

BORANG PENGESAHAN STATUS TESIS

JUDUL: ELECTRONIC STANDARD SECONDARY DOSIMETRY LABORATORY (e-SSDL)

SESI PENGAJIAN: 2006/2007

Saya NUR FATIHAH BINTI YUSOFF
(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 dan projek 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 : No 46, Kampung Bukit Kechik,
16400 Melor, Kota Bharu, Kelantan Darul Naim.

Prof. Madya NorHazia Bt Md Salleh
Nama Penyelia

Tarikh : 21 November 2006

Tarikh : 21 November 2006

CATATAN: ** Jika tesis ini SULIT atau TERHAD, sila lampirkan surat daripada pihak berkuasa.

^ Tesis dimaksudkan sebagai Laporan Projek Sarjana Muda (PSM)

raf

QA76.5.E56 .N87 2006



0000039129

Electronic - Standard Secondary Dosimetry Laboratory
(e-SSDL) / Nur Fatimah Yusoff.

**ELECTRONIC-STANDARD SECONDARY DOSIMETRY LABORATORY
(e-SSDL)**

NUR FATIHAH BINTI YUSOFF

KOLEJ UNIVERSITI TEKNIKAL KEBANGSAAN MALAYSIA

**ELECTRONIC-STANDARD SECONDARY DOSIMETRY LABORATORY
(E-SSDL)**

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

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY KOLEJ
UNIVERSITI TEKNIKAL KEBANGSAAN MALAYSIA
2006

DECLARATION

I hereby declare that this project report entitled
**ELECTRONIC-STANDARD SECONDARY DOSIMETRY LABORATORY
(E-SSDL)**

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

STUDENT :  _____ Date : 21 Nov 2006
(NUR FATIMAH BINTI YUSOFF)

SUPERVISOR :  _____ Date : 21 Nov 2006
(PROF.MADYA NORHAZIAH BT MD SALLEH)

DEDICATION

To my Family

Whose boundles love and support replenishes and enriches my soul
During the long hours of writing.

For my supervisor, Prof. Madya Norhaziah Md. Salleh

Kolej Universiti Teknikal Kebangsaan Malaysia (KUTKM)

ACKNOWLEDGEMENT

First of all, I would like to thank Allah s.w.t to give me an opportunity to my Final year Project .I would like to take this opportunity to express my sincere appreciation to all who was involved in my PSM I

I sincerely express would like to thanks for my Coordinator Prof Madya Norhaziah Binti Md Salleh were involved for guiding me and had enthusiasm in finishing my reporting for my project electronic-Standard Secondary Dosimetry Laboratory (e-SSDL). In addition, thanks a lot to my family for giving me their blessings to have my attachment here and also their supporting moral, finances and so on. Thanks also to all friends to give ideas in this project and willingness to help me during PSM I period.

And lastly, I would like to thank all that are involved directly or indirectly with my report for final year project THANK YOU.

Abstract

electronic-Standard Secondary Dosimetry Laboratory (e-SSDL) that the thesis project This system will be replacing for the current system, which is a two different computer application, such Sistem Personal Dosimetri and Sistem SSDLCet This system is web based system. The functions are focused on the online registration by customer, record of data inventory (badge) information, generate barcode for inventory (badge), scan barcode for confirmation and record generated of radiation report The other functions for this system is to, view the customers status, search and viewing the report. The customer must be register first to get the badge and the SSDL will approve the application if the customer followed the rules. Then the SSDL unit will process the application which the unit will provide the badge. Before the badge is delivery to the customer SSDL will generate a barcode to every badge and will be parked at the back of the film badge. The film badge must be recorded. After one month the customer must return the film badge to find out the radiation dose in the film badge. The next process is the SSDL will scan the barcode at the film badge. Then the film badge will be brought to laboratory to wipe out the radiation dose. The result from laboratory about the film badge must be entering into system to record and to generate a report to customer. This system also has the facility to check customer and report status. This system is systematic and better than the two computer applications and its will be easier for the MINT SSDL Unit to record their business process in radiation tasks

ABSTRAK

electronic-Standard Secondary Dosimetry Laboratory (e-SSDL) adalah tajuk tesis. Sistem ini adalah bagi menggantikan dua sistem yang sedia ada di unit Makmal Standard Sekunder Dosimetri di Malaysian Institute of Nuclear Technology Research Bangi. Unit SSDL telah menggunakan dua aplikasi komputer dalam aktiviti harian iaitu Sistem Personel Dosimetri dan Sistem SSDLCet. Namun sistem sedia ada mempunyai banyak kelemahan. Sistem yang akan dibangunkan adalah sistem berdasarkan web. Sistem ini menyediakan kemudahan untuk pelanggan unit SSDL untuk mendapatkan lencana bagi radioaktif. Proses bagi sistem ini ialah, pelanggan membuat pendaftaran sendiri secara *online* dan pihak SSDL akan memberi kelulusan jika pelanggan yang berdaftar adalah mengikut peraturan yang telah ditetapkan. Selain itu sistem ini memberi kemudahan dari segi penyimpanan data inventori, data keputusan makmal, carian pengguna, penyediaan *barcode* dan juga memaparkan status pelanggan. Pihak SSDL akan menyediakan *barcode* dan ditampal dibelakan lencana sebelum dihantar kepada pelanggan. selepas itu, dalam tempoh masa satu bulan, pelanggan dikehendaki menghantar kembali lencana tersebut untuk proses cucian dan seterusnya mendapatkan keputusan cerapan dos keatas lencana tersebut. Selepas proses cucian dilakukan, keputusan direkodkan kedalam sistem bagi membantu pihak SSDL dalam penyediaan laporan untuk pelanggan. sistem yang akan dibangunkan ini adalah lebih sistematik berbanding dengan sistem yang sedia ada dan ia akan memudahkan pihak SSDL dalam merekod aktiviti hariannya.

TABLE OF CONTENT

CHAPTER	SUBJECT	PAGE
	DECLARATION	ii
	DEDICATION	iii
	ACKNOWLEDGEMENT	iv
	ABSTRACT	v-vi
	TABLE OF CONTENT	vii
	LIST OF TABLES	viii
	LIST ABBREVIATIONS	x
CHAPTER 1	INTRODUCTION	
	1.1 Project Background	1
	1.2 Problem Statements	2
	1.3 Objectives	3
	1.4 Scopes	4-5
	1.5 Project Significance	6
	1.6 Conclusion	7
CHAPTER II	LITERATURE REVIEW AND PROJECT METHODOLOGY	
	2.1 Introduction	8
	2.2 Fact and Finding	9-10
	2.3 Project Methodology	11
	2.4 Project Requirements	18
	2.4.1 Software Requirements	18
	2.4.2 Hardware Requirement	20
	2.4.3 Network Requirement	22
	2.5 Project Schedule and Milestones	22
	2.6 Conclusion	22
CHAPTER III	ANALYSIS	
	3.1 Introduction	23
	3.2 Analysis of current system	24
	3.2.1 Business Process	24
	3.3 Analysis of Proposed System	28
	3.3.1 Functional Requirement	28
	3.3.2 Existing and Required Data	31
	3.3.3 Software Requirements	36
	3.3.4 Hardware Requirements	36
	3.3.5 Hardware Requirements	37
	3.4 Conclusion	38

CHAPTER IV DESIGN	
4.1 Introduction	39
4.2 High-Level Design	39
4.2.1 System Architecture	40
4.2.2 User Interface Design	42
4.2.2.1 Navigation Design	47
4.2.2.2 Input Design	49
4.2.2.3 Output Design	51
4.2.3 Database Design	53
4.2.3.1 Conceptual and Logical Database Design	53
Business rules	55
Data Dictionary	56
Normalization	62
DBMS Selection	62
4.3 Detail Design	63
4.3.1 Software Specification	63
4.3.2 Physical Database Design	73
4.4 Conclusion	84
CHAPTER V IMPLEMENTATION	
5.1 Introduction	85
5.2 Software Development Environment Setup	86
5.3 Database Implementation	87
5.4 Software Configuration Management	89
5.5 Implementation Status	92
5.6 Conclusion	93
CHAPTER VI TESTING	
6.1 Introduction	94
6.2 Test Plan	94
6.3 Test Strategy	98
6.4 Test Design	101
6.5 Test Data	116
6.6 Conclusion	118
CHAPTER V PROJECT CONCLUSION	
7.1 Observation on Weakness and Strengths	119
7.1.1 Strengths of System	119
7.1.2 Weakness of System	120
7.2 Proposition for Improvement	120
7.3 Contribution	123
7.4 Conclusion	123

REFERENCE

121

APPENDIX A

APPENDIX B

APPENDIX C

LIST OF FIGURES

FIGURE	TITLE	PAGE
2.1	Project Methodology	11
2.2	Design (DBLC)	13
3.1	Flow Chart	27
3.2	Context Diagram for current system	28
3.3	Context Diagram proposed system	29
3.4	DFD Level 0 for e-SSDL system	30
4.1	E-SSDL architecture.	40
4.2	Overview of software and hardware development	41
4.3	Login customer Interface	42
4.4	Login SSDL Interface	42
4.5	Registration form	43
4.6	User registration interface	44
4.7	Machine registration	45
4.8	Area Registration	46
4.9	Navigation Design	47
4.10	Input Design	64
4.11	Output Design	64
4.12	Login Interface	64
4.13	New Registration Interface	66
4.14	List New Registration Interface	66
4.16	Equipment Registration Interface	68
4.17	Registration status interface	70
4.18	Generate report interface	72
5.1	Environment Setup	86
5.2	Setting site	89
5.3	Setting Server	90

5.4	Setting working Environment	90
5.5	Testing files	91
5.6	Summary	91

LIST OF TABLES

TABLE	TITLE	PAGE
2.0	Hardware Specification	20
2.1	Hardware Recommended	21
4.1	Input Design	50
4.2	Output Design	52
4.3	Table Customer	58
4.4	Table Inventory	58
4.5	Table Suppliers	59
4.6	Table Staff	59
4.7	Table Area	60
4.8	Table Machine	60
4.9	Table result	61
4.10	Input and Output	64
4.11	Input and Output	67
4.12	Input and Output	69
4.13	Input and Output	71
5.1	Implementation environment	86
5.2	Network Configuration	87
5.3	Setting Specification	88
5.4	Configuration	89
5.5	Implementation Status	93
6.1	Personal Detail	95
6.2	Testing environment factor	95
6.3	Testing Schedule Specification	96
6.4	Test Database	101
6.5	Test Description for Login	103

6.6	Test Description for Registration	104
6.7	Test Description for List New Registration	105
6.8	Test Description for Equipment Registration	106
6.9	Test Description for Report View	107
6.10	Test Description for Customer Status	107
6.11	Test Description for administrator	108
6.12	Test Description for Registration status	109
6.13	Test Description for Supplier Registration	110
6.14	Test Description Inventory Information	111
6.15	Test Description for Generate Report	112
6.16	Test Data	113
6.17	Test Data	115
6.18	Test Data	115
6.19	User Login module	116
6.20	Test Summary	117

LIST OF ABBREVIATIONS

KUTKM	- Kolej Universiti Kebangsaan Malaysia
MINT	- Malaysian Institute of Nuclear Technology Research
SSDL	Standard Secondary Dosimetry Laboratory

CHAPTER 1

INTRODUCTION

1.1 Project Background

The system is known as Electronic-Standard Secondary Dosimetry Laboratory (e-SSDL) System for Standard Secondary Dosimetry Laboratory Unit (SSDL) at Malaysian Institute of Nuclear Technology Research (MINT). SSDL was established 1980 for development ultra standard and provide dosimetry services. The SSDL have two sections such Technical and Quality (QA). From 1980 until now the SSDL become member of "The IAEA/WHO Network of SSDLs". SSDL is a Standard and Reference National Centre for ion ultra such ultra-x, gamma, beta and neutron. The standard measurement invol Roentgen@C/Kg (*Dedahan*), Gray (*Kerma udara*), Gray (*Dos Terserap*) and Sievert (*Dos Setara*). The SSDL vision is to become a dosimetry ultra laboratory well-known at national and international stage. The objectives are:

- a. Develop and provide national standard for ion ultra for intention and requirement in industry, medical, act 304, security and research.
- b.. Provide services in ultra dosimetry for customers requirement in national or international based on international standard.

The SSDL unit is involved in preparing film badges and tracking the film badges exposure to radiation. A film badge is usage by personnel who are exposed to radiation at different organizations. Currently only MINT is empowered to provide this service.

This system is a web based application system. The system will record customer information, inventory (badges), reporting, and viewing. Currently the SSDL Unit is using two different computer applications, which are developed by IT Centre of MINT for its daily activities. The systems are *Sistem Dosimetri Personel SSDL* and *SSDLCet*.

e-SSDL System is developed for SSDL. The system provides facilities for customer registration, inventory recording, barcode generation, barcode scanning, searching, customer status, and online reporting for customer.

1.2 Problem statements

The aim of this system is to help SDDL's staff to easily maintain and update data in a systematic manner. The new system is aimed to reduce problems such as following:

- i) The unnormalized database.
- ii) Unsystematic record keeping, where some data stored in the system is using Microsoft Access and some other data stored in Microsoft SQL Server.
- iii) Inadequate facilities in the current systems.
- iv) Difficult to maintain because the current system was developed using an old programming language.
- v) The systems are not user friendly and very complex
- vi) The current systems are not web based system. The customer request by manually, and that data will keep into the system.

Apart from the common problems stated above, the system SSDLCet has two more problems which are:

- i) Not integrated with *Sistem Personel Dosimetri* SSDL.
- ii) Not able to print report.

1.3 Objectives

Based on interviews with MINT research officer, Puan Maizura Bt Ibrahim, the current systems that they are using have operational problems and have no documentation. They are also not modular, which means that are difficult to modify, upgrade, and maintain. The objectives of e-SSDL System are:

- a) To develop a web based system using open source software.
- b) To provide a stable database in order to support large volumes of data.
- c) To upgrade the current system with additional modules.
- d) Systematic storage of data.
- e) To improve productivity at SSDL unit.

1.4 Scopes

e-SSDL System is mainly used in providing film badges to customers. A customer may apply for a film badge. The administrator at SSDL will approve the application. The e-SSDL will generate a barcode for a film badge before delivering it to the customer. The generated barcode will be labeled at the back of the film badge. The film badge details must be recorded. After one month, the customer must return the film badge to find out the radiation exposure in the film badge. e-SSDL will scan the barcode at the film badge to identify its owner. Then, the film badge will be brought to the laboratory to eliminate the radiation dose. After that process the information will be entered into the system. The system will then generate a report for the customer. The report includes the latest radiation dose and the cumulative dose for the film badge. e-SSDL will also generate customer status. The facilities that are provided by e-SSDL System are as below:

- a) provide online the registration for customers of MINT
- b) Record film badge for easy tracking of its badge
- c) Generation of barcodes for film badges
- d) Searching of film badge to record its exposure to radiation
- e) Online reporting of radiation dose

1.5 Project significance

The system will benefit SSDL Unit at MINT in many ways particularly to facilitate the process flow for film badge processing. The system will help SSDL Unit to produce film badges for its customer, record customers information and produce reports. In addition, the system will enable SSDL to establish a systematic and process.

1.6 Conclusion

This system is to help the SSDL unit. The web based system will enable customers to easily register. Henceforward literature review and project methodology will be continued as a next stage.

CHAPTER II

LITERATURE REVIEW AND PROJECT METHODOLOGY

2.1 Introduction

This chapter explains some of the literature, or previous referred to works consulted in order to understand and investigate the research problem. The literature review focuses on various theory and devices to be used in the Electronic-Standard Secondary Dosimetry Laboratory (e-SSDL) System.

The literature review for this system is based on the current situations and current systems to compare and identify users and system requirements.

A key issue of e-SSDL theory and devices is described in Section 2.2. Facts and finding. Section, 2.3 of the literature review explain the project methodology used in this project. Finally, Sections 2.4.1 – 2.4.3 will focus on software, hardware, and other requirements used in e-SSDL System.