Social Media Web App for Collaboration and Interaction among College Students

A PROJECT REPORT

Submitted by

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TABLE OF CONTENTS

List of Figures

List of Tables

List of Abbreviations

- UI – User Interface
- UX – User Experience
- HTML – Hyper Text Markup Lang
- CSS – Cascading Style Sheet
- SCSS – Sassy Cascading Style Sheet
- JS – Java Script
- JSX – Java Script XMZ
- HTTP – Hyper Text Transfer Protocol
- API – Application Programming Interface
- CI – Continuous Integration
- CD – Continuous Delivery
- VPS – Virtual Private Server
- SSL – Server Sockets Layers
- TLS – Transport Layer Security
- MVC – Model View & Controller
- MVP – Minimum Viable Product
- NPM – Node Package Manager

ABSTRACT

The purpose of this project is to create a web application explicitly for college students, across the country to interact with each other.
They can discuss their academic and extracurricular accomplishments on the site without being diverted by unrelated material. Also, it will allow students to enquire their seniors about the issues being faced by them and their potential solutions. The website will now act as a thriving community of learners from various fields, providing access to insightful knowledge.

INTRODUCTION

1.1. Identification of Client /Need / Relevant Contemporary issue/Project Scope

Networking is a crucial aspect of college life that can have significant benefits for students both during their studies and after graduation. Building a network of professional contacts and personal relationships can help students to expand their career opportunities, gain access to valuable resources, and develop their interpersonal skills. By connecting with professors, classmates, alumni, and professionals in their field of interest, students can learn about new job opportunities, industry trends, and potential mentors. Furthermore, networking can help students to build their confidence, improve their communication skills, and develop a strong personal brand that can help them to stand out in a competitive job market. Overall, networking is an essential part of the college experience that can provide students with a wide range of benefits and opportunities that can help them to achieve their goals and aspirations.

According to this infographic on the use of social media in the colleges, activity of students over social media has been reflected in the following figures.

— 96% of students with internet access report using social networking technologies.
— 75% of 7th through 12th graders have at least one social media profile.
— 59% of students who use social networking talk about education topics online.
— 50% of those who talk about education topics online talk specifically about college work.
This depiction of social media use in the lives of teens states some amazing facts about the use of social media by the teenagers.

Time spent on social networking sites-
Almost every first-year student, 94 percent, spent at least some time on social networking websites in a typical week.
As Figure 1 shows, the majority of students (almost 60 percent) spent between one and five hours on online social network websites in a typical week during their first college year. Nine percent reported that they spent more than ten hours a week on them.

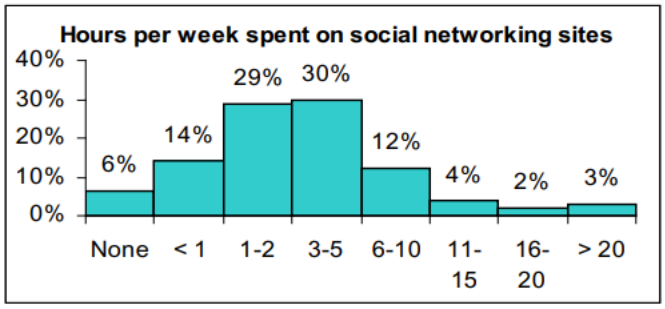


Figure 1.1

First-year students who reported that they spent a lot of time on social networking sites were more likely than those who didn't to also report that they frequently used the internet to read blogs as illustrated in Figure 1.2

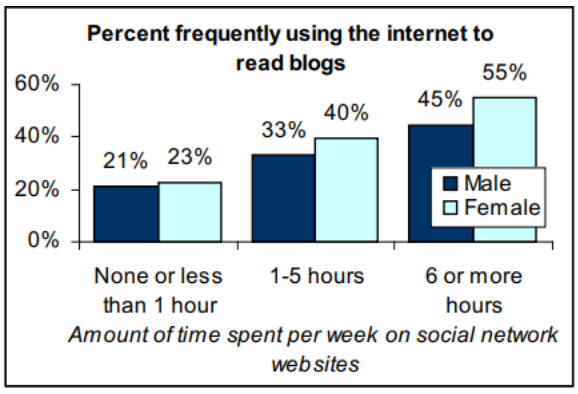


Figure1.2

If you think college is about meeting new friends, going to classes, studying for exams and finding time to play, well, you are right. Those are important aspects of college life. They are not the only aspects, however, one of the most important actions you can take in college is called networking. You have likely heard of networking by now and know that it involves meeting the right people who can help you currently or in the future with your career goals.
In fact, a recent report claims 85% of all jobs are found through networking.
Here are a few reasons why networking in college is so important.
Networking is a crucial aspect of college life that can have significant benefits for students both during their studies and after graduation. Building a network of

professional contacts and personal relationships can help students to expand their career opportunities, gain access to valuable resources, and develop their interpersonal skills. By connecting with professors, classmates, alumni, and professionals in their field of interest, students can learn about new job opportunities, industry trends, and potential mentors. Furthermore, networking can help students to build their confidence, improve their communication skills, and develop a strong personal brand that can help them to stand out in a competitive job market. Overall, networking is an essential part of the college experience that can provide students with a wide range of benefits and opportunities that can help them to achieve their goals and aspirations.

ALLOWS YOU TO KEEP LEARNING:

Graduating from college and getting your diploma does not mean you should quit learning. Employers expect you to keep up with trends in your industry, maintain certifications and licenses, and even spend time researching on your own through books or online resources.

Networking is a great way to gain information about your industry. Networking with leaders and peers in your field helps you hear tips and gain advice from others who are successful. You can even learn important news and upcoming changes that may be happening within your field.

Networking also teaches you how to properly interact with others.

GIVES YOU PRACTICE FOR YOUR SOCIAL GAME

Your social game while in college may be awesome. It just may not be appropriate for the workplace. Learning to improve your career social game while still in college can prepare you for interviewing and communicating with co-workers and leaders of a company.

Once you begin your career, you will be expected to communicate well with everyone, from customers to leaders. Having great social skills and knowing how to use them to benefit the company will prove you are an asset to the organization.

Networking is a great way to practice your social skills, make changes as needed, and practice more. You can also observe how others interact, taking note of what works and does not. The more you can adapt socially, the better relationships you can build throughout your career.

Good relationships are built on trust, which can lead to you getting insight into opportunities to better your career.

CONNECTS YOU WITH BETTER OPPORTUNITIES

You have likely been imagining what your life will be like once you graduate and start a career. Unfortunately, what you think will happen and what happens can differ. You may see yourself working as a manager as soon as you complete college.

Employers may want you to start at a more entry-level position. You will not want to stay at this level. It is usually the goal to move up through the company, matching your skills and talents with a higher paying job.

Networking can get you in front of the people who know when jobs are being created or becoming available. Build a good relationship with the right people, and they may give you tips on future employment opportunities before they are announced to the public.

You may not even need to seek out opportunities. The more you network, the more hiring staff get to know you. They may choose to reach out directly to recruit you for a position you didn't even know existed.

And if you need help in making decisions like this, you can reach out to those you met networking who can offer guidance.

MULTIPLE MENTORS

Having a mentor in your career is a great idea. But don't wait to start finding mentors until after graduation. You can start connecting with others in college who can help you through college life and beyond.

It can be hard to find one mentor that meets all your career needs. It's also hard to find a mentor that is accessible each time you need advice.

Networking can help you build a support system of mentors that are available on a very part-time basis. It allows you to match your need with the mentor you feel can help you the most. If you have a question regarding furthering your education, you can contact an academic advisor.

If you have a question regarding finances, you can contact the bank representative mentor. Networking helps you build relationships with multiple resources.

HELPS YOU STANDOUT IN A GOOD WAY

Many college graduates have big plans in their career to advance to the top, to become a leader in their field one day. To do so, it will take more than just showing up and working hard. While those traits are also necessary, you will need to get noticed.

Networking helps you get noticed. Attending social events, community functions, meetings, and other networking events will help you meet more of the right people.

Standing out in a good way means you are doing positive things that help others remember you. Offer insights and ideas that can help someone else be successful on a project. But don't be a know-it-all. Pass along valuable information that can benefit colleagues.

1.2. Identification of Problem

As we look around today, we see a plethora of social media apps that allow people to engage with one another. However, these platforms are not specifically designed for college students. The giants of the social media industry, such as Instagram, Facebook, and Twitter, are accessible to everyone, and they primarily serve as a source of entertainment. As a college student, using these platforms can be distracting, and they do not provide a conducive environment for academic pursuits such as asking questions about academic studies, semester examinations, and other college-related matters.

Therefore, there is a pressing need for a web application solely dedicated to college students. This platform would exclude non-college students and allow us to create an impeccable system for the college community. It will provide an ideal environment for college students to interact with one another and grow both personally and academically.

The college's social networking project is intended only for college students, and it is similar to many popular social networking sites where students can exchange information. By bringing college-related issues to light on this platform, it can assist students in resolving problems they may encounter. To access all the features of this platform, one must create an account.

The objective of the college social networking site is to give students a central location where they can communicate with one another about anything from their academic queries to sharing their achievements and chatting. It also enables students to seek advice from their seniors and learn from their experiences.

1.3. Identification of Tasks

- **Building the UI of the app:** Creating the design of the sign-up page, login page, home dashboard, profile page, create post page, single post screen and more.
- **Server Setup:** Set up your server and dynamically render HTML.
- **Authentication:** Implementing the backend for registration of users and verifying their login. Using “bcrypt” for hashing and salting passwords so as to enhance security.
- **Routing:** Implementing MVC patterns and using Express.js to respond to HTTP routes.
- **Database:** Building schemas and models for database and connecting it to the server. We will be using MySQL.
- **Deployment:** Adding validators and security features to finally deploy the web application for public use.

1.4. Timeline

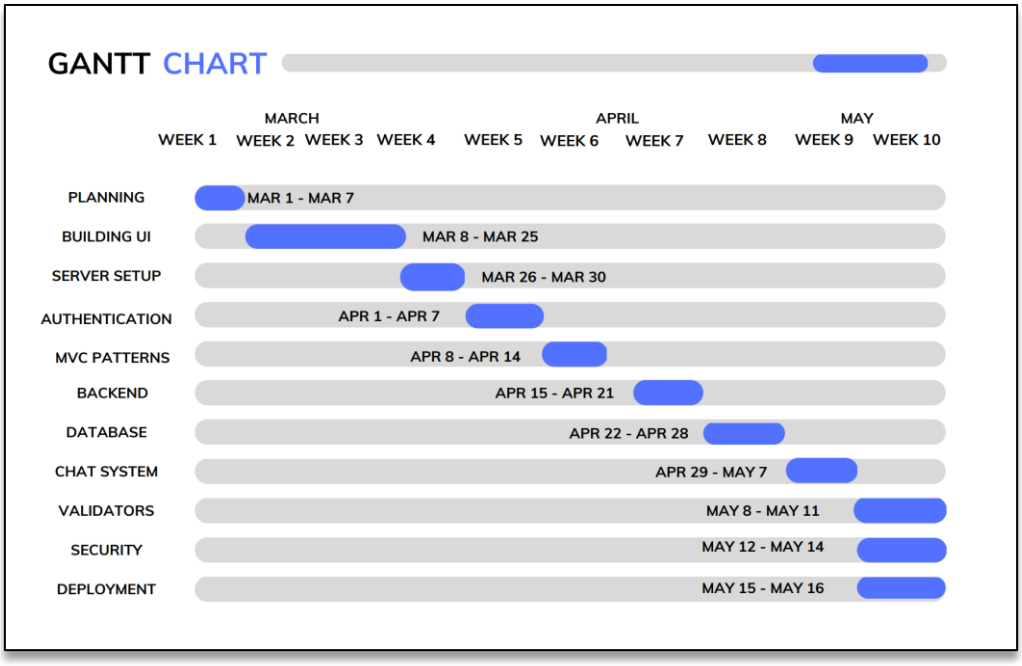


Figure 1.3

1.5. Organization of the Report

Chapter 1 Problem Identification: This chapter introduces the project and describes the problem statement discussed earlier in the report.

Chapter 2 Literature Review: This chapter prevents review for various research papers which help us to understand the problem in a better way. It also defines what has been done to already solve the problem and what can be further done.

Chapter 3 Design Flow/ Process: This chapter presents the need and significance of the proposed work based on literature review. Proposed objectives and methodology are explained. This presents the relevance of the problem. It also represents logical and schematic plan to resolve the research problem.

Chapter 4 Result Analysis and Validation: This chapter explains various performance parameters used in implementation. Experimental results are shown in this chapter. It explains the meaning of the results and why they matter.

Chapter 5 Conclusion and future scope: This chapter concludes the results and explain the best method to perform this research to get the best results and define the future scope of study that explains the extent to which the research area will be explored in the work.

CHAPTER 2
LITERATURE REVIEW/BACKGROUND STUDY

2.1. Timeline of the reported problem

The internet and social media provide students with a range of benefits and opportunities to enhance their learning process but also distractions. The main goal of this research is to examine the impact of using the social media on the academic performance. The new social networks, such as Instagram, Facebook, Twitter, etc., can affect the behavior and academic performance of the universities' students both positively and negatively. Research has been conducted on the students of Ahlia University, Applied Science University and University of Bahrain with the sample of 150 students distributed equally among the three universities. The results show that the social media has a negative impact on academic performance and 57% of students does not prefer the currently existing mobile applications as a social media for their academic purpose.[1]

The data below shows when various platforms for interaction and collaboration were created:

2003	Reddit, a social news, and discussion website, is launched. It gained a reputation for its user-driven content and community-driven moderation system.
2004	Facebook is founded by Mark Zuckerberg, initially only available to Harvard students, but it quickly expands to other colleges and eventually becomes open to the public.
2006	Twitter is launched, a micro-blogging platform that allows users to post short updates or "tweets" of up to 140 characters. Although not initially popular among college students, it later gained traction as a news source and for real-time event coverage
2006	Stack Overflow, a question-and-answer forum for programmers, is launched. It became a popular resource for developers and coders around the world.
2010	Quora, a question-and-answer forum, is launched. It gained popularity among professionals and experts who used the platform to share knowledge and insights.
2018	Discord, a chat and voice communication platform, is used for discussion and collaboration among students.

2.2. Existing solutions

Brief of the earlier proposed solutions-

1. **Edmodo** - Edmodo is an educational technology platform that was launched in 2008 by Nic Borg and Jeff O'Hara with the goal of providing teachers, students, and parents with a secure and collaborative environment for learning [2]. The platform has since grown to become one of the most widely used educational technology tools in the world, with over 100 million users across 400,000 schools [3].
   One of the key features of Edmodo is its virtual classroom functionality. Teachers can create virtual classrooms and share class materials, assignments, and announcements with their students [3]. Students can then access these materials and interact with their peers and teachers through the platform's messaging and discussion features. [4].
   In addition to its virtual classroom features, Edmodo also includes tools for grade tracking, attendance management, and analytics to help teachers and administrators monitor student performance and identify areas where additional support may be needed [2]. This data-driven approach to education has been shown to be effective in promoting student success [5].
   In conclusion, Edmodo is an educational technology platform that provides teachers, students, and parents with a secure and collaborative environment for learning. Its virtual classroom features, grade tracking tools, and analytics capabilities have been shown to be effective in promoting student engagement and academic success.

2. **LinkedIn -** LinkedIn is a social networking platform designed for professionals and businesses to connect, network, and build their careers. It was founded in 2002 by Reid Hoffman and is currently owned by Microsoft Corporation. As of 2022, LinkedIn has over 740 million registered users in more than 200 countries and territories, making it the world's largest professional network [6].
   One of the key features of LinkedIn is the ability for users to create a professional profile that showcases their skills, education, work experience, and accomplishments. This profile serves as an online resume and can be used to connect with other professionals, potential employers, and clients. Users can also join groups related to their industry or interests, participate in discussions, and share content related to their field [6].
   LinkedIn has become a vital tool for job seekers and recruiters alike. According to a survey conducted by the Society for Human Resource Management, 96% of recruiters use LinkedIn to search for potential candidates [7]. In addition, LinkedIn offers a range of job search tools and resources, such as job postings, salary data, and career advice articles.
   In conclusion, LinkedIn is a powerful social networking platform that has become a key tool for professionals and businesses to connect, network, and build their careers. Its ability to connect job seekers with potential employers and provide businesses with networking and advertising opportunities has made it an essential tool for professionals in every industry.

3. **CampusGroups -** CampusGroups is a comprehensive campus engagement platform designed for universities and colleges. It was founded in 2008 and is headquartered in New York City. The platform provides a suite of tools for student organizations, departments, and administrators to manage events, communication, and activities across campus. As of 2022, CampusGroups serves over 350 campuses in more than 20 countries [8].

   One of the key features of CampusGroups is its event management tools. Student organizations and departments can create and promote events, manage registrations, and track attendance through the platform. The system also includes tools for managing ticket sales, sending reminders, and generating reports to evaluate event success [9].

   CampusGroups also includes a range of communication and collaboration tools for student organizations and departments. Users can create discussion boards, share files, and send messages to specific groups or individuals. In addition, CampusGroups includes a mobile app that allows students to access campus information, events, and updates from their smartphones [9].

   In conclusion, CampusGroups is a comprehensive campus engagement platform that provides tools for managing events, communication, and student involvement across campus. Its event management and communication tools, along with its mobile app and data-driven approach, make it a valuable tool for universities and colleges seeking to enhance student engagement and involvement.

4. **Quora -** Quora is a question-and-answer platform founded in 2009 by Adam D'Angelo and Charlie Cheever. The platform is designed to provide a space for people to ask and answer questions on a wide range of topics. As of 2022, Quora has over 300 million monthly active users and is available in over 20 languages [10].

   One of the key features of Quora is its community-driven approach to content creation. Users can ask questions on any topic, and other users can provide answers based on their knowledge and experience. Quora's community also includes experts in various fields, who can provide detailed and insightful answers to complex questions [11].

   Quora also provides a range of tools to help users find the information they need. The platform uses algorithms to recommend questions and answers based on a user's interests and past activity. Users can also follow topics, users, and questions to receive notifications when new content is posted [11].

   In conclusion, Quora is a popular question-and-answer platform that provides a space for people to share their knowledge and expertise on a wide range of topics. Its community-driven approach, recommendation tools, and commitment to quality content have made it a valuable resource for people seeking information and insights on a variety of subjects**.**

5. **Stack Overflow -** Stack Overflow is a question-and-answer website for programmers and software developers. It was founded in 2008 by Jeff Atwood and Joel Spolsky, and has since become one of the most popular resources for developers seeking solutions to programming problems. As of 2022, Stack Overflow has over 100 million monthly active users and is available in multiple languages [12].

   One of the key features of Stack Overflow is its community-driven approach to problem-solving. Users can ask and answer questions related to programming and software development, and can vote on the quality of the questions and answers provided. This helps to ensure that the most helpful and informative content rises to the top of the site

[13].

Stack Overflow also includes features that allow users to track their progress and measure their expertise. Another important aspect of Stack Overflow is its commitment to open access and community participation. The site is free to use and allows users to contribute content without having to pay for access. This has helped to build a large and diverse community of users from around the world, and has made it a valuable resource for developers seeking solutions to programming problems [13].

In conclusion, Stack Overflow is a question-and-answer website for programmers and software developers that provides a community-driven approach to problem-solving. Its reputation system, commitment to open access, and range of additional resources have made it a valuable resource for developers seeking solutions to programming problems.

Apart from above discussed solutions, there are some other examples like –

- Slack which is a powerful and user-friendly team collaboration tool that has become a vital tool for businesses seeking to enhance communication and collaboration. Its instant messaging system, integrations, and security features, along with its user-friendly interface, have made it a popular choice for businesses of all sizes.
- Discord is a communication platform that has become a popular tool for communities, particularly for gamers, to communicate and collaborate with each other. Its voice chat and messaging capabilities, customization features, and focus on community building have made it a valuable resource for people seeking to connect with others and engage in collaborative activities.
- Reddit is a popular social news aggregation and discussion platform that provides a space for users to connect with others who share their interests and engage in discussions on a wide range of topics. Its system of subreddits, upvotes and downvotes, and commitment to free expression have made it a valuable resource for people seeking information and insights on a variety of subjects.
- YouTube is a video-sharing platform that allows users to upload, share, and view videos. It was created in 2005 and has since become one of the most popular websites in the world, with billions of users and videos available in a wide variety of categories, including music, entertainment, education, and more.

2.3. Bibliometric analysis

Year	Approach Used	Advantages	Drawbacks	Future Scope	Publisher
2012 [14]	1. Quantitative and qualitative assessment methods were used. 2. This paper investigates the acceptability of using social media for collaborative learning in the context of higher education.	1. Enhanced collaboration and communication. 2. Increased engagement. 3. Networking opportunities.	1. Privacy concerns. 2. Security risks. 3. Lack of adoption. 4. Maintenance and sustainability.	Expanding the platform's features to add additional tools that enable students to collaborate and communicate more effectively.	Proceedings of the 5th International Conference on Advances in Computer-Human Interactions
2015 [15]	1. Analyzed and Qualitative approach were used to investigate the impact of social media and collaboration. 2. The study employed semi-structured interviews and data was analyzed using thematic analysis to identify recurring themes and patterns in the data.	1. Increases the generalizability of the findings. 2. Deep understanding of the experiences and perspectives of the participants in the study. 3. It informs the development of effective educational practices.	1. Limited to only two universities in the United States. 2. The sample size was relatively small. 3. Study relied on self-reported data, which may be subject to bias or inaccuracies.	Exploring the ethical and privacy implications of using social media and collaboration technologies in higher education, including issues such as data security, ownership of intellectual property, and academic integrity.	Published in Journal Education for Information, vol. 31, no. 1-2, pp. 73-98, 2015
2016 [16]	1. The authors used a content analysis approach to categorize and classify social media platforms based on their features, functionality, and intended use.	1. Increased connectivity and engagement. 2. Opportunities for learning. 3. Better marketing.	1. Cyberbullying. 2. Spread of misinformation. 3. Reduced face-to-face interaction.	The survey could inspire the development of new classification systems for social media platforms, particularly as new platforms emerge and existing platforms evolve.	2016 in International Journal of Computer Applications

	2. A qualitative approach is used to gather information and insights about the different types of social media platforms and their classification.			Future studies could examine the implications of social media usage for different groups of users.	
2016 [17]	1. The authors use a literature review approach to collect and analyze data from various academic sources, including journals, articles, and books. 2. The authors also present several case studies to illustrate the impact of social media on different sectors	1. Awareness: Providing a platform for people to express their opinions and raise awareness. 2. Networking: Social Media provides a platform for people to connect with others who share similar interests.	1. A lack of face-to-face interaction. 2. False information: It can be used to spread false information, leading to misinformation and propaganda. 3. Potential privacy violations.	Further examination of the ethical and legal implications of social media use, particularly in relation to privacy, data protection, and the responsible use of technology. Development of new technologies and tools for enhancing the positive aspects of social media use.	International Journal of Computer Applications Technology and Research
2018 [18]	1. The paper uses a systematic and empirical approach to explore the impact of social media on students 2. Quasi-experimental research is used and the data collected from the survey was analyzed using statistical methods such as regression and correlation analysis.	1. Increase participation and engagement among students. 2. Foster personal and academic growth. 3. Communities of same practice.	1. Inappropriate content and cyberbullying. 2. Confidentiality concerns. 3. A source of plagiarism and academic dishonesty.	The authors suggest that future research could investigate the long-term effects of social media use on academic performance. It could also explore the effectiveness of intervention strategies designed to help students manage their social media use and improve their academic performance.	International Journal of Scientific & Engineering Research, in March 2018.

	Description	Advantage	Drawbacks	Gaps	Future Scope
Quora	A question-and-answer platform where users can ask and answer questions on any topic, with content moderated by a community of users.	1. Access knowledge from experts and professionals. 2. Collaborative tool for group projects. 3. Great source of information for research papers and assignments.	1. Spending too much time on the platform. 2. Inaccurate or outdated answers. 3. Negative comments or feedbacks discouraging students.	1. Limited customization options. 2. Difficulty in finding relevant content. 3. Limited control over content quality.	1. Enhanced search capabilities. 2. Integration with other platforms. 3. Customization options.
LinkedIn	A professional networking platform that connects individuals with employers, colleagues, and industry professionals to facilitate career advancement and business opportunities.	1. Career Exploration and Personalized Job Recommendations. 2. Industry Insights. 3. Alumni Networking and Internship Opportunities.	1. Professionalism Pressure: 2. Highly competitive environment. 3. Limited Opportunities:	1. Lack of Innovative Features. 2. Lack of Group Collaboration: 3. Insufficient Privacy Controls.	1. Enhanced Group Management. 2. Enhanced Privacy Controls. 3. Emphasis on Professional Development.
Edmodo	An educational social media platform that allows teachers, students, and parents to communicate, collaborate, and share content.	1. Personalized Learning. 2. Easy Communication. 3. Mobile Access and file sharing.	1. Technical Difficulties. 2. Limited Customization and integration.	1. Limited Collaborative Features. 2. Learning Curve:	1. Improve its security measures to protect student privacy. 2. Edmodo could adapt to the new learning trends. 3. Edmodo could make its interface more user-friendly and intuitive.
Slack	A communication and collaboration platform designed for teams to organize and streamline their workflows through channels, direct messages, and integrations with other tools.	1. Streamlined Communication. 2. Cross-Platform Compatibility. 3. Customizable Notifications.	1. Limited Functionality for Education. 2. Information Overload. 3. Potential for Miscommunication	1. Lack of Integration with Learning Management Systems. 2. Limited Functionality for Group Projects.	1. Continued Focus on User Experience. 2. Integration with Other Educational Tools. 3. Enhanced Educational Functionality:

Stack Overflow	A community-driven platform for programmers to ask and answer technical questions, share knowledge, and build their professional reputations. Its instant messaging system, integrations, and security features, along with its user-friendly interface	1. Rapid Response Time. 2. Comprehensive Question-and-Answer Database. 3. User-Friendly Interface.	1. Difficulty Filtering Information. 2. Potential for Plagiarism. 3. Limited Support for Non-Technical Topics.	1. Limited Support for Project Management. 2. Limited Feedback on Answers:	1. Adding Social Features. 2. Supporting Non-Technical Topics. 3. Ensuring Accuracy and Relevance
Youtube	A video-sharing website where users can upload, watch, and share videos on a wide range of topics.	1. Rich Educational Content. 2. Student-Created Content. 3. On-Demand Learning.	1. Easily distracted and lose focus on their studies. 2. Time-Consuming 3. Lack of Academic Rigor.	1. Inconsistent Quality. 2. Limited Interactivity. 3. Limited Collaboration Tools.	1. Better Content Organization. 2. More Interactive Learning Experiences. 3. Integration with Learning Management Systems.
Discord	A communication platform designed for communities of all kinds, from gamers to study groups, with features including voice and text chat, screen sharing, and integrations with other apps and services.	1. Easy communication with classmates. 2. Access to resources and support. 3. Voice and video chat.	1. Glitches and other technical issues. 2. A source of distraction and procrastination 3. Privacy and security concerns	1. Lack of integration with other tools: 2. Limited customization options 3. Potential distractions	1. Improved focus and productivity features 2. Options to allow for even greater flexibility 3. Integration with other productivity tools, and research databases.
Campus-Groups	A campus engagement platform that helps colleges and universities manage student organizations, events, and communication.	1. Club and Organization Management. 2. Integration with Other Platforms. 3. Streamlined Communication	1. Limited Functionality for Remote Learning 2. Limited Features for Large-Scale Events 3. Limited compatibility with certain devices or software.	1. Limited Support for Multimedia Content: 2. Limited analytics capabilities	1. Improved Integration with Learning Management Systems (LMS) 2. Improved Features for Remote Collaboration 3. Enhanced Analytics

2.4. Review Summary

Our college social networking project is an innovative and valuable platform that caters exclusively to college students. The platform's focus on providing students with a space to discuss academic issues, share achievements, and seek advice from seniors is highly commendable. The platform encourages students to exchange information and collaborate with each other on various topics related to college life.

The platform's design and user interface are user-friendly and easy to navigate. The platform offers a variety of features that enable students to communicate and interact with each other, such as sharing updates, messaging, and connecting with peers in groups. The requirement for creating an account to access all the features of the platform is understandable, as it allows for better security and privacy protection. Students can share their ideas and experiences with their peers without the fear of their personal information being compromised.

However, as with any social networking platform, privacy and security concerns are essential. The platform must ensure that personal information is kept confidential, and data privacy policies are transparent and easy to understand. Furthermore, the platform should implement robust security features to safeguard user data from unauthorized access or breaches.

In summary, the college social networking project has the potential to create a positive impact on the academic and social lives of college students. The platform's focus on collaboration and communication between peers can help students resolve academic issues, find support and advice, and make meaningful connections. With a user-friendly interface and a variety of features, this platform is highly recommended for college students who want to enhance their academic and social lives. However, the platform must ensure that privacy and security concerns are addressed to provide a safe and secure environment for students to communicate and collaborate.

2.5. Problem Definition

As we look around today, we see a plethora of social media apps that allow people toengage with one another. However, these platforms are not specifically designed for college students. The giants of the social media industry, such as Instagram, Facebook, and Twitter, are accessible to everyone, and they primarily serve as a source of entertainment. As a college student, using these platforms can be distracting, and they do not provide a conducive environment for academic pursuits such as asking questions about academic studies, semester examinations, and other college-related matters.

Therefore, there is a pressing need for a web application solely dedicated to college students. This platform would exclude non-college students and allow us to create an impeccable system for the college community. It will provide an ideal environment for college students to interact with one another and grow both personally and academically.

The college's social networking project is intended only for college students, and it is like many popular social networking sites where students can exchange information. By bringing college-related issues to light on this platform, it can assist students in resolving problems they may encounter. To access all the features of this platform, one must create an account.

The objective of the college social networking site is to give students a central location where they can communicate with one another about anything from their academic queries to sharing their achievements and chatting. It also enables studentsto seek advice from their seniors and learn from their experience.

2.6. Goals/Objectives

1. To develop a user-friendly interface for the platform that is accessible to all students and enables them to easily navigate the site.
2. To be designing and implementing security features that ensure user data is protected from unauthorized access or breaches.
3. To create an environment that enable students to create profiles and connect with each other, including messaging and group communication features.
4. Our site will facilitate the sharing of academic queries, achievements, and advice from seniors among students.
5. It will encourage students to participate in forums and discussions on various topics related to college life.
6. To develop a mechanism for peer-to-peer mentoring that enables students to seek advice and support from seniors.
7. To also create an analytics dashboard to measure user engagement and track platform usage.
8. Establish partnerships with college administrations and faculty members to ensure the platform's relevance and sustainability.
9. Conduct regular surveys and feedback mechanisms to evaluate user satisfaction and identify areas for improvement.
10. Measure the impact of the platform on academic performance, student satisfaction, and social networking opportunities.

These specific and measurable goals and objectives can help us track the progress of our college social networking project and ensure that it meets its intended goals. By setting milestones throughout the project, we can measure progress and adjust the project's direction as needed to achieve its goals.

CHAPTER 3
Design flow/Process

3.1 Feature/characteristics identification

Following characteristics have been chosen keeping in mind the gaps of already existing solutions of similar problem statements.

1. **Mentoring or Q&A System:** Implement a mentoring or Q&A system that allows students to ask questions, seek advice, or get guidance from their seniors or other experienced users within the app. This could be in the form of a forum, discussion board, or direct messaging system where students can connect with mentors or experts based on their interests or areas of expertise.

2. **Privacy and Security:** Ensure that the app includes robust privacy and security features, such as options for controlling profile visibility, managing account settings, and protecting user data from unauthorized access.

3. **Personal Progress Tracking:** Provide a feature that allows students to log and track their minor progresses, such as achievements, projects, or extracurricular activities, without the fear of being judged by others. This could be a private feature that allows students to reflect on their personal growth and accomplishments.

4. **Campus News and Updates:** Offer a campus news and updates section that provides news, announcements, and updates related to the campus community, including academic, administrative, and cultural news. This could help students stay informed about important events and decisions that affect them.

5. **Interest-based Matching:** Provide a feature that allows students to find and connect with other users who share similar interests, hobbies, or passions. This could be done through algorithms that match users based on their profile information, activities, or interactions within the app, enabling students to find like-minded peers and build meaningful connections.

Besides, there are some features carefully identified considering the general requirements of a

social media application.

1. **User Registration and Authentication:** Allow users to register and create accounts, and implement a secure authentication system to ensure that only authorized users can access the app.

2. **Profile Creation and Management:** Enable users to create and manage their profiles, including uploading profile pictures, updating personal information, and managing privacy settings.

3. **Friends/Followers System:** Implement a friends/follower's system that allows users to connect with and follow other users within the app, and receive notifications for new friend requests or follower updates.

4. **News Feed/ Timeline:** Create a news feed or timeline that displays posts, updates, and activities from users and their friends or followers, allowing for easy discovery and interaction with content.

5. **Messaging and Chat**: Implement a messaging or chat system that allows users to send private messages, create group chats, and share media files with other users.

6. **Notifications and Alerts**: Implement a notification and alerts system that notifies users of new activities, messages, friend requests, or other relevant updates within the app.

7. **Search and Discovery:** Provide search and discovery features that allow users to find and connect with other users, groups, or communities based on keywords, interests, or location.

3.2 Constraint Identification

A. Maintainability:

Maintainability is an important consideration for any software product, including a social media web app. Here are some key factors to consider for maintaining the app:

1. **Code Quality:** The code of the app should be well-organized and easy to read, making it easier for developers to maintain and update it over time. The app should also be developed using best practices and standards to ensure that it is scalable, reliable, and maintainable.

2. **Modularity:** The app should be developed in a modular way, with different components separated into distinct modules that can be updated and maintained independently of one another. This allows developers to make changes and updates without disrupting other parts of the app.

3. **Documentation:** Comprehensive documentation is crucial for maintaining the app. This includes documenting the code, the app's architecture, and any third-party dependencies or APIs that the app relies on. This documentation should be regularly updated as the app evolves over time.

4. **Testing:** The app should be rigorously tested throughout the development process to ensure that it is functioning properly and free of bugs. This includes both manual testing by developers and automated testing using tools like unit tests and integration tests.

5. **Version Control:** Using a version control system like Git is essential for maintaining the app. This allows developers to track changes and roll back to previous versions if necessary, making it easier to maintain and update the app over time.

6. **Continuous Integration and Deployment:** Implementing continuous integration and deployment (CI/CD) workflows can help ensure that the app is always up-to-date and functioning properly. This involves automating the process of building, testing, and deploying updates to the app, making it easier to maintain and update over time.

Overall, by focusing on code quality, modularity, documentation, testing, version control, and CI/CD, the app can be developed and maintained in a way that ensures it remains scalable, reliable, and easy to update over time.

B. Policy Regulation & Legal Considerations

1. **User Data Privacy:** The app must prioritize user data privacy and ensure that user information is kept confidential and secure. The app must not share user data with any third-party without explicit user consent and must comply with relevant data privacy laws and regulations.

2. **Appropriate Content:** The app must prohibit any content that is obscene, violent, discriminatory, or offensive in nature. The app must also establish clear guidelines for user behavior and content creation, and moderate any content that violates these guidelines.

3. **Cyberbullying Prevention:** The app must take measures to prevent and combat cyberbullying, including identifying and removing any content or behavior that is abusive or harassing in nature. The app must also offer reporting and blocking features that enable users to report any instances of cyberbullying.

4. **Intellectual Property Rights:** The app must respect intellectual property rights, including copyright and trademark laws, and prohibit any content that infringes on these rights. The app must also provide clear guidelines for user-generated content and ensure that users are aware of the implications of sharing copyrighted or trademarked content.

5. **User Verification:** The app must require users to verify their identity before using the app, to ensure that the app is being used by legitimate users and to prevent any fraudulent or malicious activities. The app must also establish clear guidelines for user verification and ensure that user data is protected during the verification process.

6. **Advertising Policies:** The app must establish clear guidelines for advertising and ensure that any advertisements displayed on the app are appropriate and non-deceptive. The app must also provide clear labeling and disclosures for any sponsored content or advertisements.

7. **Compliance with Laws and Regulations:** The app must comply with all relevant laws and regulations, including data privacy laws, advertising laws, and cyberbullying laws. The app must also provide clear guidelines for user behavior and content creation that align with these laws and regulations.

C. Cost Analysis

Hosting

Considering our traffic potential, we will be choosing a cloud hosting plan. For example, medium-sized businesses can start with the Cloud Startup plan for $9.99/month on hostinger.

Pros
High reliability. When one server fails, the website uses other servers to stay online.
Traffic load balancing. Cloud hosting maintains website performance even when traffic is high.
Scalability. When growing your website, upgrade your bandwidth and storage to support the increased needs.

Cons
Limited control. The web host manages cloud hosting. As such, users assume less control over their hosting environment.
Higher average cost. The average cost of cloud hosting is higher than shared hosting and VPS.
Security vulnerabilities. Improper configuration can cause security issues.

Domain Name

A domain name works as an address that directs users to a website. Without a domain, users must enter your website's IP address to find your content. As such, having a memorable domain name is essential for the overall user experience.
This will be included along with hosting plan.

SSL Certificate

An SSL/TLS encrypts all data transferred between a website server and a browser. Its primary purpose is to prevent unauthorized users from accessing sensitive information. Having an SSL has many benefits and it helps you rank higher on search engines.
This will be included along with hosting plan.

Cost of running server – MySQL

The pricing for MySQL starts at $2000.0 per year. MySQL has 3 different plans:

1. MySQL Standard Edition (Web and End Users) at $2000.00 per year.
2. MySQL Enterprise Edition (Web and End Users) at $5000.00 per year.
3. MySQL Cluster Carrier Grade Edition (Web and End Users) at $10000.00 per year.

We will be using *MySQL Enterprise Edition* (Web and End Users) at $5000.00 per year.

Included features of MySQL:

1. MySQL Document Store
2. MySQL Router
3. MySQL Partitioning
4. MySQL Shell
5. Oracle Enterprise Manager for MySQL
6. MySQL Enterprise Monitor
7. MySQL Enterprise Dashboard
8. MySQL Enterprise Advisors
9. MySQL Query Analyzer
10. MySQL Replication Monitor
11. MySQL Enterprise Backup Full, Incremental, Partial, Optimistic Backups
12. Encryption and Compression
13. Point-In-Time-Recovery
14. MySQL Enterprise Security
15. MySQL Enterprise Authentication1
16. MySQL Enterprise Scalability

S.No.	Item	Pricing (per month)
01	Hosting Platform	10$
02	Domain Name	Included
03	SSL Certificate	Included
04	Server	400$

Table 5: Cost Analysis

Total Cost – 410$ per months, equivalent to ~35000INR

3.3 Design selection

When it comes to selecting a design approach for a social media web app, there are several options to consider. Here are some of the most common design approaches and their advantages and disadvantages:

1. **Monolithic Architecture:** Monolithic architecture involves building the entire app as a single, cohesive unit. This approach is straightforward and easy to develop, but it can become difficult to maintain and scale as the app grows larger.
   Advantages:
   - Easy to develop and deploy
   - Simple architecture

   Disadvantages:
   - Difficult to maintain and scale as the app grows
   - Limited flexibility in terms of updating individual components

2. **Microservices Architecture**: Microservices architecture involves breaking the app down into small, modular components that can be developed and deployed independently. This approach offers greater flexibility and scalability, but it can be more complex to develop and deploy.
   Advantages:
   - Greater flexibility and scalability
   - Easier to update and maintain individual components

   Disadvantages:
   - More complex to develop and deploy
   - Requires more coordination between components

3. **Serverless Architecture:** Serverless architecture involves building the app using cloud-based services that can be scaled up or down as needed. This approach is highly scalable and cost-effective, but it requires a higher level of technical expertise to develop and maintain.
   Advantages:
   - Highly scalable and cost-effective
   - No need to manage servers

   Disadvantages:
   - Requires a high level of technical expertise
   - Limited control over infrastructure

Selected Design: Monolithic Architecture

Monolithic architecture is a traditional software development approach where the application is built as a single, self-contained unit. In this architecture, all the components of the application, including the user interface, business logic, and data storage, are tightly coupled and run on a single server. This approach has some advantages, such as easier development, deployment, and testing, as well as less complexity in terms of architecture.

However, monolithic architecture also has some disadvantages, such as limited scalability and difficulty in maintaining the system as the application grows. As the size of the codebase increases, it becomes harder to understand and maintain the application. Additionally, monolithic applications require more resources to run and are less fault-tolerant, which can lead to downtime and lost revenue.

Despite its drawbacks, monolithic architecture will be a suitable choice for our medium-sized applications with simple requirements, where scalability is not the major concern whilst the time of deployment. Later, we are considering to switch on Microservices architecture.

Flow of Code:

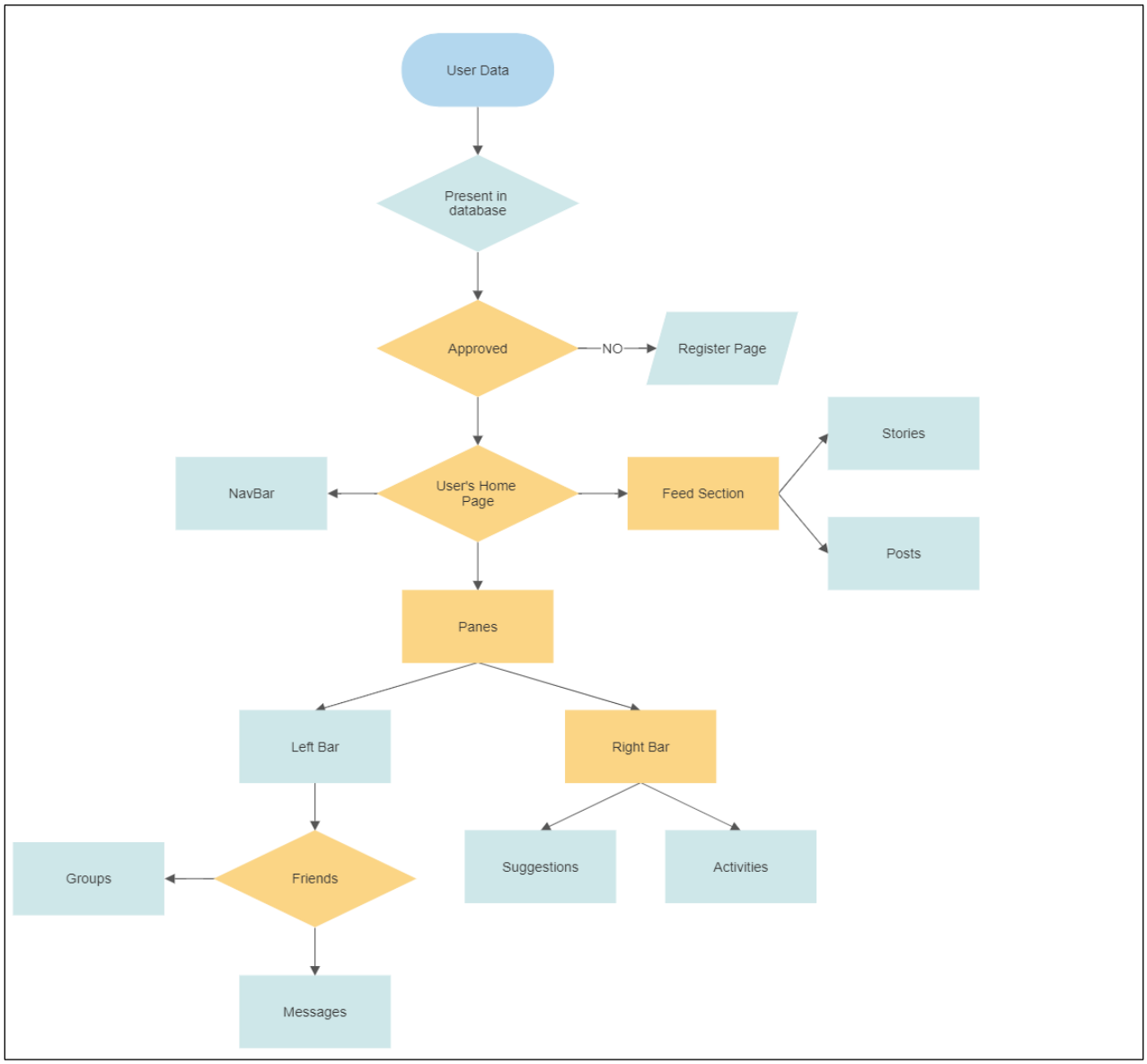


Figure 3.1: Code Flow

CHAPTER 4
Detailed System Design/Technical Details

4.1 Use of Modern tools in design and analysis

HTML:

- It is the standard markup language for creating web pages and is widely used.
- Easy to learn and has a simple syntax.
- Has support for multimedia, animations, and other dynamic content.

SCSS:

- A powerful pre-processor scripting language that extends the functionality of CSS.
- Offers features like variables, nesting, mixins, and functions, which improve the development process.
- Allows for the creation of modular and maintainable code.

JavaScript:

- One of the most widely-used programming languages for building web applications.
- Supports both front-end and back-end development.
- Offers a range of libraries and frameworks for easier and faster development.

React:

- A popular JavaScript library for building user interfaces.
- Offers a component-based approach, which makes the code more modular and easier to maintain.
- Provides a fast and seamless user experience, thanks to its Virtual DOM and efficient rendering capabilities.

MySQL:

- An open-source relational database management system.
- Offers high performance, scalability, and security.
- Has support for a wide range of programming languages, including JavaScript, making it a versatile choice for web development.

Node.js:

- Node.js is a runtime environment that allows executing JavaScript code on the server-side.
- It uses an event-driven, non-blocking I/O model, making it efficient and suitable for handling concurrent requests.
- Node.js enables developers to build scalable and high-performance server-side applications.

- It has a vast ecosystem of modules and packages available through npm (Node Package Manager), which allows easy integration of third-party libraries and tools.

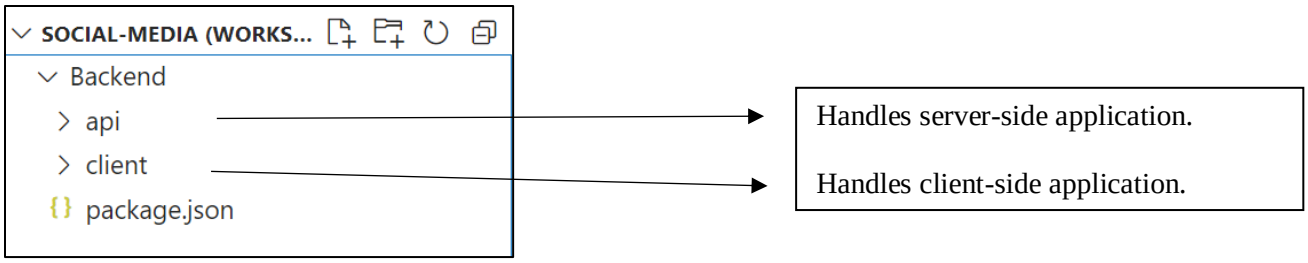
Express.js:

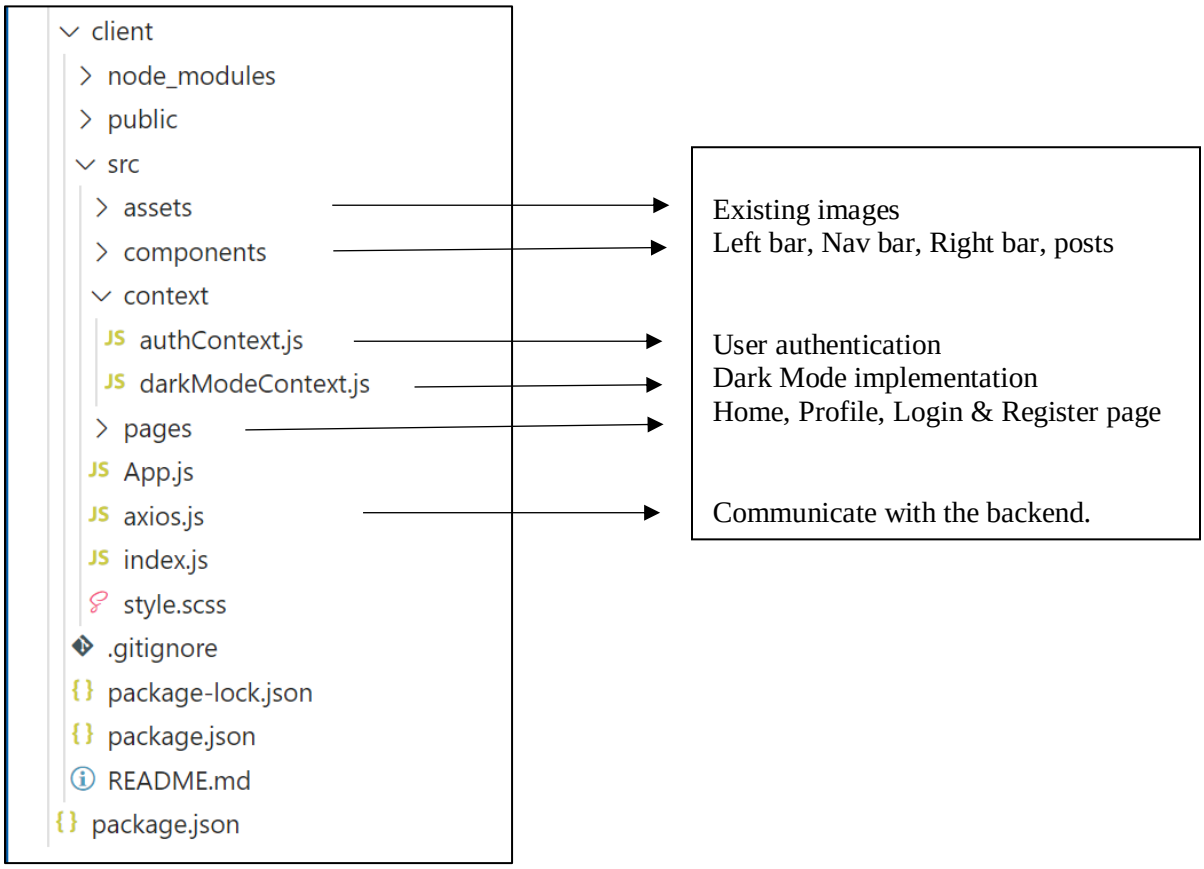
- Express.js is a minimalist and flexible web application framework for Node.js.
- It provides a robust set of features for building web applications and APIs.
- Express.js simplifies the process of creating server-side applications by offering a clean and intuitive API for handling routes, middleware, and HTTP request/response handling.
- Express.js allows the use of middleware, enabling developers to add additional functionality to the application, such as authentication, logging, and error handling.

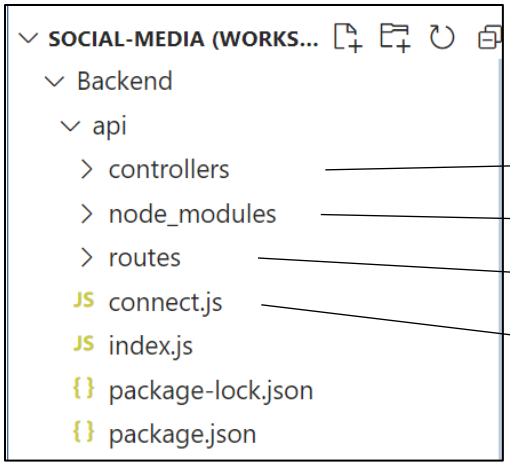
Together, Node.js and Express.js provide a powerful combination for building server-side applications. Node.js enables JavaScript to run on the server, while Express.js simplifies the development process by providing a structured framework and essential web application functionalities. This combination allows for efficient, scalable, and robust server-side development using JavaScript.

Overall, we chose this tech stack because it offers a powerful set of tools and frameworks that allow for efficient, maintainable, and scalable development of web applications.

4.2 Code workspace management





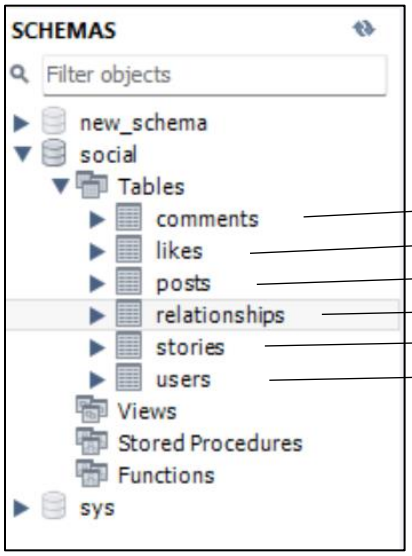


Fetch data from database

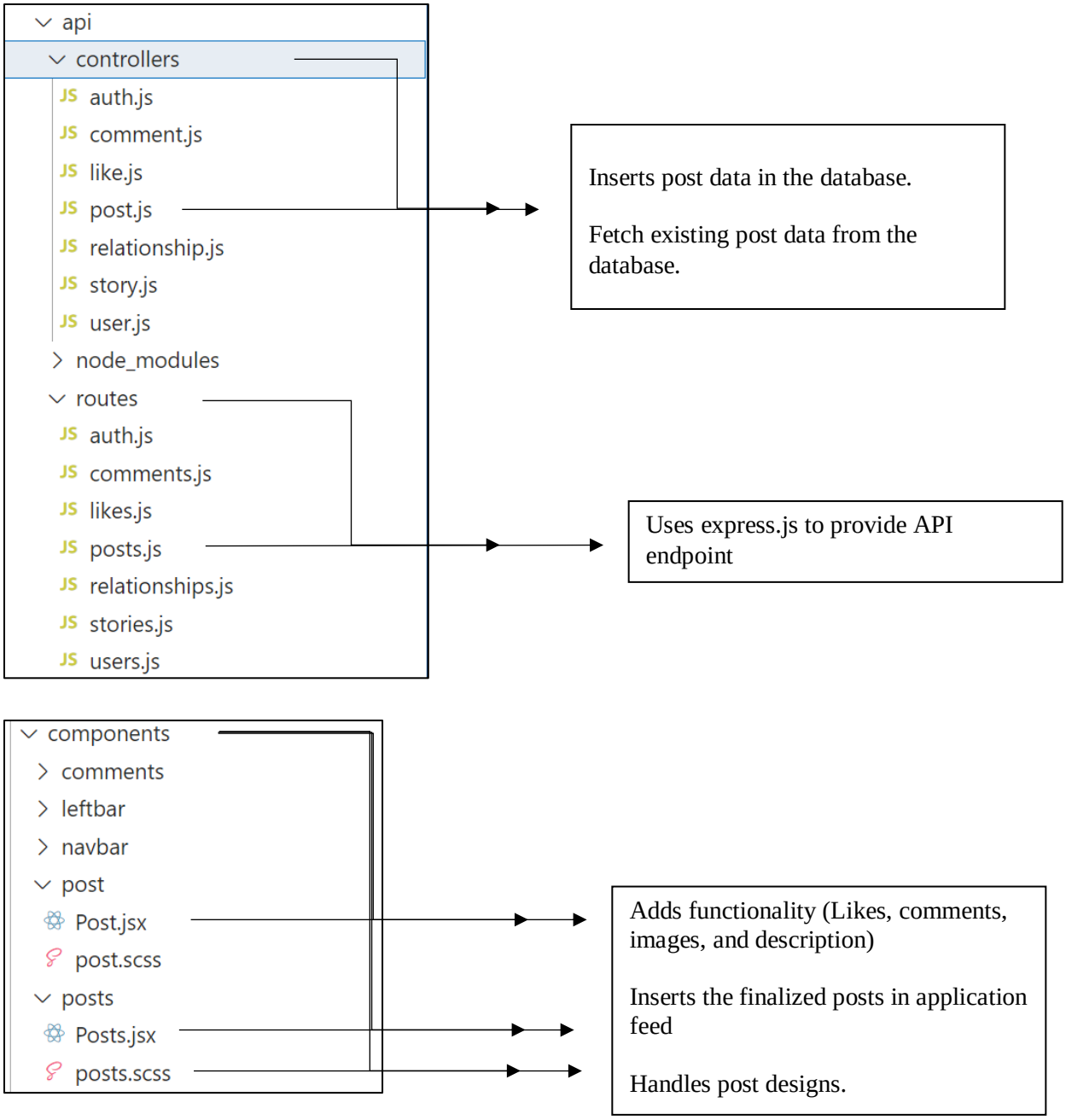
Contains required npm packages

Provides routes via express.js

Connects MySQL workbench with application



Database for storing comments
Database for storing likes
Database for storing posts
Handling following & followers
Database for storing stories
Database for storing users info.


api
controllers
auth.js
comment.js
like.js
post.js
relationship.js
story.js
user.js
node_modules
routes
auth.js
comments.js
likes.js
posts.js
relationships.js
stories.js
users.js
Inserts post data in the database.
Fetch existing post data from the database.
Uses express.js to provide API endpoint
components
comments
leftbar
navbar
post
Post.jsx
post.scss
posts
Posts.jsx
posts.scss
Adds functionality (Likes, comments, images, and description)
Inserts the finalized posts in application feed
Handles post designs.

4.3 RESULT ANALYSIS

Design prototype: Frontend

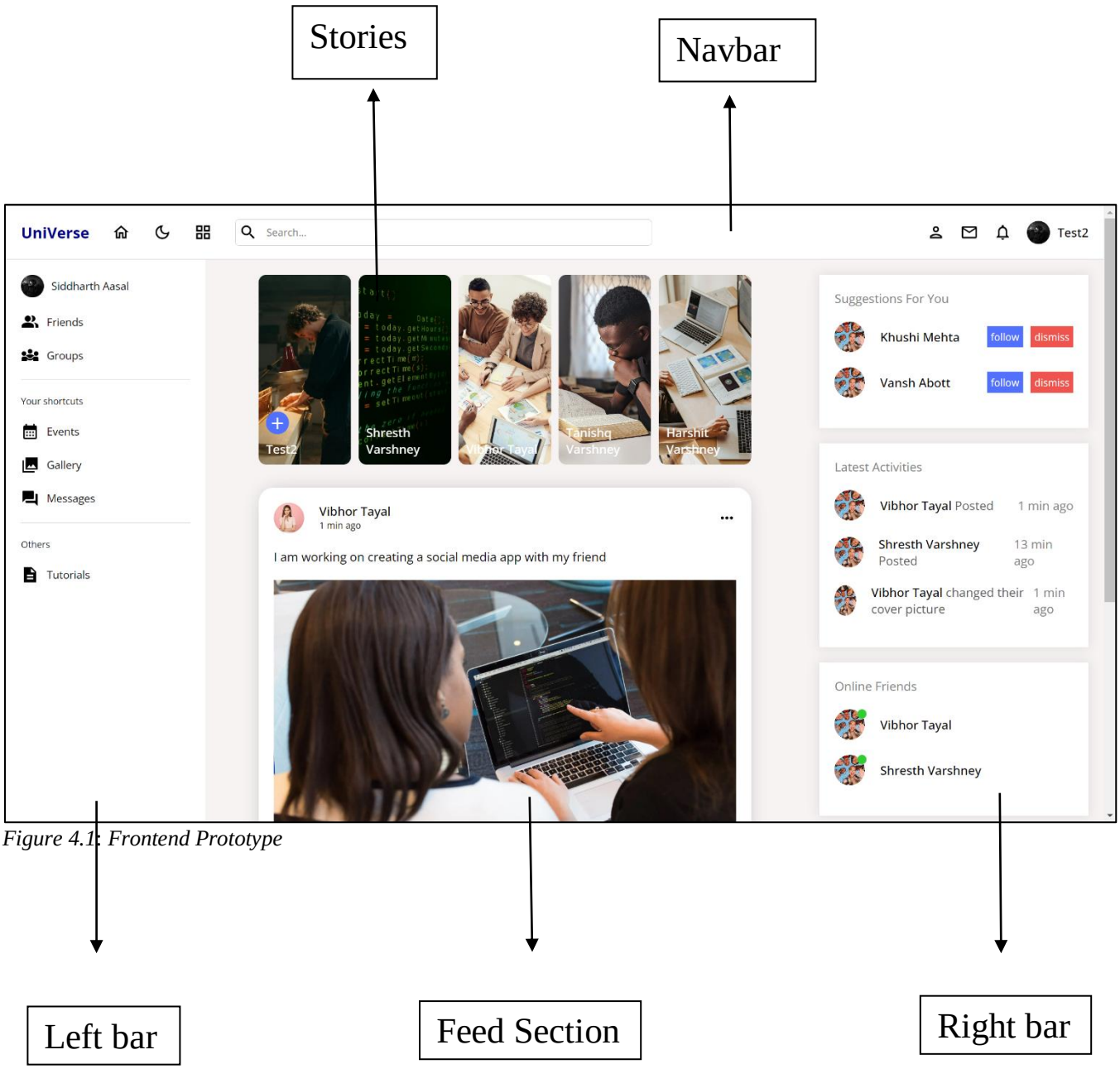


Figure 4.1: Frontend Prototype

POST FEATURE:

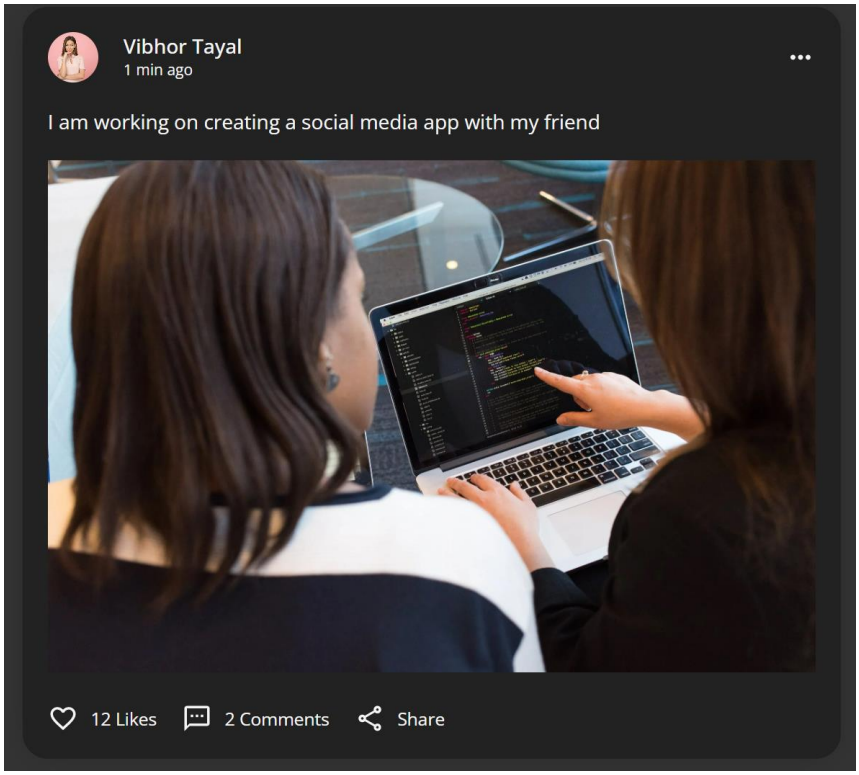


Figure 4.2: *Post Design*

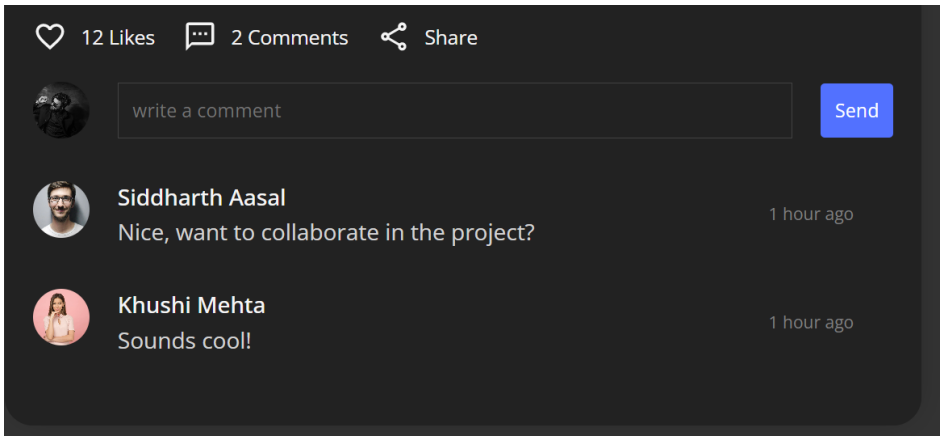


Figure 4.3: *Fetching Comments*

UI-UX

We have worked on creating an aesthetic and easy to use UI for a better UX.

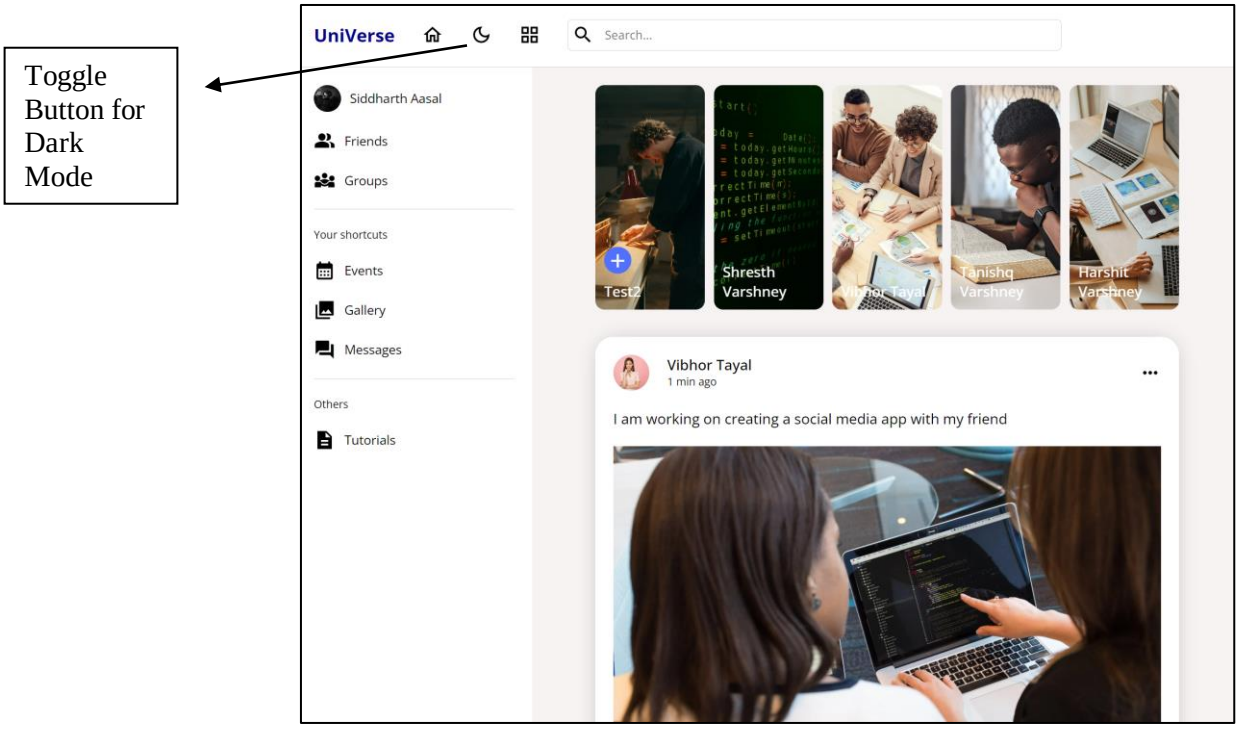


Figure 4.4: Web app light mode

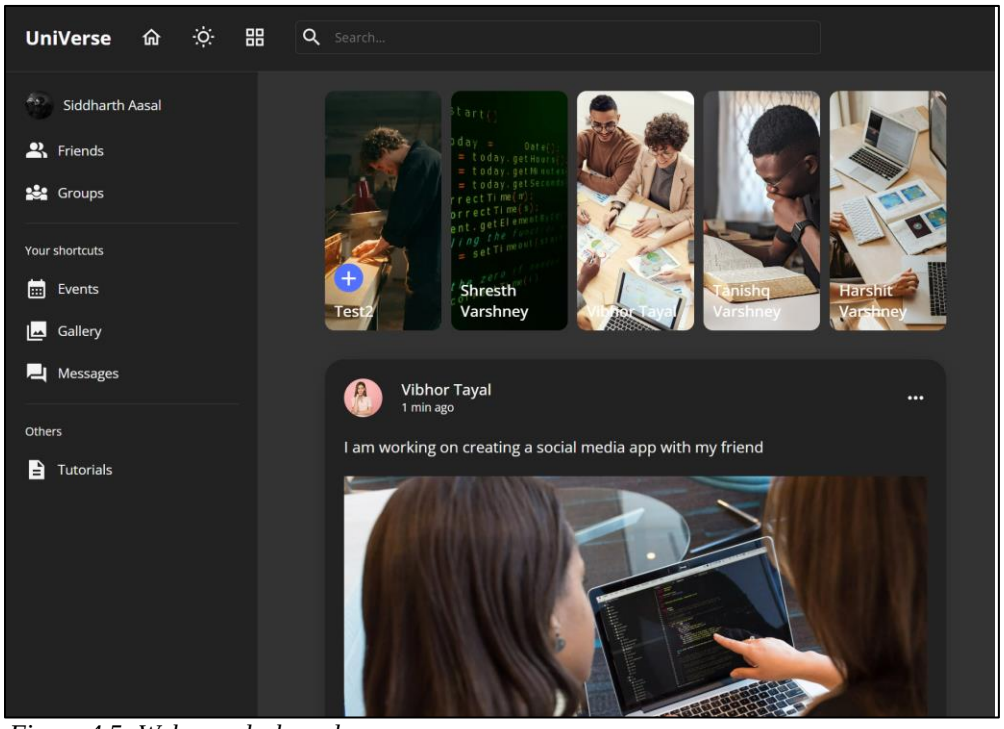


Figure 4.5: Web app dark mode

AUTHENTICATION

Via authentication students can firstly register and then login into the web app.

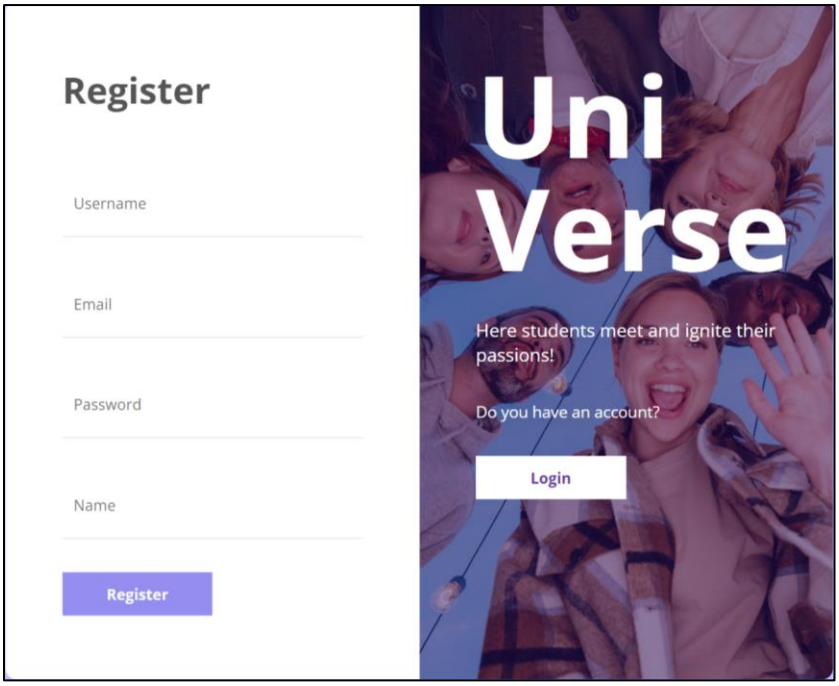


Figure 4.6: *Registration Page*

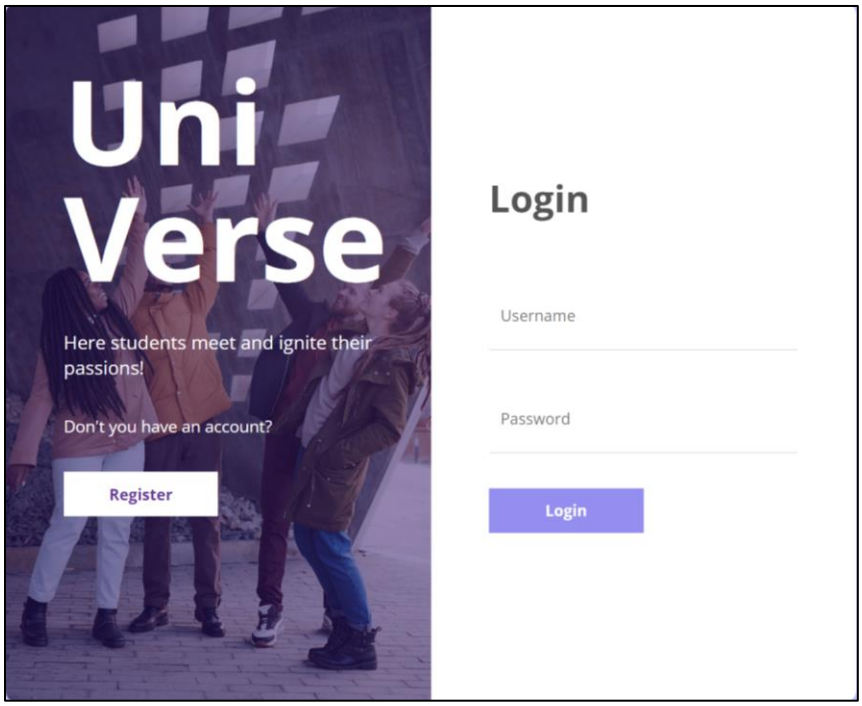


Figure 4.7: *Login Page*

SECURITY

Password hashing is turning a password into alphanumeric letters using specific algorithms. Hashing is beneficial when bad guys breach the data. With hashing, the data they get is in hash format, and hashed data is unintelligible. Some popular algorithms for password hashing include bcrypt and SHA.

We have used “bcrypt” via NPM for password hashing.

Now, let’s dive into how bcrypt works. On the surface, bcrypt takes a user-submitted plain password and converts it into a hash. The hash is what is stored in the database. This prevents attackers from accessing users’ plain passwords in the event of a data breach. Unlike some other password-hashing algorithms that just hash the plain password, bcrypt uses the concept of salt.
This unique randomly generated string provides an additional level of security for a generated hash. Before the plain password is hashed, a salt is generated. Then, it is appended to the plain password, and everything is hashed (the plain password and salt). This help protects against rainbow table attacks because attackers can randomly guess users’ passwords, but they can’t guess the salt.

- Bcrypt turns a simple password into fixed-length characters called a hash.
- Before hashing a password, bcrypt applies a salt — a unique random string that makes the hash unpredictable.

```
//Hash the password
const salt = bcrypt.genSaltSync(10);
const hashedPassword = bcrypt.hashSync(req.body.password, salt);
const q =
    "INSERT INTO users (`username`,`email`,`password`,`name`) VALUE (?)";
```

Figure4.8: Security Code Snippet

[Hashed Password]

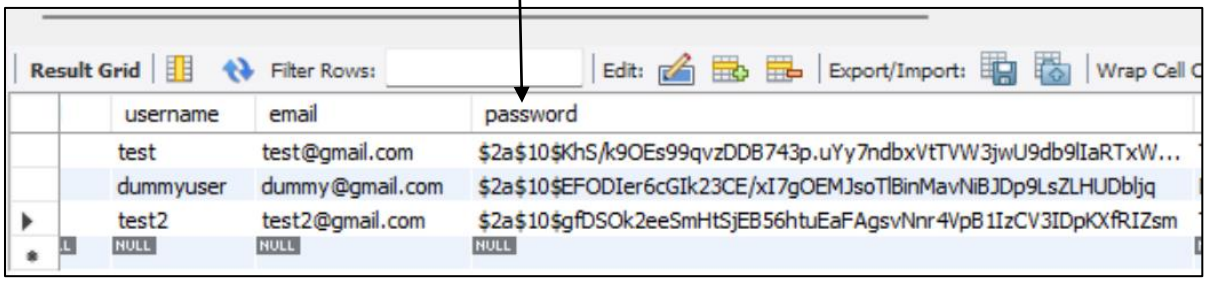


Figure4.9: Security Code Snippet

4.4 PROJECT OUTCOMES

S.NO	TASKS	STATUS
1	Registration	Accomplished
2	Login	Accomplished
3	Posts	Accomplished
4	Likes	Accomplished
5	Comments	Accomplished
6	Follow-Following	Accomplished
7	Image Upload	Accomplished
8	Security	Accomplished
9	UI with Dark Mode	Accomplished
10	Update User	Accomplished
11	Profile Fetch	Accomplished
12	Data Filtering	Future Scope
13	Forums	Future Scope
14	Queries	Future Scope
15	College Ambassadors	Future Scope
16	User Verification	Future Scope

CHAPTER 5
Conclusion And Future Scope

5.1 FUTURE SCOPE

1. AI-based User Verification

- We plan to implement an AI-powered user verification system that will ensure that only college students have access to the platform.
- By scanning ID cards or other relevant identification documents, the system will verify the user's status as a registered college student, ensuring a trusted and secure user base.

2. Academic Data Filtering

- With the integration of AI algorithms, we will implement an advanced data filtering mechanism to ensure that all posted content is academically relevant.
- The AI system will analyze and classify user-generated content, filtering out non-academic or irrelevant posts to maintain the platform's focus on educational discussions and collaboration.

3. Collaborating with College Ambassadors:

- In order to enhance the engagement and relevance of our social media web app, we plan to collaborate with ambassadors from different colleges.
- These ambassadors will play a crucial role in managing the news feed and content specific to their respective colleges.
- By involving ambassadors, we aim to ensure that the information shared on the platform is accurate, up-to-date, and tailored to the needs and interests of each college community.

4. Global and Local Query Sections:

- To provide a comprehensive and personalized experience, we will introduce two query sections within the web app: global and local.
- The global query section will enable users to post queries and engage in discussions that are relevant to broader academic topics or areas of interest across colleges.
- The local query section will focus on college-specific discussions, allowing users to seek advice, share information, and collaborate within their own college community.
- By incorporating these query sections, users will have access to a wider range of insights, expertise, and perspectives from both a global and local context.

5.2 CONCLUSION

In conclusion, our project aimed to address the need for a social media platform specifically designed for college students. We identified the problem of existing social media platforms causing distractions and lack of features for college-related interactions, which led us to develop a web application that allows college students to collaborate and interact with each other.

We employed a Microservices architecture and utilized a tech stack consisting of HTML, SCSS, JavaScript, React, and MySQL to develop our application. This allowed us to develop an efficient, maintainable, and scalable web application.

Through the implementation of this project, students can connect with their peers, engage in academic discussions, and seek guidance from seniors, facilitating a collaborative and supportive environment. The platform's emphasis on college-related issues and problem-solving can assist students in overcoming obstacles and finding resolutions.

In terms of marketability, our application can potentially target a large user base, including college students and educators. Our marketing strategy involves social media and online advertising, targeting relevant groups and communities, and promoting word-of-mouth.

Overall, our project provides a solution to the existing problem of the lack of a social media platform specifically designed for college students. With further development and improvement, our application can potentially have a significant impact on the way college students interact and collaborate with each other.

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DESIGN CHECKLIST

Project Title	Social Media Web App for Collaboration and Interaction among College Students
Area	Web Development
Constraints	**Description**
Accessibility	It would be accessible to all the college students all over the globe.
Aesthetics	The app comprises of both light and dark mode optimization.
Codes	Major coding has been done using React.js, Node.js and Express.js.
Constructability	Monolithic architecture has been used for the web app.
Cost	It has been analyzed that it would take around 10K INR per month to run on medium scale and 35K INR per month to run on a large scale.
Functionality	The app has been moderately featured till now and design prototype has been created for further features.
Interoperability	It has been ensured that the web app runs on all majorly used browsers.
Legal Considerations	We will ensure Intellectual Property Rights are being followed.
Maintainability	CI/CD will be used for maintainability of the app.
Manufacturability	We will look for funding after the completion of our design prototype.
Marketability	It can be easily marketed via College Ambassadors and social media.
Policy Regulations	
Process Elements	
Project Planning	Define project objectives, scope, and deliverables.
Requirement Gathering	Engage with college students to understand their needs and expectations from the social media platform.
Design and Prototyping	Create wireframes, mockups, and user interface designs for different screens and features of the application.
Development	Set up the development environment with the chosen tech stack (HTML, SCSS, JavaScript, React, Node.js, Express.js, MySQL).
Integration and Testing	Integrate front-end and back-end components to create a cohesive application.
Deployment and Release	Configure the server environment and ensure compatibility with the chosen tech stack.
Maintenance and Support	Address bug fixes, user-reported issues, and feature enhancements.

Plagiarism Report

Yet to be received.

USER MANUAL

1. The first thing to do, is to register on the platform by entering username, email, password, and name.

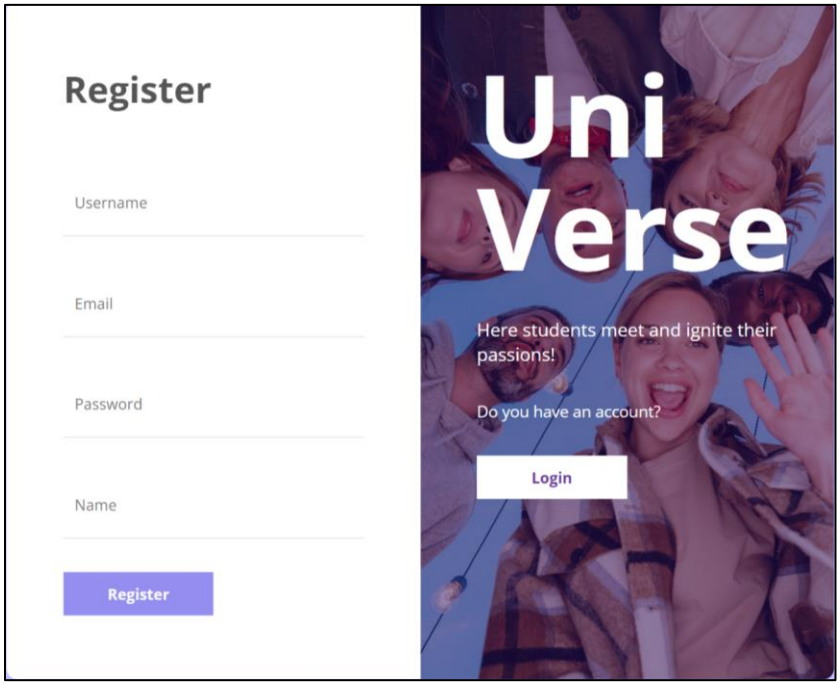

Figure4.5: Registration Page

2. After registration, login to the web app, via entering your username and password.

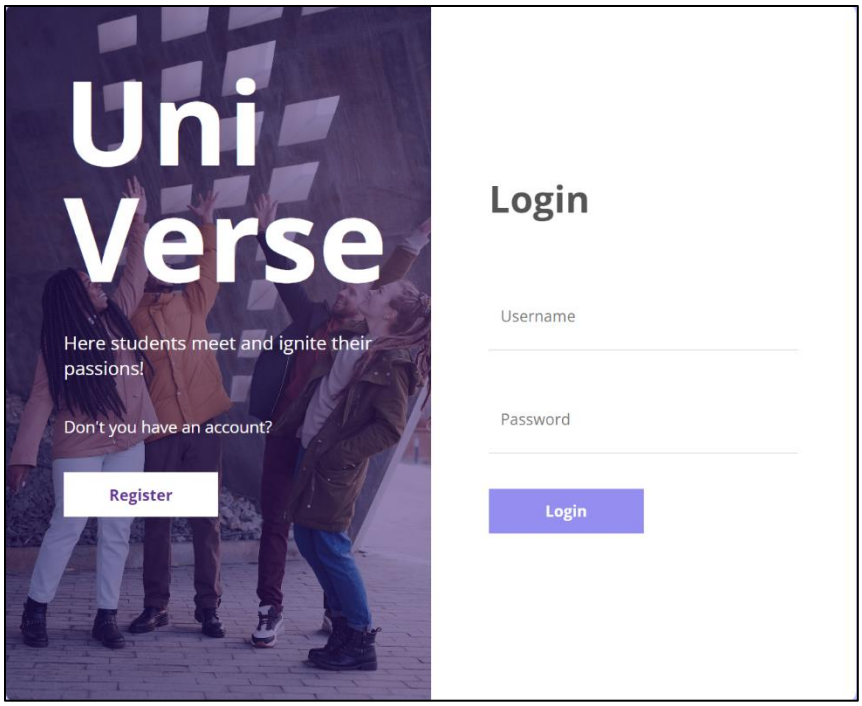

Figure4.6: Login Page

3. After successful authentication, you will land onto this web page.

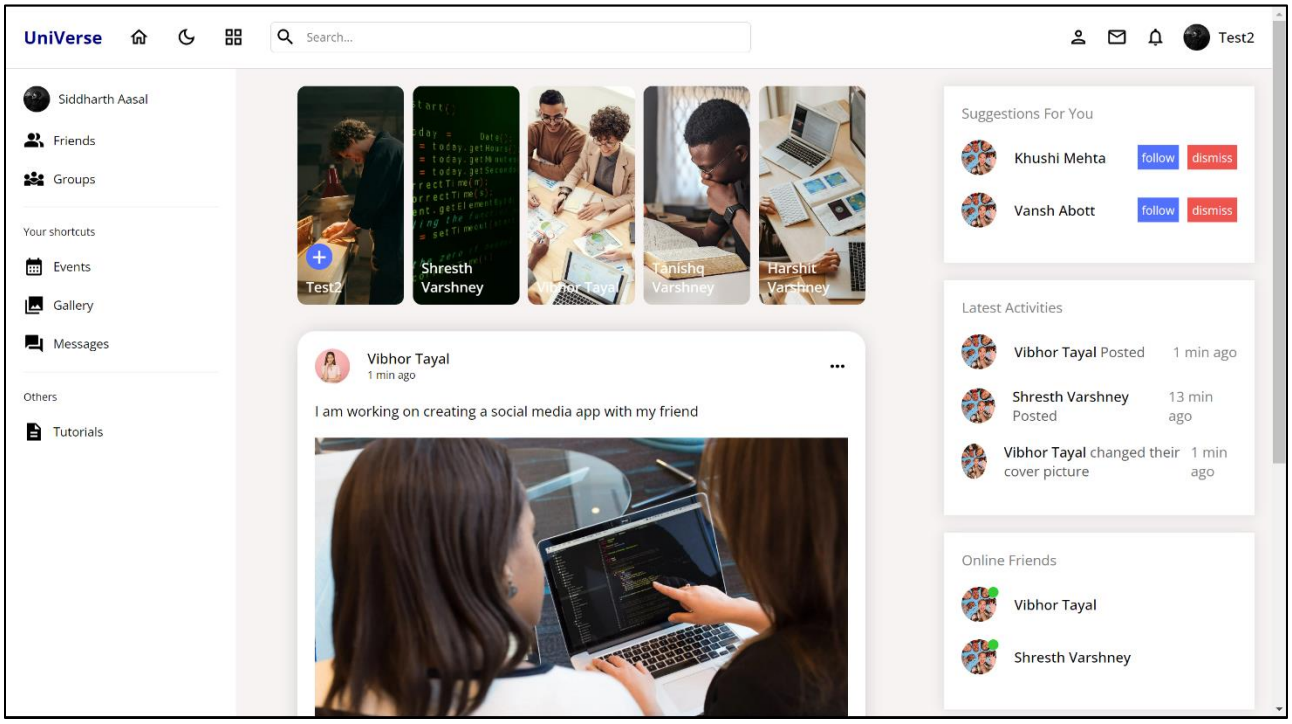

Figure4.7: Webpage

4. Here you can upload stories, view other people's stories. Also, you can add posts, it will have the functionality to add images in the post alongside description.

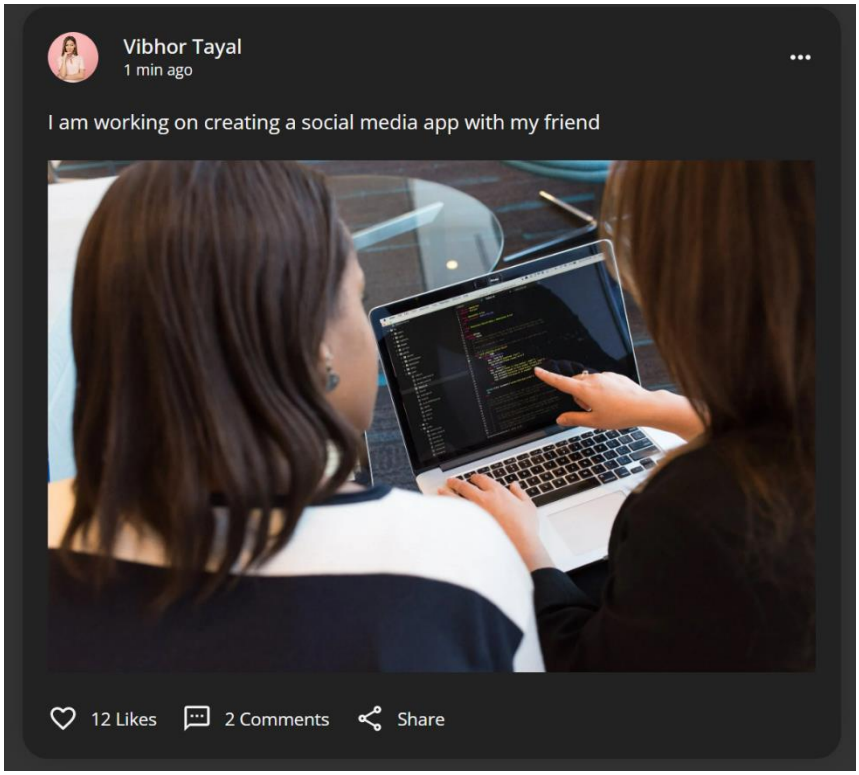

Figure4.8: Post

5. Moreover, you can comment on the posts as well, and read other people’s comments.

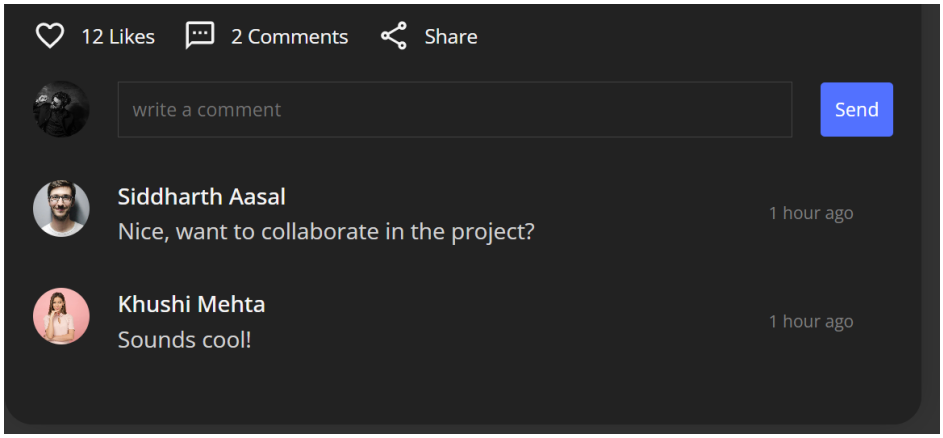

Figure4.9: Comment Section

TEAM ROLES

NAME	UID	ROLE
Khushi Mehta	22BCT10033	• Collection of data for the website. • Research for Literature Survey.
Shresth Varshney	22BCT10013	• Handling Documentation of the project. • Researched for the UI of the app.
Siddharth Aasal	22BCT10056	• Building the frontend of the web app. • Building the backend of the web app.
Vibhor Tayal	22BCT10083	• Implementing security features and helping in building the frontend of the web. • Handling Documentation of the project.