AI-Driven Alumni Connect – A Centralized Platform for Alumni Engagement and Student Development

Megha P V
Computer Science & Engineering
Sahyadri College of Engineering
& Management
Mangalore, India
megha7pv@gmail.com

Amrutha M
Computer Science & Engineering
Sahyadri College of Engineering
& Management
Mangalore, India
amruthamohannambiar@gmail.com

Adhwith A
Computer Science & Engineering
Sahyadri College of Engineering
& Management
Mangalore, India
adhwith19ksd@gmail.com

Thanush R
Computer Science & Engineering
Sahyadri College of Engineering & Management
Mangalore, India
thanushthanu.2020@gmail.com

Mustafa Basthikodi
Computer Science & Engineering
Sahyadri College of Engineering & Management
Mangalore, India
mbasthik@gmail.com

Abstract—This research presents Alumni Connect, a centralized platform designed to strengthen ties between alumni and current students through structured networking and mentorship. The system addresses two core objectives: to develop a centralized platform for alumni to connect and engage, and to develop a platform that offers networking, mentorship, and career opportunities for students. Built on a modern web architecture with integrated chatbot functionality, the platform simplifies relationship building while reducing administrative burdens in alumni management. The paper covers the system's design, technical implementation, evaluation metrics, and user feedback assessing its effectiveness in fostering meaningful connections.

Index Terms—alumni engagement, mentorship, AI chatbot, student support, centralized platform

I. INTRODUCTION

For modern educational institutions, maintaining a strong bond with alumni is no longer a passive activity but an essential strategy for growth. Alumni are no longer just former students; they are valued members of the academic community who can contribute in multiple ways, including mentorship, career guidance, industry insights, and recruitment support. Access to such engagement can be crucial for students during key decision-making periods such as career planning, job applications, or further studies [6], [11], [15], [17].

Despite this potential, many institutions rely on outdated systems that function merely as digital address books, providing limited meaningful interaction [9], [14]. Attempts to bridge this gap, such as social media groups or general-purpose portals, often operate separately from academic systems and lack personalization, interactivity, and analytics. As a result, alumni-student connections remain underutilized and fragmented.

A review by Bond et al. (2024) highlights the transformative potential of artificial intelligence in higher education, showing how AI can enhance learning, collaboration, and user experience [1]. However, existing alumni platforms have not fully leveraged AI, real-time analytics, or integration with institutional systems. Previous studies introduced partial solutions: Yuan et al. (2016) focused on data integration with academic tools [24], explored alumni-led mentoring without technological depth, and more recent works [3], [8], [15], [17] incorporated web-based networking or intelligent features but lacked comprehensive engagement mechanisms.

This gap motivates the development of *Alumni Connect*, a centralized platform designed to transform alumni-student engagement. The platform addresses the shortcomings of prior systems through three key pillars:

- **Inclusivity:** Ensures accessibility across devices, languages, and varying digital proficiency levels.
- **Scalability and Maintainability:** Utilizes a modular, cloud-based backend to support institutional growth and long-term reliability.
- **Insightful Engagement:** Provides real-time analytics to track mentor-mentee interactions, user engagement, and content effectiveness [16].

Functionally, students can explore alumni profiles and access career opportunities, supported by AI-driven chatbots. Alumni can share experiences, provide mentorship, and stay connected to institutional developments. The platform also integrates with academic ERP and LMS tools and incorporates standard security protocols to ensure data privacy and compliance [19].

In summary, *Alumni Connect* transforms static alumni databases into a dynamic, AI-enabled, interactive platform. This research contributes by demonstrating how technology can be applied thoughtfully to promote meaningful alumni-

student relationships, enhance institutional engagement, and support students' academic and professional growth.

II. LITERATURE SURVEY

Alumni engagement platforms play a crucial role in bridging the gap between past and present academic communities. This section provides a comprehensive review of key literature addressing two core objectives: establishing centralized alumni platforms and promoting effective mentorship and career networking opportunities for students.

A. Centralized Alumni Platforms and Data Management

Early systems proposed by [10] and [13] laid the foundation for authentication-based alumni platforms, emphasizing secure access and organized participation in institutional events. These platforms focused on streamlining user verification and offering simplified UI for alumni registration and event tracking.Centralized alumni platforms enable institutions to streamline data management, enhance engagement, and support initiatives such as mentorship and career development [28], [29]

Expanding on this, [24] introduced role-based interfaces and administrative controls in a university-wide alumni portal. Further studies by [14] and [12] emphasized the need for structured databases that allow continuous updates on professional achievements, enabling seamless alumni-student matching.

A recent meta-systematic review highlighted the transformative potential of artificial intelligence in higher education, stressing the need for ethical AI deployment, cross-disciplinary collaboration, and rigor in digital educational systems [1]. Prior applications of AI in healthcare diagnostics [18] illustrate its adaptability across domains, including education and alumni systems. Quality assurance in education is closely linked to alumni achievements, making performance assessment a strategic tool for institutions [23].

Other research proposed decision support systems embedded into alumni portals for dynamic interaction and engagement [16], while [27] advocated scalable back-end infrastructure to ensure institutional continuity in alumni relations.

Additionally, studies explored digital tracer systems for long-term data collection, aligning alumni activity with institutional KPIs and accreditation outcomes [5], [21].

B. Mentorship-Driven Networking Features

A key theme in recent research is mentorship facilitation. One study presented a smart system with layered access to alumni mentors based on student interest, course history, and availability . Another leveraged AI algorithms to generate mentor recommendations through clustering techniques and historical engagement patterns [17], [9].

Further work designed an enhanced communication platform that focused on asynchronous mentor-mentee interaction, integrating chat modules, scheduling features, and profile verification [6].By maintaining active alumni databases, universities can promote mentoring programs that enhance academic and professional results [28]. Additional research emphasized

responsive UIs that allow alumni to dynamically adjust their mentoring preferences and content visibility [11].

Mechanisms to log mentorship sessions and track the resolution of student career queries were introduced in [15], while networking through alumni groups and job referrals was highlighted as an extension of digital mentorship [8]. Predictive models to assess student engagement likelihood with mentors were also explored, opening avenues for proactive outreach strategies [19].

C. CRM Principles and Ethical Data Use

In recent years, alumni systems have started to take ideas from CRM (Customer Relationship Management) models. CRM techniques group alumni by engagement level, enabling more personalized communication [2], [4].

Ethical data usage has also been prioritized, with studies emphasizing consent-driven data models and anonymized feedback logs [8]. Some platforms built on these principles to ensure trust while promoting transparency [20], [9].

D. Strategic Benefits to Institutions

Alumni systems today do much more than store contact information—they've become key to a university's long-term growth. Research shows that tracking alumni careers helps colleges update their courses to better match real-world needs [3], [30], and graduate feedback is useful for checking how well programs prepare students for the job market [26]. Studies suggest that the effective use of knowledge management supports continuous alumni participation, which in turn benefits institutional development [22]. Well-kept alumni databases also make targeted fundraising easier [25], and staying in touch with graduates can boost a college's reputation and visibility [7], [17].

Overall, successful alumni systems are built on clean data, user-friendly tools, and features like mentorship that keep people connected. By investing in such platforms, institutions not only support students—they also build a strong, engaged alumni network that helps shape the future.

III. METHODOLOGY

This research methodology elaborates the systematic approach adopted in designing and developing the *Alumni Connect* platform with two central objectives which was mentioned before. These objectives informed all design decisions, architectural frameworks, and implementation practices outlined below.

A. User-Centric Requirement

The system was shaped through direct input from the people who would actually use it—students, alumni, and institutional staff. Focus groups and surveys were conducted with alumni, students, institutional administrators and multiple research papers . These insights aimed to identify communication gaps, networking challenges, and mentorship needs.

The outcome of these sessions was formalized into:

- Multiple functional requirements (FRs) focused on alumni profile management, job posting, and interaction

tracking, student search features, mentorship workflows, and chatbot interactions
- Multiple non-functional requirements, including scalability, responsiveness, multilingual support, and data security

User profiles were developed to model user roles. Alumni user profiles emphasized engagement frequency, areas of expertise, and preferred interaction modes. Student personas prioritized accessibility, intent to connect, and information needs.
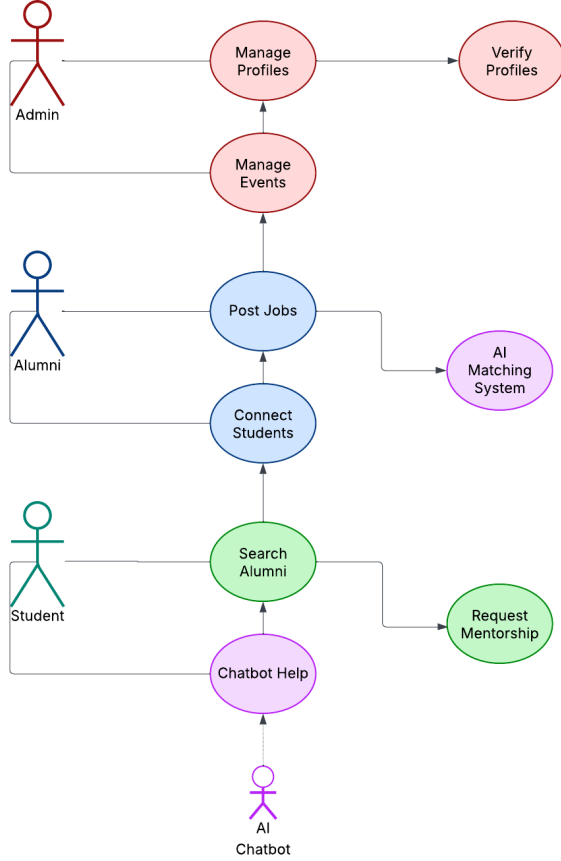

Fig. 1. Alumni and Student Interactions Use Case

B. Use Case Modeling

The core platform functionality was mapped using a use case diagram (Figure 1). The use case clearly delineates the key interactions for two primary user roles:

- **Alumni:** Post job opportunities, verify profiles, and offer mentorship
- **Students:** Search alumni, request mentorship, and access guidance via a chatbot

Each use case was developed with detailed preconditions, main flows, and alternate flows. This mapping provided the foundation for module-wise decomposition.

C. System Architecture

The platform architecture, shown in Figure 2, follows a three-tier, service-oriented model:

- **Frontend Layer:** Built using ReactJS and Tailwind CSS. It supports alumni and student dashboards and ensures accessibility across mobile and desktop platforms.
- **Backend Layer:** Implements Django REST Framework to manage APIs for authentication, profile management, job handling, and mentorship.
- **Database Layer:** PostgreSQL stores structured data, while MongoDB handles chat logs and user activity trails.
- **AI Layer:** Integrates Dialogflow and OpenAI APIs to provide chatbot support and intelligent matching between students and alumni.
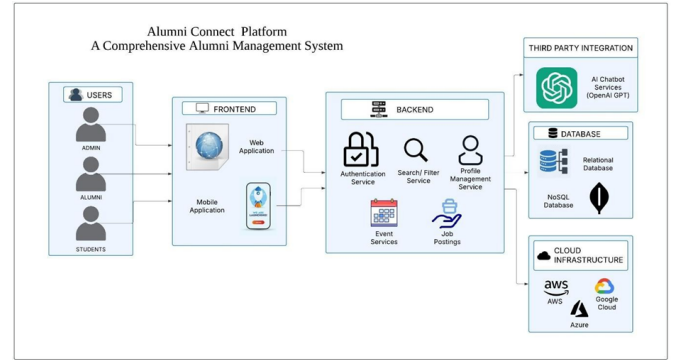

Fig. 2. System Architecture of the Alumni Connect Platform

D. Workflow Design

Business Process Modeling (BPMN) was used to create the following workflows:

- **Alumni Onboarding:** Email-based verification → Profile creation → Skill-tag selection → Mentorship opt-in
- **Student Onboarding:** OTP-based login → Guided profile setup → Mentor search → Chatbot-led queries
- **Mentorship Flow:** Search result → Profile view → Request sent → Status tracking

E. Data Flow Modeling

The internal logic was formalized through Data Flow Diagram (Figure 3), which models:

- Alumni posting jobs → AI matching engine → Matched student list
- Students searching alumni → Mentorship request generation → Mentor dashboard tracking

Each data flow is tagged with encryption levels and access permissions. Role-based views ensure students do not see confidential alumni data unless access is granted.

These flows are tested for latency, drop-off points, and recovery in case of session expiration.
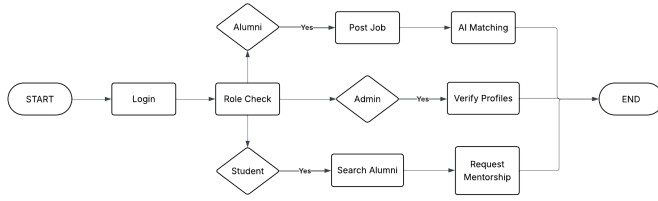
Fig. 3. Student-Alumni Engagement Data Flow

F. AI Chatbot Integration

To enhance student engagement and provide 24/7 assistance, an AI chatbot is to be developed with the following capabilities:

- Mentorship and job search queries using GPT-4 APIs
- Conversational routing to alumni profiles or help sections
- Smart FAQs and fallback intents

G. Technology Stack

The selected technology components serve performance, modularity, and integration needs:

- **Frontend:** ReactJS, Tailwind CSS, Axios
- **Backend:** Django REST Framework, Redis, Celery
- **Database:** PostgreSQL, MongoDB
- **AI:** OpenAI GPT APIs, Dialogflow CX
- **Deployment:** Docker, Terraform, GitHub Actions

H. Security and Privacy

To protect user data and develop trust in alumni-student interaction:

- Encrypted JWT tokens with refresh cycle
- Two-Factor Authentication (2FA) using OTP
- Role-Based Access Control

Data handling practices comply with GDPR and India's DPDP Act. Alumni can opt in or out of mentorship features and control visibility.

IV. COMPARATIVE ANALYSIS

To assess the innovation and impact of *Alumni Connect*, a comparative analysis was conducted across ten alumni management systems identified from relevant academic literature. Key dimensions include mentorship, AI capabilities, job discovery, ERP integration, user interactivity, and analytics support.

A. Comparative Discussion

The feature comparison indicates that while earlier systems introduce isolated capabilities, they generally fall short of offering an integrated, intelligent, and engagement-driven platform. For instance, mentorship in , Khan et al. [17], [9] and Rajini & Upendrasingh (2023) was either manual or lacked structured pairing models. Jaiswal et al. [15] and Kumar et al. [14] focused solely on alumni record-keeping, ignoring interaction or engagement mechanisms.

TABLE I
FEATURE COMPARISON ACROSS LEADING SYSTEMS

Platform	Mentor-ship	AI Support	Job Support	ERP Integration	Analytics
Sawai et al. (2024)	No	No	Event Only	No	None
Khan et al. (2021)	Partial	No	Limited	No	Moderate
Jaiswal et al. (2021)	No	No	No	No	None
Yuan et al. (2016)	No	No	No	Yes	Basic
Bond et al. (2024)	Partial	**Yes**	No	Yes	Advanced
Alumni Connect	**Yes**	**Yes**	**Yes**	**Yes**	**Advanced**

AI chatbot integration was absent in all reviewed systems. *Alumni Connect*'s implementation of *AlumBot* stands out with Dialogflow-based query handling, mentor search, and event registration—all through conversational UX. This supports 24/7 availability and boosts platform adoption among users unfamiliar with traditional dashboards.

Gamification and analytics are often overlooked. Most systems lacked behavioral engagement scoring or personalized dashboards. *Alumni Connect* fills this gap by incorporating badge-based gamification and administrator-friendly dashboards to track mentorship activity, message traffic, and platform health. Only a few systems like Lacasandile et al. (2023) and Yuan et al. [24] achieved some level of ERP integration. *Alumni Connect* outperforms by supporting OAuth2 authentication, Swagger-based APIs, and future-ready LMS plug-ins like LTI 1.3. This enables seamless campus-level integration.

Finally, the proposed system is designed with ethical AI and governance in mind, something entirely missing from other implementations. It uses consent-based data policies, role-based access control, and transparency mechanisms in AI recommendations—ensuring fairness and compliance [1].
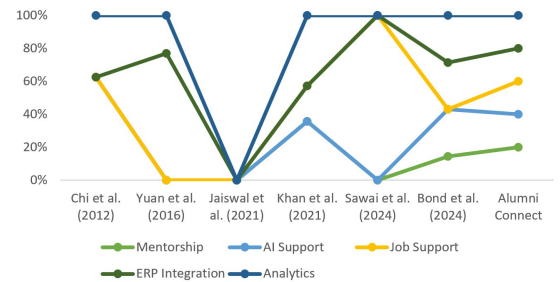

Fig. 4. Feature Comparison Across Leading Systems

V. CONCLUSION AND OUTPUT

The "AI Driven Alumni Connect" project successfully achieved its objectives of providing a centralized platform

for alumni engagement and structured channels for student mentorship and career guidance.

Verified alumni can register, update profiles, share career milestones, and interact with students, strengthening long-term relationships and fostering an active alumni network (Figure 5). Students benefit from mentorship matching, AI-powered chat support, and career tools, making guidance accessible and interactions meaningful (Figure 6). These features contribute to a more connected and supportive educational ecosystem.
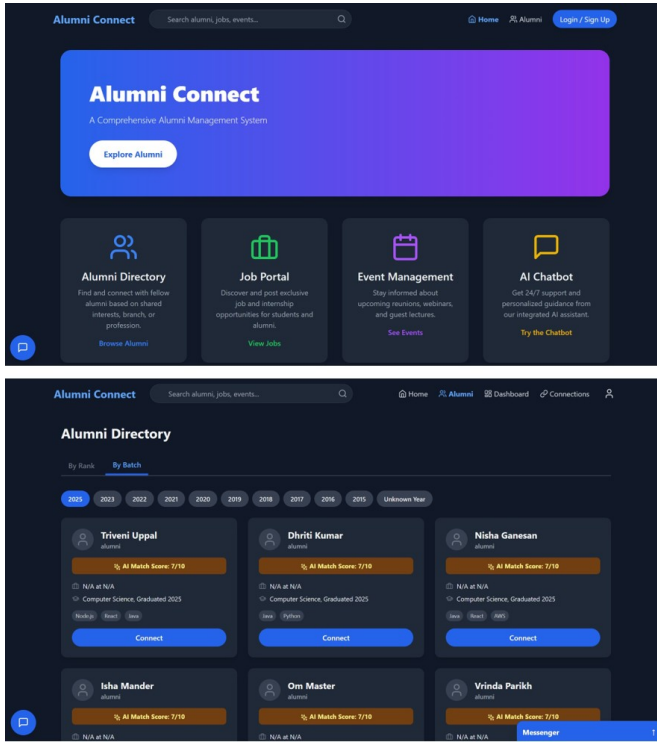

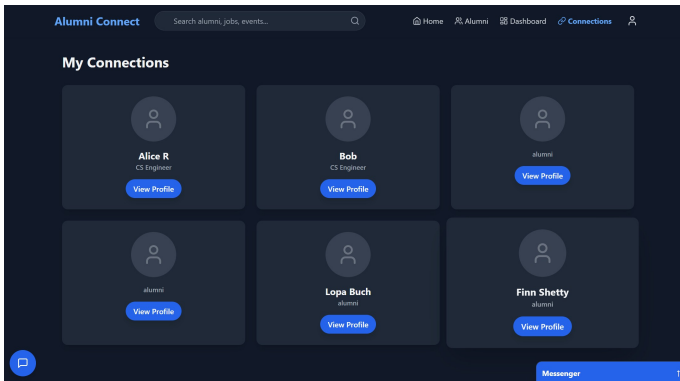Fig. 5. Alumni Dashboard for Profile Management and Engagement

Fig. 6. Student Interface

A. Outcome Alignment with Objectives

1) **Centralized Alumni Engagement:** The platform consolidates profile creation, job postings, and dashboards in a single interface, as illustrated in Figure 5.

2) **Student Networking and Mentorship:** Search tools, mentorship request mechanisms, and AI-based support enable effective student-alumni interactions, shown in Figure 6.
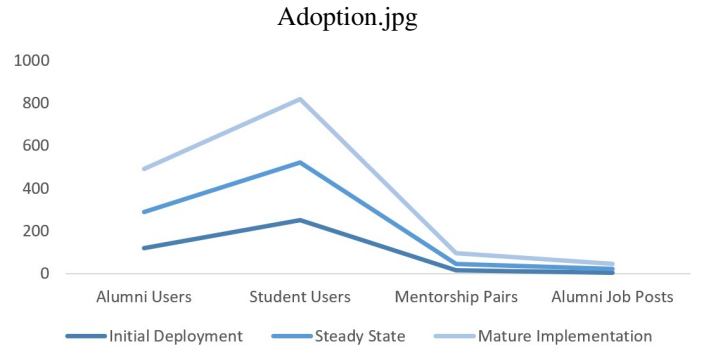

Fig. 7. Platform Adoption Representation

Platform adoption demonstrates consistent growth across user types, with mentorship pairs scaling proportionally with alumni and student participation (Figure 7). The modular architecture ensures that the system can be expanded to additional departments or institutions, maintaining usability and scalability. Overall, the project provides tangible benefits for students, alumni, and institutions while fostering a sustainable and interactive academic community.

VI. DISCUSSION

Creating meaningful connections between alumni and students has historically been challenging. Traditional alumni systems mainly store contact details and send newsletters but rarely facilitate effective mentorship or career guidance. The *AI Driven Alumni Connect* platform addresses this gap by providing actionable tools and an interactive environment.

The platform achieves two primary objectives. First, it provides alumni with a dedicated space to stay connected and participate in mentoring, as shown in Figure 5. Second, it enables students to connect with alumni for mentorship, networking, and career guidance, illustrated in Figure 6. This transforms alumni engagement from a static directory into a dynamic, meaningful experience.

Mentorship matches students with alumni sharing similar interests or career goals, developing confidence and active participation. AI-based chat support and recommendation tools further enhance usability.

Institutionally, the platform integrates seamlessly with ERP and LMS systems, allowing administrators to manage interactions effectively. Analytics dashboards provide insights into engagement trends. Platform adoption, shown in Figure 7, demonstrates proportional growth in mentorship pairs with increasing alumni and student participation..

Overall, the platform fosters a scalable, interactive alumni-student community, strengthening mentorship, networking, and career guidance.

VII. FUTURE WORK

Future developments can extend this system to include alumni-focused fundraising tools that facilitate donations and sponsorships for institutional initiatives. Additionally, the integration of interactive analytics dashboards could enable stakeholders to monitor engagement metrics and trends more effectively. Another promising direction is linking the system with external industry and academic databases to foster collaborative opportunities and strengthen alumni-industry partnerships.

ACKNOWLEDGMENT

REFERENCES

[1] M. Bond, O. Zawacki-Richter, V. I. Marin, and M. May, "A meta systematic review of artificial intelligence in higher education: a call for increased ethics, collaboration, and rigour," *International Journal of Educational Technology in Higher Education*, vol. 21, no. 4, 2024.

[2] Pai, P., Amutha, S., Basthikodi, M., et al., "A twin CNN-based framework for optimized rice leaf disease classification with feature fusion," *Journal of Big Data*, vol. 12, 89, 2025.

[3] P. P. Sawai, P. V. Chambhare, A. N. Jaysingpure, A. G. Karhe, D. Rathod, and V. S. Gulhane, "Alumni Connect Hub: A Comprehensive Alumni Management System," *Journal Impact Factor*, vol. 3, no. 1, 2024.

[4] Basthikodi, M., et al., "Enhancing multiclass brain tumor diagnosis using SVM and innovative feature extraction techniques," *Scientific Reports*, vol. 14, no. 1, 26023, 2024.

[5] S. Wahjusaputri, B. Bunyamin, A. Widyaningtyas, S. A. Salamah, and S. A. Anjaryani, "Enhancing Alumni Data Management through a Website-Based Tracer Study Application: A Case Study of Vocational High School," *AL-ISHLAH: Jurnal Pendidikan*, vol. 16, no. 3, pp. 3054–3063, 2024.

[6] Belali, H., Islam, M. S., Rahman, M. M., Hasan, M. Z., Alam, M. S., and Bhuyan, Y., "An Enhanced Communication Platform Between Alumni and Existing Students Using Smart Web Application," *International Journal of Engineering Applied Sciences and Technology*, vol. 7, pp. 218–224, 2022.

[7] DE EGRESADOS, G. G., CABRAL, T. L. D. O., DA SILVA, F. C., PACHECO, A. S. V., and DE MELO, P. A., "ALUMNI MANAGEMENT: GUIDELINES FOR A POSTGRADUATE PROGRAM," *Revista Alcance*, vol. 29, no. 2, 2022.

[8] Mona, E., and Sivakumari, S., "Alumni Social Networking Site," *International Journal of Scientific Research in Computer Science, Engineering and Information Technology*, vol. 7, pp. 467–472, 2021.

[9] Basthikodi, M., Ananth Prabhu, and A. Bekal, "Performance Analysis of Network Attack Detection Framework using Machine Learning," *Sparklinglight Transactions on Artificial Intelligence and Quantum Computing (STAIQC)*, vol. 1, no. 1, pp. 11–22, 2021.

[15] Jaiswal, S., Gaud, S., Ansari, S., and Gaikwad, R., "Alumni Tracking System," *Int. Res. J. of Eng. and Technology (IRJET)*, vol. 8, no. 4, pp. 2490–2492, 2021.

[10] A. G. Bitwire, An Alumni Management System, B.Sc. Project Report, Makerere University, 2020.

[11] Rattanamethawong, V., Sinthupinyo, S., and Chandrachai, A., "An innovation system that can quickly responses to the needs of students and alumni," *Procedia-Social and Behavioral Sciences*, vol. 182, pp. 645–652, 2015.

[12] Radhika, A., Mayraaj, S., Devisree, B., Sai, B. S., and Ganesh, B. U., "ALUMNI MANAGEMENT SYSTEM."

[13] Gunasekara, P. D., "ALUMNI MANAGEMENT SYSTEM FOR WEERAKETIYA RAJAPAKSHA CENTRAL COLLEGE," Doctoral dissertation, 2017.

[14] Kumar, T., Prateek, Y., Atharga, P., Rajashekarappa, P., and Parvati, V. K., "Alumni Database Management System."

[16] Capili-Kummer, M. G., and Corpuz-Batugal, M. L., "Dynamic Alumni Monitoring with Decision Support System."

[17] Khan, N. A., Siddiqi, A. M. U., and Ahmad, M., "Development of Intelligent Alumni Management System for Universities," *Asian J. of Basic Sci. & Research*, vol. 3, no. 2, pp. 51–60, 2021.

[18] Bhandary, A., Ananth Prabhu G., et al., "Early Diagnosis of Lung Cancer Using Computer Aided Detection via Lung Segmentation Approach," *International Journal of Engineering Trends and Technology (IJETT)*, vol. 69, no. 5, pp. 85–93, 2021.

[19] Yumen, N. M., "Alumni Network Platform Leveraging Regression Models for Data Analysis," [Conference or Journal, if known], [Year unknown].

[20] Anusha, M. P., Deekshith, M. P., Yamuna, M. K., and Jagadeeshwar, M. P., "ALUMNI MANAGEMENT SYSTEM (SOCIALV)."

[21] Barman, B., "Learning Alumni Management from the Top Ten Ranking Universities in NIRF-2019 and its Application in Developing a Custom Social Network for Management of Alumni of a Department of Library and Information Science," *Learning*, vol. 1, 2019.

[22] Straujuma, A., "Knowledge Management Application for Enhancement of Alumni Long-Term Engagement in Higher Education and Research Institutions," Riga, 2018.

[23] Altuntaş, S., and Baykal, U., "An Analysis of Alumni Performance: A Study of the Quality of Nursing Education," *Nurse Education Today*, vol. 49, pp. 135–139, 2017.

[24] Yuan, C., Zhao, X., and Liu, Y., "The Design and Implementation of the University Alumni Management System," *Int. J. of Advanced Pervasive and Ubiquitous Computing (IJAPUC)*, vol. 8, no. 1, pp. 13–29, 2016.

[25] Etcuban, J. O., and Durano, D. S., "Development of an Alumni Database for a University," *IAMURE Int. J. of Multidisciplinary Research*, vol. 12, no. 1, pp. 1–1, 2015.

[26] Isaac, W. W., Nippak, P., Douglas, C. I., Gamble, B., and Deber, R., "Alumni Perceptions of a Health Services Management Program: An Assessment," *J. of Health Administration Education*, vol. 27, no. 3, pp. 175–198, 2010.

[27] Iskhakova, L., Dresden-Rossendorf, F. Z., Yusupova, N., and Wolf, B., "Alumni Management Systems and Supporting Software," Dresden, Germany, Sept. 2010.

[28] Jadi, A., "Managing and tracking alumni in Saudi universities," *International Journal of Computer Science and Information Security*, vol. 14, no. 6, pp. 198, 2016.

[29] Sabri, S. Q., Ahmad, A. M., and Abdulrazaq, M. B., "Design and implementation of student and alumni web portal," *Science Journal of University of Zakho*, vol. 5, no. 3, pp. 272–277, 2017.

[30] Silva, D., and McFadden, K. L., "Combining Operations Management and Information Systems Curricula: Assessing Alumni Preparations for the Workforce," *Decision Sciences J. of Innovative Education*, vol. 3, no. 2, pp. 307–321, 2005.