FYP MANAGEMENT PORTAL

BY

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DECLARATION OF ORIGINALITY

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ABSTRACT

The name of this project is FYP Management Portal which is proposed by Ms. Yap Seok Gee. The main purpose of this project is to develop an online system that can reduce the workload of the FYP Committee in managing the work flows of the Final Year Project. Besides reducing the workload, it also hastens the steps and makes the data organized. By implementing this system, it would provide a lot of conveniences to the FYP Committee of Universiti Tunku Abdul Rahman while saving time and cost.

The system is limited to the use of FICT staff only at the moment and will be improved in the next few versions. The methodology that has been chosen for the development of this system is the incremental and iterative model. The reason for choosing this model is because of the constant improvement that could be done to the system. The function will be added into the system from time to time to increase the value added of the system.

The system design would be based on the existing FYP Portal which would provide high level of user friendliness to the user. This way, the user can focus on using the system to perform the intended task rather than spending time learning how to use the system. The system's interface will be as simple as possible and contain high usability at the same time.

The system implemented is able to perform many functions. One of them is the compilation of project titles which allow the supervisor to propose their titles. Besides, the assignment of supervisor and moderator can also be done easily. Next, the grade entry is another module that would be included that allow the supervisor to key in the grade of his/her supervisee. Lastly, both the supervisors and FYP committee is able to produce reports which contains the statistics of the result, information of the projects, details of students and so on.

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LIST OF ABBREVIATIONS

FYP   Final Year Project

IT   Information Technology

FGO   Faculty of General Office

ID   Identification

FICT   Faculty of Information and Communication Technology

UTAR   Universiti Tunku Abdul Rahman

MMU   Multimedia University

SDLC   Software Development Life Cycle

ERD   Entity Relation Diagram

DFD   Data Flow Diagram

CHAPTER 1: INTRODUCTION

1.1 OVERVIEW

Final Year Project (FYP) is an important subject which the student has to take in order to graduate from the university. The Final Year Project is comprised of Project 1 and Project 2. Students must pass the Project 1 in order to take the Project 2. Students who are taking the project have to build a system or application that is related to Information Technology (IT) at the end of the semester to pass.

The people who are involved in processes are FYP committee, supervisors and Faculty General Office (FGO).

The working processes of Final Year Project are very tedious and required a lot of manual works. These processes include the "Project Title Proposal Compilation", "Supervisor Assignment", "Moderator Assignment", "Grade Entry" and "Reports Generation". The management of these processes needs a lot of manpower and all of them are time consuming. Therefore, a proper management in the work flows is very important.

In order to manage and reduce the work processes, FYP management system has to be developed to hasten the work processes of the project. The main purpose is to reduce the time taken during the processes and save cost by reducing the unnecessary paper works. Besides saving the manpower in performing the processes, the steps in the work flow can be reduced as well.

1.2 PROJECT WORK PROCESSESS

1.2.1 PROJECT 1 PROCESS

Few weeks before the semester start, all the supervisors will be asked to send their proposed titles to the FGO. The FGO will then compile the list before sending it to the person-in-charge. The person-in-charge will post the list to the Faculty of Information Communication and Technology (FICT) website for the students to view.

Meanwhile, the FYP committee obtains the students' names from the Project 1 lecturer during the week 1. The list obtained will be in non-excel format and the assigned committee will compile the enrolled student list with the details such as ID, course and name of the students into an excel file. After that, all the supervisors are required to fill up the student undertaking form. The form contains supervisor's details and they have to fill in the form with the student's name which they are supervising. Once the form had been filled up, supervisor will send it to the assigned FYP committee to compile, merge the excel spreadsheets sent by all the supervisors into a single excel spreadsheet. The FYP committee checks for the name of the students who do not have a supervisor through the student-supervisor list. If there is any student who do not have a supervisor, the FYP committee will assign a supervisor to the students based on the supervisor's workload. The FYP committee will notify the students and the supervisors in which they are being assigned.

The FYP committee will assign moderators based on the title, area and the Project 1 workload. The moderator-supervisor list will be posted on the share drive which is accessible by all the supervisors and moderators.

Next, the process of grade entry will take place; lecturers will give grades to the students after their presentation. The moderator will provide the grades of the students to the supervisor. The grades will be submitted by the supervisors to the FGO for record keeping. The FGO is able to prepare an analysis report by searching the database and perform retrieval in the records. The name of the students who pass Project 1 will be stored into the database.

1.2.2 PROJECT 2 PROCESSES

The FYP committee gets the Project 1 name list and sends to every supervisor for confirmation. Check for the students' status whether he/she is taking Project 2 this semester or differ to another semester. If the lecturer/moderator left UTAR, FYP committee has to reassign lecturer/moderator to the student.

1.3 PROBLEM STATEMENT

One of the problems of the Project work processes is that the FYP committee has to manually execute them. By performing such compilations and administration are very troublesome. In other word, the processes are neither effective nor efficient as time has been wasted in performing the compilation. The way how the FYP processes being managed is very inconvenient. An example is when there involved sending of emails between two parties. Sometimes email from the same person might be sent several times when there are updates. Therefore, creating problem in communication where the supervisors might get different version of the documents if it is not properly stated in the email.

The name list of students taking Project 1 and the list of supervisor-moderator are stored in Excel file format. The searching can be very hard if the records are stored in Excel spreadsheet. Searching can only be done on the records which are stored on the same spreadsheet which causes a lot of trouble in producing analysis report. For example, when a student send an email to the FYP committee without any information on his/her own, the FYP committee have to look through the Excel files for the student's details such as the supervisor and moderator.

Besides, supervisors also have to fill up the projects' titles of their own; they have to submit to the FGO to compile it through email. This will eventually create problem to the FGO in tracking such enormous amount of emails sent by the supervisors. Tracking of the emails is hard and the loss of emails may cause delay in the work processes.

The project processes which performed by the FYP committee are ineffective. This is because the input of students' grades is being performed manually. This is not efficient as keying

data one by one might cause duplication of data due to human error. The duplication eventually leads to data redundancy and this is caused by no checking of data during insertion.

The creation of analysis report is very difficult as several spreadsheets in Excel files are required. This includes manual checking and compilation of several files to get a report done.

1.4 OBJECTIVES

The main objective of the proposed system is to increase the efficiency and the effectiveness of FYP processes by reducing the manual works that done by the FYP committee. The proposed system will increase the productivity by allowing the job to be done quickly. Compilation of data can be done easily with just a click of mouse and fewer parties are involved which greatly reduce the man power.

Retrieval of the data can be done faster because the records are stored and well-organized in the database. The links between the tables in the database allow the user to perform searching easier unlike the Excel spreadsheets in which the retrieval of data is difficult as searching of records must be done in each individual spreadsheet as they are not related to each other.

In the proposed system, reports can be generated easily. The user of the proposed system is able to generate the report based on different criteria. The FYP committee can produce analysis report which contain the statistics of the students who passed the Project 1, percentage of students who get A, the lecturer who gave the most A's to the students and many more. The generation of reports can be done with just few clicks in the system.

Besides, assignment of supervisors can be done by considering the workload of the supervisors whether he/she have any supervisee. FYP committee will also consider on the title and the area of the supervisors. A list of supervisor-student can be generated to show the name of students name with their supervisors. If there is any student without supervisor and there is supervisor without supervisee or less supervisee, the FYP committee can perform assignment straightaway. This is because the information on both student and supervisor can be viewed easily.

The grade entry by the supervisors can be done easily by just login into the system and fill up the grades which will update the database immediately. The grade submission process is faster compare to the traditional method in which the supervisor has to send the grade through email to the FYP committee. Sometimes, delay occurred due to the overloading in email servers which causes interruption in work flows.

The information of the students who passed both Project 1 and Project 2 will be archived properly in the database so that the retrieval of information can be done very fast in the future.

1.5 PROJECT SCOPE

The system is only limited to the use of FICT staffs only. There are several modules in this proposed system and the details are as follow:

1. Compilation of Project Titles

    In this module, the supervisors login to their own account in the login page. Supervisors have to login with their username and password. After that, supervisor is able to go the "Register Project Titles" page. At that page, fill in the form with the details such as the supervisor name, room, email, project title, objective, innovative, deliverables, skill required, no. of student and student's course. Next, save the details and publish the titles for the students to view.

2. Supervisor Assignment

    The supervisor has to fill in the student's details under his/her supervision such as the name, ID and course. Supervisor should save the details after everything has been finalized. After that FYP committee should be able to view the supervisor-student list to identify which student with no supervisor. If a student is without supervisor, the student will be assigned to a supervisor based on the supervisor's work load in both Project 1 and Project 2. The FYP committee will also check the supervisor's area of research too. After the assignment, both student and supervisor will be notified by the FYP committee by sending a notification message. Lastly, the FYP committee will compile the list.

3. Moderator Assignment

   The FYP committee views the student-supervisor list to make sure that every student is being assigned to a supervisor. If there is any student without supervisor, he/she will be assigned to a supervisor by the FYP committee. FYP committee will then check for the moderator details such as his/her work load, title and area of study if all the students are being assigned to a supervisor. Once the FYP committee found a suitable moderator, the moderator will be assigned to the student. The FYP committee will compile the supervisor-moderator list.

4. Grade Entry

   Supervisor will go to the Grade Entry page and view the student list under his/her supervision. Supervisor will then fill in the grade of the students and save the grade given. The moderator will gives the grade and save.

5. Report Generation

   FYP committee is able to generate analysis reports which contain the statistics of the performance of students. Different types of report can be generated; some of the report can show the overall performance of students. For example, the number of students who get A's in the Project 1, the lecturer who gave the most A's, the total number of students who passed the Project 1 and Project 2 and the number of students who failed the project.

6. Upload student record

   FYP committee is able to upload the student record which is stored in the excel file with .csv format. The database will be automatically updated with the new students' record. If the records existed, the students failed in previous semester and retake the project. Else if the record is not in the database, it will be treated as new student register for the subject.

7. System Maintenance

FYP committee is able to maintain the system by adjusting the semester timeline when the semester start, end and the submission due date for the mark entry. The committee is also able to add new lecturer to the system, change lecturer status and assign new committee as well as demote the committee member.

8. Search student record

User is able to search for a particular student's details with the current record and the history of the student if existed.

1.6 CHAPTER SUMMARY

The following chapter would be the Chapter 2 Literature Review which would describes the studies that had been done on the similar system, the suitable programming language as well as methodology. Chapter 3 Methodology would talks about the methodology chosen after some studies in the second chapter, this chapter would contain with the detailed actions to be taken in every single stage. In Chapter 4 Requirement Document and Specification, it contained the information on the specification of the system and the detailed description of every module. The Chapter 5 would be the conclusion that would talk about the overall of the system and future enhancement.

CHAPTER 2: LITERATURE REVIEW

There exist many FYP portals in the universities around the globe but those systems to manage the FYP processes are not accessible by outside due to some security issue. The details of the FYP management systems can't be found as they are hidden by the universities, we can only discover the FYP portals which are used to make announcement and sharing of resources. In this literature reviews, only two universities are being compared for their FYP portal. Studies are performed on the Universiti Tunku Abdul Rahman (UTAR) and University Multimedia Malaysia (MMU). There are a lot of differences between the FYP portal of these universities in term of design and features. Besides, studies on suitable programming language and the methodology had also been made.

2.1 STUDIES ON EXISTING FYP PORTALS

2.1.1 COMPARISON ON USER INTERFACE DESIGN

Each of the university has their own uniqueness in their user interface design and the arrangements of the elements. At the first sight, we can see that the interface management portal of UTAR is the simpler compare to the MMU.

The MMU's interface is almost similar to the UTAR where a lot of texts are being used. However, University Multimedia Malaysia's page is messier as the links are over the page (Friedman, 2008). According to Vitaly Friedman, the interface should be kept simple so that the user is able to look for the information that they really need rather than looking at the design.

The design for the two universities are consistent in term of the color used, the font size, the arrangement of the elements and the contents. Most important about the consistency is that the navigation bar for the portals is remained on the same location in every page. Collis stated that it is a good practice that the navigation bar remained at the same spot so that navigation can be done easily (Collis, 2008).

Besides, the layout of the portal must be considered when developing a system. Hunt identifies that the "*Less is more. Fewer columns feels simpler, bolder, and more honest.*" (Hunt, 2006). The lesser columns used in the portal is better due to the simplicity which allow information to be viewed better as the UTAR is practicing. The UTAR has two columns in their portal while MMU has four rows without columns

Following are the layout of two universities' management portals.
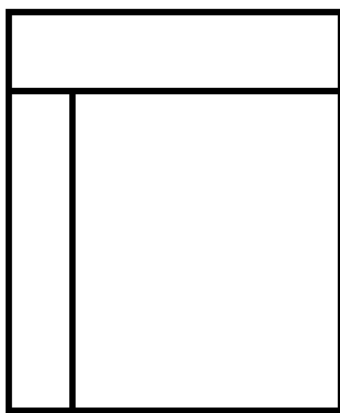
UTAR's layout   MMU's layout

Figure 2.1 Layout for 2 management portals

From the left hand side, UTAR is using such layout which has a navigation bar at the top as well as on the left. The MMU has four rows in the layout with the navigation bar from top to bottom while the top section would be the banner consists of name of the university.

2.1.2 COMPARISON ON WEB ELEMENTS

The web elements used in UTAR portal are more than MMU. UTAR contain final year project related images which attract the users when viewing. This element will give the user an indication that the page is related to final year projects and Information Technology (IT).

The color used is appropriate in which different tones of the same colour are used to differentiate the links of different sections on the left hand side as argued by Hunt (2006). Users are able to see the different between the sections easily.

Besides, the font size of the portal of MMU is smaller compare to UTAR. Smaller font size of MMU is due to the number of columns it has. This is because a lot of spaces have been used to form column and the font size tend to be reduced. From the Web Page Mistakes website, it is clearly state that the size of the font should be appropriate so that it is readable and too small font size will irritate readers' eyes (Web Page Mistakes, 2011).

2.1.3 OUTCOMES OF COMPARISON ON USER INTERFACE DESIGN

Consistency in term of font size, arrangement of information and colour is a must to achieve higher interface design quality. To have a better interface design, the total number of words must not be too many as it might confuse the user.

Lesser column is better but without column will make things look unorganized. In the meantime, too much column is not tidy as the information is not well-categorized. Thus, with 2 columns in the web layout, it would be appropriate.

2.2 COMPARISON ON FEATURES

2.2.1 FEATURES OF UTAR FYP PORTAL

The FYP Portal of UTAR contains the brief introduction on the Final Year Project on their main page that gives the users and idea of Final Year Project. There is also a section where announcements are being placed with the date it is being updated. This allows the user to identify whether the file downloaded earlier is the up-to-date version or there are new files which the user has never view before. The files are saved in PDF format and students are required to download them before view. Saving files in PDF format allow the files to be in their smallest size possible which allow the user to download them easily (Randal, 2007). Another advantage of PDF is that the files can be used in any PC platform (Information Providers Guide, 2012).

At the section after the announcement, there are resources available for the students to download. There are some guidelines for the project report and some important forms which the FYP committee wants the students to download and attach to their reports.

Another link in the FYP portal of UTAR will bring the student to the Project II Submission page. According to the description at the top of the page, it contains the information which is needed to produce a project report that meet the standard set by UTAR. It shows the format of the CD during the submission of soft copy. Besides, there is also a checklist will allow the students to check whether he/she has submitted the required documents and report. At the bottom of the page, it contains the guidelines and forms which are similar to the files on the main page of the portal.

At the page of "FYP Equipment", it contains the pictures of the equipment which the Final Year Project student may borrow for research purposes. An example of the equipment that can be found is an Android phone in which the students developing Android's application can use to test the software developed.

2.2.2 FEATURES OF MMU PORTAL

The main page of the portal of MMU, it contains a header at the top of the page which identifies the university. The page is being separated into few sections from top to bottom. At the most top section in the page, it shows the important announcement for the students who are taking the Final Year Project. The section after the announcement is the latest updates from the university. This section will provide the list of the Final Year Project Titles as well as the current status of project assignment. The user is also allowed to generate a registration confirmation form of Final Year Project. Next, there is a section which contains the files which explain about the procedures of Final Year Project processes and guidelines that helps the students in doing the project report. At the most bottom of the page, project related forms can be downloaded which consists of reimbursement requisition form, loan requisition form, presentation attendance form, report submission form and similarity index form that the user need in the process of taking project.

At the second link named "Project Proposal Browser", it contains a form which allows the student to fill in the details such as supervisor or keywords of the project title to look for the project proposed. At the top part of this new page, it contains a new link which allows the student to download a guide which teaches the students on how to apply for projects.

The third link at the main page of the portal of MMU which is the "Staff Directory" which contains the information of the academic staffs and the supporting staffs. The page enable the students to view the details of the staffs consists of name, job position, contact details, qualification, research of interest and research projects which the individual offering. Besides, student is also able to contact the Faculty of General Office in case he/she has any doubt in final year projects related issues.

The last link would be the "Feedback" which allows the student to send email to the technical team of the website maintaining the system to provide feedback and comments.

2.2.3 OUTCOME OF COMPARISON ON FEATURE

The features provided by both UTAR and MMU's FYP portal are almost similar. Both contain the section where announcement and updates are made so that the students taking the final year project can view. Another important things that both websites are offering is the guidelines that they providing on the portal which will guide the students throughout the process of doing the project. The forms which are required to attach to the report and submission are also available for the students to download.

There are some differences between the two portals where the MMU portal allow the student to check for the lecturers' details before taking him/her as supervisor. Unlike UTAR, the students from MMU are allows to feedback on the portal to the management team so that improvement could be done. MMU also got an extra feature compare to UTAR that is to search for a supervisors based on the project titles and vice versa.

Figure 2.2 Screenshots of UTAR FYP portal

Figure 2.3 Screenshot of MMU FYP portal

2.3 STUDY ON SUITABLE PROGRAMMING LANGUAGE

There are many programing language that can be used to develop an online application. Studies had been done on the available programming languages and two famous languages in web base application development have been chosen.

2.3.1 COMPARISON ON PHP AND ASP.NET

From all the languages available, PHP and ASP.net has been chosen so that study can be made to decide which would be the most suitable programing language to be used.

2.3.1.1 ADVANTAGES OF PHP OVER ASP.NET

According to the author named Tamanna (2011) from the website www.avigma.com, he stated that there are many advantages of PHP over ASP.NET. The advantages stated in the website are summarized into a list as follow.

1. PHP is simpler than ASP.net
2. User-friendly of PHP is better compare to ASP.net
3. ASP.net support many languages such as C#, J#, C++ and VB.NET but PHP can do its job well with minimum language tool.
4. PHP has a connection to MYSQL which are both free compare to ASP.net and MSSQL which require user to pay
5. PHP has many developer from around the world since it is an open source programming where everyone help and perform improvement while ASP.net is limited to the skills of developers from Microsoft only
6. PHP is free of charge but ASP.NET is not
7. PHP has better security

2.3.1.2 STUDY ON WHY DESIGNERS OFTEN USE PHP OVER ASP.NET

Janko (2008) stated that web designers often use PHP over ASP.net. It is because that the PHP is a very simple language and PHP is always free. ASP.net applications can be built without buying the developer tools but all of them come with limitations. The web design blogs or articles regarding the ASP.net are lesser compare to PHP.

An article written by Kohan (2010) shows the differences between the PHP and ASP.net. A table of comparison is as follow.

	PHP	ASP.NET
Cost	Free (Open source)	Licensing cost
Support and Resources	Developers contribute to the open source – make improvement and updates. Takes shorter time to provide feedbacks (developers from around the world)	Relies on developers at Microsoft which are limited by the numbers of developers – takes longer time to feedback to users
Editors and tools	Tools/editor independent	Microsoft Visual Studio
Platform	Independent – can run on any platform Linux, Unix, Mac OSX, Windows	Run only on Windows Platform
Usability	User interface of Linux is getting better	User interface in Microsoft Server is degrading

Table 2.1 Comparison between PHP and ASP.NET

The table below shows the popularity of PHP language compare to ASP.NET in several famous website.

Site	Programming language
Google.com	PHP and MYSQL

Facebook.com	PHP and MYSQL
Youtube.com	PHP and MYSQL
Yahoo.com	PHP and MYSQL
Wikipedia.com	PHP and MYSQL
Amazon.com	PHP and MYSQL
Msn.com (owned by Microsoft)	ASP.NET
Live.com (owned by Microsoft)	ASP.NET

Table 2.2 Popularity of programming languages used in websites

2.3.2 OUTCOME OF STUDY ON SUITABLE PROGRAMMING LANGUAGE

According to the points listed above, the PHP has a connection to the database MYSQL in which both are free while ASP.net with MSSQL requires licensing fees. The PHP is older than ASP.NET, which means that the PHP contains more examples of codes and tutorials than ASP.NET.

Most important of all is that PHP is an open source programming language where developers from around the world can perform improvement and provide helps when needed by user.

Another important point is that PHP is platform independent. PHP is supported by a lot of operating system such as Mac OSX, Linux and Windows while the ASP.NET only supported by Windows. Due to the platform independent capability of PHP, it is favorable to use this to create websites application.

Besides, there are more websites using PHP and MYSQL compare to ASP.NET which means that resources or guides for the PHP development can be easily obtained.

In the nutshell, most of the famous websites are using PHP as well as MYSQL for their databases. Only websites such as msn.com and live.com are using ASP.NET as these websites are owned by Microsoft. The programming languages such as PHP with MYSQP are widely used.

2.4 STUDIES ON SYSTEM METHODOLOGY

System Development Life Cycle (SDLC) is a conceptual model which consists of a series of processes or stages that need to be done in order to develop a system (Search Software Quality, 2012). The processes inside the SDLC are planning, analysis, design, implementation, testing and maintenance (Vadher, 2010).The SDLC is a methodology which consists of choices on the type of information and data are gathered, the way to analyze the information obtained and the way to implement it (Method 123 Project Management Methodology, 2012). SDLC contains the details of every single process in a project life cycle which guides the developers to complete the tasks. In order to find the most suitable system development methodology, studies have been done on the waterfall development, prototype development and agile method.

2.4.1 WATERFALL DEVELOPMENT

The waterfall model is a developed to aid the developers during the software development (Waterfall Model, 2012). This model will guide the developers in creating software step-by-step. The model got his name from the shape of its processes which resembles a waterfall. By applying this model, the project will be split into many stages in which a stage have to be completed before proceeding to another stage. The stages in the waterfall model are as shown in the Figure 2.2 below.
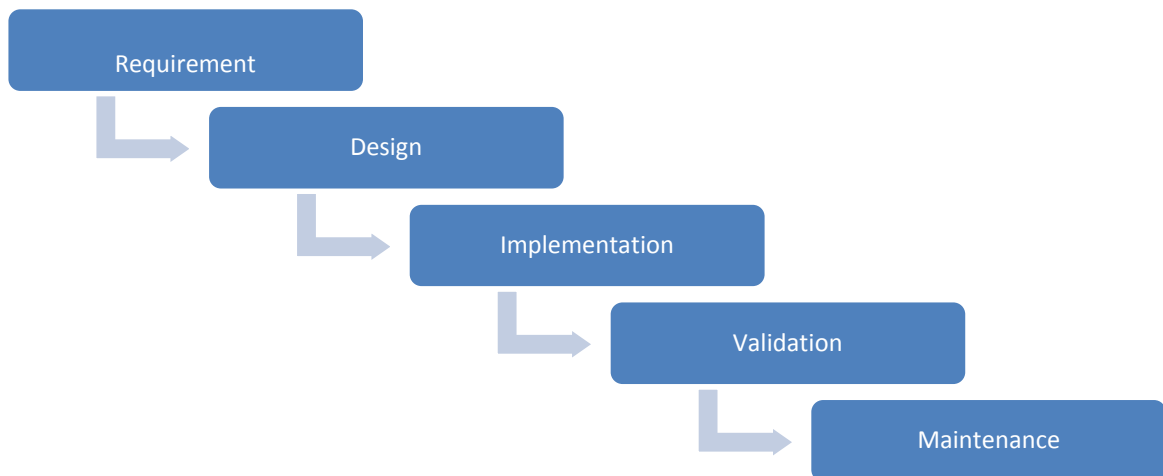

Figure 2.4 Stages of Waterfall Model

2.4.1.1 ADVANTAGES AND DISADVANTAGES OF WATERFALL MODEL

There are some advantages and disadvantages in using waterfall model in software development (Parekh, 2011) (I Answer 4U, 2011) (Dilhan, 2011).

Advantages	Disadvantages
Detailed requirements are identified at the earlier stage before proceeding to next stage to prevent the change of requirement	A stage must be completed before going to the next stage
The model is famous amongst the developers and therefore it is easy to use and understand facilitates communication	The time taken for every stage is very long which might cause delay in the project
Detailed descriptions of every steps allow new member in development team to understand the project and carry on with the task	User involvement in the project is very low as user will not provide feedback immediately
	Backtracking in the stage might be difficult and it will require a lot of cost

Table 2.3 Advantages and disadvantages of waterfall model

The waterfall model has few advantages; it consists of detailed requirement which can be identified earlier before proceeding to the next stage to prevent the change of requirement. The waterfall model is common models which are used by the developers due to its simplicity and it is easy to understand. The detailed description in every stage helps the new members in the development team to understand the software better so that they could carry on with their task as soon as possible. However, there are some disadvantages in using waterfall model. Changing the requirement in the later stage is not possible as it might incur a very high cost. The time taken to go from a stage to another stage is very long which might cause delay in the project. Other than that, the user involvement is very low where feedback from the user is not available.

2.4.2 PROTOYPE DEVELOPMENT

The evolutionary development is also known as prototyping. Prototype is an initial version of a system which involve user involvement and evaluation of the system (Rachmadi, 2010). The prototype only focuses on the functional requirement of the system rather than non-functional requirements. The main purpose of prototype is to access the feasibility and verify requirements (The Free Dictionary, 2013).
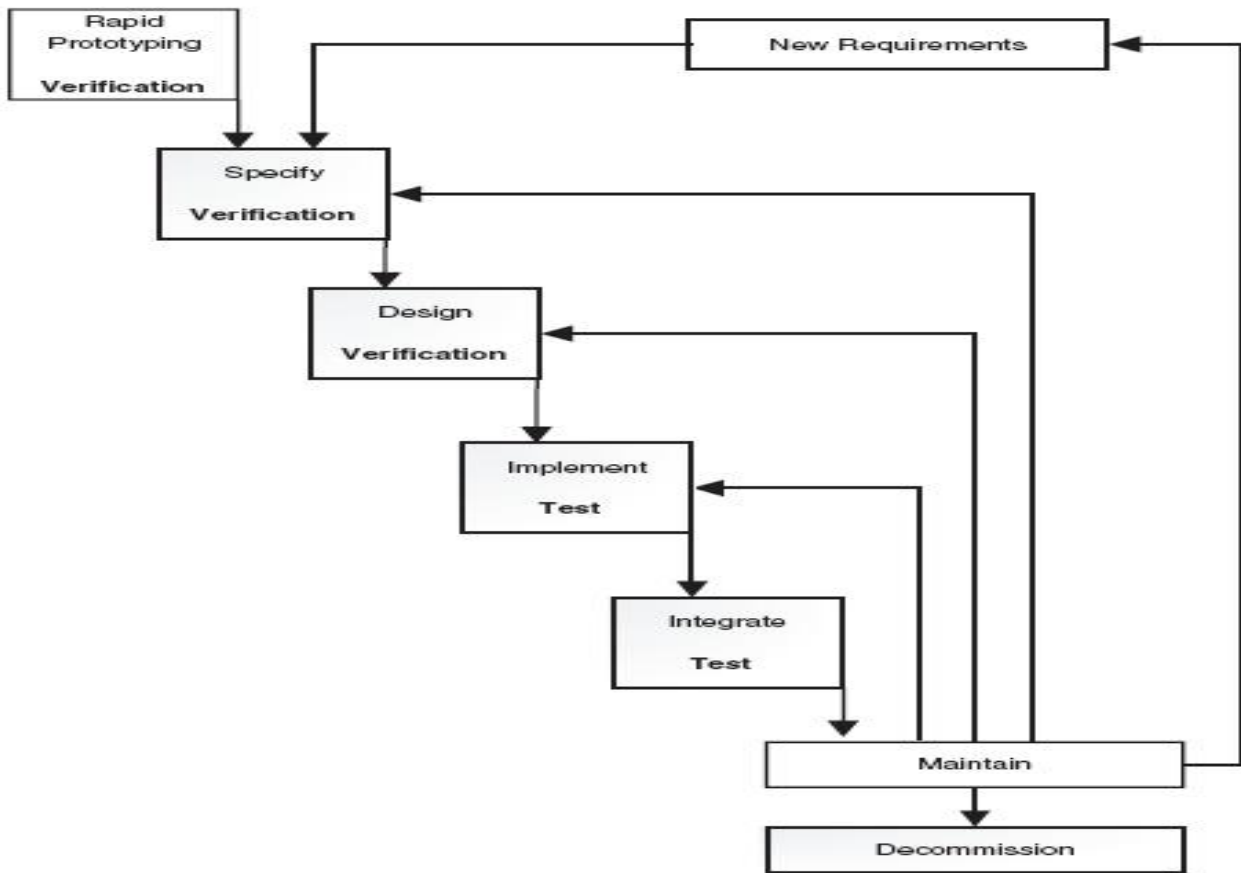

Figure 2.5 Stages of Prototype Development (Atterer, 2007)

2.4.2.1 ADVANTAGES AND DISADVANTAGES OF PROTOYPE DEVELOPMENT

There are some advantages and disadvantages of using prototype in developing software (Rkjainx , 2009) (Aotea Studios, 2012).

Advantages	Disadvantages
Reduce development time as an initial version of system is being built in a very fast face	Insufficient analysis as documentation is eliminated
Reduce cost by eliminating the documentation	User expect the final version of the system to be same as the prototype
User involvement to provide feedback which increase the quality of the system produced	Source code for the system might be unorganized which makes the maintenances difficult
	The prototype is unable to reused due to the bad quality of the code developed

The prototyping in the evolutionary development has a advantages such as reducing the development time due to the building of system is a very fast pace to show to the user. Prototyping focus on the programming rather than the documentation because the developers wanted to show the system to the user to get the feedback and not the documentation which the user finds them difficult to understand.

There are some disadvantages in using prototyping; there is insufficient analysis due to the elimination of documentation. The user also will think that the final version of the system would be the same as the prototype. The maintenances of the system can be very difficult as the source code of the system is not well-organized. The prototype is unable to be reuse as the final system because the quality of the prototype would be normally low.

2.4.3 INCREMENTAL & ITERATIVE DEVELOPMENT

Incremental and iterative development is a kind of software development model which allow the developer to create a system and later the system is being improved after testing have been done (*Incremental Development*). The basic idea of the incremental and iterative development is to build a system through repetitive cycles known as iteration and in a shorter time. At each iteration process, the design modifications are made and new functions are added.

Figure 2.6 Incremental & Iterative Developments (Waterfall Model, 2012)

2.4.3.1 ADVANTAGES AND DISADVANTAGES OF INCREMENTAL & ITERATIVE DEVELOPMENT

There are advantages and disadvantages in using the incremental and iterative model in developing a system. The details are summarized into the table below (Learn Technologyy, 2011) (Blurtit, 2010) (Answers, 2012).

Advantages	Disadvantages
User can use the first version of the system to gain experience and make changes to the requirements in next iteration	System development might run overtime and budget
User can use the first increment of system immediately if the requirements are satisfied without the need to wait for the full system	Client need to be actively involves in the development
The highest-priority services receive the most testing which reduce the chance of software failures in the system.	

The advantages of using the incremental and iterative development are that the user does not need to wait for the full system to be release before using it. As soon as the first version of the system is complete, the user can straightaway use it to perform the desired task. The user is

able to use the system first and perform modification in the requirement in the next iteration. The highest priority function received the most testing and this would reduce the chance of software failure in the system. However the disadvantages of using this development would be the continuous iteration of the software might lead to over time and budget. Besides, the user involvement is very high as the user has to be with the developer throughout the process of developing the system as well as during the testing.

2.4.4 OUTCOMES OF STUDIES ON SYSTEM METHODOLOGY

After some studies on the three methodologies, incremental and iterative development model has been chosen for the FYP Management Portal. This approach allows the developer to build the initial system once the basic requirements has been identified and enable the user to use the system as soon as possible. Besides, the user can also provide feedback on the initial version of the system and if there are any bug or modification in requirement, changes to the system can be made. This chosen methodology will be discussed in details in Chapter 3.

2.5 STUDIES ON PREVIOUS FYP PORTAL

After some studies that had been done on the FYP Portal created by Ting Lay Then, Ng Si Kai, Ling Chi Yen, Jason Lim, Chong Ka Ying and Chan Wai Mun during the Mini Project subject last semester. Some of the features in their system are quite good and can be adapted in the current system.

2.5.1 SUPERVISOR ASSIGNMENT

Figure 2.7 Supervisor assignment

One of their features they have in their system is the supervisor assignment module where the name lists of both student and lecturer are shown. In order to match the assignment, one must select a particular student by clicking on the radio at the student name list and another radio button at the lecturer name list. One thing good about this is that the view is huge where everything can be seen on the same page which includes the workload of the lecturers and so on. The best things here is the filter of the name list can be done based on the courses for the student and department for the lecturers.

2.5.2 Proposed Title

Figure 2.8 View proposed title

The page have the projects separated into two part where the upper part is active project while the lower part is inactive project which gives user a clear view on the status of the projects.

2.5.3 Grade entry

Figure 2.9 Grade entry

This page shows another good feature which can be used in the system. The grade is automatically generated from the mark input. This page can be save throughout the semester so that the lecturer can edit the mark before the due date of the mark submission and it will not allow the user to change the mark if the due date of the submission is over.

CHAPTER 3 METHODOLOGY

The methodology chosen must be appropriate and suitable for the development of the system as it will be step-by-step guide that the developer must follow in order to deliver the system successfully (Kim, 2011). In this chapter, a methodology has been chosen to apply in the development of FYP Management Portal.

3.1 CHOSEN METHODOLOGY

After some studies on the suitable methodology in the Chapter 2, we decided to use the Agile Development from Incremental & Iterative Development. The reason for choosing this methodology is because of the nature of the system that is going to be developed. The system focuses on the breadth rather than the depth. We will not focus on the depth of a function due to the importance of having few working functions which the user can use once the initial version of the system has been developed. This means that the functions of the systems are being built first so that the user is able to use it. The user will then able to provide the feedback to the developer and improvements can be made in the next iteration (Waterfall Model, 2012). Since the requirements of the user is always changing, it would be wise to perform incremental on the system so that more functions can be added or change later.
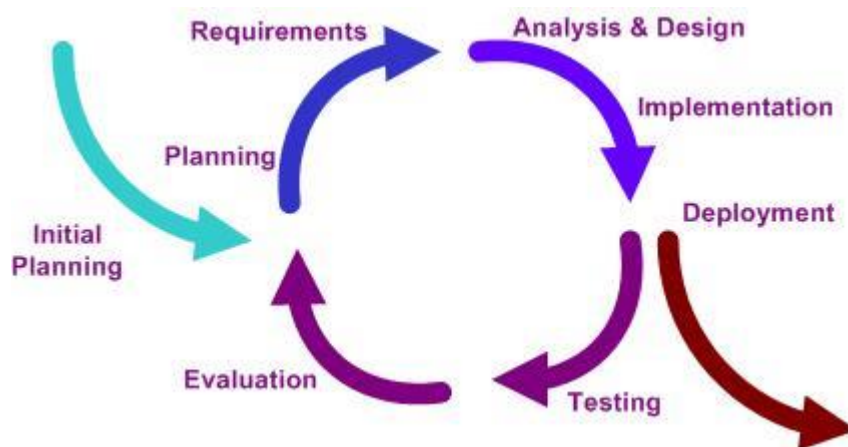
Figure 3.1 Incremental and iterative development stages (Waterfall Model, 2012)

3.2 APPLICATION OF CHOSEN METHODOLOGY

There are 7 stages in the Incremental & Iterative Development model which are Planning, Analysis, Design, Implementation, Testing, Evaluation and Deployment (Weintraub, 2006). In this section every single phase in this methodology will be discussed in detailed.

3.2.1 STAGE 1 - PLANNING

In this stage, planning has been done. After some discussion with the project supervisor, a project name "FYP Management Portal" is produced. Once the name has been confirmed, studies on the existing FYP Portal have been done. The portals that found on the internet are not the same with the FYP Management Portal that we thought of. The difference is that the FYP Portal that is visible on the internet is mainly for the use of information sharing where announcement are made. The FYP committee communicates with the final year project students through the portal. Besides, the portal also provides download links where the students are able to download the necessary files which are important for the project such as guidelines and forms. In the meanwhile, the FYP Management Portal which we are going to develop is a system where the FYP committee is able to use it to hasten the flow of FYP processes as well as reduce it. This system will helps in the administration work of FYP which improve the efficiency and effectiveness of FYP processes.

After knowing the scope of the project, reviews on the existing system are done. Unfortunately the existing FYP management systems of other universities are either hidden or can't be accessed. Only the FYP Portal which is used for information sharing is found on the internet.

After some researches on the FYP Management Portal, the problem statement has been created. Based on the problem statement, we came out with the objective of this new system which is to increase the efficiency and effectiveness of the FYP processes and the project scopes on functionality of the system has been identified.

Deliverables: Problem statement, objective and project scopes

3.2.2 STAGE 2 - ANALYSIS

In this stage, analyses have been made and one of them is the requirement analysis. Since the existing system can't be found on the internet, an interview with the stakeholder of the FYP committee has been performed. After the interview, the requirements of the proposed system are gathered. The requirements included the functional and non-functional requirements which are essential for the development of the system.

Next, literature reviews in term of user interface, features, suitable programming language and methodology are made. This is done to ensure that the project that is delivered matches the users' requirements and expectation. By learning on the interfaces used by the FYP portals, we can create a system that suits the requirement of the user. The interface design must be simple yet attractive. Minimum usage of words is used and the most important thing is that the arrangement of the web elements must be correct. The features of the systems that had been studied are being considered and will be included into the proposed system if the feature is usable and helpful for the user in performing tasks. Once we have the information, a system requirement document which consists of the requirements of user must be created.

In order to know the full detailed of the data that passed between the system and the user, a use case diagram is needed. From the use case, we can identify the subject boundary which separates the system and the user. The activities that can be performed by the user with the system can also be shown.

Deliverables: Requirement analysis, functional and non-functional requirement, methodology, use case diagram

3.2.3 STAGE 3 - DESIGN

The design stage is where the project development begins. In this stage, decision on the user interface must be made. The appearance of the system must be appropriate and the functions that the system have must be stated. The interface design of the system included the layout of the system, the number of links contained in a single page, the position of the navigation bar, the position of the university name and the position where the information is being displayed.

Besides, the colour used on the system must be appropriate and resembles the university. The consistency in the position of the web elements, color, font size and layout must be maintained all the time.

Next would be the design of database. Entity Relationship Diagram (ERD) must be developed so that the entities can be extracted. All the data elements of the system must be included and properly assigned so that the primary key which identify the uniqueness of each record and the foreign key that links to another table can be identified. All the tables related to the system must be drafted out so that we could know what data is stored into the database and which is needed to show to the user. Once we have the tables, we must also perform normalization so that the redundancy of the records can be reduced to the minimal.

A test plan must be designed so that the testing can be done once the system has been developed. The test plan contained the procedures that are required to perform testing. The test plan will identify the person who is required to test the system as different user will have different kind of input to the system. The test data must also be included in this test plan so that the user knows what should be input into the system and check whether the output is as expected. This test plan can be used after the initial version or the first version of the system has been developed.

This is one of the important stages where the whole project framework is developed.

Deliverables: User interface design, database design (ERD), test plan, system specification

3.2.4 STAGE 4 - IMPLEMENTATION

Implementation stage is a stage where the database must be created based on the database design produced in the design stage. The database will be created using the MYSQL.

Once the database has been created, development of the first version of system shall begin. The initial version of the system is developed based on the system requirement created in the earlier stage. As for the user interface design, the document that drafted in design stage will be used as a guideline. Next, the feature that must be included in the system has been identified earlier. The

programming language used must be as stated in the design stage. Changes in the programming language used are prohibited unless it is necessary. The development of the system must match the methodology as planned earlier so that the development process will go accordingly. The methodology chosen must focus on the functions in term of breadth rather than depth which means the modules must exist and less time will be spent on every single module.

Deliverables: MYSQL database, initial version of system

3.2.5 STAGE 5 - TESTING

Once the system has been developed, testing shall be performed as planned. The user must input the test data as written in the test plan and check whether the output is as expected. If the output is not as expected, it will be recorded so that the evaluation on the system can be done.

Deliverable: System testing

3.2.6 STAGE 6 - EVALUATION

At this stage, an evaluation of the system will begin. This evaluation will check whether the system functions as intended. From the testing at the previous stage, we can check whether the system meets the user requirement. We can decide whether the system will go into the next iteration or need to perform incremental on the existing functions. There are two things to consider at this stage, if the user wants to have more functions then the system will go into the next iteration where the development will go back to the planning stage. Another thing is that, the user wanted to enhance the existing function which will lead the development of the system to go back to the planning stage as well.

Deliverables: Test result, evaluation and feedback

3.2.7 STAGE 7 - DEPLOYMENT

In this stage, the system has meet the requirement from the user and functions work as intended which support the user in performing tasks. Therefore, the system is ready for the

deployment and ready to be used by the user. The whole processes of development must be documented so that the system can be easily maintained in the future. At the same time, it would also help the user to understand how the system can be operated.

Deliverable: Final version of system

3.2 TECHNOLOGIES INVOLVED

3.2.1 HARDWARE REQUIREMENT

The hardware required to run the FYP Management Portal are as follow.

Description	Minimum Requirements
Processor	1.6GHz or faster processor
Memory	512MB or higher
Hard Disk	5GB of available hard disk space
Video Card	DirectX 9 or higher
Resolution	1024 x 768 or higher

Table 3.1 Hardware requirements for user

The hardware required to develop the FYP Management Portal are as follow

Description	Minimum Requirements
Processor	2.0GHz or faster processor
Memory	1GB or higher
Hard Disk	10GB of available hard disk space
Video Card	DirectX 9 or higher
Resolution	1024 x 768 or higher

Table 3.2 Hardware requirements for developer

3.2.2 SOFTWARE REQUIREMENT

The software required to run the FYP Management Portal are as follow:

Description	Tools
Operating system	Windows XP Service Pack 3 or newer
Internet browser	Internet Explorer 8 or newer, Mozilla Firefox or Google Chrome

Table 3.3 Software requirements for user

The software required to develop the FYP Management Portal are as follow

Description	Tools
Operating system	Windows XP Service Pack 3 or newer
Internet browser	Internet Explorer 8 or newer, Mozilla Firefox or Google Chrome
Server program	Apache 2 newer
Database	MySQL 5.0.x or newer
Interface design software	Adobe Dreamweaver CS 6
PHP Editor	Windows Notepad

Table 3.4 Software requirements for developer

3.3 PROJECT PLAN

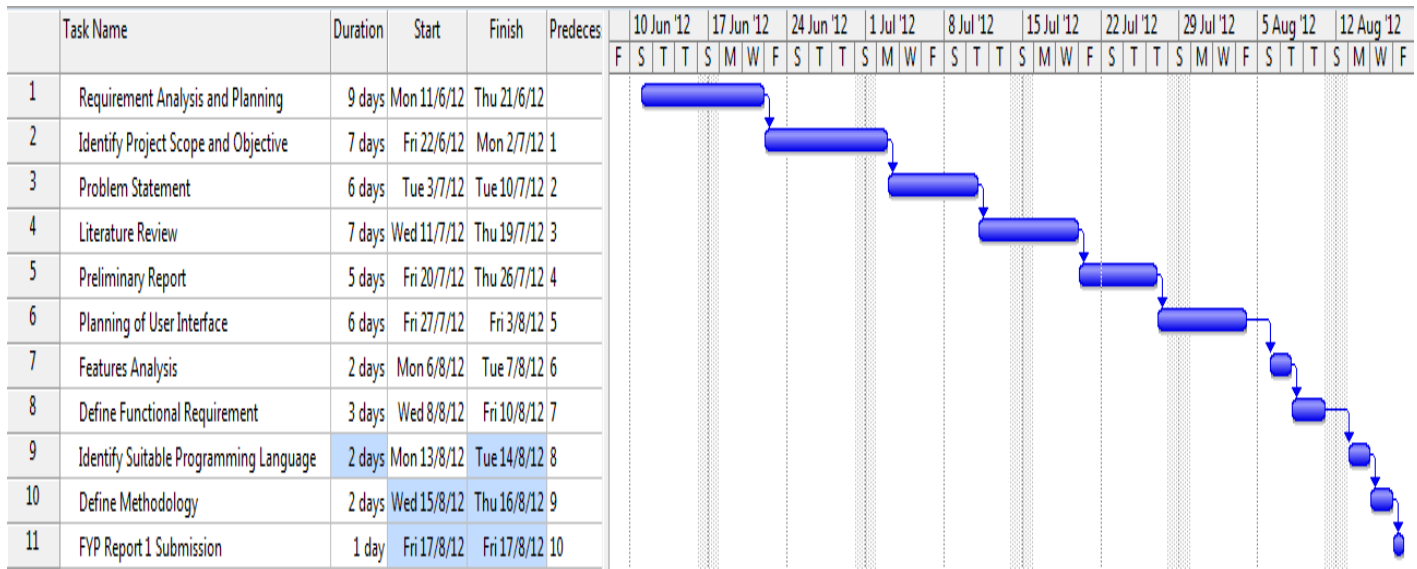|	Task Name	Duration	Start	Finish	Predeces
1	Requirement Analysis and Planning	9 days	Mon 11/6/12	Thu 21/6/12	
2	Identify Project Scope and Objective	7 days	Fri 22/6/12	Mon 2/7/12	1
3	Problem Statement	6 days	Tue 3/7/12	Tue 10/7/12	2
4	Literature Review	7 days	Wed 11/7/12	Thu 19/7/12	3
5	Preliminary Report	5 days	Fri 20/7/12	Thu 26/7/12	4
6	Planning of User Interface	6 days	Fri 27/7/12	Fri 3/8/12	5
7	Features Analysis	2 days	Mon 6/8/12	Tue 7/8/12	6
8	Define Functional Requirement	3 days	Wed 8/8/12	Fri 10/8/12	7
9	Identify Suitable Programming Language	2 days	Mon 13/8/12	Tue 14/8/12	8
10	Define Methodology	2 days	Wed 15/8/12	Thu 16/8/12	9
11	FYP Report 1 Submission	1 day	Fri 17/8/12	Fri 17/8/12	10

Figure 3.2 Gantt chart for project development

CHAPTER 4 REQUIREMENT DOCUMENT AND SPECIFICATIONS

4.1 TARGER USER

The target user for this system would be the supervisors and the FYP committee of Faculty of Information and Communication Technology only. In this FYP Management Portal, the user is able to manage the students who are taking the final year project with the projects that they are doing. Besides, the users are also able to view the students' details with the supervisor that is assigned to them. The system allows the user to fill in the grades after the submission of the report and presentation. User is allow to generate reports at the end of the systems to view the statistics of the results obtained, lecturers who gave the most A's grade and many more. All the students who passed the project 1 and project 2 will be archived.

4.2 REQUIREMENTS GATHERING

The techniques that has been used for the requirement gathering was interviewing and document analysis as mentioned in the Chapter 3. One of the reasons to choose interview is because of the existing system could not be found. This is mainly due to the security and the privacy of the universities that are using the system. Such system which contains the information of the lecturers, students as well as the projects will not be published to the public (Wifi Notes, 2012).

Another reason would be the amount of information gathered would be sufficient and in detailed since it's the user that are using the system. The user would be able to precisely state the requirements of the system.

The person that is being interviewed is one of the stakeholders of FYP management team. Since she is one of the FYP committee members managing the flow of the FYP processes, she would know the requirements of the system completely.

As for the document analysis technique, the FYP portal of universities which contains the information of the final year projects has been studied thoroughly. The portals that can be found

are just the front end system that the students and public can view. Although the information provided in the portals are swallow but the features and design can be studied and implemented in the FYP Management Portal.

With the in depth studies on the portals as well as interview on the one of the stakeholders of FYP management team, the functional and non-functional requirements can be identified.

4.3 FUNCTIONALS AND NON-FUNCTIONAL REQUIREMENTS

Functional Requirements

1. Propose project titles
2. Compilation of proposed titles
3. Upload student list in excel file format into the database
4. Supervisor-student assignment
5. Supervisor-moderator assignment
6. Grade entry/submission
7. Generate reports
8. Archive students' name after Project 2

Non-functional requirements

1. Increase efficiency and effectiveness of FYP processes by eliminate the manual works that done by the FYP Committee, supervisors and moderators
2. Reduce the use of papers during the processes thus saving cost
3. Reduce the work done by the FYP Committee and supervisors by inputting the information to the system directly
4. Improve the way the data being manipulated and make things look organized
5. Allow the direct communication with the stakeholders
6. Save time by providing conveniences to view the statistic directly at the system

7. Retrieval of information become easier as printing and viewing is just a click of button

4.4 SYSTEM SPECIFICATION

The system specification has been defined after the in depth studies of the final year project portals and interview with the FYP committee. The specifications are then being organized and stated.

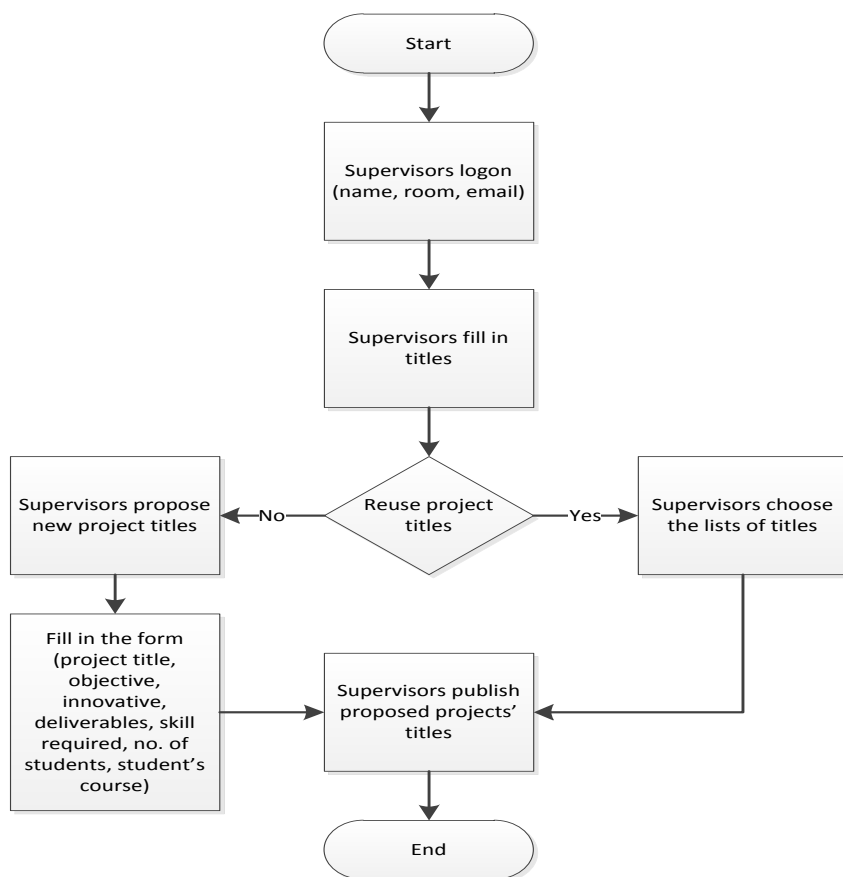### 1.0 Project Titles Compilation Module

Figure 4.1 Compilation of project titles processes

1.1 Register supervisor details

This module will allow the supervisor to login into the system and fill in their details such as name, area of research, room and emails as a registration.

1.2 Register project titles

The supervisor is able to fill in the project titles, the supervisor can choose to propose new project titles or choose from a list of titles that he/she has filled before. If the supervisor wish to propose new titles, then he/she have to fill in a form containing project titles, objectives, innovative, deliverables, skill required, number of students and the suitable course.

1.3 Publish proposed project titles

The supervisor should be able to publish the project titles to the system with the detailed descriptions.
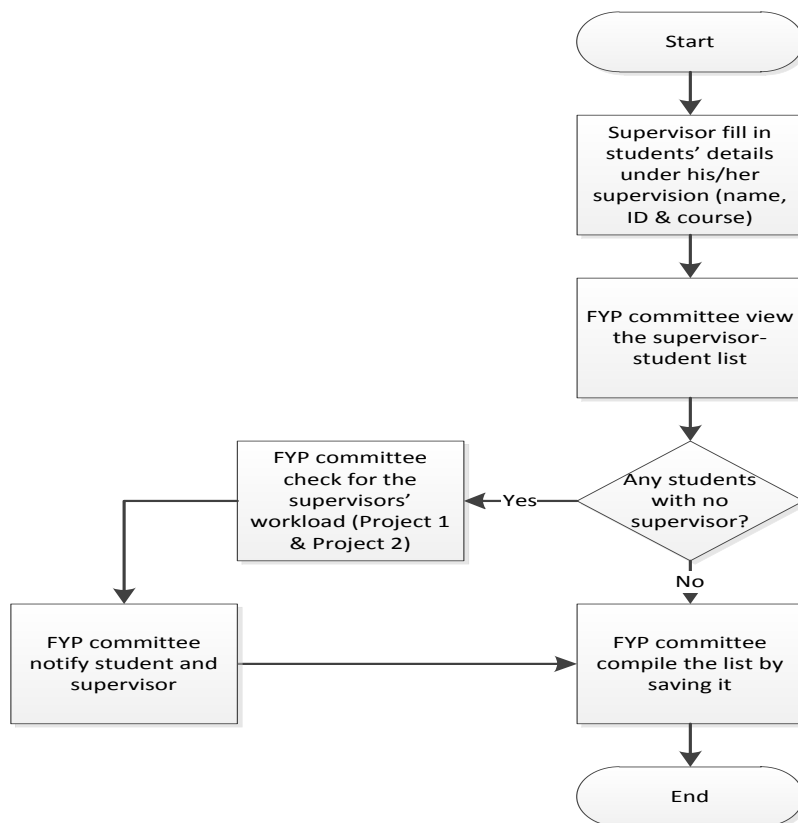
2.0 Supervisor Assignment

Figure 4.2 Supervisor assignment processes

2.1 Register supervisees

The supervisors are allowed to register their supervisees' details on the system which contains the name, ID number and course.

2.2 View supervisor-student list

The FYP committee shall be allowed to view the list containing the details of the supervisors with their supervisees.

2.3 Check supervisors workload

The FYP committee is allowed to check for the supervisors' workload if there is any student without supervisor so that supervisor with less workload will have to take the student without supervisor as supervisee.

2.4 Notification to supervisor and students

FYP committee can send notification to the supervisors to notify and confirm with the supervisors with the students that they are undertaking.

3.0 Moderator Assignment

```
┌─────────────┐
│    Start    │
└──────┬──────┘
       │
       ▼
┌─────────────────┐
│ FYP committee view
│ student-supervisor
│      list       │
└──────┬──────────┘
       │ No
       ▼
┌─────────────────┐
│ FYP committee   │
│ check for moderator
│ details (workload,
│   title, area)  │
└──────┬──────────┘
       │
       ▼
┌─────────────────┐
│ FYP committee   │
│ assign moderator to
│    student      │
└──────┬──────────┘
       │
       ▼
┌─────────────────┐
│ FYP committee   │
│ compile supervisor-
│  moderator list │
└──────┬──────────┘
       │
       ▼
┌─────────────┐
│     End     │
└─────────────┘
```
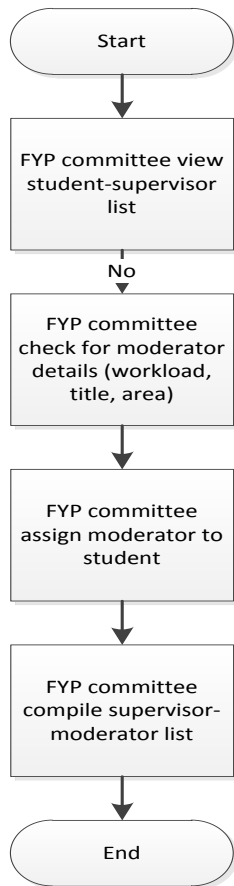
Figure 4.3 Moderator assignment processes

3.1 View supervisor-student list

The FYP committee shall be allowed to view the list containing the details of the supervisors with their supervisees.

3.2 Check moderator workload

The FYP committee is able to check for the moderators' workload and assign them to the students appropriately. The number of student being assigned to the moderator will depend on the workload, the lesser the workload the high the number of students under the moderator.

3.3 Assign moderator

The FYP committee will assign the moderator to the student based on the workload of the moderator.
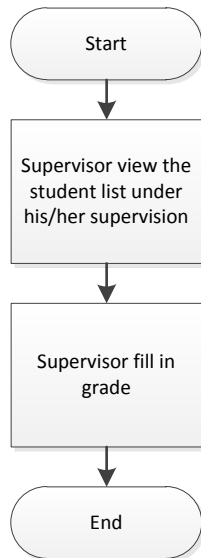
4.0 Grade entry

Figure 4.4 Grade entry processes

4.1 View student list

The supervisor is able to view the list of the student which contains the name of his/her supervisees.

4.2 Fill in grades

The system allows the supervisor to enter the grade for the student under his/her supervision and save the grade.
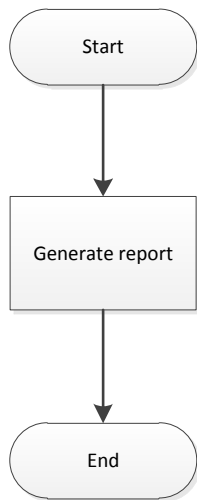
5.0 Report generation

Figure 4.5 Generate report

5.1 Generate report processes

The system enables the FYP committee to generate report that is able to show the statistics of students who get A's grade, statistics of lecturer who gave the most A's grade, the students who is under the supervision of lecturer and many more.
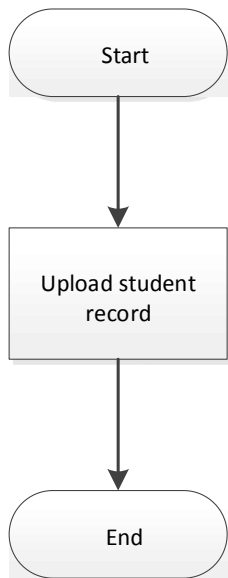
6.0 Upload student record

Figure 4.6 Upload student record

6.1 Upload student record

The system enables the FYP committee to upload the student record which is stored in the excel file with .csv format. The database will be automatically updated with the new students' record. If the records existed, the students failed in previous semester and retake the project. Else if the record is not in the database, it will be treated as new student register for the subject.

7.0 System Maintenance

```
┌─────────────┐
│    Start    │
└─────────────┘
       │
       ▼
┌─────────────┐
│Maintain system│
│   details   │
└─────────────┘
       │
       ▼
┌─────────────┐
│     End     │
└─────────────┘
```
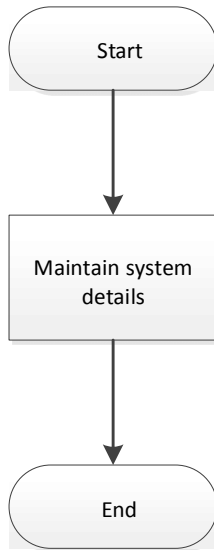
Figure 4.7 System maintenance

7.1 Maintain system details

The system enables the FYP committee to maintain the system by adjusting the semester timeline when the semester start, end and the submission due date for the mark entry. The committee is also able to add new lecturer to the system, change lecturer status and assign new committee as well as to demote the committee member to become non-committee members.
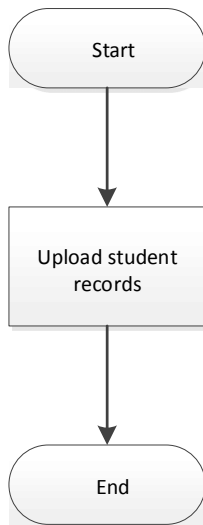
8.0 Search student record

Figure 4.8 Search student record

7.1 Search student details

The system enables the FYP committee and non-FYP committee user is able to search for a particular student's details with the current record and the history of the student if existed.

Case to be considered here is that the students may have different course structure which the new batch of students will have more subjects than the old batch of students. However the course structure of the old batch of student will be obsolete soon which such differences may not happen. Since the system will not be used immediately, therefore, this issue is not a problem.

CHAPTER 5 INTERFACE AND SYSTEM DESIGN

One of the most important things that developer must do is to have the design of the system before it is being developed. A good system will have a good design to start with, so that the system created is able to cope with the requirements from the users. In this chapter, the interface design of the system would be introduced, follow by the design of the system.

5.1 INTERFACE DESIGN

The interface design must be as simple as possible so that the user would not spend too much time in learning on how to use the system. The design must be simple and consistent so that when a user used the system, he/she do not need to relearn on how to use the system.

After some studies on the interface design based on several websites of other universities, an outcome has been produced. The template of the FYP Management Portal has been decided, the layout of the interface would be divided into four different parts.

The first part would be the header which is mainly for the logo of the system to be placed and this header will be located at the top part of the design. The second part would be the navigation panel located on the left hand side of the layout. In this navigation panel, there are clickable links which allow the user to navigate to different modules of the system. The third part would be the most important part where the content is shown to the user of the system. The final part would be the footer that consists of disclaimer that shows the faculty that involved and for whom the system is built for as well as the year the system is developed.

Width: 1050px

Header

Height: 100px

Navigation bar

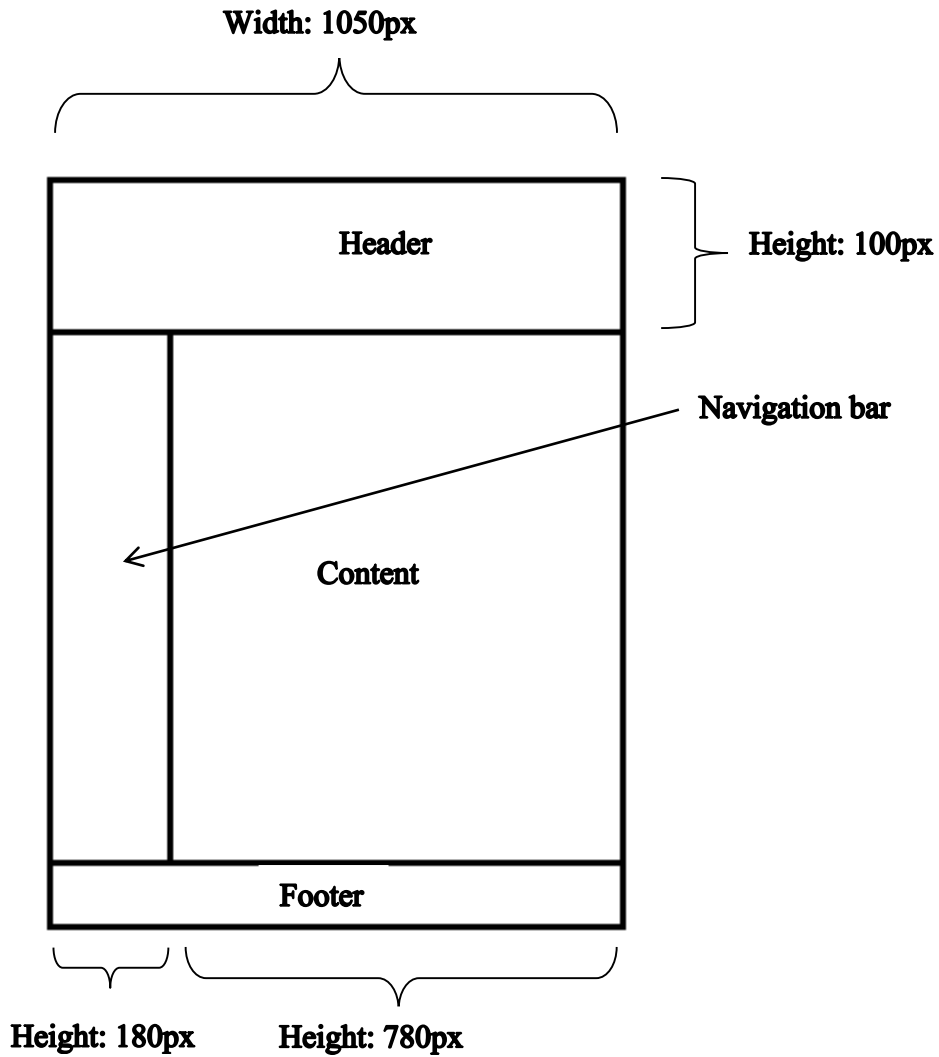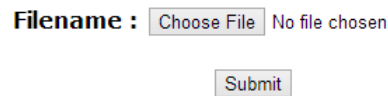Content

Footer

Height: 180px   **Height: 780px**

Figure 5.1 Layout of the system

5.2 SYSTEM FEATURES

The system contains a lot of features that are unique and useful for the user so that they will have a better control over the system.

One of the features is upload student record from an excel file to the database.

Upload Student File (Project 1)

Filename : [Choose File] No file chosen

[Submit]

Figure 5.2 Upload student record

The file can be located and submit to the database without the need of entering the student's record one by one as it will be very time consuming.

The system will also check for the file before uploading to make sure that it is a file with the extension ".csv". Besides, it will also check whether a file is selected. It will not allow any upload if there is not file being selected.

Another feature that the system has is the tab panel where the user is able to go through tab by tab to edit their profile based on the area such as basic info, area of expertise and password as shown in the figure 5.3 below.

(Basic Info | Area of Expertise | Password   )

ID :   L001

Name :   Azwin Hazrina binti Ahmad

Email :   azwin@hotmail.com

Room No. :   N008

Update Profile

Figure 5.3 Edit profile with tab

Supervised Students

Supervised Student (Individual)

Student ID	Student Name	Course	Title	Phone Number	Email		
S011	Lee Kong Chin	IA	qwer	016-5012222	kongching@hotmail.com	Edit	🗑

Supervised Student (Group)

Student ID	Student Name	Course	Title	Group ID	Phone Number	Email		
S010	Leong Kah Choon	CT	testing project title	G001	016-5012111	leong@hotmail.com	Edit	🗑
S014	Goh Seng Ling	CN	Testing Title 123456	G001	016-5012951	gohsl@hotmail.com	Edit	🗑

Figure 5.4 Edit supervised student info

The figure 5.4 above shows the individual and group student that is being supervised by a lecturer. The lecturer can view the information regarding the students and edit them easily as there is an "Edit" button on the most right hand side of the table to allow the user perform changes on the student's details. The user is also allow to delete the supervisee in the case where supervisor add wrong supervisee or other reasons. Moderated students are same but without the edit and delete function.

Active Project

Project	Objective	Innovation	Deliverables	Number of Student	Suitable Course	Skill Required	Proposed Semester	Status
Moveable Wirel...	To develop a fl...	Flying device ...	Prototype	1	CS IB	Java C++	201301	Active ⌄

Inactive Project

Project	Objective	Innovative	Deliverables	Number of Student	Suitable Course	Skill Required	Proposed Semester	Status
Voice-based Dat...	To input data u...	Voice-based re...	Prototype	1	CN CS CT IA IB	Java C++	201301	Inactive ⌄

Delete Project(s)

Figure 5.5 View projects

The feature that the system include the view project page where the projects are being separated to either "Active Project" or "Inactive Project" to allow the user to have a better view on the projects that has been proposed. Besides, the status of the project can be easily changed by changing the value of the dropdown list on the status column. Lastly, there is a delete button link to allow user to delete that particular record from the database. The user is able to check multiple projects that the user wanted to delete and delete them. There will be a confirmation alert message before the record is deleted.
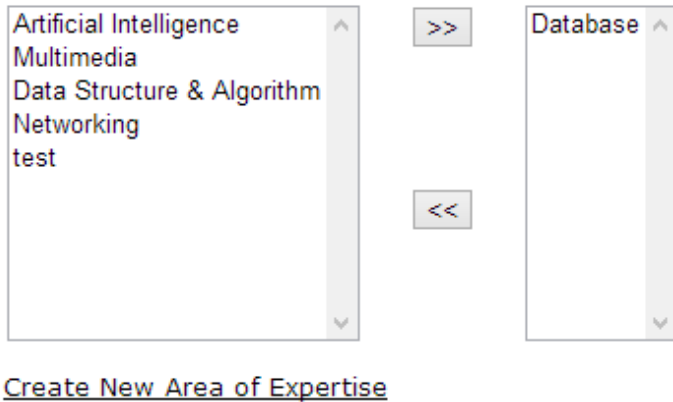
Figure 5.6 Choosing the area of expertise

In the edit profile's second tab, the lecturer is able to choose their area of expertise by using the two list boxes in which the left side list box shows the pool of available area of expertise while the right side list box shows the selected area of expertise. The values inside the list boxes can be easily transferred from left to right or vice versa by clicking the button between the list boxes.

There is also a link where the lecturer can create a new area of expertise and add it inside the pool of available area of expertise. Later, the new area of expertise can be added to the right hand side list box.
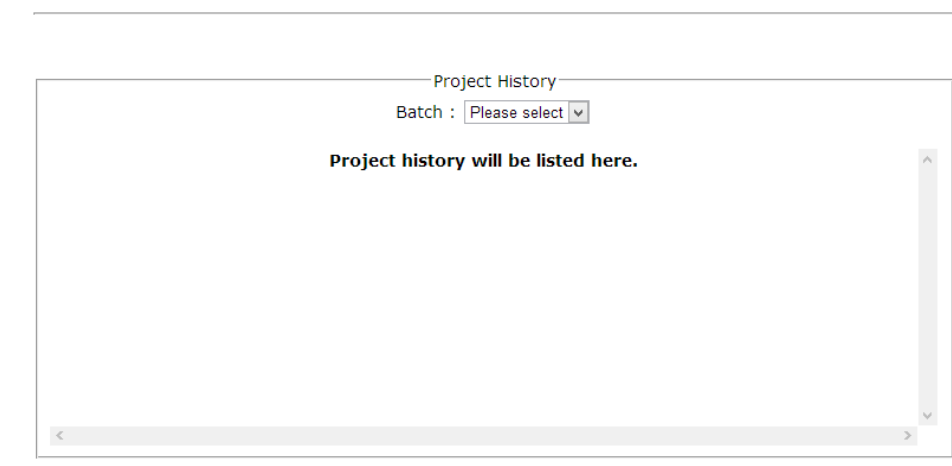

Figure 5.7 View project histories

The figure 5.7 is located on the same page with the view project list where the user is able to view back all the project history that has been proposed by the user before.

Figure 5.8 Grade entry

The grade entry feature here is that the user is able to enter the mark for the students who he/she is supervising before the due date of mark entry. If today's date is more than the due date of mark entry then the user is not able to enter the mark anymore, and it will just display the mark. The grade will be automatically be added to the database when the mark is entered. The date when the mark is being entered will also be recorded in the database.

UNIVERSITI TUNKU ABDUL RAHMAN
Faculty Information Computer Technology (FICT)

18/03/13

Grade Report

Overall Result

Batch: 201205

UCCD3583 Project 1

StudentID	Name	Course	Title	Mark	Grade
S002	Benson Law	IB			
S003	Chan Wai Mun	CS			
S004	Ong Yi Fen	CN			
S005	Lam Chun Fei	CT			
S006	Poon Yi Ling	IA		90	A+
S007	Tay Wai Leong	IB			
S008	Esmond Goh Dik Mern	CS			
S009	Wong Zheng Qin	CN			
S010	Leong Kah Choon	CT			
S011	Lee Kong Chin	IA			
S012	Ang Chin Tong	IB			
S013	Tang Boon Chong	CS			
S017	qw	IB			
S018	ew	CS	test		
S019	tt	CN			
S020	r	CT			
S021	uu	IA			
S022	yy	IB			
S024	ii	CN			
S025	kk	CT			
S026	hh	IA			
S027	gg	IB			
S028	ff	CS	ff		

page 1 / 2

Figure 5.9 Grade report

The figure above shows on of the report's layout which can be generated after the submission date of mark entry to allow the key person of FYP to perform report printing and record keeping.

Project 1: Student-Supervisor List :   Sort by Course   Sort by Supervisor

Project 2: Student-Supervisor List :   Sort by Course   Sort by Supervisor

Newly-updated Supervisor Report   Assigned Supervisor Report

Newly-updated Supervisor Assignment Report

Lecturer Name	Supervised Student	Title
Cheng Wai Khuen	ew oo ff	test Test 3 ff
Choo Peng Yin	r Poon Yi Ling dd	
Kheng Cheng Wai	tt ii	

Print Report   Clear Report

Figure 5.10 Supervisor Assignment report

At this page, the user is able to view the report for the newly-updated supervisor assignment which means the supervisor that just assigned to the students.

The overall student-supervisor list for project 1 and project 2 can also be viewed where the user is able to choose whether to have the list sort by course or by supervisor.

All the report on the screen can be printed easily by pressing the "Print Report" button at the bottom of the page.

The report for the Moderator Assignment is similar to the figure 5.10.

Lecturers' Status

Saw Seow Hui	Active	Active	▼
Sohail Safdar	Active	Active	▼
Mohamed Saleem Haja Nazmudeen	On leave	On leave	▼
Soong Hoong Cheng	On leave	On leave	▼
Sun Teik Heng	On leave	On leave	▼
Tan Chun Wei	On leave	On leave	▼
Tan Hung Khoon	On leave	On leave	▼
Tan Teik Boon	On leave	On leave	▼

Submit

Figure 5.11 Lecturer's status

The lecturer's status can be easily viewed and manipulated through this page. The status of the supervisor will be shown here where the lecturer with the status "Active" will have the word in green color, "On leave" to be blue color and "Resign" to be in red color. This is to ensure that the status could be easily be identified by the user. To change the status of the supervisor required the change of the value at the dropdown box on the right hand side and click on the "Submit" button to confirm the changes made. Another feature that applies for most of the module is that the division of the page is scrollable if the list is too long. This feature most effective be applied in the supervisor/moderator assignment.

Results

Searched For: S015

ID	Name	Course	Batch	Mark	Grade	Phone	Email	Supervisor	Moderator
S015	Kau Kean Yuen	CT	201305			017-5012456	kauky@hotmail.com	Azwin Hazrina binti Ahmad	Cheng Wai Khuen

Failed Project 1 History:

ID	Name	Course	Batch	Mark	Grade	Phone	Email	Supervisor	Moderator
S015	Kau Kean Yuen	CT	201301	40	F	017-5012456	kauky@hotmail.com	Azwin Hazrina binti Ahmad	Cheng Wai Khuen

Back

Figure 5.12 Search student

The searching student feature is also unique as the full details of the students will be displayed at here. The lecturer can check on the student who is currently taking project 1 and the history whether the student has failed the project 1 before this.

This feature also enables the user of the system to check on project 2 students.

5.3 DATA FLOW DIAGRAM

The Data Flow Diagrams (DFD) were introduced and popularized for structured analysis and design (Scott W. A., 1997). It shows the flow of data from external entities into the system, showed how the data moved from one process to another, as well as its logical storage (database).

Data flow diagrams also illustrate how data is processed by a system in terms of inputs and outputs. Individuals who want to draw a data flow diagram must first identify external inputs and outputs, determine how the inputs and outputs relate to each other, and explain with graphics how these connections relate and what they result in.

5.3.1 CONTEXT DIAGRAM
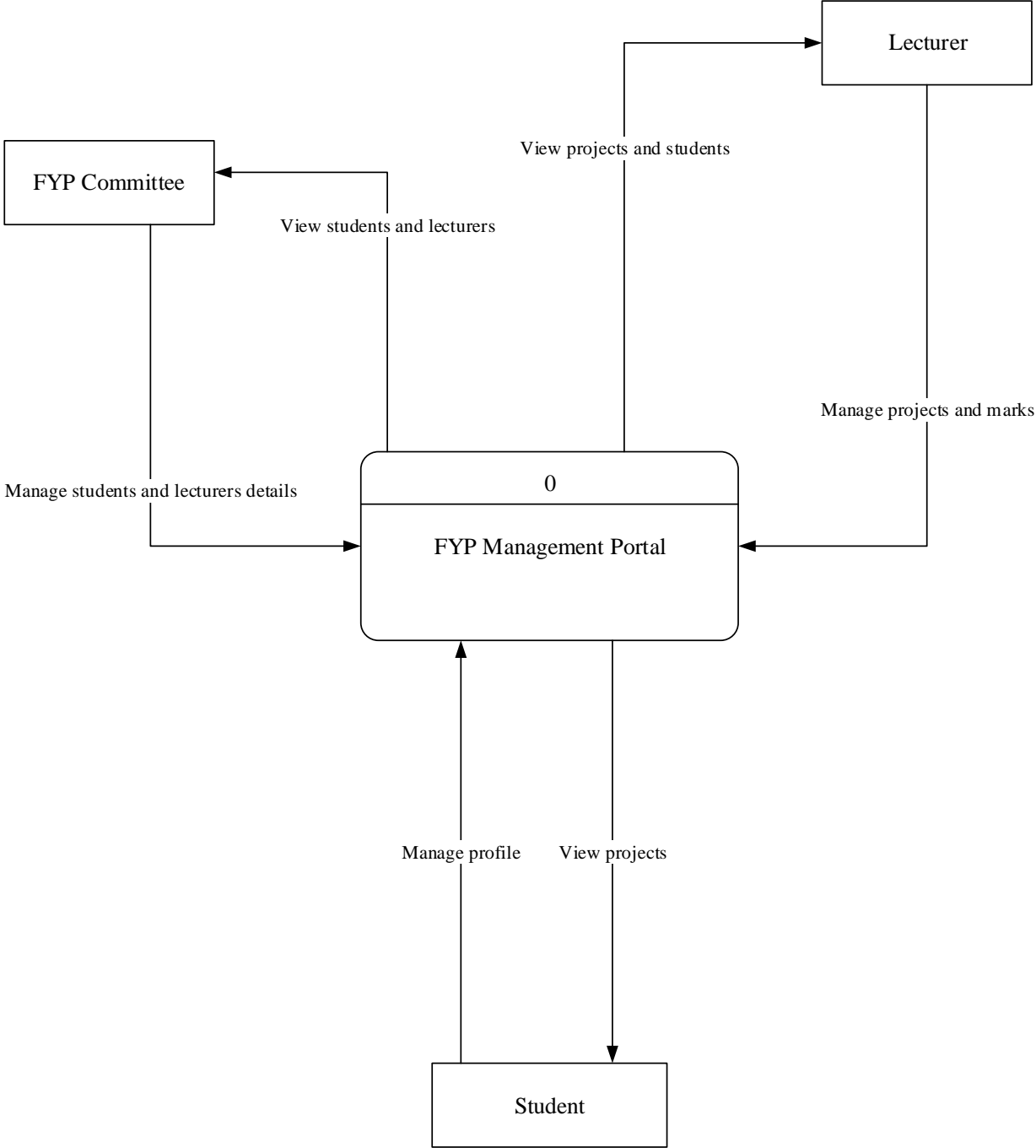
Figure 5.13 Context Diagram

5.3.2   LEVEL-0   DATA   FLOW   DIAGRAM
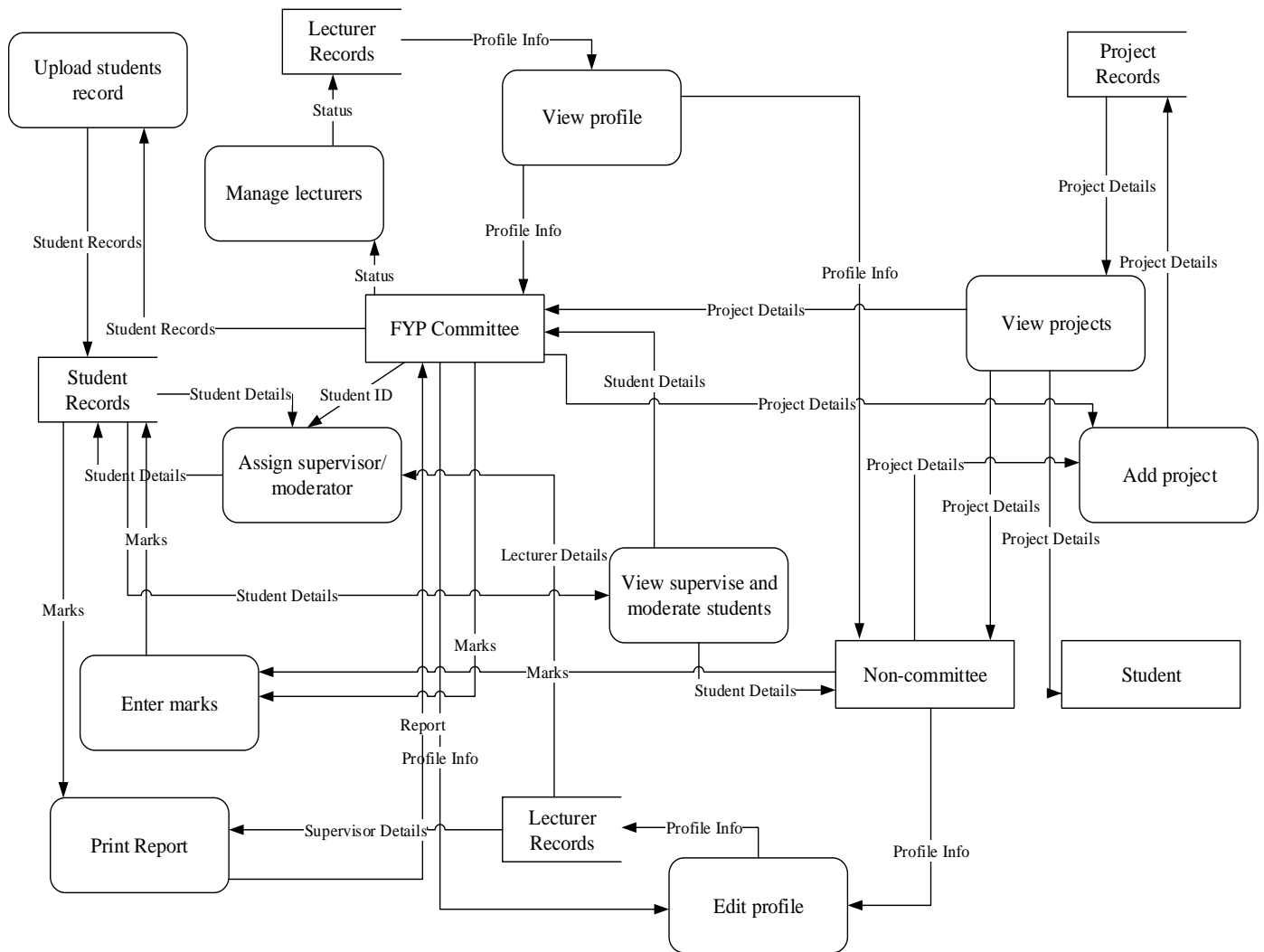
Figure 5.14 Data Flow Diagram Level 1

5.4 ENTITY RELATIONSHIP DIAGRAM (ERD)

One of the fundamental activities to be done before the implementation started should be the design of database. The design is very crucial as it will affect the whole system if it is not properly plan. There will be an Entity Relationship Diagram (ERD) that shows the relationship between all the entities involved in

the system. Before the design of the ERD begins, first we must understand and gather all the requirements of the system. Next, we would have to identify the information or data that are needed to be stored into the database and group them accordingly.

In the ERD diagrams, all the relationship between the entities can be easily identified by the link that used to connect them. There will always be a primary key that uniquely identify the records and foreign key which links to another entity. The figure 5.28 below is the ERD for this FYP Management Portal.

Special case:

- Some of the lecturers in the lecturer entity will resign from UTAR but the record of that particular lecturer will not be deleted.
- The student who failed the Project 1 or Project 2 before will be recorded in an entity.
- All the old project proposed will not be deleted despite of new batch
- The name list in the supervisor/moderator assignment is based on the student which the marks is not yet been entered.
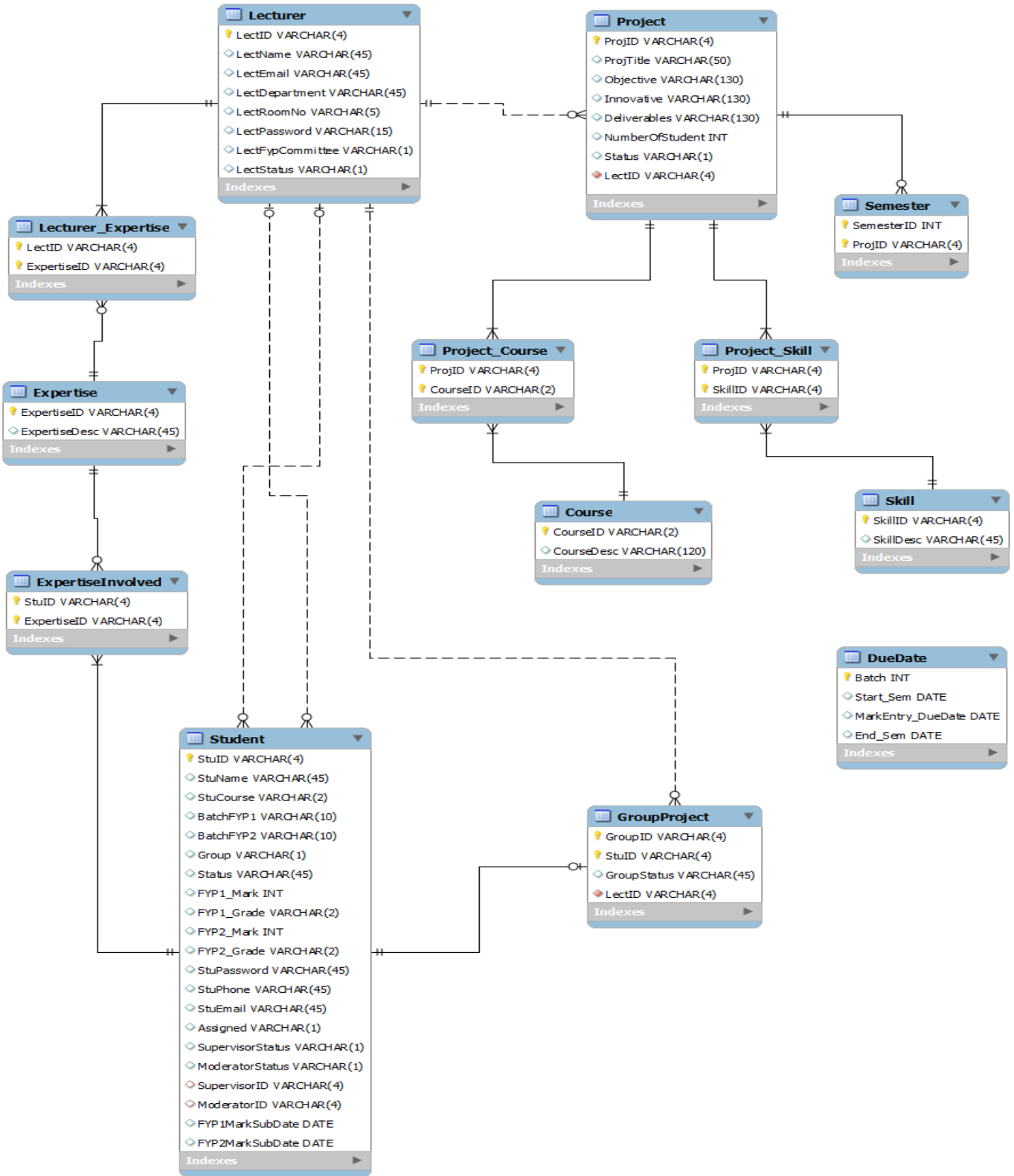
Figure 5.15 Entity Relationship Diagram (ERD)

5.5 DATA DICTIONARY

Course Entity

Entity Name	Attributes	Description	Data Type	Null
Course	CourseID	Identify course uniquely	varchar(2)	No
	CourseDesc	Description of course	varchar(120)	Yes

DueDate Entity

Entity Name	Attributes	Description	Data Type	Null
DueDate	Batch	Identify batch uniquely	int(11)	No
	Start_Sem	Begin date of semester	date	Yes
	MarkEntry_DueDate	Submission date of mark entry	date	Yes
	End_Sem	End date of semester	date	Yes

Expertise Entity

Entity Name	Attributes	Description	Data Type	Null
Expertise	ExpertiseID	Identify expertise uniquely	varchar(4)	No
	ExpertiseDesc	Description of expertise	varchar(45)	Yes

ExpertiseInvolved Entity

Entity Name	Attributes	Description	Data Type	Null
ExpertiseInvolved	StuID	Identify student uniquely	varchar(4)	No
	ExpertiseID	Identify expertise uniquely	varchar(4)	No

GroupProject Entity

Entity Name	Attributes	Description	Data Type	Null
GroupProject	GroupID	Identify group uniquely	varchar(4)	No
	StuID	Identify student uniquely	varchar(4)	No
	GroupStatus	Status of the group	varchar(45)	Yes
	LectID	Identify the lecturer	varchar(4)	No

Lecturer Entity

Entity Name	Attributes	Description	Data Type	Null
Lecturer	LectID	Identify lecturer uniquely	varchar(4)	No
	LectName	Name of the lecturer	varchar(45)	Yes
	LectEmail	Email address of the lecturer	varchar(45)	Yes
	LectDepartment	Department the lecturer is in	varchar(45)	Yes
	LectRoomNo	Lecturer's room number	varchar(5)	Yes
	LectPassword	Lecturer system password	varchar(15)	Yes
	LectFypCommittee	Identify the lecturer is committee member	varchar(1)	Yes
	LectStatus	Status of the lecturer	varchar(1)	Yes

Lecturer_Expertise Entity

Entity Name	Attributes	Description	Data Type	Null
Lecturer_Expertise	LectID	Identify lecturer uniquely	varchar(4)	No
	ExpertiseID	Identify expertise uniquely	varchar(4)	No

Project Entity

Entity Name	Attributes	Description	Data Type	Null
Project	ProjID	Identify project uniquely	varchar(4)	No
	ProjTitle	Name of the project	varchar(50)	Yes
	Objective	Objective of the lecturer	varchar(130)	Yes
	Innovative	Innovative of the project	varchar(130)	Yes
	Deliverables	Deliverables of project	varchar(130)	Yes
	NumberOfStudent	Number of student in project	int(11)	Yes
	Status	Project status	varchar(1)	Yes
	LectID	Identify the lecturer for the project	varchar(4)	No

Project_Course Entity

Entity Name	Attributes	Description	Data Type	Null
Project_Course	ProjID	Identify project uniquely	varchar(4)	No
	CourseID	Identify course uniquely	varchar(2)	No

Project_Skill Entity

Entity Name	Attributes	Description	Data Type	Null
Project_Skill	ProjID	Identify project uniquely	varchar(4)	No
	SkillID	Identify skill uniquely	varchar(4)	No

Semester Entity

Entity Name	Attributes	Description	Data Type	Null
Semester	SemesterID	Identify semester uniquely	int(11)	No
	ProjID	Identify project uniquely	varchar(4)	No

Skill Entity

Entity Name	Attributes	Description	Data Type	Null
Skill	SkillID	Identify skill uniquely	varchar(4)	No
	SkillDesc	Description of skill	varchar(45)	Yes

Student Entity

Entity Name	Attributes	Description	Data Type	Null
Student	StuID	Identify student uniquely	varchar(4)	No
	StuName	Name of the student	varchar(45)	Yes
	StuCourse	Course of the student enrolled	varchar(2)	Yes
	BatchFYP1	Batch which the student take FYP 1	varchar(10)	Yes
	BatchFYP2	Batch which the student take FYP 2	varchar(10)	Yes
	Title	Title of project	varchar(50)	Yes
	Group	Indicate group	varchar(1)	Yes
	Status	Status of student	varchar(45)	Yes
	FYP1_Mark	Mark for FYP 1	int(11)	Yes
	FYP1_Grade	Grade for FYP 1	varchar(2)	Yes
	FYP2_Mark	Mark for FYP 2	int(11)	Yes
	FYP2_Grade	Grade for FYP 2	varchar(2)	Yes
	StuPassword	Password for student	varchar(45)	Yes
	StuPhone	Phone number of student	varchar(45)	Yes
	StuEmail	Email address of	varchar(45)	Yes

		student		
	Assigned	Student taken as supervisee	varchar(1)	Yes
	FYP1MarkSubDate	Date submission of FYP 1 for the mark by supervisor	date	Yes
	FYP2MarkSubDate	Date submission of FYP 2 mark by supervisor	date	Yes
	SupervisorID	Identify the supervisor	varchar(4)	Yes
	ModeratorID	Identify the moderator	varchar(4)	Yes
	FYP1Status	Status for FYP 1	varchar(30)	Yes
	FYP2Status	Status for FYP 2	varchar(20)	Yes
	SupervisorStatus	Status of newly-assigned supervisor	varchar(1)	Yes
	ModeratorStatus	Status of newly-assigned moderator	varchar(1)	Yes

StudentOld Entity

Entity Name	Attributes	Description	Data Type	Null
StudentOld	StuID	Identify student uniquely	varchar(4)	No
	StuName	Name of the student	varchar(45)	Yes
	StuCourse	Course of the student enrolled	varchar(2)	Yes
	BatchFYP1	Batch which the student take FYP 1	varchar(10)	Yes
	BatchFYP2	Batch which the student take FYP 2	varchar(10)	Yes
	Title	Title of project	varchar(50)	Yes
	Group	Indicate group	varchar(1)	Yes
	Status	Status of student	varchar(45)	Yes
	FYP1_Mark	Mark for FYP 1	int(11)	Yes

FYP1_Grade	Grade for FYP 1	varchar(2)	Yes	
FYP2_Mark	Mark for FYP 2	int(11)	Yes	
FYP2_Grade	Grade for FYP 2	varchar(2)	Yes	
StuPassword	Password for student	varchar(45)	Yes	
StuPhone	Phone number of student	varchar(45)	Yes	
StuEmail	Email address of student	varchar(45)	Yes	
Assigned	Student taken as supervisee	varchar(1)	Yes	
FYP1MarkSubDate	Date submission of FYP 1 for the mark by supervisor	date	Yes	
FYP2MarkSubDate	Date submission of FYP 2 mark by supervisor	date	Yes	
SupervisorID	Identify the supervisor	varchar(4)	Yes	
ModeratorID	Identify the moderator	varchar(4)	Yes	
FYP1Status	Status for FYP 1	varchar(30)	Yes	
FYP2Status	Status for FYP 2	varchar(20)	Yes	
SupervisorStatus	Status of newly-assigned supervisor	varchar(1)	Yes	
ModeratorStatus	Status of newly-assigned moderator	varchar(1)	Yes	

CHAPTER 6 IMPLEMENTATION AND DEPLOYMENT

The system implementation can only be started after the design work has been done. During this stage, a step-by-step development and installation would be performed on the system. Once the system has been completed, it can be used by the FYP committee member in the condition that the minimum requirement to run the system must be met.

6.1 SYSTEM IMPLEMENTATION

The first thing that had been done during the implementation was to download all the development tools such as the AppServ which is a package consist of Apache, PHP, MYSQL and phpMyAdmin. It is very time-consuming as long time is needed to perform the configuration and it is troublesome to install the development tools one by one, therefore the AppServ is used. Another tool that aid in the development was the Adobe Dreamweaver CS 5.5. This tool can be used to create interfaces for the whole system as well as error checking during the coding stage. Some of the additional tools used were Adobe Photoshop CS 6 and Notepad++. Lastly, the MYSQL Workbench is use to create the Entity Relationship Diagram as well as the database for the whole system where the tables can be easily created.

To start with the implementation, first thing that need to be done is the installation of development tools. Since the AppServ is a package consists of all the tools needed, the installation can be done in just few minutes. Next, the database which consists of all the entities has to be created by using the MYSQL Workbench. Connections between the entities are also identified during this step.

Once the database has been set up using the MYSQL workbench, the next step is to export out the script from it and import it into the MYSQL through the phpMyAdmin. The phpMyAdmin can be easily accessed from the browser to perform importing of database.

After the MYSQL has all the entities, the coding can be started by first creating the main page for the system which is the login page. The language used in the development of the system would be the PHP as it is one of the famous languages used by the developers to create online system which can be easily accessed through the use of a browser and internet connection.

To create an interface for the system, the Adobe Dreamweaver CS 5.5 is used. Some of the designs need to be done in Adobe Photoshop CS 6 before it can be used in the Adobe Dreamweaver CS 5.5. The interfaces can be easily designed with the help of the tool. During the design of interfaces of the system, HTML with the CSS is used. With CSS, many things can be standardized so that the location of navigation bar, header, content and footer can always be in the same location. The changes can also be easily made with some adjustment to the CSS style sheet. The style sheet can be used by importing it into every PHP files created.

As for the data that the user can input, retrieve, edit and delete are through the use of queries from the MySQL. To have a better view of the source codes, normally Notepad++ is used, however the codes are sometimes being copied to the Adobe Dreamweaver CS 5.5 to perform checking and debugging. Besides, the codes can be placed exactly on any location on the interface of the system since Adobe Dreamweaver CS 5.5 has the split view where the codes and the screen design are being placed side-by-side.

The next step after the development of login page would be the profile viewing page follow by profile management, upload student record page, view supervised and moderated student page, project management page, assignment page, grade entry and report page as well as search student page.

There are two roles that use the system which are the FYP Committee member and Non-FYP Committee member. The FYP Committee member will have the full access to the system and all the functionality mentioned while the Non-FYP Committee will have limitation on certain functions of the systems.

6.2 SYSTEM INSTALLATION

The first development tool that must be installed is the AppServ which can be downloaded from their official website in which the URL for would be http://sourceforge.net/projects/appserv/files/AppServ%20Open%20Project/ for free since its open source software. The main purpose of installing the AppServ is to have the Apache that transform the computer into a local server where the PHP files can be easily accessed through the use of browser. Besides, it also provides the database tools such as MySQL and phpMyAdmin to manage the databases in a more user friendly environment.

Another software tool used is the Adobe Dreamweaver CS 5.5. The software is mainly for the design of interfaces as well as code debugging for the PHP language. The CSS sheet can be easily edit in this software and by using the CSS, the design can be standardized easily throughout the system. The Adobe Dreamweaver can be downloaded from the official website of Adobe for a 30-days trial.

Additional software such as Adobe Photoshop and Notepad++ are useful to aid in interface design and source code viewing.

Lastly, the most important software that needed in the FYP Management Portal is the browser that used to view the PHP pages created. The details of all the software installation will be further explained in the Appendix A.

Hardware Requirement

Description	Minimum Requirements
Processor	1.5GHz or faster
Memory	2 GB RAM
Hard Drive	10GB of available hard disk space
Video Card	DirectX 10 capable video card running at 1024 x 768 or higher-resolution display

Table 6.1 Hardware Requirements for FYP Management Portal

Software Requirement

Description	Minimum Requirements
Operating System	All 32-bit MS Windows (95/98/NT/2000/XP), POSIX (Linux,BSD,Solar is etc..), Linux
Browser	Internet Explorer 8 or newer, Google Chrome 20.0.1132 or newer, Mozilla Firefox 15.0 or newer
Flash Player	Flash Player 10 or newer
PDF Viewer	Adobe Reader 9 or newer
Java	Java version 6 or newer

Table 6.2 Software Requirements for FYP Management Portal

CHAPTER 7 SYSTEM TESTING

Once the system has been successfully developed, testing has to be performed to ensure that the system working as intended. This is also to check that the system meets the requirement stated earlier. Besides that, system testing will help in finding the errors that may be hidden from the user. There are few types of testing which includes the unit testing, functional testing and integration testing. The testing must be completed before it is being deploy for user to use (Software Testing Class, 2013).

7.1 UNIT TESTING

Unit testing is a kind of testing that test on each of the individual component in the system. The testing of the components includes the forms in each of the module to make sure that they are working as intended stated by Don Wells (1999). The main point in unit testing is to make sure that error does not happen during the usage of system. At the same time, if error and or bug do happen, they have to be fixed immediately and this reduces the number of fault in the system. This kind of testing can also be used to check on the input in the form to ensure that the correct format is being entered into the system and to the database thus, producing high integrity records. In order to perform the testing, a test plan has to be used.

Unit Testing 1: Login as FYP Committee

Testing Objective: To ensure the login form is working correctly.

No	Test case/test script	Attribute and value	Expected result	Result
1	Verify user login after click on the 'Login' button on login form with correct input data	Username: L001 Password: 1234	Successfully log into the main page of the system as FYP Committee member.	Pass
2	Verify user login after click on 'Login' button on login form with null value	Username: NULL Password: NULL	Login failed, error message shown and request user input username and password.	Pass
3	Verify user login after click on 'Login' button on login form with invalid username or password	Username: L001 Password: 4321	Login fail and error message is shown to request user indicates wrong username or password or user does not exist	Pass
4	Clear the login form with the "Clear" button	Username: L001 Password: 1234	Login form cleared successfully	Pass

Table 7.1 Unit Testing 1: Login as FYP Committee

Unit Testing 2: Edit Profile

Testing Objective: To ensure the edit profile form is working properly.

No	Test case/test script	Attribute and value	Expected result	Result
1	Edit email address and room number with correct value	Old Email: azwin@hotmail.com Old Room No.: N008 New Email: azwin123@hotmail.com New Room No.: NF008	Successfully update the info and return to the edit profile page.	Pass
2	Edit email address with invalid email address format	Old Email: azwin@hotmail.com New Email: azwin123	System shows error message to request user to enter an email address.	Pass
3	Edit email address and room number with null value.	Old Email: azwin@hotmail.com Old Room No.: N008 New Email: NULL New Room No.: NULL	System accept the value as lecturer can have no email address or no room	Pass
4	Edit area of expertise by	-	System is able to update the	Pass

	passing value between the list boxes		area of expertise by passing the value from left list box to right list box and vice versa without a problem	
5	Edit password with correct value	Current password: 1234 New password: 123 Re-enter new password: 123	Successfully update the password.	Pass
6	Edit password with null value.	Current password: NULL New password: NULL Re-enter new password: NULL	System display error message that no record is update.	Pass
7	Edit password with wrong value for current password	Current password: 123	System display error message stating wrong current password	Pass

Table 7.2 Unit Testing 2: Edit Profile

Unit Testing 3: Import Student List

Testing Objective: To ensure only excel file with .csv extension is uploaded and student record is successfully imported into database.

No	Test case/test script	Attribute and value	Expected result	Result
1	Verify file type after click on the 'Upload' button on import student record form with selected csv file	-	File uploaded and alert message is shown to the user upon successfully import.	Pass
2	Verify file type after click on the 'Upload' button on import student record form with no file is selected	-	No file is uploaded and alert message shown no file is selected.	Pass
3	Verify file type on import student record form with non-csv file selected	-	No file is uploaded and alert message shown that only .csv files can be uploaded.	Pass

Table 7.3 Unit Testing 3: Import Student List

Unit Testing 4: Add new area of expertise

Testing Objective: To ensure new area of expertise is added.

No	Test case/test script	Attribute and value	Expected result	Result
1	Verify new area of expertise is added with correct value	New Area of Expertise : Network Security	System accepts the value and record is successfully updated with the message alert.	Pass
2	Verify new area of expertise is added with no value	New Area of Expertise : NULL	Error message shown to user stating no record is updated.	Pass
3	Verify new area of expertise is added with value exist in database	New Area of Expertise : Network Security	Error message shown to user stating that the record is existed in database.	Pass

Table 7.4 Unit Testing 4: Add new area of expertise

Unit Testing 5: Create New Project Title

Testing Objective: To ensure new project title registration form is working properly.

No	Test case/test script	Attribute and value	Expected result	Result
1	Verify new project registration after click on the 'Add Project' button on registration form with correct input data	Title Name : Project Name Objective : Project Objective Innovative : Project Innovative	System accepts the value and record is successfully updated with the message alert.	Pass

		Deliverables : Project Deliverable		
		Number of Student : 1		
		Suitable Course : CS		
		Skill Required : PHP		
2	Verify new project registration after click on the 'Submit' button on registration form with null value	Title Name : NULL	Error message shown to user stating all field must be entered and no record is being created.	Pass
		Objective : NULL		
		Innovative : NULL		
		Deliverables : NULL		
		Suitable Course : NULL		
		Skill Required : NULL		

Table 7.5 Unit Testing 5: Create New Project Title

Unit Testing 6: Edit Project Details

Testing Objective: To ensure edit project details form is working properly.

No	Test case/test script	Attribute and value	Expected result	Result
1	Verify choosing project details is working when a project is selected through the radio button	-	System accepts the choice and edit project details page is shown.	Pass
2	Verify choosing project details when the radio button is not	-	Error message shown to user stating that the one of the	Pass

	selected		records must be selected.	
3	Verify edit project details after click on the 'Edit Project' button on edit form with correct input data	Title Name : Project Name Objective : Project Objective Innovative : Project Innovative Deliverables : Project Deliverable Number of Student : 1 Suitable Course : CS Skill Required : PHP	System accepts the value and record is successfully updated with the message alert.	Pass
4	Verify new project registration after click on the 'Submit' button on registration form with null value	Title Name : NULL Objective : NULL Innovative :	Error message shown to user stating all field must be entered and no record is being created	Pass

		NULL		
		Deliverables : NULL		
		Suitable Course : NULL		
		Skill Required : NULL		

Table 7.6 Unit Testing 6: Edit Project Details

Unit Testing 7: Add New Lecturer

Testing Objective: To ensure add new lecturer form is working properly.

No	Test case/test script	Attribute and value	Expected result	Result
1	Verify new lecturer is added after click on the 'Create	Lecturer ID : L050	System accepts the value and record is successfully updated	Pass

	Account' button on add new lecturer form with correct input data	Password : 1234 Name : Alan Email : alan@utar.edu.my Department : Department of Computer Science Room No. : NF046 Assign as FYP committee? : Yes Area of Expertise: Database	with the message alert.	
2	Verify new lecturer is added after click on the 'Create Account' button on add new lecturer form with null value	Lecturer ID : NULL Password : NULL Name : NULL Email : NULL Department :	Error message shown to user stating all field must be entered and no record is being created	Pass

		NULL		
		Room No. : NULL		
		Assign as FYP committee? : NULL		
		Area of Expertise: NULL		
3	Verify new lecturer is added after click on the 'Create Account' button on add new lecturer form with existed Lecturer ID	Lecturer ID : L001	Error message shown to user stating error in ID entered and no record is being created	Pass
		Password : 1234		
		Name : Alan		
		Email : alan@utar.edu.my		
		Department : Department of Computer Science		
		Room No. : NF046		
		Assign as FYP committee? : Yes		

_____

		Area of Expertise:		

Table 7.7 Unit Testing 7: Add New Lecturer

Unit Testing 8: Search Student

Testing Objective: To ensure search student form is working properly.

No	Test case/test script	Attribute and value	Expected result	Result
1	Verify search student after click on the 'Search' button on search student form with correct input data	Student ID: 1000001	System accepts the value and record is successfully shown.	Pass
2	Verify search student after click on the 'Search' button on search student form with NULL value	Student ID: NULL	Error message is shown stating the field must be entered.	Pass

Table 7.8 Unit Testing 8: Search Student

7.2 FUNCTIONAL TESTING

The functional testing will take place after the unit testing. In this functional testing, the functionality of each of the module is tested. This is to ensure that the system produced meets the specifications and requirements as stated earlier (Functionality Testing, 2011). Most if not all the bugs will be uncovered in the functional testing so that less error will occur during the usage of the system. When more bug or error is discovered and fixed in the testing, it improves the overall quality of the system.

Functional Testing 1: Login with different roles

Objective: To ensure that the correct page with the correct navigation bar is loaded.

No	Test case/test script	Attribute and value	Expected result	Result
1	Login as a 'FYP Committee' member.	Username: L001 Password: 1234	Main page for the FYP Committee member is loaded with the FYP Committee navigation bar	Pass
2	Login as a 'non-FYP Committee' member.	Username: L002 Password: 1234	Main page for the non-FYP Committee member is loaded with the non-FYP Committee navigation bar	Pass

Table 7.9 Functional Testing 1: Login with different roles

Functional Testing 2: Edit and View profile

Objective: To ensure correct profile of the lecturer is retrieved from the database.

No	Test case/test script	Attribute and value	Expected result	Result
1	Login as "FYP Committee" member	Username: L001 Password: 1234	Login successful and the FYP Committee page with its navigation bar is loaded and in the view profile page	Pass
2	Click on Edit Profile button	-	Successfully redirect to edit profile page.	Pass
3	Edit account details	Old Email: azwin@hotmail.com Old Room No.: NF002 New Email: azwin1122@hotmail.com New Room No.: NF009	Successfully updated and return back to edit page.	Pass
4	Click on View Profile on navigation bar	-	Profile successfully updated with the value inserted	Pass

Table 7.10 Functional Testing 2: Edit and View profile

Functional Testing 3: Add new project, view, change project status and view history

Objective: To ensure the new project is added, be viewed and status change.

No	Test case/test script	Attribute and value	Expected result	Result

1	Login as "FYP Committee" member	Username: L001 Password: 1234	Login successful and the FYP Committee page with its navigation bar is loaded and in the view profile page	Pass
2	Create new project	Title Name : Project Name Objective : Project Objective Innovative : Project Innovative Deliverables : Project Deliverable Number of Student : 2 Suitable Course : CS, CT, CN Skill Required : PHP, ASP, MYSQL	New project successfully created	Pass
3	Click on View Project link	-	Projects proposed by the user are displayed out from the database successfully.	Pass

4	Change project status	Old Status: Active New Status: Inactive	Project with active status on top and project with inactive status at bottom. Active project selected being move to the inactive project list	Pass
5	View project history	Bath: 201301	Project with the label batch is display properly from the database.	Pass

Table 7.11 Functional Testing 3: Add new project, view, change project status and view history

Functional Testing 4: Assign supervisee

Objective: To ensure the supervisee is added to the user's list.

No	Test case/test script	Attribute and value	Expected result	Result
1	Login as "non-FYP Committee" member	Username: L002 Password: 1234	Login successful and the non-FYP Committee page with its navigation bar is loaded and in the view profile page	Pass
2	Check on the radio button for a particular student and insert project title	Student Details: Goh Seng Ling Project Title: Student Attendance Monitoring	Successfully updated and alert message shown to the user.	Pass

		System		
3	Show supervising and moderating students	-	Details for supervising and moderating students are shown for that particular user in that particular batch.	Pass

Table 7.12 Functional Testing 4: Assign supervisee

Functional Testing 5: Assign supervisor

Objective: To ensure the supervisor is assigned to unregistered student.

No	Test case/test script	Attribute and value	Expected result	Result
1	Login as "FYP Committee" member	Username: L001 Password: 1234	Login successful and the FYP Committee page with its navigation bar is loaded and in the view profile page	Pass
2	Check on the radio button for a particular student and the radio button for particular lecturer	Student Details: Goh Seng Ling Lecturer Details: Goh Hock Guan	Successfully assigned and alert message shown to the user.	Pass

3	View student-supervisor list by clicking "Print Report" button	-	Print report page shown up. Default student-supervisor list sort by course	Pass
4	View newly-updated supervisor report	-	Newly-updated Supervisor Assignment Report shown.	Pass
5	Print report by clicking on "Print Report" button at the bottom of the page	-	Report printing page show up to allow user to print the student-supervisor list	Pass

Table 7.13 Functional Testing 5: Assign supervisor

Functional Testing 6: Assign moderator

Objective: To ensure the moderator is assigned to student.

No	Test case/test script	Attribute and value	Expected result	Result
1	Login as "FYP Committee" member	Username: L001 Password: 1234	Login successful and the FYP Committee page with its navigation bar is loaded and in the view profile page	Pass
2	Check on the radio button for a particular student and the radio button for particular lecturer	Student Details: Goh Seng Ling Lecturer Details: Goh Hock Guan	Successfully assigned and alert message shown to the user.	Pass

3	View student- moderator list by clicking "Print Report" button	-	Print report page shown up. Default student-moderator list sort by course	Pass
4	View newly-updated moderator report	-	Newly-updated Moderator Assignment Report shown.	Pass
5	Print report by clicking on "Print Report" button at the bottom of the page	-	Report printing page show up to allow user to print the student- moderator list	Pass

Table 7.14 Functional Testing 6: Assign moderator

Functional Testing 7: Enter grade

Objective: To ensure the grade is entered for supervising students.

No	Test case/test script	Attribute and value	Expected result	Result
1	Login as "non-FYP Committee" member	Username: L002 Password: 1234	Login successful and the non-FYP Committee page with its navigation bar is loaded and in the view profile page	Pass
2	Enter mark for the supervising students and click on "Save"	Mark: 90	Mark successfully saved and grade is shown.	Pass

	button			
3	View supervisee report	-	View on the supervisee details.	Pass
4	Print supervisee report	-	Print page is shown and report is printable.	Pass

Table 7.15 Functional Testing 7: Enter grade

Functional Testing 9: FYP Committee Assignment

Objective: To ensure the particular lecturer to be promoted to FYP Committee member.

No	Test case/test script	Attribute and value	Expected result	Result
1	Login as "FYP Committee" member	Username: L001 Password: 1234	Login successful and the FYP Committee page with its navigation bar is loaded and in the view profile page	Pass
2	Select lecturer who is non-FYP	Old FYP	Record update successfully and	Pass

	Committee member	Committee: No New FYP Committee: Yes	page is refreshed.	
3	Login as "FYP Committee" member	Username: L008 Password: 1234	Login successful and the FYP Committee page with its navigation bar is loaded and in the view profile page	Pass

Table 7.16 Functional Testing 9: FYP Committee Assignment

7.3 INTEGRATION TESTING

No	Test case/test script	Attribute and value	Expected result	Result
1	Login as "FYP Committee" member	Username: L001 Password: 1234	Login successful and the FYP Committee page with its navigation bar is loaded and in the view profile page	Pass
2	Upload student record for Project 1	-	File successfully uploaded and return to the upload page. Student records are updated.	Pass
3	Check on the radio button for a particular student and insert project title	Student Details: Goh Seng Ling Project Title: Student Attendance Monitoring System	Successfully updated and alert message shown to the user.	Pass
4	View supervising student	-	The list of supervisee shown on the screen.	Pass
5	Edit supervisee's details	Old Email : gohsl@hotmail.com Old Phone Number : 012-3456678 Old Title : Testing Title 123 New Email : gohsl1234@hotmail.com	The system update the record of the student and alert message shown to user stating the record update successfully.	Pass

		New Phone Number : 012-3652234 Old Title : Testing 345		
6	Enter mark for the supervising students and click on "Save" button	Mark: 90	Mark successfully saved and grade is shown.	Pass
7	View grade report	Batch: 201301 Type: Mark/Grade Sort by: ID Project: All	Report generated and shown to the user.	Pass

CHAPTER 8 FUTURE ENHANCEMENT AND LIMITATION

The FYP Management Portal is only usable by the FYP Committee and the lecturers from the Faculty of Information Communication and Technology only. In the near future, this management system should also allow the FYP committee from other faculty to use.

Besides, the user for this system would the staffs of the university only and student is unable to login into the system as the feature is not yet available for the student. In the second version of the system, the students would have their own account and login into the system to interact with their supervisors as well as getting announcement from the FYP committee directly. The students would also be able to view the grades as soon as the grade is being entered.

There are more limitations to this system, for example is the upload student record module which only accepts files with the extension of .csv with the format given. If the format is not the same, the system would not be able to update the student record correctly.

Besides, the system can only be viewed correctly by using a computer and it will not in the proper view or certain functions in the system not supported if the user is accessing the system using a smart phone.

The FYP Management Portal will still have a lot of improvement to be done. In the near future, the system would be able to reduce the workload of the FYP committee and hasten the process of managing the final year project. The system would also be used by people from different faculty as well as the students so that the communication between the involved parties would be facilitated.

CHAPTER 9 CONCLUSION

In this 21st century, web base applications play an important role in aiding human in performing the tasks which are very tedious and troublesome. Without the application, tasks would need longer time to be done and it would cost much effort for the human.

One of the tasks mentioned was the management of FYP processes in the universities. There are a lot of processes which required the person-in-charge to do it manually which takes up a lot of time. The person-in-charge might need to enter the record one-by-one for the students who register for final year project and the data would not be kept well without the use of database. Furthermore, managing the flow of FYP involves more than one party and works maybe very complicated if the communication between the parties is not good. Miscommunication of the file versions always happen when the files are not properly documented. The assignment of supervisor to students would be very difficult if things are done manually by using the paper to register and update the record traditionally to the person-in-charge. Not to mention that the report generation would need higher time than by using a system.

Therefore, in order to help in reducing the problems, web base application name FYP Management Portal is created which is accessible by the authorized user anytime and anywhere. The system is easy to use as it has user-friendly interface, easy to manage the record as insert, update, view and delete is just a click of button away. The report generation could also be done when it is needed, the report generated can be saved for later use or be printed out as hardcopy which is easy to be carried around.

In conclusion, the FYP Management Portal is meant to help the FYP Committee by reducing the workload, making management of records easier and records are long-lasting. It also allows the user to produce report easily with the clicks of few buttons located on the screen.

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Appendix

APPENDIX

APPENDIX A: USER MANUAL

1.0 SYSTEM INSTALLATION

1.0.1 AppServ

1. The first thing to install before using the AppServ which can be downloaded from
http://sourceforge.net/projects/appserv/?source=navbar
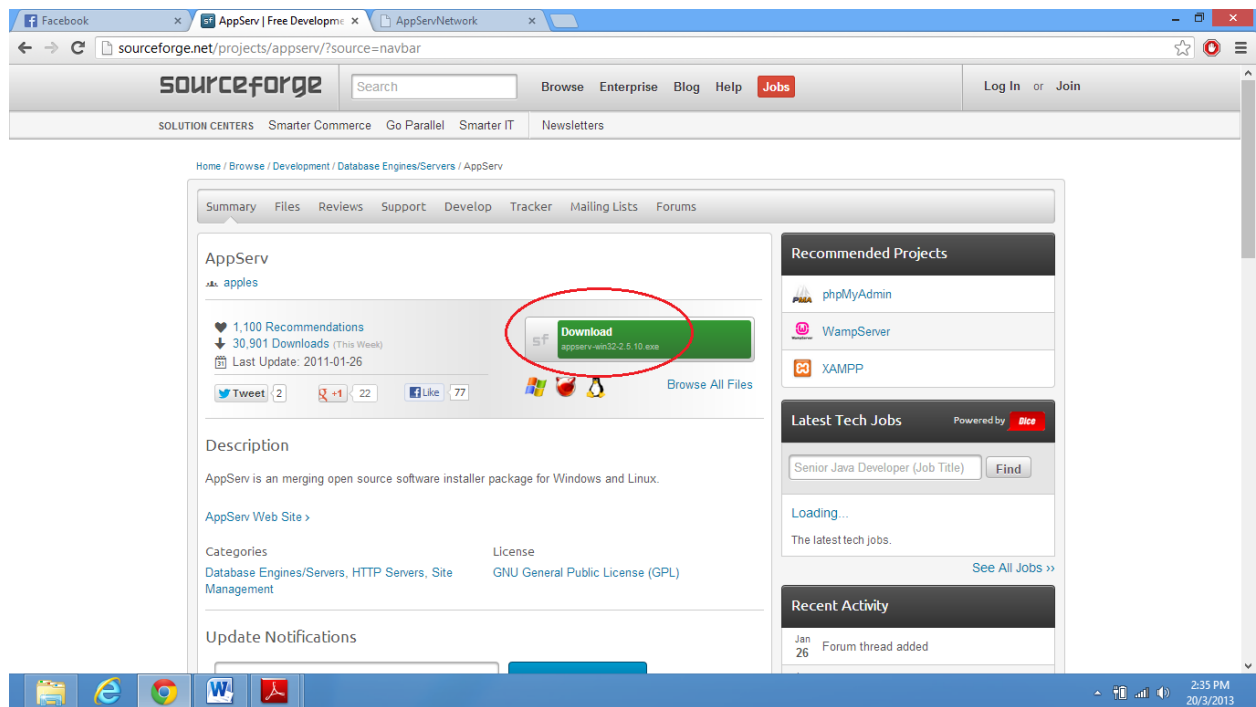
2. Click on the download link on the page to download the installer.

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Appendix
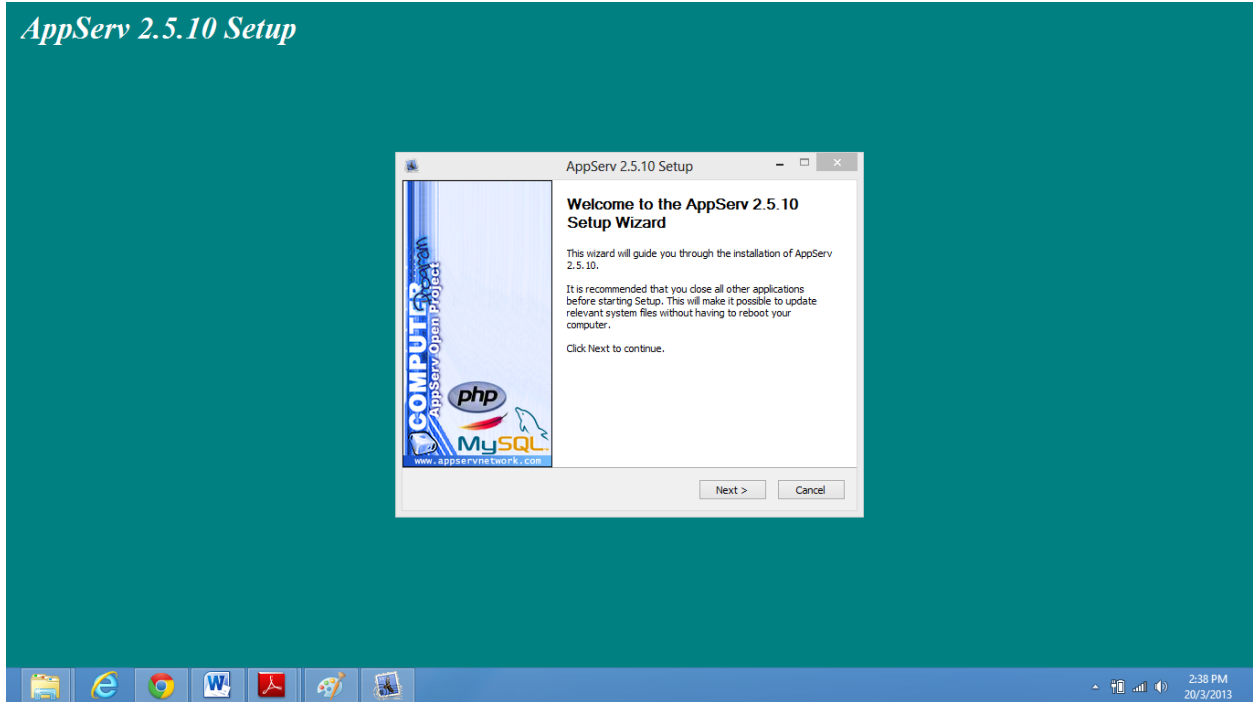
3. After downloaded the installer, double click it. Click "Next" at here.
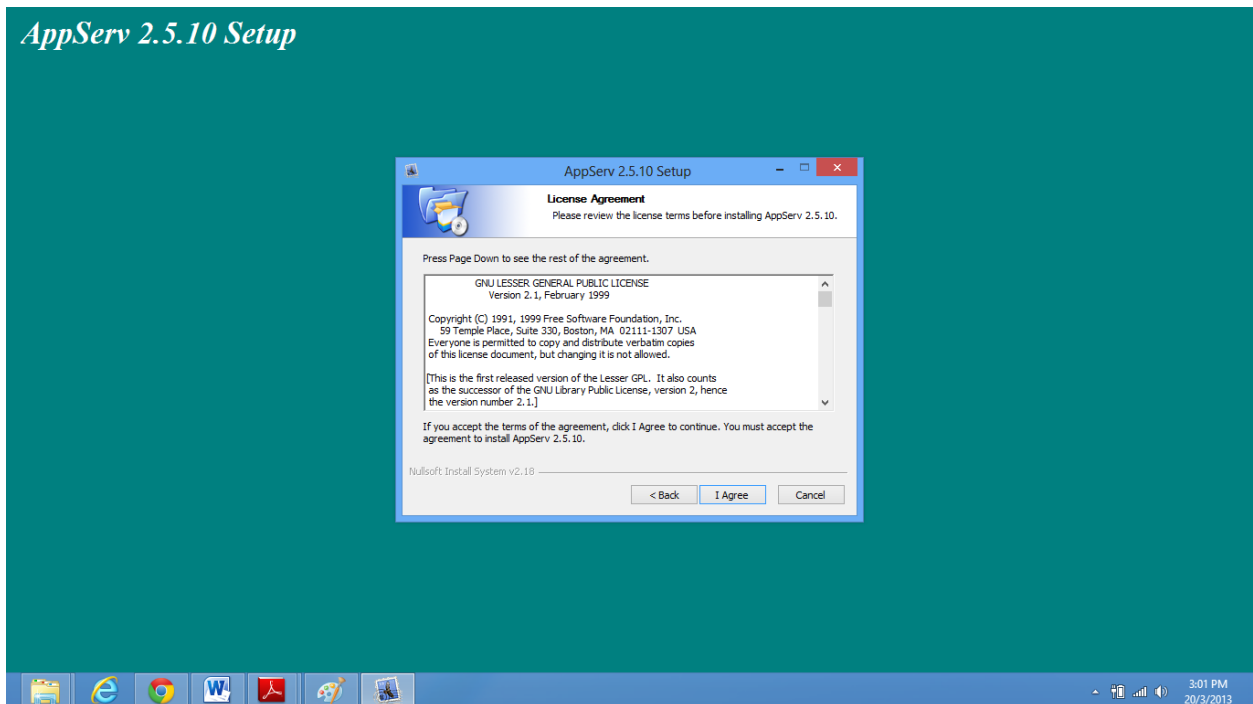
4. Click on "I Agree".

_____
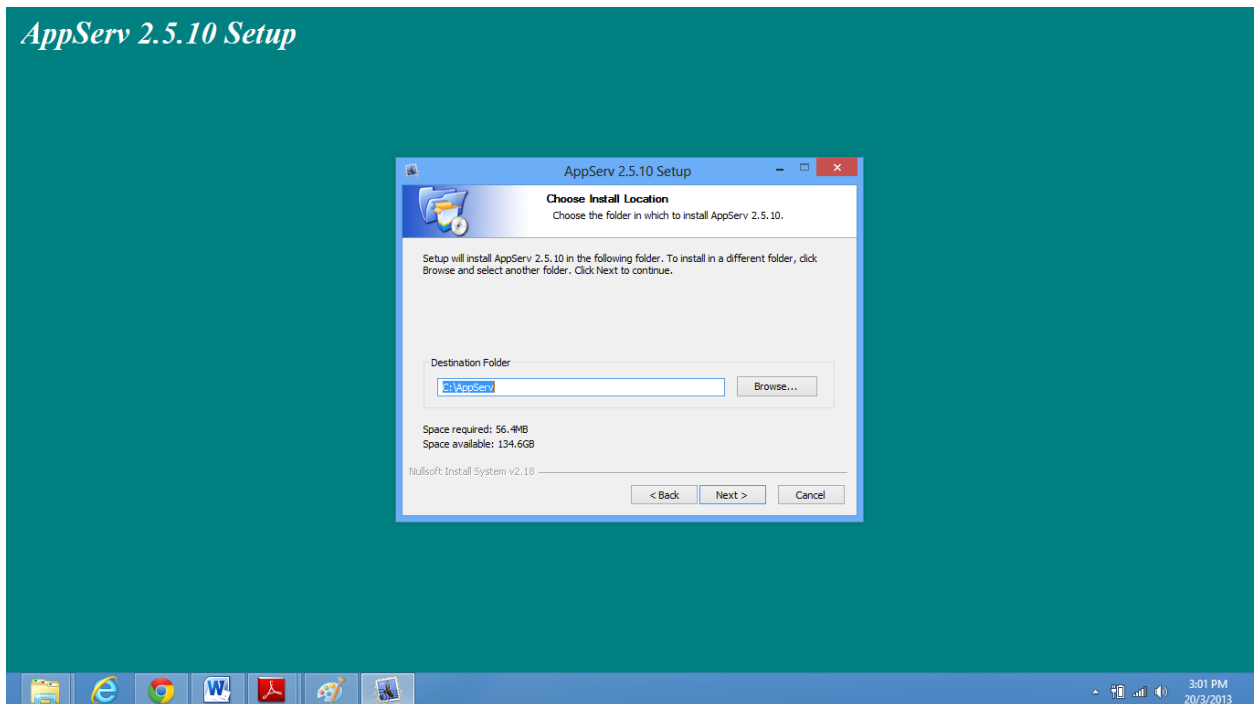
5. Choose the destination folder, by default it will be C://AppSev. Click on "Next" after that.
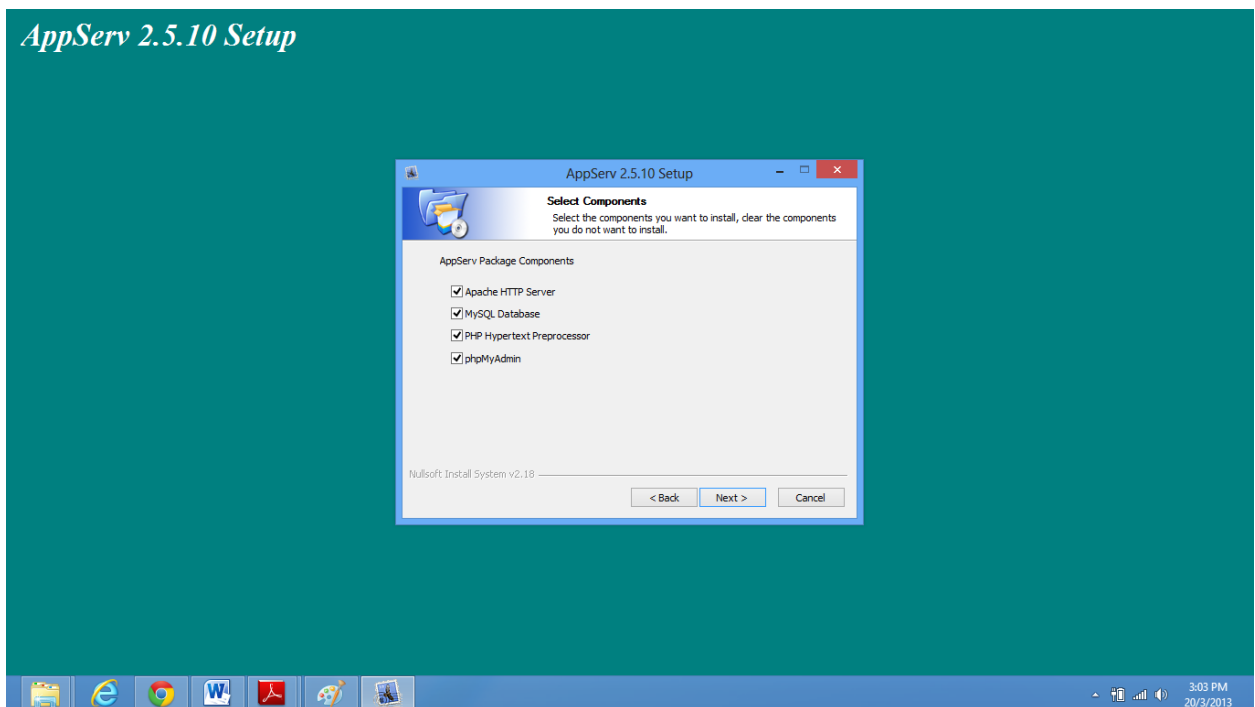
6. Select all the components here and click on "Next" again.

_____
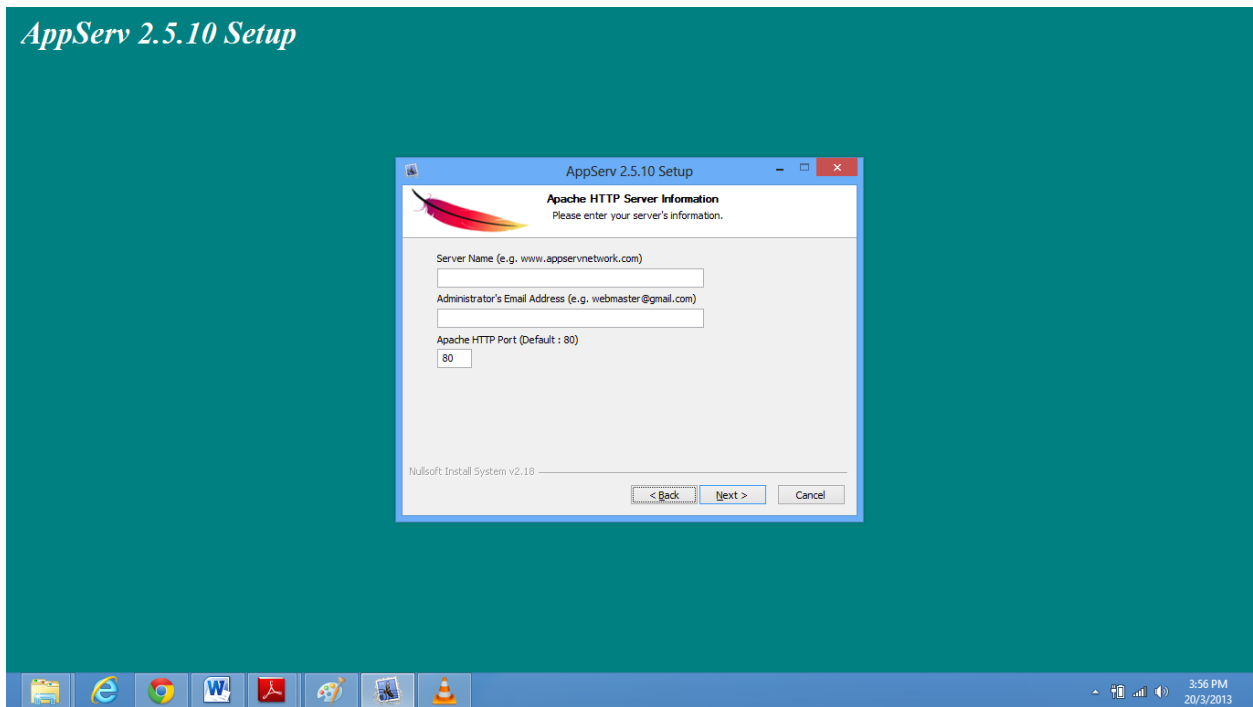
Appendix

7. Enter "root" as server name and root@gmail.com as email. The http port is left to be default and click "Next".
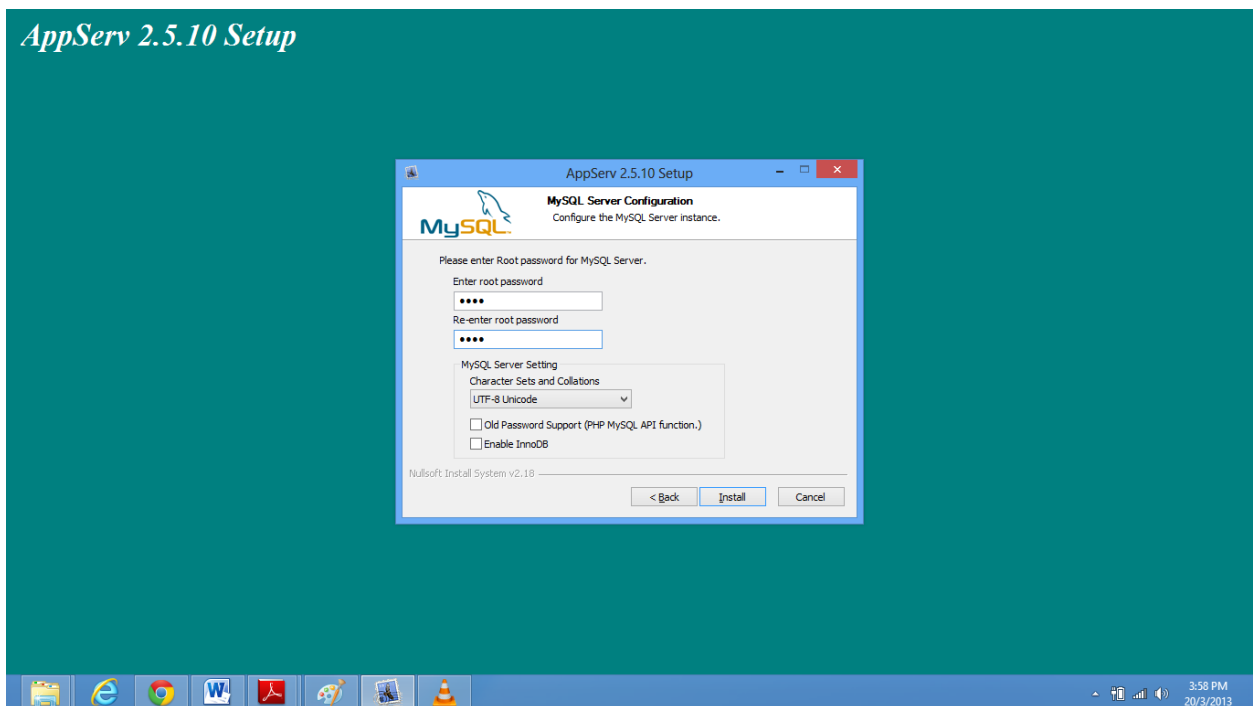
8. Enter "root" for the passwords and click on "Install".

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Appendix
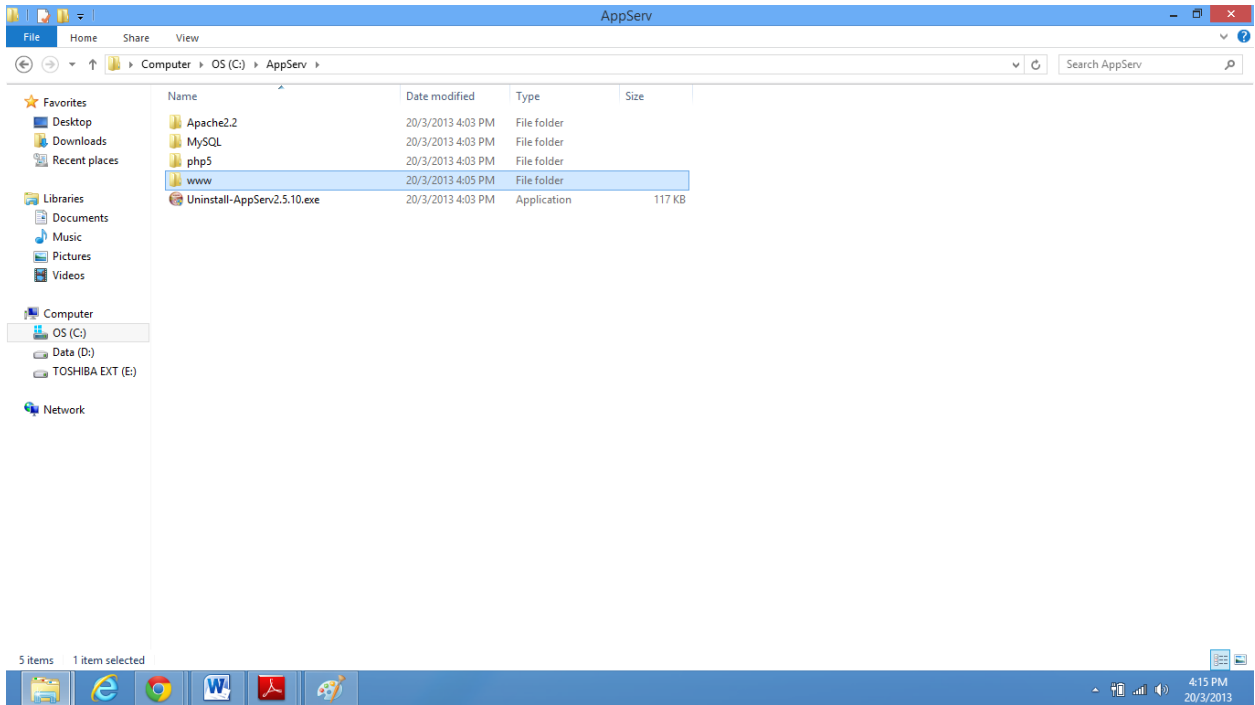
9. There will be a folder name "www" upon successfully installed. Put in the whole folder label "FYP" located in the cd into the "www" folder.

1.0.2   TCPDF

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Appendix

1. Download the files for TCPDF for report generation purpose from

http://sourceforge.net/projects/tcpdf/.
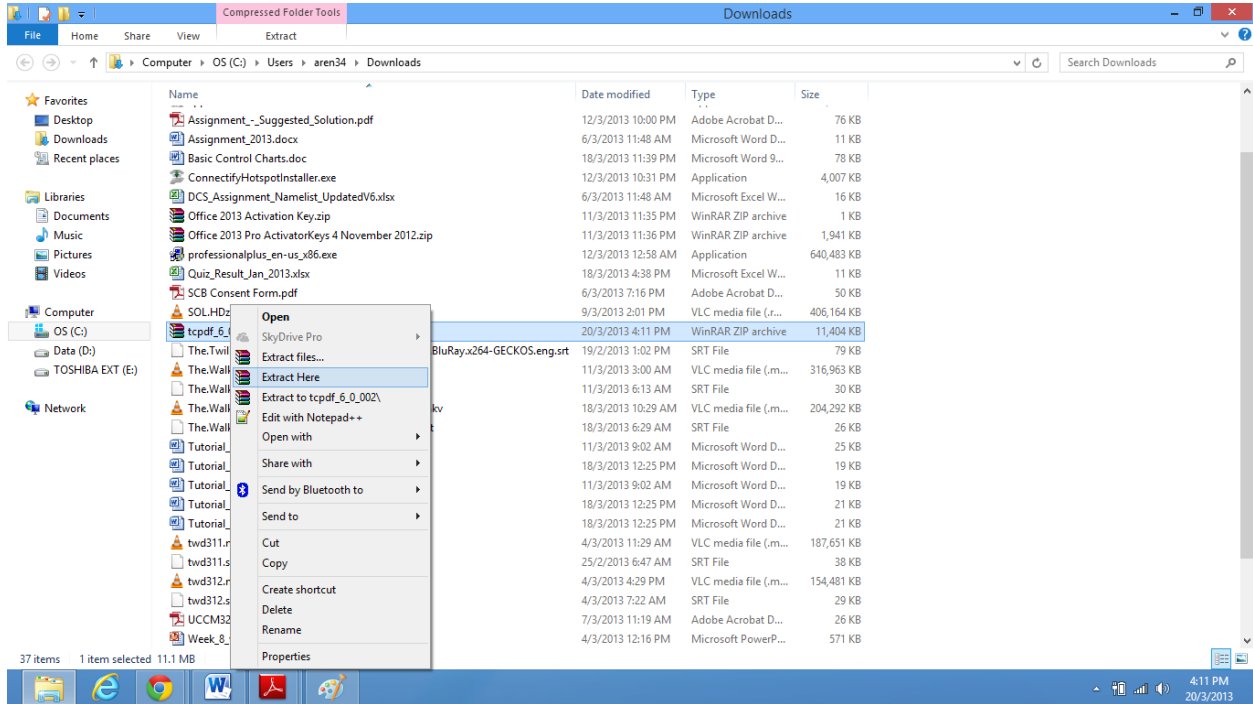
2. After finished downloaded, extract the file to obtain TCPDF folder.

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Appendix
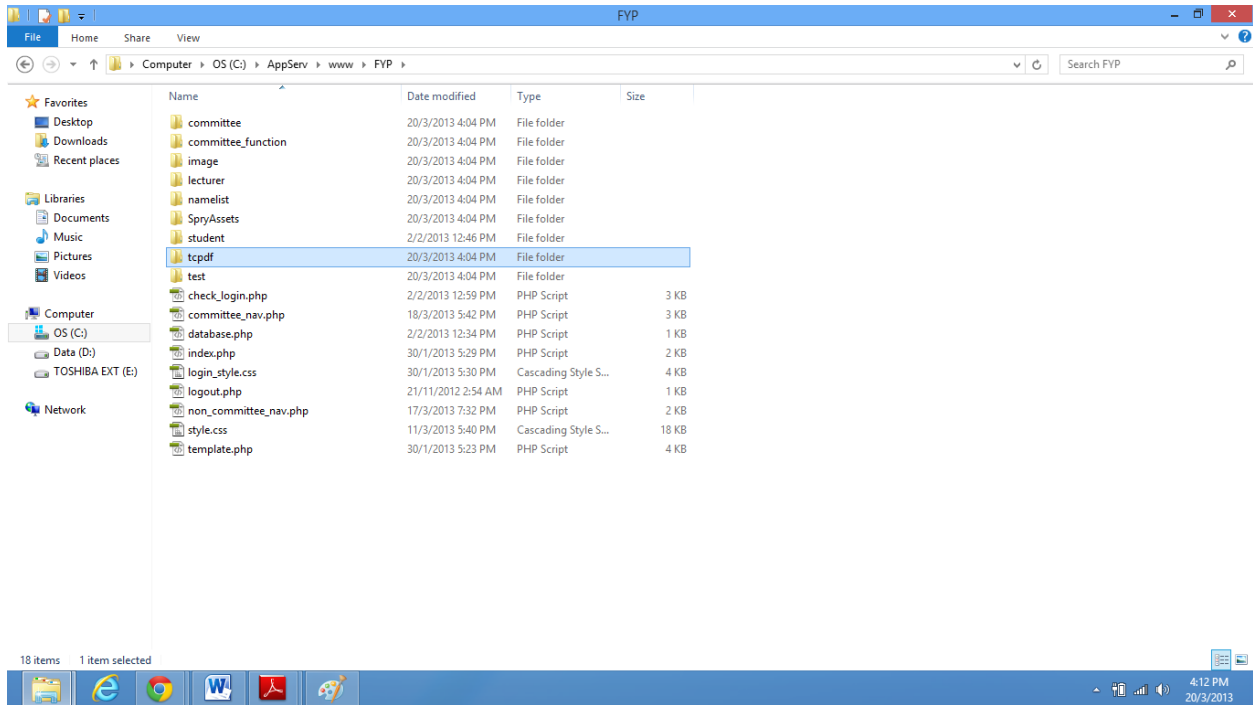
3. Copy the whole folder with the name "tcpdf" to the root folder of the files where the rest of the PHP files are kept, the destination by default should be at C:\AppServ\www\FYP.

1.0.3 Database MYSQL

1. Type in "localhost" at URL of any browser.

Appendix
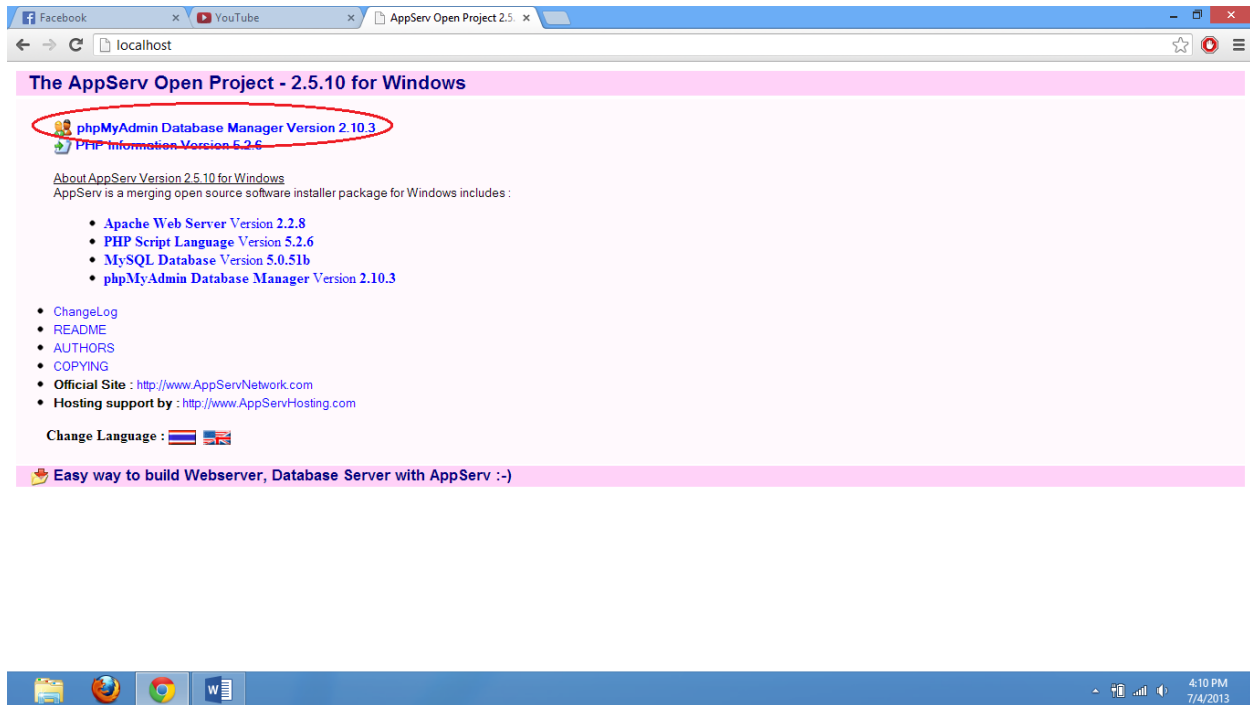
2. Click on the link as shown in the figure above.
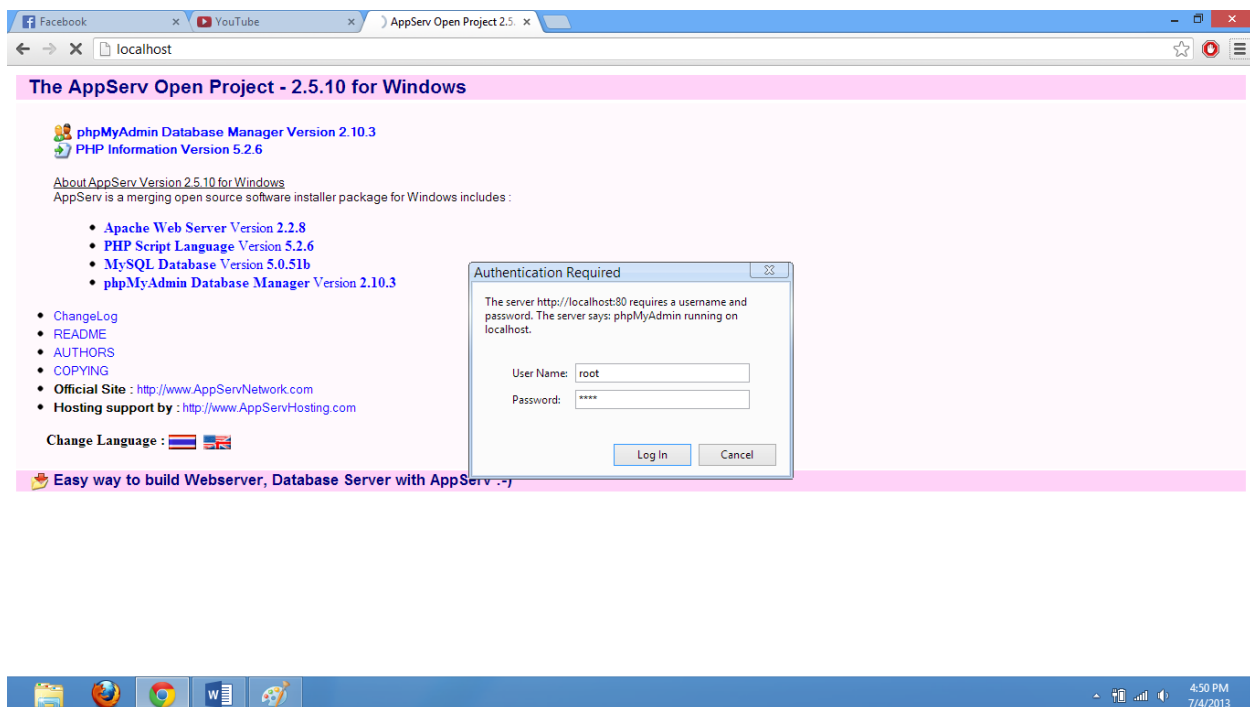
3. Type in "root" as username and "root" for the password.

_____
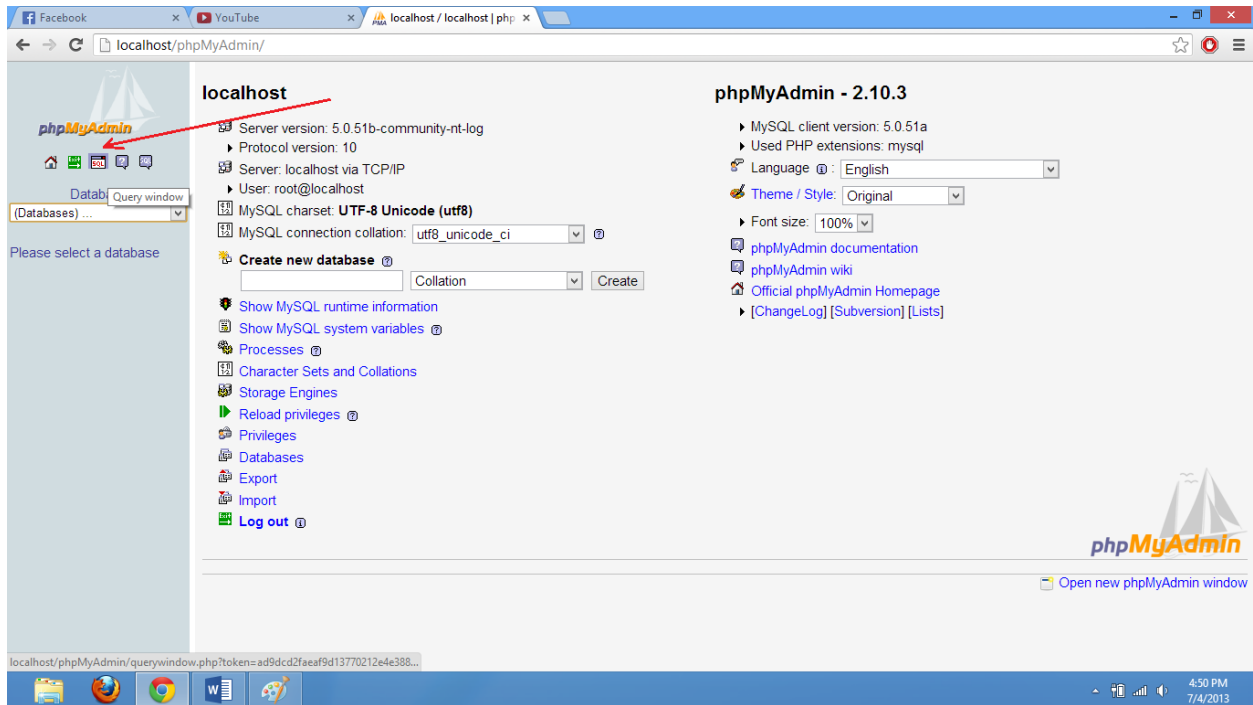
4. Click on the third option on the left hand side panel.
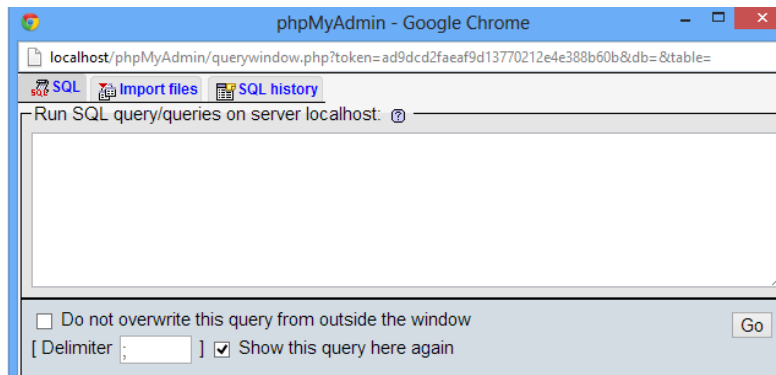
5. Run the query from the fyp.sql file located in the disc and click go to have the database ready for the system to use.

Once everything is installed, open any browser any type in localhost/fyp/index.php to access the login page for the FYP Management Portal.

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Appendix

2.0 GUIDELINES IN USING SYSTEM

2.1 LOGIN TO FYP MANAGEMENT PORTAL

The first screen that the user will see when he/she opens the index page of the system will be the login page.

On this page, the logo and the name of the system are being shown. At here, the user is able to input username and password on the textboxes located at the center of the screen. Once the user has key-in the values, the button with the label "Login" can be clicked to log into the system. However, if the user wanted to clear of every value of the textboxes, he/she can click on the "Clear" button. A disclaimer is being placed at the footer of the page.

Appendix

Upon successful login from the login page, the user will be redirected to the main page of the system which is the "Profile Page" which shows the details of the user which includes the name, email, department, room number and area of expertise. There is a button "Edit Profile" located at the bottom of the details which enable the user to edit the personal information. As for the overall layout of the system, the header can be found at the top of the system, the navigation bar at the left hand side, content on the right and footer at the bottom of the system.

Appendix

2.2 UPLOAD STUDENT RECORD
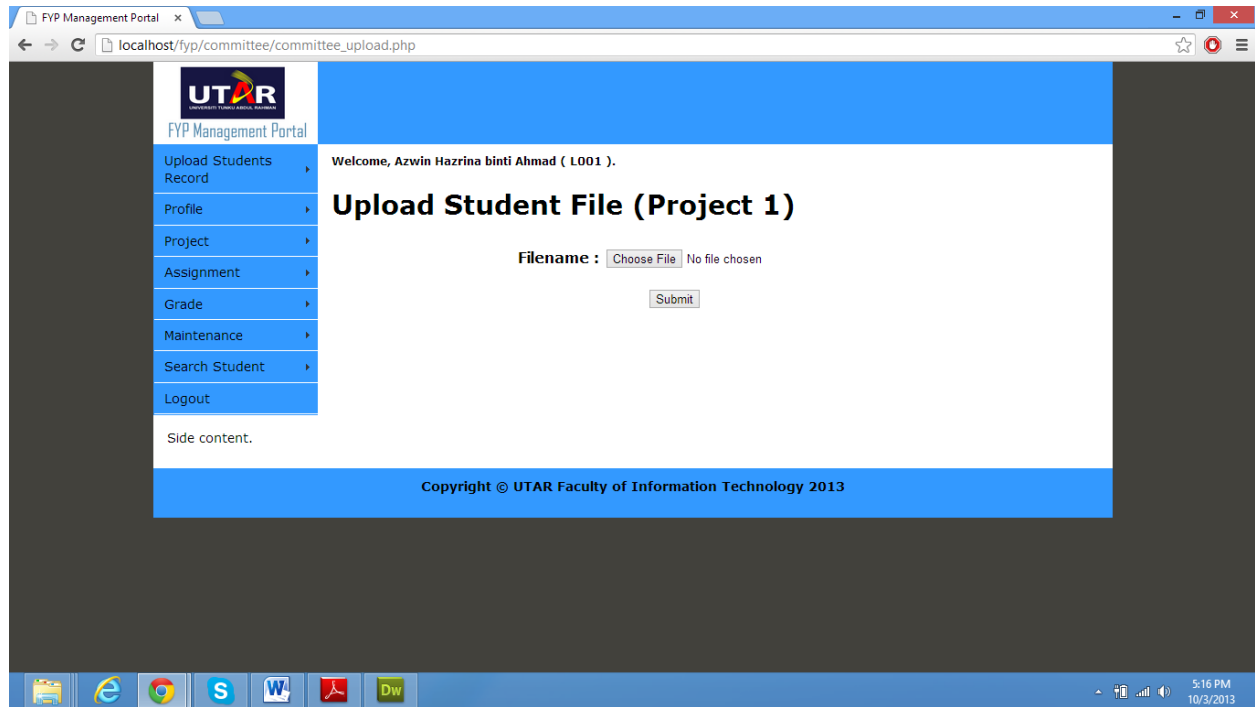
The figure above shows the page where the user is able to upload the file containing the names of the students who are taking Project 1 at that particular semester. The user may click on the "Choose File" button at the center of the page to browse for the excel file. After the file had been selected, a click of the button "Submit" will allow the names of the students to be inserted to the database of the system.

As for the student from Project 2, the steps are the same except that the students will have a field to identify the batch whether the student taking the Project 1 or Project 2.

Appendix

The content of the csv file should be exactly as the format shown below.

StuID	Name	Course	Batch_FYP1	StuPhone	StuEmail
S001	Ng Si Kai	IA	201301	016-5012011	sikai@hotmail.com
S002	Benson Law	IB	201301	016-5012010	benson@hotmail.com
S003	Chan Wai Mun	CS	201301	012-5012016	waimun@hotmail.com
S004	Ong Yi Fen	CN	201301	013-5012016	ong@hotmail.com
S005	Lam Chun Fei	CT	201301	016-5012017	lam@hotmail.com
S006	Poon Yi Ling	IA	201301	011-5012016	poon@hotmail.com
S007	Tay Wai Leong	IB	201301	013-5412016	tay@hotmail.com
S008	Esmond Goh Dik Mern	CS	201301	016-1312016	esmond@hotmail.com
S009	Wong Zheng Qin	CN	201301	016-4812016	wong@hotmail.com
S010	Leong Kah Choon	CT	201301	016-5012111	leong@hotmail.com
S011	Lee Kong Chin	IA	201301	016-5012222	kongching@hotmail.com
S012	Ang Chin Tong	IB	201301	016-5012333	tony@hotmail.com
S013	Tang Boon Chong	CS	201301	016-5012789	tanf@hotmail.com
S014	Goh Seng Ling	CN	201301	016-5012951	gohsl@hotmail.com
S015	Kau Kean Yuen	CT	201301	017-5012456	kauky@hotmail.com

Appendix

2.3 EDIT PROFILE

2.3.1 EDIT BASIC INFO
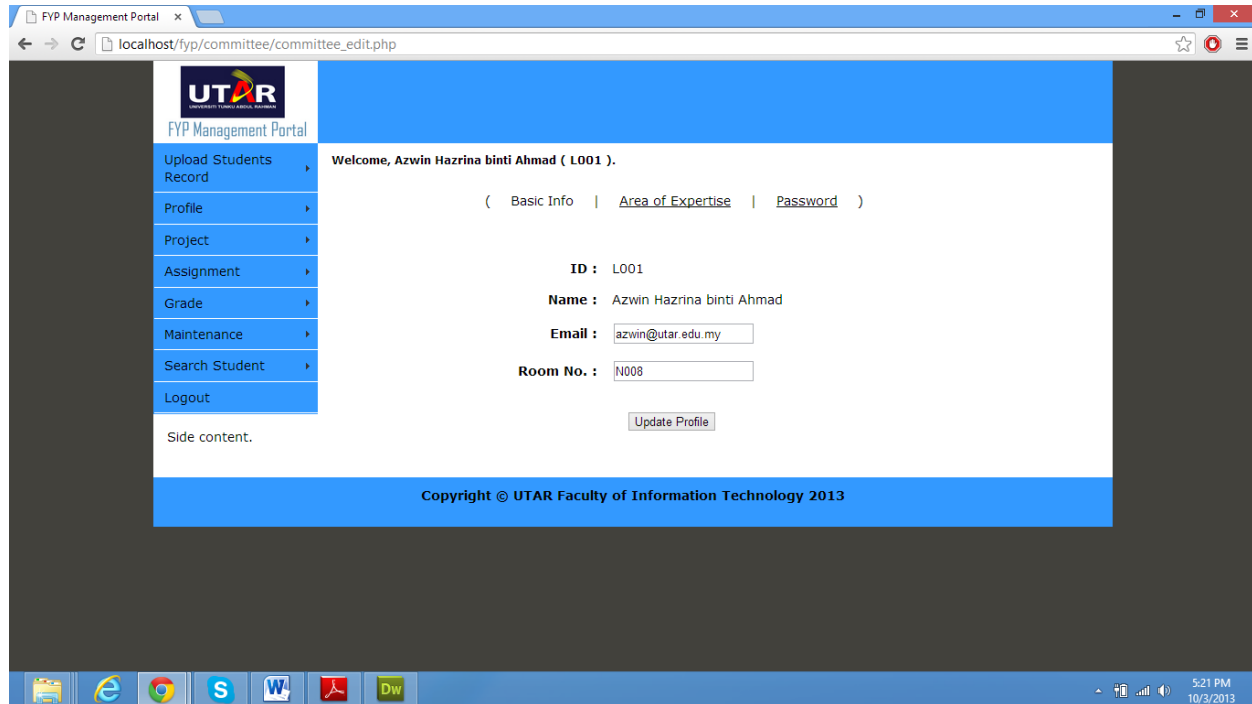
The page above can be accessed through the navigation panel on the left by clicking the Project->Edit Profile. Alternately the page could also be reached from the "Edit Button" from the view profile page.

At this page, there is a tab which allows the user to choose what kind of information that the user wanted to change. The first option on the tab is the "Basic Info" which enables the user to edit the email address as well as the room number since these fields can be changed from time to time. On the other hand, the ID and Name could not be changed from the system directly.

2.3.2 EDIT AREA OF EXPERTISE
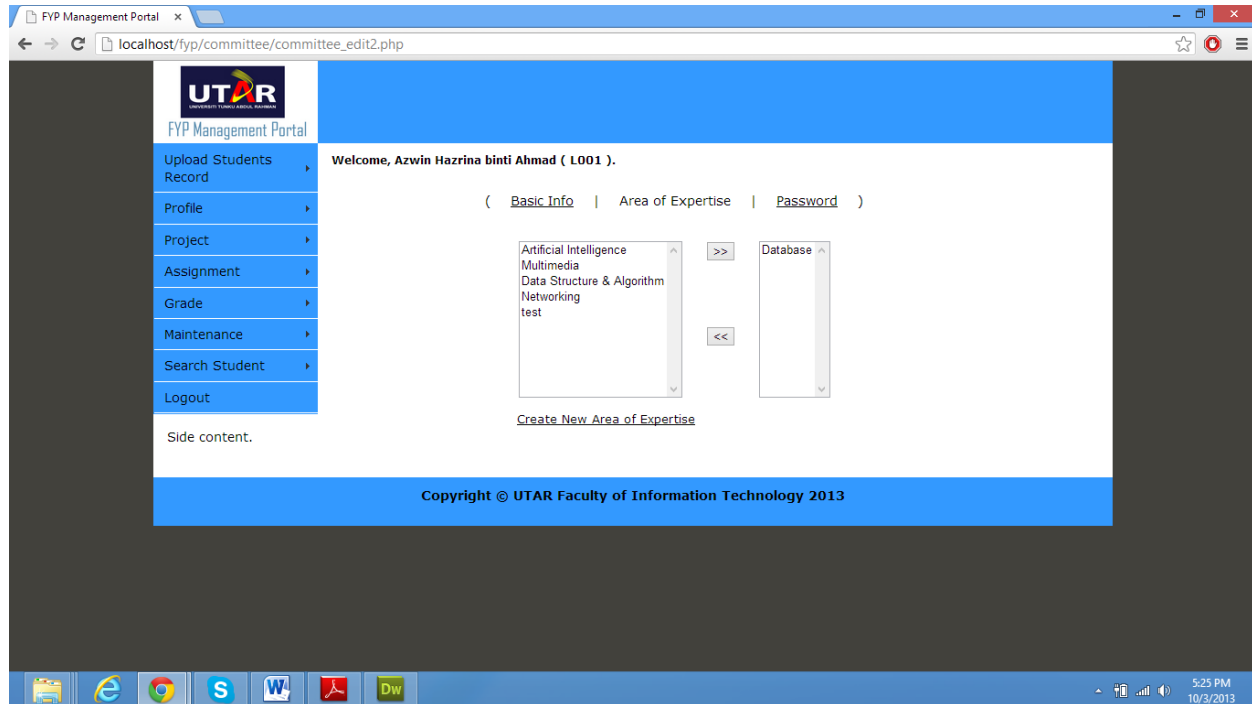
At the second option of the tab which will redirect the user to the "Area of Expertise" page, user is able to choose the area of expertise that he/she is in. In here, there are two list boxes where user can choose from the pool of expertise on the left to transfer it to the right hand side of the list box which the user is currently in through the clicks of the button at the middle of the list boxes.

If the area of expertise is not in the list, the user can create a new expertise by clicking on the link at the bottom of the left hand side list box. A pop-up box as shown in figure 5.7 will allow the user to enter the name of the new area of expertise and add it into the list box on the left hand side.

Appendix
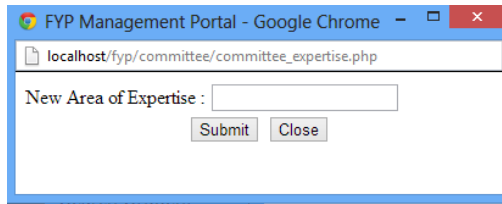
2.3.3 CHANGE PASSWORD

The page above enables the user to change the password for the login by inputting current password together with the new password. When the button "Change Password" is clicked, the user will have to login with the new password next time, else the "Clear" button can be used to clear off all the things entered.

Appendix

2.4 VIEW SUPERVISED AND MODERATED STUDENTS

This page allows the user to view the students that are being supervised or moderated by the user himself/herself. The details of the students such as student ID, name, course, phone number and email addresses would be shown on this page and can be edited by clicking on the "Edit" button at the right hand side of the record. The moderated students page have the same view but without the edit and delete functions.

Appendix

2.5 EDIT SUPERVISEE'S DETAILS
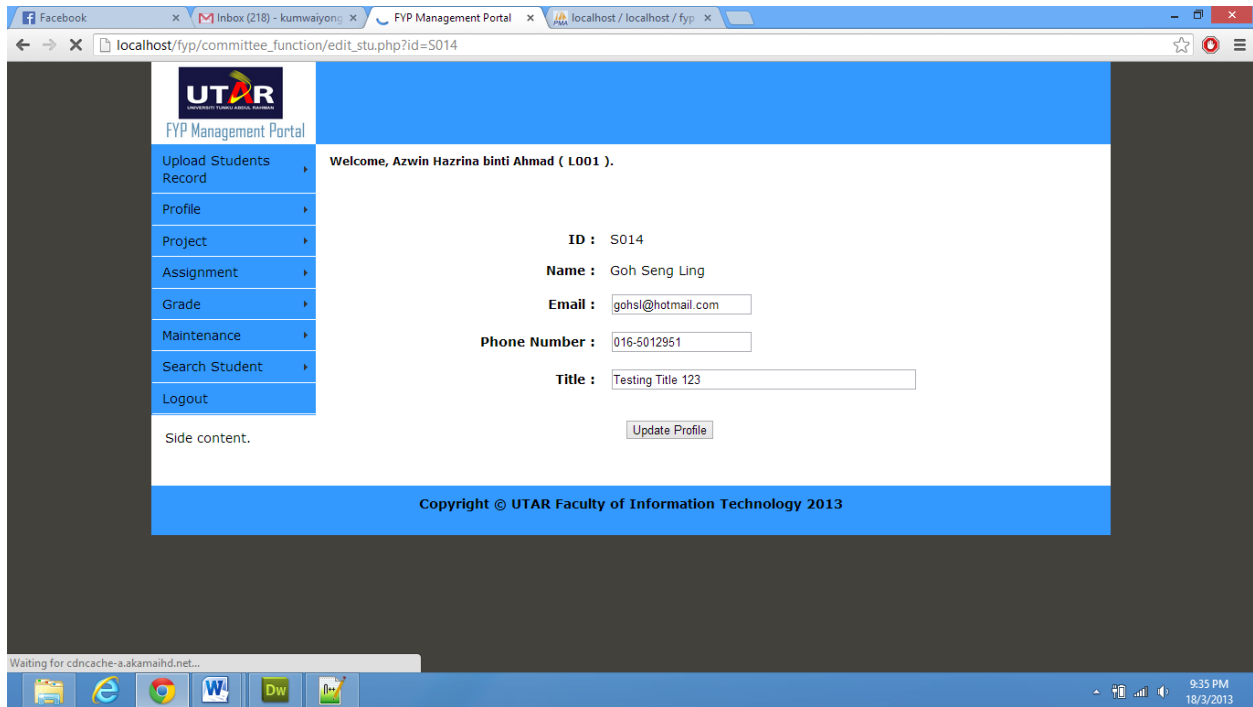
When the button "Edit" is being clicked, the system would redirect the user to this page to edit the student details such as email address, phone number and project title. To update the details, just click on the "Update Profile" button at the bottom of the page.

Appendix

2.6 VIEW PROJECTS DETAILS

The view project page shows the projects that proposed by the user. There are project with active status which the user allow the student to choose as their final year project title while there is an inactive project table which the user proposed but not yet ready to be chosen by the students.

On the same page, the user can choose to edit the status of a project whether to make it "Active" or "Inactive. The active projects will go to the top of the page while the inactive project will go to the table below the active project. The adjustment can be made by choosing the status from the dropdown list located at the right hand side of the tables and click on the "Update Project Status" to confirm the changes.

Besides, the projects can also be deleted by pressing the delete link at the bottom of the tables. Check the projects and click on the delete button. A confirmation message will pop-out to ask for the confirmation to delete certain project.

At the bottom of the page, there is a part where the user is allowed to choose the batch to view back the history of the proposed projects.

Appendix

2.7 VIEW PROJECT HISTORY

This part will allow the user to view back the old project titles which proposed by the users before in previous semesters.

Appendix

2.8 ADD NEW PROJECT

This page enables the user to fill in the title name, objective, innovative, deliverables, number of student, suitable course and the skill required for the new project. The skill required are using the concept of two list boxes where the user can add the available skills in the pool to "Your Selection" on the right hand side which will be included in the new project. If there skill required is not in the list, he/she can always create a new skill from the link located below. After that, click on the "Add Project" to create a new project for that particular semester.

2.9 EDIT PROJECT
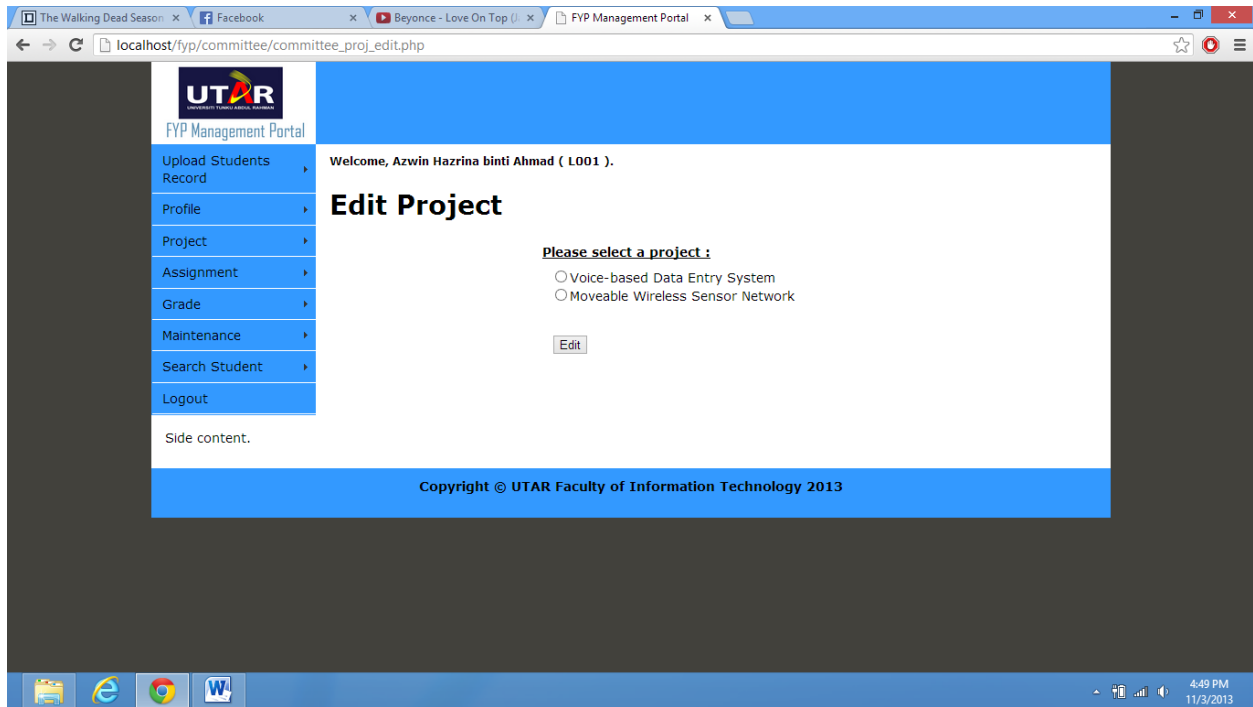
This page allows the user to choose for the existing projects of the user which is under his/her name. A click of the radio button at the left hand side would highlight the project that the user wanted to edit. Click on the "Edit" button will allow the user to edit the details of the project in which the screen layout would look similar to the figure 5.12.

Appendix

2.10 ASSIGN SUPERVISEE

Every lecturer is allowed to assign their supervisee where the lecturer can select the student from the name list as shown in the figure above. To assign a student, click on the radio button located at the right hand side of the record and enter the project title at the namelist below. Upon completion, click on the "Assign" button to have the supervisee assigned to the lecturer.

Appendix

2.11 ASSIGN SUPERVISOR

At this page, a list of the student will be appear at the top part of the page which the list can be filtered by courses such as IA, IB, CS, CN and CT as well as "Unassigned Student" category where the students did not register with their supervisor before the due date.

To assign a student with the supervisor, the user have to click on the radio button at the name list containing the name of the student, then at the name list at the bottom of the screen which is the name list of the lecturer, click at the second radio button. This would match the particular student with particular supervisor. Once this is done, a click of the button "Assign" would assign the supervisor to that particular student. After the assignment has been completed, a message will pop-up to notify the user that the assignment has been successful.

The name list of the lecturer can also be filtered by the department such as "Information System", "Computer Science" and "Computer and Communication Technology". The expertise in which they are in can be view at the table. The workload of FYP 1 and FYP2 together with the total can also be seen from to table.

Appendix

2.12 PROMOTE MODERATOR
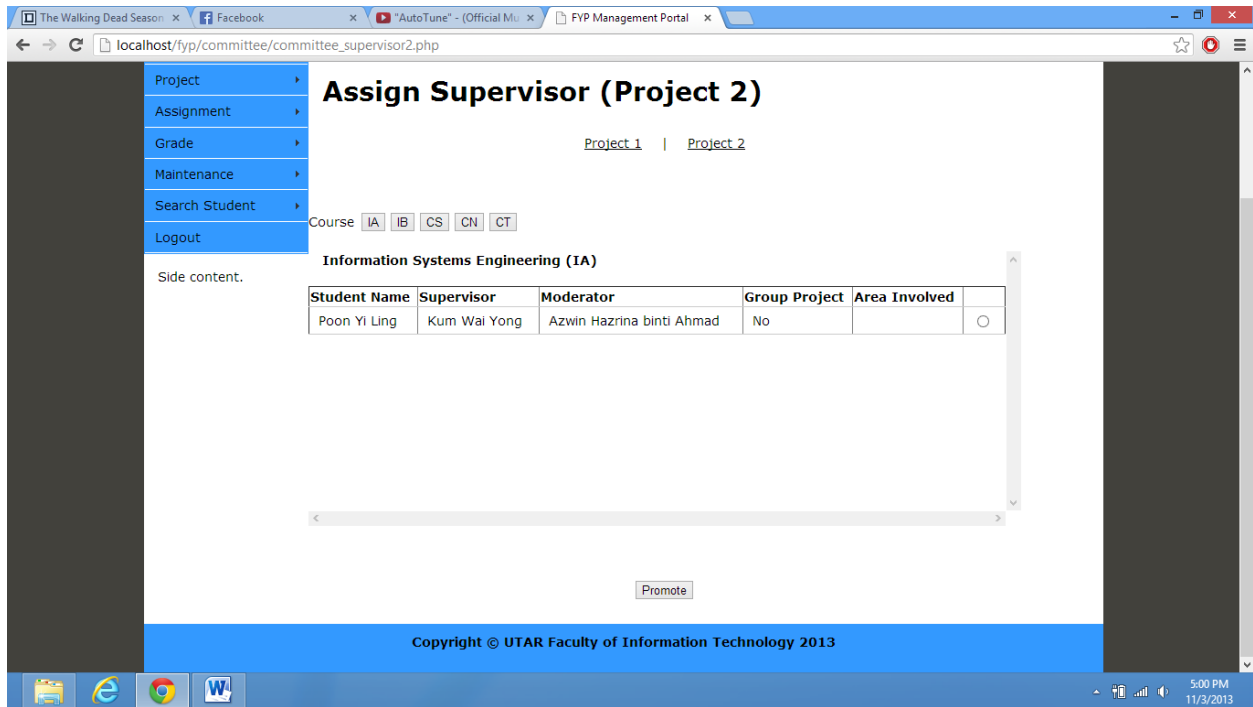
The project 2 supervisor assignment would be different from the project 1 as the supervisor would be the moderator of the student who can be promoted by the user of the system by clicking on the "Promote" button after selecting the name of the student.

The promotion of moderator only happen when the supervisor of the student in project 1 has resigned or on-leave during that particular semester.

2.13 VIEW STUDENT-SUPERVISOR LIST

In this page, the user is able to print the report for the student-supervisor list which can be sort by course or supervisor. This report also consists of the students who are currently taking project 2. There will be a "Print Report" button located at the bottom of the page which allows the user to print the report for future use or decision making.

Another type of report that the user may want to produce would be newly-updated supervisor report which shows all the names of the supervisors and students who are newly assign not long ago. The list can be clear off with the "Clear" button located next to the "Print Report" button.

2.14 ASSIGN MODERATOR
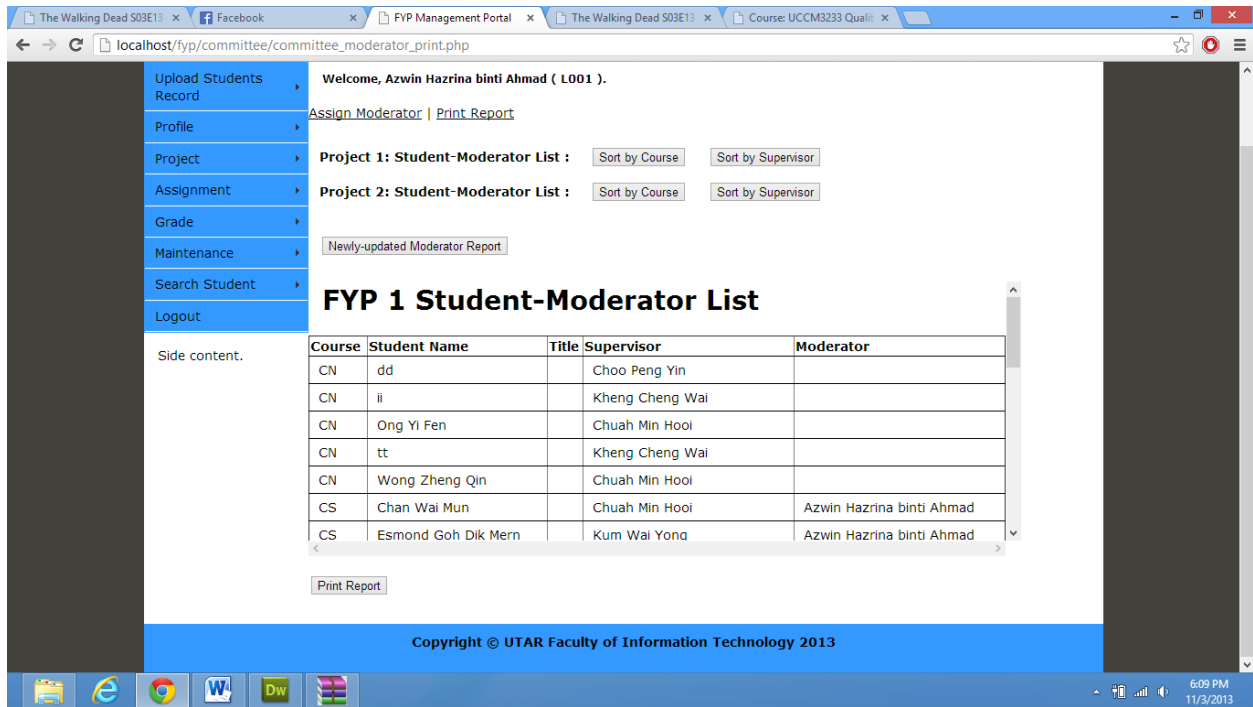
This page allow the moderator to be assigned to a student which is similar to the supervisor assignment page where two radio button have to be clicked which are from the student list and another one from the lecturer list before the "Assign" button is click. The moderator assignment for the project 2 is same with the project 1. A link is available for the user to print out the report for the moderator assignment which is also similar to the report in supervisor assignment.

Appendix

2.15 VIEW STUDENT-MODERATOR LIST

The moderator assignment report can be produced by clicking on the link located at the top of the moderator assignment page. The student-moderator list will be produced and the list can be printed. The list can also be filtered to be sort by course and supervisor.

2.16 GRADE ENTRY

At this page, the user is allowed to enter the mark for the supervised student in project 1 and project 2. The textbox allow only numbers and the numbers must be within the range of 0 to 100. Once the user has key-in the mark, the grade at the right hand side will be automatically updated. The user can click on the "Save" button to save mark. Once the user submit, the data of submission will be recorded and if the due date is more than today date, then the lecturer is not able to enter the mark anymore.

Appendix

2.17 EDIT LECTURERS' STATUS

At this page, the user can change the status of all the lecturers. There are three status which they lecturer may have. The first status is the "Active" status where the lecturer will be active during that semester. The second status would be "On-leave" where the lecturer would not be around the campus during that time. The last status would be the "Resign" status where the lecturer has already resigned. The record for that lecturer however will not be deleted from the database.

The status can be changed by selecting status from the dropdown list. Once the status has been selected, a click at the button "Submit" will update the particular lecturer's status.

Appendix

2.18 ASSIGN FYP COMMITTEE
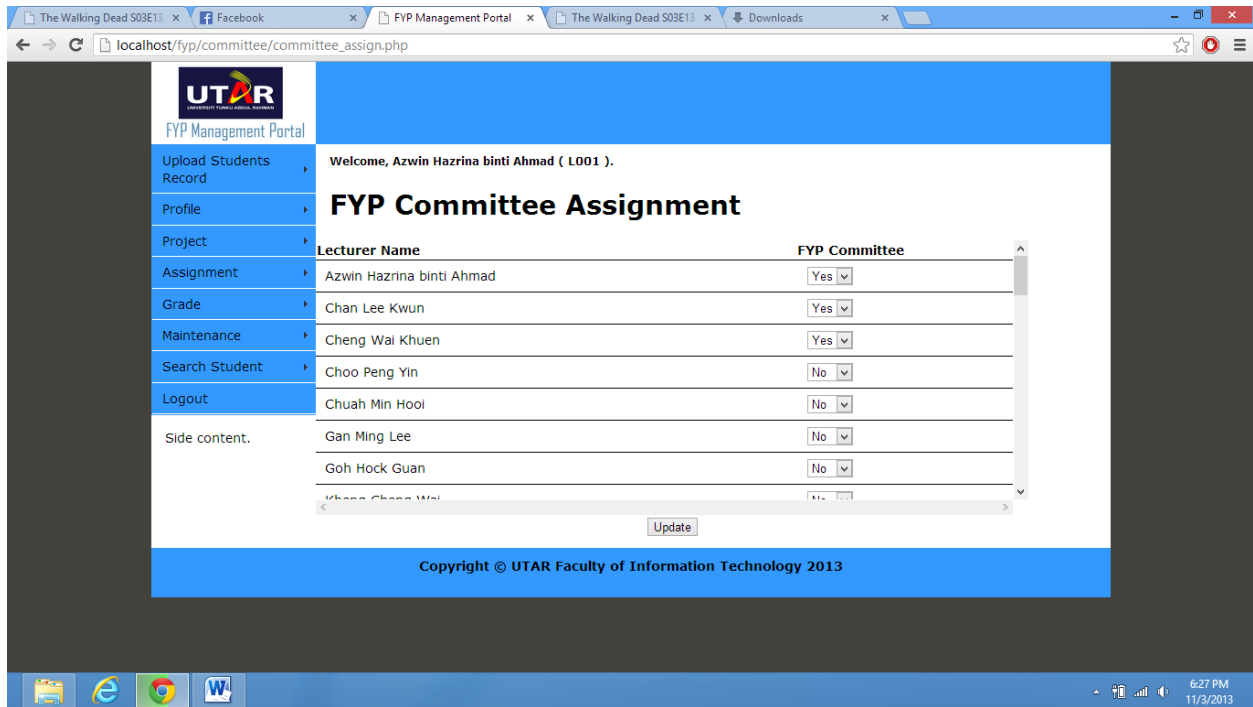
The user is allowed to assign a lecturer to become committee member by changing the selected value of the dropdown list. The process can also be reversed, that is a FYP Committee status can be revoked.

Once the value in the dropdown list has been highlighted, a click at the button "Update" will update the status of the lecturer.

Appendix

2.19 ADD NEW LECTURER

This page enables the user to add new lecturers where the details that can be inserted would be the lecturer ID, password, name, email, department, room number, FYP committee and the area of expertise he/she have. There is also a link where the user can insert a new area of expertise if the area of expertise is not in the available pool list. Upon completion of all the details, user can click on the "Create Account" button at the bottom of the page to create a new lecturer account.

Appendix

2.20 MANAGE SEMESTER TIMELINE
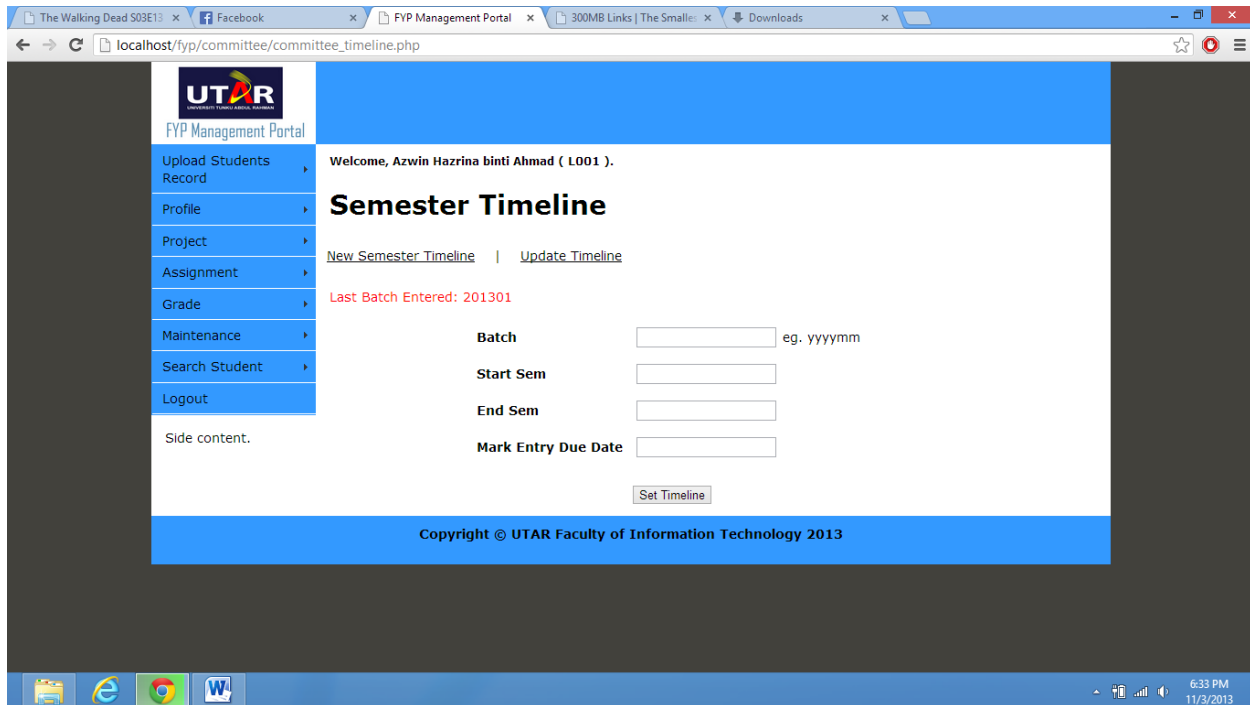
This is the page where the user can enter the new semester timeline for the current system. This includes the batch ID which is the batch that the current semester is in. The start date and end date for this semester must be included as well. Another date that the user must include is the mark entry due date to ensure that all the supervisors input the mark before the due date. After filling up the details, a click of the button "Set Timeline" will update the details of current semester.

The semester timeline can also be updated from time to time by accessing the link known as "Update Timeline".

Appendix

2.21 SEARCH STUDENT
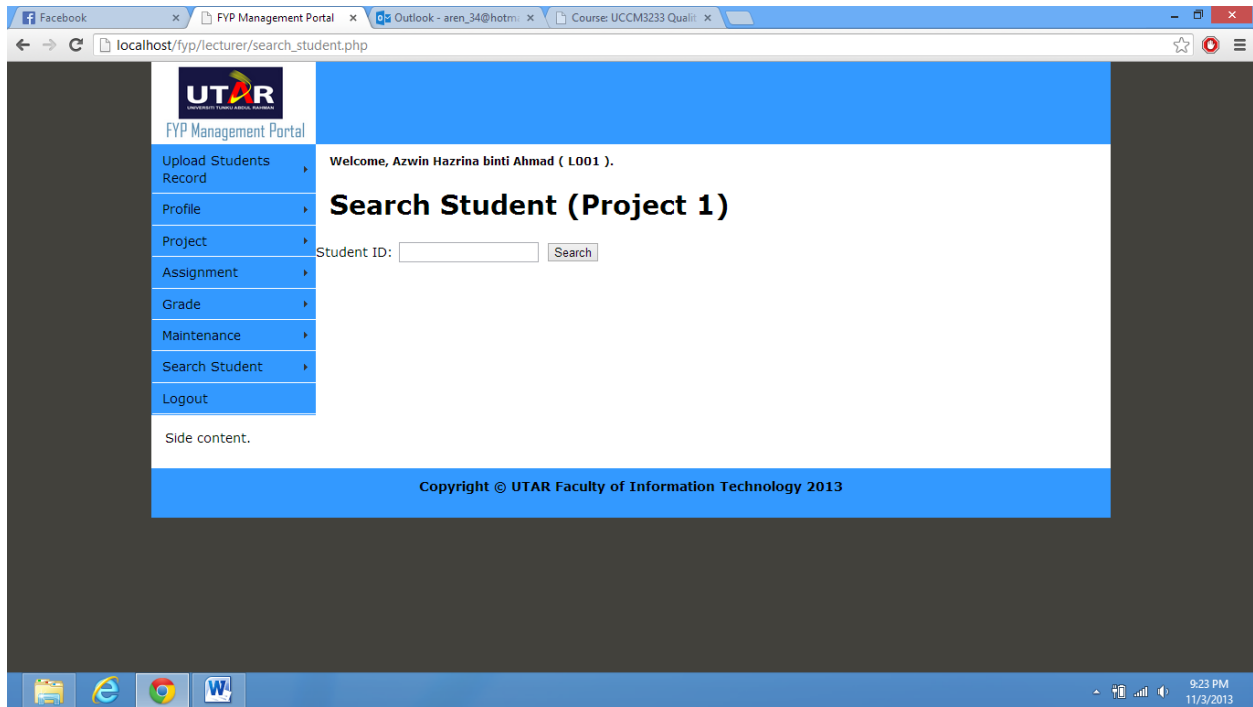
The page allows the user to search the student based on the ID. The result return from the system would be the details of the student which includes his/her supervisor and moderator.

If the student contained a failed record before, the history of the record will be shown as well.

Appendix

There will be two tables which show the current record of the student as well as the history of the student record (if there is any). If the student didn't failed before then the record for the history table would be empty.

2.22 REPORT GENERATION

Appendix
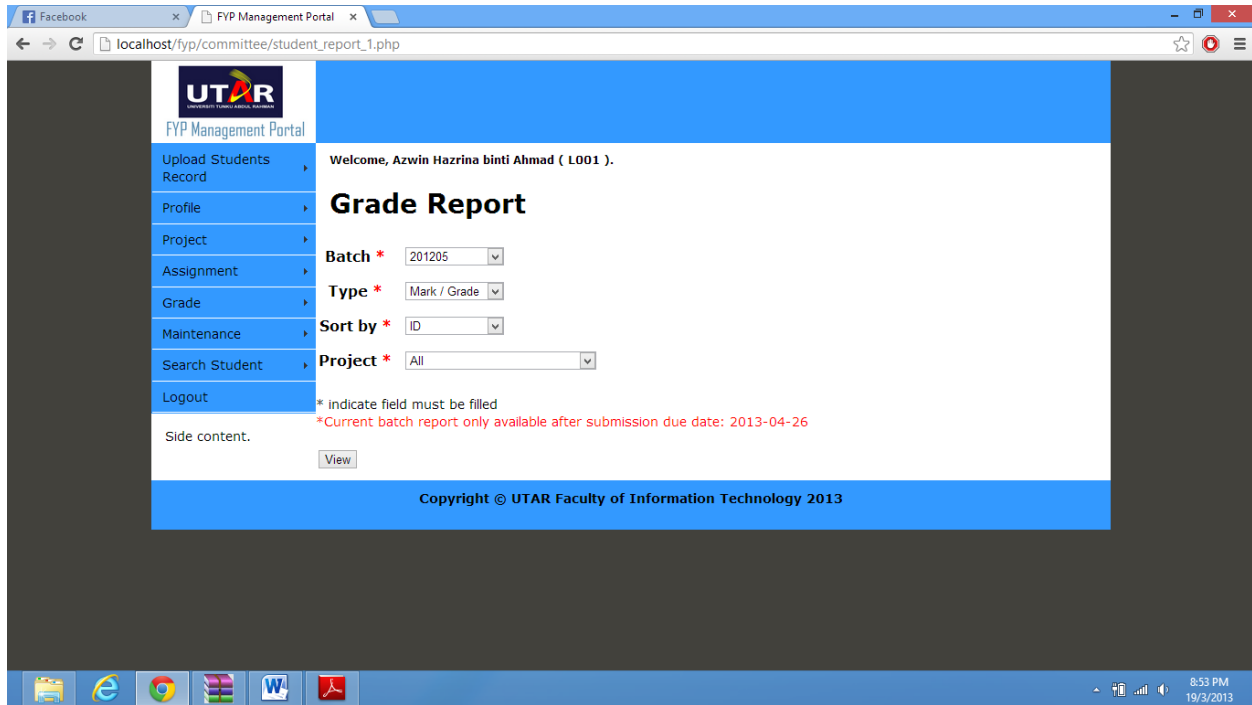
At this page, user is allowed to choose the type of report to produce. Once the four options are selected, click on the "View" button to generate the report as shown in the image below.

Appendix

Grade Report

Overall Result

Batch: 201205

UCCD3583 Project 1

StudentID	Name	Course	Title	Mark	Grade
S002	Benson Law	IB			
S003	Chan Wai Mun	CS			
S004	Ong Yi Fen	CN			
S005	Lam Chun Fei	CT			
S006	Poon Yi Ling	IA		90	A+
S007	Tay Wai Leong	IB			
S008	Esmond Goh Dik Mern	CS			
S009	Wong Zheng Qin	CN			
S010	Leong Kah Choon	CT			
S011	Lee Kong Chin	IA			
S012	Ang Chin Tong	IB			
S013	Tang Boon Chong	CS			
S017	qw	IB			
S018	ew	CS	test		
S019	tt	CN			
S020	r	CT			
S021	uu	IA			
S022	yy	IB			
S024	ii	CN			
S025	kk	CT			
S026	hh	IA			
S027	gg	IB			
S028	ff	CS	ff		

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The report generated can be save as pdf file and can be printed.

Appendix

2.23 SUPERVISEE REPORT

The user can also generate supervisee record for the details of supervisees.

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Appendix

The output would be a report that can be saved as pdf file and can be printed.

2.24 LOGOUT
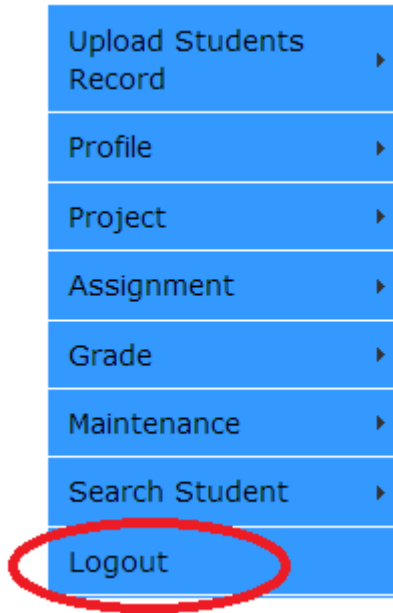
Users can logout from the system by clicking on the "Logout" button at the navigation bar.