CampusExpense Manager Mobile Application

Group 01

Members:

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Project Overview::

Content:

1. **Brief Description:**
   - CampusExpense Manager is a mobile application designed to help university students efficiently manage their personal and academic expenses.

2. **Project Goals:**
   - Simplify financial tracking for students.
   - Provide actionable insights for better budgeting.
   - Enable quick categorization and analysis of expenses.

3. **Target Audience:**
   - University students seeking a straightforward, user-friendly solution for expense management.

Stakeholders:

- Investment theme: Provide capital and expect the application to be commercializable.
- Client (student): Want the app to be easy to use and have practical features.
- Project management: Ensure progress, quality and reasonable cost.
- Development team: Implement the project, learn and improve skills.

Estimated budget:

- Total budget: 50 - 70 million VND
- Budget allocation: UI/UX design, software development, testing, marketing, and post-implementation support.

Objectives of the App

Primary Objectives:

- Track daily expenses effortlessly.
- Provide a robust budgeting tool with customizable alerts.
- Offer a user-friendly interface tailored for students' needs.
- Enable clear categorization and visualization of expenses.

User Requirements

Key User Requirements:

- Expense tracking with detailed categories.
- Budget alerts to prevent overspending.
- Intuitive user interface for ease of navigation.
- Monthly/weekly summary reports for financial overview.
- Ability to sync data across multiple devices.

Systems Investigation and Research:

Research Phase Summary:

- Surveyed over 500 students to understand financial habits.
- Gathered insights into pain points with existing apps.

Competitor Analysis:

- Identified gaps in existing solutions, such as lack of student-specific features.

Student Needs:

- Focused on simplicity, accuracy, and features like customizable budgeting and expense analysis tailored to a student's lifestyle.

Project Scope and Constraints:

Project Scope:

- Develop a mobile app for managing student expenses.
- Core functionalities: Expense tracking, budgeting, reports, and alerts.
- Platforms: Android and iOS.

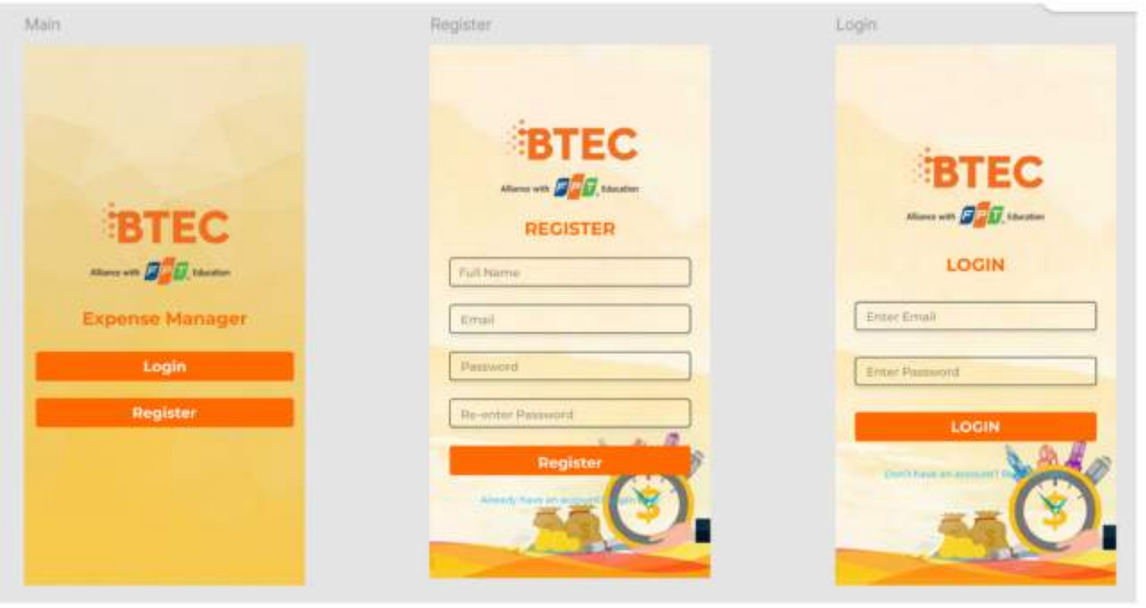
Limitations:

- Budget: Limited funding for development and marketing.
- Technical Experience: A relatively new team with mixed levels of expertise.

Constraints:

- Tight deadlines for app release.
- Need for cross-platform compatibility within the budget.
- Dependence on free or low-cost tools to reduce costs.

Tools and Technologies Used



Performed by: Nguyen Thi Tuyet Nhung

Backend: Firebase (real-time database, authentication, cloud functions).

Frontend:

- Programming: Java/Kotlin for Android.
- Frameworks: Flutter for cross-platform development.

Design Tools: Figma for UI/UX prototyping.

Development Tools: Android Studio, Visual Studio Code.

Testing: JUnit for unit testing, Firebase Test Lab for automated testing.

Development Methodology

Chosen Methodology: Spiral Model

- Focuses on iterative development with risk analysis and continuous refinement.
- Combines elements of both iterative and waterfall models.

Phases of the Spiral Model:

1. Requirement Gathering:

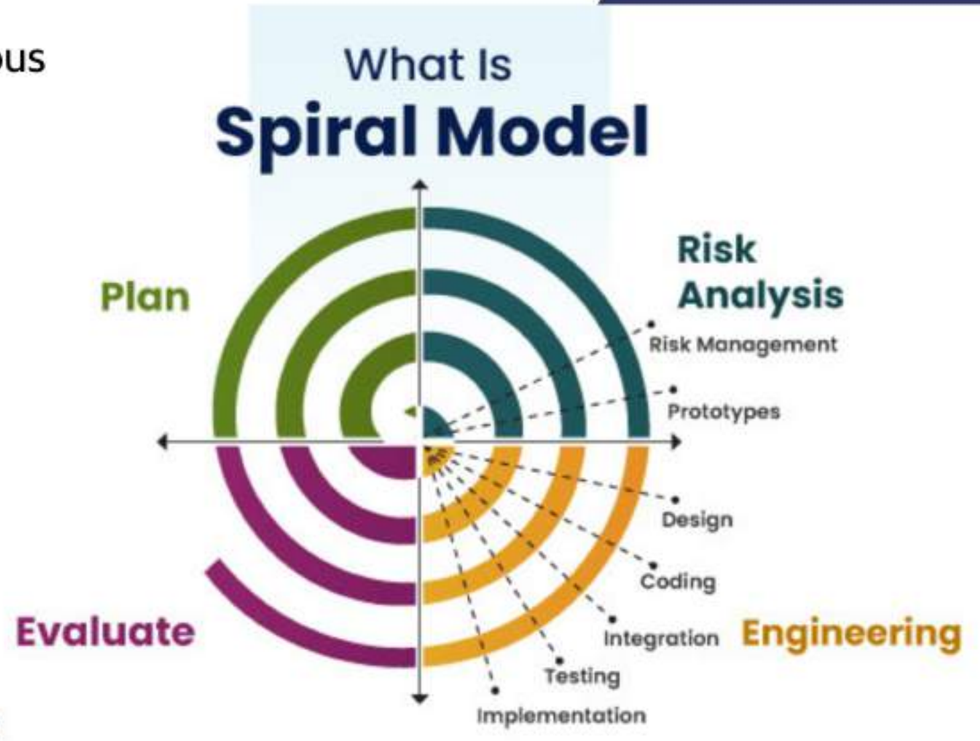
- Initial analysis of user needs (expense tracking, budget alerts, etc.).
- Stakeholder feedback incorporated into project scope.

2. Design:

- Created system architecture and UI prototypes.
- Focused on modularity and scalability.

3. Development:

- Incremental implementation of core functionalities (e.g., expense tracking, reporting).
- Conducted regular unit and integration testing.



Development Methodology

4. Risk Analysis:

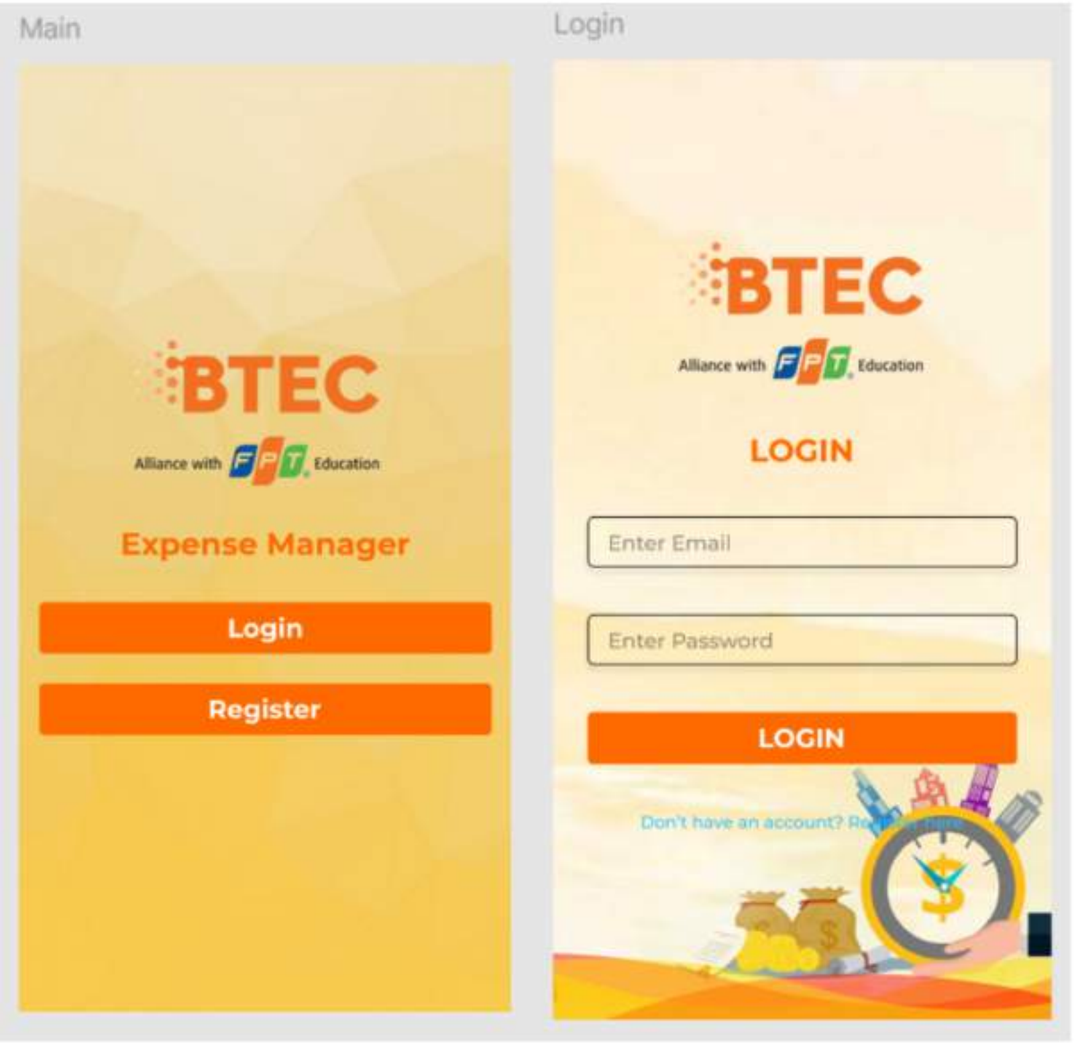
- Evaluated risks such as technical challenges, budget constraints, and timeline delays.
- Addressed risks early through resource reallocation and additional training.

5. Evaluation:

- Stakeholder review after each iteration.
- Adjusted features based on user feedback and identified areas for improvement.

Why Spiral Model:

- Suited for complex projects with evolving requirements.
- Risk management is integral to the process, reducing the likelihood of major setbacks.
- Encourages continuous refinement, ensuring high-quality deliverables.



Initial Design and Prototyping:

Performed by: Dong Manh Cuong

Design Process:

- Created wireframes for the app using Figma.
- Developed interactive prototypes for key functionalities.

User Feedback:

- Conducted usability testing with a small group of students.
- Feedback included requests for clearer navigation and customizable budget categories.

Improvements Post-Feedback:

- Enhanced navigation menus.
- Added personalization options for expense tracking.

User Interface (UI) Design:

Performed by: Nguyen Thi Tuyet Nhung

Key Design Decisions:

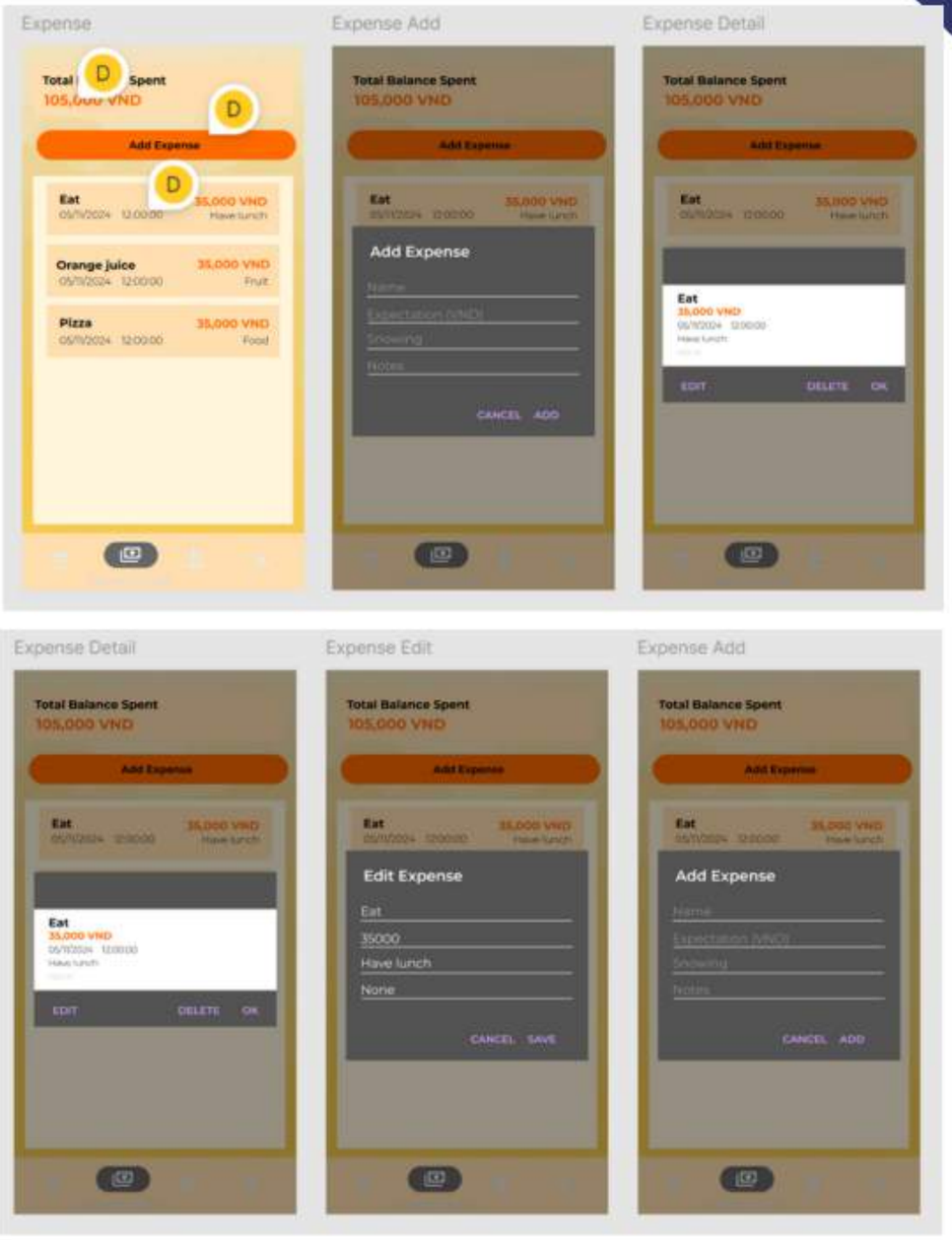
- Simplicity: Minimalist layout to avoid overwhelming users.
- Intuitiveness: Clear icons and labels for navigation.
- Color Scheme: Neutral tones with vibrant highlights for important elements.

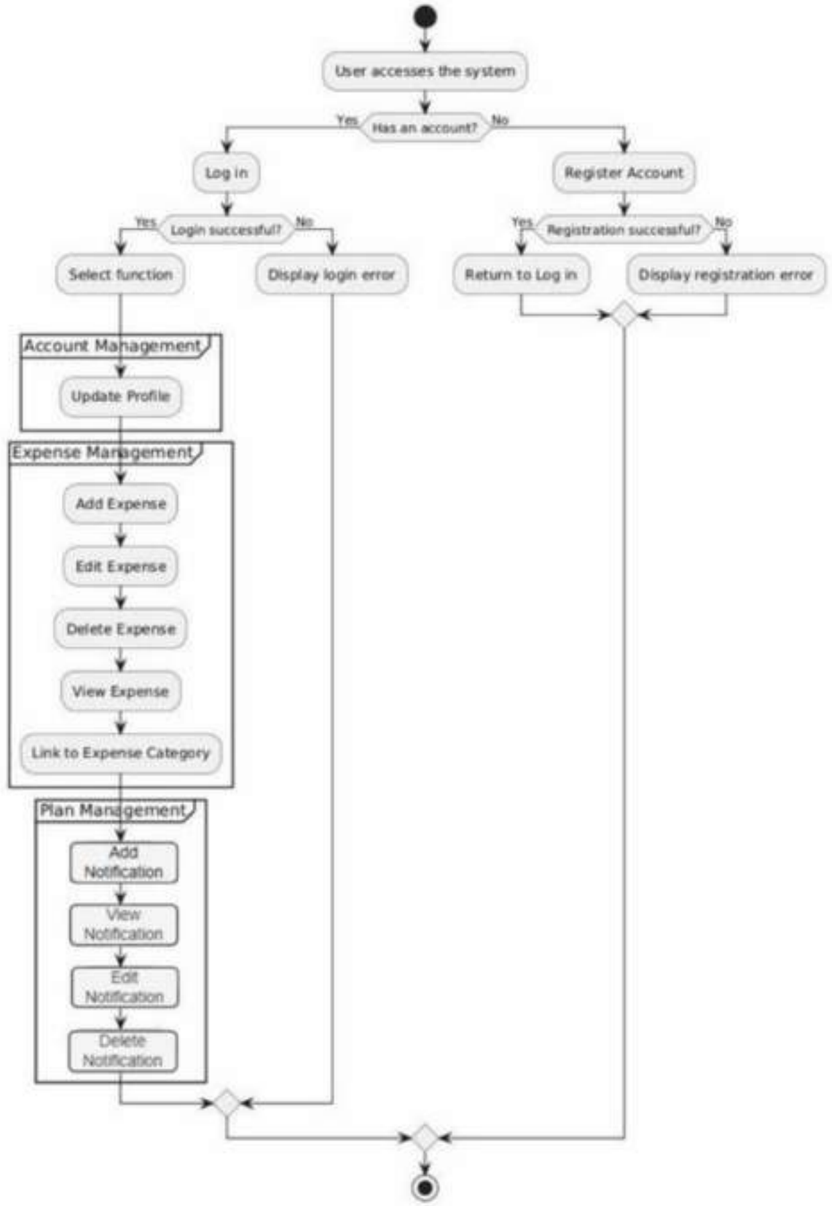
Screenshots:

- Home Screen: Overview of expenses and budget progress.
- Expense Input Screen: Quick entry form with dropdown categories.
- Reports Screen: Visual summaries using bar charts and pie charts.

Design Rationale:

- Designed for quick access to information with minimal learning curve.
- Focused on features most relevant to student users.





Backend Architecture

Performed by: Nguyen Hoang Dung & Ta Van Toan

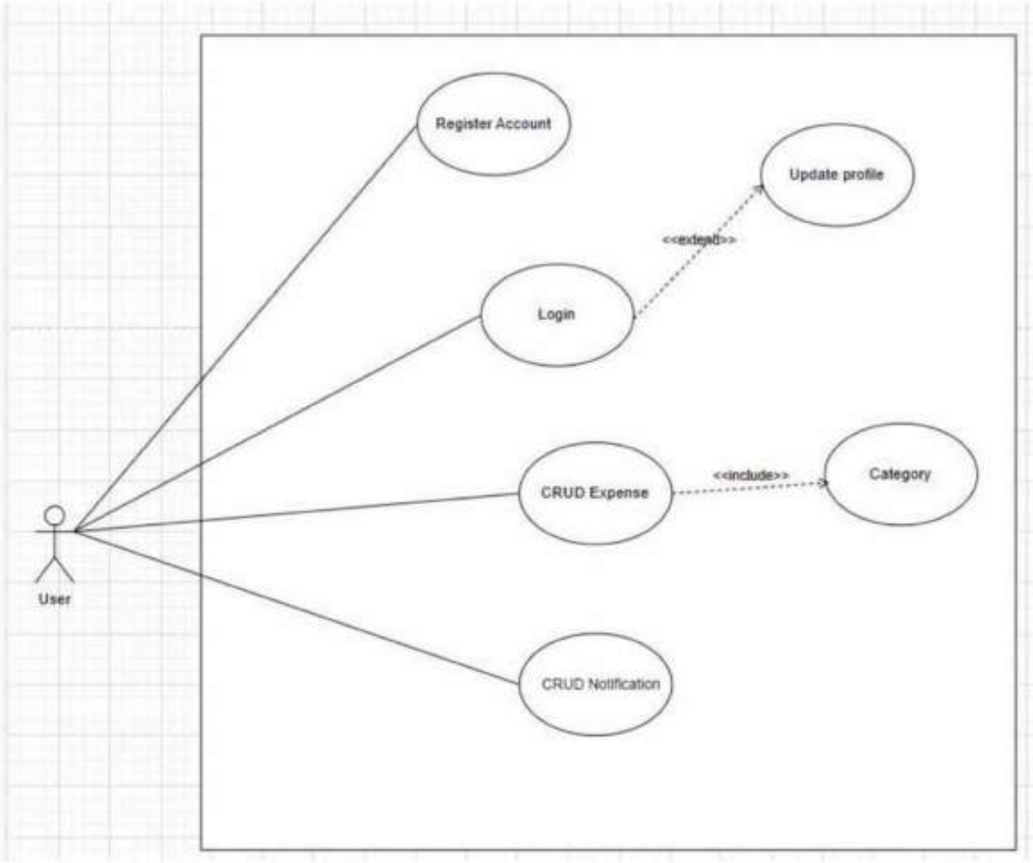
Backend Choices:

- Firebase: Used for real-time database, user authentication, and cloud storage.
- Cloud Functions: For serverless execution of backend logic.

Scalability Support:

- Handles real-time data syncing for multiple users.
- Built-in features for seamless scaling as user base grows.
- High availability and minimal maintenance requirements.

Core Features Implemented



The performer: Nguyen Hoang Dung

Expense Logging:

- Allows users to log daily expenses quickly.

Category Selection:

- Enables users to categorize expenses for better tracking.

Summary View:

- Provides visual overviews (charts and graphs) of spending habits.

Fulfillment of User Requirements:

- Delivers intuitive tracking, clear categorization, and actionable insights.

Additional Features:

Extra Features:

- Manual categorization for personalized expense tracking.
- Notifications for high spending to help manage budgets.

Prioritization:

- Based on user feedback to enhance usability and relevance.
- Implemented features that align closely with student needs.

Data Management and Security

Data Management:

- Firebase stores user data securely in a cloud database.
- Real-time synchronization ensures up-to-date information.

Security Features:

- Firebase Authentication: Protects user accounts with email/password or social logins.
- Data Encryption: Ensures secure transmission and storage of sensitive data.
- Role-Based Access Control: Limits access to specific data based on user permissions.

User Testing and Feedback

User Testing Summary:

- Conducted usability tests with 20+ university students.
- Identified issues like unclear navigation and redundant steps.

Feedback and Changes:

- Improved button placement for better accessibility.
- Simplified workflows, such as streamlined expense input forms.
- Enhanced visual clarity for charts and summaries.

Challenges Faced

Challenges:

- Technical Difficulties: Limited experience with Firebase and mobile app optimization.
- Time Constraints: Tight deadlines for development and testing phases.
- Resource Limitations: Small team with varied expertise levels.

Solutions:

- Conducted rapid upskilling sessions for team members.
- Prioritized core features to meet deadlines.
- Delegated tasks effectively to leverage individual strengths.

Quality Assurance and Testing

Performed by: Ta Van Toan & Nguyen Thi Tuyet Nhung

Testing Process:

- Functional Testing: Verified that all features worked as intended.
- Usability Testing: Assessed user experience through feedback sessions.
- Automated Testing: Used Firebase Test Lab for cross-device reliability.

Key Results:

- Identified and resolved critical bugs before release.
- Improved app stability across different device models.
- Achieved high usability ratings from test users.

Risk Management

Identified Risks:

- Limited Mobile Experience: Risk of inefficient app design.
- Scope Creep: Unplanned additions to feature list.

Mitigation Strategies:

- Focused on iterative development to incorporate gradual improvements.
- Conducted regular scope reviews to align with project goals.
- Proactively engaged stakeholders to manage expectations.

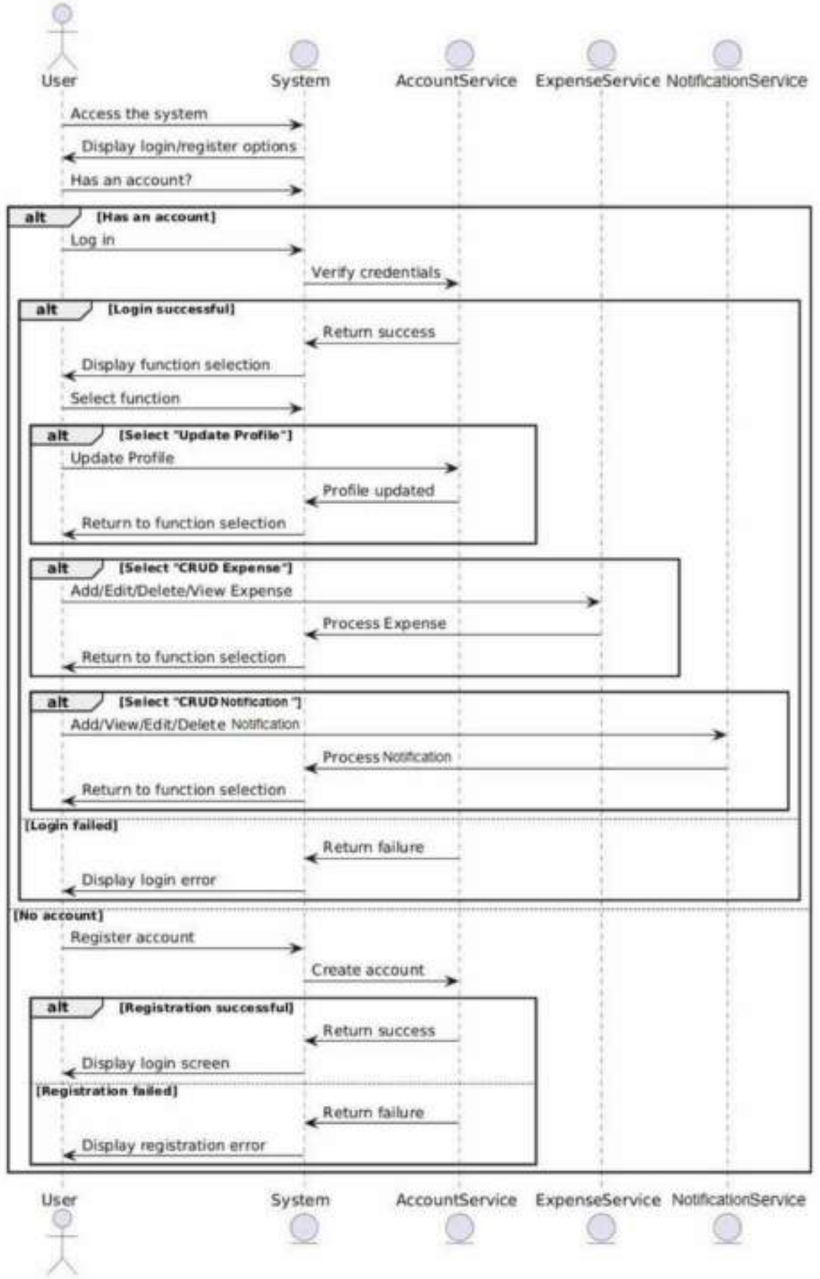
Project Management and Collaboration

Tools Used:

- Task Management: Trello for tracking progress and assigning tasks.
- Communication: Slack for team discussions and quick updates.
- Version Control: GitHub for code collaboration and issue tracking.
- GitHub implemented by: Nguyen Hoang Dung (Team Leader), Ta Van Toan (Member), Dong Manh Cuong (Member)

Strategies:

- Daily stand-up meetings for synchronization.
- Clear division of responsibilities to ensure accountability.
- Regular progress reviews to stay on track.



Performance Evaluation Criteria

Performed by: Nguyen Hoang Dung & Tran Nhu Minh

Metrics:

- Functionality Alignment: Features match initial user requirements.
- User Satisfaction: Positive feedback on usability and design.
- App Quality: Stability, reliability, and responsiveness.
- Engagement Metrics: Active users and time spent on the app.

Evaluation Results:

- App successfully met core objectives and user expectations.
- Achieved a balance of functionality and ease of use.

Summary of User Requirements Fulfillment

Fulfilled Requirements:

- Expense Tracking: Implemented easy-to-use expense logging with categorization.
- Budget Alerts: Added notifications for overspending.
- Intuitive UI: Delivered a user-friendly interface optimized for students.
- Summary Reports: Provided visual insights into spending patterns.

Examples:

- Real-time budget alerts help users stay on track.
- Clear expense categories simplify financial organization.

Lessons Learned

Technical Skills Acquired:

- Advanced knowledge of Firebase and Android development.
- Improved understanding of Agile methodology and risk management.

Insights:

- The importance of iterative development to manage evolving requirements.
- Value of user feedback in refining features and improving usability.

Team Growth:

- Enhanced collaboration and problem-solving under time constraints.

Feedback Analysis and Future Improvements

Feedback Received:

- Positive: User-friendly design and effective budgeting tools.
- Constructive: Suggestions for additional features like multi-language support and offline access.

Actions Taken:

- Addressed minor UI issues and optimized performance.

Future Improvements:

- Add new features, such as advanced analytics and group expense tracking.
- Explore cross-platform development for wider accessibility.

Future Vision

CampusExpense Manager aims to develop into a comprehensive financial management platform for students, addressing their diverse financial needs. Here is a detailed outlook for the future development of the system: Enhanced features and functions, cross-platform development, AI and machine learning integration, security and privacy enhancements, ecosystem expansion, scalability to a larger audience

By implementing these improvements, CampusExpense Manager will not only continue to meet the expectations of its current users, but also establish itself as the leading financial management solution for students worldwide.

Conclusion

Project Achievements:

- Successfully developed and deployed a functional app meeting core objectives.
- Positive feedback from users highlighted app value.

Reflection on Team Effort:

- Overcame challenges through collaboration and adaptability.

Thank You