

Synergy Passion Success Alumni Association Platform using Mode View Controller

Swapnil Jagannath Amru¹, Shishir Yadav², Pranav Aggarwal³ and Savita R. Bhosale⁴

¹⁻⁴Ramrao Adik Institute of Technology (Under the ambit of D. Y. Patil Deemed to be University) Dr. D. Y. Patil
Vidyanagar, Sector 7, Nerul, Navi Mumbai 400 706, India

Email: swapnilamru11@gmail.com, yadavshishir2001@gmail.com, info.pjaggarwal@gmail.com,
savita.bhosale@dypatil.edu

Abstract— The SPS Alumni Association Platform is a comprehensive web-based system developed to enhance connectivity among alumni, current students, and faculty of an educational institution. It addresses the limitations of traditional alumni networks by offering interactive features like real-time chat, event management, job postings, and user directory search. The platform aims to create a collaborative ecosystem by providing tailored access to students, faculty, and alumni, facilitating mentorship, career guidance, and professional networking. The system's architecture is based on the MVC model, with HTML, CSS, JavaScript, PHP, and MySQL forming the core technology stack. Through secure user registration, an intuitive dashboard, and dynamic content management, the platform bridges the gap between academia and industry. Admin tools support efficient monitoring and content updates, while features like email verification and password recovery ensure security and user control. The platform is scalable, with future enhancements including AI based career recommendations, video conferencing for mentorship, and mobile app integration. By enabling structured alumni engagement, this solution fosters growth, collaboration, and long term institutional development.

Index Terms— Alumni Network, Event Management, Mentorship System, User Authentication and MVC Architecture.

I. INTRODUCTION

A. Overview

The Alumni Association Platform is a web-based system that reunites former students of a university to form a vibrant and durable professional and social network. It facilitates alumni in having close relations with their alma mater and amongst themselves, with scope for sustained interaction through such services as member enrollment, profile maintenance, event planning, and employment advertisements. By offering one platform to communicate and work together, the site enables knowledge sharing, career development, and community building.

B. Problem Statement and Objectives

Most universities today don't have specialized and effective applications that are tailored specifically for the proper management of alumni relations.

Current systems do not track, update, and process alumni information systematically and centrally, resulting in poor data organization and lost opportunities for interaction. Alumni are usually handicapped by the need to revise their personal or professional details because the process is normally manual, lengthy, and rigid.

II. LITERATURE SURVEY

A. Survey of Existing System

The innovation of information technology has impacted educational institutions profoundly, notably in the handling of alumni data. In Indonesia, inefficiency and inaccuracies have resulted from manual processes. Literature focuses on the need for the implementation of web-based alumni information systems to solve such problems, as indicated in the works of Jonni (2015), Saputra and Waluyo (2020), and Sundari and Musril (2020). These researches suggest PHP and MySQL-based systems that provide effective alumni tracking, institutional evaluation, and tracer studies, frameworks such as ADDIE guaranteeing usability and functionality [1]. Although earlier systems incorporated rudimentary portal features like user registration and event/jobs postings, they did not emphasize data security. On the contrary, recent models incorporate SMS4-BSK encryption and use the MEAN stack for dynamic content and secure communication, providing secure alumni-student interaction [2]. In addition, paper and Word document-based traditional alumni data management restricts accessibility and analysis. Contemporary methods leverage modern data visualization like multidimensional and hierarchical models to provide analytical dashboards (e.g., Power BI) for studying career trends, compensation, and alignment of programs, for better decision-making by institutions [3].

There have been studies suggesting secured web-based alumni portals that facilitate engagement with proper protection of data. Architectures like MEAN stack and Django with SQLite provide good solutions, providing separate roles for admins, alumni, and students. Such systems offer modules for profile management, event attendance, job alerts, mentorship, and narrative, all secured with PBKDF2 authentication for increased safety and engagement [4]. Earlier alumni portals had few networking functions. In response, more recent systems are more like social networking sites with interactive timelines, live messaging, and mentorship functions, encouraging independent, thriving alumni-student communities with minimal staff intervention [5].

Evidence also confirms the growing involvement of alumni in enhancing institutional relationships. Bangladesh and Malaysian case studies demonstrate the ways in which web-based systems enhance alumni networking, data quality, and institutional engagement. These new platforms facilitate administration and enable scalable, real-time alumni-student interaction [6]. In addition to this, monitoring mechanisms employed at Harvard, IIT Kanpur, SEBS, and IOEAA in Nepal are mentorship, career guidance, donation tracking, and forums—demonstrating that interactive, organized portals are crucial for long-term alumni interaction, curriculum feedback, and institutional growth [7].

B. Limitations of Existing System

The majority of current alumni association systems are too limited in scope, too old-fashioned in design, and not adequate to meet the changing requirements of alumni and schools. They are usually designed as static web pages that function as simple databases of information with few news or event listings of generic content.

They do not provide for interactivity, customization, and community-oriented features that are critical in today's digital age. Thus, alumni participation is minimal and infrequent. Universities lack the ability to often plan and keep current alumni databases because there is no coherent, unified system. Alumni are usually unable to update their personal or professional information themselves, having to use slow, labour-intensive, and ineffective manual procedures.

III. PROPOSED SYSTEM

A. Problem Statement

The core motivation behind the SPS Alumni Association Platform stems from the long-standing challenge of maintaining effective communication and engagement between an educational institution and its alumni. Traditional methods such as email newsletters, annual meetups, and manual record-keeping often fall short in terms of consistency, outreach, and interactivity. These approaches lack scalability, timely communication, and user-centric personalization, making it difficult for alumni to stay informed or participate actively in institutional growth. Students, on the other hand, miss out on valuable real-world insights, mentorship opportunities, and job networking channels that alumni can offer. Faculty members also face difficulties in tracking the professional progress of their former students, limiting collaboration and inspiration for current academic pursuits.

B. Proposed Methodology/Techniques

System Architecture

To address the defined problem effectively, a structured and modular system architecture was designed based on the Model-View-Controller (MVC) pattern. This architecture ensures a clear separation of responsibilities, making the codebase scalable, manageable, and easy to maintain. The Model represents the MySQL database layer that stores and manages all dynamic content, including user information, job listings, events, chat logs, feedback, and system logs. The View represents the frontend interface developed using HTML5, CSS3, and Bootstrap 5. These tools collectively offer a responsive and modern UI, ensuring consistent usability across devices such as smartphones, tablets, and desktops. The Controller, written primarily in PHP, handles the logic that connects the model and view, processes user inputs, manages sessions, applies role-based access control, and ensures the secure flow of data throughout the system. To enhance the system's capabilities and security, a separate Flask (Python) microservice was integrated for facial verification. This service operates as an independent API that receives two images from the frontend—one uploaded profile image and one captured via the webcam. These images are sent asynchronously using AJAX, ensuring the page does not reload and the user experience remains smooth. The backend uses the DeepFace library to detect faces, extract their embeddings (numerical vector representations), and calculate their similarity using cosine similarity metrics. Based on the resulting distance, the system confirms whether the person in both images is the same, effectively adding a biometric verification layer during registration. The result of this verification is returned as a JSON response to the frontend, where it is dynamically displayed and used to enable or restrict form submission. Overall, this hybrid architecture—built on MVC principles, asynchronous communication, and microservice integration—delivers a powerful, real-time, and secure alumni platform designed for flexibility, extensibility, and a long operational lifecycle [8].

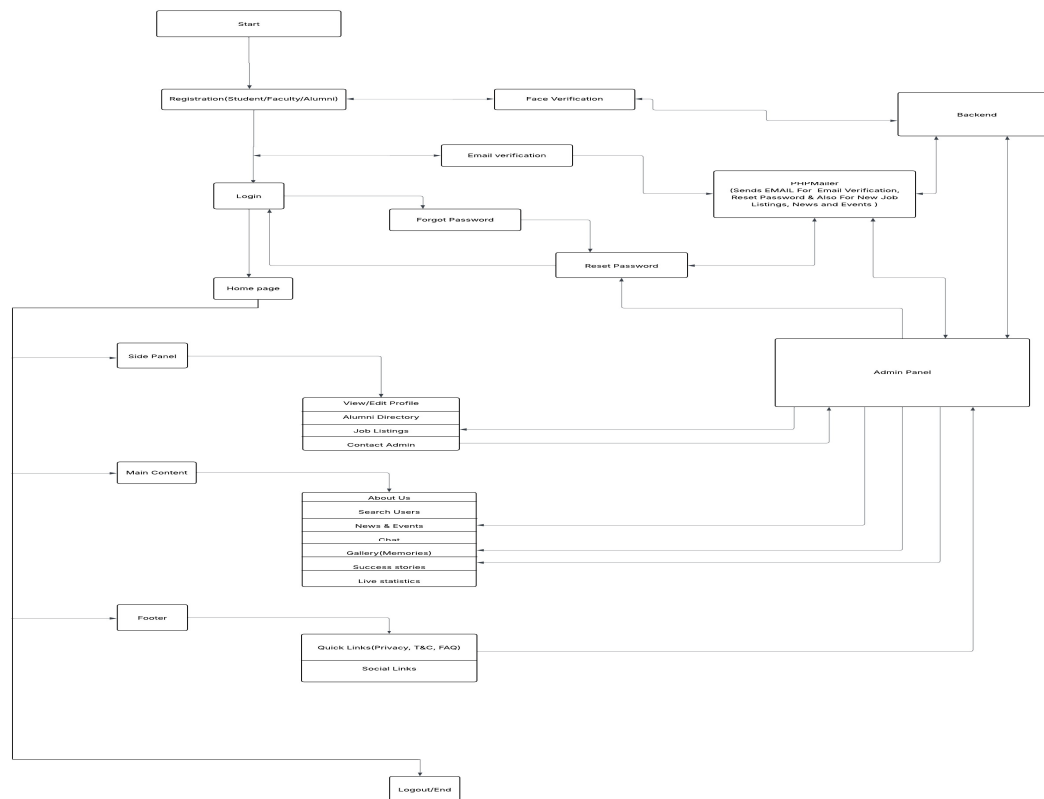


Figure 1. SPS Alumni Association Block Diagram.

Modules and Techniques

The platform is made up of several key modules, each of which was developed with purpose driven features and interactive techniques to support the core goal of engagement and connectivity. The User Registration Module

was built with a unique dual-image face verification system. During registration, users are asked to upload a static photo and capture a live webcam image. These images are sent to the backend, where the Flask API processes them using DeepFace. Cosine similarity between the two images' facial embeddings determines if the face matches. This ensures the user is authentic and prevents impersonation. The Login Module includes secure session handling, password hashing, and email verification, and it redirects users to role-specific dashboards based on whether they are a Student, Faculty, Alumni, or Admin. Each dashboard is dynamically rendered to show only the relevant sections. The Job Posting and Application Module enables alumni to post job opportunities, while students can view, save, and apply to jobs in a structured layout. The Event Management Module allows admins and faculty to post academic or networking events, and users can RSVP or get event details through automated email alerts.

The Chat System, built using AJAX, allows real-time communication between users, updating messages without reloading pages. The User Directory supports filters like department, batch, and profession to help users find each other easily. Lastly, the Admin Panel gives authorized users the ability to manage accounts, content, feedback, and view analytics related to usage and system performance. These modules, working in cohesion, offer a highly interactive, role-driven, and secure ecosystem.

Security Practices

Security is a critical aspect of the system and was implemented at multiple levels to protect user data, prevent unauthorized access, and ensure trust in the platform. All user passwords are hashed using bcrypt, a secure one-way hashing algorithm that prevents raw password retrieval even in case of data breaches. Session management ensures that users are authenticated and that session hijacking is prevented by setting expiration timers and regenerating session IDs after login. Email verification through PHPMailer confirms that users own the email IDs they register with, while password recovery ensures that forgotten credentials can be retrieved securely without exposing sensitive information. Input fields across the platform are sanitized both client-side and server-side to prevent SQL injection and cross-site scripting (XSS) attacks. CSRF (CrossSite Request Forgery) tokens are used in forms that change state, such as adding jobs or editing events, to prevent unauthorized commands from being executed.

Data Flow and Communication

The data flow between the frontend and backend is engineered to be smooth, secure, and real-time. When a user performs an action—such as registering or sending a chat message—the JavaScript layer captures the input and sends it to the PHP backend using AJAX. This ensures that the page doesn't reload and provides an uninterrupted user experience. For face verification, JavaScript captures the live webcam image using the `<video>` and `<canvas>` elements, while the uploaded image is accessed from the file input. Both images are converted into base64 format and sent via a POST request to the Flask backend, which acts as a microservice API. This backend receives the images, decodes them, and processes them through DeepFace, which generates facial embeddings and calculates cosine similarity. Based on a threshold (0.68), it returns a JSON response (verified: true/false). The PHP layer then parses this response and sends it to the frontend, where the registration button is either unlocked or an error is shown. A similar pattern is followed in other modules: when a user applies to a job, RSVPs to an event, or sends a message, the action is handled asynchronously and stored in the MySQL database. On the admin side, dashboard charts, logs, and feedback entries are loaded dynamically to reduce server load and provide faster access. This clean and efficient data communication strategy ensures that all system features work in real-time, enhancing user experience and system responsiveness illustrated in Figure 1.

C. System Design

Requirements Gathering Analysis (Website-Centric)

The development of the SPS Alumni Association Website began with a thorough requirements analysis tailored to building a dynamic, role-specific web platform. The project focused on catering to three major types of users—Students, Faculty, and Alumni—each with unique expectations and interactions on the website. To capture these needs, the team conducted online surveys, feedback forms, and virtual stakeholder meetings to determine the core web functionalities.

System Design Website Architecture

With the goals defined, the team designed the website architecture using the MVC (ModelView-Controller) pattern to ensure modularity and clean separation of frontend, backend, and data operations. Wireframes and UI mockups were designed for all key pages including the homepage, dashboard views, user directory, event feed,

and admin panel. These designs emphasized a responsive layout to ensure accessibility on desktops, tablets, and smartphones. The navigation structure was also carefully planned to make all major sections of the site (e.g., Jobs, Events, Alumni, Contact) quickly accessible from a top menu or sidebar. On the backend, the team created a relational MySQL database, designed to store all the dynamic web content such as: 1. Registered users and their roles ,2. Job listings and application links, 3. Event details and schedules 4. Real-time messages, 5. Feedback and report data

Technology Stack (Web-Oriented)

To create a fully interactive and responsive website, the following technology stack was implemented:

- Frontend: Built with HTML5, CSS3, and Bootstrap 5, the website was responsive by design, providing a clean and modern interface. Bootstrap components like modals, navbars, and cards were customized to maintain branding consistency. The face verification interface was also built using JavaScript, HTML5 video and canvas elements to access the user's webcam, capture the live image, and preview it before submission.
- Backend: PHP was used for all server-side processing. It handled user sessions, role-based content display, form submissions, and dynamic rendering of content from the database. Both procedural and OOP approaches were used to keep the code modular and manageable. A Flask(Python) microservice was introduced specifically for face verification, where the PHP frontend sends the two images (uploaded + webcam) to a Python API. This API uses DeepFace to compare facial embeddings and returns the verification result in JSON format.
- Database: MySQL served as the primary data storage system. Tables were carefully designed and normalized to support relationships between users, messages, jobs, and events. The system also logs verified face match data (optional) to track failed/successful face verifications and improve user support if needed.
- Email Verification Password Recovery: Integrated using PHPMailer, enabling the website to send account verification links and password reset emails securely via SMTP.
- Face Verification Integration: To enhance identity validation and prevent impersonation, a face verification system was integrated into the SPS Alumni Association Platform during the user registration process. This module ensures that the user uploading a profile picture is the same person who is registering, thereby improving security and user authenticity shown in Figure 2.

IV. RESULTS AND DISCUSSION

The implementation phase of the SPS Alumni Association Platform emphasized building a secure, modular, and role-driven web application. Role-based authentication using PHP sessions and password hashing ensured data privacy. Custom dashboards for Students, Faculty, Alumni, and Admin supported job postings, events, chat, and user directory access. A Flask-based face verification module with DeepFace enhanced user authenticity, while PHPMailer handled dynamic, branded email alerts. Real-time interactivity was enabled using JavaScript and AJAX, and the PHP-MySQL backend followed scalable, secure development practices.

The SPS Alumni Association Platform was evaluated on the basis of functionality, usability, and system performance across all user roles—Students, Faculty, Alumni, and Admin. Comprehensive testing confirmed the successful implementation of core modules such as user registration and login, job postings, event announcements, the chat system, and administrative controls.

To provide a clearer view of the system's functionality, layout, and interactivity, the following section includes a series of screenshots from the live platform. These images illustrate key modules. Each screenshot is accompanied by a brief explanation to highlight its purpose and the technologies behind it [9].

A. Registration Process

The Registration Page serves as the entry point for new users to join the SPS Alumni Association Platform. It features a clean and user-friendly interface where users can input their details, upload a profile image, and complete face verification using a live webcam capture.

The design ensures that only verified individuals proceed, enhancing authenticity from the start. The Face Verification section includes two input boxes: one for uploading a profile image and another for capturing a live webcam image. These are compared using DeepFace for identity verification. Successful matching allows the user to continue with registration.

The Email Verification screen confirms that a verification link has been sent to the registered email address. It includes a message box prompting the user to check their inbox and activate their account. This step ensures account authenticity before granting access.

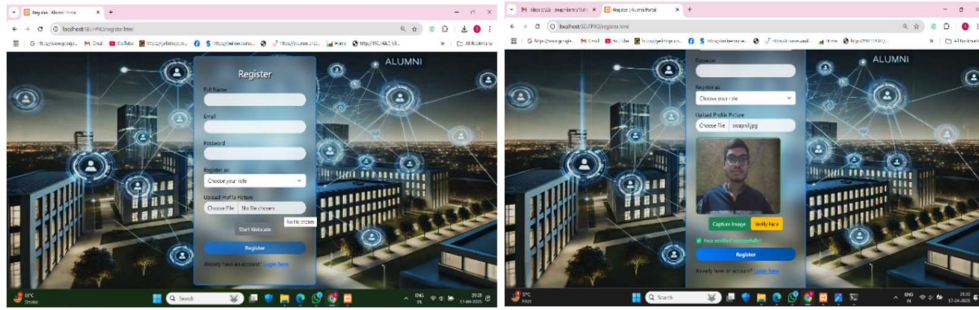


Figure (a) Registration Page

Figure (b) Face Verification Section

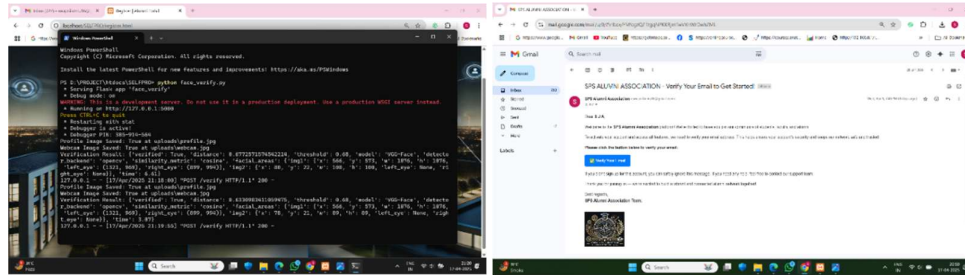


Figure (c) Face Verification Backend

Figure (d) Email Verification

Figure 2. Registration Process.

B. Login & Forget Password Process

The Login Page features input boxes for registered email & password illustrated in Figure 3, allowing users to securely access their accounts. It also includes a “Forgot Password?” link for recovery and ensures only verified users can log in. The layout is simple & user-friendly, maintaining consistent branding.

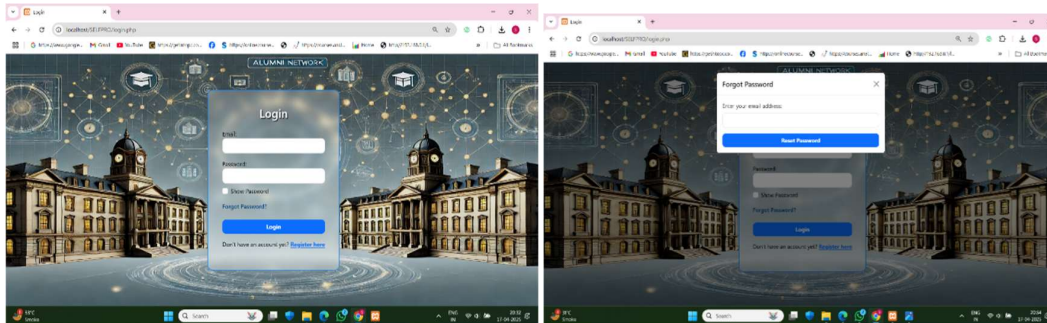


Figure (a) Login Page.

Figure (b) Forgot Password Option

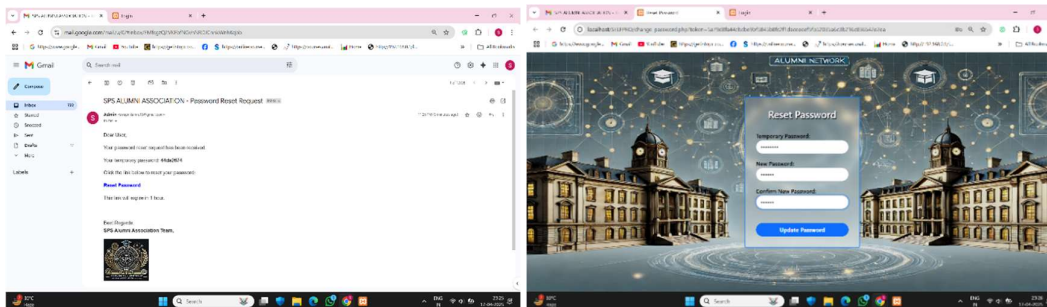


Figure (c) Reset password Email

Figure (d) Reset Password Page

Figure 3. Login and Password Recovery Screens

C. Homepage of SPS Alumni Association

The homepage of the SPS Alumni Platform is designed to give users an engaging overview of the system's features and benefits depicted in Figure 4. It includes an auto-scrolling News and Programs & Events section, allowing quick access to the latest updates. An image-rich Gallery showcases memorable moments from past alumni events, while the Success Stories section highlights notable achievements of alumni members. The footer is thoughtfully divided into Quick Links for easy navigation and social media handles to keep users connected [10].

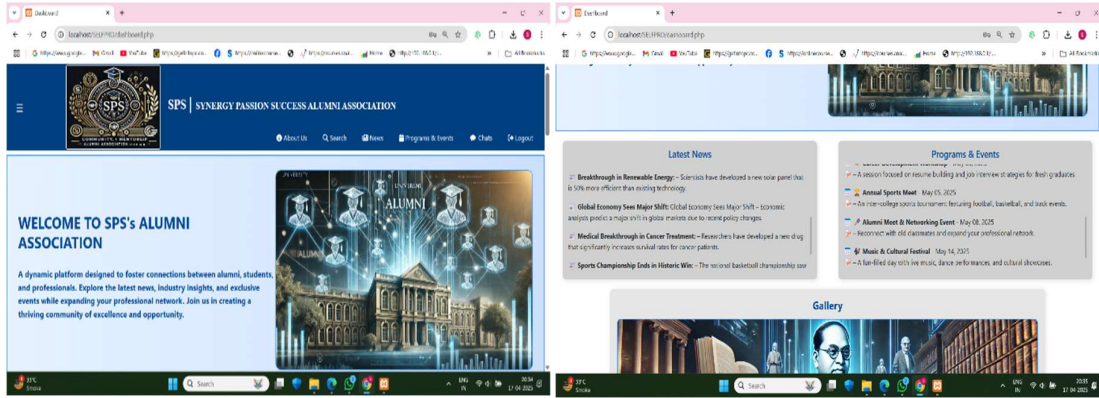


Figure (a) Taskbar & Welcome Section

Figure (b) News & Events panel

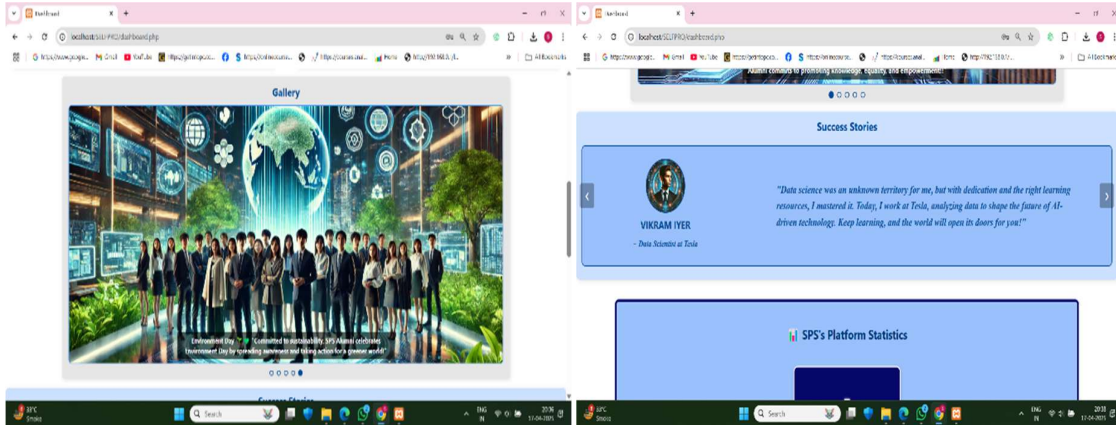


Figure (c) Gallery

Figure (d) Success Stories

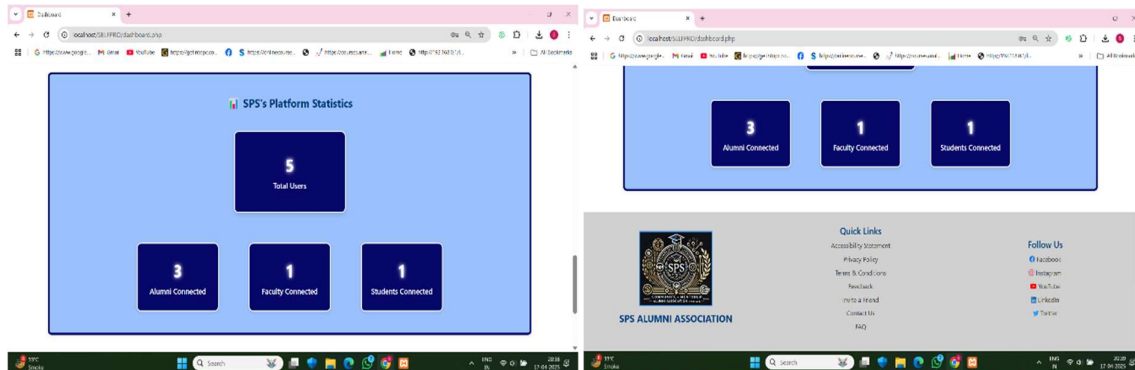


Figure (e) Platform Statistics

Figure (f) Footer

Figure 4. Homepage of SPS Alumni Association Platform: Sections Overview.

VI. CONCLUSIONS

The SPS Alumni Association Platform has effectively addressed the pressing need for a centralized and interactive digital space that connects students, faculty, alumni, and administrators. Built with a modular and scalable architecture, the platform brings together multiple essential features such as job postings, event announcements, real-time chat, and a user directory, all while ensuring role-based access and data security. Each user is provided with a personalized dashboard that aligns with their specific role and responsibilities, enhancing the overall user experience and ensuring seamless navigation.

A key innovation in this platform is the integration of a face verification system during user registration. By utilizing DeepFace—a powerful facial recognition framework based on deep learning—the system compares the uploaded ID photo with a live webcam capture to ensure the user's identity. This biometric verification adds a vital layer of trust and security to the platform, significantly reducing the risk of impersonation or misuse. It also sets a strong precedent for secure digital identity verification in academic platforms.

REFERENCES

- [1] B. Bista, A. Shakya, B. Joshi, A. Pokhrel, L. Dangol, M. Kedia, and D. S. Baral. An alumni portal and tracking system. *Journal of the Institute of Engineering*, 16(1):7–14, April 2021.
- [2] H. S. Deshpande, K. S. Bonde, R. S. Warade, S. R. Warade, and S. G. Patil. Alumni association management. *International Journal of Interdisciplinary Innovative Research Development (IJIIRD)*, 8(Special Issue 01), 2023.
- [3] N. I. Ismail, N. A. S. Abdullah, and N. Omar. Exploring alumni data using data visualization techniques. *International Journal of Advanced Computer Science and Applications (IJACSA)*, 13(9), 2022.
- [4] F. A. Kamil, K. D. Solihati, and N. Handayani. Implementation of alumni cooperation program development with polytechnic college of administrative sciences, state administrative institution jakarta. *Jurnal Administrasi Negara (JUAN)*, 12(1), 2024. Online.
- [5] P. Kumar, S. Swetha, and M. Sundari. Secured web-based alumni network and information systems. In *Proceedings of the 2023 7th International Conference on Intelligent Computing and Control Systems (ICICCS)*. IEEE, 2023.
- [6] B. M., K. Sandhiya, V. Preetha, S. Sankara Eshwari, and M. Ramya Chitra. Design of alumni portal with data security. In *2021 Second International Conference on Electronics and Sustainable Communication Systems (ICESC)*. IEEE, 2021.
- [7] R. Malhotra, M. Massoudi, and R. Jindal. An alumni-based collaborative model to strengthen academia and industry partnership: The current challenges and strengths. Springer Science+Business Media, LLC, part of Springer Nature, August 2022. Published online.
- [8] E. Mona, H. Ranjani, S. V., and S. Sivakumari. Alumni social networking site. *International Journal of Scientific Research in Computer Science, Engineering and Information Technology (IJSRCSEIT)*, 7(3):467–472, May June 2021.
- [9] N. J. Ogunode and O. O. Elizabeth. Roles of alumni association in the development of tertiary institutions in nigeria: The need for urgency. *Publishing Journals*, February 2024.
- [10] Ryan Permana, Ridho Dedy Arief Budiman, Dochi Ramadhani, and Ade Akmalia Putra. Website development for alumni of education information technology and computer. *Pendidikan Teknologi Informasi*, 15(1), 2023.