

CHAPTER FOUR

USER REQUIREMENTS ANALYSIS AND RESULTS

This chapter presents the concept of the Integrated Graduate Portal (IGP), data collection and the results of the user requirements survey carried out on all stakeholders. The discussion of the results is provided followed by the identification of user requirement for all stakeholders.

4.1 Introduction

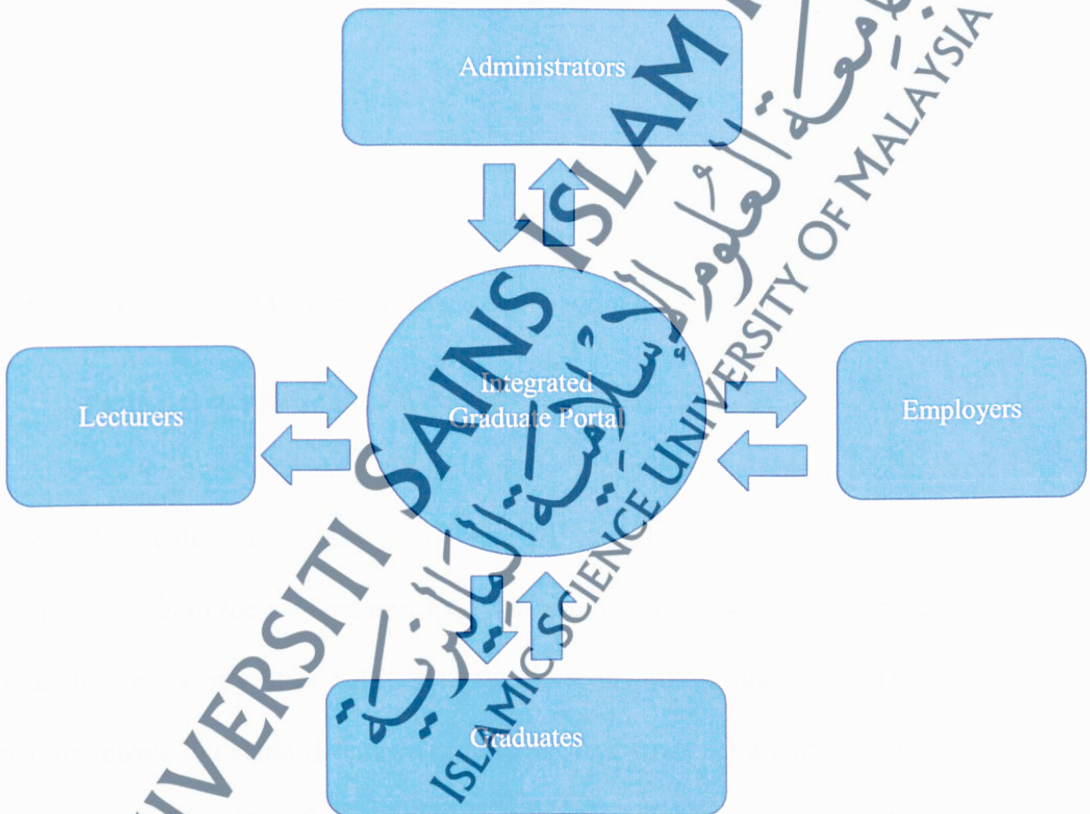
The introduction to the IGP, The roles and the potential benefits of the IGP to all the groups of stakeholders is discussed in the following section. In order to identify the user requirements for the stakeholders (graduates, employers, lecturers and administrators) of the IGP, a survey was conducted. The results of the user requirements survey for all stakeholders are presented in the following sections. The functional and non-functional requirements of the portal are likewise explained in this chapter. The result of the evaluation survey will be presented in the subsequent chapter.

4.2 Introduction to the Integrated Graduate Portal (IGP)

Hence, the development of the IGP is proposed in order to facilitate graduate marketability. The proposed Integrated Graduate Portal is a web-based portal that have integrated features and capabilities, which will be further highlighted and addressed in this thesis. The IGP will potentially assist graduates who are searching for jobs and want to increase their marketability, employers who are searching for prospective employees and want to have access to applicants' e-portfolios, lecturers

who want to assist their graduated students in having better prospects of being more employable and the administrator which is the university who will provide confirmation of graduates' previous studentship and employers verification. Figure 4.1 shows the proposed concept that consists of four identified stakeholders which are graduates, employers, lecturers and administrator.

Figure 4.1: Concept of the Integrated Graduate Portal



4.2.1 Role of Stakeholders in the proposed IGP

Administrator Role: This role is for the administrator of the IGP website and permissions for this role are strictly restricted. The administrator is in charge of verifying graduate's results and course works done in school. Verification and

authentication of other stakeholders registered in the IGP are also carried out by the administrator.

Employer Role: The role is basically performed by prospective employers who perform the job of assessors, advisors, and employers for graduates in the portal.

Lecturer Role: This role is primarily performed by lecturers who taught the students when they were still in school. The content validation process and rating of uploaded work by the graduates is managed by the lecturers. They also serve as mentors and advisors for them.

Graduate Role: These are the graduated students of a particular university whose marketability needs to be facilitated. They are the one of the key users of the portal and they are to upload their respective resume and e-portfolios online.

4.2.2 Potential Benefits of the proposed IGP to All Stakeholders

Due to interaction among all stakeholders, they may be able to understand one another better than when they were strangers. Stakeholders may also learn one new thing or two from their interaction with one another and new skills can be developed. It can become a way of bringing out new ideas, inventions and so on. This may also help graduates to decide if they want to apply and work for a particular employer or not. Potential benefits of the proposed IGP to graduates, lecturers, university and employers are discussed in the following sections.

4.2.2.1 Potential Benefits to Graduates

It may provide graduates with a medium of presenting themselves to prospective employers. Graduates can find the information they need about different employers,

their requirements and positions they offer. The use of the Integrated Portal might also enable graduate to use information technology to make and support decisions in the process of solving real-world problems and particularly in the areas of marketability and assist them in utilizing technology-based research tools to locate and collect information pertinent to the task, as well as evaluate and analyze information from a variety of sources. It may assist them in their career portfolio creation.

Building technology skills and fostering self confidence in their own abilities can be derived from e-portfolios and resources and ideas are also shared through it. Chances of internships, trainings and on-the-job trainings in companies, industries and workplaces may also be increased as a result of the relationship with prospective employers through the use of the IGP. It may as well help them in the creation of their career portfolios. Graduates may use the IGP to find training being given by employers and they can apply for them. These trainings may help them to improve their practical skills and knowledge. They can make use of this portal to contact different employers and ask for advice or help from them. Interaction with prospective employers may enable graduates to get ideas for their final year projects or any kind of research work they want to venture into.

Through the rating by the lecturers on some of the contents that has been uploaded on the portal by the graduates, the graduates will be able to know whether the contents upload on the portal is good or not according to the rating of the lecturers. If the ratings are low, applicant can edit his or her content in order to make it better and thereby be able to provide better content for showcasing himself/herself on the portal. Since the administrator will be in charge of approving and verifying

employers' information, they indirectly influence in helping their graduates gain better and easier access to different opportunities after completion of their education.

4.2.2.2 Potential Benefits to Lecturers

The use of the IGP can create more familiarity between the lecturers and their graduated students as graduates can choose whichever lecturer they want as their mentor. They will also be able to assist the graduates by providing some of the letters needed such as the attestation and reference letter for them easily on the portal in order to let employers know the kind of person the applicant is.

4.2.2.3 Potential Benefits to University

IGP may help in improving the relationship between the university and the employers which will increase the chances of graduates getting employment. The public relations of the university with all stakeholders are also ameliorated. The marketability of their graduates might also be increased through its use. One other benefit to the institution that can be derived is that it may assist them in reacting to calls for better answerability and outcomes-based certification.

4.2.2.4 Potential Benefits to Employers

The IGP might bring the employers more in contact with the graduates they might employ in future so they can get to know them a little bit better. Employers may also decide to help graduates more in achieving their goals, maybe in terms of scholarships, funding and so on. They may also take part in helping them to develop their marketability skills. It may also help in sharing information employers want to share with prospective employees like forms of co-operation in a course of study or possibilities of gaining a scholarship.

Employers may as well be able to understand what the graduates have to offer according to their work. The quality of graduates as job applicants likewise may be increased and give employers more confidence to employ them. Graduates might possess more skills demanded by employers and thus improve their level of satisfaction on prospective employees for hire. Employers can be capable of providing on the job training for graduates matching their areas of specializations and professions who they can in the long run employ in their workplaces. The IGP may improve the process of getting information by the employers in that, they will already have access to graduate student portfolios, they will be able to verify and authenticate the information given through the institution and the lecturers' assessment. It may likewise give room for new opportunities of better systematic co-operation with companies in job trainings in research and academic levels.

4.3 Data Collection

The sample for this study was thirty-three respondents which included 11 graduates, 10 lecturers, 10 employers and 2 administrators. Questionnaires were distributed through the use of online method. Out of the forty questionnaires sent to respondents, the author was able to get thirty-three responses back. Responses from the questionnaires were collated and data analysis was carried out to identify the user requirements of all stakeholders in the IGP. The survey was carried out from August, 2015 to September, 2015.

4.4 Result of User Requirements Questionnaires

The results for the graduates, employers, lecturers and administrators user requirements questionnaires are presented below.

4.4.1 Demographics and General Information

A total of 40 respondents took part in the survey but the author was able to obtain 33 responses back. Table 4.1 shows an overview of the number of surveyed respondents per user group.

Table 4.1: User Group and Number of Respondents

User Group	Number of Respondents
Graduates	11
Employers	10
Lecturers	10
Site Administrator	2

Four (4) main target groups were identified for this survey: Graduates, Employers, Lecturers and administrators. The analysis of each user group is discussed below.

4.4.1.1 Graduate Respondents

Majority of the respondents are 21 – 24 years of age (55%). All of the respondents are interested in making use of the IGP for graduate marketability if it was developed. Also, most of the respondents have more than 5 years of experience (56%). The result obtained from graduate survey is provided below. Table 4.2 presents the demographics and general information of the graduates’ respondents.

Table 4.2: Demographics for Graduate Respondents

Age group	Respondents %
21-24	55%
25-28	36%
29 and above	9%
Sex	
Female	36%
Male	64%
Use of IGP	
Yes	100%
Computer Experience	
2 to 4 years	45%
5 years or more	56%
Working with the web	
Every day- four hours or more	73%
Several times a week	27%
Use of Internet	
1-3 hours a day	18%
3-6 hours a day	27%
More than 6 hours per day	55%

4.4.1.2 Employer Respondents

The employer respondents were from the human relations department of medium-sized enterprise, IT companies and construction companies. Majority of the respondents had 2 to 4 years of experience (50%) in their job. All of the respondents are interested in making use of the Integrated Graduate portal for graduate marketability if it was developed (100%). Also, most of the respondents are very comfortable with the use of the computer (80%) and internet. The result obtained from employers' survey is provided below. Table 4.3 presents the demographics and general information of the employers' respondents.

Table 4.3: Demographics for Employers Respondents

Work Experience	Respondents %
1 year or less	10%
2 years to 4 years	50%
5 to 10 years	40%
Working with the web	
Every day- four hours or more	60%
Every day- less than four hours	10%
Several times a week	30%
Use of IGP	
Yes	100%
Use of Internet	
Comfortable – I can do most things I want to do	20%
Very comfortable – I can do everything that I want to do	80%

4.4.1.3 Lecturer Respondents

All of the respondents are interested in making use of the IGP for graduate marketability if it was developed. Also, most of the respondents are very comfortable with the use of internet (50%). 90% of the respondents stated that they were interested in the IGP for facilitating graduate marketability while 10% were indifferent about it. The result obtained from graduate survey is provided below. Table 4.4 presents the demographics and general information of the lecturers' respondents.

Table 4.4: Demographics for Lecturers Respondents

Sex	Respondents %
Female	36%
Male	64%
Age Group	
20-30	40%
31-40	30%
41-50	20%
51-60	10%
Use of IGP	
Indifferent	10%
Yes	90%
Use of Internet	
3-6 hours a day	40%
More than 6 hours per day	60%

4.4.1.4 Administrators Respondents

All of the respondents are interested in making use of the IGP for graduate marketability if it was developed. Also, all respondents are very comfortable with the use of internet (100%). All respondents also agree that the Undergraduate division of the university should be involved in the running of the IGP. They also stated that graduates data on the IGP should be kept for not more than 2 years. Table 4.5 presents the demographics and general information of the respondents.

Table 4.5: Demographics for Administrators Respondents

Work Experience 2 years to 4 years	Respondents % 100%
Use of IGP Yes	100%
Computer Experience 2 to 4 years	100%
Use of Internet More than 6 hours per day	100%
Length of Time to keep graduate's data 2 year or less	100%

4.4.2 Priority Selected Tasks IGP Should Support

In order to facilitate graduate marketability and showcase graduate achievements to prospective employers, users should be able to make use of the portal to find and acquire information, share, upload information and create user relationships such as mentors, lecturers and friends to improve the interaction between all stakeholders.

When respondents were asked on the tasks which the IGP should support, the graduate respondents rated finding and acquiring of information such as employers, lecturers' information tasks rated as essential by thirty-six percent (36%) of the graduate respondents and fifty percent (50%) of the employers respondents and very important by sixty percent (60%) of the lecturers respondents. Sharing, uploading and

archiving of information such as resumes, videos, seminars and training activities was rated as essential by thirty-seven (37) percent graduates, and fifty percent (50%) employers respondents while sixty percent (60%) of the lecturers respondents rated it as very important.

Majority of the respondents rated creating user relationships with other users such as friends and mentors as essential (37% of the graduates; 50% of the employers and 40% of the lecturers). All of the tasks the IGP should support stated in the survey were rated important (100%) by the administrator respondents. These tasks for the administrator includes managing graduates, lecturers and employers profiles, adding new services related to all stakeholders, providing roles and authentication to all stakeholders. The full list of task the IGP should support for the administrator is presented in the table below.

Figure 4.2 shows the tasks the IGP should support according to the graduates, employers and lecturers while table 4.6 shows the tasks the IGP should support according to the administrators. The differences in tasks support is as a result of the different tasks that can be performed in the IGP by different stakeholders.

Figure 4.2: Tasks the Integrated Graduate Portal should support

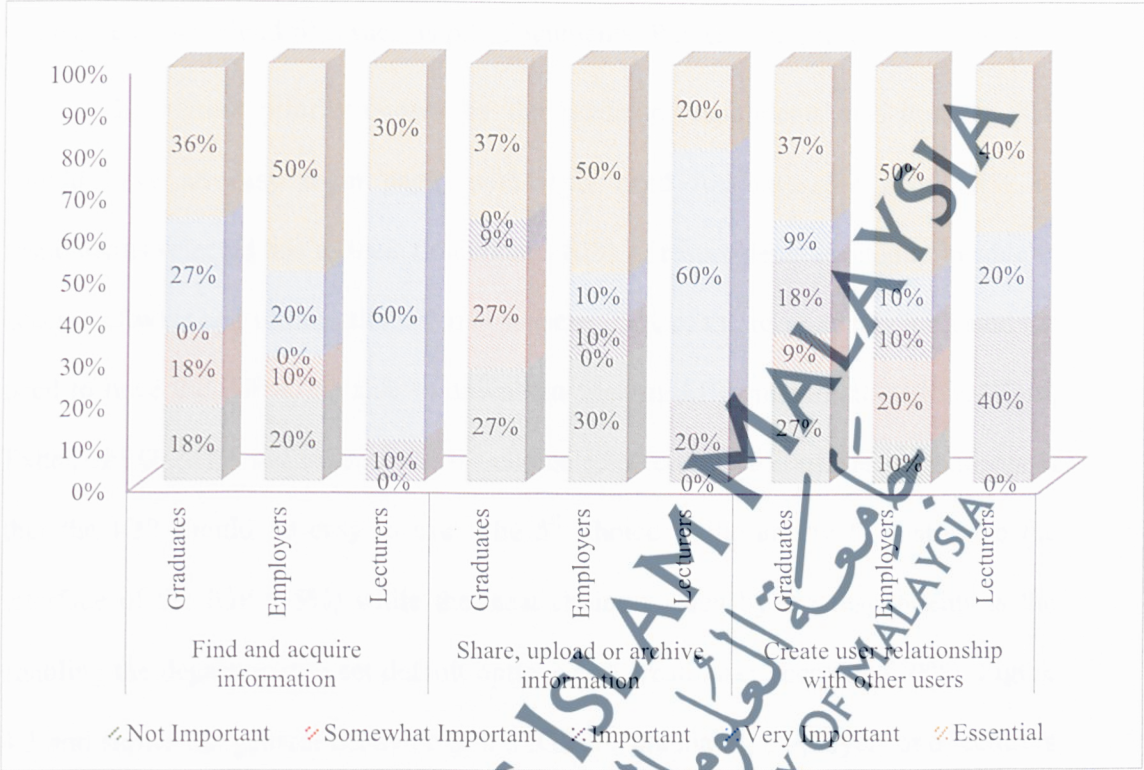


Table 4.6: Tasks the Integrated Graduate Portal should support for Administrators

	%
Manage graduates, lecturers and employers profiles	100%
Add New Services related to all stakeholders	100%
Provide roles and authentication to users	100%
Set criteria for all users	100%
Static contents can be updated through online Content Management	100%
Fully customizable graphic elements directly from admin panel	100%
Create, Edit, Save as many icon sets as you like	100%
Admin can Add, Edit, Delete, Approve, Disapprove any activities	100%
Alerts end to administrator in case of non-normal activity by any user	100%
Database backup	100%
Setup multiple admin with file access privileges	100%

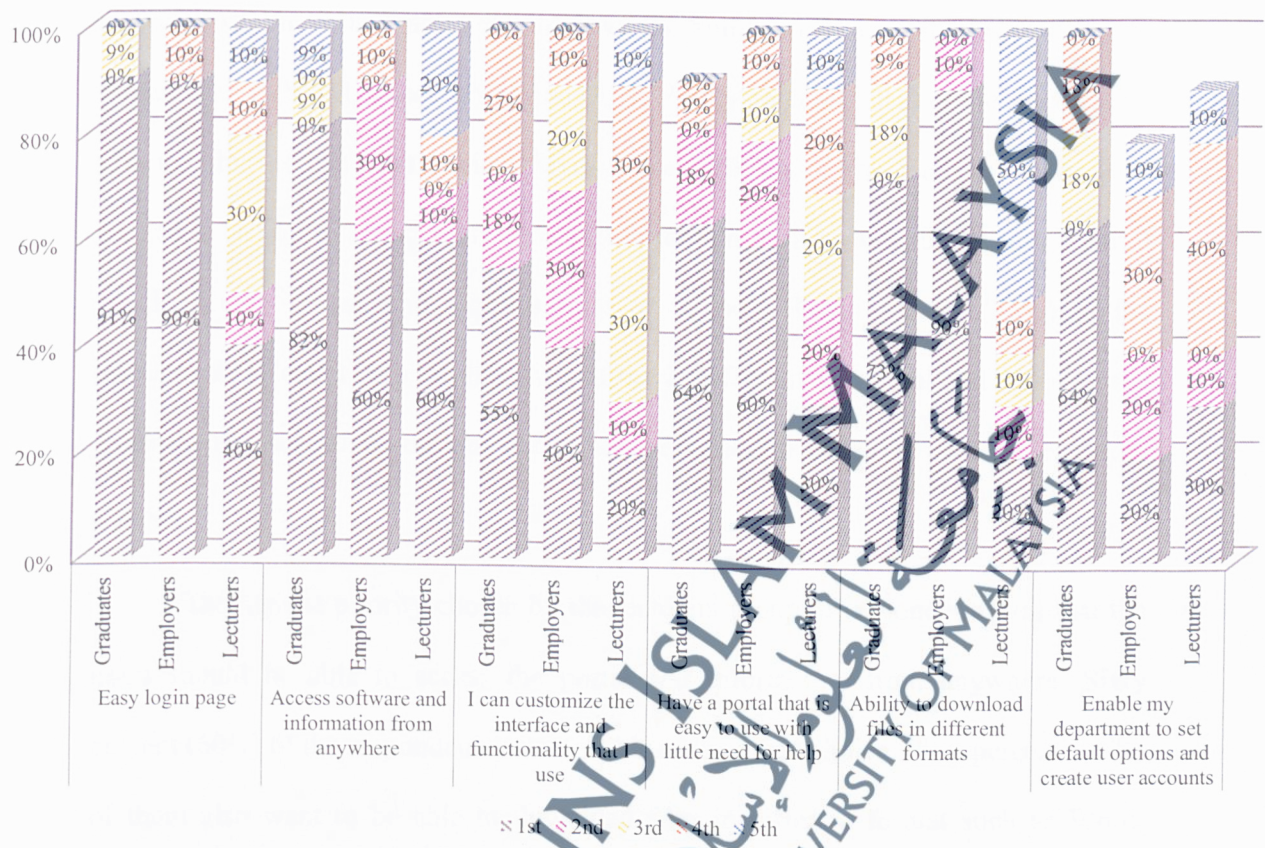
4.4.3 Priorities Selected for General Behavior of the Portal

The general behavior of the portal requirements has to do with how the portal should be operating in order to make it easy for the stakeholders to make adequate use of it. Some of the requirements include a very easy login page for the users, easy

customization of the interface and functionalities of the users and ability of the users to be able to download files such as pdf, documents, PowerPoint presentation easily.

The highest priority chosen by the graduate respondents was that the IGP should have an easy login page, with little need for extensive help. 91% of respondents selected this as their first choice. 82% of respondents wanted to be able to access software and information from anywhere. 73% of the respondents indicated the need to have the IGP to be able to download files in different format such as Word, Excel, JPEG, MP3 and others. The 4th choice selected by 70% of the respondents is that the IGP should be easy to use. The 5th choice is the ability to customize the interface of the IGP (55%) while the least choice chosen by the respondents is the enabling the department to set default options and create user accounts (50%). Figure 4.3 and shows the general behavior of the IGP for graduates, employers and lecturers respondents while table 4.7 shows the general behavior of the IGP for the administrators respondents because the behavior of the IGP is different for administrators and the other three stakeholders. For instance ability to download files and easy to use portal are some of the general features for graduates, employers and lecturers while ability to send e-mail notifications and extensive usage stats for categories and new categories and members are features of the general portal behavior for the administrators.

Figure 4.3: General behavior of the Integrated Graduate Portal



For the employers' respondents, the highest priority chosen was that the IGP should be easy to login to and users should have the ability to download files in different format such as Word, Excel, JPEG and MP3. Ninety percent (90%) of the respondents selected this as their 1st choice. Sixty percent (60%) of the lecturer respondents wanted to be able to access software and information from anywhere and have a portal which is easy to use and requires little or no help. Forty percent (40%) of the respondents selected the customization of the interface of the portal and enabling the department to set default options and create user accounts as the 3rd choice (See figure above).

The highest priority chosen by the lecturers group of respondents was that the users should be able to access the portal and information from anywhere. Sixty percent (60%) of the respondents selected this as their first choice. Fifty percent (50%) of them also want to be able to download files in different format such as Word, Excel, JPEG, MP3 and others while 40% indicated easy login page as the third choice. The least selected choice is enabling the department to set default options and create user accounts by thirty percent (30%) of the respondents.

All the administrator group of respondents selected easy login page, access of portal from anywhere, ability to send e-mail notifications to users, and extensive usage stats for categories and members as highest priorities. This is shown in table 4.7 below

Table 4.7: General behavior of the Integrated Graduate Portal for Administrators

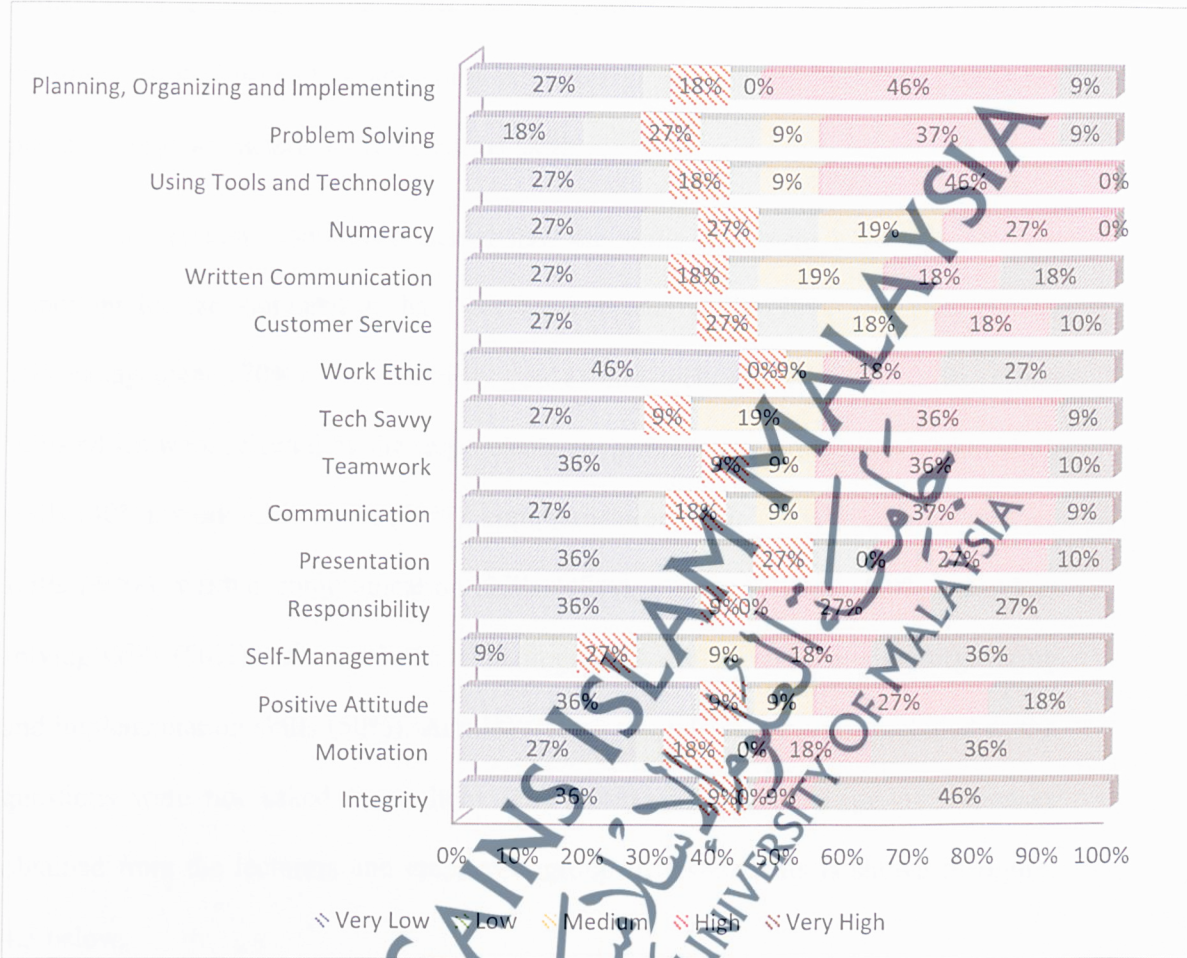
	% Responses
Easy login page	100%
Access software and information anywhere	100%
Ability to send e-mail notifications to members	100%
Automated e-mails indicating that accounts have expired	100%
Extensive usage stats for categories, members, new sign ups	100%

4.4.4 Priorities Selected For Graduates Possessed Skills

As the possession of graduate skills is important to facilitate graduate marketability, the graduate respondents were asked about the skills they possess and what they rate their level as whether very low, low, medium, high or very high. Figure 4.5 shows the skills selected by graduates as the skills that they think they currently have and the skills they still need to work on. The skills that most of the graduates stated that they possessed a high percentage of are Integrity (46%), Motivation (36%), Self-management (36%), Communication (37%), Tech Savvy (36%), Using Tools and technology (46%), Problem solving (37%) and Planning, organizing and implementing (46%) skills while the skills that the graduates do not possess much of include Positive Attitude (36%), Responsibility (36%), Presentation (36%), Team work (36%), Work Ethics (46%), Written Communication (27%) and Numeracy (27%) skills.

This result shows that many of the respondents have low ratings in the majority of the skills required by employers which they still need to work on.

Figure 4.4: Possessed Skills by Graduates



4.4.5 Priorities Selected For Required Skills To Be Possessed By Graduates

Also, in order to identify the general skills required by employers and which can be included in their requirements on the proposed portal, employers and lecturers respondents were asked to identify the skills largely required by employers. When employer respondents were asked about the required skills to be possessed by graduates, the employer respondents selected as the very important or essential skills that graduates should possess in order for them to be able to work in their companies which are motivational skills (60%), integrity (50%), self-management (50%), responsibility (50%) and tech savvy (50%) skills. Other skills which were selected by

the respondents are presentation skills (50%), team work skills (40%), work ethic skills (30%), communication skills (40%), customer service skills (40%), written communication skills (30%), numeracy skills (40%), problem solving skills (50%) and planning, organizing and implementation skills (50%).

The lecturer respondents stated that the skills that were essential and very important for the graduates to have are motivational skills (70%), integrity (80%), self-management (70%), responsibility (80%) and tech savvy (50%) skills. Other skills which were selected by the respondents are presentation skills (60%), team work skills (40%), work ethic skills (50%), communication skills (60%), customer service skills (40%), written communication skills (40%), numeracy skills (60%), problem solving skills (50%), using tool and technology skills (80%) and planning, organizing and implementation skills (50%). Administrator respondents were not included as the questions were not asked from them. The result of the percentage of responses obtained from the lecturers and employers group of respondents is shown in figure. 4.5 below.

Figure 4.5 (a): Required Skills to be possessed by Graduates

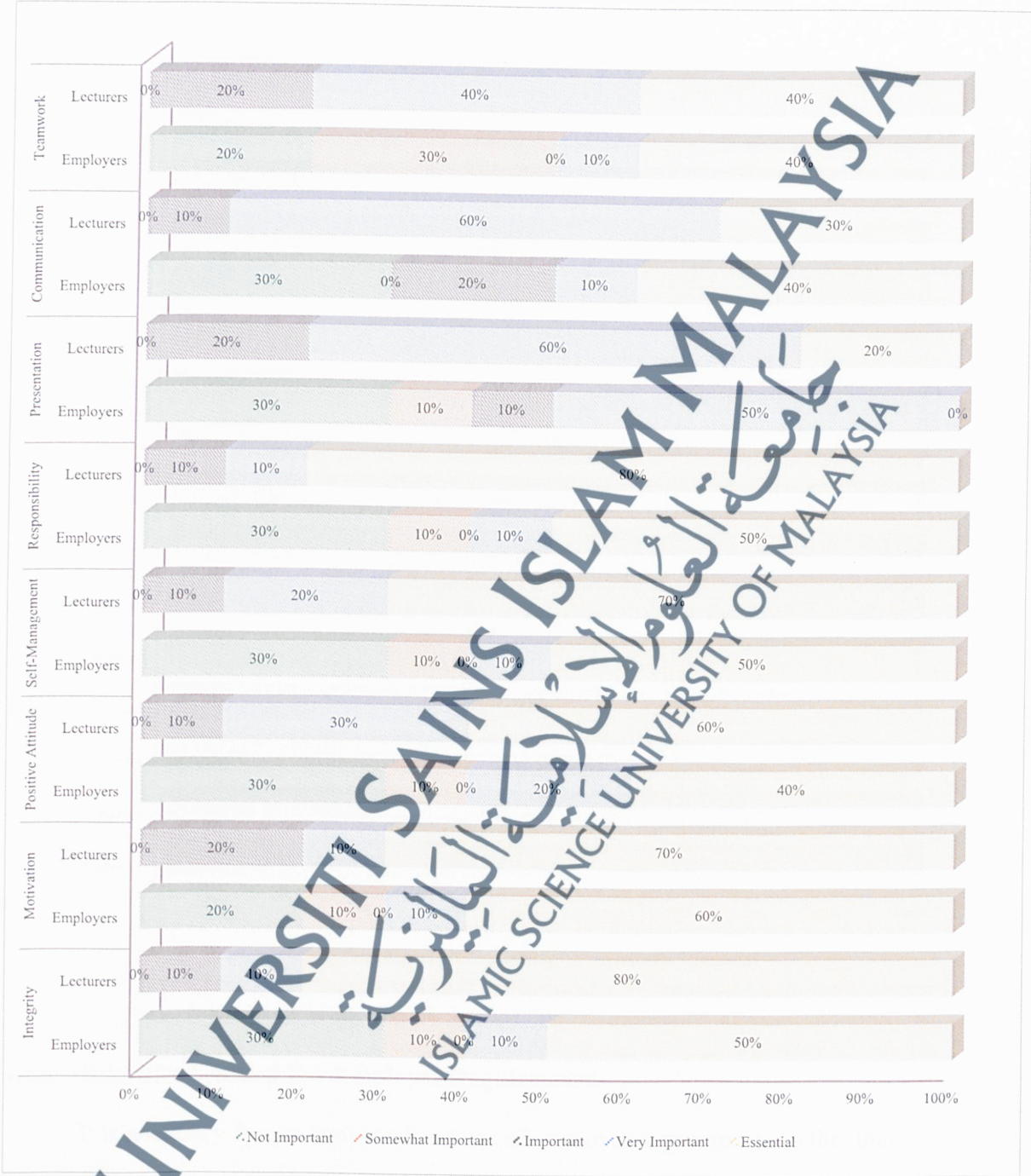
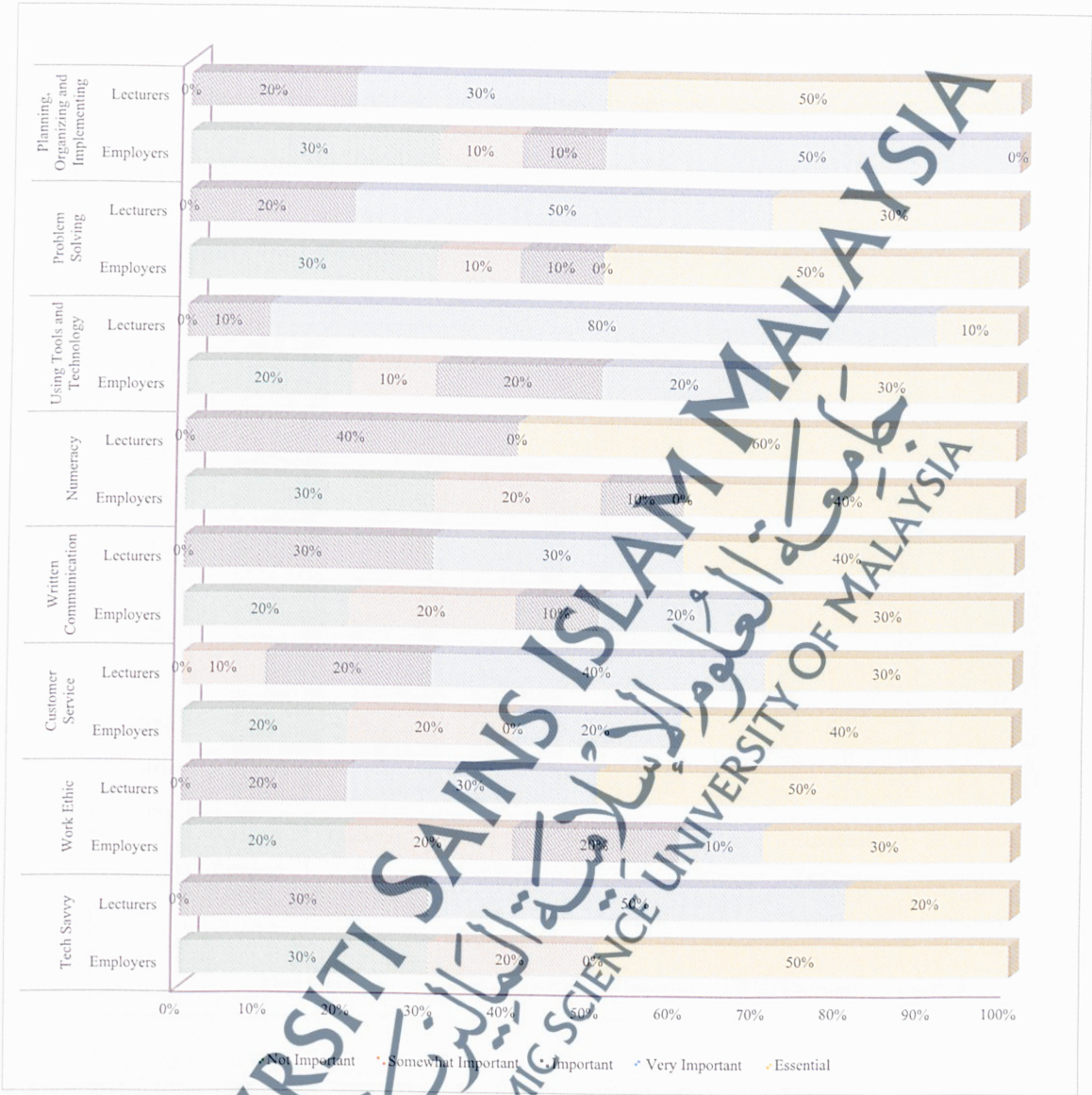


Figure 4.5 (b): Required Skills to be possessed by Graduates



4.4.6 Priorities Selected For Employer Requirements

It is necessary for graduates to be aware of employer requirements so that they can work towards achievements some of the employers requirements or showcase their e-portfolio contents which are related to the employers requirements in order to facilitate their marketability. Graduate respondents were asked to select the employer requirements needed by the graduates that the employers should provide in the IGP. A

very high proportion of respondents (37%) selected that internship and workshop opportunities available, required skills (46%) and certificate requirements (55%) among others should be provided by employers on the portal (figure 4.6). All requirements asked from the respondents were selected as important.

Figure 4.6: Priorities selected for Employer Requirements

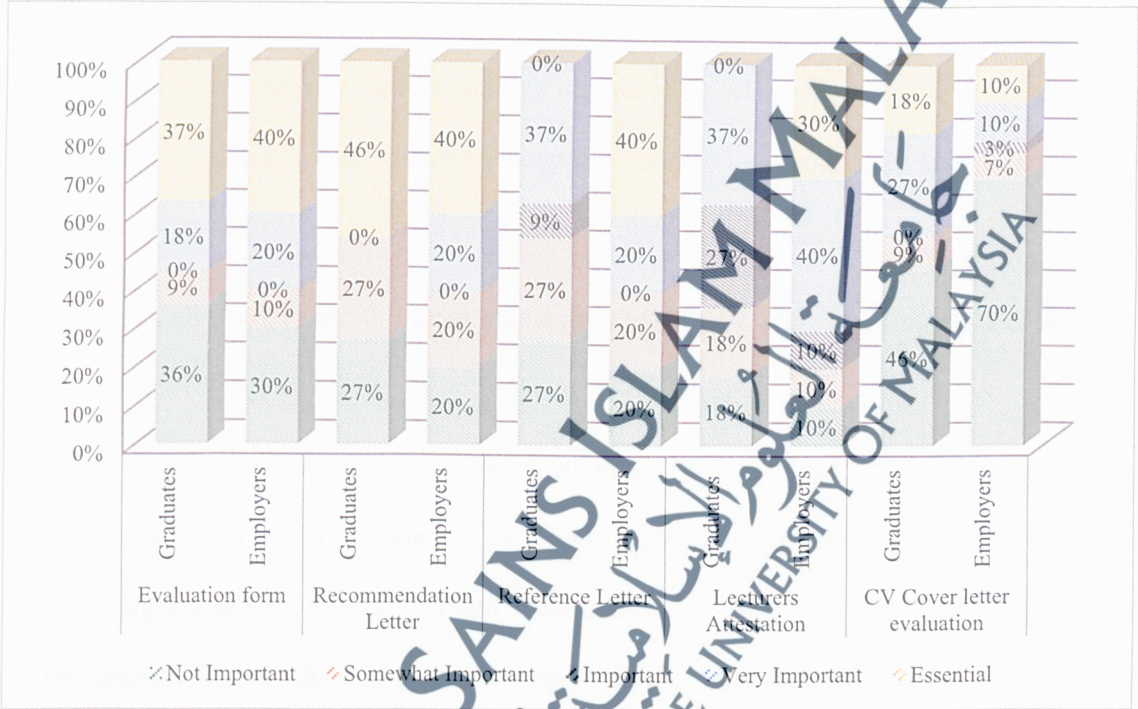


4.4.7 Priorities selected for Result of Required Content/Documents from Lecturers

Graduate and employer respondents were asked to select the content/document that should be provided by the lecturers in the IGP. Responses from the graduates indicated that evaluation form (36%) and CV cover letter evaluation (46%) are not important while lecturer’s attestation (37%), recommendation letter (46%), reference letter (37%) are the very important and essential documents to be provided by the lecturers while the employer respondents likewise selected recommendation letter

(40%), reference letter (40%), and lecturer’s attestation (40%) as the required documents. Figure 4.7 shows the required content/documents that the lecturers should provide in the IGP.

Figure 4.7: Required Content/Documents From Lecturers



4.4.8 Priorities Selected For Data Sharing Among All Users

Data sharing is important in the portal prototype in order to increase the interaction between stakeholders and assist in showcasing contents to prospective employers. Graduate respondents were asked to choose the priorities for data sharing among users and control over who can view or modify shared files was chosen by 81% of the respondents as first priority. The second priority selected was when shared data has been modified or added; group members should be notified automatically by 55% of the respondents. 46% selected enforcing of users to use the same application

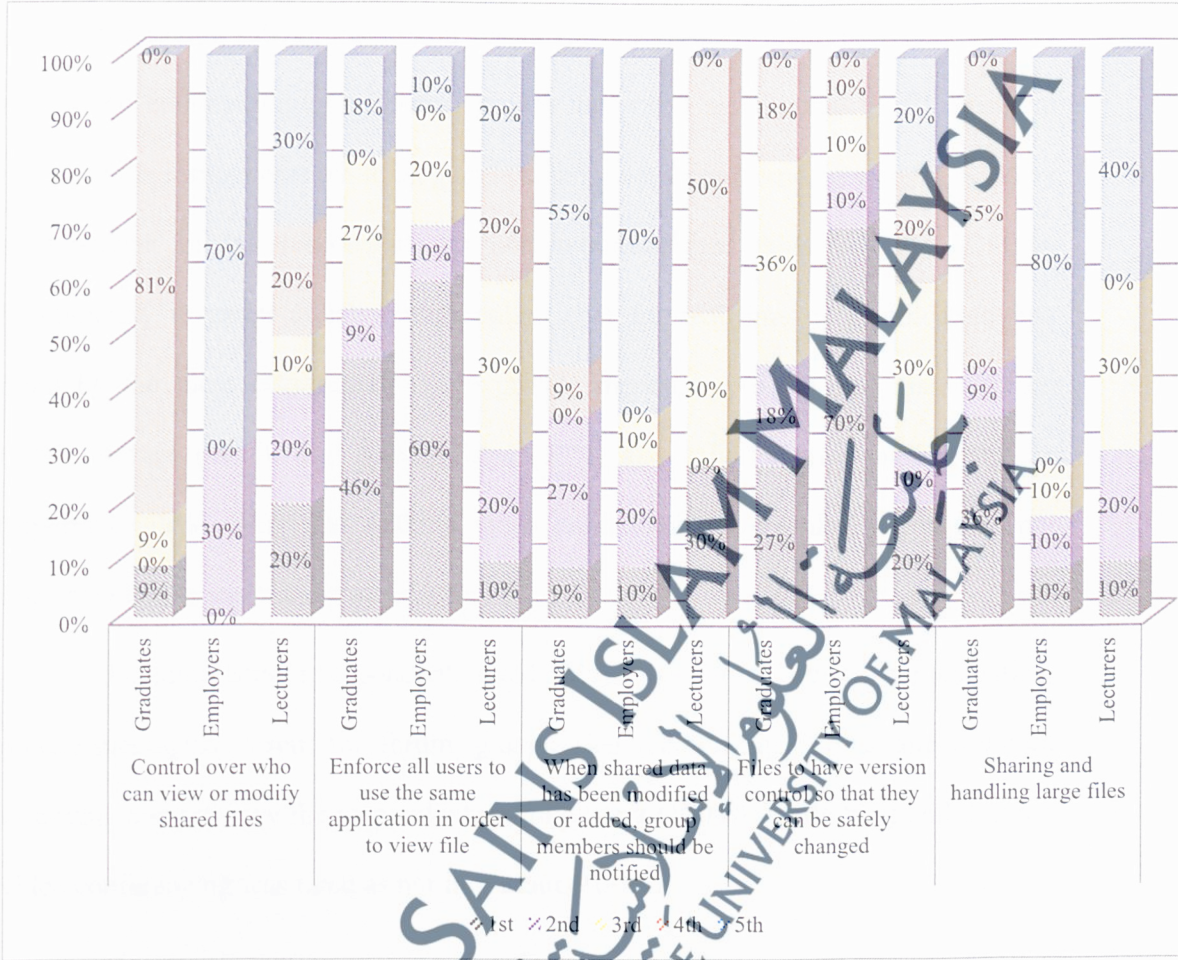
for viewing and manipulating data or files. The least selected priorities were sharing and handling of large files (36%) and multiple authorship (27%).

The top three options for first preference according to the employers group of respondents were quite close to each other and are stated before

- Sharing and handling large files (80%)
- Control over who can view or modify shared files, when shared data has been modified or added, group members should be notified automatically and files to have version control so that they can be safely changed (70%)
- Enforce all users to use the same application in order to view or manipulate data or files (60%).

When the lecturer respondents were asked this question, notification of group members when data has been added or modified is chosen as first priority (30%). The next two highest selections were version control and multiple authorship (20%). 10% of respondents chose sharing and handling of large files and use of the same application by different users that make use of the portal the least priority. This question was not included in the questionnaire for the administrator respondents; hence no response was obtained from them.

Figure 4.8: Data sharing among all users



4.4.9 Priorities Selected For Functionality To Assist Collaboration

Collaboration in the portal will increase the motivation of stakeholders to make use of the portal to communicate with each other and reduce the communication gap between the graduates, their university and the prospective employers. For the question on functionality to assist collaboration, private messaging (36%) and user relationship (46%) were rated most as top priority by graduate respondents. Online chat for real-time communication and groups was selected by 37%, discussion forum by 46% and collation/digest of e-mail by 55%. Desktop video conferencing and blog was selected as not important.

For the employer respondents, online chat for real time communication, private messaging (50%), discussion forum (50%), groups (40%), user relationships (40%) and collation/digest of e-mail groups was rated as essential by fifty percent (50%) of the respondents while blog and desktop video conferencing were selected by sixty-percent of the respondents as not important (see table below). On the functionality to assist collaboration, online chat for real-time communication was rated by the most respondents while private messaging (60%), discussion forum (50%), groups (40%), user relationships (50%) and collation of e-mail groups as important (60%). Blog and desktop video conferencing were also selected as not important by the lecturers respondents.

The administrator respondents rated online chat for real-time communication, private messaging, discussion forum, groups, user relationships, blogs, and collation of e-mail was rated by the respondents as important (100%), while blog and desktop video conferencing was rated as not important (100%).

Figure 4.9: Functionality To Assist Collaboration



4.4.10 Priorities for Setting Up Collaboration

The mechanism to find lecturers with specific expertise and graduates of a university availability received the highest number of responses (82%) by the graduates group of respondents. The other options also received a good response. Seventy-three percent (73%) selected ability to locate other potential users with similar interests and fifty-five percent (55%) selected the ability to be able to comment on other users’ profile or content. Fifty percent (50%) of respondents selected support for building new interest groups and ability to set up teams and

groups easily. Forty-six percent (46%) of the graduates selected the ability to be able to rate other users' contents.

In the case of the lecturers group of respondents, mechanism to find graduates and employers with specific expertise and ability to rate other users' contents was chosen by the most respondents (40%), followed by ability to locate other potential users with similar interests and ability to be able to comment on other users profile or content. Fairly close was the support for building new interest groups (20%) and lastly by the ability of the users to be able to easily set up teams and groups (10%).

A mechanism to find users with specific expertise and graduates, ability to be able to rate other users content and ability to locate other potential users with similar interests were chosen by the all of the administrators group of respondents (100%), with easy setup of teams and groups, support for building new interest group coming next and ability to be able to comment on other users profile or content (50%) coming next. Figure 4.10 shows the priority for setting up collaboration.

Figure 4.10: Setting Up Collaboration



4.4.11 Mechanisms for Being Kept Up To Date

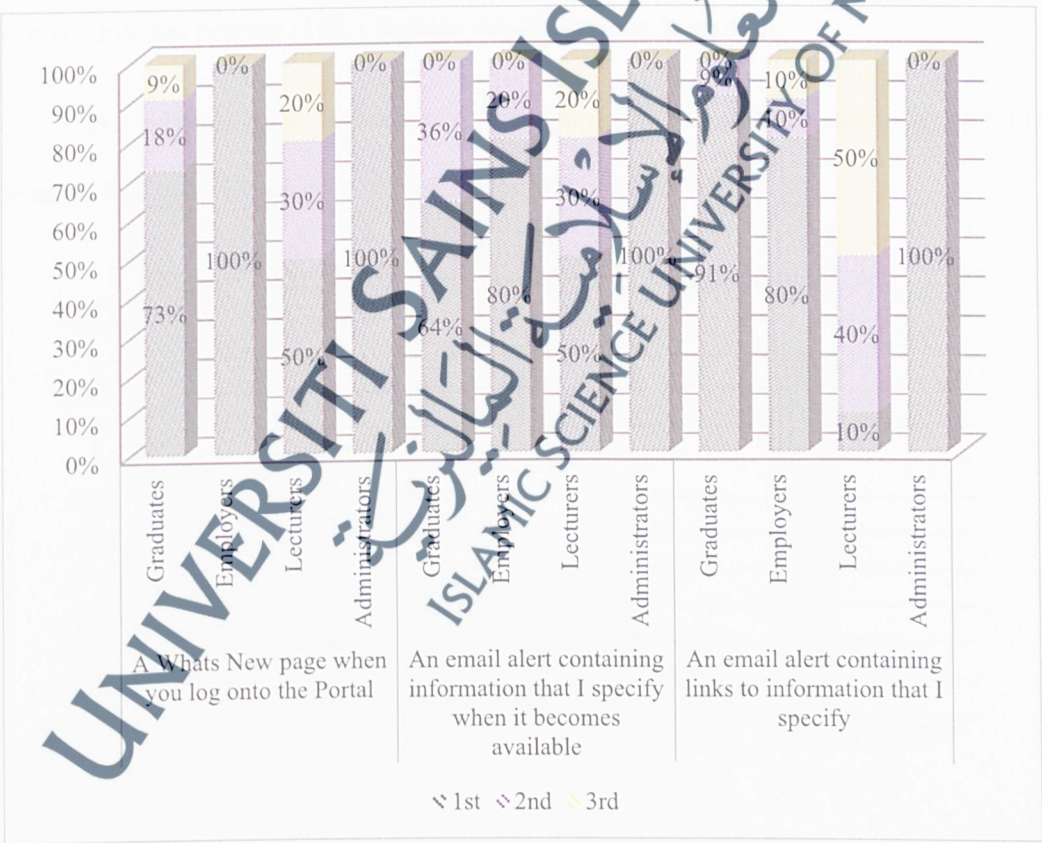
Graduates group of respondents were asked to rate the mechanisms that they would like to keep up to date according to their priorities. An e-mail alert containing links to information that “I specify when it becomes available” (e.g. update on students skills or cv) received the most choice responses (64%) and having a “what’s new” information page immediately on logon to the IGP (73%).

A “whats new” page when you logon to the Integrated Graduate Portal was selected as the first choice (100%) by the employers group of respondents while an e-

mail alert containing information that “I specify when it becomes available” (e.g. updates on graduates’ e-portfolio) and an e-mail alert containing links to information that “I specify when it becomes available” (e.g. update on students skills or cv) were selected as the second choice (80%) by this group of respondents.

The lecturer respondents chose an e-mail alert containing links to information that “I specify when it becomes available” and having a “what’s new” information page immediately on logon to the IGP received the choicest responses (50%). All the mechanisms keeping the users up to date in the IGP stated in the survey were chosen as first choice by the administrators group of respondents (See figure 4.11 below).

Figure 4.11: Mechanisms for being kept up to date



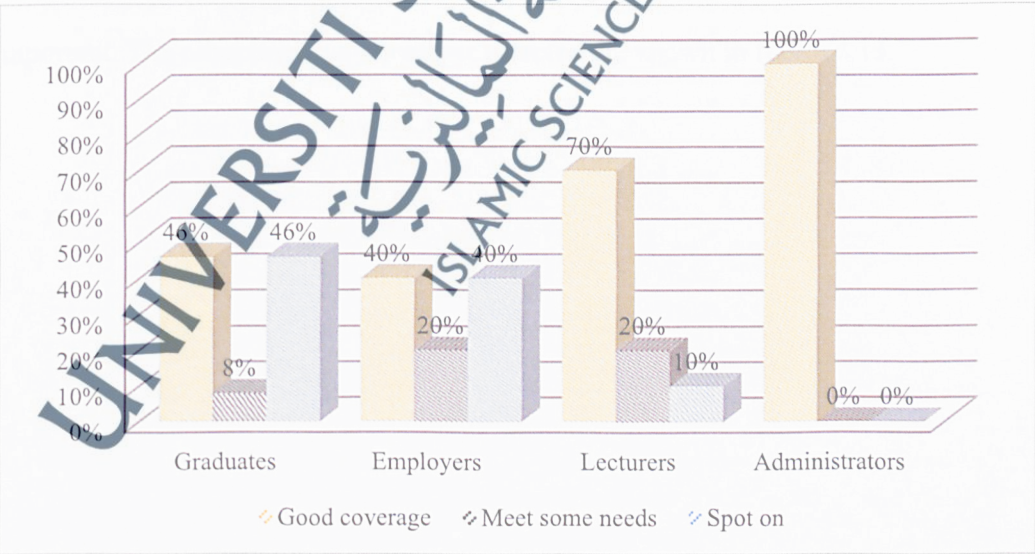
4.4.12 Coverage and Applicability

Most of the graduates’ respondents that filled the online questionnaire indicated that the features in the survey were applicable to their particular needs. Figure 4.11 shows that forty-six percent (46%) of respondents agreed that the features had good coverage; nine percent (8%) indicated that it meets some needs while forty-six percent (46%) thought that they were spot on.

The employers’ respondents indicated that the features in the survey applicable to their particular needs as forty percent (40%) of them agreed that the features had good coverage and spot on. Seventy percent (70%) of lecturers respondents thought that the features had good coverage; twenty percent (20%) thought it meets some needs while ten percent (10%) thought the features set is spot on.

All administrator respondents that completed the questionnaires thought the features had good coverage. This is shown in the figure below.

Figure 4.12: Stakeholders perception of the requirements set



4.4.13 Priorities Selected For Graduates' E-portfolio Content

In order to facilitate graduate marketability, the use of e-portfolio is encouraged in order to showcase the achievements of graduates to prospective employers. Hence, the need to identify the contents that should be made available in the graduates' e-portfolio for employers to see. Transcripts, internship, courses and description, cover letter and research projects were rated by the most respondents as very important while professional mission statements, testimonials, awards and honours, presentations (video and audio) and professional courses taken were also rated important and the next highest ratings selected were resume, goals, samples of related work, recommendation letters, list of references, educational qualifications, extra curricula activities and possessed skills by the employer respondents as important. Voluntary service record was selected as not important by the employer respondents.

The lecturer respondents likewise selected all the options given as very important and essential except the voluntary service record which was selected as not important. The other important contents selected are shown in figure 4.13.

Figure 4.13 (a): Graduates’ E-portfolio Content



Figure 4.13 (b): Graduates' E-portfolio Content



4.4.14 Open Ended Comments

Some of the completed questionnaires included comments that suggest or request features that were added by different groups of respondents (graduates,

employers and lecturers). The suggested featured which were identified by various stakeholders is shown in the table below according to the user group respondents that mentioned it.

Table 4.8: Other Suggested Features for IGP by graduate, employer and lecturer respondents

Graduate Respondents	Employer Respondents	Lecturer Respondents
Career opportunities	Co-ordination	Employer's information
Internship and job opportunities for students	Range of salary to be earned	Attitude skills
Job vacancies	Awards received	
	Career opportunities	
	Internship and job opportunities for students	
	Microsoft skills and real world problem solving skills which is technical and requires applicability of knowledge	
	To give feedback high priority	

4.5 Identification of User Requirements for all stakeholders.

From the analysis and the result obtained in sections 4.3.2 – 4.3.14 above, the user requirements for all stakeholders have been identified. Responses that were selected as very important and essential were chosen to be part of the user requirements while the not important, somewhat important and important option selections were dropped (see section 3.6). Also, in the ranking questions, the author selected the top three ranking requirements (i.e. 1st, 2nd and 3rd) chosen by the different group of respondents and with the highest percentages.

4.5.1 Tasks the IGP Should Support

In the tasks, the IGP should support, the user requirements with the highest frequencies chosen by three groups of stakeholders are selected. The user requirements for the graduates, employers and lecturers are shown in the table below.

Table 4.9: User Requirements for Tasks the IGP should support for graduates, employers and lecturers

	Graduates		Employers		Lecturers	
	Frequency	(%)	Frequency	(%)	Frequency	(%)
Find and acquire information such as employers, lecturers and graduates information	4	37%	5	50%	6	60%
Share, upload or archive information such as resume, videos, seminars and training	4	37%	5	50%	6	60%
Create user relationship with other users such as friends, mentors and followers	4	37%	5	50%	4	40%

The user requirements for tasks the IGP should support which are selected by the administrators respondents is presented in table 4.10.

Table 4.10: User Requirements for Tasks the IGP should support for administrator

Requirement	Frequency	Percentage (%)
Manage graduates, lecturers and employers profiles	2	100%
Add New Services related to all stakeholders	2	100%
Provide roles and authentication to users	2	100%
Set criteria for all users (graduates, lecturers and employers)	2	100%
Static contents can be updated through online Content Management System	2	100%
Fully customizable graphic elements (directly from admin panel)	2	100%
Create / Edit / Save as many icon sets as you like	2	100%
Admin can Add, Edit, Delete, Approve, Disapprove any activities	2	100%
Site administrators have control over what is displayed in nearly all dropdown lists and list boxes throughout the site i.e. "Functions", "Search Categories", "Employers ", "Graduates" etc	2	100%
Alert send to administrator in case of non-normal activity by an user	2	100%
Database backup	2	100%
Setup multiple admin with file access privileges	2	100%

4.5.2 General Behavior Of The Portal

According to the data analysis, the top three choices based on the general behavior of the portal which are selected by the graduates, employers, lecturers and administrators respondents are shown below.

Table 4.11: User Requirements for general behavior of the IGP for all stakeholders

	Graduates		Employers		Lecturers		Administrators	
	Frequency	(%)	Frequency	(%)	Frequency	(%)	Frequency	(%)
Access software and information from anywhere	9	82%	6	60%	4	40%	2	100%
Easy login page	10	91%	9	90%	4	40%	2	100%
Ability to download files in different format such as Word, Excel, JPEG, MP3 and others.	8	73%	9	90%	4	40%	2	100%

4.5.3 Required Skills to Be Possessed By Graduates

The required skills are stated by the employers that the graduates should possess in order to be able to work in a general workplace and so these requirements concerns only the graduates in the portal. The selections obtained from the employers and lecturers respondents are shown in the table below.

Table 4.12: Required Skills to be possessed by graduates

	Employers		Lecturers	
	Frequency	(%)	Frequency	(%)
Integrity	5	50%	8	80%
Motivation	6	60%	7	70%
Positive Attitude	4	40%	6	60%
Self-Management	5	50%	7	70%
Responsibility	5	50%	8	80%
Presentation	3	30%	6	60%
Communication	4	40%	6	60%
Team work	4	40%	4	40%
Tech Savvy	5	50%	5	50%
Work Ethic	3	30%	5	50%
Customer Service	4	40%	4	40%
Written Communication	3	30%	4	40%
Numeracy	4	40%	6	60%
Using Tools and Technology	3	30%	8	80%
Problem Solving	5	50%	5	50%
Planning, Organizing and Implementing	5	50%	5	50%

4.5.4 Employer Requirements

These are the requirements needed by the employers according to the graduates group of respondents. These requirements are shown in the table below.

Table 4.13: Requirements for the Employers

	Frequency	(%)
Required skills	5	46%
Job Requirements	4	37%
Information on training and workshops	4	37%
Computer knowledge requirements	4	37%
Certificate Requirements	6	55%
Professional courses requirements	4	37%
Internship or work placements	4	37%

Some of the graduates respondents suggested that the range of salary to be earned, awards received by employers and job vacancies should be included in the requirements to be supplied by the employers.

4.5.5 Required Content/Documents from Lecturers

The identified user requirements for the documents which are to be provided by the employers according to the graduates and employers respondents are provided in Table 4.14.

Table 4.14: Required Content/Documents from Lecturers

	Graduates		Employers	
	Frequency	(%)	Frequency	(%)
Recommendation Letter	5	46%	4	40%
Reference Letter	4	37%	4	40%
Lecturers Attestation	4	37%	4	40%

4.5.6 Data sharing among all users

The top three choices for data sharing requirements for graduates, employers and lecturers which were selected by the three groups of stakeholders (graduates, employers and lecturers) are displayed below.

Table 4.15: User Requirements for Stakeholders

	Graduates		Employers		Lecturers	
	Frequency	(%)	Frequency	(%)	Frequency	(%)
Control over who can view or modify shared files	9	82%	7	70%	3	30%
When shared data has been modified or added, group members should be notified automatically	6	55%	7	70%	5	50%
Sharing and handling large files	6	55%	8	80%	4	40%

4.5.7 Functionality To Assist Collaboration

The highest frequency user requirements identified to assist collaboration between all stakeholders which were selected by the four groups of stakeholders are shown in table 4.16.

Table 4.16: User Requirements for functionality to assist collaboration for All Stakeholders

	Graduates		Employers		Lecturers		Administrators	
	Frequency	(%)	Frequency	(%)	Frequency	(%)	Frequency	(%)
Online chat for real-time communication	4	37%	6	60%	5	50%	2	100%
Private messaging	4	37%	5	50%	6	60%	2	100%
Discussion Forum	5	46%	5	50%	5	50%	2	100%
Groups	4	37%	4	40%	4	40%	2	100%
User Relationships	5	46%	4	40%	5	50%	2	100%
Collation/digest of e-mail groups	6	55%	5	50%	6	60%	2	100%

4.5.8 Setting up Collaboration

All the four groups of stakeholders also selected the user requirements for setting up collaboration in the portal according to their level of importance. The most selected requirements are presented below.

Table 4.17: User Requirements for setting up collaboration for all stakeholders

	Graduates		Employers		Lecturers		Administrators	
	Frequency	(%)	Frequency	(%)	Frequency	(%)	Frequency	(%)
Mechanism to find users with specific expertise	9	82%	10	100%	4	40%	2	100%
Ability to be able to rate other users' contents	5	46%	7	70%	4	40%	2	100%
Ability to locate other potential users with similar interests	8	73%	8	80%	4	40%	2	100%

4.5.9 Mechanisms for Being Kept Up To Date

The top selections by the four groups of stakeholders for the mechanisms for being kept up to date are provided in the table below.

Table 4.18: User Requirements for being kept up to date in the IGP for all stakeholders

	Graduates		Employers		Lecturers		Administrators	
	Frequency	(%)	Frequency	(%)	Frequency	(%)	Frequency	(%)
An e-mail alert containing links to information that I specify when it becomes available (e.g. update on students skills or cv)	10	92%	8	80%	5	50%	2	100%
A Whats New page when you logon to the Integrated Graduate Portal	8	73%	10	100%	6	60%	2	100%
An e-mail alert containing information that I specify when it becomes available (e.g. updates on students or	7	64%	8	80%	5	50%	2	100%

lecturers portfolio)								
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4.5.10 Graduates’ E-portfolio Content

The content of e-portfolio’s content for graduate was obtained according to the selection from employers and lecturers respondents. The requirements for graduates are shown in the table below.

Table 4.19: User Requirements for e-portfolio contents for Graduates

	Employers		Lecturers	
	Frequency	(%)	Frequency	(%)
Resume	6	60%	8	80%
Possessed Skills	5	50%	7	70%
Professional Mission statement	4	40%	7	70%
Goals	5	50%	7	70%
Samples of related work experience	6	60%	5	50%
Testimonials	4	40%	6	60%
Recommendation letters	4	40%	6	60%
Awards and honours	5	50%	5	50%
List of references	4	40%	6	60%
Educational Qualifications	6	60%	5	50%
Transcripts	5	50%	4	40%
Cover letters	5	50%	5	50%
Research Projects	6	60%	5	50%
Presentations (video and audio)	4	40%	4	40%
Internship	5	50%	4	40%
Courses and Description	4	40%	5	50%
Professional courses taken	4	40%	4	40%
Extra-curricular activities	4	40%	4	40%
Business plans & Research Proposals	6	60%	4	40%

4.6 Functional Requirements of the IGP

Functional requirements specify the software functionality that the must be built into a system to enable users to accomplish their tasks, thereby satisfying their user requirements (Mifsud, 2013). The functional requirements of the proposed portal which are derived from the user requirements of all stakeholders (graduates, employers, lecturers and administrators) which have been identified in chapter four are listed below.

4.6.1 Graduates

The functional requirements which have been obtained from the user requirements for the graduates in the IGP are shown in Table 4.20.

Table 4.20: Functional requirements for graduates in the IGP

Requirements	Functional Requirements
Tasks the graduates can access	Apply for a job with the click of a button Find and acquire information such as employers and lecturers information Search jobs by location, qualification, categories, company, location, experience and keywords. View application history from profile Ability to add and submit Photos to profile. Login and update profile, including forgotten password reminders Ability to view rated e-portfolio contents such as resume, presentations and cover letters by lecturers
General behavior of the IGP	Graduate Registration and easy login Automatically retrieve passwords by email. Ability to download files in the IGP
Required Skills to be possessed by graduates	Ability to select the possessed skills
Data sharing	Applicant sets 'privacy level' to control how much information is visible to employers through resume searches.
Functionality to assist collaboration	Ability to chat with other users, join discussion forums and groups, send private messages Ability to add relationships with other users such as followers, mentors, lecturers etc.
Setting up collaborations	Ability to locate other potential users with similar interests, ability to find other users with specific expertise
Mechanism for being kept up to date	Ability to receive e-mail alerts and view the what's new page
Graduates' e-portfolio contents	Resume Posting and e-portfolio showcase. Add multiple lists of qualification and experience. Ability to add cover Letter when apply for job. Ability to add other contents such as transcripts, professional mission statements. Audio and video presentations, research projects and others

4.6.2 Employer

The functional requirements which has been obtained from the user requirements for the employers in the IGP in chapter 4 are shown in Table 4.21 below

Table 4.21: Functional requirements for employers in the IGP

Requirements	Functional Requirements
Tasks the employers can access	View application history from profile Ability to add and submit Photos to profile. Login and update profile, including forgotten password reminders View submitted graduate resume and e-portfolio Ability to view lecturer's attestation and reference letters for graduates. Download application submitted by graduate Ability to search resume by keywords, job category, days since posted and search graduates Post jobs with detailed job description (job title, company name, company URL, location, salary, job type, work type, description and required skills). Ability to create and edit a company profile. Ability to add a Company Logo.
General behavior of the IGP	Employer Registration and easy login Automatically retrieve passwords by email. Ability to download files in the IGP
Employer Requirements	Ability to provide information on job requirements like computer knowledge requirements, certificate requirements, professional courses requirements, internship, work placements, workshops and training available, salary range awards received and job vacancies.
Data sharing	Applicant sets 'privacy level' to control how much information is visible to employers through resume searches.
Functionality to assist collaboration	Ability to chat with other users, join discussion forums and groups, send private messages Ability to add relationships with other users such as followers, mentors, lecturers etc.
Setting up collaborations	Ability to locate other potential users with similar interests, ability to find other users with specific expertise
Mechanism for being kept up to date	Ability to receive e-mail alerts and view the what's new page
Graduates' e-portfolio contents	Resume Posting and e-portfolio showcase. Add multiple list of qualification and experience. Ability to add cover Letter when apply for job. Ability to add other contents such as transcripts, professional mission statements. Audio and video presentations, research projects and others

4.6.3 Lecturer

The functional requirements which has been obtained from the user requirements for the lecturers in the IGP in chapter 4 are shown in Table 4.22 below

Table 4.22: Functional requirements for lecturers in the IGP

Requirements	Functional Requirements
Tasks the lecturers can access	Ability to search resume by keywords, job category, days since posted Ability to verify graduate’s providing attestation and reference letters for them Ability to rate graduates resumes, cover letters, professional mission statements and other e-portfolio contents Find and acquire information such as employers and graduates information Ability to add and submit Photos to profile. Login and update profile, including forgotten password reminders
General behavior of the IGP	Lecturer Registration and easy login Automatically retrieve passwords by email. Ability to download files in the IGP
Data sharing	Applicant sets 'privacy level' to control how much information is visible to employers through resume searches.
Functionality to assist collaboration	Ability to chat with other users, join discussion forums and groups, send private messages Ability to add relationships with other users such as followers, mentors, lecturers etc.
Setting up collaborations	Ability to locate other potential users with similar interests, ability to find other users with specific expertise
Mechanism for being kept up to date	Ability to receive e-mail alerts and view the what’s new page

4.6.4 Administrators

The functional requirements which have been obtained from the user requirements for the administrators in the IGP in chapter 4 are shown in Table 4.23.

Table 4.23: Functional requirements for administrators in the IGP

Requirements	Functional Requirements
Tasks the administrators can access	Ability to manage graduates, employers and lecturers profiles. Ability to add new services which are related to graduates, employers or lecturers Ability to grant user permissions, provide roles and authentication to all the users of the portal Ability to change the look and feel of the website by changing template Ability to create / edit / save as many icon sets as you like Location management console to add/edit/remove

	locations for which jobs can be posted or remove resumes of graduates which has reached the stipulated number of years on the portal Admin can add/edit/delete/approve/disapprove any job. Setup multiple admin with file access privileges
General behavior of the IGP	Graduate Registration and easy login Automatically retrieve passwords by email. Ability to download files in the IGP
Data sharing	Applicant sets 'privacy level' to control how much information is visible to employers through resume searches.
Functionality to assist collaboration	Ability to chat with other users, join discussion forums and groups, send private messages Ability to add relationships with other users such as followers, mentors, lecturers etc.
Setting up collaborations	Ability to locate other potential users with similar interests, ability to find other users with specific expertise
Mechanism for being kept up to date	Ability to receive e-mail alerts and view the what's new page

4.7 Non-Functional Requirements

Mansourvar (2011) defined non-functional requirements refer to the services constraints and system quality. They can also be described as the constraints or standards that the system must have or comply with for a system to function properly (Mifsud, 2013).

Non-functional requirements define the system's quality characteristics. The non-functional requirements for the Integrated Graduate Portal are as follows:

- Secure access of confidential data (user's details). SSL can be used.
- 24 X 7 availability
- Better component design to get better performance at peak time
- Flexible service based architecture will be highly desirable for future extension.

Other non-functional requirements taken into consideration include:

4.7.1 Usability

The user interface of the Integrated Graduate Portal must be easy to use for all stakeholders and should be designed according to the user requirements of all stakeholders. All users should be able to make use of the IGP for the tasks and operations for which it was developed for instance, graduates should be able to create resumes, bookmark resume and so on. The prototype in this project should be able to meet the needs and requirements of the users.

4.7.2 Privacy

Privacy is another important aspect of the IGP. This is important so that all stakeholders can feel comfortable in making use of the system. Stakeholders like the students, employers and lecturers should be allowed to select what things they want to be made public or private. Since data like evaluations and transcripts are private data that should be given by lecturers and administrative, the system should support and enforce appropriate access control rules. This example was reported by (Kudrass, 2006) where he discussed about building an Integrated University Information System and explained that some data like examination results and transcripts are subjects of the Data Protection Act and therefore should be kept private. Employers who are interested in these documents should contact the respective owners in order to be granted access to them.

4.8 Conclusion

The chapter presents the proposed portal to be developed and its potential benefits to stakeholders. The user requirements result has been presented and data analysis has been carried out in this chapter. Hence, the user requirements for graduates, employers, lecturers and administrators have been identified. The development of the

IGP in the next chapter will therefore be based on the user requirements results obtained from all groups of respondents (graduates, employers, lecturers and administrators).

