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[DECLARATION I hereby declare that this project report is based on my original work except for citations and quotations which have been duly acknowledged. I also declare that it has not been previously and concurrently submitted for any other degree or award at UTAR or other institutions. Signature : Name : Chua Chang Chyuan ID No. : 1400230](#)

Date : 04 April 2019 iii APPROVAL FOR SUBMISSION I certify that this project report entitled "CAMPUS RECRUITMENT SYSTEM" was prepared by CHUA CHANG CHYUAN has met the required standard for submission in partial fulfilment of the requirements for the award of Bachelor of Science (Hons.) Software Engineering at Universiti Tunku Abdul Rahman. Approved by, Signature : Supervisor : Date : Dr. Farizuwana Akma Binti Zulkifle 05 April 2019 Signature : Co-Supervisor : Date : iv The copyright of this report belongs to the author under the terms of the copyright Act 1987 as qualified by Intellectual Property Policy of Universiti Tunku Abdul Rahman. Due acknowledgement shall always be made of the use of any material contained in, or derived from, this report. © 2019, Chua Chang Chyuan. All right reserved. v ABSTRACT Industrial training is an opportunity to allow students to be involved in the industry field before they finish their study and graduate. Every year during the short trimester, students from Universiti Tunku Abdul Rahman will undergo the internship training. Before the industrial training, there are several processes that need to be done in order to get placement approval which involved attending the internship briefing, manually send application to apply for job, attend interview session and lastly received offer letter from the company. Hence, a web-application system was developed as the proposed solution to solve the current problem and shorten the process for industrial training. The system will help to shorten the amount of time and process for student to get the placement. Besides, this system also allowed admin user such as placement officer, industrial training coordinator and university staff to monitor the student placement status as well as their internship company. Other than that, employers that wish to recruit students from Universiti Tunku Abdul Rahman can easily join the platform and post job vacancy. By developing this system, multiple issues can be easily solved in the current workflow for industrial training. vi TABLE OF CONTENTS DECLARATION APPROVAL FOR SUBMISSION ABSTRACT TABLE OF CONTENTS LIST OF TABLES LIST OF FIGURES LIST OF SYMBOLS / ABBREVIATIONS LIST OF APPENDICES ii iii v vi x xi xiv xv CHAPTER 1 INTRODUCTION 1.1 Introduction 1. 2 Background of The Problem 1. 3 Problem Statement 1.4 Project Objectives 1.5 Proposed Solutions 1.6 Proposed Approach 1.7 Scope 16 16 17 18 19 20 21 24 2 LITERATURE REVIEW 2.1 Introduction 2.2 Similar Web Applications Study and Evaluation 2.2.1 JobStreet 2.2.2 LinkedIn 2.2.3 Indeed 2.2.4 Similar System Comparison Matrix 2.2.5 Conclusion 26 26 26 26 29 31 33 33 2.3 Methodology Comparison 2.3.1 Waterfall Model 2.3.2 Agile Methodology 2.3.3 Prototyping 2.3.4 Comparison of system development matrix 2.3.5 Conclusion vii 33 34 35 37 39 40 3 METHODOLOGY AND WORK PLAN 3.1 Introduction 3.2 Requirement Gathering 3.2.1 Quantitative Research 3.2.2 Qualitative Research 3.2.3 Literature Review 3.2.4 Prepare Use Case Diagram 3.2.5 Prepare Use Case Description 3.3 Iteration 3.3.1 Phase 1 3.3.2 Phase 2 3.4 Development 3.5 3.4.1 3.4.2 3.4.3 Testing 3.5.1 3.5.2 3.5.3 Integrate Scope Develop product Development Tools Perform Unit Test Perform integration test Perform user acceptance test 3.6 Roll Out 3.6.1 Prepare final report 3.6.2 Prepare presentation 41 41 41 41 41 42 42 42 42 42 43 43 43 44 44 45 45 45 45 46 46 46 4 PROJECT INITIAL SPECIFICATION 47 4.1 Functional Requirements 47 4.1.1 Functional Requirements for Student 47 4.1.2 Functional Requirements for Employer 4.1.3 Functional Requirements for Admin 4.2 Non -Functional Requirements 4.3 Use Case Diagram 4.4 Use Case Description 4.5 Fact Findings viii 47 47 48 49 50 55 5 SOFTWARE DESIGN 5.1 Introduction 5.2 User Interface (UI) Design 5.2.1 Login Module 5.2.2 Search Module 5.2.3 View Job Page 5.2.4 Update profile page 5. 2.5 Create New Job Page 5.2.6 Manage employer and student profile page 63 63 63 63 64 65 66 67 68 5.3 68 System Design



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## INTRODUCTION

### 1.1 Introduction

As the advancement of internet and information technologies, the web-based application become useful in minimizing time and distance to travel, increase efficiency for data processing and also data storage. In recent years, the web-based application has become a demand in information technology industry. Every year, industrial training programme have given student the opportunity to explore the world outside the university before they graduate. In Universiti Tunku Abdul Rahman (UTAR) such opportunity is given to those who are in final year. Since the current practices are still using manual technique, these had caused the increase of workload to university staff to manage the student placement information with increase numbers of students joining UTAR every year. Without a proper platform for students to apply for job posting, some problems have arisen which causing troubles to students and university staffs. Some of the problems are identified through direct observation and also personal experience as a student. To further reveal the problems, a survey to a target group of 30 students has been carried out to support the problem statements. Through the direct observation and survey, the problems such as lack of platform, students unable to obtain the application status and also current manual practices that causes the industrial training process to be a difficult task. In order to solve the problems, the proposed solution to overcome this is to develop a system for campus recruitment. This system is a web-based application system which allow students to access it and perform application for industrial training. This system also allowed the UTAR staff to easily manage students profile and their placement information in order to keep track their record efficiently. Other than that, Laravel framework was used as the tool to develop this web- based application with MySQL that worked as the database. The system allowed all the information of admins, students and employers to stored inside in the database. The suitable methodology used for the development of this project is prototyping model.

### 1.2 Background of The Problem

Entering the 21st Century, evolution of storing information have went from paperwork to digitalized documentation. In recent years, advancement of internet technology has allowed peoples to save time and paperwork by using a web-based system that able to provide information and services to the users. From traditional handwritten documentation to digitalized documentation, online application not only help to save time and travel distance, it also helps the user to maintain and manage data easier. With web-based applications, every data entered is stored inside a server or database which allowed the users to easily retrieve it when needed. In this university, the current manual technique for student to apply for industrial training has been a difficult and time-consuming task. From the process of apply for jobs through paperwork, email application until get employed, it required a long process and manual submission of application forms to Industrial Training coordinator, employer and interviewer. Due to the lack of a portal or platform for placements, students cannot directly send their internship application to the employers. Thus, this required numerous steps from applying for jobs until getting employed. During this process, some of the students will have to wait for a long period of time before they can get the reply from the employer. Some might never get any reply from them. There are some employers tend to delay jobseeker's application without giving any notice about their application status. Other than that, the current process of internship in UTAR is considered manual technique. The UTAR staff have to manually enter student information such as their placement



information to the database for record. For the employer that wish to recruit UTAR students to join their company, they will have to send their information and vacancy notice the UTAR staff, lecturers or Head of Department (HOD) so that the notice for available job vacancy will be passed to the student. There are few problems in current practice which will cause: 1. The increase of workload for the process of students to go placements increase corresponding to increase number students joining UTAR every year. 2. Missed out student placement information. 3. Students might not be able to get notification for internship. 4. Students might get postponed in order to join internship programme. 5. Students might miss the chance to join their first-choice company for placements. 6. Employers might miss out the details about vacancy which they wish to pass to the students. Industrial Training Programme is a very good opportunity for students to get to know about the outside world of university. It gives the student an impression of what kind of jobs they are looking for or which company they want to join after they graduated later. It is a must attend opportunity that student must not missed out before finished their study. Thus, it is important to have a platform for the students to able to join internship programme while having the UTAR staff as admins to manage student profile efficiently.

**1.3 Problem Statement** In this project, there were several problems that had been identified. These problems had been found by direct observations, survey to the targeted group and personal experience as a student in UTAR. These problems had occurred since the beginning and happened every time when students looking for job applications.

1. Universiti does not have a platform for job or internship applications Currently, UTAR does not have a job portal for students and graduates to directly interact with employers for jobs applications. Students that are going for internship have to apply for jobs through third party job portal such as Jobstreet, Linkedin or Indeed. Although these job portals do help to ease jobseeker to find jobs, but they are not under control by UTAR and the UTAR staff are able to keep track of their students through this job portal. Besides, companies that wish to recruit UTAR student to join their company will have to post their job vacancies advertisement through UTAR Alumni Portal which will linked directly to third party job portals.

2. Unable to acquire the status for jobs applications Other than that, when students apply for internships, some employers tend to delay in replying the student applications. Some of the students have wait for some time without getting to know about the status for their internship applications. They are few cases where the student did not receive the email until the due date to submit their placement form. For this situation, student might miss their chance to get into the company they want based on their field on interest.

3. Manual system Due to lack of existing system for job applications in UTAR, the university staff have to collect student placements information manually through Google Forms or by paperwork. After gathering the information submitted by the students, UTAR staffs will have to manually enter the student information into the database.

**1.4 Project Objectives** One of [the objectives](#) for [this project](#) was [to](#) conduct a survey by using questionnaires to gather information. This survey was to identify the problems faced by students in UTAR especially final year students that were going for internship and also graduates. This method was used to support the problems statements that had been identified in this project. Besides that, the next objective was to conduct literature reviews on similar system. By using this method, the background for this project can be identified. Conducting literature review can also help to collect information about the similar system and how the project can be developed. Other than that, the following objective is to evaluate the system after development. The

developed product had gone through some testing before the final roll out. Few users had been invited to perform the user's acceptance testing in order to get the feedback and suggestion for improvement of user interface. Besides, proper validation and unit testing had been conducted to prevent system crashing during the runtime. Finally, the last objective is to develop a web-based application system for the campus recruitment. By developing a campus recruitment system, it will eventually help to save students time and effort for job posting. This system helped to save the workload of UTAR staff to manually manage the students and employer information.

1.5 Proposed Solutions In order to overcome the problems during the job posting, a web-based online system named as campus recruitment system was developed as a proposed solution. This system will solve most of the problems currently faced by UTAR students and staffs. This proposed system will have following features and functions such as:

1. Allows students and employers to directly interact with each other Student no longer need to personally apply for industrial training through personal email or through third party job portal. By using this system, students can select the company based on the suggested list and directly apply for job posting. Student are able to view the company profile and types of position the companies are recruiting. Besides, employers can review student profile with the cover letters and resume attached after the student submit their application. If the students have questions to ask the employers, they can directly send an enquiry message to them. These features allowed the students and employers to interact directly with each other easier.
2. Allows student to know about their application status faster After submissions of applications, the employers are given a certain period of time to reply the students. When the company is reviewing the student applications, the status of application will change from "Submitted" to "Reviewed". If the employers decide to interview the students, the status will change to "Interview" and the employers can send a message to the students to let them know about time and location. When the employers decide to hire the students, application status will change to "Approved" with offer letters send. The students can choose to accept to reject company offer as well as the employers to reject student application. With these features, the acknowledgement of status for job application will become faster and convenient for both student and employer.
3. Allows employers to recruit intern easier For the employer that wish to recruit UTAR students to join their company, they can post a notice about the vacancies through the Campus Recruitment System. They can post about their requirement, position offered directly through this system instead of posting the notice in faculty's website or UTAR WBLE.
4. Allows UTAR staff to manage the portal This feature allowed UTAR staff such as Industrial Training Coordinator to login as administrator to manage students and employer profile easily. The administrators able to blacklist certain companies that violated the rules set by UTAR. For the students that have not submit complete information for internship, the admin can restrict them to apply for internship as well as those employers that do not disclose enough information about their company, the admin can reject their application to join the portal.

1.6 Proposed Approach Prototyping model was used as the proposed methodology for this project since [there is no existing system to help determine the](#) requirement. [The prototype model is](#) useful for developing this system as the system is an online web-based application that having high-level interactions with users (Tutorials Point, 2018). Since, the requirements for this project is not clear, then the prototyping model is suitable to understand the user requirement (Thakur D., n.d.). Before the designing phase, the system prototype was developed, tested and reviewed

by users repeatedly until a final prototype produced. Requirement Gathering Quick Design Building Prototype Redefine prototype User Evaluation Development Testing Roll out [Figure 1](#). 1: [Shows the workflow of the prototyping model](#) Workflow for implementing [the system](#). 1. Requirements gathering and analysis: This step required analysis and requirements of the systems which defined in detail through the direct observation, research on similar system and survey with approximately 30 students from UTAR, an early stage of paper-based prototype design is produced. 2. Quick design: Since the requirements were known, an early design for the system was produced. The design was just an illustration for the system and it is not a complete design. It had only limited design and important aspects of the system in order to shows the user an idea of the systems. This helped to further develop the system. 3. Build prototype: An early stage prototype was created to show the basic features and functions of the system after the paper-based of quick design produced. This prototype model was based on the quick design in order to represent the [working model of the system](#). 4. [User evaluation: Next, the prototype system](#) was sent [to the user for evaluation](#) in order [to](#) allow them to understand more about how the system work. This gave the users an idea of which features should be added or removed so that the system will be more user-friendly. Feedbacks of the system with suggestion for modification from users were collected and sent to the developers. 5. Refining prototype: After user evaluation done, the current prototype was redefined to fit the user requirements based on feedback and suggestion given during the evaluation. When the modification of the prototype system completed, the modified prototype was sent to the user for another evaluation in order to obtain further information, feedback and suggestion provided by the user. Then, the new prototype system was redefined again based on new additional information received. This process continued until all requirements were done with user satisfaction of the system. As this step end, it continued with the delivery of final system. 6. Testing: Testing had been done on the final system before delivering the final product. There were several tests such as unit testing, integration testing and user acceptance testing that had been carried out before final roll out. 7. Roll out: The final system was delivered after all the requirements and satisfaction met. The final system was evaluated thoroughly with routine maintenance to prevent major error, bugs and failures during the operation. Prototype model is useful in this case as the understanding of the system was unclear and likely to change at the beginning. Besides, the prototype model had underwent several times of redefining process in order to get enough satisfaction and requirements from users. This actually helped the users to understand about the system and at the same time, allowed developer to understand users' requirements based on their comments and suggestion. All these comments, feedback, suggestions and requirements were useful in developing a final quality system (Thakur D., n.d.). 1.7 Scope As the proposed solution to solve the problems was to develop a system for the campus recruitment, therefore the system is an online web-based application which allowed students and employers to register to use the portal and also allowed UTAR staff as admin to manage it. This application was developed using Laravel framework and MySQL as the database to store all users' information. Since the system is still in early stage of prototyping, the target users are only usable to: 1. UTAR Department of Internet Engineering and Computer Science (DIECS) students - Students were able to use the system - Students were able to edit their profile - Students were able to upload their e-resume - Students were able to view the employer and company profile - Students were able to send application to the employer for job posting - Students were able to

send messages to the employer for more enquiry 2. UTAR staffs - UTAR staffs were able to log in to the system as admin - UTAR staffs were able to review all students' and employers' profile - UTAR staffs were able to manage all students' and employers' profile - UTAR staffs were able to view job application list submit by students to employers. - UTAR staffs were able to remove students and employers as users 3. Employers from various company - Employers were able to log in as company representative. - Employers were able to edit their profile - Employers were able to post notice for job vacancy - Employers were able to view the students' profile - Employers were able to reject the students' applications for job vacancy - Employers were able to reply students' messages for enquiry - Employers were able to send offer letter to the student - Employers were able to update the application status when a student apply for job posting. Currently, the system only limited to the students from UTAR DIECS to access it while Industrial Training coordinator as admin to control students' and employers' profile. For the system feature, it filtered the information to match students' field of interest selected by the student. If the students are looking for software engineering internship, the system only show notices and list about internship posted by IT companies. Besides, when a student applied for internship to a company, the system sent a message to the employers for acknowledgement. When the employers updated the application for the student, the system sent a message to the students to notify and remind them about the status of application. Other than that, the system allowed admin to manage the system. Admins are allowed to block the active status of students and employers. The system also allowed admins to remove any students or employers profile.

## 2. LITERATURE REVIEW

### 2.1 Introduction

There are 3 similar system which are widely known by most of the jobseekers that help them to look for jobs. These systems had been studied and analyse to discuss about their features which will be useful to the campus recruitment system.

### 2.2 Similar Web Applications Study and Evaluation

#### 2.2.1 JobStreet

Figure 2.1: JobStreet Job Portal

##### 2.2.1.1 Main features of jobstreet

1. Search Engine Jobstreet provides a search engine for user to search for related jobs the user wants. User can edit the search criteria to look for a more specific job types or skills. If the user wants to find a specific company, he or she can choose to company profiles tab to find the company.
2. Registration Job seeker and employer are able to register an account in the system. This allow them to search or post job. For jobseeker, after they sign up an account, they are able to login with their account email and password. After that, they are able to upload resume to their profile when they want to apply for job. For employers, they can register an account to allow themselves to login and post job.
3. Job Applications status After an application was sent to the employer, the application status tab will appear to allow user to view it. Any progress make by the employer will show to user such as actively processing, stop processing, candidate not suitable, withdraw or accepted. This will let the applicants to know about the current processing status by employer.
4. Interview status When the employer wants to interview the applicant, the interviews tab will show to allow applicant to check and reply the interview invitations. There are there options to allow user to choose to reply the employers which is accept, decline and time not suitable. When user click on time not suitable button, it will let user to enter the suitable to be send back to the employer.
5. Profile When searching for jobs, user can view the company's profile to check about company's details, such as the size, dress code, benefits, working hours and contact. User can also check and wrote the reviews about the company.
6. Notifications After register an account in JobStreet, the system will send message notification through email to the

users. Any updates and job alerts will be send to the users to notify them such as interview invitations, job offer acceptance email, profiles view by employers and also any profile update by user.

### 2.2.1.2 Evaluation on JobStreet.com

JobStreet is a job portal that allows job seeker or employers to search or post job. In order to use the job portal, users have to sign up an account by using email address or Facebook link account. An email verification will send to user's email and have to be verified in order to proceed next step of setting up user profile. After finish set up the profile, users can proceed to use the job portal. There are few features in this system and one of the best is the applications status feature. It allows the applicants to acknowledge about the application process status by the employers. This will allow the user to decide whether to wait for the employers to reply or they should move forward to look for other company. Besides the applications status features, the interview invitation features is very good as it can let user to reply the invitations send by employers. User can choose to accept or decline the interview. The time not suitable option can allow user to reschedule another time for interview appointment which is a very recommended feature in this system. In conclusion, some of the features from JobStreet.com can be used in the job portal system. The applications status and interview invitations features are preferred to be implemented in the online campus recruitment system. These two features will allow students to easily keep track about the processing status of the employer.

### 2.2.2 LinkedIn

#### Figure 2.2: LinkedIn Job Portal

#### 2.2.2.1 Main features of LinkedIn

1. Sign Up In order to use LinkedIn job portal, the users are required to register an account in the system. Without login to the system, users are unable to access it and use other features.
2. Search Engine Once system login to the system, user able to perform search function to look for individuals, post or jobs related news. If user wants to search only for jobs or locations, users can choose the job tab to use the feature.
3. Connections LinkedIn allow users to connect with each other using the connections feature. User can follow other users or companies in the system and see any related post shared by them. These connections feature act as an socialise feature to allow users to interact with each other. Once the user had connected to the other user, they will be added to the MyNetwork list.
4. Notification The notifications feature in LinkedIn system will let user know about any update or news inside user's connection. If a user reviewed the other user profile, it will also notify the user about profile reviewing.
5. Messages This feature allows users to communicate with each other or to ask any question to the employers. This Messages feature act as a social media to allow users to interact with one another.
6. Profile User profile shows the photo, name, connections, interest, field of study, educations, skills and user's activity. User can edit their profile, upload photo and post resume.

#### 2.2.2.2 Evaluation on LinkedIn

LinkedIn is very much similar with JobStreet as both of this system is for job recruitment. Although their goal is the same, but there are some differences in both systems. To use the LinkedIn system, users are required to sign up an account and login to access it. One of the best features in LinkedIn is the connections feature which allow users to connect with one another. This feature act as a social media to help users to socialise in a more professional way. Users can see each other post which is related to jobs, career and latest trend of technologies. Besides, the messages feature allows users to send a message to the individuals inside the connections. Any enquiry about jobs detail can be send to the employer without the need to use email address. This feature will shorten the time for users to write email and faster for users to reply each other. In conclusion, LinkedIn has provided few features which help to ease users work when applying for jobs.

The only disadvantages of this system is the user will have to sign up an account before they can access it. Unlike JobStreet.com, users can directly search for job through the search engine. However, some of the provided features in LinkedIn are very well recommended to be used on any job recruitment system such as Connections and Messages features.

### 2.2.3 Indeed

Figure 2.3: Indeed Job Portal

#### 2.2.3.1 Main features of Indeed

1. Search Engine Indeed provide a search engine feature for user to look for related job title, keywords or company. User can enter the desire location of jobs when performing the search function. There is also a filter function provided to allow user customizes the search criteria such as distance, type of jobs and also sorting function.
2. Register resume and login User can click register resume button to sign up an account or login to the system if he or she is an existing user. Users can choose to either sign in with their own email address, sign in with Facebook or Google account. With the register resume feature, users can upload or build their own resume. After that, system will ask the user to enter their email address to sign up for an account.
3. Employer/Post Job This feature is mainly for employers that wish to recruit interns, fresh graduates or any job seeker to join them. When the employer clicked on this feature, it will ask the employer to fill up particular details for job recruitment such as position offered, company name, company size, employer name and other necessary information.
4. Profile Users can edit their profile by selecting the account menu at upper right corner of the page and select the resume link. It will direct user to a page where user can perform any modification on user profile. Users are able to edit profile, desired job, desired job types, desired salary, work experience, education, skills, certifications or licenses. If user want to add any other information, there is a button that allow user to do so.
5. My Jobs User can find this feature at the upper right corner under the account drop-down list which right below the resume button. When user apply for jobs, it will show in the list and any interview invitation reply by employer will be shown here.

#### 2.2.3.2 Evaluation on Indeed

Indeed is another job portal that have similar function with JobStreet.com and LinkedIn but with lesser features. Indeed have a very simply and friendly user interface. The homepage of indeed displayed a very direct features of search engine which allow users to directly search for what they want. One of the best features in indeed is register resume and login with google or Facebook account. It had shorten the time for user to create an account and verified with email address. Besides, the register resume feature allowed users to build their own resume. It has very similar features as LinkedIn and JobStreet which allow users to edit their profile and upload resume. But in Indeed, the interface is very simple and direct which it skipped a lot of unnecessary features. In conclusion, Indeed job portal very well recommended for its simple interface which only focus on searching for job. Users might find it very easy to use as it is not as complex as other job portal. However, limited features in Indeed might be a downside for as some of the users might prefer a job portal with more features such as messages and network which allow users to socialize even using a job portal.

#### 2.2.4 Similar System Comparison Matrix

Application name \ Features	JobStreet.com	LinkedIn	Indeed
Registration	Yes	Yes	Yes
Direct Access	Yes	No	Yes
Search Engine	Yes	Yes	Yes
Search criteria / filter	Yes	Yes	Yes
Notification	Yes	Yes	Yes
Direct job application	Yes	Yes	Yes
Add user	No	Yes	No
Chat Tools	No	Yes	No

#### Table 2.1: Comparison of Similar System

#### 2.2.5 Conclusion

According to Table 2.1 which summarise the comparison of few similar system, there are few features that are important and recommend to be implemented into the Campus Recruitment System such as registration, search engine, direct job application, notification and chat tools. Out of these three systems, Indeed job portal have the most



simple interface which is preferred to be implemented to avoid confuse when using the system. For the registration, both employer and student have to sign up an account in order to use the system.

### 2.3 Methodology Comparison

In order to develop the system efficiently, it is recommended to choose a suitable methodology to control and plan the development process of a project. There are different kind of development methodologies that able to be carried out when developing a system which have been recognised and used by most of the developers for decades. However, every methodology has their differences in term of limitations and strengths. Choosing a correct methodology that suit the project is important as it might affect the whole development process.

#### 2.3.1 Waterfall Model

Waterfall model is a traditional methodology which the development process is flowing downwards from a stage to another. According to Bassil (2012), the Waterfall Software Development Life Cycle (SDLC) was proposed by Winston W. Royce to explain about the software development process and each phases must be done before moving on to next phase. Bassil (2012) in his article described about five phases of the development life cycle of waterfall methodologies which are analysis, design, implementation, testing and maintenance. Each stages of a waterfall model have their specific task which all the tasks have to be carried out before moving on to another. Analysis Design Implementation Testing Maintenance

**Figure 2.4 The waterfall model Advantages Disadvantages**

1. It is a linear and structured model which is very simply and less
1. It is hard to determine the outcome of one stage before expensive to be implement (Adenowo and Adenowo, 2013).
2. Each stages are prepared and completed one at a time (Alshamrani and Bahattab, 2015).
3. A lot of importance documentation are done which allow new worker to catch up easily (Kannan and Jhajharia, 2014).
- moving to another stage (Adenowo and Adenowo, 2013).
2. Not possible to go back to previous step to make any changes in the system as the process is sequential (Adenowo and Adenowo, 2013).
3. Client may not clear about what they want or need for the system (Alshamrani and Bahattab, 2015).
4. There are a lot of risk and uncertainty which might cause a lot of issues when making changes to the system once it is completed (Alshamrani and Bahattab, 2015).

**Table 2.2 Shows the advantages and disadvantages of Waterfall model**

### 2.3.2 Agile Methodology

According to Sharma, Sarkar and Gupta (2012), Agile Methodology is one of the software development life cycle which is an iterative and incremental based development. This is because the requirements of the system are changeable based on customer needs. In Sharma, Sarkar and Gupta (2012) article, they mentioned that the software development activities in Agile Methodologies such as requirement gathering, analysis, design, coding, testing, delivery and feedback are based on the customer demand. The number of iterative process is based on customer feedback and evaluation to determine customer satisfaction. Requirement Gathering Analysis Design Coding Testing Delivery of partial implemented software Feedback

**Figure 2.4 The Agile Model process Advantages Disadvantages**

1. Faster to deliver the initial product (Alshamrani and Bahattab, 2015).
2. Decrease failure rate and able to change requirements (Alshamrani and Bahattab, 2015).
1. Good planning and design are important and required at the beginning (Alshamrani and Bahattab, 2015).
2. Constant change of requirements might waste a lot of resources and time (Sharma, Sarkar and Gupta, 2012).
3. It does not require a lot of documentation (Sharma, Sarkar and Gupta, 2012).
3. The iterations of the system are based on customer's need and they have to be clear about what they want so that the project development will not go out of track (Sharma, Sarkar and Gupta, 2012).

**Table 2.3 Shows the advantages and disadvantages of Agile Model**

### 2.3.3 Prototyping

According to Carr and Verner (2004), prototyping model is a "tool" used within the software development process which there are different types of prototypes are developed to achieve the goals. Pressman (2010) in his article explained that a limited feature prototype is produce, test and modified repeatedly until it fulfilled the satisfaction of the client which the final product is developed. Like most of the other software development methodologies, requirement gathering is the first stage of the development life cycle. According to Pressman (2010), after the gathering requirement stage, there are four general stages which are quick design, building prototype, customer evaluation and lastly the redefine prototype in order to develop a software [prototype. start Requirement gathering Quick design Building prototype stop Engineer](#) Redefine Customer [product prototype evaluation Figure 2. 5 Prototyping model](#) process Advantage Disadvantages

1. Able to shorten the time frame and minimize expenses as 1. It will be very time consuming and expensive if the user is not problems are able to detect satisfied with the prototype and earlier (Pressman, 2010). need to repeatedly change it 2. Gives the developer a better until user agree with it. understanding and vision of the 2. It might affect the developer system when developed primary goal which is speedy (Pressman, 2010). development due to high 3. Involve user during the numbers of iterative process. development before 3. Users may get confused with the implementing the final product early prototype and the real (Sommerville, 2011) system (Sommerville, 2011). [Table 2. 4 Shows the advantages and disadvantages of Prototyping Model 2.3. 4 Comparison of system development matrix Methodology \ Features Waterfall Agile Prototyping Requirement gathering Early stage Frequently change Frequently change Customer involvement during the process Low High High Development time Long Short Short Complex project Good Good Poor High risk project Poor Good Good Flexibility Low Medium High Expenses Low Very High High Cost estimation Easy Medium Hard Success rate Low High High Table 2.5: Comparison of System Development 2.3.5 Conclusion Based on the review of the methodologies in table 2.2, the prototyping methodology was chosen and implemented into this Campus Recruitment Project. This is because the prototyping method is suitable for project with less requirement gathering for the early stage. However, it has high involvement of user during the whole process until suitable and user satisfaction is achieved for the prototype. Besides that, the flexibility of prototyping is high which allow it to be change frequently to suit user requirement and needs. However, too much iteration will make it costly as the process will keep on repeating until it achieved the goals. This is why the cost estimation for prototyping methodology is difficult and unpredictable as the numbers of iteration is depends on the user requirements. The high success rate of project is the main reason this methodology is adopted to be used on this project.](#)

[3METHODOLOGY AND WORK PLAN 3.1 Introduction In this chapter](#), the phases [of the](#) chosen [methodology](#) will be discussed with different task to be done in each phase. The five phases which are requirement gathering, iteration, development and testing follow by the last phase which is roll out.

3.2 Requirement Gathering The initiation of the project is requirement elicitation which is also the first step of the methodology. Planning of the project were started here with the WBS and Gantt Chart created. Other than literature review and comparison of similar system, there were two requirement gathering method used to obtain the requirement for this project in order obtain the requirement. The two requirement gathering methods are quantitative and qualitative research. 3.2.1 Quantitative Research Creswell, (Creswell 2008) in this book of Education Research described that qualitative research methodology is deeply dependant on the

reviews, comments, opinions and views of users or participants of the survey. This type of research is a data collection research which requires to ask broad, general questions to the participants. Data collected from the survey were analysed by the researchers. In this project, 30 students from UTAR were invited to participate in this questionnaire survey in order to understand their issues regarding the industrial training process. The survey questionnaires that have been distributed to thirty students which consists of 9 closed ended questions.

**3.2.2 Qualitative Research** Creswell, (Creswell 2008) also explained the quantitative research as a type of educational research that allowed researcher to ask specific questions to the participants which helped researchers to decided what to be studied. Two examples of the quantitative methodology conducted in this project are interview and direct observation. In this project, an informal interview had been conducted on both Human Resource Manager of Chaintope Malaysia and Industrial Training Coordinator from UTAR DIECS department. The purpose of these informal interview carried out was to understand the standard operation procedure of the industrial training process and job application reviews by the human resource department.

**3.2.3 Literature Review** The literature review about the similar systems were carried out in order to study the important features which were implemented into the system. Comparison of few similar systems were done to determine the suitable features and interface used in developing the system. Besides comparing the similar systems, few methodologies were also compared so that the suitable methodology was chosen to be adopted in development process of the system. The three methodologies which are waterfall model, agile model and prototyping model that have been compared. Prototyping model was chosen among these three methodologies in developing the system.

**3.2.4 Prepare Use Case Diagram** After gathered enough information, use case diagram was prepared to further understand about the system. There were 11 use cases that shows how the users access and use system function.

**3.2.5 Prepare Use Case Description** Use Case Descriptions were used to explain the use cases and their functions which included how the users perform the task on the web-application system.

**3.3 Iteration**

**3.3.1 Phase 1** For this phase, simple user interface and features such as searching for related company, post resume, and post job will be added in this iteration. In this phase, users such as students, employers and job portal admins were able perform login and search job. Student user were able to search for company based on job keyword, company name or field of work interest through the prototype. Student user were able to view the job vacancy details posted by the employer user. After the prototype was build, few students were invited to evaluate the prototype. Then, the feedback and opinions from the users were recorded, analyse and improved in second phase of iteration. Below were the four process that had been carried out during the first iteration phase. - Quick Design - Building Prototype - User Evaluation - Redefine Prototype

**3.3.2 Phase 2** After the first iteration phase, minor changes of user interface and more features had been added to the prototype based on feedback on user's evaluation. Features such as student job application, inbox message inquiry, manage profile and admins management as the job portal controller had been added. The purpose of second iteration was to redefine the previous prototype in order to improve the functionality, features and user interface. The second prototype was sent for user evaluation after finished modified and improved the prototype. After the evaluation, user satisfactory on the prototype achieved even though there were still some feedback regarding the user interface. The opinion from the user was recorded down to improve the system user interface. Below show the same steps had been done during second

iteration. - Quick Design - Building Prototype - User Evaluation - Redefine Prototype

### 3.4 Development

In this phase, there are variety of tools used to build the online web-based application. This phase was start after iteration phases are done. After getting user agreement and satisfaction on the prototype, the scope can be integrated into the actual system to develop final product.

#### 3.4.1 Integrate Scope

Required scope, components and features were implemented into the system during the development. Important features such as login, upload resume, search engine, post job vacancy, inbox messages, update profiles and admin management control had been added to the system.

#### 3.4.2 Develop product

The actual system was developed after gathered enough scope and requirement. The system was developed using several development tools such Laravel Framework, Visual Studio Code, PhpMyAdmin and MySQL.

#### 3.4.3 Development Tools

1. Ampps AMPPS is a platform used for web development from Softaculous which include Apache, MySQL, PHP, Python, Perl and MariaDB on a desktop. It is a complete package of web development tools that support installation in Macintosh Operating System (MacOS).
2. Laravel Framework Laravel Framework is php framework that used to build the web-application which is created by Taylor Otwell. It is free, open source framework introduced in 2011 to developed robust applications with powerful tools used. In this project, Laravel Framework was selected as one of the development tools to build the system.
3. Visual Studio Code Besides laravel framework, the source code editor chosen for this project is [visual studio code](#). [Visual studio code is](#) a powerful editor introduced by Microsoft for edit, build and debug code with ease. [Visual studio code is able to](#) support many types of programming languages by just installing the extension which can be found in Visual Studio Marketplace. Other than that, it also supports the intellisense extension which able to help developer to code easier.
4. PhpMyAdmin [PhpMyAdmin is a free software tool written in PHP that is intended to handle the administration of MySQL](#) and [MariaDB database server](#). [PhpMyAdmin](#) is integrated with AMPPS and required for administration of MySQL in a browser.
5. MySQL MySQL [is a relational database management system \(RDBMS\) that](#) allows multiple user [to](#) access [and use](#) numbers of databases which runs as a server. MySQL allow the user to create, read, update and delete (CRUD) data in the databases.
6. Axure RP 8 Axure RP 8 is a prototype used to create static wireframe, iterative prototype, flow diagrams and documentation which able to provide demonstration of prototype to the client.

### 3.5 Testing

#### 3.5.1 Perform Unit Test

After the development of actual system is done, each features and component of the system will undergo unit testing to reduce errors. There are several test cases design for the system which was performed to make sure the outcome of test results are same as the expected results.

#### 3.5.2 Perform integration test

For this section, it combines two or more components to perform testing which is to verify the functional, performance and reliability between the modules. There will be several test cases and dummy prepared for this test to make sure the related components were able to output the correct results.

#### 3.5.3 Perform [user acceptance test](#)

Lastly, [the user acceptance test](#) which [is](#) a testing methodology where client or end users are involved to validate the final system against their requirements. For this case, a group of selected students, university staffs and lecturers will be chosen to test the system before final rollout.

### 3.6 Roll Out

This phase is the final phase of the prototyping model when all testing have been done. The final product will be delivered and start running.

#### 3.6.1 Prepare final report

Documentation of the whole project will be written in this final report with implemented methodology used. The final report gives an overview of the entire project

and how the web application system was built which include the problems statements, proposed solution, literature reviews, methodology used and sketch prototype of the system. 3.6.2 Prepare presentation A presentation regarding the developed system will be prepared and delivered to the audience. The demonstration of actual system be given to the audience on how the web applications works. 4PROJECT INITIAL SPECIFICATION 4.1 4.1.1 Functional Requirements Functional Requirements for Student 1. The system shall allow students to be able to perform login. 2. The system shall allow students to be able to search for jobs by entering keyword 3. The system shall allow students to be able to view the searched result. 4. The system shall allow students to be able to apply for job. 5. The system shall allow students to be able to send message. 6. The system shall allow students to be able to view their job application status. 7. The system shall allow students to be able to update their profile. 8. The system shall allow students to be able to 4.1.2 Functional Requirements for Employer 1. The system shall allow employers to be able to perform login 2. The system shall allow employers to be able to post job vacancy. 3. The system shall allow employers to be able to edit the job posted by their own account. 4. The system shall allow employers to be able to delete the job posted by their own account. 5. The system shall allow employers to be able to view student's profile when they apply for job. 6. The system shall allow employers to be able to update their profile. 7. The system shall allow employers to be able to view inbox messages. 8. The system shall allow employers to be able to reply inbox messages. 9. The system shall allow employers to be able to change student application status. 4.1 .3 Functional Requirements for Admin 1. The system shall allow admins to be able to perform login 2. The system shall allow admins to be able to create student and employer profile. 3. The system shall allow admins to be able to block student and employer profile. 4. The system shall allow admins to be able to delete student and employer profile. 5. The system shall allow admins to be able to check student application letter when they apply for job. 6. The system shall allow admins to be able to send inbox messages to students and employers. 4.2 Non-Functional Requirements 1. The system shall be able to show search company page after student successfully login. 2. The system shall be able to show manage job list after employer successfully login. 3. The system shall be able to deny student's or employer to access the portal when their active status is blocked. 4. The system shall be able to notify employers in application list when student apply for job. 4.3 Use Case Diagram Figure 4.1: Use Case Diagram 4.4 Use Case Description Assume that portal = Campus Recruitment System. Use Case ID 1 Use Case Name Login Actors Student, Employer, Admin Description Student, employer or admin login to the system Preconditions Student, employer or admin must have an account.2 Post Conditions Student, employer or admin are able to access the portal. Normal Flow 1. Student, employer or admin enters the user's email and password. 2. The system checks the user's entered email and password for verification. 3. The system allows the user to access the portal. 4. Student, employer or admin able to access to the home page of the portal. Alternate Flow 1.1 Student or employer not able to perform login. 1.1.1 If student or employer do not have an account, the system will display an error message to ask user to sign up account. 1.1.2 If student or employer are blacklisted from login to the portal, the system will ask them to contact office-in-charge for further enquiry. Use Case ID 2 Use Case Name Manage user profile Actors Admin Description Admin able to manage, blacklisted or remove any student or employer profile. Preconditions - Post Conditions Student or employer that have been blacklisted or remove by admin are unable to login to the system. Normal Flow 1. Admin manage the



user's profile from student or employer database. 2. The system checks any user's that have been blacklisted or remove by admin from the database. 3. The system blocked them from login. 4. Student or employer that have been block are not able to login to the system. Alternate Flow - [Use Case ID 3 Use Case Name Update](#) profile [Actors Student](#) and Employer [Description Student](#) or employer able [to update](#) their profile including personal information, contact, password and photo. Preconditions Student or employer must login to the portal Post Conditions Student or employer are able to update their profile. Normal Flow 1. Student or employer click on the user's name button and select profile from drop-down list. 2. The system will direct it to profile page. 3. Student or employer edit the profile's information. 4. Student or employer click on update button after finish editing. 5. The system will save student or employer data into the database. Alternate Flow - [Use Case ID 4 Use Case Name](#) Upload resume [Actors Student Description Student](#) are able [to](#) upload resume to their profile Preconditions Student have to login to the portal Post Conditions Student successfully upload the resume. Normal Flow 1. Student or employer click on the user's name button and select profile from drop-down list. 2. The system will direct it to profile page. 3. Student choose to upload resume file from local system. 4. Student click on update button after upload. 5. The system will save student data into the database. Alternate Flow - [Use Case ID 5 Use Case Name](#) Search Job [Actors Student Description Student](#) are able [to](#) search for related job and locations. Preconditions Student have to login to the portal Post Conditions The system will display a list of searched result Normal Flow 1. Student click the Find Job tab at upper panel. 2. The system directs the student to Find Job page. 3. Student enter the desired search title. 4. The system displays a list of searched result. 5. Student can browse the result list. Alternate Flow - [Use Case ID 6 Use Case Name Post Job](#) Actors [Employer Description Employer](#) able [to](#) post about [job](#) vacancy. Preconditions Employer have to login to the portal Post Conditions Employer successfully post job in the portal. Normal Flow 1. Employer click on Post Job tab on upper panel. 2. The system directs the Employer to Post Job page. 3. Employer enters all necessary information of job vacancy offered by the company. 4. Employer click on submit button to post job. 5. The system will save employer's data into the database. Alternate Flow - [Use Case ID 7 Use Case Name](#) Apply Job [Actors Student Description Student](#) are able [to](#) send application directly to employer Preconditions Student have to search for the company. Post Conditions Student successfully send the application to the employer. Normal Flow 1. Student click on desired company name from the searched list. 2. The system direct student to company profile page. 3. Student click on Apply Now to send application. 4. The system direct student to Send Application page. 5. Student enter required information such as cover letters and resume. 6. Student click on submit button to send application. 7. The system saves student data and send the information to employer. Alternate Flow - [Use Case ID 8 Use Case Name](#) Invite Interview [Actors Employer Description Employer](#) are [able to](#) send interview invitation to student. Preconditions Student have to send application to the employer. Post Conditions Employer successfully send interview invitation to student Normal Flow 1. Employer click on inbox tab from upper panel. 2. The system direct employer to the inbox page. 3. The system displays a list of student application to the employer. 4. Employer select student application from the inbox list to view their profile. 5. Employer click on invite interview button and enter interview information such as time, date and location. 6. Employer click submit button to send invitation. 7. The system saves employer data and send the information to student. Alternate Flow - [Use Case ID 9 Use Case Name](#) Reply interview



**Actors Student Description Student** are able to reply employer interview invitation Preconditions Employer have to send interview invitation to student. Post Conditions Student able to accept or reject interview. Normal Flow 1. Student click on inbox button for upper panel 2. The system direct student to the inbox page 3. The system displays a list of interview invitation from employer. 4. Student select the invitation from the list. 5. Student click accept button to reply employer. 6. The system sent the reply to the employer. Alternate Flow 5.1 Student want to reschedule interview time and date. 5.1.1 Student can click reschedule button and enter desired time and date. 5.1.1 The system sent the reschedule message to the employer. 5.2 Student want to cancel the interview invitation. 5.2.1 Student can click reject button to reject interview invitation and enter reasons. 5.2.2 The system sent the reject message to the employer. Use Case ID 11 Use Case Name Approve Job Actors Employer Description Employer able to hire the student. Preconditions Student have sent job application to the employer Post Conditions Employer successfully hired the student Normal Flow 1. Employer click on inbox button on upper panel. 2. The system displays a list of students' applications. 3. Employer select the student application to view student profile. 4. Employer click on hire student button. 5. The system will send a message to the student. Alternate Flow - 4.5 Fact Findings In this section, the data collected from the survey and interviews conducted will be discussed. The survey consists of 9 closed ended question had been sent to the 30 invited students from UTAR DIECS. Based on the data collected from the survey, analysis on result of the survey had been carry out in order to understand their issues regarding the current industrial training procedure. The survey questionnaires can be referred in the appendix. The summarised response from students are recorded and observed. 1. Percentage of final years or graduates involved in these surveys. Figure 4.2: Are you a final year student or graduate? Based on Figure 4.2, 83.3% of the students that responded in these surveys are final year student and graduates. This shows that out of 30 respondents, 25 of them should have go through the process of apply jobs. 2. Percentage of students that have applied for jobs. Figure 4.3: Percentage of students that have applied for jobs According to Figure 4.3, around 27 respondents have went through the process of apply jobs and internship. This statistic result shows that there are 2 respondents are not in final years or graduates. In order to verify the validity of the following questions below, shows that most of the respondent will give valid answers regarding their experience which they had undergo this process. 3. How many of them have encountered problems during the apply job process? Figure 4.4: Student that have encountered problems during the process. Figure 4.4 shows that 65.5% of students that have apply jobs before encountered problem during the process. There are supposed to be 27 respondents only for this questionnaire but it appears to be 29 persons. The extra 2 persons can be assumed that they answered 'No' for this question. The purpose of this questions is to determine whether the problem is legit or not. 4. Numbers of company respondent had applied before getting replied. Figure 4.5: Numbers of company respondent had applied for. In this statistic result, around half of the respondent have applied for 3 to 5 companies before they finally get a reply from them. 17.9% out of 30 respondents had applied for more than 5 companies while 35.7% out of 30 respondents only applied for 1 to 2 companies. This result shows that many companies or employers tend to ignore or delay student applications during the process. 5. Duration for employer to reply. Figure 4.6: How long the respondents have to wait for employer to reply. Figure 4.6 shows that most of the respondent had wait for 4 to 6 days for employer to reply them while 21.4% respondent only had

to wait within 3 days. However, there are 7.1% of the respondent had to for more than 2 to 4 weeks while 32.1% of them waited for 1 to 2 weeks. This statistic shows that average employers had kept the job applicant wait for more than 1 weeks before they get reply from employers. 6. Respondent that do not get reply from employers. Figure 4.7: How many respondents do not get a reply from the employers. Out of 30 respondent, 22 respondents had experienced a problem where the employer did not reply the respondent at all. Through personal observation and experience, some of the employers did not even reply the job applicants which kept the job applicant waiting for some time until they give up and decide to move on. However, there are 6 respondents did not experience this problem. 7. Should employer reply job applicant faster? Figure 4.8: Percentage of respondent preferred employer to reply faster. The result shows that all respondent preferred the employers to reply the applicants faster. This shows that everyone wants to get a reply from their employers faster without keeping them to wait for some time. Waiting a reply from employer can be frustrated especially for those that wish to go for internship because the applicants have to quickly get a placement confirmation before the internship period start. If a student failed to get confirmation before the internship period start, he or she might not able to go for industrial training and might have to delay for another year. 8. How many weeks for employer to reply the applicants. Figure 4.9: Duration for employers to reply Based on the feedback from Question 7, Figure 4.9 shows that most of the respondents preferred employers to reply within 2 weeks while 26.7% of the respondent preferred employers to reply within one week. Only 6.7 % of the respondent preferred the duration of within one-month time. 9. Student prefer university to provide a job portal. Figure 4.10: Percentage of respondent prefer university to provide a platform Lastly, 26 respondents out of 30 preferred the university to provide a platform for students or fresh graduates to apply for jobs. This result shows that most of the students preferred a have a job portal provided by UTAR to help the students to apply jobs easier. Based on the pie chart, only 13.3% of the respondent choose "maybe" while none of them disagree with this idea. Interview with Industrial Training Coordinator and Human Resource Manager An informal interview with Industrial Training Coordinator and Human Resource Manager (HR Manager) from Chaintope Malaysia Sdn. Bhd. had been carried out in order to understand the standard operation procedure of current internship process and also how a company recruit new employees. Through the UTAR Software Engineering Industrial Training Coordinator, the current technique for students to go industrial training is still consider manual technique. Every year, students that are going for internship are required to manually apply for internship training through email to the employers. Currently, the university does not have a job portal system to allow students to apply for job directly to the employers. However, to those cooperative partner company that have signed the memorandum of understanding (MOU) with UTAR, they will have the special privilege where the students that have the interest to join the company have to send their resume or cover letters to university staff first. Then, the university staff will help the students to submit their application to the company. Other than that, another interview with the HR Manager of Chaintope Malaysia Sdn. Bhd. had been conducted to understand the procedure of a company to recruit the employee. The procedure may vary due to different requirement by different company. For example, when a person had applied for a job in the company, the HR manager will review their application first including the attached cover letters and resume. Then, the HR manager will invite the applicant to the company for interview session. During the interview session, there

management staff which are the acting director (Chief Operation Officer of Chaintope Malaysia), HR Manager and a senior developer will evaluate the interviewee. After the interview, the management staff will discuss among themselves whether they want to employ him or her. For Chaintope Malaysia, the company will discuss with the internal management staff first, then they will consult the headquarter company at Japan about the new employment. After discussing with Chaintope Japan team, then the HR manager will email the interviewee about their decision. According to the HR manager, the timeline for this process took approximately 3 weeks to 5 weeks.

## 5 SOFTWARE DESIGN

### 5.1 Introduction

### 5.2 User Interface (UI) Design

In this system, there are three main users which are admin, employer and student. Admin represents the university staff, industrial training coordinator and lecturers which will be the superuser to control the employer user and student user in the platform. Each user page navigation will be different according to their functionalities and features. Sub-sections in 5.2 show the user interface design of important features and pages.

#### 5.2.1 Login Module

[Figure 5.1 Shows the login page](#) [Figure 5.1 shows the page](#) that allows students, employers and admins to enter their email and password in order to login to the system. All users have to enter valid login credentials to access the system.

#### 5.2.2 Search Module

[Figure 5.2 Shows the search job page](#) [Figure 5.3 Shows the search result by entering company name as keyword](#) [Figure 5.2 shows the search job page](#) which allows student to perform search by entering the keyword such as job title, company name, location or career type. Then, a list of searched result will be listed out as shown in [Figure 5.3](#).

#### 5.2.3 View Job Page

[Figure 5.4 Shows the detailed job page](#) When student search for the job, the student can click in to view the detail job posted by the employer. The detail job description, requirements, roles, position, work location and contact will be posted out by employer to allow student to understand more about the job recruitment. After that, student can scroll down to the bottom of the page to apply for job if he or she is interested in joining the company for placement. [Figure 5.5 Shows the job applications submitted by student](#) After student submitted the job application, student can view their submitted application, application status and employers name in the list as shown in [Figure 5.5](#).

#### 5.2.4 Update profile

[page](#) [Figure 5.6 Shows the update profile page](#) [Figure 5.6 shows the update profile page](#) for employer to [update](#) their [profile](#). The design of this page is almost identical to student update profile page. The update profile page includes the change password function which allows user to change their password through here.

#### 5.2.5 Create New Job

[Page](#) [Figure 5.7 Shows the create profile page](#) In this page, employer is allowed to create new job post to different recruitment. The figure 5.7 shows the design of the page which input the input of few information such as company website, company name, company registration number and many more regarding detail information of the company.

#### 5.2.6 Manage employer and student

[profile page](#) [Figure 5.8 Shows the manage employer page](#) [Figure 5.8 shows the page](#) which is only for admin user to manage the employer. Only admin user is allowed to suspend employer or student from accessing the system. The UI design of this page is very similar to manage student as shown in [figure 5.9](#).

#### Figure 5.9 Shows the admin manage students

### 5.3 System Design

In this section, Data Flow Diagram, System Architecture and Activity Diagram are drawn to describe the functionalities and interactions of the important modules.

#### 5.3.1 Data Flow Diagram

The DFD shows in this sub-section represent the data flow of each users which includes the important modules, data flow of input data and output data of different user type.

70 [Figure 5.10 Admin's Data Flow Diagram](#)

71 [Figure 5.11 Employer's Data Flow Diagram](#)

72 [Figure 5.12](#)

Student's Data Flow Diagram 5.3.2 Activity Diagrams for Admin 5.3.2.1 Admin Login Figure 5.13 Activity Diagram for Admin Login 5.3.2.2 Admin View Employer Profile Figure 5.14 Activity Diagram of Admin View Employer Profile 5.3.2.3 Admin View Student Profile Figure 5.15 Activity Diagram for Admin View Student Profile 5.3.2.4 Admin Create Employer Profile Figure 5.16 Activity Diagram of Admin Create Employer Profile 5.3.2.5 Admin Check Student Application Figure 5.17 Activity Diagram for Admin Check Student Application 5.3.2.6 Admin Approve Student Application Figure 5.18 Activity Diagram for Admin Approve Student Application 5.3.3 Activity Diagram for Employer 5.3.3.1 Employer Login Figure 5.19 Activity Diagram for Employer Login 5.3.3.2 Employer Create Job Figure 5.20 Activity Diagram for Employer Create Job 5.3.3.3 Employer Manage Job Figure 5.21 Activity Diagram for Employer Manage Job 5.3.3.4 Employer Reply Message Figure 5.22 Activity Diagram for Employer Reply Message 5.3.3.5 Employer Response through Application Figure 5.23 Activity Diagram for Employer Response through Application 5.3.3.6 Employer Update Profile Figure 5.24 Activity Diagram for Employer Update Profile 5.3.4 Activity Diagram for Student 5.3.4.1 Student Login Figure 5.25 Activity Diagram for Student Login 5.3.4.2 Student Wants to Apply Job Figure 5.26 Activity Diagram for Student that wants to apply job 5.3.4.3 Student Reply Message Figure 5.27 Activity Diagram for Student Reply Message 5.3.4.4 Student View Application [Status Figure 5. 28 Activity Diagram for Student View Application Status 5.](#) 3.4.5 Student Update Profile Figure 5.29 Activity Diagram for Student Update Profile 5.4 System Architecture In this project, the system was built using the Laravel Framework which means that the system architecture for the Campus Recruitment System platform is a Model- View-Controller (MVC). The model in this system is represented by the Eloquent Model of the database which is MySQL using InnoDB engine and hosted by PhpMyAdmin. The controller is the Application Programming Interface (API) which will manage the input and output of data from frontend to the backend of the system. For the view module, it is represented by the frontend of the system which consist of user interface, data input and output. Web browser Display generated view Http request Controller return data Return results to view View is generated Get data request Model Figure 5.30 System architecture View [5.5 Database Design 5.5.1 Physical](#) Entity Relationship Diagram (ERD) 5.5.2 Logical Entity Relationship Diagram Table Name Description Application Contains information for every application Employers Contains information for every employer inboxMessages Contains information for every inbox message jobs Contains information for every job students Contains information for every student Admin Contains information for every Admin in the university 5.5.3 Data dictionary Entity name: applications Attribute Description Data type PK/FK NULL id Unique identification for applications Integer PK N jobID Reference to Job of the application Integer FK N mouStatus To identify whether the company is a collaborative partner with UTAR. Integer N showApplication Flag to show application to the employer before being approved by admin (0 for hide, 1 for show) Integer N stuID Student identification number of the applicant Integer FK N employerID Identification number of the employer Integer FK N applicationStatus Flag to identify the status of the application (1 for pending, 2 for Interview invitation, 3 for reviewing, 4 for offer letter sent, 5 for rejected by student, 6 for employer, 7 for rejected by admin) Integer N applyDesc Application description of student Text Y pdfFile Resume attachment of applicant Varchar Y created\_at Created date and time of the application Timestamp Y modified\_at Modified date and time of the application Timestamp Y Entity name: employers Attribute Description Data type PK/FK NULL id Unique

identification for employers Integer PK N status Flag to identify the status of the employer (0 for suspend, 1 for active) Char N password Password for employer's account access Varchar N name Name of the employer Varchar N email Email of the employer Varchar N mobileNo Mobile phone number of the employer Varchar N address Address of the employer workspace Text N companyName Name of the employer company Varchar N mouStatus To identify whether the company is a collaborative partner with UTAR. Tiny integer N created\_at Created time and time of the employer Timestamp Y modified\_at Modification date and time of the employer Timestamp Y Entity name: inboxMessages Attribute Description Data type PK/FK NULL id Unique identification for inbox message Integer PK N stuID Identification number of the student Char FK N employerID Identification number of the employer Char FK N adminID Identification number of the admin Char FK N letterDesc Message or letter content to be submitted during student submission of application. Text N pdfFile Resume attachment of applicant Text Y created\_at Created date and time of the message Timestamp Y modified\_at Modified date and time of the message Timestamp Y Entity name: jobs Attribute Description Data type PK/FK NULL id Unique identification for jobs Integer PK N title Title of the job Varchar N companyName Name of the company Varchar N companyRegNo Registration number of the company Varchar N companyWeb Website URL of the company Varchar N jobDesc Description of the job Varchar N Requirement Minimum requirement for the job position Text N lookingFor Job opportunity, position or role that the company or employer is looking for. Text N companyOverview Overview description of the company Text N companySnapshot Describe the company size, commodity information, safety record or any other information about the company Text N address Address of the company Text N district District of the company Text N state State of the company Text N contactUs Contact number of the company Text N employerID Identification number of the employer Integer FK N created\_at Created date and time of the job Timestamp Y modified\_at Modified date and time of the job Timestamp Y Entity name: students [Attribute Description Data type PK/FK NULL id](#) Unique identification for [student](#) Integer [PK](#) N studentID Identification number of the student Char FK N status Flag to identify the status of the employer (0 for suspend, 1 for active) Char N password Password for student account access Varchar N name Name of the student Varchar N email Email address of the student Varchar N mobileNo Mobile phone number of the student Varchar N address Address of the student Text Y course Course of the student Text N education Education level of the student Text Y cgpa Cgpa of the student Varchar N achievement Achievement history of the student Text Y clubSociety Club or society the student is joining Text Y skills Skills of the student Text Y resume Resume attachment of student Text N created\_at Created date and time of the student Timestamp Y modified\_at Modified date and time of the student Timestamp Y Entity name: admin Attribute Description Data type PK/FK NULL id Unique identification for admin Integer PK N name Name of the admin Varchar N email Email address of the admin Varchar N password Password of the admin account Varchar N created\_at Created date and time of the admin Timestamp Y modified\_at Modified date and time of the admin Timestamp Y

[6 TESTING 6.1 Unit Testing](#) The purpose of [unit testing](#) conducted in this phase is to validate each unit of the system and to validate that the software will performs as expected design. It is easier to identify errors, bugs or any loophole while performing the unit testing. When the [test fails, the problem](#) must [be identified](#), refine [and retested until success](#).

**6.1.1 Unit Test Cases** Each feature or module of the system will be tested accordingly such as buttons, forms submit, attachment and many more. In this sub



chapter, all test cases for important modules were carried out and described.

### 6.1.1.1 Unit Test Cases (Student) Login

Module	Test Case	Test Execution Steps	Test Data	Expected Output	Actual Result	Test Status
Student Login	Enter correct user email and valid password	1) Enter student email 2) Enter student password 3) Click 'login' button	Correct email, Correct Password	Successful login	Successful login	Pass
	Enter correct user email and incorrect password	1) Enter student email 2) Enter wrong password 3) Click 'login' button	Valid email, Incorrect password	Unsuccessful login, display "invalid user or password"	Unsuccessful login, display error message	Pass
	Enter correct user email and incorrect password	1) Enter wrong email 2) Enter student password 3) Click 'login' button	Incorrect email, correct password	Unsuccessful login, display "invalid user or password"	Unsuccessful login, display error message	Pass
	Enter incorrect email and incorrect password	1) Enter wrong email 2) Enter wrong password 3) Click 'login' button	Incorrect email, incorrect password	Unsuccessful login, display "invalid user or password"	Unsuccessful login, display error message	Pass
	View Find Job, Inbox, My Job and Profile page	Test Case Test Execution Steps	Test Data	Expected Output	Actual Result	Test Status
	Show inbox message list	Click on 'Inbox' button on navigation bar	Inbox message list will show	Inbox message list shown	Pass	Show student application list in My Job page.
	Click on 'My Job' button under username dropdown list	- My Job application list will show	My Job application list shown	Pass	Show profile page	Click on 'Profile' button under username dropdown list
	Manage profile page will show	Manage profile page shown	Pass	Show Search Job page	Click on 'Search Job' button on navigation bar	- Search Job page will show
	Search Job page shown	Pass	Search for Job	Test Case Test Execution Steps	Test Data	Expected Output
	Actual Result	Test Status	Enter keyword correct	1) Enter correct keyword 2) Click on 'search' button	Correct keyword Show searched result	Searched Result shown
Enter keyword incorrect	1) Enter incorrect keyword 2) Click on 'search' button	Incorrect keyword No searched result show, display "No Matched Result Found"	No Searched Result shown, displayed no matched result message	Pass		

### 6.1.1.2 Unit Test Cases (Employer) Login

Module	Test Case	Test Execution Steps	Test Data	Expected Output	Actual Result	Test Status
Employer Login	Enter correct user email and valid password	1) Enter employer email 2) Enter employer password 3) Click 'login' button	Correct email, Correct Password	Successful login	Successful login	Pass
	Enter correct user email and incorrect password	1) Enter employer email 2) Enter wrong password 3) Click 'login' button	Valid email, Incorrect password	Unsuccessful login, display "invalid user or password"	Unsuccessful login, display error message	Pass
	Enter correct user email and incorrect password	1) Enter wrong email 2) Enter employer password 3) Click 'login' button	Incorrect email, correct password	Unsuccessful login, display "invalid user or password"	Unsuccessful login, display error message	Pass
	Enter incorrect email and incorrect password	1) Enter wrong email 2) Enter wrong password 3) Click 'login' button	Incorrect email, incorrect password	Unsuccessful login, display "invalid user or password"	Unsuccessful login, display error message	Pass
	View Manage Job, Inbox, Profile and Post Job page	Test Case Test Execution Steps	Test Data	Expected Output	Actual Result	Test Status
	Show Application List page	Click on 'Application List' button on navigation bar	Application list will show	Application list shown	Pass	Show inbox message list
	Click on 'Inbox' button on navigation bar	- Inbox message list will show	Inbox message list shown	Pass	Show profile page	Click on 'Profile' button under username dropdown list
	Manage profile page will show	Manage profile page shown	Pass	Show post job page	Click on 'Create New Job' button on navigation bar	- Post job page will show
	Post job page shown	Pass				

### 6.1.1.3 Unit Test Cases (Admin)



Login Test Case Test Execution Steps Test Data Expected Output Actual Result Test Status Enter correct user email and valid password 1) Enter admin email 2) Enter admin password 3) Click 'login' button Correct email, Correct Password Successful login Successful login Pass Enter correct user email and incorrect password 1) Enter admin email 2) Enter wrong password 3) Click 'login' button Valid email, Incorrect password Unsuccessful login, display "invalid admin or password" Unsuccessful login, display error message Pass Enter correct user email and incorrect password 1) Enter wrong email 2) Enter admin password 3) Click 'login' button Incorrect email, correct password Unsuccessful login, display "invalid admin or password" Unsuccessful login, display error message Pass Enter incorrect email and incorrect password 1) Enter wrong email 2) Enter wrong password 3) Click 'login' button Incorrect email, incorrect password Unsuccessful login, display "invalid admin or password" Unsuccessful login, display error message Pass View Manage Employer, Manage Student, New Application, Sent Application and Inbox Page. Test Case Test Execution Steps Test Data Expected Output Actual Result Test Status Show Manage Student page Click on 'Manage Student' button on navigation bar - Manage student list will show Manage student list shown Pass Show Manage Employer page Click on 'Manage Employer' button on navigation bar - Manage employer list will show Manage employer list shown Pass Show application list new Click on 'Sent Application' button under 'Manage Special Application' dropdown list. - Manage sent application page will show Manage sent application page shown Pass Show application list new Click on 'New Application' button under 'Manage Special Application' dropdown list. - Manage new application page will show Manage new application page shown Pass Show inbox message list Click on 'Inbox' button on navigation bar - Inbox message list will show Inbox message list shown Pass

6.2 Integration Test Next, after unit testing was done, integration testing was conducted to test the individual module that was combined in group. It is important to have integrated testing conducted in order to find out the errors and problems when different modules are integrated so that all features of the system work perfectly.

6.2.1 Integration Test Cases (Student Module)

Modules Involved Test Case Test Execution Steps Output

1) Search for job 2) View job page 3) Send application Student wants to apply for job by searching for the desire job. 1) Student enter search job keyword. 2) After select from a list of searched result, student is able to view company page. 3) Student scroll down to the button of the page and click on 'Apply Now' button. 4) Student is redirected to a send application page. 1) Display a 'Application sent, please wait for employer to reply' message and redirect user back to company page. 2) An application record is created in 'applications' table in database. 5) Student enter information, attachments and click send application with attachment. 6) System display response message and redirect student to company page. 1) Search for job 2) View job page 3) Send message Student wants to send message to employer for enquiry after viewed job page. 1) Student enter search job keyword. 2) After select from a list of searched result, student is able to view company page. 3) Student click send message button at upper left corner of the page 4) Student is redirected to a send message page. 5) Student enter enquiry information and click send message to employer. 1) Display a 'Message sent' message. 2) A message record is created in 'inboxMessages' table in database. 6) System display response message. 1) Inbox message 2) Reply message Student wants to reply message to employer. 1) Student click on inbox button and redirect to inbox message page. 2) Student select the message from the list to reply. 3) Student enter words to reply the employer and click send button. 4) System display response message. 1) Display a

'Message sent' message. 2) A message record is created in 'inboxMessages' table in database.

### 6.2.2 Integration Test Cases (Employer Module) Modules Involved Test Case Test Execution Steps Output

1) Application list 2) Application content 3) Update application status Employer wants to approve student's application 1) Employer click on application list. 2) Then, Employer click on student name from the list to view application content. 3) Employer click back button to navigate back to previous page. 4) Employer click on the update status button beside the application status. 5) Employer updated the application status. 6) System refresh page and show status updated 1) Display a 'Status updated' message and refresh the 2) application list page. 3) An application record is updated in 'applications' table in database. 1) Manage job list 2) View job page 3) Edit job Employer wants to view and edit existing job page. 1) Employer click on manage job on the navigation bar 1) Display updated" message and "Successful 2) Employer click on the job title from the owned job list. 3) Employer is able to view the job page. 4) Employer click on the edit button at upper left corner of the page. 5) Employer change the information inside the edit page and click update button at the bottom of the page. 6) Employer is redirect view job page. redirect employer back to view job page. 2) An employer record is updated in 'employers' table in database. 1) Inbox message 2) Reply message Employer wants to reply message to student. 1) Employer click on inbox button and redirect to inbox message page. 2) Employer select the message from the list to reply. 1) Display a 'Message sent' message. 2) A message record is created in 'inboxMessages' table in database. 3) Employer enter words to reply the employer and click send button. 4) System display response message.

### 6.2.3 Integration Test Cases (Admin Module) Modules Involved Test Case Test Execution Steps Output

1) Manage student 2) View student profile 3) View student application list 4) Update student account status Admin wants to change student's account status 1) Admin click on the manage student button on navigation bar. 2) Admin click on the name from the student list 3) Admin view the student profile page to check the student profile. 4) Admin go back to student list to change student account status 5) Display a 'Student account status updated' message and redirect admin to the manage student page. 6) A student record is updated in 'students' table in database. 1. Manage employer 2. View employer profile 3. View employer application list 4. Update employer account status Admin wants to change employer's account status 1. Admin click on the manage employer button on navigation bar. 2. Admin click on the name from the employer list 1. Display a 'Employer account status updated' message and redirect admin to the manage employer page. 3. Admin view the employer profile page to check the employer profile. 4. Admin go back to employer list to change employer account status 2. A employer record is updated in 'employers' table in database. 1) Inbox message 2) Reply message 3) Application content Admin wants to message student through view new student application 1) Admin click on new application button under Manage special application dropdown list. 2) Admin click on the student name in new application list. 3) Admin view the application content submitted by student. 4) Admin click on send message button and redirect to inbox message page. 5) Admin select the message from the list to reply. 1) Display a 'Message sent' message. 2) A message record is created in 'inboxMessages' table in database. 6) Admin enter words to message the student and click send button. 7) System display response message. 1) Manage application 2) View application content 3) Send application to employer Admin wants to approve special application submitted by student. 1) Admin click on new application button under Manage special application dropdown list. 2) Admin click on the student name in new application list. 3) Admin view the application

content submitted by student. 4) Admin click on 'send application to employer' button after approve student application. 5) System display response message 1) Display a "Application send to employer" message and redirect admin to manage new application page. 2) An applications record is updated in 'applications' table in database. 6.3 User Acceptance Test 6.3.1 Test case for student Testing date Testing start time Testing end time Tester name Test module Test scenario Pass/ fail Comments Login verification Student enters their own student id and password to login to the system Search job 1. Student wants to search for a job 2. Student enters any keyword to search for a job. 3. System displays search result. Profile management Update profile 1. Student wants to view their own profile. 2. Student chooses to update profile 3. Student enters any field and selects update. Update resume 1. Student wants to update his own resume. 2. Student chooses to view profile. 3. Student chooses upload resume. 4. Resume successfully uploaded. Job application management Send application 1. Student performs search job module. 2. Student views searched job page and selects any job 3. Student views searched job page and selects any job 4. Application is created in the database. Application status 5. Student wants to view job application status. 6. Students view applied job list 7. Select any applied job and view the status of the application Inbox message Send message 1. Student performs search job module. 2. Student views searched job result page and selects any job 3. Student chooses to send message to the employer. 4. Enter message and send to the employer. 5. Message is created and sent to the employer View message 1. Student wants to view inbox messages 2. Student select inbox message button 3. Student view inbox message list 4. Select any message and reply to the inbox message. 5. Message is created and sent to the employer 6.3.2 Test case for employer Testing date Testing start time Testing end time Name of tester Test module Test scenario Pass/ fail Comments Login 1. employer login to their own account by entering employer id and password Job management Create job 1. employer wants to create a job 2. employer chooses to create a job. 3. Employer enters relevant fields and select create. 4. Job is created. View job created 1. Employer wants view job created. 2. Employer chooses to view job details from a list of jobs. Update job 1. Employer perform view job created submodule. 2. Employer wants to update job posted. 3. Employer enters relevant fields and update job description 4. Job is successfully updated Delete job 1. Employer wants to delete a job 2. Employer performs view job submodule 3. Employer selects a job to delete. 4. Job is successfully deleted. Profile management View profile 1. Employer wants to view employer profile 2. Employer selects to view employer profile. Update profile 1. Employer wants to update profile 2. Employer enters relevant fields and select update profile 3. Employer profile is successfully updated Application management 1. Employer want to view application status 2. Employer select any of the application from the application list. 3. Employer chooses to update application status 4. Application status is updated. Inbox message Send message 1. Employer wants to send a message 2. Employer performs application management module 3. Employer sends a message by selecting a receiver and entering the message in the message box. 4. Message is successfully created and sent to the receiver. View message 1. Employer chooses to view inbox messages 2. employer selects inbox message button 3. Employer view inbox message list 4. Select any message and reply to the inbox message. 5. Message is created and sent to the receiver 6.3.3 Test case for admin Testing date Testing start time Testing end time Name of tester Test module Test scenario Pass/ fail Comments Login 1. Admin login to account by entering admin ID and password Employer profile

management Create employer profile 1. Admin wants to create employer profile 2. Admin enters relevant fields to create employer profile 3. Employer profile is created successfully. View employer profile 1. Admin wants to view profile 2. System displays a list of employers 3. Admin selects any of the employer 4. Admin views employer profile Update employer account status 1. Admin performs view employer profile submodule 2. Admin chooses to change employer account status 3. Employer account status is successfully updated Student profile management 1. Admin wants to view student profile 2. System displays a list of students 3. Admin chooses any one of the students to view his profile 4. Admin chooses to change student account status. 5. Student account status is updated successfully Application management 1. Admin wants to view application 2. Admin selects any application from the application list to view the detail 3. Admin checks the application content 6.3.4 UAT result for student Test module Number of tests conducted Number tests passed of Comments Login verification 5 5 Search job 5 5 Profile management 5 5 Job application management 5 5 Colour indicator for status change is useful. Inbox message 5 5 6.3.5 UAT result for employer Test module Number of tests conducted Number of tests passed Comments Login 5 5 Job management 5 5 Delete module should display alert before proceeding with delete job page. Profile management 5 5 Employer comment on UI which is simple. Application management 5 5 Employer comment on colour indicator of status changes is useful and easy to change student application status. Inbox message 5 5 7 CONCLUSION In conclusion, this system had been developed to solve the following issues of the current place process which is the manual technique of industrial training process. In order to solve the problem of current manual technique of placement process, a Campus Recruitment System had been developed which fulfilled its objectives such as to conduct literature reviews on similar system, to evaluate the system after development and to develop a web-based application for the campus recruitment. As such, the proposed solutions for this web-application system which allows students and employers to directly interact with each other, allows students to know about their application status faster, allows employers to recruit interns faster and lastly, to allows UTAR staff as system administrator to control and manage the portal. This project development had been carried for a time period of approximately 6 months which start planning the project until the final testing phase before rolled out. At the early stage of the development, quantitative and qualitative researched had been carried out to identify the problem of this project as well as to support the problem statement. Then, literature reviews research was carried out to compare the differences of a few similar systems and different types of methodology in order to identify the useful features, functionalities as well as the suitable development methodology for the developing the entire system. Prototyping methodology was chosen as the suitable methodology to develop the system. After the researched was done, the project moved to next cycle which involved implementation of the system. Few prototypes were developed to illustrate the user on how the system will work. Then, implementation of the real system had started after getting enough feedback and user requirement. When the implementation of the system was done, testing was conducted to validate the system so that the functionalities, features and other modules worked as expected. User acceptance test was carried out to ensure that the system met the expected user requirement. From the feedback, comments, and suggestion from user acceptance test, some extra features implement in future improvement. Even though the system had met the basic requirement, but there is still some improvement that need to be made in the future to

provide more functionalities and improve reliability of the system. Table shows the future enhancement that can be done for future cycle. Limitations Recommendations and suggestions No self-registration for employers. Instead of employer to manually submitting the application form to university staff, a registration page can be implemented to allow employer to perform self-registration. No sharing platform for placement information. Sharing of placement information such as guidelines, rules and regulations is essential to allow both students and employers to understand the procedure for industrial training. Lack of resume template for student to follow. Informative and neat resume can improve the first impression for employer to evaluate the student. An informative and neat resume template to allow student to fill in will be a very good future features to allow employer to able to view student profile and evaluate the student. This system is only for internship. In future improvement, the system will not only open for all department in the university but will also allowed fresh graduates to use the system. This will ease the Department of Alumni Relation and Placement (DARP) to keep track of UTAR alumni. REFERENCES

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students and graduates from UTAR. Internship students and graduates have undergo some troubles when they are applying for jobs. In order to protect the data privacy, your identity and answer will be kept confidential. Your information and time spent to finish the questions are highly appreciated. Thank you very much. \* Required Name \*

Study course \*

1. Are you a final year student or graduates ? \* Yes ( ) No ( ) 2. Had you apply for any position in a company before ? \* Yes ( ) No ( ) 3. Did you encounter any problem when applying for jobs ? \* Yes ( ) No ( ) 4. How many companies did you apply for before you get a reply from them ? \* 1 – 2 ( ) 3 – 5 ( ) 5 and above ( ) 5. How long did you wait for a company or employer to reply you ? \* 1 - 3 days 4 - 6 days 1 - 2 weeks within 1 month 1 - 3 months 3 months and above ( ) ( ) ( ) ( ) ( ) 6. Did you experience any company or employer that did not reply you at all ? \* Yes ( ) No ( ) 7. Do you think that an employer should provide a reply to the applicants (including internship) as soon as possible ? \* Yes ( ) No ( ) 8. Refer to Question 7. If yes, do you think how many weeks should it takes for employer to reply. < 1 weeks < 2 Weeks < 4 Weeks 4 - 8 Weeks ( ) ( ) ( ) ( ) 9. Do you prefer the university to provide a platform for students or fresh graduates to apply for jobs / internships ? \* Yes No Maybe ( ) ( ) ( )

APPENDIX D: Standard Operation Procedure of Internship APPENDIX E: Employer User Acceptance Test (UAT) Result Testing date 3/4/2019 Testing start time 7.08pm Testing end time 7.31pm Name of tester Jimmy Tee Ming Jie Test module Test scenario Pass/fail Comments Login 2. Employer login to their own account by entering employer id and password Pass Job management Create job 5. Employer wants to create a job 6. Employer chooses to create a job. 7. Employer enters relevant fields and select create. 8. Job is created. View job created 3. Employer wants view job created. 4. Employer chooses to view job details from a list of jobs. Update job 5. Employer perform view job created submodule. 6. Employer wants to update job posted. 7. Employer enters relevant fields and update job description 8. Job is successfully updated Pass UI is simple and good. Edit job page shows the existing data input is useful for editing. Delete job should have a warning confirmation before proceeding. Delete job 5. Employer wants to delete a job 6. Employer performs view job submodule 7. Employer selects a job to delete. 8. Job is successfully deleted. Profile management View profile 3. Employer wants to view employer profile 4. Employer selects to view employer profile. Update profile 4. Employer wants to update profile 5. Employer enters relevant fields and select update profile 6. Employer profile is successfully updated Pass Application management 5. Employer want to view application status 6. Employer select any of the application from the application list. 7. Employer chooses to update application status 8. Application status is updated. Pass Color indicator for status is useful Inbox message Send message 5. Employer wants to send a message 6. Employer performs application management module 7. Employer sends a message by selecting a receiver and entering the message in the message box. 8. Message is successfully created and sent to the receiver. View message 6. Employer chooses to view inbox messages Pass The Inbox UI is simple. 7. employer selects inbox message button 8. Employer view inbox message list 9. Select any message and reply to the inbox message. 10. Message is created and sent to the receiver APPENDIX F: Student User Acceptance Test (UAT) Result Student 1 Testing date 2/4/2019 Testing start time 10.43am Testing end time 11.02am Tester name Andy Lau Lian Soon Test module Test scenario Pass/ fail Comments Login verification Student enters their own student id and password to login to the system Pass Search job 4. Student wants to



search for a job 5. Student enters any keyword to search for a job. 6. System displays search result. Pass Profile management Update profile 4. Student wants to view their own profile. 5. Student chooses to update profile 6. Student enters any field and selects update. Update resume 5. Student wants to update his own resume. 6. Student chooses to view profile. 7. Student chooses upload resume. 8. Resume successfully uploaded. Pass Job application management Send application 8. Student performs search job module. 9. Student views searched job page and selects any job Pass 10. Student views searched job page and selects any job 11. Application is created in the database. Application status 12. Student wants to view job application status. 13. Students view applied job list 14. Select any applied job and view the status of the application Inbox message Send message 6. Student performs search job module. 7. Student views searched job result page and selects any job 8. Student chooses to send message to the employer. 9. Enter message and send to the employer. 10. Message is created and sent to the employer Pass View message 6. Student wants to view inbox messages 7. Student select inbox message button 8. Student view inbox message list 9. Select any message and reply to the inbox message. 10. Message is created and sent to the employer Student 2 Testing date 2/4/2019 Testing start time 11.10am Testing end time 11.29am Tester name Chow Pui Yan Test module Test scenario Pass/fail Comments Login verification Student enters their own student id and password to login to the system Pass Search job 1. Student wants to search for a job 2. Student enters any keyword to search for a job. 3. System displays search result. Pass Profile management Update profile 1. Student wants to view their own profile. 2. Student chooses to update profile 3. Student enters any field and selects update. Update resume 1. Student wants to update his own resume. 2. Student chooses to view profile. 3. Student chooses upload resume. 4. Resume successfully uploaded. Pass Job application management Send application 1. Student performs search job module. 2. Student views searched job page and selects any job Pass 3. Student sends application by uploading resume. 4. Application is created in the database. Application status 5. Student wants to view job application status. 6. Students view applied job list 7. Select any applied job and view the status of the application Inbox message Send message 1. Student performs search job module. 2. Student views searched job result page and selects any job 3. Student chooses to send message to the employer. 4. Enter message and send to the employer. 5. Message is created and sent to the employer Pass View message 1. Student wants to view inbox messages 2. Student select inbox message button 3. Student view inbox message list 4. Select any message and reply to the inbox message. 5. Message is created and sent to the employer Testing date 2/4/2019 Testing start time 11.40am Testing end time 11.43am Tester name Mak Ji Teng Test module Test scenario Pass/fail Comments Login verification Student enters their own student id and password to login to the system Pass Search job 1. Student wants to search for a job 2. Student enters any keyword to search for a job. 3. System displays search result. Pass Profile management Update profile 1. Student wants to view their own profile. 2. Student chooses to update profile 3. Student enters any field and selects update. Update resume 1. Student wants to update his own resume. 2. Student chooses to view profile. 3. Student chooses upload resume. 4. Resume successfully uploaded. Pass Job application management Send application 1. Student performs search job module. 2. Student views searched job page and selects any job Pass 3. Student sends application by uploading resume. 4. Application is created in the database. Application status 5. Student wants to view job application status. 6. Students view applied job list 7. Select any

applied job and view the status of the application Inbox message Send message 1. Student performs search job module. 2. Student views searched job result page and selects any job 3. Student chooses to send message to the employer. 4. Enter message and send to the employer. 5. Message is created and sent to the employer Pass View message 1. Student wants to view inbox messages 2. Student select inbox message button 3. Student view inbox message list 4. Select any message and reply to the inbox message. 5. Message is created and sent to the employer Testing date 3/4/2019 Testing start time 7.30pm Testing end time 7.45pm Tester name See Lem a/I Eh Di Test module Test scenario Pass/ fail Comments Login verification Student enters their own student id and password to login to the system Pass Search job 1. Student wants to search for a job 2. Student enters any keyword to search for a job. 3. System displays search result. Pass Profile management Update profile 1. Student wants to view their own profile. 2. Student chooses to update profile 3. Student enters any field and selects update. Update resume 1. Student wants to update his own resume. 2. Student chooses to view profile. 3. Student chooses upload resume. 4. Resume successfully uploaded. Pass Job application management Send application 1. Student performs search job module. 2. Student views searched job page and selects any job Pass 3. Student sends application by uploading resume. 4. Application is created in the database. Application status 5. Student wants to view job application status. 6. Students view applied job list 7. Select any applied job and view the status of the application Inbox message Send message 1. Student performs search job module. 2. Student views searched job result page and selects any job 3. Student chooses to send message to the employer. 4. Enter message and send to the employer. 5. Message is created and sent to the employer Pass View message 1. Student wants to view inbox messages 2. Student select inbox message button 3. Student view inbox message list 4. Select any message and reply to the inbox message. 5. Message is created and sent to the employer Testing date 3/4/2019 Testing start time 8.28pm Testing end time 8.46pm Tester name Seah Sheng Hong Test module Test scenario Pass/ fail Comments Login verification Student enters their own student id and password to login to the system Pass Search job 1. Student wants to search for a job 2. Student enters any keyword to search for a job. 3. System displays search result. Pass Profile management Update profile 1. Student wants to view their own profile. 2. Student chooses to update profile 3. Student enters any field and selects update. Update resume 1. Student wants to update his own resume. 2. Student chooses to view profile. 3. Student chooses upload resume. 4. Resume successfully uploaded. Pass Job application management Send application 1. Student performs search job module. 2. Student views searched job page and selects any job Pass 3. Student sends application by uploading resume. 4. Application is created in the database. Application status 1. Student wants to view job application status. 2. Students view applied job list 3. Select any applied job and view the status of the application Inbox message Send message 1. Student performs search job module. 2. Student views searched job result page and selects any job 3. Student chooses to send message to the employer. 4. Enter message and send to the employer. 5. Message is created and sent to the employer Pass View message 1. Student wants to view inbox messages 2. Student select inbox message button 3. Student view inbox message list 4. Select any message and reply to the inbox message. 5. Message is created and sent to the employer 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101

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