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Responsive Web Design for Educational Institution: A Case of ALUMNIApps

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ABSTRACT

Alumni means those who have graduated from the university. In order to stay relevant to the university, the university or institution must establish a platform for accessing and retrieving alumni data. The purpose of creating the platform or known as a system is to reduce barriers in terms of data access, especially information regardless of their university, career opportunities and programs developed to strengthen the skills of graduates. This research aims to examine the evolution of the alumni system utilized in higher education institutions. This will incorporate the web development framework that has been employed in the system at one of the private universities in the Klang Valley. This study also examines the system requirements for the alumni of the university. Responsive web has been explored and implemented with aesthetic features, regardless of system requirements. Therefore, the Alumni Portal is developed and is also known as ALUMNIApps. Future studies will utilize dashboard analytics to analyze alumni data, which will be utilized by managers to make significant decisions at the university management level.

1. Introduction

Alumni was an important element to the institution. According to Bista *et al.*, [1] alumni associations play an essential role in higher education institutions, as they provide networking opportunities and contact between the university and the alumni or among the alumni. They are a person who graduated from her or his institution which is completed the requirement set from the programme that they enrolled. Alumni plays a vital role in Higher Education Institution (HEI), because it gives the HEI support in terms of giving feedback on the programme of the university regarding the improvements of the course, supporting the university in most of the activities that require alumni's participation [2].

According to [2] one of the criteria in quality assurance for higher education is the connection of the HEI to its alumni and tracer study of its graduates once you have these data, you can manage and

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analyse these kinds of information and it will serve also as a very important parameters of improving the quality in higher education, specifically the programs being offered by the HEI. In order to improve the quality of programs, there should be continuous feedback from the alumni who are working particularly in the industry. Their feedback is very important inputs to the curriculum and activities of every HEI [3].

Most of institution take the opportunity to provide a platform in order to get along with their alumni. Communication between graduates or alumni and university can be suitable for both sides the faculty also wants to keep in touch with its graduates using web application, providing a channel for professional and social communication between graduates themselves and the faculty [4]. Furthermore, with the rising of technological advancement it's easier to provide a system so that the institution can get alumni data and they may keep it in their database of the system.

In fact, the industrial revolution 4.0 became the current paradigm discussed both in industry and also in education. The Ministry of Research Technology and Higher Education encourages all universities follows technological developments including the application of the revolution paradigm industry 4.0 to education [5]. Beside that the emergence of the internet has created a massive opportunity for businesses to expand their reach and engage with global audience [6,7].

Websites are the primary platform for showcasing products and services, providing information, and interacting with customers. However, building a successful website is not as simple as just putting together some images and text. Two critical processes, web designing and web development, are required to create an effective online presence. According to [8], web designing involves creating the visual aspects of a website, including layout, colour schemes, typography, and graphics. It aims to create an aesthetically pleasing and user-friendly website that attracts visitors and keeps them engaged [8].

The website can be utilized for business and institution in order to engage with the graduate and alumni. These would include the utilization of e-learning technology such as learning management system (LMS), mobile learning and application development [9]. The significant of using these platform and technological advancement can help the institution to boost their business strategy and met the requirement setting as well.

Thus, the objective of this paper is that to explore the development framework of the alumni web site in term of requirements needed in order to produce the portal. The study would also incorporate the aesthetic features of responsive web in the development process which is has been explored together with the system requirement. As for the implementation the alumni portal as long as ALUMNIApps has been develop for University Poly Tech Malaysia UPTM as one of the platforms within alumni and the university.

2. Methodology

The methodology used in this research is a qualitative technique. The technique focuses on the development framework used in this research which follows the system life development cycle for a common website creation. For the past few decades, the software development methodologies have been evolving intensively [10]. According to [11], the best methodology for a particular project will depend on factors such as the size and complexity of the project, the availability of resources, and the preferences of the project team. Phase one is a planning stage and proposal of the development strategy. This is the basic stage of common development framework. In general Figure 1 exemplify the whole picture of the framework of the alumni portal. The analysis phase sets the stage for the subsequent phases of the software development life cycle, guiding the development team toward a clear understanding of what needs to be built and how it will address the identified business problem.

A well-executed analysis phase contributes to the overall success of the project by minimizing misunderstandings, reducing rework, and ensuring that the final system meets stakeholder expectations.

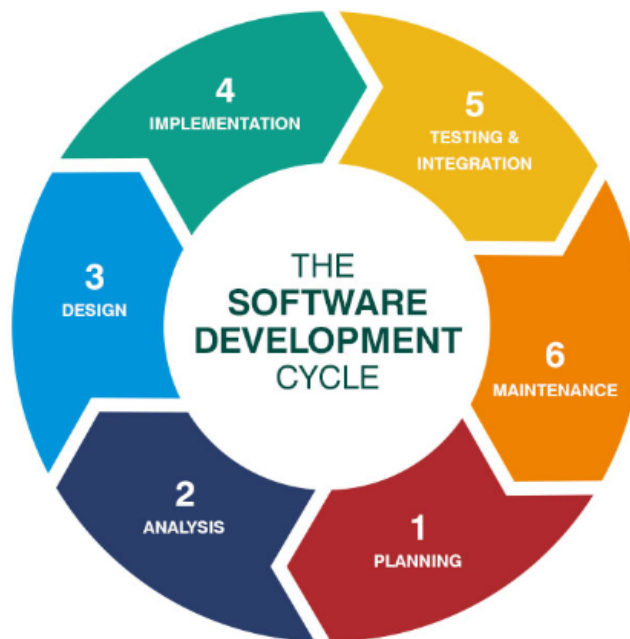


Fig. 1. Web Design Developmental Framework

The second phase of the framework is that to gather a requirement need especially by the client or user of the portal or website. In this phase a few requirements have been proposed in order to develop the portal [12]. The phase is known as analysis. Next phase will be the design of all the requirement needed. The fourth stage is implemented and followed by testing and maintenance phase of the phase five and six of the developmental framework.

The important stage of the development process would be the design phase [13]. These would include a few diagrams such as use case (US) and entity relationship diagram (ERD) of the alumni portal. Figure 2 on the next page, display the use case of the system or portal. The use case diagram is a model of how different types of users interact with the system to solve a problem. As such, it describes the goals of the users, the interactions between the users and the system, and the required behaviour of the system in satisfying these goals.

In this case, we have two categories of user of the portal which are alumni itself and alumni administrator. In term of software and hardware requirement of the portal, this alumni portal has been developed by using Google Site as a wireframe and phpMyAdmin as their database. PhpMyAdmin is a free and open-source administration tool for MySQL and MariaDB. As a portable web application written primarily in PHP, it has become one of the most popular MySQL administration tools, especially for web hosting services. Besides that, phpMyAdmin offers a range of features that simplify database management tasks, enhance accessibility, and provide a user-friendly interface for both beginners and experienced database administrators.

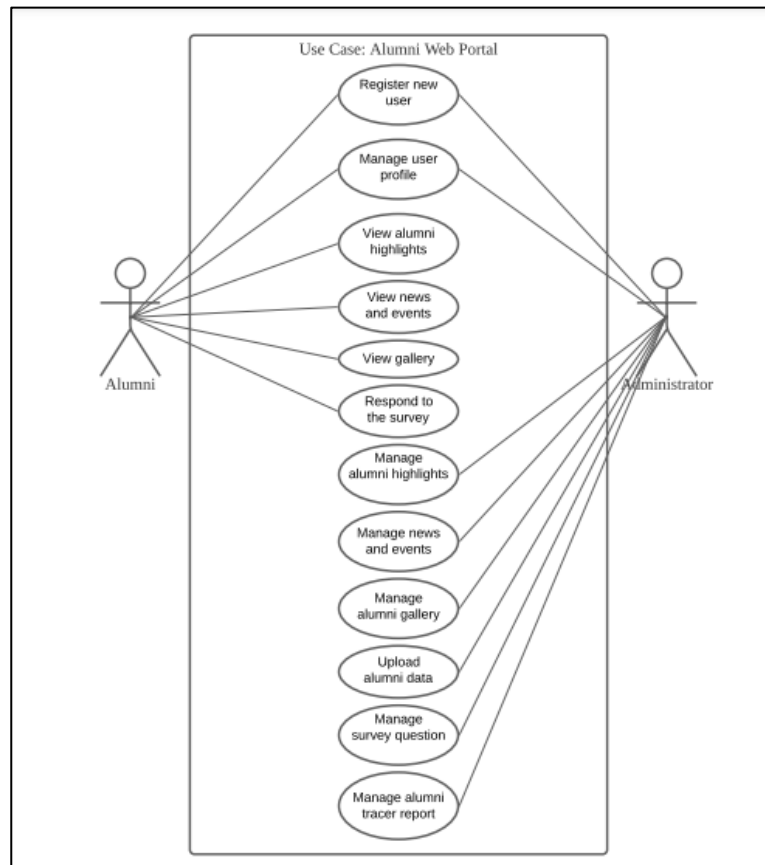


Fig. 2. Use Case Diagram

Figure 3 demonstrates the entity relationship diagram which is another requirement necessary for the alumni portal. Entity relationship diagrams (ERD) provide a visual starting point for database design that can also be used to help determine information system requirements throughout the development framework. It includes a conceptual data model, which lacks specific detail but provides an overview of the scope of the project and how the data sets relate to one another.

Nonetheless, a logical data model, which is more elaborate than a conceptual data model, reveals specific attributes and connections among data points. While a conceptual data model does not need to be designed before a logical data model, a physical data model is based on a logical data model.

The implementation phase is where the portal or website been developed based on the requirement and design from the previous step. This phase is a crucial stage in the software development life cycle where the actual system is developed based on the requirements gathered during the analysis phase. It involves the translation of design specifications into a functional and operational system. Next will be the testing and integration phase which is the action taken where all the function in the portal has been tested such as button, linkage and text or image display. The maintenance phase is a last activity and vital process in most development framework where it is a challenge for the developer in term of to handle all sorts of things.

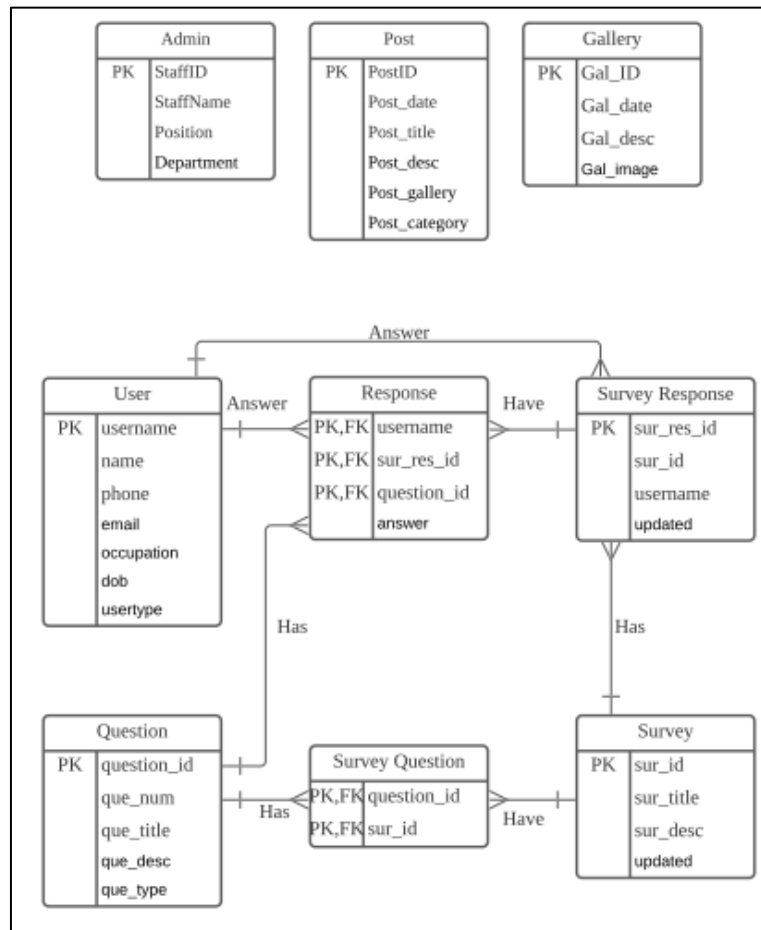


Fig. 3. Entity Relationship Diagram (ERD)

Apart from that, the research also explores the aesthetic features of responsive web design for the portal. According to [14] responsive design allows software developers to build a Web page that can dynamically adapt to the size of the devices. This development philosophy enables the rendering of Web pages in a fast and optimized way, ensuring a good user experience on mobile devices, tablet and desktop [14]. Thus, one of the most popular techniques is the responsive Web design, which is a technique that allows a website to adapt to the device where a page is being accessed (e.g., desktop, laptop, tablet or a smartphone). According to [15], the responsive web design solves the compatibility problems of web pages displayed at different resolutions, different platforms, and different screen sizes, and also brings high-quality experience to users.

Moreover, responsive configuration implies keeping up the same look and feel of site for various gadgets with no real distinction [16]. This could help the client to effectively get to the information from various gadgets with no many-sided quality to comprehend the stream of data and yield of the data. Clients need not pick a specific gadget to get to the data from the site. According to [17] the benefits of responsive web design include it can easily adapt to the display on any device, the content accessibility, visibility and readability and no need to resize website pages on the used devices horizontally or vertically. Besides that, it can provide necessary savings without no need for creating a separate website for mobile devices. That sound good. A design is considered to be responsive if it uses these three points which is flexible grid, flexible images and media, and also media queries [18]. Hence, responsive design promotes a specific way of implementing interfaces that is however difficult to apply to existing web sites without major reengineering [19,20].

3. Results

This section will deliberate the result from the developmental framework that has been discussed in the previous part. It then follows a screenshot of a responsive web for the portal. The finding of this research is that when the testing phase has been completed in the development framework. Figure 4 portrays the main page of the alumni portal. Meanwhile Figure 5 depicts the interface for the alumni (user) to register into the portal.

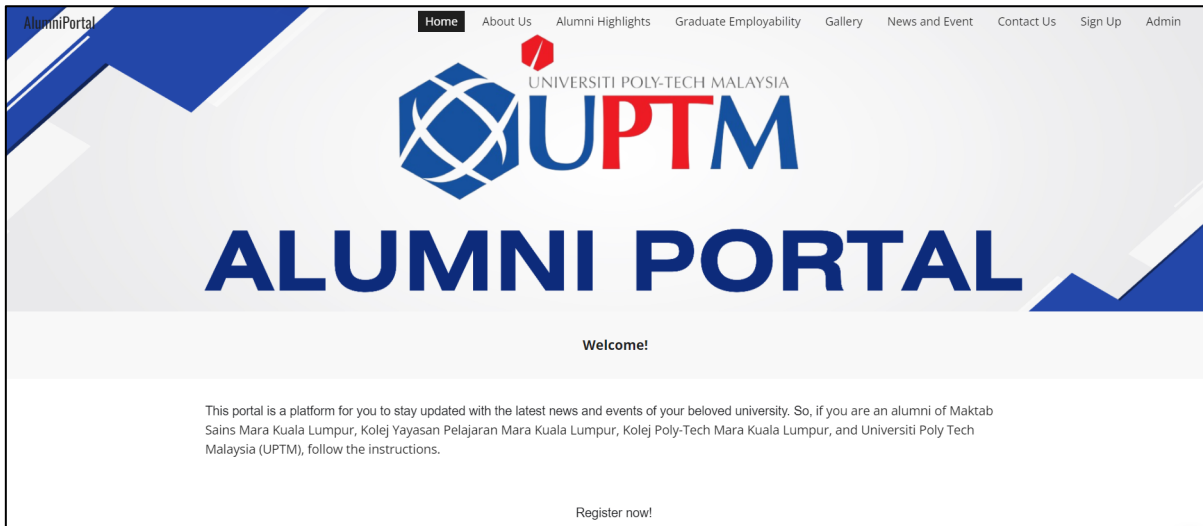


Fig. 4. Main page of Alumni Portal

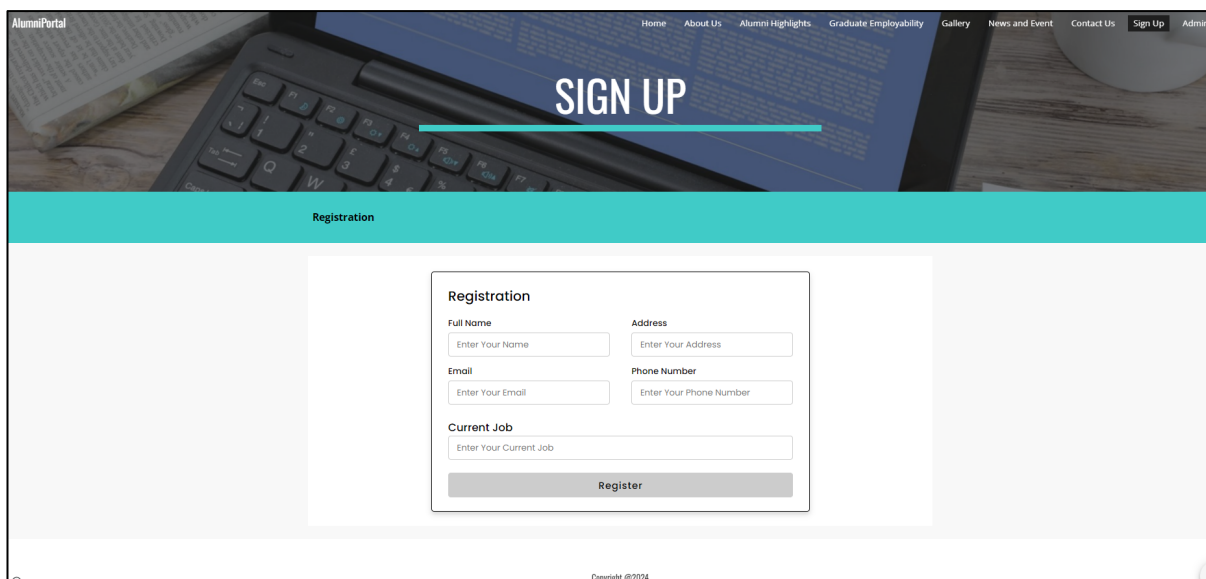


Fig. 5. Alumni (User) Registration page

Once the alumni (user) enrol into the portal, they will receive a notification through email immediately upon registration completed. This will ensure that the user acknowledges that the session has been done.

Figure 6 and Figure 7 illustrates some of another interface of the Alumni Portal which is About Us and Graduate Employability page. They were also a linkage to other website such as SKPG system for the page.

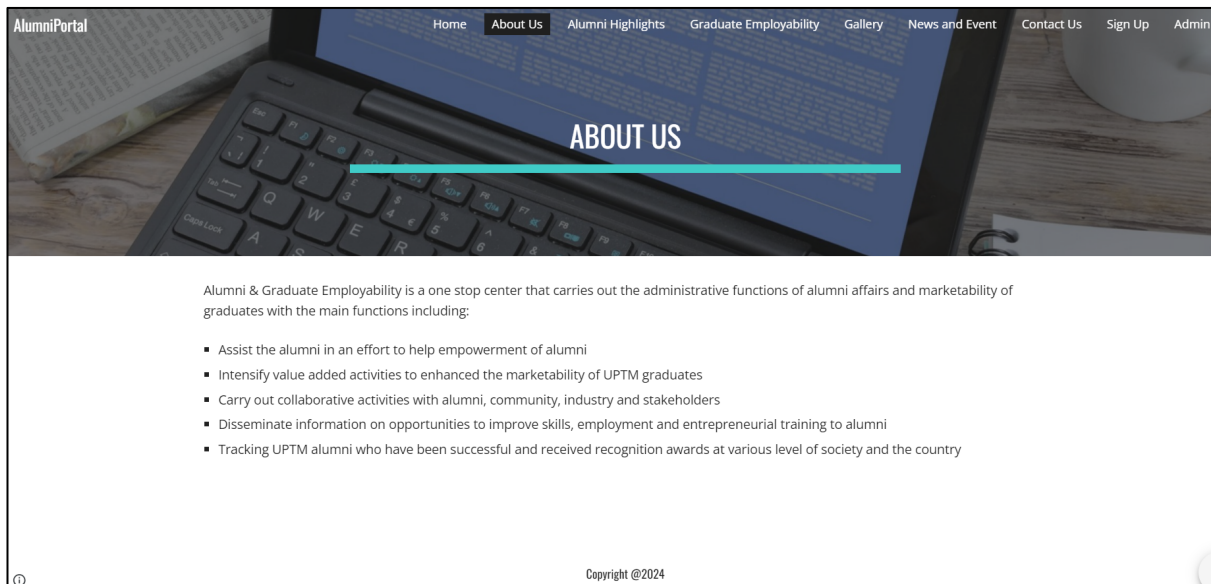


Fig. 6. About Us page

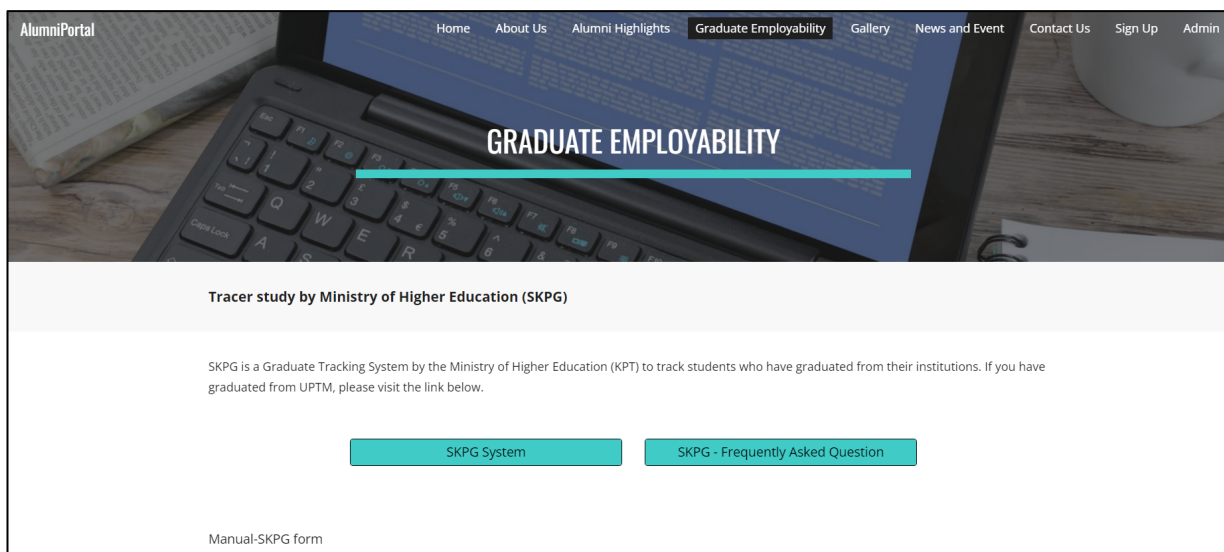


Fig. 7. Graduate Employability page

In addition to the user, the administrator also plays a significant role in the Alumni Portal. Figure 8 depicts the interface of admin in the portal. Admin is a person who can manage the alumni (user) data in the portal. A few tasks can be handled by an administrator of the portal such as to add, delete and edit alumni data in the system.

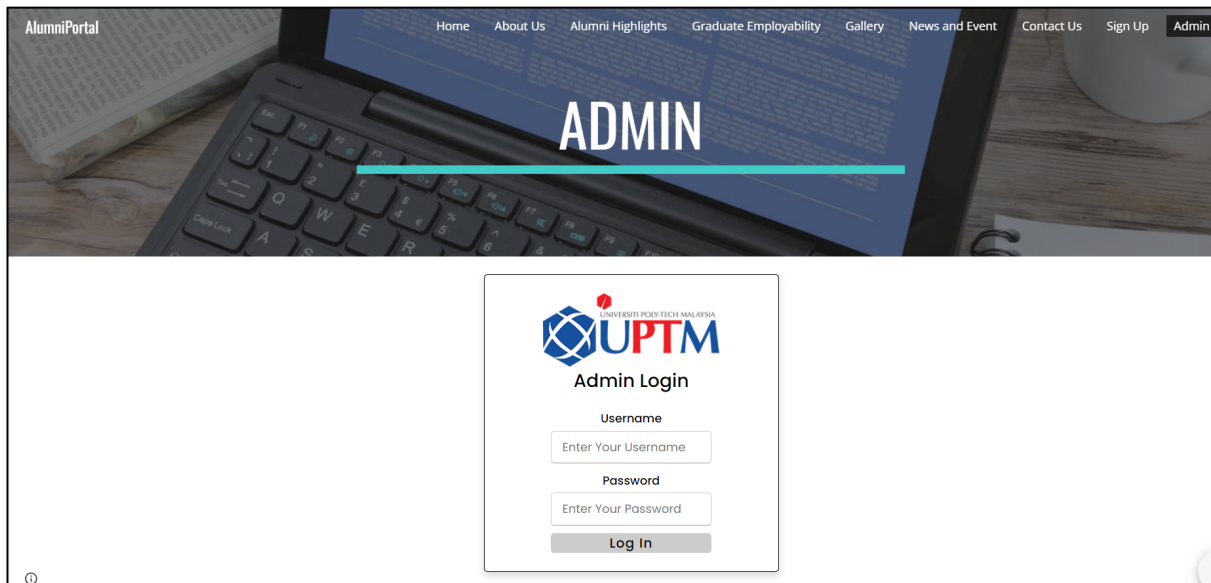


Fig. 8. Administrator page

Figure 9 show the interface where the administrator of the portal can view, edit, add or delete the alumni data in the database. These could give the admin of the system a priority towards the Alumni Portal.

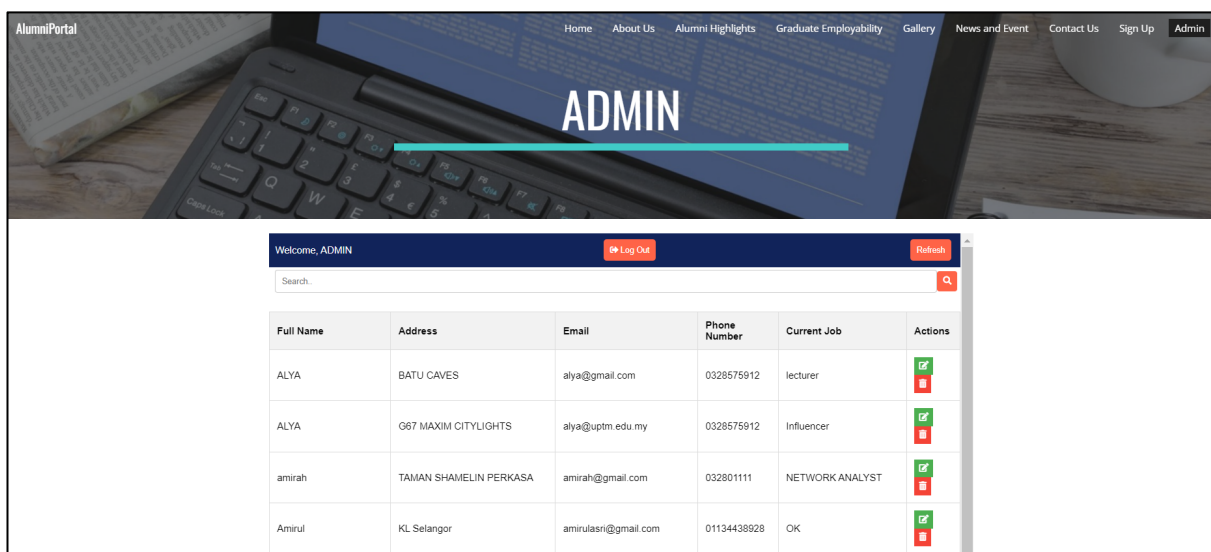


Fig. 9. Administrator view

The benefits of a responsive web design are numerous and contribute to an enhanced user experience across various devices. A responsive web design is essential for delivering a consistent and optimal user experience. It will also be improving reach, reducing costs, and adapting to the ever-evolving landscape of digital devices. The responsive web design in this study is to certify that the website can adapt with the cross-browser compatibility approach. This is to ensure the compatibility with major web browsers such as Chrome, Firefox, Safari, Edge, etc. to provide a consistent experience for all users. For clarification Figure 10 depicts the view of the portal via another device such as tablet PCs and smart phone. Figure 11 also depicts on how the menu in the portal can be viewed and select by the users.

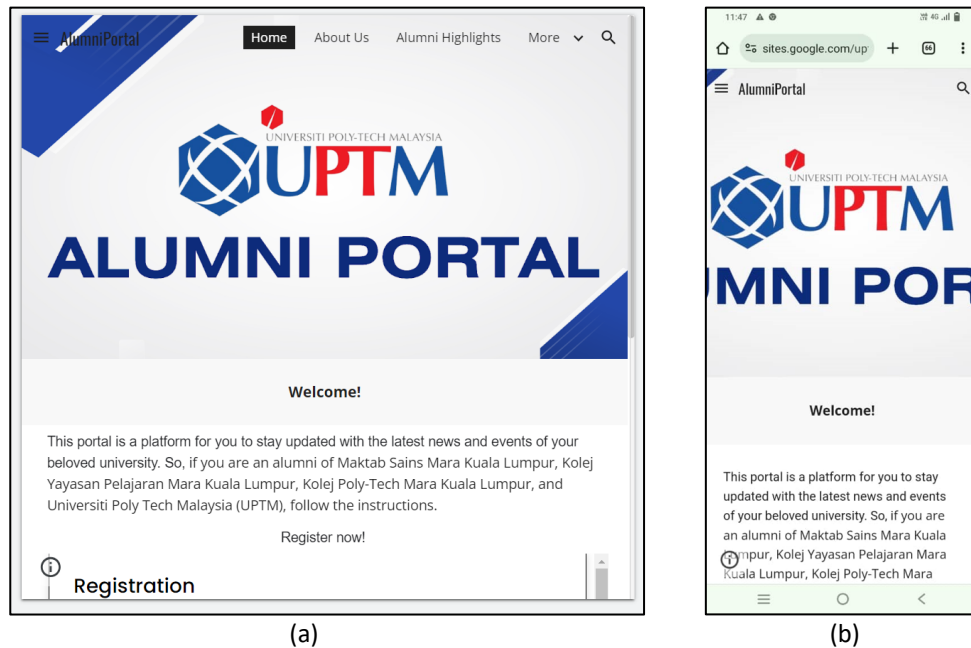


Fig. 10. Figure (a) Tablet view and (b) Phone view

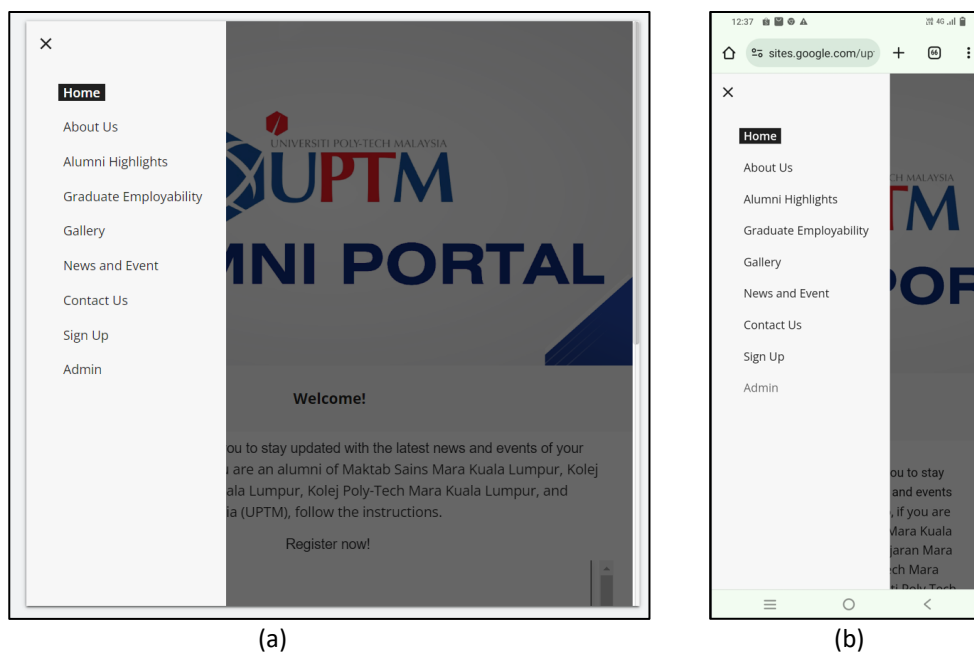


Fig. 11. Figure (a) Tablet - Menu view and (b) Phone - Menu view

4. Conclusions

As a conclusion, the finding of this research is that the implementation of an Alumni Portal for University Poly Tech Malaysia was successful. The development framework that has been explored in order to proceed with the implementation of the portal thoroughly gives an impact on this research outcome. The development is a crucial and strategic initiative for fostering a strong and engaged community of graduates. Through this digital platform, alumni can seamlessly connect, collaborate, and contribute to the growth and success of both the institution and its graduates. The benefits of such a portal are manifold, ranging from networking opportunities and knowledge sharing to mentorship programs and professional development resources.

By providing a centralized hub for alumni activities, the portal facilitates communication, encourages collaboration, and strengthens the bond between the institution and its graduates. This, in turn, can lead to increased support for the alma mater in terms of financial contributions, industry partnerships, and recruitment opportunities.

Additionally, the Alumni Portal serves as a valuable tool for the institution to stay connected with its graduates, gather feedback, and enhance the overall educational experience. It becomes a dynamic platform that evolves with the changing needs of the alumni community, ensuring its relevance and effectiveness over time. Nevertheless, more explorations are needed in order to help with successful implementation of the portal in term of new software and platform and also skill and training involved.

Other than that, implementing a responsive web design for an Alumni Portal is a strategic and imperative decision in today's digital landscape. The adaptability of such a design ensures a seamless and user-friendly experience across various devices, catering to the diverse preferences and lifestyles of alumni members. By embracing responsiveness, the alumni portal becomes more accessible, enhancing user engagement, satisfaction, and retention.

The benefits of a responsive web design extend beyond mere aesthetics. It fosters a sense of inclusivity, allowing alumni to connect with their alma mater effortlessly, regardless of the device they choose. This adaptability is particularly crucial as users increasingly access online platforms through smartphones, tablets, and various screen sizes.

Moreover, a responsive Alumni Portal positively impacts the institution's image by showcasing a commitment to technological advancements and user-centricity. It reflects a forward-thinking approach that aligns with the evolving expectations of alumni, reinforcing the institution's dedication to staying connected with its graduates.

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