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Connectify: A College Exclusive Social Media

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ABSTRACT: : This research paper presents the design and implementation of CONNECTIFY, a college-exclusive social networking platform featuring real-time chat functionality, secure user authentication, and admin-controlled access. Built using the MERN stack (MongoDB, Express.js, React.js, Node.js) and WebSocket technology, CONNECTIFY addresses the limitations of generic social media platforms by ensuring exclusivity, low latency, and robust scalability. The platform leverages WebSocket for efficient bidirectional communication and incorporates advanced privacy controls and encryption for user data protection. Performance evaluations demonstrate exceptional responsiveness and scalability, with support for up to 5,000 concurrent users. This paper discusses the development process, key technical challenges, and future enhancements, including multimedia sharing and group chat functionality.

KEYWORDS: MERN stack, WebSocket, real-time communication, chat application, scalability, security.

I. INTRODUCTION

The rise of digital communication platforms has revolutionized how individuals connect and collaborate. However, mainstream platforms often lack features tailored to specific communities, such as exclusivity, security, and real-time interaction, which are essential for closed networks like college campuses. This paper introduces CONNECTIFY, a dedicated social media platform for college students. Built on the MERN stack, CONNECTIFY combines advanced technologies like WebSocket and MongoDB to deliver a seamless, secure, and efficient user experience. The platform prioritizes user verification, ensuring only verified students gain access, and supports real-time communication, fostering an interactive and collaborative community.

II. RELATED WORK

A. Existing System

Current social media platforms, such as Facebook, Twitter, and Instagram, provide generic social networking features but lack exclusivity and secure access control for specific groups, such as college students. Most existing platforms have limitations in enabling real-time, secure communication and cannot ensure that only verified students gain access to the network. Additionally, they do not provide a dedicated administrative interface for managing and verifying users based on a student database.

B. Proposed System

This social media platform is designed exclusively for college students, featuring real-time chat and an admin-controlled student verification system. Users can only join and interact on the platform after verification against a college-managed student database. The system aims to foster a secure, closed environment for communication, collaboration, and social engagement within the campus..

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III. METHODOLOGY

1. System Design:

The chat application was designed using a client-server architecture. Key components include:

- Frontend: Developed with React.js, providing a dynamic and user-friendly interface.
- Backend: Powered by Node.js and Express.js for server-side processing, API routing, and user authentication.
- Database: MongoDB for storing user profiles, chat histories, and multimedia , using GridFS for efficient file storage.
- Real-Time Messaging: WebSocket enables bidirectional communication, ensuring minimal latency.
- The admin-controlled student verification system ensures only eligible users can join, creating a secure and exclusive network.

2.Technology Stack

- MongoDB: A NoSQL database used for storing user profiles, chat histories, and other platform data. Its flexible schema allows for easy scaling as the application grows.
- Express.js: A web application framework for Node.js, used to manage server-side routing and handle requests.
- React.js: A JavaScript library for building the user interface, enabling dynamic, single-page application behavior.
- WebSocket: A protocol for real-time communication between clients and the server, enabling bidirectional data exchange with low latency.
- Node.js: A JavaScript runtime for the server-side, allowing for asynchronous operations and efficient real-time data handling.

3.Challenges:

Several challenges were encountered during development:

- Scalability: Ensuring the platform could handle a growing user base, achieved through horizontal scaling.
- Real-Time Performance: WebSocket was optimized for managing multiple concurrent connections with minimal latency.
- Security: Implemented strong authentication (JWT), encryption for data transmission, and measures against vulnerabilities like WebSocket hijacking.
- User Experience: Balancing feature richness with an intuitive interface, ensuring non-technical users could navigate effortlessly.
- Handling concurrent users: Ensuring real-time communication for a growing number of users, especially during peak usage times.
- Scalability: Ensuring the system could scale horizontally to accommodate increasing traffic.
- Security: Implementing robust authentication and authorization to protect user data and prevent unauthorized access.

IV. EXPERIMENTAL RESULTS

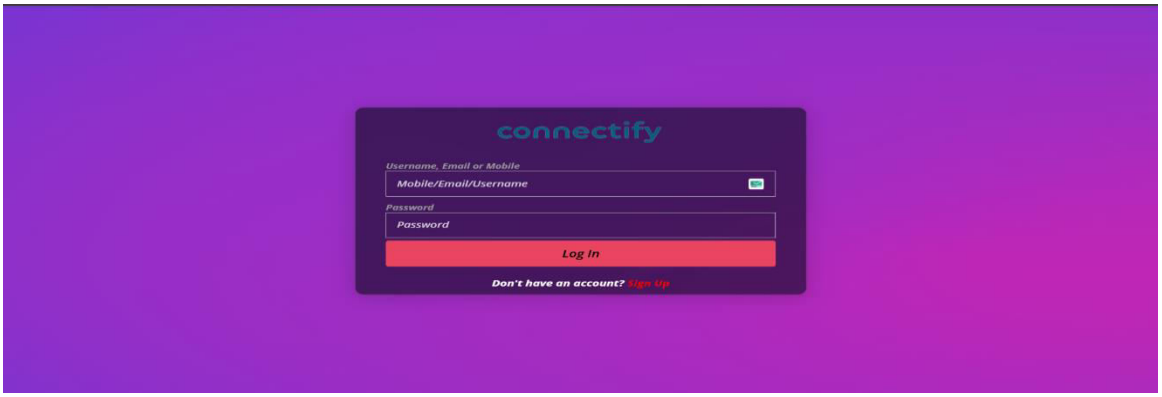

Fig1: Start page

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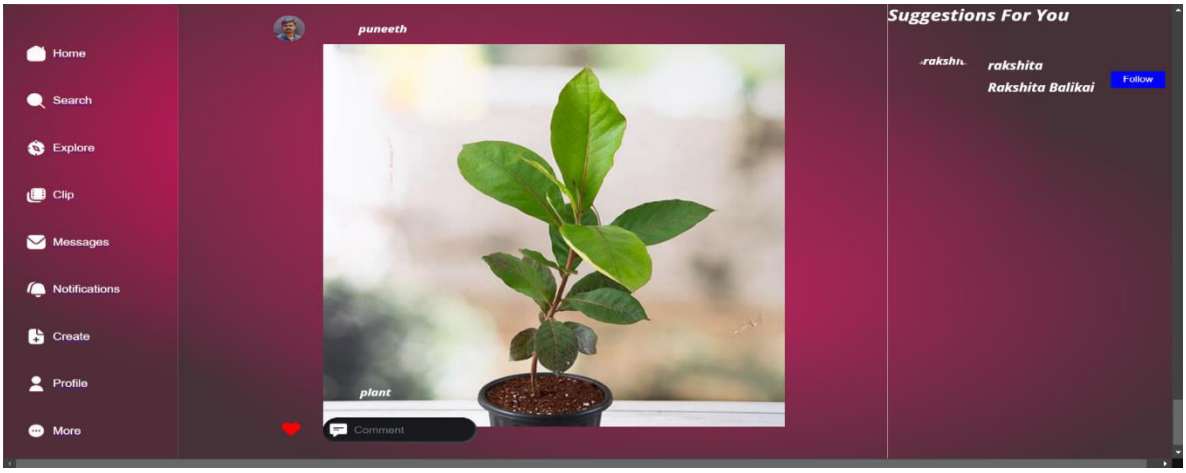

Fig2: Home page

Fig3: Message page

Fig4: admin page-manage students

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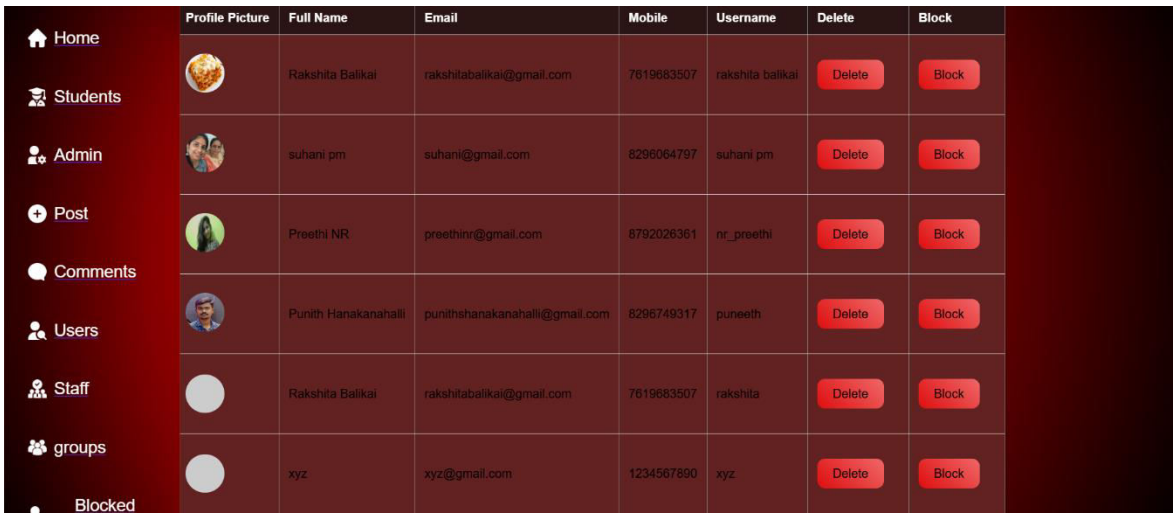

Fig5: admin page-manage users

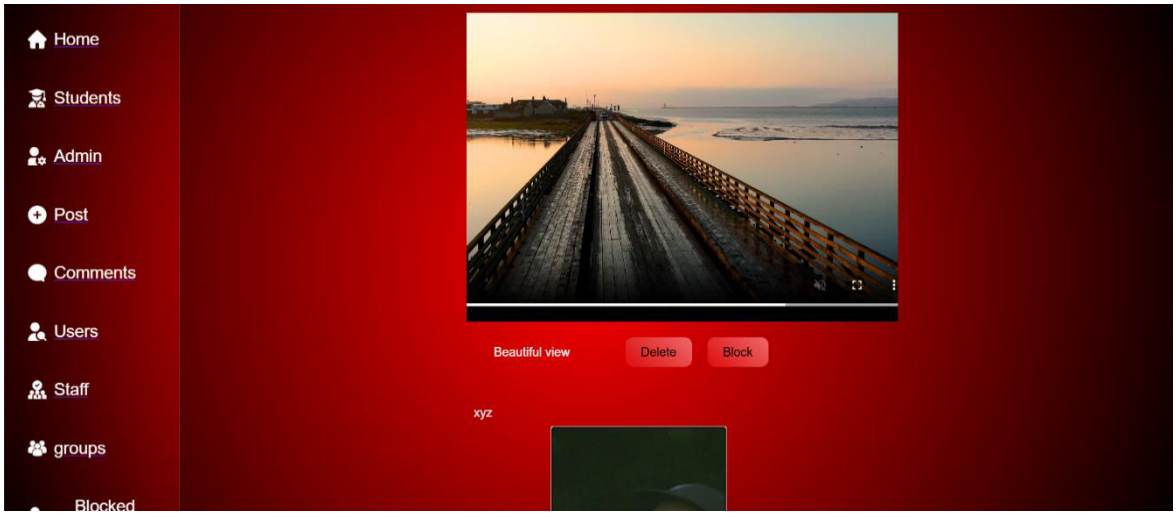

Fig6: admin page-manage posts

V. CONCLUSION

CONNECTIFY successfully addresses the limitations of traditional social media platforms by offering a scalable, secure, and exclusive communication platform for college students. Utilizing the MERN stack and WebSocket, the system demonstrates exceptional performance in terms of latency, scalability, and security. Future developments include support for multimedia sharing, group chats, and AI-based content moderation. This project highlights the potential of integrating modern web technologies to create tailored solutions for specific communities.

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