KNOWLEDGE SHARING STATION: WEB 2.0 APPROACH

By

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DECLARATION OF ORIGINALITY

I declare that this report entitled "**KNOWLEDGE SHARING STATION: WEB 2.0 APPROACH"** is my own work except as cited in the references. The report has not been accepted for any degree and is not being submitted concurrently in candidature for any degree or other award

Signature : _____

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I would like to express my sincere thanks and appreciation to my supervisors, Dr Choo Wou Onn who has given me a very god opportunity to engage in web base project. It is my very first step to establish a career in web base field.

Furthermore, I must say thank you to my parents for their love, support and continuous encouragement throughout the course. Thank you!

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ABSTRACTS

This project is a Web Base project for academic purpose. It will provide the students and lecturers an environment that allows them to interact with each other. Other than interaction, it also provides some functionality that allows the user to learn something. For example, the system will provide some links to encourage the users to learn something out of the academic. Other than learning, the system also allows the users to get some important information for certain user. For example, the user is able to search for the timetable of a certain user then try to set up an appointment. Furthermore, the user is also able to share their opinion and discuss with each other and thus the interaction between the users becomes better. Other than user's opinion, the user is also able to share some files. Hence, not only it will improve the interaction between the users, they are able to gain some knowledge also from the system.

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1.0 Introduction

Nowadays, the university portal has become a very common thing for every university. It can be said that every university also need a university portal because it plays a very important role for everyone in the university. That is because the university portal can make the people easier to find some university information which is targeted at them. When the people need to get some information, instead of searching from web, the people also can login to the portal and get all the information. Besides that, whenever the visitors want get the information of the people in the university, they don't need to search for the information from many different websites. That's because the information of the people is stored in the database of the university.

During these days, a lot of university aimed to create a successful university portal. To create a successful university portal is not easy because it takes a lot of time for developing it. A successful university portal has to be very informative enough for assisting the students and lecturers in many ways without having them gone through a lot of problem. The information alone is not enough for a university portal, interactive between the students and the lecturers are quite important as well. When the relationship between student and lecturer is better, the case of argument between the lecturer and student will become lesser. Rather than that, the performance between the students and lecturers will become better.

This chapter will cover background problem, problem statement, objectives, beneficial to user, definition of terms, and outline of the remainder of the thesis.

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1.1 Background ISSUE

Nowadays, in order to become a successful university portal, it has to overcome some problems. The first problem that the university portal has to overcome is the single login. Normally, the system has to find a way to identify the person who login to the system and the person can be lecturer, students or staffs. A successful university portal won't separate the login according to the role. After that, the university portal should try not to force the user to login for many times for using tools in order to prevent unnecessary disturbance.

Other than single login, the university portal should have the identification of roles. Once the user login to the system, the portal should determine what is the role of the user. Afterwards, the portal should decide what tools and information for that user can access and what tools and information cannot.

Another issue that the university portal has to come over is the portal should decide who owns the data. In order to identity who the person is and what information and tools that the person can access, the portal must have access to most of the database in the university. And these databases have to be seen as institutional database but not department database and the ways to access this data must be developed. Otherwise, the portal will become unsuccessful.

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1.2 Problem Statement

Through the requirement gathered, it is been noticed that there are a few problems with the WBLE Portal, there are:

1.2.1 Lacking of Information

According to the requirement gathered, the information is the biggest problem in the WBLE portal. The user profile information is not sufficient enough for the user to meet up with each other because the user doesn't know about the timetable and the venue of the other user. Whenever the user has something to do with the other user like appointment or assignment submission, they need to go through some communication before they meet up to decide the time and the venue. Just in case that the user cannot communicate with each other face to face, it is very inconvenient and time consuming for the user to send an email and wait for reply.

Rather than that, WBLE Portal only allowed the user to view those users profile that are in the same course. It is lacking of the information from the other courses' users. The worst thing is, the user don't even know the email of the user from other course. They can neither email nor meet up with the user from other courses for some reason. In the end, they are wasting their time in asking around for a way to communicate with the user.

1.2.2 Lacking of Interaction

In WBLE Portal, some of the communication tool is lacking of interaction among the user. For the communication tool like forum and Online Web Messaging System, it is only allow the interaction between the users who are in the same course. The user can only communicate with the users who are in the same course but they have no way to communicate with the users from the other courses by using the forum or Online Web Messaging System. With less interaction, the number of posts in the forum is getting lesser and lesser and eventually become "inactive".

1.2.3 Time Consuming

Lately, some of the features in the WBLE Portal are very time-consuming. For example, the user has to go through all course subject page in order to check out is there any new

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announcement. It is wasting the time of the user to go through so many pages just for the announcement.

Another feature which is time consuming in the WBLE Portal is the forum. For forum, the forum section is not centralized. As what the user can see, the user has to go through every course subject page in order to get to the subject forum. Whenever the user need to check out is there any new post for their course, they have to spend some time to go through all subject page.

Time consuming is very inconvenient for the user to and sometimes it becomes very troublesome especially when the users are having bad internet connection.

1.2.4 Privacy

By using WBLE Portal, some of the users feel that their privacy is insecure. Especially for the forum, they don't feel very secure with their name being revealed to the other user when they post something. That is because they are afraid that the post they make may bring them any unnecessary conflict with other user.

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1.3 Objectives

For every people in the university, the learning environment is very important. So, every university will try to use any kind of method in order to provide a good learning environment. Same goes with UTAR, "Knowledge Sharing Station: Web 2.0 approach" project has been introduced for providing a learning environment university portal. To do so, there are some goals that need to be achieved, which are the following;

1.3.1 Enrich and Up-to-date Information

In order to solve the inconvenience of the user, the project will include the information of the timetable and the location of the user for time being. By providing the information, it is convenient for the user and not time consuming as well because the user do not need to communicate with the other user to decide the time and venue before they meet up. Rather than that, the project is also allowed the information of the user profile from the other courses to be viewed to the user. So, the users no need to go through the problem to ask around in searching for a way to communicate with the people. In this way, the users can easily communicate with the rest of the user in a fast and convenient way.

Rather than the internal information of the university, this project will also provide some external information which is outside of the university so that the user can gain some information which is not relevant to university. It's a very good opportunity for the students to learn something new from the external information. Even though it's external information, this system will only provide the information which will benefits the user for example, health and safety, career and etc. This way, the user will get the feeling that the reason of login to the system is not only for downloading or uploading the lecture notes and tutorials but also for the other things.

1.3.2 Improve Interaction between Users

In order to improve the interaction between the user, the enhancement of the communication tools are needed that's because the communication tools are the tools that the user used to interact with each other.

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In this project, it is trying to improve the communication tools to allow the interaction between the users from other courses as well. In this way, more communication will be happen and the forum will be getting more active since the user can share their experience, information, feedback or opinion to the others user and more topic will be discuss in the forum.

With the better interaction, the bonds between the users will become stronger and it would lead to a successful university.

1.3.3 Improve and Rich Features on Management System

Due to the problems of some features are not managed very well in the WBLE Portal, the users have to spent quite a lot of time to go through the features. So, this project is trying to save the time of the user by improving the features.

To do so, the course subject announcement and the subject forum will be combine all together into one announcement page and one forum page so they user do not need to go through every course subject page to get the announcement or check out for any new post.

It could be very helpful for those who are having weak internet connections without the needs of going through many pages.

1.3.4 More Secure

In order to become a more secure university portal, the project will avoid the true identity of the user being revealed in the forum. To do so, the user has the ability to change their name whenever they post something in the forum. In this case, the user will feel more secure and they can avoid any unnecessary conflict with others user.

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1.4 Scope of Project

1.4.1 Lecturer and Student benefits

The main focus of the proposed system is the lecturer and student's benefit. Hence, it is trying to provide a comfortable environment to the lecturer and students to achieve something.

Furthermore, the proposed system will provide a convenient way of using the functionalities. So, the users will not doing too much procedure while trying to achieve something in the system.

Besides, the lecturer and student will find that it is very efficient in using the proposed system because many of the functionalities in the proposed system will assist them in a lot of way.

1.4.2 Learning Management System

The proposed system is considered a learning management system. Learning management system is the software application that handles tracking, reporting at training events and administration.

1.4.3 Communication Tools

The proposed system is also involving many kinds of communication tools. Communication tool is a tool that allows to user to interact with other using in a simple way. So, the users can discuss on something through the system without having to meet face to face. The communication tool that is including in the proposed system is survey, forum and web messaging system.

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1.5 Terms of Definition

Web 2.0

One of the characteristic of Web 2.0 is user centered design. It is a web design which is created to fulfil every possible needs of the user and enhances the user to perform certain customizations within the design and user-centered designs are cleaner and easy to navigate. One of the most appropriate examples of user-centered design is iGoogle, a customizable Google homepage. (Sharma, 2002)

Web 2.0 is also about having a business that works and not protecting the trademarks is a weak business practice. So the exclusive use of "Web 2.0" is not in all contexts. The service mark applies only to "Web 2.0" when used in the title of "live events" such as conferences and tradeshows. (Battelle, 2006)

Learning Management System

A complete, secure, web-based learning and e-learning solution to create a simple user interface. In this way, either technical or non-technical training managers can easily create and manage interactive training courses for all levels of users. (eLeaP Learning Management system LMS, 2005)

The characteristic of the learning management system is:

- Centralize and automate administration

- Use self-service and self-guided service

- Assemble and deliver learning content rapidly

- Consolidate training initiatives on a scalable web-based platform

- Support portability and standards

- Personalize content and enable knowledge reuse

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(Ryann, 2009)

1.6 Outline of the remainder of the thesis

In Chapter 1, consist of the problems that the WBLE portal is having, the objectives of this project in order to solve the problems in the WBLE portal and the features of the project that would benefits the users.

In Chapter 2 will consist of the review from other article about the things about the project going to develop like software, tools, system and so on. Hence, there will be some comparison for that to decide which of them are better to be used in developing the project.

In chapter 3 will explain which method of methodology that the project is going to use to develop and briefly explain the phases in the methodology. Rather than that, chapter 3 will also include the ways of requirement gathering for example questionnaire, interview and so on.

In chapter 4 will include the findings of the project. That would include the system, software or application description for their functionalities. After that, chapter 4 will include the findings of testing.

Chapter 5 would be the summary and recommendations in which include the summary of the project covered in Chapter 1 to Chapter 4, contribution to explain about the importance of the study, limitations and recommendations.

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1.7 Conclusion

At the end of this chapter, the reason of this project is being established is because of there are still some problems in the current system. With the students and lecturers providing some feedback of the current system, I managed to identified the problems that they user that they are having in the current system. In order to provide a suitable environment of learning for the students and the lecturers, this project is trying to solve the problems in the current system. From the feedback of the students and lecturers, some of them even provide some useful idea to solve the problems. With the helps from the students and lecturer, this project managed to start without any delay. In order to fulfil the students and lecturers' expectation, this project is trying to make the current system one step closer to be a successful university portal in the world.

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2.0 Introduction

In this chapter will cover the review of the tools that is going to apply in this chapter. So it consist a lot of information that provided from the people about the tools and each pros and cons of the tools has been reviews. Then compare each of them to select the best one.

Hence, the tool that is going to compare in this chapter is existing system and software development. Other than comparing, this chapter will also provide details about the tools that must be applied in the system without comparing with others like communication tools and knowledge management system.

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2.1 Historical Background

The system is an enhancement of UTAR portal. In the current UTAR portal, it allows the users to upload/download the lecture notes and tutorial. Hence everyone in the university will get their notes or tutorial without having difficult problems. Furthermore, the users also will get some announcement from their lecturers like the submission dateline of the assignments or date of the exam. So the system will introduce some other functionality that tries to assist the users in the system as much as possible.

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2.2 Existing Systems

For enhancing the proposed project, some of the existing systems are being selected to compare the features of each other which are the following:

- UTAR WBLE Portal

- Curtin University of Technology Portal

- Curtin University Sarawak Malaysia

2.2.1 UTAR WBLE Portal

UTAR, stand for University Tunku Abdul Rahman is a private, coeducational comprehensive research university in Malaysia. Established in 2010, UTAR has renowned for its programs in business, finance, accounting, economics, Chinese studies research, broadcasting, journalism and science.

Functions of the portal
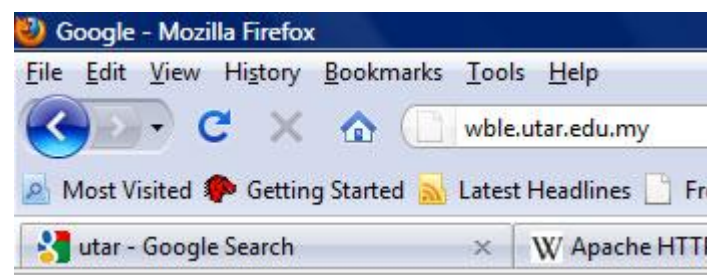
Figure 2-2-1-F1 Type portal link

1. The visitors type the WBLE portal link which is "wble.utar.edu.my".

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Figure 2-2-1-F2 Key in Username & Password

2. The WBLE portal will prompt the user to key in the username and password in order to figure out who is the visitor.
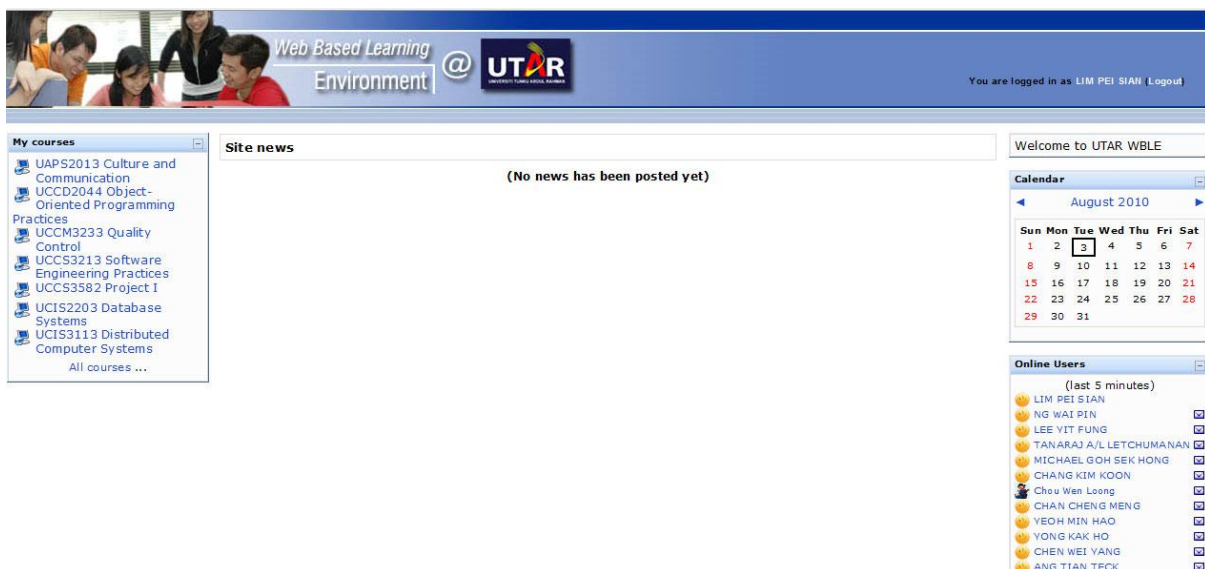
Figure 2-2-1-F3 Main Page

3. Once login, the user will see a webpage consisted of a page header, a list of the course subject, user profile, calendar, and who is online currently. In this webpage, there is also a link for the user to log out.

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Figure 2-2-1-F4 Course Structure Page

4. In each of the subject page, the user will see the weekly outline which consists of the file of the lecture notes or tutorial and also the date for that lecture notes or tutorial. Rather than that, the user also can see the latest news, up-coming event, recent activity, forums, and participants for that particular subject.
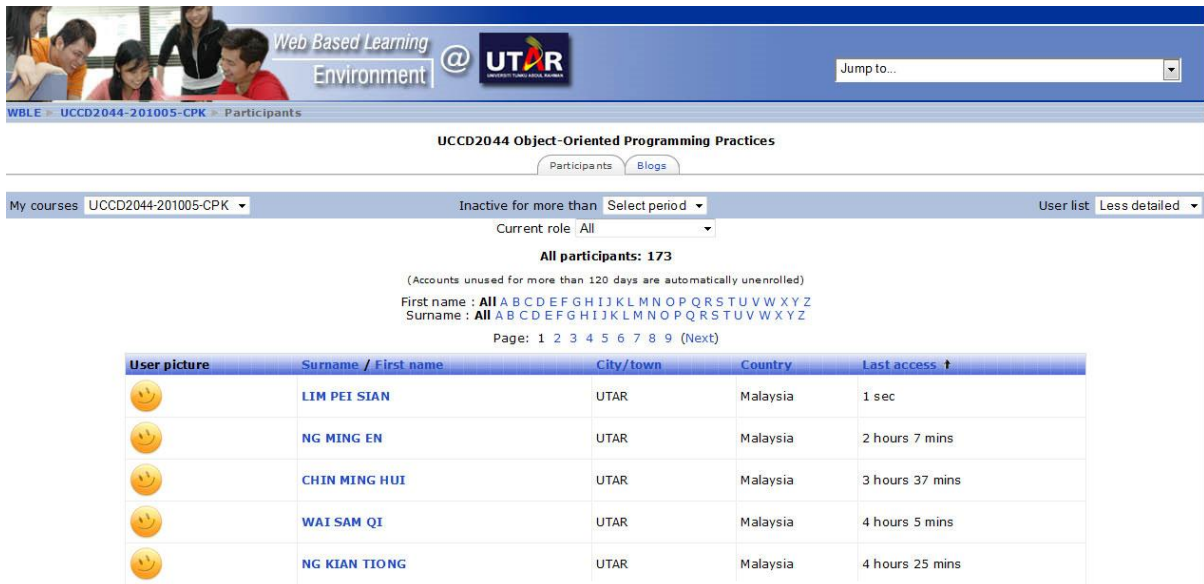
Figure 2-2-1-F5 User Searching Page

5. In the participants' page, the user can see a list for the participants who are in the same subject who are including the students and the lecturers. The user also can search for the participants that are in the same subject by searching for its current role, period of inactive.

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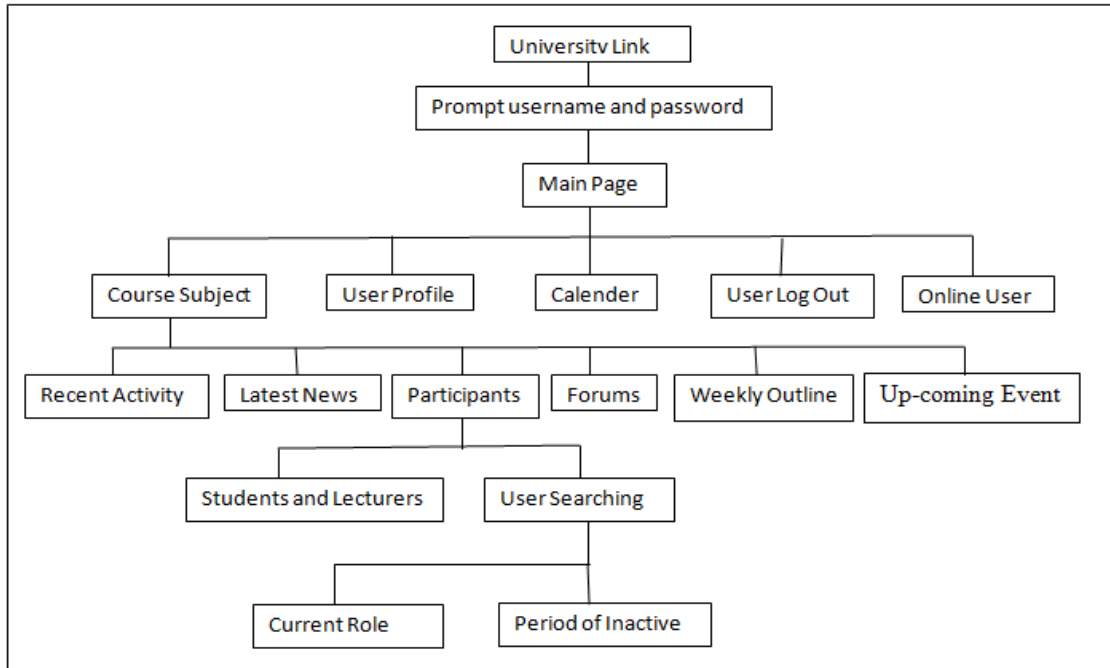
Figure 2-2-1-F6: UTAR Functionality Diagram

Strength and Weaknesses

Strength	Weaknesses
Provide lecture notes or tutorials	No privacy
Consist of the information of user	Limited range of user to communicate
Allow interaction between the user	Very limited information

Table 2-2-1-T1: UTAR WBLE Portal

2.2.2 Curtin University of Technology Portal

Curtin University of Technology is the Western Australia's Largest and most multi-cultural university. The university will offer a wide range of courses in business, humanities, health sciences, resources, engineering and related sciences.

Functions of the portal

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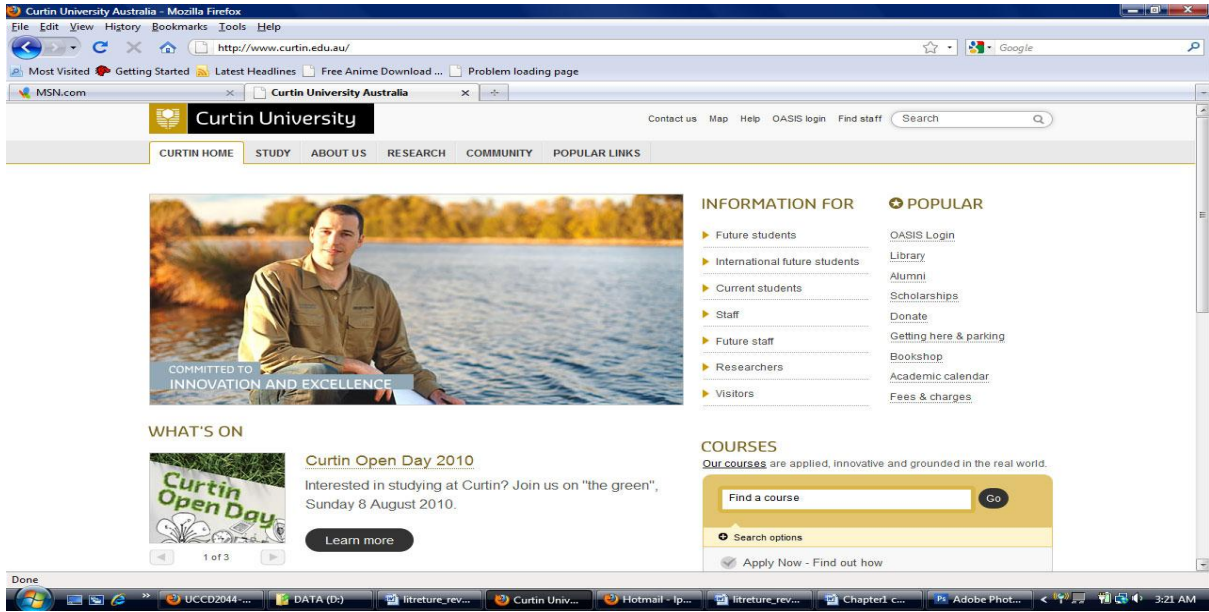
Figure 2-2-2-F1 Type portal link

1. The visitor has to type the http://www.curtin.edu.au/ to browse the university page.

Figure 2-2-2-F2 Click "OASIS Login"

2. In the university page, press the button "OASIS login" in the header.
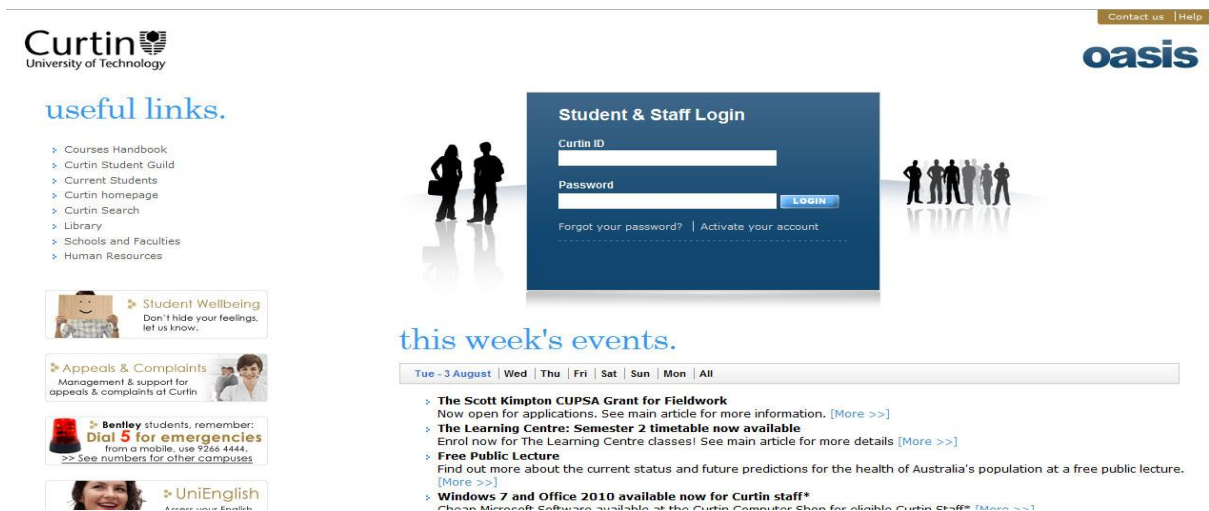
Figure 2-2-2-F3 Prompt username & Password

3. After that, the website will ask for the username and password in order to identify the user.

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Figure 2-2-2-F4 Type portal link

4. The visitor will see a page heading, and three tabs which are "Home", "Students" and "OUA". When login to the system, the "Home" tab is open. In the "Home" tab, the user will see six columns which are "My Units: Quick View", "ICT policy for Curtin", "My Announcement", "FLECS-Blackboard Availability", "Student Login", and "Assessment Centre Booking System".

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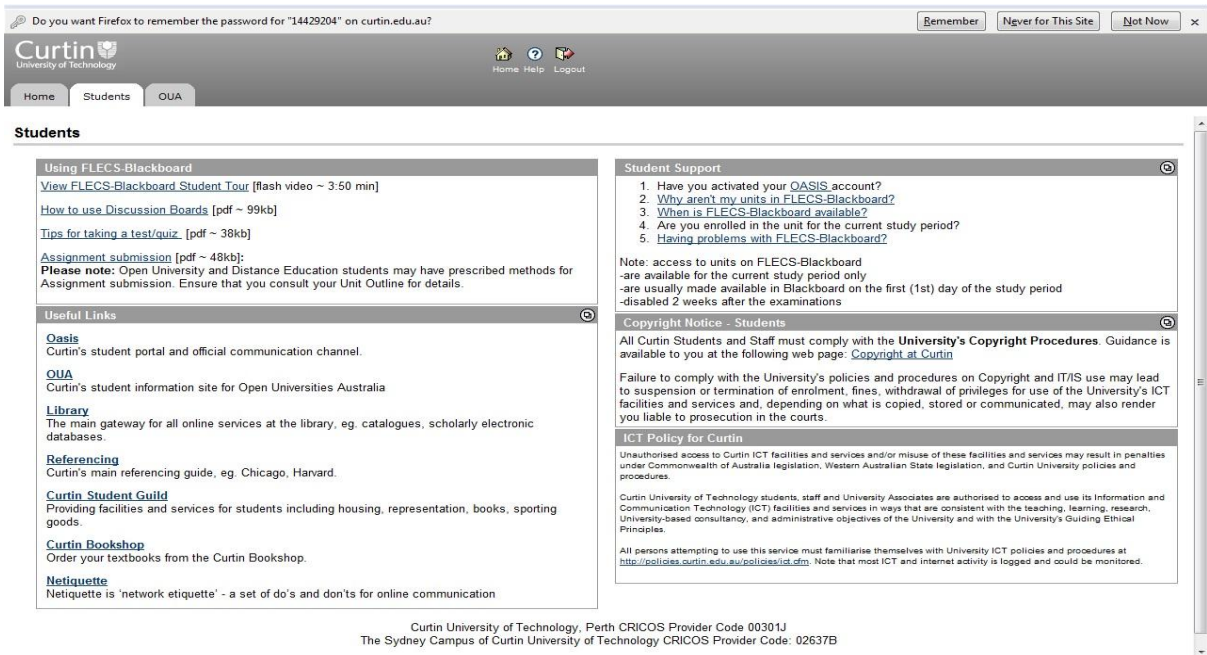
Figure 2-2-2-F5 Student Tabs Page

5. In the "Students" tab, there are some useful links that provide some important information for the students. Rather than that, there is a column in the page that assists the students in solving the problems with their portal. There is also a "FLECS-Blackboard" that assists the students in their studies.
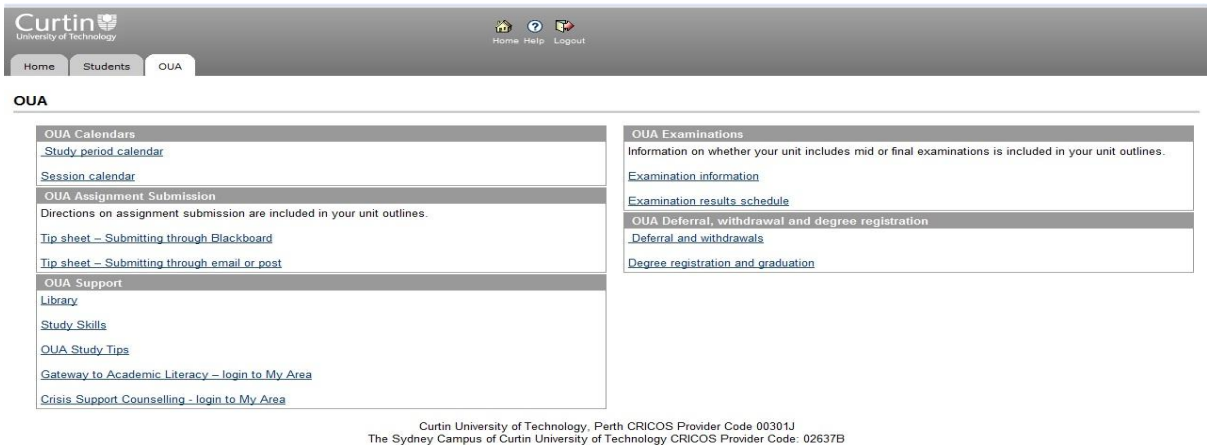
Figure 2-2-2-F6 OUA Tabs Page

6. In the "OUA" tab, there are information about the date, assignment submission, examinations and deferral, withdrawal, and degree registration.

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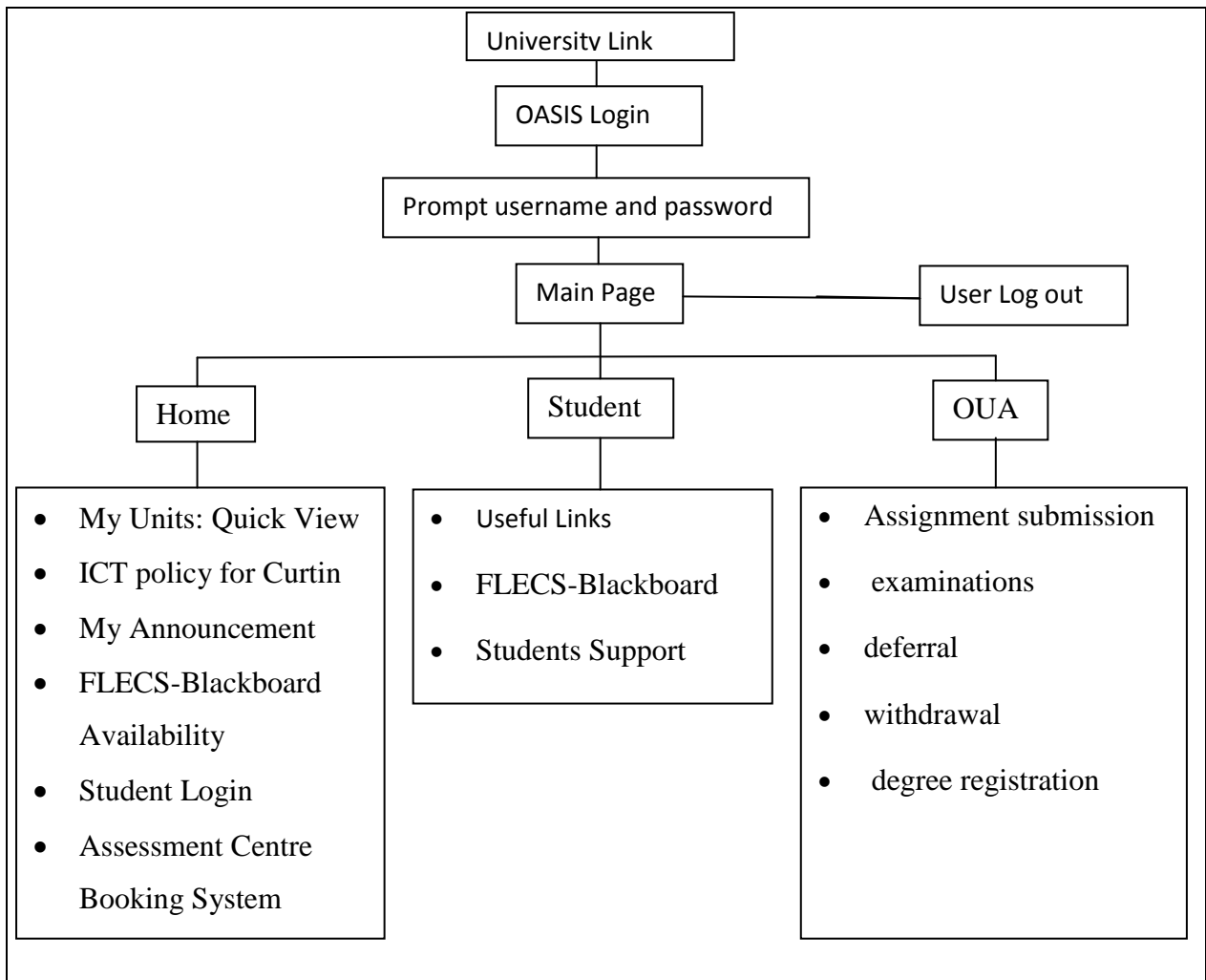
Figure 2-2-2-F7: University of Technology Portal Functionality Diagram

Strength and Weaknesses

Strength	Weaknesses
• Provide sufficient information • More privacy	• No communication between the user • Unable to search other user profile

Table 2-2-2-T1: Curtin University of Technology Portal

2.2.3 Curtin University Sarawak Malaysia

Curtin University of Technology is the Western Australia's Largest and most multi-cultural university. The university will offer a wide range of courses in business, humanities, health sciences, resources, engineering and related sciences.

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Functions of the portal
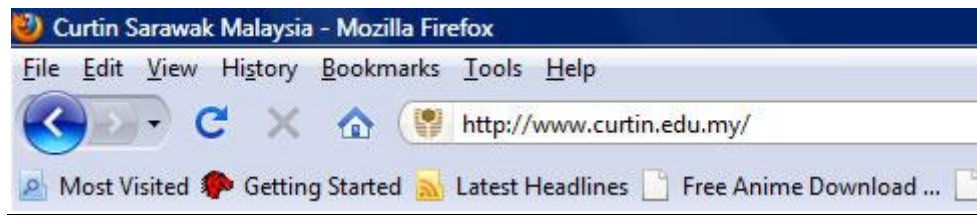
Figure 2-2-3-F1 Type portal link
1. The visitor has to type the http://www.curtin.edu.my/ to browse the university page.
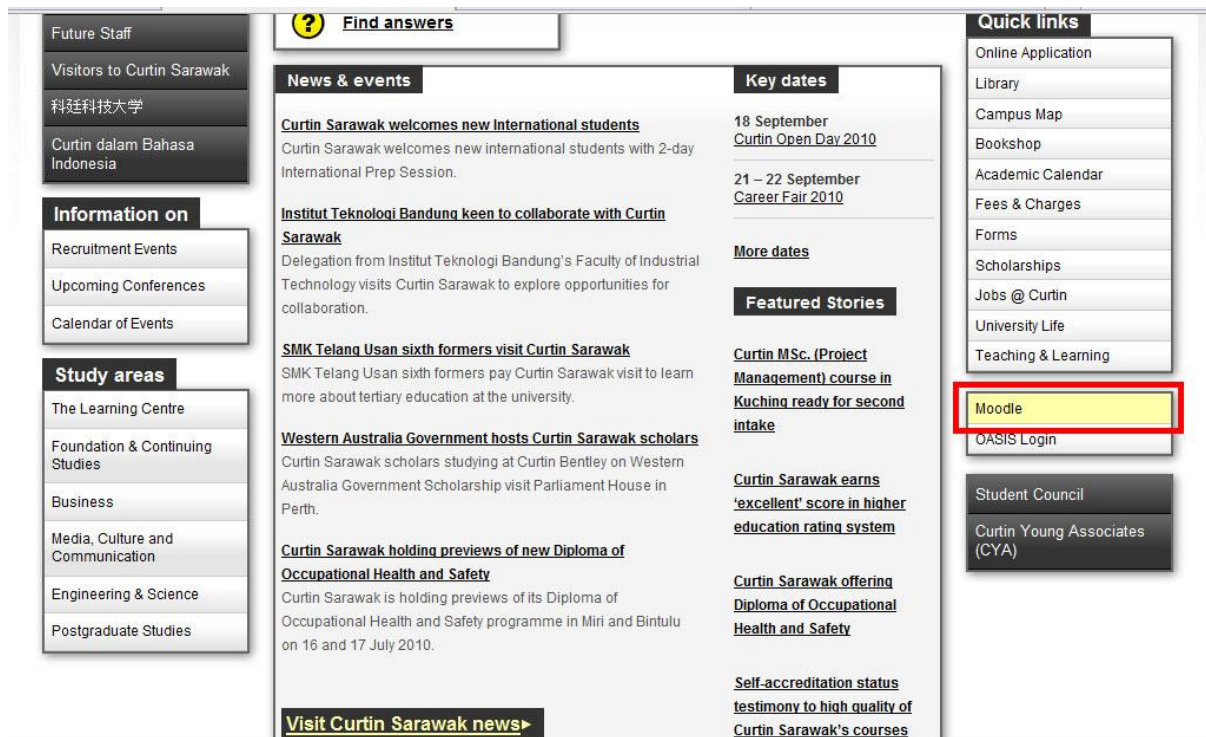
Figure 2-2-3-F2 Click "Moodle"
2. In the university page, press the button "Moodle" in the Quick Links site bar there.

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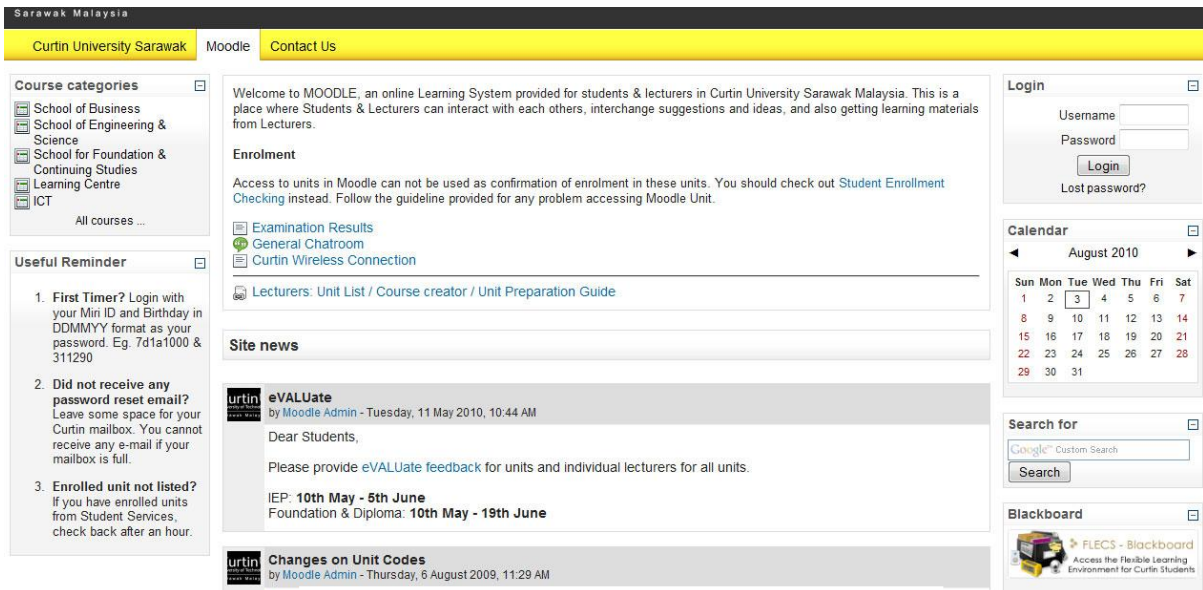
Figure 2-2-3-F3 Prompt username & password

3. After that, the website will prompt the user for the username and password in order to identify the user.
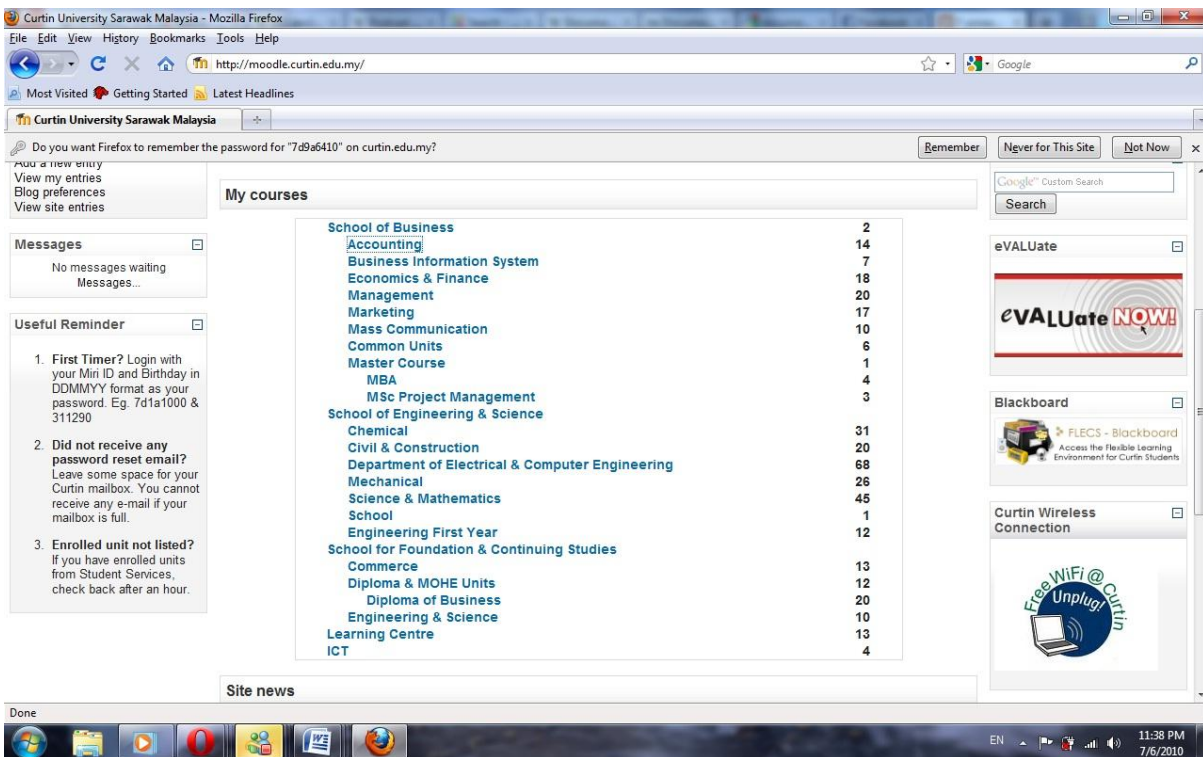
Figure 2-2-3-F4 Login Page

4. When the user log in, there will be a list of courses of the user.

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Figure 2-2-3-F5 Course Page

5. After select a course, there will be a list of courses.
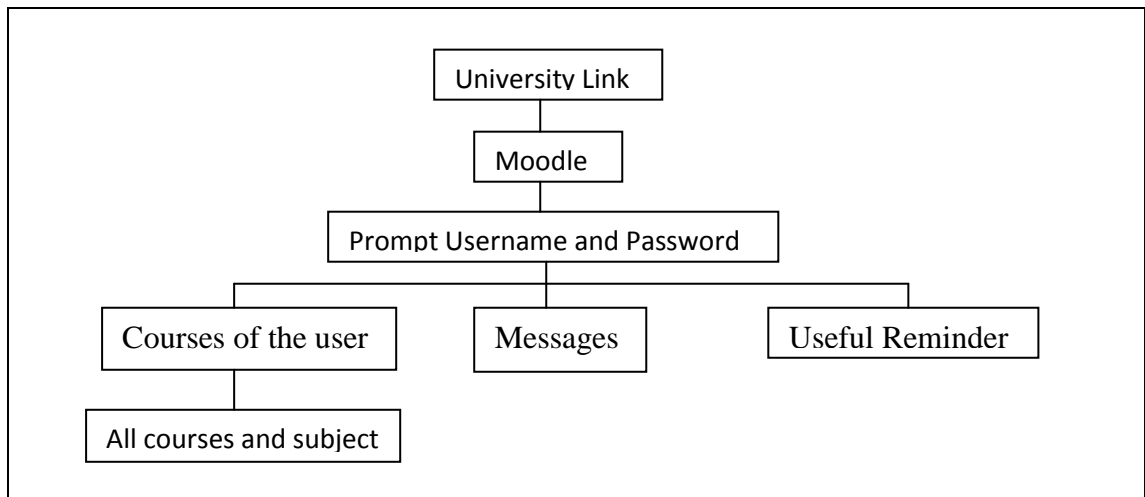
Figure 2-2-3-F6: Curtin University Sarawak Malaysia Functionality Diagram

Strength and Weaknesses

Strength	Weaknesses
• Consist of the user information and course information	• Limited of information • No communication between the user

Table 2-2-3-T1 Curtin University Sarawak Malaysia

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2.2.4 Comparison between the Existing Systems

		UTAR	Curtin University Australia	Curtin University Sarawak	Proposed System
Information	**User**	✓	✓	✓	✓
	Course	✓	✓	✓	✓
	External		✓		✓
Communication Tools	**Forum**	✓			✓
	Survey	✓			✓
	Messaging	✓			✓
Security		✓	✓	✓	✓
Privacy			✓	✓	✓
Efficiency			✓		✓

Table 2-2-4-T1: Comparison between the Existing Systems

Compared with UTAR portal, the proposed system will provide external information for the user to learn something and has more privacy and efficiency. In the perspective of privacy, UTAR portal are weaker than the proposed system for example the username will be revealed to other user when the user post something in the forum. Because of this, many users are afraid to post something in order to avoid any conflicts. Rather that, the proposed system is more efficient than the UTAR portal because the information or tools in the proposed are centralized. Unlike UTAR portal, the user does not have to waste a lot of time to get the information.

Compared with Curtin University Australia, the proposed system will provide some communication tools to the user to communicate with each other. On the other hand, Curtin University Australia only provide sufficient information, security, privacy and efficiency to the user and the user cannot find a way to communicate with each other in the university portal.

Compared with Curtin University Sarawak, the proposed system is allowed to communicate with each other within the portal and also sufficient information for the user. Unlike the proposed system, Curtin University Sarawak portal only provide the information

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of the course and user and it does not has any communication tools to allow the user within the portal to communicate with each other.

2.3 Software Development

In order to produce a dynamic web site, some applications are required in the process of developing for example web development tools, relational database management system and web server application.

2.3.1 Web Development Tools

2.3.1.1 PHP Version 5.3

PHP is a general-purpose scripting language which is originally designed to produce dynamic web pages. For now, PHP focus mainly on server-side scripting which is similar to other server-side scripting languages that provide some dynamic content from a web server. (Netfirms, 2010)

For a general-purpose programming language, PHP code is processed by an interpreter application in command-line mode to perform the desired operating system operations and producing program output. (Sancodmw, 2010)

By using PHP, the development of many frameworks are being attracted which is provide building blocks and design structures in order to promote rapid application development. Rather than, PHP offers many levels of security in order to prevent any malicious attacks and the security levels can be adjusted in the .ini file. (Netfirms, 2010)

Furthermore, the main PHP source repository is loaded with modules and interfaces that the other users have already write and contribute. PHP is using a modular system of extension to the interface with much kind of libraries like graphics, XML and etc. The programmers are able to extend PHP by writing their own extensions and compile into executable and load it by using PHP's dynamic loading mechanism. (Celeste Stewart, 2006)

Hence, one of the features that PHP offers is its community. Since PHP is open source, the PHP community is willing to share. If somebody is looking for a particular script, the chances of another user has already do something similar is very high. So the person only checks for the PHP community for availability. (Servageone)

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Advantages of PHP	Disadvantages of PHP
- Open Source - Easy to learn - Support by many operating system - Has extremely useful text processing features - Easy deployment and cost effective hosting	- Security flaws - Not good to create desktop applications

Table 2-3-1-1-T1 Advantages & Disadvantages of PHP

2.3.1.2 HTML Version 5

HTML, known as HyperText Markup Language is used to create structured documents by denoting structural semantics for text. Rather than that, some images and objects are allowed to be embedded to create interactive forms in HTML. (Chico, 2010)

By using HTML, some scripts in languages can be embedded to affect the behaviour of HTML web pages for example, JavaScript. In order to define the appearance and the layout of the text and other material, cascading style sheets also can be used in HTML. (Computer Desktop Encyolopedia, 1998).

HTML instructions can divide the text of a document into blocks which is called elements and it can be divided in to two categories. One of the categories is those that define how the BODY of the document is displayed by the browser and those that define information which is 'about' the document for example, the title or relationship with other documents. ($Computronics$, 2010)

The detailed rules for HTML are defined with using another kind of language which is known as the standard generalized markup language. The standard generalized markup language is very difficult which is designed for massive document collections for example, maintenance plans for nuclear submarines. Compared with standard generalized markup language, HTML is much simpler. (Ian Graham, 1998)

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Advantages of HTML	Disadvantages of HTML
• Easy to use	• Cannot produce dynamic output alone
• Loose syntax	• Sometimes, when structuring HTML documents are hard to grasp
• Supported by most of the browser	
• Free	• Security features are limited
• Increasingly used for data storage	

Table 2-3-1-2-T1 Advantages & Disadvantages of HTML

2.3.1.3 ASP Version 3.0

ASP is stand for Active Server Pages which was the Microsoft's first server-side script engine to generate a dynamic web page. Some script commands, HTML pages and COM components can   be combine with ASP in order to create a powerful web-based application which is easy to modify and develop. (Techi Warehouse, 2010)

The default scripting language that is used for writing ASP is VBScript and the people also can use JavaScript. Every ASP page has to be executed at the server and the page will consist of the extension ".asp". (Ponraj 89, 2008)

According to some information, an ASP page must be requested through a web server that supports ASP and it cannot run by simply opening it in a web browser. Because of this, ASP stands for Active Server pages, without server, there are no active pages. (Plus2net)

When a browser requests for an ASP page, the web server will interprets any ASP that is in the web page before send the HTML produced to the browser. So, the entire ASP is run on the web server and there is no ASP will be passed back to the web browser. (Plus2net)

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Figure 2-3-1-3-F1: ASP files Client/Server Interaction Process

Advantages of ASP	Disadvantages of ASP
• Minimizes network traffic • Has faster loading time • Provides better security measures • Allows to run program in languages that are not supported by the browser	• Runs only on windows server • Closed source • Expensive

Table 2-3-1-3-T1: Advantages & Disadvantages of ASP

2.3.1.4 Comparison between PHP, HTML, and ASP

	PHP	HTML	ASP
Open source	Yes	Yes	No
Free	Yes	Yes	No
Support by most operating system	Yes	Yes	No
Easy to learn	Yes	Yes	Yes
Dynamic web page	Yes	No	Yes

Table 2-3-1-4-T1 Comparison Table between PHP, HTML, and ASP

From the comparison table as shown above, PHP is the best choice to be used to develop a dynamic website. According to the table, PHP is free, easy to learn, open source and supported by many operating system. The developer is able to get it from anywhere, get used to the software easily and able to develop the website by using any kind of computers.

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Comparing with ASP, even though ASP able to generate dynamic web page, but it is not free and ASP only can runs on windows server. It could cost a lot of expenses by purchasing the product and not all operating system can support ASP. In the aspect of expenses and operating system, PHP is better and no limitations comparing with ASP.

Comparing with PHP, HTML is a tool for displaying text in different ways by using tags. In order to update some images or information on the web page, the user has to manually edit the information within the file and re-upload it. As for PHP, it is used to handles the data which is obtained from the people and stored while HTML is used to format data. In fact, PHP is more suitable in generating a dynamic web page than HTML.

2.3.2 Relational Database Management System

2.3.2.1 MYSQL Version 5.0

MYSQL is a relational database management system to provide a multi-user access to some databases. MYSQL is an extensible, open storage database engine, and offer some multiple variations like Heap, Berkeley DB, InnoDB and MyISAM. One of the reasons that MYSQL being so popular is because of it can scale down to support embedded database applications. Besides, MYSQL can support large amount of data and end user. (Adam Hobach, 2008)

MYSQL ensures that transactions comply with the ACID Model, allowing the builds of indexes, supports standard data types and also database replication. (Mike Chapple)

Just like Linux operating system, MYSQL is also released as open source software under GNU Public License. So the user can download, install and work with MySQL with free. (Mike Chapple)

2.3.2.2 Oracle 10g

Oracle is a fourth generation of relational database management system. A database consists of a number of data which is treated as a unit in order to store and retrieve some relevant information. Rather than that, a server is able to manage a large number of data in a multiuser environment so that the users can concurrently access to the same data. Generally, a database

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server is able to detect unauthorized access to prevent it and also provides efficient solution for failure recovery. (Oracle, 2005)

As for Oracle database, it is the first database which is designed for enterprise grid computer, the most flexible and cost-effective way to manage information and applications. (Oracle, 2005)

2.3.2.3 Microsoft SQL 2008

Microsoft SQL server provides an environment to generate database that can be accessed from the internet, work station or other media.

The goal of Microsoft SQL 2008 is to provide near-zero downtime with the development of SQL Server Always On technologies to make data management self tuning, self organizing and self maintaining. SEEKDOTNET ASP.NET WEREHOSTING COMPANY (1996-2008).

SQL Server 2008 also consists of the support for structured and semi-structured data for pictures, video, audio and other multimedia data. Rather that, SQL Server 2008 also can be a data storage backend for many kind of data for example, XML, email, file and etc and also perform search, analysis, and synchronization through all data types. (Arun Mallick, 2009)

Furthermore, full text search functionality has been integrated with database engine and it can improve the performance by simplify the management. (Fernando Azpeita Lopez, 2008)

SQL Server 2008 also consists of good compression features and it helps to improve the scalability by enhancing the indexing algorithms and introduced the notion of filtered indexes. (Wapedia)

2.3.2.4 Comparison between MYSQL, Oracle, and Microsoft SQL

	MYSQL	Oracle	Microsoft SQL
Open Source	Yes	No	Yes
Free	Yes	No	Yes
Support by most operating system	Yes	No	No

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| Maximum database size | Unlimited | Unlimited | 524,258 TB |

Table 2-3-2-4-T1 Comparison Table between MYSQL, Oracle, and Microsoft SQL

From the comparison table as shown above, MYSQL is the best tool to develop a dynamic web site especially combined with PHP. That is because MYSQL is free and can be supported by almost all operating system.

Compared to MYSQL, even though oracle has unlimited database size, but it is not free and not all operating system can support Oracle which have become the drawback of the Oracle.

As for Microsoft SQL, it is only can be supported by certain operating system and the database size is limited. Although Microsoft SQL is open-source and free, but MYSQL is also same while MYSQL can be supported by almost all operating system and it doesn't has limited database size.

2.3.3 Web Server Application

2.3.3.1 Apache Version 2.0

The Apache HTTP Server, also known as Apache is public domain web server software that is used to serve the static content and dynamic Web page. Apache is developed and maintained by an open community of developers under the auspices of the Apache Software Foundation. Public domain is referring to any of the program which is not copyrighted. So the software is free and it can be used without any restrictions. (Markus aka Suno Ano, 2010)

The oldest version of Apache was developed in 1995 according to NCSA httpd Web server. Because it was developed from the existing NCSA code and many patches, so it was called a patchy server. Therefore, the name of Apache Server comes out.

Because of its variety features, good performance and low cost, Apache has become the world's most popular Web server around the world. According to the estimation, there are more than 50% of the websites are using Apache Server as a host in the world. (Web-Host, 2001-2005)

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The oldest version of Apache was written for UNIX only, but now the versions can be run on OS/2, windows and other platforms. (TECHI WAREHOUSE, 2001-2010)

Apache server is a very powerful and flexible server. That is because it implements with the latest protocols and highly configurable and extensible with the third-party modules. Rather that, it also can be customized by writing the 'modules' using the Apache module API to provide a full source code. (TECHI WAREHOUSE, 2001-2010)

Advantages of Apache	Disadvantages of Apache
- Can be supported by many kind of operating system - Strong script support - Very stable, reliable and secure - Easy to incorporate database - Cheap	Many programmers use asp because they are familiar with MS development tools

Table 2-3-3-1-T1: Advantages & Disadvantages of Apache

2.3.3.2 Internet Information Services

Internet Information Service, ordinary called Internet Information Server is a web server application and set of and feature extension modules which are created by Microsoft. IIS is a part of NT Server 4.0 and it is a server service the serve for the interactive data-driven web applications to the web browsers. (i.t.wales, 2002-2010)

IIS is a scalable enterprise network tool for the purpose of publishing FTP and web content internally for intranets and externally for internet sites. Many of the web sites are being build and hosted on IIS server because of the usability of NT server in the commercial market. (i.t.wales, 2002-2010)

IIS 6.0 has provides some enhancements over IIS 5.0 in order to increase the reliability, manageability, scalability, and security. IIS 6.0 is a main component of the Windows Server 2003 application platform, which is used to develop high performance ASP.NET application and XML Web Services. (Thiru Thangarathinam, 2003)

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IIS 6.0 is aimed for the performance and scalability attributes for Web servers for example, the web server is expected to raise the speed of the processing the HTP request and allow more applications and sites to run on one server at the same time. Rather that, IIS 6.0 also aimed to increase the reliability. IIS 6.0 has been designed from the ground up to allow the people to create more reliable application. (Thiru Thangarathinam, 2003)

Advantages of IIS	Disadvantages of IIS
• Easy to install • Instant access to database	• Only available for MS Windows OS • Expensive • Not stable

Table 2-3-3-1-T1 Advantages & Disadvantages of IIS

2.3.3.3 Comparison between Apache and Internet Information Services

	Apache	Internet Information Services
Supported by operating system	All	Only MS Windows OS
Price	Cheap	Expensive
Stability	Yes	No

Table 2-3-3-3-T1 Comparison Table between Apache and Internet Information Services

Through the comparison table, Apache is clearly has more advantages than Internet Information Services. By using Apache, the cost of it is very low and it can be supported by many kind of operating system. Rather than that, Apache is more stable than Internet Information Services. With using Apache to generate a dynamic website will produce a better result than Internet Information.

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2.4 Communication Tools

Nowadays, internet provides much different kind of communication tools to allow the people to communicate with each other and that makes the internet to become so interesting. Communication tools like electronic tools, newsgroup, chat, and forums are widely used around the world and each of them has their own strong point.

2.4.1 Forum

Forum is place on the internet for exchanging the user's idea and information. The forum allows the user to talk about their experience, information, tips, tricks and etc. For example, if you are having some problem with your computer, through the forum you might find out some people who are talking about the same problems as yours and the solution of it. Generally, a forum is an online communication between multiple users, through a text-style communication. That means the user needs to some typing or writing to communicate with others in the forum. When the internet has become more and more popular, it is easier to find

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a specific forum. Nowadays, some of the forums even enable the user to find anything that they want, buy or sell things. (Videojug, 2006-2010)

2.4.1.1 Rules & Policies of Forum

Forum is being in charged by a group of people, commonly made up by the moderators and administrators. This group of people will be handling the forum's conception, maintenance and policies. Normally, the forums will set up a list of rules for the user about the wishes, aims and guidelines of the forum creators. Usually, there is a section called FAQ in order to assist the users who are new to the forum in providing them the information of the use and the principals of the forum. (My Online Forums 2010)

The rules of the forum are maintain and enforced by the moderation teams. Rather than moderation teams, users are allowed to help them through a system called report system. Once the user makes a report, it will notify all currently available moderators so an action or judgement will be taken immediately. (My Online Forums 2010)

If the user breaks the rules, some of the steps will be taken. At the beginning, the first warning will be given to the particular user. Subsequently, if the user ignores the warning and still doing the same thing, a more serious action will be taken: that is the user will be banned for a few days. During these few days, the user cannot log in to the forum or even view to the website. After the period of being banned, if the user still keeps doing the same things, eventually leads to a permanent ban. Sometimes, this kind of problems wouldn't be solved because of the user can create another new account and keep harassing the forum. So, the administrators will apply an IP ban. It will prevent the offender's machine from accessing to the forum. (My Online Forums 2010)

2.4.1.2 Forum Structure

Normally in a forum consist of a directory structure. In this section, I will be talking about the user group, moderator, administrator, post and thread.

User Group

For some forums, it will have a system that divides the users into several user groups. The privileges and rights will be given based on the groups of the user. For example, for the groups of user who has register to the forum have the rights of post something inside the

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forum while the groups of user who didn't register to the forum also known as visitors or guest can only view the post of the forum and they do not have the rights of post something in the forum.

As the visitors, usually they are granted the access view the contents of the forum but for some forums, the administrators will not allow the user to read their forum unless they become a member of the forum.

Moderator

A moderator is the user who granted the authority to access to the post or threads of all members for the purpose of keeping the forum clean. Commonly the friends of the site owner can be promoted to be the moderator because they can access to all post and threads in their area of responsibility. Not only keep the forum clean, the moderator also can assist the user in many ways for example answering the question of the users who need help.

Administrators

In order to run the forum, the administrators are required to manage the technical details. They can do a lot of things like promote a member to become a moderator, set the rules of the forum or even create sections or subsections. Not only that, the administrators also can make announcement to the other user. In order to make the forum as attractive as possible, the administrators also can change the appearance of the forum.

Post

A post means that the user submit the message and enclosed it into a block which contains the information of the user for example the username, age and etc along with the date and time of the message being submitted. Usually the users are allowed to edit or delete their own post in order to prevent too many posts in the forum. Most of the forums also keep track the number of post of the member. The member who has higher number of post normally considered as more active than the member who has lower number of post.

Thread

A thread is a collection of posts, normally displayed from the oldest to latest. A thread can contain any number of posts, including the posts from the same user. Normally the threads'

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popularity is depends on the number of reply from the user. The more number of replied, the better threads' popularity.

2.4.2 Online Web Messaging System

Online web messaging system will use a secure messaging to send or receive the message from an alternative web-based mail system. By using the secure messaging system, there is no actual mail is transmitted through any third party server. By using the system, the user needs to visit the website in order to get the message or send the message because only an optional message notice is sent to the recipient. (Hot Scripts, 2010)

2.4.2.1 Secure Messaging

Secure messaging is used to protect sensitive data and provide compliance with industry regulations. Comparing with classical secure e-Mail, the confidential and authenticated exchanges of secure messaging can be started immediately by any user because there is no requirement to install any software. Secure messaging provides the fact as the recipients are identified and the transactions are logged by a secure email platform.

Functionality

Secure messaging is a kind of online service. The username and password are required for the user in order to log in to his/her account. If the recipient is contacted for the first time, a message unlock code is needed to authenticate the recipient.

Sending Secure Messages

1. The sender writes an email and sends it to the secure messaging server.
2. Through a normal email, the recipient is notified that a secure message is waiting for delivery on the source server.
3. The sender provides the recipient with a message unlock code in order to access to the pending message. This step is not necessary if the recipient already in contact with the sender through secure messaging server and has registered.

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4. The secure messaging and confidential documents can be accessed with message unlock code and downloaded.
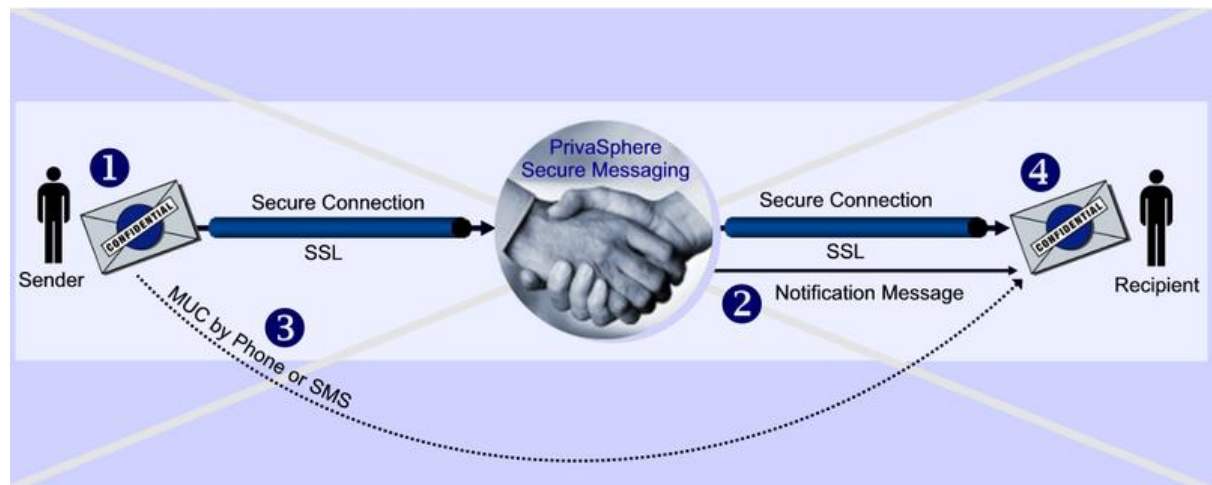
Figure 2-4-2-1-F1: Process of Secure Messaging

Message Unlock Code

Message unlock code is a message password to protect the message sent to a new communication partner from being viewed by erroneous recipients. When the message is sent to a new recipient, the system will automatically generate a random message unlock code. With the message unlock code, the recipient can access to the secure message and confidential documents and download them. If the recipient is already in contact with the sender, the message unlock code is not required.

Secure Delivery

Secure messaging has many different kind of delivery for example, secure web interface, S/MIME or PGP encrypted communication or TLS secure connections to email domains or individual eMail clients. A single secure message can be sent to many recipients with different types of secure delivery and it is not an issue to be concerned by the sender.

Application

Secure Messaging can be used in many different aspects especially business areas with company-wide and sensitive data exchanges for example financial institutions, insurance companies service provider and etc rely on the protection by Secure Messaging. Hence, secure messaging can be integrated easily into corporate email infrastructures.

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As for government, secure messaging can also provide electronic registered mail functions. For the purpose of this, there are some countries require it to be accredited as a secure platform for example Switzerland.

2.4.3 Statistical Survey

Statistical Survey is a method of collecting quantitative information about items in a population. A survey can be focus on opinions or factual information depending on the purpose and many surveys will be involves administering questions to individuals. If the questions are managed by researcher, the survey is called structured interview and it is called questionnaire if the questions are managed by respondent.

2.4.3.1 Structure

In a survey, the questions are structured and it is intended to reduce bias. For example, the questions should be ordered in a way that it would not influence the answer to subsequent questions. Survey has to be standardized in order to be more reliable and validity. For example, every respondent should have the same question as the other respondent.(SlideShare Inc, 2010).

Advantages of surveys

- An efficient way to collect information from a large number of respondents.

- Flexible to use because wide range of information can be collected

- Relatively free from several types of errors

- Easy to administer

- Cheaper to run

(Colorado State University, 1993-2010)

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Disadvantages of surveys

- The respondent may be motivated to give answer that present themselves in a favourable light

- Survey question answer choices could lead to vague data sets

- Structured surveys may have low validity while researching affective variables

(Colorado State University, 1993-2010)

2.5 Learning Management System

Learning management system is a software application that handles tracking, reporting at training events and administration. A strong learning management system is capable to the following things:

- Centralize and automate administration

- Use self-service and self-guided services

- Assemble and deliver learning content is a short time

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- Support standards and portability

- Allow knowledge reuse and personalize content

(Ryann K. Ellis, 2009)

Besides, a learning management system should be able to integrate with other application solutions in order to enable the management to measure the impact, effectiveness, and overall cost of training initiatives. (Ryann K. Ellis, 2009)

Most of the learning management systems are web-based which is develop by using Java, Microsoft .NET or PHP. They also use the database like Mysql, Microsoft SQL server or Oracle as back-end. (Ryann K. Ellis, 2009)

Features

In order to allow the technology to determine how the organization will use its learning management system, it is important to define clearly and prioritizes the requirement to find the right learning management system initial core requirements. The features of the learning management system are the following:

(Ryann K. Ellis, 2009)

Integration with Human Resource

Learning management system should be able to synchronize with Human Resource systems. When a human resource employee key in a new hire's information into Human resource system, the employee will automatically signed up for determine the role of the new hire in the company. (Ryann K. Ellis, 2009)

Administration tools

In learning management system, the administrators should have the control in managing user registrations and profiles, defining roles, managing content and etc. Administrators have the access to the database and enabling them to create standard and customized reports on individual and group performance. (Ryann K. Ellis, 2009)

Content Access

Involve with the medium, method, languages in which the content is delivered and to whom the content is being deliver. (Ryann K. Ellis, 2009)

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Content Development

Content development concerned with the authoring, maintaining, and storing the learning content. (Ryann K. Ellis, 2009)

Content Integration

As a strong learning management system, it should be able to provide native support to a wide range of third-party courseware. (Ryann K. Ellis, 2009)

Adherence to Standards

Learning management system is able to import and manage content that complies with standards according to the authoring system that produced it. (Ryann K. Ellis, 2009)

Security

Security is very important in any data system which contains the employee information and proprietary content. Normally the security will include password and encryption. (Ryann K. Ellis, 2009)

3.0 Introduction

In this chapter, it would include the requirements of the proposed project and that would include the techniques of the requirement gathering for example, questionnaire, self observation, survey and etc.

Furthermore, this chapter will give an explanation about the method that is going to be used in this project. It will be including the explanation of each phase of the development.

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3.1 Methodology and Tools

Although System Development Life Cycle (SDLC) has many different models and forms, but it follows certain steps and these steps could have the same name in one methodology but they are being used in different ways and might lead to something different.

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The SDLC models are created by different developers and some of them will follow the standard steps in a model. However, some of them prefer to create their own type of model.

Rather that, the tools like learning management system is being applied in this project in order to provide a suitable learning environment for all users to learn.

Waterfall Model

In the proposed project, it is going to use Waterfall Model during the development. Compared with other model, Waterfall model is sequential. So, there would not be any confusion about the steps and the steps are straight down. By using the model, there are no worries about so many conditions while working on the project and it could be useful for future code revisions and references.

By using Waterfall model, its drawback would be the length of time a project would be developed and the cost of the project. The timeline of this project is approximately 1 year to be done. The problem of the length of time could be solved because there is quite a lot of time given to finish this project. Rather that, this project is going to use low cost development tools for example, PHP, MYSQL and Apache to develop the project. So, the cost of the project is nearly zero and it could solve the drawback of Waterfall model.

Waterfall model is a sequential software development process while the progress is seen as flowing steadily downwards through the phases of planning, analysis, design, and implementation.

Planning
1.   What project is going to develop
2.   Gather the requirements

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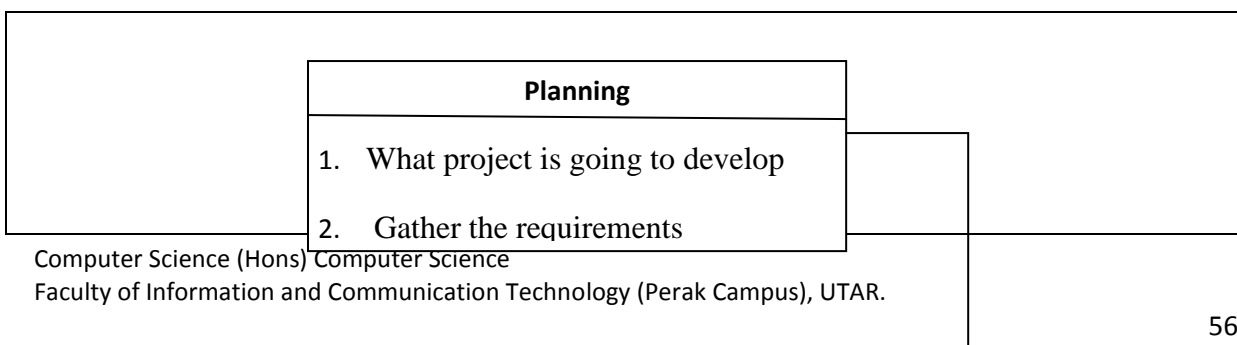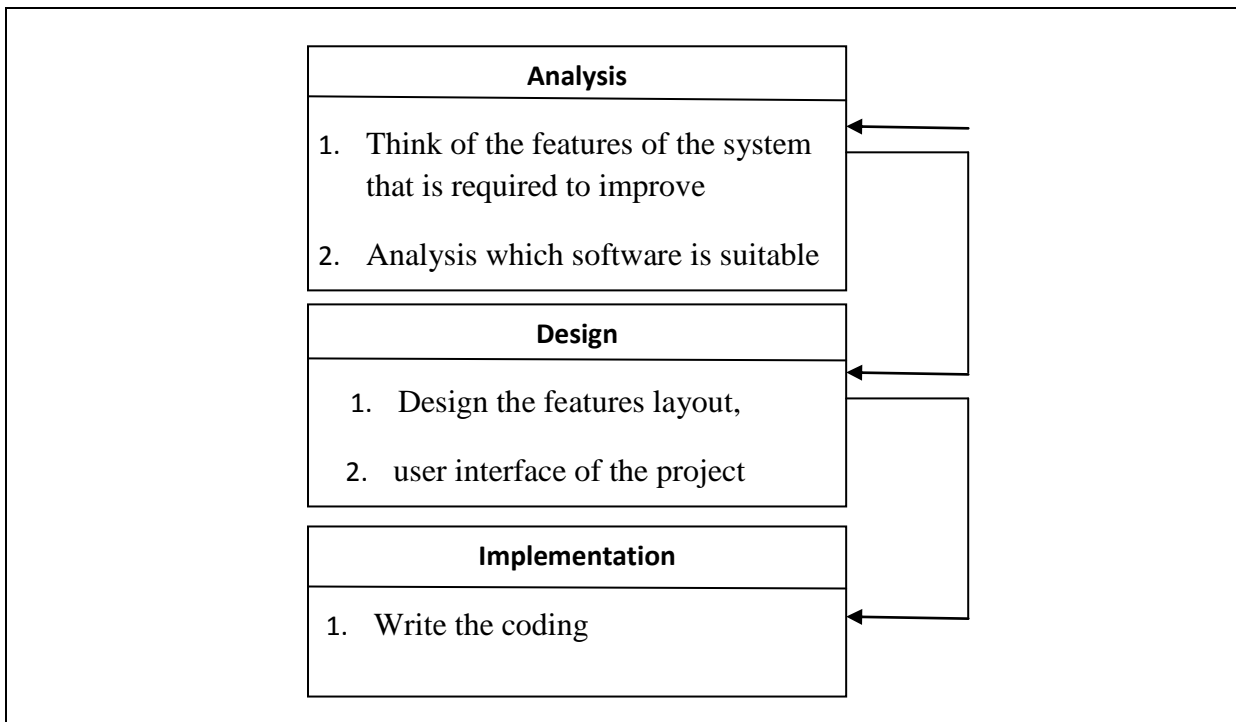
Figure 3-1-F1 Phases of Waterfall Model

Phases

Planning

Decided what kind of project that is going to develop and then gather the requirements from the other user through questionnaire and self observation.

Analysis

After gathered the requirements, analysis them. Then, start to think of the features of the system that is required to improve and also analysis which software is suitable to be used during the development.

Design

Once understand what is going to do through analysis, start to design the features layout, user interface of the project.

Implementation

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Once know the design of the project, start to write the coding by using some software development tools, database and web server to implement the project.

Learning Management System

This project is a kind of learning management system. Learning management system is a web base system for training programs and information sharing between the individual and giving them the flexibility to access it from anywhere.

Architectural Design of Learning Management system

The architectural design of a Learning Management System by using UML diagram is shown below. This design consists of one use case and one sequence diagram.
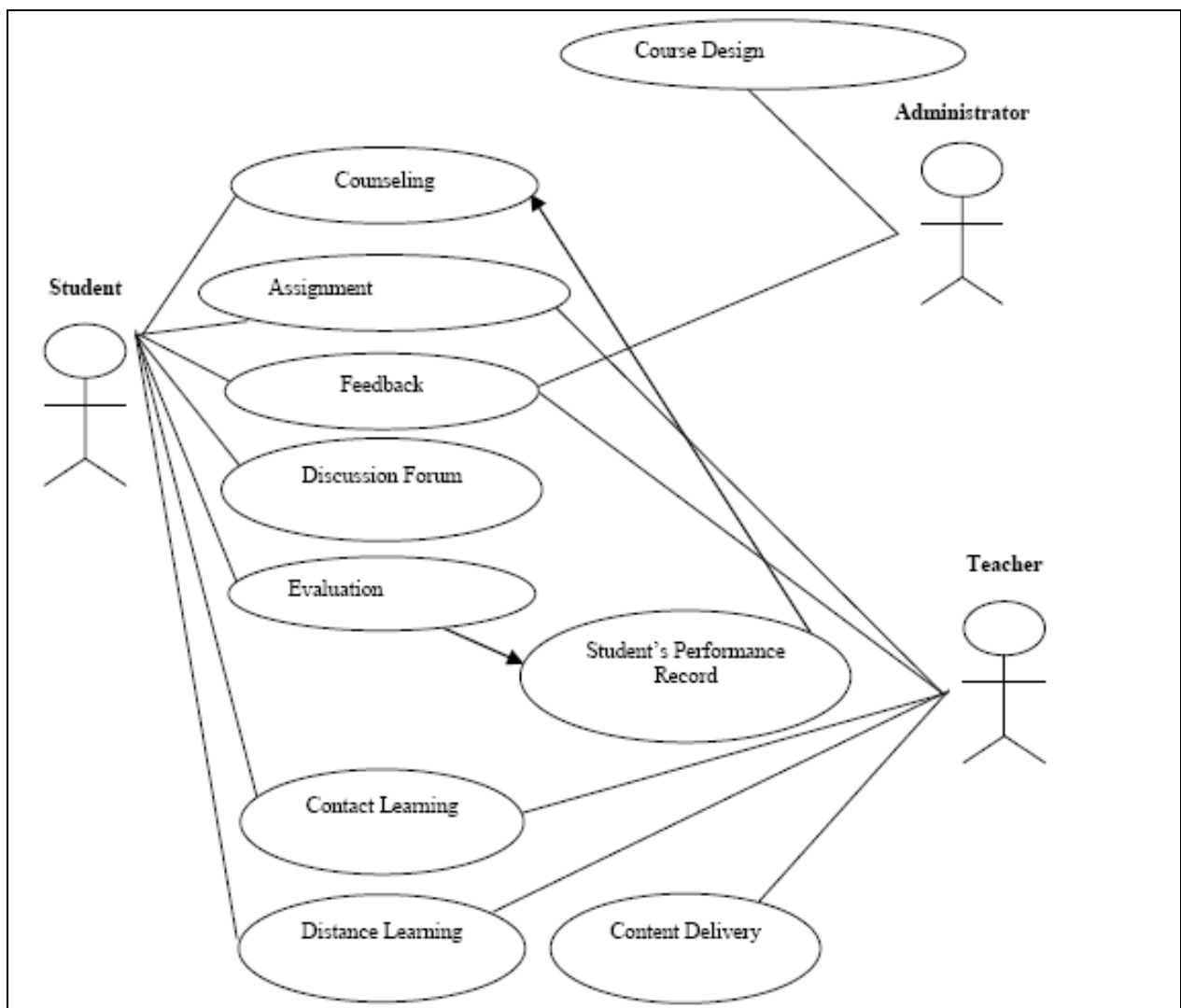
Figure 3-1-F2 Use case Diagram of Learning Management System

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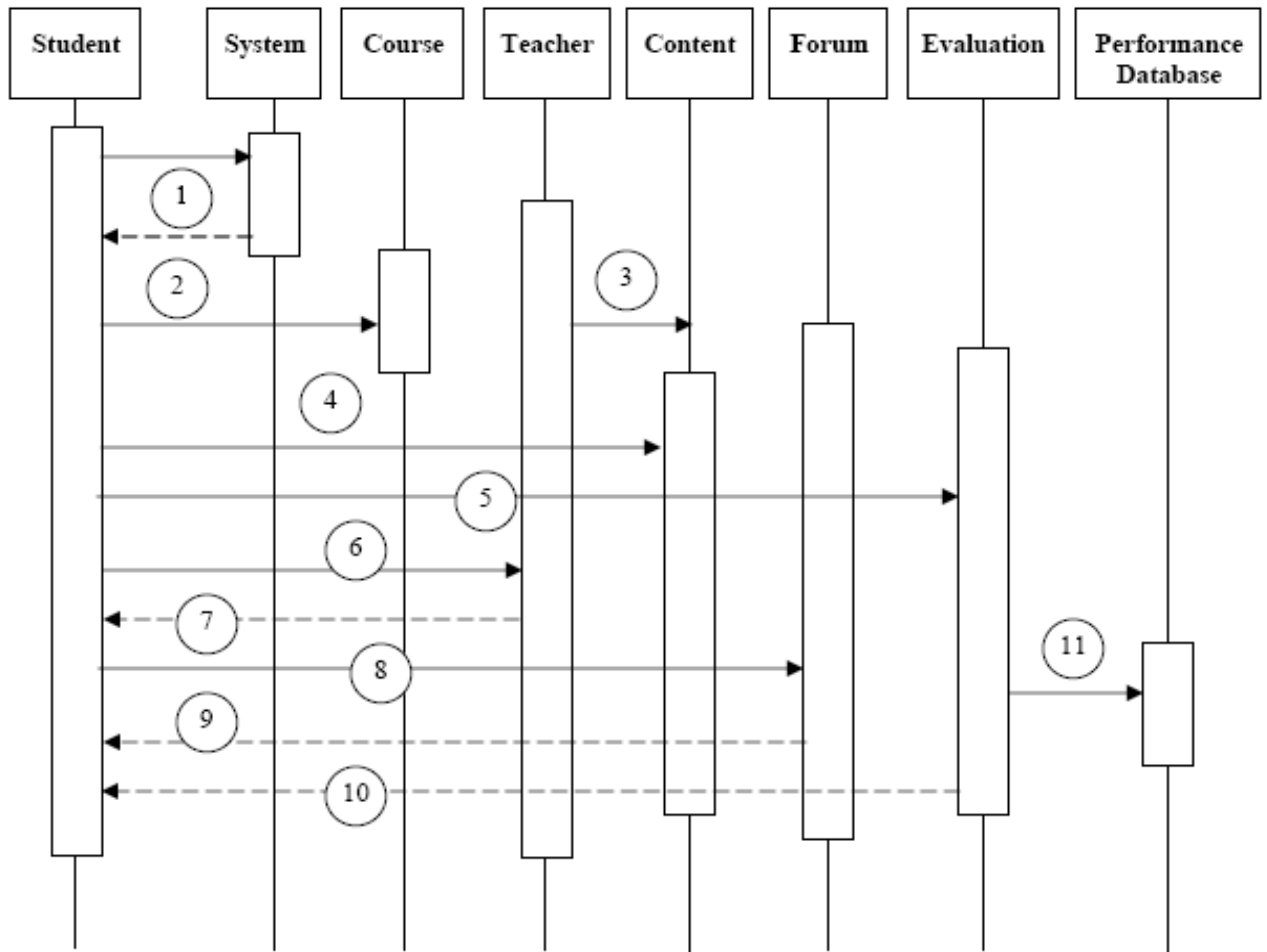
Figure 3-1-F3 Sequence Diagram of Learning Management System

1. Counselling	2. Enrolment	3. Delivery	4. Learning
5. Participate	6. Asking help	7. Negotiating Teaching Style	8. Contributory
9. Beneficiary	10. Result	11. Record Evaluation	

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3.2 Implementation issues and Challenges

The main implementation issues and challenges of the project would be the inexperience of using the development tools. That is because the methods of using development tools are still fresh for the beginners. So it takes time for a beginner to learn the functionalities of the development tools by searching for more information from the web or ask from senior.

Before using the development tools, to choose which kind of development tools is quite challenging as well. That is because there are many different kind of development tools can be used to develop a system. So, selecting the most suitable development tools is not easy because the basic of the development tools have to been known first in order to choose the best one out of so many kinds of development tools.

Rather that, the duration of creating a system is quite challenging as well. That is because the time is quite pack when there is assignment and test coming ahead. So, the time management of developing a project and managing test or assignment has to be very good in order to manage the time equally.

During the implementation, searching for functionalities from the web is another kind of challenges. Sometimes, the information of the functionalities about the development tools may not be found in the web because no much people have used it before.

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3.3 Requirements

3.3.1 User Requirement

The requirements about the project are gathered from two techniques which is the following:

1. Questionnaire

Questionnaire is a method of asking some questions and tries to collect some requirements from the answer. Questionnaire can be done through face to face communication or phone communication. The requirements of this project are collected from the questionnaire from a number of people.

The questions that would be asked in questionnaire are the following:

1. "What do you think about the current WBLE?"

2. "Is there any problems that you are facing with the current WBLE?"

3. "Is downloading lecture notes and tutorials the only reasons that you log in to WBLE? "Why?"

4. "In which aspect you think that need to improve in WBLE?"

Some of the results collect from questionnaire:

Person No.	Answer	
1	Question 1	I think that the current WBLE is still ok la. Because everyone can at least download the notes
	Question 2	Not particularly. Because I only get the notes from there
	Question 3	Yes. Because there is nothing else that I can do from there
	Question 4	For providing the notes, it is quite okay. For other aspects, it needs to work harder.
2	Question 1	Not as good as I expected.
	Question 2	Nope

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| | Question 3 | Of course, WBLE only provides notes and nothing else. |
| | Question 4 | A lot, but I think they need to do something with the forum because it seems useless for me. |

3	Question 1	Nothing special.
	Question 2	I am not sure about that, because I seldom log in to WBLE.
	Question 3	I have no idea because I normally get the notes from my class representative
	Question 4	No commend. But I heard from some of my friends saying that the email address which is provided in user profile sometimes is useless because most of the users do not read their mail. So maybe they can think of a way to make it easier for the user to communicate.

Table 3-3-1-T1 Questionnaire Result

2. Self Observation

Rather than questionnaire, the requirements gathered about the proposed project are also based on self observation. Self observation is a method of observing the current system and come out with the requirements based on own judgement by referencing from the other existing system.

Through the self observation, there are some requirements gathered when compare with the other existing system.

3.3.2 System Requirement

3.3.2.1 Software Requirement

1. PHP Version 5.3

- Up-to-date browser with Flash plug-in version????

- Broadband internet connection

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2. MYSQL Version 5

- Ranging from Celeron shared-host machines with a single HD and 512MB RAM to multi-processor 64-bit systems with RAID 10 over 16

3. Apache Version 2.0

4. IE 7.0 and above / Chrome v??? /

3.3.2.2 Hardware Requirement

- 512MB RAM

- Pentium 4 2.6 GHz or higher, or Apple Mac G5

- Sound card with speakers or headphones attached

- Screen resolution 1024 x 768 or higher

- Up-to-date browser with Flash plug-in

- Broadband internet connection

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3.4 Timeline

The project is started from Year 3 Semester 1, on 21 June 2010 and the project is estimate to be completed around 22 April 2011. The project is started once the supervisor has signed the undertaking letter.

The first submission of the project is the preliminary report which is on 19 July 2010. Inside the preliminary report, the students are required to explain about the chapter one and also the technologies involved in the project.

Before the submission of the preliminary report, chapter one has to be done which is consisting of the objectives, problem statement and scope of project. In order to start working on chapter 1, some requirements are required in order to find out the problems of the current project. It takes two weeks to gather the requirements and analyse them. Once finish the requirements, the project report is started from chapter 1 to chapter 3.

A few weeks after the preliminary report, there is the turn of the chapter 1 to chapter 3 report submission date. The students are required to submit their chapter 1 and chapter 3 report and having a presentation to their supervisor and moderator between week 12 to week 14.

In the end, the project is considered to be completed once the project deliverables are done along with the presentation of the project.

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Gantt Chart

Year 3 Semester 1

		Wk1	Wk2	Wk3	Wk4	Wk5	Wk6	Wk7	Wk8	Wk9	Wk10	Wk11	Wk12	Wk13	Wk14
Looking For Project Title		██	██												
Search for the information of the project title			██												
Writing Proposal			██	██											
Requirement Gathering				██											
Analyze Requirement					██										
Start Chapter 1	Introduction, Background Issue					██									
	Problem Statement, Objectives, Scope of work					██									
	Conclusion					██									
Start Chapter 2	Introduction, Historical Background						██	██							
	Purposes to be served by review of research literature							██	██	██					
	Conclusion								██						
Prepare for the moderation										██					
Start Chapter 3	Introduction, Description of research methodology										██	██			
	Instrumentation, Methodological assumptions											██	██		
	Conclusion											██			
Finalization												██			
Report Submission													██		
Presentation														██	██

Figure 3-4-F1 Year 3 Semester 1 Chart

Semester Beak

	Week1	Week2	Week3	Week4	Week5	Week6	Week7	Week8	Week9	Week10	Week11
Software Development	██	██	██	██	██	██	██	██	██	██	██

Figure 3-4-F2 Semester Break Chart

Year 3 Semester 2

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		Wk1	Wk2	Wk3	Wk4	Wk5	Wk6	Wk7	Wk8	Wk9	Wk10	Wk11	Wk12	Wk13	Wk14
Software Development		■	■	■	■	■	■	■	■	■	■				
Start Chapter 4	Introduction, Background Issue	■													
	System/Software description	■	■												
	Findings of testing			■	■										
	Conclusion				■										
Start Chapter 5	Introduction					■									
	Summary of Project					■	■								
	Contribution						■	■							
	Limitations							■	■						
	Recommendation								■	■					
	Conclusion									■					
Start Chapter 6	Introduction										■				
	Testing										■	■			
	Conclusion											■			
Finalization												■			
Report Submission													■		
Prepare for Presentation													■		
Presentation														■	■

Figure 3-4-F3 Year 3 Semester 2 Chart

3.5 Database Design

In order to support the functionalities in the system, a database has been used to store the information that is needed to execute the functionalities. For example, the user table is used to store the information about the users, without the table, users cannot create and account and log in to the system.

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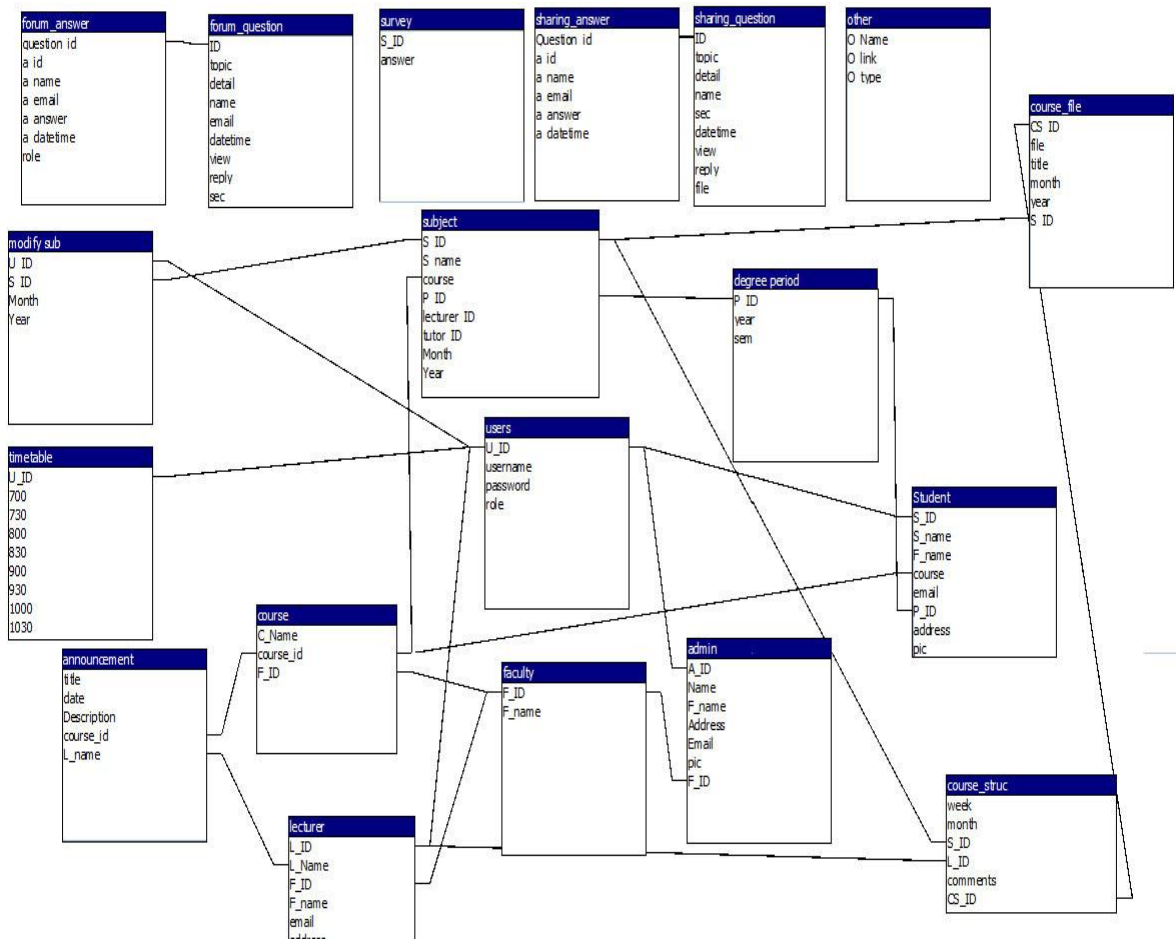Faculty of Information and Communication Technology (Perak Campus), UTAR.

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Figure 3-5-F1 ERD Diagram

There are 19 tables in the system to collect various data, which are the following:

- Users table – it is being used to save the data of the users including username, password and role of user.

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- Admin table – Consist of the information about admin like picture, email, address and faculty.
- Lecturer table - Consist of the information about lecturer like picture, lecturer field, email, address and faculty.
- Student table - Consist of the information about students like picture, email, address, course and date intake.
- Announcement table – Consist of the information about the announcement like title, date, description, course, and the name of the user who announce.
- Subject table – Consist of the information about the subject in university like subject ID, name, lecturer ID, tutor ID, date, and course.
- Course table - Consist of the information about the course in university like course name, course ID and faculty ID.
- Faculty Table - Consist of the information about the faculty in university like faculty ID and faculty name.
- Course Structure table - Consist of the information about the course structure starting from week 1 to week 14 like week, month, subject ID, lecturer ID, year and etc.
- Course File table - Consist of the information about the files that is being uploaded in the course structure like file name, file title and etc.
- Degree Period table – Consist of year and trimester information.
- Forum Question table – Consist of the information about the forum title like topic, detail, name, times of being viewed, number of replies, date and etc.
- Forum Answer table - Consist of the information about the forum reply like question ID, name, answer ID, date and etc.
- Sharing Question table – Consist of the information about the sharing title like topic, detail, name, times of being viewed, number of replies, file of being shared, date and etc.
- Sharing Answer table - Consist of the information about the replies of file being shared like question ID, name, answer ID, date and etc.
- Survey table – Being used to store the answer of users about the survey.
- Modify Sub table – Being used to store the information about the subject that user enrolled like subject ID, year and month.
- Other table – Store the information about the "other information" like the links, type and the name.

3.6 Design Layout

In the system, the design layout of the login page or register page and inside login page is different. For login page or register page, the design layout is:

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Top Banner	
Picture	Login / Register
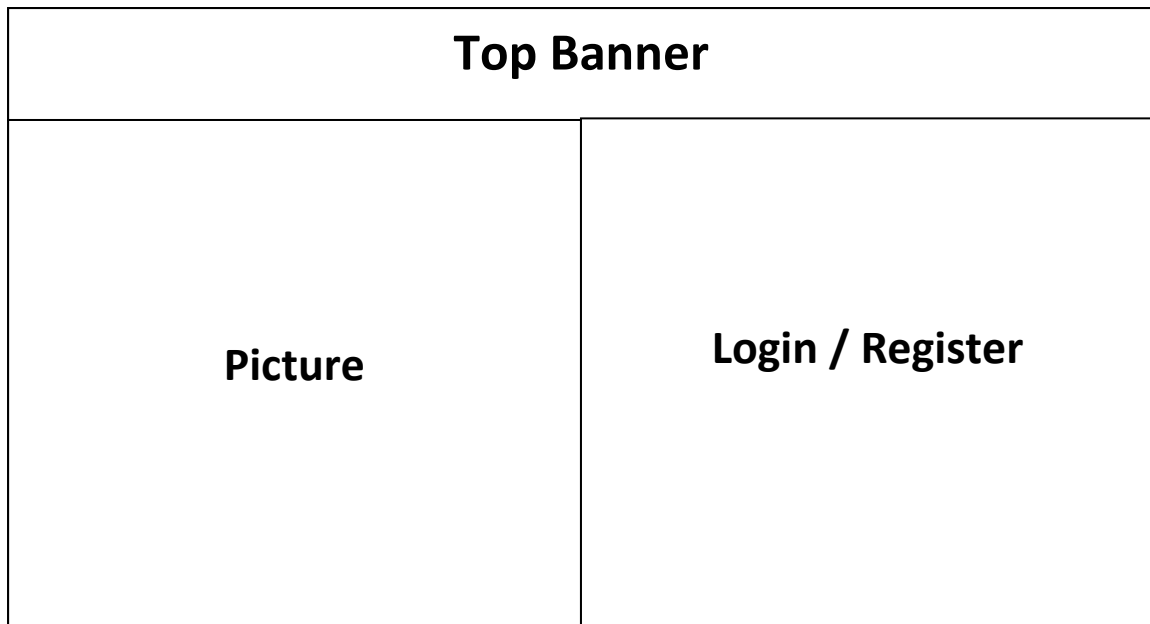
Figure 3-6-F1 Login/register page design layout

When the user is in login page, he/she will see the image with university logo in the top banner. Below the banner, there are some images about the university branches and its description. At the right of the university branches' images, there consist of the forms to allow the user to login or register.

When the user is inside the log in page, the design layout would be like this,

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University Logo	Top Banner	
	Page Name	Log Out
Menu	Content	Calender
Left banner		Right Banner
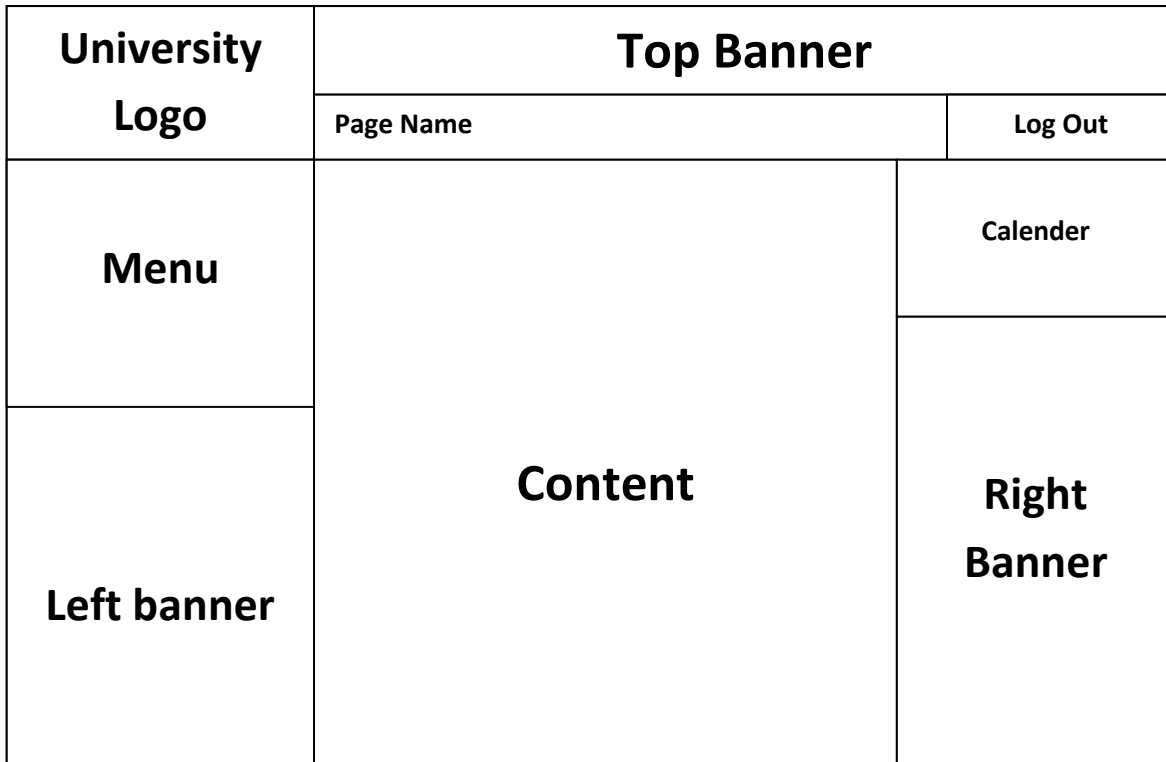
Figure 3-6-F2 Inside Login page design layout

The design layout inside every login page is as above diagram. At the top of the website consist of the university logo, banner, page name and log out. When the user clicks on different page, different page name will comes out. At the left of the website, there are menu and left banner. The menu consists of a list of functionalities. At the middle of the page, it contains the content of the page. Hence, different page will display different content. At the right of the page, it has the calendar and some functionality which are below the calendar.

3.7 Conclusion

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In conclusion, there are many different model of methodology and each of them has their pros and cons. There is no best model that everything is perfect and the choice of methodology model is depends on the situation and what kind of system that is going to develop.

During the implementation phase in SDLC, it is a very important phase because it needs a lot of work to be done. If the result of implementation did not reach the expectation of the client, it has to redo again. To reach the expectation, certain knowledge and manpower is required during the implementation.

Before developing a project, requirement gathering is very important and it has to in detail because the project can only start once the project is fully understand. There are many ways to get the requirements of the project for example, questionnaire, survey, self observation and etc.

4.0 Introduction

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This chapter will explain about the system description for the functionalities of the project and findings of testing.

In the system description, this chapter will introduce step by step about how to use the functionalities of the system. Besides, the functionalities of the system would be different for students, lecturers and admin because some roles are able to access certain functionalities only.

In the findings of testing, some print screens are presented to test about the functionalities of the system.

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4.1 System Description

The system is a dynamic website that allows the people from the university to share their information. So, the users are required to login in order to access to the website. For those who are students of the university but don't have an account, they are able to register their account using their student ID.

Basically, the system has three roles which are students, lecturers and admin. Each role has different access of the functionality for example only admin is able to delete the account. The functionalities of the system are shown below:

The functionalities of the system:

- Announcement
  - Allows the lecturers or admin to post some news or event.
- Course Structure
  - Allows the lecturers to post some lecture notes or tutorial for the students.
- User Profile
  - Stores the user's personal information.
- File Sharing Centre
  - Allows the user to share some files.
- Forum
  - Allows the users to discuss everything and share the information that they know.
- Other Information
  - Allows the user to learn some external knowledge
- Add/Delete Account (For admin only)
  - Allows the admin to add an account or delete any existing account
- Knowledge Sharing
  - Allows the user to get some guides or news from the other users.
- Survey
  - Allows the user to vote on something
- User Searching
  - Allows the user to search for other participant
- GPA & CGPA Calculator
  - Allows the user to calculate GPA and CGPA
- Search for Units
  - Allows the user to search for subject on certain date

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Announcement

In announcement page, the view will be different for students, lecturer and admin. When students login to the website, the announcement of their course will be shown but they cannot add any announcement or delete any announcement.

When the lecturers login to the website, the announcement page will not display any result until they have choose the courses. The lecturers are able to view the announcements of the courses which are under the same faculty. The lecturers are able to add the announcement or delete the announcement. Hence, the lecturers are able to add/delete the same announcement to a few courses at the same time. When the lecturers want to delete the announcement, they only can delete the announcement that they posted.

Similarly to the lecturers, when admin login to the website, the announcement page will not display any result until they have choose the course. However, admin is able to access to all announcements from all faculty. Admin is also able to add/delete announcement to a more than one course at the same time and delete the announcement that they posted.

```
                           ┌──────────────────┐
                           │   Announcement   │
                           └──────────────────┘
          ┌──────────────────────┼──────────────────────┐
   ┌──────────────┐       ┌──────────────┐       ┌──────────────┐
   │    Admin     │       │   Lecturer   │       │   Student    │
   └──────────────┘       └──────────────┘       └──────────────┘
```

Admin	Lecturer	Student
1. Add/Delete announcement 2. Delete own announcement only 3. Able to access any announcement	1. Add/Delete announcement 2. Delete own announcement only 3. Able to access announcement under same faculty only	1. Able to access announcement under same faculty only
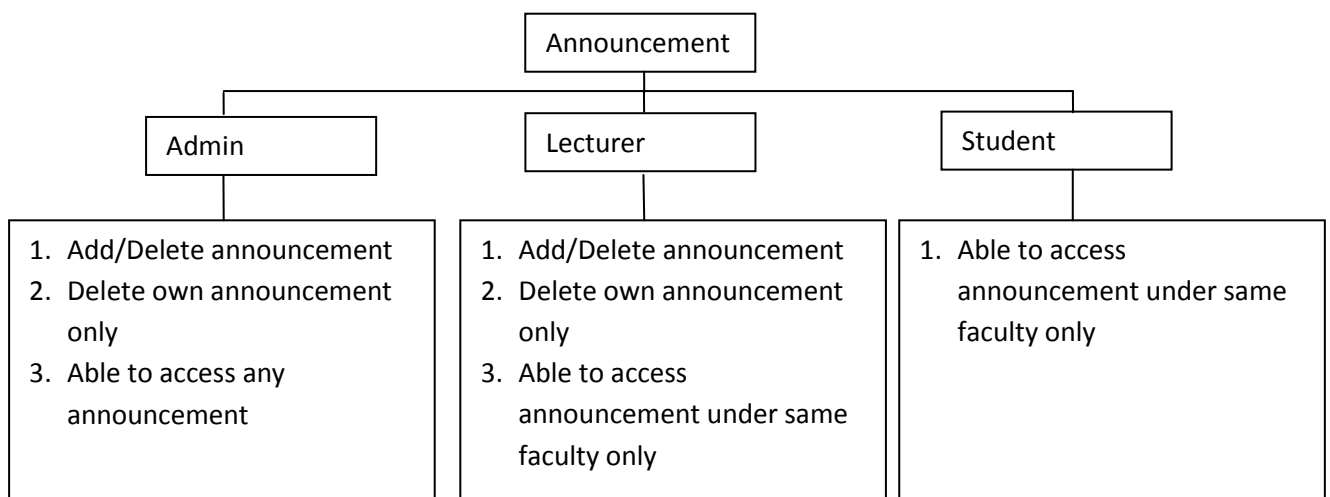
Figure 4-1-F1 Announcement Functionalities

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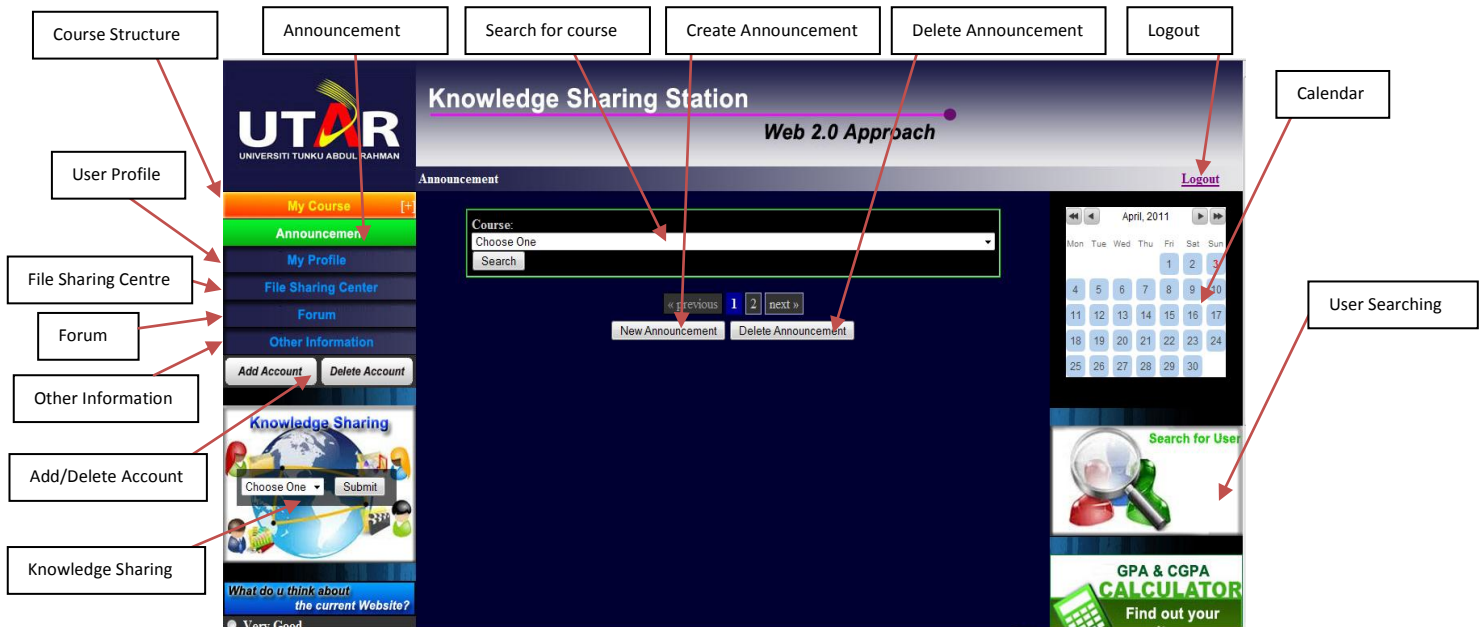
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Figure 4-1-F2 Announcement Page

Course Structure

In course structure, everyone is able to enrol any subject that they want and the subject will become secondary subject and categorized as 'other subject'. During the subject enrolment, the users are required to choose the date of the subject to keep track the messages and notes of the subject.

Other than enrolling subject, lecturers are able to upload the files and post some messages to their students on the subject that they are teaching. Hence, lecturers are also can edit the messages and the files that they upload. Lecturers are able to upload the files and post some message to the subject that they enrol also.

For students, they are able to download the file and view the message from their lecturer.

For admin, they are able to upload the files and post some message to their students also which is same as lecturers.
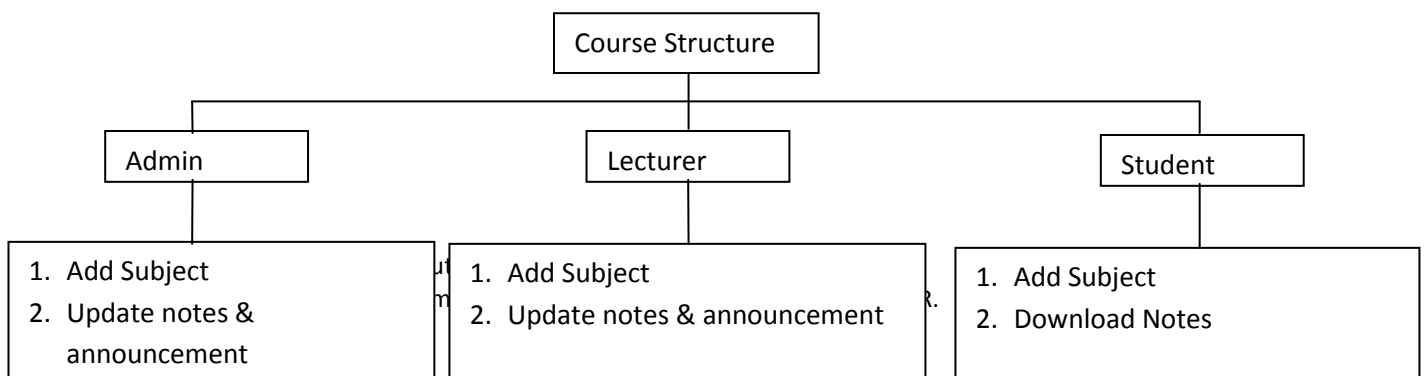

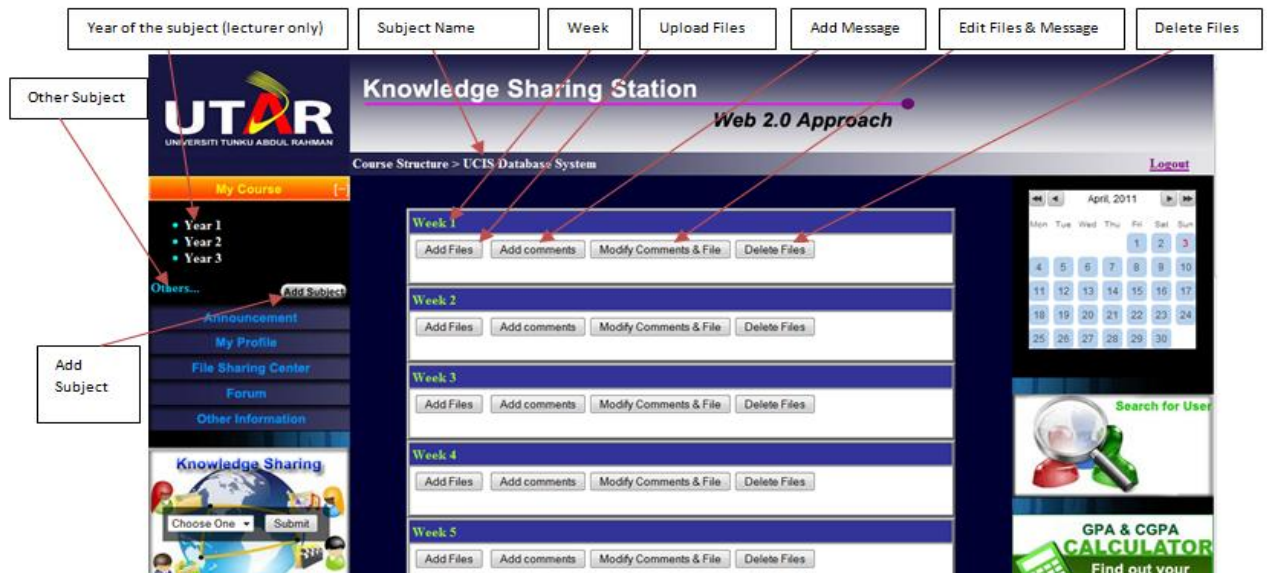Figure 4-1-F3 Course Structure Functionalities

Figure 4-1-F4 Course Structure Page

User Profile

The user's personal information that will be included in user profile is name, forum name, faculty, role, office, address, email address, display picture and timetable. The view of the user profile is almost same for every user except the information of lecturers' office venue will be display for lecturer only. The users are able to edit almost all information in their profile except their role in the university. The users can also create their time table to notify which period they are available or unavailable.
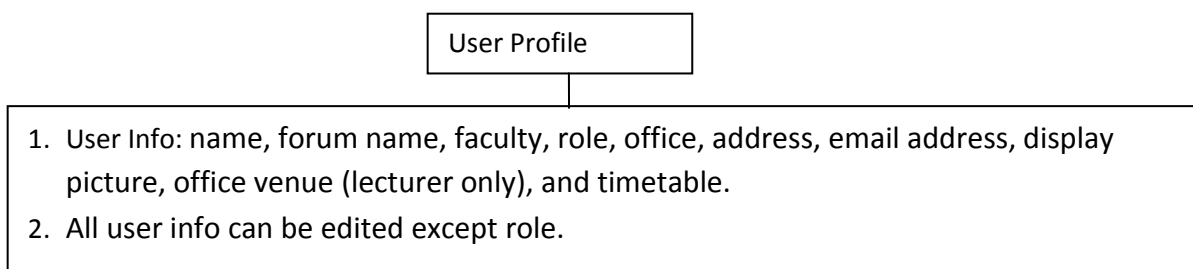

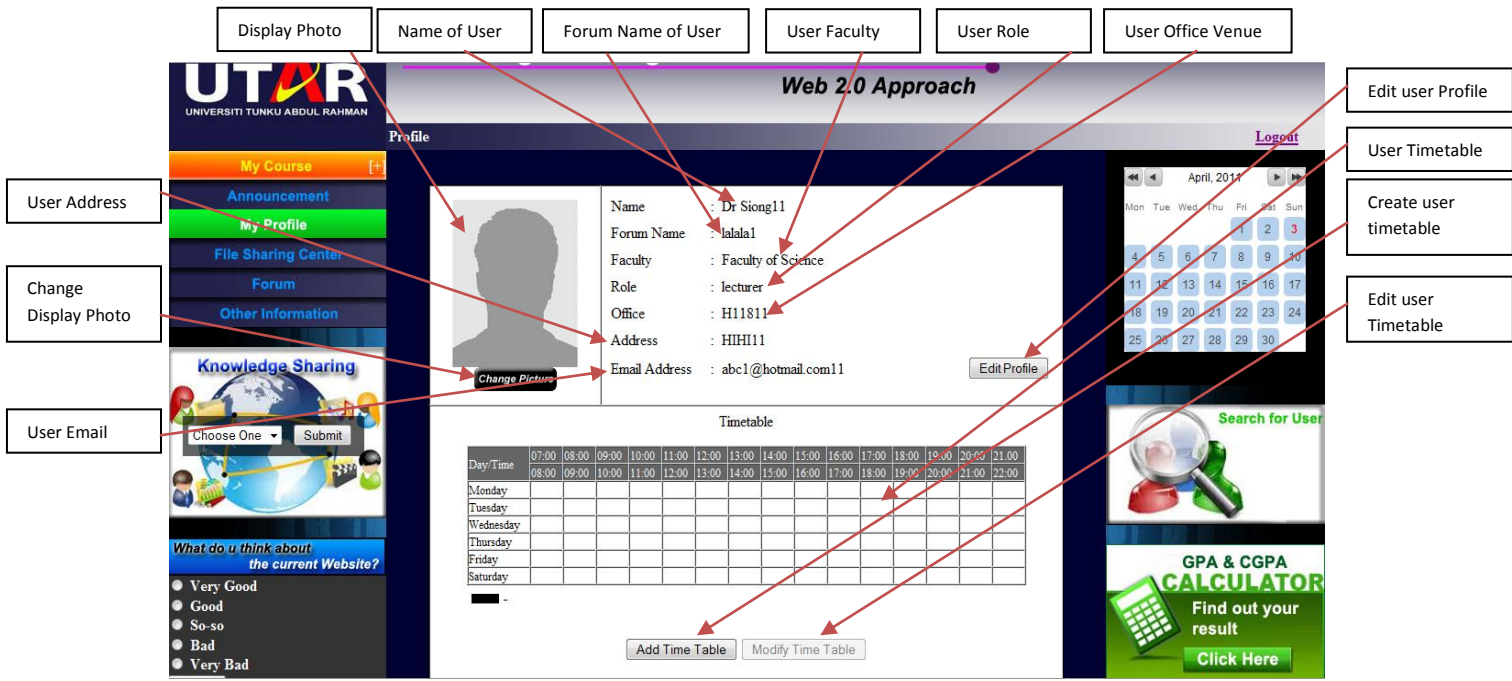Figure 4-1-F5 User Profile Functionalities

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Figure 4-1-F6 User Profile Page

File Sharing Centre

In file sharing centre, it will be divided into four sections which is photo, video, documents and 'others'. In each section, only certain types of file are able to be uploaded. For example, only jpeg and gif file can be uploaded in photo sections. In video section, the users are required to key in the video embedded code from other source like youtube.com. For 'others' section, all kind of files are able to be uploaded.

For each file to be uploaded, the information of title, details, file size, file name, date uploaded, name, time of views and reply will be shown. Other than that, the users are able to provide the feedback on the file that they share.

Basically, all users are able to add the file and modify/delete the files that they uploaded except that admin is able to delete/modify all files that the users uploaded.

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Figure 4-1-F7 File Sharing Centre Functionalities

Figure 4-1-F8 File Sharing Centre Page

Forum

Basically, forum has been divided into 5 sections which are rules and announcement, general discussion, academic, university branches and activity. Each section will be discussing about different information. For each section, the information like number of topic, number of post, and last post will be shown.

Inside the section, there will be the topics that user would like to discuss. For each topic, the information like number of views and reply and last post will be shown. Whenever the user post a topic or reply, the role of the user, total topic and replies, date, title and detail will be shown.

In the forum, the user also can search the title of the topic. All users also can create a new topic to discuss and they are able to edit the topic or replies that they post. For admin, they also can delete the topic and modify the other user topic or replies.

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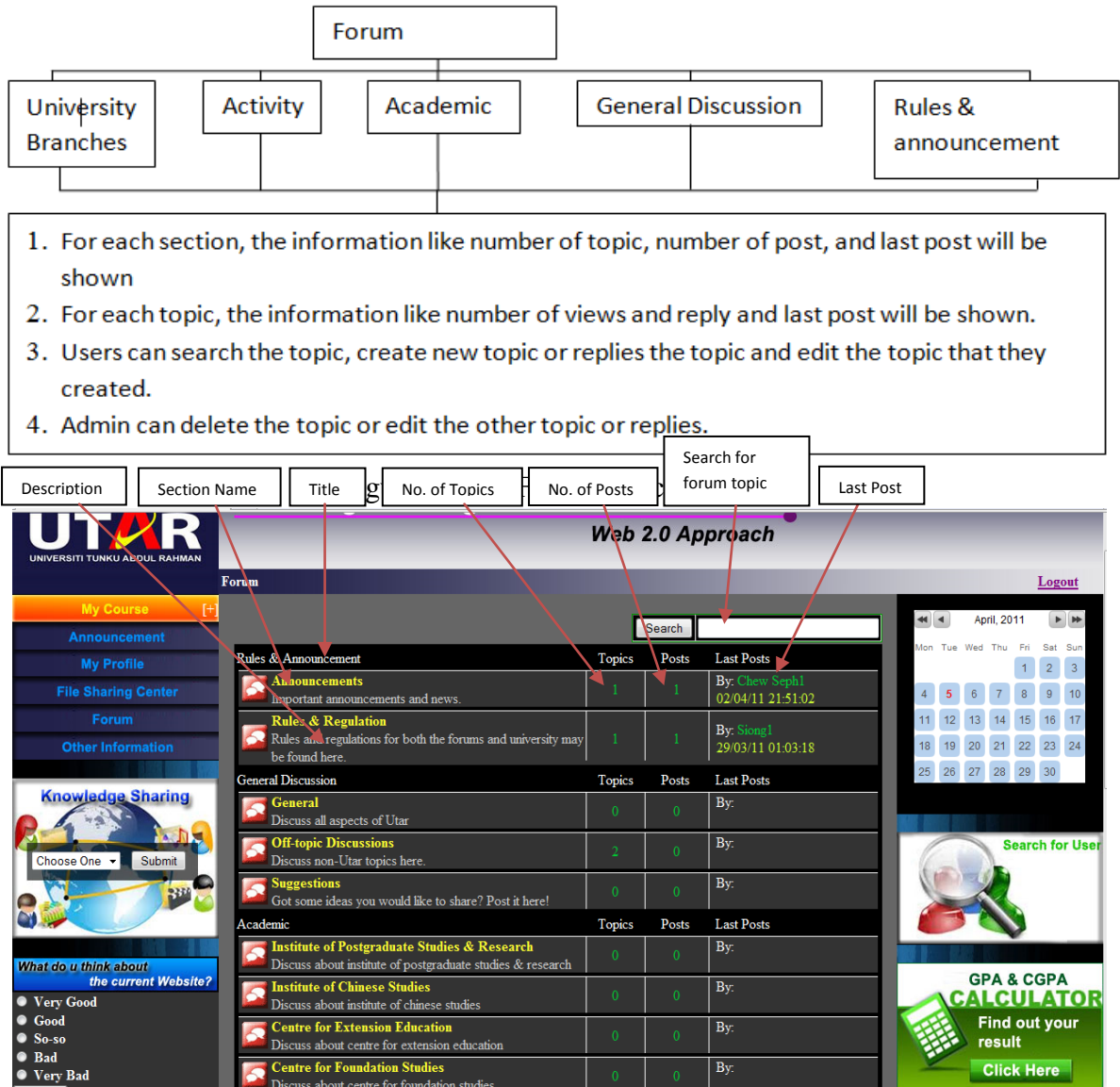
Figure 4-1-F10 Forum Page

Other Information

In other information, the admin will post some useful links for the user. The links has been divided into three sections, which is sports & recreation, career, and health & safety. So, admin can add new links or delete the links in other information part. For students and lecturers, they are able to check on any links that would benefits for them.

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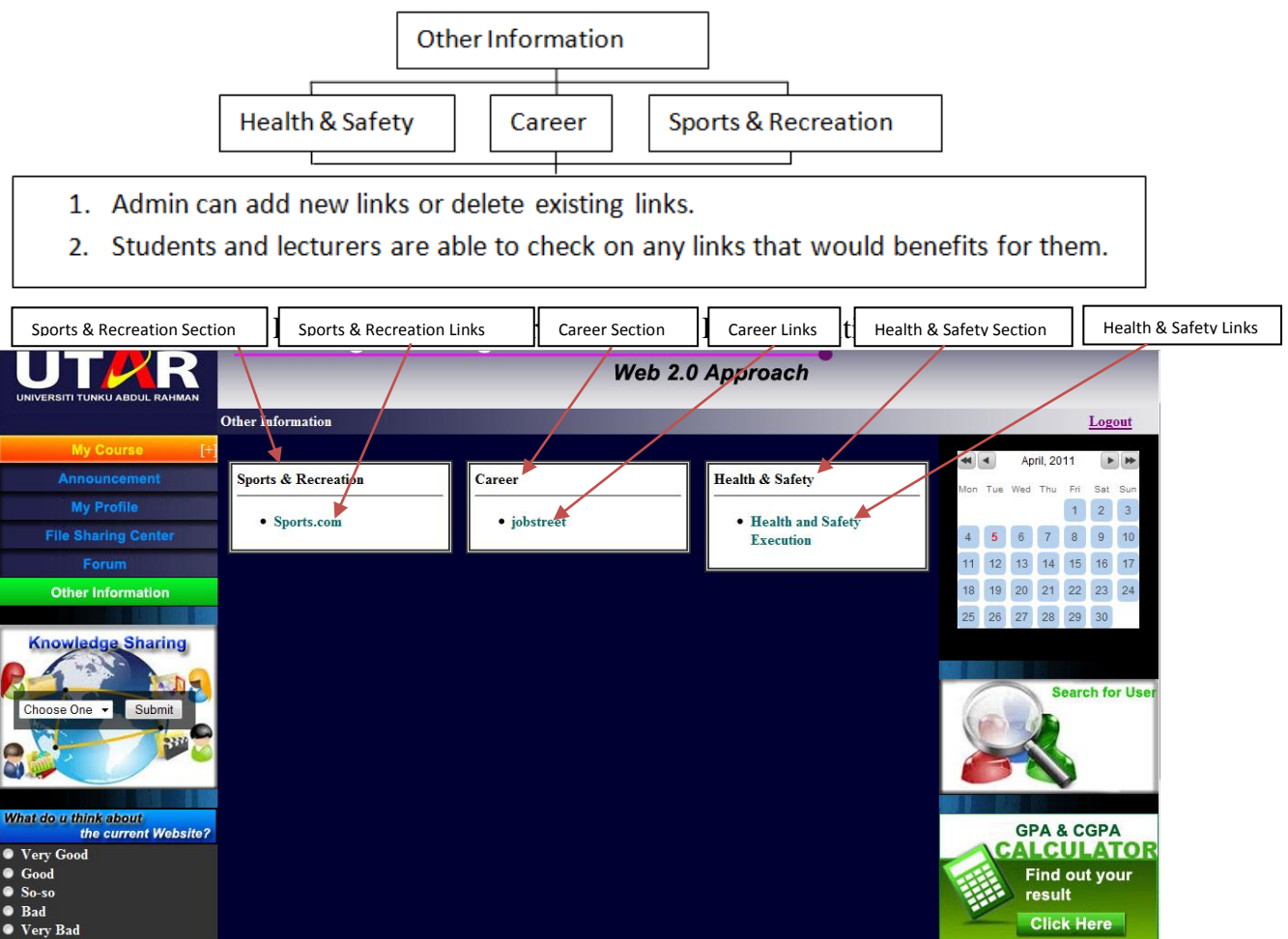
Figure 4-1-F12 Other Information Page

Add/Delete Account

Admin is able to add a lecturer account or delete any existing account.
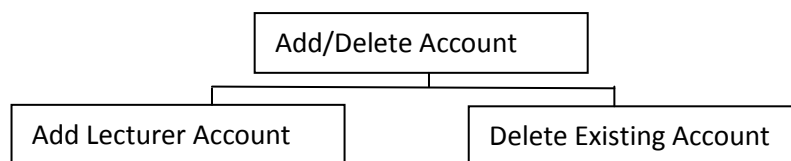
Figure 4-1-F13 Add/Delete Account Functionalities

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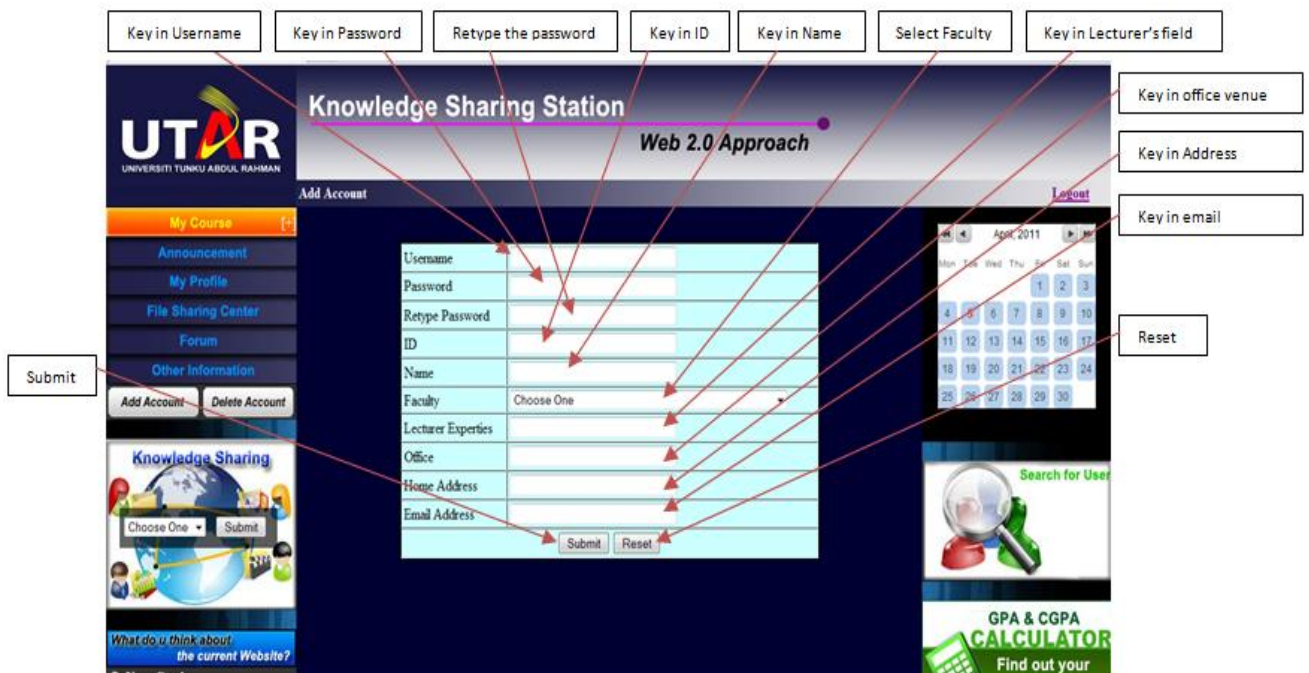
Figure 4-1-F14 Add Account Page

Knowledge Sharing

Knowledge sharing has been divided into three sections which are called Q & A Bank, tips bank and news bank. For each section, different things will be discussed. If the users have any question, they can request for answer in Q & A bank. If the users are looking for a guide, they can go for tips bank. News bank is a section that allows the user to discuss everything about news. Same like forum, the users can create new topic, search for a topic, and edit the topic or replies that they posted. For admin, they can also delete the topic and edit the topic or replies from other user.
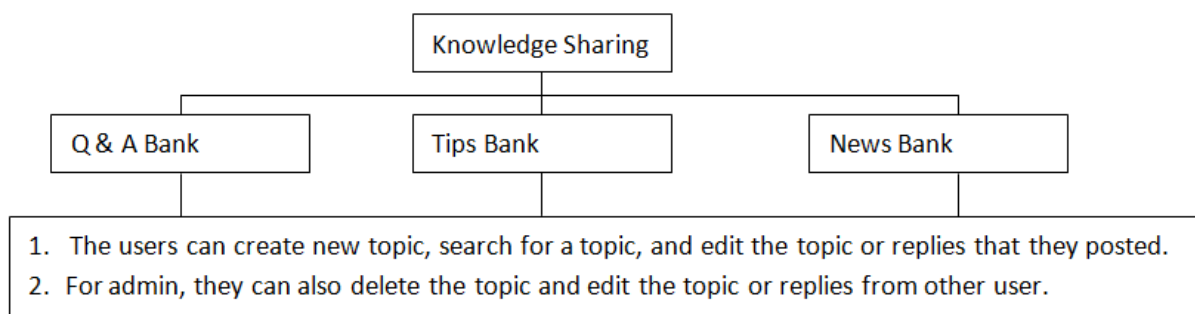
Figure 4-1-F15 Knowledge Sharing Functionalities

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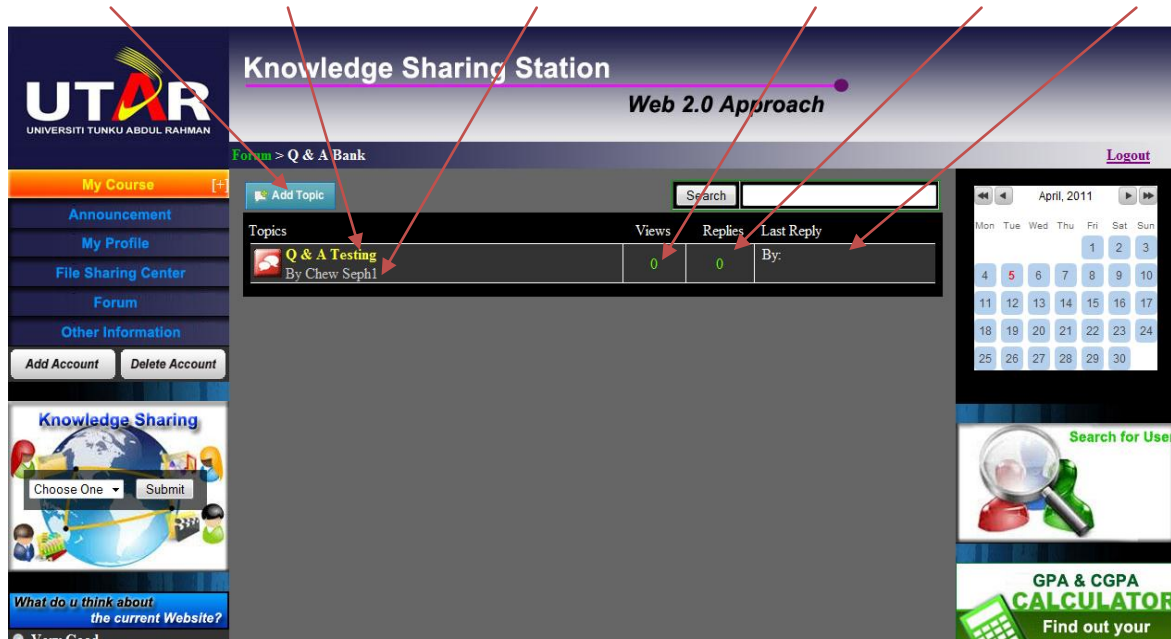
Figure 4-1-F16 Knowledge Sharing Page

Survey

Survey is a place that allows the user to vote about the current website. Survey is open for all users to fill up. The result of the survey will display at the bottom of the survey.
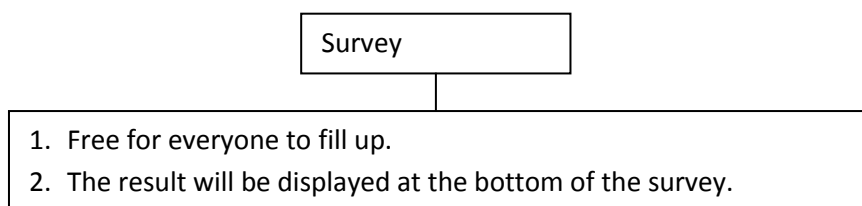
Figure 4-1-F17 Survey Functionalities

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Figure 4-1-F18 Survey Section

User Searching

User Searching is a place that allows the user to search for other user. The user searching is being viewed by three separate roles, which are students, lecturers and admin. In user searching, the user can search by the name of the user, email, role and faculty. Then, the information of the user like, name, role, faculty, address, email address and timetable will be displayed. User searching also allows the user to send message to that particular user.
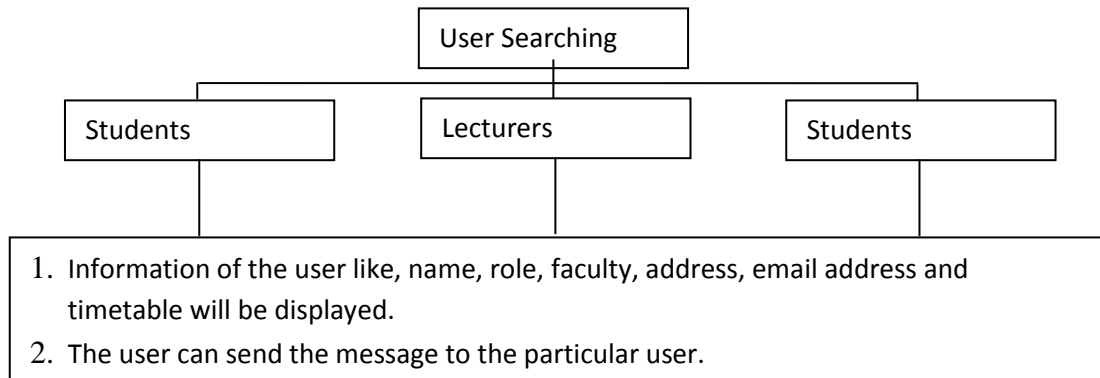
Figure 4-1-F19 User Searching Functionalities

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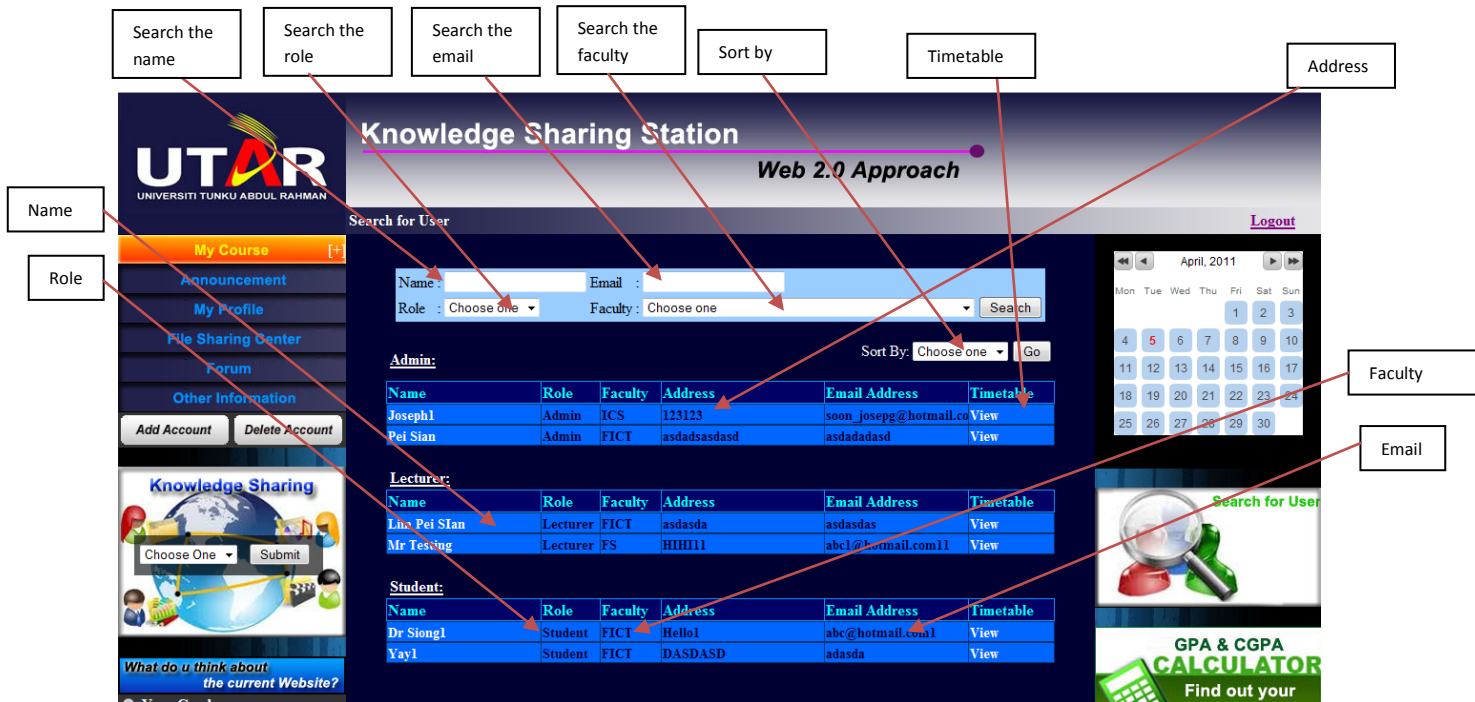
Figure 4-1-F20 User Searching Page

GPA & CGPA Calculator

GPA & CGPA calculator allows the user to calculate their GPA and CGPA by key in the total credit hour, previous CGPA and current result.

GPA & CGPA Calculator

The users are required to key in the total credit hour, previous CGPA and current result.
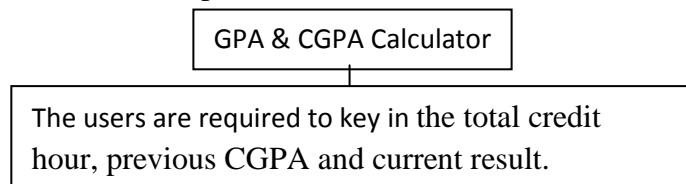
Figure 4-1-F21 GPA & CGPA Calculator Functionalities

Key in Current CGPA value   Key in Total Credit Hour   Course Name   Unit credit hour   Unit Grade

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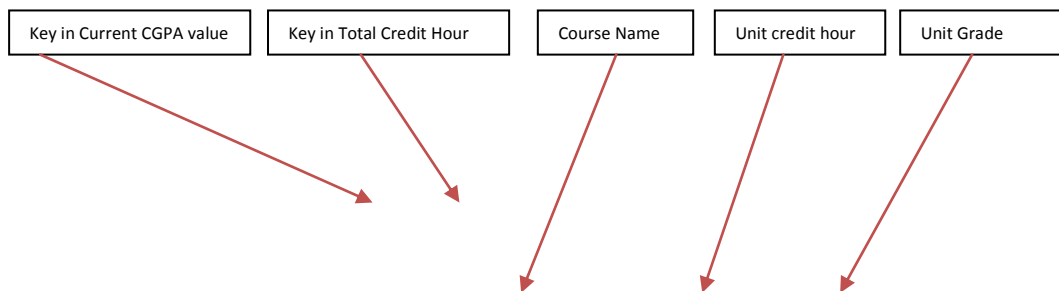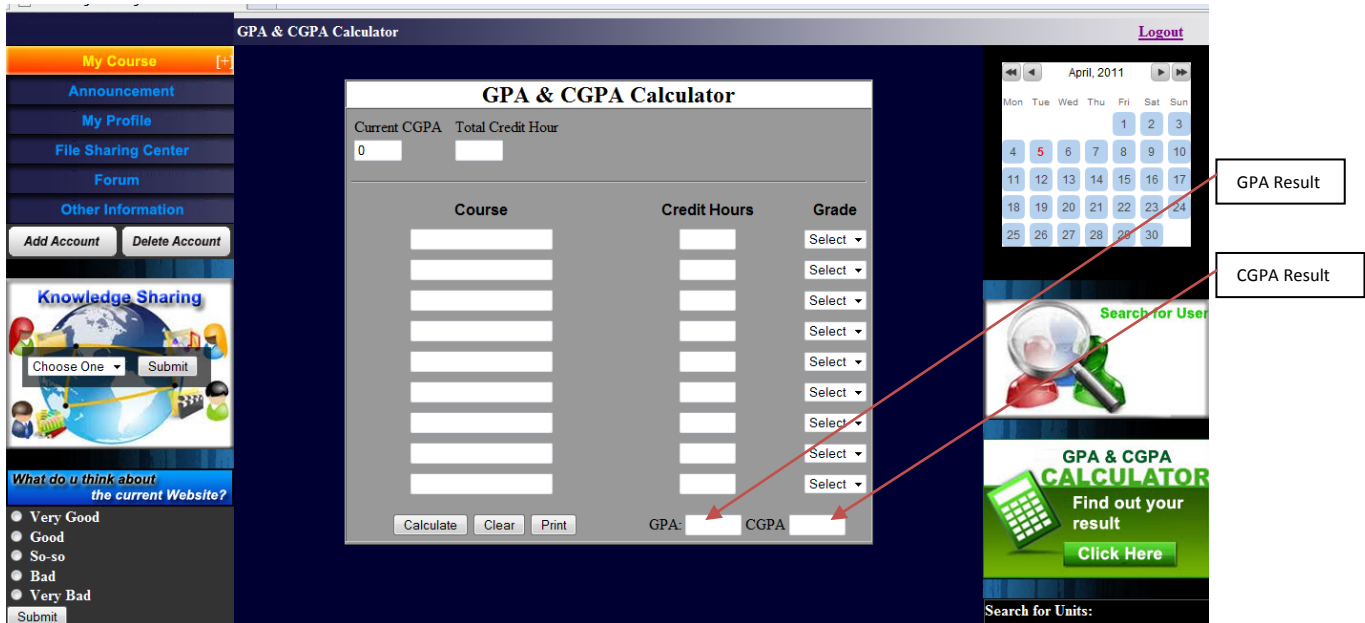
Figure 4-1-F22 GPA & CGPA Calculator Page

Search for units

Search for units is a place that allows the user to search the units during a certain period. The users are required to key in the name and the date of the units. After that, the user can view the files and the message of that particular subject during that period.
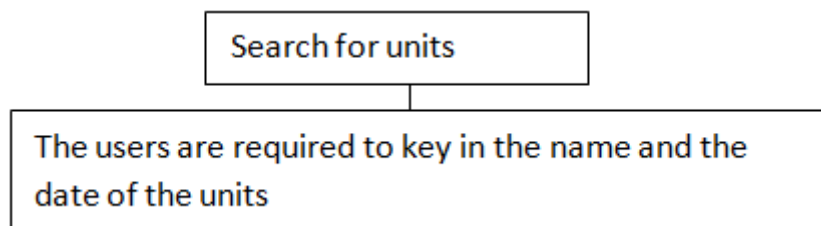
Figure 4-1-F23 Search for unit functionalities

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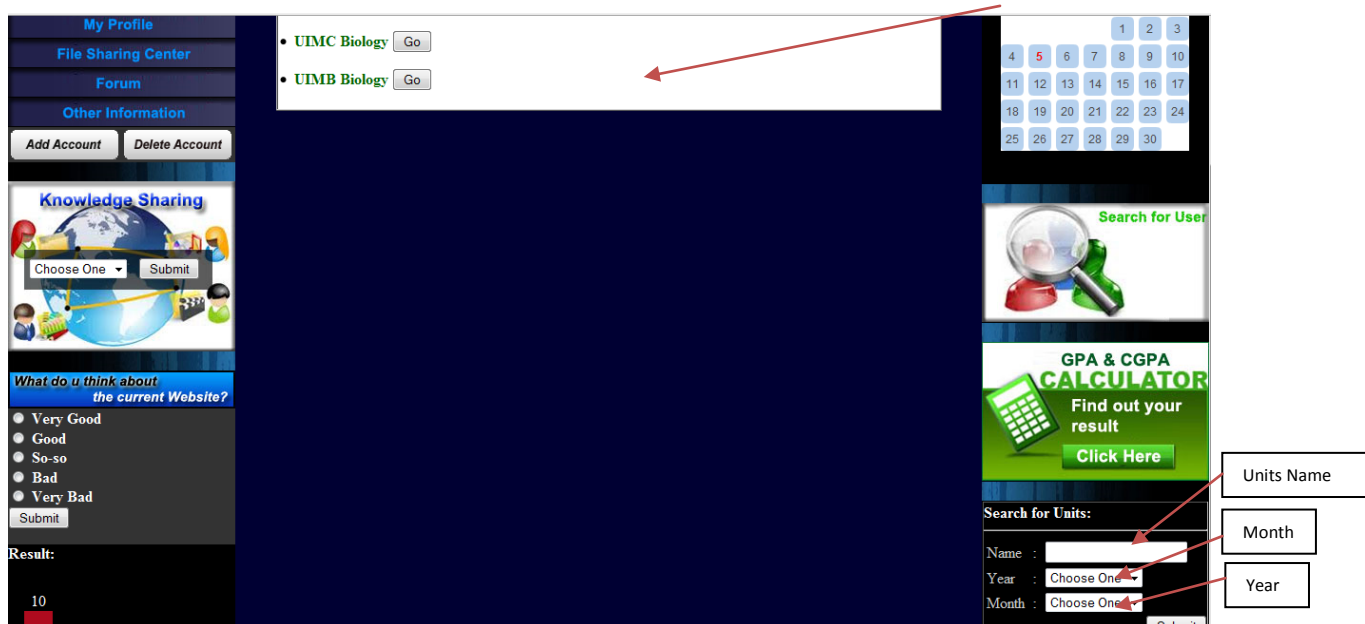
Figure 4-1-F24 Search for unit result page

4.2 Testing

4.2.1 Create Student Account

Testing Object	Testing Procedure	Testing Result
Students register for an account.	1. Click "Sign Up" button in login page 2. Fill up the required information in the form like student ID, username, name, password, retype password, year and month intake, year and trimester, course, email and home	A student's account has been created.

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	address	
Status: Pass		

Table 4-2-1-T1 Testing Create Student Account

This is a test about a student is able to create an account from the system.

4.2.2 Create Lecturer Account

Testing Object	Testing Procedure	Testing Result
Lecturers register for an account.	1. Login to the system as admin 2. Click on "Add Account" button on the left side 3. Fill up the required information in the form like lecturer's ID, username, name, password, retype password, lecturer's field, office venue, email and home address	A lecturer's account has been created.
Status: Pass		

Table 4-2-2-T1 Testing Create Lecturer Account

This is a test about whether the admin is able to create a lecturer account.

4.2.3 Create New Announcement

Testing Object	Testing Procedure	Testing Result
FICT lecturer create an announcement for CS and IB students	1. Login to the system as lecturer 2. Click on "Add Announcement" on the announcement page. 3. Key in the title and details of the announcement 4. Select CS and IB course. 5. Press "Submit" button	An announcement from FICT lecturer for CS and IB students has been created

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Status: Pass

<div align="center">Table 4-2-3-T1 Testing Create New Announcement</div>

This is a test about whether the lecturer is able to create an announcement to the students who are under the same faculty.

4.2.4 Delete Announcement

Testing Object	Testing Procedure	Testing Result
FICT lecturer deletes an announcement for CS students only.	1. Login to the system as lecturer 2. Click on "Delete Announcement" on the announcement page. 3. Key in the title that has been created. 4. Select CS course. 5. Press "Submit" button	The announcement from FICT lecturer to CS students has been deleted.
Status: Pass		

<div align="center">Table 4-2-4-T1 Testing Delete Announcement</div>

This is a test about whether the lecturer is able to delete the announcement that they announce to certain faculty.

4.2.5 Edit User Profile

Testing Object	Testing Procedure	Testing Result
A user wants to change their profile information.	1. Click on "My Profile" button on the left side. 2. Click "Edit Profile" 3. Change the profile information 4. Click "Submit"	The profile information for the user has been change
Status: Pass		

<div align="center">Table 4-2-5-T1 Testing Edit User Profile</div>

This is a test about whether the user is able to change his/her profile information from the system.

4.2.6 Create Timetable

Testing Object	Testing Procedure	Testing Result
A user wants to create a timetable	1. Click on "My Profile" button on the left side. 2. Click "Add Time Table" 3. Select the time slot 4. Click "Submit"	The timetable of a user has been created
Status: Pass		

<div align="center">Table 4-2-6-T1 Testing Create Timetable</div>

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This is a test about whether the user is able to create a timetable at their personal profile so that it can be viewed to other users.

4.2.7 Upload File

Testing Object	Testing Procedure	Testing Result
A user wants to upload a file	1. Click on "File Sharing Centre" button on the left side. 2. Select the section based on what type of files to be uploaded 3. Click "Add File" button 4. Fill in the title and detail 5. Select the file to be uploaded 6. Click "Submit"	A file has been uploaded
Status: Pass		

Table 4-2-7-T1 Testing Upload File

This is a test about whether the user is able to upload a file in the system and share with other users.

4.2.8 Comment the file uploaded

Testing Object	Testing Procedure	Testing Result
A user wants to comment a file which is uploaded	1. Click on "File Sharing Centre" button on the left side. 2. Search for the file 3. Click "Enter" button when the file is found 4. Fill in the comments 5. Click "Submit"	A comments from a user has been posted
Status: Pass		

Table 4-2-8-T1 Testing Comment the file uploaded

This is a test about whether the user is able to post a comment on a file which is uploaded by the other users.

4.2.9 Create Forum Topic

Testing Object	Testing Procedure	Testing Result
A user wants to create a topic in announcement section.	1. Click on "Forum" button on the left side. 2. Click "Announcement" 3. Click "Add Topic" 4. Fill in the topic name and detail	A topic in the announcement section has been created

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	5. Click "Submit"	
Status: Pass		

Table 4-2-9-T1 Testing Create Forum Topic

This is a test about whether the user is able create a topic in a forum section.

4.2.10 Replies a topic in the forum

Testing Object	Testing Procedure	Testing Result
A user wants to reply to a topic in announcement section	1. Click on "Forum" button on the left side. 2. Click "Announcement" 3. Select the topic that the user wants to reply 4. Fill in the replies at the answer column 5. Click "Submit"	A reply has been create in a topic
Status: Pass		

Table 4-2-10-T1 Testing Replies a topic in the forum

This is a test about whether the user is able reply to a topic in a forum section.

4.2.11 Answer the Survey

Testing Object	Testing Procedure	Testing Result
A user wants to answer the survey	1. Choose the user answer below the survey question 2. Click "Submit" button	A result for the survey comes out
Status: Pass		

Table 4-2-11-T1 Testing Answer the Survey

This is a test about whether the user is able to fill up the survey in the system and view the result of the survey.

4.2.12 Search for User

Testing Object	Testing Procedure	Testing Result
A user name "Ali" wants to search for a particular user name "Ahmad"	1. Click on "Search for User" button on the right side 2. Fill up the "Ahmad" information like name,	A list of users who share the same information as "Ahmad" comes out

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Testing Object	Testing Procedure	Testing Result
	role, email and faculty 3. Click "Submit" button	
Status: Pass		

Table 4-2-12-T1 Testing Search for User

This is a test about whether the user is able to search for other users by giving the information to the system.

4.2.13 Calculate GPA & CGPA

Testing Object	Testing Procedure	Testing Result
A user wants to calculate his/her GPA and CGPA	1. Click on "GPA & CGPA Calculator" button on the right side 2. Fill up the current CGPA and total credit hours 3. Fill up the unit credit hours and grade 4. Click "Calculate Button"	The GPA and CGPA result will comes out
Status: Pass		

Table 4-2-13-T1 Testing Calculate GPA & CGPA

This is a test about whether the user is able to calculate their GPA and CGPA in the system.

4.2.14 Search for unit

Testing Object	Testing Procedure	Testing Result
A user wants to search for a subject name "Biology" in October 2011	1. Fill up the subject information in "Search for Units" section 2. Click "Submit"	The subject who has similar name "Biology" in October 2011 will comes out
Status: Pass		

Table 4-2-14-T1 Testing Search for unit

This is a test about whether the user is able to search the subject which is from the pass.

4.2.15 Enrol a Subject

Testing Object	Testing Procedure	Testing Result
A user wants to enrol a subject	1. Click "Add Subject" button in "My Course" section	The subject will be appear in the "Others" button

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	2. Select the name and date of the subject 3. Press "Submit" button	
Status: Pass		

Table 4-2-15-T1 Testing Enrol a Subject

This is a test about whether the user is able to enrol a subject into their course structure.

4.3 Conclusion

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As the conclusion, this chapter is involving a lot of print screens and some diagrams in order to show the design of the system. Hence, it presents the user a guide on how to run the system and the functionalities of the system.

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5.0 Introduction

This chapter will be giving a brief summary of the project which has been covered from the previous chapter. Hence, this chapter will also cover the contribution which is about the benefit obtained by the users and limitation of the systems. Furthermore, this chapter will explain about the recommendation of the system for future improvement.

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5.1 Summary

The chapter 1 is involved with the planning of the project. The main focus of chapter 1 would be the problem statement, objectives, and scope of project. In problem statement, the area of concern will be explained in detail. In the objectives, it will be including the goals that the system has to achieve.

In chapter 2, it explains about the review of the tools that applied in the system. The tools cover in chapter 2 is existing system, software development, communication tools, and learning management system.

Furthermore, chapter 3 will be including the methodology applied in the system and some brief explanations for the each phases in methodology. Besides, chapter 3 will cover the methods of requirement gathering like questionnaire, interview and etc.

Lastly, chapter 4 is involving the system functionalities explanation and findings of testing. In the system functionalities explanation, some print screens of the system are included. In findings of testing, a number of testing is executed to test the efficiency of the system.

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5.2 Contribution

There are many kinds of benefit that user would gain by using the system, which is the following:

- **Information Sharing**
  One of the contribution in the system is the user manage to share their opinion or information to all users. Hence, the user is able to upload some files and also provide some feedback on the file that they uploaded.
- **User Profile**
  In the system, the user is able to check on the other user's timetable. So, it is benefit to the users because they can easily make an appointment to the other users. Besides, for those who forgot the venue of their lecture's office, they also can check on their lecturer's office venue in the system. Furthermore, the user is able to edit their timetable in the system. So, it is very efficient for those who need to change their timetable frequently.
- **External Knowledge**
  Furthermore, the user is able to learn some external knowledge from the system. That is because the system allows admin to upload some useful links which are concern about sports & recreation, career, and health & safety.
- **GPA & CGPA Calculator**
  The system has provided a GPA & CGPA Calculator for the users to calculate the GPA and CGPA. It could be benefit to those who are not very familiar with the formula of GPA and CGPA.

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5.3 Limitations

The data has been stored in the system is not so many and testing is not involving many users, so there might be some limitations have not discovered yet. So the limitations of the system that has been discovered is the following:

- **Information Details**
  One of the limitations in the system would be some information is not so detail enough. For example, the user information in this system is only including the important information like name of the user, email and address. For some user, it may not be enough for them to find the user.

- **Scope of External Information**
  The scope of external information in system may not be sufficient for the users to learn something. That is because the external information that the system has provided is only career, sports & recreation and health and safety. So, it may not cover much information from these three sections.

- **GPA & CGPA Calculator**
  Although the GPA & CGPA calculator that system provided allows the user to calculate GPA & CGPA. However, it requires the user to fill up the total credit hour value. So, some users may not know how many their total credit hour is. Hence, it may not help the users at the end.

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5.4 Recommendation

The first recommendation about the system is the improvement for timetable system in the user profile. That's because the timetable system in the system is quite simple currently. So, it is recommend that the timetable system would be more advance and provide a lot of functionalities to the users.

The second recommendation about the system is to provide a photo gallery in the user profile like the Facebook or Friendster. In their website, they allow their user to create a photo gallery and share a lot of photos to the other users.

The third recommendation about the system is to improve the calendar in the system. In the current system, the calendar can only viewed by the users. So, it can be improved by allowing the users to click on the date in the calendar, then a list of announcement on the date will displayed.

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5.5 Conclusion

Overall, the system has provided much functionality for the users to learn and share the information. Even though there might be some limitations occur in system, it would not influence much to the users because the system at least can fulfil the basic requirement of the user.

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Appendix

Add_sub_result.php

```php
<?php
// Connect to server and select databse.
session_start();
                mysql_connect("localhost","root","") or die (mysql_error());
                mysql_select_db("users") or die(mysql_error());
                $myusername = $_SESSION['myusername'];
//the value sent from form
$subject=$_POST['haiz'];
$year3=$_POST['year3'];
$month=$_POST['month'];
$query1 = "SELECT U_ID from users WHERE users.username= '$myusername'";
$result1 =mysql_query($query1);
while($row=mysql_fetch_array($result1))
                {
                $uid=$row['U_ID'];
                }


$query = "INSERT INTO modify_sub VALUES ('$uid', '$subject','$month','$year3' )";
$result=mysql_query($query);
```

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header("location:login_success.php?page=0");

?>

Modify_sharing_result.php

<?php

// Connect to server and select database.

session_start();

        mysql_connect("localhost","root","") or die (mysql_error());

        mysql_select_db("users") or die(mysql_error());

        $myusername = $_SESSION['myusername'];

//the value sent from form

$title=$_POST['title'];

$id=$_GET['id'];

$detail=$_POST['comments'];

$target_path2 = "course_file/";

$target_path1 =$target_path2 . basename($_FILES['file']['name']);

if($target_path1 == 'course_file/')

{

$query = "UPDATE sharing_question SET topic='$title',detail='$detail' WHERE id='$id'";

$result=mysql_query($query);

}

else

{

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```php
if(move_uploaded_file($_FILES['file']['tmp_name'], $target_path1))

{

$query2 = "UPDATE sharing_question SET topic='$title',detail='$detail',file='$target_path1'
WHERE id='$id'";

$result2=mysql_query($query2);

        }

        else{

   echo "<script>alert('Sorry, it is either the file format is wrong or the file is too big. The file
cannot be uploaded!'); location.href = 'sharing.php';

</script>";

}

}

header("location:sharing.php");

?>
```

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