Real-Time Team Collaboration Platform For Software Project Management

Research Work Proposal

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1. Abstract

"Real-time Team Collaboration Platform For Software Project Management" aims to facilitates real-time seamless communication , efficient task management and collaborative project execution within software teams. Most importantly application leverages websockets technology to enable instant real-time interactions. Socket management is done by manually on the server so that it will fit for better customizations such as scaling later. Because of this, the system provides high performance and efficiency to its clients.

2. Introduction

In the fast-paced world of software development, effective collaboration and streamlined project management are paramount. The "Software Project Management Platform" seeks to address this critical need by providing a real-time team collaboration environment tailored for software projects. Imagine a platform that empowers software development teams to transcend geographical barriers, engage in instant communication, and seamlessly manage project tasks. The proposed system is designed to be the virtual workspace where ideas are exchanged, tasks are assigned, progress is tracked, and outcomes are realized. By utilizing cutting-edge websockets technology, real-time interactions transform project execution from fragmented to fluid, enhancing the agility of software teams in adapting to changes. System also implements an advance Authentication mechanism, so that it will enhance the security of the application. The importance of this project is mainly for the software teams that are facing problems with managing software projects. By using the platform they can manage and maximize their project outcomes. System also provides NLP(Natural Language Proccesing) and ML features like collaborator recommendation, so that managers can find suitable members for their projects.

3. Project Goal

The goal of this project is to develop a platform that provides real-time communication capabilities with enhanced socket management mechanisms on the server and advance software project management features and functionalities for software teams.

4. Related Work

Existing Systems and Solutions:

- Current collaboration platforms like Slack and Asana offer real-time communication and project management capabilities. However, our application stands out by focusing on the specialized needs of software project management, integrating advanced NLP for collaborator recommendation.

Research Papers and Advances:

- Q. Liu and X. Sun in [1] explored the benefits of adopting Web Socket technology for enhanced web real-time communication.

- "Research of Web Real-Time Communication Based on Web Socket" by Liu and Sun [2] presents advancements in WebSockets for real-time communication, which aligns with our project's foundation.
- The paper [3] introduces a content-based recommender system tailored for computer science publications, aiding authors in choosing suitable journals or conferences for their manuscripts. So this helped to understand various methods that I could leverage for my project.

5. Methodology

1. System requirements gathering
   - Gather the application requirements according to the system's needs.
2. Study about WebSockets and its behavior
   - A study on websockets must be performed since it is a stateful protocol.
3. Design the server side architecture
   - According to the needs a proper server side architecture must be designed.
4. Design application logic and Data Models
   - Identifying the logical flow of features and functionalities of the whole application.
5. Interface design
6. System Implementation
   - Start developing the system from the ground up.
7. System testing

6. Tools & Techniques

Programming languages : JavaScript, Python
Front End technologies : React (SPA-Single Page Application) and Tailwind CSS (As a CSS framework)
Back End technologies : NodeJS (Offers a non-blocking event-driven architecture, ideal for handling websockets)
Database : MongoDB (No-SQL type of database which is ideal for storing more complex data)
NLP Libraries : Tensorflow or Hugging Face Transformers
Protocols : Websockets , HTTP
API Testing Tools: Postman, Thunder client
IDE : VS Code
Architecture : Hybrid

7. Time Schedule

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Proposal Writing	█	█													
Websocket Study			█												
System Design				█	█	█	█								
Implementation						█	█	█	█	█	█	█			
Testing											█	█	█		
Final Report														█	█

8. References

- [1] Q. Liu and X. Sun, "Research of Web Real-Time Communication Based on Web Socket," Int'l J. of Communications, Network and System Sciences, vol. 5, no. 12, 2012. DOI: 10.4236/ijcns.2012.512083.
- [2] D. G. Puranik, D. C. Feiock, and J. H. Hill, "Real-Time Monitoring using AJAX and WebSockets," in 2013 20th IEEE International Conference and Workshops on Engineering of Computer Based Systems (ECBS), Scottsdale, AZ, USA, April 22-24, 2013, pp. 141-148. DOI: 10.1109/ECBS.2013.10.
- [3] D. Wang, Y. Liang, D. Xu, X. Feng, and R. Guan, "A content-based recommender system for computer science publications," vol. 152, May 2018. DOI: 10.1016/j.knosys.2018.05.001.

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