ADVANCED WEB DEVELOPMENT
SOCIAL MEDIA WEBSITE - KUMA

PROJECT PLAN

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CS3810 - FINAL YEAR PROJECT

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1 Abstract

Social media influence on communication and interaction is increasing as the technical society is improving and they are now reshaping the digital landscape.Not only that, social media plays a critical role in creating virtual communities, enabling users to interact and share ideas and knowledge[5] and social media platforms foster community-building and dialogue, which is essential for modern digital spaces[1]. Nevertheless, the value of Web 2.0 technologies is rising on enabling user-driven content creation and interaction[4], and the role of platform design is making a great impact on how users engage with content and one another[2]. Drawing on these perspectives,this project, KUMA social media web application, aims to create a platform that leverages the interactive potential of social media to build interactive and knowledge-sharing communities.

The KUMA project is a social media platform which will be designed to enhance user interaction through real-time content sharing and community engagement and aims to develop a scalable, secure and user-friendly social media platform. KUMA social media website will be using React for the frontend, Node.js for the backend, and MySQL for data storage. Also, the application will utilise Prisma as an ORM for efficient database management to support real-time interaction and scalability[3].

KUMA is the social media web application mainly aiming for users for knowledge sharing and to facilitate discussions while providing the user secure and scalable platform experiences. Basically, KUMA enables users to create profiles, edit the profile and also post contents, react to the posts, comment on discussions across various communities. Users can also follow the other users and can block the users as well.

Ensuring data security, optimising performance, and providing a responsive user experience is the most challenging obstacle for a social media website since data privacy and user engagement are crucial factors for the success of a social media platform[2]. Thus, with this project, I will focus on robust security measures and performance optimization techniques, such as caching and load balancing, to ensure seamless user interaction even under heavy traffic. Moverover the scalability of the application will ensure that it can handle increasing user engagement and adapt to future needs[4], so I aim to deliver a scalable solution that enhances knowledge-sharing, fosters collaboration, and accommodates growing user engagement by utilising Web 2.0 technologies[4] and innovative platform design[2] to improve user interaction.

2 Timeline

I will focus on implementing the core features, including frontend, backend, and basic user functionality of a social media web application in this KUMA project in term 1 and will implement extra features and unique features for KUMA in term 2.

2.1 Term 1

Week 1 - 2	Research existing social media platforms and define user requirements and features.
Week 3 - 4	Design the application architecture and develop wireframes for the user interface (UI).
Week 5	Begin frontend development using React, focusing on building the basic components and layouts.
Week 6	Set up the Node.js backend and configure the MySQL database with Prisma.
Week 7	Develop RESTful APIs for user data and ensure smooth integration between the frontend and backend.
Week 8 - 9	Implement post creation, commenting, and interaction features (liking, following). Focus on user-driven content creation, aligning with Web 2.0 principles.
Week 10	Extra week to try to implement extra features in the project if the KUMA project is having no delay.
Week 11	Interim project review and prepare for report writing, highlighting progress and any challenges encountered.

2.2 Term 2

Week 1-2	Implementing notifications using WebSockets and refine user interactions (blocking/unblocking).
Week 3-4	Focus on optimising MySQL queries, improving response times, and ensuring that the system scales effectively with user growth.
Week 5-6	Perform unit testing, integration testing, and user acceptance testing. Implement security protocols to safeguard user data, such as encryption and secure authentication.
Week 7	Refine user experience based on feedback and testing. Implement any remaining minor features.
Week 8-9	Finalise documentation and write the final report detailing project outcomes, challenges, and future work.
Week 10-11	Prepare for the final full report, summarising key aspects of the project and its implementation.

3 Risk and Mitigation

3.1 Data Security

One of the most crucial risks for social media platforms like KUMA is data security and sensitive user data could be exposed or even compromised if proper security protocols are not followed. To mitigate the risk of this occurring, I will focus on robust security practices HTTPS for secure communication, and store passwords securely using hashing algorithms for password storage and secure authentication protocols like JWT.

3.2 Performance Issues

As the number of users and data grows, database queries will definitely become slow, impacting performance. In this project, I will optimise database queries using indexing, and apply caching techniques for frequently accessed data, and implement pagination for handling large datasets efficiently.

3.3 Integration Challenges

Issues may arise when integrating the frontend and backend components which can cause delays due to API communication issues. In this KUMA project, I will combat this risk by using clear API documentation and employ tools like Postman to test API endpoints during whole development.

3.4 Time Management

The project could be falling behind on important tasks due to underestimating and additional features could interrupt the project timeline, putting other tasks at risk. For the risk, I will ensure that I break tasks into smaller, manageable parts and adjust priorities when necessary and ensure realistic timelines are set for each milestone.

Acronyms

KUMA = くま means ‘Bear’ in Japanese (Royal Holloway is Home of the Bear)

ODM = Object Data Manager

JWT = JSON Web Tokens

Reference

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[4] Wirtz, B.W., Schilke, O. and Ullrich, S., 2010. Strategic development of business models: Implications of the Web 2.0 for creating value on the internet. ‘*Long Range Planning’*, 43(2–3), pp.272-290. https://doi.org/10.1016/j.lrp.2010.01.005.

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