GITSHUB - A COMPREHENSIVE PLATFORM FOR ACADEMIC NETWORKING, MENTORSHIP, AND CAREER DEVELOPMENT

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Abstract*—Traditional academic networking platforms often lack the specific functionalities needed to connect students, alumni, and faculty within educational institutions. GitsHub addresses these gaps by integrating secure user authentication through institutional emails, ensuring controlled access to academic resources via Dspace, and enabling seamless real-time collaboration. A key feature of GitsHub is its AI-powered chatbot, which provides instant academic assistance, career guidance, and administrative support, enhancing user engagement and accessibility. The platform's iterative and adaptive methodologies ensure secure authentication, real-time data management, and intelligent resource accessibility. Initial performance insights highlight GitsHub's potential to strengthen academic interactions, streamline knowledge sharing, and support professional networking. Furthermore, its scalable architecture allows for expansion to other educational institutions, creating a unified academic ecosystem that fosters collaboration and career development.

Keywords: *Academic Networking, Secure Authentication, Institutional Email Verification, Dspace Integration, Real-Time Collaboration, AI-Powered Chatbot, Career Guidance, Professional Networking, Adaptive Methodologies, Scalable Academic Ecosystem, Knowledge Sharing, Intelligent Resource Accessibility.*

I. INTRODUCTION

In the modern academic environment, the need for efficient networking and collaboration platforms is more pressing than ever. Traditional academic networking tools often fall short in addressing the specific needs of students, faculty, and alumni within educational institutions. Existing platforms such as LinkedIn and ResearchGate primarily focus on professional connections and research dissemination but lack institution-specific functionalities, secure access to academic resources, and real-time interactive features that foster deeper academic engagement. Additionally, many of these platforms do not provide a structured way for students to seek academic assistance, mentorship, or access to digital learning materials tailored to their institution's curriculum.

To bridge this gap, GitsHub is designed as a comprehensive academic collaboration platform that offers secure authentication, seamless digital resource access, and AI-powered assistance. By integrating institutional email-based authentication, GitsHub ensures that only verified users from a specific institution can access its features, providing a secure and exclusive environment for academic networking. Unlike generic networking sites, GitsHub is tailored to academic institutions, creating a community-driven ecosystem where students, faculty, and alumni can engage in meaningful interactions, mentorship, and professional development.

One of the key features distinguishing GitsHub from existing platforms is its integration with digital library resources, such as Dspace. These repositories enable users to access academic papers, research materials, e-books, and institutional publications without the typical access restrictions found on commercial research platforms. By providing seamless connectivity to institutional repositories, GitsHub enhances the learning experience and encourages scholarly collaboration.

A major advancement in GitsHub's functionality is the incorporation of an AI-powered chatbot that acts as a virtual academic assistant. This chatbot plays a critical role in improving user engagement by providing instant responses to academic qu ries, career guidance, research ecommendations,

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and administrative support. Whether students seek help with coursework, faculty members require research materials, or alumni need career advice, the chatbot ensures quick and reliable assistance, significantly reducing dependency on manual support systems. The inclusion of AI-driven automation enhances the overall efficiency of the platform, making academic interactions more accessible, personalized, and dynamic.

As the digital transformation of education accelerates, the demand for secure, scalable, and intelligent collaboration platforms is increasing. Many institutions struggle with fragmented communication channels, where students and faculty rely on multiple disconnected tools for academic interactions, library access, and professional networking. GitsHub unifies these functionalities into a single, integrated platform, fostering a cohesive academic environment that enhances engagement and productivity.

Beyond academic collaboration, GitsHub supports professional networking, allowing users to connect with peers, mentors, and industry experts within their institution. By bridging the gap between academic learning and career development, the platform helps students build valuable connections that extend beyond their educational journey, improving their employability and career prospects.

To ensure long-term adaptability and user satisfaction, GitsHub follows an iterative development methodology, continuously refining its features based on user feedback and technological advancements. This agile approach enables the platform to remain relevant in an ever-evolving academic landscape, accommodating new tools and integrations that enhance user experience.

This study explores how GitsHub revolutionizes academic networking by integrating AI-driven automation, secure authentication, and digital resource accessibility. By presenting insights from the platform's initial deployment, the research highlights its impact on academic collaboration, resource utilization, and professional growth. The findings underscore how institution-specific networking platforms like GitsHub can serve as scalable models for other educational institutions, fostering a more connected, knowledge-driven academic ecosystem.

II. Literature Review

The development of GitsHub, an academic networking platform integrating secure authentication, real-time collaboration, digital resource accessibility, and AI-powered chatbot assistance, is supported by various research studies. This literature review examines existing research related to networking platforms, SaaS implementation, agile development, security in cloud services, and authentication systems—all of which are critical to the architecture and implementation of GitsHub.

The study "Networking via LinkedIn: An Examination of Usage and Career Benefits" by Davis, J., Wolff, H.-G., Forret, M. L., Sullivan, S. E. (2020) explores LinkedIn as a professional networking platform, emphasizing the career benefits of active engagement and strategic networking. The research highlights that users who actively participate—such as by joining groups, posting content, and interacting with industry professionals—gain more career opportunities, professional visibility, and social capital compared to passive users. GitsHub, while similar to LinkedIn in fostering networking and collaboration, focuses on academic engagement. Based on this study, GitsHub should encourage active participation through discussion forums, mentorship program, and research collaboration, implement AI-driven recommendations to connect students with faculty and alumni based on academic interests, and provide career-enhancing tools like AI-powered chatbots for career guidance and research networking.

The paper "Agile Logic for SaaS Implementation: Capitalizing on Marketing Automation Software in a Start-Up" by Mero, J., Leinonen, M., Makkonen, H., Karjaluoto, H. (2022) discusses how Software-as-a-Service (SaaS) applications benefit from agile methodologies, enabling rapid implementation, scalability, and adaptability to user needs. It also highlights the importance of user-centric design and iterative development for ensuring the platform meets user expectations, particularly in the context of marketing automation for start-ups. GitsHub, which follows an agile development model, can apply these principles by focusing on continuous improvement based on user feedback, ensuring scalability and seamless integration with academic repositories like Dspace, and incorporating automated onboarding and AI-driven interactions, such as chatbot-assisted navigation and academic recommendations, to enhance user experience.

The paper "Understanding Efficacy of Off-Campus Remote Access Services: Use Case of Dspace and MyLOFT" by Sharma, R., Kaur, A. (2022) examines off-campus remote access services, focusing on Dspace and MyLOFT, in enabling seamless access to academic content and digital libraries. It highlights how digital repository systems assist students and researchers in efficiently accessing knowledge while ensuring security and institutional authentication. For GitsHub, this paper's insights are relevant as it integrates Dspace to provide secure, institution-specific access to academic materials. Ensuring seamless authentication and user verification is vital to prevent unauthorized access, and AI-powered assistance can further help users find relevant academic resources based on their research interests.

The paper "Adopting Agile Software Development: Issues and Challenges" by Hajjdiab, H., Taleb, A. S. (2015) outlines the challenges of agile software development, such as team coordination, iterative testing, and adaptability to changing requirements. It also emphasizes the benefits of agile methodologies, including rapid feature delivery, continuous improvement, and enhanced collaboration within software teams. For GitsHub, this research is relevant as it follows an agile development approach, incorporating incremental updates based on user feedback. The real-time collaboration feature of GitsHub benefits from agile methodologies, ensuring a dynamic and evolving platform, while agile frameworks allow for quick adaptation to user needs, improving the efficiency and usability

of the platform.

III. METHODOLOGY

GitsHub is an academic networking and collaboration platform designed to foster seamless interaction between mentees (students) and mentors (faculty and alumni). It offers a range of features aimed at enhancing academic growth and professional development. The platform enables mentees to view available mentors, request video calls for career guidance, and interact in real-time. Mentors, on the other hand, can manage their availability and respond to mentee requests.

Built using React for the frontend, Express.js for the backend, and MongoDB for data storage, GitsHub ensures a robust, scalable solution for both users and administrators. The admin module allows for effective user management, ensuring that only approved mentees and mentors can access the platform. Additionally, integration with Dspace provides users with access to valuable academic resources, such as previous year's questions and e-library content.

The platform incorporates Jitsi for video conferencing and Nodemailer for email notifications, ensuring seamless communication between mentees and mentors. Chatbase, an AI-driven chatbot, is also integrated to offer real-time academic assistance, enhancing the overall user experience. The project aims to improve academic networking, streamline career guidance, and foster collaboration within educational institutions.

GitsHub is designed to create a secure, user-friendly environment for students and faculty, with a focus on scalability, performance, and integration with key educational resources.

A. System Design and Architecture

The GitsHub platform consists of three primary modules: Mentee, Mentor, and Admin. These modules are designed to facilitate seamless interaction between mentees (students) and mentors (faculty and alumni). The platform is built on a client-server architecture, with a clear separation between the frontend and backend.

- **Backend** The backend is developed using Express.js, a minimal and flexible web framework for Node.js. It handles user authentication, database operations, video call requests, email notifications, and integration with external services such as Dspace and Jitsi.
- **Frontend:** The frontend is built using React and Vite. Vite is used as the build tool for faster development and improved performance during the build process, while React is used for building the dynamic and interactive user interface. React's component-based structure allows for efficient management of different views (Mentee, Mentor, and Admin).
- **Database:** The platform uses MongoDB for storing user data (e.g., mentee and mentor profiles, video call requests, notifications, etc.). MongoDB's flexible schema design makes it ideal for managing the diverse data involved in this platform.
- **Authentication:** Username-password authentication is used for user registration and login. For security, bcrypt is employed to hash passwords, and JWT (JSON Web Tokens) is used for user sessions and authentication.
- **Architecture:** The system architecture is modular, where different functionalities (e.g., video call requests, mentor-mentee interactions, admin management) are handled by separate components. The API layer ensures communication between the frontend and backend, maintaining a seamless data flow.

B. Authentication and User Management

The authentication and user management system in GitsHub ensures secure access by allowing users to register with username-password authentication and using JWT tokens for secure sessions. Admins manage user access through a dedicated admin module, where they can approve or reject mentee and mentor registrations, updating user statuses accordingly in the MongoDB database. This system ensures only authorized users have access to the platform.

Authentication Process: Users, including mentees and mentors, can create accounts using username-password authentication. Upon successful login, the system issues JWT (JSON Web Tokens) to enable secure sessions across the platform. These tokens are used to authenticate users for subsequent interactions, ensuring that the user's identity is verified for each request. User roles such as Mentee, Mentor, and Admin are assigned based on the user's registration details and stored securely in the MongoDB database . This role-based authentication helps manage access control, ensuring that users only have access to features relevant to their role.

Admin Control: The Admin module is developed using React and includes a dedicated dashboard for managing user registrations. Admins have the authority to approve or reject mentee and mentor requests. This feature ensures that only authorized individuals can gain access to the platform, maintaining security and integrity. When an admin approves or rejects a request, the user's status in the database is updated accordingly, either granting or denying access to the platform. The admin's decisions are crucial in ensuring the controlled, secure environment of the platform, where only verified users can participate.

C. Mentee and Mentor Interaction Flow Mentee Module:

View Mentors: Mentees can browse available mentors, including their profiles and available time slots for video calls.

Video Call Request: After selecting a mentor, the mentee sends a video call request with preferred dates and times. Notifications and Emails: The mentee's request triggers notifications and email alerts to the mentor, using Nodemailer. Once the mentor reviews the request, they can either accept or reject it.

Mentor Module: Mentor Review: Mentors receive requests and review them. They can accept or reject a video call request.

Notifications and Emails: Notifications and emails are sent to the mentee, informing them of the mentor's decision.

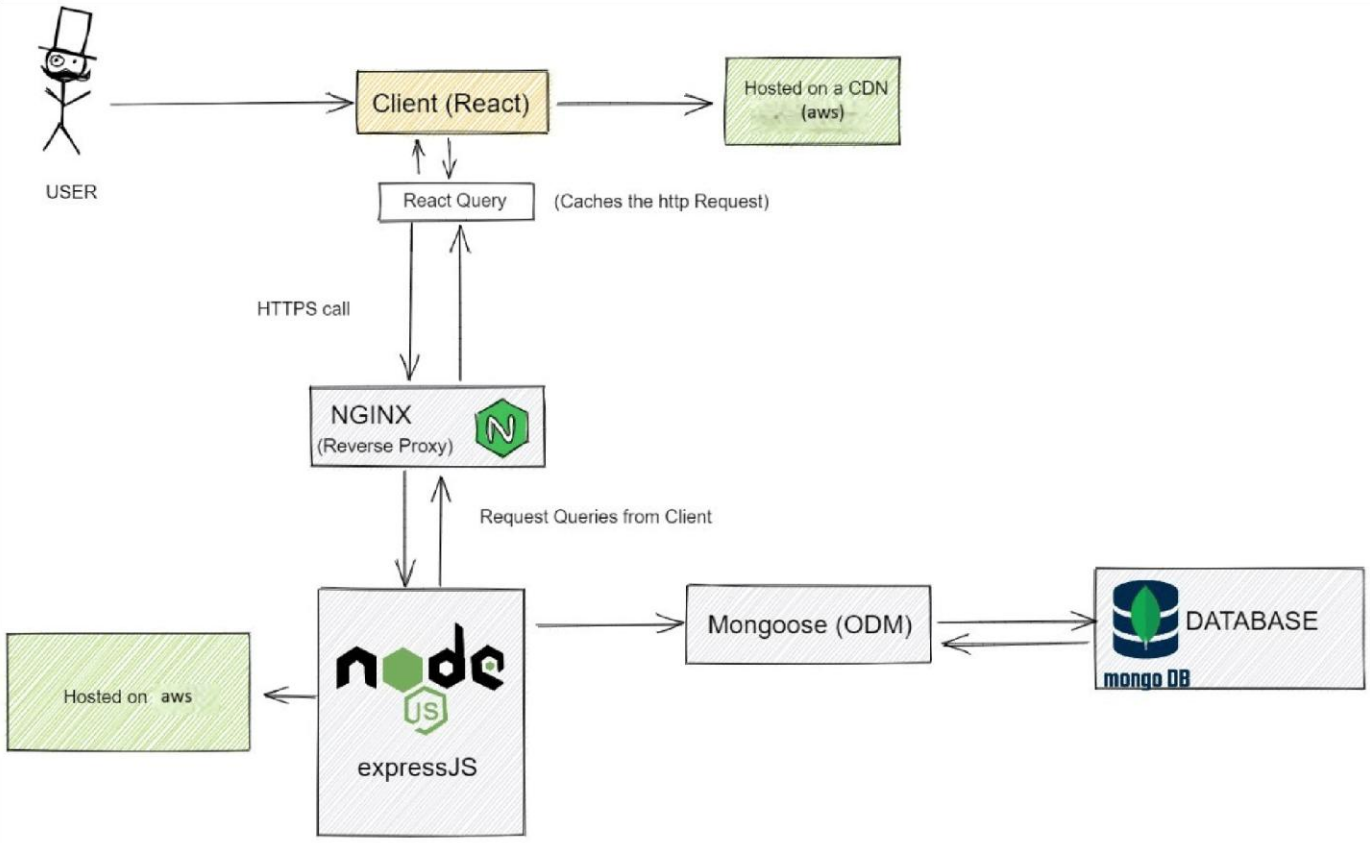

Fig. 1. System Architecture

Video Conferencing with Jitsi: Once the request is accepted, mentees and mentors connect through Jitsi for the video call. The integration of Jitsi ensures a smooth video conferencing experience within the platform.

D. Admin Module

Admin Control: The Admin module allows the administrator to approve or reject user registrations, ensuring that only authorized individuals gain access to the platform. Admins have full control over user access, enabling them to maintain the integrity and security of the system. Through this module, admins can oversee and manage the overall functionality of the platform, including handling user roles and access rights.

User Management: The admin has access to a dedicated dashboard that displays all mentee and mentor registration requests. From this dashboard, the admin can evaluate user credentials and make decisions to approve or reject requests accordingly. This feature ensures that only verified users are granted access, keeping the platform secure and organized by controlling user participation and roles.

E. Dspace Integration

GitsHub integrates with Dspace, an academic repository, via iframe to provide users with seamless access to previous year's question papers and e-library resources. This integration allows users to browse and utilize academic content directly within the platform, eliminating the need to navigate away from GitsHub, thus enhancing the overall user experience by centralizing all relevant academic resources in one place.

F. AI Chatbot Integration

Chatbase Integration: Chatbase, an open-source chatbot, is integrated into GitsHub to assist users by providing real-time academic support. The chatbot, integrated via Chatbase, was trained using domain-specific academic materials, including review papers related to mentorship and academic queries. During the training phase, preprocessing steps such as text normalization, stopword removal, and tokenization were applied to structure the data efficiently. We used Chatbase's support for uploading datasets in text and QA formats. The model was fine-tuned to focus on relevant academic keywords, mentor-related queries, and career guidance questions. While default hyperparameters were retained due to the no-code nature of Chatbase, the model configuration included confidence threshold tuning and intent categorization for improved accuracy.

Natural Language Processing (NLP): The chatbot utilizes Natural Language Processing (NLP) to process and understand user queries, allowing it to deliver contextual responses. This capability enables the chatbot to assist users effectively by providing information and solving academic-related issues.

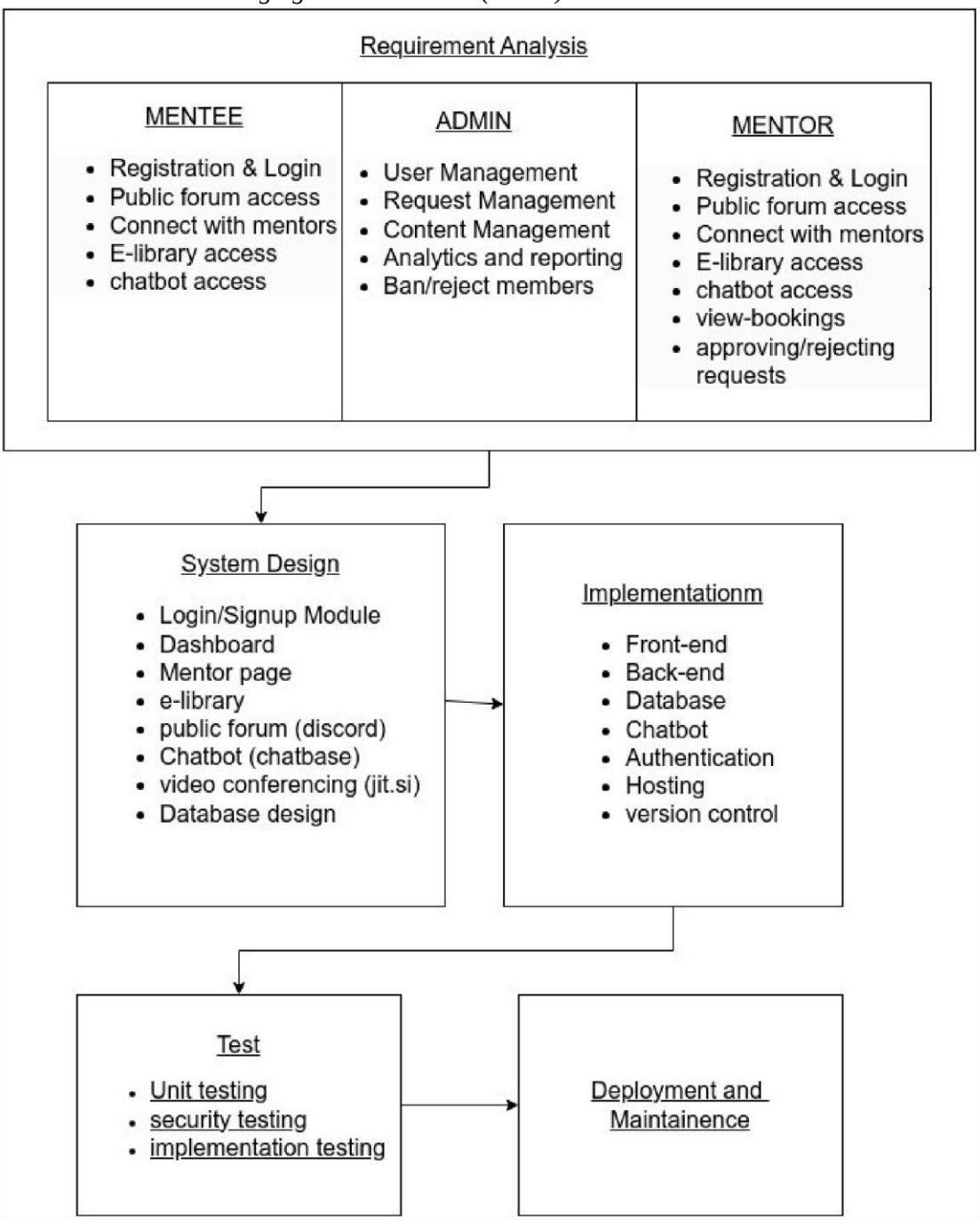

Fig. 2. Flowchart

NLP ensures that the chatbot's responses are tailored to the specific needs and context of the user's query, making the interaction more efficient and user-friendly.

G. Email Notifications with Nodemailer

Nodemailer Integration: Nodemailer is integrated into GitsHub to handle email notifications across the platform. It sends mentor request notifications to inform mentors about incoming video call requests from mentees, ensuring timely responses. Additionally, Nodemailer sends approval or rejection emails to both mentees and mentors, notifying them of status changes, such as when a request is accepted or declined. The system also uses Nodemailer to send admin alerts regarding user registration requests and platform updates, keeping the administrators informed about the ongoing user management process.

H. Technology Stack

The technology stack for GitsHub is designed to ensure scalability, performance, and a seamless user experience. For

the frontend, React is used in combination with Vite and TypeScript to build a dynamic, responsive user interface. The backend is powered by Express.js and Node.js, providing a robust framework for handling server-side operations. MongoDB is the database of choice, with Mongoose used to manage database schemas and queries.

Authentication is handled securely using JWT for token-based authentication and bcrypt for password hashing. For email notifications, Nodemailer is integrated to handle sending notifications for various actions, such as mentor requests, status updates, and admin alerts. Jitsi API is used for video conferencing, enabling real-time communication between mentees and mentors. The platform also integrates Chatbase, an open-source AI-powered chatbot, to provide real-time academic assistance. Lastly, Dspace is integrated via an iframe to provide access to academic resources, including previous year's question papers and e-library content.

I. Implementation

1. System Design and Database Schema: The first step involves designing the system components and defining the database schema to handle various entities such as users, mentors, mentees, requests, and notifications. The data model ensures efficient management and interaction between these entities, storing necessary information for user profiles, requests, and video call histories in MongoDB.

2. Frontend Development: The frontend development focuses on implementing the Mentee and Mentor modules to allow browsing of profiles, management of user information, and facilitating mentor-mentee interactions. The Admin module is developed for managing user access, approvals, and ensuring proper role-based access control across the platform.

3. Backend Development: Express.js is set up to handle RESTful API requests, managing communication between the frontend and backend. JWT and bcrypt are used for secure user authentication, ensuring that only authorized users can access the platform. MongoDB is integrated to store data related to user profiles, requests, and video call histories.

4. Video Call Integration: The integration of the Jitsi API ensures seamless real-time video communication between mentees and mentors. Proper configurations and testing are conducted to ensure that video calls are stable and provide a smooth experience for users during mentorship sessions.

5. Chatbot Integration: Chatbase, an AI-powered chatbot, is integrated to provide automated academic support and assist users in navigating the platform. The chatbot is trained with relevant content to offer real-time assistance, answer user queries, and guide mentees and mentors through various platform features.

6. Testing: Unit testing and integration testing are performed using frameworks like Jest and Mocha to ensure that individual components and the entire system work as expected. Additionally, User Acceptance Testing (UAT) is conducted to validate the platform with real users (mentees and mentors), gathering feedback to ensure it meets user expectations and is intuitive.

7. Deployment: The final platform is deployed to cloud servers (such as AWS or Azure) to ensure scalability and high availability. A CI/CD pipeline is set up for continuous integration and deployment, allowing for automatic testing, version control, and smooth updates across the platform.

J. Testing and Evaluation

1. Unit Testing: Unit testing will be performed to ensure that individual features of each module, such as mentee registration, mentor video call requests, and admin control, function correctly. Each module will be tested in isolation to identify and fix any issues before integration.

2. Integration Testing: Integration testing will verify the end-to-end flow of user interactions, such as a mentee sending a request, a mentor receiving the request, and the notification system being triggered. This ensures that all system components work together as expected and that data flows correctly between modules.

3. User Acceptance Testing (UAT): Real users, including mentees and mentors, will interact with the platform to evaluate its usability, functionality, and performance. Feedback from UAT will be gathered to identify areas for improvement and to ensure the platform meets user expectations and is intuitive to navigate.

4. Performance Testing: Performance testing will be conducted to assess the platform's responsiveness and scalability, particularly during peak usage. Multiple concurrent users will be simulated to ensure the platform can handle real-time features, such as video conferencing, without performance degradation. This helps guarantee the platform's stability under load.

K. Deployment

Cloud Deployment: Deploy the platform on AWS for scalability and high availability. Use services like AWS EC2 for hosting, S3 for storage, and RDS for any relational database needs.

IV. RESULTS AND DISCUSSION

The implementation of GitsHub has shown significant promise in addressing gaps left by traditional academic networking platforms such as LinkedIn and ResearchGate. While these platforms focus on general professional networking, GitsHub offers a more tailored solution for academic collaboration, mentorship, and resource sharing. Unlike existing platforms, GitsHub integrates real-time video conferencing via Jitsi, allowing mentees and mentors to interact seamlessly within the platform. The platform also offers direct access to academic resources through Dspace, providing valuable materials like previous year's question papers and e-library content. Additionally, GitsHub's AI-powered chatbot helps users navigate the platform, offering personalized academic support and career guidance—an innovative feature that traditional platforms do not provide. The integration of a secure admin-controlled approval process ensures that only verified users gain access to the platform,

Feature	LinkedIn	ResearchGate	GitsHub
Primary Focus	Professional networking and career development	Academic networking and research sharing	Academic networking, mentorship, and career development
User Roles	Professionals, students, recruiters, companies	Researchers, scholars, students	Mentees (students), Mentors (faculty and alumni), Admins
Video Conferencing	No built-in video conferencing	No built-in video conferencing	Integrated real-time video conferencing with Jitsi
Access to Academic Resources	Limited to shared content, articles, posts	Focus on research papers, publications, and articles	Direct integration with Dspace for academic resources (e.g., question papers, e-library)
AI-Powered Support	No AI assistance or chatbot	No AI assistance or chatbot	AI-powered chatbot for real-time academic support and career guidance
User Authentication	Basic email/password and external accounts (LinkedIn, Google)	Basic email/password authentication	Username/password authentication with JWT tokens for secure sessions
Mentorship/Student-Teacher Interaction	Indirect, via connections or messaging	Indirect, via researcher profiles and publications	Direct interaction through video calls, with scheduling and requests managed within the platform
Approval Process	Open to anyone with a valid email	Open to anyone with a valid email	Admin-controlled approval for mentees and mentors before platform access
Mobile Support	Full mobile app support	Full mobile app support	Planned mobile app development for enhanced accessibility
Data Privacy and Security	Standard privacy settings	Standard privacy settings	Admin-controlled user access, ensuring verified and secure interactions
Platform Focus	Professional networking and job opportunities	Academic collaboration and research sharing	Academic networking and mentorship with integrated career development tools
User Interaction	Messaging, connection requests, job postings	Publication sharing, research discussions	Mentor-mentee interaction through video calls, request handling, and real-time collaboration

TABLE I
COMPARISON OF EXISTING PLATFORMS AND GITSHUB

adding an extra layer of security and control not typically found in other networking platforms.

While the AI-powered chatbot effectively supports basic academic queries, the current configuration lacks advanced training parameters control, such as batch size, learning rate, and deep model customization. Future versions of Gitshub can leverage more customizable NLP frameworks to enhance query handling, integrate multilingual support, and utilize token-level embeddings for deeper context understanding. Additionally, the integration of features such as screen sharing and real-time collaborative document editing within the video conferencing tool would further improve the mentoring experience. Mobile optimization is another area for growth, as developing a native mobile app would increase accessibility and engagement for users on smartphones or tablets. Overall, GitsHub addresses key needs within the academic community, offering a comprehensive platform for

mentoring, resource access, and academic collaboration. With continued improvements, such as enhanced AI capabilities and mobile app development, GitsHub has the potential to become an essential tool for students, faculty, and alumni in educational institutions.

V. Future Scope

The future scope of GitsHub includes several opportunities for enhancing user experience, expanding platform capabilities, and increasing applicability across educational institutions. One key area for development is the integration with more academic resources beyond Dspace, such as additional academic repositories, journals, and open-source platforms. This would allow users to access a wider range of scholarly content. Mobile app development for both Android and iOS would increase accessibility, enabling mentees and mentors to interact on-the-go, receive real-time notifications, and access resources conveniently. Additionally, advanced AI features can be implemented, including enhanced chatbot capabilities for complex queries, personalized learning recommendations, and career pathway suggestions based on mentee profiles.

Further developments could include incorporating gamification elements, such as badges, leaderboards, and progress tracking, to boost engagement and motivation for both mentees and mentors. Real-time collaboration tools like document editing, whiteboards, and group discussions could be added, enabling better collaboration during academic mentoring sessions. GitsHub can also enhance global accessibility by implementing multi-language support, making the platform usable for a more diverse audience across international educational institutions.

In future iterations, the chatbot can be improved to support multilingual queries, deeper contextual understanding, and personalized academic responses through integration with large language models and expanded datasets.

In addition, integrating career platforms and job boards could help mentees find tailored job recommendations and internships, providing a bridge between academic mentorship and professional development. To enhance security and trust, GitsHub could adopt blockchain technology for managing educational credentials and certificates. With continuous improvements in AI-driven features, video conferencing tools, and data analytics, GitsHub can evolve into a more comprehensive platform, offering a well-rounded academic and professional development experience for students, faculty, and alumni.

VI. Conclusion

This research demonstrates the development of GitsHub, a platform designed to enhance academic networking and mentorship between students, faculty, and alumni. By integrating secure user authentication, role-based access control, and real-time interaction tools such as Jitsi for video conferencing and Chatbase for AI-driven academic support, GitsHub provides a robust solution for fostering academic collaboration and career development. The platform's integration with Dspace for access to valuable academic resources further enriches the user experience, making it a comprehensive tool for both professional and academic growth.

The implementation of GitsHub was carried out through a structured approach, ensuring the efficient operation of each module, including mentee, mentor, and admin functions. Using modern technologies such as React, Express.js, and MongoDB, the platform ensures scalability, high performance, and secure data management. The iterative development process, combined with thorough testing, has resulted in a reliable platform that meets the needs of its users while allowing for continuous improvements.

Looking to the future, GitsHub offers significant potential for further growth, including the integration of more academic resources, advanced AI capabilities, mobile app development, and multi-language support. These enhancements will expand the platform's reach and functionality, allowing it to better serve educational institutions worldwide. Through this research, GitsHub sets the stage for the future of academic networking and mentorship, driving both personal and professional development within the academic community.

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