

A-

raf

QA76.76.D47 .M34 2007



0000044466

Asset inventory information system for Lembaga Akreditasi
Negara / Maimunah Ismail.



JUDUL: Asset Inventory Information System for Lembaga Akreditasi Negara (e-AIIS)

SESI PENGAJIAN : 2006/2007

Saya : MAIMUNAH BINTI ISMAIL

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. Perpustakaan Fakulti Teknologi Maklumat dan Komunikasi dibenarkan membuat salinan untuk tujuan pengujian 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: 22, Jalan P35

9/6 Bandar Sunway, 46150

P. Jaya Selangor

Tarikh: 12/11/07



(TANDATANGAN PENYELIA)

En. Mohd Fadzil Bin Zulkifli

Tarikh: 12/11/2007

CATATAN: *Tesis dimaksudkan sebagai Laporan Akhir Projek Sarjana Muda(PSM)

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

**ASSET INVENTORY INFORMATION SYSTEM FOR LEMBAGA AKREDITASI
NEGARA**

MAIMUNAH BINTI ISMAIL

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

**FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
UNIVERSITI TEKNIKAL MALAYSIA MELAKA**

2007

DECLARATION

I hereby declare that this project report entitled
**ASSET INVENTORY INFORMATION SYSTEM FOR LEMBAGA
AKREDITASI NEGARA**

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

STUDENT :  Date : 07/11/07
(MAIMUNAH BINTI ISMAIL)

SUPERVISOR :  Date : 7/11/07
(EN. MOHD FADZIL ZULKIFLI)

ACKNOWLEDGEMENTS

First, I would like to take this opportunity to dedicate my appreciation to Lembaga Akreditasi Negara (LAN) management and staffs for their cooperation that enable me to develop a system for my *Projek Sarjana Muda*.

I place my deepest gratitude to Encik Muhd Asuwad Asli, the Store Officer of LAN and Encik Mukhtar Mohd, the Asset Officer of LAN. They had given many useful ideas regarding the requirement needed for Asset Inventory Information System. I was thankful with their enthusiasm and valuable suggestions.

Not forgetting my appreciation towards Encik Mohd Fadzil Zulkifli who is my supervisor, I would like to thank him for the guidance, support and advices given during my *Projek Sarjana Muda*. He was able to spend his time to check my reports and giving guidance for me in preparing the final report. A lot of useful explanation on becoming database programmer had given by him.

To my family a heartfelt thank you for their supports, advices and patience shower to me. Finally, I would like to say that I would not disappoint anyone who helps me during my *Projek Sarjana Muda*. I will always remember all the advices and knowledge obtained in the future.

THANK YOU ALL.

ABSTRACT

Asset and Inventory management is a major concern for companies today. This project is focus on Asset Inventory Information System (e-AIIS) which occupies few important functions like registration, online orders, approval process, e-mail notification, re-order level for stock control, report generations and asset maintenance information. Currently, only inventory registration activity is done using computerized system and the rest are done manually. This poses problem for the staff as he is unable to keep track of inventory used and managing asset. Taking inventory count is not easy but essential in a control environment. Human errors in calculating cause unreliability functions in accessing data. A computerized online asset inventory information system will be developed by including all the functions proposed. Related records have been gathered from internet research, current system analysis and interview. Prototyping Methodology is used through out the development of e-AIIS. This application will be using SQL Server 2000 as the database management system and IIS as web server that manages the business logic of e-AIIS. The purpose of e-AIIS is toward achieving greatest effectiveness, profitability and productivity in managing daily business.

ABSTRAK

Pengurusan aset dan inventori adalah satu kemestian bagi sesebuah syarikat atau organisasi. Tumpuan projek ini adalah terhadap Sistem Maklumat Aset & Inventori (e-AIIS). Sistem ini memuatkan fungsi utama seperti pendaftaran, pesanan secara *online*, proses kelulusan, pemberitahuan secara email, pesanan semula untuk menampah stok, penghasilan laporan dan maklumat penyelenggaraan aset.. Kini hanya proses pendaftaran inventori di LAN menggunakan sistem perkomputeran dan proses lain dilakukan secara manual sahaja. Staf yang menguruskan inventori itu akan menghadapi masalah seperti rekod inventori dan aset yang digunakan tidak teratur dan hilang. Kesilapan manusia dalam pengiraan sering menyebabkan pemprosesan data kurang sempurna dan tidak boleh digunakan. Sistem maklumat inventori dan aset melalui komputer serta *online* akan dibangunkan dengan bercirikan fungsi yang dicadangkan. Rekod berkaitan telah diperolehi melalui penyelidikan menerusi internet, analisis sistem yang sedia ada serta melalui sesi temubual. “*Prototyping Methodology*” atau Kaedah Prototaip telah digunakan sepanjang proses pembangunan e-AIIS. Aplikasi ini menggunakan *Microsoft SQL Server 2000* sebagai sistem pengurusan pangkalan data dan IIS sebagai pelayan web yang menguruskan proses perhitungan logik. Tujuan e-AIIS adalah untuk mencapai tahap yang paling efektif, produktiviti dan memberi keuntungan dalam mengurus perniagaan dari masa ke semasa.

TABLE OF CONTENTS

| CHAPTER | SUBJECT | PAGE |
|-------------------|--|------|
| | ACKNOWLEDGEMENTS | ii |
| | ABSTRACT | iii |
| | ABSTRAK | iv |
| | TABLE OF CONTENTS | v |
| | LIST OF TABLES | ix |
| | LIST OF FIGURES | x |
| | LIST OF ABBREVIATIONS | xii |
| | LIST OF ATTACHMENTS | xiii |
| | | |
| CHAPTER I | INTRODUCTION | |
| | 1.1 Project Background | 1 |
| | 1.2 Problem Statements | 2 |
| | 1.3 Objectives | 3 |
| | 1.4 Scope | 4 |
| | 1.5 Project Significance | 6 |
| | 1.6 Expected Output | 7 |
| | 1.7 Conclusion | 7 |
| | | |
| CHAPTER II | LITERATURE REVIEW AND PROJECT METHODOLOGY | |
| | 2.1 Introduction | 8 |
| | 2.2 Facts and Findings | 9 |
| | 2.2.1 Domain | 9 |

| | |
|-------------------------------------|----|
| 2.2.2 Existing System | 9 |
| 2.2.3 Technique | 23 |
| 2.2.3.1 Interview | 23 |
| 2.3 Project Methodology | 25 |
| 2.4 Project Requirements | 29 |
| 2.4.1 Software Requirement | 29 |
| 2.4.2 Hardware Requirement | 30 |
| 2.5 Project Schedule and Milestones | 30 |
| 2.6 Conclusion | 31 |
| | |
| CHAPTER III ANALYSIS | |
| 3.1 Introduction | 32 |
| 3.2 Problem Analysis | 33 |
| 3.2.1 Background of current system | 33 |
| 3.2.2 Problem Statement | 36 |
| 3.3 Requirement Analysis | 37 |
| 3.3.1 Data Requirement | 38 |
| 3.3.2 Functional Requirement | 38 |
| 3.3.3 Non-Functional Requirement | 43 |
| 3.3.4 Other Requirement | 44 |
| 3.3.4.1 Software Requirement | 44 |
| 3.3.4.1 Hardware Requirement | 47 |
| 3.3.4.1 Network Requirement | 48 |
| 3.4 Conclusion | 48 |
| | |
| CHAPTER IV DESIGN | |
| 4.1 Introduction | 49 |
| 4.2 High-Level Design | 49 |

| | | |
|---------|--|----|
| 4.2.1 | System Architecture | 50 |
| 4.2.2 | User Interface Design | 51 |
| 4.2.2.1 | Navigation Design | 52 |
| 4.2.2.2 | Input Design | 53 |
| 4.2.2.3 | Output Design | 53 |
| 4.2.3 | Conceptual and Logical Database Design | 54 |
| 4.2.3.1 | Conceptual Design | 54 |
| 4.2.3.2 | Logical Design | 55 |
| 4.2.3.3 | DBMS Selection | 59 |
| 4.3 | Detail Design | 63 |
| 4.3.1 | Software Specification | 63 |
| 4.3.2 | Physical Design | 63 |
| 4.4 | Conclusion | 75 |

CHAPTER V IMPLEMENTATION

| | | |
|-------|--|----|
| 5.1 | Introduction | 76 |
| 5.2 | Software Development Environment Setup | 77 |
| 5.2.1 | Software Setup | 77 |
| 5.2.2 | Hardware Setup | 78 |
| 5.2.3 | Database Setup | 78 |
| 5.3 | Database Implementation | 79 |
| 5.4 | Software Configuration Management | 81 |
| 5.4.1 | Configuration Environment Setup | 82 |
| 5.4.2 | Version Control Procedure | 86 |
| 5.5 | Implementation Status | 87 |
| 5.6 | Conclusion | 87 |

| | | |
|--------------------|---|-----|
| CHAPTER VI | TESTING | |
| 6.1 | Introduction | 88 |
| 6.2 | Test Plan | 88 |
| 6.2.1 | Test Organization | 89 |
| 6.2.2 | Test Environment | 90 |
| 6.2.3 | Test Schedule | 91 |
| 6.3 | Test Strategy | 91 |
| 6.3.1 | Unit Testing | 92 |
| 6.3.2 | Integration Testing | 92 |
| 6.3.3 | Functional and System Testing | 93 |
| 6.3.4 | Security Testing | 94 |
| 6.4 | Test Design | 94 |
| 6.4.1 | Test Description | 94 |
| 6.4.2 | Test Data | 94 |
| 6.5 | Test Case Result | 95 |
| 6.6 | Conclusion | 95 |
| CHAPTER VII | PROJECT CONCLUSION | 96 |
| 7.1 | Observation on Weaknesses and Strengths | 96 |
| 7.1.1 | Weaknesses | 96 |
| 7.1.2 | Strengths | 97 |
| 7.2 | Propositions for Improvement | 98 |
| 7.3 | Contribution | 98 |
| 7.4 | Conclusion | 98 |
| | REFERENCES | 99 |
| | BIBLIOGRAPHY | 100 |
| | APPENDICES | 101 |

LIST OF TABLES

| TABLE | TITLE | PAGE |
|-------|--|------|
| 2.1 | Comparison of each Case Study | 22 |
| 2.22 | Combined features to be included in e-AIIS | 23 |
| 2.3 | Development tools needed for e-AIIS development | 29 |
| 2.4 | Operating System needed for e-AIIS development | 29 |
| 2.5 | Database software needed for e-AIIS development | 30 |
| 2.6 | Hardware requirement needed for e-AIIS development | 30 |
| 3.1 | Non-functional requirement included for e-AIIS | 44 |
| 3.2 | Hardware Requirement needed for e-AIIS | 47 |
| 4.1 | e-AIIS Output Design | 53 |
| 4.2 | SQL Server 2000 and Access 2000 limits | 60 |
| 4.3 | Comparison SQL Server versus Oracle 9i | 61 |
| 4.4 | Feature differences between SQL Server 2000 and MySQL v4 | 62 |
| 5.1 | Software Requirement for each machine | 78 |
| 5.2 | Hardware Requirement for each machine | 78 |
| 61 | Test Schedule | 91 |

LIST OF FIGURES

| DIAGRAM | TITLE | PAGE |
|----------------|---|-------------|
| 1.1 | e-AIIS Modules | 5 |
| 2.1 | Asset Registration Form | 13 |
| 2.2 | Asset Maintenance Form | 14 |
| 2.3 | Inventory Registration Form | 14 |
| 2.4 | Stock Balance Form | 15 |
| 2.5 | Menu for ITP | 17 |
| 2.6 | Interface for data backup | 17 |
| 2.7 | Location for Backup files | 17 |
| 2.8 | Backup Confirmation | 17 |
| 2.9 | Backup Confirmation | 17 |
| 2.10 | Assign Password | 17 |
| 2.11 | Password assigned verification | 17 |
| 2.12 | Login to access menu | 18 |
| 2.13 | Menu for Item | 18 |
| 2.14 | Inventory usage form | 18 |
| 2.15 | Re-order level reminder | 18 |
| 2.16 | List of Products | 20 |
| 2.17 | List of Purchase Order | 20 |
| 2.18 | Inventory Registration Form | 20 |
| 2.19 | Records for Inventory Ordered | 21 |
| 2.20 | Product's ordered by category report | 21 |
| 2.21 | Stock Balance Report | 21 |

| | | |
|-------------|---|-----------|
| 2.22 | Software Development Life Cycle (SDLC) – Prototyping Methodology | 28 |
| 3.1 | Current Inventory Registration Flow | 33 |
| 3.2 | Current Inventory Ordering Flow | 35 |
| 3.3 | Current Asset Disposal Flow | 36 |
| 4.1 | Three-tier architecture view | 50 |
| 4.2 | e-AIIS Navigation Design | 52 |
| 5.1 | System Architecture of e-AIIS | 77 |
| 5.2 | Create Data Source Name (DSN) | 82 |
| 5.3 | Connection Information | 83 |
| 5.4 | Data source list that is added | 84 |
| 5.5 | Security section specification | 84 |
| 5.6 | Login Properties | 85 |
| 5.7 | Database Access Properties | 85 |
| 5.8 | Data Source Status | 86 |
| 5.9 | Tracking of source code version by windows | 87 |

LIST OF ABBREVIATIONS

| | | |
|------------------|---|--|
| LAN | - | Lemabaga Akrediatasi Negara |
| e-AIIS | - | Asset Inventory Information System |
| DBMS | - | Database Management System |
| PSM I | - | Projek Sarjana Muda I |
| PSM II | - | Projek Sarjana Muda II |
| ICT | - | Information Communication Technology |
| SQL | - | Structured Query Language |
| ITP | - | Inventory Tracker Plus |
| SiNetInSy | - | Silver Net Inventory Web based System |
| OTIS | - | Office Tools Inventory System |
| DFD | - | Data Flow Diagram |
| ERD | - | Entity Relationship Diagram |
| SDLC | - | Software Development Life |
| GB | - | Giga Byte |
| MB | - | Mega Byte |
| HTML | - | Hyper Text Markup Language |
| CSS | - | Cascading Style Sheet |
| IIS | - | Internet Information Services |
| RDBMS | - | Relational database management system |
| DDL | - | Data Definition Language |

LIST OF ATTACHMENTS

| ATTACHMENT | PAGE |
|---|-------------|
| Appendices | 101 |
| Appendix A Gantt Chart | 102 |
| Appendix B Data Flow Diagram | 104 |
| Appendix C Input Design | 114 |
| Appendix D Data Dictionary | 119 |
| Appendix E Entity Relationship Diagram | 128 |
| Appendix F Implementation Status | 130 |
| Appendix G Test Description | 139 |
| Appendix H Test Data | 141 |
| Appendix I Test Case | 144 |
| Appendix J User Manual | 152 |
| Appendix K Pseudocode | 203 |

CHAPTER I

INTRODUCTION

1.1 Project Background:

The project is to develop an Asset Inventory Information System (e-AIIS) for the used of a government organization, *Lembaga Akreditasi Negara* (LAN). LAN is located at 13A, Menara PKNS-PJ, No 17, Jalan Yong Shook Lin, 46050 Petaling Jaya, Selangor. Currently, there is no database system at LAN which causes the management face several problems. This to align with Malaysian government target to produce Information Technology based society.

The project mainly intends to computerize LAN manual system by developing a web based e-AIIS software, which can provide much better performance. e-AIIS will be centralized in LAN intranet web page for real time data view and modification. All the services will run as online, which as LAN staffs, LAN Store Officer and Asset Officer of the unit will have privilege to use this system.

This system is developed by using Macromedia ColdFusion MX and Macromedia Dreamweaver MX as the programming language and interface application. Where as, Microsoft SQL Server 2000 is used for the DBMS. This project is estimated to be completely finished by November 2007, which covers duration of PSM I and PSM II.

The importance of the system is to make smooth and ease work for the management of LAN.

1.2 Problem Statement:

A number of problems have been identified with the manual system that is not very effective to manage daily business. Currently, the Store Officer uses two (2) separate manual recording systems to manage inventory. This causes to problem for Store Officer as he is unable to keep track on inventory used. The processes of Asset and Inventory management have lead to many paper works that is not done systematically. Since the inventory ordering process done by filling paper forms, it only increase risk of the data damaged and there is no provision for data back up currently. In addition to that, the data is insecure because it can easily burn and destroyed by the act of nature.

The current manual system does not have the capabilities in showing the product re-order level. This means the officer will not realize whether certain product had reached critical quantity. Besides that, some of the products were ordered unnecessary where it had taken a lot of store space.

The management of registering and recording data for products and other businesses may take a very long time. This cause unreliability functions in accessing data. The probability performing mistakes is high. For example, the store officer will mistakenly calculate product quantity when doing product inventory. This can lead to operational problems and human issues.

1.3 Objectives:

The main objective of this to-be-system project is to overcome the problems that exist in current system, so that the new system will work efficiently and systematic.

1. To change the manual inventory ordering to an online ordering system.
A web-based system will be developed. All inventory ordering are recorded into database. The access to that information can be done instantly. The system to be is intended to allow automation in terms of ordering and to ease the store officer's work.
2. To help manage the re-order activities.
Proper planning to purchase office stocks which can decrease the obsolete heap stock. Store officer can order products instantly once products achieve the re-order (critical) level. These help to decrease the problem of stock shortage and disruption when it is needed.
3. To eliminates the probability of making mistake during the calculation process.
Calculation based on acceptance and outgoings of products will be calculated automatically. This will ensure the correct quantity of each product.
4. To record asset information more systematically
The user can check the asset information based on the record registered earlier.

1.4 Scopes:

As explained in the prior section, e-AIIS will be developed to cater to the needs of LAN. The scope for e-AIIS can be divided into four (4) categories, which are User, Deployment, Technology and Function.

1. The target user for the system are (Only internal user involved) :
 - i) Office Staffs
 - ii) Store Officer
 - iii) Asset Officer

2. Deployment
The system is developed for the used of Public Management Unit, Service Management Division (*Unit Pentadbiran Umum, Bahagian Khidmat Pengurusan*). Users can only access and use the system at LAN. This system is restricted and only can be used by authorized user.

3. The technologies used are:
 - i) Operating System
 - a) Windows XP Professional

 - ii) Software (web-base tools)
 - a) Macromedia Dreamweaver MX
 - b) Macromedia ColdFusion MX
 - c) Microsoft SQL Server 2000

 - iii) Methodology
 - a) Prototyping Methodology

4. The function of the system will be explained briefly by modules that includes in this system. e-AIIS will be invented of three (3) modules as illustrated in figure 1.1 below. Different module will have different access of function.

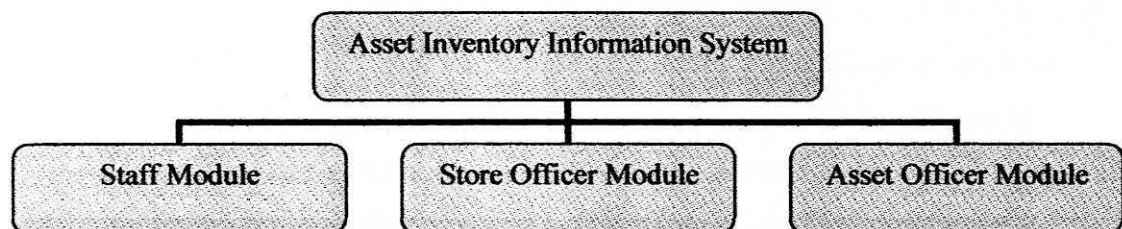


Figure 1.1: e-AIIS Modules

i) Staff Module

This module is developed for Staff. It is expected to eliminate difficulty in doing inventory ordering. This module contains of function login to allow only authorized staff to access the system, update staff information, view products available and making orders. Staff can view the products available and do online inventory ordering with easy steps. Besides that, staff can update their information if any changes involved.

ii) Store Officer Module

This module is responsible for managing inventory. The overall functions for this module are login for authentication, Staff, Category and Product registration, updates, search and delete; display Product level, Generate Report and making approval for orders. Besides that, all the function that can be access by Staff can also be access by Store Officer.

For registration side, Store Officer needs to register staff to enable them make orders. Without a product, there is no mean for this system.

Therefore, Store Officer will register the product available at store and the category of the product. For searching side, Store Officer can search staff information by their staff id. To find product easily, Store Officer can search the product by their full name or parts of the product's name.

For stock control, Store Officer is expected to be able to view the re-order level of the product, like *Paras Menokok* and *Paras Kritikal*. The product displayed needs to be ordered to supplier because it has reached small quantity. Reports on occurrences of Staff making orders will be included in the system and can be viewed by Store Officer. For Update side, Store Officer can edit staff and product's information. This is the same for Delete where Store Officer can delete staff and product. The most important part for Store Officer module is making approval for ordering. After the product has been approved, the system will automatically calculate the current quantity after subtraction.

iii) Asset Officer Module

Module for Asset Officer is expected to consist of Asset registration function, Asset placement, recording maintenance and generating reports for maintenance.

1.5 Project Significance:

The importance of e-AIIS is to make ease of work for the management of LAN in terms of registering product and asset, online inventory ordering, stock control and asset disposal. User also can inspect the daily business easily compare to manual system. A better communication and transfer of data between staff and inventory will applied. Besides that, the system will minimize the mistake that occur when recording the data.

Report generation will help the officers to view the progressive of inventory ordering and analyze the asset history for decision support before decides to do disposal. Staffs can do ordering from their own computer, notify the status of approval via their e mail and officers do approval in a short time and efficient way. Moreover, e-AIIS decrease the problem of obsolete heap stock and stock shortage.

Indirectly, e-AIIS increase LAN image because it can provides better customer service. Computer usage is essential in office administrative process. It is very effective in improving staff working performance thus improving office administrative efficiency.

1.6 Expected Output

All the function is expected to be developed successfully according to each user level defined. The processes for asset that are started from acquisition, usage and maintenance of asset are expected to be systematically works as an advisory function to asset officer. The process of online inventory ordering is to help staff to do ordering instantly. Store officer is granted to manage the inventory by doing approval process, identifying products that have reached critical level, updating records and etc.

1.7 Conclusion

As for conclusion, e-AIIS will help the officers to manage the inventory and asset more easily and efficiently. The system will minimize constraints that exist in the manual system such as data redundancy, misplace record of data and etc. This will reduce the system user's burden that has to update data everyday by using the manual system before the asset inventory information system is introduced.

Next phase will be literature review and project methodology phase where all necessary and essential data will be gather for future understanding. This system proposal will be used as a guide of the next phase.

CHAPTER II

LITERATURE REVIEW AND PROJECT METHODOLOGY

2.1 Introduction

Literature review is a standard chapter in a thesis. It forms an important chapter to provide the background to and justification for the research undertaken (Bruce 1994). A literature review aims is to review the critical points of current knowledge on a particular topic. Most often associated with science-oriented literature, the literature review usually precedes a research proposal and methodology.

Its ultimate goal is to bring the reader up to date with current literature on a topic and forms the basis for another goal, such as the justification for future research in the area. Information is available in a number of formats. Literature review can be done by analyzing the topic or research on reference materials, journals, electronic database, learn on current system, study on other system and internet.

From literature review, project methodology which suites the project can be identified. Methodology refers to the development of methods and, anything or everything that can encapsulated for a discipline or a series of processes, activities and tasks.