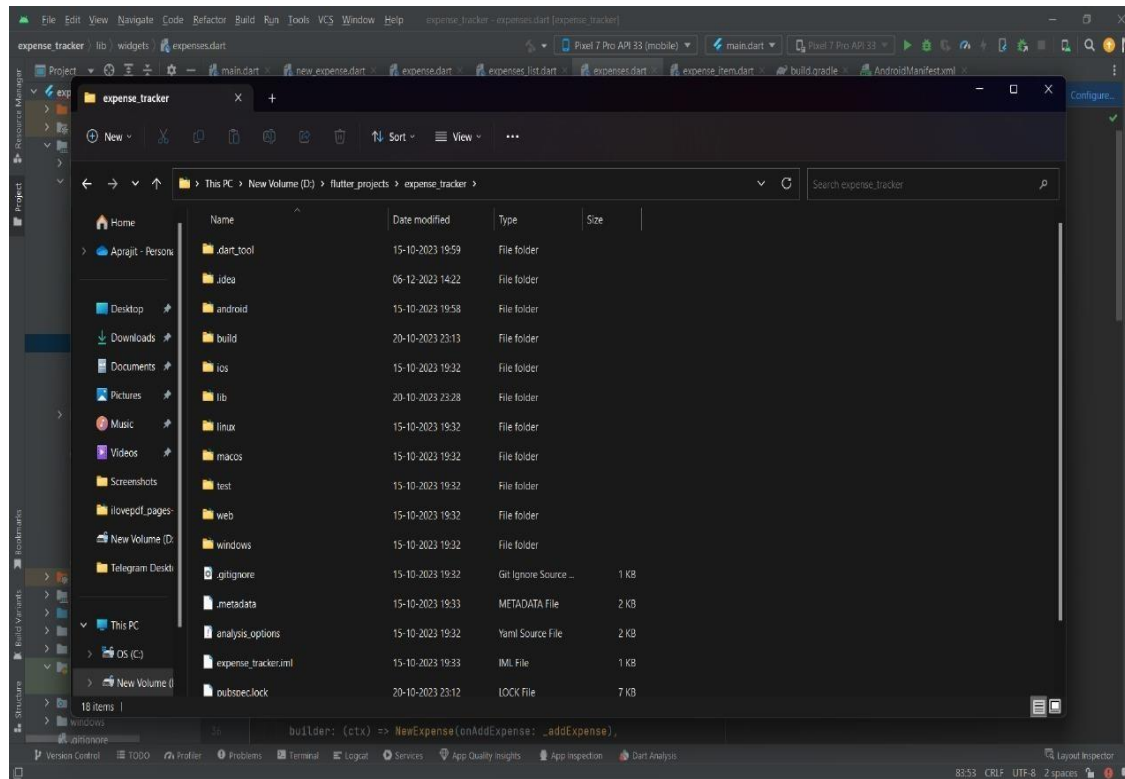
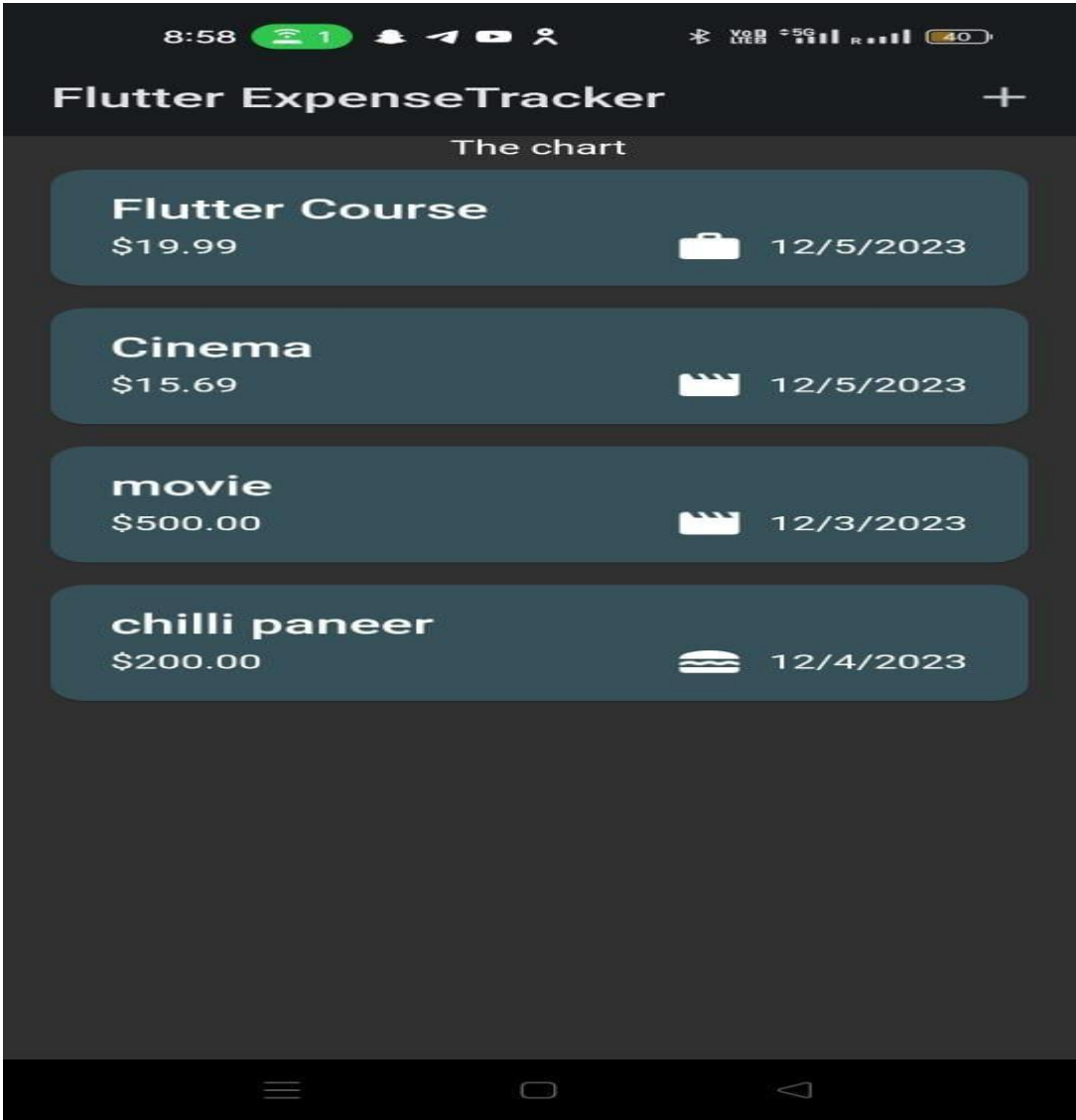


Fig 3: Creation of the files arrangement of the FinVista App

Results

- Satisfying user interaction and feedback. [?]
- System performance indicators were demonstrated, guaranteeing scalability and responsiveness. [?]
- Exact results of financial analysis presented in case studies. [?]
- The efficient operation of combined artificial intelligence models with possible improvements noted. [?]
- Integrating secure data from several financial sources. [?]
- Metrics measuring user happiness show a favorable reaction.

Results of FinVista App Dahboard in Mobile



Results & Graphs after integration of AI Features of FinVista App

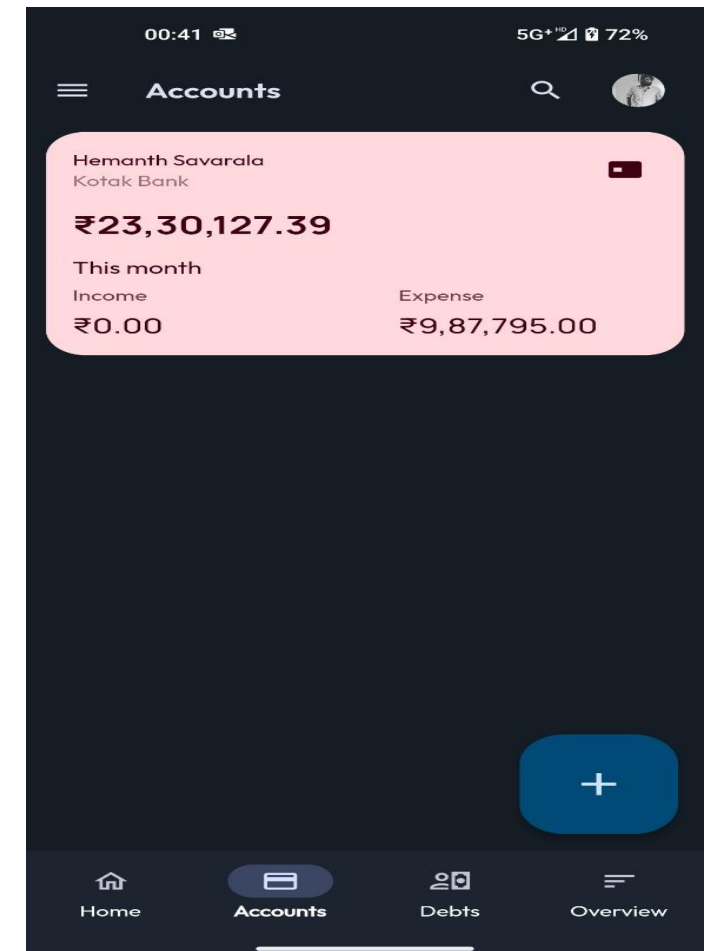
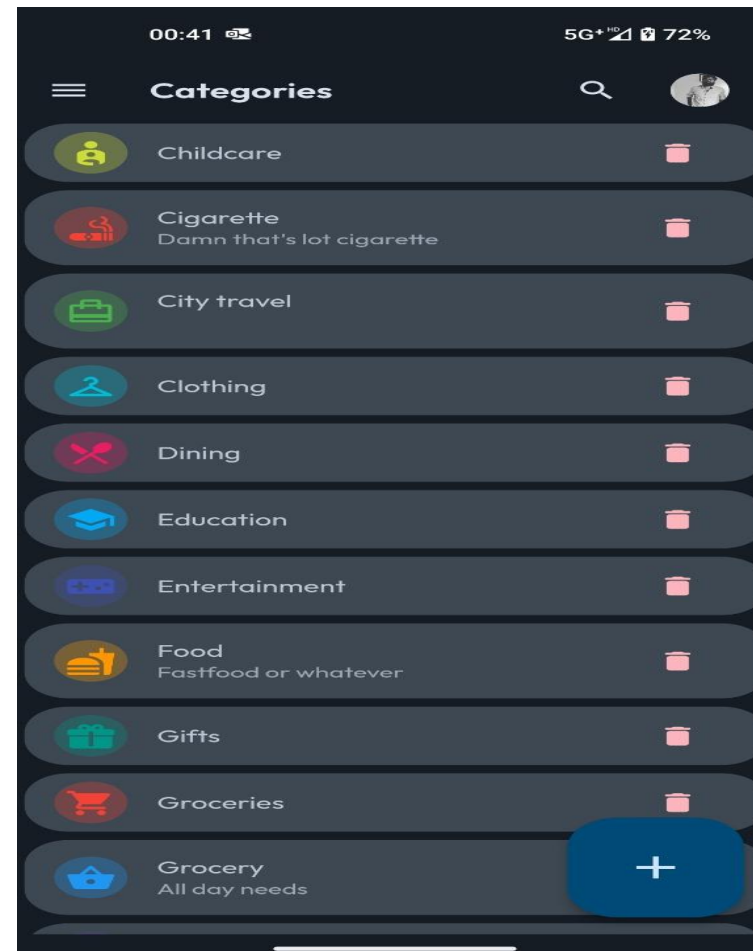
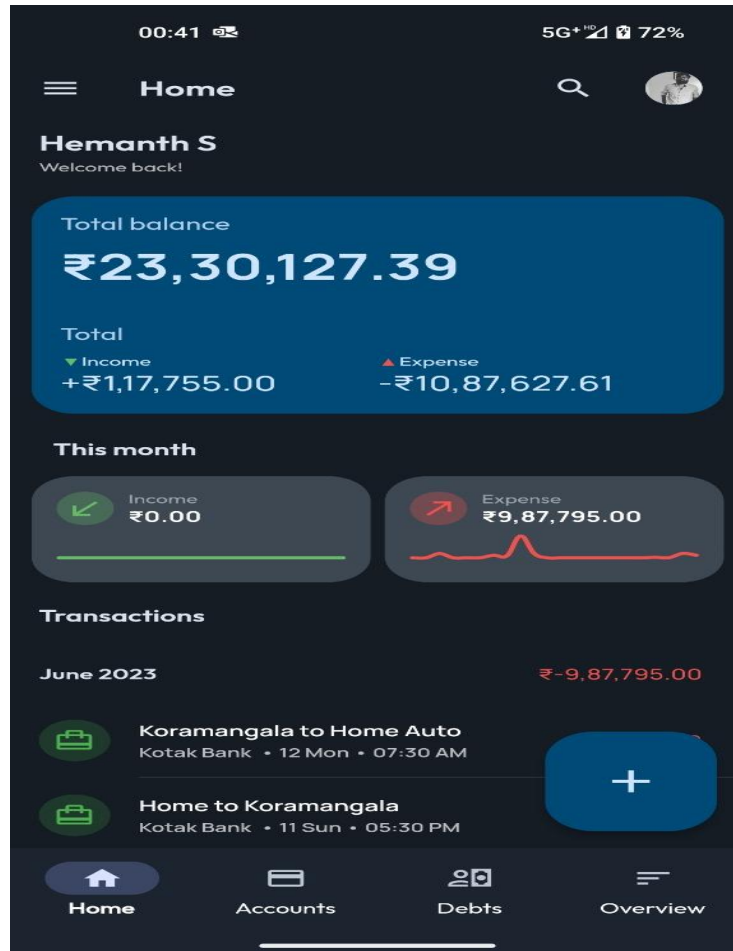


Fig 4: Showing all the outputs after integrating AI Features in FinVista App in phone

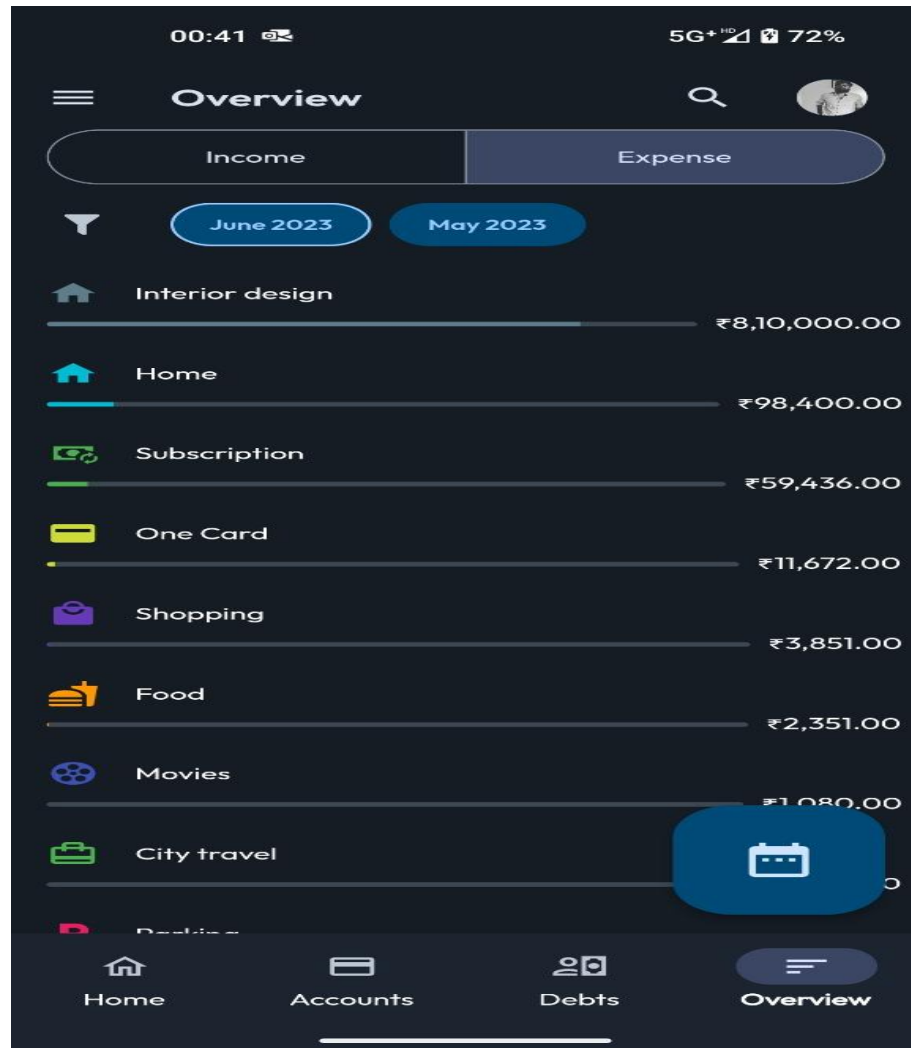


Fig 5: Overview of the app how much spent in any months

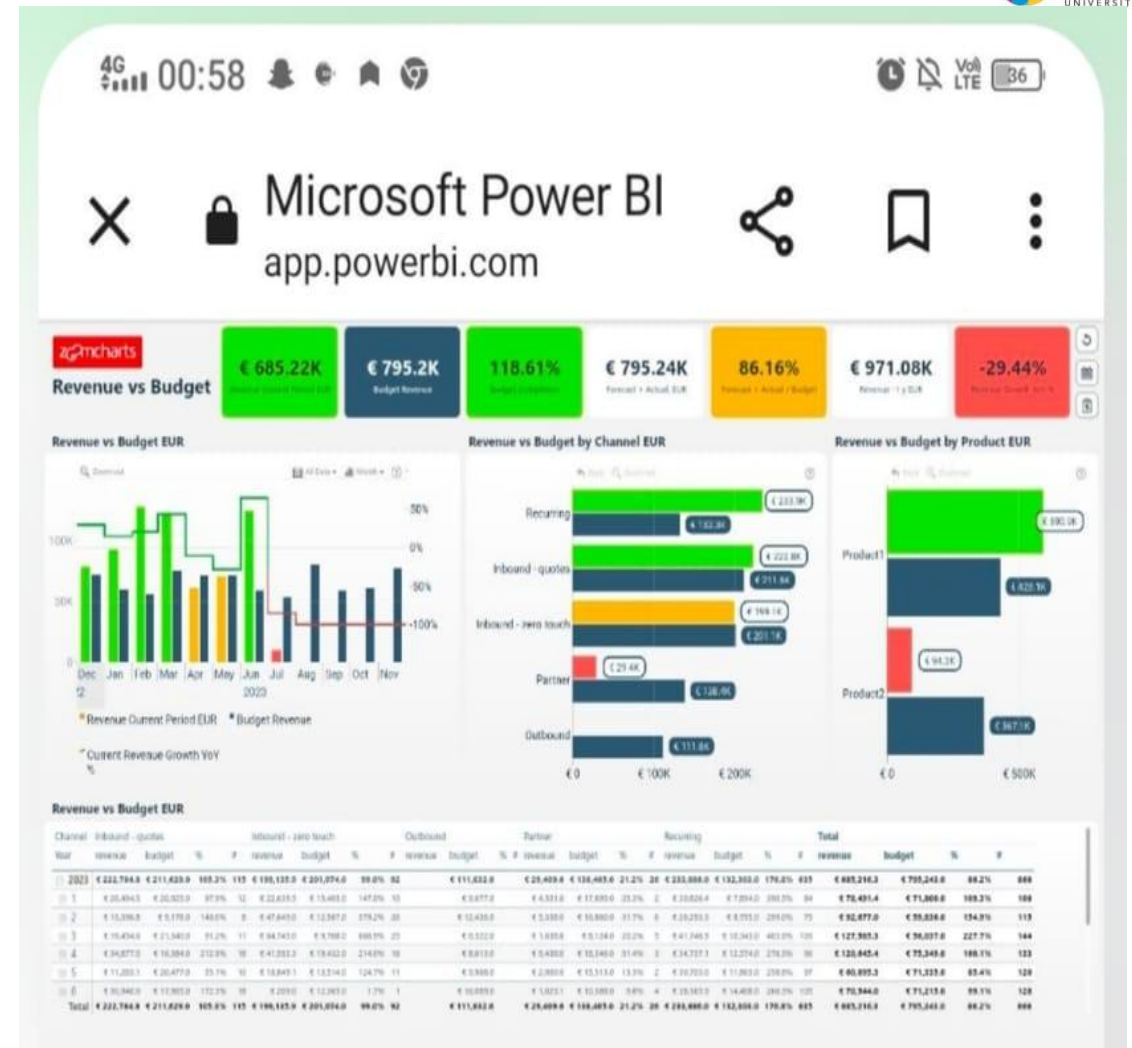


Fig 6: Overview of the dashboard of the app using Power BI

Comparative Studies

Comparative Study

Criteria	Conventional Expense App	AI Integrated Expense App
Features And Functionality	Enumerate the typical features (budgeting, category monitoring, and expense input).	Emphasize other AI-powered characteristics (predictive analysis, automated classification).
User Experience	Standard Cost App: Evaluate the user interface and simplicity of use & consumer satisfaction feedback.	Analyze user experience using features powered by AI. Examine user comments on the AI integration.
Accuracy & Efficiency	Analyze how accurate the budget tracking and spending classification. Discuss about any necessary manual interventions.	Analyzing the accuracy of AI predictions & Visualizations. Analyze the AI automation may save time and increase efficiency.
Cost & Accessibility	High cost in standard app .	Less costly in Ai integrated app
Results	Normal options and time taken work are done here. Here are very normal dashboard & no visualizations of your budget,.	But in case of AI it has so many options for tracking and give security and visualizations of your daily budget and voice talking assistant.

Conclusion

The Cloud-Based Intelligent Financial Analytic App has shown promise in satisfying user requirements and offering insightful data. Resolving issues and suggesting improvements for the future guarantees ongoing development and market applicability. Because of its beneficial effects on user happiness and financial statistics, the app is regarded as a useful resource in the field. Although Cloud Based AI cannot solve all your organization's problems, it has the potential to completely change how business is done. It affects every sector, from manufacturing to finance, bringing about never before seen increases in efficiency. As more industries adopt and start experimenting with this technology, newer applications will be invented. Cloud Based AI will bring a change even more widespread and sweeping than the introduction of computing devices. We are well on our way to tapping into this enormous potential, and as a result, the future holds better decision-making potential and faster.

Future Scope

Future development of the Cloud-Based Intelligent Financial Analytic App will focus on the following five areas:

Upcoming Projects:-

- 1. Advanced AI Models:** To improve the precision and functionality of AI-driven financial analysis, investigate cutting-edge machine learning approaches. Examine how advanced algorithms for trend analysis and predictive modeling may be integrated.
- 2. Extended Data Integration:** Increase the scope of data integration by including financial sources such foreign markets, investment portfolios, and newly developed financial instruments. Investigate joint ventures with banks to provide safe and easy data connectivity.
- 3. Personalization and Customization:** Include options that let users adjust the app to suit their own reporting needs, financial objectives, and tastes. Investigate machine learning for customized financial advice and adaptable user interfaces.
- 4. Integrating Blockchain Technology for Security:** Examine how blockchain technology may be used to improve the security and transparency of data and financial activities. Investigate decentralized finance (DeFi) ideas to get more financial services and security.

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Thank You