**1.0 Introduction**

* 1. Project Background

Applications are therefore being made to solve certain problems which come up every day. It was very hectic to keep a record of every cent spent without missing any, so the world came up with what is called an expense tracker application. Most of the readily available applications in the market are full of impressive features such as synchronizing bank accounts, investment accounts, and credit cards, and also customizing of spend reports.

However, even if an application is downloaded at high rates, it does not mean that the number of active users that use it is high, too. Eduardo Barbaro et al. claim that in a mobile app, there is a need to maintain the user's attraction in order to keep them active for consuming services and creating new contents. On the other hand, there can be reasons parallel why users abandon an app due to other emerging apps or simply because of the decline in interest over the service it offers. Therefore, according to Chenxi Liu et al., factors such as usability, learning opportunities, social interaction, and incentives of completing tasks have a strong influence on user engagement. According to David Raso, moreover, people feel far more committed in cases when they can perform a wide range of activities. Of course, this principle could be applied to repetitive activities like expense tracking. While people may initially be excited about using an expense tracker, they may get bored over time due to this constant recording of expenses. As a matter of fact, it can be so unexciting for some people if the features on an app don't excite them.

This calls for the solution by addressing the problem with a new application Expense Tracker that will have several engaging features. The app being an expense manager would take benefit further by facilitating sharing of bill amounts amongst friends and groups for convenience. It would also provide gamification or the use of game design elements in non-game contexts to increase and reward certain behaviors and improve user experience. As per Ganit Richter et al., gamification has become one of the latest trends to be used across sectors like marketing, politics, health, and education and is fast gaining popularity.

For instance, IT research firm Gartner predicted that by 2015, half of large companies will have incorporated gamification techniques into at least one business process. At the same time, M2 Research forecasted revenues of gamification software and services to rise to $938 million in 2014 from less than $100 million in 2011. Incorporating expense management, splitting, and gamification into an expense tracker app will make financial handling more enjoyable and engaging for its users.

* 1. Problem Statement

While there are already a lot of expense trackers in the market, several of these also face difficulties in retaining the users engagingly. The installation rates of such apps are always high; in many cases, people get bored or lose interest after some time. This may be from very repetitive tasks, not too interesting of features, or not enough social interaction. Hence, it can be a very tedious job for users to track their expenses; therefore, this may reduce motivation and perhaps even leave using the application altogether. This indicates there is a need for an expense-tracking application that will ease managing finances but also keeps users motivated to create and interact with such features.

* 1. Objective

a. To develop an intuitive and user-friendly expense tracker application that simplifies the process of recording and managing personal finances.

b. To integrate expense splitting features that allow users to easily share and manage costs with friends or groups, promoting collaborative financial management.

c. To incorporate gamification elements that engage users through game-like features, encouraging regular use and making the experience of tracking expenses more enjoyable.

* 1. Scope

These features within the scope of this project offer a series of enhancements to the current Expense Tracker application. It will handle expenses efficiently by recording expenditure, categorizing, and tracking expenses with ease. The bill-splitting feature inside the application will let users share their expenses quickly with friends or family. To make it more gameful, the features will also include rewards, challenges, and progress tracking. It will also provide useful analytics for users, like insights and reports on spending behavior to help them make educated decisions about their finances. Last but not least, huge attention will be paid to user interface design: an application will be worked out in the most intuitive and stylish way to enhance overall user experience.

* 1. Project Significance

This project holds immense potential; it solves the users' common drawbacks when using expense tracker applications. Incorporating gamification and social features into financial management will render it more attractive, appealing, and enjoyable for the users, thus encouraging good spending behavior and accommodation of good financial literacy. Besides, sharing expenses with friends and groups boosts cooperation and communication; they cannot do without one another in managing their finances. Thus, the project attempts to join the ranks in this fast-growing industry of personal finance technology by offering solutions that can meet the continuous changes in user needs.

**2.0 Project Planning**

2.1 Methodology

The proposed project will adopt the Agile Development methodology. It is a development approach characterized by iterative and incremental development, where there is continuous flexibility and response to needed changes from the users. The work shall be divided into small, manageable features, developed in short cycles or sprints, lasting generally from 1 to 4 weeks. Each sprint can focus on the delivery of different functionalities from the Expense Tracker application, which could be authentication, friend or group feature, expense management, bill splitting, or gamification aspects. During the development phase itself, proactive solicitation of user feedback should be called for and integrated through early and frequent involvement of users in order to make sure that the application will meet the needs and expectations of the users. Continuous Integration and Testing will be performed to identify problems fast and fix them. It will include automated testing, which is very important for stability with new added features. Gathering feedback regarding the effectiveness and usability of the implemented features after each sprint will dictate the prioritization for further development. Proper documentation of user stories, their acceptance criteria, and the outcomes of the sprint shall be maintained throughout the project. Regular review meetings shall be in place to check progress and realign project goals if needed. Using this Agile approach, the project will work on a developed, user-friendly, engaging expense-tracker application needed for fitting with changing user needs and effectively delivering value.

2.2 Feasibility Study

2.2.1 Tools

The proposed solution will be built using Next.js and Firebase. Next.js is a powerful React framework for building full-stack web applications, providing seamless server-side rendering and static site generation. TypeScript is used as a strongly typed language, adds static type-checking to JavaScript, enhancing maintainability and keeping the codebase robust and easy to work with.

Firebase which is developed by Google that provides a full range of tools and services to help developers build, manage, and scale mobile and web apps efficiently. In the application, Firebase Authentication is used to provide secure authentication through signing in with options like Google or email and password. Clous Firestore which is a scalable NoSQL cloud database is used to offer features like automatic scaling, high performance, and real-time data sync.

Apart from this, Cloud Storage in Firebase will be used as well for storing user-generated content such as images. This helps to improve the application due to Google Cloud’s fast, secure infrastructure. Hence, these technologies will form a strong and efficient foundation for the expense tracker application, delivering a seamless and engaging user experience.

2.2.2 Gantt Chart

* **Authentication**
  + Set up Firebase Authentication
  + Implement sign-in/sign-up functionality
  + Test authentication flow

**Sprint 2 (Weeks 3-4)**

* **Application Layout**
  + Develop the main application layout
  + Ensure responsiveness and user experience

**Sprint 3 (Weeks 5-6)**

* **Manage Friends or Groups**
  + Design and implement friend/group management features
  + Integrate social sharing options
  + Test functionality

**Sprint 4 (Weeks 7-8)**

* **Expense Management**
  + Develop expense entry and categorization features
  + Implement tracking of expenses
  + Conduct user testing for usability

**Sprint 5 (Weeks 9-10)**

* **Expense Split**
  + Design and implement the expense-splitting feature
  + Ensure seamless integration with expense management
  + Test with user scenarios

**Sprint 6 (Weeks 11-12)**

* **Gamification**
  + Incorporate gamification elements (rewards, challenges)
  + Design user engagement strategies
  + Test gamification features with users

**Sprint 7 (Weeks 13-14)**

* **Expense Analytics**
  + Develop analytics dashboard for users
  + Implement data visualization for spending habits
  + Conduct user testing for feedback

**Sprint 8 (Weeks 15-16)**

* **Final Testing and Refinements**
  + Perform comprehensive testing of all features
  + Gather final user feedback
  + Make necessary adjustments and refinements

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