

CHAPTER FIVE

DESIGN, IMPLEMENTATION AND DEVELOPMENT OF INTEGRATED GRADUATE PORTAL (IGP)

This chapter presents the design, implementation and development of the IGP prototype.

5.1 Introduction

Using the results obtained from the previous chapter on the user requirements which were identified from the surveys conducted, an Integrated Graduate Portal (IGP) was proposed for facilitating graduate marketability. This chapter discusses the issues related to the development of the portal prototype, the interface and others.

5.2 Design

The design of the IGP was carried out based on the requirements identified from the graduates, employers, lecturers and administrators in the survey which were discussed in the previous chapter. Systems design includes the definition of the architectures, components, modules, interfaces and data of a system in order to satisfy the user requirements. The aim of designing this portal is to facilitate graduate marketability. The IGP is a tool that may facilitate graduates' marketability by allowing integrated features such as verification of uploaded contents by lecturers, rating the contents uploaded by the graduates and providing reference letters and attestation letters for them, providing employers' requirements for graduates and showcasing the e-portfolios of graduates to employers between graduates, employers,

lecturers and administrators, The IGP therefore provides an integrated link between the university, graduates, lecturers and the prospective employers.

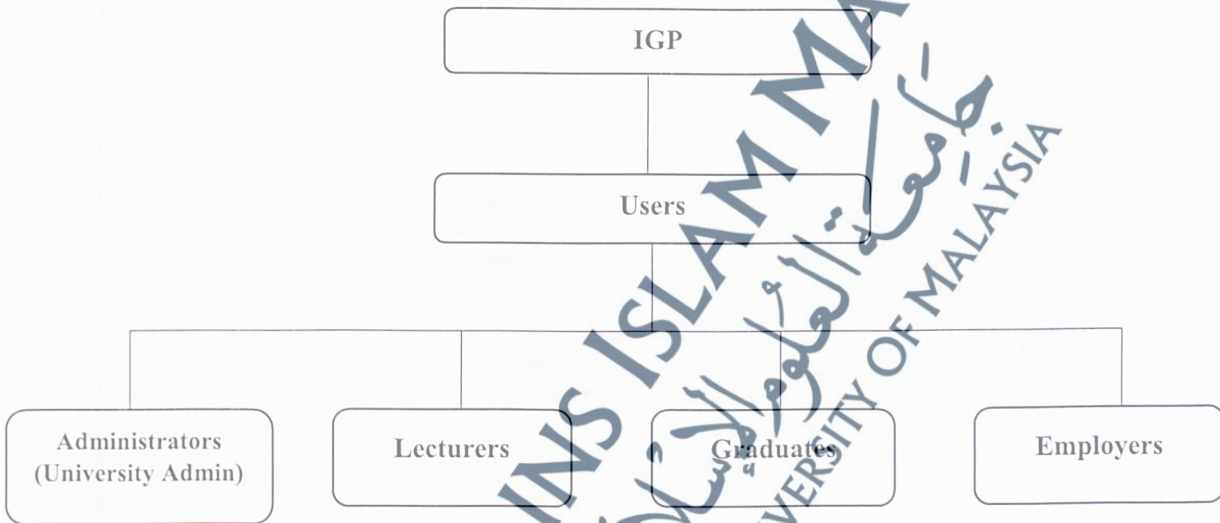
The IGP prototype can be found at <http://igraduateportal.com>. The author built the IGP prototype by making use of Drupal content management system version 7 (Drupal.org, 2014). A Content Management System (CMS) can be a web application which makes it easy for non-technical users to; add, edit, keep track of users, permissions and security settings, automatically generate navigation elements and manage a website (Drupal.org, 2014). Drupal is a database-backed web platform that gives room for file maintenance tools and has a very high level of security. It also adopts the use of PHP 5 and MySQL databases which allows developers to create powerful websites without writing codes and allowed them to grow rapidly on the web. MySQL database is a database layer of Drupal's architecture. The IGP is a multi-user system that allows different users login, for instance, visitors or authenticated users can login through different interfaces and the administrator has the ability to control access level of the users and assign roles for multiple permission levels.

In the implementation of the portal prototype, there were some modules such as access control list module, content access module, features modules and distribution that were installed in order to achieve the functionalities that were identified in the user requirements for all stakeholders of the Integrated Graduate Portal. The installations of modules in the portal were important as it is required by Drupal in order to develop the IGP with the integrated features that may assist in facilitating graduate marketability.

5.2.1 Users of the Integrated Graduate Portal

The following section describes the main users of the portal. Figure 5.1 shows the 4 categories of users which are: Graduates, Employers, Lecturers and Administrators. .

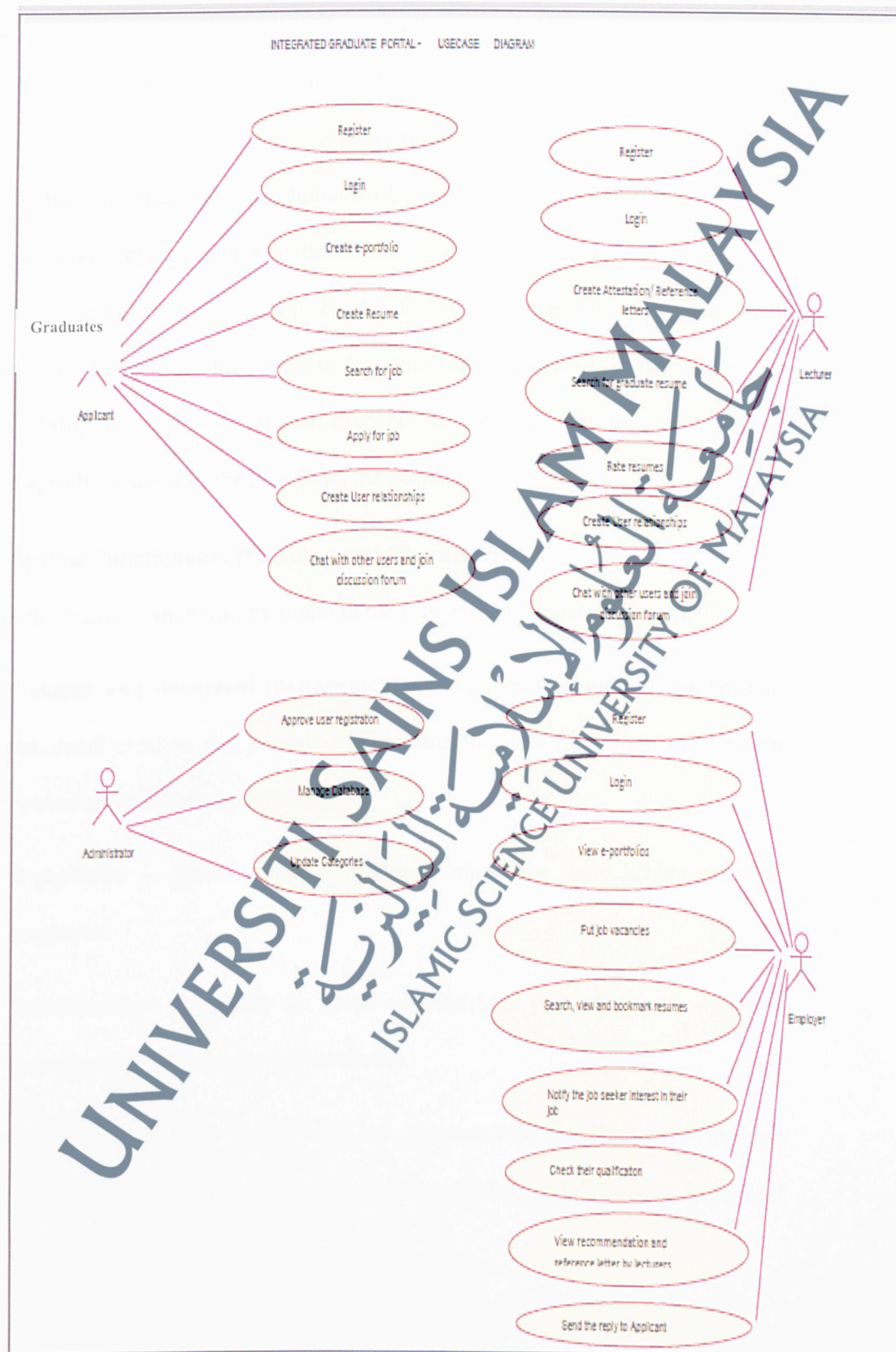
Figure 5.1: Users of the Integrated Graduate Portal (IGP)



5.2.2 Use Case Diagram

The development of the use case diagram is to provide a definition to a prototype and an overview of a project requirements and planning. It likewise provides a visual aid for prototype functionality (Kamble, 2010). The use diagram below shows the user interaction with the prototype and the prototype itself. Please note that the diagram is not exhaustive and only shows the most important use cases. The use case diagram below shows some of the activities that the graduates, employers, lecturers and administrators will be able to perform in the Integrated Graduate Portal. A more detailed account will be discussed in the subsequent section.

Figure 5.2: Use Case Diagram for Integrated Graduate Portal



As it can be seen from the diagram, all stakeholders can interact with one another by creating user relationships, having discussions in forum or through online chat. Applicants can also create resumes, electronic portfolios, search and apply for jobs. Lecturers can create reference and attestation letters, rate the resume of students and rate other contents which are uploaded by graduates such as their professional statements, goals, uploaded presentations such as audio and video presentation. This function is given to lecturers so as to be able to assist graduates in showcasing their best works to the employers in order to facilitate their marketability. Administrators have the ability to accept and verify all users before accepting their registration. They also manage all the users of the portal and the portal itself.

5.2.3 System Functionality (Features and Characteristics)

Some of the features which can be found in the Integrated Graduate Portal include:

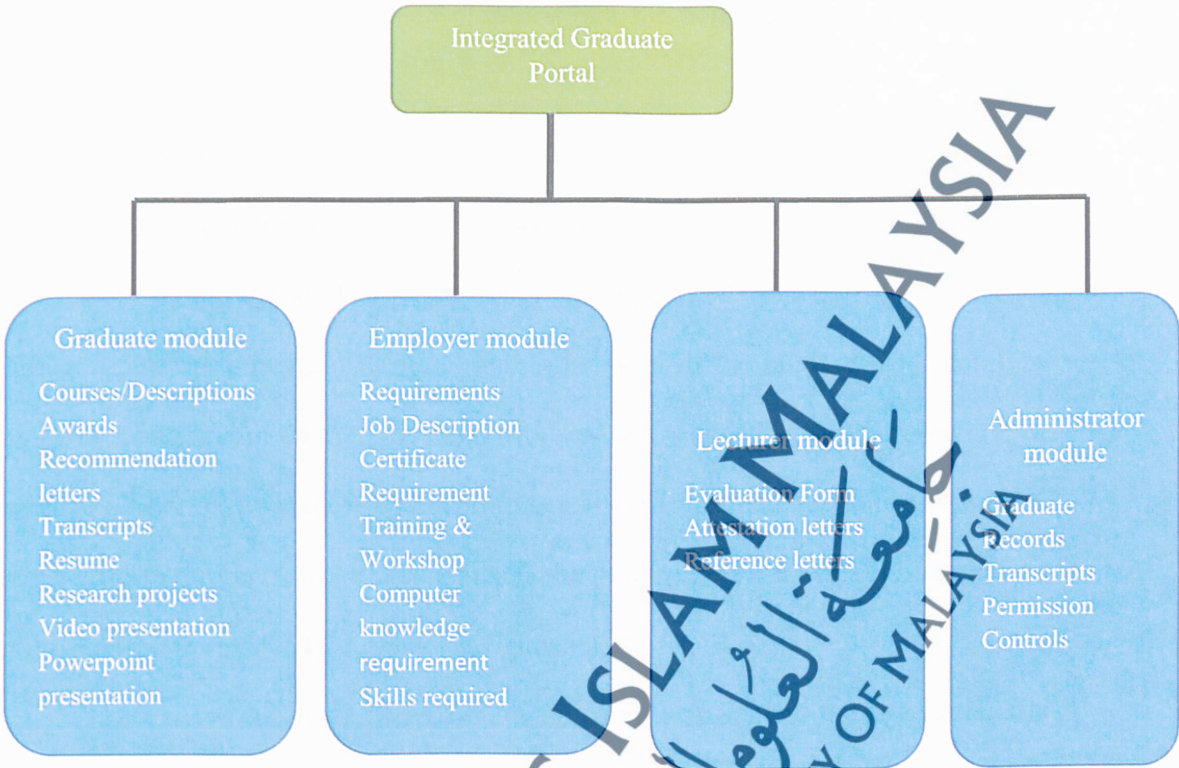
- **Content and document management** — services that support content and document creation and provide mechanisms for authoring, approval, version control and scheduled publishing.
- **E-portfolio** — graduates can create and showcase their achievement to employers
- **Entitlement** — the ability for portal administrators to limit specific types of content and services users has access too.
- **Collaboration** — all stakeholders can communicate synchronously (through chat, or messaging) or asynchronously through threaded discussion and email digests (forums)

- **Rating** – Lecturers can rate some of the graduate's content such as resume, so graduates can be able to find ways of making their contents better to facilitate their marketability
- **Job Creation** – Employers can create job and job requirements for graduates to access.
- **Recommendations** – Jobs and resumes can be recommended according to the different groups of stakeholders access
- **Reference Letters** - Lecturers can provide reference letters for graduates which the employers can access.

5.2.4 Components of the IGP

In order to be able to explain the development of the prototype, there is a need to discuss the interface of the different groups of users. As a result, the author classifies each user's interface as a module. Hence, the modules that make up the IGP are: Graduate module, Employer module, Lecturer module and the Administrator module. This is shown in the figure below:

Figure 5.3: Components of the Integrated Graduate Portal



The stakeholders of the portal can be classified into 4 categories which are: Administrators who will manage and run the site, Employers who are looking for applicants that possess the needed skills to work in their workplace, lecturers who will be assisting their graduates in improving their chances of getting jobs and graduates who want to improve their marketability and showcase their e-portfolios to prospective employers. The components of each of the different groups of stakeholders (graduates, employers, lecturers and administrators) in the IGP are shown in the figure above. The implementation of the components into the IGP is discussed in section 5.2.6.

5.2.5 Interface Design of the Integrated Graduate Portal

In this section, some of the primary pages that can be found in the IGP prototype will be demonstrated. The IGP prototype is made for four groups of users

which are: Graduates, Employers, Lecturers and the Administrators. In the prototype, the graduates are represented as candidates while the employers are represented as recruiters.

The interfaces of these user groups are different for example, different users will only have the option to see and view what the administrator allows them to. This is necessary due to the kind of portal being developed and the user requirements of each group of users being different. Firstly, the users of the implemented prototype register for an account on the IGP website. Users can register as graduate, lecturer or employer. After registration, the site administrator confirms the registration of the new user before an e-mail is sent which contains the password of the user. The screenshot of the homepage of the IGP is shown in figure 5.4.

The top section of the page is made up of main menu and the site name. The body page consists of available job listings, the occupational field and the locations where the jobs are. There is also a main navigation bar which can be seen but cannot be accessed by an unregistered user.

Figure 5.4: Screenshot of IGP Homepage



There are different links through which the users can register on the portal. Users can register as graduate (candidates), employers (recruiters), lecturers and administrators. Users will remain blocked until the administrator confirms their accounts.

5.2.6 Required Integrated Graduate Portal Features Implementation

The user requirements obtained in chapter four are implemented into the proposed IGP when it was being designed. These user requirements are discussed below and according to the different stakeholders that will be making use of the portal.

5.2.6.1 General Requirements for All Stakeholders

These refer to the general requirements that were selected to be included in the IGP to be used and accessed by graduates, employers, lecturers and administrators as identified in chapter four and section 5.2.4. These requirements include:

5.2.6.1.1 Group

All stakeholders have the ability to create groups and raise topics or have discussions on the discussion forum. The group and discussion forum is open to all stakeholders and so all stakeholders can have mutual interaction with one another and help each other out.

5.2.6.1.2 A What's new Column

It was selected that the users should be able to see the recent updates that occur on the portal when they log in such as when a graduate posts a new resume or when an employer posts a new job or when a lecturer rates any of the graduates content. These are just some of the updates that can be seen on the portal.

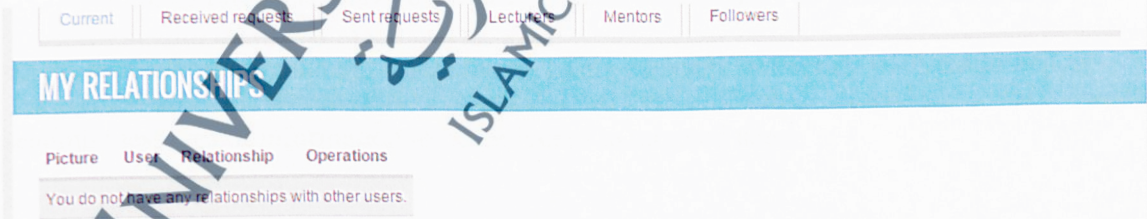
Figure 5.5: Screenshot of What’s New Column



5.2.6.1.3 Create User Relationships

All users on the portal also wanted to have the opportunity to add and create user relationships with other users on the site. For instance, a graduate can add a lecturer as his or her lecturer or his or her mentor. A follow relationship can also be created i.e. users can follow other users he or she have access to on the portal. A screenshot of the user relationship page is shown in figure 5.6

Figure 5.6: Screenshot of User Relationship Page



5.2.6.1.4 Forum

The forum is an online meeting place where users can share information or discuss about general or specific issues. It can also be seen as an online message board through which website users can post messages about topics that interest them or ask

questions from other users too. There should be a forum in the IGP where everyone can discuss and ask questions from one another apart from using the inbox.

5.2.6.1.5 Online Chat

All stakeholders also have the ability to join the chat room and discuss with one another. This will assist in helping all stakeholders to get to know each other or market themselves directly to employers.

5.2.6.1.6 Private Messaging

Users have the ability to send private messages to other users on the portal. They can delete read messages and view sent messages. The screenshot of the private message page is shown below.

Figure 5.7: Screenshot of Private Message Page



5.2.6.1.7 Collation/digest of e-mail groups

Administrators also have the ability to send bulk e-mails to group of users or a single user or a particular group of users. This includes collecting of e-mails and sending messages of information to be delivered to targeted users.

5.2.6.2 Graduates' Requirements

The graduate page is developed according to the user requirements. The graduates have access to job listings on the website; they can view, bookmark and apply for jobs directly. They can also update their resume, add research projects, and

Figure 5.8: Screenshot of Application to vacancy page



5.2.6.2.2 Resume

The graduates in the IGP should also be able to complete their resume online and should be able to make use of it for applying for jobs in the portal.

5.2.6.2.3 Selection of Possessed Skills

Applicants can be able to choose and add the skills they possess in their resume. The skills they will be able to choose from are the skills the employers stated that prospective applicants looking for jobs should possess. They will also be able to add video presentations to show some of the skills they possess.

Figure 5.9: Screenshot of Possessed Skills Selection Page

SKILLS

Skill

General Skills

	Basic	Intermediate	Advanced	Expert	
Self-Management skills	☐	☒	☐	☐	Remove
Use of Tools and Technology skills	☐	☐	☒	☐	Remove
Motivation skills	☐	☐	☒	☐	Remove
Numeracy skills	☐	☒	☐	☐	Remove
Communication skills	☐	☒	☐	☐	Remove
Planning, Organizing and Implementing skills	☐	☐	☐	☐	Remove
Customer Service skills	☐	☐	☐	☐	Remove
Additional terms: Positive Attitude skills, Presentation skills, Problem Solving skills, Team work skills, Tech Savvy skills, Written Communication skills					

Office applications

	Basic	Intermediate	Advanced	Expert	
Pagemaker	☐	☐	☐	☐	Remove
Paint Shop	☐	☐	☐	☐	Remove
Photoshop	☐	☐	☐	☐	Remove
Additional terms: OpenOffice / StarOffice, MS Word, MS Project, MS Publisher, MS Visio, SPSS, Statistica, Windows 2000/XP/ Vista, Tex, LaTeX, R, RStudio, MS Powerpoint, MS Outlook, HomeSite, Illustrator, Indesign, GoLive, GNU R, Adobe Acrobat, CorelDraw, Dreamweaver, Lotus Notes, Lotus SmartSuite, MS Access, MS Excel, MS Office (in general), Mathematica, Mathcad, Macromedia Director, Maple					

Software engineering

	Basic	Intermediate	Advanced	Expert	
Pascal	☐	☐	☐	☐	Remove
Perl	☐	☐	☐	☐	Remove
PHP	☐	☐	☐	☐	Remove
Additional terms: Pione, OsCommerce, Oracle iAS, QJB, OpenCMS, OpenGL, Progress 4GL, Prolog, RMI, REXX, RPG, Ruby, REXX, RDF, RVC, Python, QT, ODBC, OIR-Mapping, JNDI, JINI, JScript, NET, JSF, JMS, JMF, JAXB, JAXP, Jboss, JSP, JTA, Maven, JFC, Modula, NetBeans, MAPInfo, Scene, JUnit, Lisp, log4j, Ruby on Rails, SAX, WSAD / RAD, WSDL, XML, XML Schema, Windows Scripting Host, Windows API, Visual, Voice XML, W3C-Standards, Web Services, more ...					

Notes

5.2.6.2.3 Add E-portfolio Contents

Graduates have the ability to be able to add different kinds of content in the portal which can be viewed and rated by lecturers and viewed by employers. These contents are the contents that were selected during the requirement phase and they include professional statements, goals, transcripts, recommendation letters, research projects, audio, video and powerpoint presentations, awards and honours and courses and descriptions. This is shown in the screenshot below.

Figure 5.10: Screenshot of E-portfolio Content



5.2.6.3 Employers Requirements

Some of the features available on the homepage of the employers' page include resume search, ability to search for lecturers, attestation letters and reference letters added by lecturers, have private chat with lecturers on issues concerning any applicant they wish to find out more information on, send private message to all users of the sites and some other features. The requirements that the employers need to be made available in the IGP are also stated and discussed below.

5.2.6.3.1 Adding Job vacancies

Recruiters should be able to add the job vacancies that are available and the requirements needed to be met for the graduates to be considered as likely candidates. The employer can add the required skills, location, job requirements, computer knowledge requirements, certificate requirements and professional courses requirement. In addition, the recruiters should be able to add information on training, workshop, seminars and internship which the graduates can see and make use of. Recruiters can also add jobs through three different methods which are job per file upload, job per link and normal method of adding jobs.

Other information that the employer can add about the vacancy include experience, education level required, and position details, these details make it easier for the job seeker to get exactly the vacancy suitable for her/him especially when using the search functions included within the system. After adding the vacancy, the system lists a number of potential applicants for this vacancy, the portal depends on the details just entered, to search for applicant from the same business category, and/or, have relevant experience, and/or living in the same area, the portal shows short information about them, in the same time, it enables the employer to see full details about each one of them, see the job seeker CV, print it, or contact him/her directly. Recruiters can edit and delete vacancies job vacancies they add on the portal. Permissions available for this job is that employer can add, edit, manage and delete his own job vacancies only.

5.2.6.3.2 Job Requirements Page

The job requirement page is the page where the employer enters the details of the job offer such as the skills, the degree required, the professional course required, the salary to be paid and other information necessary for the applicant to know before applying for the job.

Figure 5.11: Screenshot of Job Requirement Page

BASIC INFORMATION
Emploment Type: Internship / trainee Occupational Field: Creative / Design Fields of Study: Visual arts / Design Salary: \$45 000.00 per annum
REQUIREMENTS
Degree : B.Sc Skills: CorelDraw Photoshop Required Languages: French: Intermediate Japanese: Advanced Russian: Fluent
WORK LOCATION
Address: 4000 Warner Boulevard Burbank, California 91522 United States Organization: ACME

5.2.6.3.3 Browsing applicants resume

Browsing applicants resume feature is available for lecturers, recruiters and administrators, through which they can browse applicants and their portfolios, create user relationships, views resumes and details.

Figure 5.12: Screenshot of All Applicants' Resumes

The screenshot displays a resume search interface with a sidebar on the left and a main content area on the right. The sidebar contains a 'RESUME SEARCH' section with a search bar and a list of job titles: Information Technologist, Senior Chiropractor, Housekeeper, Director of HR, Game Music Composer, and R&D Consultant. Each job title is accompanied by a small profile picture and a brief description of the job requirements, including desired job title, employment type, availability start date, and desired occupation.

The main content area features a 'Desired employment type' section with a list of options: Full time (10), Freelance (1), Part-time (1), Contract (1), and Temporary (1). Below this is a 'Desired occupations' section with a list of options: IT / Software Development (1), Medical / Health (1), Administrative / Clerical (1), Banking / Real Estate / Mortgage Professionals (1), and Biotech / R&D / Science (1). The 'Degree levels' section includes options: B.A. (1), B.S. (1), and M.S. (1). The 'Fields of study' section includes options: Mathematics / Statistics (1), International Business (1), Health (1), Sport science (1), and Chemical industry (1). The 'Skills' section includes options: General skills (1), Office applications (1), Software engineering (1), and Web (1). The 'Languages' section includes options: English (1), German (1), French (1), and German (1). The 'Schools' section includes options: Full time (1), High School (1), College High (1), College Low (1), and High School (1).

On the right side of the main content area, there is a 'Dashboard Home' section with links to My Dashboard, My recruiter profile, Favourites, Logout, My profile, and My resume. Below this is a 'Profile Complete Percentage - Recruiter Profile' section showing a progress bar at 0% complete. The 'Slideshow Resumes' section displays a resume for Bridget Schmitt, including her contact information and a list of recent content. The 'Current search' section shows a list of resumes found, including Taofiq Salaha, Alan Harper, Berta Doe, Bridget Schmitt, and Charlie Harper, each with a small profile picture and a brief description of the job requirements.

5.2.6.4 Lecturers Requirements

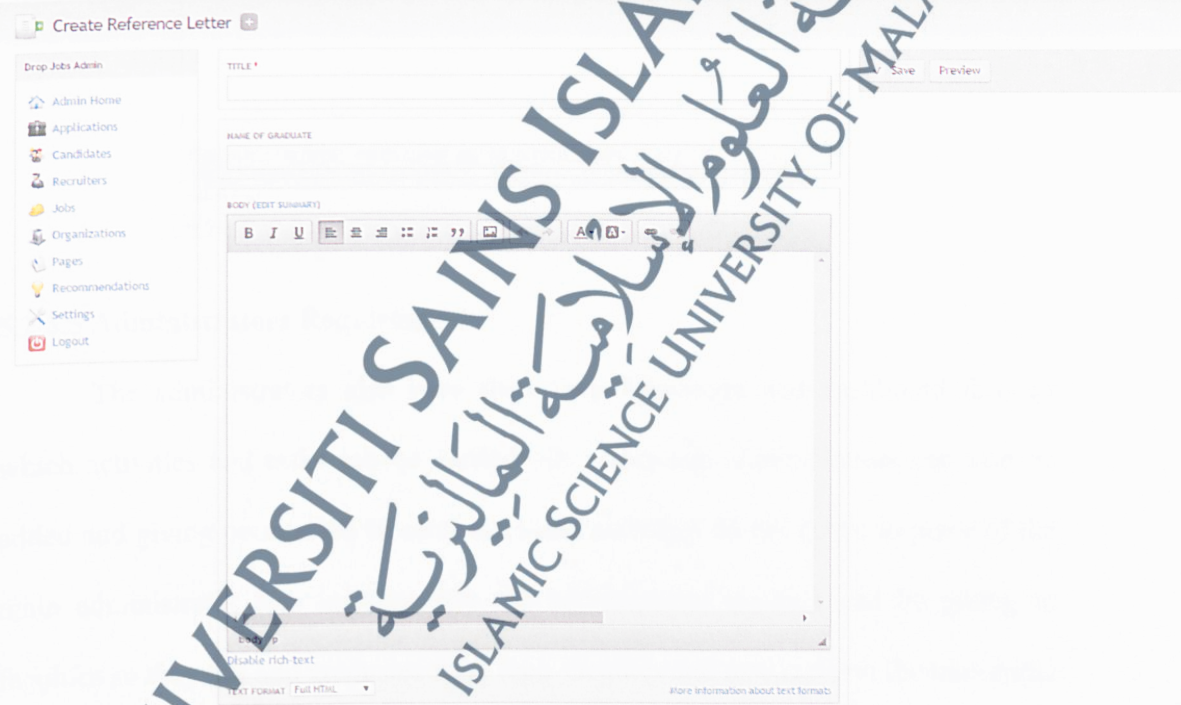
The features which are required for the lecturers in the IGP are adding of reference and attestation letters, rating of resume of graduates and rating of their other uploaded contents, viewing of graduates resume, having public chat with all users and private chat with prospective employers if the employee decides to contact an

applicant’s lecturer. Lecturers can add reference letters and attestation letters on the portal for graduates. Recruiters can contact the past lecturers of the graduates to find out information about the graduates through inbox or chat and view reference and attestation letters.

5.2.6.4.1 Add Reference Letters

Lecturers can add reference letters for any graduate that request for it from them to be viewed by the employer. The screenshot below shows the page for adding reference letter.

Figure 5.13: Screenshot of Create Reference Letter Page



5.2.6.4.2 Add Attestation Letters

A letter of attestation is a letter that is written to confirm the attitude or behavior of a graduate certifying that it is true. For instance, a lecturer can create an attestation letter for a graduate he or she knows very well certifying that the graduate is a good person generally. Lecturers can create attestation letters for graduates on the

IGP which the employers can view and know it is from authentic source as the lecturers are confirmed and authenticated users of the portal. Figure shows the screenshot of the attestation creation page.

Figure 5.14: Screenshot for Creating Attestation Letter



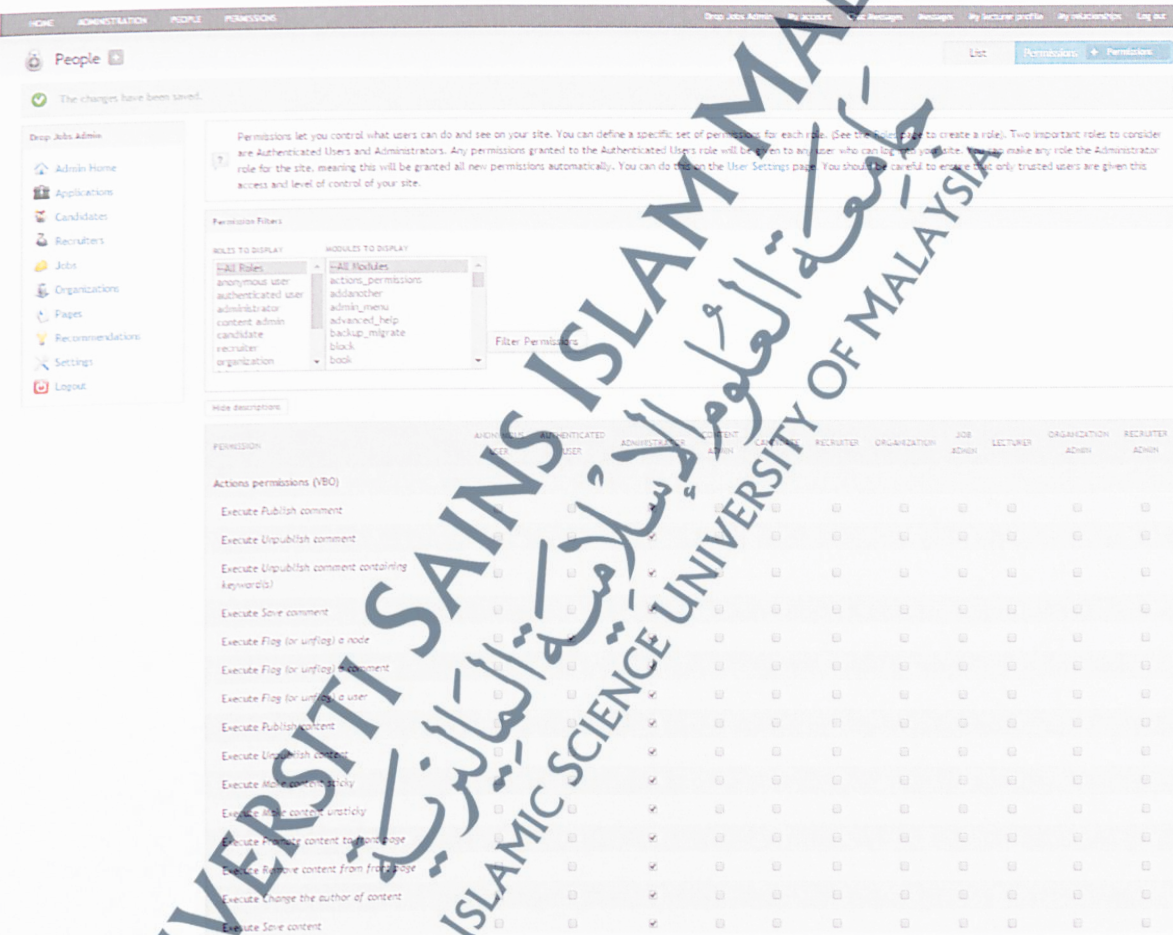
5.2.6.5 Administrators Requirements

The administrators also have their own homepage and dashboard through which activities and tasks can be carried out. Other sub administrators can also be added and giving permission to carry out some activities on the portal in place of the main administrator. For instance, the sub administrator position can be giving to faculties so they can add graduates from their faculties and also confirm the transcripts they upload on the portal. The administrative homepage and dashboard are shown below.

Administrators have the ability to add other administrators, verify user accounts and delete user accounts. Other functions which are available to administrators include editing/deleting categories and give permissions to different

users. The need to add other administrators and give limited permissions to administrators is important for the effective running of the portal when the main administrator is not available. The administrator is also in charge of setting up criteria the different groups of users have to meet in order to make use of the site efficiently.

Figure 5.15: Screenshot of the Administrator’s Permission Page



5.3 Conclusion

This chapter discussed about the prototype design and its overview and the implementation and development of the IGP. In the portal development, the user requirements obtained in chapter 4 has been incorporated. The description of the

components of the prototype is also presented. Information is also given on the details of how the IGP was developed. Even though the objectives of this research have been achieved, the portal can be improved further in the future by identifying more graduates' e-portfolio contents and more user requirements of all stakeholders which can be incorporated into the IGP.

