



## WEAVE (The Connection Web) : A Web Based Application For College Using MERN Stack

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**ABSTRACT:** This research explores the potential of Weave, a web application designed to cultivate a dynamic social and academic environment within college communities. Weave addresses the growing need for a platform that fosters communication, collaboration, and engagement among students, faculty, and staff in the digital age. This paper examines the multifaceted functionalities of Weave, including the creation of personalized profiles, interest-based group formation, and knowledge-sharing tools like discussion forums and document collaboration. Additionally, the research investigates Weave's potential to promote campus involvement through streamlined event discovery and organization functionalities, alongside fostering professional development opportunities through mentorship and networking features. Ultimately, this research aims to evaluate Weave's effectiveness in fostering a vibrant and connected college environment, enriching the social and academic experience for all users.

**Keywords:** Collaborative Learning, MERN Stack, Social Media, Interest-based communities.

### 1. INTRODUCTION:

Weave (The Connection Web) is intended to provide a comprehensive response to the evolving nature of student engagement in learning environments. It recognizes the common difficulties that students encounter, such as feeling cut off from their friends, finding it difficult to communicate well on a variety of platforms, and becoming overwhelmed by the amount of information that is readily available. Weave aims to facilitate communication, encourage teamwork, and build a feeling of community among students by serving as a central platform. Students may easily interact with one another, work together on projects or assignments, and access crucial information in one convenient area

thanks to its user-friendly interface and intuitive features. Weave acts as a central point that makes it easy for students to connect with one another, explore extracurricular activities, or just ask questions about academic support. Weave's main goal is to improve the educational experience for students as a whole by tackling issues like disconnection, poor communication, and excessive information.

### 2. LITERATURE SURVEY:

a) The author Maanil Laad, Dr. Vasudha Bahl [1] explores the advantages of Mern-based applications for students in college, particularly how they can support them in finding assistance and services, exchanging information and resources, and staying in contact with other students and localities. Due to the fact that it might help college students keep in touch with their peers inside as well as outside of their college friends. This can be of particular significance for students who are living far away from home and wants to stay connected with their college mates. Even they can find the job post and the all-other official alert though post done by officials

b) The author Moon, J. [2] is Building a social media application with the MERN stack.”. This presents the development of a social media app using the MERN stack, with a focus on implementing real time features such as live chat The authors discuss the design considerations and technical challenges involved in building the app, as well as the benefits of using the MERN stack for this type of project.

c) The author Jia Li, Lillian Mak [3] provides evidence that college students with underdeveloped language skills can benefit from a well-structured, online intervention supporting a collaborative learning environment for academic writing. This article reports on

a 10-week intervention using a cloud-based technology application to support students' collaboration in reading-to-write learning tasks. The intervention focused on systematically helping students develop distinct expository writing skills progressively with embedded reading strategies.

d) The author Ulrike Bath, Sumit Shekhar [4] study of various web-based image-editing tools and web-based collaborative tools exist in isolation. The Research focusing to bridge the gap between these two domains is sparse. It respond to the above and develop prototype groupware for real-time collaborative editing of raster images in a web browser. To better understand the requirements, conducted a preliminary user study and establish communication and synchronization as key elements.

e) The author Nikita Srivastava [5] describes the development of an online shopping platform for businesses that use the MERN technology stack. MongoDB is represented by M, Express by E, ReactJS by R, and NodeJS by N. The project consists of various components that are organized sequentially for easy online access. In addition, practically everyone uses e-commerce, whether it be for adding items to an online shopping cart or for buying and selling goods and services. Here people can see, how many people has chosen their interest. According to product quality, everyone gave rating. So, it will be easy for everyone to buy it and recommend each other.

f) The author Mrunmayee Vaibhav Kulkarni [6] describes about the interaction of people with similar interests. it may be for some romantic purpose or either for same taste of following any passion like photography, singing, dancing, and many more. Here, the main goal is to interact the people with similar interests and goal using the full stack web development MERN stack. In search of people interest of work, this application works for the fulfillment of their desired role and custom setting on app for the best search.

g) The author Desai, Krutika and Fiaidhi [7] This describes a full functionally and most friendly, social media platform that contain business ideas and creative knowledge of the design and the deployment of the customized network. Also used to design for educational purpose in search of materials for research purpose. In order to get the advancement in the communication medium in research and creative idea field, this platform play a vital role.

h) The Authors Shivansh Srivastava, Sajal Tyagi, Ishan Dixit [8] introduces Jiphy. It is a social media platform designed for developers to connect, collaborate, and learn. It features professional networking, project management tools, code sharing, educational resources,

and a space for showcasing projects. The app aims to create a supportive community for developers to enhance their skills and grow together.

### 3. PROPOSED SYSTEM:

**Clear and Intuitive Design:-** The platform will have an easy-to-navigate, uncomplicated design that makes it possible for users to locate and utilize the capabilities they require fast.

**Responsive Layout:-** This type of layout ensures a consistent user experience on all platforms by adjusting to multiple screen sizes and devices, such as tablets, and desktop computers.

**Key Features:-** To keep users interested and informed, the user interface (UI) will prominently display important features such user profiles, a news feed, messaging, and notifications. Customizable accounts:- To enhance user experience, users will be able to add details about themselves to their accounts, such as a bio, interests, profile picture, and cover photo.

**Authentication and Authorization:-** Safe User Account Creation and Login:- To safeguard user accounts, the system will use safe techniques for user account creation and login, including password hashing, email verification, and potentially multi-factor verification.

Networking and profiles:- Customized Profiles:- Users have the ability to create comprehensive profiles by personalizing their settings and adding personal information.

**User Search Functionality:-** Users will be able to locate others by name, class, or interest thanks to an effective search function. Making Connections:- Users can create a network of peers and mentors by looking through other users' profiles and extending connection requests.

**Content Management:-** submit Capabilities:- To enable a variety of interactions, users can submit a variety of content, such as text updates, pictures, and links. Features that promote interaction:- Post like and commenting are examples of features that promote community interaction and engagement. Users have the ability to tag posts and categorize information to make it easier to organize and find later.

**Content Moderation:-** To make sure user-generated content complies with community norms and guidelines, tools for content moderation will be made available.

**Recommendation:-** By making recommendations for friends, groups, and material, the platform assists users in finding new interests and connections.

**Follow System:-** By allowing users to follow one another, a network of connections is created and updates on activities are shared.

**Real-time Messaging:-** Users will be able to communicate privately in real-time

**User Controls:-** To regulate their interactions and preserve a relaxing online atmosphere, users can choose to disable his account.

**Security and Privacy:-**

**Privacy Settings:-** Users have the power to protect their privacy by deciding who can access their material and profile. **End-to-End Encryption:-** To guarantee that only the designated receivers may view private messages, they will be encrypted.

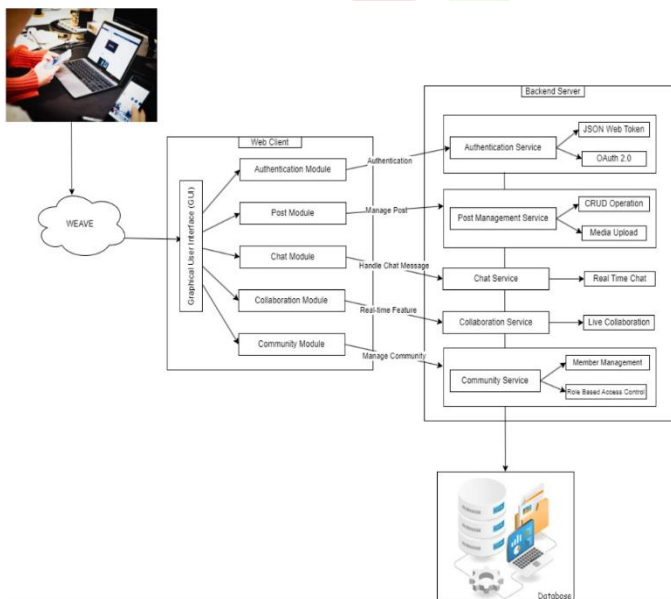
**Scalable Backend Architecture:-** The backend will be built to grow with the user base and traffic volume without experiencing performance problems. **Caching and load balancing:-** These strategies will be applied to guarantee quick load times and efficient traffic management.

**Extra Features for College Students:-** **User Onboarding and Authentication College Email Verification:-** In order to guarantee that only enrolled students and faculty may register, a college email address must be provided. **Integration with College Systems:-** To enable smooth login, the platform will, if feasible, integrate with the current college authentication systems. **Onboarding Process:-** During the first setup, new users will be assisted in creating their profiles and choosing their interests.

**Networking on Campus:-** **Getting in Touch with Classmates:-** Tools will make it easier for students to locate and get in touch with their fellow students, housemates, and members of the same groups or classes. **Integration with College Directories:-** Finding peers will be made easier by matching up with official college directories or class rosters.

In order to promote community, communication, and teamwork among college students, this suggested system aims to build a strong and captivating social media platform that is customized to meet their specific requirements.

**4. SYSTEM ARCHITECTURE:**



**Fig 4.1 :-** System Architecture of WEAVE

"Weave" is a social media platform tailored to enhance communication, collaboration, and community engagement within a specific organization. The platform's architecture is divided into three main components: the Web Client, the Backend Server, and the Database.

The Web Client serves as the user interface and consists of several modules:

**Authentication Module** manages user login and authentication.

**Post Module** allows users to create, edit, delete, and view posts, facilitating interactions like likes, comments, and shares.

**Chat Module** provides real-time messaging capabilities, enabling users to exchange text, images, and other media.

**Collaboration Module** supports activities such as project management, group discussions, and shared document editing, promoting teamwork.

**Community Module** handles community-specific features, such as creating and joining groups, events, and discussions.

The Backend Server processes all business logic and data, with services including:

**Authentication Service** utilizes JSON Web Tokens (JWT) for secure session management and **OAuth 2.0** for standardized authorization.

**Post Management Service** handles CRUD operations for posts and manages media uploads.

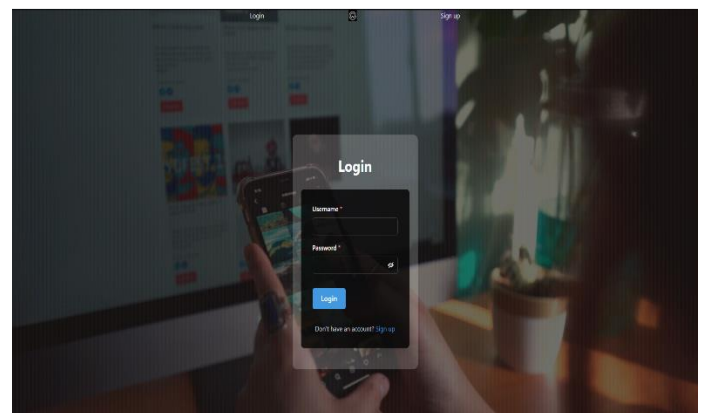
**Chat Service** ensures real-time chat functionality, supporting instant messaging.

**Collaboration Service** provides live collaboration tools, such as real-time document editing and project management.

**Community Service** manages member roles and permissions using Role-Based Access Control (RBAC) to ensure secure access to community resources.

The **Database** is the backbone of data storage, maintaining all user information, posts, chat messages, and community data, ensuring data integrity and efficient access.

**5. RESULT :**



**Fig 5.1 : Login**



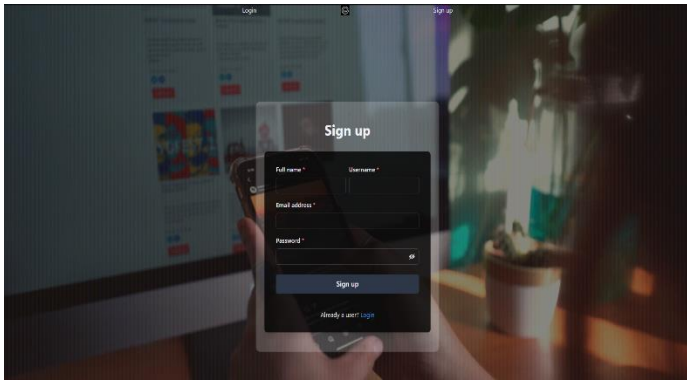


Fig 5.2 : Sign-Up

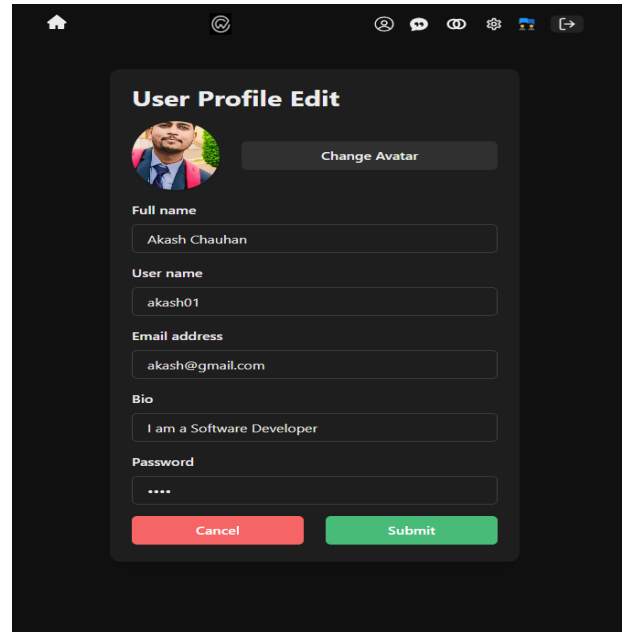


Fig 5.5 : Update Profile

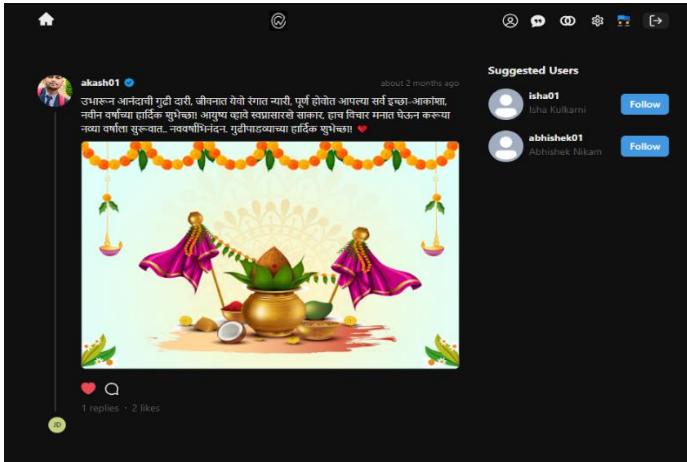


Fig 5.3 : Home Page

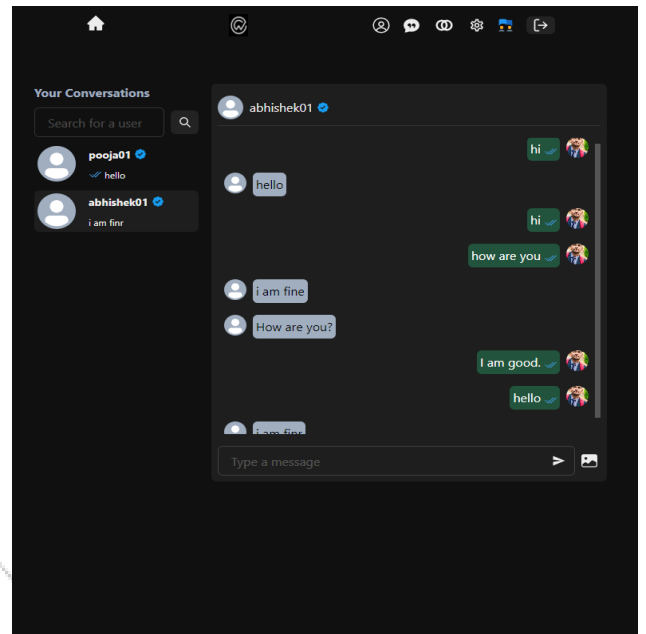


Fig 5.6 : Live Chat

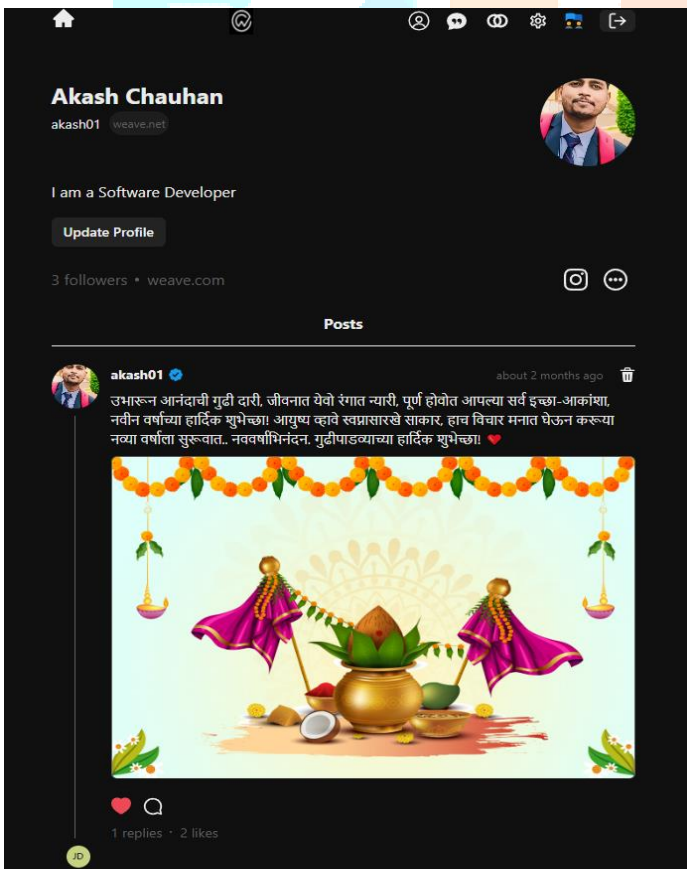


Fig 5.4 : Profile Page

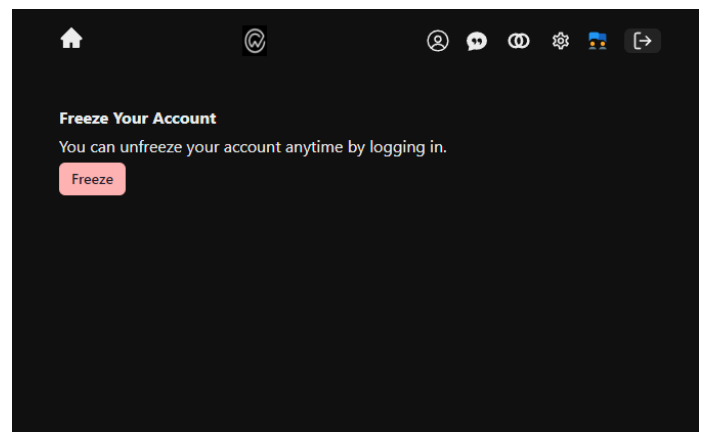


Fig 5.7 : Freez Account

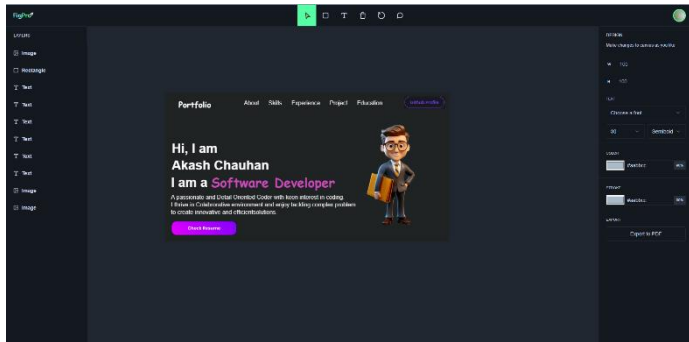


Fig 5.8 : FigPro(Collaboration tool) HomePage

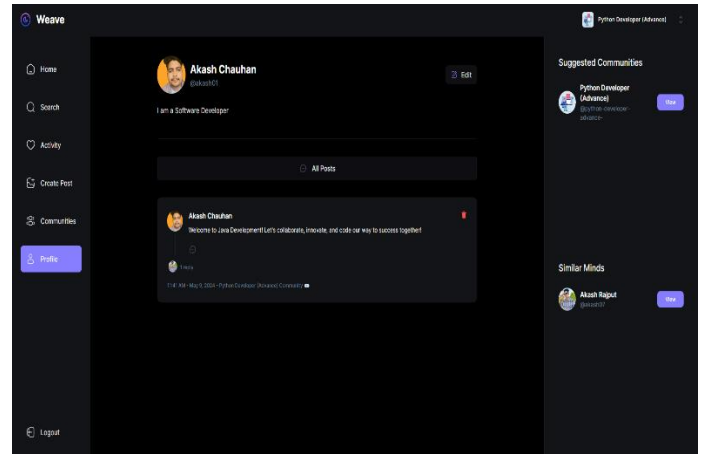


Fig 5.11 : Community Profile

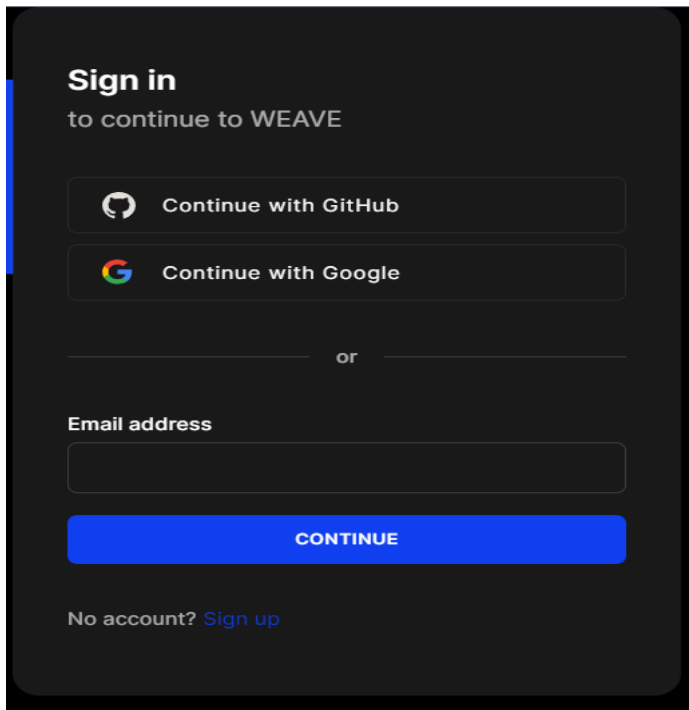


Fig 5.9 : Community Login

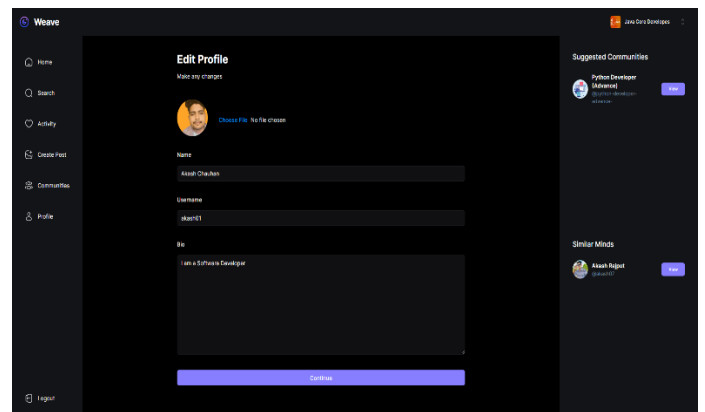


Fig 5.12 : Community Update Profile

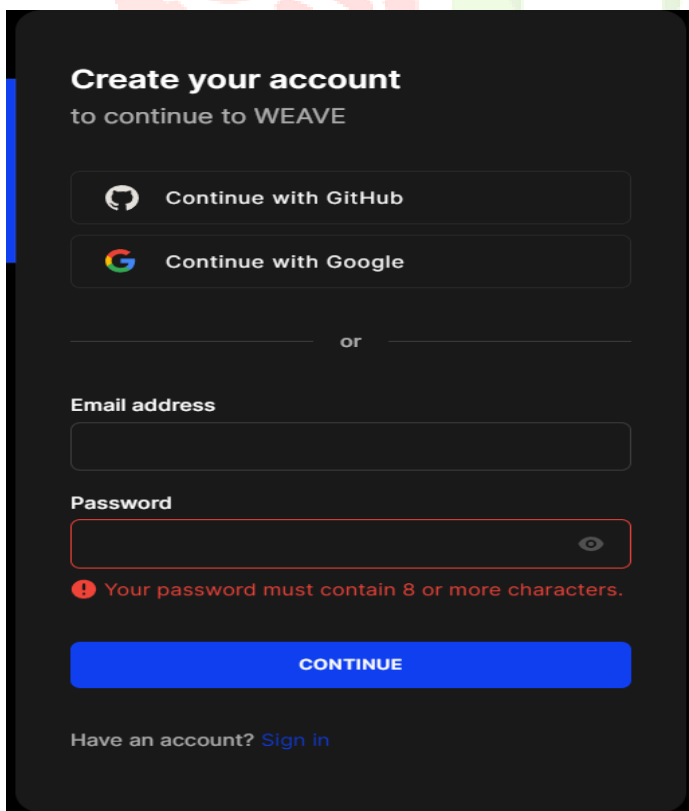


Fig 5.10 : Community SignUp

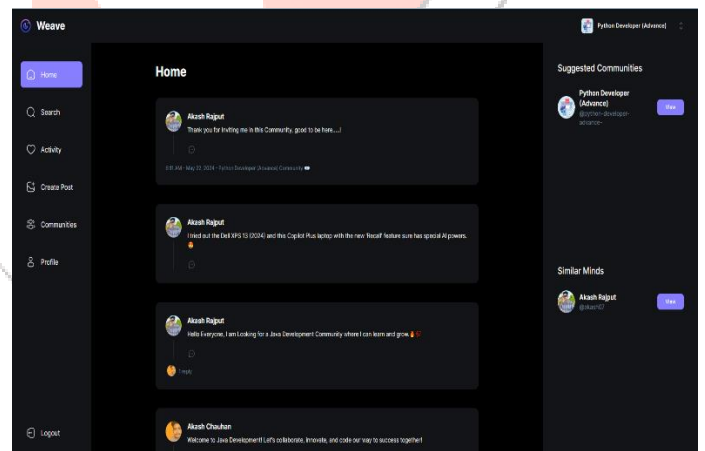


Fig 5.13 : Community Homepage

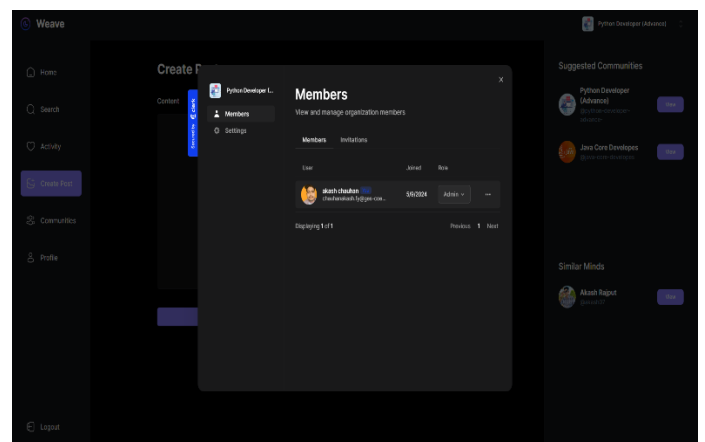


Fig 14 : Community Organization

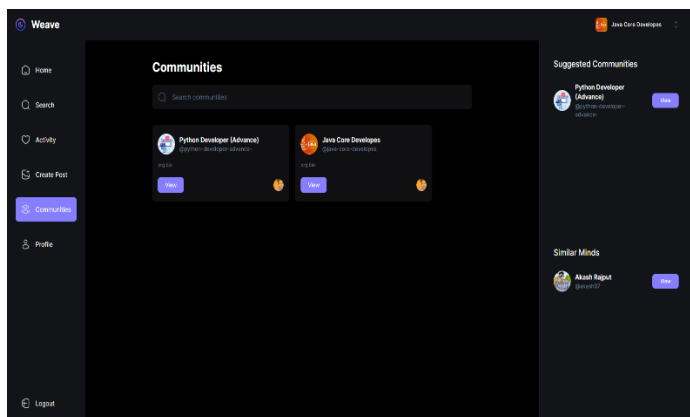


Fig 5.15 : Community Groups

## 6. ADVANTAGES :

**Enhanced Communication:** A dedicated WEAVE provides a centralized platform for instant messaging, group chats, and announcements, facilitating seamless communication among students, faculty, and staff.

**Community Building:** The Web app fosters online community engagement, encouraging stronger social connections and increased collaboration on projects, enhancing campus culture.

**Improved Campus Engagement:** WEAVE serves as a hub for campus activities, events, and organizations, helping students discover events, join clubs, and participate in initiatives.

**Personalized Experience:** Users can customize their profiles, join interest-based groups, and receive tailored recommendations, making the Web app adaptable to individual needs and preferences.

**Access to Resources :** The app supports academic activities by providing tools for collaboration, study groups, and resource sharing, enhancing the learning experience through better connectivity with classmates.

**Preparation for the Digital Age:** Using WEAVE helps students develop digital literacy skills and responsible online behavior, preparing them for the demands of the modern workplace.

## 7. APPLICATIONS :

**Streamlined Communication:** WEAVE fosters communication beyond the classroom. Students can connect with professors for questions, discussions, and resource sharing, while professors can disseminate information efficiently.

**Active Learning Environment:** The platform promotes active learning through features like real-time document editing for collaborative projects, study group formation, and a resource library for sharing learning materials.

**Vibrant Campus Community:** WEAVE fosters a sense of community by allowing students to connect based on interests, participate in discussions, and plan events. This

can combat feelings of isolation and encourage peer-to-peer learning.

**Enhanced Accessibility:** The cloud-based platform allows students to access learning resources and connect with classmates from anywhere, anytime. This is particularly beneficial for remote learners or those with scheduling conflicts.

**Centralized Platform:** WEAVE can serve as a one-stop shop for students to access campus news, announcements, event information, and safety alerts. This eliminates the need to check multiple sources for crucial information.

## 8. FUTURE SCOPE:

The future scope of a WEAVE is vast, with ongoing technological advancements and evolving student needs. Here are some potential future directions for such an app:

**Advanced Collaboration Tools:** Integrate whiteboarding tools, real-time code editing for collaborative programming projects, and project management dashboards for enhanced teamwork.

**AI-powered Learning:** Implement machine learning algorithms to personalize learning experiences by recommending relevant content, suggesting study groups based on compatibility, and providing feedback on student work.

**Gamification:** Introduce gamification elements like points, badges, and leaderboards to increase student engagement and motivation.

**Virtual Reality (VR) and Augmented Reality (AR) Integration:** Explore the potential of VR/AR for immersive learning experiences, such as virtual labs, 3D models for engineering visualization, and interactive simulations.

**Career Services Integration:** Partner with career centers to allow companies to post internship and job opportunities directly on WEAVE. Students can build online profiles and connect with potential employers.

**Alumni Network Integration:** Develop features to connect current students with alumni mentors who can offer career guidance and share industry insights.

**Multi-institutional Collaboration:** Expand WEAVE beyond R.H. Sapat College of Engineering to facilitate collaboration and knowledge sharing among students from different institutions.

**Open-source Development:** Consider an open-source development model to allow contributions from the wider educational technology community, fostering faster innovation and wider adoption.

## 9. CHALLENGES:

**Complexity of Integration:** Combining several technologies from the MERN stack (Express, React, Node, and MongoDB) can be difficult, particularly for developers who are not familiar with each component's nuances. Thorough preparation and execution are necessary to guarantee frontend and backend modules are compatible and communicate with each other.

**Scalability Bottlenecks:** As WEAVE attracts more users and accumulates data (assignments, discussions, uploaded files), the platform's initial infrastructure might struggle to keep pace. This can lead to sluggish performance, crashes, and a frustrating user experience.

**Content Moderation:** User-generated content like discussions and uploaded files need to be monitored to ensure quality and safety. WEAVE needs clear guidelines to prevent inappropriate content, misinformation, plagiarism, or copyright infringement. This might involve establishing clear community guidelines, utilizing content moderation tools, and potentially involving responsible students as volunteer moderators to foster a sense of ownership.

**Third-Party Service Integration:** WEAVE might integrate third-party services like real-time editing tools. Each service has its own API and authentication mechanisms, requiring careful integration to ensure a smooth user experience.

## 10. CONCLUSION :

WEAVE has the potential to be an invaluable resource for both students and faculty at R.H. Sapat College of Engineering. By fostering collaboration, communication, and a sense of community, WEAVE can create a dynamic learning environment that equips students with the skills and knowledge they need to succeed in the ever-evolving world. The success of WEAVE will depend on its ability to overcome the identified challenges and continuously adapt to meet the needs of its users. However, with thoughtful planning, diligent development, and ongoing user feedback, WEAVE can truly revolutionize the way students learn and collaborate at R.H. Sapat College of Engineering.

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