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Enhancing Alumni Connectivity through a Web Portal Developed via Iterative Methods

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Abstract

Connecting with alumni is vital for educational institutions as it raises professional networking opportunities, enhances the institution's reputation, and provides valuable opportunities for both students and graduates. It is observed that Jigme Namgyel Engineering College (JNEC) faces constant challenges in connecting with its alumni due to the lack of a comprehensive alumni database since data are saved document-based. To address this, a web-based called JNEC Alumni Portal was proposed to create a centralized repository for alumni data where users can search and retrieve the data anytime or anywhere. The portal was developed using the Laravel framework, utilizing PHP for the backend and a MariaDB database for data storage. During the development, Reverse Engineering and Iterative methodologies were followed to ensure a systematic approach with detailed planning and documentation. The portal can enable networking, and collaboration, and provide valuable resources for the college administration, faculty, and students. The portal features a comprehensive database of alumni profiles, including names, contact details, graduation years, and affiliations. The search functionality also enables easy access to specific alumni based on conditions such as graduation year or programme of study. Additionally, an event sub-system keeps the alumni informed about college activities.

Keywords— Alumni, Database System, Information System, Laravel, Problem-Based Learning, Portal, and Reverse Engineering

1 Introduction

In educational institutions, meaningful connections with alumni hold paramount importance, offering a gateway to professional networking, enhanced institutional reputation, and valuable opportunities for both current students and graduates. Despite the digitalization, Jigme Namgyel Engineering College (JNEC), employs outdated data preservation methods, trusting tabular forms,

excel sheets, and documentation for alumni information management. The existing system, including attempts with cloud-based solutions, falls short in providing efficient access, modification, and search capabilities, prompting the need for a transformative solution.

JNEC's current approach constrains multiple access complicates data modification, and hinders seamless record searching. The manual nature of updates and the lack of a centralized database management system make it difficult for the college to stay connected with its alumni, resulting time-consuming and inconsistent outreach process. This obvious problem requires a modern solution that impacts digital technologies to streamline alumni data management, facilitating communication and stimulating the connection between the institution and its former students.

To address this challenge, a web-based system called "JNEC Alumni Portal", was conceptualized and developed. This portal is developed using the Laravel framework with PHP, and MariaDB. Further, it employs Reverse Engineering and Iterative methodologies to ensure a systematic and well-documented approach during development. The primary objective was to create a centralized repository for alumni data, enabling user-friendly input, updating, and retrieval processes. The portal's feature encompasses a comprehensive database of alumni profiles, search functionalities based on specific criteria, and an event sub-system to keep alumni informed about college activities.

The successful development of the JNEC Alumni Portal marks an important achievement in bridging the gap between traditional data management methods and modern digital solutions. The portal not only addresses the immediate challenges faced by JNEC but also sets an example for educational institutions seeking efficient alumni engagement strategies through technology.

2 Review of Related Literature and Studies

In the article "Design and Implementation of Student and Alumni Web Portal," [1] from the University of Zakho discusses the development of a Students and Alumni Web Portal (SAWP). The authors examine the internal and external environment of three universities using the SWOT technique to identify factors that influence the strategic plan for the proposed system. The SAWP is built using technologies such as MySQL, HTML, CSS, JavaScript, jQuery, PHP, and AJAX, and it comprises two subsystems: the student portal system and the alumni portal system. Based on the review, the JNEC Alumni Portal also adopted the same language for development. [1] provides insights into the design and implementation of a Students and Alumni Web Portal, considering internal and external factors, employing the SWOT technique, and utilizing various technologies. The SUS testing confirms the system's usability and user satisfaction.

As per [2], DevOps implementation can overcome the ambiguity of the conventional methods of software development life cycle. Therefore, Reverse Engineering and Iterative methodologies were adopted to ensure a systematic approach to project success. [3] conducted testing in two stages, gathering feedback and measuring system usability using the robot framework. The results indicated overall approval from users reporting a positive experience. The implementation outcomes with the UML approach demonstrated strong compatibility and alignment between the available data and system requirements. Similar to the proposed project UML approaches were implemented for requirement elicitation.

In a technologically advanced world, web portals have emerged as a popular tool for businesses to enhance customer interactions and streamline operations. In [4] literature review highlights the advantages of web portals in business, emphasizing their role in facilitating seamless communication, serving as a central hub for data organization, and effectively delivering information to the intended audience. Web portals provide businesses with a professional platform for efficient customer engagement through features like email, and purchasing systems, fostering stronger relationships, and boosting customer satisfaction. Furthermore, web portals centralize data organization, reducing duplication and errors while improving operational efficiency. Also shining at delivering information to the target audience through personalized features such as user profiles, targeted messaging, and

content customization, ultimately enhancing engagement and communication effectiveness.

As focused in [4], the proposed project implemented an event sub-system into the alumni portal. The event sub-system was applied as it was planned and executed in [5] where the admin can add, delete, and edit the event. To view the event, it was public to all users (registered or not) and event notification was sent to all the registered users. Additionally, the collaborative technique was adopted during the implementation phase.

3 Methodology

The development of the JNEC Alumni Portal employs the Laravel framework with PHP and MariaDB. As found in [6] and [7], the Laravel framework provides robust web application development in handling multiple user sources with separate routes and controllers. This feature-rich framework not only ensures seamless organization and management of user-specific functionalities but also enhances the flexibility and scalability of the portal.

By analyzing the problems in the existing system, reverse engineering with an iterative approach methodology was utilized as shown in Figure 1 to eliminate the issue. Firstly, the team started by carefully examining the existing methods of collecting and storing alumni data. This involved studying the tabular forms in Excel sheets, and documentation that were previously used to maintain the alumni database.

Through this analysis, the JNEC Alumni Portal was presented as a solution for the existing system and developed by implementing an iterative approach. Each iteration focused on implementing and testing specific features, with regular feedback loops from stakeholders and users. This feedback guided refinements and improvements throughout the development process. The combination of reverse engineering and an iterative approach ensured a systematic and structured development process, resulting in a modern and efficient web-based platform for managing alumni data and fostering alumni engagement.

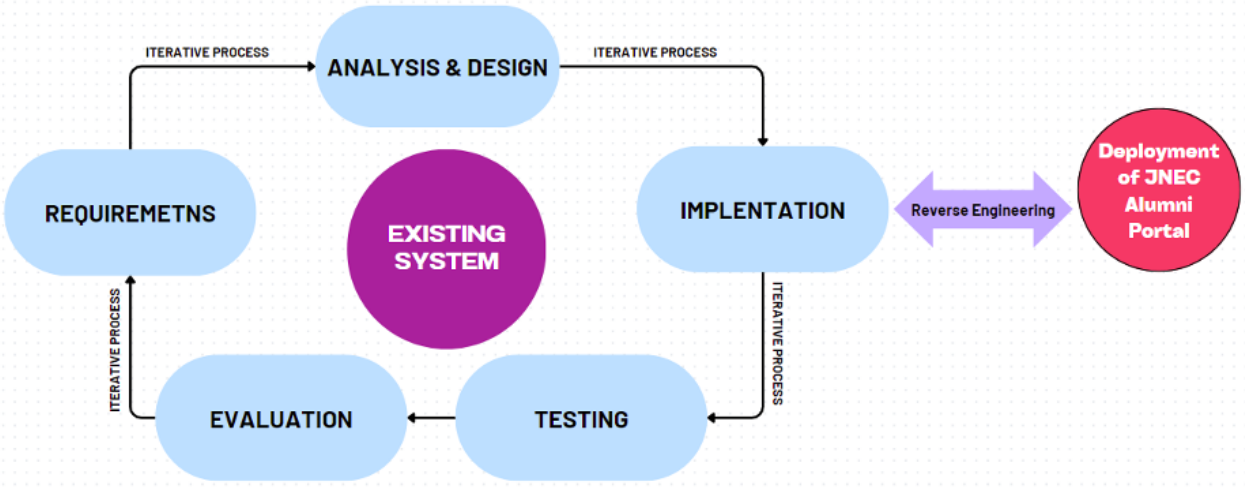


Figure 1: Reverse Engineering with iterative approach

The iterative methods applied in [8] for developing the system involved repetitive cycles of analysis, design, implementation, and evaluation, thus enhancing the system's adaptability and efficiency. As per [9], the integration of SDLC and RAD models supported iterative user feedback and structured development, resulting in a user-focused system. Therefore, adopting an iterative approach to reverse engineering as shown in Figure 1 slowly uncovers the details of a system, improves the accuracy of perceptions, and adjusts understanding as new information becomes available. This

method was particularly beneficial when dealing with additional sub-systems such as event management and when the alumni system documentation was limited. After the Analysis and Design phase, the overall system functionality and visualization were made as revealed in Figure 2 whereby the user first has to register to the portal. Then log in to edit their profile details and to search for other alumni information. Also, event management was integrated with the system for alumni engagement with the college. Users can also provide feedback on the portal for the college



Figure 2: System Functionality

4 Results

The successful implementation of the JNEC Alumni Portal produced several positive results for both the college and its alumni community. The portal not only addresses the immediate challenges faced by JNEC but also sets an example for educational institutions seeking efficient alumni engagement strategies through technology. Figure 3 shows the landing page of the system with three major navigation buttons at the top right namely Events, Login, and Register.

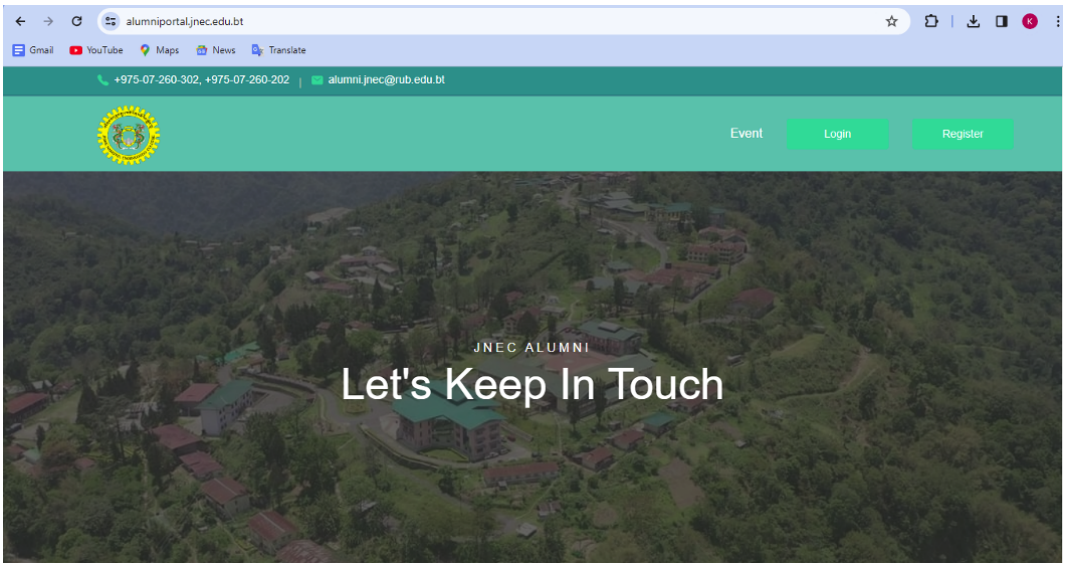


Figure 3: Landing Page

Users must first register with the required details mentioned on the registration page in order to access the portal through the login page as shown in Figure 4.

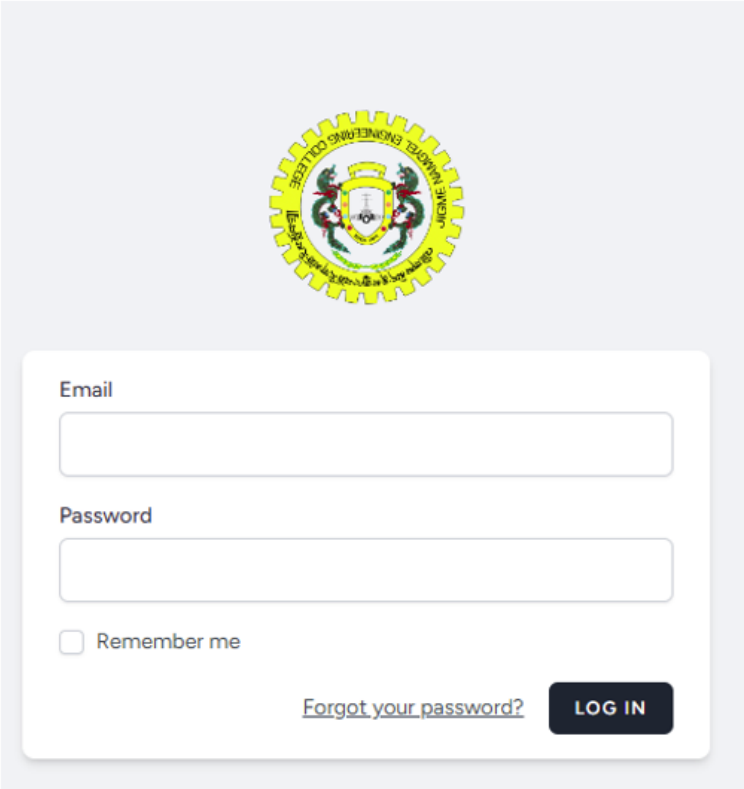


Figure 4: Login Page

Figure 5 shows the utilization of the search feature after logging in to the portal for searching other alumni information. The portal will offer an alumni directory where users can search and browse through the profiles of former students. This includes implementing search filters to facilitate quick and accurate searches based on criteria such as department, programme of study, year of graduation, and employment status.

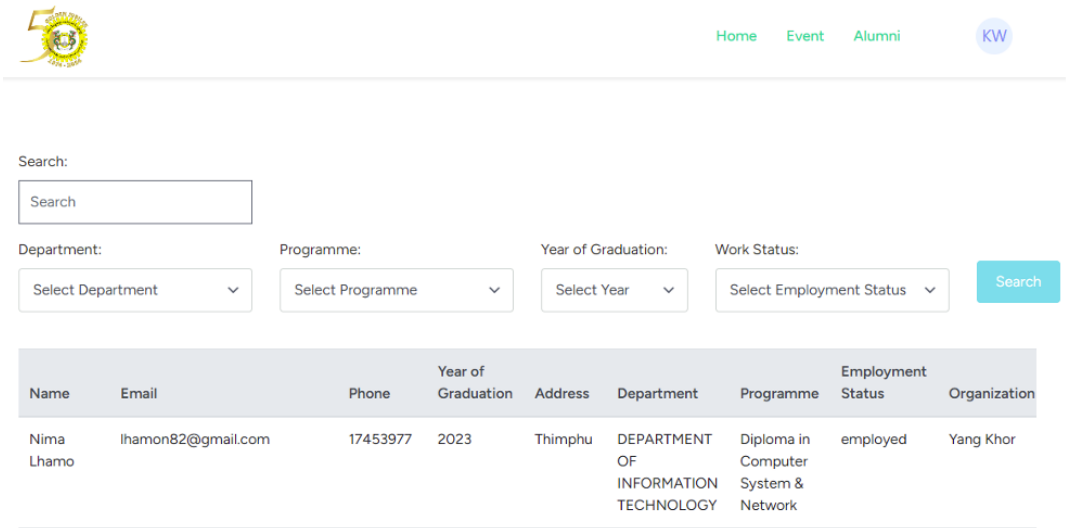


Figure 5: Search Page

The portal will facilitate effective communication and networking among alumni and the college. This includes features such as events as shown in Figure 6 that will share information about college activities and initiatives, thereby encouraging their participation and support.

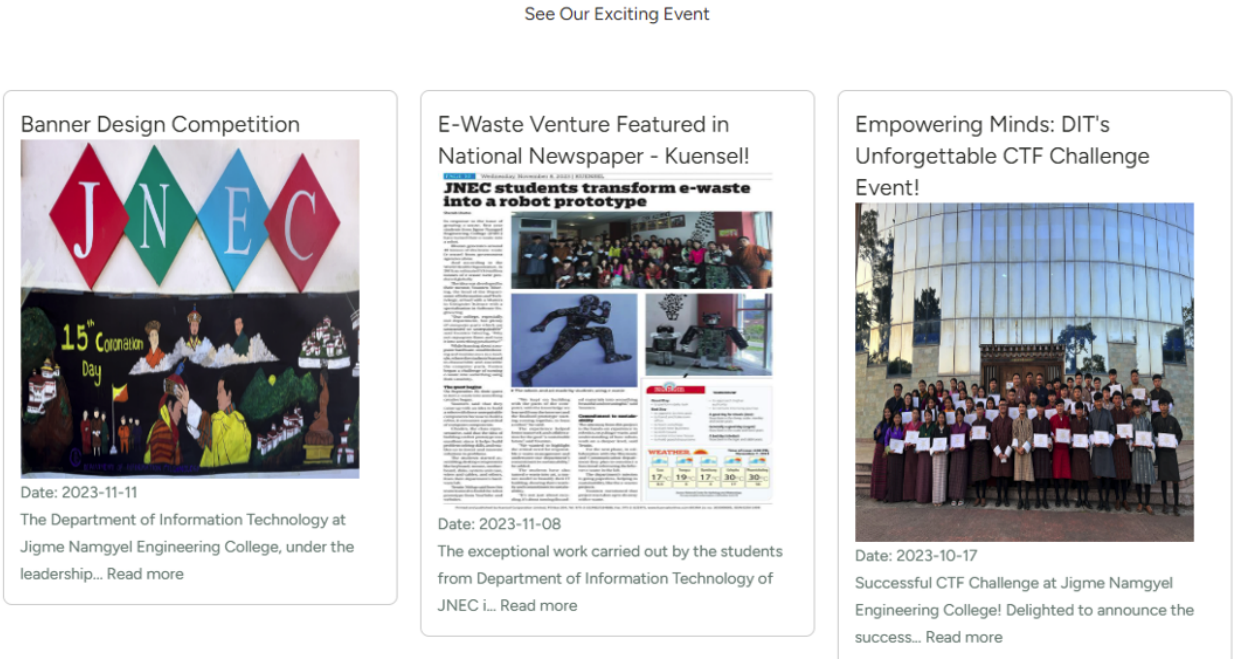


Figure 6: Event Page

5 Conclusion

The development of the web-based JNEC Alumni Portal successfully addresses the need for a centralized system to collect and organize alumni details at Jigme Namgyal Engineering College. The system was developed using the Laravel framework and reverse engineering with the iterative approach as the methodology. The JNEC Alumni Portal provides a convenient platform for the college and its former students to stay connected, fostering a strong alumni network and facilitating valuable networking and collaboration opportunities. The implementation of features such as comprehensive search functionality, notifications, and an event notice board fulfills the objective of creating a user-friendly and informative platform. The system having such engaging features also has room for authenticating whether a user is a real alumnus of the college.

6 Acknowledgement

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