CS673 Software Engineering Semester Project Proposal

Spring 2025

# Project Name: Bill Buddy

# Team Name: Bug Busters

#### **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.

#### 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.

#### 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

#### 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.