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Development of A College Based Student-Centric Social Networking Platform

Srujana Inturi, Bharath Kotipalli, Sreekar Reddy Karnati

Abstract: ***Student-centric social networking platforms are playing an essential role in engaging students with one another. These platforms are becoming increasingly popular among students worldwide for fostering cooperation, knowledge sharing, and the development of opportunities. This research paper aims to discuss a new student-centric social networking platform designed exclusively for colleges, where students can learn more about the college, explore available clubs, seek help from peers or faculty, share common interests, and stay up-to-date with campus happenings. A college-based social networking website was developed, where the front end was built with ReactJS, and the Chatbot API was built with Python and Flask. The Chatbot was implemented using natural language processing. The database was built using PostgreSQL and accessed via Hasura and GraphQL. The developed application/website promotes teaching and learning in a more dynamic manner, while also ensuring that user privacy is not compromised. Admins can use this platform to specify which semesters, classes, or teachers should receive notices. The faculty are accessible directly through this platform without sharing their personal contact information. It features a section for events and clubs, where all clubs can showcase their accomplishments and more. This allows students to meet other students with similar interests in the college (or alumni). This website also functions as a digital identification card. Furthermore, this platform is designed to connect users with the right people and enhance the college experience, both academically and socially.***

Keywords: ***Student-Centric Social Networking Platform, PostgreSQL, Hasura and Graph QL.***

I. INTRODUCTION

Millions of people worldwide use social networking platforms like Facebook, Twitter, and Instagram to interact with friends and family, share information and opinions, and consume news and entertainment. These platforms have become an omnipresent component of modern life. Although these platforms were primarily intended for use by the general public, students have been increasingly turning to them as a means of communication and collaboration in recent years.

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On the other hand, the vast majority of currently available social networking platforms are not adapted to the unique needs and preferences of students, resulting in inadequate support for their learning and educational objectives. Approximately 7 out of 10 students confirm using social media to discuss academic topics when they have access to the Internet. Half of the students reported using these platforms to complete their school assignments with friends. The purpose of this research paper is to create a social networking platform keeping the student population as its primary focus. This platform would be tailored to meet the needs of students during their studies in educational institutions. With the provision of a wide variety of features and functions tailored to the requirements and preferences of students, the developed platform aims to enhance student interaction, engagement, and learning outcomes.

II. LITERATURE REVIEW

Based on a survey of research literature, numerous institutions have examined the impact of social media on student participation and teamwork. Students' participation and communication can benefit from social networking, as discovered by Kirschner and Karpinski [1]. Rui and Wang [2], reached a comparable result, that students' ability to work together could be improved by using social networking sites like Facebook. Another study [3] in which the employment of social networking platforms have been investigated in educational institutions of higher learning. According to this study, social networking platforms can function as a complement to more conventional forms of education by providing an environment conducive to knowledge acquisition. Furthermore, student engagement and connection can be increased through the use of social networking platforms, which also help foster a sense of community among learners.

Existing social networking sites, however, lack the functionality required to support academic collaboration effectively. For this reason, numerous developments have been happening in recent years for student-focused social networking platforms. Educators and students can collaborate on assignments and other school-related tasks by joining Edmodo, a social networking site designed with their needs in mind. Just like Facebook and Google Classroom, Schoology gives a common online space for students and teachers. Based on the demand for college-specific social networking systems, a few research studies have developed different modes of college-specific communication systems, like incorporating a chatbot for college websites [4,5,6].

These Chatbot systems act as a human at an enquiry office. Still, they can only share information and do not fulfil all the requirements, such as improving student interaction, engagement, and learning outcomes.

III. PROBLEM STATEMENT

In the present world, where technology reigns, we still rely on traditional systems, such as passing around notices on paper in college, which is an inefficient and environmentally unfriendly method. There is no platform exclusively used by colleges where every student can connect with their seniors, faculty, and even alumni to resolve their queries, discuss ideas, or share their experiences. There is no system in place to notify students about unexpected events and emergencies (such as bandhs) immediately. There is no online system in college that shows the available clubs, their achievements, and allows one to join the clubs. When students want to contact a specific faculty member, they must search for their contact information online or through personal contacts, and then use their contact number to interact with them. The process is not precisely straightforward and exposes the faculty's contact number to everyone. There is no platform in the college where students, staff, etc. can share their experiences.

IV. PROPOSED SYSTEM

The proposed system is a student-centric social networking platform that contains a website and a chatbot API. Students can learn more about their college, discover available clubs, and connect with fellow students who share common interests, while staying informed about campus events and activities. The core function of campus social networks is to facilitate and encourage knowledge sharing and knowledge creation on campus. On this platform, admins can select to which semester, class, or teacher the notices should be sent. All students can contact faculty directly through this platform, which provides a certain level of privacy for teachers, as they do not need to share their contact details. It has a section for clubs, where all the clubs can showcase their activities, achievements, and more. It also has a section for events, where all the events and their details are listed. Students or staff can even buy passes directly from the website, if needed. It has a blog/articles section, where members can post articles or blogs after approval from the admin. Students can share their experiences in the activities they have participated in, and Staff can write articles about the research they have conducted and share their experiences. A section for activities, where authorized faculty can post projects that the college needs or even random open-source projects where students can apply and work on them. This helps students gain real-world skills. Students who complete their activity can receive rewards, such as vouchers. It has a resources section, where teachers can share notes, tutorials, links to resources, etc. Students or staff can create tutorials on YouTube and view them on the platform. It features a chatbot within the chat application, which is used for general enquiries related to the college or classwork, etc.

V. METHODOLOGY

A. Software requirements:

Any browser, HTML/CSS, JavaScript, ReactJS, Python, Flask, Material-UI, PostgreSQL, Hasura, GraphQL, GetStream and Netlify.

B. Hardware Requirements:

A 64-bit processor (i3 or above) with a minimum of 2 GB of RAM and a minimum of 1 GB of hard disk space.

C. Algorithms:

The ReactJS website is structured into different containers and components. The containers include the Middle Section and the Right Section. One of the main advantages of ReactJS is the ability to reuse components that have been created. On this website, each section is designed as a component. Each component contains all the necessary files (JavaScript, CSS, etc.) required for the proper functioning of the specific element. These components are sometimes reused in other components, which reduces code redundancy. The codes do not need to be rewritten and can be reused to implement the same functionality in any element where it is required.
On this website, the components include activities, clubs, events, resources, MyAccount, Help, Utils, Messenger, Chatbox, Feed, Header, and SideBar. The website uses serverless functions to implement the backend code. (To retrieve data, to use APIs, including our chatbot API). These serverless functions are implemented using Netlify, where the ReactJS website is also hosted. The database used is a PostgreSQL database hosted on Heroku, connected to the website through Hasura GraphQL. Hasura GraphQL has been used to query (or subscribe) and modify (or mutate) the data. A chatbot API is also created using Python and Flask. The chatbot is implemented using the NLTK library, as well as Spacy, among others.

D. Use case Diagram:

There are mainly three actors in this project. They are: students, staff, and administrators. The student is primarily able to chat, view content, apply, and so on. The staff has the additional capability of adding new events, activities and resources, etc. The admin is capable of registering users and can perform all the actions that a staff actor can (Fig. 1).

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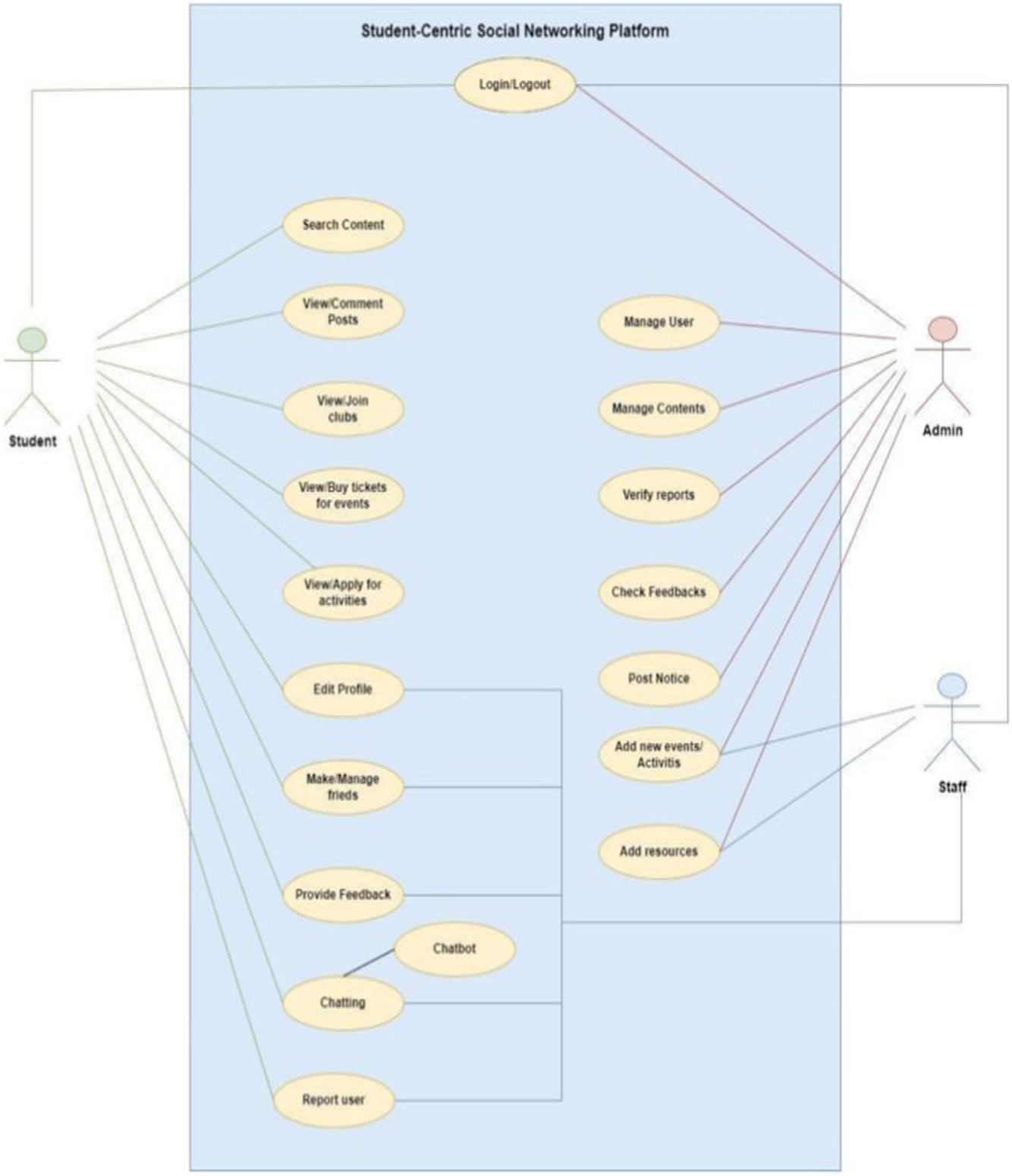

Fig. 1. Use case diagram

E. Design Flow Diagram for the Application: After logging in, users will be able to perform different tasks based on their role. Students can view and interact with the content, but are not capable of editing or adding resources, activities, or other content. Staff can add things, but can't register new users. Administrators can register new users and read feedback, among other tasks (Fig. 2).

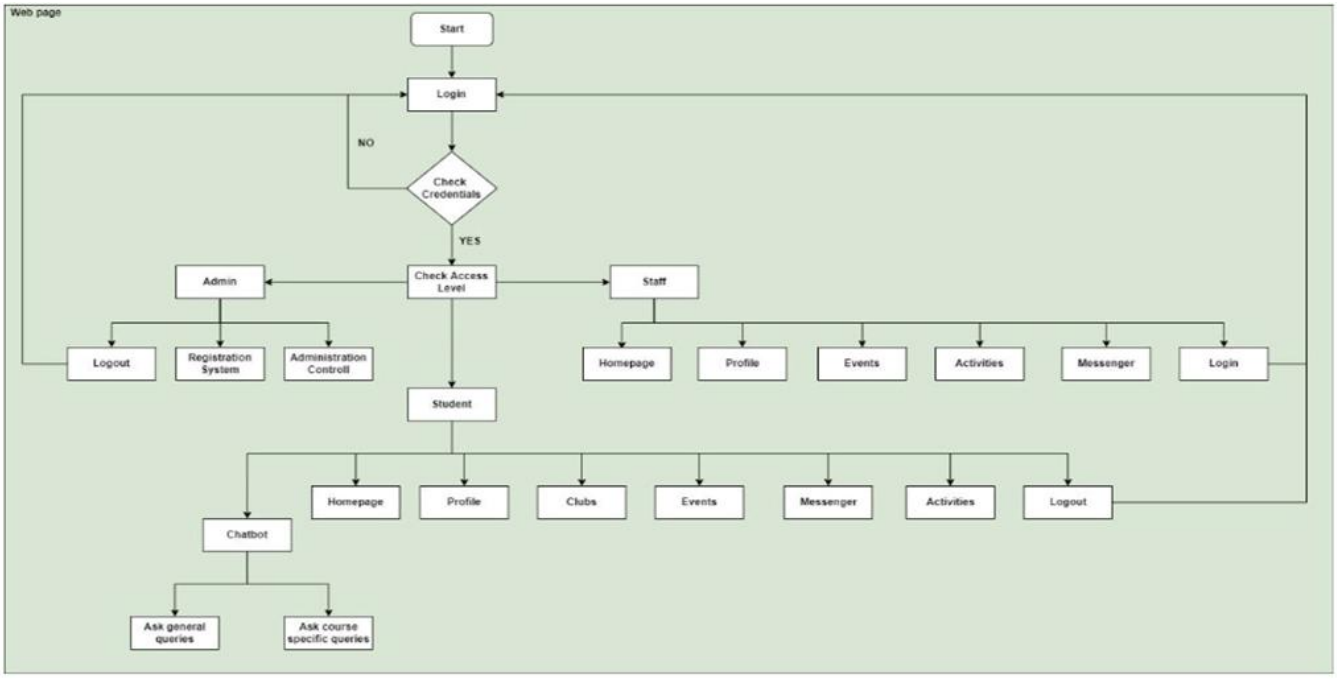

Fig. 2. Flow diagram

Design Flow Diagram for the Chatbot:

There are two levels in the DFD of the Chatbot, where level 0 allows the user to ask a query and receive a response in return. The admin can add new responses to enhance the chatbot's functionality. In Level 1 DFD, the user asks a query of the chatbot. The query is processed for intents and entities. Responses are recorded and updated by the admin. The intents and responses are checked for similarity, and matching answers are retrieved (Fig. 3).

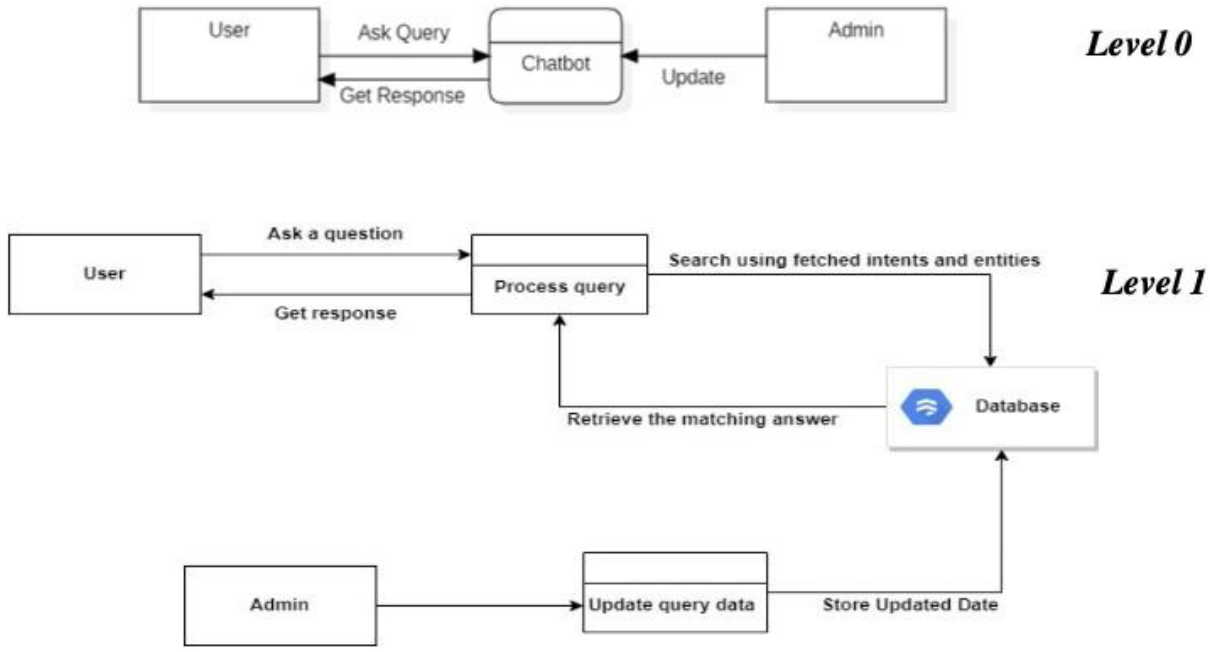

Fig. 3. Flow Diagram for Chatbot

VI. RESULTS AND DISCUSSION

A student-specific social networking website for the college, featuring a chatbot, had been successfully developed with different pages for specific actions. The website features a sign-in, home, clubs, activities, resources, my account, help, and a Chatbot. It also features a separate messenger page where information is exchanged between individual students or faculty. The sign-in page features an animated background where all the links, as shown, move around and interconnect or disconnect from each other.

Fig. 4. Sign-in page

Users can post different posts on the homepage and also vote or downvote each post. It uses Cloudinary to store the images and its upload widget to upload them to Cloudinary.

A. Quality Check

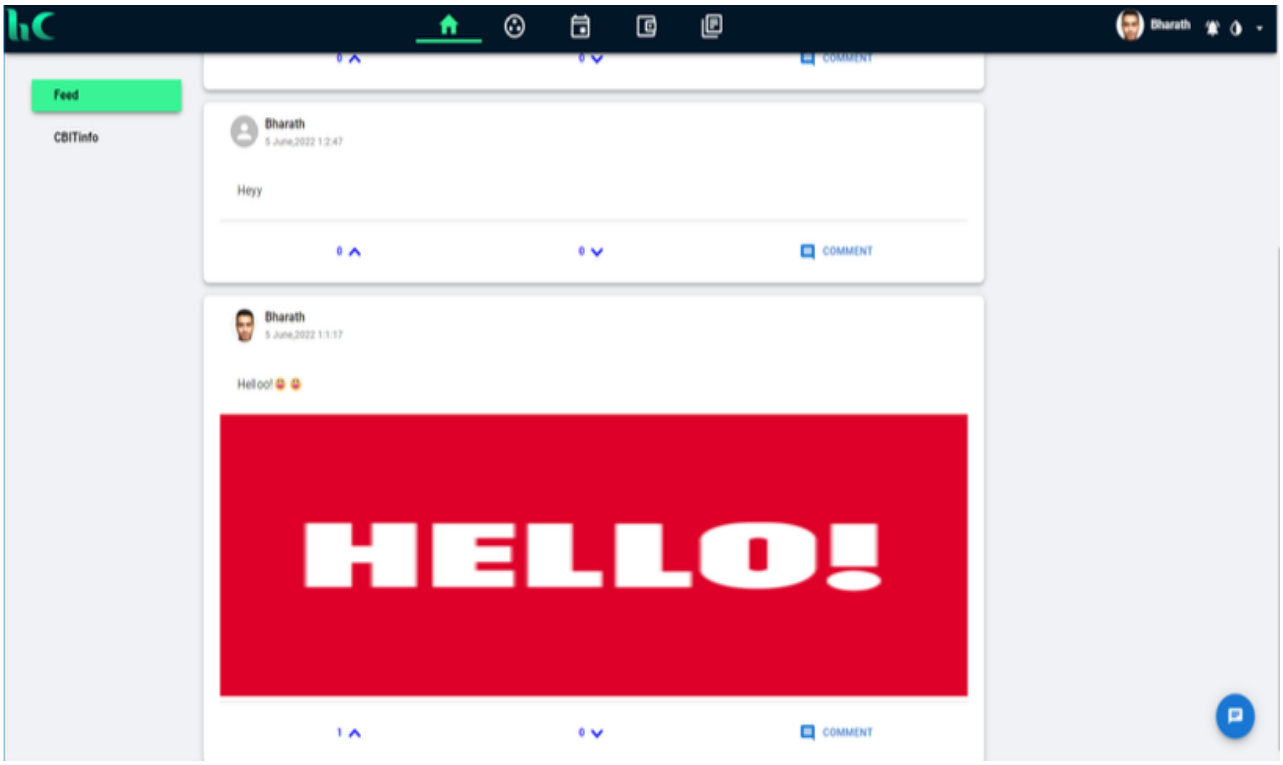

Fig. 5. Dashboard

The Club page serves as the landing page for the club section, showcasing all available clubs. Each club will have its own page, where the club's introduction, achievements, hall of fame, and club-related meetings, among other items, will be posted.

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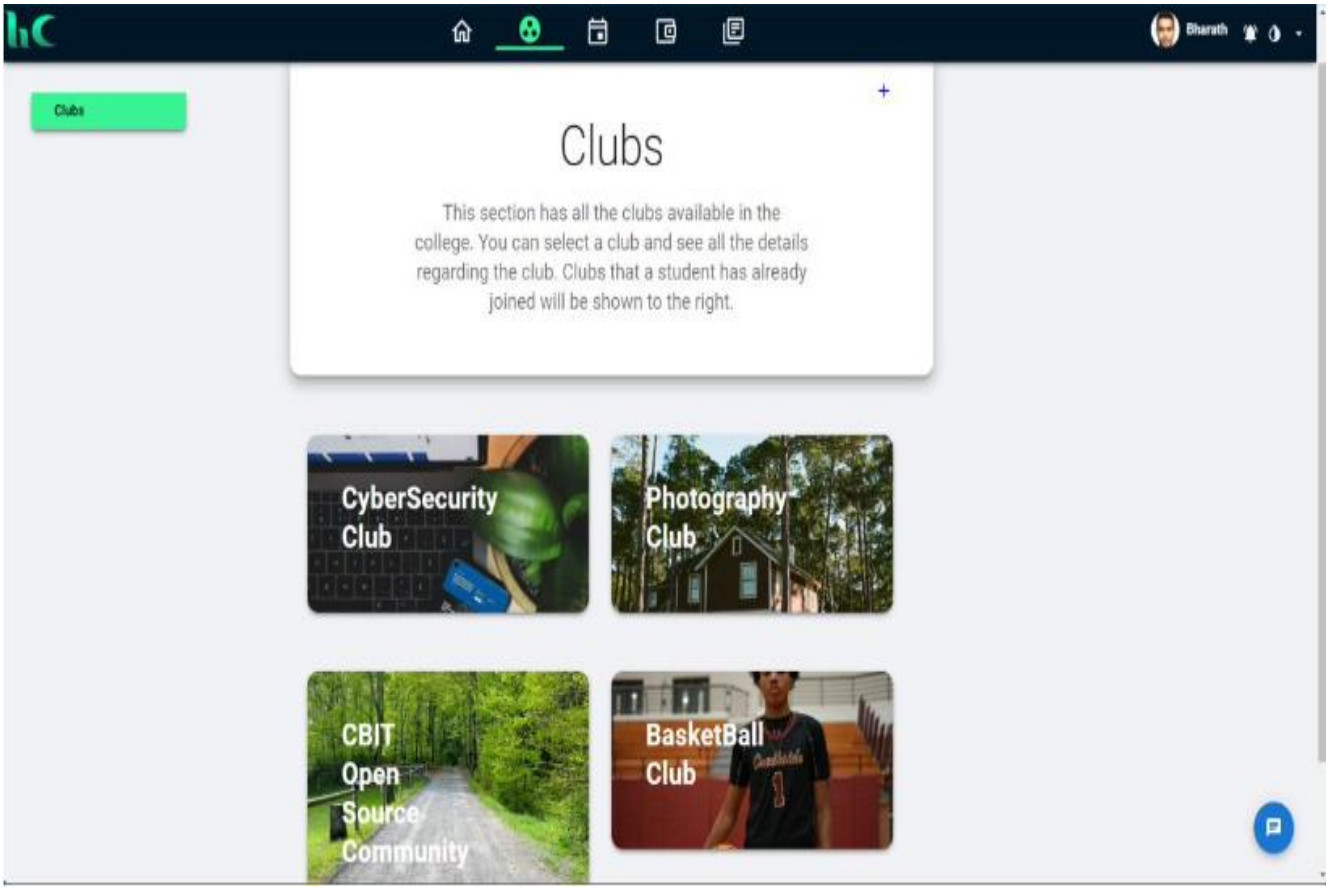

Fig. 6. Clubs page

The Events section provides details of all upcoming events at the college. The following image showcases the calendar part of the events section.

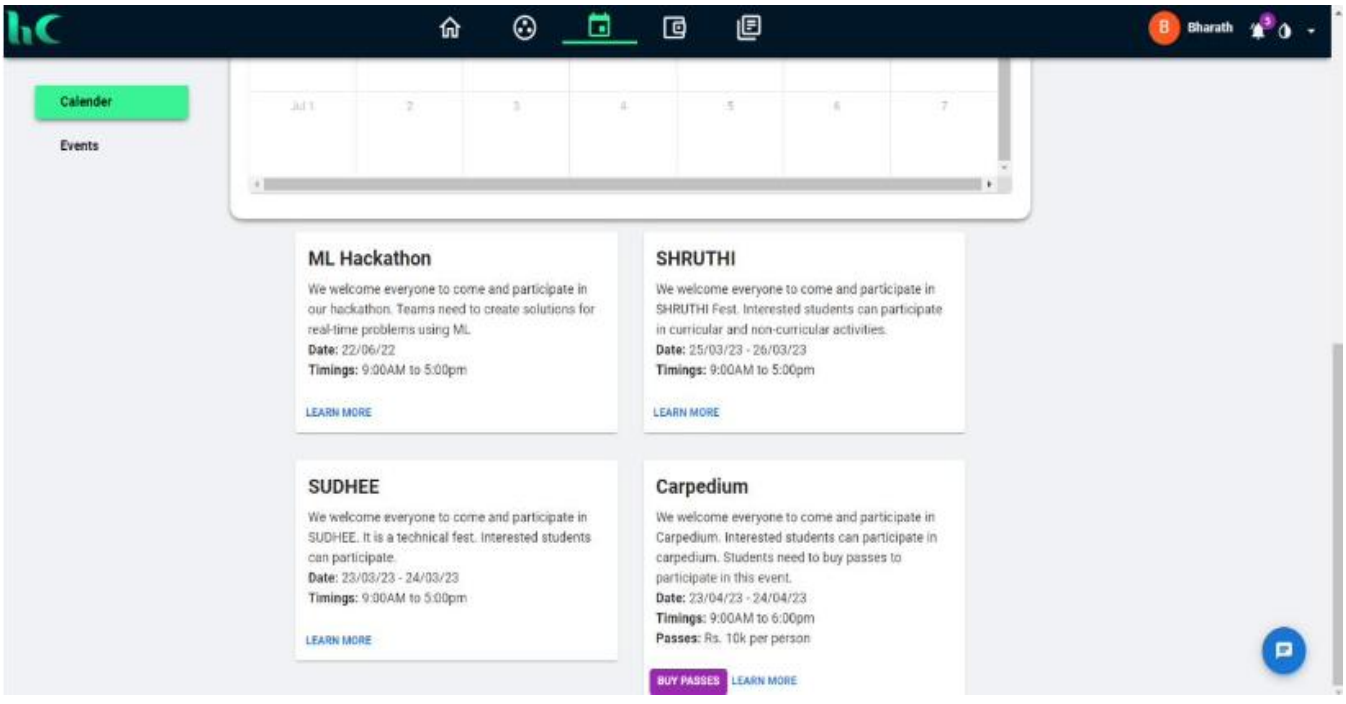

Fig. 7. Events page

The Activities page showcases all available activities on campus, and the Resources page displays different resource categories. New resource categories and their description can be added. The lectures can add lectures and related materials to the resource section. New videos can be added to this section using a YouTube URL. New references can also be added in the references section.

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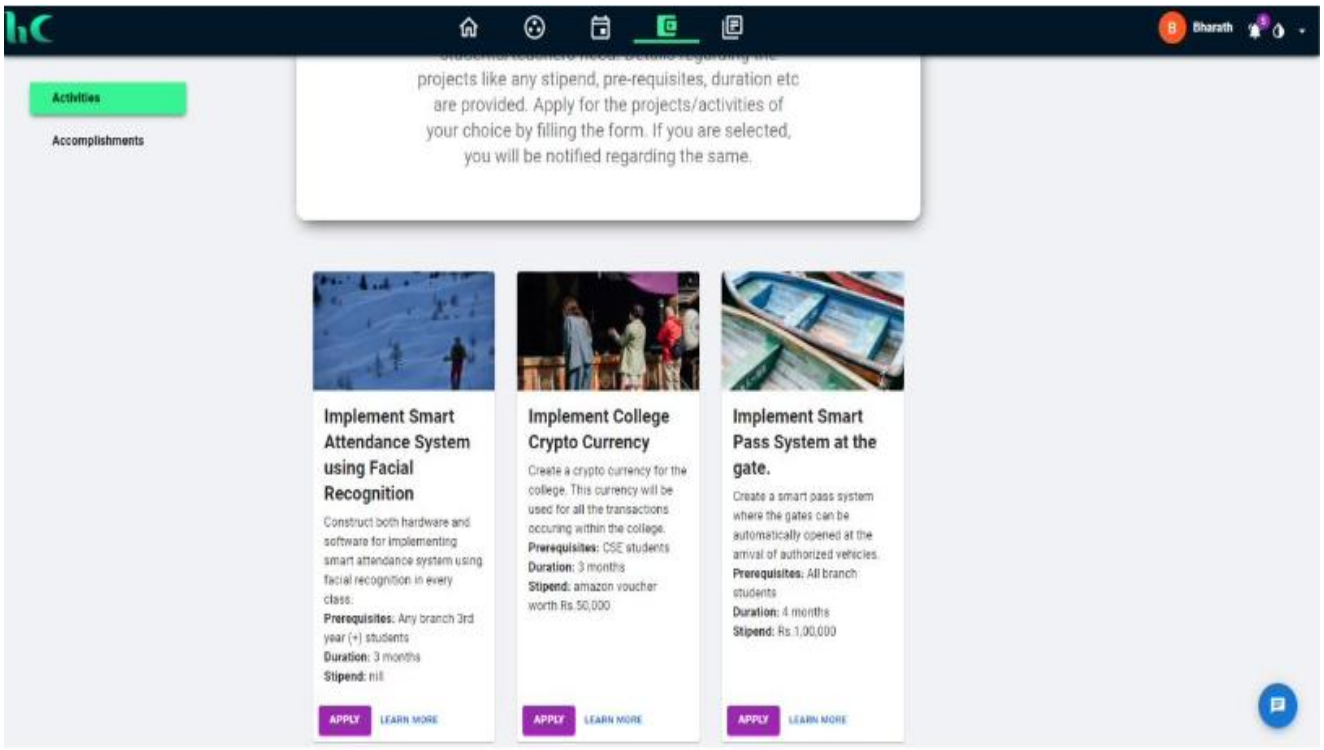

Fig. 8. Activities page

Furthermore, my account page contains a digital ID card and complete information about the user.

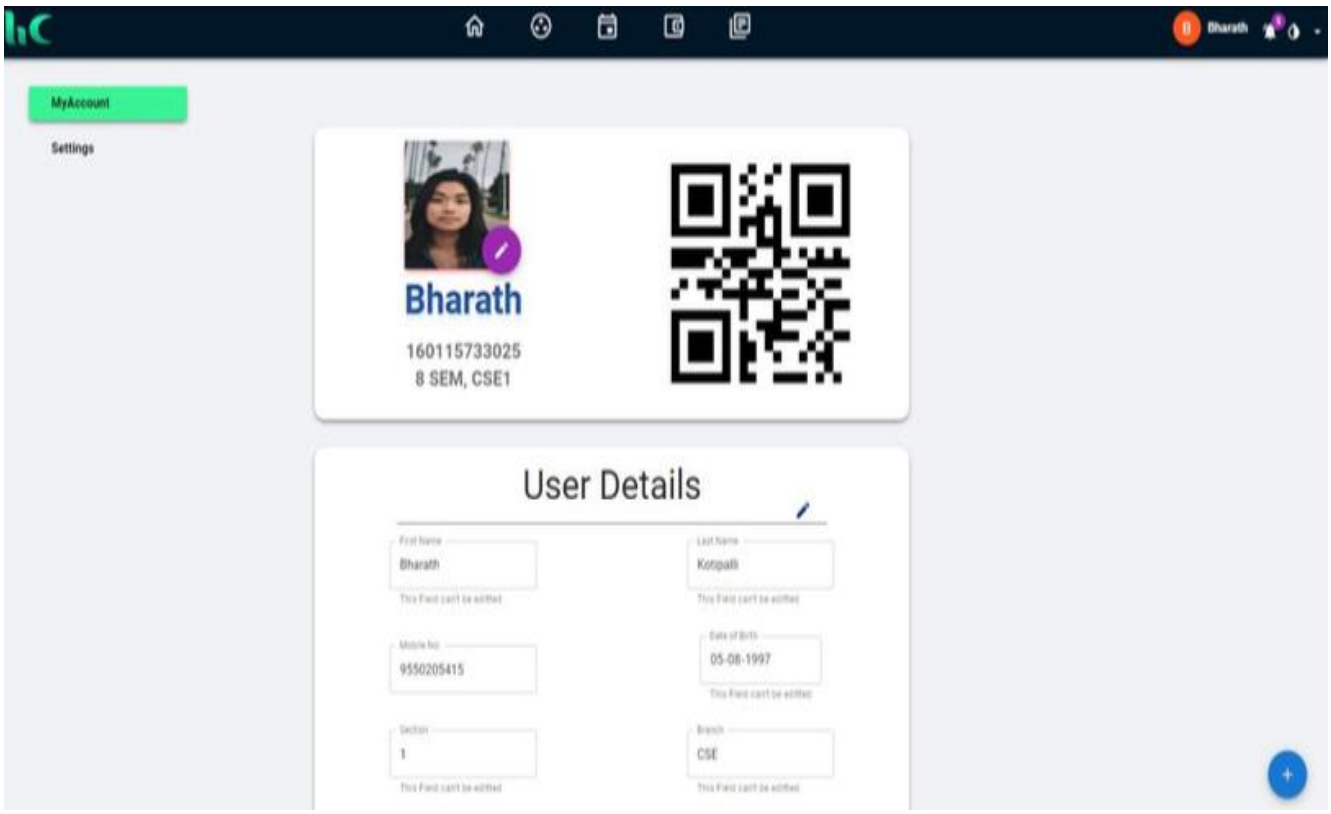

Fig. 9. Account page

The help page provides all the necessary information in the form of frequently asked questions, along with a feedback option.

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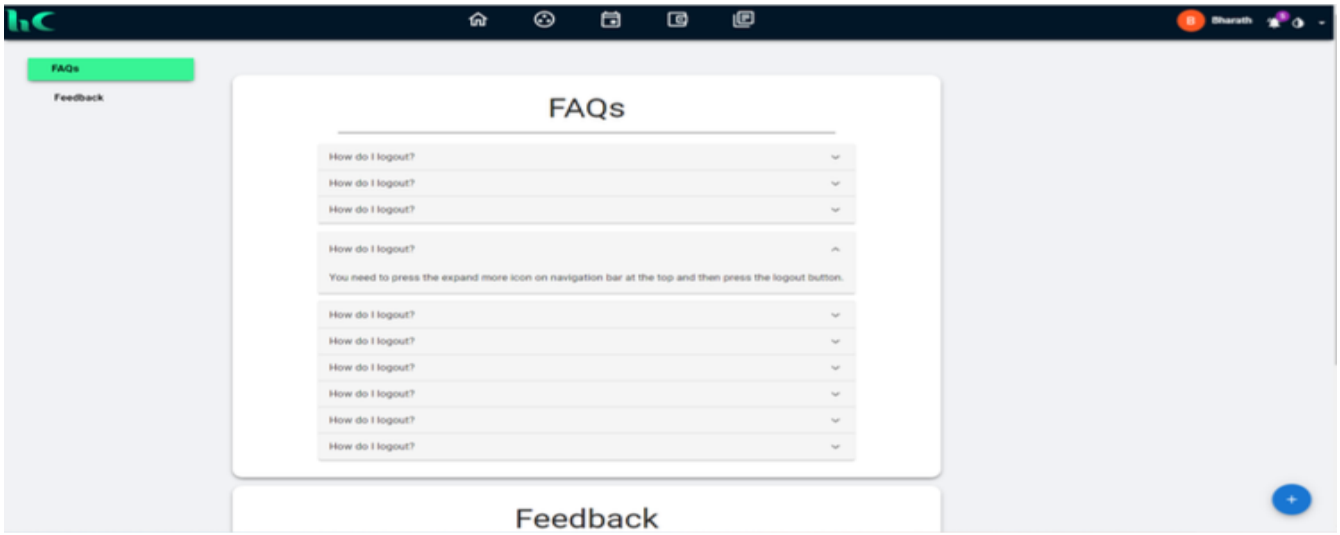

Fig. 10. Feedback page

Additionally, an AI-powered chatbot system is available for information transfer, as well as a messenger page for one-to-one communication.

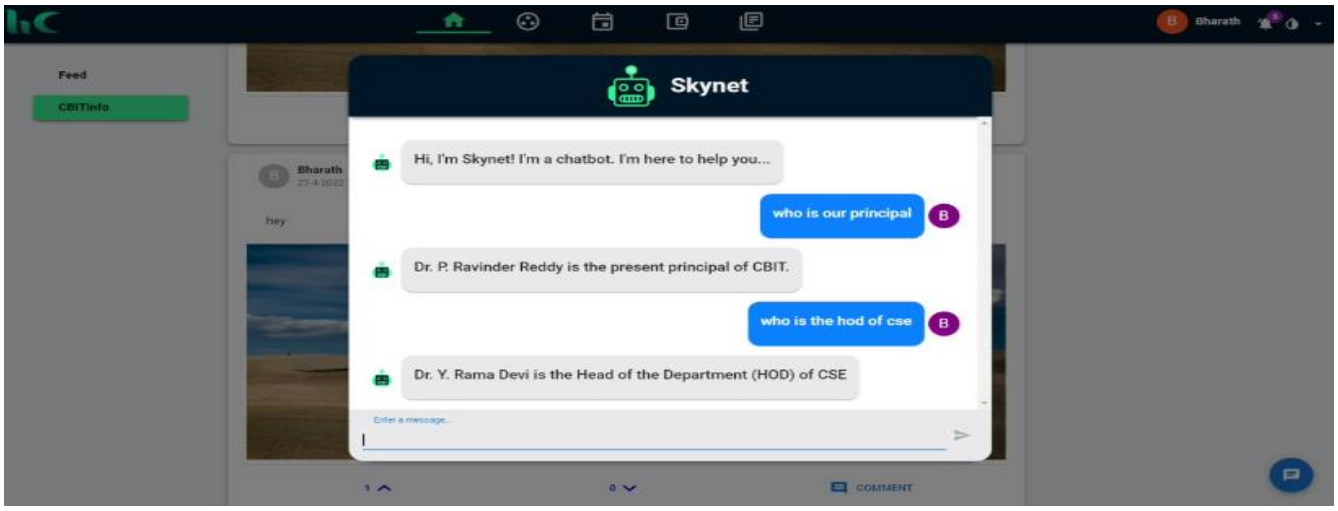

Fig. 11. Chatbot

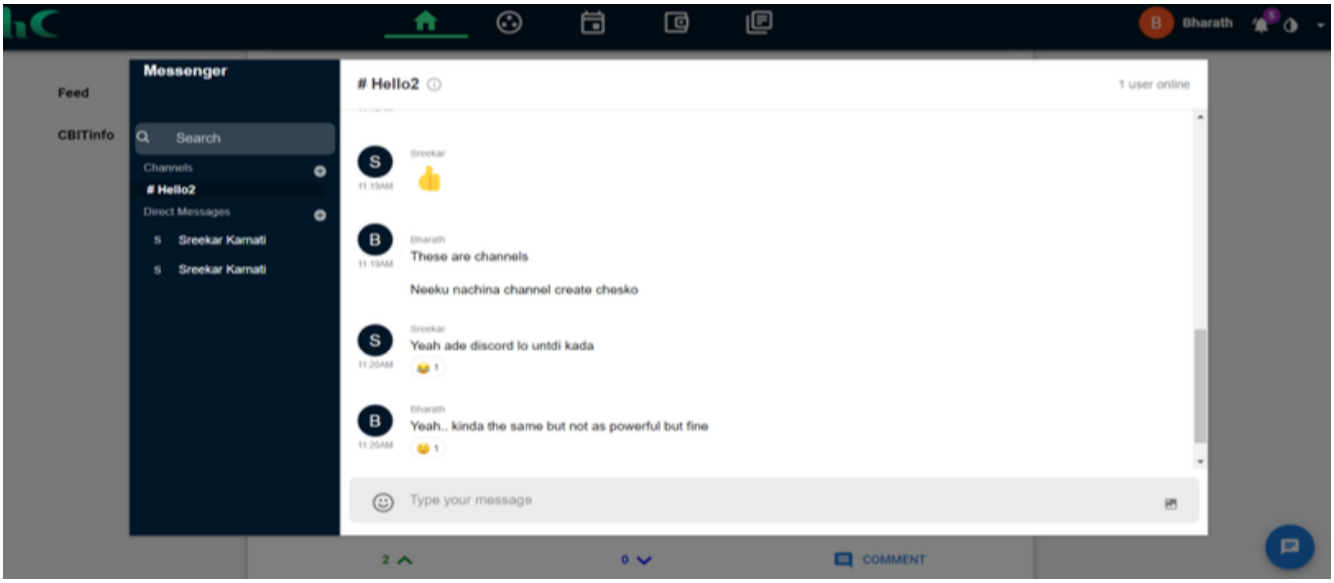

Fig. 12. Messenger Page

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VII. CONCLUSIONS

The proposed system addresses the problems arising from a lack of communication between students and the college administration. The system not only provides a forum for students but also offers a platform for them to connect with alumni and learn about their current whereabouts. It helps students explore their college, discover available clubs, connect with students who share common interests, share notes, and stay up-to-date with campus happenings. Time constraints and issues during the website creation process prevented some project functionalities from being implemented. There is no mobile application for the website. A blog section can be added to the website, and its responsiveness can be improved. The website can be made ready for actual deployment in the real world. Corresponding mobile apps can also be designed and developed.

DECLARATION

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Conflicts of Interest/ Competing Interests	No conflicts of interest to the best of our knowledge.
Ethical Approval and Consent to Participate	No, the article does not require ethical approval or consent to participate, as it presents evidence that is not subject to interpretation.
Availability of Data and Material/ Data Access Statement	Not relevant.
Authors Contributions	All authors have equal participation in this article.

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AUTHORS PROFILE

Ms. I. Srujana, working as an Assistant Professor in the Department of CSE since 7th October 2004, with an overall 15 years of experience. She is pursuing a Ph.D. at Osmania University, with a focus on Natural Language Processing and Machine Learning. As part of industry-institution interaction, she underwent 8 weeks of training at Pegasystems World Wide India Pvt. Ltd., Hyderabad, and played the SPOC role to train final-year students. She became certified as a PEGA Certified System Architect 7.1 and is also an Oracle Certified Professional and a Microsoft Technology Associate in Network Fundamentals. As part of improving the teaching-learning process, she had attended 21 workshops, FDPs, pre-conference talks, and lectures by industry experts. She organised two international workshops, FDPs, and coordinated a two-week Infosys Campus Connect Programme at CBIT. In her Credit, she has two papers in international conferences and five papers in international journals. She guided a student project to develop an automated grading system for computer programs, which is now actively used by first-year faculty to evaluate lab internal exams. She has been invited to deliver guest lectures as part of the Infosys Campus Connect Program on campus. She is also a life member of professional bodies, including ISTE and CSI.

Mr. Bharath Kotipalli completed his B.Tech from Chaitanya Bharathi Institute of Technology in 2022. He was involved in various projects like " Wallet Application Development", "College enquiry Chatbot web application", including the present study. He is well versed in using NLP, REACT JS, NODE JS, PYTHON, FLASK, PostgreSQL,

Mr. Sreekar Reddy Karnati completed his B.Tech from Chaitanya Bharathi Institute of Technology in 2022. He was involved in various projects like "College enquiry Chatbot web application", including the present study, and a technical seminar on "IoT-Based Devices and Machine Learning Algorithms for Fall Detection in Elderly People". Furthermore, he has expertise in Database Management Systems, Object-Oriented Programming with Java, DevOps, Data Science and Big Data Analytics, Cloud Computing, Computer Networks, etc.