



DiscussIT: A Collaborative Discussion Platform

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Abstract: In educational settings, online discussion forums have proven practical tools for promoting deeper learning and engagement. They provide a unique setting that goes beyond the constraints of conventional face-to-face communication. These platforms facilitate knowledge creation, collaboration, and interaction, allowing students ample time to process ideas and respond thoughtfully to their peers. However, despite the acknowledged benefits of discussion forums, the lack of dedicated spaces for academic discussions and peer-to-peer learning further hinders students' ability to collaborate effectively and seek peer-to-peer support. This paper introduces DiscussIT, a web app platform designed to improve online discussions. It builds on the strengths of existing tools and adds some new features that make them super user-friendly. This empowers users to create even more dynamic and engaging learning experiences.

IndexTerms - Online Learning, Discussion Forums, Collaboration, Student Engagement, Social Learning Knowledge Sharing, Online Communities, Remote Learning, Educational Technology, Critical Thinking, Interactive Learning.

I. INTRODUCTION

College students in fast-paced disciplines like computer science face unique challenges in accessing timely and accurate doubt-resolution resources. Traditional teacher-student models may struggle to keep pace, making community-driven learning platforms an increasingly attractive alternative. The rise of online learning environments offers undeniable advantages, but replicating the social aspects of a traditional classroom remains a challenge. This project investigates the potential of online discussion forums in fostering a crucial element for student success: a sense of community.

We explore how these forums can promote student-to-student and student-teacher interaction, leading to knowledge construction, improved learning, and greater engagement. The project further examines the concept of classroom community and its components, highlighting how discussion forums can cultivate a sense of belonging, trust, and collaborative learning within the online environment.

However, acknowledging the limitations of online interaction, the project explores the concept of the Academic Communities of Engagement (ACE) framework. This framework emphasises the importance of fostering connections beyond the online course community, encompassing both the personal and course communities for optimal student success.

Finally, the project acknowledges the challenge of content moderation in online learning platforms, particularly with the ever-growing volume of user-generated content. This highlights the need to explore automatic content moderation pipelines further to ensure a safe and appropriate online learning environment.

II. LITERATURE REVIEW

Online discussion forums are platforms within Cloud Learning Environments where students and teachers can engage in asynchronous interactions by posting and responding to messages related to course topics. [1] Online discussion forums are important because they facilitate student-student and student-teacher interactions, which are essential for constructing knowledge and improving students' abilities. They provide a space for collaborative learning and knowledge sharing and enhance students' interest in a course. [7] Enhancing the performance of these forums could involve exploring additional elements like the forum interface design, multimedia content usage, and real-time feedback mechanisms to improve engagement and productivity. Another important factor in how well students do in a class is how connected they feel to the other students and the teacher. This feeling of being connected is called a sense of classroom community.

This engagement, or sense of classroom community, involves mutual trust and interaction among students. Rovai (2002) describes four components of classroom community: spirit (feeling of belonging), trust (confidence in the group), interaction (benefiting from interacting with others), and learning (constructing knowledge through discussion). In an online environment, students might engage in discussions, share ideas, and seek advice [6].

[2] While online discussion forums offer valuable interaction, recent research on student success in online learning environments highlights the crucial role of a broader sense of community. This extends beyond just interactions within the course and emphasizes the importance of both the course community and the personal community. The course community encompasses teachers, peers, and administrators who provide formal support through the class structure and activities. The personal community includes family, friends, and others in the student's social network who provide informal support.

The Academic Communities of Engagement (ACE) framework emphasizes that fostering connections within both these communities is essential for student success. This framework aligns perfectly with the growing need for dynamic online learning platforms that can cultivate a strong sense of community alongside effective knowledge exchange [3].

In parallel, the rapid expansion of social media platforms has transformed how millions of users produce and consume content. With the exponential growth of online content repositories, managing the appropriateness of diverse materials becomes a critical concern, especially for platforms catering to various age groups and specific locations. Human-reviewed content moderation, given the sheer volume of images and the real-time nature of social media, proves impractical and may introduce inconsistencies in subjective tasks like content classification.

Recognizing this challenge, the need for an automatic content moderation pipeline for online platforms becomes a key necessity

2.1. Comparison between Existing Apps and DiscussIT

Existing online platforms like Reddit, Twitter, and Stack Overflow, while valuable, fall short of fully supporting college students' academic needs. Reddit's diverse content can be a double-edged sword, with irrelevant discussions overshadowing focused academic conversations. While Ed offers a more structured environment, its limitation to specific courses and colleges restricts the potential for broader knowledge sharing. Twitter, with its hashtag system, often presents fragmented information, making it difficult to find comprehensive resources on a specific topic. Similarly, Stack Overflow, geared towards technical problem-solving, lacks the broader academic discussions and collaborative aspects that students crave. Character limitations on Twitter further restrict the in-depth exploration of concepts, hindering collaborative learning. Overall, these platforms struggle to provide a focused environment with well-structured information that fosters academic collaboration among college students.

The purpose of DiscussIT is to transform how college students interact and engage with each other, faculty members, and alumni. By providing a dedicated platform tailored to their specific needs, DiscussIT will offer a specialized platform that is customized for a more connected, supportive, and academically enriching college experience.

III. SYSTEM DESCRIPTION

3.1 Requirement Description

1) For Web-App Building (Development):

a) Hardware Requirements:

- i. **Development Machine:** A computer (laptop or desktop) with at least 8 GB RAM and a multi-core processor.
- ii. **Web Browser for Testing:** Latest version of web browsers like Chrome or Brave.

b) Software Requirements:

- i. **Integrated Development Environment (IDE):** Latest version of Visual Studio Code for development.
- ii. **Operating System:** Windows 10 or above for the development machine.
- iii. **Development Tools:** Node.js, React, Express, Postman.
- iv. **Database System:** Integration with MongoDB Atlas database system for storing data.
- v. **Communication APIs:** Integration with communication APIs for functionalities.

2) For Web-App Usage (End-Users):

- a) **Software Requirements:** Latest updated version of any web browser.

3.2 System Overview

DiscussIT is a web application built using the robust MERN stack (MongoDB, Express.js, React.js, Node.js) and powered by the efficient Vite bundler, designed specifically for the needs of college students.

- **Multiple Login Options:** DiscussIT offers students the flexibility to choose their preferred login method. They can utilize their college email address for a direct connection or leverage the convenient Gmail login feature for a seamless and secure single sign-on experience.
- **Community Discovery:** Users navigate through a curated Explore Page. Here, they can delve into posts, discussions, and diverse content relevant to their academic interests.
- **Multi-format Post Creation:** Text-based communication has limitations, but DiscussIT goes beyond them. Students can produce thorough, educational posts with a range of content kinds. This covers polls, text, pictures, and even brief segments of code. The integrated Cloudinary service makes uploading and managing images simple, guaranteeing effective storage and a seamless user experience. Code snippets enable students to collaborate with peers to solve problems and share specific coding challenges, establishing a lively environment for problem-solving in technical subjects. Interactive polls enhance discussion and give students a way to assess views and opinions in the community.
- **Content Moderation Tools:** Provide mechanisms for flagging spam, and ensuring a safe and respectful online environment.

- Doubt Resolution:** Users engage in discussions through comments on posts, fostering a collaborative space for doubt resolution. This feature promotes peer-to-peer learning, allowing students to share insights, seek advice, and collectively tackle academic challenges.

3.2 System Workflow

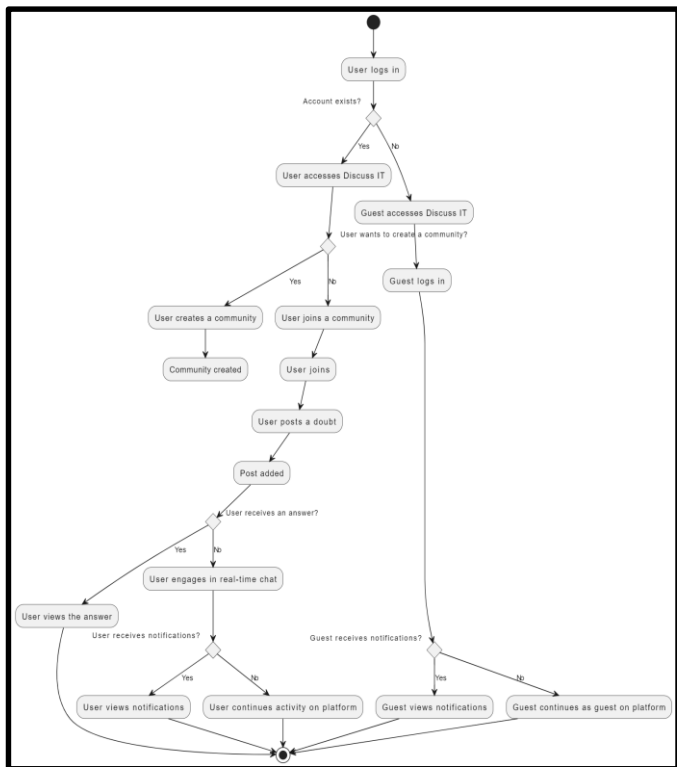


Fig.1. Activity Diagram of DiscussIT

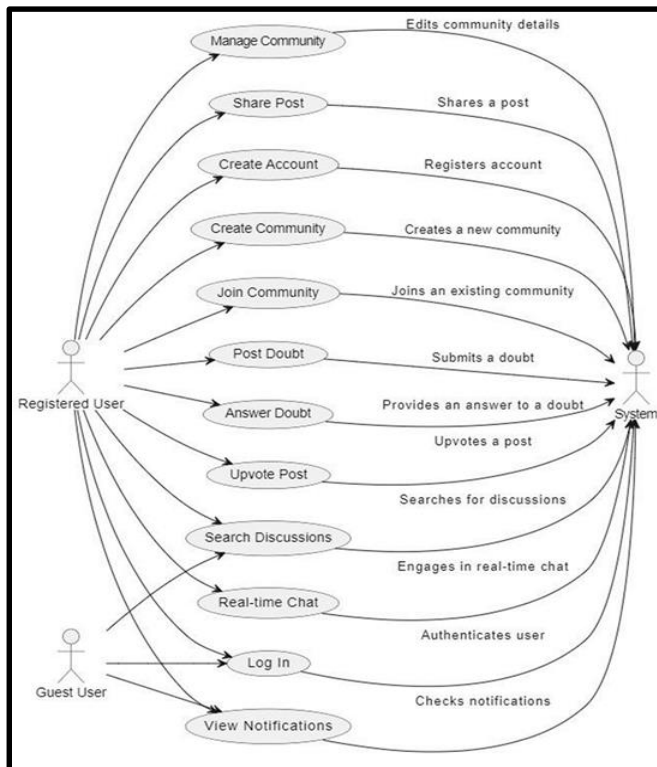


Fig.2. Usecase Diagram of DiscussIT

The activity diagram depicts the user interactions and flows within DiscussIT. The main process begins with a user logging in, and the system checks if an account exists. If an account is present, the user can access DiscussIT; otherwise, a guest can access it. The user then has the option to either create a new community or join an existing one. Once in a community, the user can post a question or doubt, which will be added to the platform. The user then waits for an answer, which can be resolved by other users through the comment section.

The use case diagram illustrates the various interactions and functionalities available to two types of users - Registered Users and Guest Users - within DiscussIT. Registered Users can perform a wide range of actions, including managing the community by editing details, creating new posts and communities, joining existing communities, posting and answering doubts or questions, upvoting posts, and searching for discussions. In contrast, Guest Users have more limited capabilities, primarily being able to log in to authenticate themselves as users and view posts.

3.4 Modules

1) User Registration and Login:

Users create accounts and provide basic information and affiliation details. The central element is a registration form with fields for users to enter their username, email address, and password. Below the standard registration form, there's an

alternative option to register using a Google account. This social login feature allows users to sign up quickly and conveniently without creating a separate DiscussIt password.

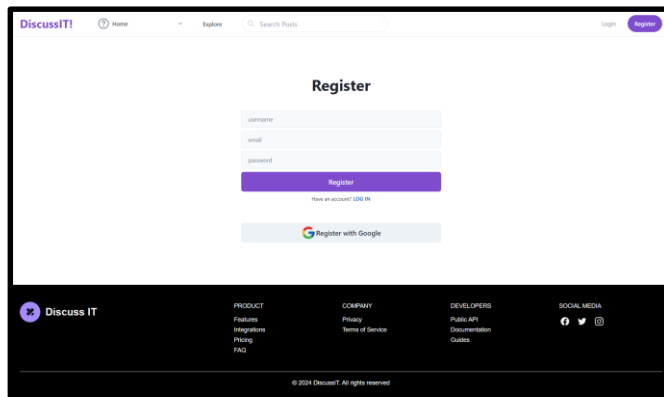


Fig.3. Register Page

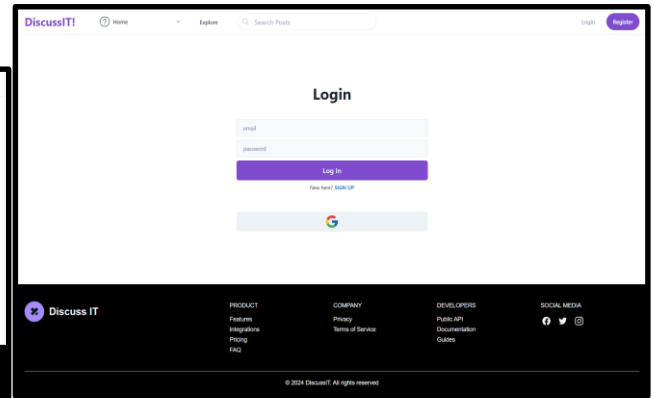


Fig.4. Login Page

2) Home Page:

The top section of the landing page includes an explore button, a search bar, and at the right corner two buttons for login and register. Users can directly use the search functionality without needing to login/signup, however, for any interaction with the post login/signup is a must.

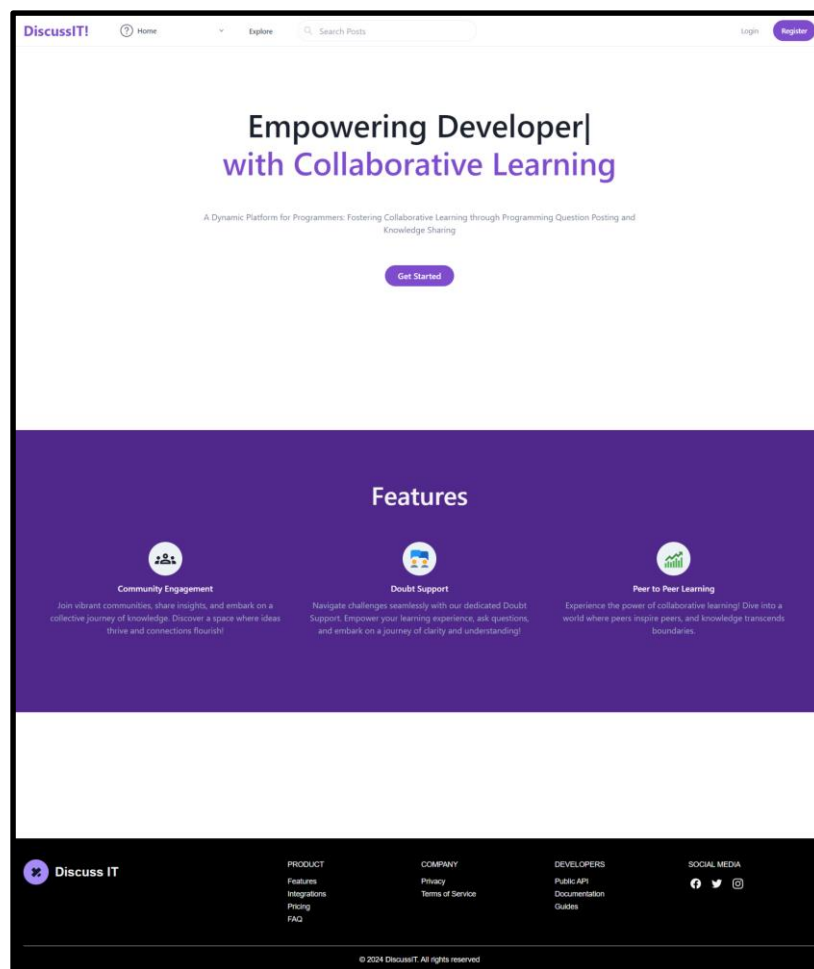


Fig.5. Home Page

3) Explore Page:

The explore page layout is divided into sections. The main content area displays a grid of cards. Each card represents a post that includes information like which community the post belongs to, title, description, images, and code snippets,

along with options of upvote/downvote and comments for each post. Users also get the option of sorting the posts based on 3 parameters (Latest, most upvotes, most comments), which are useful for filtering out relevant information.

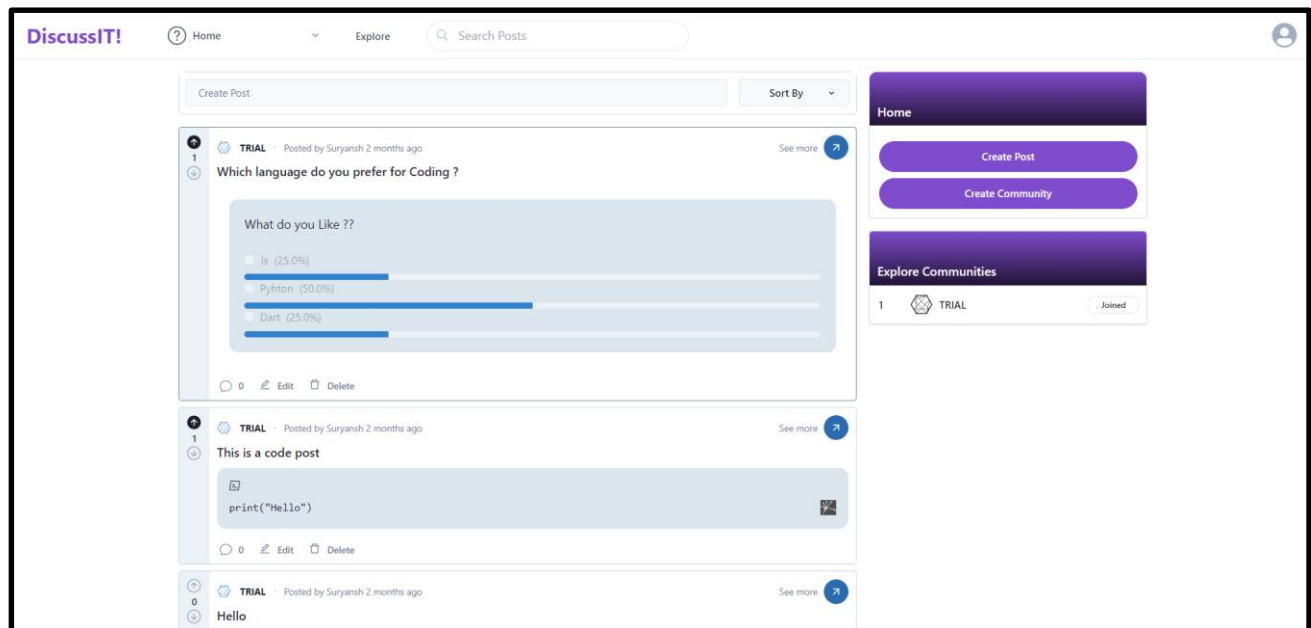


Fig.6. Explore Page

4) Post Creation Page:

The Post creation gives users the option to choose a community to post their doubts. Each post consists of a title and description. Users can also attach images with the post as well as code snippets which comes in handy while posting programming doubts.

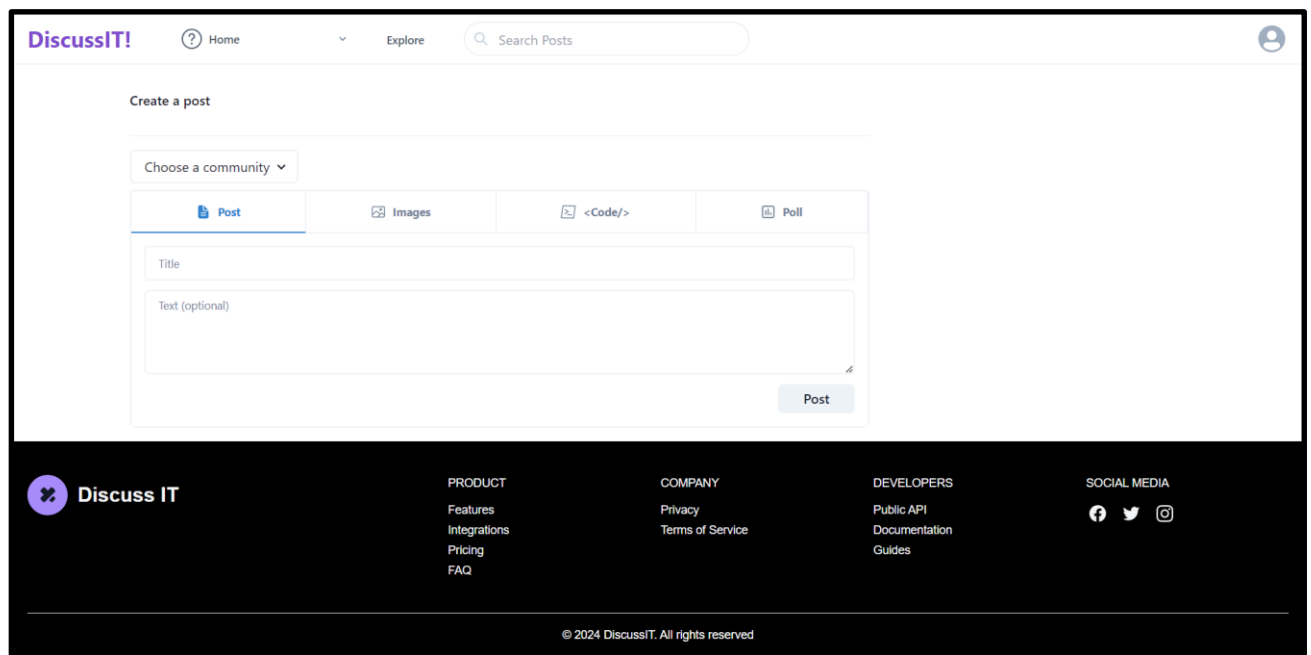


Fig.7. Post Creation Page(Supports multiple formats)

5) Search Page:

The Search feature allows users to explore posts based on specific keywords. Users simply enter a keyword of their choice, and the system retrieves relevant posts where the keyword appears in either the title or description. This functionality enables users to quickly find relevant content based on their needs.

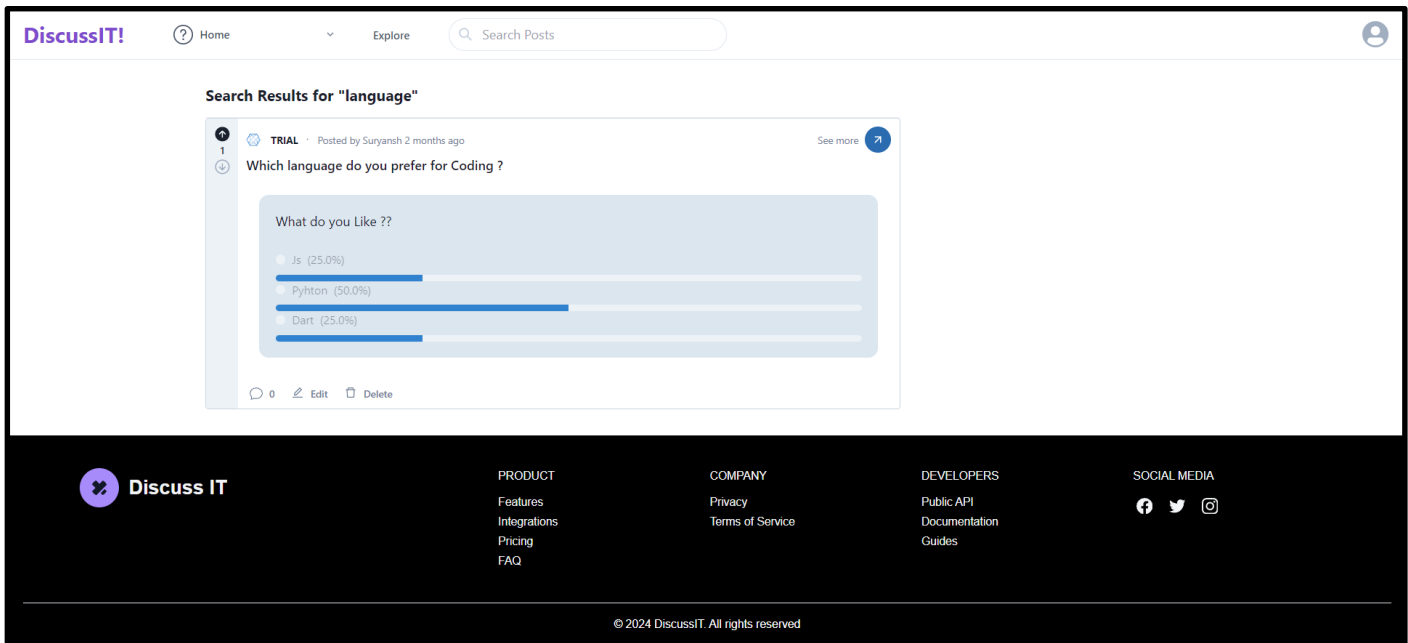


Fig.8. Search Page

IV. CONCLUSION

This project successfully built and tested DiscussIT, a web app designed to improve how college students learn online. The web app uses a combination of technologies (MERN stack) to create a strong and adaptable platform. DiscussIT encourages students to connect and actively participate by offering features that suit their needs. Students can find communities that match their interests, allowing them to have focused discussions and learn from different viewpoints. They can also share knowledge in creative ways beyond just text, making learning more engaging. Real-time features let students work together and solve problems as a group, helping them understand course material better.

V. FUTURE SCOPE

The future of DiscussIT holds exciting possibilities for even greater functionality and user engagement. Integrations with external services like video streaming platforms could allow for online lectures or group study sessions. Similarly, linking with code-sharing platforms would be particularly valuable for computer science students. These integrations would further tailor DiscussIT to specific learning needs. Looking ahead to accommodating a growing user base, DiscussIT's architecture is designed for scalability. This means the system can handle more users and data through upgrades to the server or by leveraging cloud computing solutions. Additionally, future enhancements could incorporate gamification elements, like badges and points, to motivate users to participate actively. Developing a mobile app would further improve accessibility and convenience, allowing students to seamlessly access DiscussIT on the go. By continuously adapting and evolving, DiscussIT has the potential to become an even more valuable tool for students, shaping the future of online learning.

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