

S.K.MALIM LEAVE APPLICATION SYSTEM (SKMLAS)

NOR SHANIYAH BT MEY @ JAMIL

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

BORANG PENGESAHAN STATUS TESIS*

JUDUL: SEKOLAH KEBANGSAAN MALIM LEAVE APPLICATION SYSTEM (SKMLAS)

SESI PENGAJIAN: 2008/2009

Saya NOR SHANIYAH BINTI MEY @ JAMIL

(HURUF BESAR)

Mengaku membenarkan tesis(PSM/Sarjana/Doktar 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. Perpustakaan 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)

Alamat tetap: No 238, Km 5 ½ Lrg Masjid Lama, Jln Santan, 01000 Kangar, Perlis

Tarikh: 3/7/2009

(TANDATANGAN PENYELIA)

Dr.Hidayah bt Rahmalan
NamaPenyelia

Tarikh: _____

CATATAN: * Tesis dimaksudkan sebagai Laporan Akhir Projek Sarjana Muda (PSM)
** Jika tesis ini SULIT atau TERHAD, sila lampirkan surat daripada pihak berkuasa.

S.K.MALIM LEAVE APPLICATION SYSTEM (SKMLAS)

NOR SHANIYAH BT MEY @ JAMIL

**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

DECLARATION

I hereby declare that this project report entitled

**SEKOLAH KEBANGSAAN MALIM LEAVE APPLICATION SYSTEM
(SKMLAS)**

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

STUDENT : *Nor Shaniyah* Date : 03/07/2009
(NOR SHANIYAH BT MEY @ JAMIL)

SUPERVISOR : Date : /07/2006
(DR. HIDAYAH BT RAHMALAN)

DEDICATION

To my beloved family, I love you all. To my supervisor, evaluator and friends, thank you so much.

ACKNOWLEDGEMENTS

First and foremost, I would like to thank to my supervisor, Dr. Hidayah binti Rahmalan for the valuable guidance and advice. She inspired me greatly to work on this project. She has helped me a lot during the documentation and the system development. Next, I would like to take this opportunity to thank En. Abdul Razak b. Hussain for evaluating my project. Not to forget to En.Mohd Zahlan b. Abu Hassan who is Sekolah Kebangsaan Malim teacher for giving me a lot of information regarding this project

I would also like to thank my beloved parents who have been giving me support and motivation throughout my project.

Last but not least, I would also like to thank to all my friends who have lend their hands to me whether directly or indirectly in completing this project.

Thank you.

ABSTRACT

Sekolah Kebangsaan Malim Leave Application System (SKMLAS) is a system for Sekolah Kebangsaan Malim teachers to apply leave and for school clerk to manage all the staff's leave information. Currently, Sekolah Kebangsaan Malim is using a manual system which is the teachers need to fill the leave form manually. The target users for this system are school teachers, clerk and the headmaster. This system was developed using Visual Basic 2005 and SQL Server 2005. The Rational Unified Process (RUP) life cycle and Object-oriented Analysis and Design (OOAD) technique was used for the methodology approach for this system. The analysis of this system is made in order to analyze the user requirements. The requirement include functional requirements, non-functional requirements and others requirements. The system is implemented as a client server and is conducted among the end users at Sekolah Kebangsaan Malim. Finally, this system has achieved its objectives in order to help the school teachers in applying leave application easily and also to help the clerk to manage the staff's leave information systematically.

ABSTRAK

Sistem Permohonan Cuti Sekolah Kebangsaan Malim dibangunkan untuk para guru memohon cuti dan juga untuk kerani sekolah menguruskan maklumat cuti staf. Pada masa kini, Sekolah Kebangsaan Malim menggunakan sistem manual iaitu para guru perlu mengisi borang cuti secara manual. Pengguna sistem ini adalah guru sekolah, kerani dan juga guru besar. Sistem ini dibangunkan dengan menggunakan Visual Basic 2005 disamping SQL Server 2005 untuk proses penyimpanan data. Berdasarkan kajian yang telah dilakukan, pada masa kini tiada sebuah sekolah di negeri Melaka yang menggunakan sistem pengkomputeran untuk memproseskan permohonan cuti. Kitar hayat pembangunan sistem yang digunakan adalah berdasarkan *Rational Unified Process (RUP)* dan teknik yang digunakan ialah *Object-oriented Analysis and Design (OOAD)* Proses pengujian ke atas sistem ini dijalankan di Sekolah Kebangsaan Malim. Akhir sekali, sistem yang dibangunkan ini telah mencapai objektifnya di dalam membantu para guru memohon cuti dengan mudah serta membantu kerani sekolah dalam menguruskan maklumat cuti staf dengan lebih sistematik.

TABLE OF CONTENTS

CHAPTER	SUBJECT	PAGE
	DECLARATION	ii
	DEDICATION	iii
	ACKNOWLEDGEMENTS	iv
	ABSTRACT	v
	ABSTRAK	vi
	TABLE OF CONTENTS	vii
	LIST OF TABLE	xi
	LIST OF FIGURE	xiii
	LIST OF ABBREVIATION	xvi
	LIST OF APPENDICES	xvii
CHAPTER I	INTRODUCTION	
	1.1 Project Background	1
	1.2 Problem Statement	2
	1.3 Objectives	3
	1.4 Scope	4
	1.5 Project Significance	7
	1.6 Expected output	7
	1.7 Conclusion	9

CHAPTER II	LITERATURE REVIEW AND PROJECT METHODOLOGY	
2.1	Introduction	10
2.2	Fact and Finding	11
	2.2.1 Domain	11
	2.2.2 Existing Systems	12
	2.2.3 Technique	20
2.3	Project Methodology	21
	2.3.1 Requirements Workflow	22
	2.3.2 Analysis Workflow	23
	2.3.3 Design Workflow	23
	2.3.4 Implementation Workflow	23
	2.3.5 Test Workflow	24
2.4	Project Requirements	28
	2.4.1 Software Requirement	28
	2.4.2 Hardware Requirement	28
	2.4.3 Other requirements	29
2.5	Project Schedule and Milestones	29
2.6	Conclusion	31
CHAPTER III	ANALYSIS	
3.1	Introduction	32
3.2	Problem Analysis	33
3.3	Requirement Analysis	34
	3.3.1 Data Requirement	34
	3.3.2 Functional Requirement	39
	3.3.2.1 Activity Diagram	41
	3.3.2.2 Use Case Diagram	43
	3.3.2.3. Sequence Diagram	45
	3.3.3 Non-Functional Requirement	60
	3.3.4 Others Requirement	62

	3.3.4.1 Software Requirement	62
	3.3.4.2 Hardware Requirement	64
	3.3.4.3 Network Requirement	64
3.4	Conclusion	65
CHAPTER IV	DESIGN	
4.1	Introduction	66
4.2	High-Level Design	66
	4.2.1 System Architecture	67
	4.2.2 User Interfaces Design	68
	4.2.2.1 Navigation Design	80
	4.2.2.2 Input Design	83
	4.2.2.3 Output Design	85
	4.2.3 Database Design	88
	4.2.3.1 Conceptual and Logical Database Design	89
4.3	Detailed Design	90
	4.3.1 Software Design	90
	4.3.2 Physical Database Design	106
4.4	Conclusion	108
CHAPTER V	IMPLEMENTATION	
5.1	Introduction	109
5.2	Software Development Environment Setup	109
5.3	Software Configuration Management	110
	5.3.1 Configuration Setup	111
	5.3.2 Version Control Procedure	116
5.4	Implementation Status	117
5.5	Conclusion	118

CHAPTER VI	TESTING	
6.1	Introduction	119
6.2	Test Plan	120
	6.2.1 Test Organization	120
	6.2.2 Test Environment	121
	6.2.3 Test Schedule	122
6.3	Test Strategy	124
	6.3.1 Classes of Tests	125
6.4	Test Design	126
	6.4.1 Test Description	127
	6.4.2 Test Data	137
6.5	Test Results and Analysis	144
6.6	Conclusion	153
CHAPTER VII	CONCLUSION	
7.1	Observation on Weakness and Strengths	154
7.2	Propositions for Improvement	156
7.3	Contribution	157
7.4	Conclusion	157
REFERENCES		158
APPENDICES	Leave Application Form	160
	Gantt Chart for SKMLAS	161

LIST OF TABLE

TABLE	TITLE	PAGE
Table 2.1	Comparison with the existing system	19
Table 2.2	Software Requirement	28
Table 2.3	Personal Computer (PC) with minimum requirement	29
Table 2.4	Project Schedule and Milestone	30
Table 3.1	Login Data Dictionary	37
Table 3.2	Pendaftaran Data Dictionary	37
Table 3.3	Staf Data Dictionary	37
Table 3.4	Pemohonan Cuti Data Dictionary	38
Table 3.5	Cuti Data Dictionary	38
Table 3.6	Functional Requirements of SKMLAS	39
Table 3.7	Coding Standard	60
Table 3.8	Security Systemic Qualities	61
Table 3.9	Manageability Systemic Qualities	61
Table 3.10	Usability Systemic Qualities	61
Table 3.11	Reusability Systemic Qualities	61
Table 3.12	Flexibility and Extensibility Systemic Qualities	62
Table 3.13	Software Requirement in Analysis Phase	62
Table 3.14	Hardware Requirement in Analysis Phase	64
Table 4.1	Input Design for SKMLAS	84
Table 4.2	Output Design for SKMLAS	86
Table 4.3	Entity Class Description	106
Table 5.1	Version control procedure for SKMLAS	116
Table 5.2	SKMLAS Implementation Status	117
Table 6.1	PC Specification	121
Table 6.2	Software and Purpose	122

Table 6.3	Test Schedule	122
Table 6.4	Test Description for Admin Login Module	127
Table 6.5	Test Description for Administration Management Module	128
Table 6.6	Test Description for Staff Login Module	129
Table 6.7	Test Description for Staff Registration Module	130
Table 6.8	Test Description for Leave Application Module	131
Table 6.9	Test Description for Leave Cancellation Module	132
Table 6.10	Test Description for Check Leave Status Module	133
Table 6.11	Test Description for View Monthly Leave Record by Staff Module	134
Table 6.12	Test Description for Headmaster Login Module	134
Table 6.13	Test Description for Leave Approval Module	135
Table 6.14	Test Description for View Whole Monthly Leave Record Module	136
Table 6.15	User Authentication Test Data (Admin)	137
Table 6.16	Administrator Management Test Data	138
Table 6.17	User Authentication Test Data (Staff)	139
Table 6.18	Leave Application Test Data	140
Table 6.19	Leave Cancellation Test Data	140
Table 6.20	Check Leave Status Test Data	141
Table 6.21	View Monthly Leave Record (Staff) Test Data	141
Table 6.22	User Authentication Test Data (Headmistress)	142
Table 6.23	Approval Leave Test Data	142
Table 6.24	View Monthly Leave Record Test Data	144

LIST OF FIGURE

FIGURE	TITLE	PAGE
Figure 2.1	Client-Server Architecture	11
Figure 2.2	User Menu Interface	13
Figure 2.3	Leave Application Interface	13
Figure 2.4	Pop-up Calendar.	14
Figure 2.5	Leave Form	14
Figure 2.6	Message of Leave Processing	15
Figure 2.7	Leave Cancellation	15
Figure 2.8	Carry Forward of Leave Balance	16
Figure 2.9	Leave Report	16
Figure 2.10	Leave Application for (UTeM) Staff	17
Figure 2.11	UTeM Leave Supporter	18
Figure 2.12	UTeM Leave Approval	18
Figure 2.13	Staff Leave Record	19
Figure 2.14	Interactive and Incremental Model	22
Figure 3.1	Use Case for Current Leave System	33
Figure 3.2	ERD for SKMLAS	35
Figure 3.3	Activity Diagram for SKMLAS	41
Figure 3.4	Use Case for SKMLAS	43
Figure 3.5	Sequence Diagram for Clerk and Headmaster Login	45
Figure 3.6	Sequence Diagram for Teachers Registration	47
Figure 3.7	Sequence Diagram for Manage Staff's Record	49
Figure 3.8	Sequence Diagram for Leave Application	52
Figure 3.9	Sequence Diagram for Leave Approval	54
Figure 3.10	Sequence Diagram for Check Status of the Application	55
Figure 3.11	Sequence Diagram for Cancel Leave	56

Figure 4.29	Staff's Monthly Leave Record Class Diagram	103
Figure 4.30	Monthly Leave Record Class Diagram	105
Figure 5.1	Client-Server Architecture for Software Development Environment Setup of SKMLAS	110
Figure 5.2:	Interface of Microsoft SQL Server Management Studio Express	111
Figure 5.3:	Connection to Server	112
Figure 5.4:	Create the Database	113
Figure 5.5:	Create the Table	114
Figure 5.6:	Create the Attributes	114
Figure 5.7:	Data Field	115

Figure 4.29	Staff's Monthly Leave Record Class Diagram	103
Figure 4.30	Monthly Leave Record Class Diagram	105
Figure 5.1	Client-Server Architecture for Software Development Environment Setup of SKMLAS	110
Figure 5.2:	Interface of Microsoft SQL Server Management Studio Express	111
Figure 5.3:	Connection to Server	112
Figure 5.4:	Create the Database	113
Figure 5.5:	Create the Table	114
Figure 5.6:	Create the Attributes	114
Figure 5.7:	Data Field	115

LIST OF ABBREVIATION

ERD	-	Entity Relationship Diagram
GUI	-	Graphical User Interfaces
IT	-	Integration Testing
OOA	-	Object-oriented analysis
OOAD	-	Object-oriented Analysis and Design
PC	-	Personal Computer
PSM	-	Projek Sarjana Muda
RDBMS	-	Rational Database Management System
RUP	-	Rational Unified Process
SDE	-	Software Development Environment
S.K.Malim	-	Sekolah Kebangsaan Malim
SKMLAS	-	S.K. Malim Leave Application System
UAT	-	User Acceptance Test
UML	-	Unified Modeling Language
UT	-	Unit Testing

LIST OF APPENDICES

APPENDICES	TITLE
Appendix A	Leave Application Form
Appendix B	Gantt chart for Sekolah Kebangsaan Malim Leave pplication System (SKMLAS)

CHAPTER 1

INTRODUCTION

1.1 Project Background

Sekolah Kebangsaan Malim (S.K.Malim) is located at Bertam Malim, Melaka. The school has 1300 students and 78 staffs which include teachers and support staffs. The headmistress of S.K.Malim is Puan Noor'aini binti Ahmed.

The Leave Application System that will be developed will be used by S.K.Malim teachers to apply leave. Currently, the teachers of the school used the manual system to apply leave. They need to fill the leave forms and afterward the forms will be approved by the headmaster. The administrator which is clerk will process the forms included checking and calculating the balanced of the staff's leave record. The manual system is not effective and systematic for the school management.

The system to-be will be developed based on seven modules. The modules include are login, administrator management, leave application and leave cancellation, leave approval, check the leave status, calculate the balance of the leave and lastly the module to display the monthly leave report

The Sekolah Kebangsaan Malim Leave Application System (SKMLAS) is modeled according to the object-oriented Analysis and Design (OOAD) technique. The

OOAD technique is the best approach to the system because the technique is based on Unified Modeling Language (UML). By using this UML, the system is characterized by its class, data elements and behavior. Besides that, the UML is notation to represent the system module and construct the use case, activity diagram, sequence diagram and class diagram. The Object-oriented analysis (OOA) will analyze the functional requirements in order to focus on the flow of the system. Furthermore, object-oriented design (OOD) will elaborate the analysis module to produce implementation specifications. In object-oriented design, the analysis of any non-functional requirements such as standards, systemic qualities, security, manageability, usability, reusability, extensibility and constraint will be apply to the system.

Project requirements needs in this systems includes software requirements and hardware requirements. For software requirements the system needs equipments tool such as Visual Basic.net and Microsoft project. It also used Window as operating system and Microsoft SQL Server 2005 for database system. Meanwhile, for hardware requirements the system needs the PCs or laptop to develop the system as client-server application.

1.2 Problem Statement

The system will be developed based on the problems that occur from the current manual system. The problems are stated below:

i. Difficult to manage the leave record.

Currently to apply leave, the staffs must fill leave form manually. After that, the form will be approved by the headmaster. Then, the administrator will managed the leave by checking and calculating the balanced of leave for each staffs. The existing

procedure is not efficient for administrator to organize the staffs' leave record. The leave record will be keep in a file. Besides that, the process to apply leave will also take the time.

ii. Difficult to know the status of approval leaves.

After the staffs fill the leave form, the form will be approved by the headmaster. It is difficult to get the leave status either the form had approved or not by the headmaster. The process will also take time.

1.3 Objectives

Regarding the problem statements explained before, the main goal of developing SKMLAS is to manage staffs leave systematic and efficient. Therefore, the objectives of the system are as follow:

i. To manage the leave record more effectively.

SKMLAS will be generating in order to record and stored all the staffs leave data and information systematically. Staffs need to fill the leave form in the provided application and the form will be process automatically managed by administrator. The form will be send automatically to headmaster to get the approval. After that, the staffs will get the leave status either the leave is approval or not. The report will include the total of the leave that has been taken for each staff. All the staff's leave information will be saved in database. So, it is easy for administrator to manage the data and retrieve the staff's record easily.

ii. To know the status of approval leave easily.

By this system, the staffs can check their status of approval leave easily. The report will be generated by the system after the leave is approved.

1.4 Scope

The project scope was divided into three sections which are Project Scope, Module Scope and Target User. Project Scope will explain the overall scope of the project. Module scope will explain all the modules scope that will be including in SKMLAS. Target User will state the users of the system and the system limitation for each type of users.

Project scope of this system is focused on the leave record of the Sekolah Kebangsaan Malim. This system will be used by teachers to apply leaves and only can be access in the school area because it use the client-server approach based on the user's requirement.

The SKMLAS has the target user. The target user divides into two categories. First category is back-end user and second category is front-end user. Back-end user is administrator of Sekolah Kebangsaan Malim. Administrator which is school clerk will be able to maintain the databases and manage the leave process. Administrator also responsible to secure all the data and do function that the database needs. Second category is front-end user. Front-end user also recognize as normal user or end user. Front-end users include the teachers who want to apply the leave and headmaster to approve the leave.

The module of the system has been divided into seven main modules as following:

i. Login and Logout Module

This module is used to identify teachers that used the system. Only an authorized teacher can enter the system. Besides, the administrator and headmaster also need to login the system.

ii. Administrator Management

This module allows the administrator to manage the staff's records. System will record all the information and save it into database. The administrator can add, delete or update staff information or other required information. This module is design to manage the record systematically.

iii. Leave application and leave cancellation

This module allows teachers to fill the provided form which included the type of the leave and also the duration of leave (start and end date). After that, the form will be submitted for the approval. The staffs need to apply leave a weeks before or maximum three days before leave. Whereas, the system also provide the cancel module function if the users want to cancel the leave but the leave can be cancel before it is approved by headmaster.