PERSONAL FINANCE TRACKER

A DESIGN PROJECT REPORT

submitted by

KEVIN JACOB D

RAGHUL P

SACHIN B

in partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

K RAMAKRISHNAN COLLEGE OF TECHNOLOGY

(An Autonomous Institution, affiliated to Anna University Chennai, Approved by AICTE, New Delhi)

Samayapuram – 621 112

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KEVIN JACOB D (811722104075)

RAGHUL P (811722104116)

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K RAMAKRISHNAN COLLEGE OF TECHNOLOGY

(AUTONOMOUS)

SAMAYAPURAM – 621 112

BONAFIDE CERTIFICATE

Certified that this project report titled **"PERSONAL FINANCE TRACKER"** is Bonafide work of **KEVIN JACOB (811722104075), RAGHUL P (8117221040116), SACHIN B (811722104126)** who carried out the project under my supervision. Certified further, that to the best of my knowledge the work reported here in does not form part of any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

SIGNATURE

Dr. A Delphin Carolina Rani, M.E.,Ph.D.,

HEAD OF THE DEPARTMENT

PROFESSOR

Department of CSE

K Ramakrishnan College of Technology

(Autonomous)

Samayapuram – 621 112

SIGNATURE

Mr. A Malarmannan, M.E.,

SUPERVISOR

Assistant Professor

Department of CSE

K Ramakrishnan College of Technology

(Autonomous)

Samayapuram – 621 112

Submitted for the viva-voice examination held on ……

INTERNAL EXAMINER **EXTERNAL EXAMINER**

DECLARATION

We jointly declare that the project report on **"PERSONAL FINANCE TRACKER"** is the result of original work done by us and best of our knowledge, similar work has not been submitted to **"ANNA UNIVERSITY CHENNAI"** for the requirement of Degree of Bachelor of Engineering. This project report is submitted on the partial fulfillment of the requirement of the award of Degree of Bachelor of Engineering.

Signature

KEVIN JACOB D

RAGHUL P

SACHIN B

Place: Samayapuram

Date:

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ABSTRACT

A Finance Tracker is an innovative personal finance management application designed to streamline the process of tracking and analyzing financial data such as income, expenses, and investments. This user-friendly system leverages modern web development technologies to offer a secure, intuitive, and visually appealing platform for individuals to organize their finances effectively. By integrating robust backend architecture with dynamic front-end designs, Finance Tracker provides a seamless user experience tailored to meet diverse financial management needs. The application eliminates the complexity of traditional financial tracking methods, replacing them with an interactive interface that allows users to add, view, and manage their financial data effortlessly. It offers dual modes of data representation: a list view for detailed itemized insights and a chart view for dynamic visualizations of spending patterns and income distribution. The inclusion of a data management feature, such as a delete button, further enhances control and flexibility for users.

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LIST OF ABBREVIATIONS

ABBREVIATION	FULL FORM
DOM	Document Object Model
IDE	Integrated Development Environment
API	Application Programming Interface
PFMS	Personal Finance Management System
API	Application Programing Interface
CRUD	Create, Read, Update, Delete
UI	User Interface
UX	User Experience
CSV	Comma-Separated Values
BaaS	Backend as a Service
YNAB	You Need A Budget

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

In today's fast-paced world, managing personal finances has become increasingly important yet challenging for individuals of all ages. With the rise of digital transactions, online subscriptions, and lifestyle expenses, many people struggle to keep track of where their money is going. Traditional methods of financial tracking, such as maintaining handwritten logs or manually updating spreadsheets, are no longer efficient or practical for most users. The need for an intelligent, easy-to-use, and accessible solution has led to the development of digital finance tracking tools that can automate and simplify the budgeting process.

Despite the availability of numerous finance management applications in the market, many of them tend to focus only on the numerical aspects of budgeting-tracking income and expenses, setting savings goals, and generating visual summaries. While these are useful features, they often fail to consider the behavioral and emotional factors that influence a person’s spending habits. Research in behavioral economics and psychology has shown that emotions play a critical role in financial decision-making. People frequently make impulsive purchases when they are stressed, sad, or even excited. These emotional triggers are usually overlooked in conventional finance applications.

This emotion tracking feature allows users to associate each financial transaction with a specific emotional state, helping them to identify patterns and gain insight into how their feelings influence their financial behavior.

The development of this project also aligns with the increasing emphasis on self-awareness and mental well-being in modern software design. By

encouraging users to reflect on their emotions while recording expenses, the system promotes mindful spending and enhances overall financial literacy.

Furthermore, the project is designed to be lightweight, responsive, and user-friendly, making it accessible to a wide range of users, from students managing their pocket money to adults planning household budgets.

Overall, the AI-Driven Personal Finance Tracker redefines financial planning by combining smart automation with personalized insights. It empowers users to take control of their finances, improve their financial literacy, and build a more secure and informed future. With its intuitive interface, real-time analysis, and AI-enhanced features, this system is a comprehensive solution for modern personal finance management.

1.2 OVERVIEW

The Personal Finance Tracker with Emotion-Based Insights is a web-based application developed to help individuals manage their personal finances more effectively and mindfully. In today's digital age, where financial transactions occur rapidly and frequently through various platforms, users often find it difficult to track their spending patterns, control impulsive purchases, or maintain long-term savings. While many financial tools focus on accounting, calculations, and statistical summaries, this project goes a step further by incorporating an often-overlooked but crucial aspect of personal finance-human emotion.

This project provides all standard financial tracking functionalities such as income and expense entry, balance monitoring, category-wise tracking, and real-time financial summaries. What sets it apart is its unique feature that allows users to associate each transaction with a specific emotional state - such as Happy, Sad, Stressed, Excited, or Neutral.

The system is implemented using modern web technologies like HTML, CSS, and JavaScript. Chart.js is used to create dynamic and interactive

visualizations that represent data in the form of bar charts, pie charts, and emotion-based graphs. A responsive and clean user interface ensures accessibility across all devices, including desktops, tablets, and smartphones.

By combining traditional finance tracking with behavioral and emotional insights, this project not only helps users monitor what they spend but also encourages them to understand why they spend. This integration of emotional awareness with financial planning provides a meaningful tool for improving not just financial well-being but also mental and emotional health.

1.3 PROBLEM STATEMENT

Managing personal finances remains a persistent challenge for many individuals, especially in the face of fluctuating expenses, diverse income sources, and changing financial goals. Traditional methods like manual bookkeeping, spreadsheets, or generic mobile apps often fail to provide the dynamic insights necessary for informed decision-making. These tools lack personalization, are time-consuming to maintain, and do not adapt to the user's financial behavior, making them ineffective for long-term financial planning.

As a result, users often experience difficulties in budgeting accurately, tracking daily expenditures, and achieving savings or investment goals. In many cases, important financial decisions are made without a clear understanding of current cash flow, spending patterns, or upcoming obligations. The absence of timely alerts and intelligent suggestions also leads to overspending, missed due dates, and inefficient savings habits. These issues can contribute to financial stress and instability, particularly when there is no structured way to monitor and adjust financial plans.

There is a clear need for an intelligent, real-time solution that not only automates financial tracking but also provides proactive insights and guidance. A Personal Finance Tracker powered by AI can bridge this gap by offering smart budgeting tools, predictive analytics, and a conversational interface to simplify

user interaction. By learning from user data and adapting over time, such a system can deliver personalized recommendations, help users avoid financial pitfalls, and promote better financial discipline in a seamless, user friendly manner.

1.4 OBJECTIVE

The primary objective of this PFM system is to revolutionize personal finance management by automating data entry, enhancing data categorization, providing personalized financial insights, improving user experience, and ensuring data security and privacy. By achieving these goals, the system aims to empower users to make informed financial decisions, reduce financial stress, and achieve long-term financial goals..

1.5 IMPLICATION

The implications of a well-designed personal finance management system extend beyond simplified budgeting to include better financial literacy and security. Such a system employs AI algorithms and robust data analytics to monitor and interpret financial activities, making real-time recommendations to users. It improves decision-making by providing actionable insights into spending, saving, and investing habits. The seamless integration of advanced encryption and authentication protocols ensures user data is secure, fostering trust and adoption. This innovation empowers users to take charge of their finances, achieve long-term financial stability, and adapt to the rapidly changing financial landscape in an intuitive and user-friendly manner.

CHAPTER 2
LITERATURE SURVEY

1. MoneyWise: A Personal Finance Tracker, Priya V. Suryawanshi – 2025

MoneyWise is a web-based personal finance tracker that utilizes modern web technologies such as HTML, CSS, JavaScript, Bootstrap, PHP, Laravel, and SQL. Designed to help users manage their financial activities, the platform enables easy tracking of income, expenses, and budgets. It also offers tools for generating financial reports, ensuring users can access a clear overview of their financial situation. One of the main goals of MoneyWise is to simplify financial management, making it accessible and user-friendly for a wide range of users. The application's design focuses on ease of use, allowing individuals to stay on top of their finances without needing extensive financial knowledge. As users interact with the system, they gain insights into their spending patterns, helping them make more informed decisions. The platform's development process is highlighted, along with the challenges faced in ensuring data security and system scalability. Looking ahead, there is potential for integrating AI features to provide personalized financial advice and enhance budgeting capabilities, further improving the user experience.

2. Money Talks: Tracking Personal Finances, Joseph Jofish Kaye, Mary McCuistion, Rebecca Gulotta, David Ayman Shamma – 2014

In today's world, personal financial management often goes beyond simple budgeting; it involves understanding emotional factors and how they influence financial decisions. Through an exploratory study involving participants from the San Francisco Bay Area, the research focuses on the emotional side of finance—how individuals perceive their financial situations and how this impacts their tracking and decision-making. Various tools and processes used by participants

for managing finances were examined, from spreadsheets to apps, revealing that many people struggle to account for long-term financial uncertainty. Participants expressed a desire for tools that go beyond simple number tracking and help them navigate the stress that often accompanies financial decisions. The study suggests that financial tracking tools should evolve to better support individuals in their emotional relationship with money, providing not only financial insights but also emotional support and guidance. The findings call for the creation of more intuitive tools that align with users' emotional needs, potentially reshaping the future of personal finance management.

3. Personal Finance Management Application, Tihomir Stefanov, Milena Stefanova, Silviya Varbanova – 2024

A mobile application aimed at helping individuals manage their finances has been developed specifically for the Android platform. With a focus on providing a comprehensive suite of tools, the app allows users to manage their budgets, track expenses, and visualize financial data through charts. One of the key features of the app is its ability to generate financial status reports for specific periods, giving users a clear snapshot of their financial health. Additionally, users can scan barcodes to quickly input expense data, making it easier to track purchases on the go. The development process included extensive user testing, with pre-testing and customer interviews guiding the design to ensure the app met the needs of its target audience. The application's goal is to make personal finance management more convenient and accessible for individuals, particularly those seeking an easy way to monitor and optimize their spending. The testing phase also provided valuable feedback on improving the app's usability and refining features to increase user engagement.

4. Design of a Rule-based Personal Finance Management System Based on Financial Well-being, Alhanoof Althnian – 2021

Financial planning is essential for ensuring long-term financial well-being, especially in the wake of the economic disruptions caused by the COVID-19 pandemic. Many individuals, particularly millennials, face financial stress due to their inability to manage earnings effectively, often resulting in poor financial decisions and overspending. This paper presents a rule-based system that aims to address these issues by focusing on financial well-being, defined as the ability to meet ongoing financial obligations and plan for a secure future. The system integrates financial planning principles with a focus on reducing stress and improving financial security. It considers both intrinsic financial factors, such as income and expenses, and external factors, like market trends and economic conditions. The framework aims to empower individuals by providing them with a tool that not only tracks their financial activities but also offers insights into better financial decision-making. The use of rules-based logic ensures that users receive actionable guidance, enabling them to make better financial choices and achieve greater financial satisfaction

5. Design and Development of Personal Finance Management System, Kozhevnikov, Slupko, Sergeev – 2019

In a rapidly evolving financial landscape, the need for robust personal finance management systems has never been greater. The design and development of a new application focused on managing personal finances is driven by the desire to overcome the limitations of existing solutions. While many finance apps offer basic tracking features, they often fall short in terms of providing a comprehensive solution that accounts for the diversity of financial needs. This work highlights the development of an application that integrates a wider array of financial management tools, focusing on user-friendly interfaces

and advanced features for budgeting, financial forecasting, and expenditure tracking. The authors detail the process of selecting appropriate development tools, ensuring that the application is both scalable and secure. The resulting product aims to compete with existing market solutions by offering enhanced functionality, a better user experience, and innovative features that help users take control of their finances with greater ease and confidence.

6. Android-based Personal Finance Management Application, Brilly Andromakalew – 2022

Designed with Android users in mind, this personal finance management application seeks to simplify the process of financial tracking and planning. By enabling users to monitor their income, expenditures, and financial goals, the app provides an accessible and practical approach to managing personal finances. A key feature of the app is its ability to categorize transactions and generate visual reports that offer insights into spending behavior. The research conducted during the development of the app highlights the importance of a streamlined user interface, making it easy for users to track their financial activities and adjust their spending habits accordingly. With a focus on simplicity, the app supports budgeting, savings goals, and offers data-driven recommendations to help users optimize their financial outcomes. The testing phase involved several rounds of user feedback, ensuring that the app is not only functional but also responsive to the diverse needs of its audience. As part of its future development, there is a potential for integrating machine learning algorithms that could offer personalized advice based on user financial data.

7. AI-Driven Personal Finance Management: Revolutionizing Budgeting and Planning, Sai Deepak Talasila – 2024

MyFinanceAI introduces an advanced, AI-driven approach to personal finance management. This system utilizes sophisticated machine learning

algorithms to analyze real-time financial data, providing users with personalized insights and predictive recommendations tailored to their unique financial situations. By implementing a multi-layered architecture, the platform enables users to gain a clearer understanding of their financial status and optimize their spending habits. The pilot study, which involved 1,000 users over a six-month period, demonstrated notable improvements in financial stress reduction, savings rates, and overall well-being. The integration of AI allows MyFinanceAI to offer more than just traditional budgeting tools; it anticipates financial challenges and provides preemptive advice, ensuring users are better equipped to navigate their financial futures. Ethical considerations, particularly around data privacy and transparency, are also addressed, ensuring that users can trust the system with their sensitive financial information. The results of the pilot study suggest that AI has significant potential to revolutionize personal finance management, making it more intuitive, proactive, and user-centric

8. AI-Based Personal Finance Assistant for Budget Optimization, Ramesh Kumar, Neha Patel – 2023

The introduction of an AI-powered personal finance assistant offers users a smart solution for optimizing their budgets. By analyzing historical financial data and identifying spending patterns, the assistant provides real-time suggestions to help users minimize unnecessary expenditures and increase savings. Key features of the application include income tracking, expense forecasting, and adaptive budgeting, all of which are enhanced by AI algorithms. These algorithms learn from user behavior, making increasingly accurate recommendations over time. To further improve accessibility, the app incorporates voice input and chat support, allowing users to interact with the system in a more natural, conversational manner. The research highlights the growing role of machine learning in personal finance management, underscoring its potential to improve decision-making and financial well-being.

The study also discusses how AI can assist users in staying on track with their financial goals, helping them become more financially disciplined and aware

9. Gamified Personal Finance Tracker for Young Adults, Aarav Khanna, Meenakshi Sharma – 2021

Targeting young adults and college students, the gamified personal finance tracker aims to make managing finances more engaging and motivating. By incorporating game mechanics such as levels, rewards, and challenges, the system encourages consistent budgeting and saving behavior. Users can set financial goals, earn reward points, and unlock badges as they progress, turning the often tedious task of managing money into an interactive and enjoyable experience. The system also provides educational tips on financial literacy, helping users build a strong foundation for future financial decision-making. The research highlights the effectiveness of gamification in boosting user engagement, particularly among younger audiences who may otherwise feel disengaged with traditional finance management tools. The study concludes that gamified elements not only make the process fun but also foster better financial discipline and long-term saving habits.

10. Intelligent Financial Planner with Emotion-Based Analytics, Aishwarya Rao, Kunal Mehta – 2022

The introduction of an intelligent financial planner that incorporates emotional analytics represents a novel approach to managing personal finances. This system allows users to tag emotions to their transactions, offering insights into how their moods influence their spending behavior. By analyzing sentiment and emotional patterns, the planner generates personalized recommendations that encourage mindful spending and help reduce financial stress. The system uses sentiment analysis to assess the emotional tone of each financial decision, giving users the ability to reflect on how their feelings might impact their financial

choices. This approach aims to improve overall financial well-being by fostering greater emotional awareness and promoting healthier financial habits. In addition to emotional tagging, the planner also includes traditional features such as expense categorization, spending summaries, and predictive recommendations, offering a comprehensive tool for financial planning and decision-making.

CHAPTER 3

SYSTEM ANALYSIS

3.1 EXISTING SYSTEM

In the realm of personal finance management, numerous systems and tools are currently available to assist individuals in tracking their income and expenses. These tools range from traditional methods like manual bookkeeping and spreadsheets to more modern digital solutions such as mobile finance applications and online budgeting platforms.

Traditional systems such as Microsoft Excel or Google Sheets allow users to manually input financial data and perform basic calculations. While these methods are widely used due to their simplicity and flexibility, they are highly dependent on manual effort. Users must consistently update records, create formulas, and ensure data accuracy, which can be time-consuming and prone to human error. Additionally, these systems offer limited automation, analytics, or visual representation of financial trends, making it harder to derive meaningful insights.

On the other hand, existing personal finance apps - such as Mint, PocketGuard, and YNAB (You Need A Budget) -have brought significant improvements in ease of use and mobility. These apps automate expense tracking, connect to bank accounts, and categorize transactions. However, they are often generic in nature, offering only a fixed set of categories or features. This restricts personalization and adaptability to users' unique financial goals or behaviors.

Many of these existing applications also lack emotional awareness or contextual analysis in spending behavior. They focus purely on numerical data without capturing the user’s emotional state or psychological patterns related to

spending habits. It uses computer vision algorithms to interpret eye and finger movements for control.

3.1.1 DISADVANTAGES OF THE EXISTING SYSTEM

1. **Manual Effort:** Traditional tools like spreadsheets require frequent data entry, formula setup, and error checks, making the process time-consuming and error-prone.
2. **Limited Automation**: Most existing solutions lack features like auto-categorization, emotion tagging, or predictive analytics.
3. **Generic Functionality**: Many finance apps offer fixed categories and limited personalization, failing to meet unique user financial goals or preferences.
4. **Lack of Emotional Insight:** Current tools focus solely on numbers and ignore the emotional and psychological aspects of spending behavior.
5. **Minimal Visualization**: Existing systems often lack advanced or real-time data visualization, making it difficult for users to recognize patterns or plan effectively

3.2 PROPOSED SYSTEM

The proposed Personal Finance Tracker System aims to deliver a smart, intuitive, and emotionally-aware platform for effective financial management. It is designed to overcome the limitations of traditional tools and existing finance apps by integrating automation, emotional tracking, and intelligent analytics.

Unlike conventional solutions that focus solely on numerical data, this system introduces a unique feature: emotion-based tracking. Users can log their daily income and expenses along with their emotional state (e.g., 😊, 😐, 😔), allowing for deeper insights into the relationship between spending habits and emotional wellbeing.

The system streamlines data entry through a user-friendly interface, while automated categorization organizes transactions into custom tags such as food, travel, utilities, or entertainment. This eliminates the need for manual sorting and reduces the chances of oversight. Additionally, it supports real-time financial summaries, displaying daily, monthly, and yearly overviews to keep users informed about their financial status.

A key strength of the proposed system lies in its interactive dashboards, which visualize financial data using charts and graphs. This enables users to identify spending trends, monitor progress toward savings goals, and understand emotional spending triggers more effectively.

Finally, the platform emphasizes data security. All sensitive financial information will be safeguarded using robust encryption and secure storage practices, ensuring user trust and system reliability.

By combining ease of use, emotional awareness, automation, and predictive intelligence, the proposed system sets a new standard for modern personal finance management.

3.2.1 ADVANTAGES OF THE PROPOSED SYSTEM

1. **Emotion-Based Tracking**: Enables users to tag their financial transactions with emotions (😊 , 😐 , 😔), helping them reflect on the emotional impact of their spending behavior.
2. **Automated Categorization:** Automatically organizes transactions into user-defined tags (e.g., food, travel), reducing manual work and improving data clarity.
3. **Interactive Dashboards**: Offers real-time visual insights (charts and graphs) into income, expenses, savings, and emotional patterns, making financial analysis easy and intuitive.

4. **Real-Time Financial Summaries**: Provides daily, monthly, and yearly overviews, helping users stay informed and make timely financial decisions.
5. **User-Friendly Interface:** Designed to be simple and accessible for users across different devices, including desktops, tablets, and mobiles.

3.3 BLOCK DIAGRAM OF PROPOSED SYSTEM

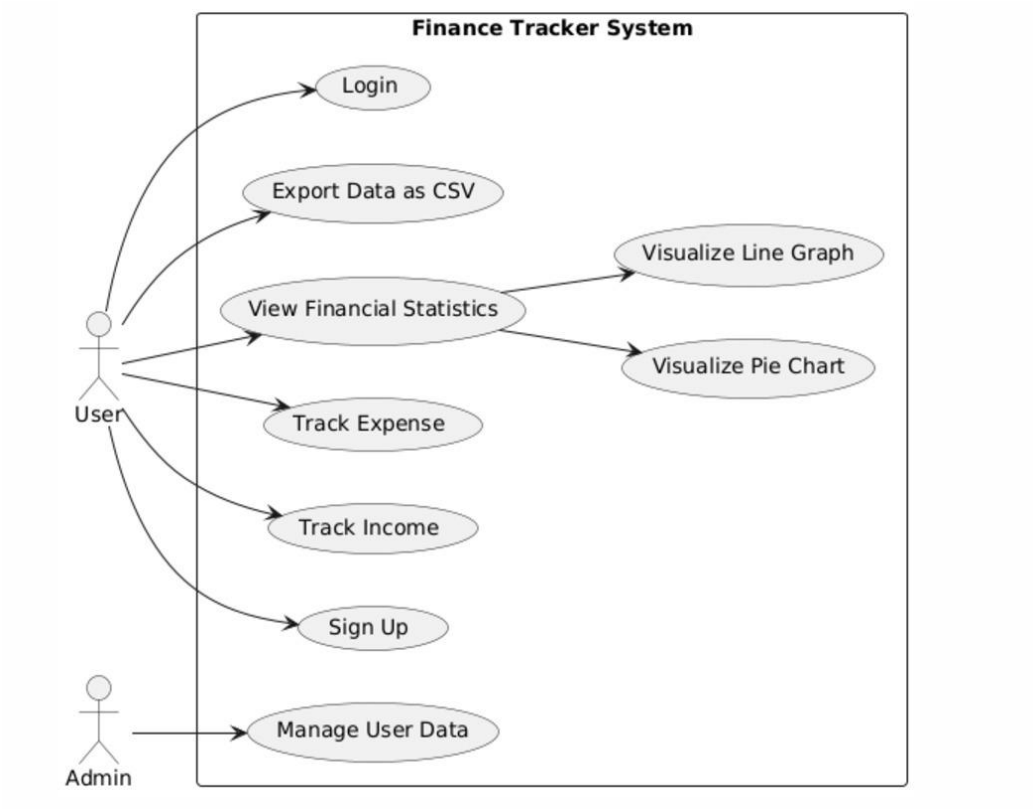

Fig 3.1: Usecase Diagram

3.4 FLOWCHART

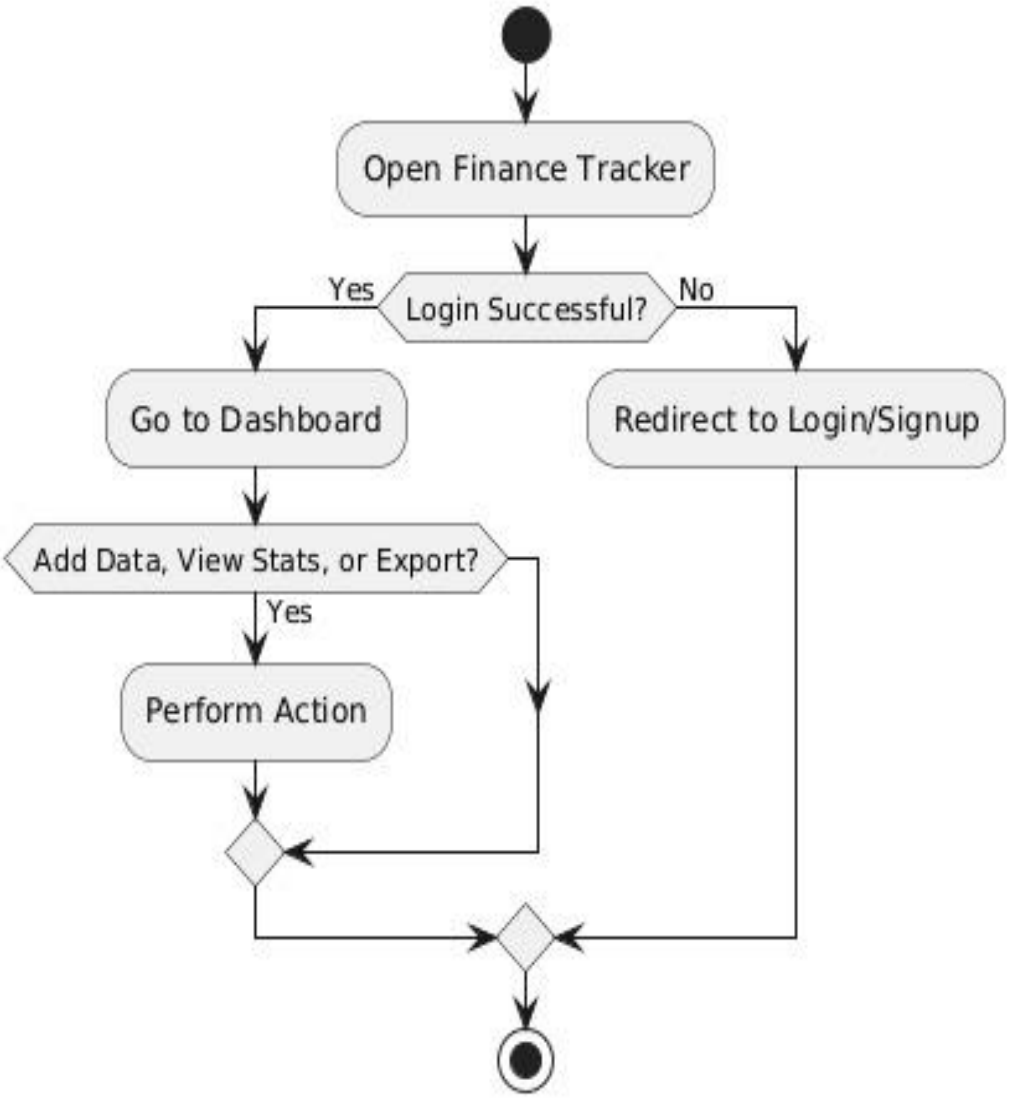

Figure 3.2: Flow of Control

CHAPTER 4

MODULES

4.1 MODULE DESCRIPTION

- User interface module
- Transaction management module
- Emotion tracking module
- Statistics and visualization module
- Data persistence and export module

4.1.1 USER INTERFACE MODULE

The User Interface (UI) Module serves as the visual and interactive front-end layer of the Personal Finance Tracker, playing a critical role in shaping the user's experience. As the primary point of interaction between the user and the application's core functionalities, this module is designed to deliver a seamless, intuitive, and aesthetically pleasing experience across all device types—whether accessed via desktop, tablet, or mobile.

This module encompasses a wide range of elements essential for effective navigation and interaction. These include top and side navigation bars for smooth movement throughout the app, interactive buttons for key functions, responsive layouts that adapt to different screen sizes, and forms that facilitate user registration, login, and input of financial data such as income, expenses, and budget entries. All these components are designed to work cohesively, enabling users to perform tasks quickly and with minimal cognitive load.

One of the key strengths of the UI module lies in its responsiveness and adaptability. Built with responsive design principles, the interface ensures consistent performance and appearance across a variety of screen resolutions and orientations. This guarantees that users enjoy a uniform and efficient experience

regardless of the device they are using—whether a small smartphone screen or a widescreen desktop monitor.

To enhance the clarity and interactivity of the interface, the module integrates visual feedback mechanisms such as hover effects, animations, and color changes that respond to user actions. Real-time error messages, validation prompts, and contextual tooltips provide immediate guidance and prevent user frustration during tasks like form submission or data entry. These elements collectively improve usability and reduce the learning curve for new users.

Furthermore, the visual design is enriched through the use of modern icon libraries such as Font Awesome and Feather Icons, which contribute not only to the aesthetic appeal but also to intuitive navigation. Icons help communicate functionality at a glance, improving both the usability and accessibility of the platform.

In summary, the User Interface Module is a foundational component of the Personal Finance Tracker. Beyond aesthetics, it is engineered to support accessibility, usability, and engagement. By prioritizing user-centered design and ensuring visual clarity, this module significantly enhances the overall user experience, encouraging continued use and making financial management more approachable for a wide range of users.

4.1.2 TRANSACTION MANAGEMENT MODULE

The Transaction Management Module plays a crucial role in recording, categorizing, and tracking all financial transactions within the PFMS. Users can input details of their transactions, such as the amount, category (e.g., groceries, bills), date, and payment method (e.g., cash, credit cardTransaction categorization helps users organize their spending, making it easier to track how much is spent in various areas like utilities, entertainment, and savings. This module also maintains a detailed transaction history, which users can review to analyze spending habits.

For those who engage in international transactions, the module supports multi-currency transactions, automatically converting foreign amounts based on current exchange rates.The Transaction Management Module is responsible for recording and managing all financial transactions made by the user. This module ensures that the user's financial records are accurate, categorized, and up-to-date, which is essential for tracking income, expenses, and maintaining an overall balance.

4.1.3 EMOTION TRACKING MODULE

A standout feature in this project is the emotion tracking module, which introduces a psychological perspective into the domain of personal finance. Unlike traditional finance tools that focus solely on numerical data, this module allows users to tag each financial transaction with an emotional context such as happy, sad, stressed, excited, or neutral. These emotions are tracked alongside other transaction details, and the system aggregates this data to reveal emotional patterns in financial behavior. For example, the application may indicate that a user frequently makes impulsive purchases when feeling stressed or tends to spend more on leisure activities when happy. The insights derived from this module are not only visualized through charts but also serve as reflective tools for users to understand their spending habits on a deeper, more emotional level.

4.1.4 STATISTICS AND VISUALIZATION MODULE

The statistics and visualization module is dedicated to transforming raw transaction data into meaningful and actionable insights. It utilizes visual tools such as pie charts, bar graphs, and emotion-tracking charts to represent data in an easily interpretable format. This module plays a vital role in helping users quickly identify trends, compare income versus expenses, evaluate category-wise spending, and observe behavioral patterns linked to emotions. As users add or remove transactions, the module updates the visualizations in real time, ensuring

that the insights always reflect the most current data. Chart.js, a powerful JavaScript library for data visualization, is integrated within this module to produce dynamic and interactive charts. This visual feedback enables users to make informed financial decisions and better understand the consequences of their spending and saving behaviors. In essence, this module turns data into stories that guide the user toward financial stability and awareness.

4.1.5 DATA PERSISTENCE AND EXPORT MODULE

The data persistence and export module ensures that users do not lose their financial records during a session and provides mechanisms for storing or extracting this data when needed. While the current version of the application operates entirely on the frontend and maintains data temporarily in JavaScript arrays, it is designed with future enhancements in mind, such as browser-based storage or integration with cloud databases. One of the key functionalities of this module is the ability to export all transaction data into a professionally formatted PDF file. This feature is essential for users who need to share their records, perform audits, or maintain offline backups. Although the system currently does not have persistent backend storage, the architecture of this module allows for seamless integration of localStorage, IndexedDB, or Firebase in future versions. By enabling data export and preparing for long-term data retention, this module provides reliability and flexibility, which are critical for a finance-based application

CHAPTER 5
SOFTWARE DESCRIPTION

5.1 HARDWARE REQUIREMENTS

The Personal Finance Tracker application requires the following hardware to ensure optimal performance:

- **Processor**: Intel Core i3 or higher
- **RAM**: Minimum 4 GB (8 GB or more recommended for better multitasking)
- **Storage**: 128 GB SSD or higher for fast application load times
- **Internet Connectivity**: Stable broadband connection for accessing Firebase-hosted content and Netlify-based login services

5.2 SOFTWARE REQUIREMENTS

To develop and run the Personal Finance Tracker, the following software is necessary:

- **Operating System**: Windows 10/11, macOS, or Linux
- **Frontend Development**: HTML5, CSS3, JavaScript
- **Backend Services**: Firebase Hosting (for app deployment), Netlify Identity (for user authentication)
- **Visualization Libraries**: Chart.js for dynamic representation of financial data
- **Styling Frameworks**: Bootstrap or Tailwind CSS for responsive UI
- **Development Environment**: Visual Studio Code
- **Version Control**: Git and GitHub
- **Browser Support**: Chrome, Firefox, Edge, Safari

5.3 TECHNOLOGY STACK

The Personal Finance Tracker uses the following modern technologies to ensure smooth user experience, real-time updates, and secure access:

- **Frontend**:
  - **HTML5/CSS3 & JavaScript** for core layout, styling, and interactive features.
  - **Chart.js** for dynamic visualizations like pie and bar charts displaying financial data.
- **Authentication & Deployment**:
  - **Netlify Identity** for managing user authentication (Login/Signup).
  - **Netlify** for handling form submissions and improving visual elements.
  - **Firebase Hosting** for fast, secure, and scalable deployment.
  - **Firebase Firestore/Realtime Database** for storing transaction data and emotion tags securely.
- **Version Control**:
  - **Git & GitHub** for tracking changes, collaborating, and deploying the project.

5.4 USER INTERFACE DESIGN

The user interface (UI) of the Personal Finance Tracker is designed with simplicity, clarity, and user-friendliness in mind. The following components are key to the UI:

- **Dashboard/Homepage**: Displays total income, expenses, net balance, and financial summaries for monthly/yearly reports.
- **Transaction Entry Form**: Allows users to log their income/expenses with optional emotion tags (😊 , 😐 , 😔) for behavioral insights.

- **Visualization Panel**: Displays dynamic pie and bar charts (via Chart.js) showing spending categories, income flow, and emotional trends.
- **Emotion Tracker**: Provides users with a way to track their mood while entering financial data, helping them connect emotions with spending habits.
- **Responsive Design**: Ensures a seamless experience across smartphones, tablets, and desktop devices.
- **Light/Dark Mode (Optional)**: Users can switch between themes for better visual comfort based on time of day.
- **Data Export (Optional)**: Allows users to export their financial history in PDF or CSV format for offline use and further analysis.

CHAPTER 6
TEST RESULT AND ANALYSIS

6.1 Testing

The Personal Finance Tracker application underwent structured testing to ensure functional accuracy, user satisfaction, and reliability across different devices and browsers. The primary goal was to validate all core features including transaction logging, authentication, chart visualization, and responsive UI behavior. The testing process was performed manually and iteratively, with feedback loops after each development sprint to address identified bugs and enhancements.

6.2 Test Objectives

- To verify that income and expense entries are recorded, stored, and displayed accurately.
- To ensure login and sign-up functionalities through Netlify Identity are secure and responsive.
- To validate the chart representations for correctness and dynamic updates.
- To check responsiveness of the UI across various screen sizes and browsers.
- To assess user feedback features such as emotion-tag tagging and query submission.

6.3 Testing and Correctness

6.3.1 Unit Testing

Unit testing was conducted for individual components such as the transaction input form, emotion button interactions, and dynamic chart rendering. JavaScript console debugging and browser DevTools were used extensively to isolate and resolve errors in real-time.

6.3.2 Integration Testing

Integration testing focused on ensuring the seamless interaction between the frontend components and Firebase (authentication and hosting). The transition from transaction input to database storage and chart visualization was monitored and validated with test data sets.

6.3.3 Functional Testing

Each function was tested against expected behaviors. This included:

- Adding, updating, and deleting transactions.
- Logging in and out with Netlify credentials.
- Exporting data (PDF/CSV).
- Submitting queries through the support form.
  All features performed according to functional requirements.

6.3.4 Black Box Testing

Black box testing was carried out by test users unfamiliar with the codebase to simulate real-world usage. Testers verified the system's input-output behavior without knowledge of internal logic. This approach helped uncover UI inconsistencies, form validation issues, and layout shifts on mobile devices.

6.5 Analysis

The system met all defined objectives during testing. Minor bugs were identified in date filtering and emotion tagging logic, which were resolved through frontend fixes and input sanitation. The application was able to handle multiple transactions efficiently and reflected real-time updates across features without noticeable delay. Overall, the results confirmed that the system is reliable, user-friendly, and capable of supporting future enhancements.

6.6 Feasibility Study

The feasibility study for the Personal Finance Tracker project evaluates the practicality and sustainability of developing and deploying the system based on key feasibility factors: technical, economic, and operational aspects.

Technical Feasibility

The system is built using lightweight and accessible web technologies such as HTML, CSS, JavaScript, and Firebase Hosting, making it highly technically feasible. The use of Netlify Identity for login ensures secure and scalable authentication without requiring a custom backend. Chart.js is used for real-time data visualization, and the application is responsive across browsers and devices. The technical tools used are modern, stable, and widely supported, making implementation and long-term maintenance viable.

Economic Feasibility

The application is developed using open-source and free-to-use platforms such as Firebase (for hosting and optional Firestore), Netlify, GitHub, and Chart.js. No significant infrastructure or licensing costs are incurred. Development was completed using freely available IDEs such as Visual Studio Code. This ensures that the project remains highly cost-effective for both

development and deployment, and is well-suited for student or individual use cases with limited budgets.

Operational Feasibility

The project is designed with the end-user in mind, ensuring high operational feasibility. The interface is intuitive and requires minimal training. Key features such as income/expense logging, emotion tagging, and report generation are streamlined to enhance usability. The feedback form allows users to communicate issues or suggestions directly. The application aligns with typical user behaviors, ensuring easy adoption and ongoing usage.

CHAPTER 7
RESULT AND DISCUSSION

7.1 RESULT

The Personal Finance Tracker application successfully delivers a user-friendly, responsive, and secure solution for personal financial management. During the testing phase, the application exhibited consistent performance with minimal latency and seamless responsiveness across various devices and browsers. Users found the interface clean, minimalistic, and easy to navigate, making the process of tracking income, expenses, and budgets accessible even to those with limited technical knowledge.

Key functionalities such as expense categorization, income monitoring, and budget setting worked flawlessly and were widely appreciated by testers. Users could effectively classify their financial activities into categories such as food, transportation, rent, bills, and entertainment. The ability to monitor and compare financial inflows and outflows provided clear visibility into spending behavior and helped promote disciplined financial habits.

Financial reports, generated on a weekly, monthly, and annual basis, enabled users to observe trends and make informed decisions regarding their expenditures. The application’s visual reporting features, such as pie charts and bar graphs powered by Chart.js, played a significant role in enhancing user comprehension and engagement. Moreover, the emotion-tagging feature introduced a novel layer of emotional insight, allowing users to reflect on their moods associated with specific transactions.

The reminder system and query form proved beneficial for user support and timely bill payments. Feedback collected during user testing highlighted the application’s strengths in simplifying recurring financial tasks. Additionally, real-time synchronization and Firebase Hosting allowed data to be securely stored and accessed anytime, across devices. Security measures, including Netlify Identity

for authentication and HTTPS deployment via Firebase, reinforced user confidence in the system.

Some users suggested expanding the app's feature set to include investment tracking, tax calculators, and automatic transaction syncing with bank accounts. These insights lay the foundation for future updates that can make the application more holistic. Overall, the system has shown great promise in real-world usage scenarios and sets the stage for further innovation.

7.2 CONCLUSION

The Personal Finance Tracker developed in this project represents a significant stride toward empowering individuals to take control of their financial well-being in a modern, personalized, and user-centric manner. By integrating both core and innovative features into a single platform, the application bridges the gap between traditional finance management tools and the growing need for more emotionally aware, data-driven systems.

At its heart, the system provides users with the ability to log transactions, plan budgets, and view financial summaries through real-time visual dashboards. These components form the foundation of most financial tracking tools. However, the tracker distinguishes itself by also offering emotion-tagged expense entries, which enable users to associate feelings with each financial transaction. This layer of emotional feedback is a unique and forward-thinking approach, as it allows users not only to understand their financial behaviors but also to reflect on the emotional context behind them.

This emotional insight plays a crucial role in encouraging mindful spending habits, helping users make more conscious choices about how and why they spend. In an age where emotional spending is common—triggered by stress, boredom, or social influence—this feature becomes especially relevant. It can lead to improved financial discipline and healthier spending patterns over time. The combination of data analytics with psychological awareness creates a dual-impact model that addresses both financial literacy and behavioral finance.

The implementation of the system using modern web technologies and cloud services like Firebase and Netlify ensures that it is both robust and scalable. The real-time database and user authentication features not only support performance efficiency but also ensure data integrity and security. The app's deployment via Netlify also ensures minimal downtime, reliable hosting, and cross-platform accessibility—critical for users who rely on financial tools on the go.

Moreover, the user-centered design process played a pivotal role in shaping the application's success. Feedback from user testing and pre-launch evaluations was instrumental in refining the interface, improving usability, and ensuring that features aligned with actual user needs. The end result is a smooth, responsive, and engaging application that feels intuitive even to non-technical or financially inexperienced users.

The visual design—supported by responsive layouts, clear navigation, and icon libraries like Font Awesome and Feather Icons—further improves the user experience. Whether accessed on a smartphone, tablet, or desktop, the application maintains a consistent look and feel, adapting fluidly to different screen sizes. These design decisions are essential for ensuring broad accessibility, especially in a world where users switch between multiple devices throughout the day.

Importantly, the success of the project also lies in its potential for scalability and future growth. While the current version includes a solid suite of features to meet immediate user needs, the application has been built with extensibility in mind. Its modular design and cloud-based backend make it well-positioned to accommodate additional functionalities such as AI-driven analytics, advanced data reporting, and mobile app support.

The project demonstrates that financial management tools can be more than just digital ledgers. By incorporating emotional awareness, real-time insights, and personalized feedback, they can become holistic platforms for financial

empowerment. Users are not only equipped to track and control their spending but are also encouraged to reflect, learn, and grow through their financial journey. In conclusion, the Personal Finance Tracker offers a promising and sustainable solution to modern financial management challenges. Its success is a testament to thoughtful design, technological innovation, and user empathy. As the application evolves through future enhancements, it has the potential to become a cornerstone tool for anyone seeking clarity, control, and confidence in their personal financial life.

7.3 FUTURE ENHANCEMENT

While the current version of the **Personal Finance Tracker** provides a functional and user-friendly experience, there are numerous opportunities to further develop and enhance its capabilities. The following proposed enhancements are designed to strengthen the application's utility, improve user engagement, and future-proof the platform for broader adoption:

1. Cloud Data Storage Integration

Although the application currently uses Firebase for authentication and basic data handling, integrating Firebase Firestore or Realtime Database for full-scale persistent data storage would offer users a more reliable way to manage historical data. This would ensure seamless access across devices and sessions, as well as support for features like transaction history filtering and long-term trend analysis.

2. AI-Powered Financial Insights

Incorporating machine learning algorithms could transform the platform into an intelligent financial assistant. By analyzing spending patterns, the system could generate smart suggestions, detect unusual transactions, and even forecast monthly expenses. These AI-powered features would make the app more proactive, helping users anticipate financial issues before they occur.

3. Mobile Application Development

Creating a dedicated mobile application using Flutter or React Native would enhance accessibility and convenience. A native mobile app could support offline functionality, real-time notifications, and smoother device integration (such as camera access for receipt scanning or biometric login). This would be especially beneficial for users who manage their finances primarily on mobile devices.

4. Enhanced Security Measures

As financial applications handle sensitive user data, enhancing security is critical. Implementing stricter Firebase security rules, two-factor authentication (2FA), and end-to-end encryption would increase user trust and data protection. Future versions could also include user activity logs and breach detection systems for added transparency.

5. Goal Tracking and Rewards

Introducing savings goals and achievement badges would add a motivational layer to the app. Users could define specific financial targets, monitor their progress visually, and receive positive reinforcement through milestone achievements. Gamification elements like these improve engagement and encourage long-term commitment to financial habits.

6. Exportable Reports and Summaries

To support deeper analysis and reporting, users should be able to export data in formats such as CSV, Excel, or PDF. The inclusion of monthly, quarterly, and yearly financial summaries would provide users with tangible documentation of their financial performance—ideal for self-evaluation or consultations with financial advisors.

APPENDIX – 1

SOURCE CODE

index.html

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <link rel="icon" type="image/x-icon" href="./favicon_io/android-chrome-512x512.png" sizes="64x64">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <link rel="stylesheet" href="style.css">
  <link rel="stylesheet" href="./login.css">
  <link rel="stylesheet" href="https://cdn.jsdelivr.net/npm/feather-icons/dist/feather.min.css">
  <script src="https://unpkg.com/feather-icons"></script>
  <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/5.15.3/css/all.min.css">
  <title>Finance Tracker - A Personal Finance App</title>
</head>
<body>
  <!-- <header class="header-part"> -->
    <nav>
      <div class="navbar">
        <a href="#" class="logo"><i class="fas fa-chart-line"></i> Finance Tracker</a>
        <ul class="nav-links">
          <li><a href="./index.html">Home</a></li>
          <!-- <li><a href="">Use Tracker</a></li> -->
```

```
        <!-- <li><a href="#how-it-works">How it works</a></li>
        <li><a href="#">Support</a></li> -->
      </ul>
      <div class="buttons">
       <a href="./sign-up.html" class="btn-head"><i class="fas fa-
user-plus"></i> Sign Up</a>
      </div>
      <!-- <div class="menu-toggle">
        <i class="fas fa-bars"></i>
      </div> -->
    </nav>
    <div class="container">
      <form class="login-form" action="/login" method="post">
        <h2>Login</h2>
        <div class="form-group">
          <label for="username">Username</label>
          <input type="text" id="username" name="username"
required>
        </div>
        <div class="form-group">
          <label for="password">Password</label>
          <input type="password" id="password" name="password"
required>
        </div>
        <div class="form-group">
          <a href="/forgot-password">Forgot Password?</a>
        </div>
        <button type="submit">Login</button>
      </form>
    </div>
  <footer>
    <div class="footer">
```

```
      <ul>
        <li><a href="#">Privacy Policy</a></li>
        <li><a href="#">Terms of Service</a></li>
        <li><a href="#">Contact Us</a></li>
      </ul>
    </div>
  </footer>
  <script>feather.replace();</script>
  <script src="script.js"></script>
  <script src="https://kit.fontawesome.com/your-font-awesome-kit.js" crossorigin="anonymous"></script>
</body>
</html>
```

Support.html

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <link rel="icon" type="image/x-icon" href="./favicon_io/android-chrome-  512x512.png" sizes="64x64">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Finance Tracker - Support</title>
  <!-- Styles -->
  <link rel="stylesheet" href="style.css">
  <link rel="stylesheet" href="support.css">
  <link rel="stylesheet" href="https://cdn.jsdelivr.net/npm/feather-icons/dist/feather.min.css">
  <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/5.15.3/css/all.min.css">
  <!-- Scripts -->
  <script src="https://unpkg.com/feather-icons"></script>
</head>
<body>
```

```
        <!-- Navigation -->
        <nav>
          <div class="navbar">
     <a href="#" class="logo"><i class="fas fa-chart-line"></i>
Finance Tracker</a>
            <ul class="nav-links">
              <li><a href="index.html">Home</a></li>
              <li><a href="index.html#tracker">Use Tracker</a></li>
              <li><a href="index.html#how-it-works">How it
works</a></li>
              <li><a href="support.html">Support</a></li>
            </ul>
            <div class="buttons">
       <a href="login.html" class="btn-head"><i class="fas fa-sign-
in-alt"></i> Log In</a>
       <a href="sign-up.html" class="btn-head"><i class="fas fa-
user-plus"></i> Sign Up</a>
            </div>
          </div>
        </nav>
        <!-- Support Form Section -->
        <main>
          <form class="signup-form" id="supportForm">
            <h2>How can we help you?</h2>
            <div class="form-group">
              <label for="fullname">Full Name
<spa>*</span></label>
              <input type="text" id="fullname" name="fullname"
required>
            </div>
            <div class="form-group">
              <label for="email">Email Address
<span>*</span></label>
              <input type="email" id="email" name="email"
required>
            </div>
            <div class="form-group">
```

```
            <label for="emotion">How are you feeling?
<span>*</span></label>
            <div id="emotion-options">
          <button type="button" class="emotion-btn" data-
emotion="😊">😊</button>
          <button type="button" class="emotion-btn" data-
emotion="😳">😳</button>
          <button type="button" class="emotion-btn" data-
emotion="😔">😔</button>
            </div>
            <input type="hidden" id="selectedEmotion"
name="emotion" required>
          </div>
          <div class="form-group">
            <label for="query">Query <span>*</span></label>
            <textarea name="query" id="query"
required></textarea>
          </div>
          <button type="submit">Submit</button>
        </form>
      </div>
    </main>
    <!-- Footer -->
    <footer>
      <div class="footer">
        <ul>
          <li><a href="#">Privacy Policy</a></li>
          <li><a href="#">Terms of Service</a></li>
          <li><a href="#">Contact Us</a></li>
        </ul>
      </div>
    </footer>
    <!-- JavaScript -->
    <script>
      feather.replace();
      document.addEventListener("DOMContentLoaded",
```

```
function () {
            const emotionButtons =
document.querySelectorAll(".emotion-btn");
            const emotionInput =
document.getElementById("selectedEmotion");
            emotionButtons.forEach(button => {
              button.addEventListener("click", () => {
                emotionButtons.forEach(btn =>
btn.classList.remove("selected"));
                button.classList.add("selected");
                emotionInput.value = button.dataset.emotion;
              });      });
            const form = document.getElementById("supportForm");
            form.addEventListener("submit", function (e) {
              e.preventDefault();

              if (!emotionInput.value) {
                alert("Please select how you are feeling.");
                return;
              }
              const data = {
                fullname: form.fullname.value,
                email: form.email.value,
                emotion: emotionInput.value,
                query: form.query.value
              };
              console.log("Form submitted with:", data);
              alert("Thank you for your feedback!");
              form.reset();
              emotionButtons.forEach(b =>
b.classList.remove("selected"));
            });
          });
        </script>
      </body>
      </html>
```

APPENDIX – 2
SCREENSHOTS

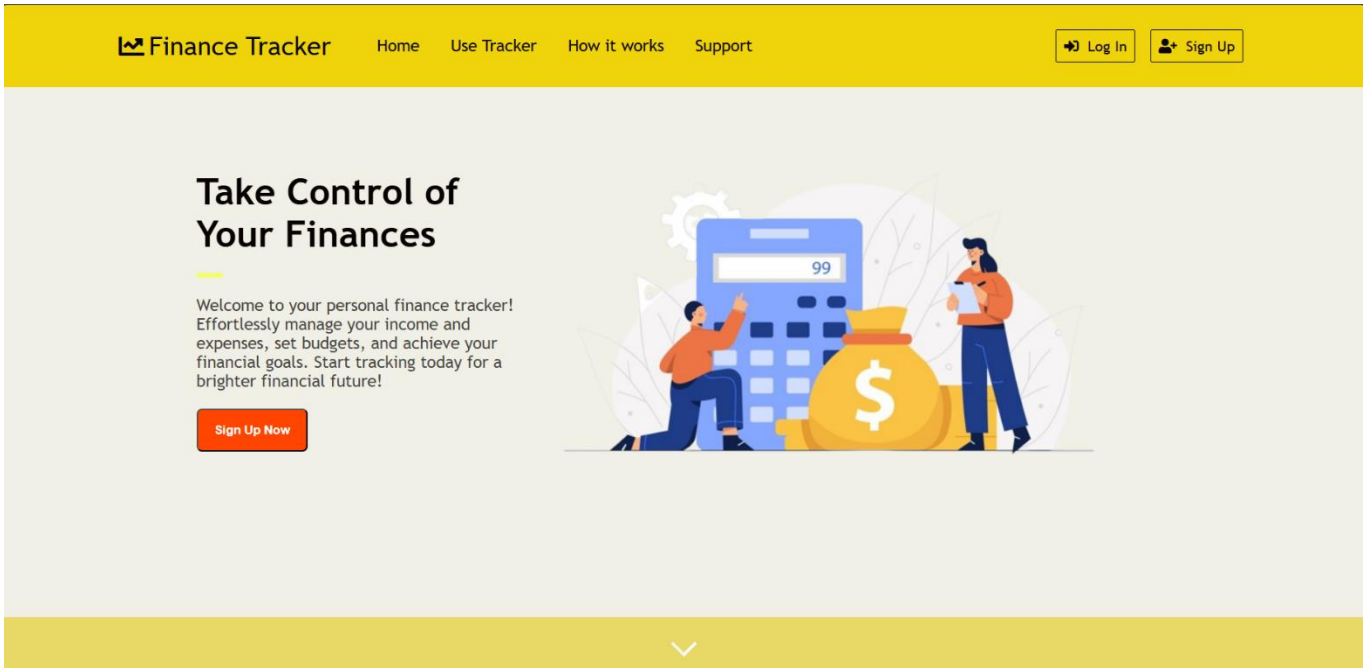

Figure 2.1: Landing page

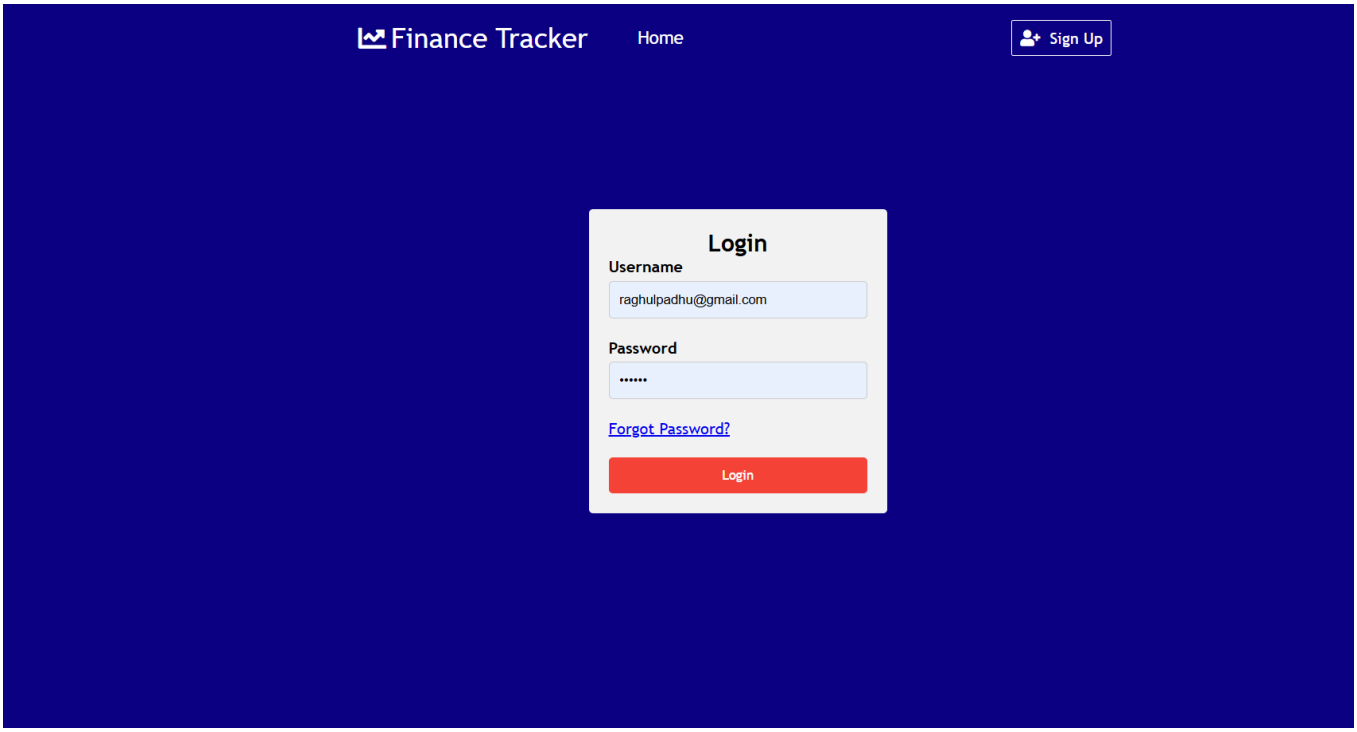

Figure 2.2: Login Page

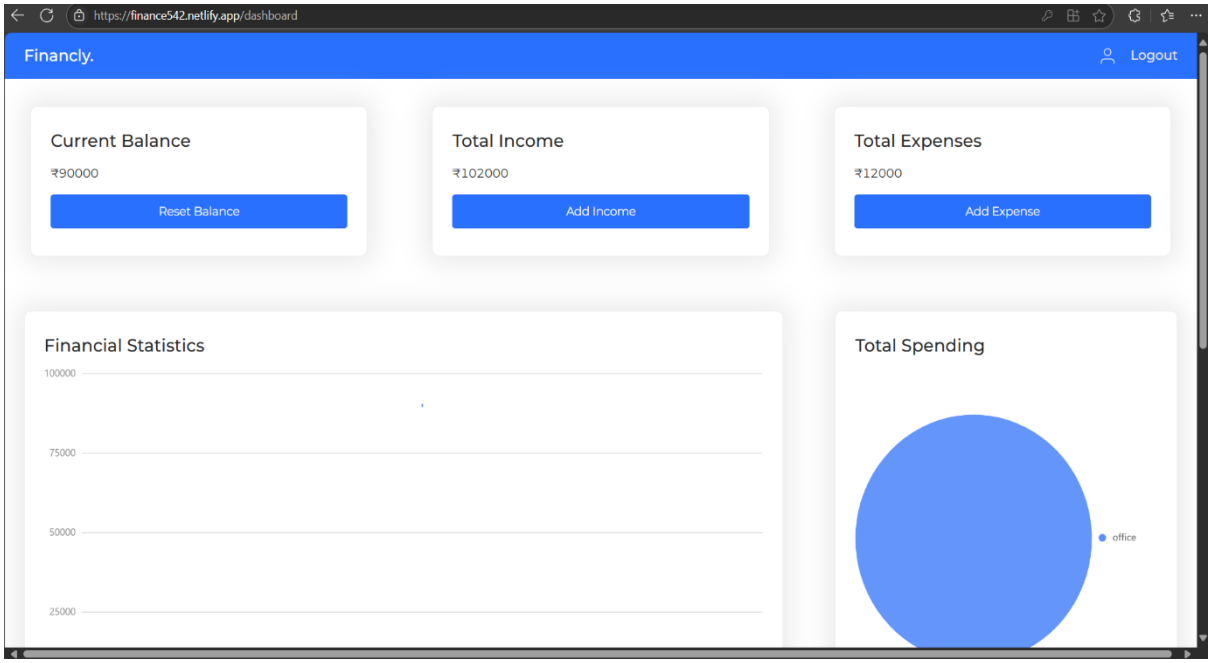

Figure 2.3: Dashboard

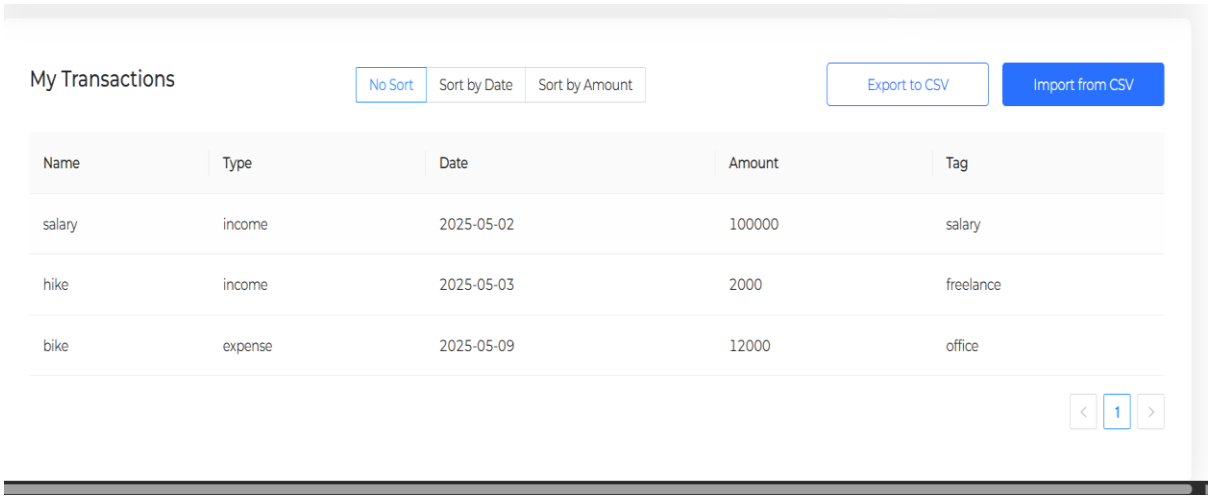

Fig 2.4: Transaction Table

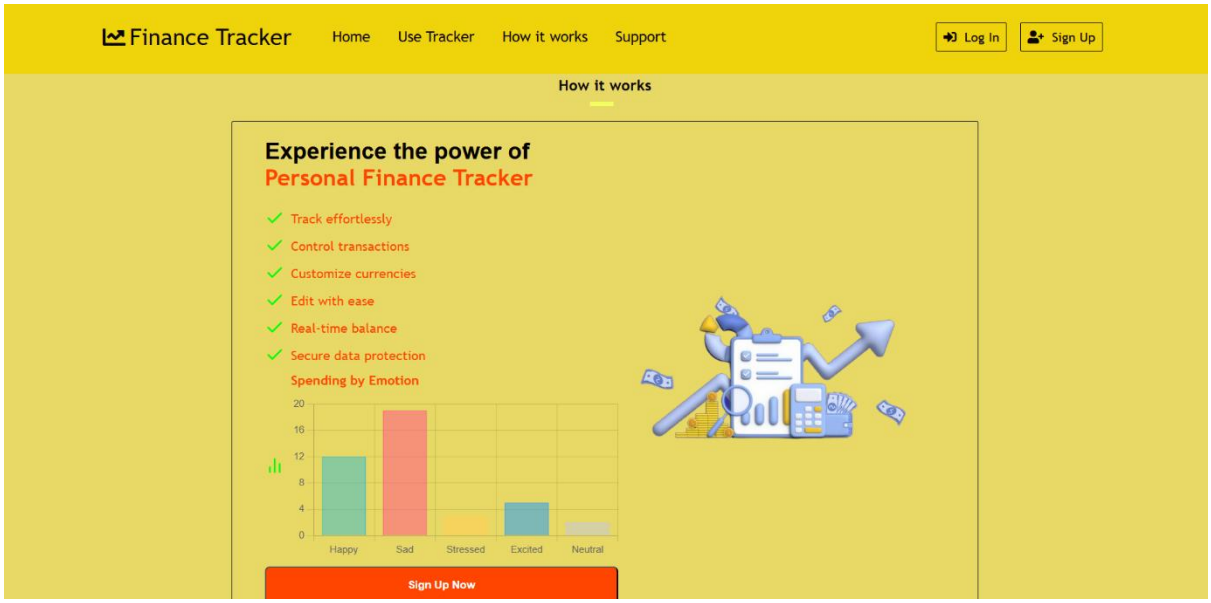

Figure2.5: Chart Representation

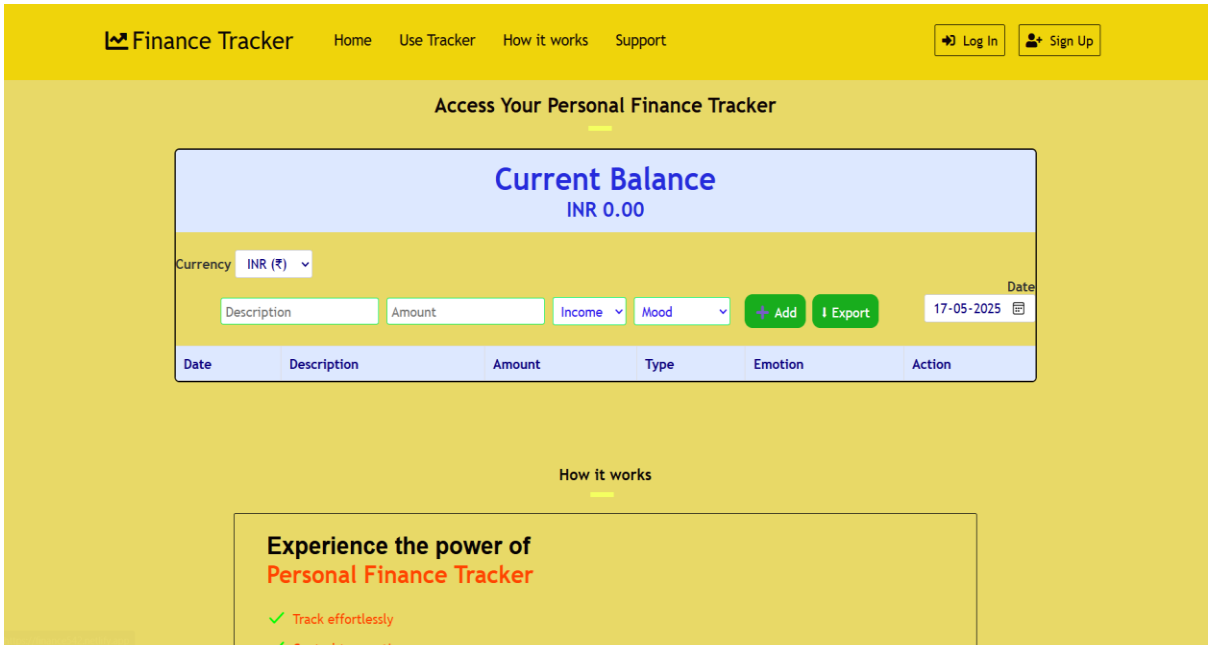

Figure 2.6: Access your Personal Finance Tracker

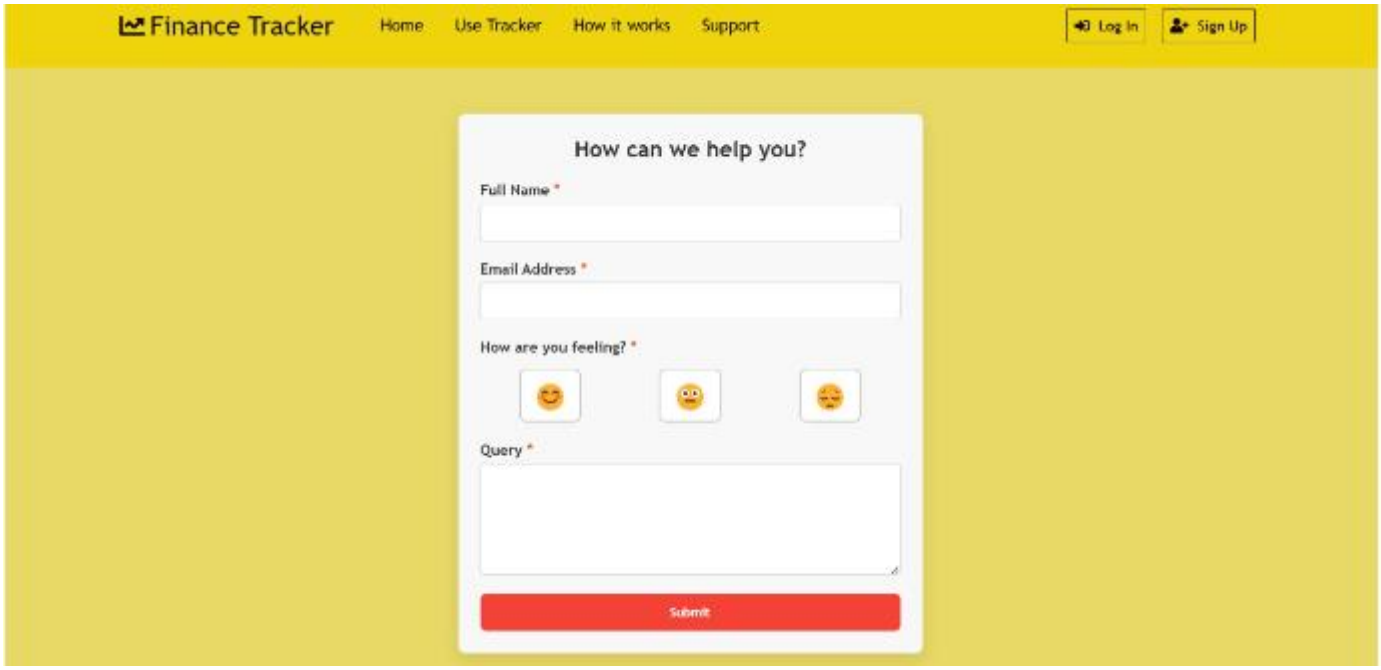

Figure 2.7: Finance Tracker feedback

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