CHAPTER 1

INTRODUCTION

1.1 Introduction to SpendWiz

In today's fast-paced and increasingly digital world, the need for an expense tracking app is more crucial than ever. Such apps provide individuals and businesses with a powerful tool to gain control over their finances. An expense tracking app is a digital tool designed to help individuals or businesses monitor and manage their spending habits. These apps typically allow users to input their expenses manually or automatically sync with bank accounts and credit cards to categorize transactions.

1.2. History

Expense tracking apps have evolved significantly since their inception, adapting to the changing landscape of personal finance management. Initially, expense tracking relied on manual methods such as pen and paper or spreadsheets. In the early 2000s, as digital technology advanced, desktop software like Quicken and Microsoft Money emerged, offering users the ability to input and categorize expenses on their computers. The rise of smartphones and mobile apps revolutionized expense tracking further, making it accessible anytime, anywhere. Apps like Mint, launched in 2006, pioneered the automatic syncing of bank accounts to provide real-time expense tracking and budgeting on mobile devices. Since then, these apps have continued to innovate with features like AI-driven insights, secure cloud storage, and integration with financial institutions, catering to a growing demand for convenient and efficient financial management tools in an increasingly digital age.

In recent years, expense tracking apps have become more sophisticated, offering advanced features such as receipt scanning, bill reminders, and customizable financial reports. They have also diversified to serve various needs, from personal budgeting to business expense management. The competition among app developers has driven continuous improvement, with a focus on user experience, security, and integration with other financial services. As more individuals and businesses recognize the benefits of meticulous financial oversight, the demand for intuitive and comprehensive expense tracking solutions continues to grow, shaping the future of personal and corporate finance management.

1.3. Applications of Expense Tracker

Expense tracking apps are versatile tools that find application in various personal and business contexts:

Personal Budgeting:

Helps individuals manage personal finances by tracking expenses, setting budgets, and analysing spending patterns to achieve financial goals.

Business Expense Management:

Facilitates tracking and categorizing business expenses, simplifying reimbursement processes, and ensuring compliance with company budgets and policies.

Travel Expense Tracking:

Ideal for tracking expenses incurred during business trips or vacations, including accommodation, meals, and transportation, for reimbursement or personal record-keeping.

Debt Management:

Supports individuals in managing and reducing debt by visualizing debt payments, interest rates, and overall financial obligations.

Financial Planning:

Provides insights into long-term financial planning by analysing spending trends, identifying areas for savings, and forecasting future expenses. This provides the user an insight into their financial behaviours and patterns

Assisting Saving Goals:

Expense tracking apps can assist in saving by identifying areas where expenditures can be reduced or optimized. By analysing spending patterns and setting budgetary limits, these apps help users allocate funds more efficiently towards savings goals.

1.4 Problem Statement

Despite the availability of various financial management tools, many individuals struggle with effectively tracking and managing their expenses. This often leads to financial stress, overspending, and difficulty in achieving savings goals. To address these issues, our expense tracking app aims to assist people in keeping better track of their expenses and savings.

1.5. Objectives of the project

- Facilitate Expense Monitoring: Enable users to easily track and categorize their expenses in real-time, providing a clear overview of where their money is being spent.

- Support Budget Management: Help users set, monitor, and adhere to personalized budgets for various expense categories, promoting financial discipline and goal achievement.

- Provide Insights and Analysis: Offer users actionable insights into their spending patterns through reports and analytics, allowing for informed financial decision-making

- Promote Financial Awareness+: Increase users' awareness of their financial habits and trends, empowering them to make adjustments that align with their financial goals and priorities.

1.6. Organization of the report

This section deals with the Introduction and organization of the project report.

In chapter 2, we discuss the System requirement and Specification. Chapter 3 gives us the System Design and Implementation and in chapter 4 Results are discussed and conclusion and future working are discussed in chapter 5.

CHAPTER 2

SYSTEM REQUIREMENTS AND SPECIFICATIONS

2.1 Functional Requirements

The functional requirements outline the fundamental features and capabilities that are indispensable for an expense tracking app to adequately serve its users. These specifications are crucial as they define the core functionalities that enable users to manage their finances efficiently and achieve their financial goals. By detailing aspects such as user registration and authentication processes, the app ensures secure access for individuals seeking to monitor their expenses. Expense entry functionalities allow users to input transactions manually, specifying details like date, amount, category, and notes, thereby facilitating accurate record-keeping and analysis.

The functional requirements of SpendWiz are as follows:

Expense Entry: Enable users to manually input expenses, including date, amount, category (e.g., groceries, transportation), and optional notes.

Budget Management: Allow users to set up budget limits for different expense categories and provide notifications or alerts when nearing or exceeding these limits.

Reporting and Analytics: Generate detailed reports and visualizations (e.g. graphs) that summarize spending patterns, trends, and budget adherence over time.

Ease of Use: Provide a platform where the managing and organising of expenses is easy and quick.

Expense Categorization: Provide predefined and customizable categories for expenses to facilitate organization and analysis.

Security and Privacy: Implement strong security measures to protect users' financial data, including encryption, secure authentication, and compliance with data protection regulations.

2.2 Non-Functional Requirements

Non-functional requirements are essential criteria that establish the broader operational framework and quality standards of an expense tracking app beyond its core functionalities. These requirements encompass aspects such as usability, ensuring that the app offers an intuitive interface and seamless user experience that promotes ease of navigation and efficient task completion. Performance requirements dictate that the app operates reliably with swift response times and minimal downtime, ensuring users can access their financial data promptly and reliably under varying conditions.

Usability:

- The usability of an expense tracking app is critical to its success, as it directly impacts user adoption and satisfaction. An intuitive and user-friendly interface is essential, allowing users to navigate the app effortlessly and perform tasks with minimal guidance.
- Clear and organized layouts for expense entry, budget management, and reporting ensure that users can easily input transactions, set budgets, and generate financial reports without confusion.
- Intuitive design principles, such as consistent navigation patterns and informative tooltips, help streamline the user experience, making it accessible even to those less familiar with financial management tools.

Performance:

- The performance of an expense tracking app determines its responsiveness and reliability under varying conditions of use. Users expect the app to operate swiftly, with quick loading times for data retrieval and seamless transitions between screens.
- Reliable performance is crucial for preventing frustration and maintaining user trust.

Reliability:

- Reliability is a fundamental characteristic of an expense tracking app, ensuring consistent availability and functionality without unexpected interruptions or crashes. By prioritizing reliability, the app enhances user satisfaction and loyalty, fostering long-term engagement.

CHAPTER 3

SYSTEM DESIGN AND IMPLEMENTATION

3.1 System Design

The SpendWiz Expense Tracking System simplifies expense related operations, offering several benefits:

1. **Efficient Working**:
   Automating expense tracking reduces the time spent on manual data entry and reconciliation, freeing up time for other tasks.
2. **Meeting Financial Goals**
   Goal Setting: Facilitates setting financial goals, such as saving for a vacation or paying off debt, and tracking progress towards these goals.
3. **Assisting Saving**
   Encouraging Saving: By providing insights into spending habits and identifying areas where users can reduce expenses. By tracking expenditures and setting budget limits, these apps help individuals allocate funds more efficiently towards savings goals.
4. **Security**
   Enhanced Security: Secure storage and encryption protect sensitive financial data,
   ensuring privacy and compliance with data protection regulations.
5. **Accessibility**
   Accessible Design: Ensures that an expense tracking app is usable and navigable by users with disabilities, adhering to accessibility standards and guidelines.
6. **Compatibility**
   Compatibility ensures that an expense tracking app functions seamlessly across various devices, operating systems, and screen sizes, maximizing accessibility for diverse user demographics.
7. **Financial Discipline**
   Alerts and reminders help users stay within budget limits and avoid overspending, fostering better financial discipline.

3.2 Tools and Technologies Used

Jetpack Compose

SpendWiz is designed using Jetpack Compose and is designed to streamline and enhance the user experience through its intuitive and visually appealing user interface. Leveraging Jetpack Compose declarative UI framework, the app offers a seamless navigation experience and robust functionality across various screens. Key features include dynamic data rendering with smooth animations, responsive layouts optimized for different screen sizes, and interactive components that prioritize user engagement. The app integrates seamlessly with Android's Material Design guidelines, ensuring a consistent and aesthetically pleasing user interface throughout. It also incorporates efficient state management mechanisms to handle dynamic content updates and user interactions effectively. With a focus on performance and usability, our app aims to provide a compelling user experience while leveraging the latest advancements in Android UI development offered by Jetpack Compose.

Jetpack Compose leverages Kotlin's capabilities to enable developers to describe UI components and their interactions in a declarative manner, rather than using traditional XML layouts and imperative programming. This paradigm shift allows developers to create UIs more intuitively through composable functions, which are reusable building blocks that encapsulate UI elements and their behaviour. By embracing reactive programming principles, Jetpack Compose simplifies state management and UI updates, enhancing code readability and maintainability. Integrated seamlessly with Android Studio, it provides powerful tooling support including real-time previews and debugging tools, facilitating rapid iteration and experimentation during UI development.

Kotlin

This modern programming language for Android development will ensure efficient and maintainable code for the app's functionalities. Kotlin is designed to be fully interoperable with Java, meaning it can seamlessly integrate with existing Java codebases and libraries. It aims to address many of the shortcomings of Java while providing modern features and enhancements that improve developer productivity and code quality.

The app we've developed uses Kotlin and is a versatile and robust Android application designed to deliver a seamless user experience with its efficient and modern programming language. Kotlin's concise syntax and interoperability with Java have allowed us to create a highly functional app that performs well across different Android devices. Key features of our app include a user-friendly interface, intuitive navigation, and responsive layouts that adapt to various screen sizes. We've leveraged Kotlin's powerful features such as coroutines for asynchronous programming, extension functions for enhancing standard library capabilities, and null safety to minimize runtime errors. The app integrates smoothly with Android's ecosystem, utilizing Android Jetpack components for enhanced architecture, data management, and user interface design. With Kotlin's support for functional programming paradigms and strong type inference, our app not only prioritizes performance and reliability but also facilitates maintainability and scalability for future updates and enhancements.

Room Persistence Library

Room Persistence Library is another tool we have used for the development of our SpendWiz App. This library from Android Jetpack simplifies database interactions within the app. Room will likely be used to store transaction data like expense amounts, categories, and dates. Alternatively, SQLite might be used directly for data storage.

Room Persistence Library is an essential component of the Android Jetpack suite developed by Google, designed to streamline SQLite database operations in Android applications. It provides a higher-level abstraction over SQLite, making it easier for developers to work with databases using Java or Kotlin. One of its key advantages is the simplification of database creation and management through the use of annotations to define entities (database tables) and their relationships. Room offers compile-time SQL query verification, which ensures that SQL queries written as annotated methods in DAO interfaces are validated early in the development process, reducing the likelihood of runtime errors. Moreover, Room automates object mapping between database rows and Java/Kotlin objects, minimizing boilerplate code typically required for data conversion. It supports LiveData and RxJava for reactive programming, enabling developers to observe database changes and update UI components accordingly. Room also includes features like type converters for handling complex data types and migrations to manage database schema changes across app updates.

3.3 DESCRIPTION OF CODE

The SpendWiz expense tracker app leverages Jetpack Compose for building its user interface, Kotlin for its core programming, and Room Database for efficient data management. Users interact with a responsive UI to input, edit, and manage their transactions, which are then processed by ViewModels ensuring data consistency and lifecycle management. The repository layer acts as a mediator, fetching and updating data through DAOs that handle database operations in the Room Database. This architecture ensures a smooth and seamless user experience, with real-time data updates and robust data persistence, making SpendWiz a powerful tool for tracking expenses and managing personal finances.

COMPONENTS AND WORKFLOW

COMPONENTS

1. **Jetpack Compose:**

- **UI Components:** Uses declarative UI components to build a responsive and dynamic user interface.
- **Composable Functions:** Modular UI building blocks for creating reusable UI components.

2. **Kotlin:**

- **Language:** Primary programming language for developing the app.

3. **Room Database:**

- **Entity:** Defines the data schema for the app's database tables.
- **DAO (Data Access Object):** Provides methods for accessing and managing the data stored in the database.
- **Database:** The main access point for the app's persisted data, configured with entities and DAOs.

4. **ViewModel:**

- **ViewModel:** Manages UI-related data in a lifecycle-conscious way, ensuring data survives configuration changes like screen rotations.

WORK FLOW

1. **User Interaction:**

- **User Input:** Users interact with the app by adding, editing, or deleting transactions through the UI.
- **UI Updates:** Composable functions in Jetpack Compose respond to user interactions by updating the UI.

2. **ViewModel Interaction:**

- **UI Requests:** The UI layer communicates with ViewModel to request data or perform actions.
- **Data Handling:** ViewModel process these requests, often involving data manipulation or retrieval.

3. **Repository and Data Source Interaction:**

- **Data Fetching:** ViewModel call repository methods to fetch or update data.
- **Data Management:** The repository decides whether to fetch data from the Room database or other data sources.

4. **Database Operations:**

- **Room Database:** The repository uses DAOs to perform CRUD (Create, Read, Update, Delete) operations on the Room database.
- **Entity Management:** DAOs handle the conversion between database rows and Kotlin objects (entities).

5. **Live Data Observation:**

- **Data Observation:** ViewModel expose LiveData objects, which the UI layer observes.
- **UI Updates:** When data changes, LiveData notifies the UI components, triggering a UI update

CHAPTER 4

RESULTS AND SNAPSHOTS

4.1 Results

The SpendWiz expense tracking app that serves as a versatile digital tool for efficiently monitoring and managing financial expenditures. Our app empowers users to effortlessly record and categorize various expenses, including daily purchases, bills, and payments, providing a comprehensive overview of their spending habits. Through a user-friendly interface, individuals can input transaction details such as dates, amounts, categories (like groceries, transportation, utilities), and additional notes, ensuring accurate and organized financial records. Moreover, our app offers functionalities to automate the import and categorization of transactions from linked bank accounts or credit cards, simplifying the data entry process. With customizable budgeting tools and insightful analytics, users can set financial goals, track their progress, and make informed decisions to optimize their finances effectively. Features like reminders for upcoming bills and alerts for budget limits further support users in maintaining financial discipline and avoiding overspending. Our expense tracking app is designed to enhance financial awareness, promote proactive financial management, and ultimately contribute to improved financial health for individuals and businesses alike.

4.2 Snapshots

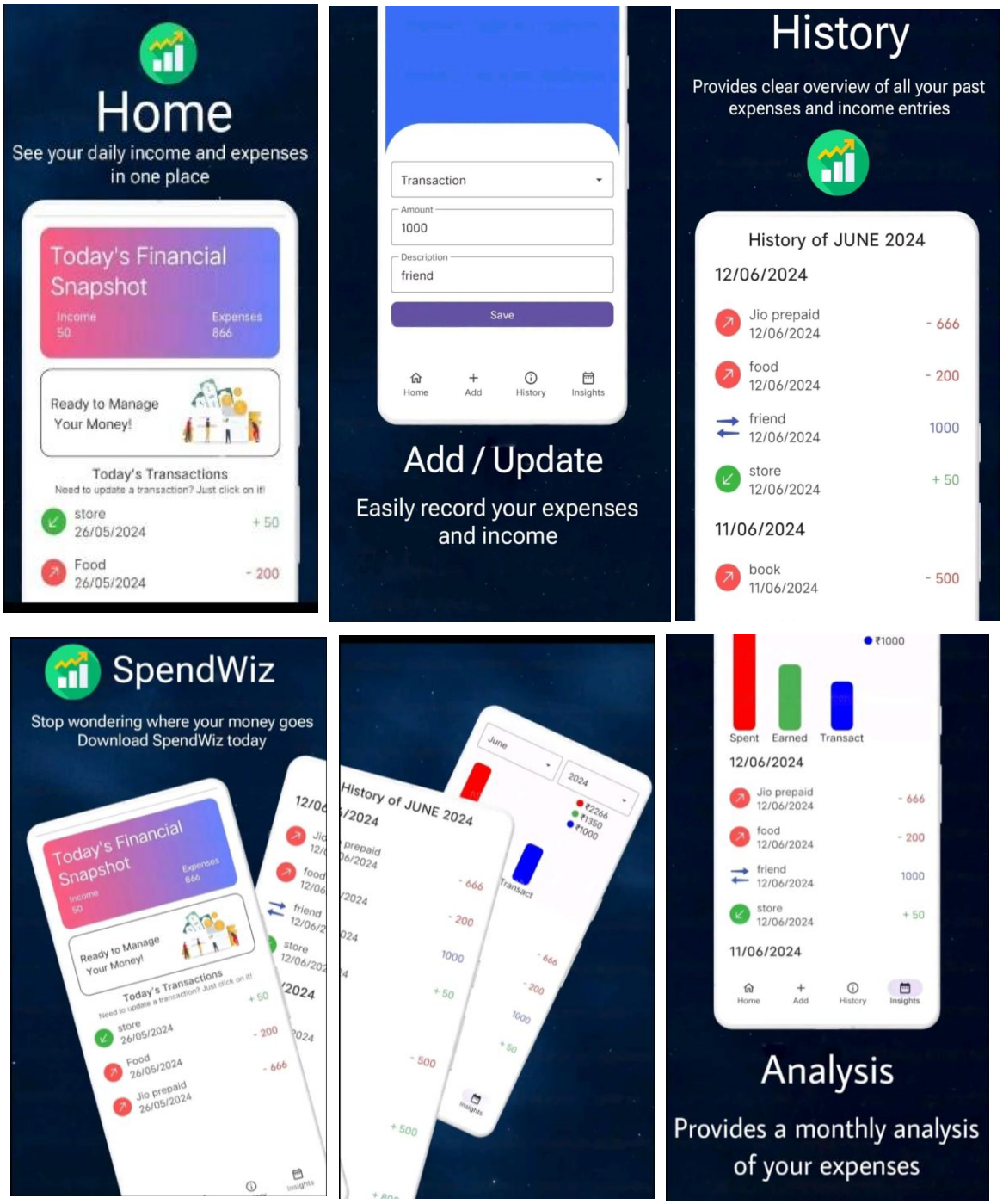

Fig 1.1. Different Screens in the Application

CHAPTER 5

CONCLUSION

5.1 Conclusion

The SpendWiz expense tracking app represents a significant advancement in personal and business financial management. By leveraging modern technology and intuitive design principles, we have created a robust tool that empowers users to take control of their finances with ease and efficiency. Through features such as automated expense recording, customizable budgeting tools, and insightful analytics, our app not only simplifies the process of tracking expenditures but also enhances financial awareness and discipline. Users benefit from real-time insights into their spending habits, enabling informed decision-making and goal setting to achieve long-term financial objectives. Moreover, the app promotes transparency and accountability in financial transactions, fostering a proactive approach to managing finances effectively. Moving forward, we are committed to continuously enhancing our app with new features and improvements to meet the evolving needs of our users and further solidify its role as a valuable companion in their financial journey.

5.2 Future Scope

The app can be further developed to directly update the transactions without any separate updating by directly reading the messages that are related to any transactions. To enhance the functionality of the expense tracker app, a feature could be developed to automatically update transactions by parsing relevant messages directly.

The app integrates with messaging platforms or email accounts where users receive transaction-related messages, such as bank notifications or receipts.

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