TESIS^ APPROVAL STATUS FORM

JUDUL: FTMK LAB INVENTORY ONLINE SYSTEM

SESI PENGAJIAN: 2004/2005

Saya MOHAMMAD HAFIDZ BIN HAMDAN
(HURUF BESAR)

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

1. Tesis adalah hakmilik Kolej Universiti Teknikal Kebangsaan Malaysia.
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)

(TANDATANGAN PENYELIA)

Alamat tetap : 406, APT-C, QRTS HOSPITAL SELAYANG, 68100, B. CAVES, SELANGOR D.E.

EN. OTHMAN BIN MOHD.
Nama Penyelia

Tarikh : 16 NOVEMBER 2005

Tarikh : 16 NOVEMBER 2005

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

© Universiti Teknikal Malaysia Melaka

raf
HD55 .M42 2005

0000039050
FTMK lab inventory online system (E-Inventory) /
Mohammad Hafidz Hamdan.

FTMK LAB INVENTORY ONLINE SYSTEM (E-INVENTORY)

MOHAMMAD HAFIDZ BIN HAMDAN

This report is submitted in partial fulfillment of the requirements for the Bachelor of Computer Science.

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
KOLEJ UNIVERSITI TEKNIKAL KEBANGSAAN MALAYSIA
2005

© Universiti Teknikal Malaysia Melaka

ADMISSION

I admitted that this project title name of

FTMK LAB INVENTORY ONLINE SYSTEM (E-INVENTORY)

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

STUDENT : _____ Date : 16 NOVEMBER
(MOHAMMAD HAFIDZ BIN HAMDAN)

SUPERVISOR : _____ Date : 16 NOVEMBER
(ENCIK OTHMAN BIN MOHD.)

© Universiti Teknikal Malaysia Melaka

DEDICATION

To my God, Allah SWT ...

To my greatest idol, Rasulullah SAW...

To my beloved parents Hamdan Bin Shamsuddin and Jahorah Binti Taris...

© Universiti Teknikal Malaysia Melaka

ACKNOWLEDGEMENTS

Assalamualaikum and alhamdulillah, great thankful to Allah because with the consent of Allah I finished the Bachelor Degree Project or 'Projek Sarjana Muda 2'(PSM 2) titled FTMK Lab Inventory Online System(E-Inventory). Behind the development and process of this project from the early phase, there are some important peoples that help and contribute towards the success of the project. Without their contribution, I cannot complete the project with satisfaction. First of all, special thanks to Encik Othman Bin Mohd., my supervisor, who gave me instruction and guidance during the project development. With his guidance, all of the hesitation about my study and analyze about the development of the project revealed. Thanks also to Encik Khairul, the technician of FTMK lab who gave me some information about the current system including the weaknesses of the current system and requirements that must be exists in E-Inventory system. Lastly, thanks to my friends who also give me guidance and help in completing this project. These peoples contribution for my project will never be forgotten.

© Universiti Teknikal Malaysia Melaka

ABSTRACT

The development of FTMK Lab Inventory Online System was carried out for the staff of Faculty of Information and Communication Technology(FTMK) of Kolej Universiti Teknikal Kebangsaan Malaysia computer lab to manage the data about inventory of the lab. FTMK Lab Inventory Online System or E–Inventory is a web application system that will function as a viewer of properties that will be used by staff of FTMK lab itself. Example of properties that include in the lab is computers, graphic tables, chairs and computer desk.

E-Inventory system is functional under E–Faculty web system. It can be used by FTMK lab staff to check the addition and the deficiency of faculty's properties from time to time. This system also can be update by FTMK lab staff. E–Inventory will be developed to make the work of FTMK lab staff more efficient than the time being and can be accessed by all staff of Kolej Universiti Teknikal Kebangsaan Malaysia (KUTKM). This system is available in KUTKM intranet under the E–Faculty that can be accessed by anyone especially head of the FTMK lab staff and FTMK lab technicians.

The E-Inventory System development are focus the security authorization function, register property data, update property data delete property data, administrator function, backup function and search function. The entire problems that have been analyzed in the Feasibility Study and Analysis Requirement phase are applied the waterfall model and prototype model as the main method of solution. The main problems that have been analyzed in study case are lack in data management, lack in data retrieval and lack in security function level. The main requirements in E-Inventory System are register, update and delete property data. Other than that is administrator function, backup function and search function.

All the information in the system is stored in a database that was developed by using SQL scripting language in medium of MySQL database server. The system is in English language firm as the main user requirement. The information will be shown on the screen with interface. The portal system is developed by using Personal Homepage language in medium of Apache Server.

© Universiti Teknikal Malaysia Melaka

TABLE OF CONTENTS

CONTENTS			PAGE
TESIS APPROVAL STATUS			i
PROJECT TITLE			ii
ADMISSION			iii
DEDICATION			iv
ACKNOWLEDGEMENT			v
ABSTRACT			vi
TABLE OF CONTENTS			vii
LIST OF FIGURES			xii
LIST OF TABLES			xiv
LIST OF ACRONYMS			xvii
CHAPTER 1			
1.0	INTRODUCTION		1
	1.1	Overview	1
	1.2	Problem Statements	3
		1.2.1 Problem Analysis	3
		1.2.2 Methods of Solution	3
	1.3	Project Objectives	4
	1.4	Project Scopes	5
	1.5	Contributions	6
	1.6	Expected Output	7

© Universiti Teknikal Malaysia Melaka

CHAPTER 2

2.0	LITERATURE REVIEW			9
	2.1	Introduction		9
	2.2	Fact and Finding		10
		2.2.1	Project Theory	10
		2.2.2	Previous System Study	11
			i) Sample Tracking and Inventory System	12
			ii) Computers Hardware and Software Data Inventory System of the Department of Irrigation and Drainage of Malaysia	15
			iii) SMP Inventory System	19
		2.2.3	Result of Literature Study	22
	2.3	Conclusion		25

CHAPTER 3

3.0	PROJECT PLANNING AND METHODOLOGY			27
	3.1	Introduction		27
	3.2	High-Level Project Requirement		27
		3.2.1	Project Facilities Requirement	27
		3.2.2	Software Requirement	28
		3.2.3	Hardware Requirement	29
	3.3	System Development Approach		30
		3.3.1	Waterfall Model	30
		3.3.2	Prototyping Model	35
		3.3.3	Justification of Methodology Selection	37
		3.3.4	Relation between Waterfall Model And Prototyping Model	39

© Universiti Teknikal Malaysia Melaka

3.4	Project Schedule and Milestones		40
	3.4.1	Gantt Chart	42
3.5	Conclusion		43

CHAPTER 4

4.0	ANALYSIS		44
4.1	Introduction		44
4.2	Analysis of Current System		45
	4.2.1	Business Process	45
	4.2.2	Problem Analysis	46
	4.2.3	Problem Statements	47
4.3	Analysis of To Be System		49
	4.3.1	Functional Requirement	49
	4.3.2	Technical Requirement	60
		4.3.2.1 Software Requirement	60
		4.3.2.2 Hardware Requirement	62
	4.3.3	Implementation/Deployment Requirement	64

CHAPTER 5

5.0	DESIGN		66
5.1	Introduction		66
5.2	Preliminary/High-Level Design		67
	5.2.1	Raw Input/Data	67
	5.2.2	System Architecture	73
	5.2.3	User Interface Design	75
		5.2.3.1 Navigation Design	75

© Universiti Teknikal Malaysia Melaka

		5.2.3.2 Input Design	78
		5.2.3.3 Output Design	79
	5.3	Detailed Design	79
		5.3.1 Software Specification	80
		5.3.1.1 Flow Chart	80
		5.3.1.2 Context Diagram	87
		5.3.1.3 Data Flow Diagram Level 1	88
		5.3.1.4 Data Flow Diagram Level 2 And 3	90
		5.3.2 Physical Database Design	103

CHAPTER 6

6.0	IMPLEMENTATION		105
	6.1	Introduction	105
	6.2	Software Development Environment Setup	106
	6.3	Software Configuration Management	108
		6.31 Configuration Environment Setup	108
		6.32 Version Control Procedure	110
	6.4	Implementation Status	111
	6.5	Conclusion	113

CHAPTER 7

7.0	TESTING		114
	7.1	Introduction	114
	7.2	Test Plan	115
		7.2.1 Test Organization	115
		7.2.2 Test Environment	115
		7.2.3 Test Schedule	116

© Universiti Teknikal Malaysia Melaka

7.3 Test Strategy 117
7.3.1 Classes of Tests 117
7.4 Test Design 120
7.4.1 Test Description 120
7.4.2 Test Data 122
7.5 Test Case Results (for each test case individually) 126

CHAPTER 8

8.0 CONCLUSION 133
8.1 Observation on Weaknesses and Strengths 133
8.2 Propositions for Improvement 135
8.3 Conclusion 136

REFERENCES 137

APPENDIX 138

© Universiti Teknikal Malaysia Melaka

LIST OF FIGURES

FIGURES		PAGE
Figure 2.1:	The Sample Tracking and Inventory System	13
Figure 2.2:	Computers Hardware and Software Data Inventory System of the Department of Irrigation and Drainage of Malaysia	16
Figure 2.3:	SMP Inventory System Main Window	20
Figure 3.1:	The Waterfall Model	30
Figure 3.2:	Relation of Waterfall Model and Prototyping Model	39
Figure 3.3:	Gantt Chart	42
Figure 4.1:	Data Flow Diagram Level 1	52
Figure 5.1:	Package Diagram for E-Inventory Architecture	73
Figure 5.2:	Flowchart Diagram for Login Function	80
Figure 5.3:	Flowchart Diagram for Register Property Menu	81
Figure 5.4:	Flowchart Diagram for Update Property Menu	82
Figure 5.5:	Flowchart Diagram for Delete Property Menu	83
Figure 5.6:	Flowchart Diagram for Administrator Menu	84
Figure 5.7:	Flowchart Diagram for Backup Function	85
Figure 5.8:	Flowchart Diagram for Search Function	86
Figure 5.9:	Context Diagram for E-Inventory System	87
Figure 5.10:	Data Flow Diagram Level 1 for E-Inventory System	88
Figure 5.11:	Diagram 1 Level 2 for E-Inventory System Login Process	90
Figure 5.12:	Diagram 1 Level 3 for Login System Process	91
Figure 5.13:	Diagram 1 Level 3 for E-Inventory Administrator Process	92
Figure 5.14:	Diagram 2 Level 2 for E-Inventory Register Property Data Process	93
Figure 5.15:	Diagram 3 Level 2 for E-Inventory Update Property Data Process	94

© Universiti Teknikal Malaysia Melaka

Figure 5.16:	Diagram 3 Level 3 for E-Inventory Display/Search Property Data Process	95
Figure 5.17:	Diagram 3 Level 3 for E-Inventory Update Property Data Process	96
Figure 5.18:	Diagram 4 Level 2 for E-Inventory Delete Property Data Process	97
Figure 5.19:	Diagram 4 Level 3 for E-Inventory Display/Search Property Data Process	98
Figure 5.20:	Diagram 4 Level 3 for E-Inventory Delete Property Data Process	99
Figure 5.21:	Diagram 5 Level 2 for Administrator Process	100
Figure 5.22:	Diagram 6 Level 2 for Backup Process	101
Figure 5.23:	Diagram 7 Level 2 for E-Inventory Search Property Data Process	102
Figure 6.1:	Apache server integrated between the E-Inventory interface application and the database.	106
Figure 6.2:	Network diagram between the users of the E-Inventory, which they can directly connect with the server.	107
Figure 6.3:	System Change Request (SCR) Form	109

© Universiti Teknikal Malaysia Melaka

LIST OF TABLES

TABLES		PAGE
Table 3.1:	Project Facility Specifications	28
Table 3.2:	Software Requirement and Function	28
Table 3.3:	Language Used and Function	29
Table 3.4:	Complete of Personal Computer	29
Table 3.5:	Other Computer Accessories and Functions	29
Table 3.6:	Phase 1 - Feasibility Study and Analysis Requirement	40
Table 3.7:	Phase 2 - Project Planning and Design	40
Table 3.8:	Phase 3 - Project Implementation and Development	41
Table 3.9:	Phase 4 - Project Testing and Maintenance	41
Table 3.10:	Phase 5 - Project Evaluation and Delivery	41
Table 4.1:	Description of Data Flow Diagram Level 1	53
Table 4.2:	Login System Diagram Analysis	54
Table 4.3:	Register Property Data Diagram Analysis	55
Table 4.4:	Update Property Data Diagram Analysis	56
Table 4.5:	Delete Property Data Diagram Analysis	56
Table 4.6:	Administrator Diagram Analysis	57
Table 4.7:	Backup Diagram Analysis	58
Table 4.8:	Search Diagram Analysis	59
Table 4.9:	Software Requirement and Description	60
Table 4.10:	Language Requirement and Description	61
Table 4.11:	Server Side Requirement for Personal Computer	62
Table 4.12:	Client Side Requirement for Personal Computer	63
Table 4.13:	Other Accessories	63
Table 4.14:	Implementation Requirement Specification	64
Table 5.1:	Interview Specification	67

© Universiti Teknikal Malaysia Melaka

Table 5.2:	Observation Specification	67
Table 5.3:	Research Specification	68
Table 5.4:	E-Inventory Login System Specification	68
Table 5.5:	Register Property Data Specification	68
Table 5.6:	Update Property Data Specification	69
Table 5.7:	Delete Property Data Specification	70
Table 5.8:	Backup Specification	71
Table 5.9:	Administrator Specification	71
Table 5.10:	Search Specification	72
Table 5.11:	Description of Input Design Issues	78
Table 5.12:	Description of Output Design Issues	79
Table 5.13:	Description of Data Flow Diagram Level 1	89
Table 5.14:	Table Inventory Specifications	103
Table 5.15:	Table Harta Specifications	104
Table 5.16:	Table Login Specifications	104
Table 6.1:	Implementation Environment in E-Inventory	107
Table 6.2:	Implementation status for each module of E-Inventory	112
Table 7.1:	Test Schedule Specification	116
Table 7.2:	Test Design Specification	120
Table 7.3:	Login System Specification	122
Table 7.4:	E-Inventory Register Property Data Specification	122
Table 7.5:	E-Inventory Update Property Data Specification	123
Table 7.6:	E-Inventory Delete Property Data Specification	123
Table 7.7:	E-Inventory Administrator Specification	124
Table 7.8:	E-Inventory Backup Specification	124
Table 7.9:	E-Inventory Search Specification	124
Table 7.10:	Test Case Result in Login System Module	126
Table 7.11:	Test Case Result in Register Property Data	127
Table 7.12:	Test Case Result in Update Property Data	128
Table 7.13:	Test Case Result in Delete Property Data	129
Table 7.14:	Test Case Result in Administrator Function	130

© Universiti Teknikal Malaysia Melaka

Table 7.15: Test Case Result in Backup Function 131
Table 7.16: Test Case Result in Search Function 132

© Universiti Teknikal Malaysia Melaka

LIST OF ACRONYMS

ACRONYMS	FULL TERMS
1. KUTKM	Kolej Universiti Teknikal Kebangsaan Malaysia
2. FTMK	Faculty of Information Communication Technology
3. PSM	Projek Sarjana Muda
4. SDLC	Software Development Life Cycle
5. CD-ROM	Compact Disk-Read Only Memory
6. CASE	Computer-Aided Software Engineering
7. PHP	Personal Homepage
8. DFD	Data Flow Diagram
9. ERD	Entity Relationship Diagram
10. ICT	Information Communication Technology

© Universiti Teknikal Malaysia Melaka

CHAPTER 1

INTRODUCTION

1.1 Overview

Faculty of Information and Communication Technology (FTMK) Lab Inventory Online System or E-Inventory is a web application system that functioned as a data storage of FTMK lab properties. This system is under administration of FTMK lab technicians. Example of properties that include in the lab is computers, graphic tables, switches and software. This system is functional under E–Faculty web system. FTMK lab technicians use this system to check the addition and the deficiency of faculty's properties from time to time. This system can be updated by FTMK lab staff.

E-Inventory will be developed to make the work of FTMK lab staffs more efficient than the time being and can be accessed by staffs who responsible in FTMK lab properties information. This system will be available in KUTKM intranet under the E–Faculty that can be accessed by administration staff who is responsible for the system.

In developing the system, information is referred to Kolej Universiti Teknikal Kebangsaan Malaysia (KUTKM) FMTK lab. Here, the technicians of FTMK lab are in charge in recording the properties of the lab. So, most of the information can be achieve from them.

Problems that the FTMK lab staff have now from the current system are there is no database to record the properties of the lab, the data that recorded in the current system is not in detail, and only certain staff can understand the code of the lab's

© Universiti Teknikal Malaysia Melaka

properties. If other staffs want the information of FTMK lab inventory information, he or she can only refer to one source which it can be achieve from the technicians. This will make the work more complicated.

To solve these problems, E-Inventory will come in handy. This is because it have database that will records the inventory, the system will depict the details of the properties, anyone can understand the properties instead of the properties' code and the system can be accessed using web browser that can help anyone who want the information about the FTMK lab inventory. So, with the E-Inventory, other staffs do not have to meet the technicians to get the information. Only access it from the KUTKM intranet system.

E-Inventory is a web application system. This system will be developed using PHP web programming scripting language and MySQL database. It can be accessed by browsing the Internet Explorer.

The main objectives of E-Inventory development is to fulfill the requirement of Bachelor of Information Communication Technology in Kolej Universiti Teknikal Kebangsaan Malaysia for Projek Sarjana Muda I and Projek Sarjana Muda II, which it is 3 credit hours for every course. E- Inventory is based on inventory record management which the information of the properties can be registered, updated, deleted. The dealings among FTMK lab technicians with the properties are improved and all problems about achieving information could be overcome. The portal system is developing to take good opportunity to enhance the health services and community in online system in Malaysia.

© Universiti Teknikal Malaysia Melaka

1.2 Problem Statements

1.2.1 Problem Analysis

There are some problems in previous system operation, which can be state in the documentation. The problems are: -

i. Old Kind of Storing Data

As usual, a technician should store and update information about collected data of FTMK lab property in the related form either KEW312 for Harta Tetap or Inventory form. Every situation that linked to FTMK lab property like changing location or get terminated, the technician must record it in the form. The form is created using Microsoft Excel. This way of storing data is difficult to manage because the data might be wrong inserted, misplaced or missing due to usage of form without the existence of database.

ii. Slow Working Environment

Nowadays, doing a job is very essential to face in many challenges in life. Like FTMK lab technicians, their also have their more important job other than record or manage the data about FTMK lab property data. It is disturbing if their work in searching, updating or calculate FTMK lab property data slowing their other job.

1.2.2 Methods of Solution

There are several types of solution for the problem statement of E-Inventory project All the specifications have referred to the problem statement below: -

i. Old Kind of Storing Data

© Universiti Teknikal Malaysia Melaka

As usual, a technician should store and update information about collected data of FTMK lab property in the related form either KEW312 for Harta Tetap or Inventory form. E-Inventory would solve the problem. E-Inventory can help the technicians to store data in modern and efficient way so if they want to get the data back, it will be easier. In the other hand, the technician also can update and delete data if they need to do so at any time. The data will be safe and secure in the database.

ii. Slow Working Environment

Nowadays, doing a job is very essential to face in many challenges in life. As FTMK lab technicians they have their more important job than manage data about FTMK lab property. So, with E-Inventory, they can save their time with keying in a collected data into the system without worry about their other job.

1.3 Project Objectives

E-Inventory system has some objectives in developing it. The objectives are depend on improvements from the current system that FTMK lab staff use in recording the inventory of FTMK lab. The objectives are:

i. To fulfill the requirement of Bachelor of Information and Communication Technology in Kolej Universiti Teknikal Kebangsaan Malaysia. The project is separated to two courses; Projek Sarjana Muda I and Projek Sarjana Muda II, which it is 3 credit hours for every course.

ii. FTMK lab staff will work more efficient.

iii. Record of the inventory can be easy to store with the existence of the database.

iv. Any FTMK lab staff can easily get the information by accessing the system without refer to the technicians.

v. FTMK lab technicians who responsible in managing the data of FTMK lab inventory can modify and update the data needed.

© Universiti Teknikal Malaysia Melaka

vi. FTMK lab technicians who responsible in managing the data of FTMK lab inventory can delete the data needed if the expiry service date of property is reached.

vii. Any FTMK lab staff can get the report of FTMK lab inventory data and print it out.

viii. FTMK lab technicians can make a backup for the E-Inventory database in case of the database corruption or intrusion.

1.4 Project Scopes

Following are the scopes of E-Inventory development: -

i Users

- The users of the E-Inventory will be dividing by two kinds. It is administrator and user.
- FTMK lab technicians are administrator in managing the data.
- User can only view, search and print out the report of FTMK lab inventory data.
- The system can be studied easily. It is very understandable and flexible.
- Suitable for office and organization to record data.

ii System Functional

- The system is based on data management concept which can help the technicians manage the data of FTMK lab property. It helps the technician in storing data, edit the existing data and delete the data needed.
- Administrator can decide the user that will use these system which among the technicians.

© Universiti Teknikal Malaysia Melaka

- The system has provided search function where it is easy to find the property data needed.
- The system has backup function in case of the database corruption or intrusion.
- User can print out record needed easily.

iii Platforms

- The system is more compatible in Apache Server.
- The system needed MySQL database server.
- The system is also can execute their program based on Microsoft Windows XP.

1.5 Contributions

E-Inventory has the following contributions of the research purposes: -

i. Enhance and Improve E-Inventory

This system allows motivated and independent developers to make progress away from the traditional data recording environment and old kind of design. The other developers could make the research as main references in their follow-up project implementation and could enhance more sophisticated system in many aspects.

ii. Integrating New Technology Aspects

New technology aspects are very popular term right now. It can be divided into two categories: decision supportive. With the power and popularity of personal computers nowadays, a point has been reached where technology, that is good enough to employ data management applications. With the integration of technology, E-Inventory will become useful system in data management services.

© Universiti Teknikal Malaysia Melaka

1.6 Expected Output

Below, there are summary of expected output following the main features in the E-Inventory.

i. Register Property

- Administrator can add and data of FTMK lab inventory property for Inventory and 'Harta Tetap'.
- The system checks the similarity from previous user input for appropriate responses. The system will warn user if the user key in error input or leaves certain field in blank.

ii. Update Property

- Administrator can update, modify or edit the data needed for Inventory and 'Harta Tetap'.
- The system checks the similarity from previous user input for appropriate responses. The system will warn user if the user key in error input or leaves certain field in blank.

iii. Delete Property

- Administrator can delete the data needed for Inventory and 'Harta Tetap' if the expiry service date for the property is reached.

iv. Administrator

- Administrator can add other administrator.
- Administrator can update only his username and password.
- Administrator can delete only his login account.

© Universiti Teknikal Malaysia Melaka