Faculty of Computer Science and Information Technology

SmartHire: A Dynamic Part-Time Job Portal System for Student Employment

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SMARTHIRE: A DYNAMIC PART-TIME JOB PORTAL SYSTEM FOR STUDENT EMPLOYMENT

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This project is submitted in partial fulfilment of
the requirements for the degree of Bachelor of Software Engineering with Honours

Faculty of Computer Science and Information Technology
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DECLARATION

I hereby declare that this project titled "SmartHire: A Dynamic Part-Time Job Portal System for Student Employment" is the result of my own work, except where explicitly stated otherwise. All data and information in this report was gathered and presented according to the academic standard and ethical rules. I affirm that this work has not been submitted in any form for any degree or diploma at any other university or institution. Appropriate credit has been given if someone else's work has been used or referenced.

Date: 11th January 2025

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ABSTRACT

The current process of connecting students with part-time job opportunities are often ineffective and lacks an engaging platform that meet the students need. SmartHire: A Dynamic Part-Time Job Portal System for Student Employment aims to bridge the gap by developing a web-based platform that streamlines the job search and application process for students. Simultaneously, it provides employers a user-friendly dashboard for managing job postings and track applicants and offering structured feedback. The system includes gamification features like badges and achievements to motivate student and encourage consistent platform engagement. The project uses iterative development in line with the Agile methodology to ensure ongoing improvement and alignment with user needs. The project uses HTML, CSS, JavaScript, and MySQL for development. As part of the requirement-gathering phase, potential employers were interviewed to collect data and make sure the system meets practical requirements. The survey's results showed a high level of need for a centralized, engaging platform to improve to part-time job search experience. Usability testing conducted with 27 participants resulted in an average SUS score of 88.52, with over 92% of respondents finding the system easy to use, indicating excellent usability and user satisfaction. The findings highlight the need for innovative solutions like SmartHire, which not only makes job matching easier but also promotes students' professional growth through employer reviews and performance tracking.

ABSTRAK

Proses semasa untuk menghubungkan pelajar dengan peluang pekerjaan sambilan sering kali tidak berkesan dan kekurangan platform yang menarik serta memenuhi keperluan pelajar. SmartHire: A Dynamic Part-Time Job Portal System for Student Employment bertujuan untuk merapatkan jurang ini dengan membangunkan platform berasaskan web yang menyelaraskan proses pencarian dan permohonan pekerjaan untuk pelajar. Pada masa yang sama, ia menyediakan papan pemuka mesra pengguna untuk majikan bagi menguruskan jawatan kosong, menjejaki pemohon, dan memberikan maklum balas yang berstruktur. Sistem ini turut mengintegrasikan ciri gamifikasi seperti lencana dan pencapaian untuk memotivasikan pelajar serta menggalakkan penggunaan platform secara konsisten. Projek ini menggunakan pembangunan berulang selaras dengan metodologi Agile bagi memastikan penambahbaikan berterusan dan penjajaran dengan keperluan pengguna. Pembangunan platform ini dilaksanakan menggunakan HTML, CSS, JavaScript, dan MySQL. Sebagai sebahagian daripada fasa pengumpulan keperluan, temubual bersama majikan berpotensi telah dijalankan untuk mengumpul data dan memastikan sistem memenuhi keperluan praktikal. Hasil kaji selidik menunjukkan tahap keperluan yang tinggi terhadap platform berpusat yang menarik untuk memperbaiki pengalaman pencarian kerja sambilan. Ujian kebolehgunaan yang dijalankan bersama 27 orang peserta mencatatkan skor purata SUS sebanyak 88.52, dengan lebih daripada 92% responden mendapati sistem ini mudah digunakan, menunjukkan tahap kebolehgunaan dan kepuasan pengguna yang sangat baik. Penemuan ini menekankan keperluan kepada penyelesaian inovatif seperti SmartHire, yang bukan sahaja memudahkan padanan pekerjaan tetapi juga mempromosikan pertumbuhan profesional pelajar melalui ulasan majikan dan penjejakan prestasi.

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LIST OF ABBREVIATIONS

AI	Artificial Intelligence
CSS	Cascading Style Sheets
CV	Curriculum Vitae
FAQ	Frequently Asked Questions
FK	Foreign Key
FYP	Final Year Project
GB	Gigabyte
GHz	Gigahertz
HTML	Hypertext Markup Language
IC	Identification Card
ID	identification
LMS	Learning Management System
Mbps	Megabits per second
MySQL	My Structured Query Language
PDF	Portable Document Format
PHP	Hypertext Preprocessor
PK	Primary Key
RAM	Random Access Memory
SPH	Singapore Press Holding
SSD	solid-state drive
TB	Terabyte
UI	User Interface
UML	Unified Modelling Language
UNIMAS	Universiti Malaysia Sarawak

CHAPTER 1: INTRODUCTION

1.1 Introduction

This project introduces *SmartHire,* a part-time job portal system for students, where they can connect with employers who offer part-time jobs. It is designed specifically for students seeking job that align with their academic and personal schedules. The idea of creating this platform comes from the challenges that some students face when balancing their academic schedules with part-time work. Most existing job platform does not fully meet these needs, therefore making it more difficult for students to find job that allows them to balance studies and gain experience. This system addresses these needs by developing a connection between employers and students by providing a streamline, supportive way to find and apply for part-time jobs.

The platform is an interactive tool for both parties involved, as employers can post jobs, review student profiles, and rate their performance after job completion. These evaluations will help students in building a good image, which will increase the possibility that they will be given opportunities in the future. Additionally, the system will enable students to generate a downloadable CV or report that includes information about their past jobs and achievements. SmartHire will also include a dashboard which will provide a clear overview of job postings and applications, and user engagement, helping track progress and activity. For employers, it will include tools to assess and rate the student's performances, which will be shown in the students' profiles.

By implementing basic job search and application tools, the system will enable students to create detailed profiles that highlight their skills and experience. To increase user engagement, the system will introduce features like badges and ranks that reward students for their activity levels, such as job applications, task completion dates, and employer feedback. Regular usage will be encouraged, creating a competitive and professional environment. These features are meant to create a motivating environment where students are encourages to build their reputations and connections.

1.2 Problem Statement

Many students are struggling to find flexible part-time job that fits their academic schedules. Xiao & Liu (2024) stated that college students encounter uncertainty when looking for job due to poor job preparation, uncertain goals, and ineffective search techniques. Most of the job platforms serve a broader audience, focusing on a wide range of job seekers instead of focusing on what student's needs, such as flexible hours, location near campus, or positions that align with their skills and future goals. This lack of student-focused job search tools makes it more difficult for students to find a beneficial and manageable work while still pursuing their studies. According to Xiao & Liu (2024), job search techniques appear to be one of the most challenging and complex tasks among all aspects of college life.

Additionally, there are no easy ways for students to properly highlight their skills and past work experience since they lack a platform that allows them to do so effectively. Current job platforms rarely provide the options for students to create a portfolio that highlight their abilities and achievements. These options would make them standout as a candidate for the job. However, due to lack of this option, it is harder for employers to know whether the students are suitable for the position based on performance, skills and experience.

For employers, deciding on the suitable candidate requires more than a basic profile or resume. Employers need a reliable tool to determine the student's level of expertise and involvement in their experience. It can be difficult to decide whether students are suitable for the part-time jobs because most platforms in use do not have the necessary tools to evaluate students past job performance or levels of engagement.

The lack of engagement-focused features on current job portals also impacts the student's motivation, since current platforms only provide limited incentives for students to stay actively involved in the platform. Without this interactive tool that acknowledge and reward the student's involvement, they will feel less motivated to use the platform frequently. Consequently, the number of applications decrease and limit the effectiveness of the job-matching system.

This project resolves those issues by developing a Part-Time Job Portal System that focuses on students need and offer important features to both students and employers, leading to a more effective and interesting job-matching process.

1.3 Project Scope

The SmartHire system streamline the connection between students and employers by providing a web-based system for finding, applying to and managing part-time job opportunities. The two main users for this system are students seeking part-time jobs and employers seeking student workers. The system target students who seek flexible, part-time work that fit with their academic schedules and future career goals. Employers looking for motivated students to fill variety of part-time positions are also the target user of this system.

The SmartHire primary purpose is to provide students with user-friendly, accessible platform that is specifically designed to meet their needs. It includes essential features including user profiles, applications tracking, and job search tools to help students search and apply for part-time jobs that fit their availability and career goals. Employers can easily post job openings, review applications, and identify students who are qualified for their positions. Future iterations of the system can consist of features like ranking and rewards system to further encourage student participation and ongoing use. This phased approach makes sure that the system provides useful features along with offering the immediate needs of students and employers.

1.4 Aims and Objectives

This project aims to enhance the part-time job searching process for students by developing an efficient job portal system for student employment. The following is the project objectives:

1. To design a user-friendly web-based system for students to find and apply part-time jobs.
2. To develop system with features such as badges and ranking systems to encourage student engagement and regular use of the platform.
3. To evaluate the usability of the SmartHire Part-Time Job system for both students and employers.

1.5 Project Methodology

For this project, it will be using the agile methodology throughout the phases. Agile is the most suitable methodology for this project because of its incremental and iterative approach, which will improve teamwork, enhance flexibility and deliver an effective product on time (Esang et al., 2024). Since agile projects are frequently divided into broken down parts or iterations, it enables ongoing feedback and improvement (Esang et al., 2024). Figure 1.1 below shows the agile methodology phases.

Figure 1.1: Agile Methodology Phases

The first phase of this project is requirements gathering. The purpose of this phase is to gather and understand the specific needs of the target users which are the students and employers and develop them into useful features. Surveys and interviews can be used to obtain some information regarding essential features. This will be done by conducting a survey for students to gather their preferences for the features in the system. For employers, we also gather information from them by interviewing potential employers to determine necessary features that are needed in the employer dashboard, such as posting jobs, and providing feedback. Clear documentation of these requirements from the beginning will ensure the system align with the user needs.

The next phase is design phase which includes creating low-fidelity prototypes, wireframes and system architecture based on the requirements that have been gathered. Furthermore, creating the database scheme, system flowcharts and UML diagram to visualize the structure of data and the system interactions. The employer and student dashboard user interfaces (UI) are also visually designed in this phase.

The third phase is the development phase. In this phase, the main features are coded and tested during each sprint. The process starts with the basic structure of the system, which includes database setup, user authentication, and main features like job postings and job application. Each feature can be developed, tested and improved in cycles by using this agile iterative methodology. This will guarantee that the system is continually improved based on the feedback from testing.

In the fourth phase, testing is done constantly throughout the development phase, to make sure that every feature works as expected. User testing sessions with employer and students helps in obtaining feedback on the functionality of the system. Meanwhile, automated and manual tests help to find any technical issues in the system. Functional testing, usability testing, and security checks are essential to make sure that the system is stable, secure and easy to use.

The fifth phase is the deployment phase where the final fully tested version of the system is released for use. After release, the system is demonstrated to users to make sure they understand it features and functionalities. Feedback from actual users during this phase assists in identifying any last changes that is needed in the system to improve the system before it can be used officially. Regular maintenance, bug fixes and potential small changes continue to keep the system effective and responsive to users.

The last phase is the review phase. In review phase, system functionality and user satisfaction are measured to determine how well it meets project objectives and user needs. Future sprints may include improvements, problem fixes and new features based on user feedback. A final report is prepared containing the system's accomplishments, challenges faced, and lessons learned during development.

1.6 Significance of Project

The SmartHire Part-Time Job Portal System provides a streamlined, efficient solution by matching students with part-time jobs that fit their interests, schedules and skills. The system is significant for several key reasons.

It increases employment opportunities for students. The system makes it easier to search, apply, and manage applications for part-time jobs by providing a single, user-friendly platform for the students. SmartHire improves the accessibility by centralizing the part-time options especially for students who might not have the time or resources to search for some job. Badges and ranking features will lead to students' active participation and motivation to find job that support their academic journey.

The employer dashboard is the most essential since it allows employers to manage job postings, review applicants or give feedback on how the students perform all in one well organized view. Consequently, this increases the hiring effectiveness because employers can view it all in one interface and it saves time. This control also enables quick troubleshooting and quality checks to maintain the platform functionality. Meanwhile, the feedback tool helps employers to find top students and assists them in gaining relevant job experience.

The downloadable curriculum vitae (CV) feature simplifies the application review process by allowing employers to quickly review the qualifications of each applicant in a standardized format which will increase, the speed of candidate shortlisting process. This feature will not only help employers to make informed decisions but will also strengthens the student's personal profile, encouraging them to keep their resumes up to date. Such accessibility will further improve the student's personal profile. Furthermore, having a CV that is easily accessible on the platform increases the chances of being chosen for position that might not initially align with their search criteria, thereby expanding their job opportunities that is dynamic and flexible.

1.7 Project Schedule

For this Final Year Project 1 (FYP 1), it will start on 14th of October 2024 and is expected to finish on 11th February 2025 which takes approximately 128 days. Meanwhile, for final year project 2 (FYP 2) will start on 7th of March 2025 and expected to finish on 8th July 2025 which will be approximately 121 days. Therefore, for FYP 1 and FYP 2 it is estimated to take 249 days. The project schedule is shown in the Table 1.1 below.

Table 1.1 Project Schedule

Tasks	**Start Date**	**End Date**	**Duration (day(s))**
Brief Proposal	14/10/2024	20/10/2024	6
Full FYP Proposal	22/10/2024	25/10/2024	3
Chapter 1: Introduction	22/10/2024	1/11/2024	10
Chapter 2: Literature Review	2/11/2024	29/11/2024	27
Chapter 3: Requirement Analysis and Design	19/11/2024	24/12/2024	35
Phase 1.0 (Requirement Gathering): Interview with potential employers	19/11/2024	25/11/2024	6
Phase 1.1 (Requirement Gathering): Distribute online survey via google form	20/11/2024	2/12/2024	12
Phase 2.0 (System Design) – Prototype and wireframes	2/12/2024	24/12/2024	22
FYP 1 Report Submission	25/12/2024	2/1/2025	8
FYP 1 Report Amendment	3/1/2025	10/2/2025	38
FYP 1 Final Report Submission after Amendment	11/2/2025	21/2/2025	10
Iteration 1	7/3/2025	14/4/2025	38
Chapter 4: Implementation	7/3/2025	9/4/2025	33
Phase 3.0 (Development): Initial coding and testing	7/3/2025	9/4/2025	33
Chapter 5: Testing	10/4/2025	14/4/2025	4
Phase 4.0 (Testing): User testing	10/4/2025	14/4/2025	4
Iteration 2	15/4/2025	20/5/2025	35
Chapter 4: Implementation	15/4/2025	16/5/2025	31

Phase 3.1 (Development): Enhanced coding and testing	15/4/2025	16/5/2025	31
Chapter 5: Testing	17/5/2025	20/5/2025	3
Phase 4.1 (Testing): User testing	17/5/2025	20/5/2025	3
Iteration 3	21/5/2025	25/6/2025	35
Chapter 4: Implementation	21/5/2025	21/6/2025	31
Phase 3.2 (Development): Final coding and testing	21/5/2025	21/6/2025	31
Chapter 5: Testing	22/6/2025	25/6/2025	3
Phase 4.2: (Testing): User testing	22/6/2025	25/6/2025	3
Chapter 6: Conclusion and future work	26/6/2025	27/6/2025	1
Phase 5.0(Deployment): System deployment and demonstration	28/6/2025	30/6/2025	2
Phase 6.0(Review): Maintenance	1/7/2025	4/7/2025	3
Final FYP report submission	1/7/2025	8/7/2025	7

1.8 Expected Outcome

The expected outcome for this project includes the development of a user-friendly interface that will make it simple for students to look for and apply for part-time job opportunities and for employers to post job vacancies and manage applications. Employers will benefit from a simplified application review process that allows them to track applicants and view downloadable CVs in a standardized format, helping in making informed hiring decisions.

A detailed administrative dashboard will make it easier to manage and monitor the platform effectively which will result in smooth system operations. The platform will also record important performance metrics such as the student's engagement levels and employer usage. These metrics can help in measuring the effectiveness of the system and development of future improvements.

Overall, it is the system goals to have a beneficial impact on student employment by connecting them with part-time jobs opportunities, which will help them in gaining more work experience, develop new skills and increasing their job opportunities both during and after their studies.

1.9 Summary

Chapter 1 introduces to the Part-Time Job Portal System, a dynamic web-based platform designed to help students find part-time jobs and make it easier for students and employers to connect with one another. This chapter starts by describing the project's goal, which is to develop a user-friendly system that simplifies job searching for students while providing employers with an effective hiring tool.

The project's objective includes designing a structured interface for students to find and apply for part-time jobs by implementing gamification elements to encourage active participation and providing employers with a well-organized dashboard for managing job postings and applications. The project scope highlights the target users which consists of students and employers and describes the features including job posting, application management, downloadable CV, and performance metrics.

The agile methodology is used in this project because of its flexibility throughout the development phases. The chapter ends by highlighting the significance of project and how it may help employers with the recruitment process, increases students job opportunities, and insights on the system future improvements.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

In recent years, online job portals have changed the way people seek for job, providing easily accessible job search and application platforms. A lot of the time spent looking for jobs on different websites is frustrating since it requires more effort (Pavani et al., 2022). According to Pavani et al. (2022), most of our daily tasks are carried out online, and the hiring process is no different.

One area of particular interest when creating the job portals for students is the engagement tools like gamification, which can promote frequent use of the platform. For younger generations particularly, this creates a thrilling opportunity to show their skills against other candidates (Haerting et al., 2023). Getman et al. (2024) stated that gamification build interest and encourage action using variety of motivational strategies. By rewarding work with features like badges, ranks or achievements levels to increase user engagement. By using the gamification as a recruiting tool, the company can evaluate skills and abilities, such as uniqueness, time management or creative thinking, before hiring decisions being made (Haerting et al., 2023).

2.2 Review of Similar Existing Systems

2.2.1 Indeed

Indeed is recognized as the leading job portal globally, which offer a platform for job matching and hiring worldwide (Indeed, n.d.). Known as the leading job portal, Indeed helps more people secure job than any other platform by prioritizing job seeker, providing them the tools to search for jobs, upload resumes, explore companies, and more (Indeed, n.d.). These features allow users to narrow down results according to location, job type, salary and expertise level. Another notable feature is the ability to research companies from the reviews, or employee insights which enables users to make well-informed decisions about their applications. The system focuses not only on to reduce the time it takes to find a job but also hoping that the speed will lead to excellent chances to job seekers (Indeed, n.d.).

Despite its strengths, Indeed serves a wide range of audience, including professional looking for full-time job, which would limit its primary focus on student's part-time job

opportunities. Even though the platform is outstanding at matching users with job opportunities, it lacks gamification features and elements that would actively engage students. For instance, SmartHire, the proposed student part-time job portal, aims to bridge these gaps by implementing gamification elements like badges and rankings to create an engaging environment according to the student needs. The login page for Indeed is shown in Figure 2.1.

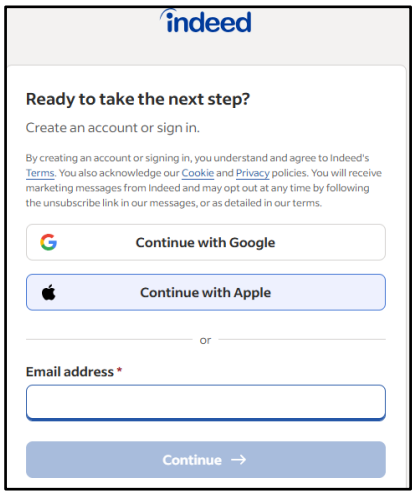

Figure 2.1: Indeed login page

Figure 2.2 as shown below is the home page of the system. The Indeed home page is designed with simplicity and usability, which benefits both job seekers and employers. There is a large search bar at the top where users can enter the keywords and location to find jobs that correspond to their needs. The layout emphasis on accessibility, by providing clear navigation links to job categories, company reviews, salary insights and resume services.

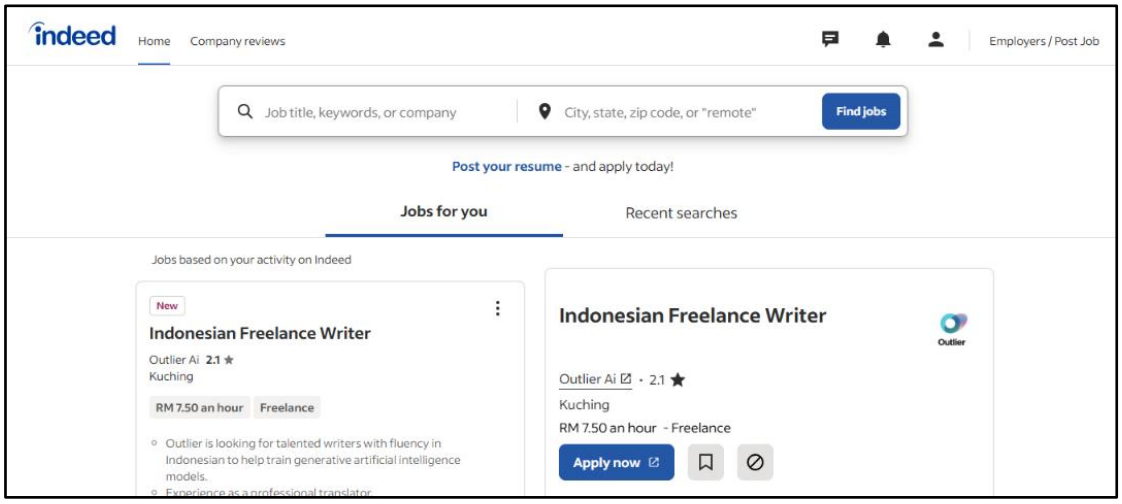

Figure 2.2 Indeed home page

The core feature of Indeed's is its powerful job search engine like shown in Figure 2.3 below. After user has searched for jobs along with the locations, some result of the search will be shown, and user can just scroll down to look for the jobs they want. The search results can be filtered by their category such as date posted, location, pay amount, job type and company. Using this advance filter, users can ensure perfect matches by refining their searches further. Furthermore, Indeed integrates job postings from multiple company websites and recruitment agency, making it a comprehensive resource. However, user may become overwhelmed with the sheer number of job listing, and occasional duplicate or outdated postings may make it less reliable.

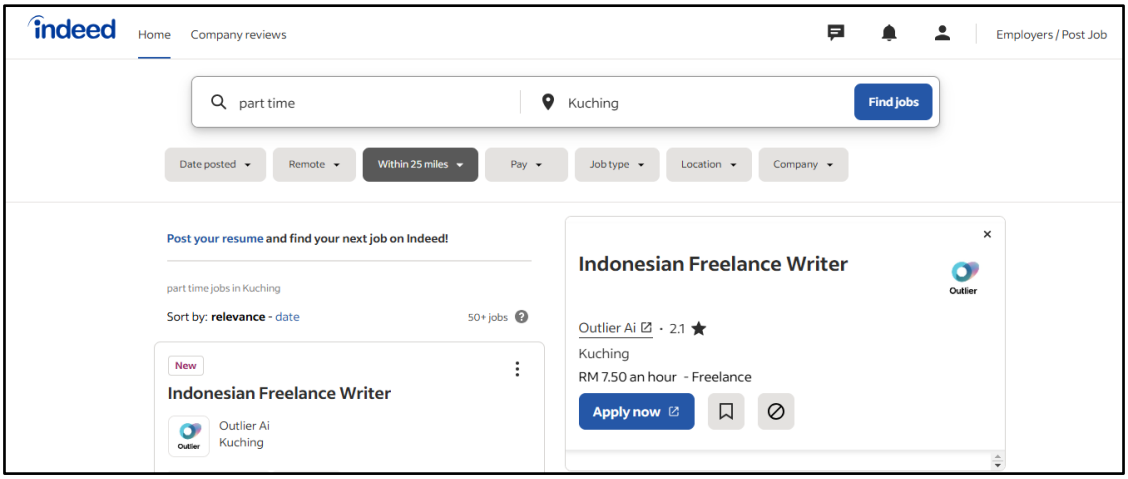

Figure 2.3: Indeed filter search results feature

Figure 2.4 shows the resume features where users can create or upload resume, which then will be shared directly to the potential employers. The platform includes a resume builder, which is a very helpful tool for people who do not already have a resume. Employers' can also search for the resumes in the database which will increase the possibility for users to be recognized. Although this function is helpful, users may become confused by the resume visibility settings, especially if they are unfamiliar with online job platforms.

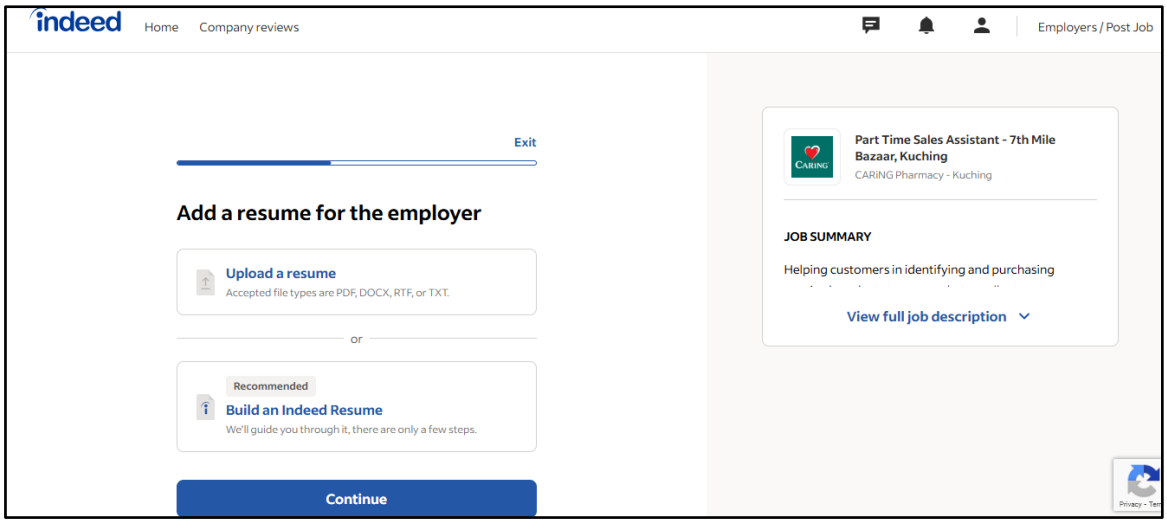

Figure 2.4: Indeed resume features page

Figure 2.5 shows the features in Indeed which is the review page where users can research companies. Company name or job title can be searched on the search bar to find companies. Users get access to detailed company profiles, average salaries, and employee reviews as shown in Figure 2.6 and Figure 2.7. This transparency allows user to make informed decisions to choose where to apply. However, the accuracy of the reviews and salaries can sometimes be in doubt, since they are user-submitted and not always validated.

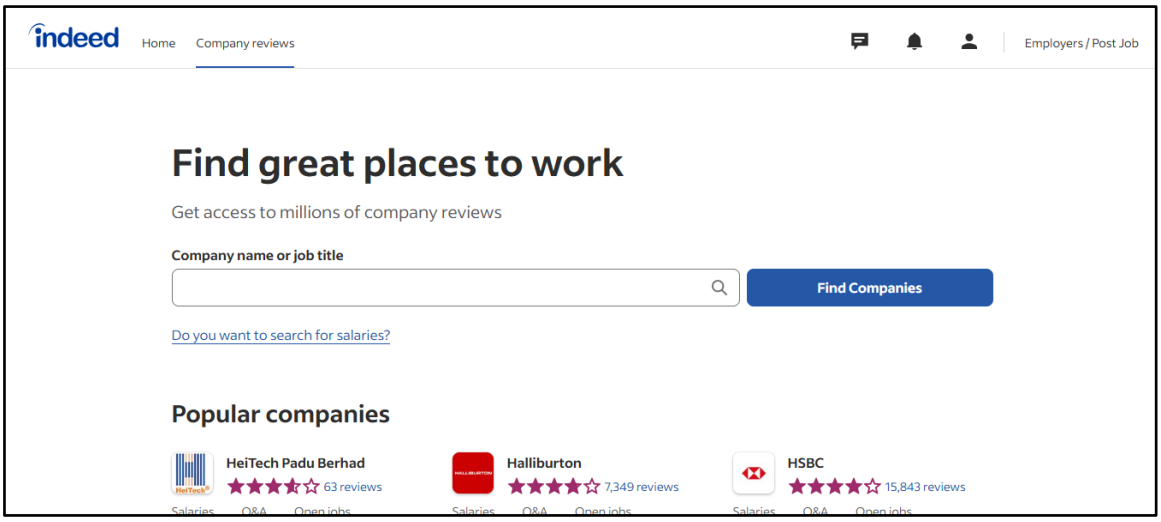

Figure 2.5: Indeed company review main page

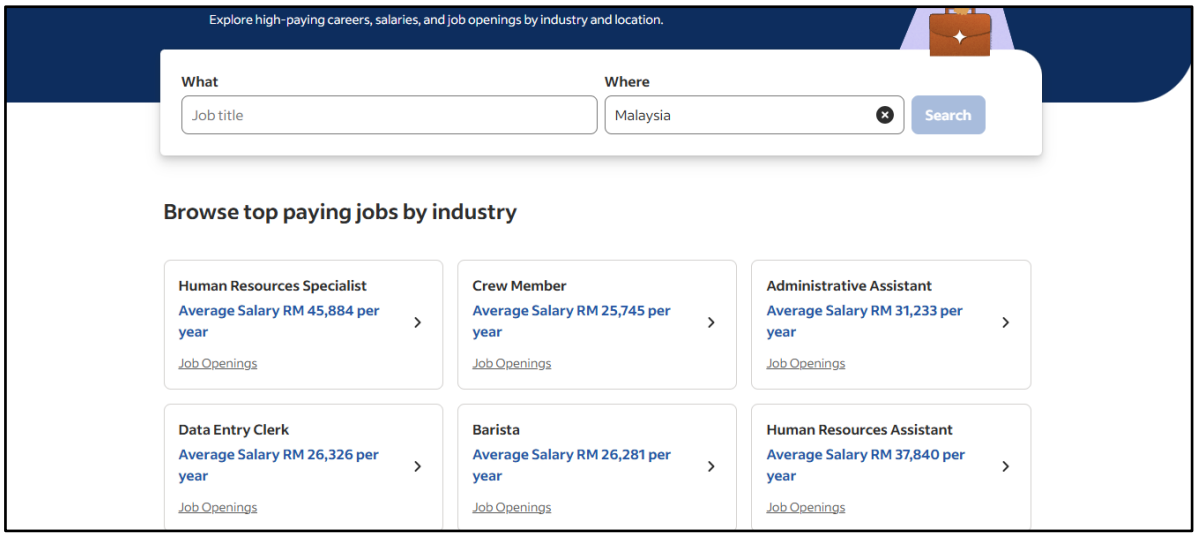

Figure 2.6: Indeed salary insight page

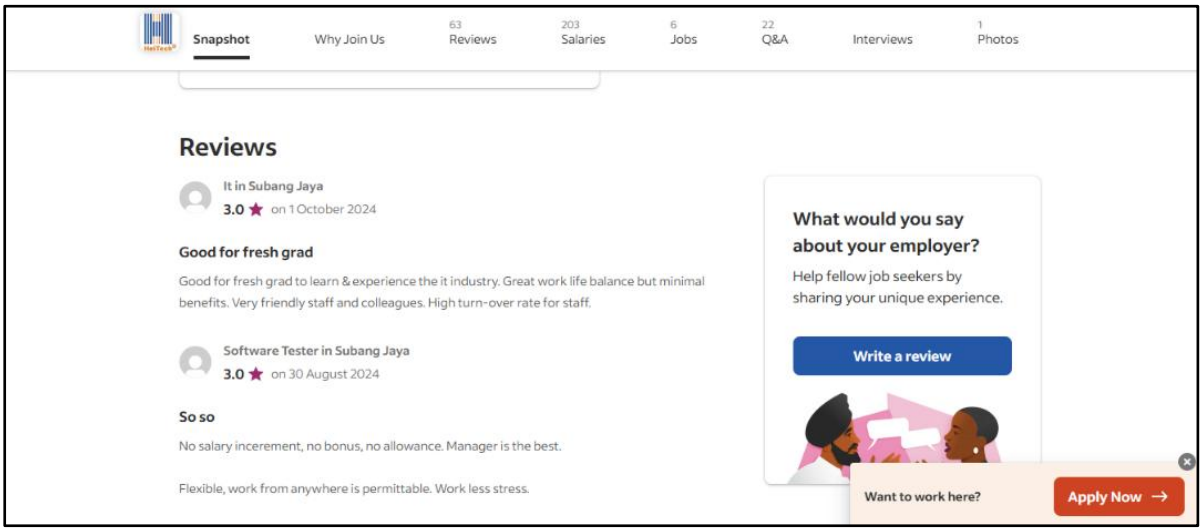

Figure 2.7: Indeed review page

Figure 2.8 shows the employer page in Indeed where there is a navigation bar on the left side consists of create new jobs or user, jobs, smart sourcing, candidates, interviews, analytics, and tools. The “Create new” section allow employers to post jobs, set budgets, and edit job details. Job posted can be monitored for performance, like the number of views and applications, and can be adjusted accordingly. Next, the “job” section is where employers can manage all their job posting. The “smart sourcing” section is an artificial intelligence (AI) technology used to recommend candidates who match the job requirements. This feature saves time, and less effort needed for resume searches. In “candidates” section, employers can view, sort, and manage applications. It includes filter which arranged candidates based on experience, hiring status. Employers can also communicate directly with candidates in the platform.

Furthermore, the “Interviews” section includes tools for arranging and managing interviews where employers can conduct interviews directly through the platform. The “analytics” section includes data driven insights of job post performance and hiring trends in helping employers to make informed decisions to optimize their hiring strategies. Lastly, the “tools” section offers additional resources for employers including applicant tracking and team collaboration. While Indeed offers a strong platform, some employers may find premium features like resume subscriptions or sponsored job expensive, especially for small businesses. Moreover, some users may not be able to use certain features since access may be limited based on account type and location.

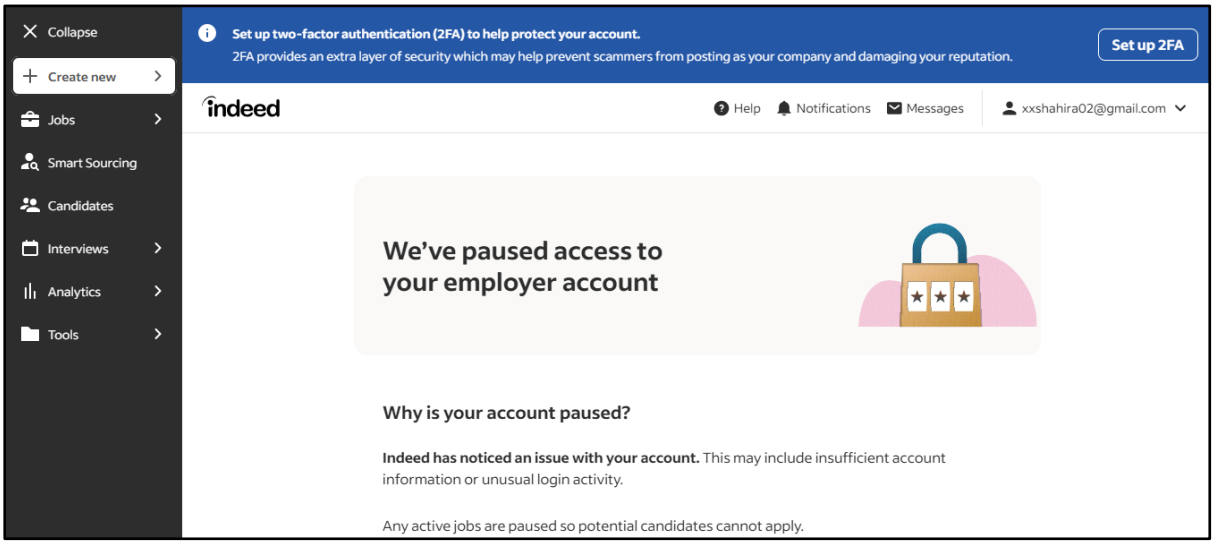

Figure 2.8: Indeed employer page

2.2.2 Job Street

JobStreet, established in 1997, is one of Southeast Asia leading online job portals which connects millions of employers and job seekers across the region (JobStreet, n.d.). With its localized focus and user-friendly interface, JobStreet is particularly common in countries like Malaysia, Singapore, the Philippines, and Indonesia. Jobstreet runs under the control of SEEK, a worldwide leader in online job services based in Australia (JobStreet, n.d.). JobStreet has benefited from worldwide developments in hiring technology, such as AI-powered features and predictive analytics. Employers can find the most suitable candidates using advanced AI-driven matching capabilities, which improves the hiring process. Its value as an employment

website is further increased by extra features like performance analytics, a salary guide, and access to a large talent pool of more than 14.6 million users.

Figure 2.9 below shows the main page of JobStreet when user enter the website. The navigation bar includes job search, profile, career advice, explore companies and community. There is also employer site button at the end of the navigation bar. For users who have not signed in there is a Sign in button located beside the employer site button allowing them to access their accounts easily.

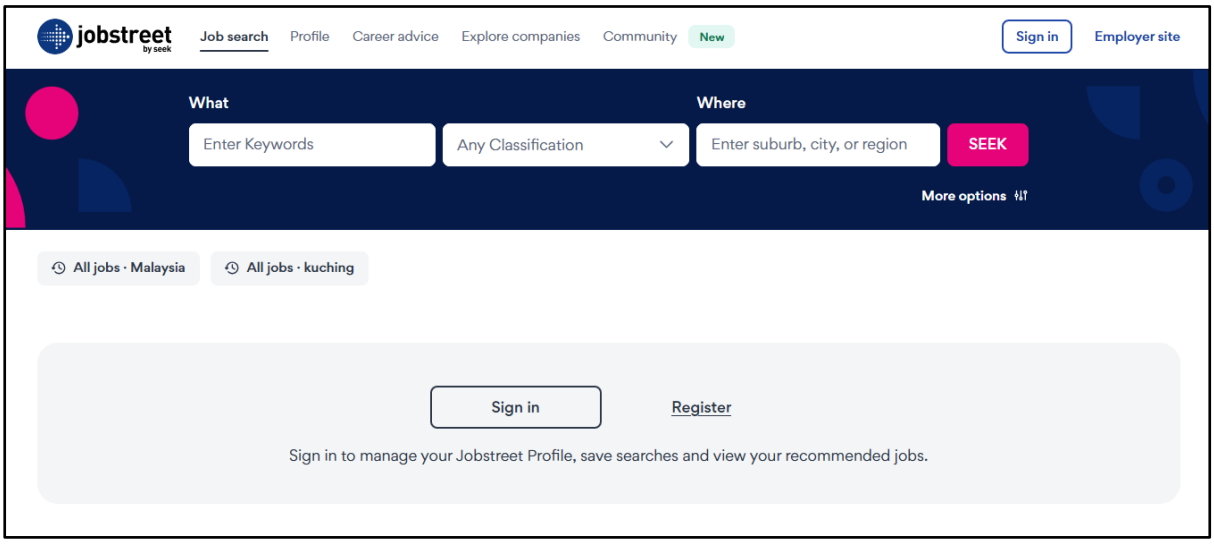

Figure 2.9: JobStreet website main page

The main page of JobStreet includes the search bar where users can enter keywords for the desired job and filter their search using the any classification drop down button. The drop-down button allows users to specify the type or category of jobs they are looking for. Then users can enter the desired job's location and click "seek" and all relevant jobs will be shown below. Additionally, there is a "More options" button below the seek button, which, when clicked will show features to filter the job searching process as shown in Figure 2.10 below. Some of the drop-down button includes filters for work type, salary range and the posting date.

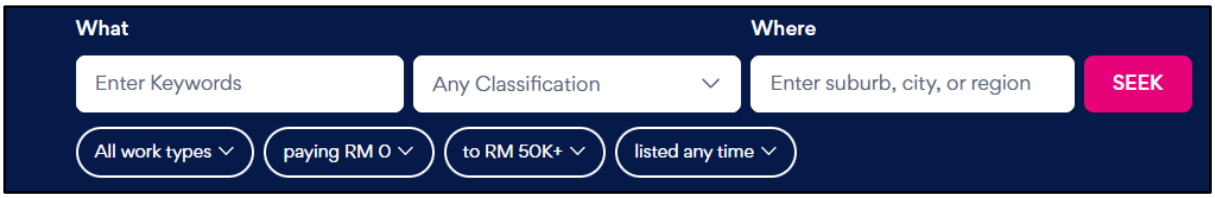

Figure 2.10: Filter job features in JobStreet home page

Figure 2.11 shows the sign in page for JobStreet website. User can sign in or register first before they proceed with the job searching process.

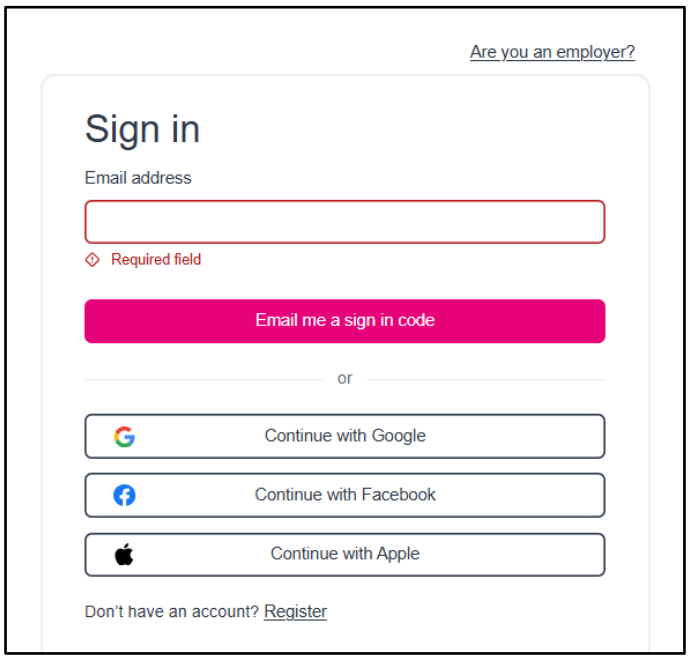

Figure 2.11: JobStreet Sign in page

After user has searched for jobs, a list of results is displayed on the home page for users to scroll through and survey, as shown in Figure 2.12. When user clicked on a job listing, the details of the job will be shown to the right of the job lists. These details include job title, location, salary range, and job description. Users have options to save jobs or apply directly through the platform. To save the listing for future use, users can click the Save button, which is often represented with a bookmark or similar icon. However, finding the saved jobs section can be difficult, since there is no obvious or noticeable icon for users who wish to revisit their saved listings quickly. User may become frustrated by this lack of easy access.

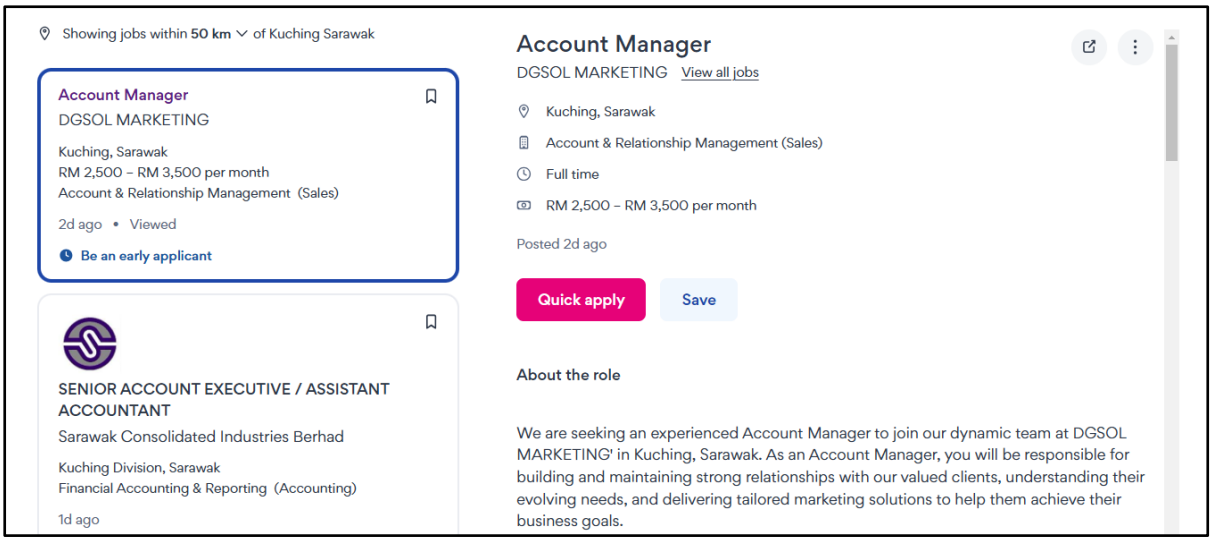

Figure 2.12: Job lists displayed on JobStreet home page

Figure 2.13 is the page that will be displayed when users clicked on Quick apply button. The system will use the information that is already saved in the user profile. Users are usually required to review and confirm their application details, including contact details, resume, and any other fields required by the employer. But if the users have not completed their profile with necessary information beforehand, the platform will prompt them to fill in the missing details before submitting the application. After completing the application, users can proceed to submit the application and a confirmation message will appear, indicating that the application has been successfully sent, as shown in Figure 2.14.

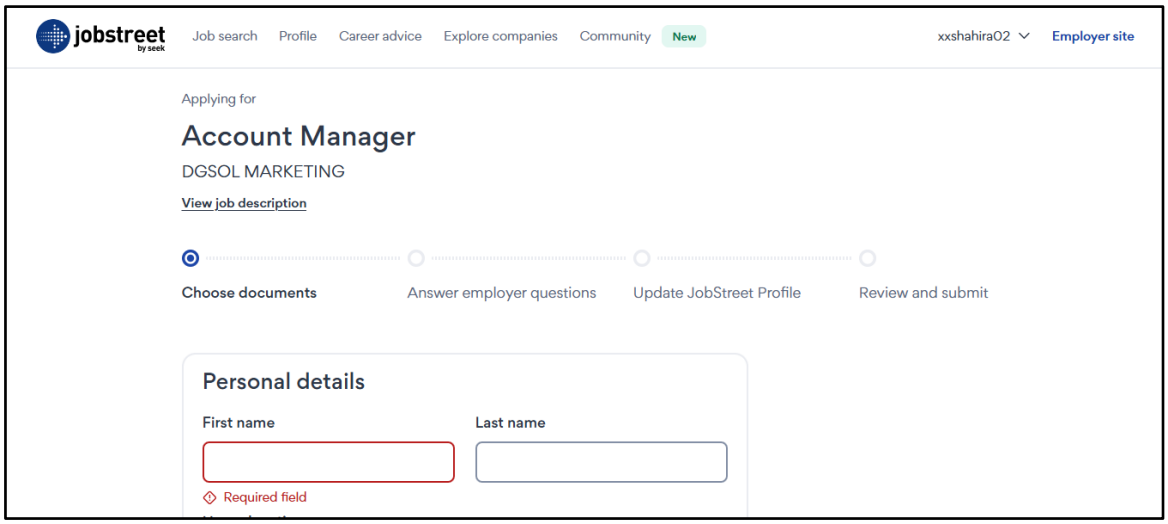

Figure 2.13: Apply for job page in JobStreet

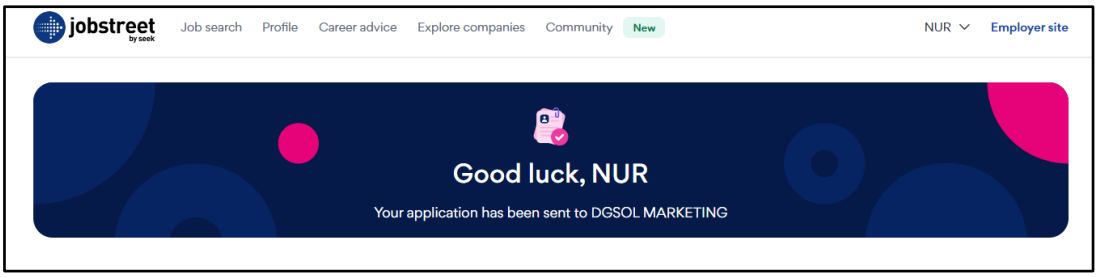

Figure 2.14: Job applies display successful application

Figure 2.15 shows the explore companies page that gives users access to detailed company profiles. Users can explore information such as reviews, life and culture, and career opportunities. Additionally, they can contribute by writing reviews about the companies they have experience with.

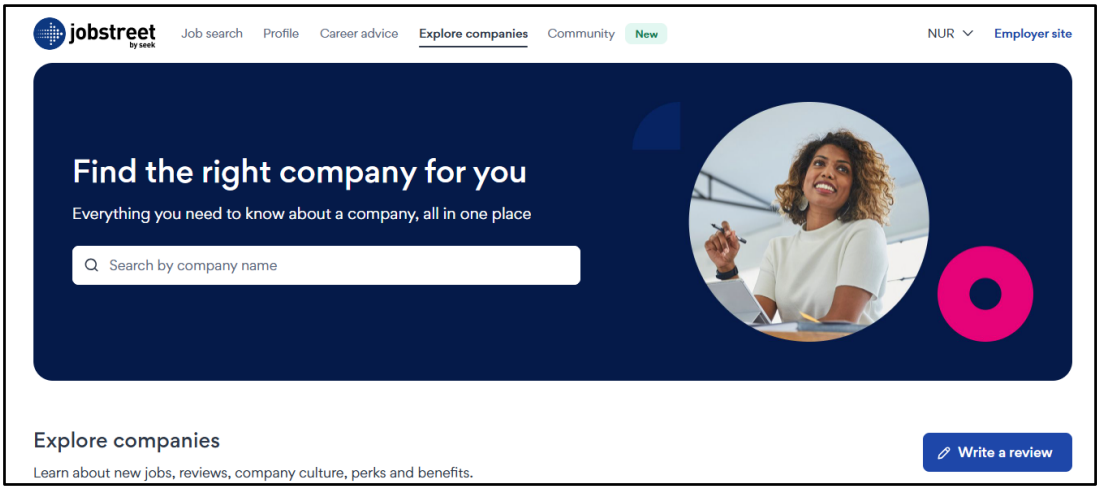

Figure 2.15: JobStreet explore companies page

The profile page as shown in Figure 2.16 is where users display their education, skills, license and certifications, career history, and other relevant information. There are also profile visibility features like shown in Figure 2.17 which enable users to limit the amount of personal data employers can see. The standard visibility is suitable for users actively looking for job since employers can view the user's profile and contact them directly. Meanwhile, limited or hidden visibility restricts employers from accessing the user's private information. This option is suitable for users who value privacy and are not actively looking for job.

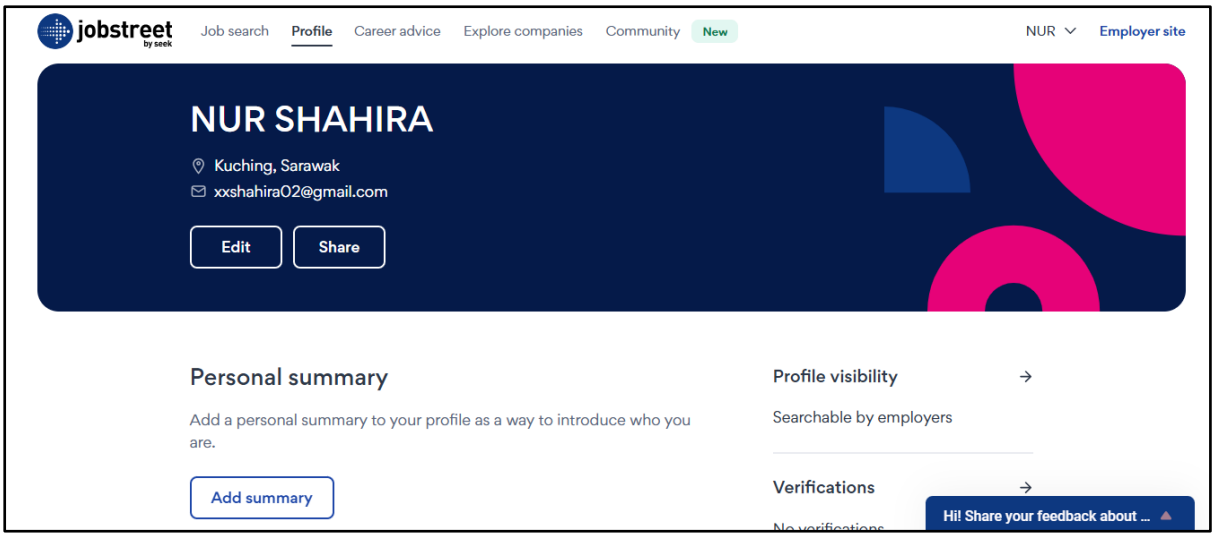

Figure 2.16: User profile page in Jobstreet

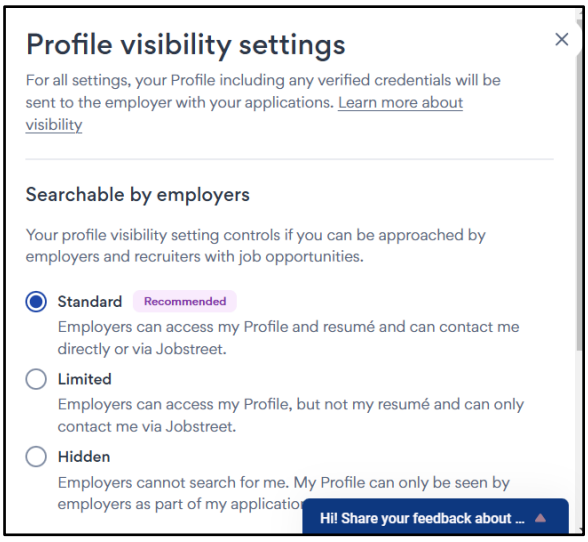

Figure 2.17: Profile visibility settings in Jobstreet

Figure 2.18 shows the career advice page designed to help users in their career. It contains materials about interview techniques, resume writing, career growth tips and job-hunting strategies. Jobstreet community page as shown in Figure 2.19 was designed to help users including professionals and job seekers to interact with one another allowing users to like and comments on featured threads posted by other users.

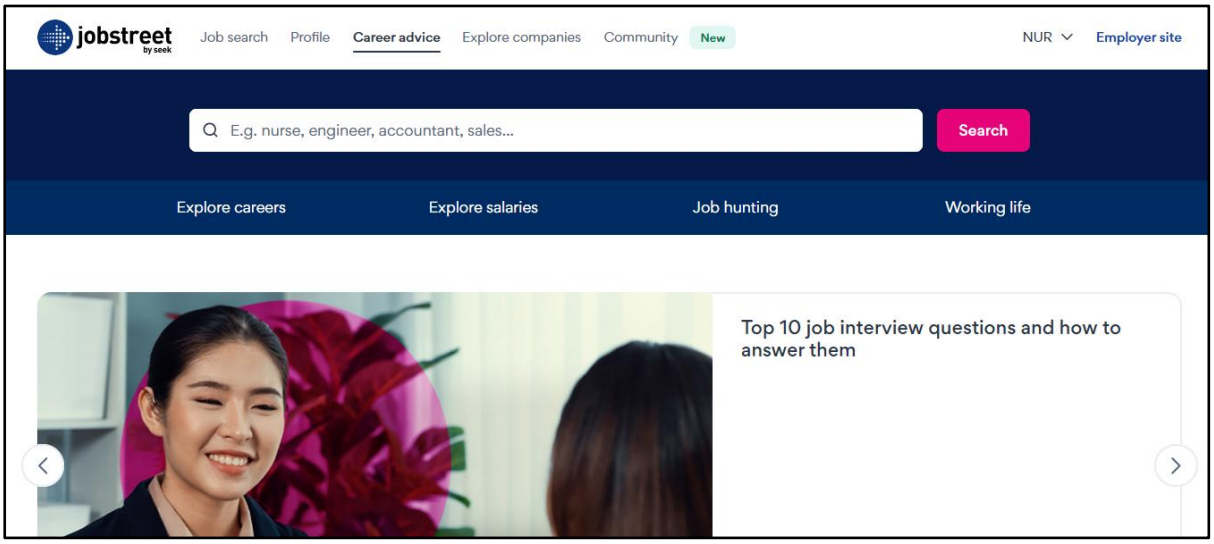

Figure 2.18: Career advice page in Jobstreet

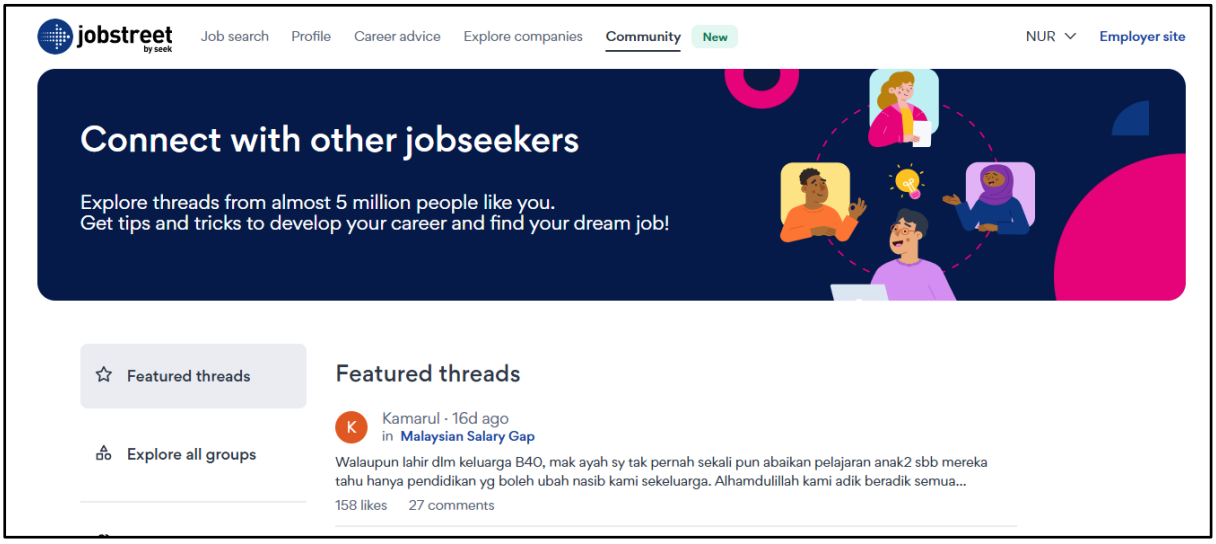

Figure 2.19: Community page in Jobstreet

Through the employer site as shown in Figure 2.20, employers can post job vacancies, manage applications, and connect with potential candidates. The navigation bar on the employer site contains Home, showing the main dashboard, and Products, where employers can explore various recruitment tools. The Hiring Advice section offers tips and guidance on hiring talent while Market Insights provides useful information regarding labour trends. Employers can post job opening by clicking the “Create a job ad” button and there is also an option for employers to sign in or register for the platform.

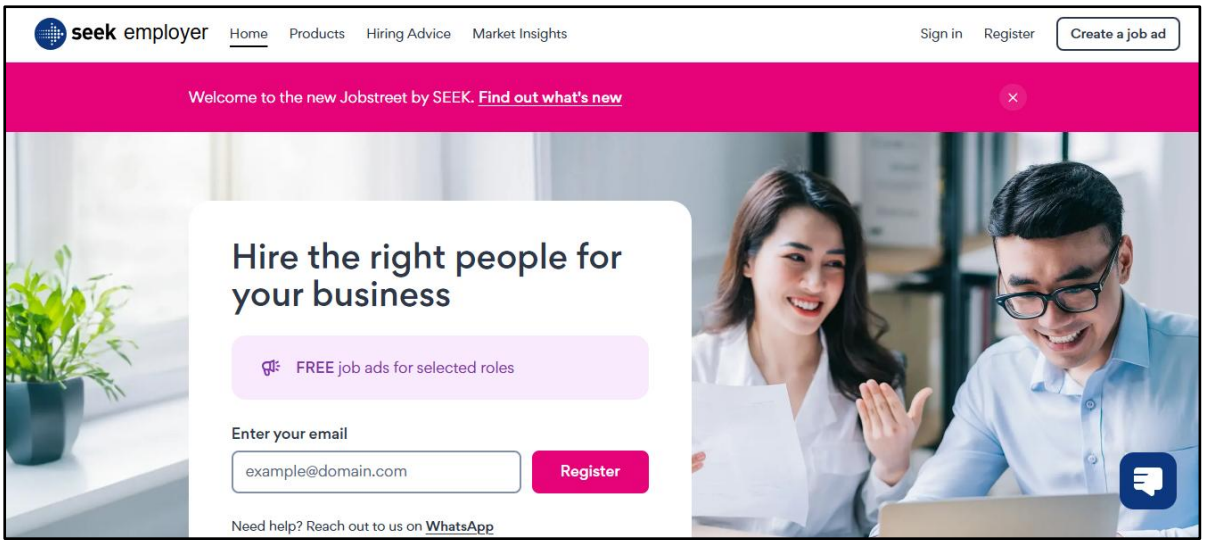

Figure 2.20: Employers site in Jobstreet

Figure 2.21 is the signup page for employers. Employers need to register or login first to post a job. After signing in successfully, they can start posting a job by clicking the "create a job ad" button and proceed to add details about the job vacancy as shown in Figure 2.22.

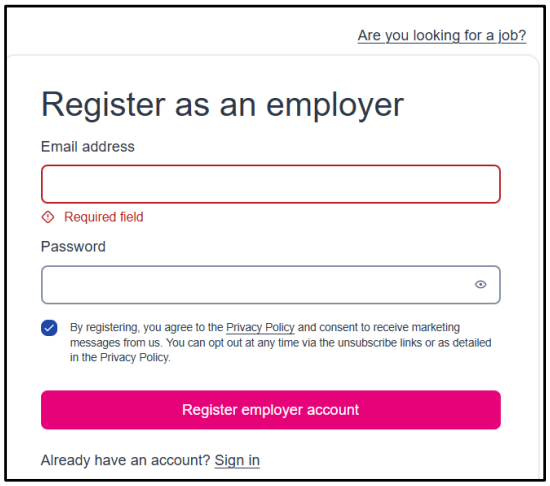

Figure 2.21: Jobstreet signup page for employers

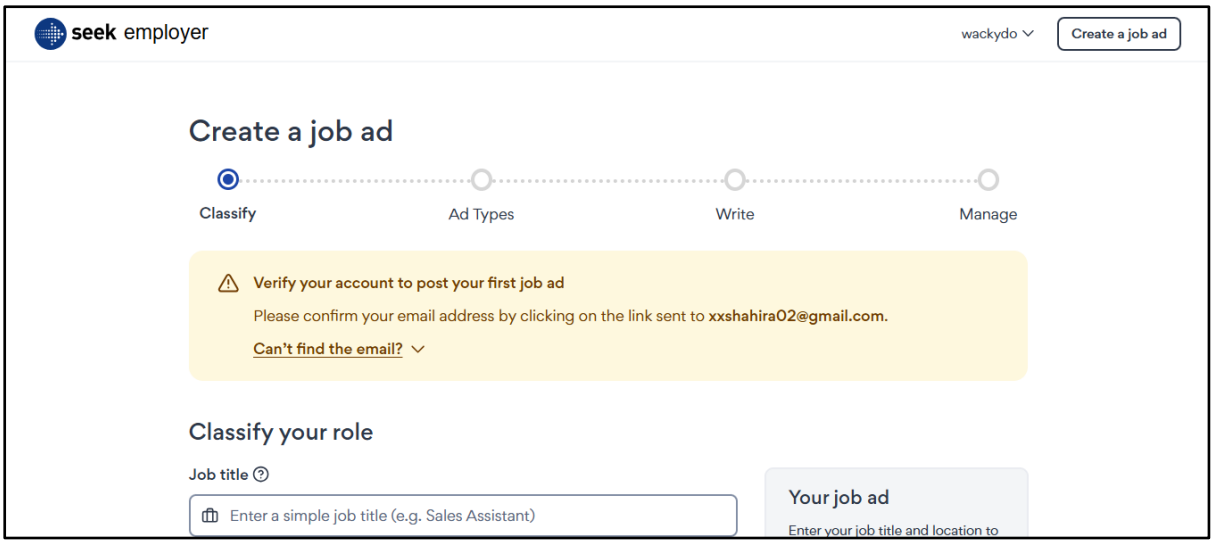

Figure 2.22: Job posting page for employers

2.2.3 Fastjobs

FastJobs was launched by Singapore Press Holding (SPH) in 2015 as a mobile-first platform designed to connect job seekers with job opportunities in the non-executive, manual and semi-skilled job markets (FastJobs, n.d.). However, it also has a website version which is suitable for people who prefer browsing on desktops or laptops, making it similar to SmartHire's web-based approach. FastJobs is available in several countries, including Malaysia, the Philippines, and Singapore, providing numerous job opportunities in the area. (FastJobs, n.d.). The platform capabilities have grown over time to include innovations like FastGig, a recruiting tool for flexible work schedules, and FastCareer for greater professional development opportunities (FastJobs, n.d.).

The home page of FastJobs is as shown in Figure 2.23. The navigation bar contains home, browse jobs, about FastJobs, resources, login and signup and employer site button. User can search for job vacancies on the main page by entering the job keywords, selecting job categories and specifying a location in the provided fields before clicking 'Find Jobs' to proceed. The home page also provides suggestions below the search field, including popular search topics and top searches.

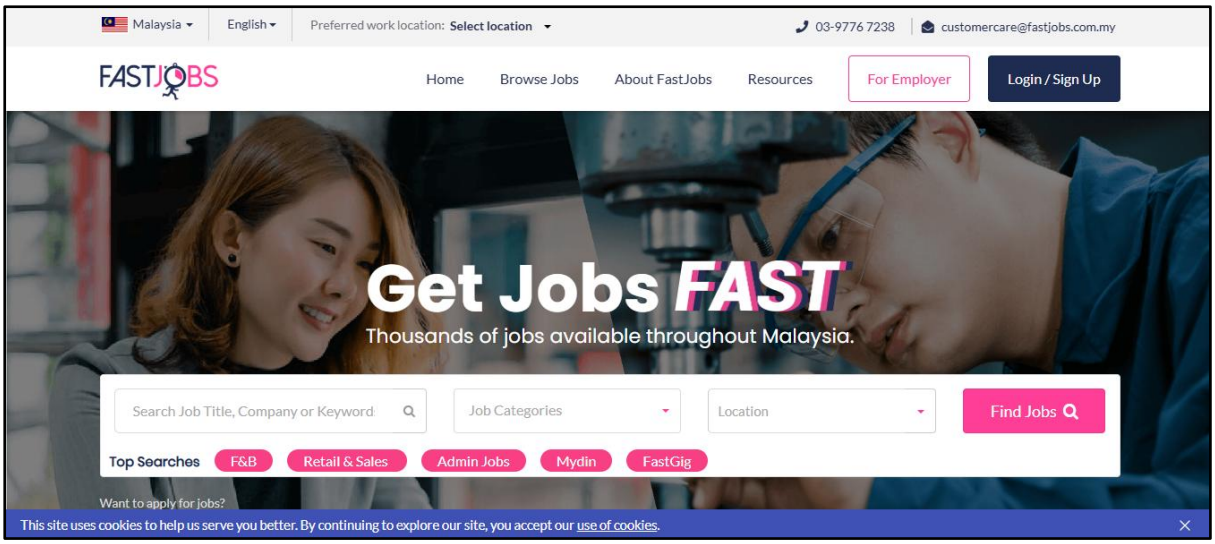

Figure 2.23: FastJobs home page

Furthermore, the home page also highlight partnership with various well-known brands such as 7-Eleven, Guardian, Don Don Donki, H&M, 4Fingers, Tealive, Maxis, and 99 SpeedMart showcasing its strong reputation and ability to connect job seekers with leading businesses in the food and beverage, retail and other industries, as shown in Figure 2.24 below.

Figure 2.24: FastJobs partners

The login page for FastJobs, as shown in Figure 2.25 allows users to login using their email or Facebook accounts. Users without an account can create a new one.

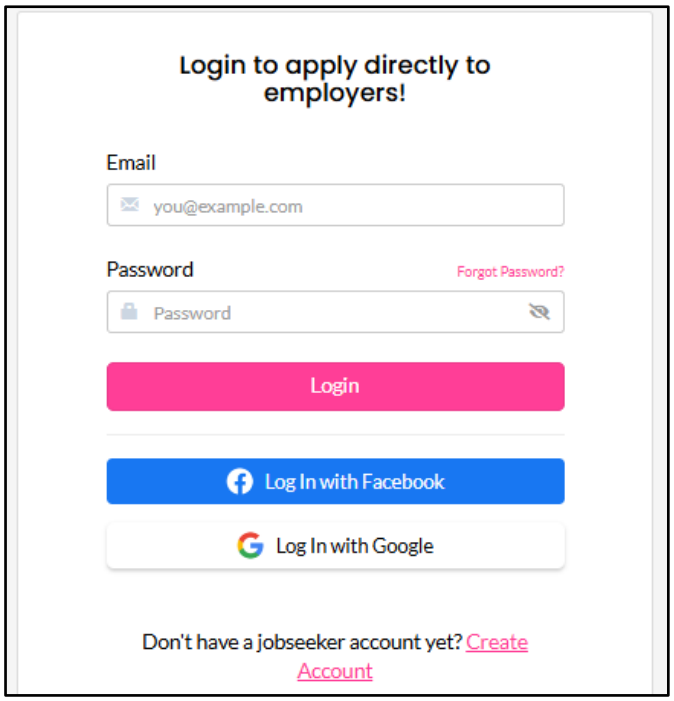

Figure 2.25: Login page of FastJobs

Figure 2.26 is the Browse Jobs page, designed to provide users with an overview of job listing categorized by type or industry. Users can filter job searches by ticking the checkbox, which include part-time, full-time, and contract options. On the left side of the page, there is a filter option allowing users to refine their search based on the latest jobs, preferred locations, or nearby opportunities. On the right side, users can filter by job function by ticking the checkbox based on their preferred job categories.

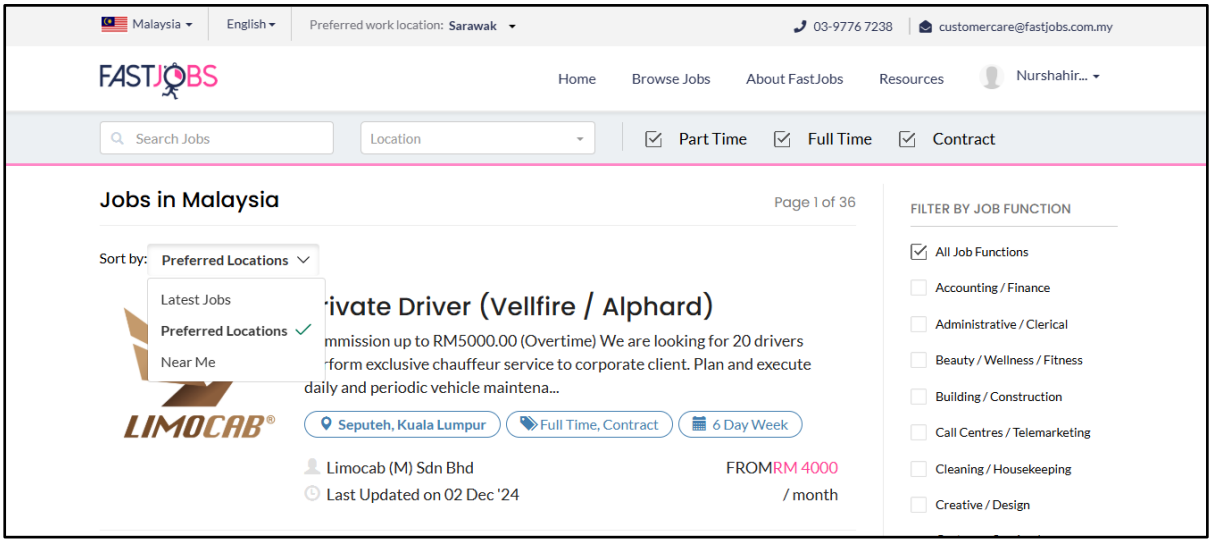

Figure 2.26: Browse Jobs page in FastJobs

After user click on the job they are interested in, they are redirected to detailed page that displays the job description along with an option to view employer's profile (Figure 2.27). Users can then proceed to apply for the position by clicking the 'Apply for this job' button. There is also an option to save the job for later reference.

Figure 2.27: Job description

If users click on the 'View Employer Profile', they are directed to the employer's page which provides details about the company, including other job vacancies available on the employer's site as shown in Figure 2.28.

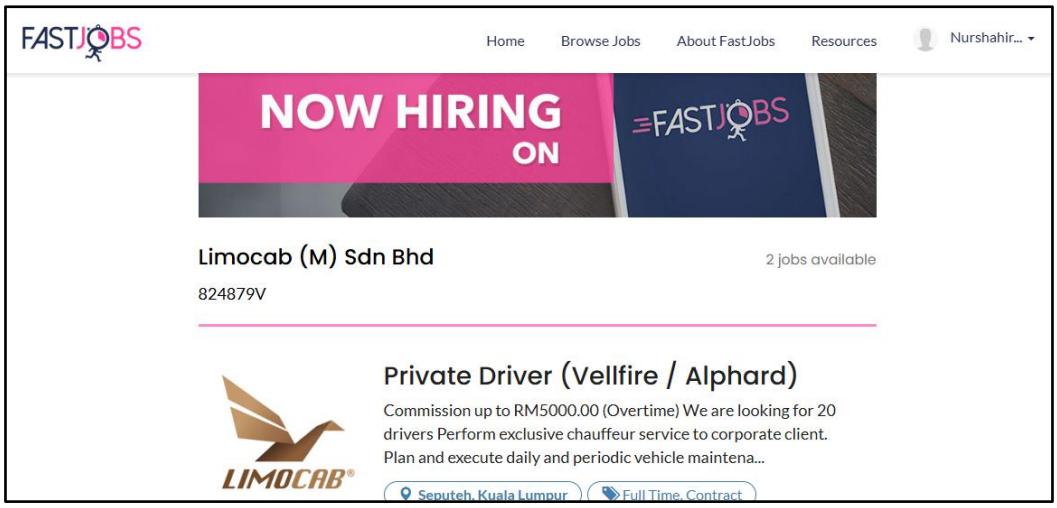

Figure 2.28: Employer profile page

However, if users click on the 'Apply for this job' button, a pop-up window appears as shown in Figure 2.29, prompting them to select their preferred method of application. Then user can proceed to click 'Apply Now'. A confirmation indicating the applications has been successfully sent will be displayed to the user (Figure 2.30).

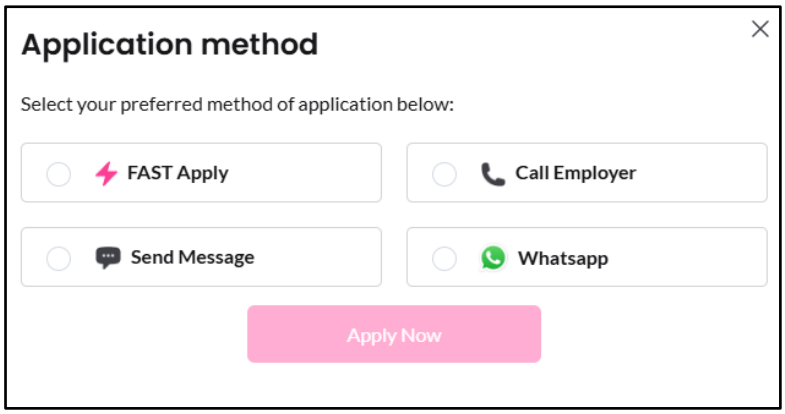

Figure 2.29: Application method pop-up

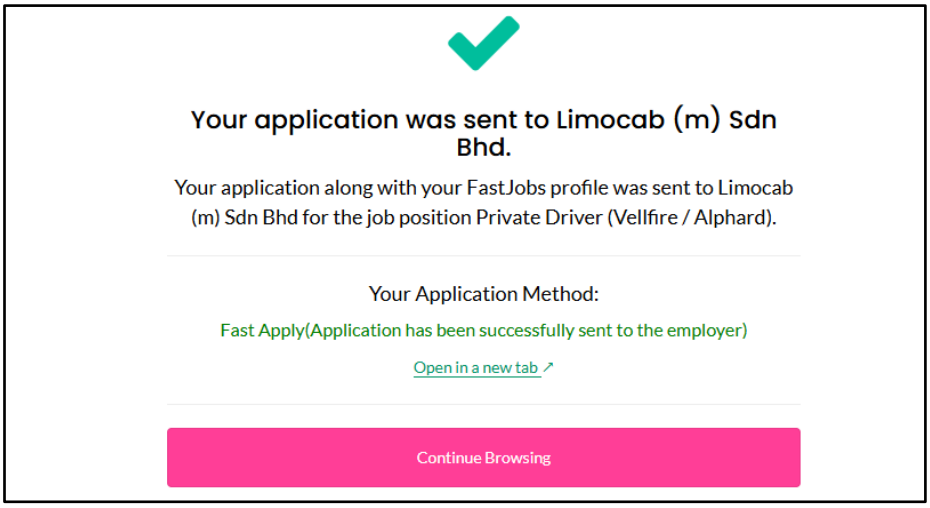

Figure 2.30: Successful application message displayed

Figure 2.31 shows the about page which provides a brief overview of the platforms mission, vision and key features. Additionally, it includes a Frequently Asked Questions (FAQ) for both job seekers and employers, providing answers to common query.

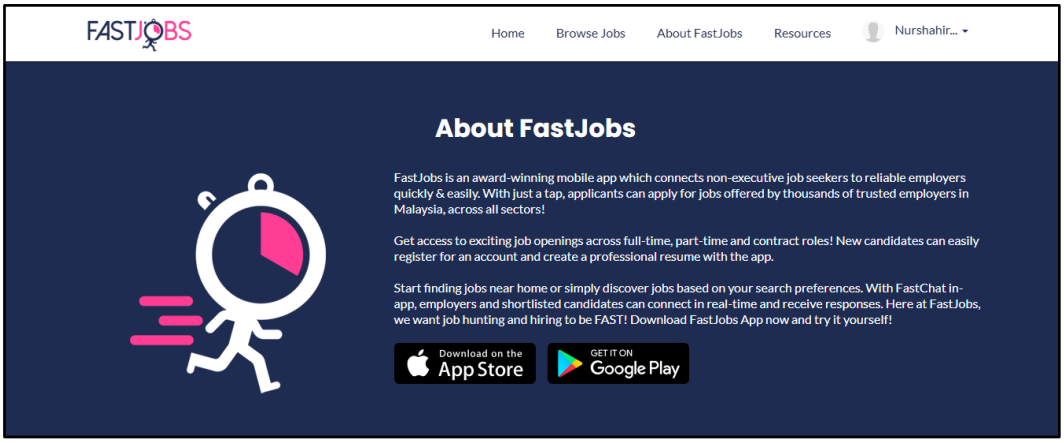

Figure 2.31: About FastJobs page

Figure 2.32 is the resources page on FastJobs which offer helpful tips like career advice, resume updates, interview preparation and more. The page's navigation bar includes 'Jobs by Specialization', where users can select between language such as English, Bahasa, or Mandarin, as well as option for jobseekers, employers and contact us.

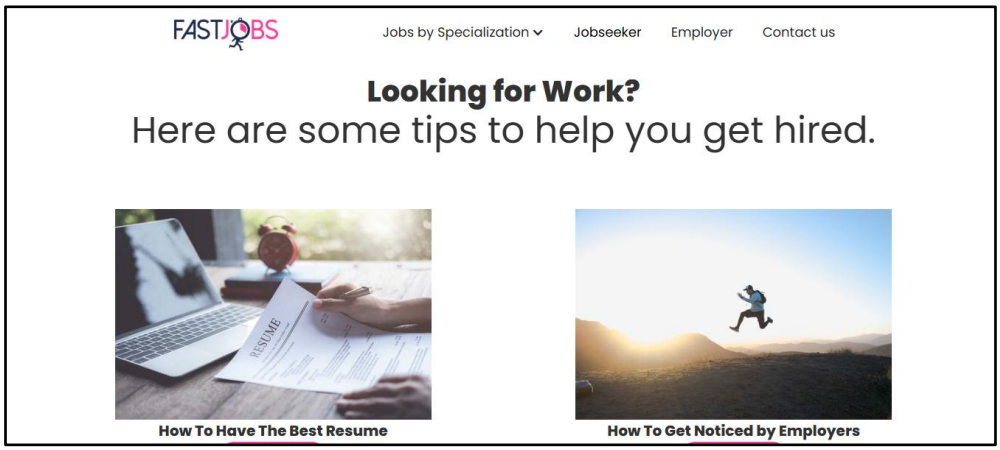

Figure 2.32: Resources page of FastJobs

When users click on their profile icon at the top right, a dropdown menu will appear with options like 'Applied Jobs', 'Saved Jobs', 'Profile', and 'Logout' as shown in Figure 2.33.

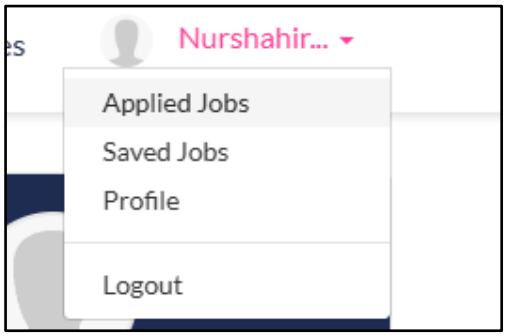

Figure 2.33: Dropdown on the user account

Figure 2.34 is the login or registration page for employers who wants to post job ads. However, this option is not free for all employers which could be a limitation for small businesses or startups with budget constraints. Employers may also be discouraged to use the platform by the absence of free job posting possibilities.

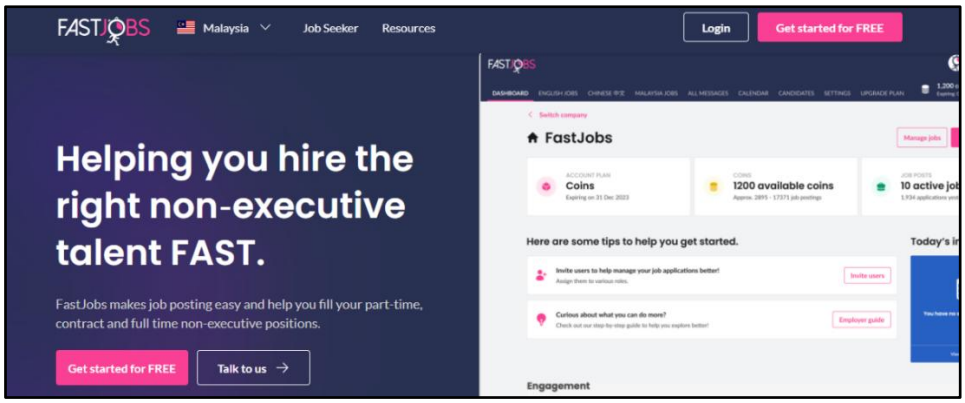

Figure 2.34: Employers page

2.2.4 MyNext

MyNext platform, developed by TalentCorp Malaysia, was officially launched on August 11, 2022, at the Sime Darby Convention Centre (MyNext, 2022). Its main purpose is to improve students' and recent graduates' employability, focusing on bridging the gap between education and industry needs (MyNext, 2022). It provides resources for career exploration, internships opportunities and career readiness tools such as psychometric evaluations (MyNext, 2022). While primarily aimed at helping students and graduates prepare for the workforce, it also helps employers with management internship program and evaluating talent. Additionally, universities use the platform to track students' progress during internships and match academic objectives with industry requirements.

Figure 2.35 shows the main page of MyNext platform with a navigation bar that includes search, login and signup button, and explore dropdown button. This platform target students, companies, and universities through its three modules: MyNext Talent, MyNext Company, and MyNext University. The login and signup pages for these modules are shown in Figure 2.36, Figure 2.37, and Figure 2.38, respectively.

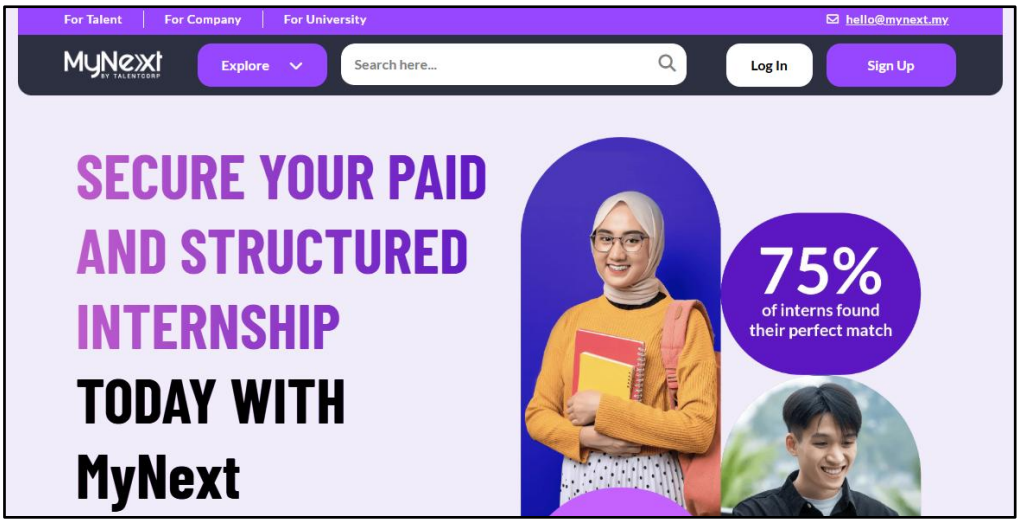

Figure 2.35: MyNext main page

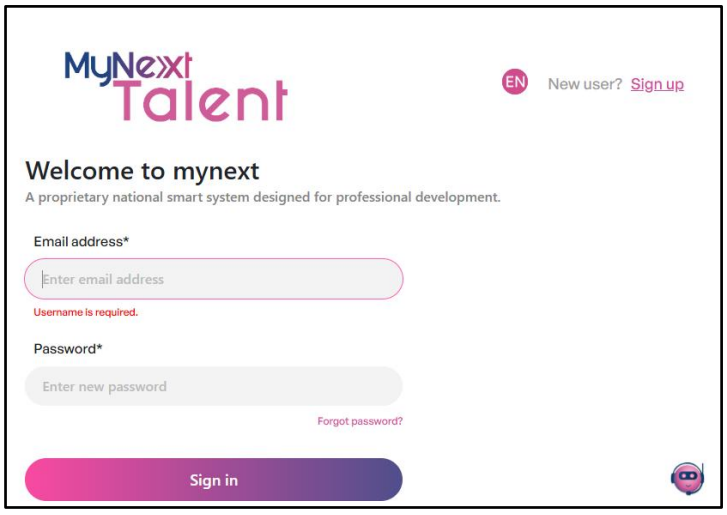

Figure 2.36: MyNext Talent login and signup page

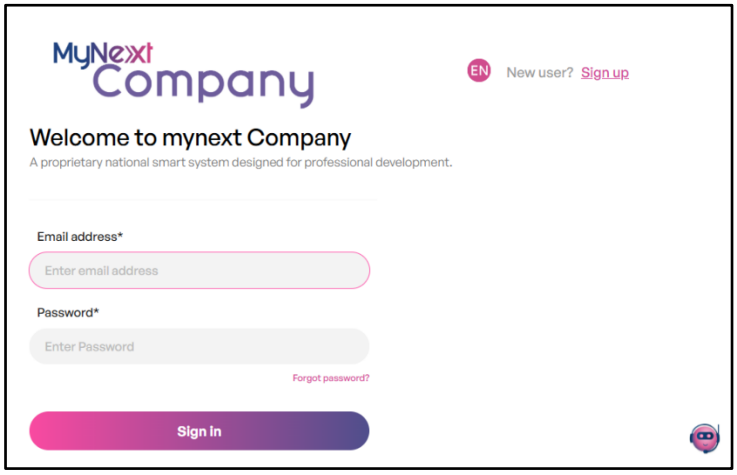

Figure 2.37: MyNext Company login and signup page

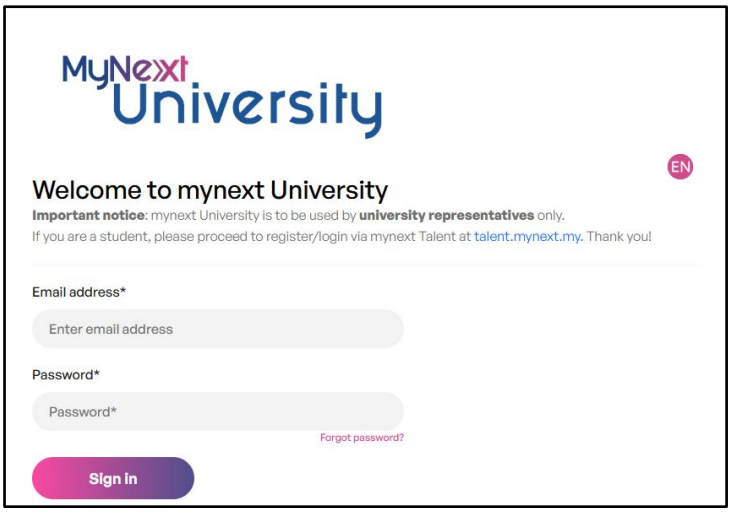

Figure 2.38: MyNext University login and signup page

Based on Figure 2.39, users can choose their desired internship category or use the search tool to find opportunities by entering keywords, location, or specialisation before clicking the search button. The home page highlights several features, including user reviews (Figure 2.40), link to resources, and navigation options to different user groups. However, the interface could appear to be confusing because there are so many options and elements presented on a single page.

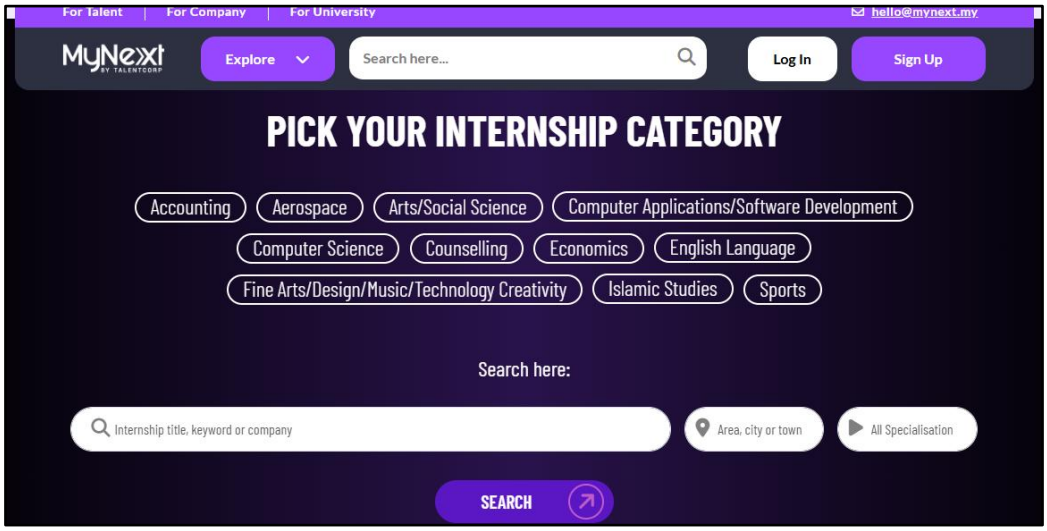

Figure 2.39: Internship category search filter in home page

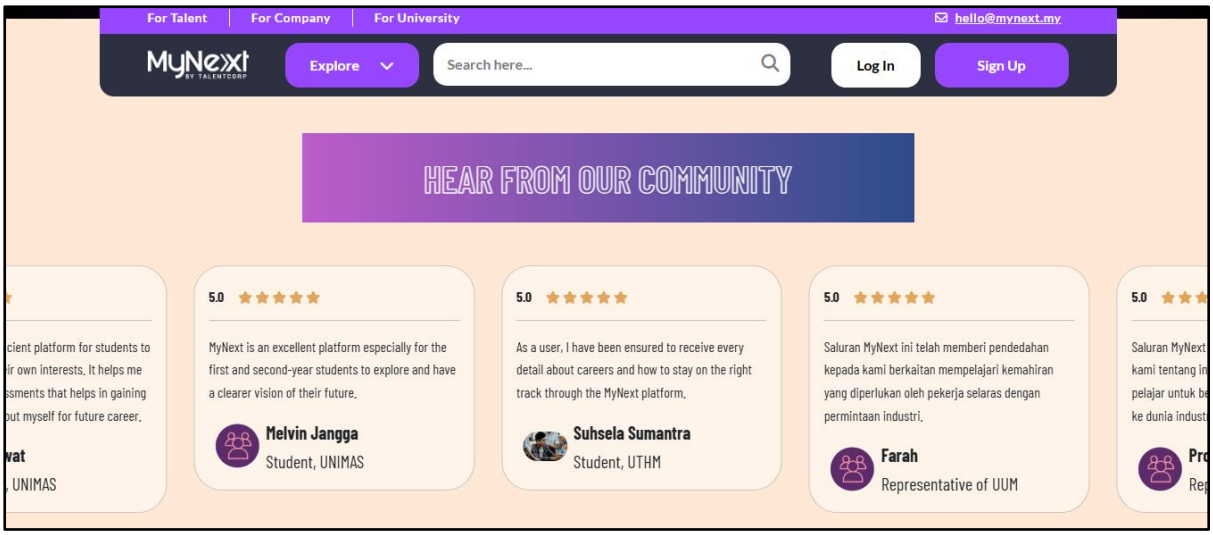

Figure 2.40: User review in home page

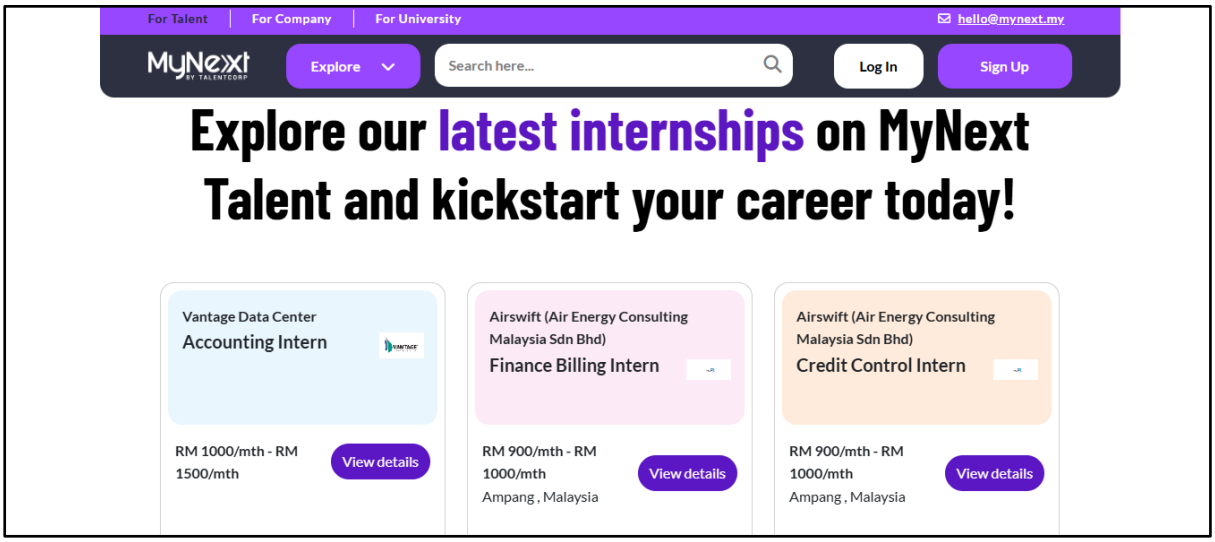

Figure 2.41: Internship job opportunities in For Talent page

Figure 2.41 shows several internship opportunities available for students, allowing them to view job details. Additionally, students can compare job to find the best fit, as shown in Figure 2.42. The result of the comparison is displayed in Figure 2.43, allowing users to evaluate the options further. Then, they can proceed by clicking the 'Apply Now' button.

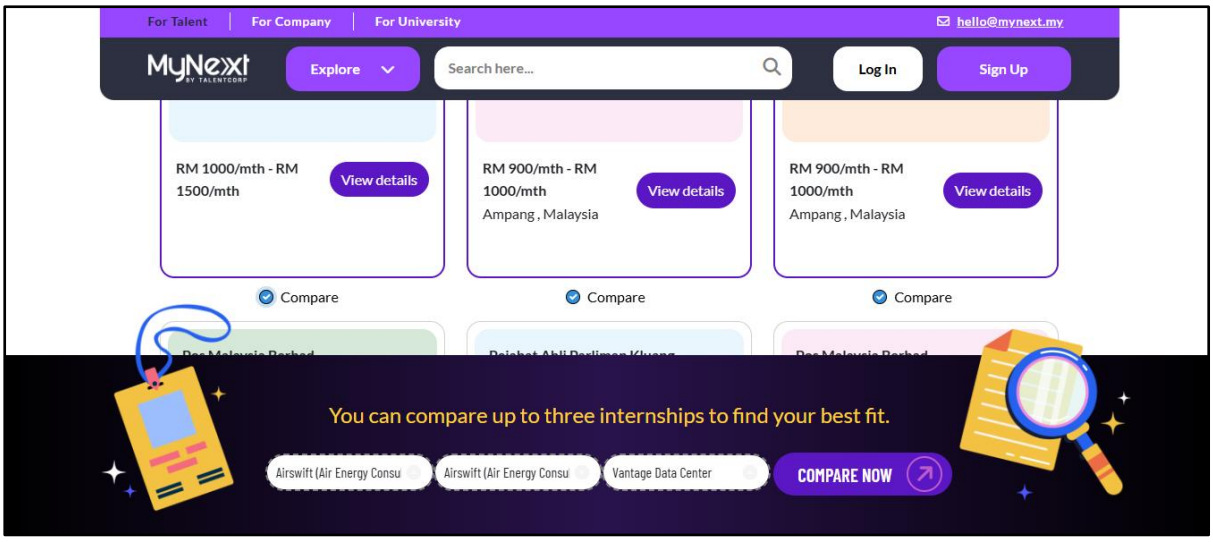

Figure 2.42: Internship job comparison features

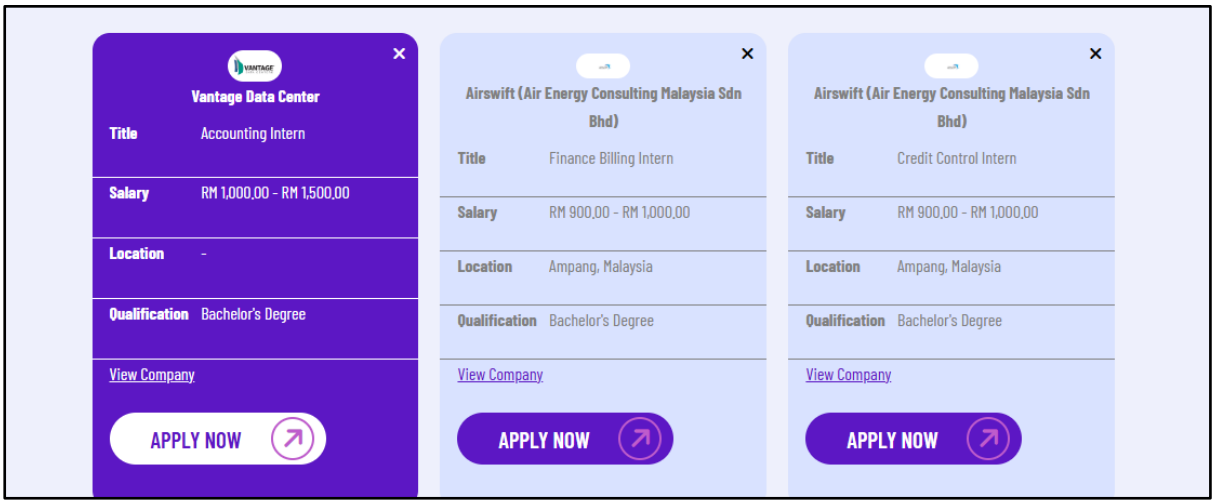

Figure 2.43: Internship job comparison results

The option for explore drop down button is shown in Figure 2.44 which includes next talent for school, graduate, women, and veteran. These categories highlight various opportunities such as exploration, experience and empowerment programs to assist specific group in their career development.

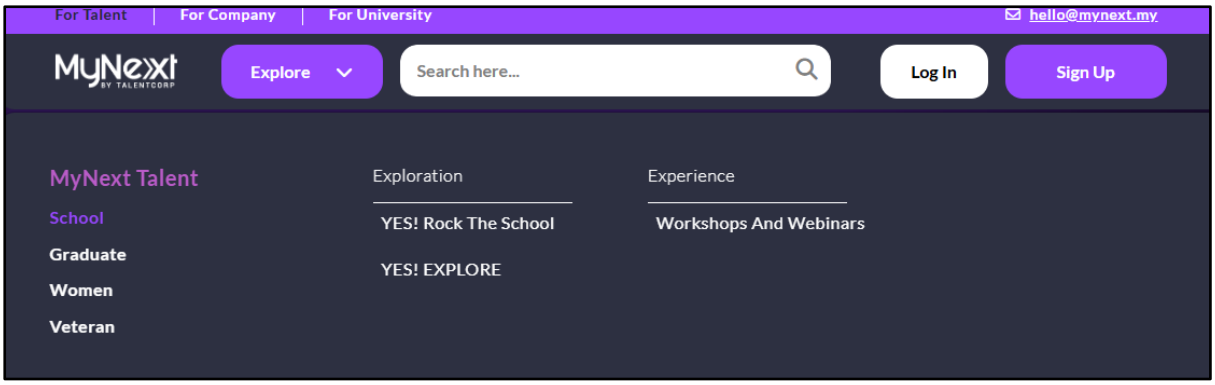

Figure 2.44: Explore drop down button option

After user, or specifically students successfully login using their student account, they are redirected to the MyNext Talent account page as shown in Figure 2.45. The navigation bar on the left includes Dashboard, Internships, My CV, Jobs, My Calendar, Learning Management System (LMS), and Settings.

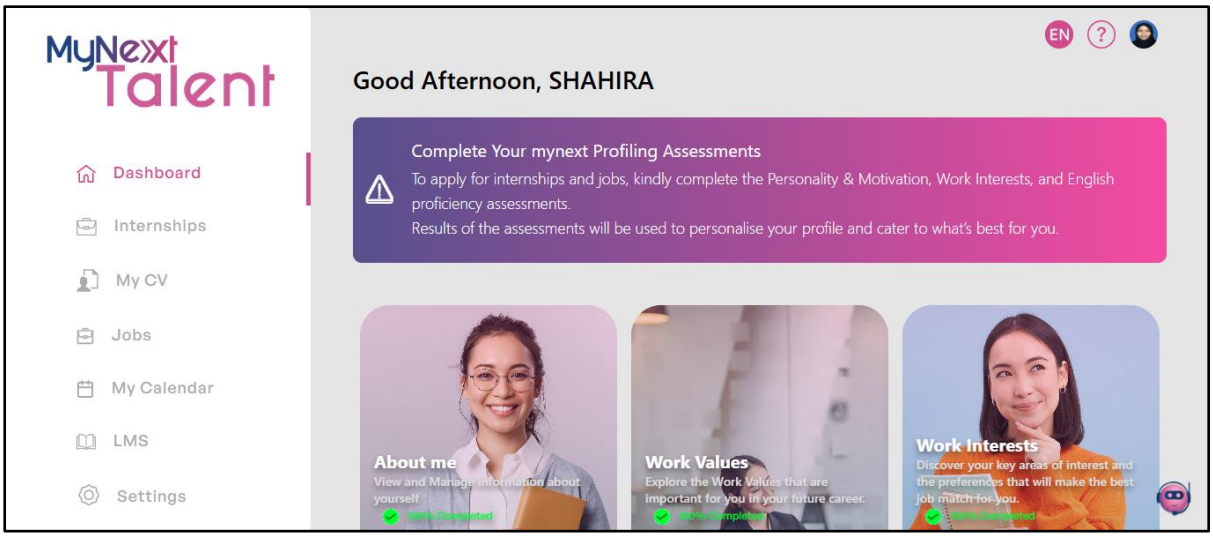

Figure 2.45: User account dashboard page

The internships page, as shown in Figure 2.46, allows users to apply for their desired internships by displaying the job description, where users can simply submit their resume through the system. Meanwhile, the My CV page (Figure 2.47) provide users with the option to enter their expected salary in the field provided. There is also a button that allows users to make their profile visible to companies, increasing their visibility to potential employers. The My Calendar page is designed to help users keep track of important dates and events related to their internships, ensuring they do not miss important milestones as shown in Figure 2.48.

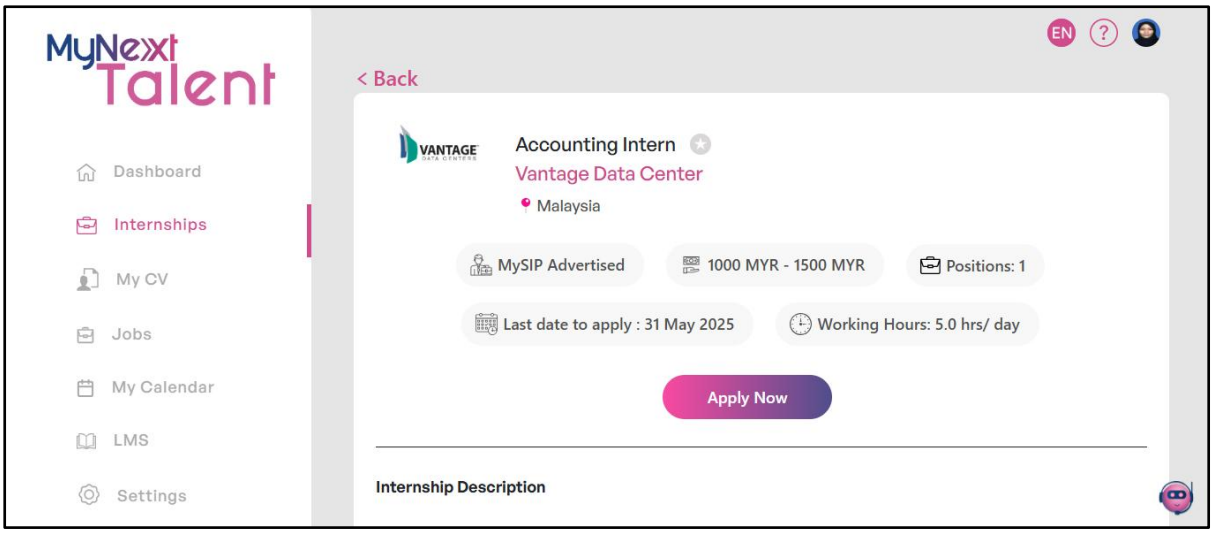

Figure 2.46: Internships job page

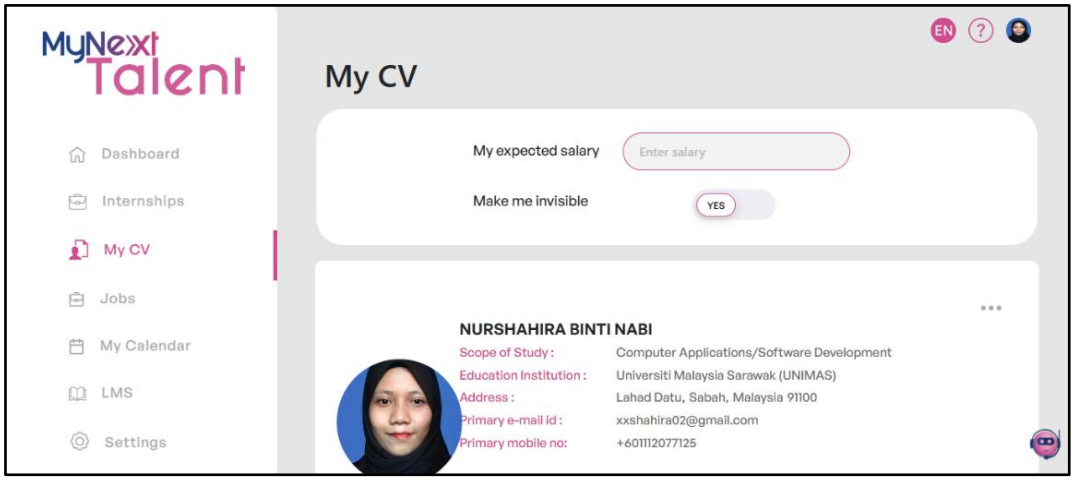

Figure 2.47: My CV page

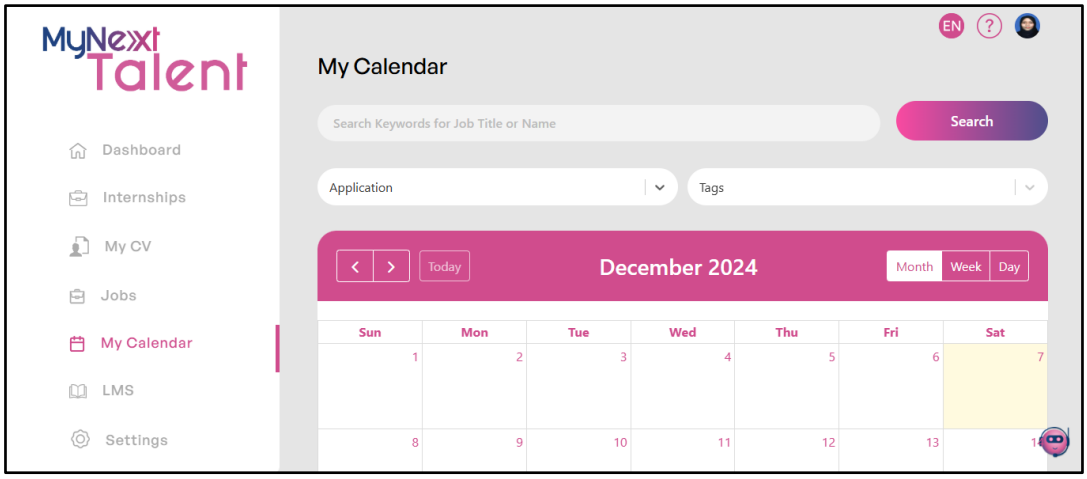

Figure 2.48: My Calendar page

Upon clicking the LMS option, users will be redirected to a new page of the LMS page as shown in Figure 2.49. This page provides users with access to skill development courses, job preparation materials, and certifications.

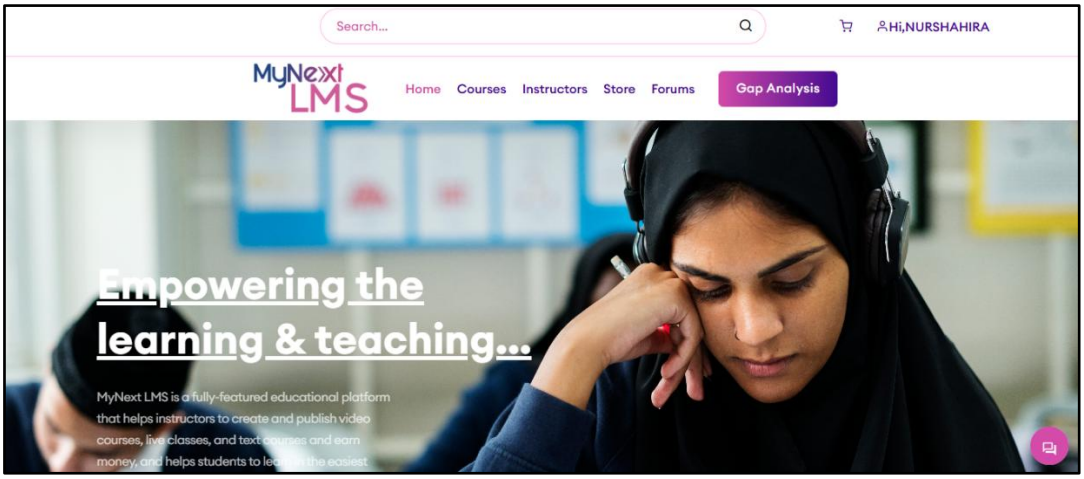

Figure 2.49: MyNext LMS page

2.3 Comparison Between Existing Systems

Table 2.1 shows a comparison in features between existing systems.

Table 2.1: Comparison between existing systems

Features	Indeed	JobStreet	FastJobs	MyNext
Log in and sign up	Simplified log in and sign-up process with email integration.	Log in and sign-up is available but can sometimes feel overwhelmed due to multiple options.	Simple and quick log in process, optimized for mobiles.	Customized login option for specific user types, students, companies, and universities.
Job search and filters	The feature provides a simple search with criteria using keywords, location, and job title.	Advanced filters, including location, job types, and salary range.	Support quick filters for job types like part-time, full time, and location.	Designed for internships, providing industry-specific filters.
Gamification	Not available.	Not available.	Not available.	Includes gamified features like badges and LMS.
Downloadable CV	Users can create, edit, and download their CVs in the system.	The system allows users to create and upload their CVs directly through the platform.	Does not provide a built-in CV builder, requiring users to upload existing CVs. Downloadable CV feature available in mobile app only.	Offers upload/download of resumes and helps create customized CVs for internships.
Review page	Offers company review page allowing users to read employee experiences. However it lacks verification, which could result in inaccurate reviews.	Has company review and ratings of company for various factors, including work-life balance. But also, might lack verification and not fully reliable.	The system does not provide employer review feature. This might be a disadvantage for users who wish to learn more about a company.	Offers review-like feedback and exploration features, but they are not comprehensive or employer-specific.

User interface	Straightforward, simple design with easily accessible features although it is text-heavy, which might be confusing for users to navigate.	Organized, user-friendly interface with easy navigation. However, the home screen sometimes displays too much content, which can be overwhelming for users.	The design is clean and minimalist, but it lacks a clear visual indicator to identify current navigation paths.	Interface that targets variety user groups but can lead to visual confusion.
Job posting (employers)	Basic job ad tools with limited customization options.	Comprehensive features for posting jobs, including templates and salary suggestions.	Has a standard job posting capabilities but lacks employers focused additional features.	Focuses on partnership and internships postings, helping universities and companies connect with student.
Employer tracking dashboard	The system has a simple dashboard with minimal insights and metrics for employers.	The system provides a moderate overview of job performance and applicant trends.	The system does not provide dedicated tracking dashboard for employers.	Internship-focused dashboard.
Employer reviews	The system enables users to leave reviews for employers.	The system allows employers to receive and view reviews.	The system has limited feedback features and is not widely used.	Limited review and feedback feature, focusing more on university partnerships and internship-related metrics.

The comparison of Indeed, JobStreet, FastJobs, and MyNext highlights a variety of strengths and weaknesses of these platforms. Indeed is well known for its user-friendly features, including a simple job search system and an integrated CV builder. However, its text-heavy interface may discourage users who prefer a more visually engaging experience. JobStreet, on the other hand, excels in offering advanced search filters and professional interface, making it ideal for detailed job searches. Nevertheless, the homepage can feel overwhelming due to excessive amount of information displayed.

FastJobs uses a more simple, mobile-friendly approach, providing a quick login procedure and an intuitive layout. While this makes it perfect for people looking for part-time work, it may not satisfy the needs of all users due to its limited customization options and lack of advanced features. Lastly, MyNext is unique for its focus on internships and academic partnerships although its interface feels crowded due to its abundant of features. Through this comparison, key insights can be made for the development of SmartHire. By integrating the strengths of these paltforms such as advanced filters, CV tools, and simplified dashboards, and addressing their weaknesses, SmartHire strives to provide a smooth and interesting experience for both students and employers.

2.4 The proposed system: SmartHire Key Features and Functionalities

SmartHire is designed to provide students with a user friendly and interactive platform for finding and applying for part-time jobs. Students need to register first then they can create their own profile by adding their information into the system. They can search and filter the job listing based on keywords like location, field of job or work schedule. The detailed job description, employers rating, and requirements for job application can be viewed by students in the system. Students can track their application history and receive notification about the status of all their application.

A key feature of SmartHire is its gamification features, which aims to increase student engagement by rewarding active participation. Student can earn badges for achieving certain goals, such as applying for jobs, getting hired, or completing jobs successfully. This helps students track their progress in seeking part-time jobs and motivates them to use this platform more frequently. The gamification element will be designed to create a sense of accomplishment, motivation, and competition among students. For instance, badges could be

rewarded for achieving tasks like “First Application”, “Top Performer”, “Job Seeker of the Month”, or “Resume Updater”. Rankings will be determined by factors like number of applications submitted, successful job placement, and positive employer feedback. Furthermore, students can also download and update their current CV by just modifying it in the system.

Employers’ key features are that they can post job openings, which include description, requirements and compensation. They can view profiles, evaluate candidates, and check the number of applicants. Those applications can be managed through the dashboard, which will provide an update on each applicant. Employers will manage applications from students including deciding whether to accept or reject them. After the student have completed their job, employers can rate and provide feedback based on their performance by adding comments.

Employers and students can securely register and login, with email verification required. Password is encrypted to ensure data protection. Students can also manage the visibility of their profiles by selecting which employers will have access to specific information, such as their contact details, academic background, work experience, skills or availability.

2.5 Summary

In Chapter 2, a detailed review of existing job portal systems was conducted, with a focus on platforms like Indeed, JobStreet, FastJobs and MyNext. These systems have been reviewed in terms of their usability, features, and functionality for both users and employers. The review also highlighted various studies and examples that support the implementation of gamification into job portal system to boost motivation and regular user. The chapter also provide a detailed comparison of the features in the existing platform with the proposed system, SmartHire. A comparison table is used to outline the differences and similarities in features.

The findings from these reviews helped in determining important features to be included in the proposed SmartHire system, which aims to utilize the strength of these platform while addressing the gaps that were observed in the existing system. The goal is to create a system that not only streamlines the job applications but also improves engagement for both students and employers.

CHAPTER 3: REQUIREMENT ANALYSIS AND DESIGN

3.1 Introduction

SmartHire is designed to be a dynamic platform that connects students with part-time job opportunities, addressing the challenges faced by both job seekers and employers in the sector. This chapter covered the requirement analysis and design phases, the first two stages of the agile methodology used for this project. These phases are essential in ensuring the system features, structures, and functionalities aligned with user requirements and expectations.

During this requirement analysis phase, user requirements are gathered via surveys with students and interviews with potential employers. The data collected is analysed to determine the essential parts and user-focused features required for the SmartHire system. The design phase build upon this analysis by outlining the database schemas, user interface designs, and system architecture that ensure the system's usability, scalability, and functionality.

3.2 Agile methodology

The development of SmartHire system used the Agile methodology, a well-known approach in software engineering that focuses on iterative progress, collaboration, and flexibility. The Agile methodology officially begins with the release of Agile Manifesto in 2001 (Daraojimba et al., 2024). The manifesto emphasizes individuals and interactions rather than procedures and equipment, customer collaboration than contract negotiation, and adapting to changes rather than following a plan (Daraojimba et al., 2024).

This methodology is divided into several iterative phases, each contributing to the system’s development. There are six key phases uses in this methodology, requirements, design, development, testing, deployment, and review. During the planning and requirement analysis phases, interviews and surveys are conducted to collect data, which is then used to define user needs and system requirements. According to Daraojimba et al. (2024), agile approaches strongly prioritize customer satisfaction and collaboration. By involving customers at every stage of the project, agile ensures that the final product matches the customer requirements and expectations.

The design phase utilizes the data gathered, to create user interface, system architecture, and prototypes. Later in the development phase, these designs are implemented incrementally ensuring that progress can be assesses and modified based on user feedback. Agile

methodology breaks down the overall system into deliverables which enable the customer to utilize or validate the deliverables before the complete system is finished (Guerrero-Ulloa et al., 2023). This approach enables a user-focused development process, ensuring that SmartHire develops into a reliable and effective platform for the target audience.

3.2.1 Analysis Phase and User Requirements

The requirement analysis phase is crucial in understanding the requirements and expectations of potential users of the SmartHire platform. This phase ensures that the system addresses specific challenges faced by students looking for part-time job and employers posting job opportunities. To gather user requirements, surveys were given to students and interviews were conducted with potential employers. These methods were chosen to get an in-depth overview of user needs from both perspectives.

The surveys were distributed using Google Forms and shared through social media like WhatsApp, targeting wide range of students. The survey includes questions about the challenges students face when searching for part-time jobs and their preferences for a job portal system. Before taking part in the survey, respondents had to read the consent form to ensure data protection and ethical compliance. Appendix A includes the consent form and the survey questionnaire.

Additionally, interviews with a few selected employers were conducted to learn more about the hiring process, expectations, and suggestions on potential features for the SmartHire platform. The discussion offered qualitative information in addition to the survey findings, ensuring a comprehensive understanding of user needs. Appendix B shows the consent form signed by the employers.

3.2.2 Analysis of Online Survey

The online survey consists of two sections, Section A focuses on demographic information to gather basic details about the respondents, while Section B explores student preferences for part-time job portals to understand their needs and expectations. The link for the google form is https://forms.gle/xURcLTNCV1kmU4cq7. The number of respondents is 67 people.

Section A: Demographic Information

Question 1: What is your age?

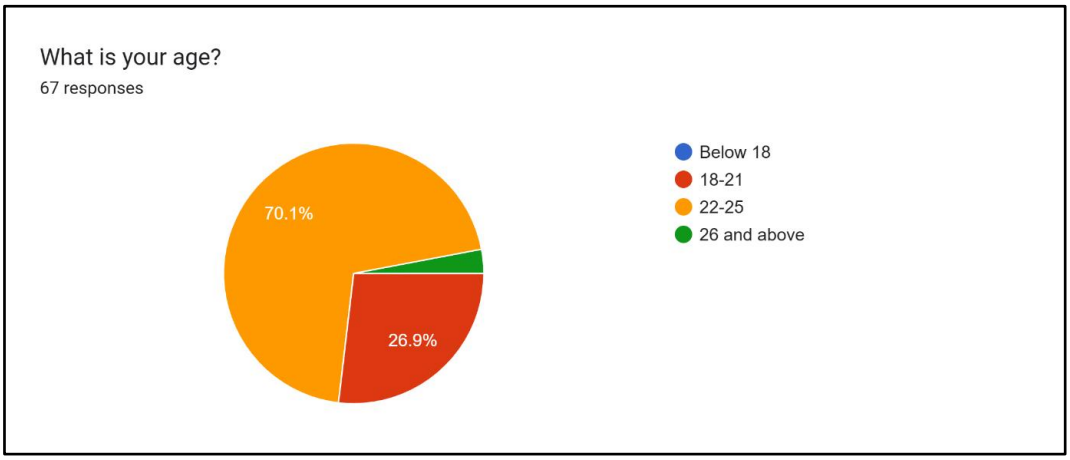

Figure 3.1: Respondents age

Figure 3.1 shows the pie chart representing the age distribution of the respondents, with 47 of them (70.1%) being between 22 and 25 years old. 18 respondents are between 18 and 21 years accounting for 26.9%. Only 2 respondents are aged 26 and above making up 3%, while no respondents are below 18.

Question 2: What is your gender?

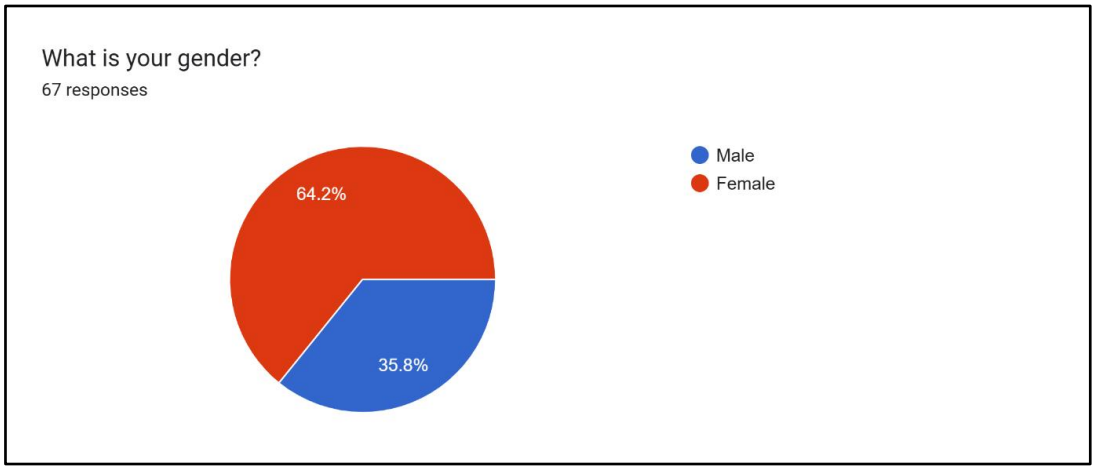

Figure 3.2: Respondents gender

Figure 3.2 is the pie chart for gender distribution of the respondents. The majority are female, with 43 respondents (64.2%), while the remaining 24 respondents (35.8%) are male.

Question 3: What is current year of study?

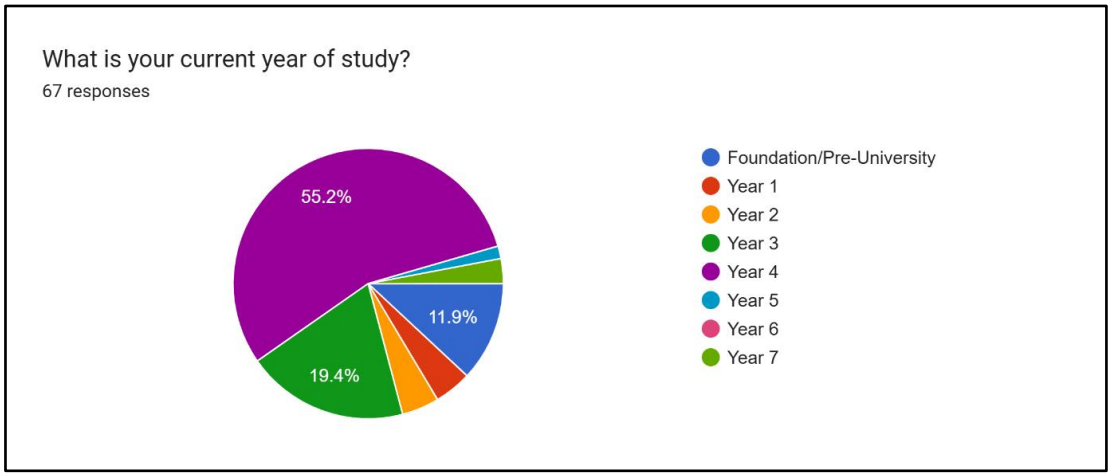

Figure 3.3: Respondents current year of study

The pie chart from Figure 3.3 illustrates the current year of study of the respondents. Majority of the respondents are Year 4 students, totalling 37 (55.2%). The second largest group consists of Year 3 students with 13 respondents (19.4%). The rest students are foundation students with 8 (11.9%), Year 2 and Year 1 students with 3 each (4.5%), Year 7 students with 2 (3%) and one Year 5 student (1.5%).

Question 4: Do you have previous part-time job experience?

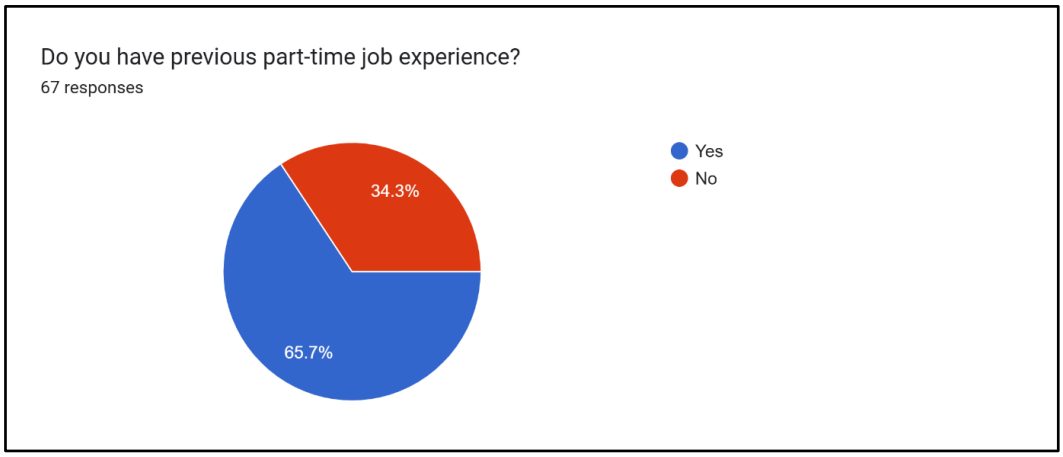

Figure 3.4: Respondents previous part-time job experience

Figure 3.4 shows the pie chart for respondent's previous part-time job experience. A total of 44 respondents (65.7%) indicated they had a previous part-time job experience, while the remaining 23 respondents (34.3%) had none.

Section B: Student Preferences for Part-Time Job Portals

Question 5: How do you currently search for part-time job opportunities? (Choose all that apply)

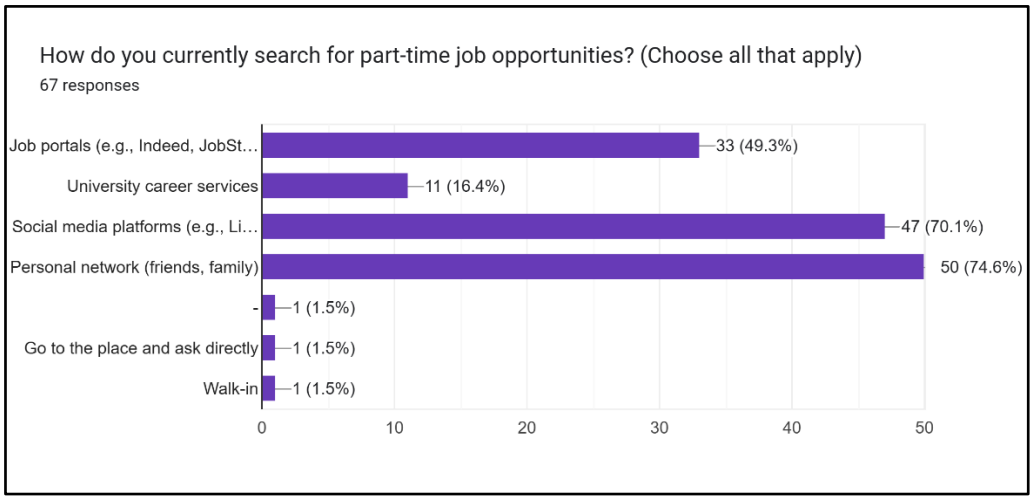

Figure 3.5: Respondents method to search part-time job

Figure 3.5 shows a horizontal bar chart illustrating the respondents' methods to search for part-time job. Respondents were allowed to select multiple option or provide their own input. The majority, 50 respondents (74.6%) indicated using personal network such as friends or family. Social media platforms were the second most popular method, selected by 47 respondents (70.1%). Job portals were chosen by 33 respondents (49.3%), while 11 respondents (16.4%) relied on university career services. 1 respondent (1.5%) stated that they go to the place and ask directly, and another 1 respondent (1.5%) mentioned using walk-in applications.

Question 6: What features you think are most important when using a job portal to find part-time work? (Choose all that apply)

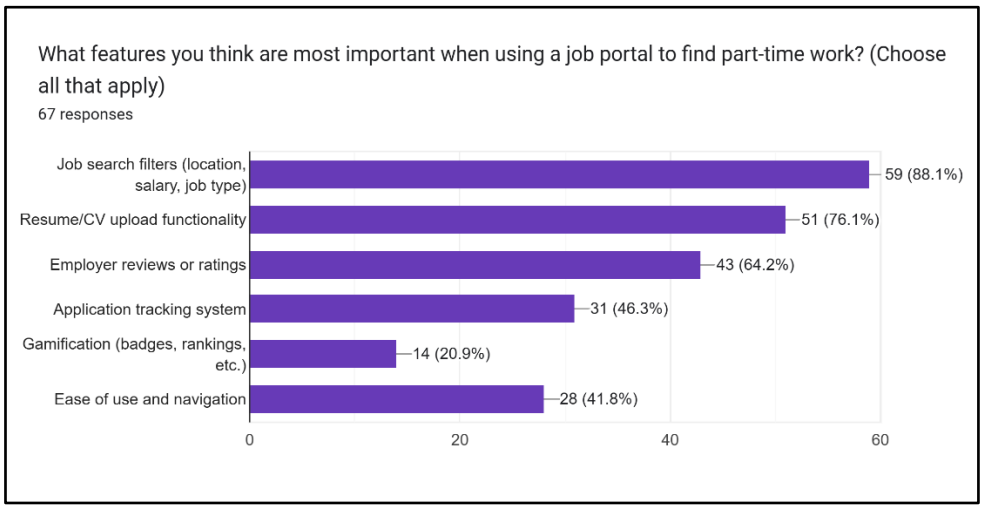

Figure 3.6: Respondents opinion on the most important features

Figure 3.6 presents a horizontal bar chart of the respondents' opinion on the most important features that is needed in a job portal when searching for part-time job. This shows that majority of students consider job search filters the most important feature, with 59 respondent (88.1%) selecting it. Respondents can choose many options, and this shown that all features are needed in the system:

a) Job search filters (location, salary, job type)
b) Resume/CV upload functionality
c) Employer reviews or ratings
d) Application tracking system
e) Gamification (badges, rankings, etc.)
f) Ease of use and navigation

Question 7: Would you be more motivated to use a job portal if it included gamified features, like earning badges for completing tasks or achieving high ratings?

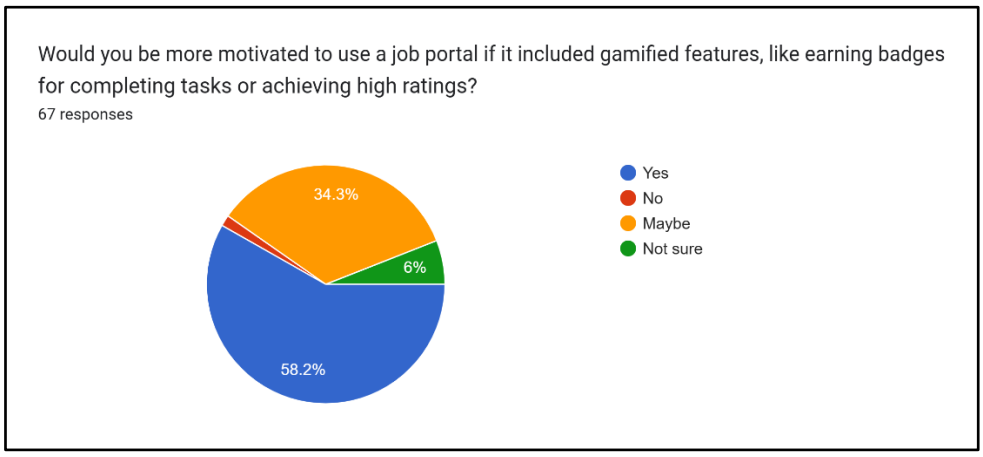

Figure 3.7: Respondents opinion in using gamified features in job portal

Figure 3.7 is a pie chart showing whether respondents would be more motivated to use a job portal that includes gamified features. A majority of 39 respondents (58.2%) choose 'Yes' indicating strong interest in gamified features. 23 respondents (34.3%) selected 'Maybe', while 4 respondents (6%) were 'Not sure'. Only 1 respondent (1.5%) choose 'No'.

Question 8: Would you use a platform that tracks your progress, provides performance feedback, and lets you showcase your achievements?

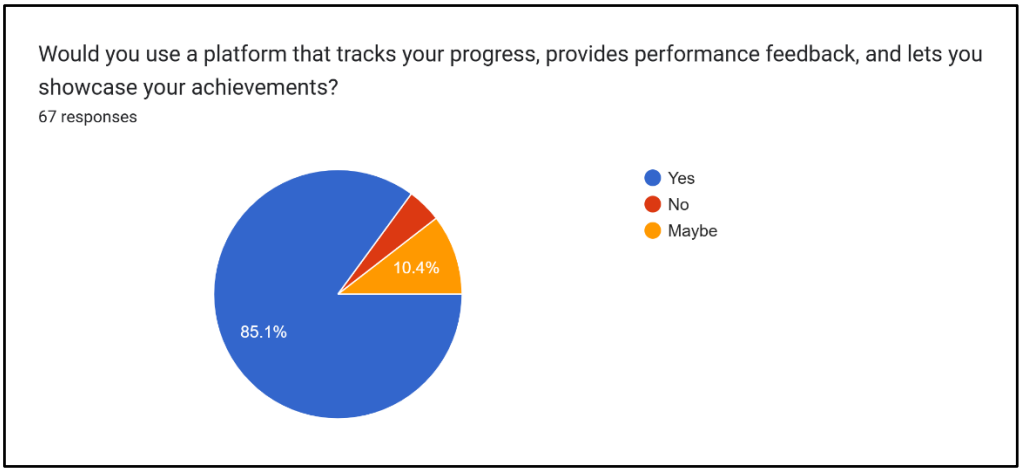

Figure 3.8: Respondents opinion on platform that track progress

Figure 3.8 illustrates a pie chart of respondents' willingness to use a job portal that can track their progress and majority of them (92.5%) choose 'Yes' indicating that the system will implement that feature.

Question 9: Do you prefer job portals that also offer training or skill-building resources to help you improve your employability?

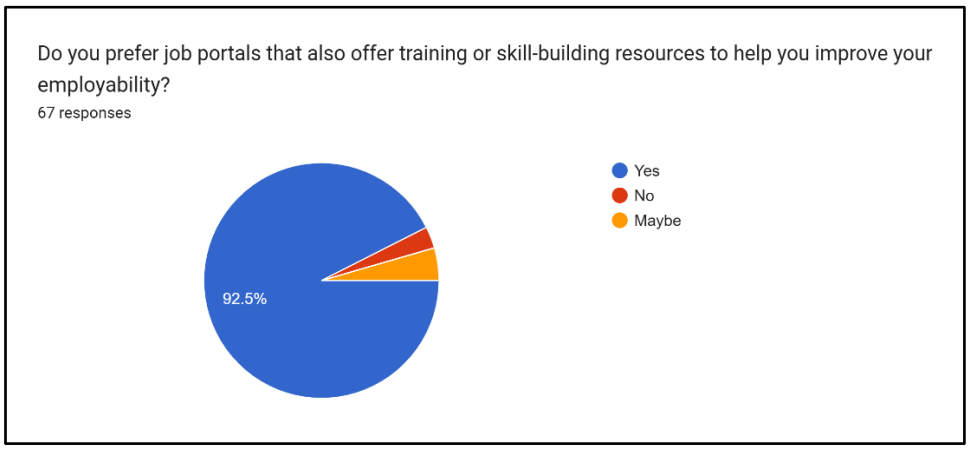

Figure 3.9: Respondents opinion on training resources in job portal

Figure 3.9 shows respondents' preference for having training or skill-building resources in the job portal, with 92.5% selecting 'Yes'. This feature could help student's employability and readiness for part-time job opportunities.

Question 10: How often do you visit job portals to look for part-time job opportunities?

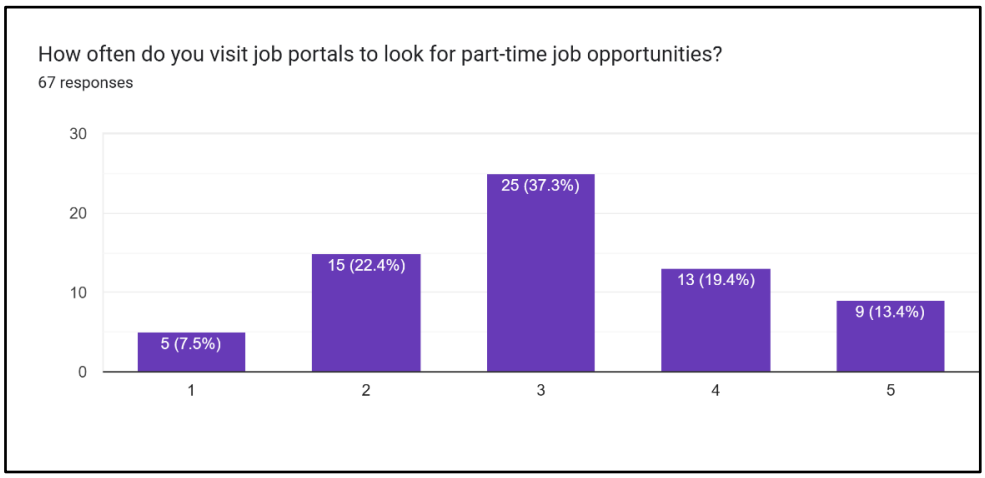

Figure 3.10: Respondents frequency of visiting job portal

Based on Figure 3.10, where 1 indicates "Never" and 5 indicates "Very often", the vertical bar chart distributions suggest that majority of the respondents rated their usage as moderate to frequent, with most selecting value 3, 2 or 4. Specifically, 25 respondents (37.3%) choose 3, 15 respondents (22.4%) choose 2, and 13 respondents (19.4%) choose 4, indicating that the job portal usage is common but not daily activity for most respondents. A smaller

portion of 9 respondents (13.4%) rated their usage as 5 (very often), while a minority of 5 respondents (7.5%) indicated they never use job portals (rating 1).

Question 11: How easy is it for you to find relevant part-time jobs on current platforms?

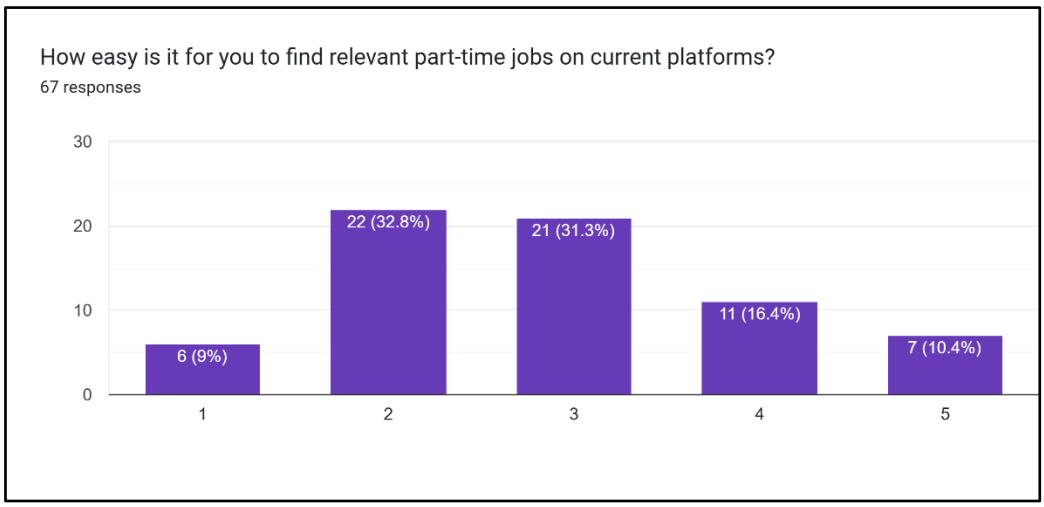

Figure 3.11: Respondents perception of ease in finding part-time jobs on current platforms

Figure 3.11 shows the vertical bar chart for respondents' opinion on the easiness to find part-time jobs, where 1 indicates "very difficult" and 5 indicates "very easy". Most of them found it moderately challenging to locate relevant part-time jobs. A total of 6 respondents (9%) rated it as 1, and 22 respondents (32.8%) choose 2, while 21 respondents (31.3%) rated it as 3. Only 11 respondents (16.4%) rated it as 4 and 7 respondents (10.4%) rate it as 5, indicating that few users found it easy to find relevant jobs. This emphasizes the need for an improved platform that enhances job matching and accessibility.

Question 12: How important is it for you to be able to track your job application status and progress on a job portal?

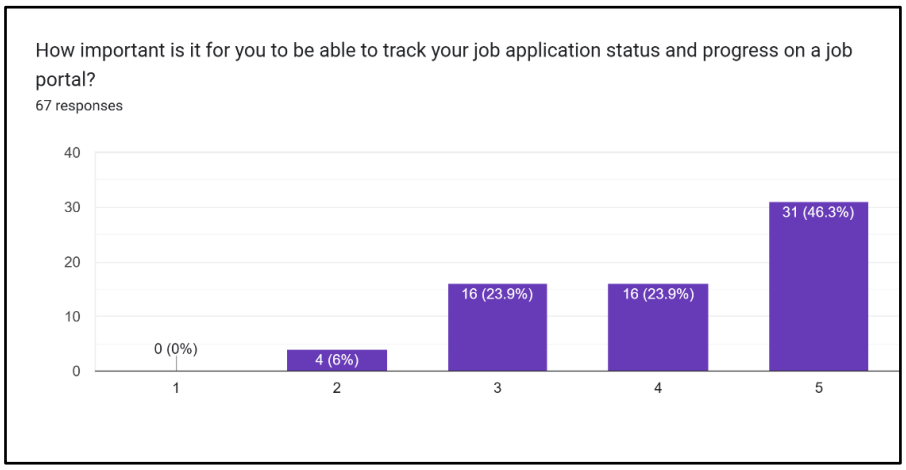

Figure 3.12: Respondents opinion on tracking job application status

Figure 3.12 shows the vertical bar chart of the respondents' perception of the importance of tracking job application status on job portals, with 1 indicating "not important" and 5 indicating "very important". The results shows that 31 respondents (46.3%) think it is very important (rating 5), with an additional 16 respondents (23.9%) each rated it as 3 and 4. This emphasizes how important it is to include effective tracking systems in job portals to meet user expectations.

Question 13: How useful do you think a performance feedback system (ratings, reviews) would be on a job portal?

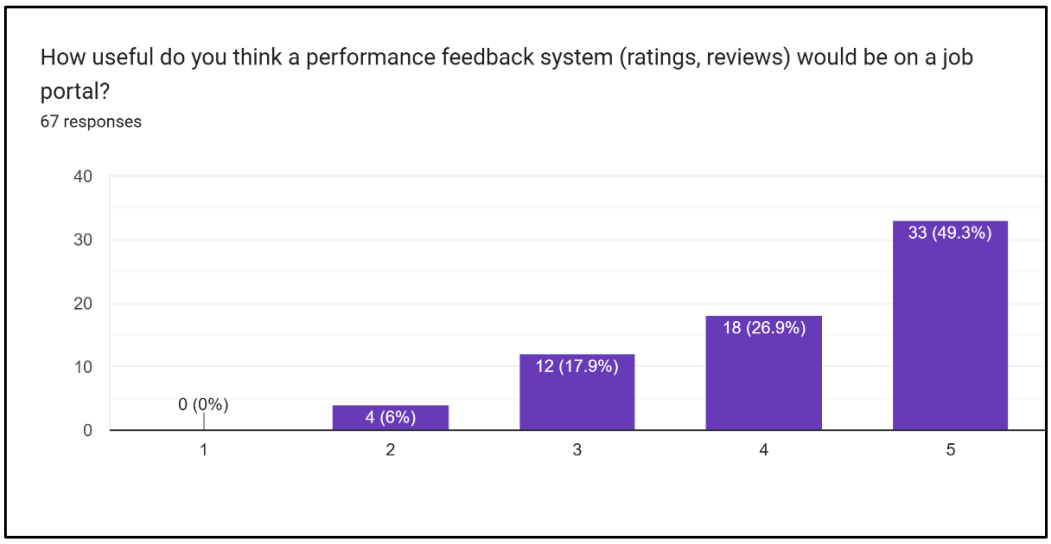

Figure 3.13: Respondents opinion on feedback system in job portal

The data in Figure 3.13 shows the respondents' opinion on the usefulness of performance feedback system, with ratings from 1 (not useful) to 5 (very useful). Majority of respondents believe that a job portal performance feedback system is helpful. Nearly half 49.3% (33 respondents) rated it usefulness as 5 (very useful) and no respondents rated it as 1(not useful). This suggests that adding such features to the job portal is highly supported.

Question 14: What additional information do you think would make your profile stand out when applying for a job?

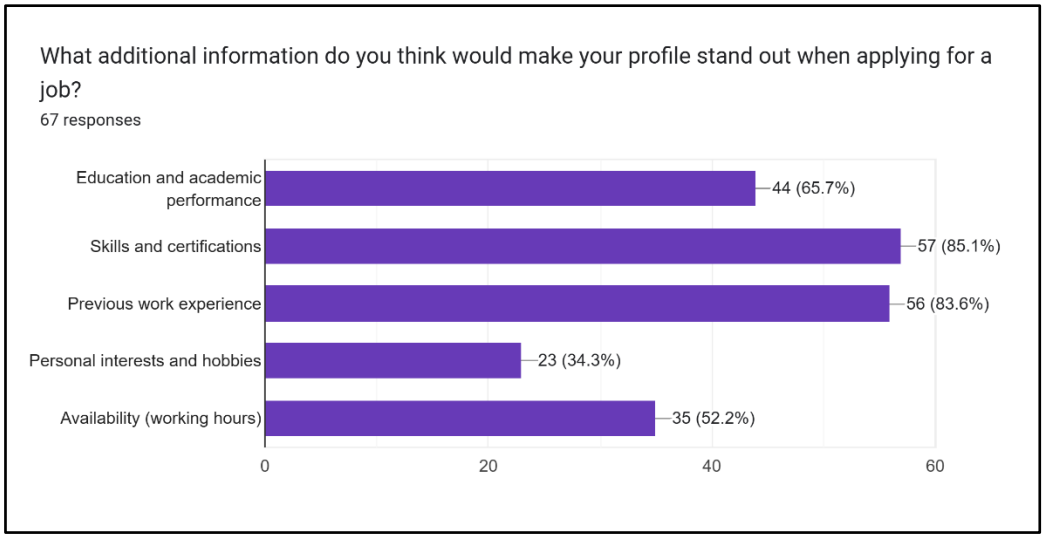

Figure 3.14: Additional information needed for student profile

The findings in Figure 3.14 highlighted that most respondents think that 'Skills and certifications' (85.1%) and 'Previous work experience' (83.6%) are the most important additional information for making their profiles stand out when applying for a job. This is followed by 'Education and academic performance' at 65.7%, and 'Availability (working hours)' at 52.2%. 'Personal interest and hobbies' are considered less significant, with only 34.3.%. These findings suggest that job seekers prioritize professional qualifications and relevant experiences over personal interests to enhance their employability.

Question 15: What additional information would you like employers to include in their job postings?

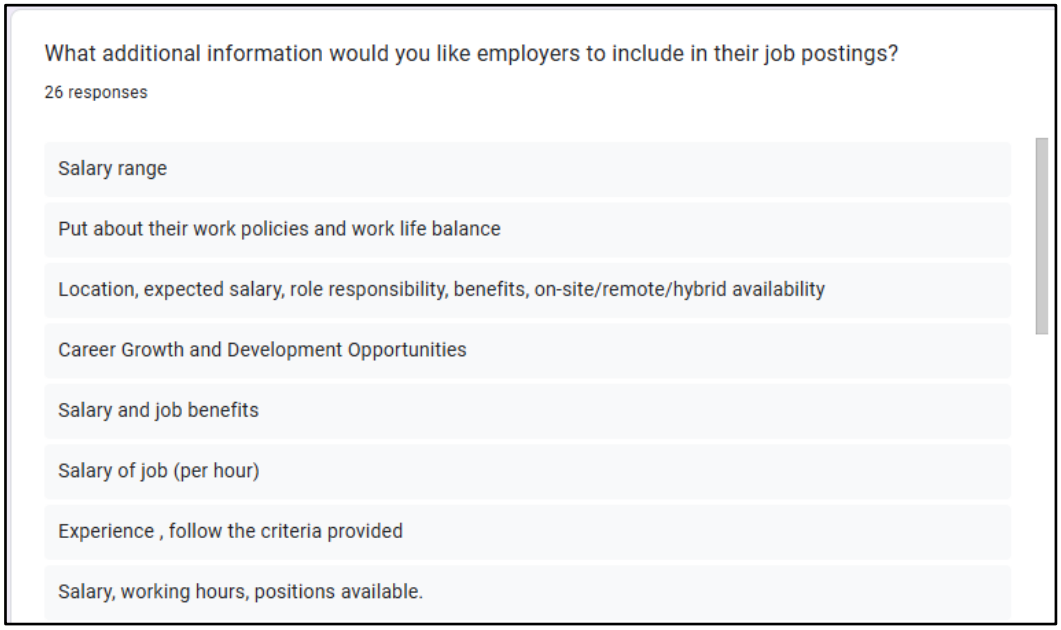

Figure 3.15: Additional information in employers job postings

Figure 3.16: Additional information in employers job postings

Figure 3.15 and Figure 3.16 shows the respondents suggestions on the additional information to be included in the employer job postings. The data provides valuable insights on job seekers preferences and expectations for the transparency and content of job postings.

Question 16: Do you have any suggestions for improving the job search experience for students on online platforms?

Do you have any suggestions for improving the job search experience for students on online platforms?

67 responses

Continues learning skills and development

Track application status/progress via syncing with student profile, real-time update of student's achievements/education etc on student's CV/resume

No.

state salary per hour

Provide a clear information on the progress of the application and improved the search functionality

To include resume checker to show new user if their resume are applicable

Get notifications such as email from the job portal for any open part time job.

nothing

Figure 3.17: Respondents suggestions for improving the job search experience on job portal

Having advertisement on the homepage based on my interest of job and recently posted by employer.

Recommender based on job reviewed

search throughly on online platform

It would be nice if it has a feature that states the job vacancy/link/application is legit or a scam

Nothing else, just hopefully it easy to use

Inform the exact time for part time job, so student can manage their schedule between study and part time job

Salary range

The profile of the person who put up the jobs notice.

Figure 3.18: Respondents suggestions for improving the job search experience on job portal

Figure 3.17 and Figure 3.18 shows the respondents suggestions for improving the job search experience for students in job portal. Based on the feedback, these data illustrate the key areas that could have an improvement. These suggestions focus on aspects such as better filtering options, personalized job recommendations, notifications, and user interface improvements. These suggestions aim to streamline the process and improve students' job search efficiency and usability.

3.2.3 Analysis of Interview Questions

Below are the interview questions for employers from different companies.

Question 1: Can you describe the process your company currently uses to hire part-time employees?

The employers explained that they have a straightforward process for hiring part-time employees. Employer A uses Google Forms to collect basic information, including name, IC, matric number and whether the applicant is a student of UNIMAS. Job openings are usually posted on Instagram and in WhatsApp groups. Employer B mentioned three methods for hiring, candidates come directly to the store, through social media, or friend referrals. The third method is the most used, though the other two methods are sometimes used also.

Question 2: How often do you hire students for part-time jobs, and do you think these numbers will increase in the future?

The rate of hiring students for part-time jobs depends on the branch and the need. Employer A hires every semester in October and February, but depending on vacancies, project needs, and layover. Employer B said that each branch of their company hires a different number of students, with one branch hiring fewer students and another hiring more. Both employers expect the number of part-time hires to increase due to expansion plans.

Question 3: What are the biggest challenges you face when hiring students for part-time roles?

According to both employers, the biggest challenges faced when hiring students for part-time roles are managing their tight schedules and responsibilities. Some students do not provide their academic commitments schedule, leading to attendance issues at work. Moreover, there are many candidates with potential, but due to limited job openings (e.g., five slots per semester), not all can be hired.

Question 4: Do you think students often lack specific skills or experiences needed for part-time jobs? If yes, which ones?

Based on the employers' answers, students often lack communication skills, especially in speaking with customers and colleagues. Some students may not address people properly, but this issue can be addressed through training. However, employers said that they do not view the students' lack of specific skills and experience as a burden.

Question 5: What additional information would you find helpful to see on a student's profile or resume?

Both employers said that they find it helpful to see a students' schedule and university responsibilities on their profile or resume to assess whether the student can commit to the part-time job.

Question 6: How do you communicate with job applicants during the hiring process? Would an in-platform messaging system help?

Employer A mentioned that they use WhatsApp to contact the job applicants and conducts offline interviews. Meanwhile, employer B said that applicants often come to store in person. Both employers believe that an in-platform messaging system will make the process more organized and systematic.

Question 7: How do you provide feedback to part-time employees, and would a platform feature for tracking or rating performance be valuable to you?

Employer A said that they usually hold meetings with the staff to discuss general improvements rather than focusing on individual performance. Employer B, on the other hand, does not currently have a formal feedback system, but both employers agree a feature for tracking or rating performance would be very helpful since for assessing employees regularly.

Question 8: Do you think a centralized dashboard to track job postings and applicant progress would be helpful? Why

According to the employers' answers, both agree that it would be helpful to have a centralized dashboard to track job postings and applicant progress. Employer A emphasized that it ensures no information is lost and prevent candidates from being overlooked. Additionally, it would enable them to inform applicants as their applications are being processed. Employer B highlighted that such feature would provide a clear overview, helping to manage tasks efficiently and ultimately saving time.

Question 9: How would you feel about gamified elements, such as badges for students completing training or high ratings, as part of the hiring process?

Based on the answers from both employers, they believe that gamified elements would be beneficial for students. Employers A added that it would encourage students to complete tasks and shows their potential, increasing the chances of getting hired. Employer B thinks gamified elements is suitable for students, as they enjoy challenging and interesting activities, and sees it as an effective approach to attract young people.

Question 10: What improvements would you like to see in the current platforms or methods you use for hiring?

Employer A stated the need dashboard and notifications, and platform that focus on student hiring since it would be helpful. Employer B would like a more user-friendly interface to streamline communication between employers and students.

3.2.4 Summary of Interview

The interview with possible employers has provided important insights into their current method used and challenges when hiring part-time students. Most employers use straightforward method like Google Form or direct communication through social media and word-of-mouth to recruit candidates. However, these approaches are usually unorganized, which can lead to miscommunications and inefficiencies. Employers expressed a need for a more centralized platform that can simplify the hiring process and improve communication with potential candidates.

The most common challenges faced by employers was organizing students' schedules, since most of the students have additional university responsibilities that could limit their availability for the job. In terms of qualities that employers look for in applicants, they highlighted the need of having clear information on students' schedules and motivations, which helps to evaluate their professionalism and commitment. Employers were receptive to integrating a centralized dashboard in the system to manage job postings, track applicant progress, and improve communication. They were also interested in features to monitor performance, provide feedback, and include gamification features to motivate students and improve the hiring process.

In conclusion, employers seek a more organized and efficient platform that streamline the hiring process. SmartHire aims to address this need by prioritizing features like centralized communication, dashboard for managing applications, and gamification elements. The insights gathered will guide the development of SmarHire, to enhance the overall experience for both students and employers.

3.3 System Design

3.3.1 Use Case Diagram

Figure 3.19 shows the use case diagram for SmartHire system. There are two primary actors, students and employers, with both interacting with the system through different functionalities. Students can register, log in, manage their profile, search for jobs, apply for jobs, track applications, download their CV, provide feedback, and view employer details. Employers, on the other hand, can post job openings, review student profiles, manage applications, and access their dashboard.

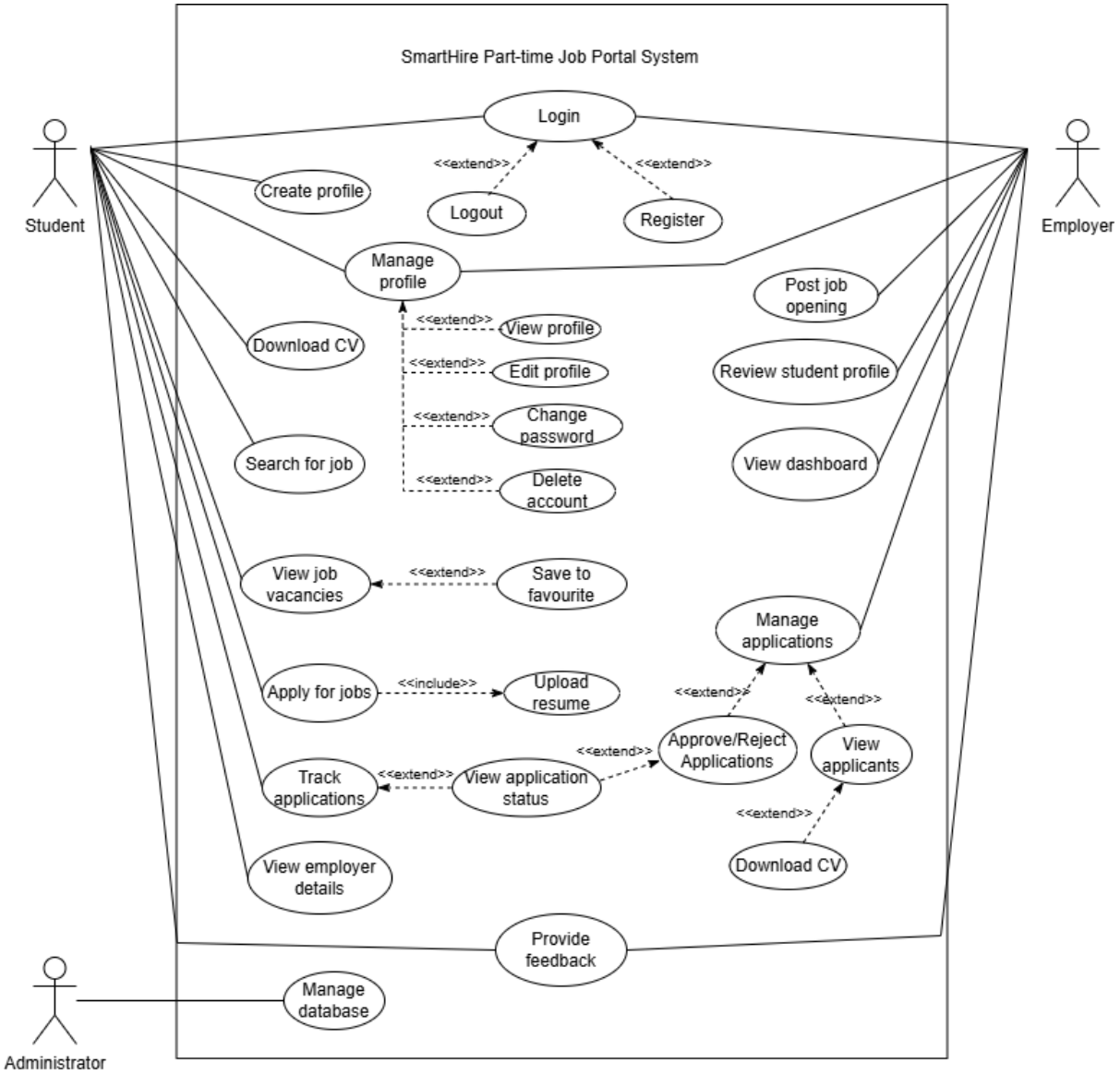

Figure 3.19: Use case diagram

3.3.2 Activity Diagram

Figure 3.20 shows the activity diagram for students. The process begins with the student registering or logging into the system. After successful login, the student can create and manage their profile, including updating details or changing their password. They can then proceed to search for jobs, view job vacancies, and apply for job. In addition, students can also manage their job applications.

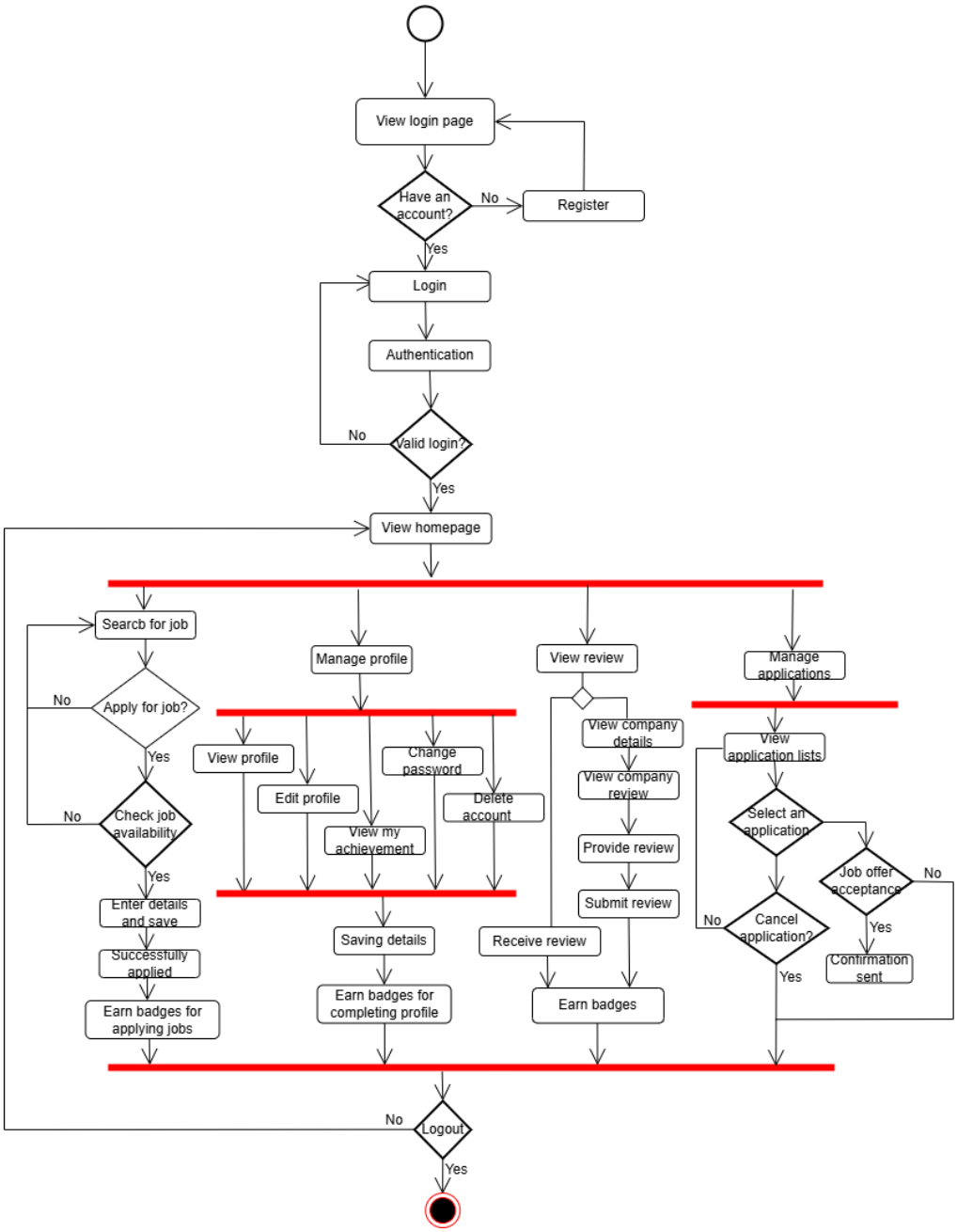

Figure 3.20: Activity diagram (Students)

Figure 3.21 shows the activity diagram for employers. The process begins with the employer registering or logging into the system. Once logged in, the employer can access their dashboard and manage their profile as needed. Employers can post new job and manage job applications by viewing applicants, downloading their resumes, and taking further actions such as approving, rejecting, or inviting candidates for interviews.

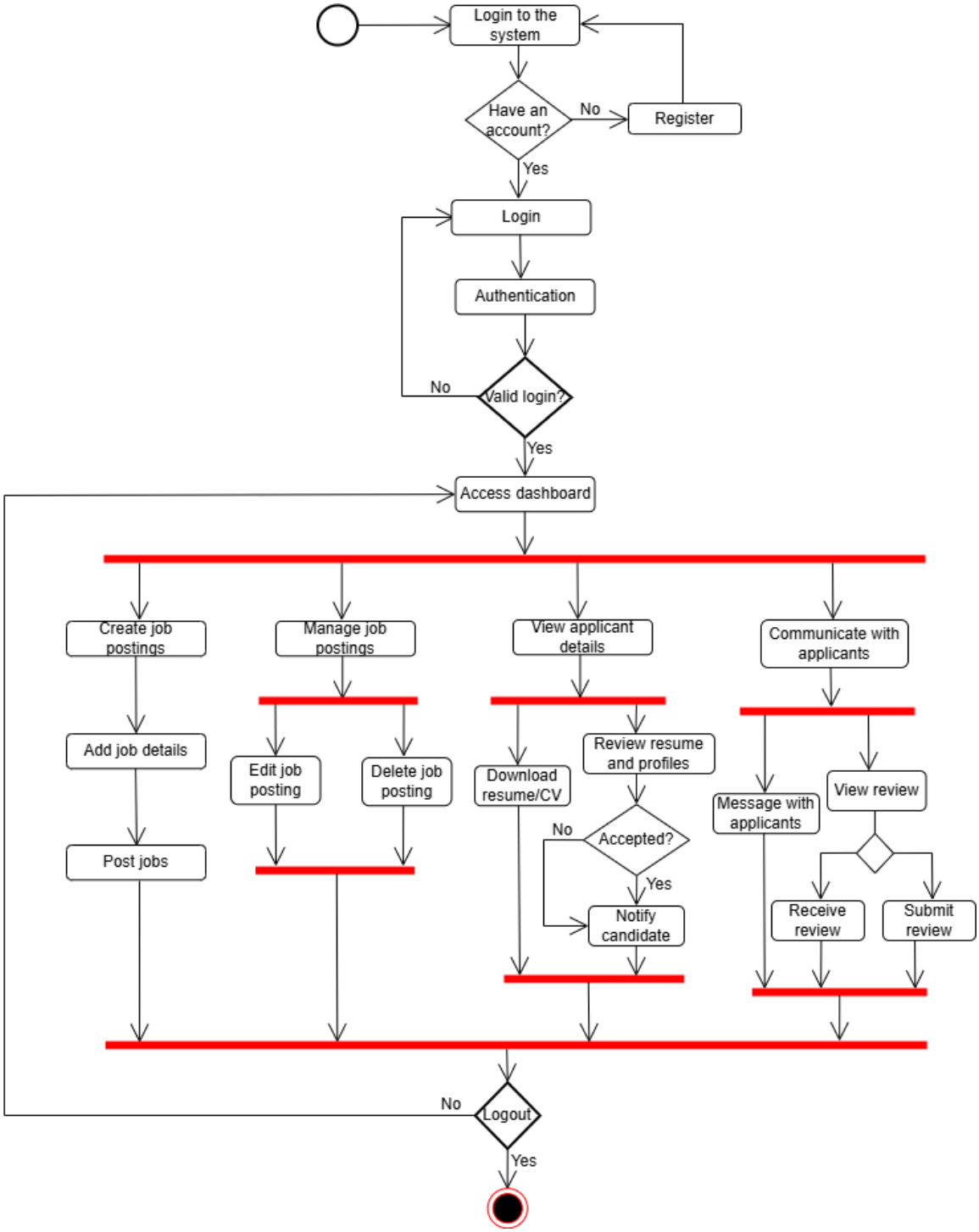

Figure 3.21: Activity diagram (Employers)

3.3.3 Class Diagram

Figure 3.22 shows the class diagram for SmartHire system. The core classes include student, employer, applyJobs, review, postJobs, achievements, dashboard, and notifications. The student class contains attributes such as studentID, name, and email, while the employer class includes attributes like employerID, companyName, and email. The PostJobs class is associated with the employer and handles job-related details and the ApplyJobs class connects students to jobs. The diagram also shows associations between classes, such as one-to-many relationships between employers and job postings, and between students and applications.

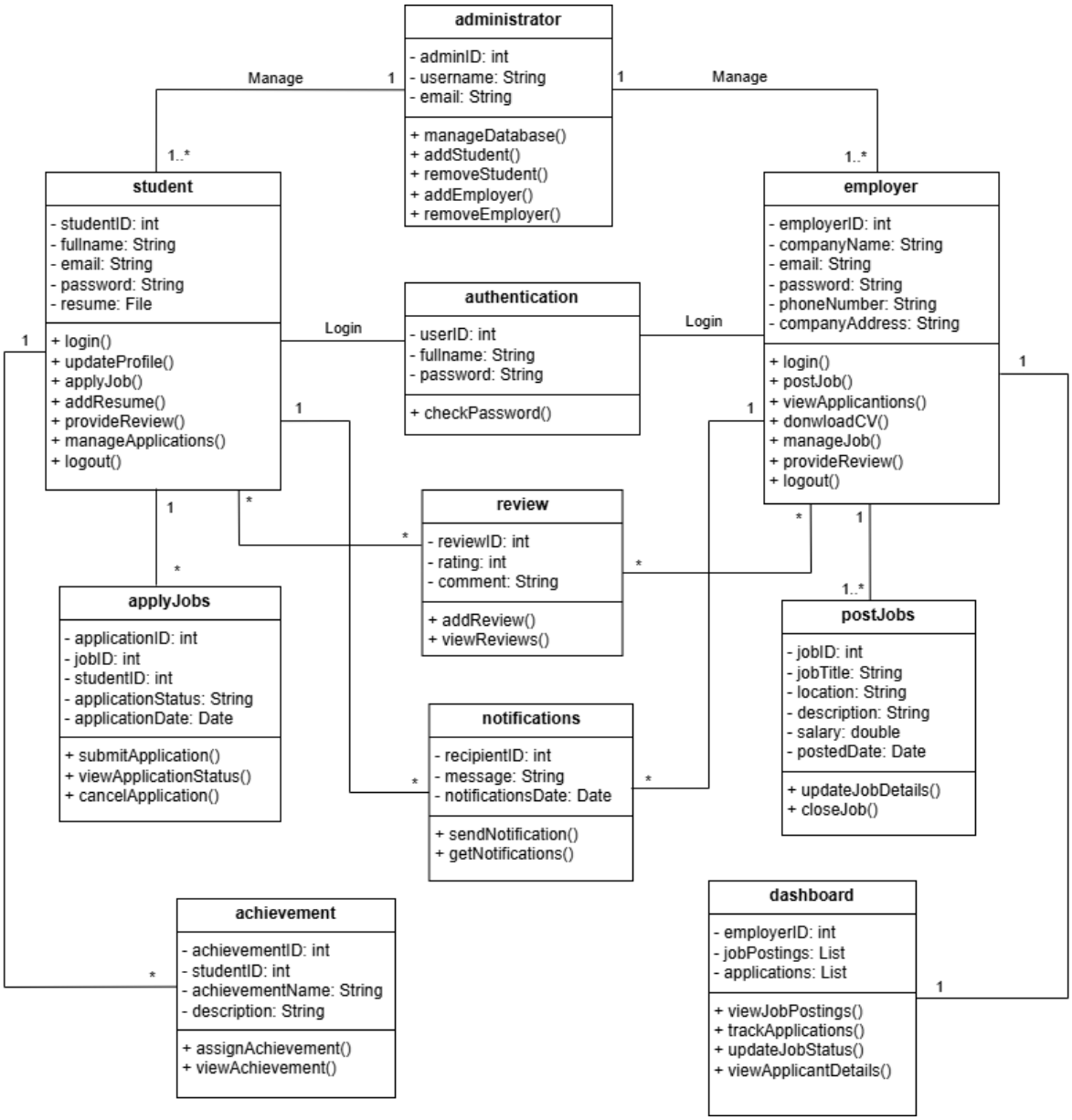

Figure 3.22: Class diagram

3.3.4 System Sequence Diagram

Login for student

Figure 3.23 and 3.24 shows the sequence diagrams for student and employer login process respectively. Both must enter valid login credentials, which will be validate by the system. Otherwise, the system will display error messages indicating invalid credentials.

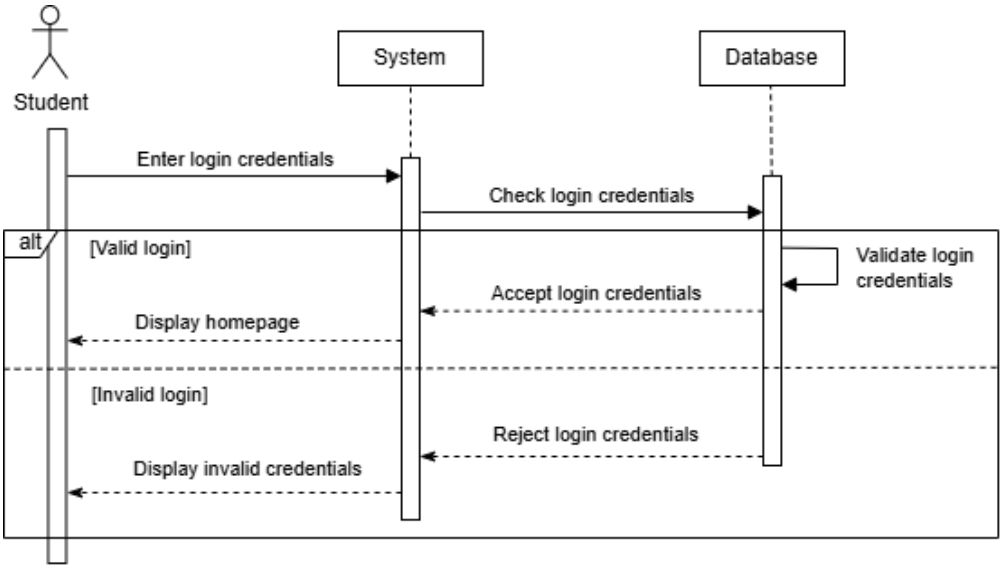

Figure 3.23: Student login sequence diagram

Login for employer

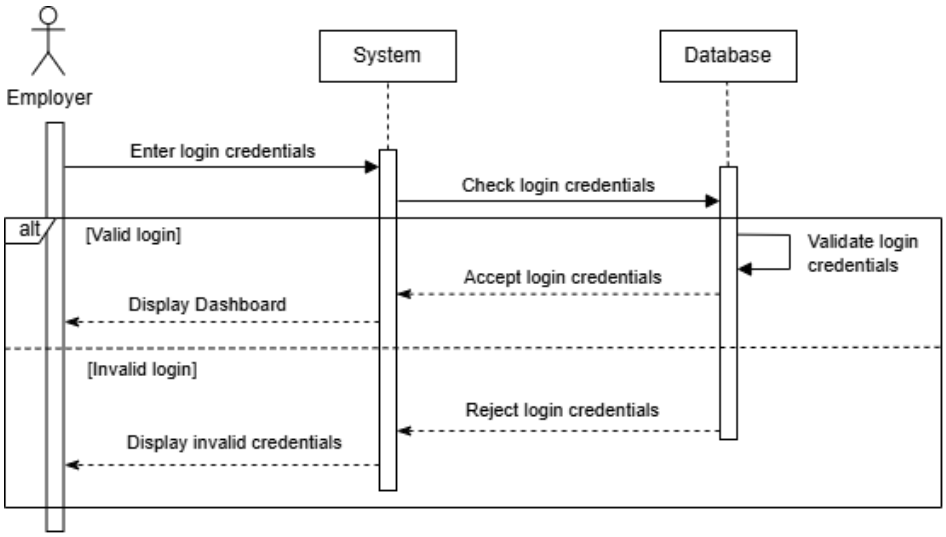

Figure 3.24: Employer login sequence diagram

User registration (student and employer)

Figure 3.25 shows the sequence diagram for user (student and employer) registration. User enters the required details, and the system validates and save the data. A confirmation or error message is displayed depending on the conditions.

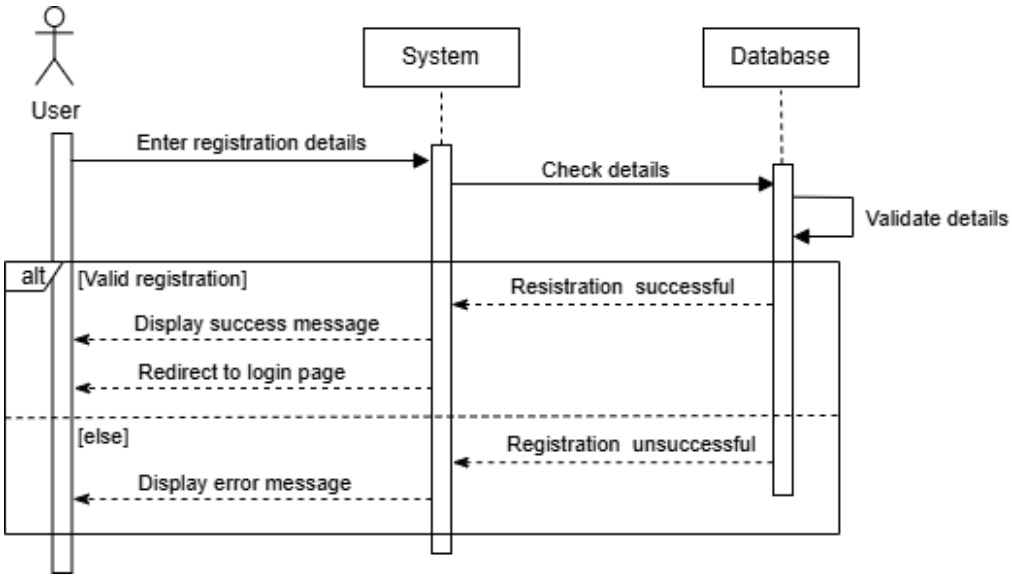

Figure 3.25: User registration sequence diagram

Logout for user

Figure 3.26 is the sequence diagram for logout. The system validates the session before deleting it and redirecting to the login page.

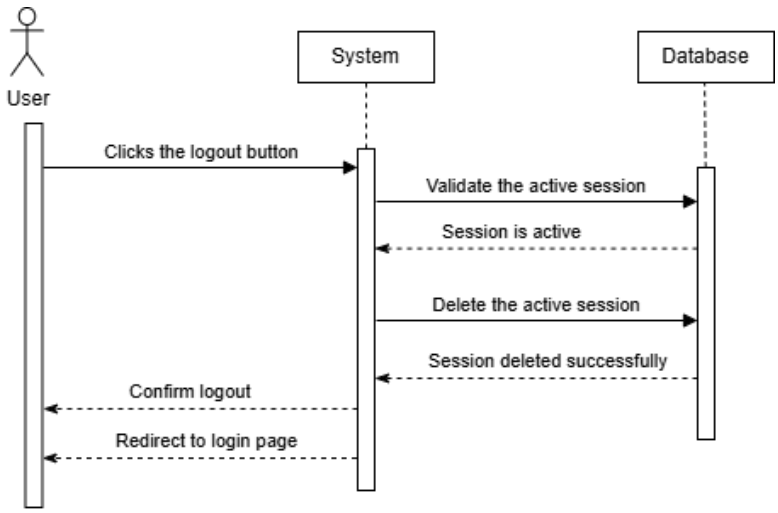

Figure 3.26: Logout sequence diagram

Student apply job

Figure 3.27 show the sequence diagram for student applying for a job. Students select a job, and the system will process the application and update the status to the student.

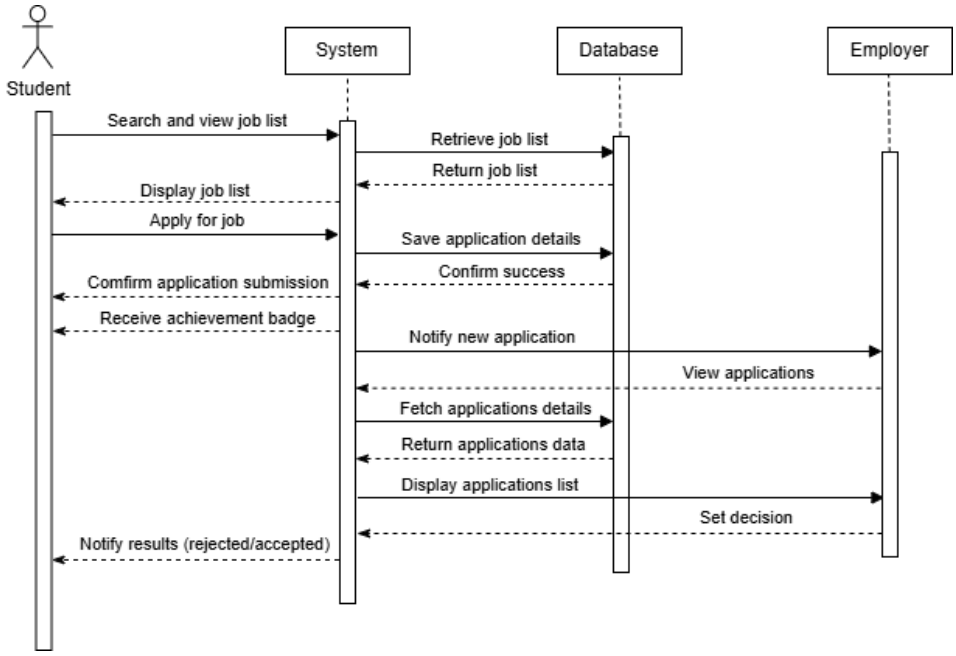

Figure 3.27: Student apply job sequence diagram

Employer post jobs

Figure 3.28 shows the sequence diagram for an employer posting a job. The employer will provide the job details, and the system store the details in the database.

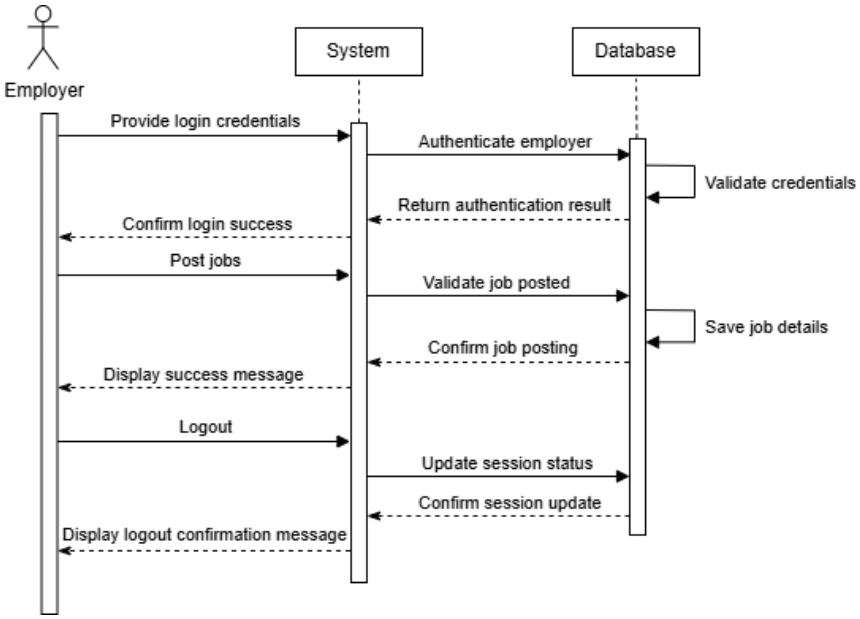

Figure 3. 28: Employer post jobs sequence diagram

Review

Figure 3.29 shows the sequence diagram for the review process. Once students complete a job, the employer can submit a review. The system stores the review in the database and students can earn achievement badges for getting a review from employer. Students can also provide feedback to the employer.

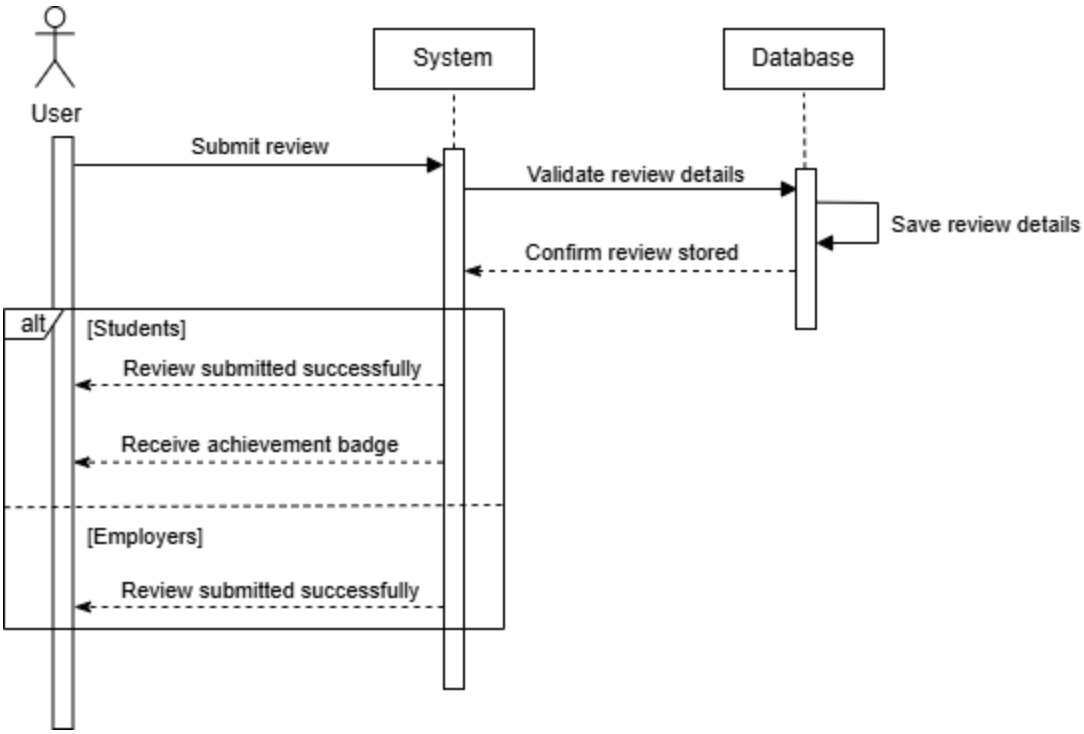

Figure 3.29: Student and employer review sequence diagram

Employer dashboard

Figure 3.30 shows the sequence diagram for the employer dashboard. The employer can view job postings, track applications, and manage job status through the system.

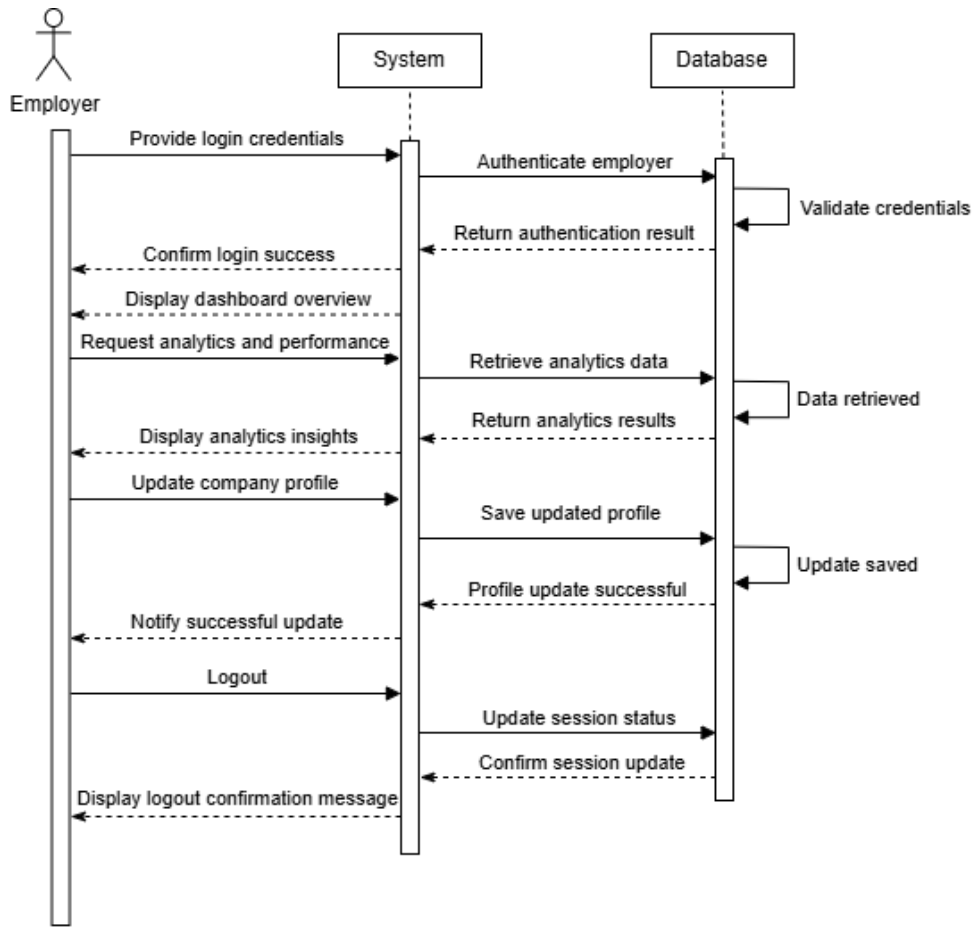

Figure 3.30: Employer dashboard sequence diagram

Admin management

Figure 3.31 is the sequence diagram for admin management. The admin can add or remove students and employers and manage system data through the system.

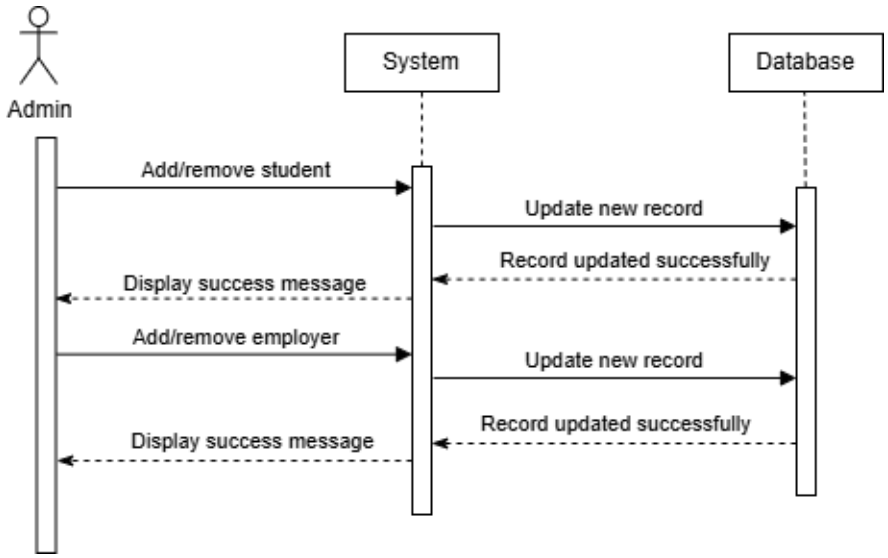

Figure 3.31: Admin management sequence diagram

3.4 System Requirements

3.4.1 Hardware Requirements

Table 3.1 shows the hardware requirements for the SmartHire system, specifying the components required and their specifications to ensure optimal performance and usability.

Table 3.1: Hardware Requirements

Component	**Specification**
Server	Minimum: Intel Xeon, 16GB RAM, 1TB SSD
Device	Minimum: 4GB RAM, 2GHz processor, 128GB SSD
Internet Connection	Minimum: 10 Mbps
Display	Minimum: 1024x768 resolution

3.4.2 Software Requirements

Table 3.2 shows the software requirements for the SmartHire system.

Table 3.2: Software Requirements

Software	**Specification**
Code editor	Visual Studio Code
Web hosting and domain	Hostinger
Programming languages	Hypertext Markup Language (HTML), Hypertext Preprocessor (PHP), Cascading Style Sheets (CSS), JavaScript
Frameworks	Laravel
Database	My Structured Query Language (MySQL)
Diagram design tool	draw.io
User interface design tool	Figma
Documentation tool	Microsoft Office 365, Portable Document Format (PDF)

3.5 System Functionalities

Table 3.3 shows the system functionalities for students in the SmartHire system, providing a comprehensive overview of the features that can improve the job search experience. Meanwhile, Table 3.4 shows the system functionalities for employers emphasizing tools that make it easier to post jobs, manage applicants, and provide feedback.

Table 3.3: System functionalities for students

System functionalities	**Description**
Manage profiles	Students can view and update their profiles such as name and contact information. They can also upload or update their resumes and change passwords.
Search and apply for job	Students can search for part-time job using filters like location, job category, or keywords. Once, they find a suitable job, they can apply directly in the platform.
Gamification features	Students can earn badge and points for activities such as completing their profiles, applying for jobs, and receiving positive feedback from employer. These features encourage and motivate active participation.
Track application status	Students can keep track of their job applications and check if they have been accepted to let them know the progress of their applications.
Download resume/CV	Students can generate and download their resume/CV in a formatted document, generated based on the details of their profile, ensuring their resume is up to date.
Notifications	Students can receive notifications about important updates, including new job postings that match their preferences, application statuses, and employer feedback.

Table 3.4: System functionalities for employers

System functionalities	Description
Manage job postings	Employers can create job postings by specifying detailed job descriptions, requirements, and locations. They also can edit or update to reflect changes and delete postings when job is full or no longer available.
View and manage applicants	Employers can access the list of applicants and view their profiles for every job posting, including uploaded resume/CV, schedule, and qualifications. This makes it possible to make a proper evaluation of applicants for the job.
Provide feedback and ratings	Employers can give applicants ratings and detailed feedback on their performance after completing a job. This increases transparency on both parties and help in building a record of student performance.
Employer dashboard	Employers have a personalized dashboard that display metrics such as the number of active job postings, number of applicants, feedback summaries and other relevant data to analyse recruitment trends and performance. They can also manage ongoing applications with the dashboard.
Download resume/CV	Employers can download applicants' resume or CV in their original formats directly from the system. This makes it easy for offline review, enabling flexible decision-making during the hiring process.

3.6 Interface Design

Figure 3.32 shows the homepage of the SmartHire system. The home page includes navigation bar with option such as 'Profile', 'Find Job', 'Companies', and 'My achievement' allowing students to explore the platform easily. It also includes quick access buttons for students to search for job quickly. To access all the functionalities of the system, students are required to log in first. Once logged in, they can access personalized features like job applications tracking and achievements.

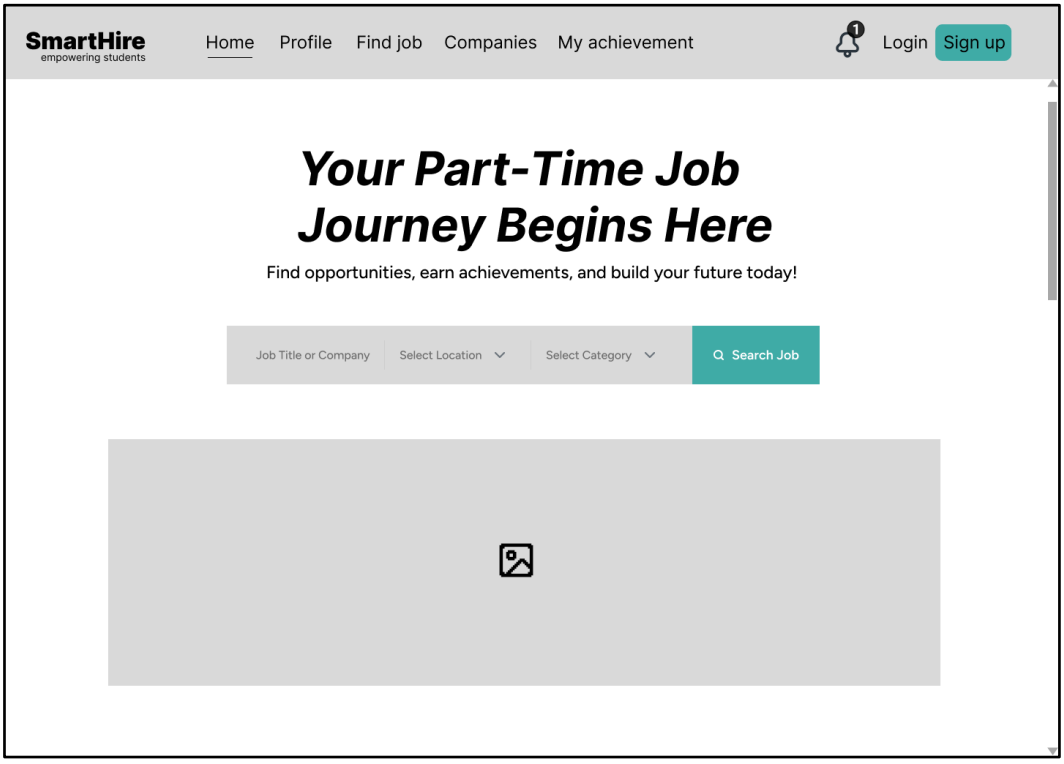

Figure 3.32: SmartHire homepage

Figure 3.33 shows the login page for students. They are required to enter their registered email address and password in the fields provided. For students who have forgotten their password, they can reset it by clicking on the 'Forgot password?' link. However, for students who do not have an account, they can sign up by providing their full name, email address, phone number and a password as shown in Figure 3.34.

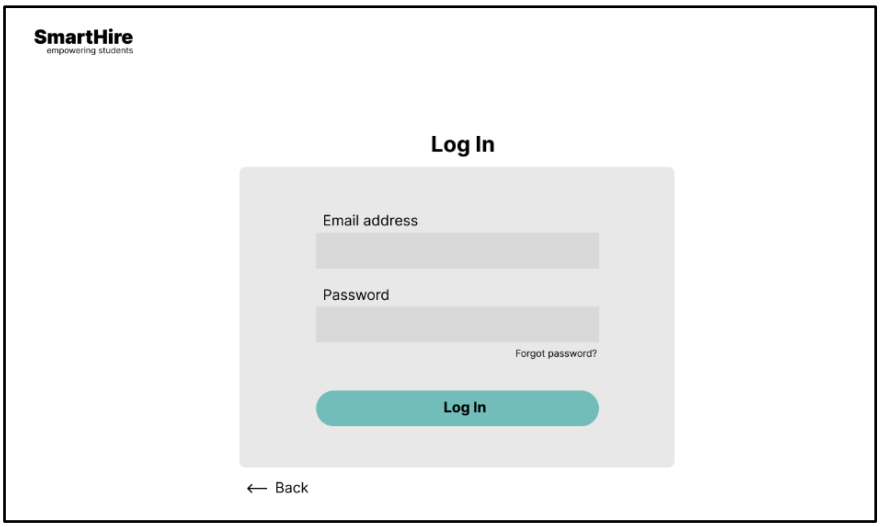

Figure 3.33: Students log in page

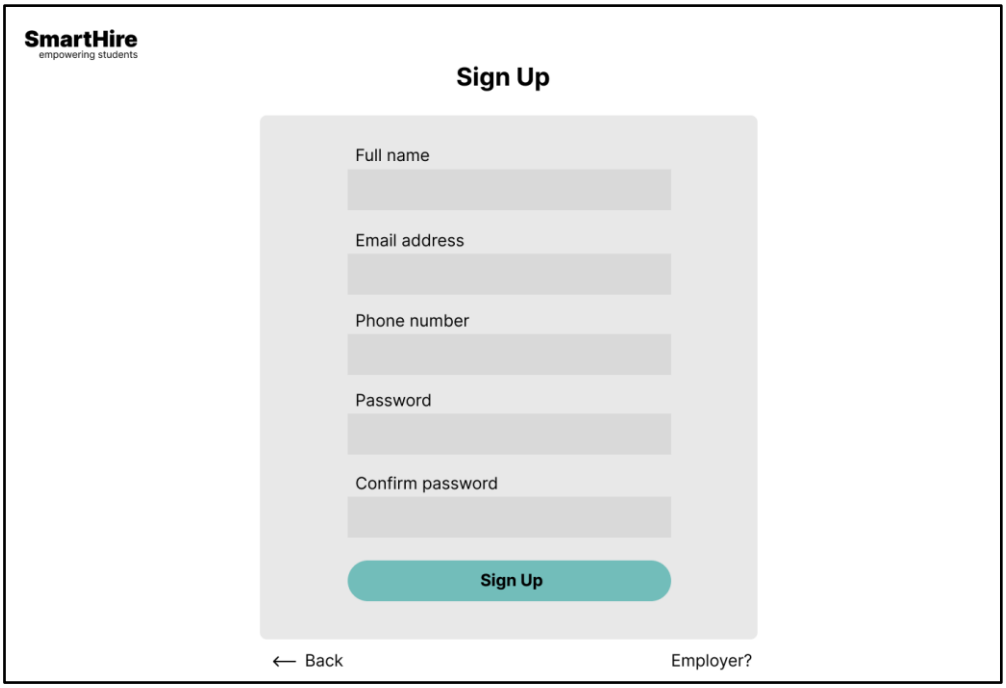

Figure 3.34: Students sign up page

Figure 3.35 shows the Jobs page when students click on the 'Find job' button on the navigation bar. This page displays a list of part-time job opportunities allowing students to search using filters like location or category. By clicking 'View job details' students can see more information about a job as shown in Figure 3.36. For easy apply, students can click on the 'Apply now' button.

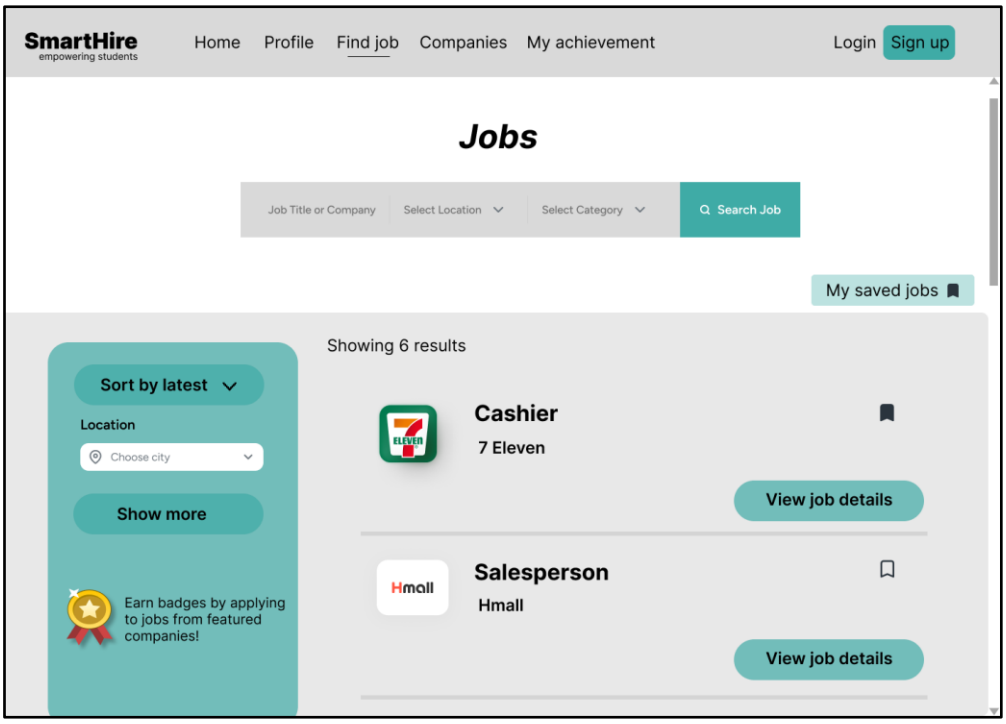

Figure 3.35: Jobs page

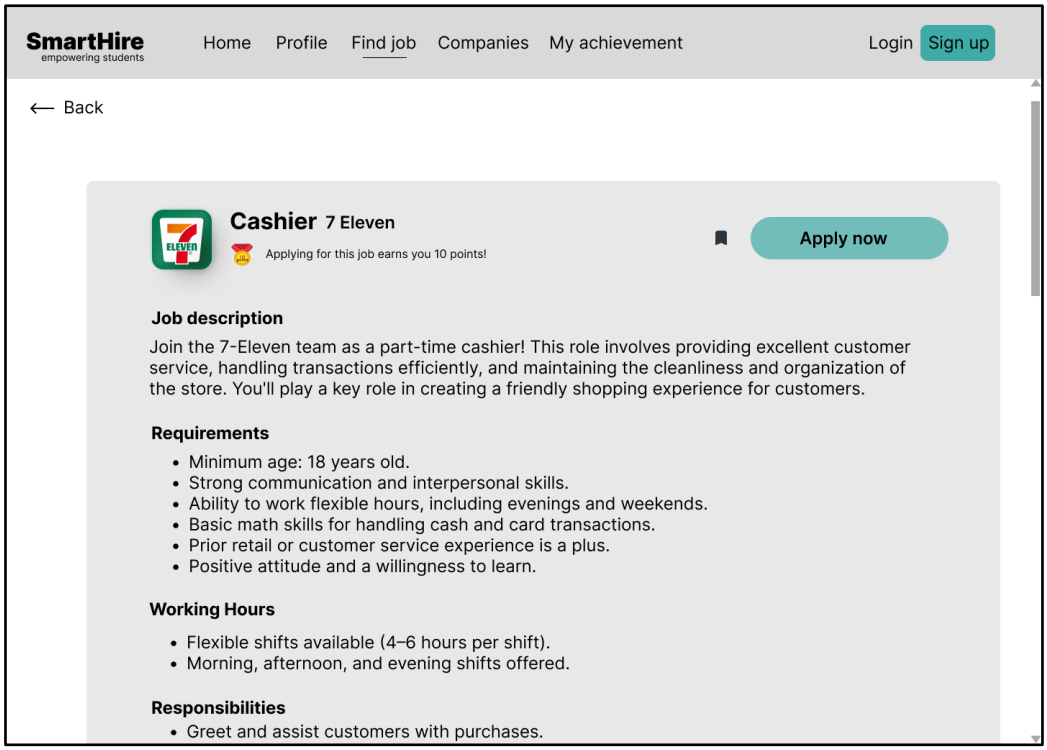

Figure 3.36: Job details page

Figure 3.37 shows the pop-up message displayed after students click the 'Apply now' button. Students are prompted to upload their resume and provide their schedule before proceeding with the application.

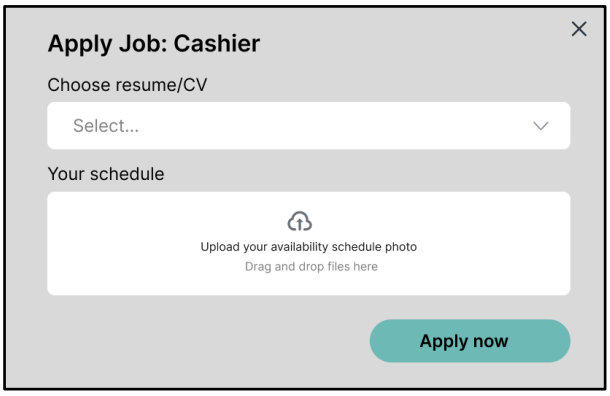

Figure 3.37: Apply now pop-up message

Figure 3.38 shows the Companies page where students can search for company and view detailed information about each one. This page also allows students to review read and write reviews and feedback on companies. To review a company, students need only provide their name, position at the company along with their review as shown in Figure 3.39.

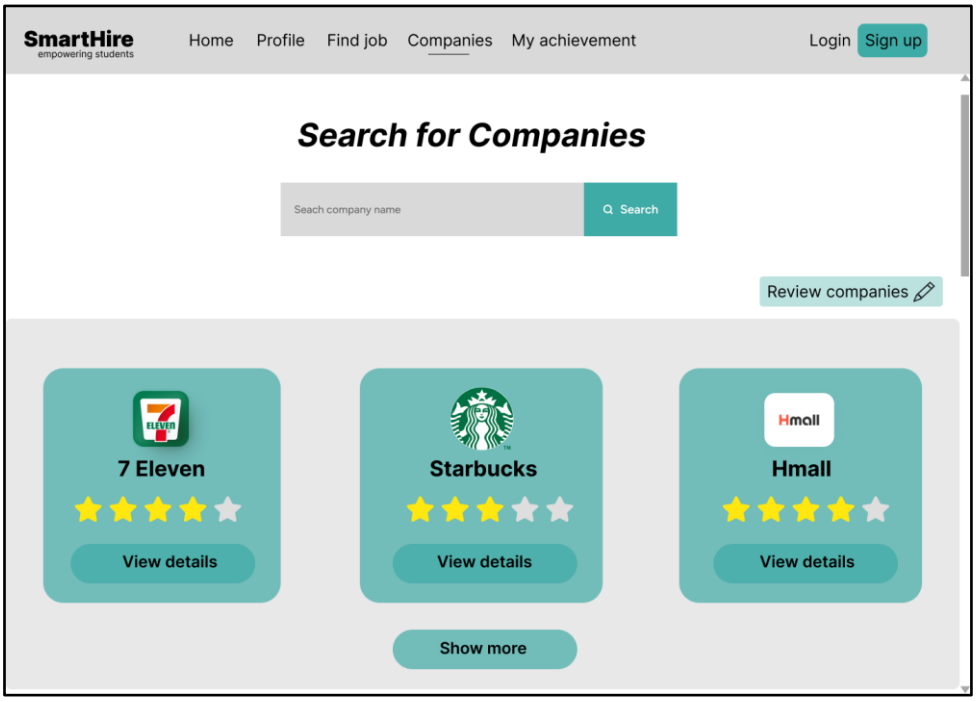

Figure 3.38: Companies page

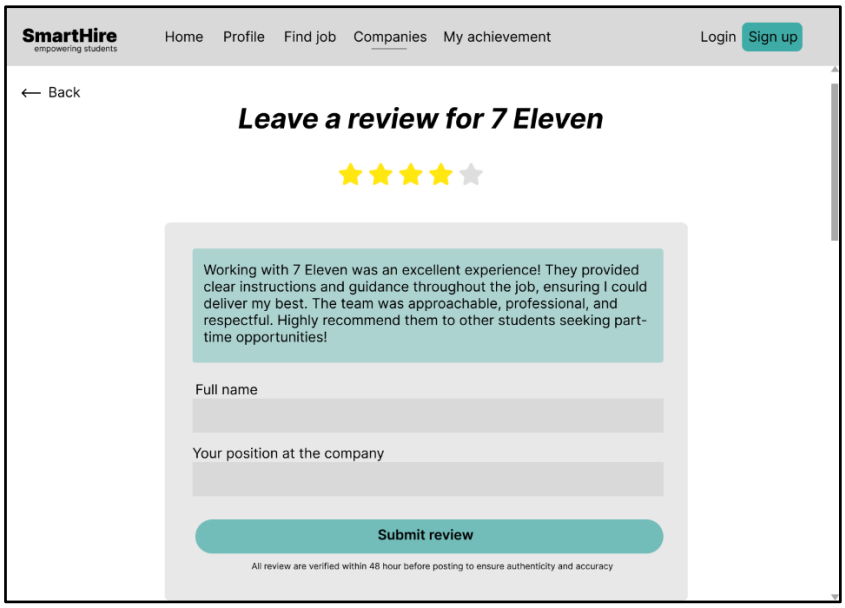

Figure 3.39: Write a review for company page

Figure 3.40 below shows the 'My achievement' page where the achievement that the students has earned is displayed. This feature encourages students to engage with the platform and motivates them to reach new milestone.

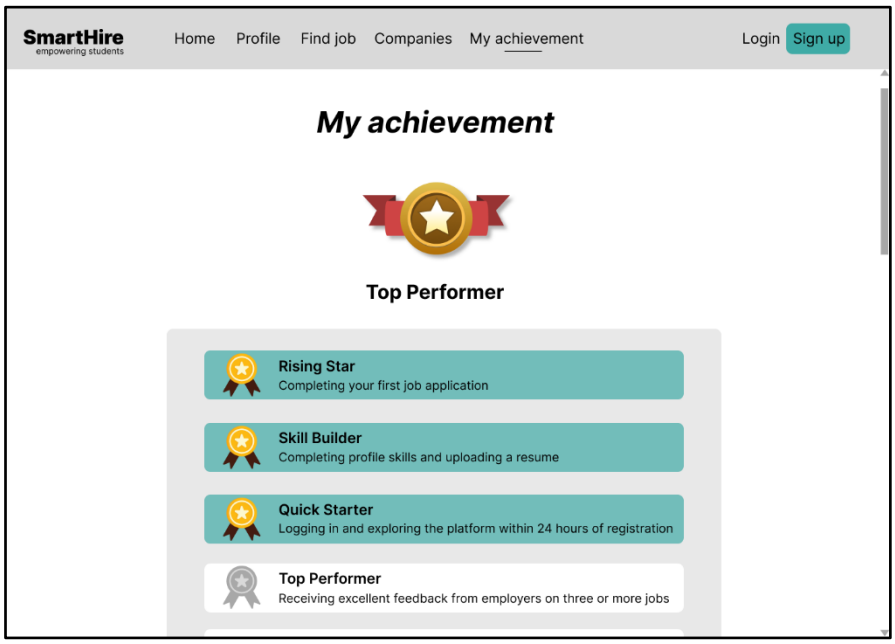

Figure 3.40: My achievement page

Figure 3.41 shows the notifications page where it provides user with updates on job applications, employer feedback, and achievements. Notifications are shown in clear list format, with unread messages highlighted for easy tracking.

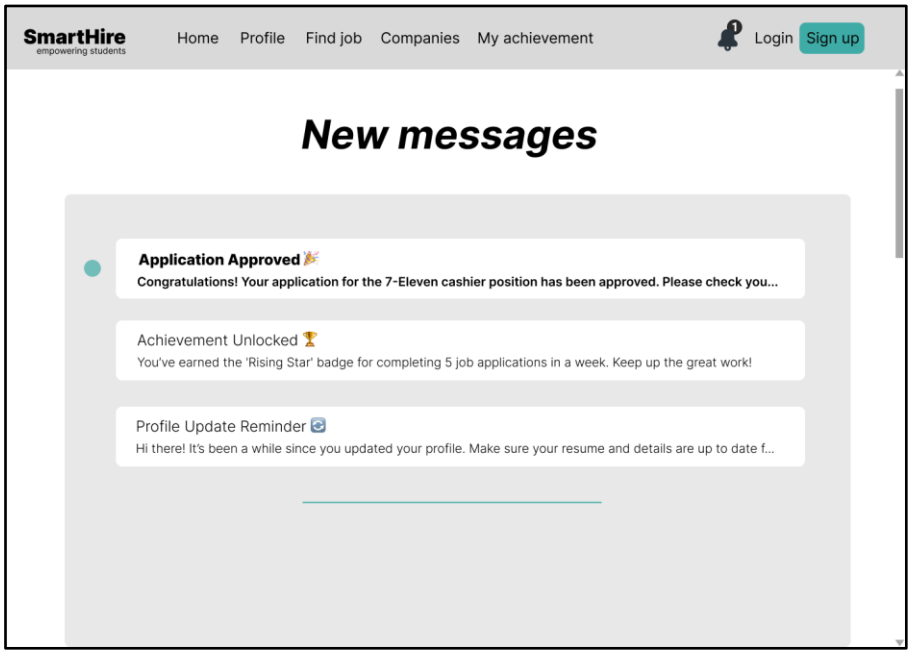

Figure 3.41: Notifications page

Figure 3.42 shows the signup page for employers, where they are required to fill in their full name, email address, phone number, company name and password.

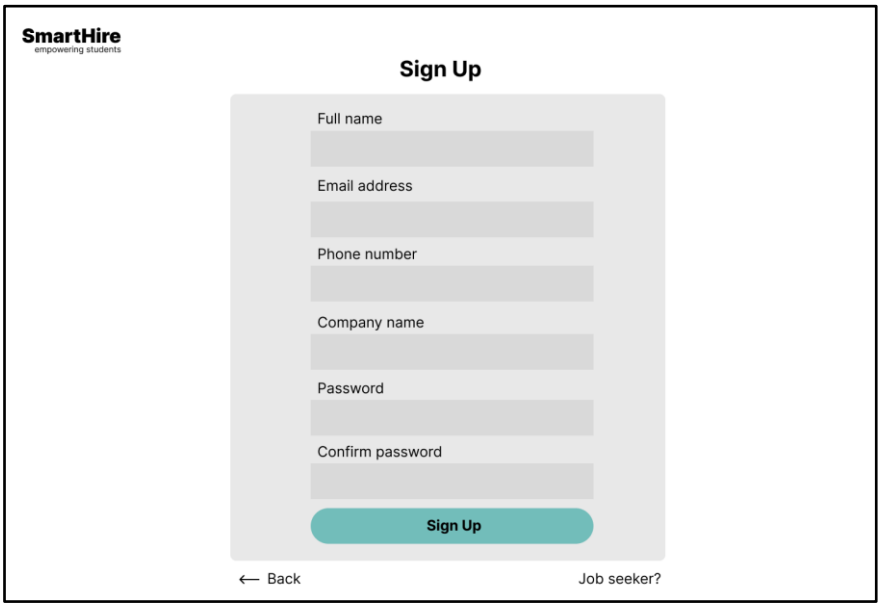

Figure 3.42: Employers sign up page

Figure 3.43 shows the dashboard for employer, which provide insights on the application engagement though features like analytics and statistics. Employer can manage all tasks from this centralized dashboard.

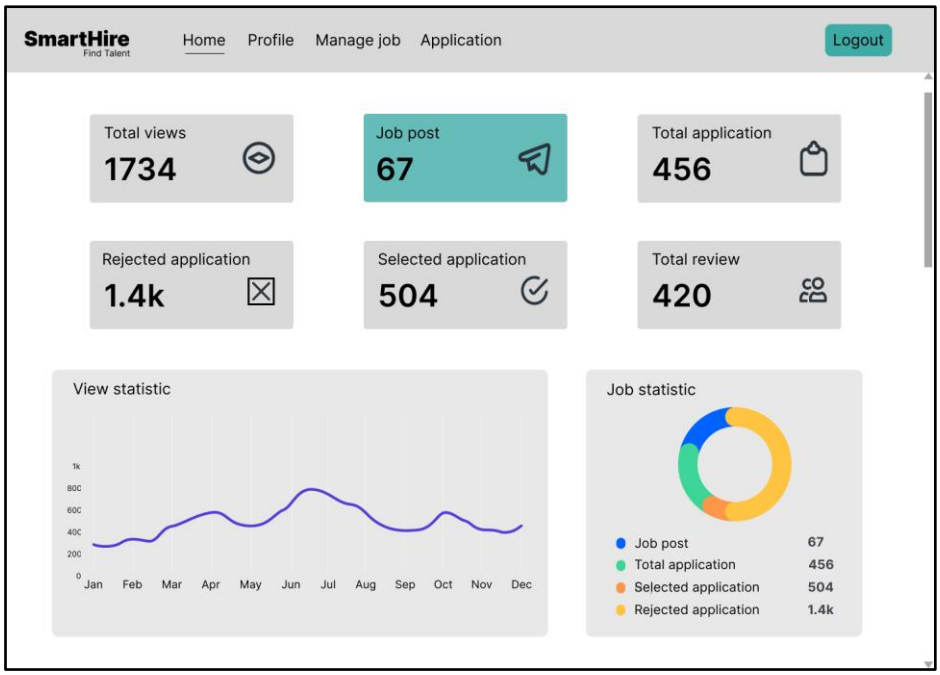

Figure 3.43: Employer dashboard

Figure 3.44 shows the employer post job page to create and manage job posting efficiently. Employer simply need to provide the details of the job before posting it.

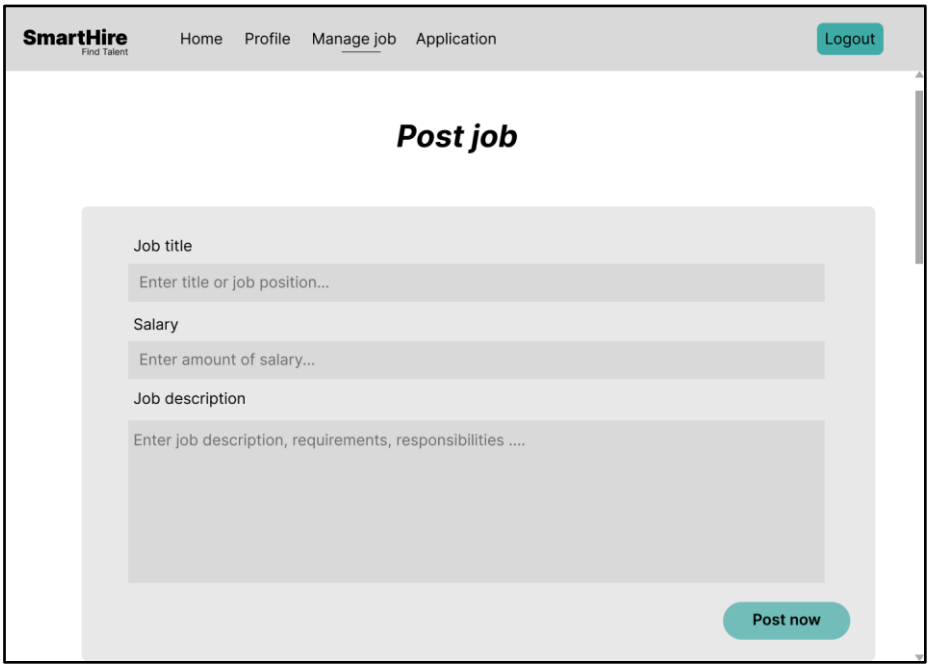

Figure 3.44: Employer post job page

3.7 Summary

Chapter 3 outlined the methodology and design of the SmarHire system. The agile methodology was used to enable iterative development and close collaboration with users. To gather insights of the user needs, surveys from students and interviews from employers are conducted. The findings from these activities help in shaping the system's features and functionalities based on user needs.

The chapter also covers hardware and software requirements, which are necessary in ensuring the system is built based on reliable platforms and tools. Key design elements are shown through the Unified Modelling Language (UML) diagrams like use case diagram, activity diagram, class diagram, and sequence diagram to show the interactions between user and system component. Additionally, the chapter also provides an explanation of the user interface design, to make sure the system is user-friendly and intuitive. Features like notifications, dashboard, and gamification elements are included to increase user engagement and experience.

CHAPTER 4: IMPLEMENTATION

4.1 Introduction

This chapter presents the implementation phase of the SmartHire, focusing on how the suggested features were implemented into a working web-based application. It highlights the platform, tools, and configurations used during development, followed by the step-by-step implementation of each important feature. Laravel was used as the main backend framework in the development process, integrated with MySQL for database management and Blade templates for frontend presentation. The system was designed with flexibility to accommodate the different roles of employers and students. The system's interface and features are demonstrated in the following sections with relevant screenshots and explanations.

4.2 Installation and Configurations of XAMPP

Installing the required software and tools to create a proper local development environment was crucial before beginning the SmartHire system's development. The main tools used is XAMPP, which stands for Cross-platform, Apache, MySQL, PHP, and Perl. Important components like the Apache server and MySQL database, are both needed to operate PHP-based web applications. Before deploying programs to a live server, developers can test, execute, and troubleshoot them locally with XAMPP.

The latest version of XAMPP was downloaded from the official Apache Friends website at https://www.apachefriends.org and installed on a Windows machine using the default setup options. After installation, the two main services required for the SmartHire system to operate, Apache and MySQL can be started from the XAMPP Control Panel. These services were activated by clicking the "Start" buttons beside each module. Figure 4.1 shows the XAMPP Control Panel interface with Apache and MySQL running.

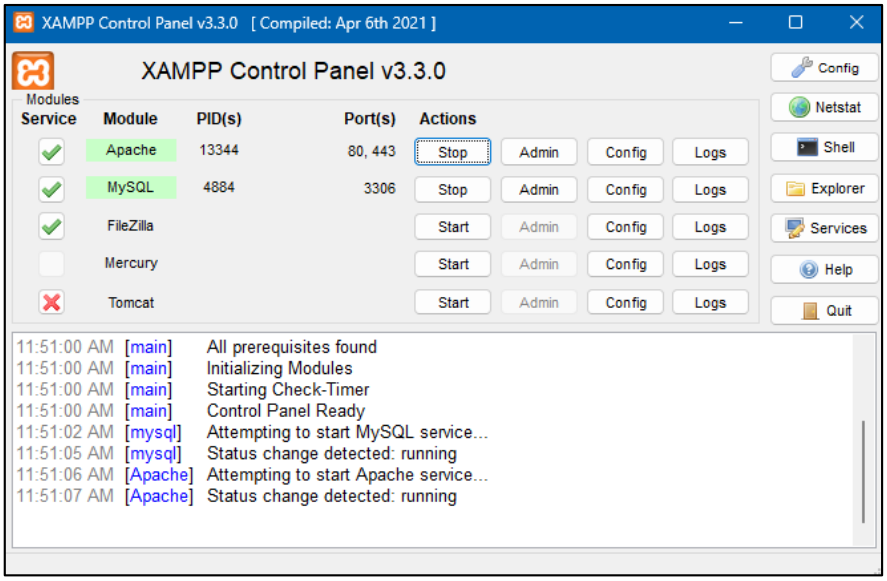

Figure 4.1: XAMPP Control Panel

After successfully running the services, the database can be managed by accessing the phpMyAdmin tool http://localhost/phpmyadmin. A new database named job_portal was created to store all application data such as user accounts, job posts, applications, notifications, and achievements. Tables can be created manually or imported using .sql files if needed. Once the database has been set up, the Laravel project folder was placed inside the htdocs directory normally found at C:\xampp\htdocs. The project was launched from the terminal using the command "php artisan serve" as shown in Figure 4.2 below This command will starts a local development server, accessible at http://localhost:8000/.

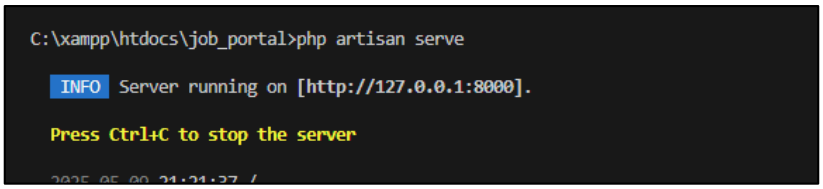

Figure 4.2: Command to run the project

The .env configuration file at the project root was modified to allow Laravel to connect to the MySQL database. The changes made to the database settings are as shown in Figure 4.3. These values create a link between the MySQL database and the Laravel backend. The default MySQL username for XAMPP is root, and no password is required.

```
22
23  DB_CONNECTION=mysql
24  DB_HOST=127.0.0.1
25  DB_PORT=3306
26  DB_DATABASE=job_portal
27  DB_USERNAME=root
28  DB_PASSWORD=
29
```

Figure 4.3: Database configuration in .env file

Finally, Laravel migration commands such as php artisan migrate as shown in Figure 4.4 were used to automatically generate the required database table defined in the project's migration files. This streamlined the process of creating structured and consistent tables without needing to manually create tables using phpMyAdmin.

```
C:\xampp\htdocs\job_portal>php artisan make:migration create_jobs_table

  INFO  Migration [C:\xampp\htdocs\job_portal\database\migrations/2025_05_09_155537_create_jobs_table.php] created successfully.
```

Figure 4.4: Laravel migration command

After all these setups completed, the SmartHire system was ready for local development and testing. These steps ensured that the environment was completely prepared to handle the development of features in the system.

4.3 Implementation of the Proposed System

There are two users for SmartHire, which are students and employers. Students can register, login, apply for jobs, generate a resume, view their homepage, track their application status, and earn achievement through the gamification features. Meanwhile, employers can register, login, and access their dashboard to post jobs, view applicants, and manage job listings. The implementation of each feature is demonstrated through the system's interface screenshots below.

4.3.1 Main Home Page

The proposed system can be accessed at https://smarthire.space. Figure 4.5 shows the home page for the SmartHire system which serves as the main landing page for both new users, and registered users. This page contains the main navigation bar, an engaging image and the search bar to help students easily navigate through the system.

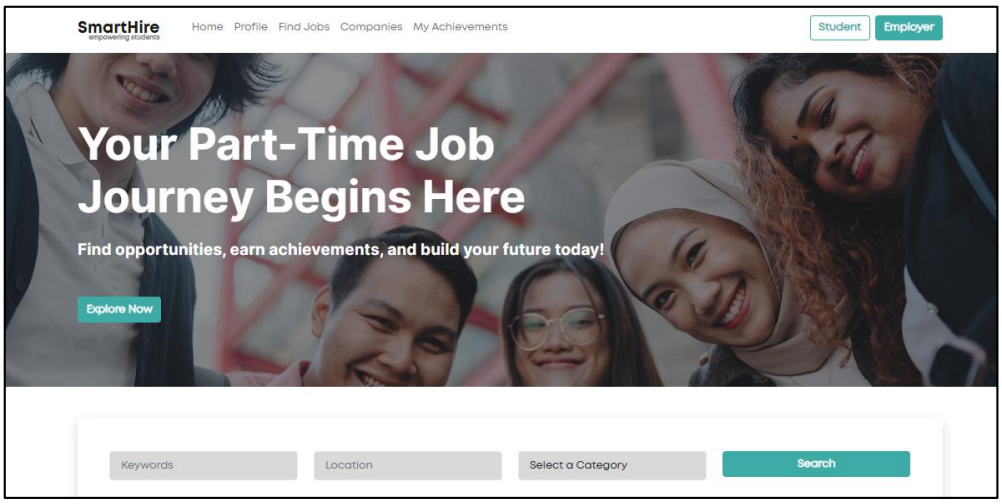

Figure 4.5: Main homepage for the proposed system

4.3.2 Login and Signup Page

Figure 4.6 and Figure 4.7 shows the login page for registered students and employers respectively. Users only need to enter their email and password to access their respective main page. After successfully logging in, students are redirected to their profile page, meanwhile employers are redirected to the dashboard. Basic validation features like password matching and email format checking are also included in the login form.

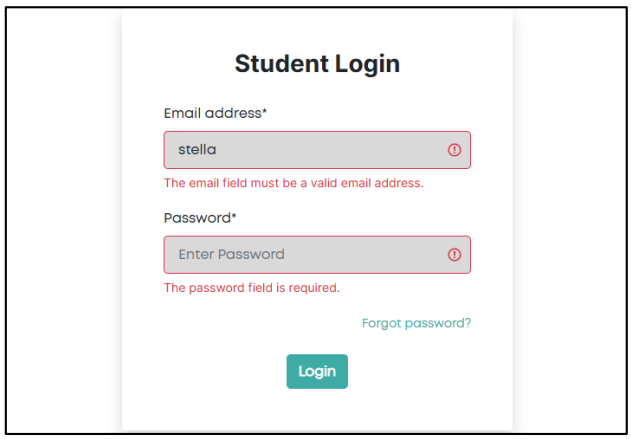

Figure 4.6: Login page for registered students

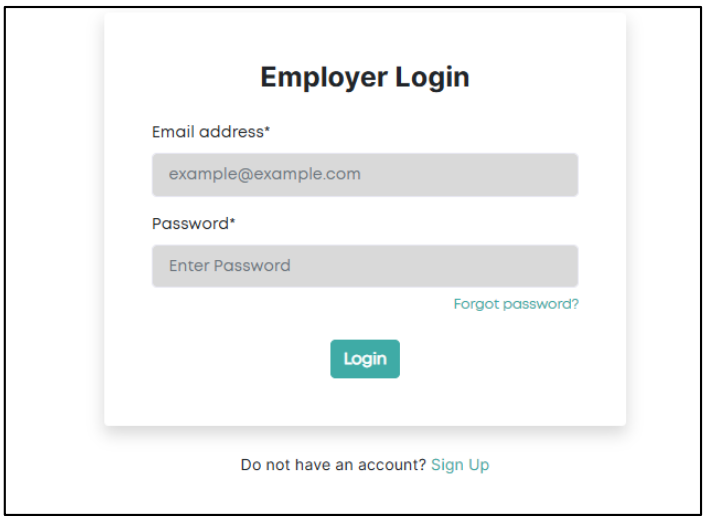

Figure 4.7: Login page for registered employers

The signup page enables students to create an account by entering in their name, email address, and password. Additionally, the system makes sure that every email address is unique to prevent duplicate registrations. Figure 4.8 shows the signup page for new users.

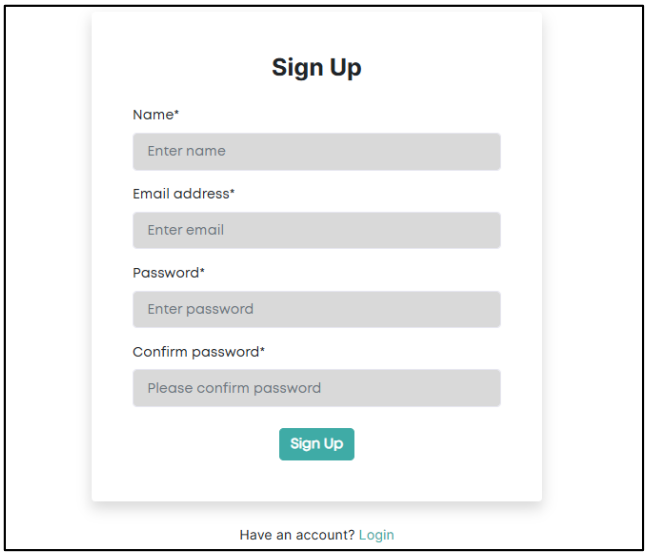

Figure 4.8: Sign up page for students

Figure 4.9 shows the signup page for employers. Employers are required to provide important details such as employer name, email address, company name and their password. Once the employer submits the form, the system validated the inputs, and employers can login to the system and begin posting jobs.

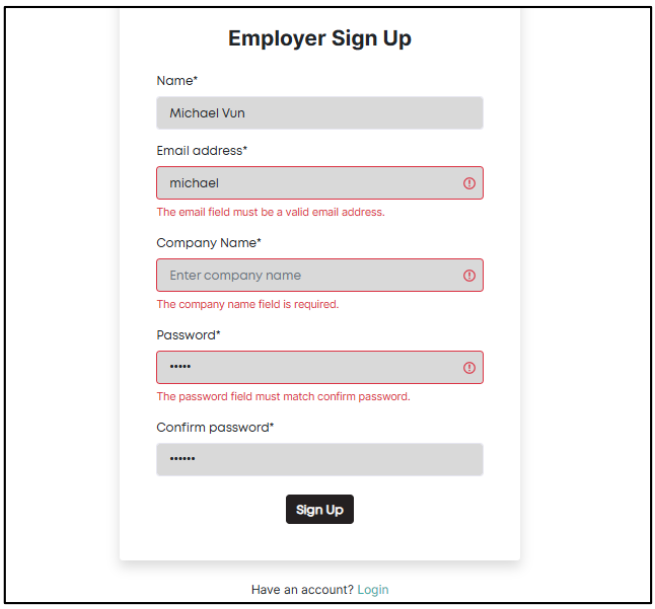

Figure 4.9: Sign up page for employers

4.3.3 Students homepage

Besides the search functionality, there are also several section displays on the homepage. Just below the search bar is the Recommended for you section, which display a selected list of job opportunities based on the student's interests or previous activity. This section helps students quickly discover relevant openings without having to search hard. For you section is as shown in Figure 4.10.

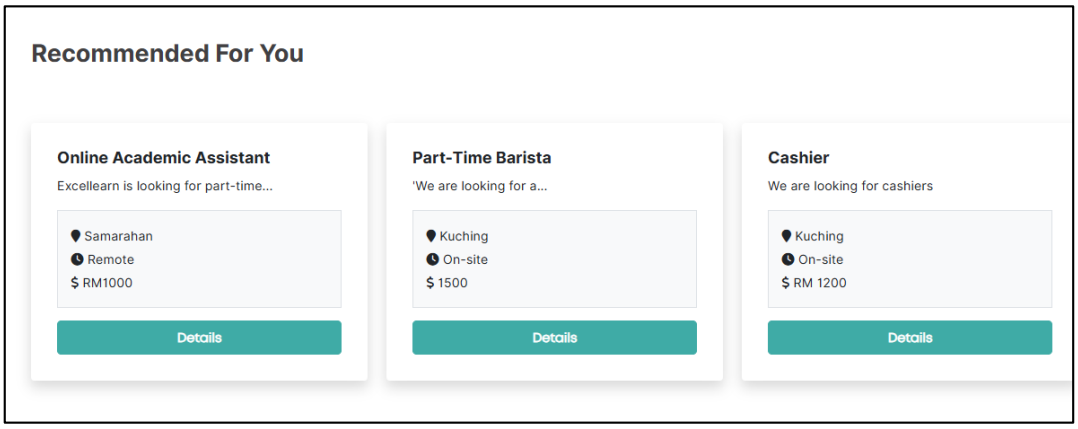

Figure 4.10: Recommended for you section

Following this is the Latest Jobs section as shown in Figure 4.11 which displays the recently posted job opportunities, allowing students to stay updated with the latest job openings added to the system. This overall layout ensures that students can easily navigate through various job options directly from the home page.

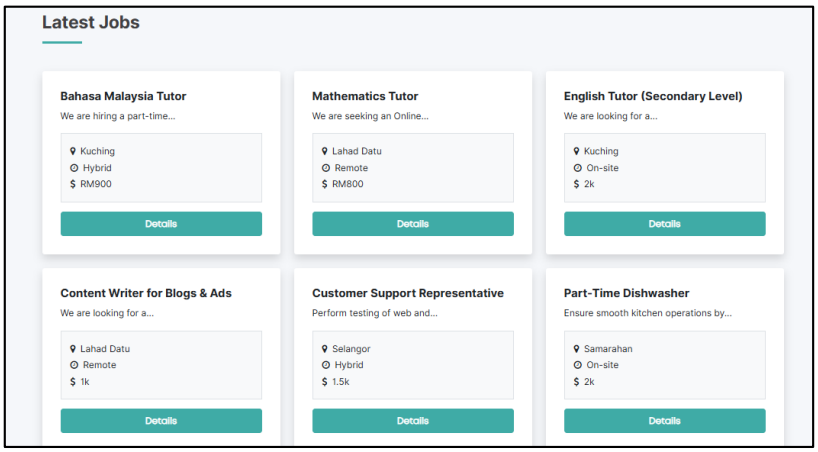

Figure 4.11: Latest Jobs section

Figure 4.12 shows the Featured Jobs section that highlights specific job posts that have been promoted or recommended by company.

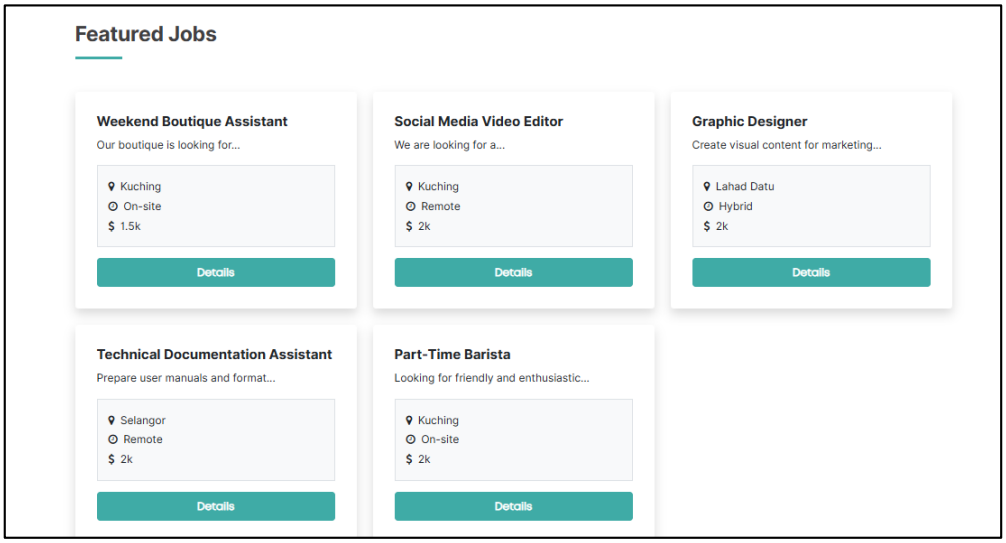

Figure 4.12: Featured jobs section

Finally, the Popular Categories section, as shown in Figure 4.13. Each category provides students with convenient way to explore jobs within a specific industry.

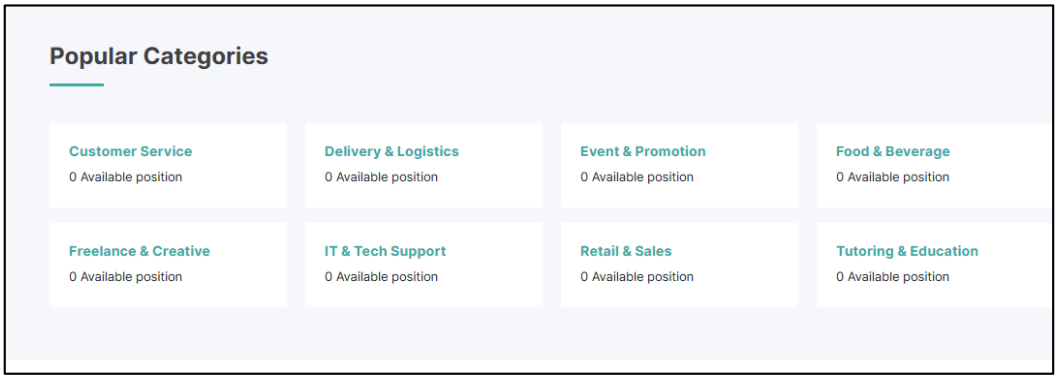

Figure 4.13: Popular Categories section

4.3.4 Students profile page

Students can view and manage their personal information through the profile page. This page displays important information such as the student's name, phone number, email address and resume. Students can update their information to ensure employers have the most up to date information when reviewing applications. Figure 4.14 shows the student profile page layout within the SmartHire platform.

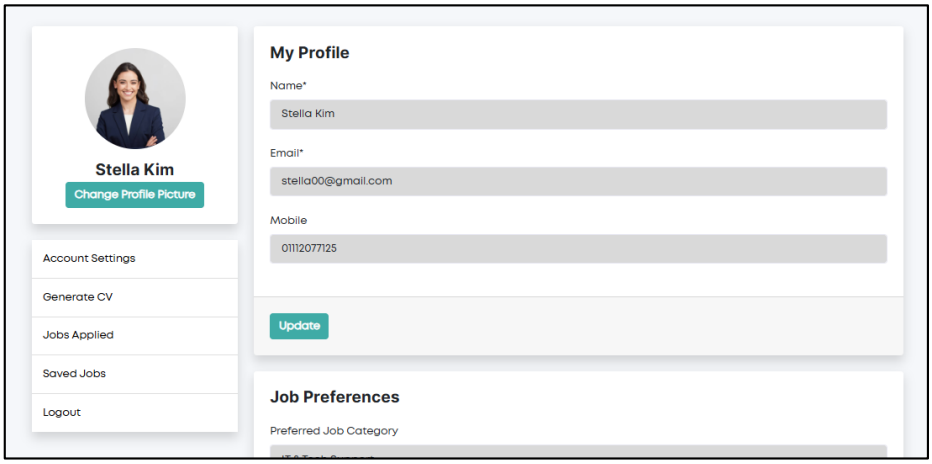

Figure 4.14: Students profile page

Based on the student profile's Job Preferences section as shown in Figure 4.15, This section allows students to set their preferred job categories, job types (e.g., remote, hybrid, on-site), and locations. This section allows students to set their preferred job categories, work types (e.g., remote, hybrid, on-site), and locations. These preferences are used by the algorithm to match students with suitable job listings, which are then displayed in the "Recommended For You" section of the homepage.

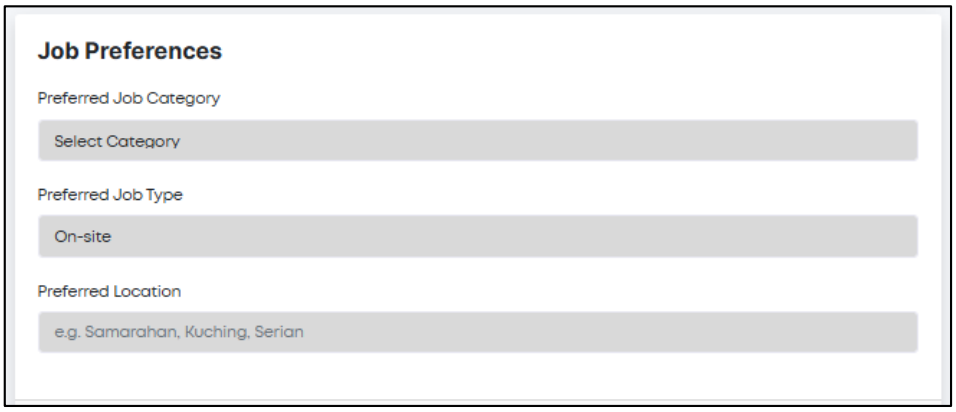

Figure 4.15: Job preferences section

The code snippet as shown in Figure 4.16 demonstrates how the system fetches jobs that match the student's saved preferences. Job listings that fit any of the criteria are then retrieved by querying the jobs table using these preferences.

```
$recommendedJobs = collect();

if (Auth::check()) {
    $user = Auth::user();

    $recommendedJobs = Job::where('status', 1)
        ->with('jobType')
        ->where(function ($query) use ($user) {
            // Match category OR type OR location
            if ($user->preferred_category) {
                $query->orWhere('category_id', $user->preferred_category);
            }

            if ($user->preferred_type) {
                $query->orWhere('job_type_id', $user->preferred_type);
            }

            if ($user->preferred_location) {
                $locations = array_map('trim', explode(',', $user->preferred_location));
                $query->orWhere(function ($q) use ($locations) {
                    foreach ($locations as $location) {
                        $q->orWhere('location', 'LIKE', '%' . $location . '%');
                    }
                });
            }
        })
        ->latest()
        ->paginate(6);

}
```

Figure 4.16: A code snippet for job matching logic for recommendations.

Figure 4.17 shows the interface of the change password section right below the job preferences section. This page requires students to input their old password, the new password, and confirmation of the new password. The system performs validation to make sure that the new password match with the confirmation input.

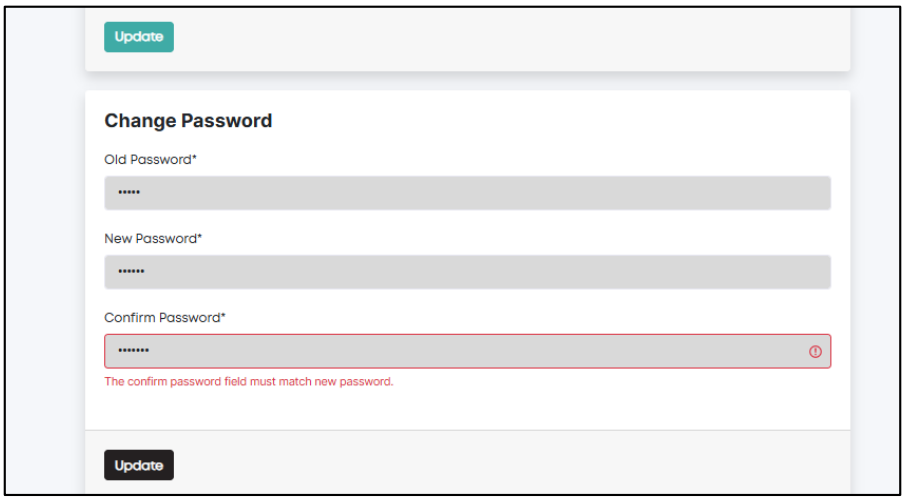

Figure 4.17: Students change password section

4.3.5 Students Find Jobs page

The find jobs page is designed to help students browse and discover available part-time job opportunities. A list of job openings is shown in this page, together with key information such as job title, short description of the job, location and job type (remote, on site, or hybrid) or even salary. Students can scroll through the page or use the filtering options to sort results based on keywords, location (via a dropdown), category or job types. There is also a sorting feature that allow students to filter the job listings by latest or oldest, helping them to view the most recent job postings or explore earlier job postings based on their preferences. Each job posting has a “Details” button that links to a more detailed job description, allowing students to view the full requirements before applying. Figure 4.18 shows the interface of the Find Jobs page.

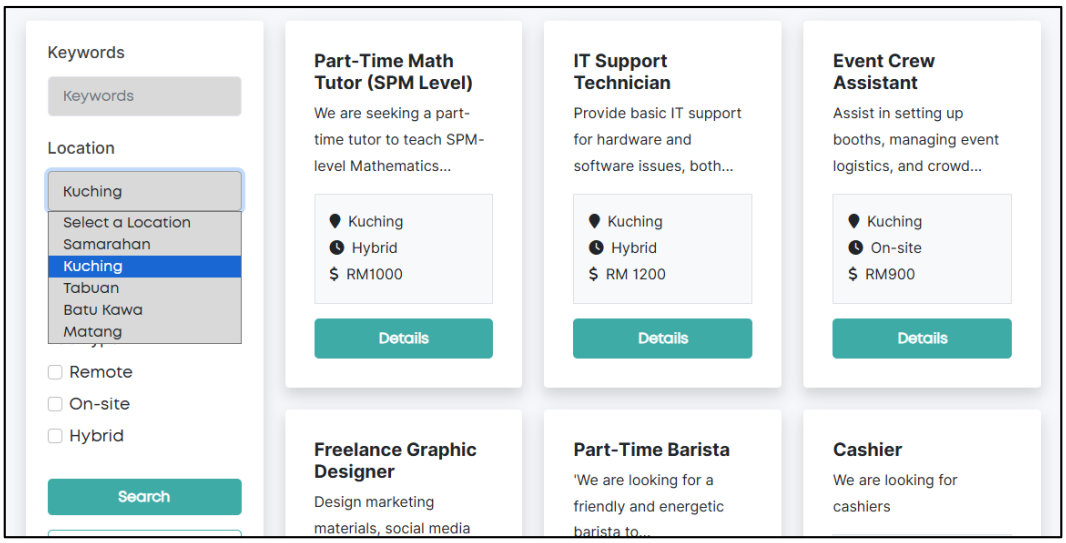

Figure 4.18: Student find jobs page

4.3.6 Students Job details page

When students click on "Details" from the Find Jobs page, they are directed to this detailed view as shown in Figure 4.19. The page displays key information such as detailed job description, responsibilities, qualifications, and benefits of the job. At the bottom there is an Apply button for students to submit their applications along with a Save button allowing them to bookmark the job for future references. The right side of the page provides a quick overview of the job summary info, while the company details part contains background information of the hiring company.

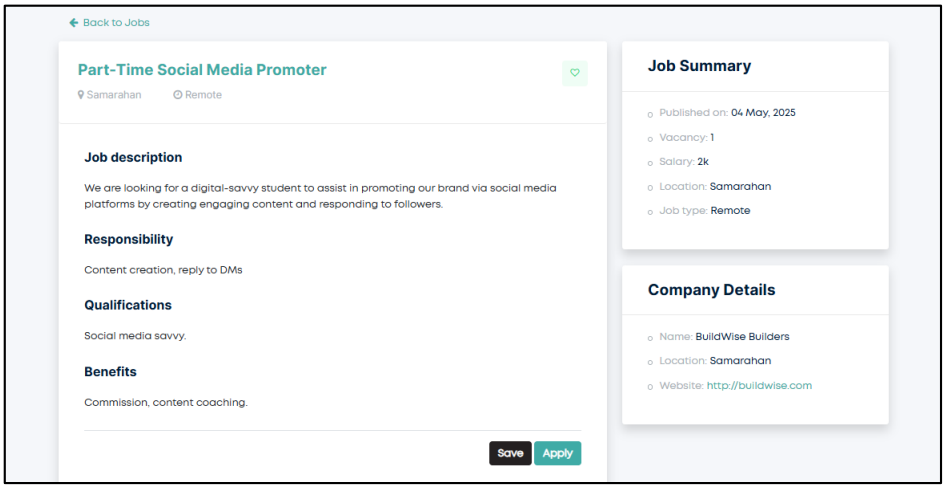

Figure 4.19: Students job details page

Figure 4.20 shows the pop-up confirmation message that appears when a student clicks the Apply button on the Job Details page. Once the student confirms by clicking OK, the job application is recorded in the database and the job will be listed on the Jobs Applied page. Student can click Cancel if they decide not to proceed with the application.

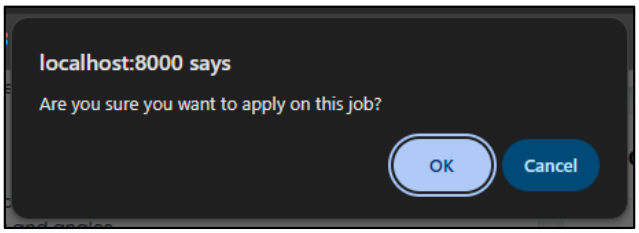

Figure 4.20: Confirmation message for student to apply job

4.3.7 Students Jobs Applied page

Students can view the list of all the jobs they have applied from the Jobs Applied page, as shown in Figure 4.21. Each application record displays the job title with job type and location, the date of applied, the number of applicants for that job, the job status, and action to either view or remove application. With the help of this function, students can easily monitor their application progress and manage their job applications. If students click on the View action, they will be redirected to the Job Details page of the selected job. Meanwhile, if they click on Remove, a confirmation pop-up message will appear.

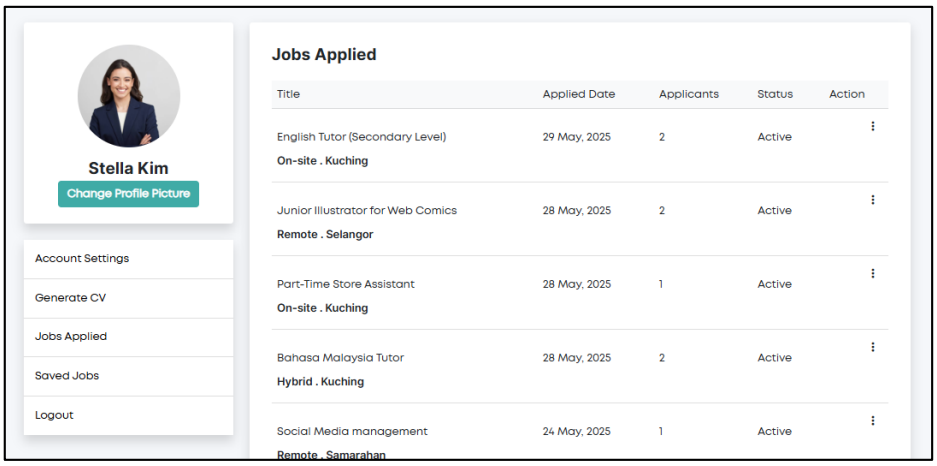

Figure 4.21: Students jobs applied page

Figure 4.22 shows the confirmation message that appears when a student tries to remove a job application from the Jobs Applied page. If students click OK, the page is updated and a success message is displayed, indicating that the job has been removed successfully, as shown in Figure 4.23.

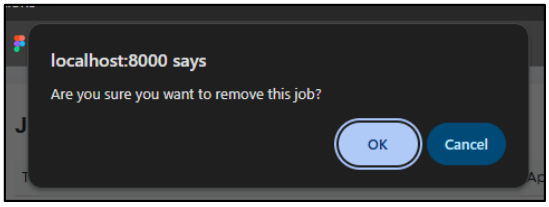

Figure 4.22: Confirmation pop-up message to remove job

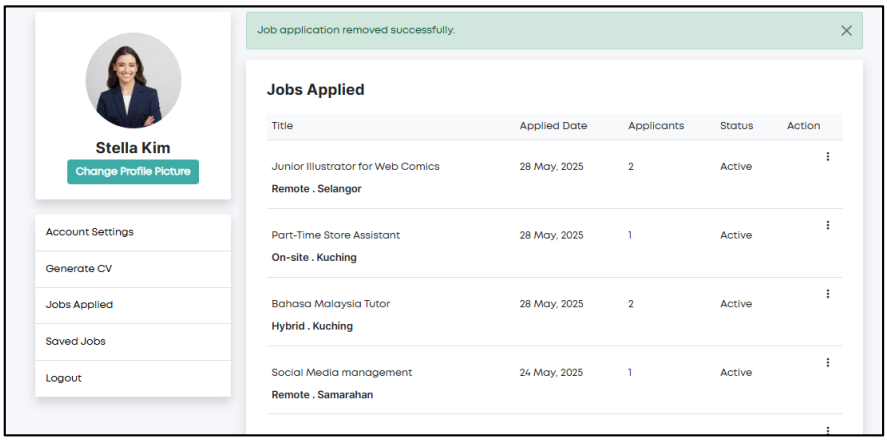

Figure 4.23: Success message for job removed

4.3.8 Students Saved Jobs page

Students can bookmark job postings they are interested in and review them later from the Saved Jobs page as shown in Figure 4.24. Each saved job displays key details such as the job title and location, with a direct link to view or remove the job from saved.

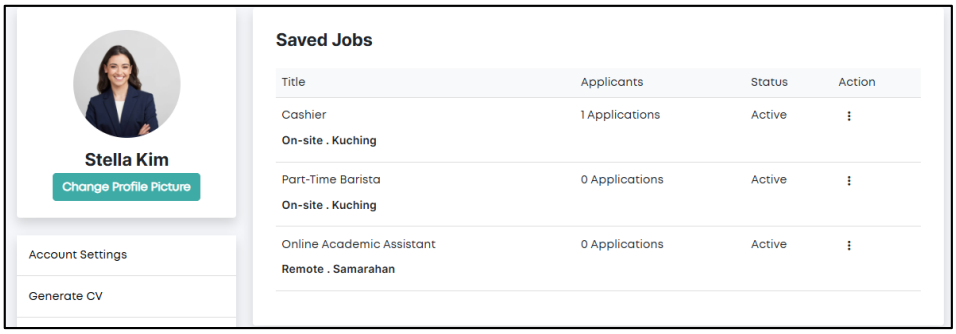

Figure 4.24: Students saved jobs page

4.3.9 Students Generate CV page

Figure 4.25 shows the generate CV page which contains the about section allowing students to briefly introduce themselves in the summary field as well as a section to list their skills. Next student can also input and manage their academic history in the Education details section. Students can add multiple educational entries, including details such as the institution name, location, field of study, and the start and end date. If no education data is found, the system displays a form to fill in the education details. Otherwise, it displays a list of all submitted education records along with edit and delete buttons.

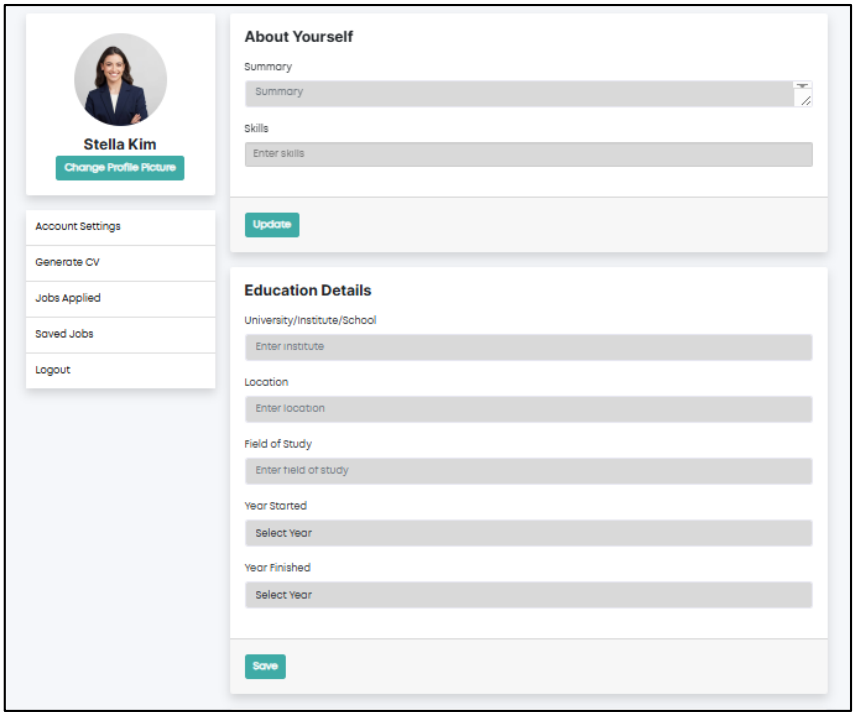

Figure 4.25: About yourself and Education details section

The generate CV page also includes the work experience section, where students can input their previous job roles along with the company name and the start and end dates. Students can also highlight their language abilities and linguistic diversity by listing the languages they are proficient in in the Languages section. After filling in their details, students can click on the View CV button to preview their resume in formatted layout before downloading it. This section is as shown in Figure 4.26 below.

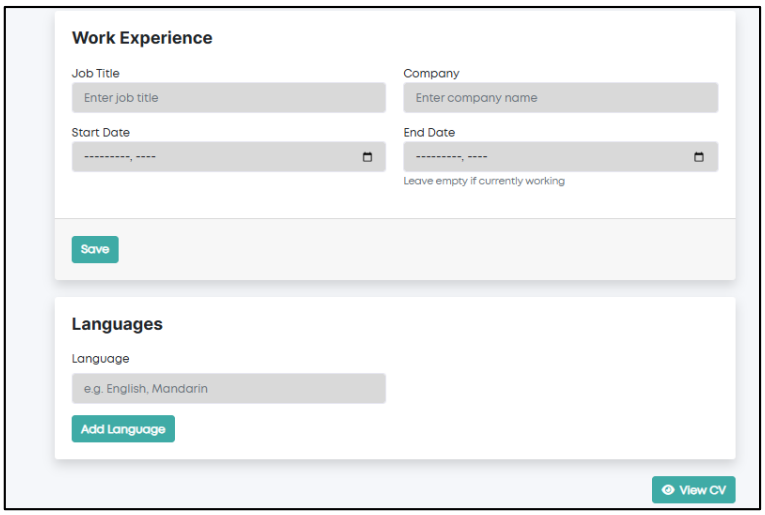

Figure 4.26: Work experience and languages section

Students can view their completed resume in structured and professional format on the View CV page (Figure 4.27). It gathers all the data entered in the "Generate CV" section and profile section, including the student's name, email address, phone number, summary, education, work experience, skills, and languages. Students can export their resume as a PDF file by clicking the "Download CV" button. This feature enables students to easily access and send their resume in a standard, printable format to potential employers.

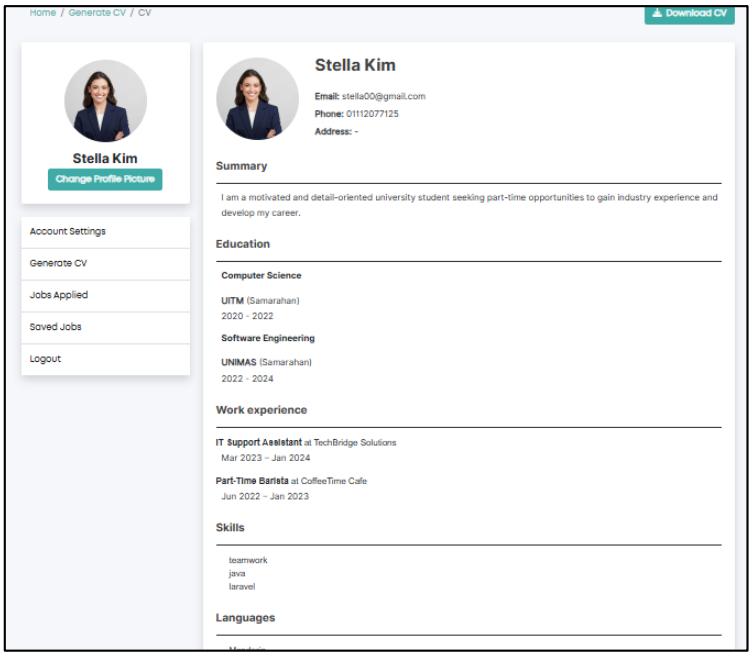

Figure 4.27: View CV page

Figure 4.28 shows the downloaded CV in PDF version of the student's resume that was created from the data entered in the system. All the key components are included in a clean, professional layout.

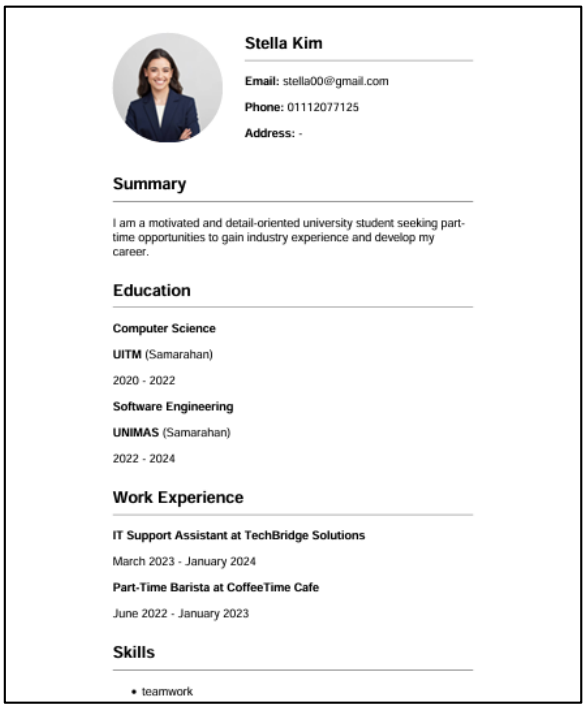

Figure 4.28: Downloaded CV

4.3.10 Students Companies page

The companies page (Figure 4.29) contains a search bar at the top of the page for students to look for the companies registered in the system. Below the search bar, a list of companies is displayed including their name, and average rating based on student reviews. A 'View Details' button is also included with each company entry, enabling students to explore the selected company.

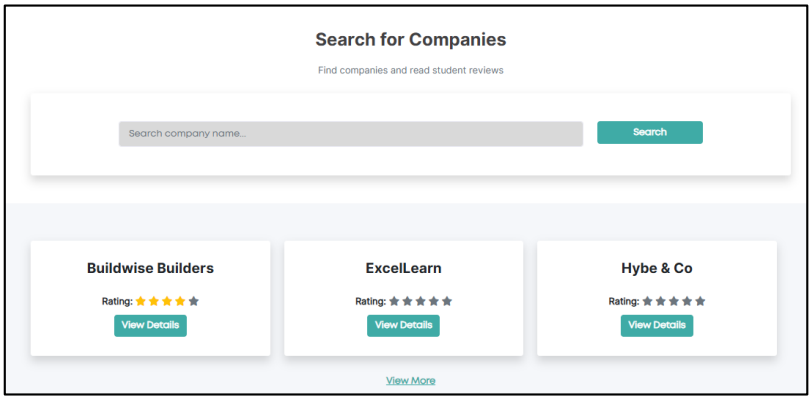

Figure 4.29: Companies page

The company details page, as shown in Figure 4.30, displays the company's name and average rating. Below that, students can view reviews submitted by other student, including the reviewer's name, position, star rating, and the review text. Students can also leave their own review for the company by clicking the "Review this Company" button.

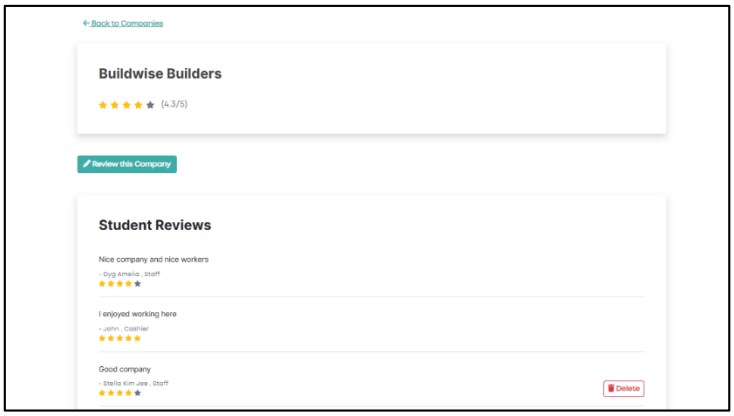

Figure 4.30: Company details page

From the review company page as shown in Figure 4.31, students can provide feedback about the company they have worked with. On this page, students can rate the company using a star rating system and write a detailed review in a text box. They also provide their name and position. After clicking on the "Submit Review" button, the review is saved and made available for other students to view on the Company Details page.

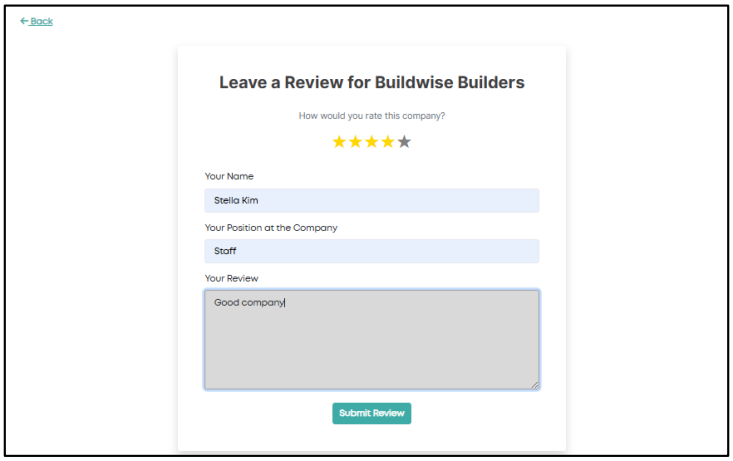

Figure 4.31: Review company page

4.3.11 Students My Achievements page

A summary of the student's progress and achievements in the SmartHire system is displayed on the My Achievements page, as shown in Figure 4.32. Based on the student's activity and engagement, this page displays their current title or status, such as "Top Performer" or "Rising Star". These titles are based on the number of completed action. For instance, students who have unlocked at least three badges earn the title "Rising Star", those with five or more badges receive "Achiever", and students who have unlocked all available badges are recognized as "Top Performer." Below the title, the page lists all available achievements or badges, indicating which have been obtained and which are still locked. To differentiate them, earned achievements are displayed in green colour, meanwhile locked achievements are grey in colour. The student will receive a notification after earning a new badge in recognition of their achievement in the Notifications page.

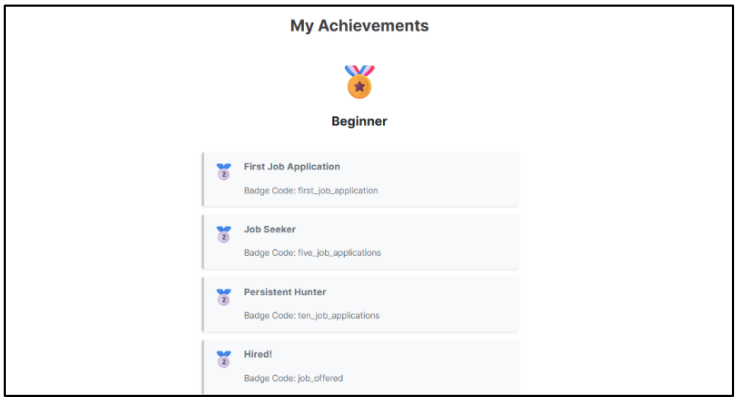

Figure 4.32: My Achievements page

4.3.12 Students My Notifications page

Figure 4.33 shows the My Notifications page which displays notifications when a student receives a badge or when they receive email from employers regarding their application status, accepted, rejected, or interviewed.

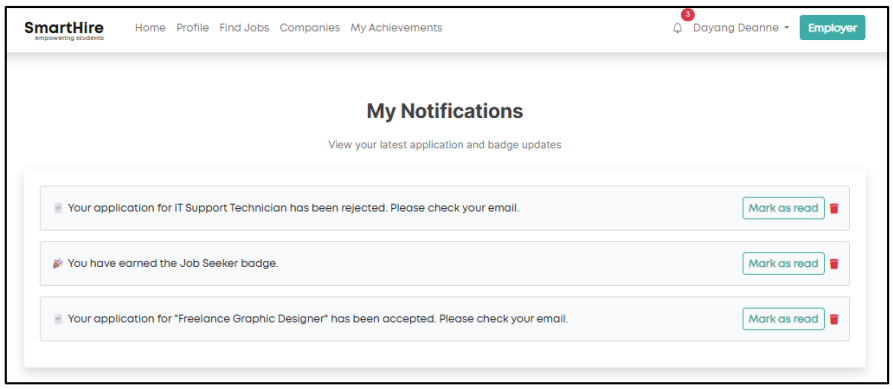

Figure 4.33: My Notifications page

4.3.13 Employer Dashboard

As shown in Figure 4.34, the employer dashboard provides employer with a centralized interface to manage their job postings and monitor applicant activity. With help from this dashboard, companies can quickly evaluate their hiring performance, understand applicants' engagement and make informed decisions to enhance their recruitment strategy.

Figure 4.34: Employer Dashboard

4.3.14 Employers Post Job page

Employers have the access to the Post Job page where they can submit new job postings to be displayed on the platform. Figure 4.35 shows the job posting form, which includes fields such as job title, category, job type, number of vacancies, salary, location, job description, benefits, and more. Employers are required to complete all fields accurately especially those with required input. After successfully posting the job, it will be listed in the system and students will be able to view and apply for the job.

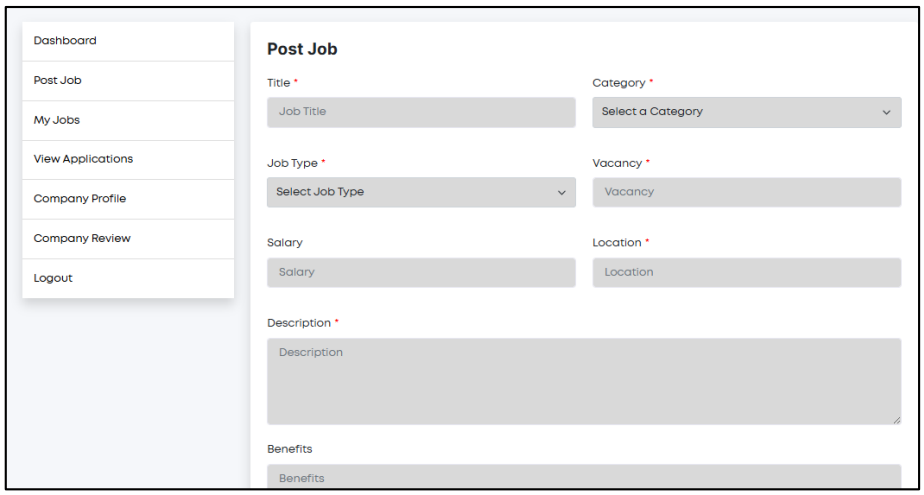

Figure 4.35: Employers Post Job page

4.3.15 Employers My Jobs page

Employers can view and manage every job they have posted on the system though the My Jobs page. As shown in Figure 4.36, each job listing displays key information such as the job title, job type, location and number of applicants. Employers can perform action such as viewing job details, edit or delete jobs. This helps employers to monitor their job listings and make necessary updates and ensure the job postings is up to date.

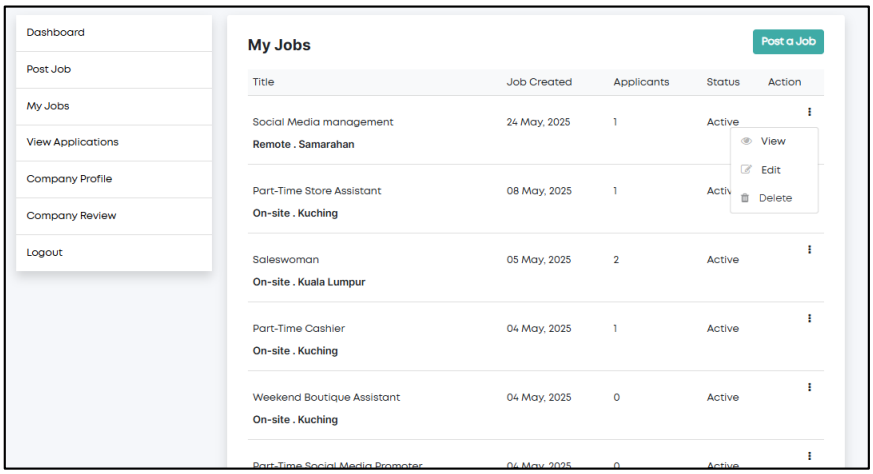

Figure 4.36: Employers view jobs page

4.3.16 Employers Edit Job page

Employers can edit an existing job posting's detail in the Edit Jobs page. This page displays a form that is already filled in with the current job details such as the job title, category, job type, vacancy, salary, location, job description and other related fields, as shown in Figure 4.37. Employers can edit the job posting by making any necessary changes and submit the form by clicking on the Update job button at the bottom.

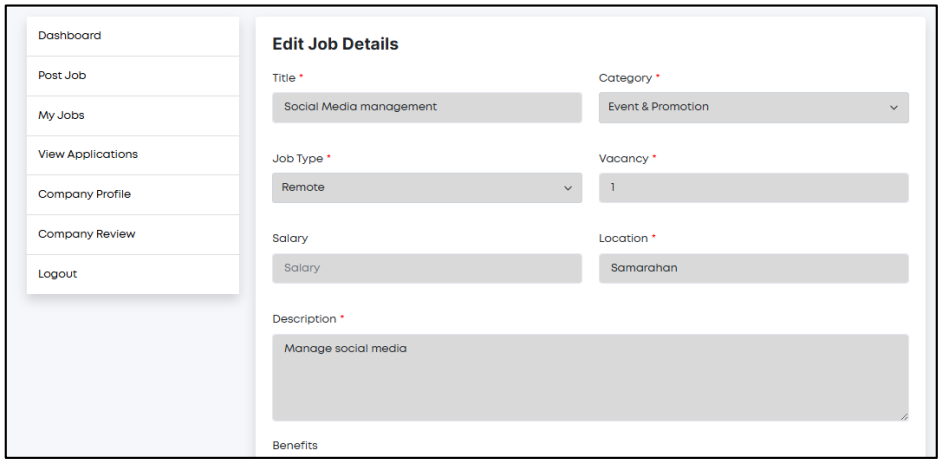

Figure 4.37: Employers edit job details page

4.3.17 Employers Delete Job

The delete job features allow employers to remove a job from the system. As shown in Figure 4.38, when employer clicks on the Delete button from the My Jobs page, a confirmation pop-up message will appear to make sure that the action is intentional. The job will be permanently deleted from the system once the employer confirms the deletion.

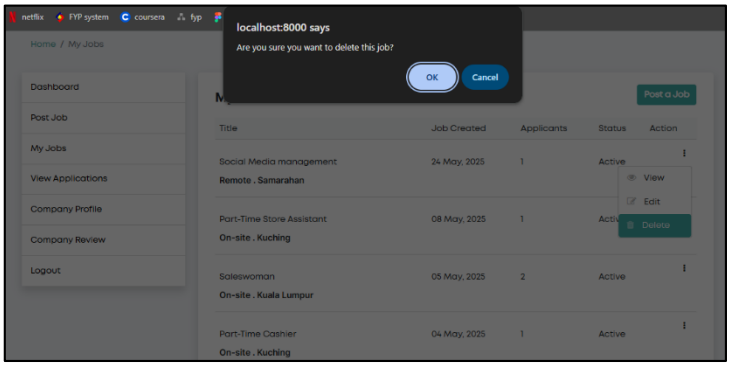

Figure 4.38: Confirmation to delete job

After the employers clicks on OK, a success message will be displayed and the job will be removed from the immediately, as shown in Figure 4.39. This feature helps employers to keep an up-to-date and accurate list of job postings.

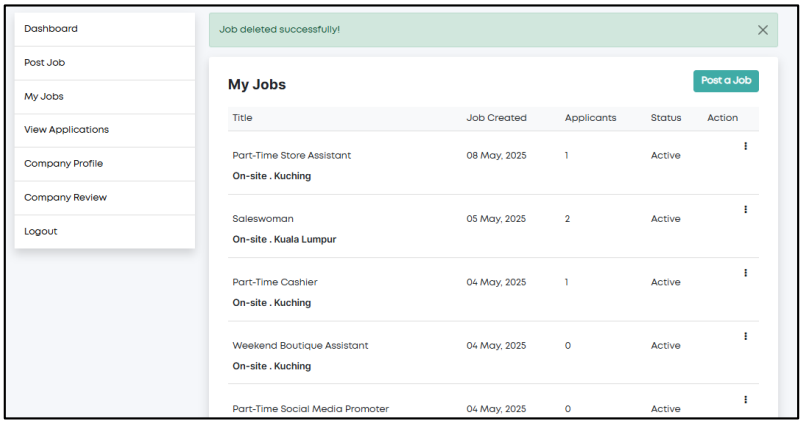

Figure 4.39: Job deleted successfully message

4.3.18 Employers View Applications page

Figure 4.40 shows the View Applications page where employers can see a list of jobs they have posted, along with the number of applicants for each job and a “View Applicants” button.

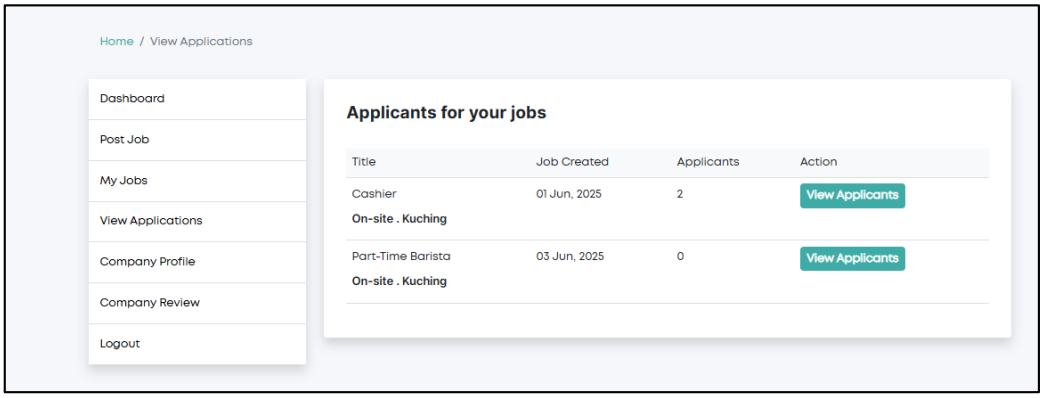

Figure 4.40: Employer view applications page

After employer has clicked on view applicants' button, it will redirect to the applicants' page that allows employers to see the list of students who have applied to their posted jobs as shown in Figure 4.41. The system will show the name, email address, and application date for each application. Employers can also view the applicant's CV directly from this page by clicking the "View CV" button. Next to each applicant's entry, there are action button labelled Accept, Reject, and Interview to help employers respond to applications quickly. Once the employer selects any of the action, an email layout will pop up, allowing employer to send and notify the student accordingly.

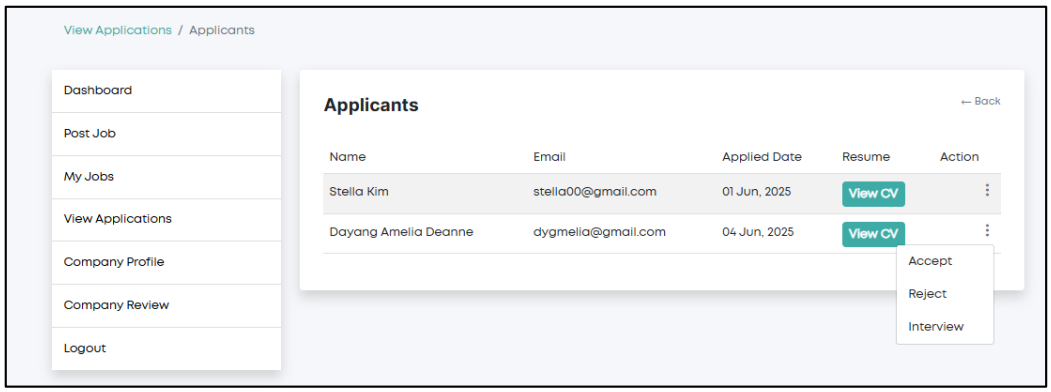

Figure 4.41: List of applicants for a job

The email pop-up message is automatically generated depending on the action selected. Each action, accept, reject, and interview will display a different default message. Employers can edit the message before sending it to the applicant as shown in Figure 4.42.

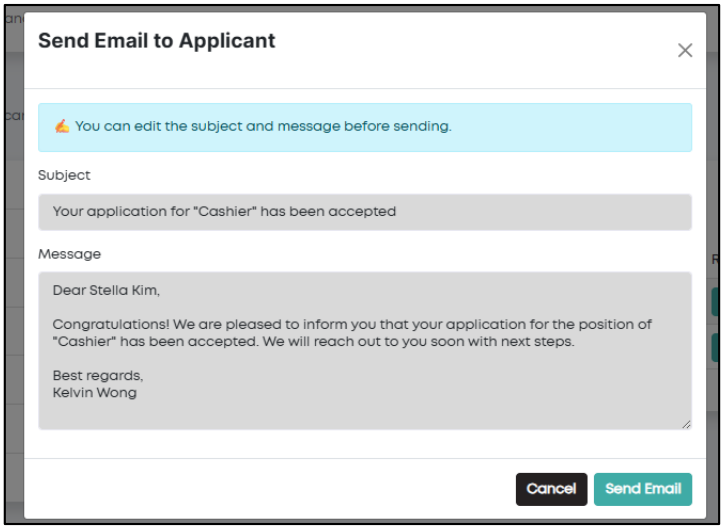

Figure 4.42: Generated email pop-up message

The system uses a real email service configured through Hostinger, to send the email directly to the applicant after the employer confirms the email from the pop-up message and click Send Email button. Figure 4.43 show the email sent to the user email inbox. Students can view the content of the email, including the subject, recipient and the message. The student will receive a notification in the My Notifications page after the employer updates their application status.

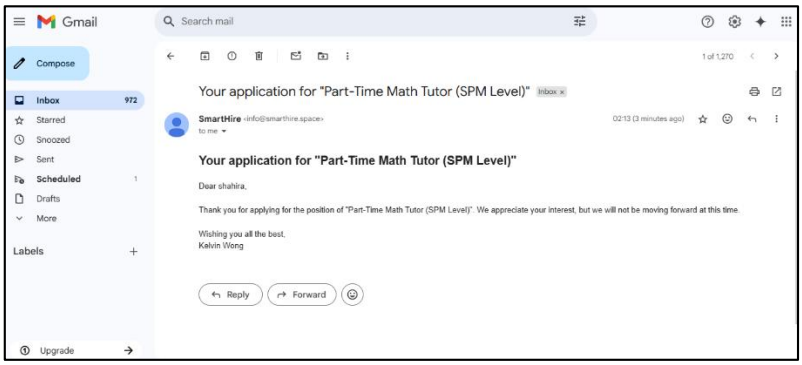

Figure 4.43: Email inbox to user inbox

4.3.19 Forgot password page

The Forgot Password page allows both students and employers to securely reset their password by entering their registered email address. Upon submission, a reset link is sent to the provided email, and user are required to create a new password. Once the password has been successfully updated, they can log in using the new credentials.

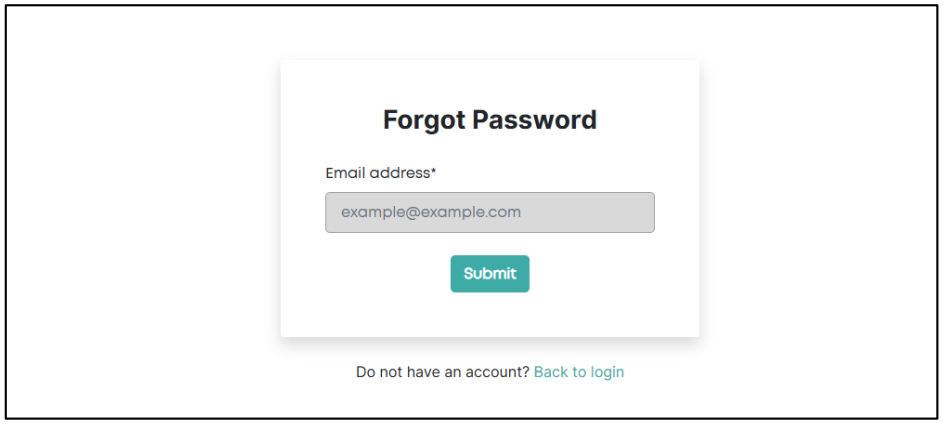

Figure 4.44: Forgot password page

4.4 Summary

In summary, this chapter provided a detailed implementation process of the SmartHire system, including both technical setup and the development of frontend features. The chapter began with the installation and setup of necessary tools, like XAMPP, which enabled local system development and testing. After that, an explanation of the implementation of the systems main feature along with screenshots of the user interface to show how each feature is functioning. For the student users, important features like home page, job search, job details, application process, and user profile management were explained.

Meanwhile, for employers, the system supports features like job posting, managing job listings, editing and deleting job entries. The chapter also highlighted various pop-up confirmations and success messages that help guide users in navigating various actions ensuring a smooth and intuitive workflow. Overall, the implementation phase effectively transformed the requirements and design of the system into a functional platform that supports the goal of connecting students with part-time job opportunities. The next chapter will focus on evaluating and testing the system to ensure all implemented features perform as expected and meet user needs.

CHAPTER 5: TESTING

5.1 Introduction

This chapter describes the testing phase carried out to ensure the SmartHire system's usability, functionality, and reliability. Various testing methods were used to identify and fix issues, validate system requirements, and ensure the system runs as expected. This testing phase's main objective is to confirm that every module, from student registration to CV generation and job application, is functioning well and convenient for both students and employers to use.

5.2 Functional Testing

Functional testing is done to make sure that every feature functions as intended, and that the system runs along with the requirements specified. In this phase, specific inputs are submitted, and the outputs are observed to test individual functions of the SmartHire system. The test is considered successful if the actual results match up with the expectations. If not, the problems are documented and fixed. The functional testing was carried out using unit testing techniques to validate key features such as dashboard displays, job applications, company reviews, and CV generation. The testing makes sure that the student and employer modules are working properly and provide a smooth user experience.

5.3 Unit Testing

Unit testing focuses on testing individual components or features to ensure that each part of the SmartHire system performs exactly as intended. To make sure everything functions properly, every feature, such as dashboard statistics, job applications, and CV generation is tested separately. By identifying and fixing errors early in the development process, this type of testing makes the system more stable and reliable. Unit testing involves entering specific inputs and comparing the outputs to the expected results. If inconsistencies are discovered, the relevant module is debugged and retested to ensure it meets the requirements. Individual tests were conducted on the following SmartHire system modules:

Test modules (General):

1. Login
2. Sign-up

Test modules for student:

1. Navigation bar
2. Edit profile
3. Generate CV
4. View and download CV
5. Search, save and apply for jobs
6. Review company
7. View achievements

Test modules for employer:

1. Navigation bar
2. Post job
3. View dashboard statistic
4. View applicants
5. View and download applicants CV
6. Accept/Reject/Interview applicants
7. Email notifications to applicants

5.3.1 Functional Test Results of General Modules (Student & Employer)

Table 5.1: Test Results of General Modules

Module	Login			
Pre-requisite	None			
Test case	**Test procedure**	**Expected result**	**Actual result**	**Pass/Fail**
Login form	User enters valid credentials.	Redirect to respective dashboard.	Redirect to student/employer dashboard.	Pass
	User enters invalid credentials.	The system displays an error message.	Error message displayed correctly.	Pass
	User clicks on the login button.	Form validation.	Form validated.	Pass
	User clicks on sign-up link.	Redirect to sign-up page.	Redirected to sign-up page.	Pass
Sign-up form	User enters all required fields correctly.	Account created, redirect to login.	Account created successfully and redirected to login page.	Pass
	User leaves required field empty.	System shows validation error message.	Validation error message shown.	Pass
	User tries to register with existing email.	Show “The email has already been taken” error message.	Duplicate email detected.	Pass

5.3.2 Functional Test Results of Modules for Student

Table 5.2: Test Results of Modules for Student

Module	Navigation bar			
Pre-requisite	Student is logged in successfully.			
Test case	**Test procedure**	**Expected result**	**Actual result**	**Pass/Fail**
Verify that all navigation links function properly	Clicks on each navigation item, which are Home, Profile, Find Jobs, Companies and My Achievements.	Each navigation link redirects to the correct corresponding page without error.	All links redirected properly.	Pass
	Student clicks on the "Student" button.	Redirect to the student login page.	Redirected to login page for student.	Pass
Module	Edit profile			
Pre-requisite	Student is logged in successfully.			
Test case	**Test procedure**	**Expected result**	**Actual result**	**Pass/Fail**
Verify that student can update profile fields	1. Navigate to Profile page. 2. Modify field such as name, phone number, address. 3. Click "Update". 4. Refresh the page.	Updated profile information is saved and displayed correctly after refresh.	Information updated and saved.	Pass

Verify that student can update their preferences	1. Navigate to Profile page. 2. Modify the preferences field. 3. Click “Update”.	Preferences updated successfully.	Preferences updated successfully.	Pass
Verify that student can change their password	1. Navigate to Profile page. 2. Modify the password field. 3. Click “Update”.	Password updated successfully. Student can use the new password next login.	Password updated successfully and can be used.	Pass
	Students enter invalid password.	Error message displayed.	Error message shown.	Pass
Logout	Student clicks the logout button from the navbar or sidebar.	Student is logged out and redirected to login page.	Logged out and redirected to login page correctly.	Pass
Module	Generate CV			
Pre-requisite	Student is logged in successfully.			
Test case	**Test procedure**	**Expected result**	**Actual result**	**Pass/Fail**
Verify that student can input and save CV details	Fill in the About section (summary and skills) and click update.	All data is saved correctly and displayed properly in the “View CV” page.	About section data saved and displayed.	Pass
	Fill in the Education section with at least one entry.	Education data is saved and displayed.	Education section data saved and displayed.	Pass
	Students try to save education section with an empty field.	Error message of required field shown.	Field is required error message shown.	Pass

	Fill in the work experience field and click save.	Work experience data is saved and displayed.	Work experience section data saved and displayed.	Pass
	Student tries to save work experience with an empty field.	Error message of required field shown.	Field is required error message shown.	Pass
	Add Languages section and save.	Languages data saved and displayed.	Languages section saved and displayed.	Pass
	Student tries to add language with an empty field.	Error message of required field shown.	Field is required error message shown.	Pass
Module	View and download CV			
Pre-requisite	Student is logged in successfully.			
Test case	**Test procedure**	**Expected result**	**Actual result**	**Pass/Fail**
View and download generated CV	Click on “View CV” button.	CV is displayed with all submitted details.	CV correctly displays all information.	Pass
	Click “Download CV” button to download as PDF.	CV is downloaded into the device in PDF format	PDF downloaded successfully	Pass
	1. Go to View CV without submitting any details 2. Try to download CV without data	System displays empty fields like, “No summary added”	Appropriate messaged displayed	Pass

Module	Search, save and apply for jobs			
Pre-requisite	Student is logged in successfully.			
Test case	**Test procedure**	**Expected result**	**Actual result**	**Pass/Fail**
Search jobs	1. Go to find jobs page. 2. Enter a job title in the search bar 3. Click search.	Jobs related to the keywords entered are listed on the page.	Relevant job listings displayed.	Pass
	Use the location field to find jobs based on desired location.	Only jobs with selected location will be displayed.	Relevant job listings displayed.	Pass
	Use the category dropdown to filter jobs.	Only jobs from selected category are displayed.	Category filter works correctly.	Pass
	Use the jobs type tick boxes	Jobs from selected job type will be displayed.	Job type filter works correctly.	Pass
View job details	Click on “Details” button to view description of job.	Redirect to the selected job details page.	Details page displayed successfully.	Pass
Apply for a job	Click on “Apply” button to apply for the job.	System confirms application and adds to student’s application list.	Application submitted and success message shown.	Pass
	Try to apply to the same job again.	System prevents reapplication and displays appropriate message.	Duplicate application blocked.	Pass
	Try to apply job without logging in.	The apply button is disabled, student must log in first.	Apply button is disabled and requires the student to login.	Pass

Save jobs	On the job details page, click the save bookmark icon.	The selected job appears on the Saved Jobs list.	Job successfully saved.	Pass
	Try to save the same job again.	Error message “You have already saved the job” shown.	Error message shown successfully.	Pass
Remove saved jobs	1. Go to the Saved Jobs page. 2. Click remove to unsaved the job.	Job is removed from the Saved Jobs list.	Jobs no longer appear under Saved Jobs.	Pass
Module	Review company			
Pre-requisite	Student is logged in successfully.			
Test case	**Test procedure**	**Expected result**	**Actual result**	**Pass/Fail**
Review company	1. Go to Companies page. 2. Seach for company name.	Redirect to company details page.	Company details page shown.	Pass
	Click the review company button.	Review form appears with fields for name, position, start rating, and text.	Review form displayed correctly.	Pass
	Fill in all fields with valid input and click “Submit Review”.	Review is submitted and appear on the company details page.	Review appears with correct information.	Pass
	Leave a required field empty and try to submit.	System show validation errors and prevents submission.	Validation works correctly and review is not submitted.	Pass
	Student clicks on the delete button for their own review.	Review is successfully deleted from the list and database.	Review is deleted and no longer available.	Pass

Module	View achievements			
Pre-requisite	Student is logged in successfully.			
Test case	**Test procedure**	**Expected result**	**Actual result**	**Pass/Fail**
Access achievements page	Clicks on “My achievements” from the navigation bar.	Redirected to the Achievements page.	Achievements page displayed successfully.	Pass
	Ensure student has completed actions to unlock certain achievements.	Unlocked achievements are displayed in full colour with relevant badges.	Unlocked achievements shown as expected.	Pass
	Check for achievements the student has not earned yet.	Locked achievements shown in grey or dimmed with no interaction.	Locked achievements shown in grey.	Pass
	Observe title section of student.	The student current title is displayed based on progress.	Title (example, “Beginner” is shown.	Pass

5.3.3 Functional Test Results of Modules for Employer

Table 5.3: Test Results of Modules for Employer

Module	Navigation bar			
Pre-requisite	Employer is logged in successfully.			
Test case	**Test procedure**	**Expected result**	**Actual result**	**Pass/Fail**
Verify that all navigation links function properly	Click on each navigation item, Home, Manage Jobs, and Profile.	Each link redirects to the correct page without error.	All links redirected correctly.	Pass
	Click the employer's name with dropdown button.	Profile and logout button shown.	Button function well.	Pass
	Click the logout button.	Employer is logged out and redirected to login page.	Logout works correctly and redirected to login.	Pass
Module	Post job			
Pre-requisite	Employer is logged in successfully.			
Test case	**Test procedure**	**Expected result**	**Actual result**	**Pass/Fail**
Post job	Go to "Post Job" page from sidebar.	Job posting form is displayed with all required fields.	Job posting form displayed correctly.	Pass
	Click "Submit" after filling in all required fields with valid input.	Job is successfully posted and appears in the job listings.	Job posted and listed correctly.	Pass

	Submit form with a required field left empty.	System shows validation error and prevents submission.	Validation works and job is not posted.	Pass
	Enter invalid data (example, past date as deadline).	System blocks submission and displays error messages.	Validation errors shown, submission prevented.	Pass
Module	View dashboard statistic			
Pre-requisite	Employer is logged in successfully.			
Test case	**Test procedure**	**Expected result**	**Actual result**	**Pass/Fail**
Access dashboard page	Check the statistic shown (example, jobs applied, posted, etc.).	Statistics are shown clearly and accurately.	Statistics displayed correctly.	Pass
	Hover to the view statistic bar graph.	Display the number of views for each month.	Bar graph displayed successfully.	Pass
	Hover to the job statistic pie chart.	Display statistic for job posts, total applications, accepted applications, and rejected applications.	Job statistic pie chart displayed successfully.	Pass
Module	View applicants			
Pre-requisite	Employer is logged in successfully.			
Test case	**Test procedure**	**Expected result**	**Actual result**	**Pass/Fail**
Access applicants list	Go to View Applications page and view applicants for selected job.	A list of applicants for the selected job is displayed.	Applicants list displayed correctly.	Pass

	View applicants' details (name, email, and applied date).	Applicant details are displayed clearly.	All details visible and accurate.	Pass
View and download applicant's CV	Click "View CV" button for an applicant.	Redirect to the selected applicant's CV.	CV displayed correctly.	Pass
	Click "Download CV" button in the resume view.	CV is downloaded into the device in PDF format.	CV downloaded successfully.	Pass
Action button	Click one of the action buttons (Accept / Reject / Interview) for an applicant.	Editable automated email contents are shown based on the selected action.	Correct email content displayed and sent.	Pass
Email notification	Perform Accept/Reject/Interview actions.	Corresponding email is sent to applicant.	Email received by applicant.	Pass
	Open "View Applicants" for a job with no applications yet.	Message like "No applicants yet." displayed	Empty state message shown.	Pass

5.4 Usability Testing

Usability testing was carried out to evaluate the effectiveness, efficiency, and user satisfaction of the SmartHire system. This process helped in identifying areas that needed improvement based on actual user feedback. The evaluation focused on key components including usability, functioning, interface design, and navigation flow from the perspective of the student and employer.

The usability testing was carried out using an online survey that was distributed to UNIMAS students and employer representative. The survey was designed to collect input on features such the dashboard interface, job application, job posting, and profile management after respondents interacted with the SmartHire system. It is also intended to provide insight into how users experience the system and whether its design and usability meet their expectations. Feedback was used to validate the system's objectives and ensure that it supports both students and employers effectively.

The consent form and the survey questions are as shown in Appendix C. Each participant must read and sign the consent form before starting answering the questionnaire. The survey was divided into two sections, one for employers and one for students to effectively gather feedback from each user role.

5.4.1 The Analysis for Usability Testing Via Online Survey

The online survey consists of three sections. Section A is the respondent's demographic information. Section B is the rating for system usability using the System Usability Scale (SUS). Meanwhile Section C is the overall user experience and suggestions for improvement. A total of thirty students and one employer representative participated in the online survey. Participants were required to first try out the SmartHire system using the link provided before answering the questionnaire. The survey responses were then collected and analysed to determine whether the proposed system meets its objectives in terms of functionality, usability, and user satisfaction. The link for the online survey is https://forms.gle/mJySsb69F9XQH27J8.

Section A: Demographic Form

Question 1: What is your gender?

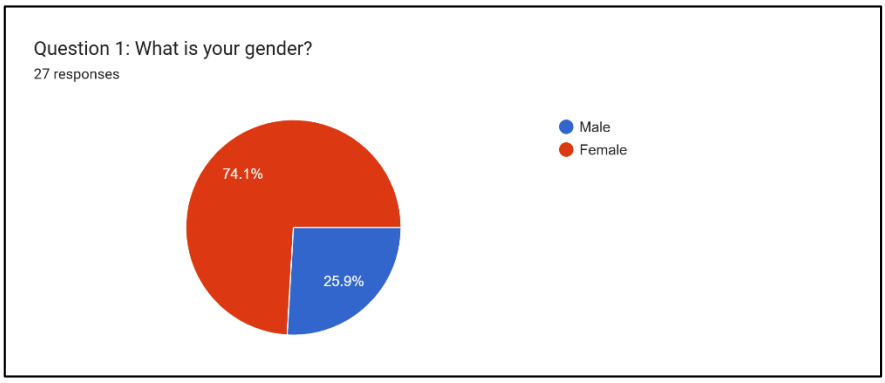

Figure 5.1: The gender of the respondents

Figure 5.1 shows the pie chart for the respondents' gender. Most of the respondents were female, which is 74.1%, while the remaining were male, making up 25.9%. In total, there were 20 female participants, and 7 male participants involved in the survey. There are more female respondents compared to female respondents.

Question 2: What is your age?

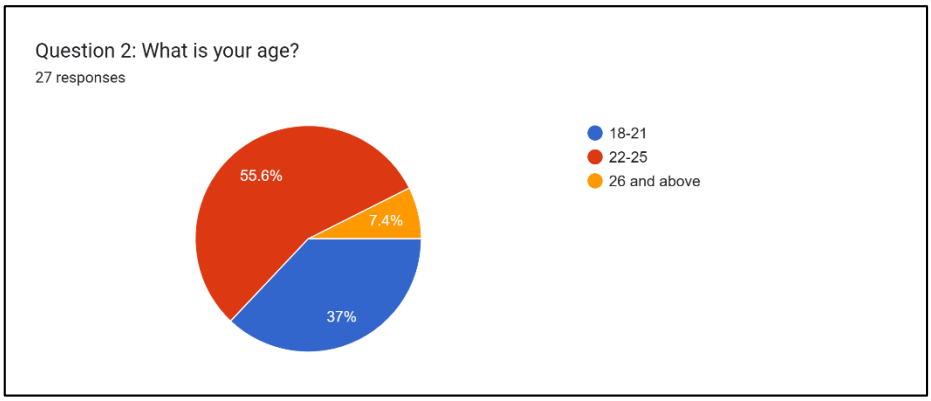

Figure 5.2: The age range of the respondents

Figure 5.2 shows the age range of the respondents. Most participants were within the 22 to 25 years age group, accounting for 55.6% of the total responses. This was followed by the 18 to 21 years age group (37%) and the above 26 years group (7.4%). Out of the 27 respondents, 2 were employers, both of whom fell within the [state their age group, e.g., above 23 years] category. The remaining 25 respondents were students, predominantly from the younger age groups.

Question 3: Please select your role while testing the system

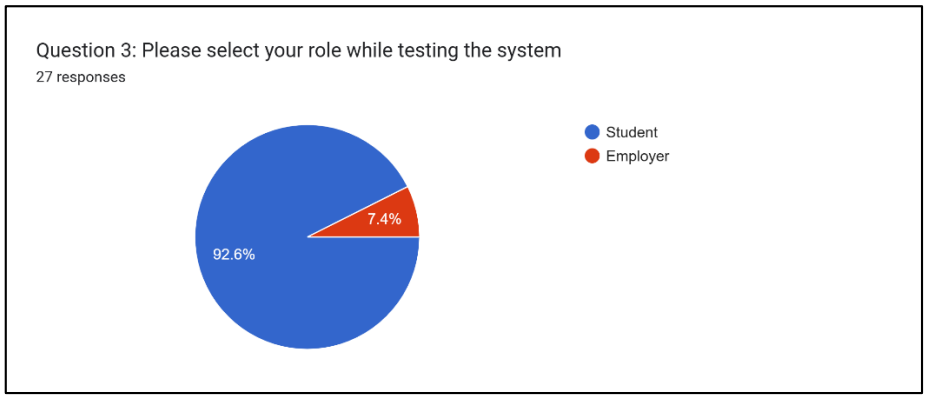

Figure 5.3: Role of the respondents while testing the system

Figure 5.3 shows the distribution of respondents based on their role while testing the system. Out of the 27 participants, the majority were students, making up 92.6% of the total respondents. In contrast, 2 participants identified themselves as employers, representing 7.4% of the overall group. This mix of roles ensures that feedback reflects both student and employer perspectives during the usability evaluation.

Section B: System Usability Scale (SUS) Evaluation

This section presents the results of the SUS questionnaire. It consists of 10 items rated on a 5-point Likert scale, ranging from 1 ("Strongly Disagree") to 5 ("Strongly Agree"). Table 5.4 shows the overall results of the ten questions for students and employers.

Table 5.4: Overall results of the ten questions of SUS

No	SUS question	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
1	I think that I would like to use this system frequently.	0	0	0	10	17
2	I thought the system was too complex.	17	6	1	1	2
3	I thought the system was easy to use.	0	0	0	3	24
4	I think that I would need help from technical person to be able to use this system.	16	6	2	2	1
5	I found the various function in this system were well integrated.	0	0	0	8	19
6	I thought there was too much inconsistency in this system.	16	8	0	2	1
7	I think that most people would learn to use this system very quickly.	0	0	0	5	22
8	I found the system very awkward to use.	18	6	2	1	0
9	I felt very confident using the system.	0	0	0	7	20
10	I needed to learn a lot of things before I could start using this system.	17	3	4	3	0

Table 5.5 shows the detailed SUS score calculation and grading for all 27 respondents. The table includes each participant's score for the 10 individual SUS items. These raw scores are based on their responses to the standard SUS questionnaire, which consists of five positively worded and five negatively worded items.

Column X shows the total scores from the odd-numbered items (SUS1, SUS3, SUS5, SUS7, SUS9), which are phrased positively. To calculate the SUS score, each of these values is subtract by 1. Therefore, since there are five items, total score in X should be minus by 5, and the final value is stored in column X0.

Meanwhile, column Y shows the total scores from even-numbered items (SUS2, SUS4, SUS6, SUS8, SUS10), which are phrased negatively. These scores are calculated using the formula 5 minus the original value, and then all five are summed. The result is obtained using the 25 minus the value in column Y, and this value is stored in column Y0.

To calculate the final SUS score for each respondent, adds the values in Column X0 and Column Y0 and multiplies the total by 2.5. This generates a score out of 100, which reflects the overall usability perception for each individual.

Finally, the Sauro-Lewis curved grading scale is used for evaluating the SUS scores by mapping score ranges to letter grades (e.g., A+, B, C−). The grading standards follow the usability guidelines proposed by Sauro and Lewis (2018) and were implemented in Excel for consistency and efficiency as shown in Figure 5.4.

```
=IF(P2>=84.1,"A+",IF(P2>=80.8,"A",IF(P2>=78.9,"A-",IF(P2>=
77.2,"B+",IF(P2>=74.1,"B",IF(P2>=72.6,"B-",IF(P2>=71.1,"C+",
IF(P2>=65,"C",IF(P2>=62.7,"C-",IF(P2>=51.7,"D","F")))))))))
```

Figure 5.4: Formula to identify the grade for the usability score in Excel

Table 5.5: The SUS scores and grades for all respondents

Respondent ID	SUS1	SUS2	SUS3	SUS4	SUS5	SUS6	SUS7	SUS8	SUS9	SUS10	X	Y	X0	Y0	SUS score	Grade
1	5	1	5	1	5	1	5	1	5	1	25	5	20	20	100	A+
2	5	1	5	1	5	1	4	1	5	1	24	5	19	20	97.5	A+
3	5	2	5	1	5	1	5	1	5	1	25	6	20	19	97.5	A+
4	5	2	4	2	5	2	5	2	4	3	23	11	18	14	80	A-
5	4	1	5	1	5	1	5	1	4	1	23	5	18	20	95	A+
6	5	1	5	1	4	1	5	1	5	3	24	7	19	18	92.5	A+
7	4	1	5	1	4	2	5	2	4	2	22	8	17	17	85	A+
8	4	2	5	2	4	2	5	2	4	1	22	9	17	16	82.5	A
9	5	1	5	1	5	1	5	1	5	1	25	5	20	20	100	A+
10	5	1	5	1	5	1	5	1	5	1	25	5	20	20	100	A+
11	4	2	5	1	4	2	4	2	4	2	21	9	16	16	80	A-
12	4	4	4	4	4	4	4	4	4	4	18	18	13	7	50	F
13	4	1	5	2	5	2	5	3	4	3	23	11	18	14	80	A-
14	4	1	5	2	5	2	5	1	5	1	24	7	19	18	92.5	A+
15	4	1	5	1	4	1	4	1	5	1	22	5	17	20	92.5	A+
16	5	1	5	1	5	1	5	1	5	1	25	5	20	20	100	A+
17	5	1	5	1	5	1	5	1	5	1	25	5	20	20	100	A+
18	4	1	5	1	5	1	5	1	5	1	24	5	19	20	97.5	A+
19	4	2	5	2	4	2	5	2	5	2	23	10	18	15	82.5	A
20	5	1	5	3	5	1	5	1	5	1	25	7	20	18	95	A+
21	5	2	5	2	5	2	5	1	5	1	25	8	20	17	92.5	A+
22	5	1	5	1	5	1	5	1	5	1	25	5	20	20	100	A+
23	5	1	5	1	5	1	5	1	5	1	25	5	20	20	100	A+
24	5	1	5	1	5	1	5	1	5	1	25	5	20	20	100	A+
25	5	3	4	5	4	4	4	2	5	4	22	18	17	7	60	D
26	5	5	5	3	5	5	5	3	5	4	25	20	20	5	62.5	D
27	5	5	5	5	5	1	5	1	5	3	25	15	20	10	75	B

Table 5.6 shows the summary of the overall SUS scores and their corresponding grades. The mean SUS score recorded was 88.52, indicating that the respondents considered the system as very user-friendly generally. The score places SmartHire above the industry average and reflects an excellent level of usability. A SUS score above 80 typically reflects a system that provides a superior user experience (Lewis and Sauro, 2018).

The standard deviation is 13.73267 which suggests that most users had similar perceptions of the system's usability, with only minor variations in individual experience. A lower standard deviation reflects consistency in feedback, indicating that the system is reliably usable to different users. The minimum SUS score was 50, while the maximum score reached the full value of 100, achieved by multiple respondents. This shows that while the system was exceptionally well-received overall, a small number of users encountered some usability challenges. These lower scores may be due to misunderstanding of certain negatively worded questions, inattentive responses, or differences in user expectations and experience.

Table 5.6: Summary of the SUS scores and grades

Summary of the mean, standard deviation, minimum, and maximum SUS score	
Mean	88.51582
Standard deviation	13.73267
Minimum score	50
Maximum score	100
Summary for SUS grade	
Grade	Frequency
A+	18
A	2
A-	3
B+	0
B	1
B-	0
C+	0
C	0
C-	0
D	2
F	1

Section C: Overall User Experience and Suggestion for System's Improvement

This section highlights the issues encountered by users in the SmartHire system and presents their suggestions for improvement.

Question 1: Did you encounter any bugs or technical issues? If yes, please describe them.

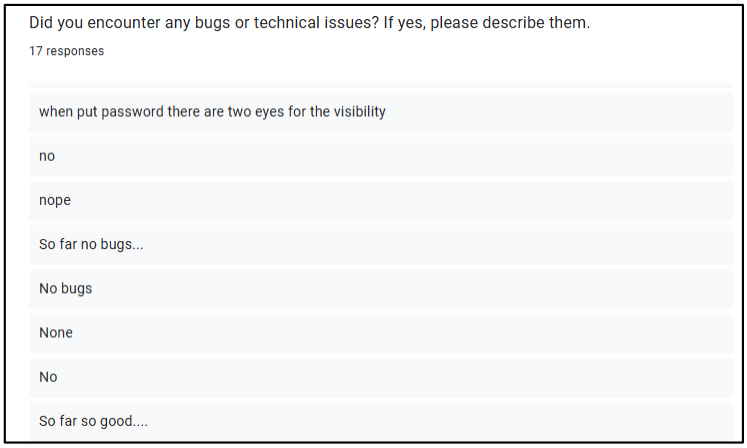

Figure 5.5: Issues encountered by users when using the system

Figure 5.5 shows the issues encountered by some users when using the system. Although the overall usability feedback was positive, some users reported minor issues during their interaction with SmartHire. Even though they are not serious problems, these indicate places that need further refinement to improve the overall user experience.

Question 2: Do you have any suggestions to improve the system?

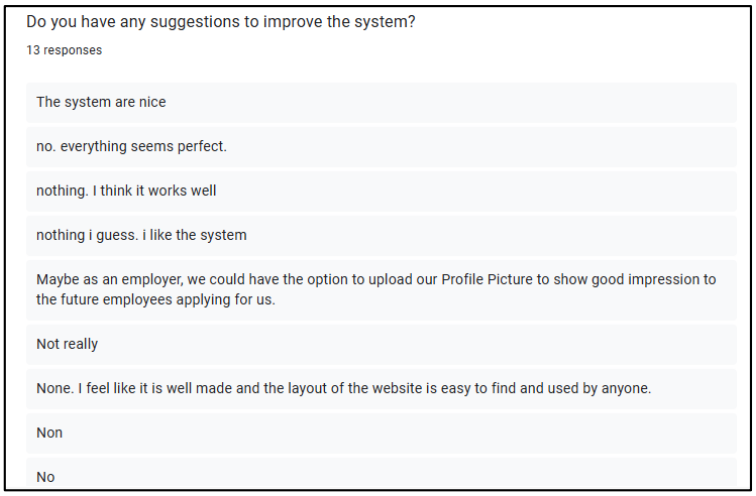

Figure 5.6: Users suggestions to improve SmartHire

Figure 5.6 shows the suggestions provided by respondents to enhance the system. The majority of participants expressed satisfaction with the system and commented that it was well-designed, easy to use, and visually clear. Meanwhile, some helpful suggestions were shared. Implementing these suggestions could further improve usability and ensure that the system better aligns with user expectations in future iterations.

5.5 Summary

This chapter discussed the SmartHire system's testing phase, focusing both usability and functional testing. Functional testing was carried out using test cases to ensure that key features, including applicant management, dashboard statistics, CV generation, job posting, and job application, work as expected. Every test case was documented with precise test procedure, expected results, and actual results, demonstrating that the system functions well under different input conditions.

Usability testing was conducted through online survey involving UNIMAS student and an employer. The goal was to evaluate the system's overall user experience, interface design, and ease of use. The feedback gathered indicated that SmartHire is user-friendly, intuitive, and helpful in supporting the employment process for both students and employers. Minor suggestions were received for future improvement.

CHAPTER 6: CONCLUSION AND FUTURE WORKS

6.1 Introduction

Chapter 6 describes the project's conclusion including a detailed assessment of objective achievements, project limitations, and future works of the SmartHire Part-Time Job Portal System for students. The main objectives are analysed in the objective achievements section to determine if each goal has been successfully met and in line with the user requirements and expectations. This assessment is important for understanding the system's overall performance and how well it achieves the specified requirements needs.

In addition, the limitation of the project is also discussed to highlight the constraints and challenges encountered during development. It's essential to acknowledge these limitations in order to identify areas that require further system improvement. Lastly, the future work section presents additional features and improvements that could be added to the system to increase its functionality and ensure its ongoing usability and relevance.

6.2 Objective Achievements

This section includes an evaluation of the project objectives for the SmartHire Part-Time Job Portal System. Every objective is evaluated based on its level of accomplishment throughout the development process. Table 6.1 provides an overview of each objective's achievements based on features that have been implemented and feedback from usability testing.

Table 6.1: Objective Achievements

Objective	**Achievement**
To design a user-friendly web-based system for students to find and apply for part-time jobs.	This objective has been achieved. Based on usability testing discussed in Chapter 5, most student respondents agreed that the system is easy to navigate, visually consistent, and intuitive. The SmartHire platform enables users to search and apply for jobs easily through categorized listings, job filters, and an organized application interface.
To develop a system with features such as badges and ranking systems to encourage student engagement and regular use of the platform.	Gamification elements like achievement badges and ranking levels are successfully included into the system. Students receive badges when completing specific milestones, such as submitting a job application or uploading their resume. During testing, these features were well accepted, and many students stated being inspired to use the platform more and explore it further.
To evaluate the usability of the SmartHire Part-Time Job System for both students and employers.	Usability testing was conducted involving both students and employers. Surveys on system performance, user-friendliness, and satisfaction were carried out by participants. High levels of satisfaction were discovered in both groups, which suggests that the system satisfies essential user requirements. Minor interface improvements were made as a result of the feedback gathered, which also confirmed that the system was ready for real-world use.

6.3 Project Limitations

The SmartHire system was developed and implemented successfully, however there were several limitations that were encountered during the project. Identifying these constraints is important for understanding current weaknesses and guiding future improvements. The limitations for SmartHire are as follows:

1. No mobile application. The system was created as a web-based platform designed for desktop and mobile browsers, but it does not include a specific mobile application. A native app could improve accessibility and convenience, especially for students who prefer using mobile devices.
2. Lack of real-time chat or messaging feature. The current version of SmartHire does not include a real-time communication feature between students and employers. This limits immediate reaction between both students and employers, such as follow-up questions or scheduling interviews. Integrating a chat or messaging function would enhance user engagement and improve communication efficiency on the platform.
3. No real-time notification alert system. Currently, SmartHire displays new notifications by updating the notification count icon, but it lacks real-time alert mechanisms such as pop-up notification, sound effects, or on-screen prompts. Users may overlook important updates, such as receiving a new badge or a status of their applications. Adding real-time visual or audio alerts to the notification system will improve user awareness and overall responsiveness.

6.4 Future Work

Several areas have been identified for future SmartHire system improvements based on limitations discovered and feedback received during testing. These improvements aim to facilitate long-term sustainability and scalability, increase user satisfaction, and expand the system's functionality. The future work to strengthen SmartHire are as follows:

1. Developing a native mobile application. A dedicated mobile application for the iOS and Android platforms could be developed to improve accessibility and usability, especially for students who are frequently on the go. A native app would provide a smoother and engaging user experience compared to the current mobile browser version.

2. Integrating a real-time chat system. To enhance communication between students and employers, SmartHire could include a real-time messaging feature so students and employers can communicate directly through the system. This would make it easier for them to ask questions, give updates, or arrange interviews without needing to leave the platform or use other apps like email.
3. Improve the notification system with alerts to ensure users are aware of important updates. The system could include pop-up messages or sound alerts when there is something important like a new badge or application update. This would help users notice updates right away and respond more quickly.
4. Implementing employer-side PDF report generation with statistical insights. A reporting feature could be added for employers to generate downloadable PDF reports containing relevant statistics such as the total job posted, total applicants, and total reviews. This feature would help employers track statistics, evaluate recruitment performance, and support decision-making processes.

6.5 Summary

In conclusion, this chapter has provided the evaluation results on the SmartHire system based on the project's objectives and user feedback. The system successfully achieved its main objective providing a functional and user-friendly part-time job platform tailored for students. With features such as CV generation, job application tracking, and company reviews, SmartHire provides a smooth and intuitive experience for both students and employers.

The usability testing, carried out using the System Usability Scale (SUS), reflected a strong positive response from users. Most respondents gave excellent scores, suggesting that the platform is easy to use and meets user expectations. At the same time, several system limitations were identified, including the lack of a dedicated mobile application, no real-time chat function, and limited notification alerts.

These limitations provide helpful recommendations for future development. Improvements such as adding a mobile app, integrating a messaging feature, and enhancing the notification system with real-time alerts will not only boost usability but also create a more responsive and engaging experience for users. Overall, SmartHire has established a strong foundation and shows strong potential for further enhancement and growth.

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APPENDIX A

Student Experience Survey: Enhancing SmartHire - A Part-Time Job Portal for Students"

Thank you for participating in this survey! This survey is part of a final year project titled *"SmartHire: A Dynamic Part-Time Job Portal System for Student Employment,"* which seeks to gather insights from students to help develop a platform specifically tailored for student job seekers. Your feedback will help shape the features and functionality of the platform, ensuring it meets your needs and preferences. The survey will take about 3-4 minutes to complete, and all responses will be kept confidential and used only for research purposes related to this project.

By continuing with the survey, you consent to participate. Participation is voluntary, and you may withdraw at any time without any consequences. If you have any questions, feel free to contact me, Nurshahira binti Nabi at 80800@siswa.unimas.my, a final-year student from the Faculty of Computer Science and Information Technology, Universiti Malaysia Sarawak.

xxshahira02@gmail.com Switch accounts

Not shared

* Indicates required question

Participant Consent *

By continuing with this survey, I confirm that I understand the purpose of this study and voluntarily agree to participate.

☐ Yes

Next

Clear form

Section A: Demographic Information

What is your age? *

- Below 18
- 18-21
- 22-25
- 26 and above

What is your gender? *

- Male
- Female

What is your current year of study? *

Choose

This is a required question

Do you have previous part-time job experience? *

- Yes
- No

Back Next Clear form

Section B: Student Preferences for Part-Time Job Portals

How do you currently search for part-time job opportunities? (Choose all that apply) *

- [ ] Job portals (e.g., Indeed, JobStreet)
- [ ] University career services
- [ ] Social media platforms (e.g., LinkedIn, Facebook groups)
- [ ] Personal network (friends, family)
- [ ] Other: _____

What features you think are most important when using a job portal to find part-time work? (Choose all that apply)

- [ ] Job search filters (location, salary, job type)
- [ ] Resume/CV upload functionality
- [ ] Employer reviews or ratings
- [ ] Application tracking system
- [ ] Gamification (badges, rankings, etc.)
- [ ] Ease of use and navigation

Would you be more motivated to use a job portal if it included gamified features, like earning badges for completing tasks or achieving high ratings? *

- ○ Yes
- ○ No
- ○ Maybe
- ○ Not sure

Would you use a platform that tracks your progress, provides performance feedback, and lets you showcase your achievements? *

- ○ Yes
- ○ No
- ○ Maybe

Do you prefer job portals that also offer training or skill-building resources to help you improve your employability? *

- ○ Yes
- ○ No
- ○ Maybe

How often do you visit job portals to look for part-time job opportunities? *

	1	2	3	4	5	
Never	○	○	○	○	○	Very Often

How easy is it for you to find relevant part-time jobs on current platforms? *

	1	2	3	4	5	
Very Difficult	○	○	○	○	○	Very Easy

How important is it for you to be able to track your job application status and progress on a job portal? *

	1	2	3	4	5	
Not Important	○	○	○	○	○	Very Important

How useful do you think a performance feedback system (ratings, reviews) would be on a job portal? *

	1	2	3	4	5	
Not Useful	○	○	○	○	○	Very Useful

What additional information do you think would make your profile stand out when applying for a job? *

- ☐ Education and academic performance
- ☐ Skills and certifications
- ☐ Previous work experience
- ☐ Personal interests and hobbies
- ☐ Availability (working hours)
- ☐ Other: _____

What additional information would you like employers to include in their job postings?

Your answer

Do you have any suggestions for improving the job search experience for students on online platforms? *

Your answer

Back | Submit | Clear form

APPENDIX B

Participant Consent Form for Interview

Study Title: *SmartHire: A Dynamic Part-Time Job Portal System for Student Employment*
Researcher: Nurshahira binti Nabi
Supervisor: Dr Amelia Jati anak Robert Jupit
Institution: Universiti Malaysia Sarawak (UNIMAS)

Purpose of the Study:
The purpose of this study is to gather insights and feedback regarding the development of the SmartHire platform, a part-time job portal system for students. Your participation will help in understanding employer needs and improving the features of the platform.

Voluntary Participation:
Your participation in this interview is entirely voluntary. You have the right to refuse to answer any question or withdraw from the interview at any time without any consequences.

Data Privacy and Confidentiality:

- The data collected during the interview will be kept anonymous and confidential.
- Your responses will not be linked to your personal information or identity in any way.
- The interview may be recorded for research purposes. These recordings will be securely stored and used only for data analysis.
- The data may be used for analysis, reporting, and may be published in academic reports and journals, but your identity will not be revealed, ensuring that you cannot be identified from the published data.

Duration of the Interview:
The interview will take approximately 20-30 minutes.

Consent:
☑ I have read the information above and agree to participate in the study.

Participant Name: MUHAMMAD YAZID BIN MOHD RIZMAN CLEMENT

Signature: _____

Date: 23 DECEMBER 2024

Contact Information:
If you have any questions or concerns regarding this study, please feel free to contact me at 01112077125 or email at xxshahira02@gmail.com.

Participant Consent Form for Interview

Study Title: *SmartHire: A Dynamic Part-Time Job Portal System for Student Employment*
Researcher: Nurshahira binti Nabi
Supervisor: Dr Amelia Jati anak Robert Jupit
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- The data collected during the interview will be kept anonymous and confidential.
- Your responses will not be linked to your personal information or identity in any way.
- The interview may be recorded for research purposes. These recordings will be securely stored and used only for data analysis.
- The data may be used for analysis, reporting, and may be published in academic reports and journals, but your identity will not be revealed, ensuring that you cannot be identified from the published data.

Duration of the Interview:
The interview will take approximately 20-30 minutes.

Consent:
☑ I have read the information above and agree to participate in the study.

Participant Name: Haziq Nikman bin Hartika

Signature: _____

Date: 27 December 2024

Contact Information:
If you have any questions or concerns regarding this study, please feel free to contact me at 01112077125 or email at xxshahira02@gmail.com.

APPENDIX C

Student Experience Survey: Enhancing SmartHire - A Part-Time Job Portal for Students"

This questionnaire is part of a Final Year Project aimed at evaluating and enhancing SmartHire, a part-time job portal designed specifically for students. The system is still under development, and your feedback is valuable in helping to improve its functionality, design, and overall user experience.
The survey is divided into the following sections:

Section A - Demographic Information
Section B - System Usability Scale (SUS) Evaluation
Section C - Overall User Experience and Suggestions

All responses will remain confidential and will be used solely for academic and improvement purposes. Your honest input is highly appreciated!

xxshahira02@gmail.com Switch accounts

Not shared

* Indicates required question

Participant Consent *

By continuing with this survey, I confirm that I understand the purpose of this study and voluntarily agree to participate.

☑ Yes

Next Clear form

Never submit passwords through Google Forms.

Section A: Demographic Form

Question 1: What is your gender? *

- Male
- Female

Question 2: What is your age? *

- 18-21
- 22-25
- 26 and above

Question 3: Please select your role while testing the system *

- Student
- Employer

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Section B: System Usability Scale (SUS) Evaluation

The following 10 statements are part of the standard System Usability Scale (SUS). Please indicate how much you agree or disagree with each statement based on your experience using the system.

I think that I would like to use this system frequently. *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

I thought the system was too complex. *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

I thought the system was easy to use. *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

I think that I would need help from technical person to be able to use this system. *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

I found the various function in this system were well integrated. *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

I thought there was too much inconsistency in this system. *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

I think that most people would learn to use this system very quickly. *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

I found the system very awkward to use. *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

I felt very confident using the system. *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

I needed to learn a lot of things before I could start using this system. *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

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