Introduction

Welcome to our presentation on the "CampusExpense Manager" mobile app, developed by BudgetWise Solutions. This app is designed to help university students track their expenses, set budgets, and manage their finances effectively. In this presentation, we will outline the project's objectives, user and system requirements, potential challenges, and proposed solutions to ensure a successful and timely launch of the app.

Introduction our team

Do Thanh Tung

Nguyen Thanh Dat
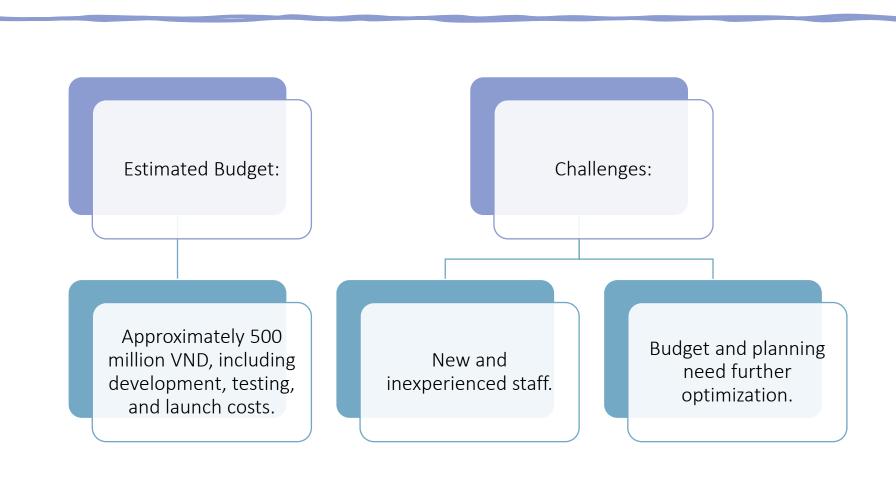
Nguyen Xuan Khanh

Do Duc Thang

Vu Lam Phuc

Project Overview

Stakeholders:

Investor: BudgetWise Solutions – wants an effective expense management system.

Users: Students – easily track expenses, budget, and receive notifications.

Development Team: 5-member team, ensuring project progress and quality.

Estimated Budget:

Approximately 500 million VND, including development, testing, and launch costs.

Challenges:

New and inexperienced staff.

Budget and planning need further optimization.

Platforms and Features:

Platforms: Android Studio, Firebase, GitHub.

Features: Spend management, trend reporting, budget notifications.

Risks and Management:

Risks: Delays, system failures, unhappy users.

Solution: Tightly manage progress, test thoroughly, get regular user feedback.

Time Line

INTRODUCTION

APPLICATION DEVELOPMENT PROCESS
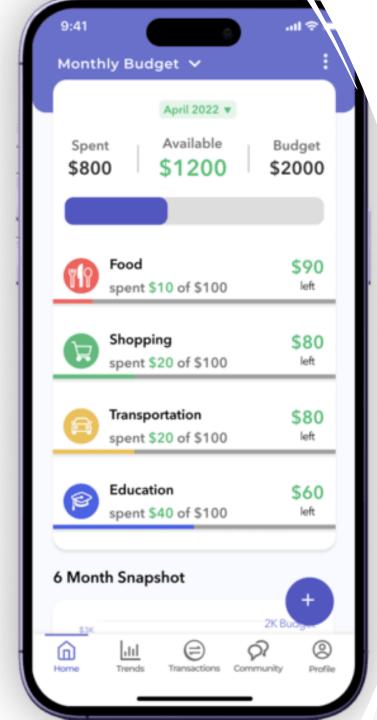
IMPLEMENTATION RESULTS

CONCLUSION AND FEEDBACK

CONCLUSION

Problem Statement & User Requirements

Key Problem:

- The primary problem BudgetWise Solutions aims to address is the difficulty university students face in managing their personal finances.

- Many students struggle to track their expenses, stay within a budget, and make informed financial decisions, leading to overspending and financial stress.

- The "CampusExpense Manager" app is designed to simplify this process, offering a user-friendly mobile solution to help students gain better control over their financial habits.

REQUIREMENTS
ANALYSIS

System and User Requirements:

1. User Registration and Authentication:

• Users must create an account with a username and password.

• Secure authentication is required to protect user data.

2. Expense Tracking:

• Users can add, edit, and categorize expenses (e.g., rent, food, transportation).

• Each expense should include a description, amount, date, and category.

3. Budget Setting:

• Users can set monthly budgets for different categories (e.g., food, entertainment).

• Ability to adjust budget limits as needed.

4. Expense Overview:

- A summary of monthly spending, remaining budget, and category-wise breakdown.

- Option to view expense trends over time.
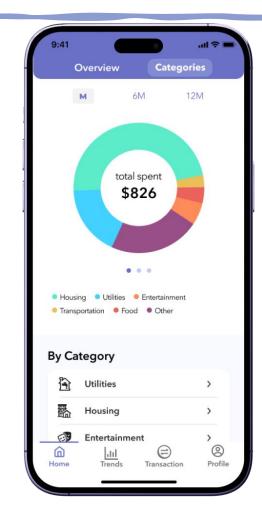
5. Recurring Expenses:

- Users can add recurring expenses (e.g., rent) with specific start and end dates.

- Automatic addition of recurring expenses to the monthly budget.

6. Expense Reports:

- Generate detailed reports for specific periods (e.g., monthly, annually).

- Breakdown of expenses by category for analysis.

7. Notifications:

- Users receive alerts when they approach or exceed budget limits.

Stakeholders and Expectations:

1. Students (Primary Users):

- Expect a simple, intuitive app to track expenses and set/manage budgets.

- Look for helpful features like notifications and reports to keep them informed.

- Value security and privacy of their financial data.

2. BudgetWise Solutions Team:

- Responsible for designing, coding, and delivering a functional, secure app.

- Must meet the development timeline, ensuring the app is ready within 12 weeks.
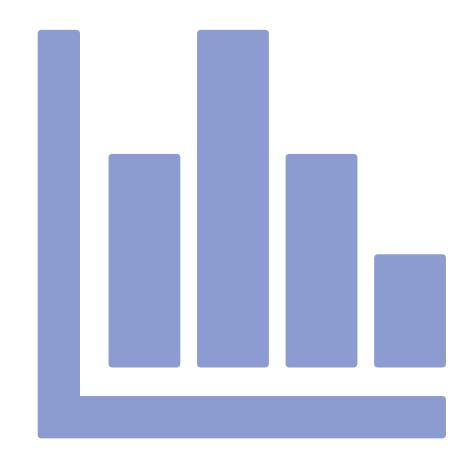
3. University Administrators:

- Interested in promoting responsible financial behavior among students.

- Expect the app to be an effective tool for helping students manage their money better.

Systems Investigation and Research

Research Phase Summary

- **Objective:** Identify student needs for effective expense management.

- **Methodology:** Surveys, interviews, and competitor analysis.

- **Participants:** 150+ university students from various campuses.

Competitor Analysis

Existing Apps:

- **MISA MoneyKeeper:** Comprehensive but overly complex for students.
- **Spendee:** User-friendly but lacks offline capability and education-focused features.

Key Gaps Identified:

- Simple interfaces tailored for students.
- Features like recurring expense tracking and budget alerts.

Student Insights:

Top Needs:

- Quick and easy expense input.
- Customizable categories (e.g., rent, groceries, tuition).
- Offline functionality for limited connectivity areas.

Preferred Features:

- Notifications for nearing budget limits.
- Visual expense summaries (e.g., pie charts).

Project Scope and Constraints

Project Scope

- Core Features:

    - Expense tracking and categorization.

    - Budget setting and notifications.

    - Monthly/annual expense reports with visuals.

    - Offline functionality for seamless usage.

- **Target Audience:** University students managing personal finances.

Limitations

- **Budget:** ~500 milions VNĐ, limiting extensive feature development and marketing.

- **Team Experience:**
  - Junior developers with limited mobile app expertise.
  - Requires additional time for training and learning.

Constraints

Development Timeline: Strict 12-week deadline.

Platform Compatibility: Support for both Android and iOS, increasing development effort.

Data Privacy Compliance: Must adhere to data security standards, adding complexity to implementation.

Resource Availability: Small team size, requiring efficient task delegation and prioritization.

Tools and Technologies Used

Development Tools:

Android Studio: Primary IDE for application development.

SQLite: Lightweight database for local data storage.

Java: Core programming language for app functionality.

Design Tools:	• **Figma:** Created intuitive UI/UX designs for the application.
Version Control and Collaboration:	• **GitHub:** Code repository and team collaboration platform.
Testing Tools:	• **Android Emulator:** Simulates app performance on various devices. • **JUnit:** For unit testing Java components.
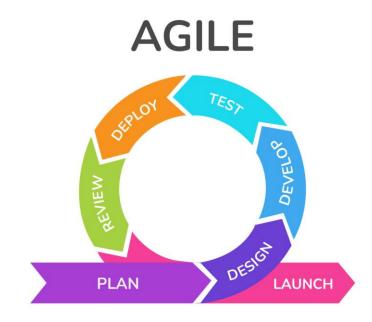
Development Methodology

Chosen Methodology: Agile

- Why Agile?
  - Flexible and adaptive to changes in project scope and requirements.
  - Encourages continuous feedback and iterative improvements.
  - Suitable for a team with limited experience, allowing gradual skill development.

Key Agile Practices:

Sprint-Based Development:

Divided the 12-week timeline into 2-week sprints.

Delivered incremental features for review and testing.

Daily Stand-Ups:

Short meetings to discuss progress, challenges, and next steps.

User Feedback Loops:

Collected feedback from students at the end of each sprint to refine the app.

Benefits for the Team and Project:

For the Team:

Improved collaboration and efficient workload distribution.

Opportunity to learn and adapt quickly.

For the Project:

Early identification and resolution of issues.

Focused on delivering a user-friendly app that meets real needs.

Application Development Process
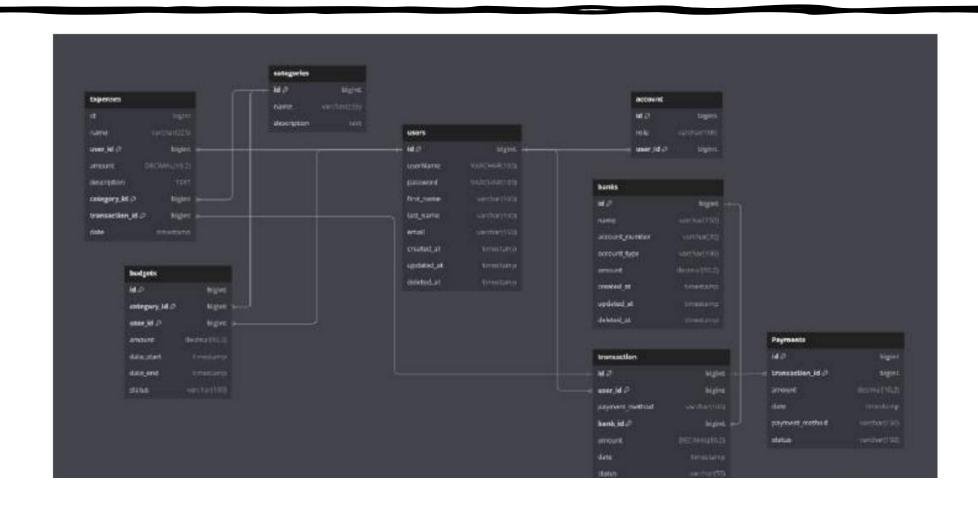
1. System Design Overview

3-layer architecture:

- Presentation Layer: User interface.

- Business Logic Layer: Handles the application logic.

- Data Access Layer: Stores and retrieves data from Firebase.
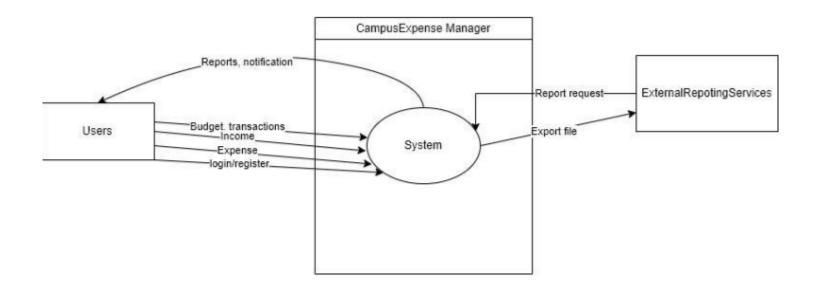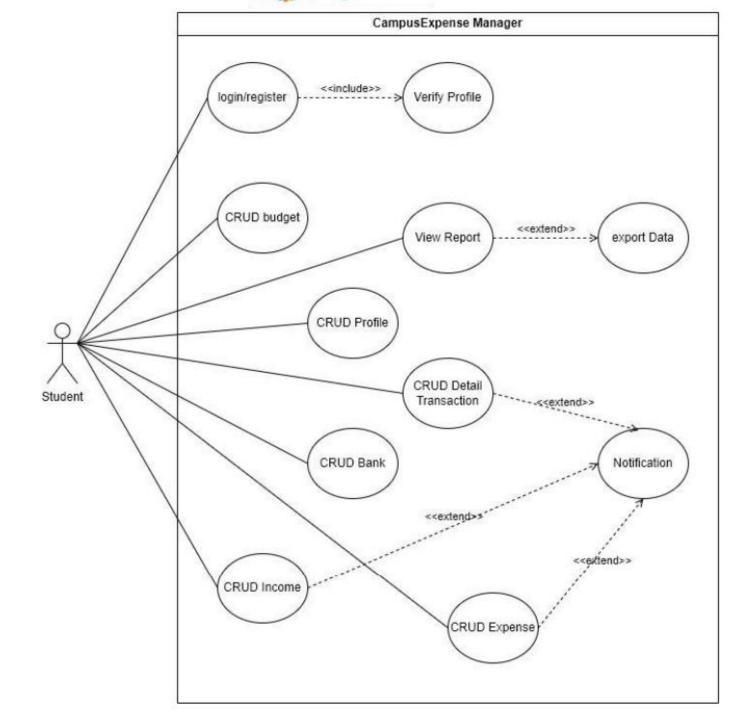
Design ERD
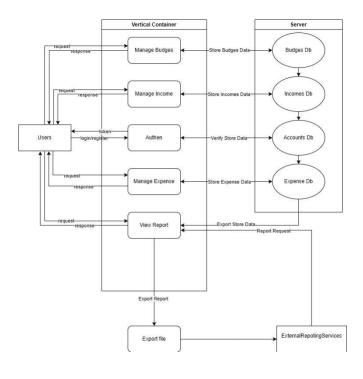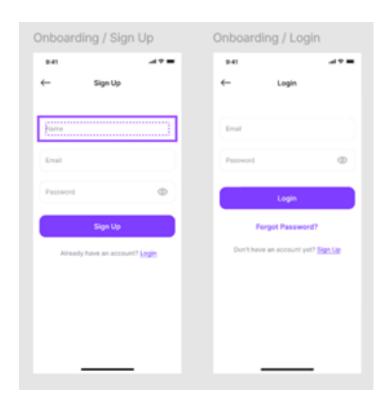
Design activity diagram

Design DFD level 0

Design DFD level 1

Design user case

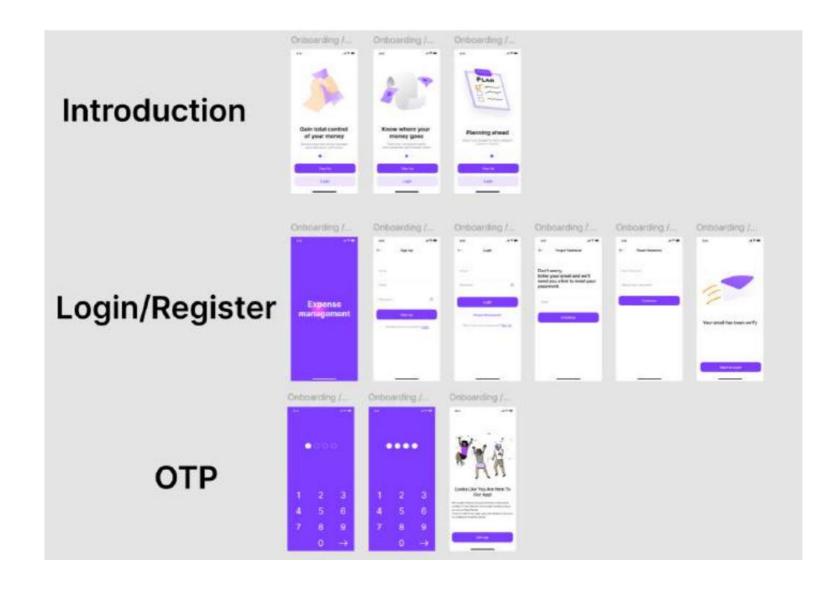# Initial Design and Prototyping

Wireframing:

- Login and assign up

- The user can login account or sign up new account for them.

User Registration and Authentication Development

- Firebase Authentication to authenticate accounts.

- Hash passwords before storing.

- Integrate email or Google login.

Login – register - OTP

Introduction

Login/Register

OTP

Expense Tracking Module

Simple data entry form design.

Allows adding, editing, deleting and classifying expenses.

Integrated search by category or date.

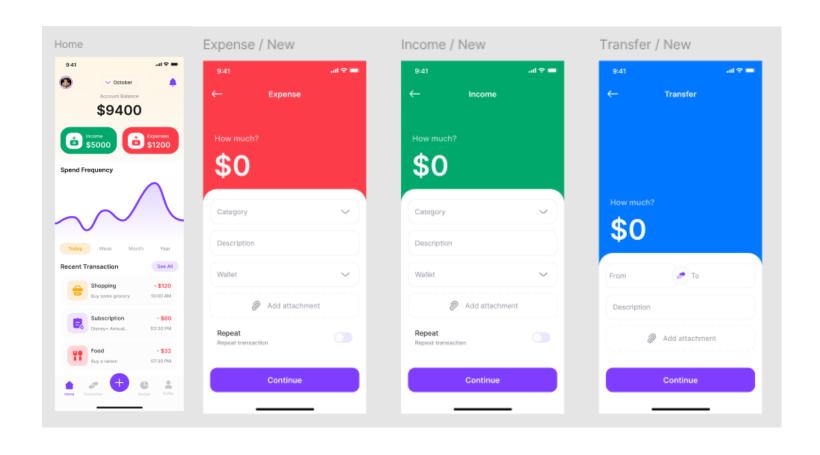# Budget Setting and Notifications

Users can set spending limits.

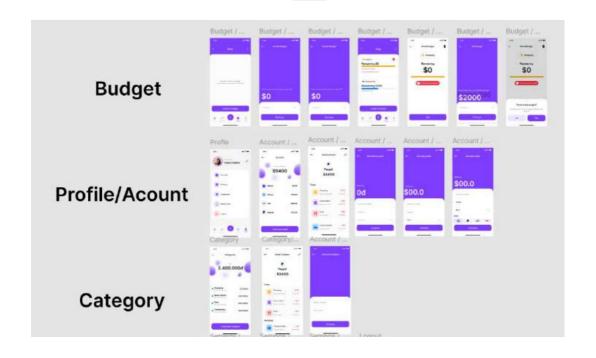Notifications via Firebase Cloud Messaging.
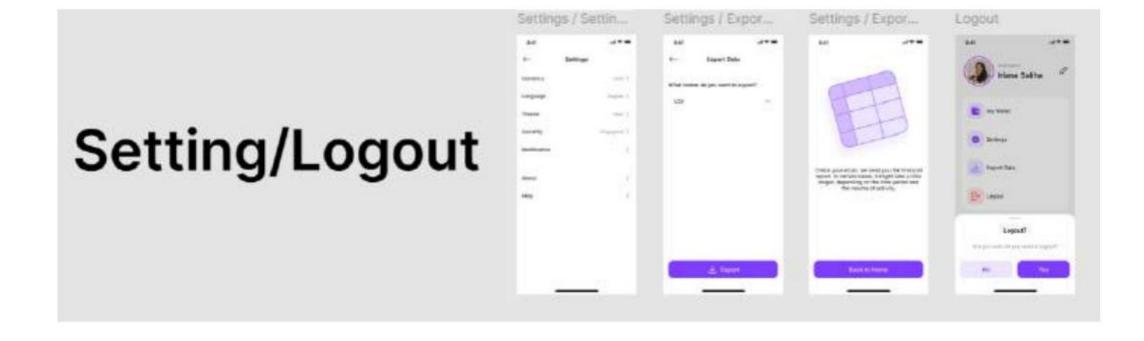
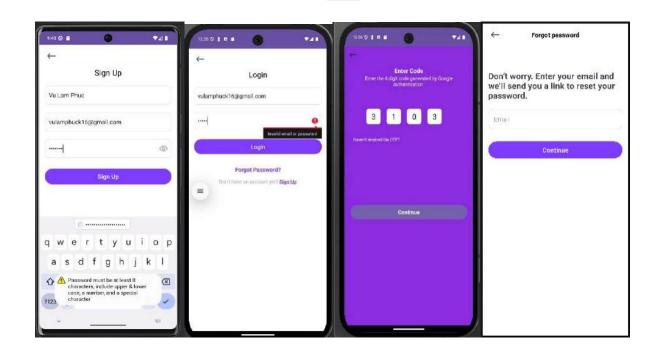Alerts when close to or over budget.

Home page – enpense - income
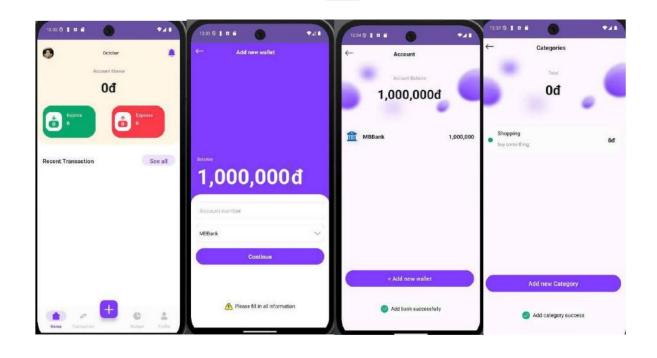
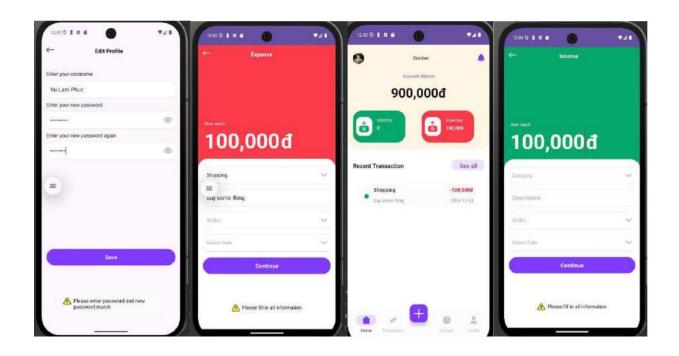# Home page – enpense - income

Setting - logout

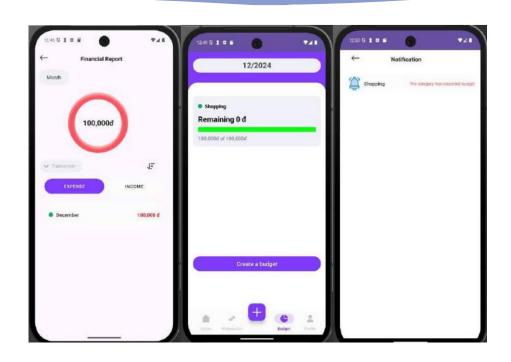# Result User Registration and Authentication Development

Expense Tracking Module

Reports and Analytics

Offline Capability Implementation

Store data locally with SQLite when offline.

Sync with Firebase when connected.

User Feedback

- Conducted usability testing with 15 students.
  - **Positive Feedback:** Intuitive layout, easy to track expenses.
  - **Suggestions for Improvement:**
    - Add recurring expense options.
    - Enhance visual clarity for budget alerts.

Business Solutions

1. Comparing Desktop vs Mobile App

a. Desktop Application:

- Advantages:
  - Generally allows for more complex features and detailed interfaces.
  - Easier to integrate with existing desktop software or tools students may use (e.g., spreadsheets, financial programs).
  - Suitable for students who prefer working on larger screens or who manage more detailed financial data.

- Disadvantages:
  - Limited portability; users need to be at a computer to track expenses.
  - Less convenient for on-the-go tracking, especially for students who frequently spend money outside their homes.
  - Less likely to be used regularly by students in fast-paced environments where immediate access is crucial.

b. Mobile Application:

- Advantages:
    - **Portability:** Students can track their expenses immediately, anytime and anywhere, making it highly convenient for users with dynamic schedules.
    - **Push Notifications:** Mobile apps allow for real-time alerts, such as budget limit warnings, keeping students aware of their spending in real-time.
    - **Offline Access:** A mobile app can be designed to work offline, allowing students in areas with poor connectivity to still manage their finances.
    - **User Engagement:** Mobile apps can provide a more personalized and engaging experience through frequent use, which is critical for financial tracking.
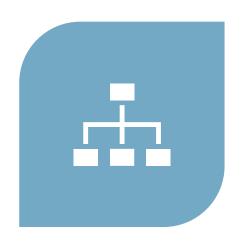
- Disadvantages:
    - Limited screen space compared to desktop, which may restrict the display of more detailed financial data or trends.
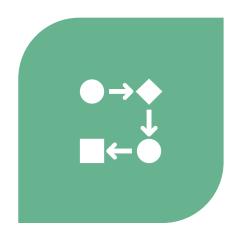   - Battery life concerns on phones may affect usage.

2. Why a Mobile App is the Best Fit:

- **Target Audience:** University students are highly mobile and rely heavily on smartphones for daily activities, making a mobile app far more accessible than a desktop application.

- **Convenience:** With a mobile app, students can log their expenses instantly after making a purchase. This reduces the risk of forgotten entries, which can happen when relying on desktop solutions.

- **Real-Time Notifications:** A mobile app allows for instant budget notifications and spending alerts, helping students make smarter financial decisions throughout the day.

- **Offline Usability:** A mobile app designed with offline functionality ensures that students can continue to manage their finances, even in areas with limited internet access.

- **Engagement:** Mobile apps are more likely to encourage consistent engagement through their ease of use and on-the-go nature, increasing the likelihood that students will stick to their budgeting goals.

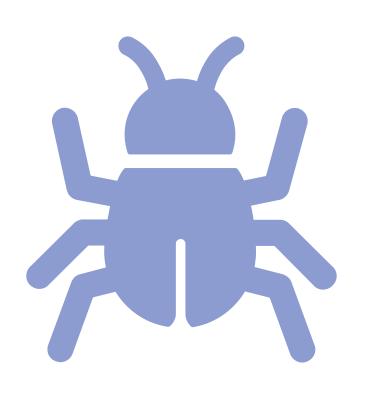# Project Management Tools

USE TRELLO TO MANAGE TASKS.

SLACK AND GOOGLE MEET TO COMMUNICATE.

TRACK PROGRESS WITH KANBAN BOARDS.

Challenges Overcome

Challenges:

- Lack of team experience.
- Initial Firebase integration was buggy.

Solution: Learn fast, test small modules.

Testing and Debugging Process

Test type: Unit Test, Integration Test, UI Test.

Testing tools: JUnit, Android Emulator.

Bug fixing process: Record, prioritize, process according to sprint.

Summary of Achievements

- Complete the requested features.

- Successfully integrated offline mode and notifications.

Future Improvements

- Additional features: Bank connection, import data from Excel files.

- Support multiple iOS platforms.

Conclusion

In conclusion, the "CampusExpense Manager" app is designed to meet the financial management needs of university students, providing them with a simple and effective tool to track their expenses and manage their budgets. Despite challenges like limited resources and a tight timeline, BudgetWise Solutions has identified key strategies to ensure successful project delivery. By focusing on core functionality, addressing risks, and utilizing the right development tools, this project aims to empower students to make informed financial decisions and achieve greater financial stability during their academic journey.

Thanks for watching