



TimeFlare - Advanced Timesheet Tracking Application Capstone

Project Report

CS 5934 - Capstone Project

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1 Project Description

1.1 Project Name

TimeFlare - Advanced Timesheet Tracking Application

1.2 Description

Imagine a tool that effortlessly transforms the way you manage time and projects. TimeFlare is that tool—a comprehensive solution designed to revolutionize time tracking, project management, and payroll processes. Whether you're a freelancer juggling multiple clients or part of a team striving for efficiency, TimeFlare has you covered. By seamlessly integrating advanced features like clock-in/clock-out tracking, project-specific time association, and smart analytics, TimeFlare ensures accurate time recording and provides valuable insights into productivity and resource allocation. With intuitive interfaces, real-time notifications, and calendar integration, staying on top of deadlines and priorities has never been easier. TimeFlare isn't just a timesheet app; it's a game-changer for anyone looking to optimize their time, streamline workflows, and maximize productivity.

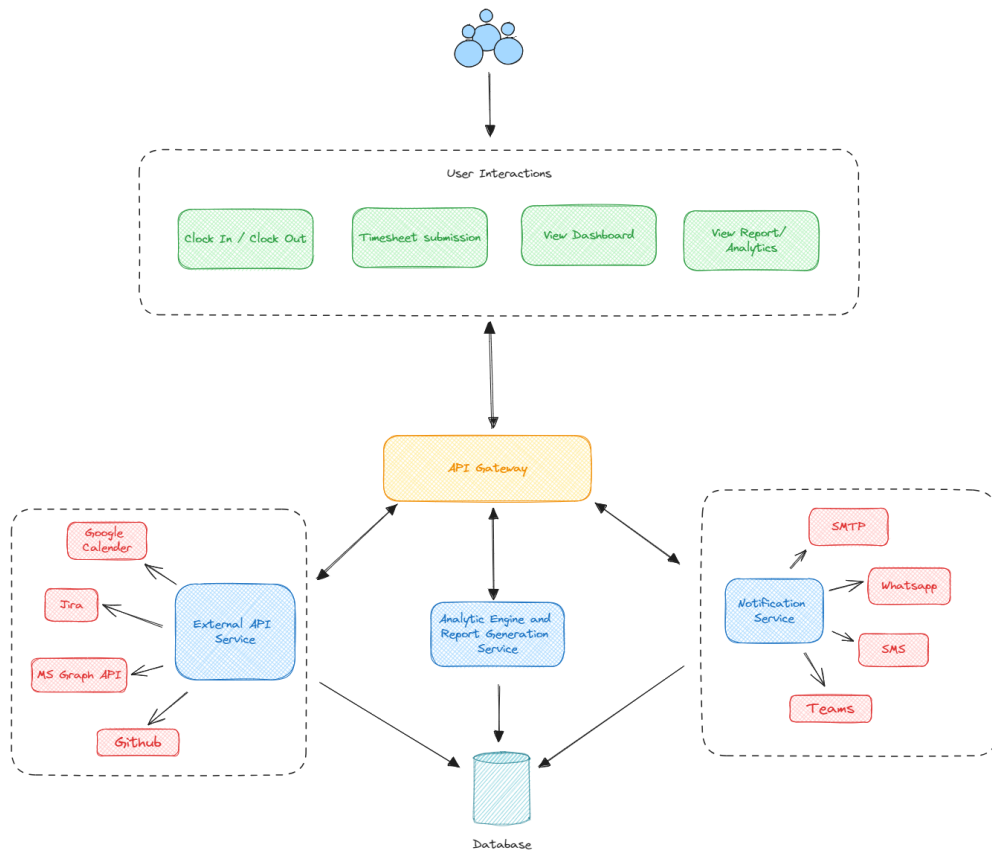


Figure 1: DFD Flow Diagram

2 Project Functionalities

TimeFlare encompasses a wide array of functionalities designed to streamline the workflow and enhance productivity. We were able to create the following functionalities -

- **Enhanced Accuracy and Accountability:** With precise clock-in/clock-out features and project-specific time association, TimeFlare ensures accurate tracking of work hours, minimizing errors and discrepancies in timesheet records.
- **Streamlined Work Processes:** TimeFlare simplifies the process of timesheet creation, reducing administrative overhead and ensuring timely payroll processing, allowing you to focus on what matters most—your work.
- **Improved Project Visibility:** Gain insight into project progress and tasks with project-specific time tracking. TimeFlare enables effective resource allocation and data-driven decision-making, enhancing visibility and driving success.
- **Flexible Time Entry:** Whether you're working in real-time or need to manually enter time, TimeFlare provides flexibility to accommodate various work situations, empowering you to manage your time effectively.
- **Smart Analytics:** Dive deep into analytics with TimeFlare's advanced features, providing insights into productivity, project timelines, and resource allocation, allowing you to make informed decisions and optimize your workflow.
- **Real-Time Notifications:** Stay on top of deadlines and important events with real-time notifications and reminders, enhancing communication and reducing delays in timesheet submission.
- **Calendar Integration:** Seamlessly integrate TimeFlare with your calendar to display important events, deadlines, and project milestones directly on the homepage, improving organization and planning.
- **Optimized Payroll Processes:** Ensure accurate and timely compensation for employees by seamlessly integrating approved timesheets with the payroll system, simplifying payroll processes and reducing administrative burden.
- **Timmy - AI Assistant Tool:** An AI assistant tool has been added which helps users to build a schedule plan as per the project needs and also helps users to prioritise tasks and plan them in most efficient way.

2.1 Demo

2.1.1 Login Page

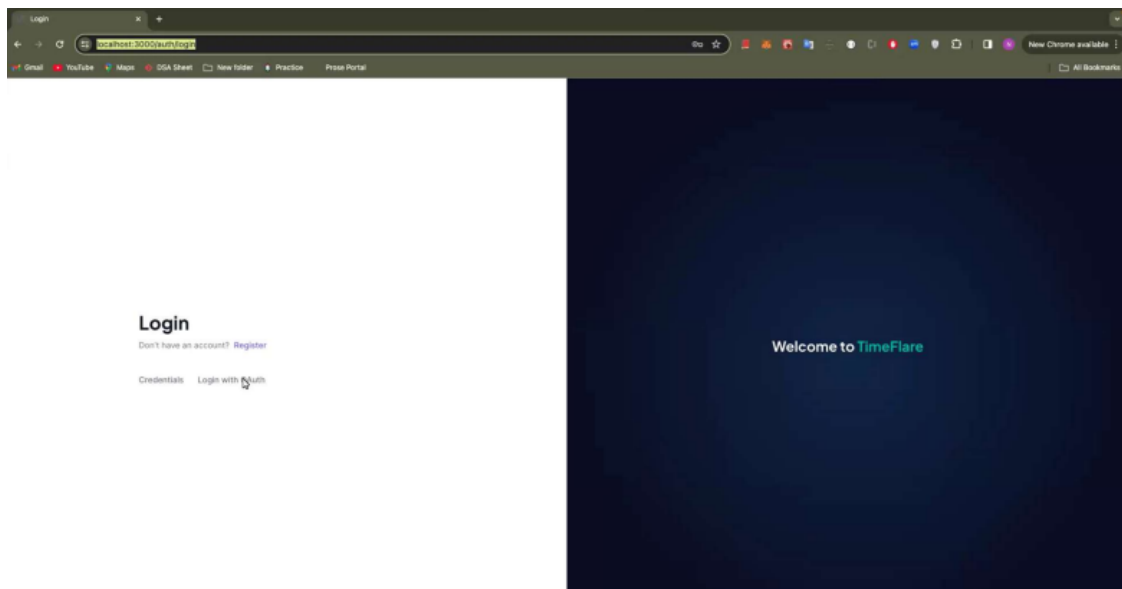


Figure 2: Login Page

2.1.2 TimeSheet Page

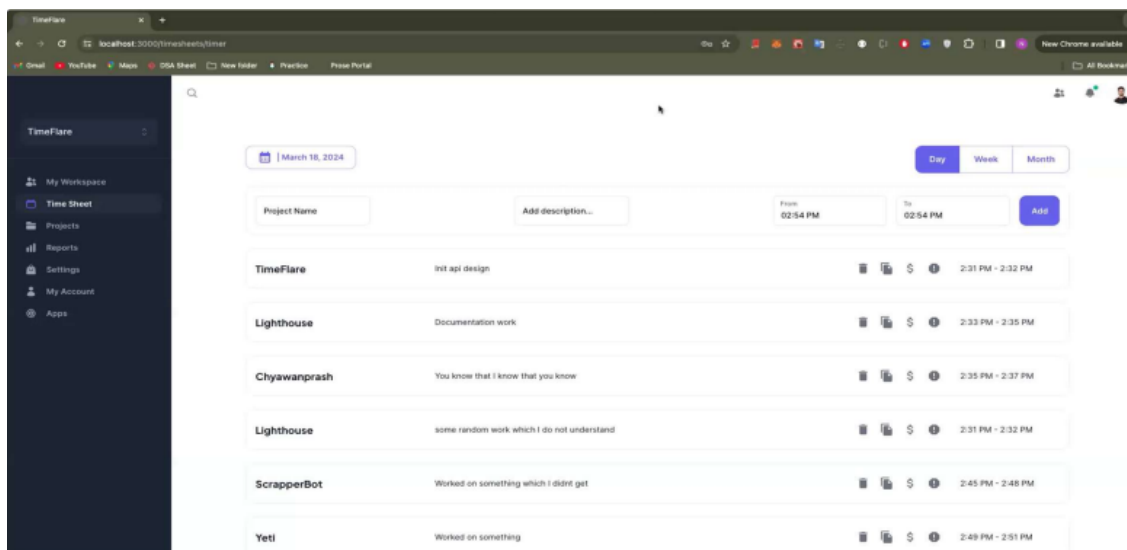


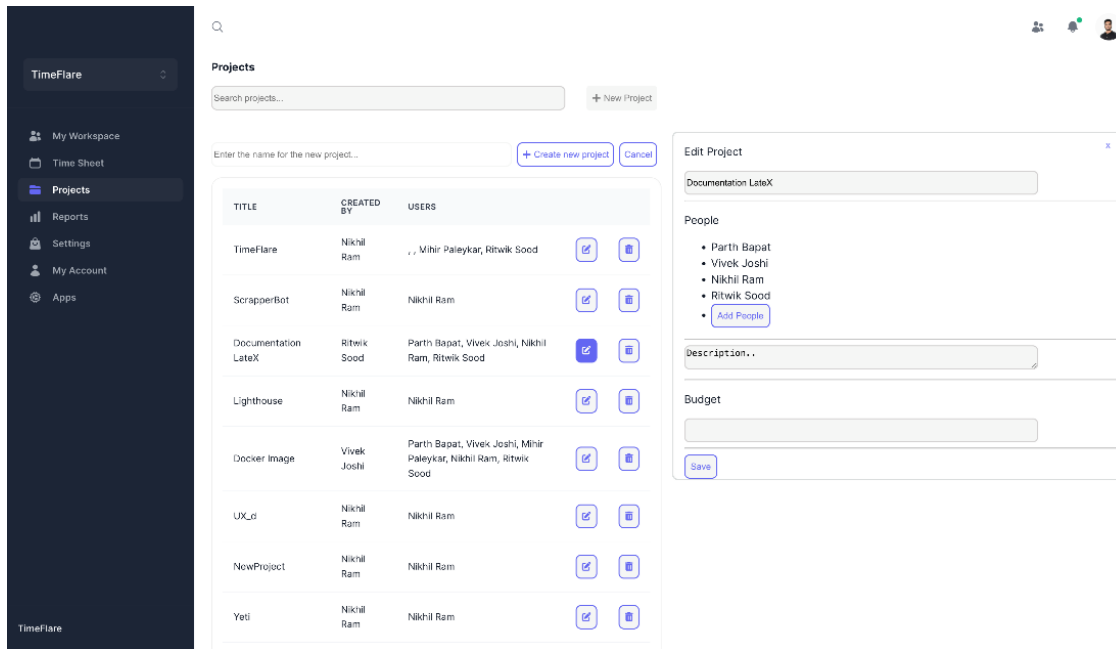
Figure 3: TimeSheet Page

2.1.3 Projects Page

The screenshot displays the TimeFlare web application interface. On the left is a dark sidebar with navigation options: My Workspace, Time Sheet, Projects (selected), Reports, Settings, My Account, and Apps. The main content area is titled 'Projects' and features a search bar and a '+ New Project' button. Below this is a table listing various projects with columns for Title, Created By, and Users. Each row includes edit and delete icons. A modal dialog is open, prompting the user to 'Enter the name for the new project...' with '+ Create new project' and 'Cancel' buttons. A green 'SUCCESS' notification is visible in the top right corner.

TITLE	CREATED BY	USERS		
Docker Image	Vivek Joshi	Parth Bapat, Vivek Joshi, Mihir Paleykar, Nikhil Ram, Ritwik Sood		
Documentation LaticX	Ritwik Sood	Parth Bapat, Vivek Joshi, Nikhil Ram, Ritwik Sood		
Lighthouse	Nikhil Ram	Nikhil Ram		
TimeFlare	Nikhil Ram	.., Mihir Paleykar, Ritwik Sood		
ScrapperBot	Nikhil Ram	Nikhil Ram		
Chyawanprash	Nikhil Ram	Nikhil Ram		
UX_d	Nikhil Ram	Nikhil Ram		
NowProject	Nikhil Ram	Nikhil Ram		
Sprint 2	Nikhil Ram	Nikhil Ram		

TITLE	CREATED BY	USERS		
NewProject	Nikhil Ram	Nikhil Ram		
YcU	Nikhil Ram	Nikhil Ram		
Docker Image	Vivek Joshi	Parth Bapat, Vivek Joshi, Mihir Paleykar, Nikhil Ram, Ritwik Sood		
Lighthouse	Nikhil Ram	Nikhil Ram		
ScraaperBot	Nikhil Ram	Nikhil Ram		
Sprint 2	Nikhil Ram	Nikhil Ram		
Documentation LaticX	Ritwik Sood	Parth Bapat, Vivek Joshi, Nikhil Ram, Ritwik Sood		
UX_d	Nikhil Ram	Nikhil Ram		



2.1.4 Reports Page

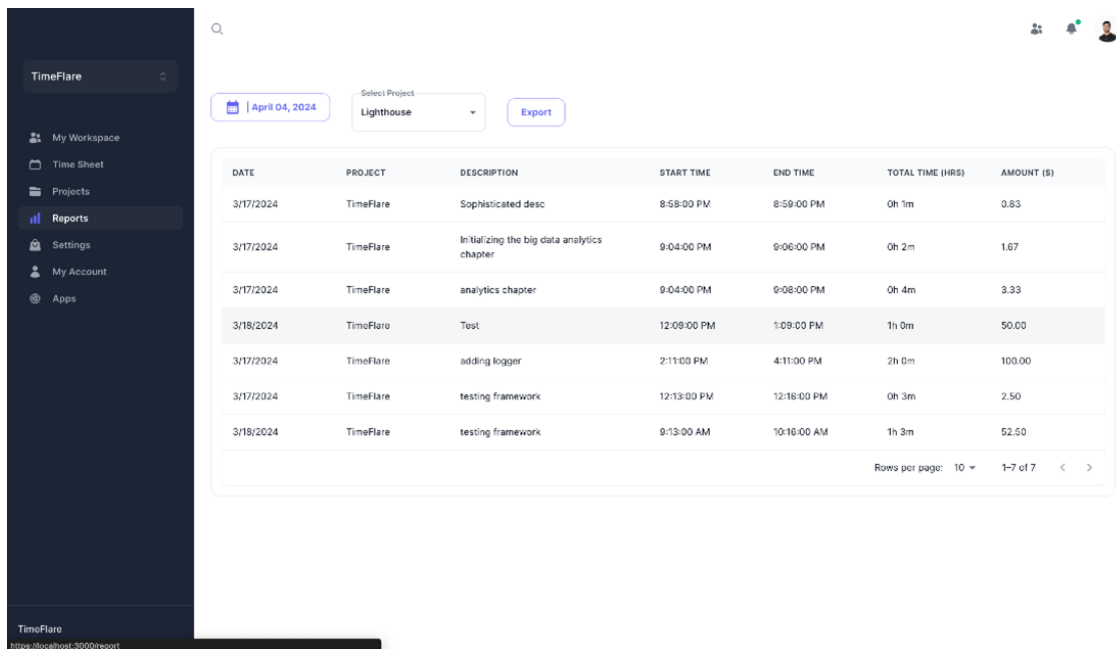


Figure 4: Reports Page

2.1.5 Settings Page

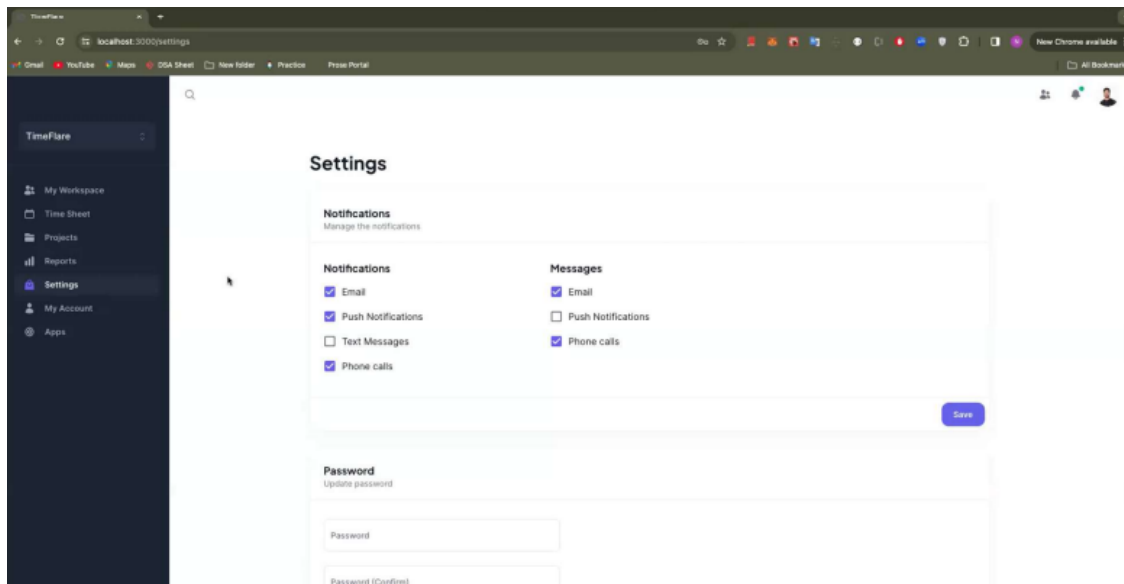


Figure 5: Settings Page

2.1.6 Accounts Page

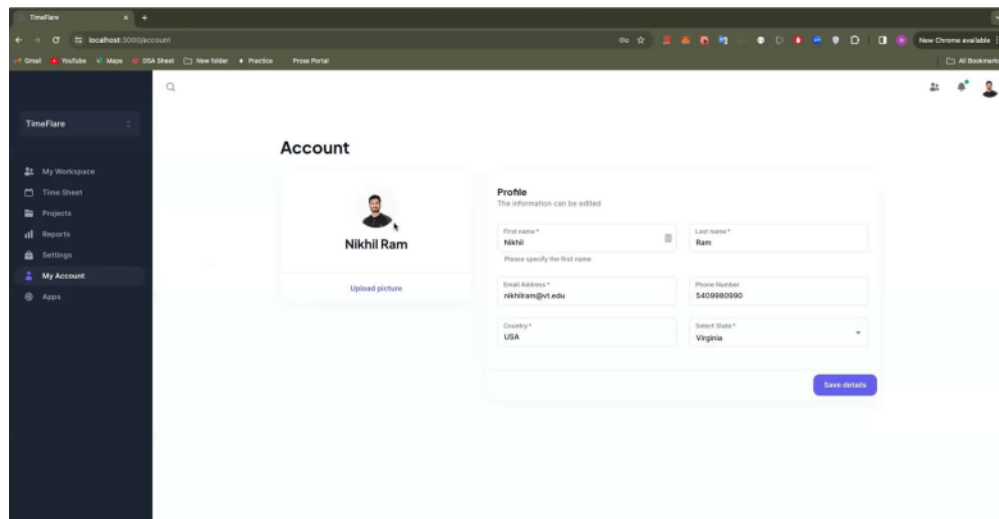


Figure 6: Account Page

2.1.7 Calendar Page

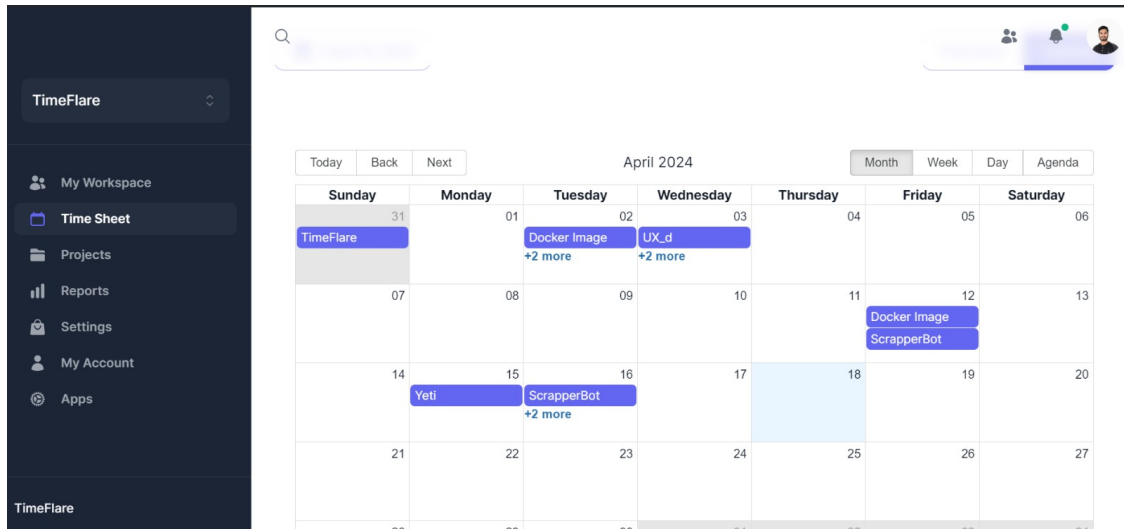


Figure 7: Calendar Page

2.1.8 Analytics Page

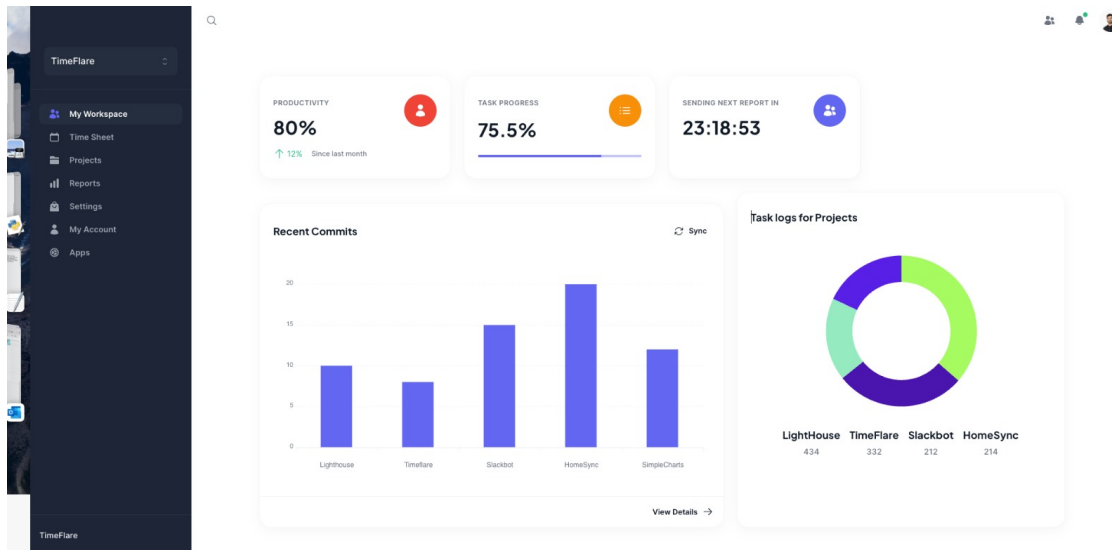


Figure 8: Analytics Page

2.1.9 Email Integration

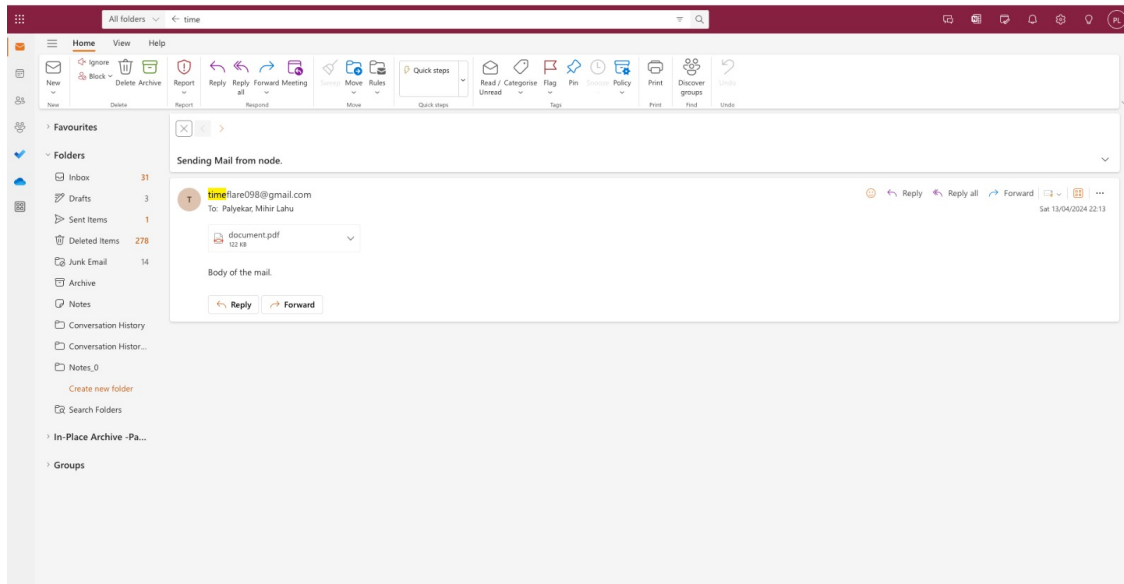


Figure 9: Email Confirmation

2.1.10 Timmy - AI Assistant Tool

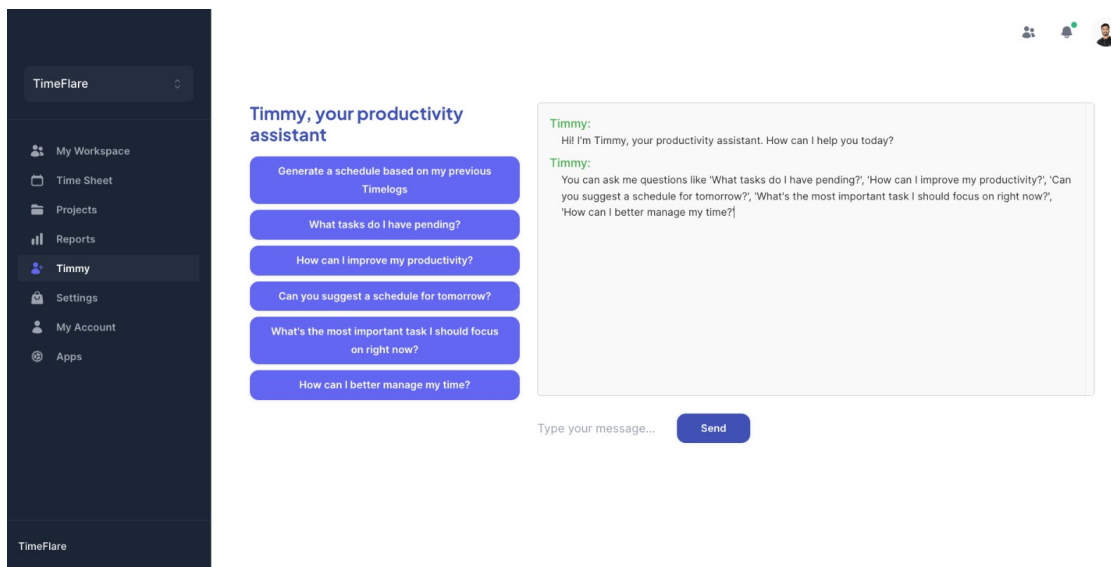


Figure 10: Timmy - AI Assistant Tool

3 Design

The design of TimeFlare is centered around providing a comprehensive and user-friendly solution for efficient time management, project tracking, and payroll processes. It integrates seamlessly with the MERN (MongoDB, Express.js, React, Node.js) stack to ensure robust backend functionalities and an intuitive frontend interface. The design principles focus on scalability, flexibility, and modularity to accommodate diverse user needs and future enhancements.

3.1 Domain Model

The domain model of TimeFlare encompasses entities such as members, projects, timelog, manager, reports and invoice. Users can be categorized into different roles, including freelancers, project managers, and administrators, each with specific permissions and access levels. Projects are associated with users and contain details such as tasks, deadlines, and additional information. Timelog capture work hours logged by users, linked to specific projects for accurate billing and payroll processing.

Based on the GRASP Principle (General Responsibility Assignment Software Patterns), we assign the following responsibilities to the domain objects.

Project:

- Controller: Handles interactions related to project management, such as updating project details, assigning tasks, and monitoring project progress.
- Information Expert: Contains the data for project like pid, title, members, created By and metadata.
- Low Coupling: Only managers are allowed to add users into a project.

Report:

- Information Expert: Contains the data for report like project, aggregated timelogs, and createdBy.
- Controller: Handles interactions related to accessing and viewing reports, as well as managing report generation processes.
- Low Coupling: Reports and invoices are kept as separate domains with their own separate business logic.

Invoice:

- Information Expert: Contains the data for projectId, billedHours, totalAmount and other metadata for all the invoices that are generated.
- Controller: Handles interactions related to generating, editing and deleting invoices, as well as managing report generation processes.
- Low Coupling: Reports and invoices are kept as separate domains with their own separate business logic.

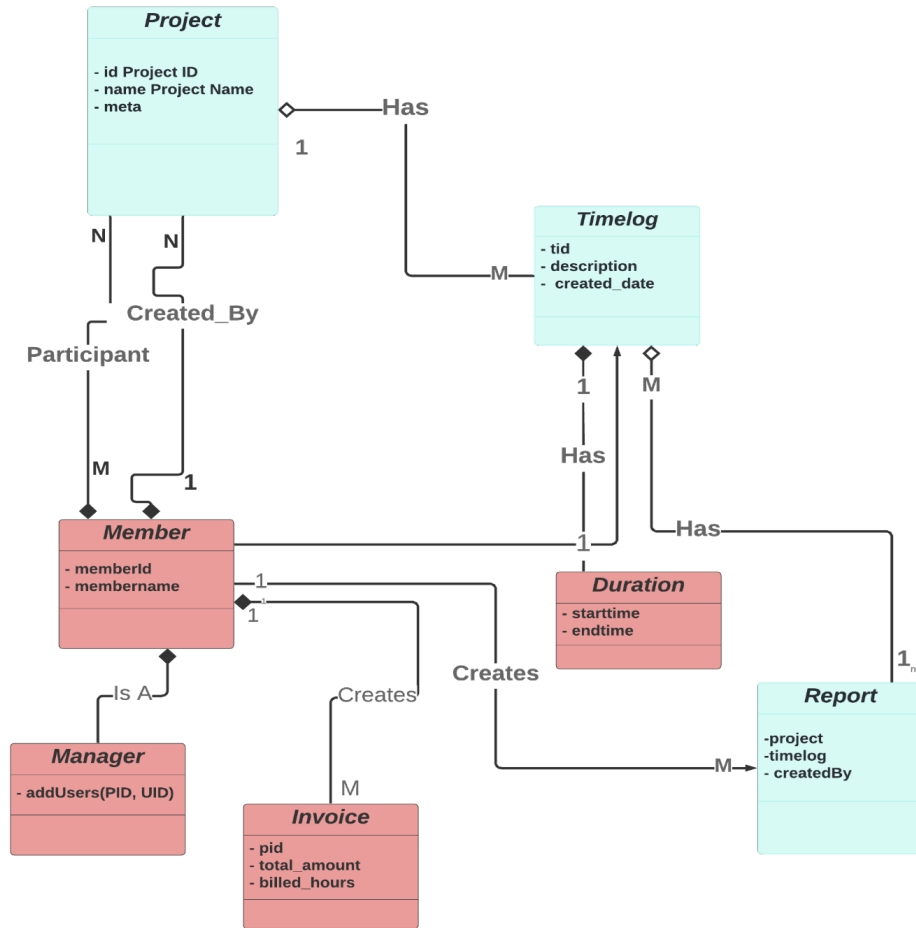


Figure 11: Domain Model Diagram

3.2 Interaction Diagrams

3.2.1 Collaboration Diagram

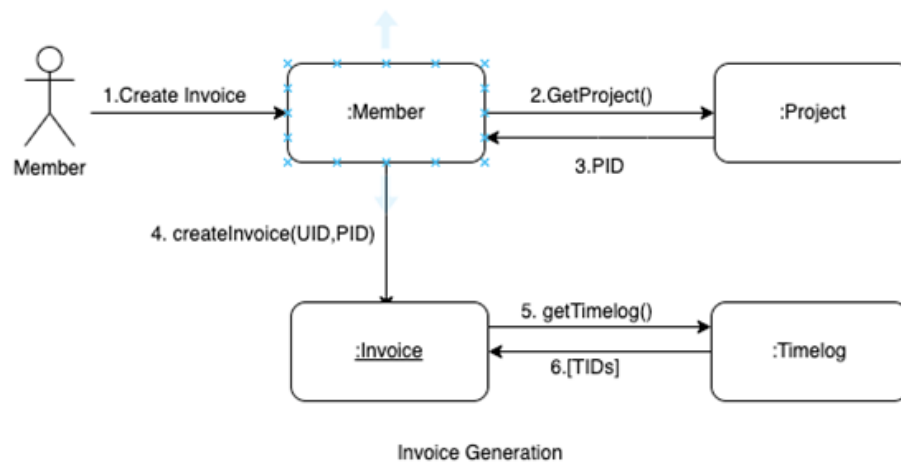


Figure 12: Collaboration Invoice Diagram

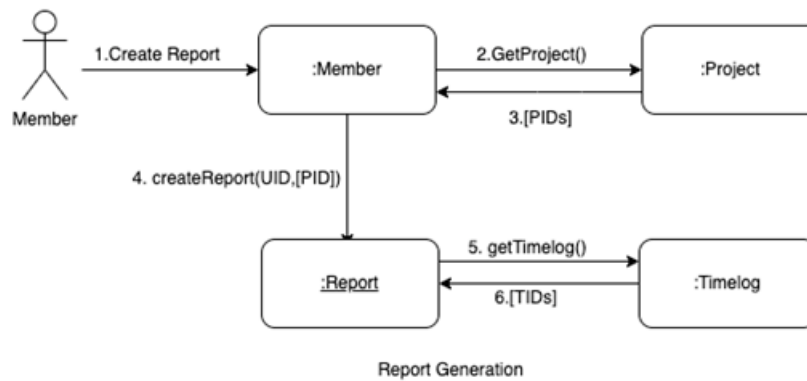


Figure 13: Collaboration Report Diagram

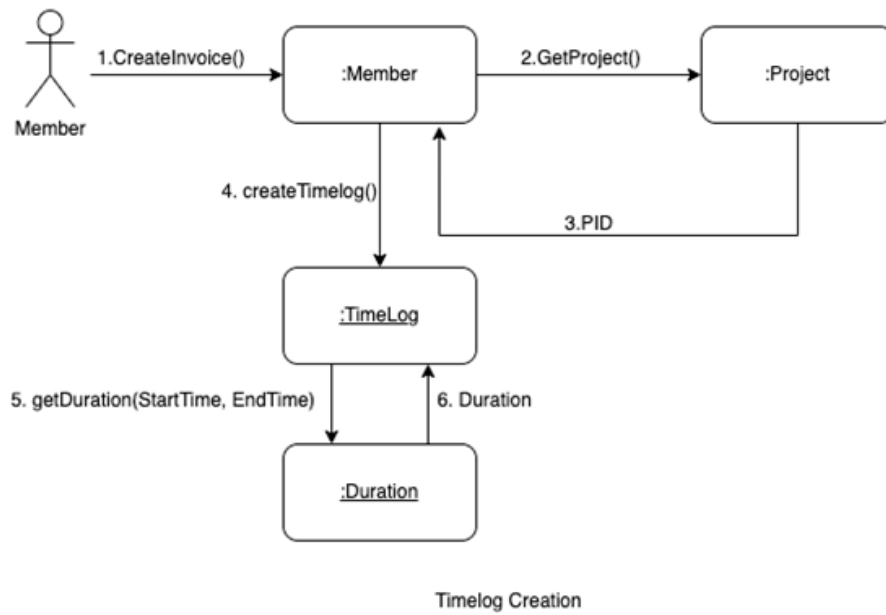


Figure 14: Collaboration Timelog Diagram

3.2.2 Sequence Diagrams

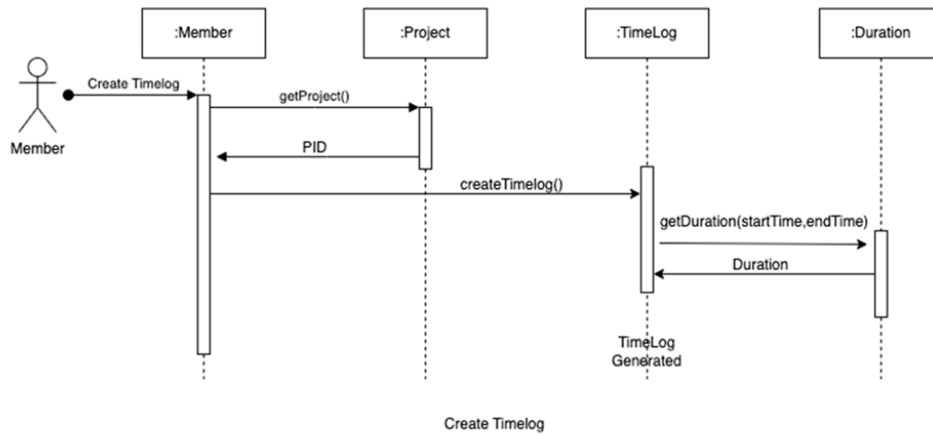


Figure 15: Create Timelog

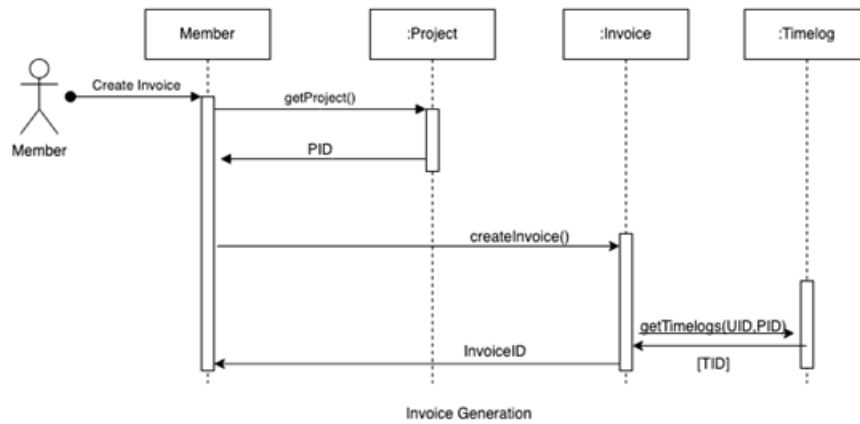


Figure 16: Invoice Generation

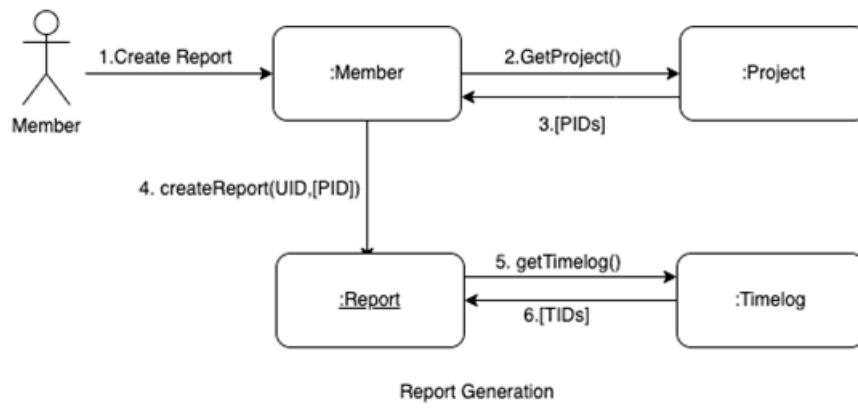


Figure 17: Report Generation

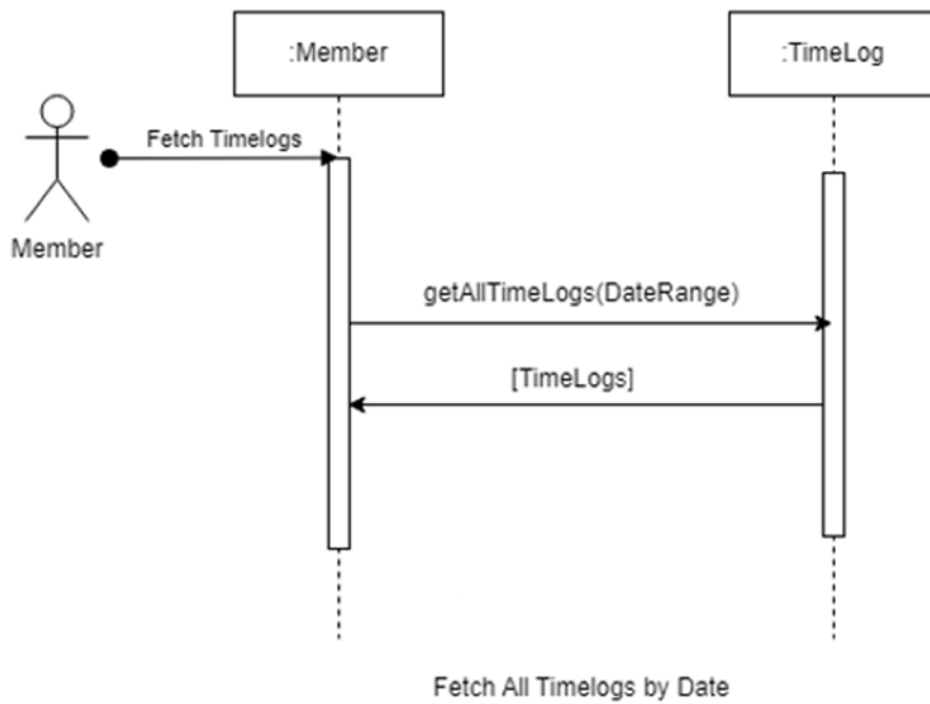


Figure 18: Timelog

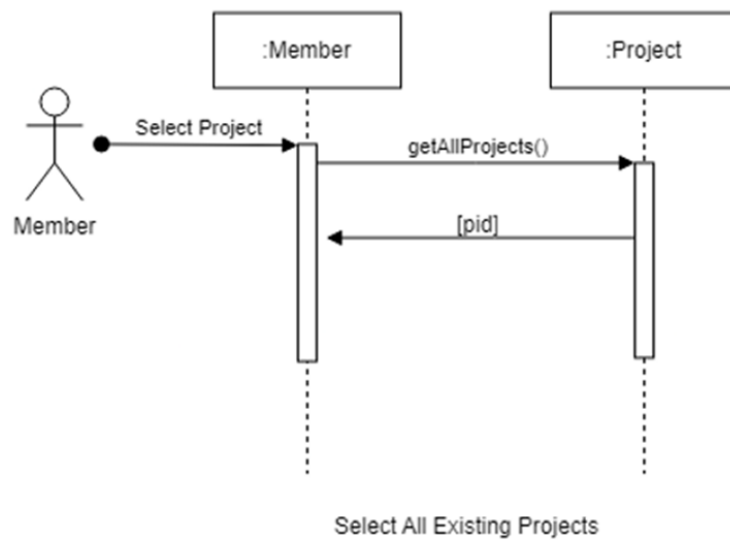


Figure 19: Selecting Projects

3.3 Parameters

- **Performance Metrics:** Measures system performance using metrics such as response time, throughput, and error rates to ensure optimal user experience and scalability.
- **Quality Metrics:** Evaluates code quality and maintainability using metrics such as code coverage, cyclomatic complexity, and dependency analysis.

3.4 Tool Used

- **Programming Languages:** JavaScript (Node.js, Next.js), HTML/CSS
- **Frameworks and Libraries:** Material UI, Bootstrap
- **Databases:** MongoDB
- **Version Control:** GitHub
- **Development Environment:** Visual Studio Code, Postman
- **Deployment:** Docker, Kubernetes

3.5 Unique Features

- **Seamless Integration:** TimeFlare offers seamless integration of time tracking, project management, communication, and analytics features within a single platform, eliminating the need for multiple tools and interfaces.
- **Real-time Collaboration:** Users can collaborate in real-time on projects, tasks, and timesheets, enhancing productivity and communication within distributed teams.
- **Advanced Analytics:** TimeFlare's analytics engine provides advanced insights into employee productivity, project progress, and resource utilization, enabling data-driven decision-making and performance optimization.
- **Customization and Scalability:** The modular architecture of TimeFlare enables customization and scalability to accommodate varying organizational needs and future growth.

4 Retrospection

4.1 What went well:

1. Team Collaboration:

- The team worked well together, leveraging each member's strengths to contribute effectively to different aspects of the project.

2. Feature Implementation:

- Most planned features were successfully implemented, including time tracking, project management, and reporting functionalities.

3. Use of Technologies:

- Leveraging the MERN stack allowed for robust backend development and a responsive frontend interface, meeting the project's requirements.

4. Documentation:

- Comprehensive documentation was maintained throughout the project, aiding in:
 - Development
 - Troubleshooting
 - Future maintenance

4.2 What went Wrong:

1. Time Management:

- Some delays occurred in the development process, leading to challenges in meeting deadlines for certain milestones.

2. Scope Creep:

- Additional feature requests emerged during the development phase, impacting the project timeline and scope.

3. Testing:

- While testing was conducted, there were instances where bugs were discovered late in the development cycle, requiring additional time for fixes.

4. Communication:

- There were occasional lapses in communication within the team, leading to misunderstandings and delays in decision-making.

4.3 Lessons Learned and Skill Development:

1. Time Management:

- Managing project timelines and prioritizing tasks effectively are crucial skills learned during this project.

2. Adaptability:

- Flexibility and adaptability in response to changing requirements and unforeseen challenges were honed throughout the project.

3. Technical Skills:

- Enhancements were made in coding proficiency, particularly in the MERN stack, as well as in version control and deployment processes.

4. Communication:

- Improved communication skills, both within the team and with stakeholders, were developed to ensure clarity and alignment throughout the project lifecycle.

4.4 Product Improvement:

1. User Feedback:

- Gathering feedback from users during beta testing and post-launch can provide valuable insights for further improving usability, functionality, and overall user experience.

2. Enhanced Analytics:

- Adding more advanced analytics features, such as predictive analytics or machine learning algorithms, can provide deeper insights into productivity and resource allocation.

3. Integration Capabilities:

- Exploring integration options with other tools and platforms commonly used in project management and time tracking can enhance the product's versatility and value proposition.

5 Links:

Presentation Link: https://drive.google.com/file/d/1jBkf1Jad8D3RtS4wBmQ7CxywvoWwCUg/view?usp=drive_link

Demo Link: <https://drive.google.com/file/d/12Mlu7JgyQ0abaL1I00RmugsPY1XNyZkD/view>