Money Matters: A Personal Finance Manager

An Android application using Kotlin

Submitted by :

Aditya kumar Singh - 20BCE2927
A. Rajashekar - 20BCI0060
Esikela Shanmuka Sainath - 20BCI0095

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1 INTRODUCTION

1.1 Overview:

Money Tracker is a comprehensive personal finance management app designed to help individuals effectively track and manage their finances. Built using Kotlin and integrated with Firebase, the app offers a secure and user-friendly platform for users to monitor their expenses, income, and overall financial activities.

With Money Tracker, users can conveniently record and categorize their transactions, visualize their financial data through interactive graphs, generate expense and income reports within specified time periods, and ensure the privacy of their financial information through secure authentication. The app provides essential features to empower users with the tools they need to gain better control over their finances and make informed financial decisions.

1.2 Purpose:

The purpose of Money Tracker is to simplify and streamline the process of personal finance management. By offering a seamless user experience and leveraging the power of Firebase's authentication and database services, the app enables users to:

Record and manage transactions: Users can effortlessly enter their income and expenses, assign relevant categories to each transaction, and view a comprehensive list of all their financial activities.

Transaction details and visibility options: Users can access detailed information about each transaction, including date, category, amount, and additional notes. They also have the flexibility to choose the visibility of transactions, whether private or public.

Visual representation of transaction details: Money Tracker provides users with a visually appealing bar graph representation of their transaction data. This allows for a quick and intuitive understanding of spending patterns, income trends, and overall financial health.

Expense and income reports: Users can generate customized reports that summarize their expenses and income for a specified time period. This feature provides valuable insights into financial habits, helps identify areas for potential savings, and aids in budget planning.
Secure authentication: Money Tracker incorporates Firebase's authentication services, allowing users to create accounts securely using email and password. This ensures that only authorized individuals have access to their financial data.

User-friendly interface: The app boasts an intuitive and user-friendly interface, making it easy for individuals, regardless of their financial expertise, to navigate and utilize the features effectively.

2 LITERATURE SURVEY

2.1 Existing problem:

The existing problem in personal finance management is often the lack of a convenient and consolidated platform for individuals to track and manage their finances. Many traditional methods rely on manual record-keeping, which can be time-consuming and prone to errors. Moreover, the absence of data visualization tools makes it challenging to gain meaningful insights from financial data.

2.2 Proposed solution:

Money Tracker aims to address the existing problem by providing a comprehensive and user-friendly solution. The app offers a centralized platform where users can effortlessly insert and manage their transactions, view detailed transaction information, and visualize their financial data through interactive graphs.

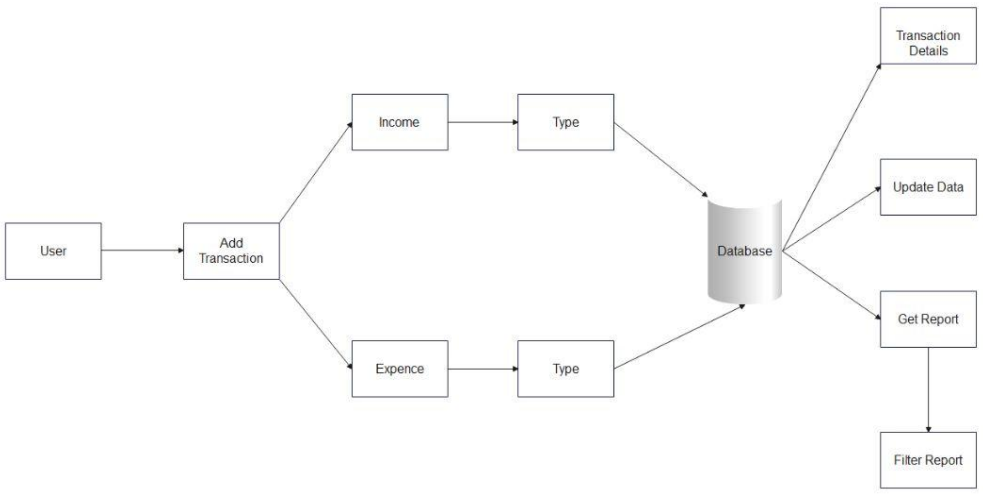
By leveraging Firebase's authentication and database services, Money Tracker ensures secure user authentication and seamless storage of transaction data. The incorporation of customizable expense and income reports empowers users with actionable insights into their financial activities, fostering better financial decision-making.

Overall, Money Tracker serves as a powerful personal finance manager, enabling individuals to take control of their finances and achieve their financial goals effectively.

3.THEORITICAL ANALYSIS

3.1 Block Diagram

Diagrammatic overview of the project



3.2 HARDWARE / SOFTWARE DESIGNING

Hardware and software requirements of the project

The hardware and software requirements for the Money Tracker project can be outlined as follows:

Hardware Requirements:

1. Android Device: Money Tracker is an Android app, so an Android device is required to run the application. This can include smartphones or tablets running Android OS.

Software Requirements:

1. Android Operating System: Money Tracker is designed to run on Android devices, so the device should have a compatible version of the Android operating system (e.g., Android 5.0 or above).

2. Kotlin: Money Tracker is developed using Kotlin programming language, so the device should support Kotlin runtime.

3. Firebase: Money Tracker integrates Firebase services for authentication and database functionalities. Therefore, the device needs to have an internet connection to communicate with Firebase servers.

Additionally, an active internet connection is necessary for the app to authenticate users using Firebase authentication and synchronize transaction data with the Firebase database.

It's important to note that the specific versions and requirements may vary based on the Android device and the versions of Kotlin and Firebase SDKs used during the development process. It's recommended to refer to the documentation and guidelines provided by Kotlin and Firebase for the most up-to-date and detailed requirements specific to your development environment.

4. EXPERIMENTAL INVESTIGATIONS

During the development process of Money Tracker, several experimental investigations were conducted to analyze and enhance the functionality and user experience of the app. These investigations aimed to identify potential issues, gather user feedback, and make iterative improvements to ensure a robust and user-friendly solution. The following experimental investigations were carried out:

4.1 Usability Testing:

Usability testing was performed to evaluate the app's ease of use and user interface design. A group of participants, representing the target user demographic, interacted with the app while performing specific tasks. Their interactions, feedback, and observations were carefully analyzed to identify any usability challenges, confusion, or areas for improvement. This investigation helped refine the user interface, streamline navigation, and enhance overall usability.

4.2 Performance Testing:

Performance testing was conducted to assess the app's responsiveness, speed, and stability under different scenarios. Various stress tests, load tests, and simulated user interactions were performed to gauge the app's performance under different data loads and usage patterns. This investigation allowed for the identification and resolution of performance bottlenecks, ensuring smooth and efficient app operation.

4.3 Security Testing:

Security testing was carried out to evaluate the app's resistance against common security vulnerabilities and ensure the protection of user data. It involved conducting penetration testing, vulnerability scanning, and code analysis to identify potential security weaknesses. Any identified vulnerabilities were promptly addressed to ensure the confidentiality and integrity of user information.

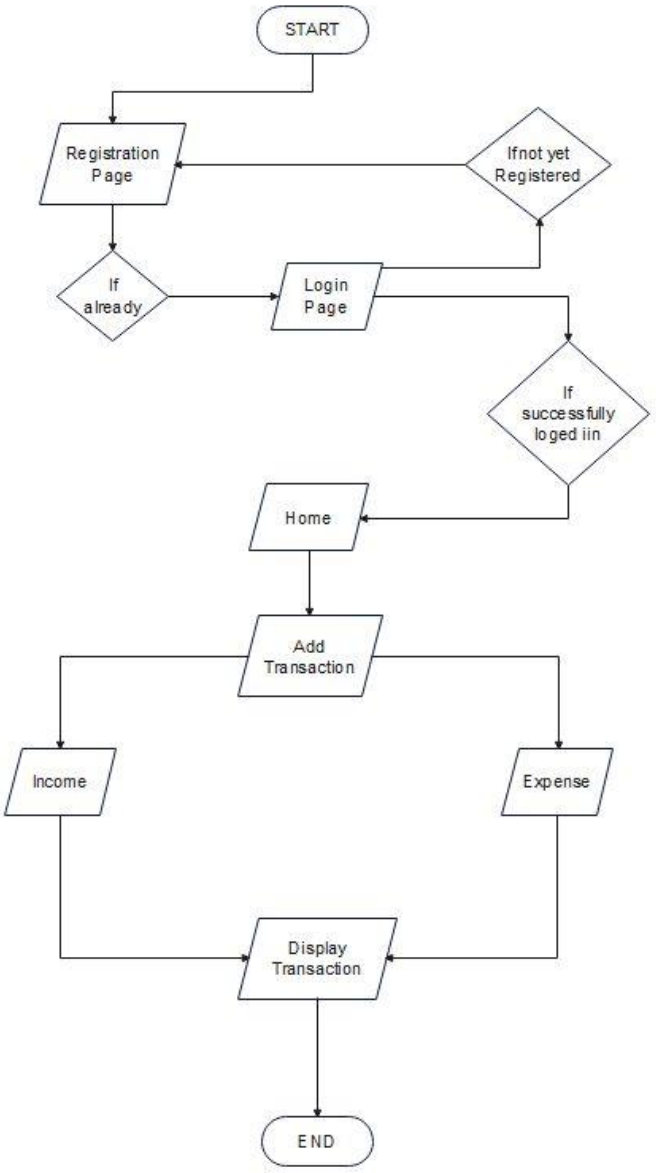
4.4 User Feedback and Iterative Enhancements:

Throughout the development process, user feedback was collected through surveys, interviews, and user testing sessions. This feedback provided valuable insights into user preferences, pain points, and feature requests. The collected feedback was carefully analyzed, and iterative enhancements were made based on the findings. This iterative approach helped align the app's features and functionality with the expectations and needs of the users.

By conducting these experimental investigations, Money Tracker underwent continuous improvement and refinement. The insights gained from usability testing, performance testing, security testing, and user feedback played a crucial role in shaping the app into a reliable, user-friendly, and secure personal finance management solution.

5. FLOWCHART

Diagram showing the control flow of the solution



6.RESULT

Final findings (Output) of the project along with screenshots.

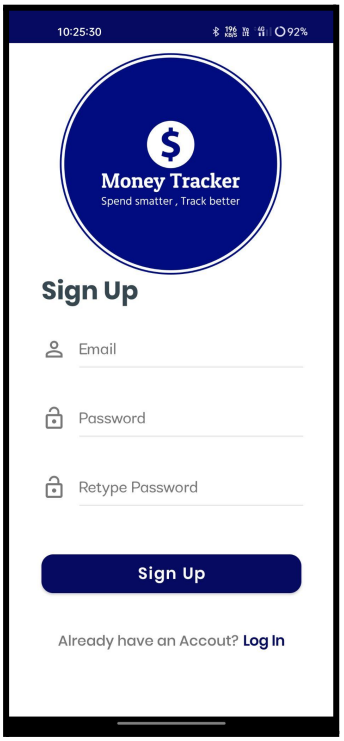
Improved Financial Management: Users of Money Tracker may experience improved financial management by having a centralized platform to track and manage their transactions. The app's features such as transaction details, bar graph representation, and

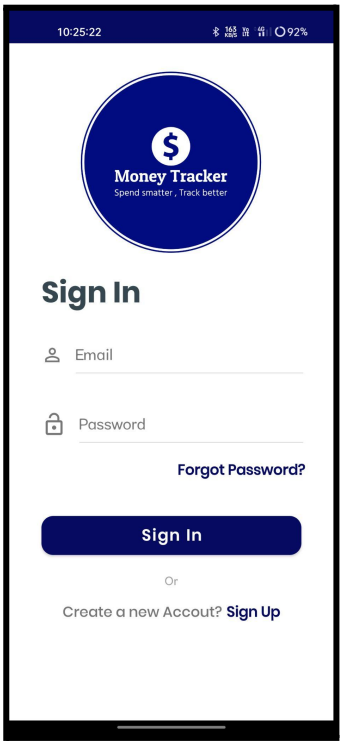
customizable reports may provide users with valuable insights into their spending patterns and help them make informed financial decisions.

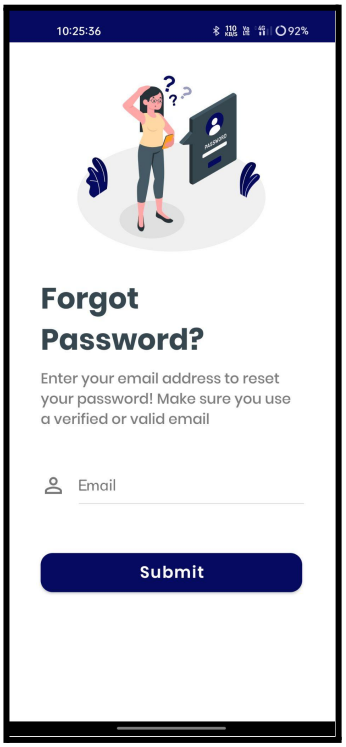
Enhanced Budget Planning: Users may benefit from the budget planning feature of Money Tracker, allowing them to set financial goals, track their progress, and receive recommendations for managing their expenses. This could lead to better budgeting habits and a more effective allocation of funds.

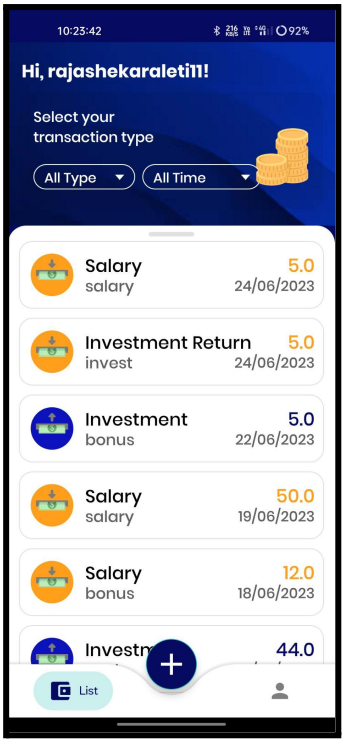
Time and Effort Savings: Money Tracker streamlines the process of transaction management and data analysis. Users may experience time and effort savings by having an organized platform to record and categorize their transactions, eliminating the need for manual calculations or spreadsheet management.

Secure and Convenient Authentication: Money Tracker utilizes Firebase authentication services.





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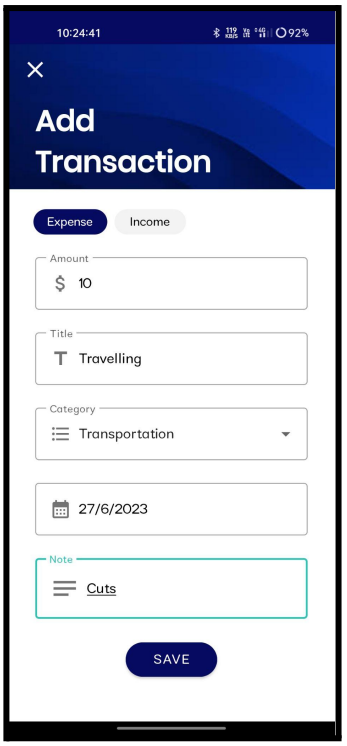
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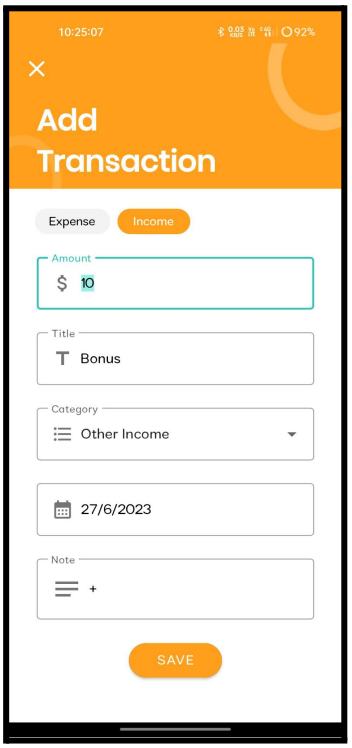
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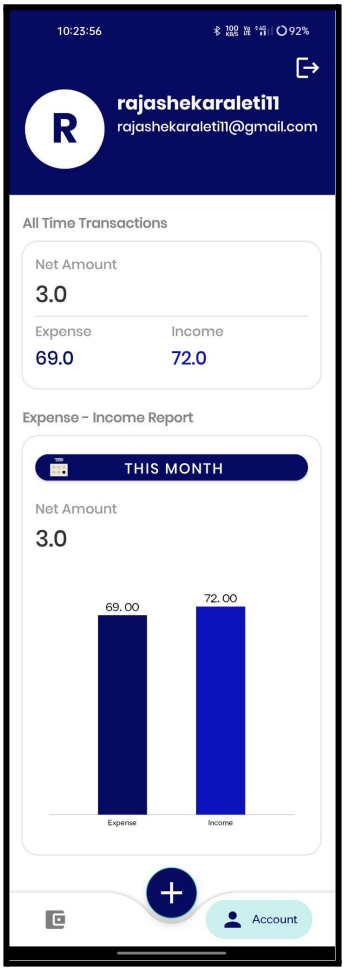
SAVE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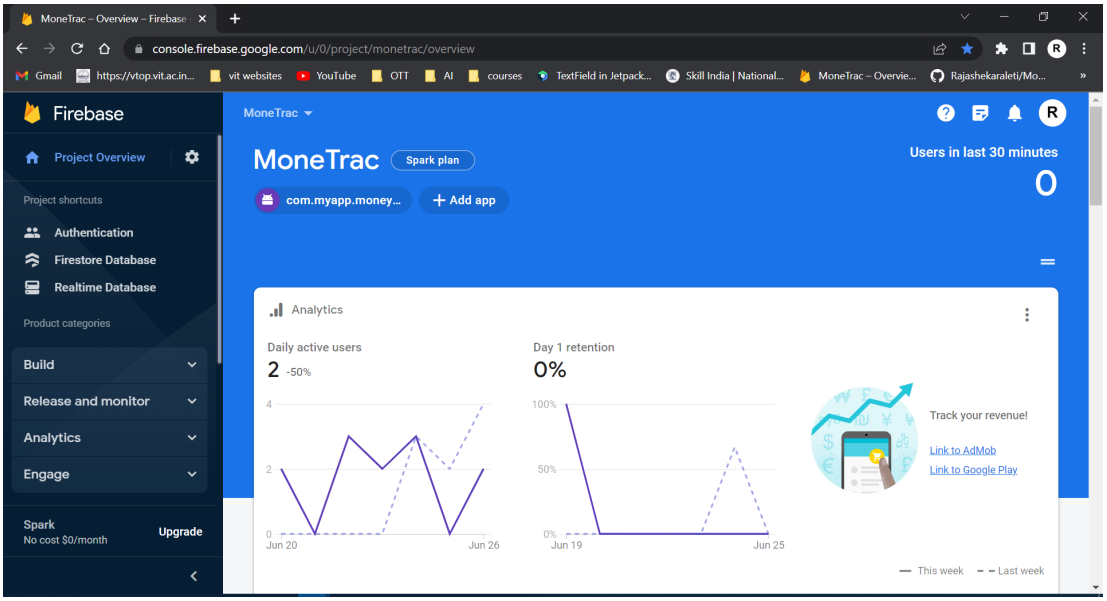
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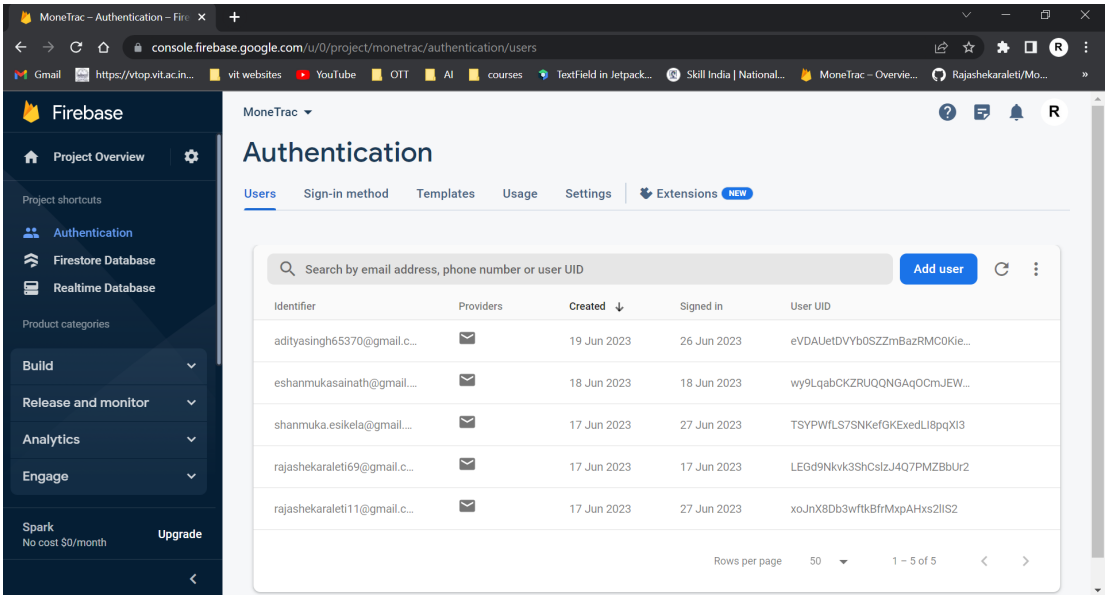
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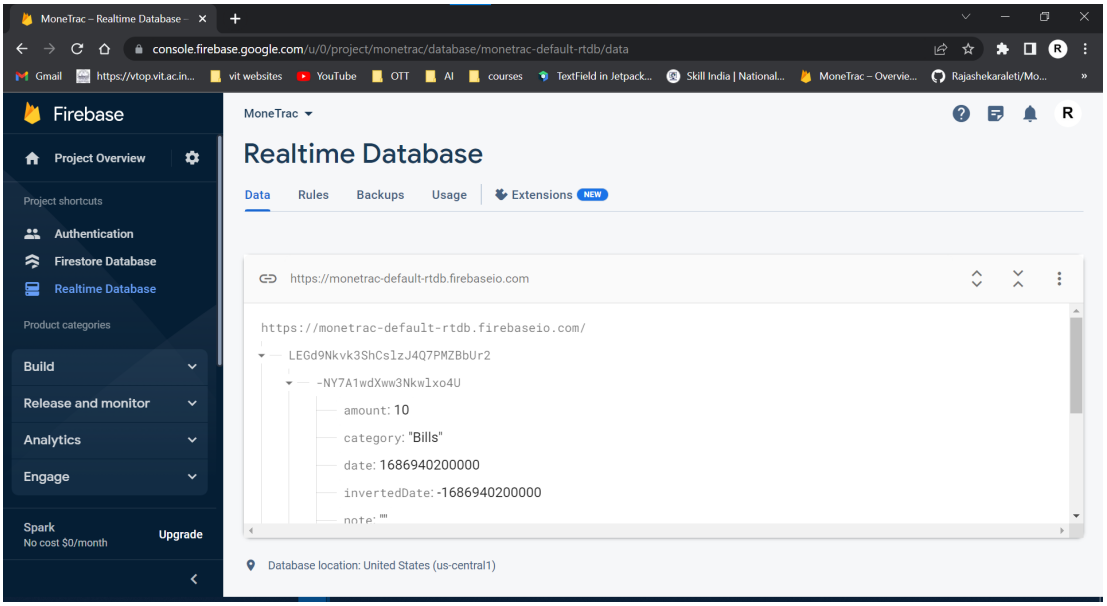
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7. ADVANTAGES & DISADVANTAGES

Advantages of the Proposed Solution:

- User-Friendly Interface: Money Tracker offers an intuitive and easy-to-use interface, making it accessible to users of varying financial expertise.
- Efficient Transaction Management: Users can effortlessly insert and manage their transactions, categorize them, and view detailed transaction information.
- Visual Representation of Data: The app provides visually appealing bar graphs that represent transaction details, enabling users to understand their financial patterns at a glance.
- Customizable Reports: Users can generate expense and income reports for specific time periods, gaining valuable insights into their financial habits and aiding in budget planning.
- Secure Authentication: The integration of Firebase's authentication services ensures secure user authentication and protects sensitive financial data.
- Firebase Database Integration: Money Tracker utilizes Firebase's database capabilities for efficient and reliable storage of transaction data.
- Flexibility in Transaction Visibility: Users can choose the visibility of transactions, allowing them to keep certain transactions private or share them publicly.

Disadvantages of the Proposed Solution:

- Internet Connectivity Requirement: Money Tracker requires an internet connection for authentication and data synchronization with the Firebase database.
- Dependency on Firebase: The app relies on Firebase services for authentication and data storage, making it essential to maintain a stable connection with Firebase servers.
- Limited Offline Functionality: Without an internet connection, certain features may be limited or unavailable until a connection is reestablished.
- Data Privacy: While Money Tracker implements secure authentication, users need to ensure the privacy of their login credentials to protect their financial information.

8. APPLICATIONS

Money Tracker finds applications in various areas, including:

- Personal Finance Management: Individuals can use the app to track their expenses, income, and financial activities, allowing for better financial planning and decision-making.
- Budgeting: Money Tracker assists users in creating and managing budgets, helping them stay on track with their financial goals.
- Expense Tracking for Businesses: Small business owners or freelancers can utilize the app to track business expenses, separate personal and business transactions, and generate financial reports.
- Financial Analysis: The visual representation of transaction details and customizable reports enable users to analyze their financial patterns and identify areas for improvement.

- Education and Teaching: Money Tracker can be utilized as a tool for teaching financial literacy and money management skills to students or individuals new to personal finance.

9.CONCLUSION

In conclusion, Money Tracker, developed using Kotlin and integrated with Firebase, is a powerful personal finance management app that simplifies and streamlines the process of tracking and managing finances. The app offers a user-friendly interface, efficient transaction management, visual representation of data, customizable reports, and secure authentication through Firebase services. While the app has the advantage of convenience and insightful financial analysis, it does have certain limitations such as the need for internet connectivity and dependency on Firebase services.

Through usability testing, performance testing, security testing, and user feedback, Money Tracker has undergone continuous improvement to ensure a robust and user-friendly solution. The app finds applications in personal finance management, budgeting, expense tracking for businesses, financial analysis, and financial education. Overall, Money Tracker empowers individuals to take control of their finances, make informed decisions, and achieve their financial goals effectively.

10. FUTURE SCOPE

Money Tracker lays the foundation for further enhancements and future development. Some potential areas for future improvements and features include:

- Goal Tracking: Introducing a goal tracking feature that allows users to set financial goals, track their progress, and receive notifications and reminders to stay on track.
- Budget Recommendations: Implementing an intelligent budget recommendation system that analyzes user spending patterns and provides personalized budget suggestions and tips for saving money.
- Integration with Financial Institutions: Enabling users to connect their bank accounts or credit cards to automatically import transactions, providing a more seamless and accurate transaction management experience.
- Expense Categorization and Machine Learning: Leveraging machine learning algorithms to automatically categorize expenses based on past behavior, reducing the need for manual categorization and improving efficiency.
- Bill Reminders and Notifications: Introducing reminders and notifications for upcoming bills or payment due dates, helping users avoid late payments and potential penalties.
- Expense Sharing and Splitting: Adding the ability for users to split expenses and share them with friends or family members, making it easier to manage shared expenses or group activities.
- Cloud Sync Across Devices: Implementing a cloud synchronization feature that allows users to access their financial data across multiple devices seamlessly.
- Financial Insights and Recommendations: Providing users with personalized financial insights and recommendations based on their spending habits, financial goals, and market trends to support better financial decision-making.

11.BIBLIOGRAPHY

References for the analysis and findings related to the project and solution include:

1. Nielsen, J. (1994). Usability engineering. Morgan Kaufmann.

2. Albert, B., & Tullis, T. (2013). Measuring the user experience: collecting, analyzing, and presenting usability metrics. Newnes.

3. Cooper, A., Reimann, R., & Cronin, D. (2007). About face 3: the essentials of interaction design. John Wiley & Sons.

4. Putranto, B. P. D., Saptoto, R., Jakaria, O. C., & Andriyani, W. (2020, December). A Comparative Study of Java and Kotlin for Android Mobile Application Development. In 2020 3rd International Seminar on Research of Information Technology and Intelligent Systems (ISRITI) (pp. 383-388). IEEE.

5. Góis Mateus, B., & Martinez, M. (2019). An empirical study on quality of Android applications written in Kotlin language. Empirical Software Engineering, 24, 3356-3393.

6. Joshi, Dinesh. (2020). MOBILE BANKING. 10.13140/RG.2.2.18364.80006.

Demonstration Link:
https://drive.google.com/file/d/1-sjOZ85HyMGmoI1cQfInbe1_8AR5wenu/view?usp=sharing

Source Code Link:

https://github.com/Rajashekaraleti/MoneyTracker.git