BORANG PENGESAHAN STATUS TESIS

JUDUL: Biology E-Learning System

SESI PENGAJAIN: 2 08/09

Saya TAI LEE WAN

mengaku membenarkan tesis (PSM/Sarjana/Doktor Falsafah) ini disimpan di Perpustakaan Fakulti Teknologi Maklumat dan Komunikasi dengan syarat-syarat kegunaan seperti berikut:

1. Tesis dan projek adalah hakmilik Universiti Teknikal Malaysia Melaka.
2. Perpustakan Fakulti Teknologi Maklumat dan Komunikasi dibenarkan membuat salinan untuk tujuan pengajian sahaja.
3. Perpustakaan Fakulti Teknologi Maklumat dan Komunikasi dibenarkan membuat salinan tesis ini sebagai bahan pertukaran antara institusi pengajian tinggi.
4. Sila tandakan (/)

_____SULIT	(Mengandungi maklumat yang berdarjah keselamatan atau kepentingan Malaysia seperti yang termaktub di dalam AKTA RAHSIA RASMI 1972)
_____TERHAD	(Mengandungi maklumat TERHAD yang telah ditentukan oleh organisasi/badan di mana penyelidikan dijalankan)
_____/_____TIDAK TERHAD	

_____ _____

(TANDATANGAN PENULIS) (TANDATANGAN PENYELIA)

Alamat tetap: 9, Jalan 6, Taman Sungai Mas, _____

34000, Taiping, Perak. Nama Penyelia

Tarikh: 01 July 2009 Tarikh: _____

© Universiti Teknikal Malaysia Melaka

BIOLOGY E-LEARNING SYSTEM

TAI LEE WAN

This report is submitted in partial fulfillment of the requirements for the Bachelor of Computer Science (Software Development)

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
UNIVERSITI TEKNIKAL MALAYSIA MELAKA
2009

© Universiti Teknikal Malaysia Melaka

DECLARATION

I hereby declare this project entitled

BIOLOGY E-LEARNING SYSTEM

(BELS)

Is written by me and is my own effort and that no part has been plagiarized without citations.

STUDENT :_____ DATE:_____

(TAI LEE WAN)

SUPERVISOR :_____ DATE:_____

(Mr. Yogan)

© Universiti Teknikal Malaysia Melaka

DEDICATION

I would like to dedicate this report to my beloved parents and all my family members as an appreciation for their tremendous support to me. And also to all my friends who have helped me whether directly or indirectly in the progress of making this report. Not to forget, I also would like to dedicate this report for my PSM Supervisor and PSM Evaluator.

© Universiti Teknikal Malaysia Melaka

ACKNOWLEDGEMENTS

I would like to express my gratitude especially to my beloved family who always give me tremendous moral and financial support to me. Without their support and blessings, I'm not sure how am I going to finish and complete this report and project.

And a very special appreciation for Mr.Yogan who is also my supervisor for her help, co-operation and also guidance during my Projek Sarjana Muda period. Without his hands on me, I am very sure the progress of this report would not be in smooth sailing.

I also would love to thank Pn. Syahida who is my PSM Evaluator as well in terms of facilitating me in order to complete this final report and regarding my project.

Finally to all my friends who have involved and helped me directly or indirectly with my PSM to achieve the requirements as a UTeM student as well, I would like to thank you all.

And for those who have not been mentioned above, I would love to put all of you in a pedestal of my heart.

© Universiti Teknikal Malaysia Melaka

ABSTRACT

The project that I built is a web-base courseware. The application is called Biology E-Learning System. The application helps teacher to store, edit and delete the exam questions. Besides, it also help teacher to distribute information in more effective way since teacher can upload file to the site. In student's site, student can download file from the site and sit for exam in a more comfortable way.

In chapter one, an introduction about the project is explained. Also stated in this chapter are the problem statements of the project, objective of the project, scope of the project, project significance, expected output and lastly the conclusion of this chapter.

Chapter two, it discusses about the methodology and techniques that are applied in this project. A good planning will often lead to a good ending of a project. Thus, the planning was presented in this chapter. Furthermore, a schedule is created in this chapter in order to have a good time management so that the system can be completed in time. A milestone allows project management to accurately determine whether or not the project is on schedule.

In chapter three, the system flow and the weaknesses of existing system are analyzed and the suggestion of new function to improve the system is recommended. The functional requirement, non-functional requirement and data requirement of new system was discussed in detail.

© Universiti Teknikal Malaysia Melaka

Chapter four, systems design is the process of defining the architecture, components, modules, interfaces, and data for a system to satisfy specified requirements. This chapter defines and refines the design of the system. The designs of the system include system architecture, user interface design, navigation design, input and output design and also the database design. The design stage is followed by implementation stage.

In chapter five, implementation processes of the project are discussed. Also discussed in this chapter are about versioning control and the software configuration and environment setup.

Chapter 6, locate error of the system and then fix the error to ensure the system meet user's requirements and produce good quality product.

Chapter 7 is about overall conclusion of the project. In this chapter, the weakness and strengths of the project is defined. Besides, the proposition for improvement of the project is also discussed. Last but not least, the contribution of the project is also described precisely in this chapter.

© Universiti Teknikal Malaysia Melaka

TABLE OF CONTENTS

CHAPTER	SUBJECT	PAGE
	DECLARATION	ii
	DEDICATION	iii
	ACKNOWLEDGEMENTS	iv
	ABSTRACT	v
	TABLE OF CONTENTS	vii
	LIST OF FIGURES	xi
	LIST OF TABLES	xiv
	LIST OF ATTACHMENTS	xvi
CHAPTER 1	**INTRODUCTION**	
	1.1 Project Background	1
	1.2 Problem Statement	2
	1.3 Objective	2
	1.4 Scope	3
	1.5 Project Significance	3
	1.6 Expected Output	4
	1.7 Conclusion	4
CHAPTER 2	**LITERATURE REVIEW AND PROJECT METHODOLOGY**	
	2.1 Introduction	5
	2.2 Facts and Findings	9

© Universiti Teknikal Malaysia Melaka

	2.2.1 Domain	9
	2.2.2 Existing System	9
	2.2.3 Techniques	10
	2.3 Project Methodology	10
	2.4 Project Requirements	11
	2.4.1 Software Requirements	11
	2.4.2 Hardware Requirements	12
	2.5 Project Schedules and Milestones	12
	2.6 Conclusion	15
CHAPTER 3	**ANALYSIS**	
	3.1 Introduction	16
	3.2 Problem Analysis	17
	3.3 Requirement Analysis	
	3.3.1 Data Requirement	23
	3.3.2 Functional Requirement	24
	3.3.3 Non-Functional Requirement	
	3.3.3.1 Communication/Transmission	27
	3.3.3.2 Performance and Throughput	27
	3.3.3.3 Integrity	28
	3.3.3.4 Reliability & Availability	28
	3.3.3.5 Security	29
	3.3.3.6 Manageability	29
	3.3.4 Others Requirement	30
	3.4 Conclusion	30
CHAPTER 4	**DESIGN**	
	4.1 Introduction	31
	4.2 High Level Design	
	4.2.1 System Architecture	32
	4.2.2 System Interface	34

© Universiti Teknikal Malaysia Melaka

	4.2.2.1 User Interface	
	4.2.2.2 Navigation Design	41
	4.2.2.3 Output Design	46
	4.2.3 Database Design	
	4.2.3.1 Conceptual and Logical Database Design	49
	4.2.4 Data Dictionary	50
	4.3 Detailed Design	
	4.3.1 Software Design	51
	4.4 Conclusion	65
CHAPTER 5	**IMPLEMENTATION**	
	5.1 Introduction	66
	5.2 Software Development Environment Setup	67
	5.3 Software Configuration Management	68
	5.3.1 Configuration Environment Setup	68
	5.3.2 Version Control Procedure	69
	5.4 Implementation Status	71
	5.5 Conclusion	73
CHAPTER 6	**TESTING**	
	6.1 Introduction	74
	6.2 Test Plan	75
	6.2.1 Test Organization	75
	6.2.2 Test Environment	75
	6.2.3 Test Schedule	76

© Universiti Teknikal Malaysia Melaka

	6.3 Test Strategy	76
	6.3.1 Classes of tests	77
	6.4 Test Design	77
	6.4.1 Test Description	77
	6.4.2Test Data	93
	6.5 Test Results and Analysis	94
	6.6 Conclusion	98
CHAPTER 7	**CONCLUSION**	
	7.1 Observation on Weaknesses and Strengths	99
	7.2 Proposition for Improvement	100
	7.3 Contribution	100
	7.4 Conclusion	101

© Universiti Teknikal Malaysia Melaka

LIST OF FIGURES

DIAGRAM	TITLE	PAGE
2.1	Interaction between client and server	6
2.2	Tiered architecture of client-server network	7
2.3	Rational Unified Process	11
2.4	Gant Chart	14
3.1	Business Flow Diagram of Existing System	17
3.2	Login Sequence Diagram	18
3.3	Change Password Sequence Diagram	18
3.4	Edit Question Sequence Diagram	19
3.5	Manage User Sequence Diagram	20
3.6	Add Exam Sequence Diagram	21
3.7	View Result Sequence Diagram	21
3.8	Do Exam Sequence Diagram	22
3.9	Entity Relationship Diagram	23
3.10	BELS Use Case Diagram	26
4.1	Architecture Design of Biology E-Learning System	33
4.2	Login Screen	34
4.3	Main Menu Screen	34
4.4	Upload Screen	35

© Universiti Teknikal Malaysia Melaka

4.5	Add Admin Screen	35
4.6	Add Question Screen	36
4.7	Change password	37
4.8	Add Student Form	38
4.9	Student Main Menu Screen	38
4.10	Download Screen	39
4.11	View Result Screen	39
4.12	Exam Screen	40
4.13	Navigation Design	41
4.14	Students' Result	46
4.15	Student's Individual Score	47
4.16	Instant Result of Exam	48
4.17	Entity Relationship Diagram of Biology E-Learning System (BELS).	49
4.18	Login class Diagram	51
4.19	Edit question class diagram	52
4.20	Change password class diagram	53
4.21	Manage user class diagram	53
4.22	View result class diagram	54
4.23	Perform Exam Operation Class Diagram	54

© Universiti Teknikal Malaysia Melaka

5.1	Deployment Diagram of BELS Environment Architecture	67
5.2	Subversion tool's concept	70
6.1	Test Organization for BELS	75
6.2	Path Coverage Technique for Login	78
6.3	Path Coverage Technique for Upload File	79
6.4	Path Coverage Technique for Add User	80
6.5	Path Coverage Technique for Add Question	81
6.6	Path Coverage Technique for View Question	82
6.7	Path Coverage Technique for Edit Question and Answer	83
6.8	Path Coverage Technique for delete question and answer	84
6.9	Path Coverage Technique for Change Password	85
6.10	Path Coverage Technique for View All Students' Results	86
6.11	Path Coverage Technique for Reset Exam	87
6.12	Path Coverage Technique for Download File	88
6.13	Path Coverage Technique for Exam	90
6.14	Path Coverage Technique for View Individual Result	92

© Universiti Teknikal Malaysia Melaka

LIST OF TABLES

TABLE	TITLE	PAGE
3.1	BELS Functional Requirement	24
3.2	Communication/Transmission Standard	27
3.3	Performance and Throughput Systemic Qualities	27
3.4	Integrity Systemic Qualities	28
3.5	Reliability and Availability Systemic Qualities	28
3.6	Security Systemic Qualities	29
3.7	Manageability Systemic Qualities	29
4.1	Input Design for student's site of Biology E-Learning System	42
4.2	Input Design for Administrator's or Teacher's Site of Biology E-Learning System	44
4.3	Data Dictionary for Relationship Diagram of Biology E-Learning System	50
5.1	Server Configuration of BELS system	68
5.2	Implementation Status of BELS	71
6.1	Test Schedule for BELS	76
6.2	Unit Testing for Login	78

© Universiti Teknikal Malaysia Melaka

6.3	Unit Testing for Upload File	79
6.4	Unit Testing for Add User	80
6.5	Unit Testing for Add Question	81
6.6	Unit Testing for View Question	82
6.7	Unit Testing for Edit Question and Answer	83
6.8	Unit Testing for Delete Question	84
6.9	Unit Testing for Change Password	85
6.10	Unit Testing for View All Students' Results	86
6.11	Unit Testing for Reset Exam	87
6.12	Unit Testing for Download File	88
6.13	Unit Testing for Exam	91
6.14	Unit Testing for View Individual Result	92
6.15	Test Data for BELS	93
6.16	User Acceptance Test for Login Module	94
6.17	User Acceptance Test for Upload Module	94
6.18	User Acceptance Test for Add Question Module	95
6.19	User Acceptance Test for Change Password Module	95
6.20	User Acceptance Test for View Students' Results Module	96
6.21	User Acceptance Test for Add User Module	96
6.22	User Acceptance Test for Download Module	97
6.23	User Acceptance Test for Exam Module	97
6.24	User Acceptance Test for View Individual Result Module	98

© Universiti Teknikal Malaysia Melaka

LIST OF ATTACHMENTS

ATTACHMENT	TITLE	PAGE
I	Log Book	102
II	Proposal Form	107
III	User Manual	114
IV	References	120

© Universiti Teknikal Malaysia Melaka

Chapter I

INTRODUCTION

1.1 Project Background

The web-base courseware can be said as an edutainment aspect as it involves education and entertainment. The system allows students to sit for exam via online and the students can also download notes from the website. The targeted user for this system is secondary school teachers and student. So far there are still very few secondary schools that apply such web-base courseware. Students nowadays find it boring to study manually and they prefer systems that are computerized and automated. The colour effects and the graphic of the website will attract the students' attention and these will make learning more enjoyable. Thus, the system might reduce the stress of students while sitting for exam. The system achieves two objectives as the phrase says "killing two birds in one stone" where students will learn and enjoy learning at the same time. Besides, the system will reduce the work of school authorities as the teachers do not

© Universiti Teknikal Malaysia Melaka

need to mark for the exam paper one by one as the system will mark the answer after student submit the answer through the system. In addition, it is also easier for teachers to handle every student's score as the score is automatically stored in the system after students submit the answers. Apart from that, teachers can distribute the tutorial notes or latest article information about the subject at anytime by uploading the tutorial in the website. In long run, teachers can save time and cost to print the tutorial notes for students. This system also allows the teacher to share information with students.

1.2 Problem Statement

As we all know many schools implement exam manually and the teachers finds it difficult to mark the papers as some teachers might be busy with other workload. Besides, some students might feel learning is stressful. By using this edutainment system, the student will feel more interesting to learn the subject and reduce the stress while sitting for school exam. Moreover, manually distribute hand-out for students are not effective way to impart knowledge to the students.

1.3Objective

The objective of this system is to enhance the knowledge of students and also allow students to sit for exam in a more comfortable way. Therefore, this could help the students to score better result in examination. Besides, this system allow teacher to handle exam and students' score in more effective way. In addition, this system allows

© Universiti Teknikal Malaysia Melaka

teachers to distribute information effectively. Last but not least, the system will be an interactive system so that it can attract attention of its target users.

1.4 Scope

The target users for this system are secondary school students who take biology subject and secondary school teachers who teach the biology subject.

The modules that will be included in this system for student mode are registration, login, download, take exam, view score for every exam taken and change personal password for secure authentication purpose.

The modules that will be included for teacher's mode are login, upload, search a student's score, add question, delete question, change password and set timing for the exam.

1.5 Project Significance

The significance of this project is that the secondary school teachers and students who are involved in the biology will gain benefits from the system. This is because the web-based courseware system can reduce the workload of teachers and teachers can distribute subject information to students more effectively. Meanwhile, students can learn biology in more interesting way and take exam more comfortably.

© Universiti Teknikal Malaysia Melaka

1.6 Expected Output

The expected output of the project is the web-based courseware can be fully developed with the functions of add user, add question, delete question, searching a student's score, set timing for exam, mark the answers of exam, change password, upload and download notes. The function of set timing for exam is expected to be well developed although the function is the hardest part in the system.

1.7Conclusion

As for the conclusion, the system will help students to know their strength and weaknesses in biology subject. Besides, the students will gain new knowledge about biology since the students can download notes from the system which are uploaded by the biology teachers. In addition, the teachers can reduce their workload. The methodologies of the project will be discussed in next chapter.

© Universiti Teknikal Malaysia Melaka

CHAPTER II

LITERATURE REVIEW AND PROJECT METHODOLOGY

2.1 Introduction

In this chapter, the literature review of the system and the methodologies which are using in developing the system will be discussed. This chapter includes the current relevant research and also delivers summaries of previous research or work regarding on the same particular research to this project case study. In order to support the finding, some existing system will be analyzed to get more understanding of the new project which will be delivered later.

First of all, client-server will be discussed as the system will implement this concept later. Client-server is a network architecture which separates a client from server whereby each instance of the client software can send requests to a server. There are few types of server which are application servers, file servers, terminal servers and mail servers. The server is passive or slave in the client-server architecture. This is because

© Universiti Teknikal Malaysia Melaka

the server is waiting for request from client. Server will reply if client send a request. In contrast, client is active or master because client sending request to server and waiting for reply from server. A popular client in worldwide use today is web browser which communicates with web servers over the internet to fetch and display web page content.

Client-server is a computational architecture that involves client processes requesting service from server processes. A server can be software application that provides a service to other software or the computer on which the server software is running. A server (software application) must be installed and managed by someone with the title of system administrator, network administrator or for Web servers-Webmaster.

Nowadays, due to the number of applications that use the Internet is on growing number, the need for client software on computers to use these applications also arises. The only solution to the growing number of Internet applications is an all-in-one client or universal client. The all-in-one client can handle several application and changing buttons and functions to accommodate each application. The example of all-in-one client is Microsoft Internet Explorer and FTP client. The diagram below illustrates a client and a server using the TCP/IP protocol stack.

Figure 2.1: Interaction between client and server

© Universiti Teknikal Malaysia Melaka

The distinctions between client server network architecture and peer to peer network architecture is client-server is asymmetric relationship by which client predominately makes request whereas server make reply. In contrast, peer to peer is symmetric relationship.

The generic client server architecture is two tiered architecture. Unluckily, there is a problem in two tiered architecture which is the relative power of clients has grown considerably, we could shift processing to the client, but then maintaining data integrity is difficult. Later, the problem is overcome by using three tiered architecture. The diagram below shows 3-tiered interaction of client server.

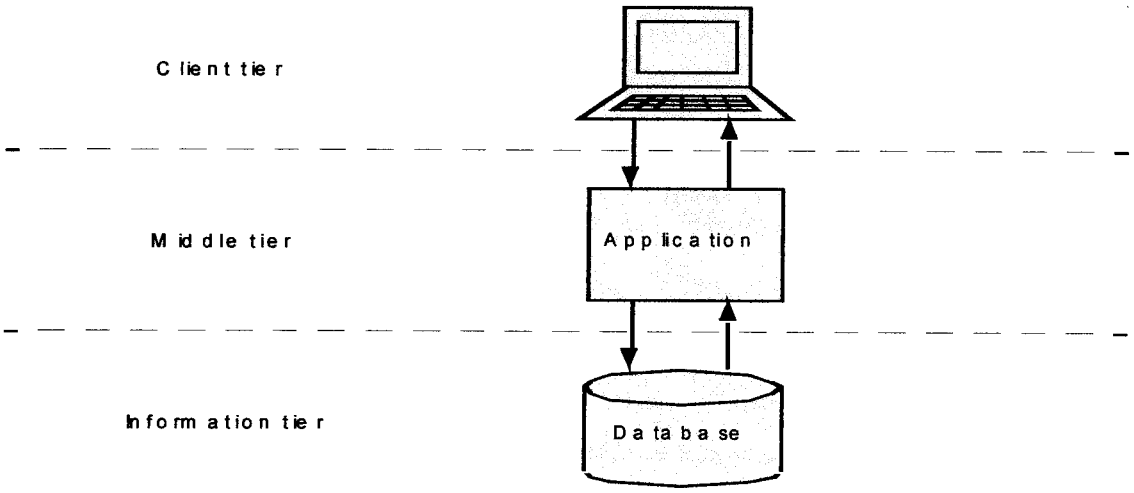

Figure 2.2: Tiered architecture of client-server network

Client tier in the above diagram is referred to as top tier. Client tier is application's user interface by which users can interact with application through user interface. Client tier interact with middle tier to make request and to display retrieve data from information tier then display data to user. Middle tier implements business logic. Middle tier is also controls interactions between application client and application data and act as intermediary between data in information tier and application client. Information tier is referred to as data tier or bottom tier. This tier is to maintain data for application and stores data in relational database management system.

© Universiti Teknikal Malaysia Melaka