CS673 Software Engineering Semester Project Proposal
Spring 2025

Project Name: Bill Buddy
Team Name: Bug Busters

1. Problem Domain

Managing shared expenses among groups can be frustrating and time-consuming. Whether it's a trip, apartment rent, or a social gathering, keeping track of who paid for what and how much each person owes can lead to misunderstandings and disputes. Manual tracking (e.g., sheets or chat messages) is error-prone and inconvenient.

Key Issues in Current Practices:

- Lack of Transparency: People struggle to remember and fairly distribute expenses.
- Calculation Complexity: Manually splitting bills for multiple transactions is tedious.
- Limited Accessibility: Existing solutions often require manual entry and lack automation.

2. Propose to Address The Diagnosed Problems

To address the challenges of manual expense tracking, lack of transparency, and computational complexity, Bill Buddy will launch an automated, user-friendly system to simplify group expense management. Our solution will include

Automated Expense Sharing: Users can record shared expenses, select participants, and have the system automatically calculate everyone's share of the expense. This eliminates manual calculations and ensures fairness.

Real-time balance updates: Each team member can instantly see their contributions, pending payments and settlements, reducing confusion and disputes.

Transparent transaction history: A clear record of all expenses ensures accountability and prevents misunderstandings.

3. Plan

Research and Planning (1-2 Weeks)

Objectives:
Define core functionalities system architecture and UI and UX wireframes
Set up the development environment and project repository
Conduct market research and analyze competitors for feature benchmarking

Key Deliverables:
Detailed feature list and user stories
UI wire-frames for key screens
Project repository setup on GitHub

Back-end and Front-end Framework Setup(1 week)

Objectives:
Establish the foundational structure for both back-end and front-end
Ensure a scalable and maintainable architecture for smooth development

Key Deliverables
Back-end framework setup
Database schema design in MySQL
Front-end project initialization using React with routing and state management setup
Basic UI layout for navigation and user authentication

Back-end and Front-end Code Development(4 weeks)

Objectives:
Develop and integrate core functionalities of both backend and frontend
Ensure API communication and real time data updates

Key Deliverables:
Back-end implementation including user authentication expense management and team handling
Front-end development with user registration login team creation and expense entry
API integration to enable seamless data exchange between front-end and back-end
Automated expense calculation engine to determine user balances
Notification system for pending balances and reminders

Testing (1 Week)

Objectives

Perform comprehensive testing to ensure system stability and usability
Identify and resolve critical issues before deployment

Key Deliverables

Unit testing for back-end API endpoints and expense calculations
Front-end UI and user experience testing to ensure responsiveness and accuracy
Security testing to prevent vulnerabilities in authentication and data handling

User Feedback and Deployment (1 Week)

Objectives
Release an initial version for real user testing
Refine and improve based on user feedback before full deployment
Key Deliverables
Beta version launch for early adopters
User feedback collection through surveys and analytics
Final refinements and bug fixes based on user insights
Public deployment on cloud hosting platforms such as AWS or Firebase
Why This Plan Works
Clear structure with distinct phases ensuring organized development
Logical dependencies ensuring smooth progress from framework setup to deployment
Agile flexibility allowing continuous iteration based on testing and feedback
Feasibility with a well scoped workload aligned with the semester duration
With this structured plan our team is confident in delivering a functional and user
friendly expense sharing application by the end of the semester

4. Describe My Team

Our team consists of experienced software developers who have completed various
software development courses, providing a strong technical foundation for this project.
Additionally, we have worked together in previous semesters, which has significantly
enhanced our team coordination and communication efficiency.
Developing Bill Buddy required multiple areas of expertise including back-end
development, front-end implementation, database management, API integration and
testing. Given the complexity of expense tracking, automated calculations, and real-
time user interactions, a smaller team would have struggled to meet the development
timeline and maintain high quality standards, while a larger team would have put our

communication efficiency to the test. With our expertise and collaborative experience, we are well positioned to deliver this project efficiently and successfully.