Centralized Web Application for University Students' Internship Placements: A Technological Approach to Career Readiness

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Abstract

University students often face significant challenges in securing internships and job placements due to a fragmented and inefficient job search process. This research project aims to develop a web application addressing the need for a centralized, user-friendly platform that consolidates job search efforts. The proposed web application leverages modern web technologies to provide real-time updates, efficient filtering options, and a comprehensive repository of job opportunities, streamlining the job search process. The current lack of a structured and efficient approach to finding internships and job placements leads to missed opportunities and increased frustration among students. This project tackles these issues by creating a dedicated web application designed to simplify and centralize the job search process. The front end poses real-time updates and interactive features like autocomplete and infinite scrolling. The back-end is powered by the Laravel framework, chosen for its robust features, including the Blade engine and its MVC architecture. The usability testing generated key findings confirming the platform's usability. Most student users successfully navigated the interface and completed the primary job/ internship application task independently, demonstrating that the system is effective in enhancing the job search process. The project is significant in its potential to enhance the career readiness of students by providing a reliable platform that connects them with potential employers, improving the overall job search experience and increasing the chances of securing suitable internships and job placements.

Keywords: Career Readiness, Internship Placement, Job Search Process, Modern Web Technologies, Web Application

I. INTRODUCTION

University students often face difficulties in securing internships and job placements due to a fragmented approach to job searching. The preliminary survey conducted shows that the difficulties faced by the students in finding job placement are critical. Figure 01 visualizes the summary of the preliminary view of the challenges faced by students in finding internships.
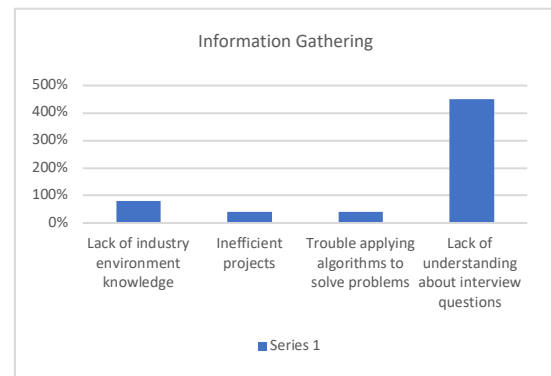

Figure 01: Challenges faced by students in job placement

This project aims to consolidate job search efforts into a single, user-friendly web platform specifically designed for students in the Technology faculty. By leveraging modern web technologies, the platform will provide real-time updates, efficient filtering options, and a centralized repository of job opportunities. The current lack of a structured, efficient process for finding internships and job placements leads to missed opportunities for students. Studies have shown that fragmented job search processes can result in students feeling overwhelmed and missing out on potential opportunities (Pham & Soltani, 2021; Khattab et al., 2022). This project addresses this problem by creating a dedicated web application streamlining the job search

process. The proposed solution involves developing a web application that allows students to search and apply for internships and job placements. Additionally, it will provide employers with a platform to post vacancies and review applications, ensuring the system is user-friendly, responsive, and provides real-time updates.
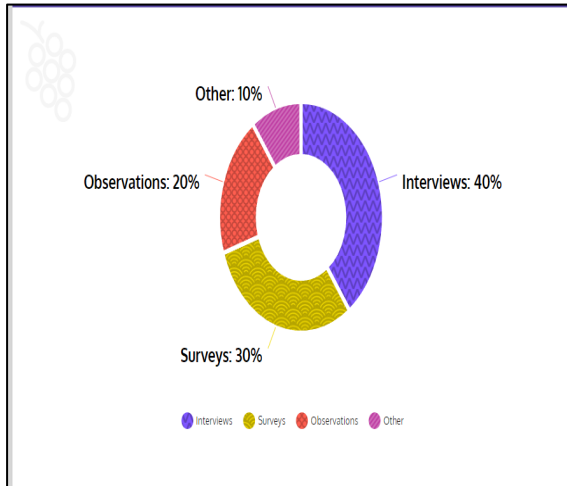

Figure 02: Requirement Gathering Process

The importance of a centralized job search platform for university students cannot be overstated. According to Ben Dhia (2020), students who have access to a structured job search system are more likely to secure internships and job placements compared to those who rely on traditional methods. Furthermore, the integration of real-time updates and efficient filtering options has been found to significantly improve user satisfaction and engagement with job search platforms (Lu et al.,2015)

The scope of the project includes designing and developing the web application, focusing initially on the Technology faculty of the South Eastern University of Sri Lanka. Future expansions can include other faculties and additional features based on user feedback. This project is significant as it directly impacts students' career readiness, providing a structured approach to job hunting and facilitating connections between students and potential employers. The development of this platform will not only help students in securing internships and job placements but also enhance their overall career readiness by providing them with a tool that simplifies and streamlines the job search process.

II. METHODOLOGY

A. Requirement Gathering

The requirement-gathering phase employed multiple techniques to capture comprehensive user needs and expectations Figure 02. Structured and semi-structured interviews were conducted with key stakeholders including students, university placement officers, and company HR representatives to gather qualitative insights into their specific needs and expectations. To complement this, online surveys were distributed to a broader audience to collect quantitative data on desired features, while direct observations of existing placement processes helped identify current inefficiencies. This multi-faceted approach ensured that the data collected, covering user preferences, pain points, and required functionalities, was thorough and well-rounded.

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Key stakeholders involved in this phase were students, who provided insights into their preferences for applying to internships; university placement officers, who shared how they manage internship postings and student applications; and company HR representatives, who discussed their requirements for posting internship opportunities and selecting candidates. The data collected included user preferences, pain points in the current process, required functionalities, and suggestions for improvements. The process also involved conducting structured interviews with students, university placement officers, and company HR representatives to understand their needs and expectations. Online surveys provided quantitative data on desired features and functionalities. Observations of existing internship placement processes helped identify inefficiencies and areas for improvement.

B. UI/UX Design

During the initial stages of the Internship and Job Placement Management System project, significant effort was dedicated to designing UI/UX prototypes to ensure an intuitive and user-friendly experience for all users. The primary goal

of these prototypes was to create a visually appealing and highly functional interface that would cater to the diverse needs of students, employers, and university placement officers.

The design process began with thorough research and analysis of the existing systems and user preferences. This involved studying various design patterns and trends, conducting user interviews, and gathering feedback through surveys. With this information, wireframes and mockups were created for key interfaces, including the student dashboard, company portal, and admin panel. These prototypes provided a clear visual representation of the system's layout, navigation flow, and overall aesthetic. In designing the UI/UX, particular attention was given to ease of use and accessibility. The student dashboard, for instance, features a clean and organized layout, allowing users to easily navigate through different sections such as job postings, applications, and notifications. The use of a consistent color scheme and typography ensures a cohesive look and feel, while interactive elements like buttons and forms are designed for intuitive use.

The prototypes also included advanced search functionality with multiple filters, enabling students to quickly find relevant internships based on criteria such as location, industry, and duration. Real-time updates and notifications were integrated into the design to keep users informed about new job postings and application statuses. For employers, the company portal was designed to streamline the process of posting job vacancies and reviewing applications, with a focus on simplicity and efficiency. Throughout the design process, feedback was continuously sought from potential users to refine and improve the prototypes. Usability testing sessions were conducted to identify any issues and gather suggestions for enhancements. This iterative approach ensured that the final design was not only aesthetically pleasing but also highly functional and aligned with user needs. These initial UI/UX designs (Figure 03) served as a critical foundation for the development phase, providing a clear blueprint for the implementation of the system. By prioritizing user experience from the outset, the project team was able to create a prototype that effectively addresses the challenges faced by students in finding internships and job placements, ultimately contributing to the system's success.

The mockups set the fundamental layout, core concept, and visual style, which were then improved and implemented via the Laravel Blade templating engine to create the final user facing interface that will be shown later in the paper.

C. System Design

The system architecture includes a front-end developed with HTML, CSS, Bootstrap, and JavaScript, and a back end using Laravel. Diagrams and mockups illustrate the database schema, user interface, and overall system architecture. The system design for the internship job placement project was meticulously planned to ensure robust architecture and user-friendly interfaces. The system architecture followed a three-tier model consisting of a presentation layer, a business logic layer, and a data layer. Figure 04 shows the overview of the system design.

The architecture of the system is based on a strong three-tier structure, as shown in Figure 04. This architecture separates the application's concerns into logical tiers, which allows the application to be both scalable and maintainable.

1) Presentation Layer (Front-End):

This tier includes the user interface and runs in the user's web browser. It is built with HTML, CSS, and JavaScript. This layer is responsible for presenting information to the user and capturing input from the user. In our project layer, this tier renders the Blade templates sent from the server.

2) Application Layer (Back-End):

The center of the application is the back-end, which is part of the Laravel framework running on a web server and contains all the business logic. When a user sends a request, for example to search for a job, the server receives the request and routes the request to the appropriate controller in Laravel, where the request will be handled, retrieving information from the database, processing it as needed, and preparing suitable information for the user.

3) Data Layer (Database):

This layer contains a MySQL relational database. This layer will provide for storing, retrieving, and
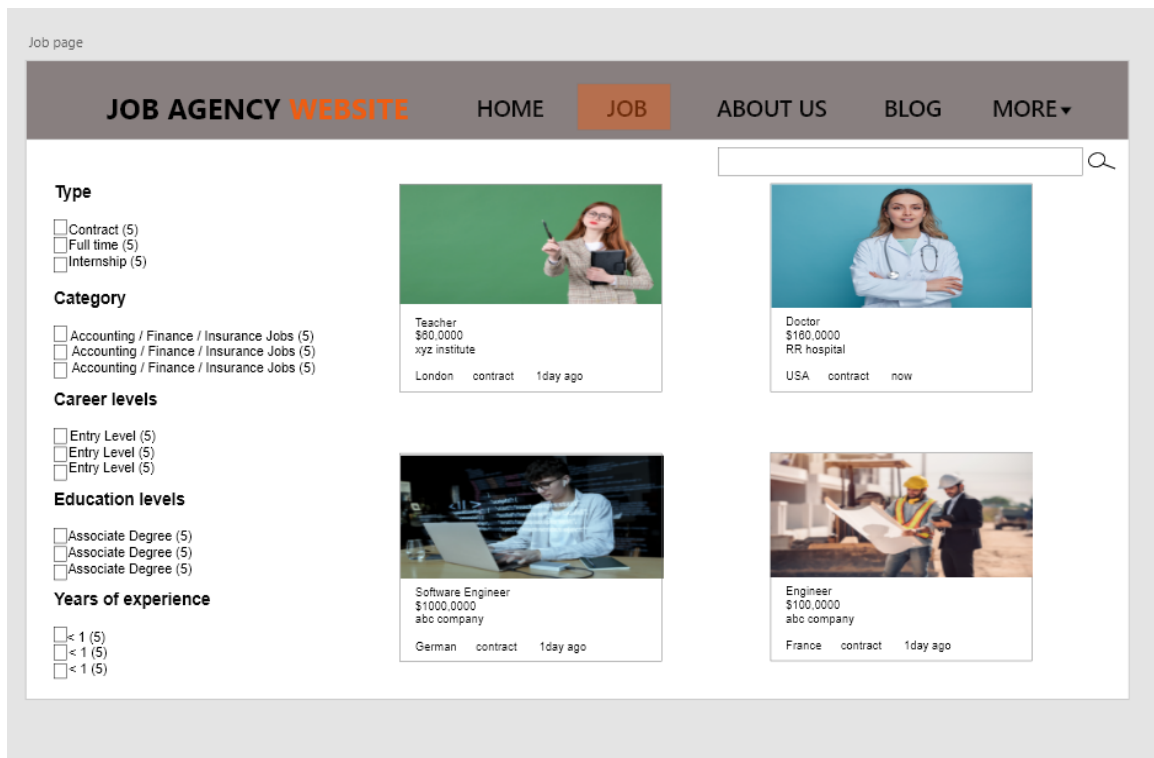
Figure 03: Early-stage UI/UX Mockup for the Job Search Page and About Us Page

managing all data related to the application (e.g. user profiles, company profiles, job postings, etc.). The Laravel application will communicate with this database using its Eloquent ORM (Object-Relational Mapper).

This architecture ensures that a user request flows logically from the browser to the Laravel application, which then securely interacts with the database before returning a fully rendered page to the user.

D. Development

The development process follows agile practices, with iterative cycles of coding, testing, and feedback. Technologies used include AJAX for real-time updates, Blade for templating in Laravel, and integrated payment gateways for subscription services. The development process for the internship job placement project adhered to agile methodologies, enabling incremental progress and continuous improvement. The team conducted bi-weekly sprints, with each sprint focusing on defined goals and deliverables based on priority and feedback.
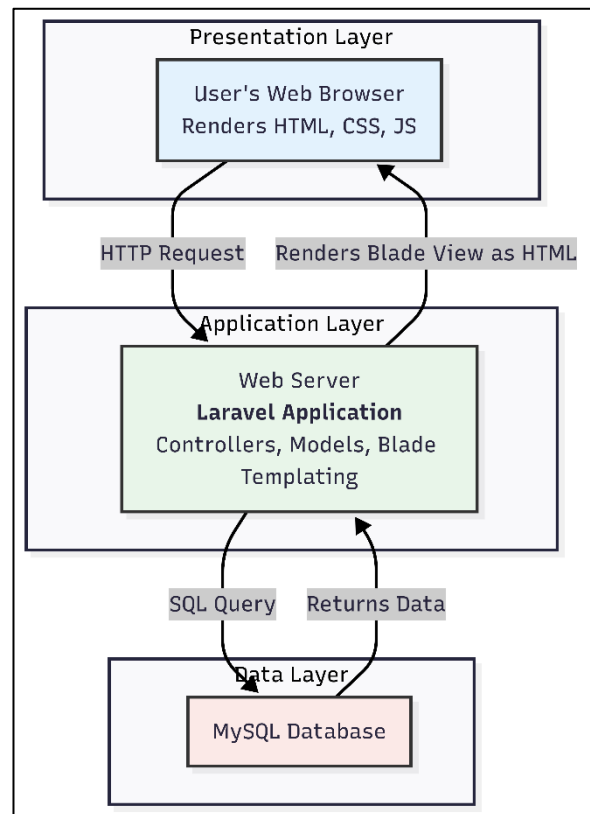

Figure 04: The Three-Tier System Architecture of the Placement Platform

Daily stand-ups were held to discuss progress, challenges, and next steps, while sprint reviews provided opportunities to demonstrate completed features to stakeholders for feedback. Sprint retrospectives were used to evaluate the process and identify improvements for subsequent cycles. The development utilized a range of established web technologies. The back end was built using the robust Laravel framework, while the front end was rendered using HTML and Laravel's native Blade templating engine. Dynamic user interactions and form validations were implemented with JavaScript and AJAX to ensure a responsive user experience. Git was employed for source code management and collaboration, and Jira was used for tracking tasks, bugs, and sprint progress. To ensure a professional and visually appealing interface for the Internship and Job Placement Management System, we sourced templates from the HTML Codex website. HTML Codex is a reputable online resource known for its extensive collection of high-quality HTML templates, which are responsive and modern, catering to various web project needs. This resource provided the essential tools needed to develop a sophisticated and user-friendly web application Additionally, we utilized resources and customization codes from the Bootstrap platform. Bootstrap's components, such as "Modals," "Form Control," and validation classes like "is-valid" and "is-invalid," were instrumental in enhancing the functionality and user experience of the application

E. Testing

Testing strategies included unit tests for individual components, integration tests for system interactions, and user acceptance testing. Test cases covered all major functionalities, and automated tools were used for continuous integration and deployment. A comprehensive testing strategy was employed to ensure the system's functionality and reliability. The strategy included unit testing to validate individual components and functions, integration testing to verify interactions between different modules, system testing for end-to-end validation, and user acceptance testing (UAT) involving actual users to ensure the system met their needs and expectations.

Detailed test cases were developed to cover all possible scenarios, including edge cases. Manual testing was performed by QA testers to validate functionality and user experience, while automated testing utilized tools like Selenium for regression testing, ensuring that new code changes did not break existing functionality.

F. Documentation

Comprehensive user manuals, technical specifications, and project reports were created to ensure ease of use and maintenance. Thorough documentation was an integral part of the project to ensure that users and developers could effectively use and maintain the system. User manuals were created to assist users in navigating and utilizing the system, featuring step-by-step instructions, screenshots, and troubleshooting tips. Technical specifications documented the system architecture, database schema, API endpoints, and configuration details, providing detailed descriptions of each module, component, and their interactions. Regular progress reports detailed the development milestones, testing results, and stakeholder feedback, culminating in a final project report that summarized the entire project lifecycle, including challenges faced and solutions implemented.

III. RESULTS AND DISCUSSION

A. Development Progress

The development progress of the internship job placement system was meticulously documented, with each phase summarized to highlight key milestones and challenges encountered.

During the initial phases, the focus was on setting up the foundational architecture and developing core functionalities. Significant milestones included the successful integration of user authentication, the creation of a dynamic database schema, and the development of the user interface.

As the project advanced, challenges such as optimizing AJAX calls for performance arose. These challenges were addressed by implementing efficient coding practices and optimizing server-side processing, which significantly improved the system's response

time and overall performance. The team also faced difficulties in managing real-time data updates and ensuring a seamless user experience. Through iterative testing and user feedback, solutions were developed, including the enhancement of asynchronous operations and the implementation of caching mechanisms to reduce server load.

B. System Features

The system boasts several key features designed to enhance the user experience and streamline the internship search process. A notable feature is the advanced search functionality, which allows users to filter internship postings based on various criteria such as location, industry, and duration. This feature is complemented by real-time job posting updates, ensuring users have access to the latest opportunities as soon as they become available. The system's responsive design ensures accessibility across different devices, providing a consistent and user-friendly experience whether accessed via desktop, tablet, or mobile phone.

C. Search Functionality

The search functionality is a core component of the system, enabling users to perform detailed searches with multiple filters. This feature significantly reduces the time and effort required to find suitable internships by allowing users to narrow down results based on specific parameters. The search interface is intuitive, with auto-suggestions and real-time filtering to enhance user experience.

D. Testing Outcomes

Extensive testing was conducted to ensure the system's reliability and usability. Testing phases included unit testing, integration testing, system testing, and user acceptance testing (UAT). During testing, a few bugs were identified, such as issues with infinite scrolling and the autocomplete feature in the search functionality.

These bugs were promptly resolved through code debugging and optimization. Additionally, performance testing highlighted areas where AJAX calls needed optimization, which was addressed by streamlining the calls and reducing unnecessary server requests. The

testing outcomes demonstrated the system's stability and efficiency, with user feedback from usability testing sessions showed a strong degree of satisfaction demonstrated by most participants' ability to independently complete key tasks including job search and filtering results that showed the system worked as intended and was user friendly.

E. User Feedback

Initial user feedback through informal discussion and observation was overwhelmingly positive. Students highlighted the platform's clean, modern design and appreciated the convenience of real-time job postings. Employers also indicated that posting vacancies and managing applications was simple and efficient.

Additionally, there were suggestions to enhance the user interface with more interactive elements and to expand the filtering options in the search functionality. These suggestions are being considered for future updates to further improve the system's effectiveness and user satisfaction.

IV. CONCLUSION

The project successfully culminated in the development of a comprehensive web application tailored to meet the needs of university students seeking internships and job placements. The platform was meticulously crafted to offer an intuitive and user-friendly interface, integrated with powerful search and filtering functionalities. Essential components such as user authentication, real-time job posting updates, and a responsive design were seamlessly incorporated, resulting in a robust and accessible system. The development process encompassed extensive requirement gathering, meticulous system design, iterative development, and thorough testing, all of which contributed to the creation of a reliable and effective tool for students.

By providing a centralized and efficient resource for job hunting, the platform has streamlined the process of finding and applying for internships and job placements. Students can now easily access a broad range of opportunities tailored to their interests and qualifications, greatly enhancing their chances of securing relevant positions. Employers

benefit from the platform as well, gaining access to a pool of qualified candidates and thereby facilitating the recruitment process. Overall, the platform has proven to be a valuable asset in bridging the gap between students and potential employers, fostering career development and readiness.

V. FUTURE WORK

Looking ahead, several potential improvements and expansions have been identified to further enhance the platform's capabilities. One major area for future work is the expansion of the platform to other faculties, allowing a broader range of students to benefit from its features. Additionally, integrating AI-based job recommendations can provide personalized internship and job suggestions based on user profiles and past interactions, further improving the user experience. Enhancing security features is also a priority, ensuring the protection of user data and maintaining the platform's integrity. These future enhancements aim to make the platform even more comprehensive and secure, catering to a wider audience and adapting to evolving user needs.

In our ongoing efforts to enhance the Internship and Job Placement Management System, we have identified several key areas for future development that will significantly benefit students. One such enhancement is the addition of mock interview options. Recognizing the importance of interview preparation in securing internships and job placements, this feature will allow students to practice their interviewing skills in a simulated environment. The mock interview module will include a variety of industry-specific questions and scenarios, providing students with a realistic experience. Feedback will be provided after each mock interview, highlighting areas of strength and offering constructive suggestions for improvement. This feature aims to build students' confidence and competence, ultimately improving their chances of success in real interviews.

Another pivotal feature we plan to introduce is a CV analysis and feedback system. This tool will analyze students' CVs and resumes, assessing various aspects such as formatting, keyword optimization, and content relevance. Using advanced algorithms and industry best practices, the system will identify areas where the CV can be improved to make it more appealing to potential employers. Students will receive detailed feedback, including tips on how to enhance their CVs to better match job descriptions and stand out in the competitive job market. This feature will empower students to create high-quality, optimized resumes that effectively showcase their skills and experiences. Integrating these future features into the system aligns with our commitment to providing comprehensive career support to students. By offering mock interviews and CV analysis, we aim to equip students with the necessary tools and feedback to enhance their career readiness. These enhancements will not only improve students' chances of securing internships and job placements but also foster their professional development. As we continue to evolve and expand the system, we remain dedicated to leveraging technology to bridge the gap between academia and the industry, ultimately contributing to the success and career growth of our students.

VI. REFLECTION

The project has provided invaluable learning experiences for the development team. Working with advanced web technologies and agile development practices has honed the team's technical and collaborative skills. The iterative nature of agile development allowed for continuous improvement and adaptation based on user feedback, ensuring the final product met the needs of its users. Challenges such as optimizing performance and ensuring system reliability were addressed through innovative solutions and teamwork. This project not only resulted in a successful product but also contributed to the professional growth of the team, equipping them with practical skills and insights that will be beneficial in future endeavors.

The development and implementation of the Internship and Job Placement Management System for the Technology faculty at the South Eastern University of Sri Lanka have been a significant step towards enhancing students' career readiness. This web application has successfully streamlined the process of finding and applying for internships and job placements by consolidating job search efforts into a single,

user-friendly platform. The use of modern web technologies and agile development practices ensured that the system was not only robust and responsive but also capable of providing real-time updates and efficient filtering options.

Through comprehensive requirement gathering, involving students, faculty members, and potential employers, the project team was able to develop a solution that addressed the key challenges faced by students. The positive feedback from initial users underscores the system's effectiveness and the high level of user satisfaction. Looking forward, the potential for expanding the platform to other faculties and integrating advanced features like AI-based job recommendations highlights the project's commitment to continuous improvement and innovation. This project not only delivered a valuable tool for students and employers but also provided significant learning experiences for the development team, ensuring their preparedness for future projects. Overall, the Internship and Job Placement Management System stand as a testament to the impactful application of technology in educational contexts, significantly improving students' career prospects and bridging the gap between academia and industry

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