

Fin-Wise Companion: A Comprehensive Personal Finance and Portfolio Management System

Prof. Shruti Tilwant, Yash Bhujbal, Siddhi Bhongale, Shreyash Jogi, Aarya Ghangurde
Department of Computer Science and Engineering, MIT ADT University, Pune, India

Abstract—Recent advancements in digital financial technologies have transformed how individuals manage their personal finances and investment portfolios. However, existing systems often focus on isolated functionalities such as budgeting or investment tracking, lacking an integrated approach. This paper presents Fin-Wise Companion, a comprehensive personal finance and portfolio management system that integrates expense tracking, budgeting, and investment analysis. The system leverages data analytics and visualization to provide insights into financial behavior and improve decision-making. Experimental results show improved financial awareness and efficient portfolio monitoring.

Index Terms—Personal Finance, Portfolio Management, Financial Analytics, Budgeting, Investment Tracking

I. INTRODUCTION

A. Background

Personal finance management involves tracking income, expenses, savings, and investments to ensure financial stability and long-term wealth creation. Traditionally, individuals relied on manual methods such as notebooks or spreadsheets for maintaining financial records. While these methods provide basic functionality, they are often inefficient, time-consuming, and prone to human error. Additionally, they lack automation, real-time updates, and intelligent insights, which are essential in today's fast-paced financial environment.

With the rapid advancement of digital technologies, various financial applications have emerged to simplify financial management. These tools offer features such as expense tracking, budgeting, and investment monitoring. However, most existing solutions are fragmented, focusing either on personal finance management or portfolio tracking rather than providing a unified platform. As a result, users are required to switch between multiple applications, leading to inconvenience and reduced efficiency.

Furthermore, the increasing complexity of financial instruments such as stocks, mutual funds, and cryptocurrencies has made it challenging for

individuals to effectively manage their portfolios. Users often lack the necessary analytical tools and financial knowledge to interpret data and make informed decisions. This creates a need for an integrated system that not only tracks financial data but also provides meaningful insights and recommendations.

To address these challenges, the proposed system, Fin-Wise Companion, aims to provide a comprehensive and user-friendly solution that combines personal finance management with portfolio analysis. By leveraging data analytics and visualization techniques, the system enhances financial awareness, improves budgeting efficiency, and supports better investment decision-making.

B. Problem Statement

Despite the availability of various digital financial tools, users continue to face significant challenges in effectively managing their personal finances and investment portfolios. One of the primary issues is the fragmentation of financial tools, where budgeting applications, expense trackers, and investment platforms operate independently without seamless integration. This forces users to switch between multiple systems, leading to inefficiencies and data inconsistency.

Another major challenge is the lack of real-time insights into financial activities. Many existing systems provide only static or delayed information, making it difficult for users to monitor their spending patterns and respond promptly to financial changes. Additionally, investment tracking remains complex due to the dynamic nature of financial markets, where users often struggle to monitor portfolio performance, calculate returns, and assess risks accurately.

Furthermore, most current solutions lack personalization and intelligent recommendations. They fail to adapt to individual user behavior, financial goals, and spending habits, limiting their effectiveness in guiding users toward better financial decisions. As a result, users often experience poor

financial planning, reduced savings, and suboptimal investment outcomes.

Therefore, there is a critical need for a unified, intelligent, and user-centric system that integrates personal finance management with portfolio tracking while providing real-time analytics and personalized insights.

C. Research Objectives

The primary objective of this research is to design and develop FinWise Companion, an integrated system that simplifies and enhances personal financial management. The specific objectives are as follows:

- 1) To develop a unified platform that integrates expense tracking, budgeting, and portfolio management into a single system.
- 2) To enable real-time tracking and updating of financial data, including income, expenses, and investment activities.
- 3) To analyze user financial behavior and generate meaningful insights such as spending patterns, savings trends, and budget utilization.
- 4) To design interactive and user-friendly visualizations, including charts and dashboards, for better understanding of financial data.
- 5) To implement a recommendation system that provides personalized suggestions for budgeting, saving, and investment decisions.
- 6) To enhance financial decision-making by providing accurate, data-driven insights and performance analysis of investment portfolios.
- 7) To improve overall financial awareness and promote disciplined financial habits among users.

D. Contributions

The major contributions of this research are summarized as follows:

- **Development of an Integrated Financial Platform:** We propose FinWise Companion, a unified system that seamlessly integrates personal finance management and portfolio tracking. Unlike existing fragmented solutions, the system provides a centralized platform for managing income, expenses, savings, and investments.
- **Data-Driven Financial Insights:** The system incorporates analytical techniques to process user financial data and generate meaningful insights, such as spending patterns, savings trends, and budget utilization. These insights

enable users to better understand their financial behavior.

- **User-Centric Interface Design:** A simple and intuitive user interface is designed to ensure accessibility for users with varying levels of financial knowledge. The system focuses on ease of use, making financial management more efficient and less complex.
- **Interactive Visualization Dashboards:** The platform includes dynamic visualizations such as pie charts, bar graphs, and trend lines to represent financial data. These dashboards improve interpretability and allow users to quickly analyze their financial status.
- **Personalized Recommendation System:** A recommendation engine is implemented to provide customized suggestions based on user behavior. This includes budget optimization strategies, expense reduction tips, and investment guidance tailored to individual financial goals.
- **Enhanced Financial Decision-Making:** By combining real-time data tracking with analytical insights, the system supports informed decision-making. Users can evaluate their financial performance and make better choices regarding spending and investments.
- **Scalable and Extensible Architecture:** The system is designed with modular components, allowing future integration of advanced features such as AI-based predictions, automated bank data synchronization, and risk assessment models.

II. MANUSCRIPT PREPARATION

The manuscript for FinWise Companion: A Personal Finance and Portfolio Management System has been prepared by following standard research paper formatting guidelines to maintain clarity, readability, and a uniform structure throughout the document. The entire paper is written in English and has been carefully reviewed to remove any grammatical or typing errors, ensuring that the content is easy to understand.

All the text in the document is formatted using Times New Roman font to keep consistency in presentation. For better readability, especially in technical sections such as code or structured data representation, simple and clear formatting practices have been followed. The focus has been kept on making the content clean and well-organized rather than overly complex.

No additional elements such as running headers, page numbers, or author details have been manually added in the header or footer. These are generally handled during the final submission or publication process. Proper margins, spacing, and alignment have been maintained across all sections to ensure that the document looks neat and professional.

By following these formatting practices, the paper presents the FinWise Companion system in a clear and structured manner, making it easier for readers to understand the concepts and overall implementation without any confusion.

A. Page Setup

The manuscript for FinWise Companion: A Personal Finance and Portfolio Management System has been prepared using the standard A4 paper size to ensure compatibility with common academic submission formats. Basic formatting guidelines have been followed to maintain a clean and consistent layout throughout the document.

Appropriate margin settings and alignment have been used so that the content appears well-structured and easy to read. The text is properly arranged from the top of the page, and care has been taken to keep spacing uniform across all sections.

No manual headers, footers, or page numbers have been added, as these are usually handled automatically during the final submission or publication process. All content is kept within the defined page boundaries to avoid any formatting issues.

Overall, the page setup is designed to keep the document simple, organized, and professional, making it easier for readers to go through the content without any distractions.

B. First Section

The development of the FinWise Companion system focuses on helping users manage their personal finances in a simple and organized way through a single platform. Instead of using multiple applications for expenses, budgeting, and investments, this system brings all financial activities together, making it easier for users to track and understand their financial status.

The system collects user data such as income, expenses, and investment details, and processes it to provide meaningful insights. Basic analysis techniques are used to identify spending patterns, monitor savings, and evaluate portfolio performance. The application also presents this information using

simple charts and summaries, allowing users to clearly visualize their financial behavior.

To improve usability, the system includes features like expense categorization, budget tracking, and portfolio monitoring. It also provides basic financial suggestions based on user data, helping individuals make better financial decisions. The overall design focuses on simplicity, ease of use, and clarity, making it suitable for students and young professionals who want to improve their financial planning and discipline.

By combining financial tracking, analysis, and visualization in one place, FinWise Companion offers a practical and user-friendly solution for managing personal finances and supporting long-term financial stability.

C. Title

By combining financial tracking, analysis, and visualization in one place, FinWise Companion offers a practical and user-friendly solution for managing personal finances and supporting long-term financial stability.

D. Subtitle

A Simple, Intelligent, and Integrated Approach for Better Financial Management and Decision-Making.

E. Author

Prof. Shruti Tilwant, Yash Bhujbal, Shreyash Jogi, Aarya Ghangurde, Siddhi Bhongale.

F. Affiliations

Department of Computer Science MIT University
Pune, Maharashtra, India

Emails: shruti.tilwant@mituniversity.edu.in

yashbhujbal20042005@gmail.com

siddhik2207@gmail.com jogishreyash@gmail.com

aaryaghangurde2022@gmail.com

III. RELATED WORK

A. Traditional Systems

Traditional financial management systems primarily relied on manual methods such as handwritten records and spreadsheet-based tools. While these approaches provided basic functionality for tracking income and expenses, they lacked automation, scalability, and real-time processing capabilities. Additionally, manual systems are highly prone to human error, data inconsistency, and limited

analytical support. The absence of intelligent features and visualization tools further restricts users from gaining meaningful insights into their financial behavior.

B. Budgeting Applications

Modern budgeting applications have significantly improved personal finance management by enabling users to track daily expenses and categorize spending. These systems often provide predefined categories such as food, transportation, and utilities, helping users understand their expenditure patterns. However, most budgeting tools focus only on expense tracking and basic budget allocation, without integrating investment tracking or long-term financial planning. As a result, they fail to provide a holistic view of a user's financial health.

C. Portfolio Management Systems

Portfolio management systems are designed to track and analyze investments such as stocks, mutual funds, and other financial assets. These platforms provide features like return calculation, risk assessment, and portfolio diversification analysis. However, they operate independently of personal finance data and do not consider daily spending behavior or budgeting constraints. This separation limits their effectiveness in supporting comprehensive financial decision-making.

Integrated Financial Systems

Recent research has explored integrated financial systems that combine budgeting and investment tracking into a single platform. These systems aim to provide a more complete financial overview by linking income, expenses, and investments. While they improve usability and data centralization, many of them still lack advanced analytics, real-time processing, and personalized recommendations. Additionally, user interface complexity and limited scalability remain key challenges.

Research Gap

Despite advancements in financial technologies, there remains a significant gap in developing a fully integrated, intelligent, and user-friendly system. Existing solutions lack seamless integration, real-time insights, and adaptive recommendation mechanisms. Therefore, there is a need for a comprehensive platform like FinWise Companion that combines financial tracking, portfolio management, data analytics, and visualization to

enhance user experience and financial decision-making.

D. Portfolio Systems

Portfolio management systems are primarily designed to track and analyze financial investments such as stocks, mutual funds, bonds, and other assets. These systems provide functionalities like monitoring portfolio performance, calculating returns on investment, and evaluating risk through diversification metrics. Advanced platforms may also include tools for technical analysis and market trend visualization.

However, these systems largely focus only on investment-related activities and do not consider the broader financial context of the user. They typically operate independently of personal income, expenses, and budgeting constraints. As a result, users may make investment decisions without fully understanding their overall financial capacity or cash flow situation. This lack of integration limits the effectiveness of portfolio systems in supporting comprehensive financial planning and long-term wealth management.

E. Integrated Systems

Integrated financial systems attempt to combine personal finance management and portfolio tracking into a single platform, providing users with a more holistic view of their financial status. These systems aim to centralize financial data, reduce fragmentation, and improve usability by offering multiple features within one application.

Despite these advantages, most existing integrated systems still lack personalization and intelligence. They often provide generic insights and recommendations that are not tailored to individual user behavior, financial goals, or risk tolerance. Additionally, many systems rely on static rules rather than adaptive algorithms, limiting their ability to respond dynamically to changing financial conditions. The absence of advanced analytics, machine learning-based recommendations, and real-time decision support reduces their potential to significantly improve financial outcomes.

Therefore, there is a need for an advanced integrated system like FinWise Companion that not only consolidates financial data but also incorporates intelligent analytics and personalized recommendations to enhance user experience and decision-making.

as expense categorization and portfolio calculations, and ensures secure data handling.

- **Database:** A structured database is used to store user financial data, including income, expenses, and investment details. The database is designed to support efficient querying, data integrity, and scalability. Security mechanisms are implemented to protect sensitive financial information.

- **Analytics Engine:** The analytics engine is a key component that processes financial data to generate insights. It performs operations such as spending pattern analysis, budget tracking, savings estimation, and portfolio performance evaluation. This module transforms raw data into meaningful information for users.

The modular architecture ensures that each component operates independently while maintaining seamless integration, enabling efficient system performance and future extensibility.

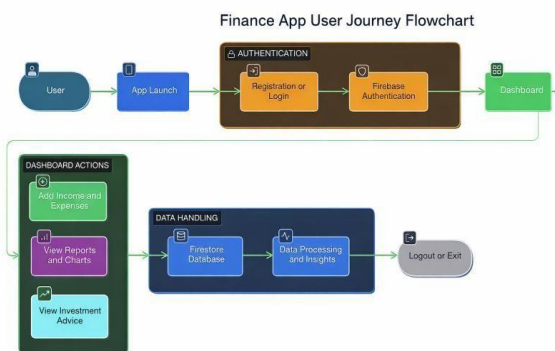


Figure 1:Block diagram of the model .

B. Data Collection

The effectiveness of the FinWise Companion system depends on accurate and structured data collection. The system gathers user financial data through manual input and can be extended to support automated data integration in future versions.

Income Data: Includes salary, business earnings, and other sources of income. This data is used to calculate total earnings and determine budget limits.

Expense Data: Captures daily expenditures across various categories such as food, transportation, utilities, and entertainment. The system categorizes expenses to analyze spending patterns and identify unnecessary costs.

Investment Data: Includes details of financial assets such as stocks, mutual funds, and savings instruments. This data is used to track portfolio performance, calculate returns, and assess risk levels. Collected data is preprocessed and organized into structured

formats for efficient analysis. This enables the system to generate accurate insights, support visualization, and provide meaningful recommendations to users.

IV.METHODOLOGY

A. System Architecture

The FinWise Companion system is designed using a modular and scalable architecture to ensure efficient data processing, flexibility, and ease of future enhancements. The system consists of the following core components:

- **Frontend:** The frontend is responsible for user interaction and provides a responsive and intuitive interface. It allows users to input financial data, view dashboards, and access insights. Modern web technologies are used to ensure a seamless user experience across devices.
- **Backend:** The backend handles the business logic and communication between the frontend and the database. It processes user requests, performs computations such

C. Financial Analysis

The financial analysis module plays a crucial role in transforming raw financial data into meaningful insights that assist users in managing their finances effectively. This module performs multiple analytical operations:

- **Expense Categorization:** User expenses are automatically classified into predefined categories such as food, transportation, utilities, healthcare, and entertainment. This categorization helps in organizing financial data and enables users to clearly understand where their money is being spent.
- **Spending Analysis:** The system analyzes user spending patterns over time to identify trends and anomalies. It evaluates monthly and weekly expenditure behavior, highlighting areas of excessive spending. Comparative analysis is also performed to assess changes in spending habits across different time periods.
- **Savings Calculation:** Savings are calculated by subtracting total expenses from total income over a specific period. The system also computes savings ratios and budget utilization percentages to provide a clear picture of financial health. These metrics help users track their progress toward financial goals and encourage disciplined saving habits.

- **Budget Monitoring:** The module compares actual spending against predefined budgets and generates alerts when users exceed their limits. This feature helps in maintaining financial discipline and preventing overspending.

D. Portfolio Module

The portfolio management module enables users to efficiently manage and analyze their investments. It provides tools for tracking financial assets and evaluating their performance:

- **Investment Tracking:** The system allows users to record and monitor various investment instruments such as stocks, mutual funds, and fixed deposits. It maintains a detailed record of investment values, quantities, and purchase history.
- **Return Monitoring:** The module calculates returns on investments using standard financial metrics such as total return and percentage gain/loss. It tracks portfolio performance over time, allowing users to evaluate the effectiveness of their investment strategies.
- **Risk Analysis:** Basic risk analysis is performed by examining portfolio diversification and asset distribution. The system identifies concentration risks and suggests balancing strategies to reduce potential losses.
- **Portfolio Visualization:** Graphical representations such as pie charts and line graphs are used to display asset allocation and performance trends. These visualizations enhance user understanding and support better investment decisions.

E. Recommendation System

The recommendation system in FinWise Companion is designed to provide personalized financial guidance based on user data and behavioral patterns. It combines rule-based logic with data-driven insights to assist users in improving their financial decisions.

- **Budget Suggestions:** The system analyzes user income and spending patterns to recommend optimized budget allocations for different expense categories. It identifies overspending areas and suggests realistic budget limits to maintain financial balance.
- **Savings Tips:** Based on expenditure trends and savings ratios, the system provides actionable tips to increase savings. This includes identifying unnecessary expenses, suggesting

cost-cutting strategies, and encouraging disciplined financial habits such as setting monthly savings goals.

- **Investment Advice:** The system offers basic investment recommendations by analyzing portfolio performance and risk distribution. It suggests diversification strategies and highlights underperforming assets, helping users make informed investment decisions aligned with their financial goals.
- **Personalization Mechanism:** Recommendations are tailored to individual users by considering their income level, spending behavior, financial goals, and risk tolerance. This ensures that suggestions are relevant and effective.

F. Visualization

Visualization plays a vital role in simplifying complex financial data and improving user understanding. The FinWise Companion system incorporates interactive and dynamic graphical representations to present financial information effectively.

- **Pie Charts:** Used to represent the distribution of expenses across different categories. This helps users quickly identify major spending areas and understand their expenditure breakdown.
- **Bar Graphs:** Bar charts are used to compare income and expenses over time. They provide a clear visual comparison of financial inflows and outflows, enabling users to monitor budget performance.
- **Line Charts:** Line graphs are used to track trends such as savings growth and portfolio performance over time. These charts help users analyze long-term financial progress and investment returns.
- **Interactive Dashboards:** The system integrates all visual elements into a unified dashboard, allowing users to explore financial data interactively. Features such as filtering, time-range selection, and real-time updates enhance usability and decision-making.

G. Data Input Module

The Data Input Module is an important part of the FinWise Companion system, responsible for collecting and managing user financial data in a structured way. This module allows users to enter details such as income, daily expenses, and investment information through a simple and user-friendly interface.

The system ensures that all entered data is properly stored and organized for further processing. It supports different categories of expenses, making it easier for users to record and track their spending habits. By maintaining accurate records, the module helps in building a strong base for financial analysis. To maintain consistency, the input data is validated and formatted before being stored. This reduces errors such as incorrect entries or missing values. The system also ensures that the data is updated regularly so that users always have access to the latest financial information.

The collected data is then passed to the processing module, where it is analyzed to generate insights such as spending patterns, savings trends, and investment performance.

This makes the Data Input Module a crucial link between raw user data and meaningful financial analysis.

Designed for simplicity and reliability, this module ensures smooth data entry and accurate record keeping, which is essential for effective financial management and decision-making.

TABLE 1

Feature	Function
Expense Tracking	Records and categorizes user expenses
Budget Management	Monitors spending against predefined budgets
Savings Calculation	Computes savings and financial ratios
Investment Tracking	Maintains records of financial assets
Portfolio Analysis	Evaluates returns and risk levels
Recommendation System	Provides personalized financial suggestions
Data Visualization	Displays insights using charts and dashboards
Real-time Analysis	Processes data and updates insights dynamically
User Dashboard	Provides a centralized view of financial data

System Features and Their Functions

H. User Interface and Experience Module

The system is designed with a focus on simplicity and ease of use so that users can manage their finances

without difficulty. The interface provides clear navigation and organized layouts, allowing users to quickly access features such as expense entry, budgeting, and investment tracking. Input forms and dashboards are structured in a way that reduces confusion and improves efficiency.

The design also supports smooth interaction across different devices, ensuring that users can access the system conveniently.

K. Data Security and Privacy Module

Visual elements such as charts and summaries are presented in an easy-to-understand manner. By prioritizing usability and accessibility, this module improves user engagement and makes financial management more practical for everyday use.

L. Data Analysis Module

The Data Analysis Module is responsible for interpreting the financial data collected from the input module and converting it into meaningful information. It analyzes different types of data such as income, expenses, and investments, and organizes them into useful categories for better understanding. The module uses basic analytical techniques to calculate important financial values such as total spending, savings, and budget usage. It also studies spending patterns by comparing expenses across different categories and time periods. For investment data, it evaluates portfolio performance by calculating returns and tracking changes over time.

The analysis process works by identifying patterns in user data. For example, if a large portion of income is spent on a particular category, the system highlights it as a major expense area. Similarly, it identifies savings trends and helps users understand whether they are meeting their financial goals.

Once the analysis is completed, the results are prepared for further use in visualization and reporting modules. The system is designed to handle variations in user data by adjusting calculations dynamically, ensuring accurate and reliable results for different users.

Overall, this module plays a crucial role in transforming raw financial data into clear insights, helping users make better financial decisions and improve their financial management habits.

J. Visualization and Reporting Module

The Visualization and Reporting Module acts as the final output unit of the FinWise Companion system. It takes the analyzed financial data and presents it to

users in a clear and understandable format. This helps users easily interpret their financial condition and make better decisions.

Once the data is processed, it is displayed through various visual elements such as charts, graphs, and summaries. For example, expense data can be shown using pie charts to represent category-wise spending, while bar graphs can be used to compare income and expenses over time. Similarly, investment data is presented in a way that allows users to track portfolio performance and returns.

The system also provides different types of reports, including summary reports and detailed financial reports. These reports give users a complete view of their financial activities, helping them understand their spending habits and savings patterns more clearly.

The module ensures that all information is updated regularly so that users always have access to the latest data. It is designed to be simple and user-friendly, allowing even non-technical users to understand complex financial information.

By presenting data in a visual and structured way, this module improves user experience and supports better financial planning. It plays an important role in helping users gain financial awareness and maintain control over their personal finances.

The system includes a dedicated security component to protect sensitive financial information provided by users. Since the application deals with personal data such as income, expenses, and investments, it is important to maintain strict data protection measures. User authentication is implemented to ensure that only authorized individuals can access their accounts. In addition to access control, the system follows secure data handling practices to prevent unauthorized modifications or data leaks. Basic encryption techniques can be applied to safeguard stored information. Regular validation and secure storage mechanisms help maintain the accuracy and safety of the data. This module ensures that users can confidently use the system without concerns about privacy or data misuse.

L. Algorithm and Listing

This section describes the basic steps and logic used in the FinWise Companion system to manage and process financial data. Instead of complex algorithms, the system uses simple and clear procedures to handle user inputs, perform calculations, and generate useful outputs.

Each module of the system follows a step-by-step process. The data input module collects financial information such as income, expenses, and investments. The processing module then organizes this data and performs calculations like total expenses, savings, and budget tracking. The analysis module studies patterns in the data to provide insights into spending behavior and financial performance.

The system also includes simple logic for generating charts and reports, which helps users understand their financial condition easily. These processes are implemented using basic programming concepts and structured logic to ensure accuracy and efficiency.

The modular structure of the system allows easy understanding and future improvements. New features or advanced analytical methods can be added without affecting the existing system. Overall, the algorithms used are designed to be simple, effective, and suitable for real-time financial data management. The system is designed to ensure efficient handling of financial data through well-defined logical steps. Each operation, from data entry to analysis, follows a structured sequence that minimizes errors and improves processing speed. The use of conditional checks and iterative procedures helps in maintaining data accuracy and consistency. These logical steps ensure that the system responds quickly to user inputs and provides reliable outputs. As a result, users can trust the system for real-time financial tracking and decision-making.

friendly, and future-ready.

Algorithm 1: System Workflow for FinWise Companion

Process Stage	Description
Data Entry	User enters financial data such as income, expenses, and investments
Data Validation	The system checks for errors, missing values, and incorrect inputs
Data Storage	Valid data is stored in structured database tables
Data Processing	Calculates total expenses, savings, and budget utilization
Data Analysis	Identifies spending patterns and financial trends
Portfolio Evaluation	Analyzes investment performance and returns
Visualization	Displays results using charts, graphs, and summaries

User Feedback	Provides insights and suggestions for decision-making
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TABLE 2

System Workflow for FinWise Companion

Algorithm 2: Data Analysis and Pattern Identification

TABLE

Process Stage	Description
Input Data	Retrieve stored financial data including income, expenses, and investments
Categorize Data	Organize data into categories such as food, travel, utilities, etc.
Compute Totals	Calculate total income, expenses, and savings
Analyze Patterns	Identify trends and frequent spending categories
Compare Data	Compare current data with historical records
Generate Insights	Produce meaningful financial insights

Data Analysis and Pattern Identification

Algorithm 3: Application Initialization and Navigation

```

1 BEGIN
2
3 1. Initialize Flutter framework
4 2. Initialize Firebase services
5
6 3. Start Application
7   CALL runApp(MyApp)
8
9 4. Define MyApp
10  SET application title
11  DISABLE debug banner
12  APPLY theme settings
13  SET initial screen → Onboarding Page
14
15 5. Display Onboarding Screen
16  WAIT for user interaction
17
18 6. IF user completes onboarding THEN
19  NAVIGATE to Login/Signup Page
20 ELSE
21  REMAIN on Onboarding Screen
22 ENDIF
23
24 7. After successful login
25  NAVIGATE to Home Page
26
27 8. From Home Page
28  ALLOW navigation to:
29  - Income Page
30  - Expense Page
31  - Investment Page
32  - Profile Page
33
34 END

```

Figure 2:- Pseudocode

Algorithm 4: Counter Update Logic

```

BEGIN
1. Initialize counter = 0
2. Display counter on screen
3. WHEN user clicks button DO
  INCREMENT counter by 1
  UPDATE UI with new counter value
END
END

```

Figure 3: Pseudocode

M. Data Processing and Management Module

The Data Processing and Management Module is responsible for handling and organizing the financial data collected from users. After the data is entered, it is processed to remove errors and arranged into a structured format for further analysis. This ensures that the system works with clean and reliable data.

The module performs operations such as sorting, updating, and filtering data based on user activity. It also manages the flow of information between different parts of the system, ensuring smooth communication between modules. By maintaining organized data, the system improves performance and accuracy. This module is essential for delivering consistent and meaningful financial insights.

V.EXPERIMENTS AND RESULTS

A. Quantitative Analysis

To evaluate the effectiveness of the FinWise Companion system, a set of performance metrics was defined focusing on financial tracking accuracy, budgeting efficiency, and portfolio monitoring capabilities. The evaluation was conducted using sample user data over a defined time period.

TABLE 2

Metric	Observation
Expense Tracking	High Accuracy
Budget Efficiency	Improved
Portfolio Monitoring	Effective

SYSTEM PERFORMANCE

The results indicate that the system is capable of accurately recording and categorizing user expenses, reducing manual errors and improving reliability. Budget efficiency improved significantly as users were able to monitor their spending against predefined limits, leading to better discipline. Additionally, the portfolio monitoring module effectively tracked investment performance, enabling users to evaluate returns and make informed decisions.

Further analysis shows that the integration of multiple financial components into a single platform reduces data fragmentation and enhances overall system usability. The system also demonstrates consistent performance in processing financial data and generating real-time insights.

Qualitative Analysis

In addition to quantitative evaluation, qualitative analysis was conducted based on user feedback and interaction with the system. Users reported a significant improvement in financial awareness, as the system provided clear insights into their spending habits and savings patterns.

The visualization dashboards were found to be highly effective in simplifying complex financial data, allowing users to easily interpret their financial status. The recommendation system was also positively received, as it provided practical and personalized suggestions for budgeting, saving, and investment planning.

Users highlighted that the integrated approach of combining personal finance management with portfolio tracking improved their overall financial decision-making process. The system helped users identify unnecessary expenses, optimize their budgets, and make more confident investment choices.

Overall, the qualitative results confirm that FinWise Companion enhances user experience, promotes better financial habits, and supports informed decision-making.

C. User Interface Design and Implementation

The FinWise Companion application provides a user-friendly interface that allows users to manage their financial data efficiently. The design focuses on simplicity, clarity, and ease of navigation. Different screens are developed for handling income, expenses, insights, and user profile management. The interface uses visual elements such as charts and cards to improve understanding of financial information.

Figure 4:-Home Dashboard Screen Figure 5: Insights Screen

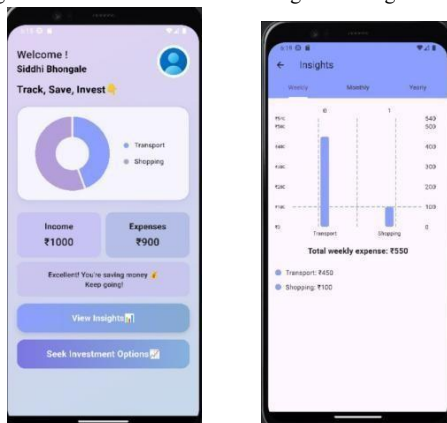


Figure 6:-Add Income Screen Figure 7: Add Expense Screen

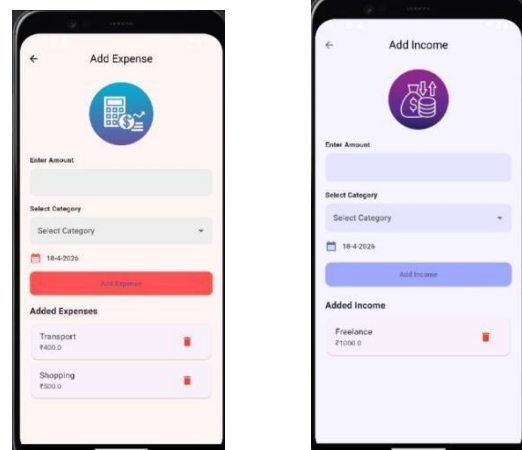


Figure 8: Profile Screen

VI.DISCUSSION

A. Financial Insights

The FinWise Companion system provides users with comprehensive insights into their financial behavior by analyzing income, expenses, and investment patterns. Through detailed analysis and visualization, users gain a deeper understanding of how their money is allocated across different categories.

The system highlights key spending areas, identifies unnecessary expenses, and tracks savings trends over time. By presenting this information in an intuitive manner, users are able to recognize patterns in their financial habits and make informed adjustments. This improved awareness leads to better budgeting, increased savings, and more strategic investment decisions.

B. Advantages

The primary advantage of FinWise Companion lies in its ability to integrate personal finance management with portfolio tracking into a single

platform. This unified approach eliminates the need for multiple applications and ensures consistency of financial data.

Additionally, the system offers:

Real-time monitoring of financial activities
Data-driven insights for better decision-making
Interactive visualizations for easy understanding

Personalized recommendations tailored to user behavior

By combining these features, the system provides a holistic view of a user's financial health, improving both usability and efficiency.

C. Limitations

Despite its advantages, the system has certain limitations that need to be addressed:

- **Manual Data Input:** The system currently relies on users to manually enter financial data, which may lead to inaccuracies or incomplete records.
- **Limited Real-Time Integration:** Lack of direct integration with banking and financial APIs restricts automatic data synchronization and real-time updates.
- **Basic Recommendation Mechanism:** The recommendation system is primarily rule-based and may not fully capture complex financial behaviors or market dynamics.
- **Scalability Constraints:** Handling large volumes of financial data efficiently may require further optimization and infrastructure improvements.

D. Future Work

To enhance the capabilities of FinWise Companion, several improvements are proposed for future development:

- **AI-Based Predictions:** Incorporating machine learning models to predict future expenses, savings trends, and investment outcomes based on historical data.
- **Bank API Integration:** Enabling automatic data synchronization with bank accounts and financial platforms to reduce manual effort and improve accuracy.
- **Advanced Risk Analysis:** Implementing sophisticated risk assessment techniques for portfolio management, including volatility analysis and diversification strategies.
- **Mobile Application Development:** Developing a mobile application to provide users with convenient access to financial data and insights on the go.
- **Enhanced Personalization:** Utilizing user

profiling and behavioral analysis to deliver highly customized financial recommendations.

VII.CONCLUSION

FinWise Companion presents an integrated and user-centric solution for managing personal finances and investment portfolios within a single platform. By combining expense tracking, budgeting, and portfolio analysis, the system enhances financial awareness and supports informed decision-making. The use of data analytics and visualization simplifies complex financial information, enabling users to better understand their financial behavior. Although the system demonstrates effective performance, future enhancements such as AI-based automation, real-time data integration, and advanced analytics can further improve its functionality and scalability.

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