

AI-Powered Alumni Portal: Connect, Learn, Thrive

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Abstract

The AI-powered Alumni Portal is developed to enhance alumni engagement, strengthen networking opportunities, and support career development for both alumni and current students. The system is implemented as a web-based application accessible on any device, featuring user roles for Alumni, Students, and Admin. The platform integrates AI technologies to provide personalized networking recommendations, automated skills extraction from student resumes using OCR, and post moderation through NLP-based content filtering. Alumni can post job opportunities, events, and contribute through the donation portal, while students receive personalized career suggestions, job opportunities, and mentorship guidance. A discussion forum is implemented to enable direct communication between alumni and students, facilitating knowledge sharing, mentorship, and collaborative discussions on career-related topics. The admin panel manages users, posts, contributions, and provides comprehensive insights through analytics dashboards. The platform promotes seamless interactions, secure data management, and dynamic alumni-student collaboration, creating a supportive ecosystem for lifelong engagement and career advancement.

Keywords: Alumni engagement; Career development; Job opportunities; Mentorship guidance; Personalized networking recommendations.

1. Introduction

Maintaining strong connections between alumni and their alma mater has always been a vital aspect of educational institutions. Alumni networks not only offer a platform for social interactions but also create opportunities for career growth, mentorship, and community contribution. However, most traditional alumni portals fail to deliver these experiences effectively, often offering only static directories or occasional event updates. The lack of personalized engagement and dynamic features in these systems limits their ability to foster meaningful interactions between alumni and current students. The AI-Powered Alumni Portal: Connect, Learn, thrive aims to transform the alumni experience by leveraging artificial intelligence to create a dynamic, interactive platform. This system is designed to go beyond conventional alumni portals by offering personalized networking recommendations, job portals, mentorship opportunities, and contribution

mechanisms. By integrating AI technologies such as Natural Language Processing (NLP) and Optical Character Recognition (OCR), the platform delivers intelligent features that enhance user engagement and foster lifelong connections. The existing systems often rely on manual moderation and generic content delivery, which restricts user participation and makes it difficult to maintain high-quality interactions. These platforms lack the capability to automatically extract insights from resumes or filter out inappropriate content, creating a gap between what users need and what the systems can offer. Furthermore, alumni portals rarely provide direct communication channels between alumni and students, missing out on valuable opportunities for mentorship and knowledge sharing. Our proposed solution addresses these challenges by incorporating AI-powered features that automate content moderation, extract skills from student resumes, and

deliver personalized career recommendations. The platform not only enables alumni to post job opportunities and contribute to institutional growth through contributions but also empowers students by connecting them with mentors and providing tailored career advice. The discussion forum creates a collaborative space where alumni and students can engage in meaningful conversations, bridging the knowledge gap between the two groups.

2. Existing System

The existing alumni portals primarily function as static platforms with limited capabilities, offering only basic features such as alumni directories, email newsletters, job postings, and event announcements. These systems lack intelligent technologies like artificial intelligence, natural language processing, and optical character recognition, making them inefficient in fostering meaningful alumni-student engagement. Without AI-driven personalized networking, students and alumni often struggle to find relevant connections, limiting opportunities for mentorship and career guidance. Job and event postings in these platforms are static and do not provide tailored recommendations based on user skills or interests, making it challenging for students to discover relevant opportunities. Communication between alumni and students is also highly restricted, as most existing platforms do not include interactive discussion forums or real-time collaboration tools. This leads to missed opportunities for professional networking, knowledge sharing, and mentorship. Additionally, content moderation in traditional alumni portals is manually handled, which not only delays the filtering process but also increases the chances of human error in identifying inappropriate or irrelevant content. The absence of automated moderation tools makes it difficult to maintain a high-quality, professional, and secure platform. Furthermore, most existing systems have weak data security measures, making them vulnerable to unauthorized access, data breaches, and privacy issues. Without proper security protocols, sensitive user information, including personal details and career data, is at risk. Beyond engagement and security challenges, traditional alumni portals often suffer from a poor user experience due to outdated

interfaces and a lack of interactive features. Users are required to navigate through static pages without AI-driven assistance, making the platform less engaging and efficient. As a result, participation rates remain low, and the system fails to create an active and dynamic community for alumni and student

2.1. Disadvantages

- Limited networking opportunities, as there are no AI-driven recommendations to help alumni and students connect based on shared interests, skills, or career goals.
- Manual and inefficient job or event searches, requiring users to browse through listings without personalized suggestions, making the process time-consuming.
- Lack of real-time communication tools, as most existing platforms do not provide interactive discussion forums or mentorship spaces for alumni-student engagement.
- Weak content moderation, relying solely on manual filtering, which can lead to delays in removing inappropriate or irrelevant content and increases the risk of errors.
- Poor security and data protection, exposing sensitive user information to unauthorized access, breaches, and cyber threats due to inadequate encryption and security measures.

Outdated and static user interfaces, resulting in a less engaging experience with minimal interactive elements, reducing user participation and overall platform effectiveness.

3. Proposed System

The proposed system, an AI-powered alumni portal, is designed to overcome the limitations of traditional platforms by integrating advanced technologies such as artificial intelligence (AI), natural language processing (NLP), and optical character recognition (OCR). Unlike existing systems that rely on static directories and manual processes, this platform offers personalized networking recommendations, automated skills extraction from resumes, intelligent job and event suggestions, and secure content moderation. These AI-driven features enable more meaningful alumni-student interactions, fostering mentorship, career guidance, and professional networking in an efficient and user-friendly manner.

A key enhancement in this system is the personalized alumni and student networking module, which utilizes AI-based algorithms to suggest relevant 11 connections based on users' skills, career backgrounds, and interests. This allows students to easily find alumni mentors in their field of interest and helps alumni expand their professional networks. Additionally, the AI-powered job and event recommendation system ensures that users receive tailored suggestions based on their preferences, eliminating the need for time-consuming manual searches. To further streamline career development, the system includes an automated resume analysis module that extracts key skills from student resumes using OCR, NLP and BERT. This feature allows students to build accurate profiles effortlessly and receive job recommendations aligned with their expertise. The platform also incorporates an interactive discussion forum, where alumni and students can engage in career-related discussions, share experiences, and seek guidance. Unlike traditional portals that lack real-time engagement features, this forum fosters collaborative learning and mentorship. Security and content moderation are also significantly improved in the proposed system. The AI-based content filtering module ensures that posts and discussions adhere to community guidelines by automatically detecting and removing inappropriate content. This eliminates the inconsistencies and delays associated with manual moderation, creating a safer and more professional environment for users. The platform also integrates secure authentication mechanisms, including email OTP verification and encrypted password storage, to protect user data from unauthorized access. The admin panel provides a centralized dashboard for user management, content moderation, analytics, and donation tracking. Admins can generate insights into platform activity, monitor engagement metrics, and ensure smooth platform operation. The contribution management module further enables alumni to make financial contributions securely, supporting scholarships, institutional development, and student welfare programs. Overall, the proposed system enhances alumni engagement by leveraging AI-driven automation, real-time interaction features, and

personalized recommendations, 12 making it a dynamic and user-friendly platform for alumni and students alike.

3.1. Advantages

- AI-driven personalized networking, helping students and alumni connect based on shared skills, career paths, and interests.
- Automated job and event recommendations, reducing manual search time and ensuring users receive relevant opportunities tailored to their profiles.
- Intelligent resume analysis, using OCR, NLP and BERT to extract skills from resumes and provide career guidance efficiently.
- Real-time discussion forums, facilitating direct interaction, mentorship, and knowledge-sharing between alumni and students.
- AI-powered content moderation, ensuring a secure and professional environment by filtering out inappropriate or irrelevant content automatically.
- Advanced security features, including email OTP authentication and encrypted password storage, protecting user data from breaches.
- Centralized admin dashboard, providing easy management of users, content, and analytics for efficient platform oversight.
- Seamless donation and contribution management, allowing alumni to support institutional growth through a secure and transparent system.
- Enhanced user engagement, thanks to an interactive and AI-powered experience that encourages continuous participation and networking.

4. Implementation

The AI-powered Alumni Portal was developed to boost networking opportunities, improve alumni engagement, and aid in current and former students' professional growth. Using the integration of AI technologies, the platform offers post-moderation using NLP-based content filtering, automatic skills extraction from student resumes using OCR, and personalized networking recommendations. While

students receive individualized career recommendations, job prospects, and mentorship support, alumni can submit events, job openings, and donate through the donation site.

4.1. User Management

The User Management module forms the backbone of the AI-powered Alumni Portal, providing secure user authentication, registration, and role-based access control. The system supports three types of users: Alumni, Students, and Admin. Users can be managed by using admin panel (Fig 4.1) Each user undergoes their credentials are verified through email OTP authentication. Passwords are securely stored using encryption techniques, and users can update their profile information as needed. Role-based access control ensures that users access only the features relevant to their role, enhancing security and the overall user experience. The module also includes session management to maintain secure user sessions. (Figure 1)

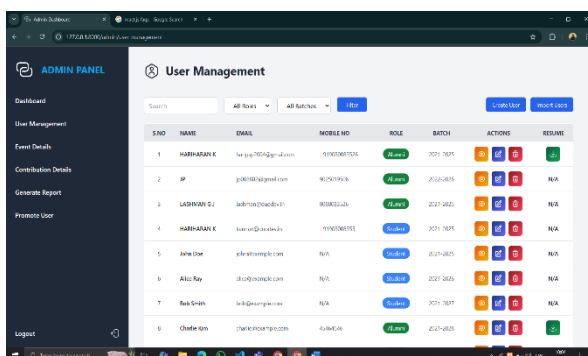


Figure 1 User Management Using Admin Dashboard

The module also tracks event registrations and participation to provide insights into user activity. (Figure 2,3)

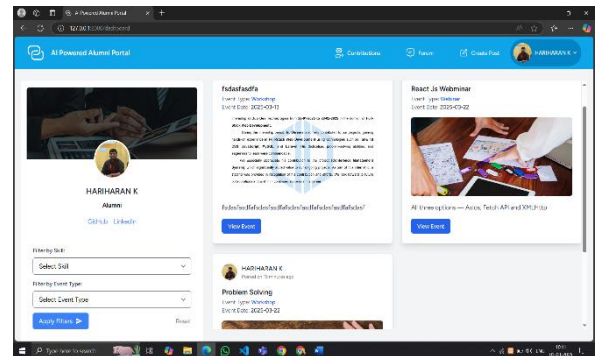


Figure 2 Events Recommendations

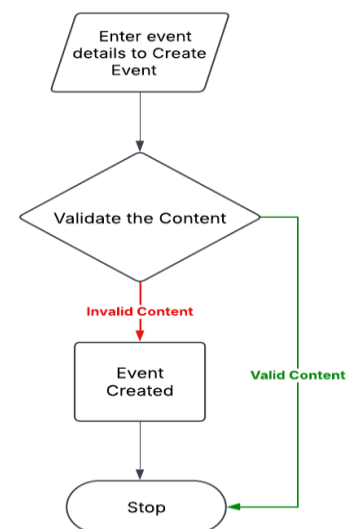


Figure 3 Content Moderation Workflow

4.2. Event Management & Recommendation

The Event Management & Recommendation module (Fig 4.2) allows alumni to create and share events such as webinars, workshops, and job fairs. Alumni can submit event details through an intuitive interface, while the system automatically moderates content using NLP-based filtering (Fig 4.3) to prevent inappropriate or irrelevant posts. The AI recommendation engine analyzes user's skills and preferences, providing personalized event suggestions to students. This feature enhances user engagement and makes the platform more dynamic.

4.3. Contribution Management

The Contribution Management module enables alumni to make financial contributions to various causes such as scholarships, college development, and student welfare programs. Alumni can select contribution categories and payment methods through a secure payment gateway integrated into the platform. The system automatically generates contribution receipts and maintains a history of transactions for both users and administrators. This module ensures transparency and encourages alumni participation in institutional development. (Figure 4)

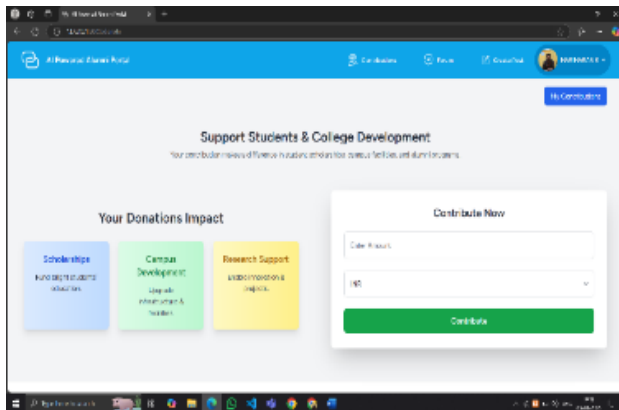


Figure 4 Contributions Management

4.4. Resume Analysis

The Resume Analysis module leverages Optical Character Recognition (OCR) and Natural Language Processing (NLP) to extract key information from uploaded resumes. The system automatically identifies educational background, professional experience, and technical skills. Based on this extracted data, the module suggests job opportunities and career paths aligned with the user's profile. The platform also provides constructive feedback on resume structure and generates downloadable reports, helping students improve their resumes and boost employability. The workflow of the skill extraction shown in Workflow of skills extraction

4.5. Discussion Forum

The Discussion Forum module fosters interactive communication between alumni and students. The forum allows users to create discussion threads, post replies, and share experiences on various career-related topics. Content moderation powered by NLP ensures that posts meet community guidelines and maintain quality standards. The forum promotes knowledge sharing, mentorship, and collaborative discussions (Fig 4.6), enhancing the platform's community-driven environment. Notifications are triggered to keep users updated on new replies and discussions. (Figure 5)

1.1.Admin Dashboard & Analytics Module

The Admin Dashboard & Analytics Module serves as the central control panel for administrators. It provides comprehensive tools for user management, post moderation, contribution tracking, and event approvals. The module generates detailed reports on

platform activity, including user engagement, event participation, and contribution statistics. Through the analytics dashboard, administrators can monitor performance metrics and optimize platform functionalities to improve user satisfaction. (Figure 6)

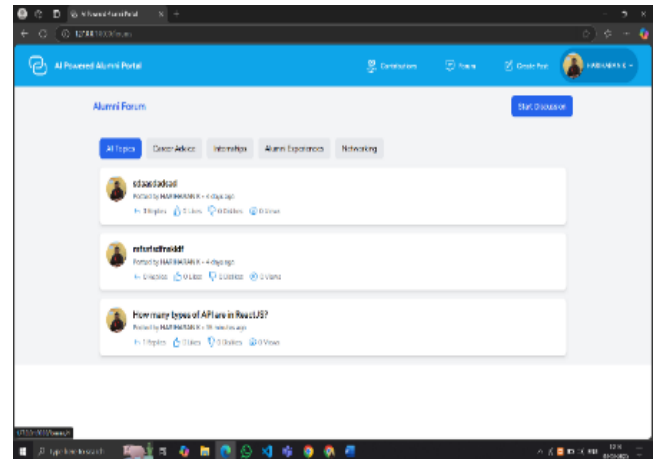


Figure 5 Discussion Forum

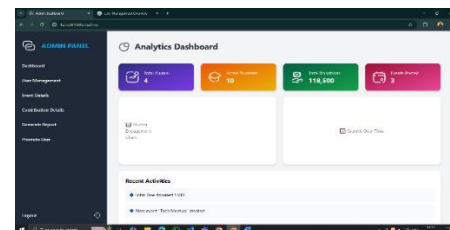


Figure 6 User Management in Admin Dashboard

Discussion

The AI-powered alumni portal has successfully transformed alumni-student engagement by integrating advanced technologies such as artificial intelligence (AI), natural language processing (NLP), optical character recognition (OCR) and Bidirectional Encoder Representations from Transformers (BERT). The system provides a dynamic and interactive platform that enables personalized networking recommendations, automated skills extraction, AI-driven content moderation, and intelligent job/event suggestions. By leveraging these technologies, the portal enhances career development, mentorship opportunities, and professional networking, creating a seamless

experience for both alumni and students. During testing and evaluation, the content moderation system demonstrated high accuracy in filtering inappropriate posts, ensuring a safe and professional environment. The resume analysis feature successfully extracted key skills from uploaded resumes using BERT algorithm, eliminating the need for manual data entry and allowing students to receive tailored job recommendations. The AI-based recommendation engine efficiently connected students with relevant alumni, fostering mentorship, career growth, and industry networking. Additionally, the event recommendation system helped students and alumni discover relevant career fairs, webinars, and networking events, improving overall engagement and participation. The interactive discussion forum played a crucial role in facilitating real-time knowledge sharing, bridging the gap between experienced alumni and students seeking guidance. The AI-powered moderation ensured that discussions remained constructive, informative, and professional, preventing spam or irrelevant content. Users actively participated in conversations related to career opportunities, industry trends, and skill development, making the platform a valuable hub for professional interactions. User feedback was overwhelmingly positive, highlighting improved engagement, ease of access, and enhanced user experience compared to traditional 23 alumni portals. The secure authentication system, including email OTP verification and encrypted password storage, provided robust data protection, ensuring user privacy and security. The admin panel proved to be an essential tool for managing users, moderating content, tracking contributions, and analyzing platform activity, helping administrators gain valuable insights into user behavior and engagement trends. Overall, the results clearly demonstrate that the AI-powered automation significantly enhances user experience, networking opportunities, and career guidance. By eliminating manual processes, improving content quality, and providing personalized recommendations, the platform creates a seamless, efficient, and secure environment for alumni and students to connect, collaborate, and thrive.

Conclusion

Students often struggle to connect with alumni for mentorship, job opportunities, and guidance on career development. The lack of a unified platform for alumni-student interactions creates a gap, limiting the potential for valuable knowledge sharing and collaboration. This disconnect hampers students' access to career advice, networking opportunities, and professional growth. Existing solutions such as social media groups and basic alumni directories provide limited engagement features and lack personalized recommendations. These systems do not offer dynamic interactions, content moderation, or tailored career guidance. Manual processes and static interfaces result in poor user experience and minimal participation from both alumni and students. The proposed AI-powered Alumni Portal addresses these limitations by integrating AI technologies such as OCR, NLP, and recommendation systems. The platform enables personalized networking recommendations, automated skills extraction, secure donation management, and interactive discussion forums. By providing dynamic features and seamless interactions, the system fosters a collaborative ecosystem where alumni and students can engage in meaningful discussions, career mentoring, and knowledge sharing, ultimately enhancing lifelong learning and professional development.

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