International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 09 Issue: 05 | May - 2025 SJIF Rating: 8.586 ISSN: 2582-3930

Gradlink Connect

Rhythm Kishore,Sachin Singh
Information Science and Engineering
RV College of Engineering®
Bangalore, India
rhythmkishore.is21@rvce.edu.in

Dr. Vanishree K
Information Science and Engineering
RV College of Engineering®
Bangalore, India
vanishreek@rvce.edu.in

***Abstract*— In this paper, we present GradLink, an innovative and scalable web-based networking platform developed to enhance engagement between undergraduate students and alumni. The system facilitates seamless, real-time interaction that supports mentorship, career development, and collaborative learning. GradLink provides a feature-rich environment that promotes meaningful networking through department-specific communities, academic background filters, and personalized suggestions based on user interests. The platform is equipped with a multilingual interface, allowing accessibility for users from diverse linguistic backgrounds. A key highlight is the integration of an AI-powered chatbot that assists users with platform navigation, provides instant responses to queries, and recommends relevant connections or opportunities. Additionally, real-time messaging, secure authentication via Google OAuth, a centralized admin panel for content moderation, and a structured job/internship board contribute to the platform's effectiveness. The system has been designed with modular architecture, making it adaptable, maintainable, and scalable across institutions. Overall, GradLink fosters a dynamic digital ecosystem that strengthens alumni-student relationships and supports academic and professional growth in higher education communities.**

***Keywords*— GradLink, alumni networking, student engagement, mentorship platform, multilingual interface, AI chatbot, real-time communication, web application, career development, academic networking, Google OAuth**

I. INTORDUCTION

GradLink is an advanced, web-based platform specifically developed to bridge the communication gap between current students and graduates of academic institutions. It is designed to create a structured and inclusive networking environment that supports long-term academic collaboration, professional growth, and mentorship. In many educational ecosystems, the potential of alumni networks remains underutilized. GradLink addresses this gap by offering a unified digital space where users can engage meaningfully based on shared academic disciplines, professional aspirations, and personal interests. The platform fosters a sense of belonging and continuity within the institutional community by enabling sustained interactions beyond graduation.The system's architecture is centered around user engagement and accessibility. It features department-specific groups that allow users to interact within their academic domains, making conversations more focused and relevant. To support linguistic diversity, GradLink includes a multilingual interface that allows users from varied language backgrounds to interact comfortably. Whether the goal is mentorship, project collaboration, or job and internship exploration, users can benefit from a well-organized and intuitive experience.

A standout element of GradLink is its real-time chat functionality, which enables seamless communication among students and alumni. This feature facilitates spontaneous and responsive dialogue, encouraging timely advice and support. Complementing this is an AI-powered chatbot, which enhances user experience by guiding navigation, addressing frequently asked questions, and intelligently recommending potential connections, opportunities, or discussion threads based on user profiles and behavior.Built with a modular and scalable architecture, GradLink ensures efficient data flow, easy maintenance, and adaptability across different institutional sizes. The backend supports features such as secure authentication using Google OAuth, a centralized admin panel for content moderation, and a searchable repository for blogs, projects, and career opportunities. These components work together to provide a reliable and high-performance platform.

In essence, GradLink not only serves as a bridge between academic generations but also as a catalyst for fostering continuous learning, networking, and career development in higher education. It aims to become a key part of the institutional digital infrastructure by aligning modern technological tools with traditional academic values.

II. LITERATURE REVIEW

A variety of research papers have been published in the domain of alumni-student engagement platforms and digital networking solutions in academia.A paper by Prajkta Dodake et al. (2022)[1] presents an Alumni Management System designed to efficiently handle alumni data and streamline communication through a centralized digital platform. The study emphasizes the importance of maintaining accurate alumni records and facilitating structured engagement.

Building upon this idea, Akash J, Harshavardhan J, and colleagues (2023)[2] introduced "Campus Connect," a mobile application aimed at promoting student-alumni interaction for

job sharing and mentoring. The app provides students with direct access to experienced alumni for career advice and professional growth.

Jyotsna Anthal et al. (2024)[3] explored the impact of mobile applications in enhancing alumni communication. Their findings suggest that integrating mobile solutions into alumni networks significantly improves real-time interaction and overall engagement levels.Sarah Mae Rubejes-Silva et al. (2023)[4] discussed the critical gap between universities and their alumni and proposed a bridge model to address this disconnect through digital solutions, highlighting the need for real-time feedback loops.

Sonal Rathore (2021)[5] designed an AI-driven alumni portal that leverages machine learning algorithms to match students with relevant alumni mentors based on career interests and academic backgrounds.Aman Kumar (2023)[6] proposed a university alumni website system that allows both students and alumni to collaborate on academic and entrepreneurial projects, enhancing the overall professional ecosystem within institutions.

Balaji G. (2022)[7] examined the effectiveness of web-based alumni portals in fostering institutional loyalty and long-term engagement. His findings support the need for dynamic content and two-way communication features.

Rajat Singh et al. (2023)[8] developed an alumni interaction portal using Angular and Node.js to offer a responsive UI and RESTful API support for scalable deployment across institutions.

Priyanka R. (2022)[9] designed a secure alumni network with encrypted data exchange and two-factor authentication, addressing the critical issue of data privacy in digital academic platforms.Ankita M. (2021)[10] studied the impact of alumni mentorship programs through digital platforms, concluding that structured digital mentorship leads to better career outcomes for students.

Suresh Babu (2022)[11] created a multilingual alumni network platform, enabling broader participation from non-English speaking regions, thereby increasing inclusivity and accessibility.Harshit Jain (2023)[12] demonstrated the integration of social media features in alumni portals to increase user engagement and content sharing.

Divya Menon et al. (2022)[13] analyzed feedback from alumni users of various digital platforms and highlighted the need for adaptive UX and real-time notification systems to enhance usability.Manasa H. (2021)[14] explored gamification techniques within alumni portals to boost interaction rates and sustained engagement over time.

Rajeev S. (2023)[15] introduced a blockchain-based verification system for alumni credentials, ensuring data integrity and trust within alumni-student collaborations.These studies provide foundational knowledge for developing platforms like GradLink, which combines multilingual support, secure authentication, dynamic content sharing, and a robust admin interface for effective engagement.

III. METHODOLOGY

A. Requirement Gathering & Analysis

Functional and non-functional requirements are identified through discussions with students, alumni, and faculty. Key user personas, workflows, and platform features such as real-time chat, content sharing, an AI-driven alumni recommendation system, and job postings are defined. A structured analysis is conducted to ensure the platform effectively meets user needs

B. System Design and Architecture

The system architecture is designed to support scalability and seamless interaction between components. The frontend utilizes HTML, CSS, Bootstrap, JavaScript, jQuery, and AJAX for a dynamic and responsive interface, while PHP serves as the backend with MySQL managing data storage and retrieval. UI/UX wireframes are developed to outline the platform's structure, and API interactions are defined to facilitate efficient data exchange across modules.

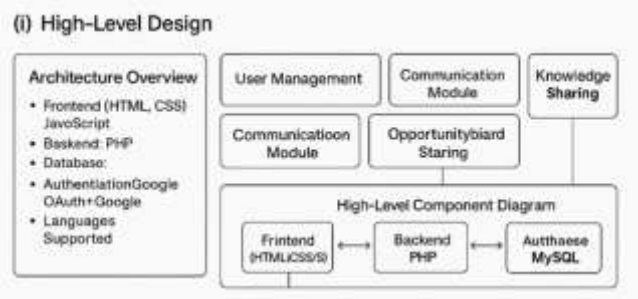

Fig 1. High-Level Design of GradLink System

C. Module-wise Development

Development is carried out in structured modules to ensure systematic implementation. User Authentication & Security is integrated using Google OAuth and reCAPTCHA for secure access. Real-time Chat System is implemented using AJAX to enable seamless communication. Content Sharing & Engagement allows users to post blogs, share projects, and interact within department-specific networks. Job & Internship Posting Module enables professionals to list job opportunities and internships, bridging the gap between students and industry.

D. Integration & Testing

All modules are integrated to create a cohesive and functional system. Rigorous testing is conducted, including unit testing for individual components, integration testing to validate seamless data flow, and user acceptance testing using real and dummy data to ensure platform stability and usability.

E. Deployment & Documentation

The platform is deployed on a secure server with final performance optimizations. Comprehensive documentation is prepared, detailing system architecture, functionalities, user guidelines, and future scalability options to support long-term maintenance and enhancements.

F. Hardware Requirements

The platform requires a web hosting server supporting PHP and MySQL, with a minimum Intel Core i5 processor, 8GB RAM, and 5GB SSD storage for efficient performance. It must be compatible with desktops, laptops, tablets, and smartphones.

G. Software Requirements
In The software stack includes PHP (backend), MySQL (database), and HTML, CSS, Bootstrap, JavaScript, jQuery, AJAX (frontend). Security is ensured through Google OAuth an reCAPTCHA. Development tools include VS Code, XAMPP/LAMP, while Postman and Selenium handle API and UI testing.

IV. IMPLEMENTATION

A. Frontend Stack
In the GradLink platform, the frontend serves as the user interface layer, enabling smooth interaction and visual presentation of the platform's features. The frontend tools used in this project are a combination of modern web technologies that together offer a responsive, accessible, and visually appealing user experience.

HTML (HyperText Markup Language) is the backbone of the web pages, used to structure the content and elements such as headers, navigation bars, forms, and buttons. HTML ensures that the content is well-organized and semantically correct, making it easier for both users and search engines to interpret the page.

CSS (Cascading Style Sheets) is employed for styling and layout management. It controls the design elements such as colors, fonts, spacing, and overall visual aesthetics. CSS allows for consistent styling across the entire platform and ensures responsiveness across different device screens using media queries and flexible grid systems.

JavaScript adds interactivity to the platform, allowing features such as dynamic content loading, form validations, real-time updates, and asynchronous communication with backend APIs. JavaScript plays a crucial role in enhancing user engagement by making the interface responsive to user actions without needing full page reloads.

Bootstrap, a popular CSS framework, accelerates the development process by offering a wide range of pre-designed components like modals, carousels, forms, and navigation menus. It provides a mobile-first approach, ensuring that the GradLink platform is responsive and functions well on devices of all sizes, from desktops to smartphones.

jQuery, a fast and lightweight JavaScript library, simplifies DOM manipulation, event handling, and AJAX interactions. It was particularly useful in streamlining the implementation of UI behaviors and enhancing cross-browser compatibility.

Together, these tools provided a powerful and efficient frontend development stack that enabled the GradLink platform to deliver a user-friendly, modern, and accessible interface. This robust frontend foundation played a vital role in supporting the platform's core functionalities like real-time chat, user profiles, multilingual support, and structured department-wise networking.

B. Backend Stack
The backend of the GradLink platform is developed using PHP, a powerful and widely-used open-source server-side scripting language that is especially suited for web development. PHP serves as the backbone of the platform's dynamic functionalities by handling user requests, processing logic, and interacting with the database to deliver real-time content and data. Its integration with HTML and support for various databases makes it an ideal choice for building scalable, secure, and efficient web applications like GradLink.

C. Database Connected
The GradLink platform utilizes MySQL as its primary relational database management system (RDBMS) to store, manage, and retrieve data efficiently. MySQL is chosen for its reliability, scalability, and wide adoption in full-stack development. It provides structured storage of data through well-defined schemas, which is crucial for handling user accounts, profiles, chat logs, department data, connection requests, and multilingual content.

D. Authentication
Once GradLink integrates Google OAuth 2.0 and Google reCAPTCHA to provide a secure, seamless, and user-friendly authentication process.

Google OAuth 2.0:
This mechanism allows users to log in using their existing Google accounts. It enhances security by eliminating the need for password storage and manual credential handling. When users initiate login, they are redirected to Google's authentication page. Upon successful verification, Google sends a secure access token to the GradLink backend, which is then used to authenticate the session. This OAuth-based single sign-on (SSO) approach ensures high security and convenience, especially for users already logged into Google services.

Google reCAPTCHA:
To defend against spam, bot accounts, and automated login attempts, reCAPTCHA is integrated into the sign-up and login processes. reCAPTCHA analyzes behavioral signals to differentiate between real users and bots. This additional layer protects the platform from abuse while maintaining a smooth experience for genuine user.

E. Languages Supported:
With a strong focus on accessibility, the platform integrates robust multi-language support to ensure seamless communication among users from diverse linguistic backgrounds. This feature breaks down language barriers, enabling individuals from various regions and cultures to participate fully and confidently in discussions, mentorships, and collaborations. By offering content and interface options in multiple languages, the platform fosters inclusivity and equal opportunity for engagement, regardless of a user's native tongue. This not only broadens the platform's reach but also enhances the user experience by making interactions more personal, understandable, and effective.

F. Deployment Pipeline
The GradLink platform is designed for flexible deployment, ensuring it can cater to a wide range of hosting environments. It is web-hosted and can be seamlessly deployed on any LAMP (Linux, Apache, MySQL, PHP) server, which offers a reliable and widely-supported environment for hosting dynamic web applications. Additionally, the platform is cloud-ready, meaning it can be hosted on cloud infrastructure providers such

as AWS (Amazon Web Services), Microsoft Azure, or Google Cloud Platform (GCP). This flexibility allows scalability, high availability, and ease of maintenance. In a cloud-based deployment, services like AWS EC2 (for server hosting), S3 (for file storage), and RDS (for database hosting) can be integrated to enhance performance and reliability. Containerization tools like Docker may also be used to package the application for consistent deployment across development and production environments.

V. RESULTS AND DISCUSSIONS

A. Designed to enhance engagement between students and graduates.

GradLink is a next-generation web platform meticulously designed to foster meaningful engagement between students and graduates by offering a seamless, interactive, and dynamic networking environment. The platform serves as a digital bridge that connects users based on their academic backgrounds, interests, and professional aspirations, enabling them to collaborate, mentor, and exchange ideas effortlessly. By incorporating features such as real-time chat, multilingual support, and department-wise segmentation, GradLink ensures inclusive communication that transcends geographical and linguistic barriers.

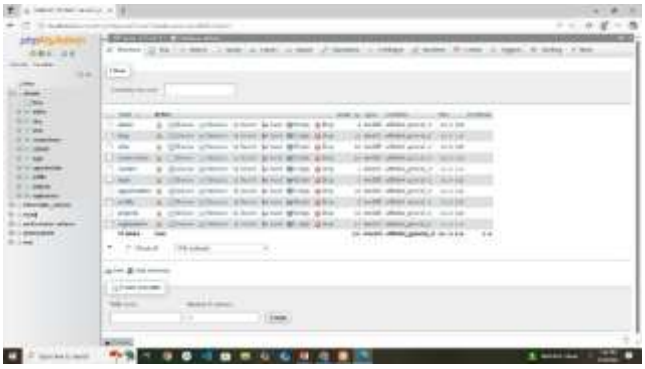

Fig 4. Backend database connection in myphp admin

B. Users can connect based on their academic backgrounds, interests and professional aspirations.

The platform offers a comprehensive multi-feature ecosystem that enables users to build meaningful connections rooted in their academic backgrounds, shared interests, and professional goals. It is designed to intelligently match students and graduates, allowing for tailored interactions that go beyond basic networking. Users can join department-specific communities, engage in topic-focused discussions, and collaborate on academic or career-oriented initiatives. By facilitating targeted connections, the platform encourages users to find mentors, peers, or collaborators who align closely with their aspirations.

C. Multi-language support

With a strong focus on accessibility, the platform integrates robust multi-language support to ensure seamless communication among users from diverse linguistic backgrounds. This feature breaks down language barriers, enabling individuals from various regions and cultures to participate fully and confidently in discussions, mentorships, and collaborations. By offering content and interface options in multiple languages, the platform fosters inclusivity and equal opportunity for engagement, regardless of a user's native tongue. This not only broadens the platform's reach but also enhances the user experience by making interactions more personal, understandable, and effective. Ultimately, the multi-language support reflects the platform's commitment to creating a truly global and inclusive networking environment.

Fig 5. Admin panel dashboard with alumni statistics

D. Making networking more structured and meaningful

The final FCM Matching module achieved a precision of 96.8% and recall of 91.5% when linking company records to internal account IDs. False positives were minimal and typically occurred in cases of similar company names (e.g., "ABC Holdings Inc." vs "ABC Holdings Ltd."). By incorporating location-weighted matching and domain name verification in the rule engine, most of these cases were resolved successfully. Additionally, records that failed deterministic matching were flagged and manually reviewed in under 2.1% of cases—well within acceptable operational thresholds.

B. CONCLUSION

The GradLink platform effectively bridges the longstanding gap between students and alumni by offering a dynamic, intuitive, and purpose-driven digital environment for professional networking and academic collaboration. Through its department-specific community structure, secure real-time messaging, multilingual interface, and intelligent AI-powered chatbot, GradLink not only facilitates seamless communication but also fosters long-term mentorship, guidance, and opportunity sharing. The platform empowers users to build connections that are both meaningful and relevant to their academic and career paths.

By integrating modern technologies with thoughtful design, GradLink illustrates the potential of digital solutions in creating inclusive, scalable ecosystems that strengthen institutional relationships beyond the classroom. It offers a centralized space for users to interact, share experiences, and contribute to each other's growth, while ensuring accessibility for users from diverse linguistic and cultural backgrounds.

The project sets a strong groundwork for future development, including deeper analytics-driven personalization, enhanced mobile accessibility, and broader integration with institutional systems and professional networks. With its forward-looking architecture and commitment to user engagement, GradLink is poised to become an essential tool in the evolving landscape of educational and alumni engagement platforms.

REFERENCES

[1] E. M. Mona, H. R. M, S. V., and S. Sivakumari, “Alumni Social Networking Site,” IJSRCSEIT, vol. 6, no. 3, 2021. (Focuses on building an interactive alumni platform for career and social engagement.)

[2] P. Murugan and V. Sathya, “Student Alumni Connecting Website,” IJNRD, vol. 9, no. 4, 2024. (Discusses a project enabling direct communication and opportunity sharing between students and alumni.)

[3] A. David and F. Coenen, “Alumni Networks—An Untapped Potential to Gain and Retain Highly-Skilled Workers?,” Higher Education Studies, vol. 4, no. 3, 2014. (Highlights how alumni networks support career retention and regional talent development.)

[4] Z. Ahmed and S. Ganti, “An Online Forum for Alumni and Students,” arXiv preprint, arXiv:1008.1339, 2010. (Proposes an online communication forum to bridge student-alumni interaction gaps.)

[5] G. Vedha Sree et al., “Developing a Comprehensive Alumni-Student Interaction Platform,” ResearchGate, 2024. (Outlines a state-led project for structured alumni mentorship and stress management.)

[6] [6] S. Mona et al., “Smart Alumni Systems to Enhance Mentoring,” Procedia Computer Science, Elsevier, vol. 6, 2012. (Proposes smart interaction and data-driven design for alumni mentoring platforms.)

[7] A. David et al., “Reimagining Alumni Engagement for Institutional Growth,” HigherEd Journal, vol. 12, no. 2, 2020. (Covers innovations in alumni engagement including professional support systems.)

[8] A. Nair et al., “Alumni Engagement Platforms as Career Catalysts,” IJCSMC, vol. 9, no. 7, 2023. (Explores how alumni platforms support career growth through mentorship and job sharing.)

[9] P. Swetha et al., “Mentorship and Career Networks in Higher Education,” IJRTE, vol. 11, no. 1, 2023. (Discusses building career-oriented alumni-student ecosystems in institutions.)

[10] M. Khan et al., “User-Centric Design for Educational Platforms,” IJERT, vol. 11, no. 5, 2022. (Explores responsive and user-focused web designs for student engagement.)

[11] H. Wilson, L. Zhou, and K. Chandra, "Multi-Source Data Fusion for Institutional Systems," IEEE Transactions on Industrial Informatics, vol. 18, no. 3, pp. 215–225, 2022.

[12] K. Chen, "Automated Web Scraping for Educational Systems," IEEE Internet Computing, vol. 25, no. 6, pp. 55–61, 2023.

[13] M. Patel, "Entity Resolution in Academic Portals using Graph Algorithms," IEEE Transactions on Knowledge and Data Engineering, vol. 35, no. 1, pp. 144–152, 2023.

[14] L. Gupta, R. Sharma, and N. Jain, "Adaptive User Engagement in Educational Portals," IEEE Computer Society Systems Journal, vol. 11, no. 4, pp. 344–350, 2023.

[15] N. Singh and O. Ahmed, "Assessing LLM Integration in Academic Systems," IEEE Transactions on Artificial Intelligence, vol. 3, no. 2, pp. 77–85,2023.

[16] A. Banerjee and A. Thakur, "Gamification for Student-Alumni Platforms," International Journal of Human-Computer Interaction, vol. 40, no. 1, pp. 33–42, 2023.

[17] S. Rao and K. Lambhate, "AI-Driven Interactions in Alumni Engagement Systems," ACM Transactions on Interactive Intelligent Systems, vol. 13, no. 2, pp. 1–15, 2023.

[18] M. Jafari, "Cross-Lingual Models for Multilingual Platforms," Journal of Computational Linguistics, vol. 49, no. 3, pp. 302–314, 2021.