UTP Project Monitoring System

by

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Universiti Teknologi PETRONAS

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CERTIFICATION OF APPROVAL

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CERTIFICATE OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.

NURUL AAIN BINTI MOHD ISMAIL

ABSTRACT

Projects are exposures to students in practical problems of the studies and provide dynamic unscripted learning opportunities for students. However, students facing bundle of problems at managing their project with the current project monitoring process by lecturers which result to passing deadlines and unsatisfactory outcome. This objective of this thesis is to develop an online project monitoring tool for lecturers and students to monitor project progress. It aims to monitor students' projects, thus, assist students toward better managing project which resulted to producing better outcome. Methodology used in developing this project is the throw-away prototyping technique. Result section discussed on the software architecture of the system and system functionalities. System functionalities are categories in 3 categories that is monitoring of projects, administrating system and managing account. For future work, the research suggests to combine the current course management system with this project.

ACKNOWLEDGEMENT

Through the whole process of developing this project, I have included many people from diverse backgrounds to assist me in gathering information and knowledge, helping me to clarify some uncertainties, and at the same time provide me with useful guidance on subjects which are not within my expertise area.

First and foremost, I would like to thank my supervisor, Ms. Elaine Chen Yoke Yie who has continuously given me support and guidance to improve my project in terms of reporting and such.

At the same time, thank you to all my course mates, Business Information Systems Students of July 2005 who is always there for me to ask questions and show some support and given useful guidance on matters in which I overlook during the whole process.

Last but not least, thank you to my family and friends who has supported and motivated me in completing this project.

TABLE OF CONTENTS

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDIES

In the working world, there exists a shortage of highly skilled individuals. Beyond the technical skills, employers expect graduates to demonstrate and polish in other soft skills such as teamwork, group development and project management [1]. To fulfill the demand of the employers, universities such as University Technology Petronas (UTP) has determined student project as an integral part of students' studies. Projects expose students to the practical problems of the studies and provide dynamic and unscripted learning opportunities for students [2]. However, students facing bundle of problems at managing their project works which result to passing deadlines and unsatisfactory outcome.

Cook and Olsen (2006) believe that projects best illustrate the foundations of project management principles [3]. Project management involves in planning, estimating and scheduling the activities needed to achieve the desired levels of quality and performance within the limitation for cost, schedule and resources [4]. To achieve desired levels of quality and performance in students' project, therefore, consistent monitoring in project management is vital as it is the most crucial part of project management.

1.2   PROBLEM STATEMENT

Students often have difficulty to manage their project individually and in group. The current way of offline monitoring arises several problems:

- Poor communication caused by distraction, misinterpretation and noise
- Lack of cooperation and commitment by group members
- Lack of knowledge
- Conflicts between students' and lecturers' schedule

Consequently, these result to handing in the projects beyond the deadline and disappointing outcome. An online project monitoring tool can help the lecturers and students to reduce the problems faced by offline monitoring.

1.3   OBJECTIVE AND SIGNIFICANCE OF SYSTEM

The objective of this thesis is to develop an online project monitoring tool for lecturers and students to monitor projects progress.

These are the benefits it aimed to bring to the students of UTP:

- i.   Create an online platform for students and lecturers to communicate and share knowledge
- ii.   Allow lecturers to share documents that are related to the project
- iii. Remind the students of the deadlines.

1.4 SCOPE OF STUDIES

The functionalities of this system will have to meet the expectation of only the end users; lectures and students of UTP. The system main function should include elements that will be beneficiary at monitoring the students' project and help students to have better understanding on their project. The system focuses on communication functionality of project monitoring. The reason for taking communication as the focused functions is because they are the most problematic area for students at managing their project.

Scope of studies includes research in understanding the project management guidelines specifically in monitoring and controlling and the concept of computer supported cooperative work (CSCW). Consequently, implement the research to develop a project monitoring system that is web-based.

CHAPTER 2

LITERATURE REVIEW

2.1 PROJECT MANAGEMENT

People nowadays have put deep interest in project management. According to Schwalbe (2007) [5], Project Management is defined as "the application of knowledge, skills, tools and techniques to project activities to meet requirements".

Project Management Process consists of five (5) processes. They are initiating process, planning process, executing process, monitoring and controlling process and closing process. Of all the processes, monitoring and controlling process is the most crucial process of all as it is done throughout the project.

Monitoring and controlling processes include measuring progress toward the project objectives, monitoring deviation from the plan and taking corrective action to match progress with the plan. It is very important to monitor and control to ensure these changes are made efficiently and effectively to meet project objectives. Monitoring and controlling processes overlap all of the other project management process groups because changes can occur at any time.

Many articles have supported the importance of control in the achievement of the project aims and objectives. Rozenes, Shai (2006) strongly agreed and declared that it is widely recognized that planning and monitoring plays a major role as the cause of project failures. Despite the continuous evolution in the project management field, it appears evident that the traditional approaches still show a lack of appropriate methodologies for project control [6].

2.2   PROJECT MANAGEMENT SYSTEM

The success of a project is achieved upon a variety of factors that interconnect in complex ways. These include the task, formal and informal team processes, individual team member characteristics and contributions, resource constraints, organizational context factors, and, in the case of distributed, or "virtual," teams, technology availability and use [7]. Figure 2.0 represents a systems view (input process-output) of group work supported by a number of researches.
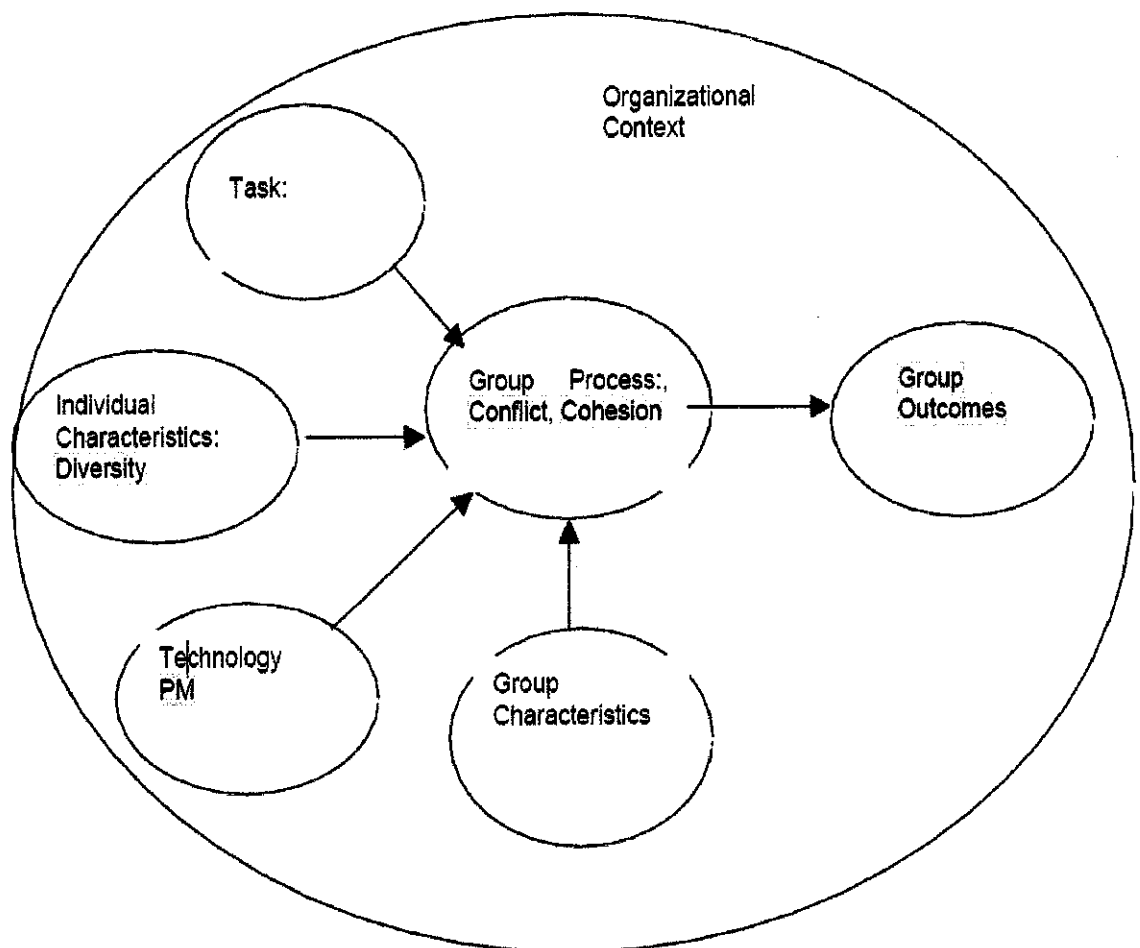

Figure 2.0: Research Context - Conceptual Model

Concept	Meaning/Dimensions	Measures in This Study
Task	Generic: Brainstorming, Problem-solving Domain: System design, product innovation	
Technology	Project Management Individual and Group Tools ICT Infrastructure, access, training	Formal methods re: PMBOK e.g., Agenda, Schedule, Milestones, Role Definitions, Group Contract
Organizational Context	Culture, Structure, Resources, Management	
Group Characteristics	History, Size	
Individual Characteristics	Skills, Knowledge, Personality, Demographics, Cultural Background	Demographics
Group Process	Conflict Cohesion Trust Stages of Development	Conflict, Cohesion, Stages of Development
Group Outcomes	Performance (Quality, On-time, Within Budget) Satisfaction Emergent Structure	Performance (Deliverable Quality), Satisfaction

Figure 2.1: Dimensions and Measures

Discussion above stated that an outstanding technology such as a project management system is one of the factors contribute in achieving the success of a project. Having effective project management system is a crucial ingredient in guiding students towards successful completion their task and project works. Project management system is a phrase covering many types of software, including scheduling, cost control and budget management, resource allocation, collaboration software, communication, quality management and documentation or administration system, which are used to deal with the complexity of large projects [8]. As discussed in the scope of studies, this system focused on communication in project monitoring process.

2.3 COMPUTER SUPPORTED COOPERATIVE WORK (CSCW)

Computer supported cooperative work (CSCW) is the study of how people use technology, with relation to hardware and software, to work together in shared time and space. CSCW began as an effort by technologists to learn from anyone who could help them better understand group activity and how technology could be used to support people in their work. These specialists spanned many areas of research, including economists, social psychologists, anthropologists, organizational theorists and educators [9].

There are two dimensions to CSCW that are space and time. Figure 2.3 shows examples related to the project in the usual CSCW quadrants. One kind of information sharing is when the students meet the lecturer to discuss on a project. This situation is fall under the 1st CSCW quadrant, where they share the same time and place. Another quadrant is when the students read the notice board in the study room, where lecturers posted new projects and idea for the project on the notice board. Hence, they share the same place, but visit the location at different times. The information shared in this instance need not be shared immediately and is generally formed over time, but is still relevant to the totality of the project. This example would fall under the 2nd CSCW quadrant.

If the information is in need immediate sharing, they are sharing their time and performing synchronous sharing. The examples of synchronous sharing are instant messaging and whiteboard conferencing. Although the students are not in the same place, each individual is connected by time that they share. This example would fall in the 3rd CSCW quadrant. If the students leave discussion on the message board in the project monitoring system to be review by lecturers not necessarily at the same time, they are not sharing time. This is termed asynchronous sharing. The other students will only get information once they read the online message board. This example will fall in the 4th CSCW quadrant. In the example above, the students are not in the same place when the information is shared. They are therefore distributed.

7

TIME		
	Same Time (*Synchronous*)	Different Time (*Asynchronous*)
Same Space	*1st Quadrant* Ad-hoc conversation, group meeting	*2nd Quadrant* Design room, notice board
Distributed	*3rd Quadrant* Instant messaging, white-board conferencing	*4th Quadrant* Online message board, Email

Note: Left side label reads SPACE

Figure 2.2: CSCW Quadrants

2.4   CAMPUS'S USE OF CSCW SYSTEM

In this modern era, technology plays a big role in everyone's life. CSCW system is used regularly to facilitate cooperation and communication among people. In the education at the university, CSCW has changed a lot in the practice of education. The reason to change is an emerging shift in the ways of how people gather and distribute information. A research by Jeusfeld in 1998 claimed since the rise of the World Wide Web the number of technical reports manually published by IT department at Aachen University declined to less than 50%. The cause of the decline is not because there is less research being done, but it is because people found it convenient to publish the papers on the Web home page [10].

The change has been massive; students and lecturers often use Electronic Mail (E-Mail) and Instant Messaging (IM) for most of communication purpose. Other than that, computers with software development tools are used in programming courses. In more and more campuses including UTP, course materials are put on the Web.

To cater the emerging technology, more and more company produced CSCW system that assists learning in campus. One of the most use CSCW systems in education is Moodle, a course management system. Some of universities that have been adopting

Moodle are University of Glasgow, University of Kent and University Technology Petronas.

2.5 PROJECT MANAGEMENT SYSTEM IN CAMPUS

Project management systems are eminent among project managers who strive to succeed in developing their projects. There more than millions project management system in the market. However, adaptation of project management system in campus is considered new [11]. They are not many universities have realized the important of providing project monitoring system between lecturers and students. Hence, lecturers and students using the existing project management systems that are designed for general usage. There are a lot of project management systems that are available in the market. Two of the most recognized project management system is Microsoft Sharepoint and Microsoft Project.

2.5.1 Microsoft Sharepoint

Figure 2.3: Screenshot of a MS Sharepoint

SharePoint refers to a combination of three Microsoft products and technologies that facilitate collaboration within an organization and with partners and customers. *Sharepoint Services* offers basic web portal and intranet functionality, team, document or project sub-sites, version-controlled document storage, and a basic search functionality. It works in conjunction with Microsoft Office's *SharePoint Portal Server* and *Project Server* so that users can easily create, manage, and build collaborative Web sites and make them available throughout an organization, or with trading partners.

Drawbacks of Microsoft Sharepoint:

- Problematic of finding required information and knowledge as the size of the system grows.
- No common introduction on how to use it
- Need knowledge in managing the software to use it

2.5.2 Microsoft Project
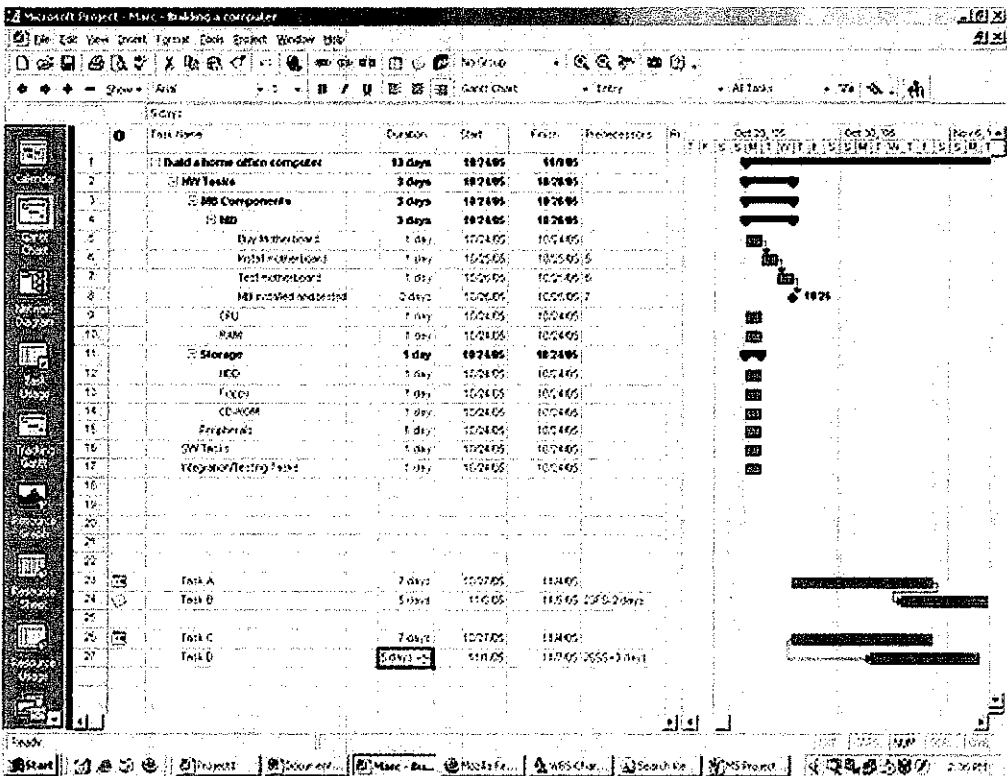
Figure 2.4: Microsoft Project Screenshot

Microsoft project is proprietary desktop application software. It is especially designed to enhance the ability to schedule, collaborate with resources, track progress, and communicate status on your projects. It is based on the Microsoft Office software model, hence makes it easy to navigate. The help menu is very beneficial as it has a built in tutorial to help the user while they are using MS Project. Wizard-like instructions and controls are always at hand in the left pane to help build a new project, manage tasks and resources, specify and change working time, track project, and report project information

Drawbacks of Microsoft Project:

- It is a desktop application and requires to be installed.
- Top management does not have the full picture of the project and does not know what each team member is busy with.
- Each user must be trained to user MS Project.

2.6 SUMMARY

From the literature reviewed, of all the project management processes, monitoring and controlling process is the most essential process. It plays a major role as the cause of project failures. The success of the project can be improved with project management software such as this project monitoring system. Project monitoring system fits the fourth quadrants of Computer Supported Cooperative Work (CSCW) which is working together in different time and different space. CSCW is a study on how people use technology to work together. Nowadays, CSCW is changing the practise of education a lot and helps the education practise to be more efficient. This project monitoring system is aimed to monitor the students' project progress, thus, improving education practise in higher education.

CHAPTER 3

METHODOLOGY

3.1   SYSTEM DEVELOPMENT METHODOLOGY
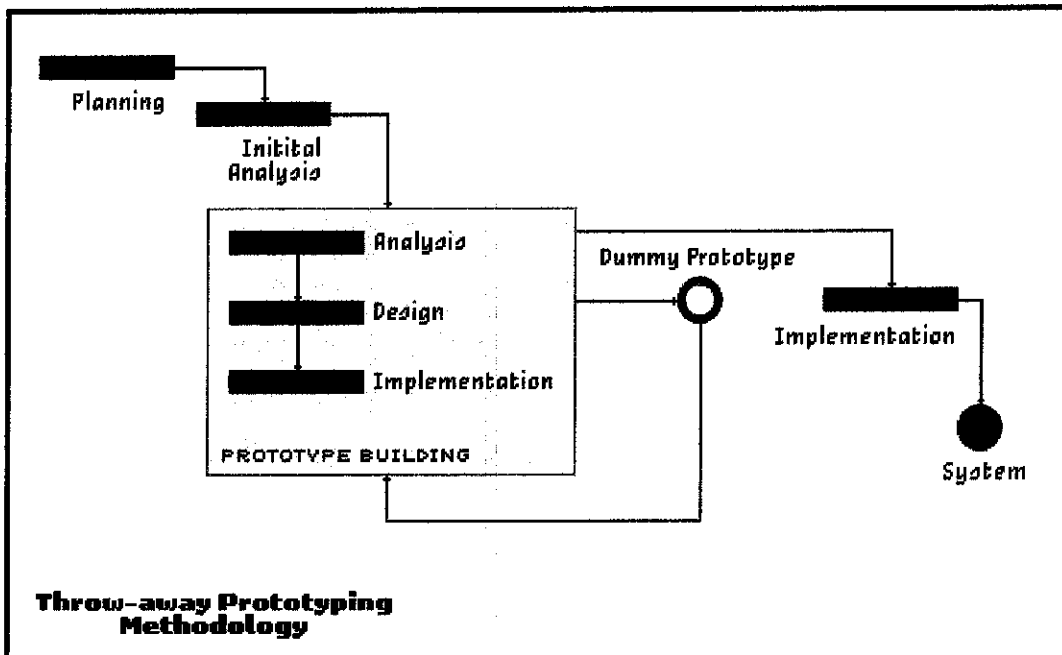
Figure 3.0: Throw-away Prototyping Methodology

Application of the Throw-away Prototyping Methodology (Figure 3.0) as the means of the online project monitoring system development is found to be the most suitable. In this model, a prototype (an early approximation of the final system) is built, tested, and then reworked as necessary until an acceptable prototype is finally achieved from which the complete system or product can now be developed.

3.1.1 Analysis and Requirements Gathering

Initiation of this project starts of with gathering all of the necessary requirements from students and lecturers in order to produce a website which meets user requirements in addition to enhance the current students' project management. Primarily, focus is put more on research on various project management systems which are already up and running in the global market, on top of that, a research was made on current project monitoring process of lecturers and students in UTP.

3.1.2 Design

Design paradigm begins with prototype design of the graphical user interface (GUI) layer and consequently outlines the back end (database and software architecture) system of the website which is only visible to the administrator of this system. Construction of prototype is always refurnished to produce an online project monitoring system which adheres to the required elements at the end of this project.

3.1.3 Implementation

The prototype which results from the design phase is then evaluated by the students and lecturers as end user's group and used to refine the requirements for the software to be developed. Iteration occurs as the prototype is tuned to satisfy the user requirements, while at the same time enabling the developer to better understand what needs to be done. After designing the GUI design prototype, the website is then deployed the university's server in order to make it accessible by the end-users via the net.

3.1.4 System Testing

After all functions are developed, each work unit has to undergo a system testing where each unit has to be integrated to ensure its compatibility. The portal deployed will need to undergo the relevant user acceptance testing before the live run takes on. This is to assess system effectiveness and if it meets the requirements identified. The user acceptance survey takes place as soon as the portal is running. In doing this, the portal will be running for a period of time and the usage will be monitored. Based on the results from users, the finding will be analyzed and results on the user acceptance test will be discussed.

3.2   GANTT CHART
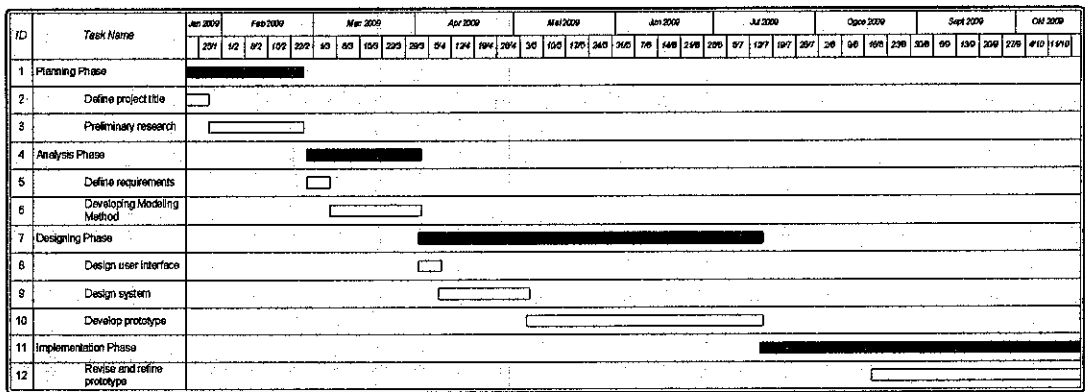
Figure 3.1: Gantt chart

For better resolution of this Figure 3.1, please refer to Appendix A. The chart shows the stages in developing the system. The development of the system took 10 months to complete from January 2009 to October 2009.

3.3   TOOLS AND SOFTWARE REQUIRED

Development of the website requires few selected software to assist in integrating the web pages also codifying the sites so that it will perform its function accordingly. Tools utilized up to current phase of the web application development are:

a.   Adobe Dreamweaver CS4 – Enhancing GUI and placing functions within different pages.

b.   NetBeans 6.5 IDE (Java) – Programming language used for some functions in the web development.

c.   WAMP (Windows Apache MySQL Php) Server – Act as HTTP server, enable server scripting scripts and MySQL database.

d.   Adobe Photoshop CS – Use in designing pictures, texts, and banners for the interface of the portal.

The hardware for the system development is personal computer with the specification of:

a.   AMD Athlon Neo Processor MV-40

b.   1.60 GHz

c.   2GB of RAM

d.   400GB of hard disk

CHAPTER 4

RESULT AND DISCUSSION

4.1 SOFTWARE ARCHITECTURE

Software architecture is a conceptual design that illustrates the structure and behaviour of the system [12]. Software architecture was built at the early design stage as a set of blueprint in developing the prototype. An architecture description is a formal description of a system, organized in a way that supports reasoning about the structural properties. There are three types of diagram used for designing the structure and behaviour of the system; class diagram, use-case diagram and conceptual web diagram.

4.1.1 Class Diagram

Class diagram is one of the most significant UML diagrams. It contains classes' interfaces, collaborations, dependencies, associations and inheritance relationships [13]. Class diagram describes the structure of the system. Figure 4.0 illustrates the class diagram of the system.

16
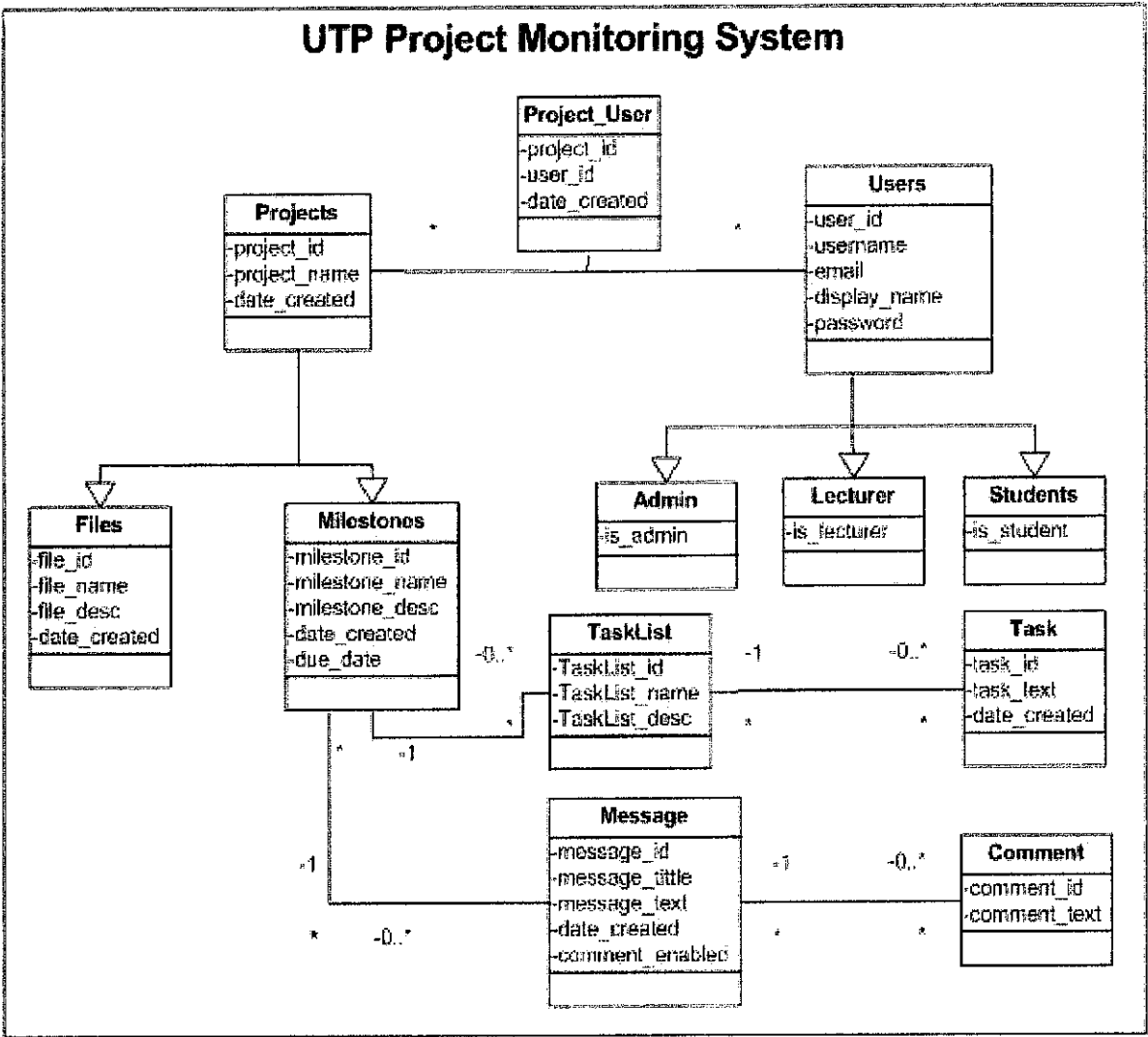
Figure 4.0: Class Diagram

4.1.2 Use-Case Diagram

Use-case diagram shows the functionality provided by the system in terms of actors, their goals represented as use cases and any dependencies among those use cases [14]. It emphasizes on behavioural structure of the systems and defines roles of the actor in the system. Figure 4.1 illustrates the use-case diagram of the system developed.
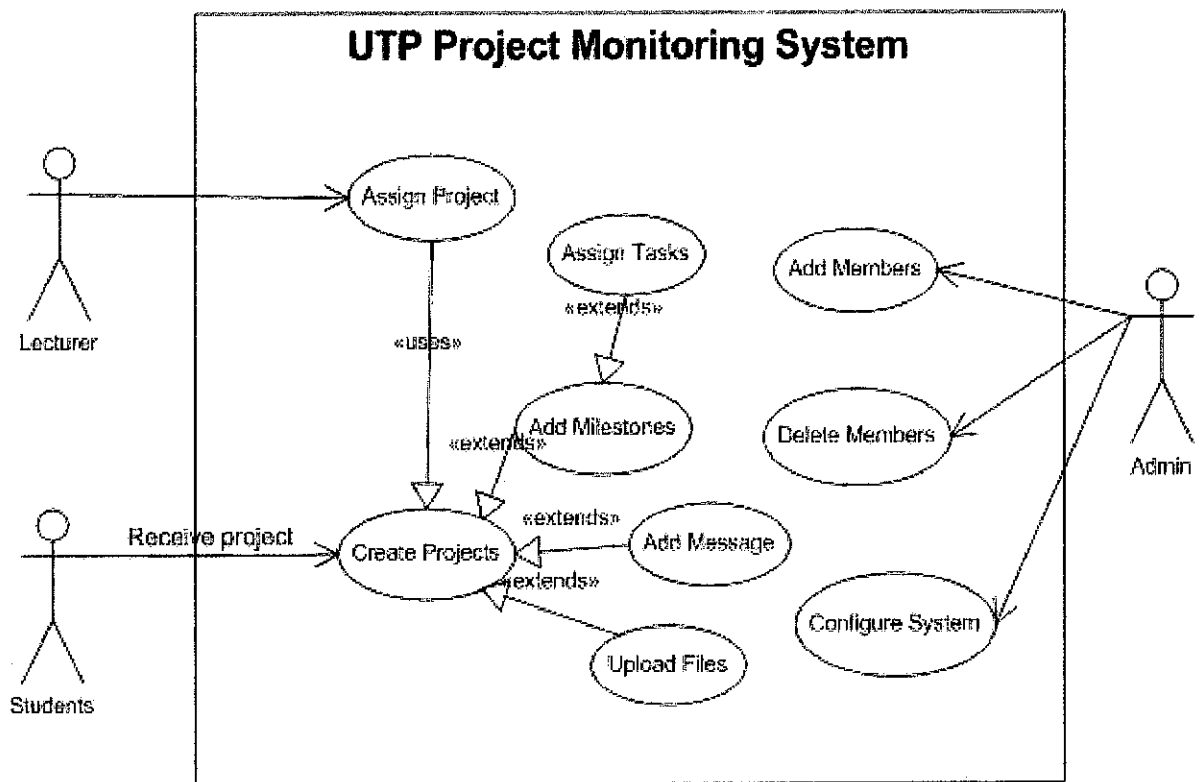
Figure 4.1: Use-case diagram

4.1.3 Conceptual Web Diagram

Conceptual web diagram defines structure flow of the system website. Figure 4.2 illustrates the conceptual web diagram of the system.
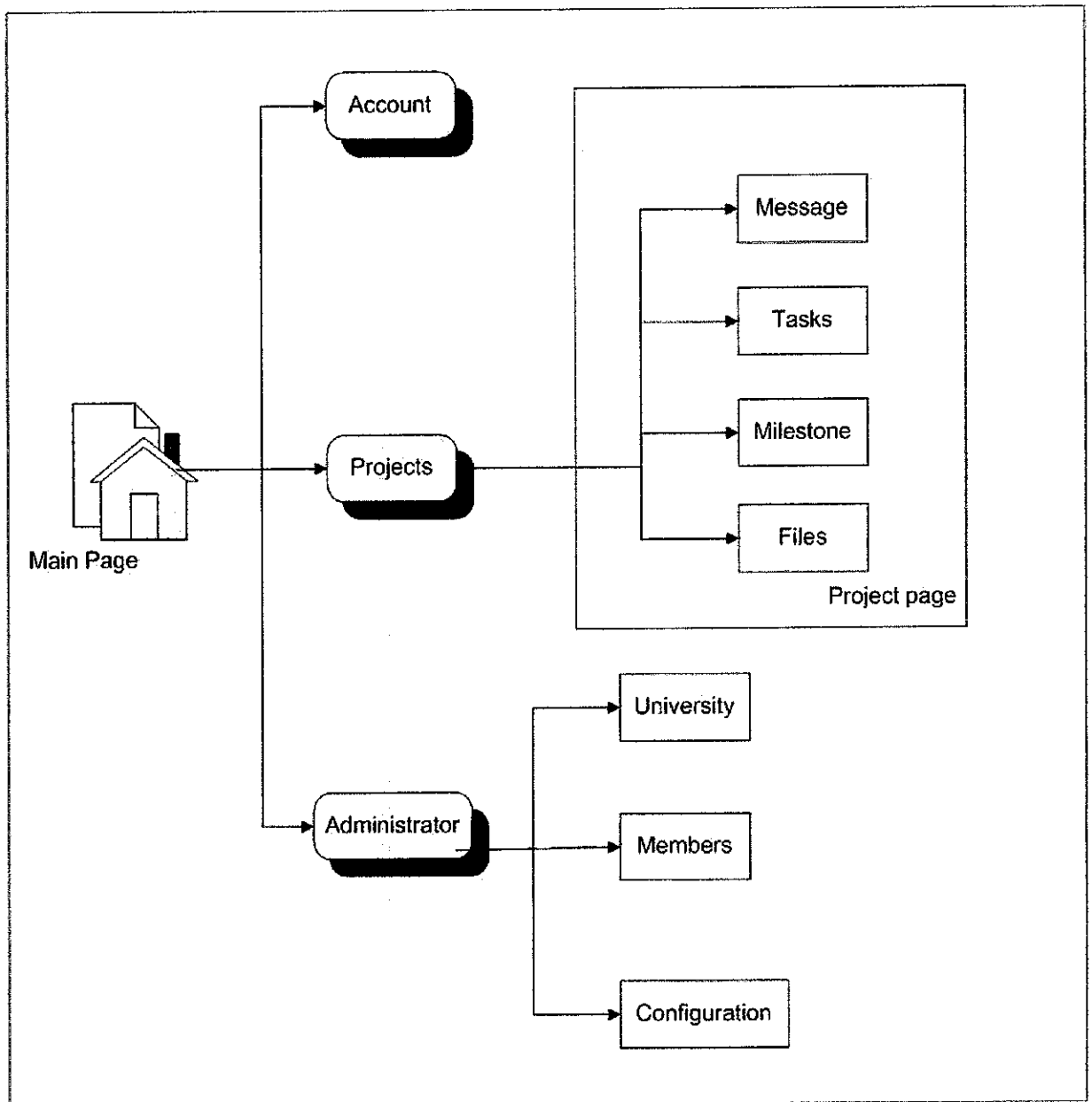
Figure 4.2: Conceptual Web Diagram

4.2 SYSTEM FUNCTIONALITIES

The purpose of this topic is to define the characteristics of the developed system with respect to the monitoring of projects, administrating system and managing account.

4.2.1 Monitoring Projects

The monitoring process starts by the first function of the system which is creating projects. Only lecturers and administrator are allowed to create projects and assign it to students. Figure 4.3 illustrates the creating the projects page.

Figure 4.3: Creating a project

The system allows the all users to create milestones, which defines the duration of the project. Figure 4.4 illustrates create milestone page.

Welcome back **dr rashid** (Logout),
Account ⊙ Projects ⊙ Administration ⊙

Overview | Messages | Tasks | Milestones | Files | People

PROJECT MONITORING SYSTEM
UNIVERSITI TEKNOLOGI PETRONAS

» Dashboard » Malaysian Studies Book Report (Group 1) » Add milestone

Search...

Add milestone

Name: *

Book Report Discovery

Description:

Discovery of Book report

Due date: *

October ▾ 8 ▾ 2009 ▾

Assign to:

Anyone ▾

☑ **Send email notification to user**

Add milestone

Figure 4.4: Create milestone

The lecturers or students themselves can assign the tasks to the students involves in the project as illustrated in Figure 4.5.

**PROJECT MONITORING SYSTEM
UNIVERSITI TEKNOLOGI PETRONAS**

| Overview | Messages | Tasks | Milestones | Files | People |

» Dashboard » Malaysian Studies Book Report (Group 1) » Tasks » Add task list

Search...

Add task list

Add task list ▾

Name: *

Preliminary report

Description:

Report on early book discovery

Milestone:

Book Report Discovery ▾

Private task lists: *(Private tasklists are visible only to members. You will not be able to see them.)*

○ Yes ◉ No

Tasks

Task:	Assign to:
Select book	Universiti Teknologi PETRONAS: liyana ▾
Introduction	Universiti Teknologi PETRONAS: nurul ▾
Author biography	Universiti Teknologi PETRONAS: iskandar ▾

| Add task list |

Figure 4.5: Assign tasks to students

The project will then appear on the project list of the students. Figure 4.6 illustrates a student project list.

Figure 4.6: Student's project list

All users involved in the project are allowed to add messages and upload files as illustrated in Figure 4.7 and Figure 4.8. Lecturers and students can discuss about the project through this function.

Welcome back **nurul** (Logout),
Account ⊡ Projects ⊡

| Overview | Messages | Tasks | Milestones | Files | People |

» Dashboard » Malaysian Studies Book Report (Group 1) » Messages » Add message

PROJECT MONITORING SYSTEM
UNIVERSITI TEKNOLOGI PETRONAS

Search...

Add message

Title: *

Text: *

Add message

Figure 4.7: Create message

Welcome back **nurul** (Logout),
Account ⊡ Projects ⊡

| Overview | Messages | Tasks | Milestones | Files | People |

» Dashboard » Malaysian Studies Book Report (Group 1) » Files » Add file

PROJECT MONITORING SYSTEM
UNIVERSITI TEKNOLOGI PETRONAS

Search...

Add file

Add file ⊡ Add folder ⊡

| File: * | Folder: |
| Browse... | -- None -- ▼ |

You can upload files of any type. Max filesize you are allowed to upload is 2MB

Description

Add file

Figure 4.8: Upload File

24

All updates appear in the overview page of the project as illustrated in Figure 4.9.
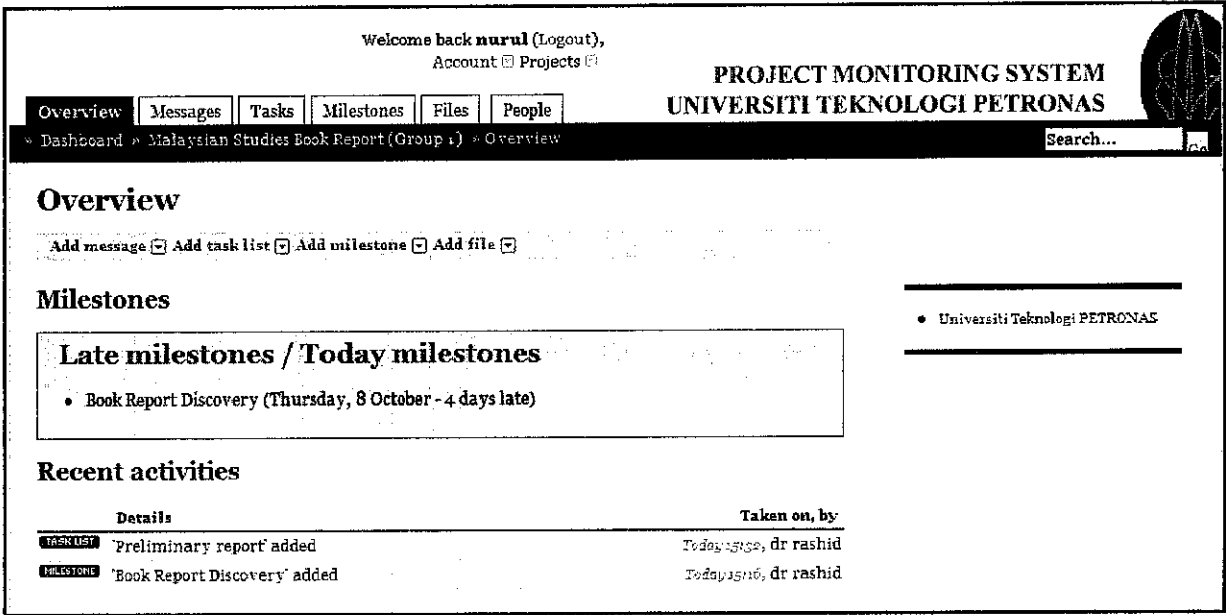The milestones will appear in red, if it is overdue to remind the students.

Figure 4.9: Project overview

Students need to update the progress of the task by ticking the task box if completed
as illustrated in figure 4.10. The lecturer will then monitor the progress and need to
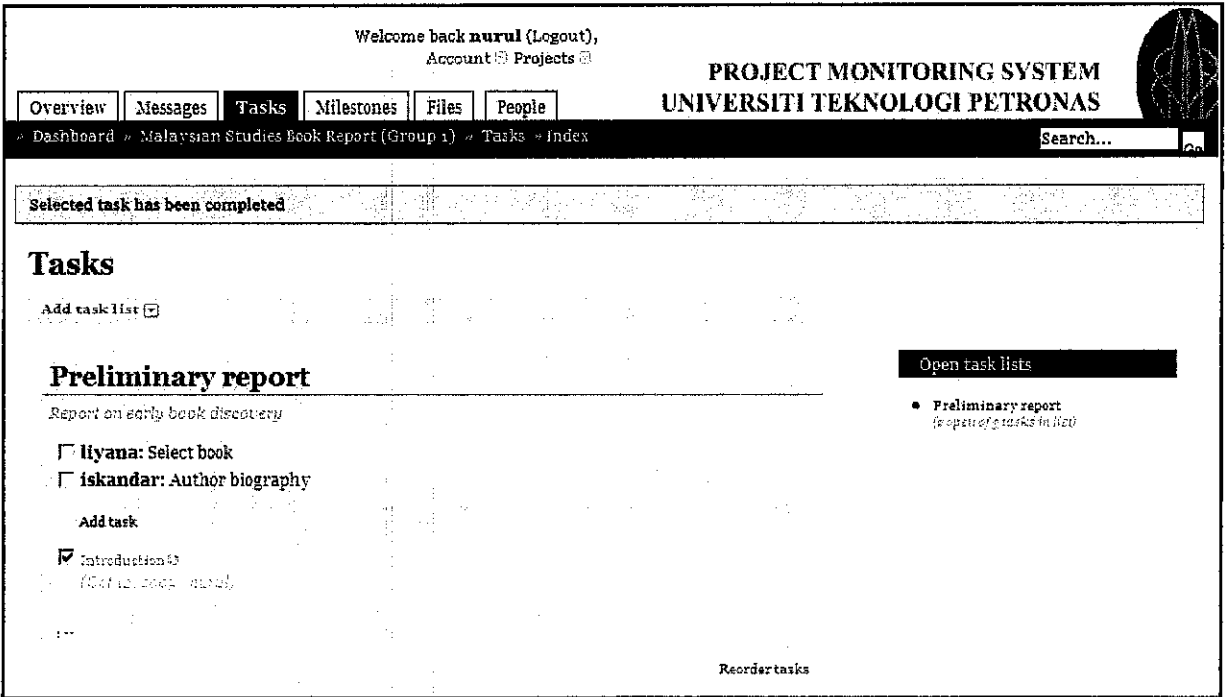advice on the progress when necessary.

Figure 4.10: Update tasks

4.2.2 Administrating System

The administrator of the system is the one who will add and delete members of the system. Figure 4.11 illustrates the registration form for administrator to add new members to the system.

Figure 4.11: Registration form

4.2.3 Managing Account

Registered users are allowed the update the profile, change password and also update avatar. Figure 4.12 illustrates the account overview of the user.
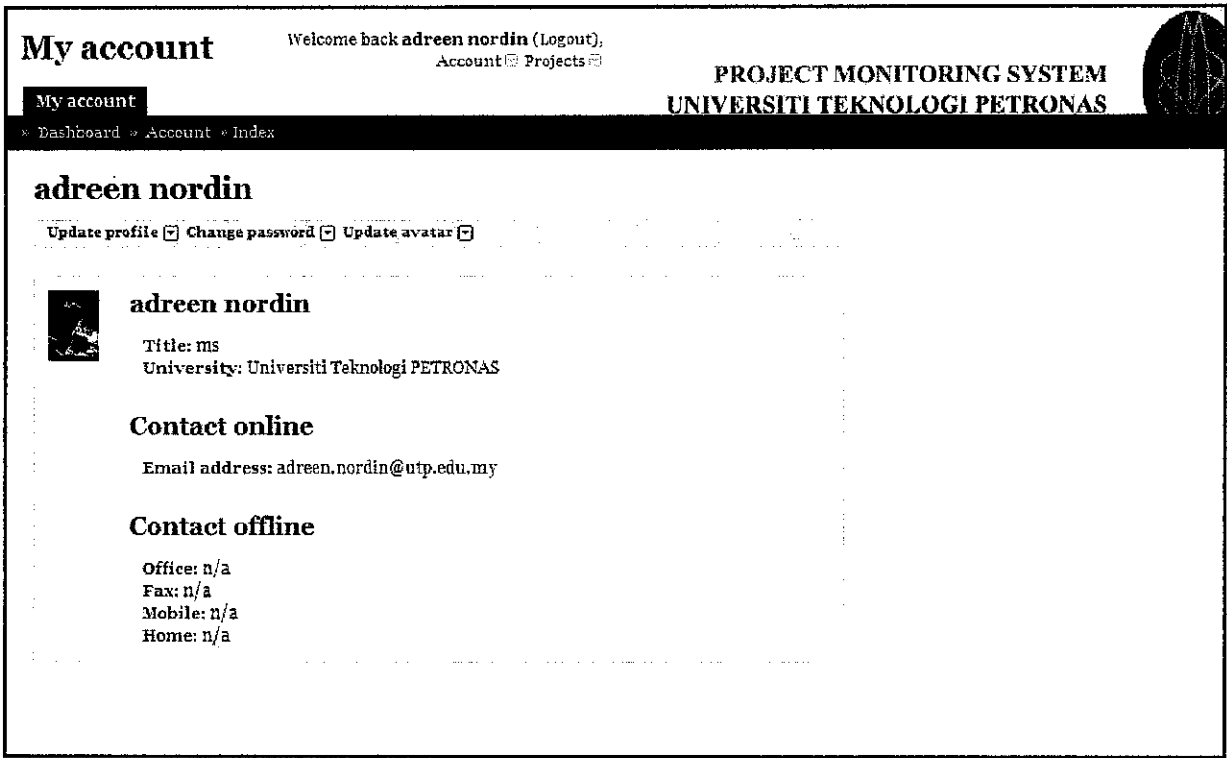

Figure 4.12: Account overview

CHAPTER 5

CONCLUSION AND RECOMMENDATION

Project monitoring system is vital among lecturers and students to educate and assist them in managing their projects. Project management has existed around the globe in assisting project managers to deliver project more efficiently. In line with UTP's mission to be the leader in technology education, new technologies and ways of doing things which are found efficient needs to be developed. In this case, this project permits the enhancement of project management by students.

Adhering to the objectives, this system is dedicated to monitor the students' project, thus, assist and improve the current process of students managing their bundles of individual and group projects. Simple language and interface is being used to ensure quick and easy understanding by students to enable them to get the information they need immediately.

5.1 Future Work and Recommendation

The suggested and recommended work is to combine the existing course management system, such as Moodle with the system. In such way, projects can be classified accordingly to the course taken and student taking the course. By having the combined system, it will make it easier for lecturers and students, thus creating one stop point for UTP learning assistants.

REFERENCES

[1] Nance, W.D. (2000). "Improving information systems students' teamwork and project management capabilities: Experiences from an innovative classroom", Information Technology and Management, 1 (4): 293-306.

[2] Alshare, K.A., Sanders D., Burris, E., and Sigman, S. (2007). "How do we manage student projects?", Journal of Computing Sciences in Colleges, 22 (4): 29-31.

[3] Cook, E., & Olson, J.R. (2006, June). The Sky's the Limit: An Activity for Teaching Project Management. Journal of Management Education, 30(3), 404-421.

[4] Dixon, D. 1988. "Integrated Support for Project Management", Imperial Software Technology: 49-58

[5] Schwalbe, Kathy. 2007. Information Technology Project Management,(5), Massachusetts, Thomson Course Technology.

[6] Rozenes, Shai. 2006. "Project Control", Project Management Journal.

[7] Beise, C.M., 2004, "IT Project Management and Virtual Teams", Special Interest Group on Computer Personnel Research Annual: 129-133.

[8] "Project Management", Wikipedia: The Free Encyclopedia. <http://en.wikipedia.org/wiki/Project_Management>.

[9] Grudin, J. (1994). "CSCW: History and focus". IEEE Computer 27 (5), 19-26.

[10] Jeusfeld, M.A., (1998). "CSCW in IT Education" in IT-Monitor, (9); Hagen & Stam

[11] Clark, A.J. (2008). "Nurturing Project Management in Higher Education IT", Research Bulletin, 66.

[12] "System Architecture", Wikipedia: The Free Encyclopedia. <http://en.wikipedia.org/wiki/System_architecture>

[13] Alsaadi, A. (2004). "A performance analysis approach based on the UML class diagram", Source Workshop on Software and Performance, 254-260.

[14] Sommerville,Ian. 2007. Software Engineering, (8), England, Pearson Education.

[15] Pournaghshband, H. (1990). "The students' problems in courses with team projects", ACM SIGCSE Bulletin, 22 (1): 44-47.

[16] Pritchard, C. (2004). The Project Management Communications Toolkit, Massachusette, Artech House.

[17] Fox, T.L., and Spence, J.W. "The effect of decision style on the use of a project management tool: an empirical laboratory study", ACM SIGMIS Database 36(2): 28-42

[18] Xiong, L (1), Chitti, S. and Liu, Ling. (2) (2007), Preserving Data Privacy in Outsourcing Data Aggregation Services, Emory University (1), Georgia Institute of Technology (2)

[19] Eriksson, J. 2008, SharePoint's Implications on Knowledge Management: A Case Study of Stora Enso's Usage of SharePoint, Bsc. Thesis, Uppsala University, Sweden.

APPENDIX A

Gantt chart