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Abstract

This e-inventory system is an Internet based system developed. As a web based application, e-inventory system's client works in tandem with the server, operating over the Internet. The server side contains all the related operating applications, and data storage. Web browser is involved to retrieve information from the web server. It is a centralized kiosk for the retrieval and collection of information.

There are many examples of current inventory system either is online or stand-alone system that have been referred during the system design. Furthermore, system functional requirements of this project include login function, output displaying function, search functions, ads, edit or delete function, output displaying function and user manual. Next, the data flow diagrams is used to illustrate data sources, destinations, flows, store, and transformations of the system. The online system consist of a few separate module, this include system user architecture design module, authentications module, user management module and product transaction module.

For the system development, Windows 2000 will be used as application platform, Microsoft Access server as the database server, ASP and ASP.Net as the web page technology, JavaScript and VB Script as the scripting language and the IIS as the web server. Moreover, the waterfall model with prototype is the selected methodology to develop the e-inventory system.

Acknowledgement

This project is completed through the advice, assistance and contributions from many individual. I would like to take this opportunity to express my utmost gratitude to them.

First and foremost, I'd like to extend my utmost gratitude to Dr. Diljit Singh, my project supervisor who has provided me with invaluable guidance, advices, ideas and unlimited support throughout the development stages of this project. Without his patient guidance, I would not have been able to complete the project successfully.

Special thank to Pn. Maizatul Akmar Ismail, the project moderator for his suggestions and comments. I would also like to thank all my course mates who had shared their knowledge throughout the duration of the project and their valuable inputs, encouragement, co-operations and patience.

Finally, I would like to convey my appreciation to my family and friends who are always there for me during my project development.

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CHAPTER 1
INTRODUCTION

Chapter 1: Introduction

1.1 Background To Project

According to many leading publishers of dictionary, inventory is defined as a quantity of goods or materials, which is in control, by an organization. More generally, inventory could be regarded as a resource that has economics value. An inventory is made up of one or more items where each item is a unique supply item, raw material, purchase or manufactured part, assembly, or final product. As the quantity of these goods and materials are becoming larger as time goes by, it will become too difficult to keep track of them manually.

Information Technology is being regarded as vital in assisting an organization in all aspect. In short, information system is a critical factor to every organization in carrying out their daily operations. As more and more infrastructures such as faculty and colleges were being built to accommodate an increasing number of students each year, it would be difficult to keep track of the hardware and software that is used manually. An information system for the management of the inventory is needed for better efficiency.

Keeping track of all the hardware and software is not an easy task in such a vast environment. Information on every single software and hardware have to be recorded, details of the license of software have to be kept, details of vendors for the software and hardware have to be easily obtained when necessary and so on.

The manual filing system is too time-consuming as well as it involves a lot of clerical work. A lot of university properties were not properly used due to poor

maintenance and the human inability to keep up with the increasing properties in the university. Therefore a management information system is the best solution for all the difficulties and troubles faced. The proposed system will help the authorized staff of each facility to ease their workload by providing a quick and easy to use inventory management system.

1.2 Project Overview

The main purpose of this project is to create an E-Inventory System for FSKTM. Inventory control system is defined as coordination and supervision of supply as well as storage and distribution and recording of materials to maintain adequate quantities for current needs. Inventory control system will provide user with critical information that will help to analyze and make informed product and purchasing decisions.

This e-inventory system is an internet-based system, which contains a server site with database system, web client/server. A web-based system has a thin client which results in a less error prone system. User have to access to internet/intranet to run this application. This system can provide the client (browser) with data that does not reside with the client, and there fore users can access it anywhere anytime. Maintenance of the database is more efficient because the system will be based in one web-server, for example data back up would consume less time.

This system would reduce the total inventor tracking cost in the future and it would also reduce the burden on the system administrator as well. There will be two types of users for this system. They will login to the system once the application is being run in their browser. One of them is administrator who allowed browsing and

modifying the data. His/her scope is to modify, edit, delete, add and keep track of user with limited access. This user can only browse the data but they cannot do any modification to the data.

Users have to go specific URL to run the application, which is stored in the web server. Once they go in the page, a user name and password will be required. The system administrator will login as admin with a password and on the other hand, another type of user will login with a different user name and a specific password. This login session will recognize the user's type and differentiates the accessibility limitation.

All the data will be stored in the server. The system administrator can log in to edit the data at any location once they access the specific location. The new data will be automatically up loaded to the data server.

1.3 Objectives of Project

The fundamental objective of this project is to develop a web-based inventory system that:

- To create system, which can only access with valid ID and password.
- To keep track and manage all records of a facility.
- To increase quality and accuracy in data keeping.
- Create databases that can store various type of related information of the University's property
- Allow authorized user to maintain the database.

1.4 Scope of Project

The proposed system is a web-based system that is designed for the use of staff in each facility in the university. This system will be divided into four main modules, which is

i. Security Module

ii. Administration Module

iii. Inventory Module

iv. Vendor Module

i. Security Module

This module assures that only authorized personnel are allowed to access the system according to the level of authentication given. This is very important because the system is accessible through the Internet.

ii. Administration Module

This module allows the authorized user to Add, Edit, Update and Delete the user list and also to print out selected reports. Examples are creation of new user account and printing of reports on some fields such as item's list.

iii. Inventory Module

This module has the purpose of managing inventory transaction and also to handle query regarding the inventory. Authorized user uses forms to perform data-entry activities. Other users can search and display the search result through this module.

iv. **Vendor Module**

This module will provide information to all authorized user on the details of available vendors. Administration and authorized facility staff can add, edit, update and delete the details of the vendors.

1.5 Significance of Project.

- To enable the control and management of inventory to be done easily via web technology.
- Create databases that can store various type of related information of the university's property and user account for security purposes. It should be secure enough so that contents in the database are not alterable in the non-permitted ways.
- To enable staff of a facility to access, view and update their information anytime and easier by storing all records in their facility centralized database, it will save the facility's staff's time and reduce the processing time.
- To provide accurate, persistent and relevant property information.
- To create a paperless environment through the system and avoid redundant paper works, it will contribute to the cost saving aspect in terms of paper cost and paper storing facilities.
- Allow authorized user to maintain the database. Database records that can be maintained by a particular user depend on the level of restriction assigned to the person on the Access Control List.
- Allows various information to be generated for analysis purposes.

- Support multi-user environment. User can access particular record in the database according to task assigned to the users.
- To provide a harmonic and user-friendly environment.

1.6 Definitions

1.6.1 Inventory

According to many leading publishers of dictionary, inventory is defined as a quantity of goods or materials, which is in control, by an organization. More generally, inventory could be regarded as a resource that has economics value. An inventory is made up of one or more items where each item is a unique supply item, raw material, purchase or manufactured part, assembly, or final product. As the quantity of these goods and materials are becoming larger as time goes by, it will become too difficult to keep track of them manually.

1.6.2 E-Inventory

E-inventory system is an interned based system developed. As a web based application, e-inventory system's client works in tandem with the server, operating over the Internet. The server side contains all the related operating applications, and data storage. Web browser is involved to retrieve information from the web server. It is a centralized kiosk for the retrieval and collection of information.

CHAPTER 2
LITERATURE REVIEW

Chapter 2: Review of Literature

2.1 Role of Literature Review

Review of literature is a background study about knowledge and information, which gathered and gained to develop this project. The purpose of this review of literature is to get a better understanding on the development tools that used to develop a project and get a better knowledge on the development strategies used while developing a project.

Apart from that, the review of literature also enables the developer to do a comparison on the past-developed project and study the strength and weakness of it. It will also give an overview on how to improve the weakness and fulfill the requirements that needed. The information gathered in this review is through research on printed media and also electronic medias such as resources from websites in the Internet and also CD-ROMs.

2.2 Approach to Literature review

Approach to literature review is discovery or determination of facts or accurate information. The task involved is together data. This is achieved by investigating the following:

i. Written documents

   Manual, reports forms etc. currently used by the system

ii. Interviews

Ask the people who use the current system, like Mr. Baharuddin and Pn. Sawiah (technical staff of Faculty Computer Science and Information Technology, university Malaya).

iii. Observations

Watching what happens in an organization will allow the analyst to get real insight on what happens within an organization.

iv. Sampling

Collect data about factors such as quantities, cost and time periods.

v. Analysis

Previous tasks produce a lot of data and this must be summarized into a form that allows future tasks. Data analysis shows how the current system works. Tools such as data flow diagram allows a proper analysis to be affected.

2.3 Review of E-Based Services

2.3.1 Introduction to Internet

The Federal Networking Council (FNC) on the 24th of October 1995. This definition was developed in consultation with members of the Internet and intellectual property rights communities. [1]

Internet is referred to the global information system that: -

i. Is logically linked together by a globally unique address space based on the Internet Protocol (IP) or its subsequent extensions/follow-on;

ii. Is able to support communications using the Transmission Control Protocol/Internet Protocol (TCP/IP) suite or its subsequent extensions/ follow-on, and/or other IP-compatible protocols; and

iii. Provides, uses or makes accessible, either publicly or privately, high level services layered on the communications and related infrastructure described herein.

2.3.2 Why a Web-Based System

The Internet is available all over the world, twenty-four hours a day, seven days a week. It is simple to use and the transaction costs for the end user are low. The costs are also extremely low for the vendors on the Internet, compared to traditional distribution channels. The Internet allows two-way communications and is built around open standards. The two-way communication allows for direct feedback of customers and open standards mean interoperability between companies, web sites and services. Once they have been digitized, it is easy to integrate processes, services and products.

2.3.3 Introduction to E-University

The e-university is a relative new concept that was introduced during the mid 1980s. This term arises when there are some colleges and universities made attempts to make use of the technology of networked computers and communication to provide distance learning.

Today, some of the traditional universities were re-engineered to create a paperless environment in their administrative services. Others are trying to provide an integrated information services [3]. The new mission of an electronic university is to

extend and enhance the delivery of courses, programs of instruction and campus services by use of modern technologies.

E-University can best defined as a conceptual model that incorporates stability (traditionalist), opportunities (progressivism), production efficiency (enterprising) and values that meets the expectations of the society (social constructivism). The e-university will have the following features: -

- Integrated and accessible information systems
- A critical mass of technology users, e.g. students, staff
- Improved products, e.g. learning and teaching materials, and services to internal and external clients
- Improved collaboration with other institutions.

2.3.4 Introduction to E-Business

E-Business is the complex fusion of business processes, enterprise applications and organizational structure necessary to create a high performance business model. It refers to the use of digital technologies to transform both the internal processes as well as an organization's interactions with external parties. In other words, it combine the resources of traditional information systems with the vast reach of the Web and connect critical business systems directly to critical business constituencies - customers, employees, partners and suppliers using Intranets, Extranets and the World Wide Web [4].

E-Business, the Internet and the globalization all depend on each other. The more global players exist, the more E-Business they want to do. The more E-Business is

online, the more people will be attracted to get direct Internet access. And the more people are online, the more global players will arise.

2.3.5 Introduction to E-Commerce

In general, E-Commerce is the exchange of goods or services - buying and selling through the Internet. It is a modern business methodology that addresses the needs of organizations, merchants, and consumers to cuts cost while improving the quality of goods and services and increasing the speed of service delivery. [5]

E-Commerce can also be defined as the use of electronic data transmission to implement or enhance any business process. Frequently people use this term to refer to commerce on the Internet or Web because they are most extensive data transmission networks. [2]

2.4 Client/Server Architecture

The client/server computing is one of the several ways to accomplish the deployment of computers using the distributed computing approach. In client/server architecture, different devices on the network are treated as clients or servers [10].

2.4.1 Characteristics of Client/Server Architecture

The basic characteristics of client/server architectures are [11]:-

1. Client/server architecture is highly scalable. It can be scaled horizontally; as in adding or removing client workstations with only a slight performance impact, and also vertically; as in migrating to a larger and faster server machine or multiservers.

2. Combination of a client or front-end portion that interacts with the user, and a server or back-end portion that interacts with the shared resources. The client process contains solution-specific logic and provides the interface between the user and the rest of application system. The server process acts as a software engine that manages shared resources such as databases, printers, modems or high-powered processors.
3. The front-end task and the back-end task have different fundamental requirements for computing resources such as processor speed, memory, disk speed and capacities, and also input/output devices. The environment is typically heterogeneous and multivendor. The hardware platform and operating system of the client and server are not usually the same. Client and server processes communicate through a well-defined set of standard application program interfaces (API) and remote procedure call (RPC).

2.5 Review of Existing System

There are a lot of online control system either apply in Local Area Network (LAN) or Internet that are using by several company for keep track their company's stock or product transaction. There are a few current inventory control system examples that have some parts and concepts that similar to this project system. The relationship between the example system and project system are stated as below:

2.5.1 USBid Inventory Control System (http://www.usbid.com)

2.5.1.1 USBid Inventory Overview

USBid is the premier e-commerce provider of content, community, and commerce for the electronic component sourcing community. The USBid inventory, complemented by leading-edge commerce solutions and highly personalized customer support, provides unmatched opportunities for buyers and sellers to fulfill their sourcing requirements. USBid is a global e-commerce market place where manufactures and distributors can merchandise their inventories to buyers desiring to conveniently purchase electronic components online. Components manufactured by many of the world's leading semiconductor and electronics companies are listed on the web site. Representative manufactured include Intel, AMD, Motorola, international Rectifier, Intersil, Mitsubishi, Maxim, and Analog devices.

2.5.1.2 USBid Inventory Advantages

USBid web-based solutions enable buyers to reduce procurements cycles, access global inventories, lower transaction costs, and compare available parts-sellers have the ability to list and fully manage their inventory, which results in lower overhead costs, higher inventory turns, new market penetration and maximized profits.

USBid's current e-commerce solutions represent the state-of-the-art in online component sourcing. Buyers and sellers can conduct transactions in four commerce models (trading options): Fixed price, RFQ, Exchange and Auctions. In response to the needs of users and to create a true e-market place, USBid developed two applications-Buy List TM upload for buyer, and Inventory Upload for sellers. These easy-to-use

solutions provide sophisticated BOM uploading and tracking for buyers, and flexible inventory uploading and management for sellers.

Furthermore, buyers can simply bid on or buy the parts they need. If an advertised price is not attractive, bidding is always an option. This creates a dynamic pricing environment that accurately reflects the current supply and demand in the marketplace. USBid combines enterprise computing and e-commerce knowledge with its electronics industry expertise to deliver tremendous benefits to buyers, component manufacturers and distributors.

2.5.1.3 Relationship between Project System and USBid Inventory

USBid inventory control system provides an online purchasing environment between the seller and the buyer. The buyer or customer can choose their desired product from the catalog display in the website. The buyer will fill in the order form to order the product that they want to buy. Then, the seller or inventory administrator will manage the customer record and ordered product through the online inventory control system. The inventory administrator will send the products to customer after customer doing product payment.

The project system provides the company product inventory control method that has same idea with USBid inventory. But, the customer not fill up the order form through the web site, the customer doing product request through the request staff. Next, the request staff will fill up product order form to order product from inventory administrator. Furthermore, both systems required user name and password to login into system. Different users have different right to manage the online inventory system.

USBid Inventory Control System (http://www.usbid.com/

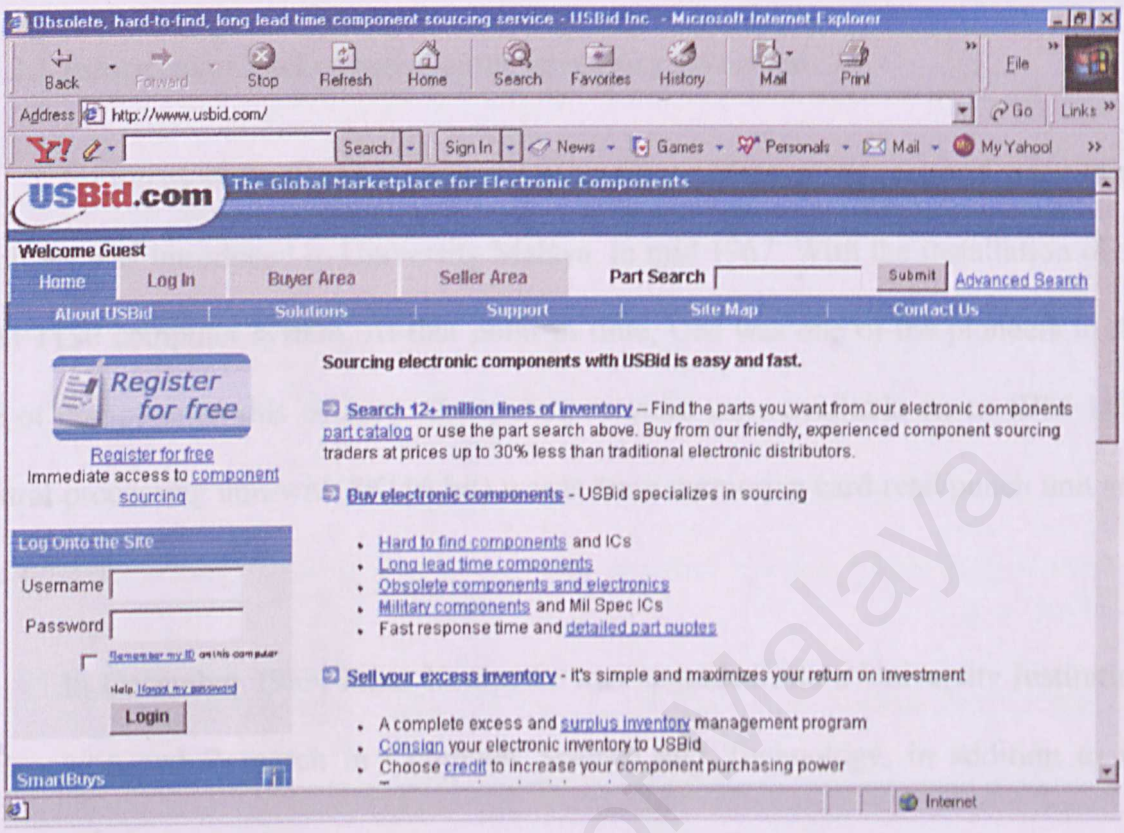


Figure 2.1: USBid Inventory Control System's Main Page

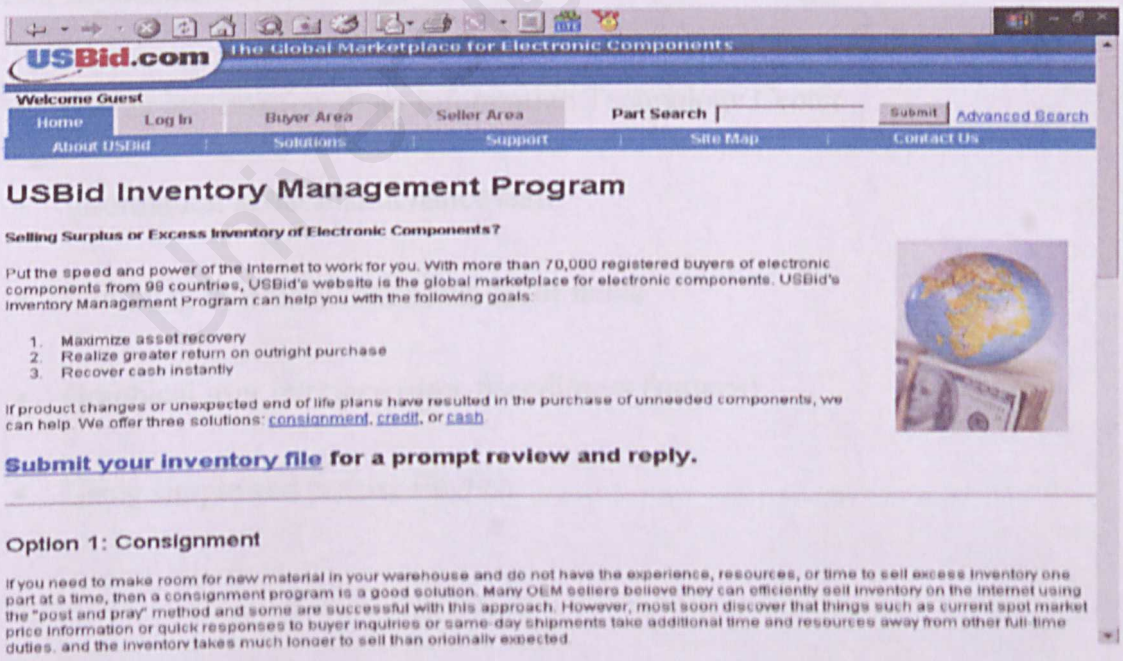


Figure 2.2: USBid Inventory Control System's Inventory Management Program

2.5.2 Information Technology Center of University Malaya

2.5.2.1 Information Technology Center Inventory Overview

Information Technology Center of University Malaya is organized computing facilities was introduced in University Malaya, in mid 1967. With the installation of an IBM 1130 computer system. At that point in time, UM was one of the pioneers in the use of computer in this country. Computing services were available on an IBM 1130 central processing unit with 8K(16-bit) words main memory a card read/punch unit and line printer.

In December 1969, Pusat Komputer was upgraded into a University Institution of teaching and Research in Computer Science and Technology, in addition to its service role.

2.5.2.2 Information Technology Center Inventory Advantages

- Giving information about Information Technology Center
- Information about maintenance staff
- Providing inventory forms and list of items
- Graphical user interface (user-friendliness features)
- Using simple and precise English

Limitations

- Using a manual inventory system
- Cannot support multi-job services
- Not referred to any database
- Cannot keep track and manage all records of facility
- Poor quality and accuracy in data keeping

2.5.2.3 Relationship between Project System and Information Technology Center Inventory

- The project system provides the product inventory control method that has same idea with Information Technology Center inventory.
- Contents of web site similar to mine, in the information such as items code and inventory forms are the same.

Information Technology Center of University Malaya

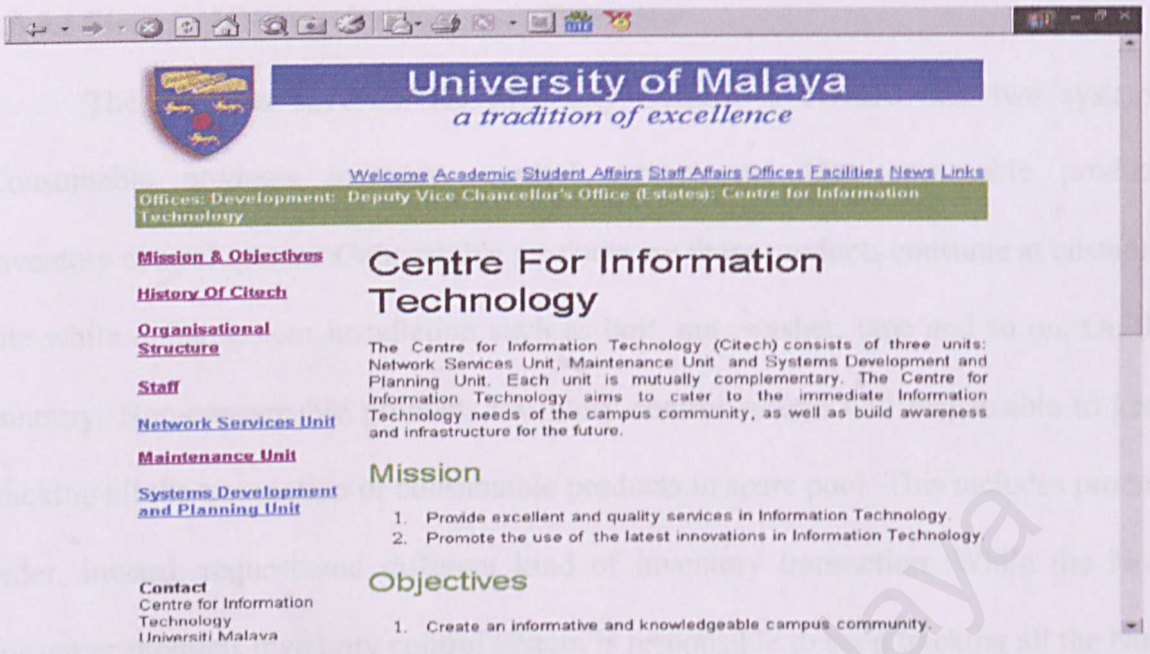


Figure 2.3: Information technology Center Inventories Main Page

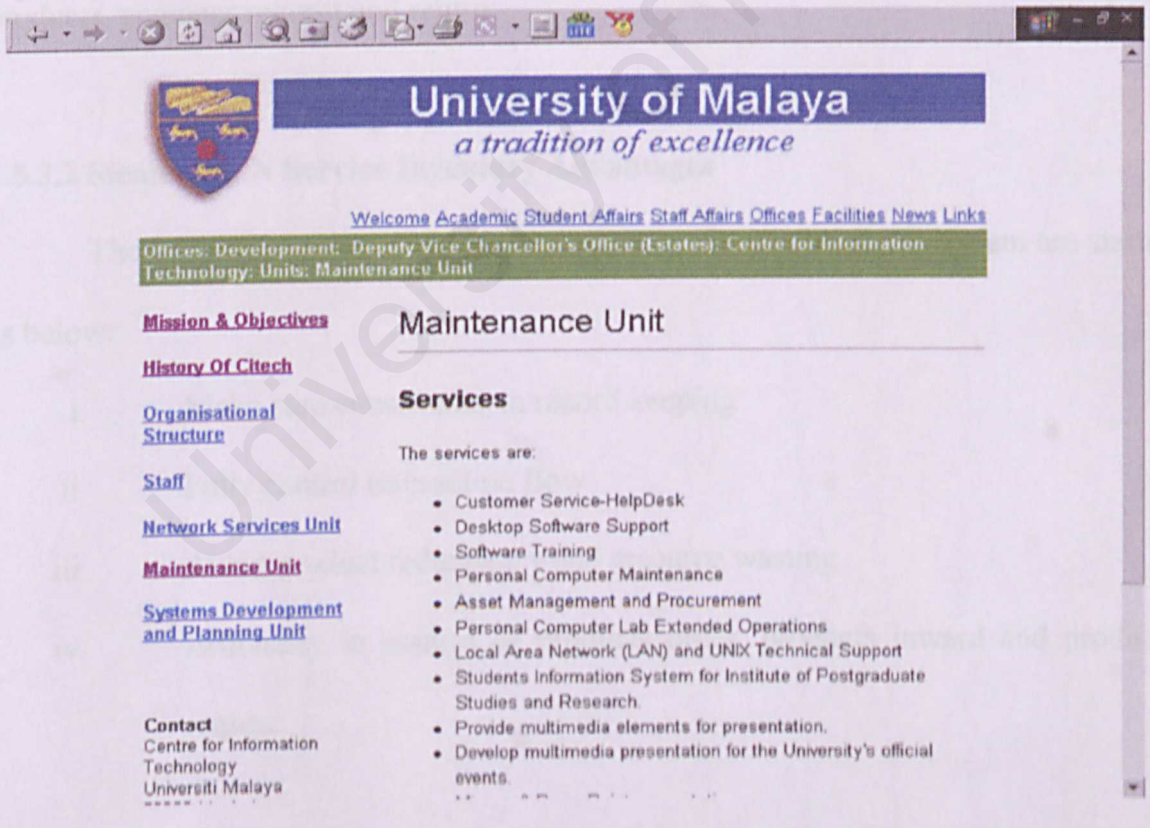


Figure 2.4: information technology Center Inventories Maintenance Unit

2.5.3 Siemens ICN Service inventory Control

2.5.3.1 Siemens ICN Service Inventory Overview

The Siemens ICN Service Inventory Control is divided into two systems, Consumable products inventory control system and Non-consumable products inventory control system. Consumable products are those products consume at customer site while doing system installation such as bolt, nut, washer, tape and so on. On the contrary, Non-consumable products inventory control system will responsible to keep tracking all the transaction of consumable products in spare pool. This includes product order, inward, request and different kind of inventory transaction. While the Non-consumer products inventory control system is responsible to keep tracking all the Non-consumer products transaction in spare pool. This includes incoming and outgoing of products, engineer request and return.

2.5.3.2 Siemens ICN Service Inventory Advantages

The main advantages and objectives for the inventory control system are started as below:

i. Make sure consistency in record keeping

ii. Fully control transaction flow

iii. Avoid product redundancy and resource wasting

iv. Efficiency in control of products order, products inward and products request

2.5.3.3 Relationship between Project System and Siemens ICN Service Inventory

Project system using online method in order to perform the inventory control function. On the contrary, the Siemens ICN service inventory control system implement in terms of stand-alone system.

The major disadvantage of the Siemens ICN Service Inventory Control is the system is stand-alone system. Hence, the project system provides the online system that can manage the company inventory. The online function in the project system will get rid of the inconvenient problems that occurred in the stand-alone system.

Both systems have same transaction flow in consumable product inventory controlling method that is "Company Product" which is the company-selling product.

2.6 Summary

Literature review is a process of information gathering to allow the developer to have a better understanding on the development for the system. Research had been done on various topics to gather this information. The research is all mostly done through printed materials and electronic media such as websites in the Internet and also product review CD-ROMs.

Research on the Internet helps to help to gain better understanding on how the growth of the Internet affects an organization and also the potential of Internet towards an organization. Research had been done on E-university to gain a brief idea on how the system will fit in to the next generation of university management. Meanwhile, research on the E-business and E-commerce helps in the understanding of how to manipulate the usage of the Internet in the business aspect.

A study of available existing system is also done on commercially available system. This study helps me to understand the different approaches and needs of different organization. Studies on the transition from the traditional client/server architecture the web-based system is also done to identify the differences of the both mentioned architecture.

CHAPTER 3
METHODOLOGY

Chapter 3: Methodology

3.1 Project Objectives

The proposed system is a web-based system that is designed for the use of staffs in FCSIT. They are not static pages, but rather they are dynamically produced from information stored in a database. Each time the database is updated, Web site is updated. The purpose of this site is to provide a platform for to manage the FCSIT's assets like hardware and software. This system can manage all hardware and software records of a facility in a systematic and effective way. This application can only be accessed through valid username and password.

The list below is the synthesis of other objectives that are not mentioned above:

- To keep track and manage all records of a facility.
- To increase quality and accuracy in data keeping.
- To enable the control and management of inventory to be done easily via web technology.
- Create databases that can store various type of related information of the University's property
- Allow authorized user to maintain the database.

3.2 Development Methodology

3.2.1 System Analysis

System Analysis is a most important phase in a software development life cycle. It is the process of gathering and interpreting facts, diagnosing problems and using the information to recommend improvements to the system. The information gathered during this phase has provided alternative strategies to develop this system. This alternative strategy is in terms of what methodology and development tools are most suitable to develop this system, and there are several methodologies and development that being considered. From the information I get from Literature Review in Chapter 2 justify among the methodologies and development tools and give reasons why I see a certain methodology or development tool to develop my system but not others.

The purposes of this analysis phase are:

- Justify which methodology is the most suitable methodology to be used to develop my proposed system.
- Justify which kind of hardware and software which will be used to develop the system, this includes operating system, web application language, web technology, scripting language, web application development tools, web browser and web server.
- Analysis what are the smart features from the existing system can be incorporated in my system.
- Introduce new and smart features in my proposed system's modules.
- Justify what are the limitations of my proposed system.
- Justify what are the non-functional requirements that should be considered.

3.2.2 Waterfall Model With Prototyping

Waterfall Model with prototyping has been chosen as the system process model. The figure below shows the waterfall model with prototyping. This system process model contains seven phases, which are described as below:

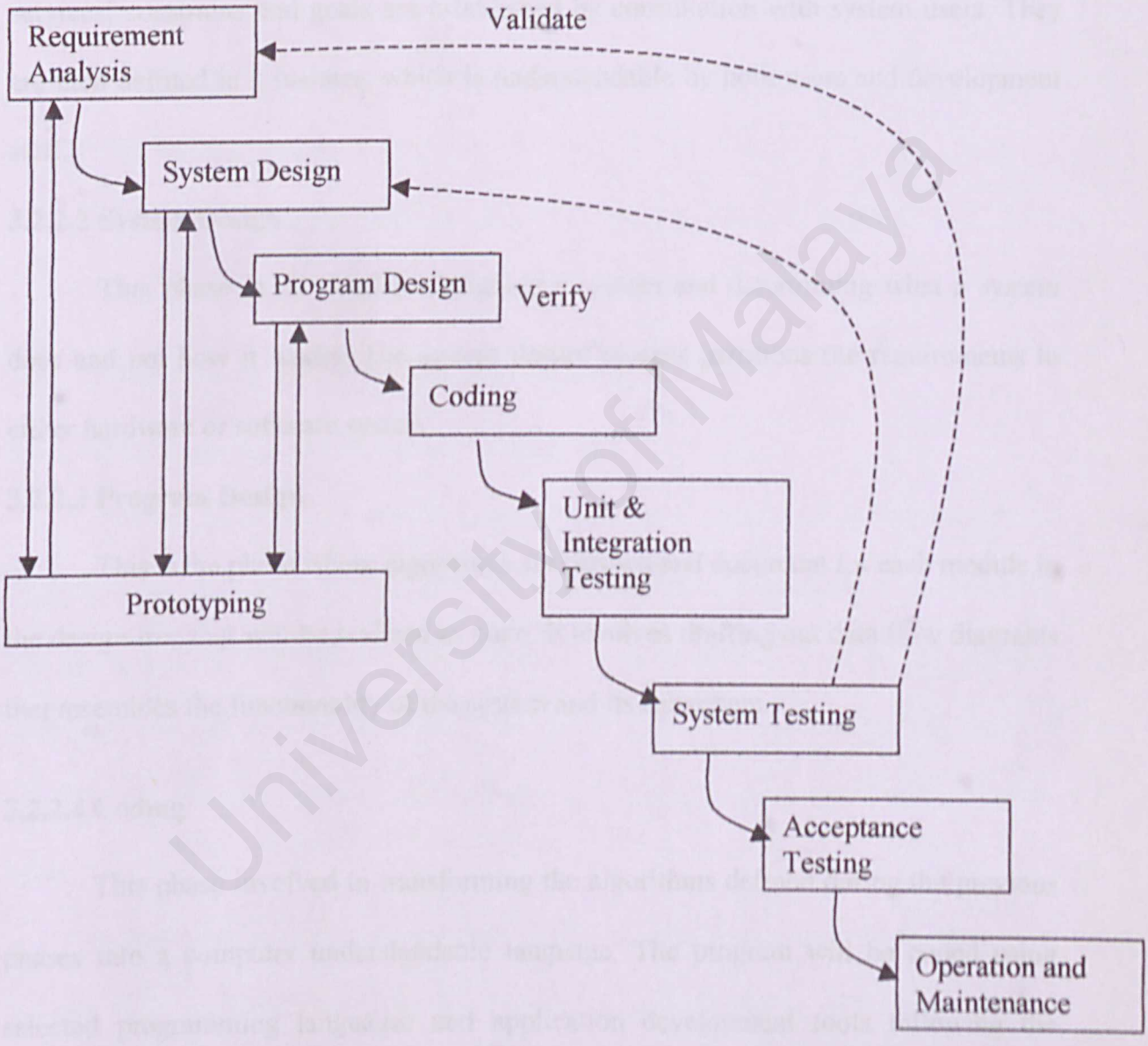


Figure 3.1: Waterfall Model With Prototyping

3.2.2.1 Requirement Analysis

This phase requires information gathering. It may be in technical aspect or non-technical aspect. Information will be gathered through the Internet, conduct interview and reading materials. The materials may include journals, magazines, books and newspaper. This is the phase where research and survey are done. The system's services, constrains and goals are established by consultation with system users. They are then defined in a manner, which is understandable by both users and development staff.

3.2.2.2 System Design

This phase is involved in designing a system and determining what a system does and not how it works. The system design process partitions the requirements to either hardware or software system.

3.2.2.3 Program Design

This is the phase where algorithms are defined and document for each module in the design tree that will be realized as code. It involves drafting out data flow diagrams that resembles the functionality of the system and its subsystem.

3.2.2.4 Coding

This phase involved in transforming the algorithms defined during the previous phases into a computer understandable language. The program will be coded using selected programming languages and application development tools following the design specification.

3.2.2.5 Unit Testing

The purpose of unit testing is to ensure that each module behave accordingly to its specification defined during program design phase. It checks each coded module for the presence of bug.

3.2.2.6 System Testing

This phase checks the entire system to ensure that the system behaves according to the software requirement specification.

3.2.2.7 Operational Maintenance

This phase continues defection and repair of bugs are carrying out.

3.3 Rationale for Proposed Methodology

3.3.1 Why Waterfall Model With Prototyping?

The Waterfall Model with Prototyping is chosen because Waterfall Model can suggest to the developer the sequence of events they should expected to encounter. It can be very useful in helping developers lay out what they need to do. Besides, developer also can estimate how close the project was to completion to give point of time. This model also enables developers to make necessary preparation for the coming phase.

Prototyping is used with waterfall model because it can help the developers to enhance their understanding about the system. In the prototyping section in waterfall model, the user requirement will be identified and documented. This information will be used to develop user interface and will be taken as prototype. Prototyping enable the users to interact with the system so that they have a better understanding what the new

system will be. All the feedback from the users will be used to re-adapt the prototype in order to satisfy the users needs. The prototype is then used again and re-adapt until satisfy by the developers and users. The prototyping is added to waterfall model because the users do not know exactly what they want until they actually have a chance to see and work with the system or part of the system. Then, the system developers build system-using feedback supplied by the users.

The reason why the prototype is important to be integrated with the waterfall model is shown as below:

- Requirements are often poorly understood.
- Requirements usually change during the development process.
- Current requirements remain only partially understood until after users have an actual opportunity to use a system.

3.3.2 Why Not Waterfall Model?

Many problems will arise if we only use waterfall model alone. The biggest problem with the waterfall model is that it does not reflect the way code is really developed. Except for very well understood problems, software is usually developed with a great deal of iteration. Often, software is used in a solution to a problem that has never before been solved or whose solution must be upgraded to reflect some change in business climate or operating environment. The actual software development process, if uncontrolled, developers may thrash from one activity to the next and then back again, as they strive to gather knowledge about the problem and how the proposed solution addresses it.

Waterfall model shows how each major phase of development terminates in the production of some artifact (such as requirements, design, or code). There is no insight into how each activity transforms one artifact to another, such as requirements to design. Thus, the model provides no guidance to managers and developers on how to handle changes to products and activities that are likely to occur during development. For instance, when requirements change during coding activities, the waterfall model does not address the subsequent changes to design and code.

Curtis, Krasner, Shen and Iscoe (1987) note that the waterfall model 's major shortcoming is its failure to treat software as a problem-solving process. The waterfall model was derived from the hardware world, presenting a manufacturing view of software development. But manufacturing produces a particular item and reproduces it many times. Software is not developed like that; rather, it evolves as the problem becomes understood and the alternatives are evaluated. Thus, software is a creation process, not a manufacturing process. The waterfall model tells us nothing about the typical back-and forth activities that lead to creating a final product. In particular, creation usually involves trying a little of this or that, developing and evaluating prototypes, assessing the feasibility of requirements, contrasting several designs, learning from failure, and eventually settling on a satisfactory solution to the problem at hand.

3.3.3 Why Not Prototyping?

In the competitive world, every manufacturer wants to develop their products as fast as possible and want to promote that product before their competitors. Therefore, most of them use prototyping model. Prototyping is the technique of constructing a partial implementation of a system so that users or developers can learn more about a problem or solution to that problem. It causes the entire system to be constructed quickly

If a system is needed badly and welcomed readily, the prototype may be accepted in its unfinished state and pressed into service without the necessary refinements. While superficially, this may seem to be an appealing way to short cut the development effort, it works to the business' and team's disadvantage.

Besides, the manufacturer also does not considered the long-run maintenance. They always produce products that are difficult to maintain. However, they argue that when the problems arise in the future, the next release of the software that is more advanced had published to solve those problems. From this point of view, the manufacturer is blamed to be not responsible to the users.

Users will develop interaction patterns with the prototype system that are not compatible with what will actually occur with the complete system. Additionally, a prototype will not perform all necessary functions. Eventually, when users discover the deficiencies, user backlash may develop if the prototype has been mistakenly adopted and integrated into the business as if it were a complete system

All of the possible problems that project management is subject to are relevant here. It can be quite difficult to manage prototyping as a project within the larger

systems effort. Although several iterations of the prototype may be necessary, extending the prototype indefinitely also creates problems. It is important that the system analysis team devises and then carries out a plan regarding how feedback on the prototype will be collected, analyzed and interpreted.

3.4 Requirements Analysis

3.4.1 Functional Requirements

Functional requirements specify what actions a system design must provide in order to benefit the users of the system. The functional requirements for E-inventory System are: -

- The system must provide adequate security measures to protect the system from being invaded by unauthorized user. Both the user and the administrator should take charge in protecting user's information integrity.
- The system must provide adequate security measures to provide its data integrity. Staff from another facility mustn't alter data from one facility.
- A proper management for the users account where the administrators and only the administrators have rights to alter the data in this field.
- The inventory module should allow authorized user to alter the data when necessary.
- The administrator and facility staffs that are authorized should maintain the vendor's list. This list will be able to only authorized user to view and alter.
- Allow all authorized user to perform the search function.
- Generate reports according to specified criteria.

3.4.2 Non-Functional Requirements

The non-functional requirements specify certain criteria, which the system must satisfy in order for the system to be more usable. These actions are not actual actions taken by the system but they are further restrictions on what the system must be able to handle.

The following are the non-functional requirements that are embedded into the proposed system: -

- User friendliness is very important to avoid any unnecessary difficulties to users when they are manipulating with the functions of the system. A good user interface is required to perform this criterion.
- Readability is the extents to which a system can be expected to perform its intended function with required precision and accuracy. Thus, the system should be reliable in performing its daily functions and operations. For example, whenever a button is clicked, the system should be able to perform some functionality as generate some message to inform the user what is happening.
- The system has to be maintainable in the sense that whenever a problem occurs, the problem should be easily detected, understood and debugged for recovery. Also, maintainable also means that backing up of data is available to assure that normal operation of the system is not disrupted should there be any disaster happens to the database.
- The system should be equipped with sufficient security. Each access by the user should be authenticated and validated by the system. Te system should

not show any potential of leakage of information. The password should be encrypted.

- The system should have the capability to migrate as a client or server to machines of greater or lesser power, depending upon requirements, with little or no charge to underlying components.

The degree of expandability is important for future enhancement to the system, which is developed.

3.5 Feasibility Studies

Feasibility study is important before the requirements of a system can be gathered in order to make sure that the system being develop, meets the users requirements. This study is also to determine whether the system is feasible to be implemented and whether it can be implemented with the time and cost given. Several methods have been carried out to determine whether the faculty inventory system is feasible to be implemented or not, for example checking out the other similar existing applications.

Basically, all the features in this application already exist in other similar application. Also, interviews with Mr. Baharuddin and Pn. Sawiah, FCSIT's technical staffs were carried out to get some feedback on how the system should look like and its functions, and whether this system can be completed in the cost and time given. The conclusion made from this study was this site is feasible enough to be implemented.

3.6 System Requirements

3.6.1 Hardware Requirement for System Development

3.6.1.1 Hardware Requirement for Server

- Pentium 200MHz and above (or equivalent)
- Memory 64Mb RAM or above
- 2.0GB hard disk or above
- CD-Rom
- Others standard peripherals that include mouse, keyboard, monitor, printer and so on.

3.6.1.2 Hardware Requirement for Client

- Pentium 133MHz and above (or equivalent)
- Memory 64Mb RAM or above
- 2.0GB hard disk or above
- CD-Rom
- Others standard peripherals that include mouse, keyboard, monitor, printer and so on.

3.6.2 Software Requirement for System Development

3.6.2.1 Operating System

Windows 2000 Professional

Due to several advantages that are distinct when compared to other operating systems, Windows 2000 Professional was selected as the operating system in the project. The main reason for choosing this Windows is that Windows currently enjoys a dominant position as the preferred operating system by most corporations.

UNIX is extremely difficult to administer, even with attempts to make it friendly. It is based on several text files, which are often maintained manually. The formatting is critical software from operating NT Server, on the other hand, uses a Registry database. The graphical front end for managing the database interacts integrally with the operating system, making it easy to access and modify both user and system configurations.

UNIX has a native networking scheme called Network File System NFS, developed by Sun MicroSystem, allows the same sort of remote access to drives on servers on the PC redirector software. Although native to UNIX, NFS is quite foreign to the PC. NT Server does not suffer from this 'foreigner' status. NT Server is windows, from the interface to the networking and fits into a Windows network like a native. If no Windows access to NT Server is desirable, it can be accomplished through a third-party product.

UNIX systems are under constant attack by hackers. There is continuous Computer Emergency Team (CERT) alert warning of ways that various flavors of UNIX are open to comprise. Furthermore, UNIX does not use encrypted passwords at

login. Thus, a packet snifter on the network can read passwords in clear text — a real danger. NT Server has been certified as C2-secure, so it does not have the potential security holes of UNIX. NT Server can be used for secure government installations and has been widely adopted by financial firms instead of UNIX for security reasons.

3.6.2.2 Markup language

Hyper Text Markup Language (HTML)

HTML is a way of adding various attributes to plain text that are published on the World Wide Web. An HTML document is an ordinary text file. One of the key strength of HTML is that a document conforming to the HTML standard can be understood no matter what sort of software or computer the reader has. For example, someone using Netscape in Windows or someone using Lynx UNIX can interpret the same page.

HTML is the set of markup symbols or codes inserted in a file intended for display on a W.W.W. browser page. The markup tells the Web browser how to display a Web page's words and images for the user. Each individual markup code is referred to as an element (but many people refer it as a tag). Some elements come in pairs that indicate when some display effect is to begin and when it is to end.

HTML is a formal recommendation by the World Wide Web Consortium (W3C) and is generally adhered to by the major browsers, Microsoft's Internet Explorer and Netscape's Navigator, which also provides some additional non-standard codes. Both Internet Explorer and Netscape implement some features differently and provide non-standard extensions. Web developers using the more advanced features of HTML 4 may

have to design pages for both browsers and send out the appropriate version to a user. Normally, HTML files are 'interpreted' on the client side (in a user's web browser).

3.6.2.3 Technologies

Active Server Page (ASP)

An Active Server Page (ASP) is an HTML page that includes one or more scripts (small-embedded programs) that are processed on a Microsoft web server before the page is sent to the user. The code inside ASP is mixed with standard HTML and will not be seen by the browser. ASP pages run in all browsers unless the person making the page uses HTML or browser commands outside of the ASP portions.

ASP is a server-generated page that can call other programs to access databases, serve different pages to different browsers. Typically, the script in the web page at the server uses input received as the result of the user's request for the page to access data from a database and builds or customizes the page on the fly before sending it to the requestor. ASP is as efficient as writing code directly to server's application program interface.

ASP is an open, compile-free application environment in which HTML, scripts, and reusable ActiveX server components can be combined to create dynamic and powerful web-based business solutions. ASP has evolved into an 'open technology framework', means it is not necessary to use Microsoft products to create code in it. Nowadays, any language can be used to create ASP pages. ASP can also take advantage of COM and DCOM (Component Object Model and Distributed Component Object Model) objects with minimum effort.

Any text editor can be used to create Asp code. Microsoft Visual Interdev will give nice highlights, wizards and pop-up boxes. With ASP, the code can be simply written in the HTML page. The HTML tags and the code are side by side. There is no compiling and complex interfacing. ASP has made it much quicker and easier to create highly interactive web sites. It also enables the pages easier for maintenance and updating in the future.

The output of an ASP file is plain HTML, the content of which can be customized for the capabilities of the client. We can capture all sorts of information that is not known at the time the instruction was written, for example, a user's input and profile, the time and location the user accesses the page, the type of browser and/or operating system that is running on the user's computer or the information contained in database, text files, etc. This HTML-generation instructions can be written in such a way that they use newly captured information to create up-to-minute, personalized, interactive web pages that serves fresh information every time they are requested. ASP allows you to define application and session variables that can be carried across multiple pages in a Web site.

ASP allows persistent connections between the client and server, the development of client server sessions, and the access and management of databases from the client side. They are not static pages, but rather they are dynamically produced from information stored in a database. Each time the database is updated, your Web site is updated. When you make a change or modification to the ASP file on the server, you need to only save the changes to the file. The next time the Web page is loaded, the script will automatically be compiled.

ASP.NET

Active Server Pages (ASP) has long been the foundation for creating rich and dynamic Web sites using server-side scripting. With the Beta release of the .NET Framework, ASP has evolved into ASP.NET, and it now embodies many of the important key concepts behind the .NET Framework. In addition to being able to access any of the programmatic interfaces exposed by the .NET Framework, you can now construct server-side code using any of the languages that are compatible with the .NET Framework.

ASP.NET is a set of technologies in the Microsoft .NET Framework for building Web applications and XML Web Services. ASP.NET pages execute on the server and generate markup such as HTML, WML or XML that is sent to a desktop or mobile browser. ASP.NET pages use a compiled, event-driven programming model that improves performance and enables the separation of application logic and user interface. ASP.NET pages and ASP.NET XML Web Services files contain server-side logic (as opposed to client side logic) written in Visual Basic .NET, C# .NET, or any .NET compatible language. Web applications and XML Web Services take advantage of the features of the common language runtime, such as type safety, inheritance, language interoperability, versioning, and integrated security.

ASP compare to CGI Application

ASP provides all of the functionality of CGI applications in an easier-to-use and more robust environment. ASP is an easier way for server to access information in a form not readable by the client (such as an SQL database) and then act as a gateway between the two to produce information that the client can view and use. With CGI, the server creates as many processes as the number of client requests received. The more concurrent requests there are, the more concurrent processes created by the server. However, creating a process for every request is time-consuming and requires large amounts of server application itself slowing down performance and increasing wait times on the web. ASP instead runs in the same process as the web server, more handling client requests faster and more efficiently. It is much easier to develop dynamic content and web application with ASP.

ASP compare to PERL

Perl and other scripting language are not robust development tools by themselves. ASP provides a familiar framework and objects for building complex applications that require data from relational databases and legacy sources. ASP supports virtually any scripting language to build these applications. Third parties are currently developing additional scripting engines, such as Perl, which will be announced when they are ready.

3.6.2.4 Scripting Languages

JavaScript

JavaScript is an interpreted programming or script language from Netscape. In general, script languages are easier and faster to code in than the more structured and compiled languages such as C and C++. Script languages generally take longer to process than compiled languages, but are very useful for shorter programs. JavaScript is used in web site development to do such things as:

- Automatically change a formatted date on a web page
- Cause a linked-to page to appear in a popup window
- Cause text or graphic to change during a mouse rollover

JavaScript uses some of the same ideas in Java, the compiled object-oriented language derived from C++. JavaScript code can be imbedded in HTML pages and interpreted by web browser (or client). JavaScript can also be run at the server as in Microsoft's Active Server Page (ASP) before the page is sent to requestor. Both Microsoft and Netscape browsers support JavaScript, but sometimes in slightly different ways.

JavaScript gives developers the ability to do things such as check from contents, communicate with the user based on their actions, and modify the web page dynamically without the web page being re-loaded and without the use of Java, plug-ins or ActiveX controls. JavaScript also supports functions, again without any special declarative requirements. Functions can be properties of objects, executing as loosely typed methods.

VBScript

VBScript allows truly interactive Internet application to be constructed. HTML forms the basic design of a homepage, whereas VBScript adds interactively and performs validations on inputs keyed in by the user. The advantages of VBScript are:

- It can be written as a HTML file
- VBScript can be used to check variables in the input boxes. It verifies that all of the input boxes on a given form are filled and contain valid data ranges
- VBScript can also capture incoming e-mail addressed from the web site visitors.

The limitations of VBScript are:

- VBScript cannot write a file to web server's hard disk but uses another scripting language (ASP) to create interactive forms that append data to a file.
- No any compliant database. Data are stored in arrays to replace database files.

Visual Basic Scripting is a lightweight scripting language that provides programming functionality based on the Visual Basic programming language. It is natively executed on the Internet Explorer browser and can be executed in the browser through plug-in technologies. VBScript lets the user to interact with a web page rather than simply viewing it. VBScript can take input from the user and check the data to make sure it is valid or meets certain criteria. Then, it can put an Internet server to work either by actually storing the data or causing some action to take place on the server based on the information given. VBScript validates data, pricing, provides impressive multimedia feedback, and initiating data storage. The user can use VBScript to sequence the questions based on responses.

3.6.2.5 Web Application Development Tools

Macromedia Dream weaver

Macromedia Dream weaver is a designing tool used for creating a good web page with its special functions. There are three main categories to look at in this software that is design, code and develop.

In the design category, the latest version of it that is the macromedia Dream weaver MX, there are certain new features such as improve workspace layout, predefined sample page layouts and code, improved cascading style sheets (CSS) support and enhanced dream weaver templates.

The code category includes of a lot of new features such as coder-oriented workspace layout, code hints, snippets panel and tag editors. Where else the develop category comprises of ColdFusion MX support, ASP.Net support, PHP support and web services introspection.

3.6.2.6 Database

Microsoft Access

Microsoft Access 2000 is a Windows-based database management system, which runs under the Windows 95/98/2000/NT operating system. Access offers an easy-to-use database for managing and sharing data. It also adds increased integration with the Web for easier sharing of data across a variety of platforms and user levels. It enables sharing of database among the co-workers over the Internet, searching and retrieving the information quickly, and taking advantage of automated, pre-packaged solutions to quickly create databases.

Also, Stat/Transfer can be used to convert data between Microsoft Access and your favorite spreadsheet, database or statistical package. Besides that, data in Microsoft Access can be migrated to the Microsoft SQL Server.

Benefits of Microsoft Access:

- An easy-to-use tool for easily finding information that provides consistency and integration with the other applications in the office suite.

- Access 2000 allows easily sharing information via the corporate Intranet and the ability to easily host a database within the browser. User may create solutions that combine the easy-to-use of the Access interface (client) with the scalability and reliability of SQL server.

3.6.2.7 Web Browser

Web Browser is a client program (application) that is used to search through the information provided by a specific type of server. A browser helps you to view and navigate the information on the Internet. The creation of the browser made the Internet easier because the web-browser provides graphical, text-based terminal interface to the web-server. The web-browser translates client-requesting information sent by the web-server into a graphical user interface within the browser. It is also responsible in sending the request of the client in HTML form to the web-server.

Microsoft Internet Explorer 5.0

Currently, almost all the Internet users use either Netscape's browser or Microsoft's Internet Explorer browser or both. Although Netscape was initially the predominant product in terms of usability and number of users, Microsoft's browser is now considered superior by many users (although many other users see them as roughly equivalent) and has taken a slight lead in usage. Microsoft Internet Explorer (MSIE) is the graphical World Wide Web browser that is provided with the Microsoft Windows operating system. The MSIE browser competes closely with an earlier browser, Netscape Navigator. (As of December 2001, Internet Explorer was the dominant browser in terms of numbers of users and has apparently dominated the browser market.)

3.6.2.8 **Web Server**

Internet Information Server (IIS)

Internet Information Server (IIS) is a group of Internet servers (including a Web or Hypertext Transfer Protocol server and File Transfer Protocol server) with additional capabilities for Microsoft's Windows NT and Windows 2000 Server operating systems. IIS is Microsoft's entry to compete in the Internet server market that is also addressed by Apache, Sun Microsystems, O'Reilly, and others. With IIS, Microsoft includes a set of programs for building and administering Web sites, a search engine, and support for writing Web-based applications that access databases. Microsoft points out that IIS is tightly integrated with the Windows NT and 2000 server in a number of ways, resulting in a faster Web page serving.

A typical company that buys IIS can create pages for Web sites using Microsoft's FrontPage product (with its WYSIWYG user interface). Web developers can use Microsoft's Active Server Page (ASP) technology, which means that applications – including ActiveX controls – can be imbedded in Web pages that modify the content sent back to users. Developers can also write programs that filter requests and get the correct Web pages for different users by using Microsoft's Internet Server Application Program Interface (ISAPI). ASP and ISAPI programs run more efficiently than common gateway interface (CGI) and server-side include (SSI) programs, two of the current technologies.

Microsoft includes special capabilities for server administrators designed to appeal to Internet service provides (ISPs). It includes a single window (or 'console') from which all services and users can be administered. It's designed to be easy to add components as snap-ins that you didn't initially install. Individual customers can customize the administrative windows for access. IIS includes security features and promises that it is easy to install. It works closely with the Microsoft Transaction Server to access databases and provide control at the transaction level. It also works with Microsoft's Netshow in the delivery of streaming audio and video, delayed or live.

3.7 System Design

3.7.1 Data Flow Design

A data Flow Diagram is a graphic illustration that shows the data flow and logic within a system. In order to simplify and clarify what the data flow diagram is portraying, there are supplemental conventions as shown in the table below.

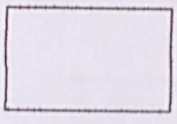
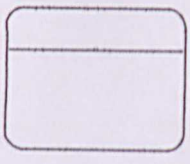
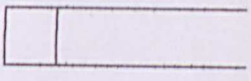
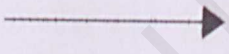
Symbol	Name	Description
	Source or destination of data	External sources or destinations of data. It interacts with system but is outside its boundary.
	Process	It represents the transformation or processing of information within a system
	Data Store	It is used for showing the data storage or referred by a process
	Data Flow	It is used to show the movement of data from an origin to a destination with the head of arrow pointing towards the destination.

Table 3.1 Symbols using Gane and Sarson Method

The following diagrams are the Dataflow design for the system.

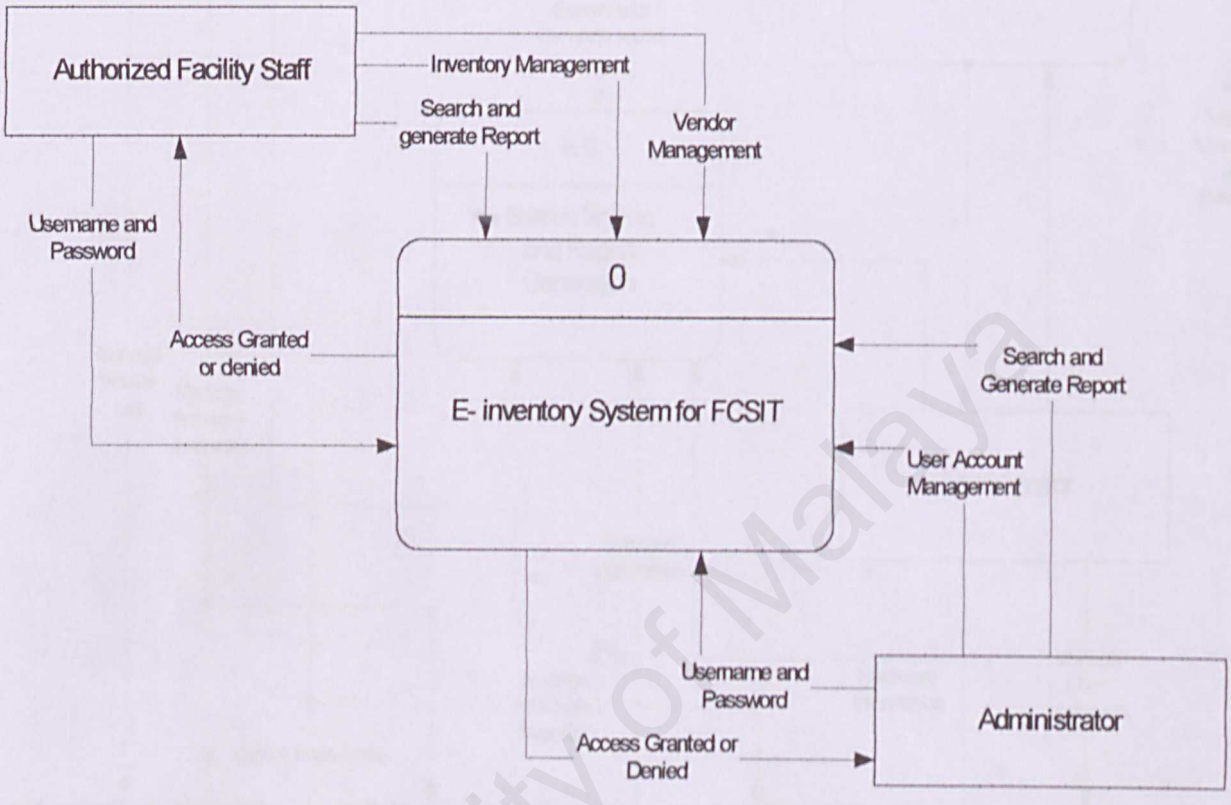


Figure 3.2: Context Diagram

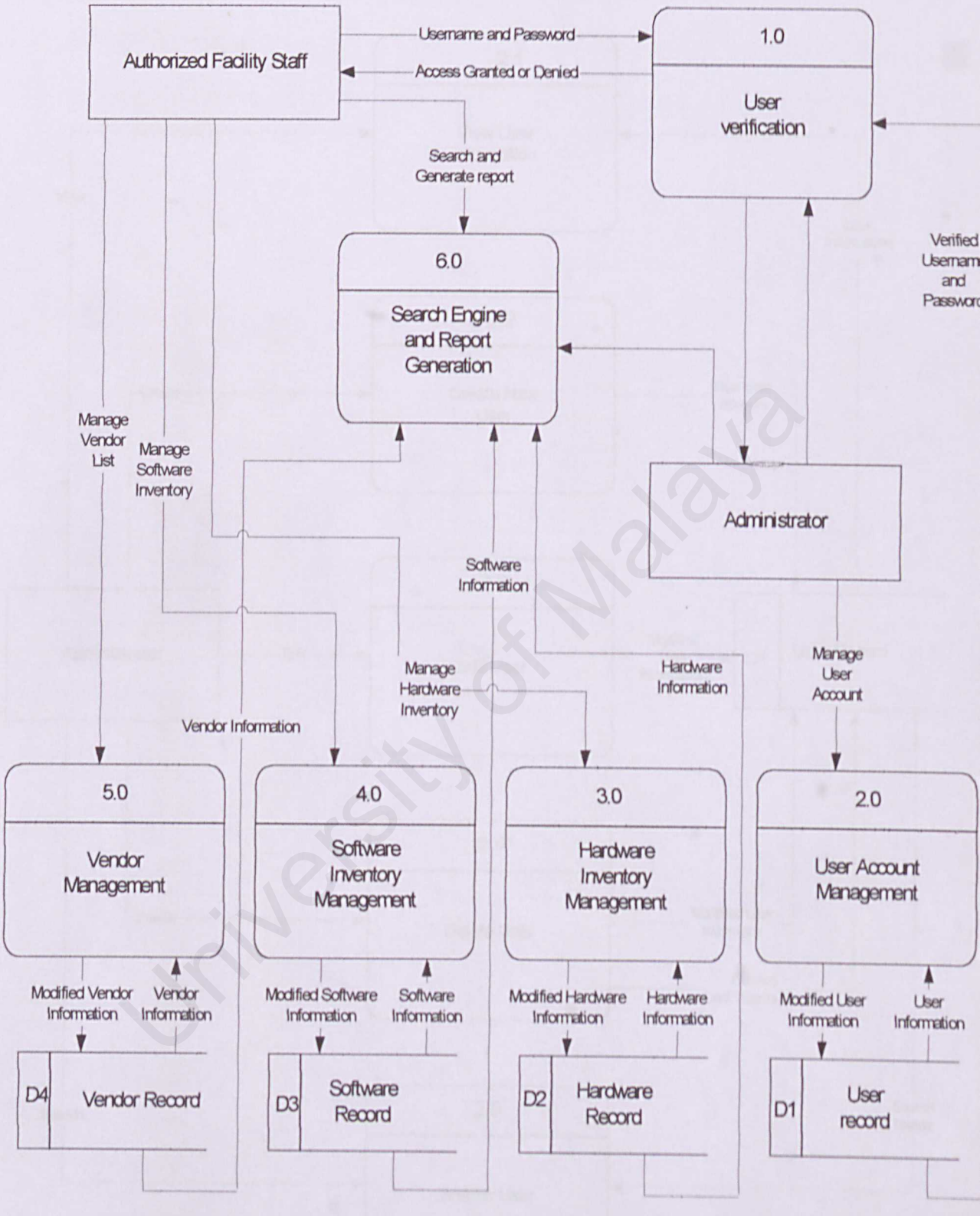


Figure 3.3: Level 0 diagrams

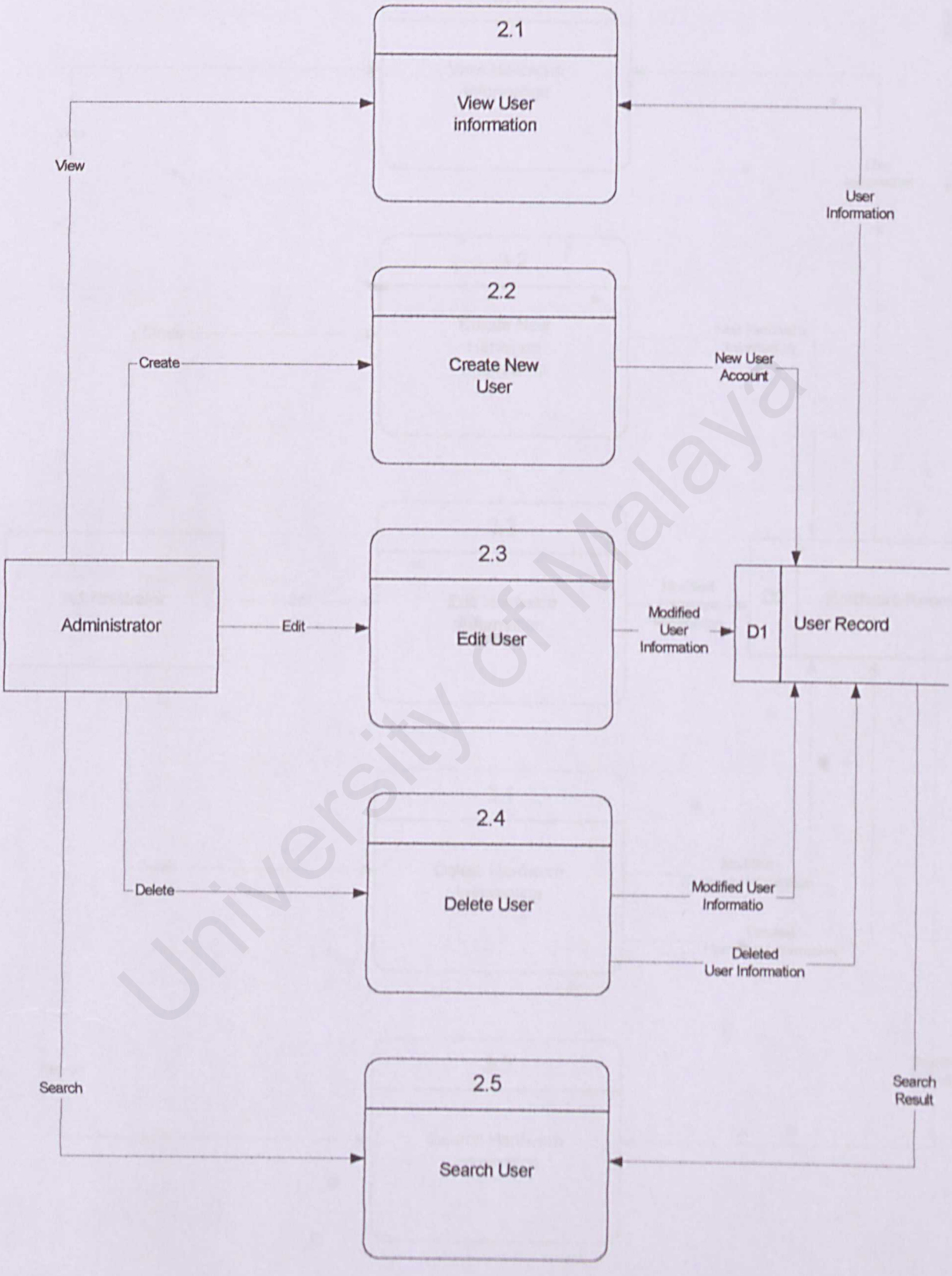


Figure 3.4: User Account Management Data Flow

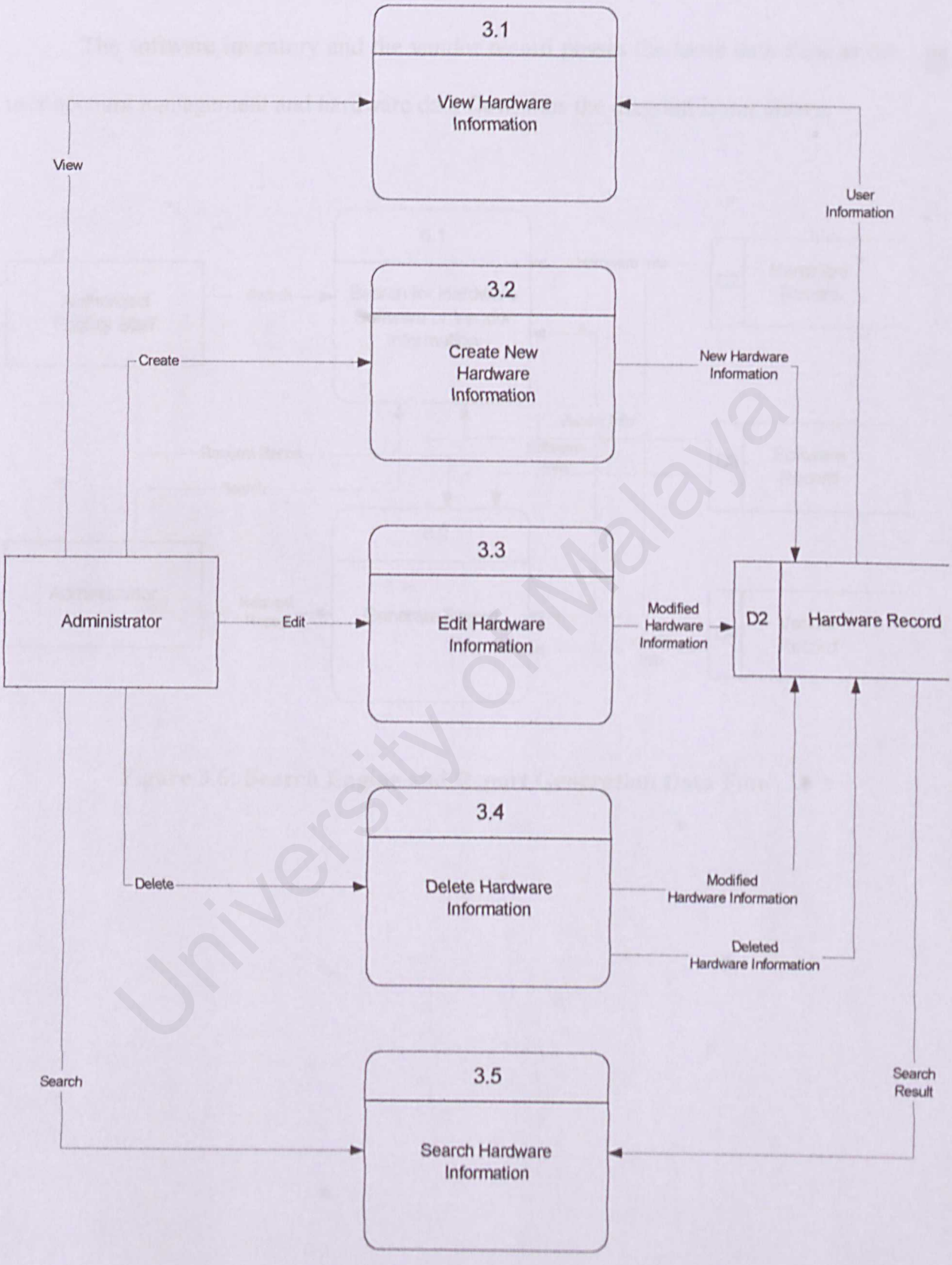


Figure 3.5: Hardware Inventory Data Flow

The software inventory and the vendor record posses the same data flow as the user account management and hardware data flow, thus the diagram is not drawn.

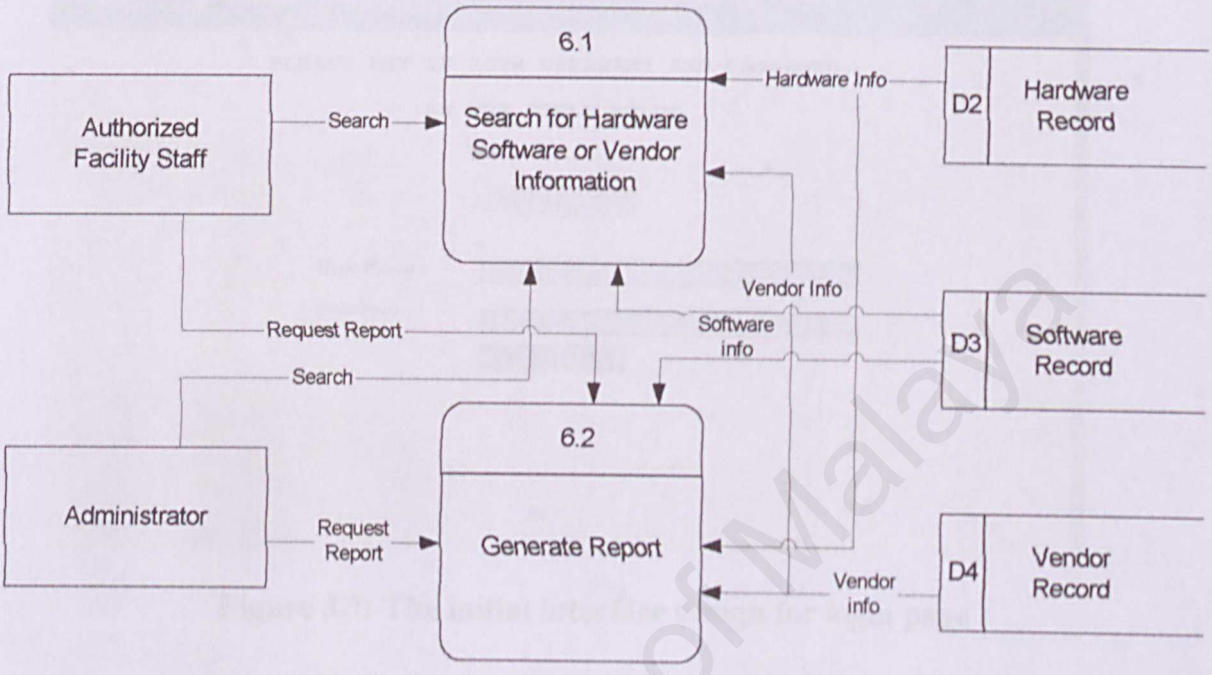


Figure 3.6: Search Engine and Report Generation Data Flow

3.7.2 System Interface

Below is the initial design for the interface

Figure 3.7: The initial interface design for login page

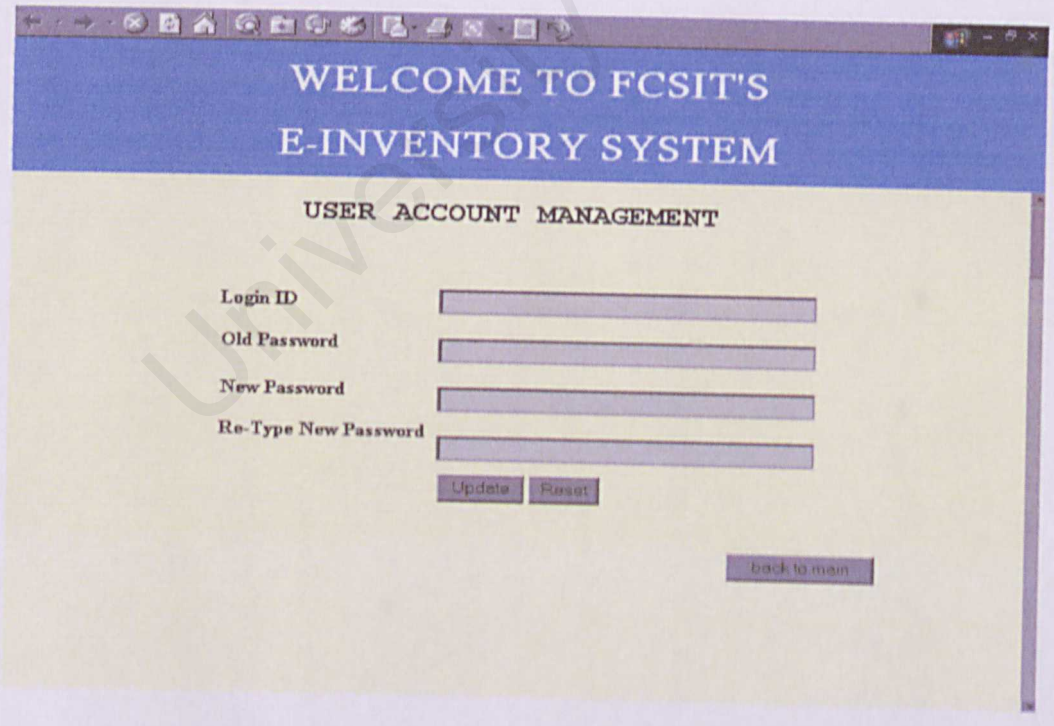


Figure 3.8: The initial interface design for updating user account

3.8 Expected Outcome of Project

Upon completion to this project, the staff of each facility which has this system implemented there will be able to manage and keep track of their respective facility hardware and software inventory system. The authorized user will just need to go to the address and log on using given user id and password.

CHAPTER 4
SYSTEM IMPLEMENTATION

Chapter 4: System Implementation

4.1 Introduction

System implementation in software development is a process to convert system requirements into program codes. This phase always involves some modifications to the previous design due to the limitations of the programming language used. The initial stage of system implementation involves setting up the development environment. This includes setting up development tools to facilitate the system implementation.

4.2 Development Environment

Development environment has certain impact on the development of a system. Using the suitable hardware and software will speed up the system development and it performance.

4.2.1 Hardware resource

From previous system proposal, system will be running in the networking environment, which is web – base system. So, to archive this objective, a proper hardware component should be chosen because this will determines the degree of successfulness of an implementation computerized system, as the e-faculty desired. The computer equipment will become the property of the users. This method is usually the most popular and advisable when the equipment is to be kept 5 years.

4.2.2 Software Resources

A computerized system will not be operated if there is not any software being installed and run in the computer system. There are basically three types of software for a computer system. They are system software (operating system), utility software and programming languages and application software.

Software	Purpose	Description
Microsoft Windows 2000	System requirement	Operating System
Internet Information Server	System Requirement	Web Server Host
Microsoft Access	Database	Build the data to store and manipulate the data
Macromedia Dreamweaver MX	User Interface Design	Design the web pages.
ASP	System Development	Coding the web pages
HTML	System Development	Coding the web pages
Internet Explorer	System Development	Viewing the web pages
Adobe Photoshop	User Interface Design	Image design and creation
Ulead Cool 3D 3.0	User Interface Design	Banner design and creation

Table 4.1: Summary of software/ software tools used for E-Inventory System

4.3 Program Development

Program development is the process of creating the programs needed to satisfy the system process requirements. It consists of 5 steps, which are review the program documents, design of the program, code the program, completion of the program documentation. Figure 6.1 shows the steps of the program development.

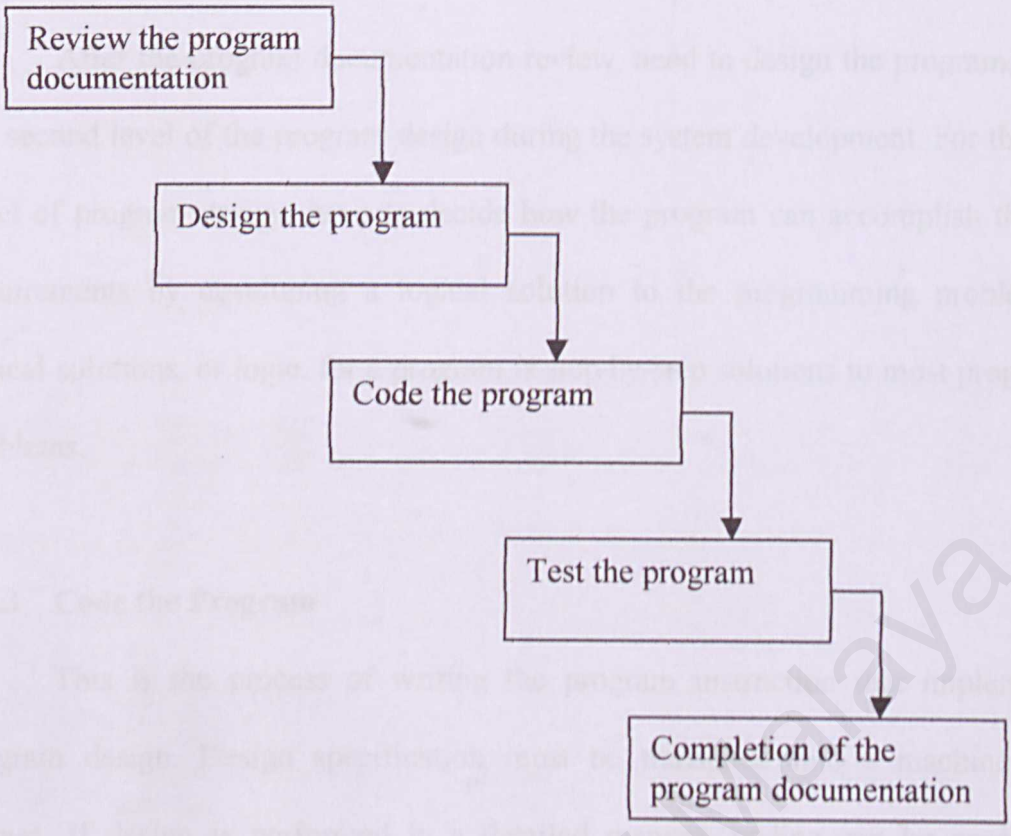


Figure 4.1: Steps of Program Development

4.3.1 Review the Program Documentation

The first step of the program development is to review the previous program documentation. The program documentation of the E-Inventory System consists of simple system description, system requirements and database design. This documentation helps to understand better the task that has to be covered during this coding phase.

4.3.2 Design the Program

After the program documentation review, need to design the program, which is the second level of the program design during the system development. For this second level of program design, have to decide how the program can accomplish the system requirements by developing a logical solution to the programming problems. The logical solutions, or logic, for a program is step-by-step solutions to most programming problems.

4.3.3 Code the Program

This is the process of writing the program instruction that implements the program design. Design specification must be translated into a machine-readable format. If design is performed in a detailed manner, coding can be accomplished mechanically.

4.3.4 Test the Program

This process is to ensure the system function by testing the program thoroughly. Testing is a must before the program processes actual data and produces information on which people will rely. I will perform several types of test on an individual program, which will be discussed further in the following chapter.

4.4 Program Coding

4.4.1 Coding Principles

Throughout the coding phase for the system, several principles are followed in order to ensure the quality and the structure of the generated code. They are as follows:

1. Readability

Easy to read codes are essential for the future system enhancement by another developer. To cater for this, meaningful variables and label names have been used. Comments are written in most of the coding pages to explain their every functionality. Proper indentations are followed to enhance readability.

2. Maintainability

Codes should be easily read, corrected and revised. To achieve this, codes should be readable (as explained above), highly cohesive and loosely coupled. A code that performs functions for one module should be grouped together and tries our best as much as possible to achieve high cohesive and loose coupling.

3. Robustness

Codes should be robust in terms of handling errors and responding by displaying appropriate error messages and try to avoid system failure.

4.4.2 Coding Methodology

In the coding phase, two approaches have been used, which are the top-down and the bottom-up approach. Both of the approaches are used to obtain the benefits from them.

1. **Top-Down Approach**

This approach starts by looking at the large picture of the system and then exploding to smaller parts or subsystem. Top-Down approach allows the higher-level modules to be coded first before the lower level modules.

This method ensures that the important or core modules of the system to be developed and tested first. Deploying the methods gives a preliminary version of the system sooner. The advantages of using this approach are as follows:

- Prevents the developer from getting so mixed in the detail that they loose track of what the system is suppose to do.
- Avoiding the chaos of attempting to code a system all at once
- This method is compatible with the general system thinking of normal human nature.

2. **Bottom-Up Approach**

In contrast with the top-down approach, the bottom-up approach starts coding at the lower level modules before the higher-level modules. The higher-level module acts as an empty shell that calls these lower level modules. The completed lower level module will then be integrated with the newly completed higher-level module.

4.4.3 Database Implementation

For E-Inventory System, the database is stored in a PC in which Microsoft Access is installed. Any data creation, updates or data retrieval will be connected directly to the database server through ADOBD connection. The database includes

tables to keep customers details including customer registration, product info, employee details, and profile information.

After the E-Inventory System is completed and tested successfully, all the data were flush from the database. All the unnecessary tables were eliminated from E-Inventory System database to avoid data overlapping and to reduce workload of the entire system when deployment.

4.5 ASP Coding

ASP coding was used widely whereby files were saved as .asp. Using the server map function and full directory path used ASP coding to connect database.

```
<%
  Dim objConn
  Set objConn = Server.CreateObject("ADODB.Connection")
  objConn.ConnectionString = "DSN=inventory.dsn"
  objConn.Open

  Dim objRS
  Set objRS = Server.CreateObject("ADODB.Recordset")
  objRS.Open "boole", objConn,,adlockOptimistic, adCmdTable

  objRS.AddNew
  objRS("Pc") = request.Form("Pc")
  objRS("Model") = request.Form("Model")
  objRS("TagCpu") = request.Form("TagCpu")
  objRS("TagMonitor") = request.Form("TagMonitor")
  objRS("SirialCpu") = request.Form("SirialCpu")
  objRS("SirialMonitor") = request.Form("SirialMonitor")
  objRS("Processor") = request.Form("Processor")
  objRS("OS") = request.Form("OS")
  objRS("IP") = request.Form("IP")
  objRS("Remark") = request.Form("Remark")
```

```
objRS.Update
objRS.Close
Set objRS = Nothing
objConn.Close
Set objConn
= Nothing
%>
```

Table 4.2: Server Map ASP Coding

```
<%
name = session ("name")
pass = session ("pass")

Dim objConn
Set objConn = Server.CreateObject("ADODB.Connection")
objConn.ConnectionString = "DSN=inventory.dsn"
objConn.Open

Dim objRS
set objRS = Server.CreateObject("ADODB.Recordset")
objRS.Open "inventory", objConn, , , adCmdTable

bol = False
%>
```

Table 4.3: Full Directory Path ASP Coding

Using the post method functions also uses ASP to send or get information from a page to another.

```
<form method="post" action="changepasswordp.asp">
  <tr>
   <td width="30%" align="right"><font color="#FFFFCC"> </font></td>
   <td width="33%" align="right" bgcolor="#660000"><div align="right"><font
color="#FFFFFF"><strong>Username
     :</strong></font></div></td>
   <td width="37%" align="left" bgcolor="#FF9900"><input type="text" name="username"></td>
  </tr>
  <tr>
   <td align="right"><font color="#FFFFCC"> </font></td>
   <td align="right" bgcolor="#660000"><font color="#FFFFFF"><strong>Old Password
    :</strong></font></td>
   <td align="left" bgcolor="#FF9900"><input type="password" name="oldpass"></td></tr>
  <tr>
   <td align="right"><font color="#FFFFCC"> </font></td>
   <td align="right" bgcolor="#660000"><font color="#FFFFFF"><strong>New Password
    :</strong></font></td>
   <td align="left" bgcolor="#FF9900"><input type="password" name="newpass"></td> </tr>
  <tr>
   <td align="right"><font color="#FFFFCC"> </font></td>
   <td align="right" bgcolor="#660000"><font color="#FFFFFF"><strong>Confirm
    New Password :</strong></font></td>
   <td align="left" bgcolor="#FF9900"><input type="password" name="newpass2"></td></tr>
  <tr>
   <td align="center" colspan="3"> <div align="left">  </div></td></tr>
  <tr>
   <td align="center">  </td>
   <td align="center"><div align="right"> </div></td>
   <td align="center"> <div align="center">
     <input name="submit" type="submit" value="Confirm Change">
    </div></td></tr>
</form>
```

Table 4.4: Post Method Function ASP Coding

Beside that session object was used to store user name and password so that any page can trace the current user using the system. The session object is used to enhance secure surfing. Once a current user completes surfing, he would have to logout so that his profile would not appear again (session abandon).

```
<%
name = session ("name")
pass = session ("pass")
if ((name="")or(pass=""))then
response.Redirect("index.asp")
else
Dim objConn
Set objConn = Server.CreateObject("ADODB.Connection")
objConn.ConnectionString = "DSN=inventory.dsn"
objConn.Open
Dim objRS
set objRS = Server.CreateObject("ADODB.Recordset")
objRS.Open "inventory", objConn, ,adlockOptimistic, adCmdTable
bol = False
do until objrs.eof or bol
if (strcomp(objrs("username"), name, vbtextcompare) =0) then
bol=true
else
objrs.movenext
end if%>
```

Table 4.5: Retrieve Session Object ASP Coding

```
<%
name = session ("name")
pass = session ("pass")
%>
<%
session.abandon
response.Redirect("index.asp")
%>
```

Table 4.6: Session Abandon ASP Coding

Besides that, ASP is also used in adding, updating and deleting records

```
<%
 Dim objConn

 Set objConn = Server.CreateObject("ADODB.Connection")
 objConn.ConnectionString = "DSN=inventory.dsn"
 objConn.Open

 Dim objRS
 Set objRS = Server.CreateObject("ADODB.Recordset")
 objRS.Open "boole", objConn,,adlockOptimistic, adCmdTable
 objRS.AddNew
 objRS("Pc") = request.Form("Pc")
 objRS("Model") = request.Form("Model")
 objRS("TagCpu") = request.Form("TagCpu")
 objRS("TagMonitor") = request.Form("TagMonitor")
 objRS("SirialCpu") = request.Form("SirialCpu")
 objRS("SirialMonitor") = request.Form("SirialMonitor")
 objRS("Processor") = request.Form("Processor")
 objRS("OS") = request.Form("OS")
 objRS("IP") = request.Form("IP")
 objRS("Remark") = request.Form("Remark")

 objRS.Update
 objRS.Close
 Set objRS = Nothing
 objConn.Close
 Set objConn = Nothing
%>
```

Table 4.7: Add New Details ASP Coding

```
<script language="javascript">
<!--
function check() {
var v1,v2,v3,v4,v5,v6,v7;
v1=document.form1.username.value ;
v2=document.form1.pass.value;
v3=document.form1.pass1.value;
v4=document.form1.name.value;
v5=document.form1.address1.value;
v6=document.form1.postcode.value;
v7=document.form1.state.value;
if (v1=="" || v2=="" || v3=="" || v4=="" || v5=="" || v6=="" || v7=="" )
{    alert ("WARNING \n Enter values in all fields") ;
return false    }
else if(v2 != v3)
{
alert("Both Passwords Does't Match")
return false   }
else
{ document.forms[0].submit();
}}
//-->
</script>
```

Table 4.8: JavaScript Validation Check Coding

```
<script language=vbscript>
sub getme()
result=window.event.keycode
result=chr(result)
if(isnumeric(result) or result=" ")then
msgbox "Enter Only Alphabets",,"Warning"
document.form1.name.value =""
end if
end sub
</script>
```

Table 4.9: VBScript Validation Coding

4.6 The Flow Of The E-Inventory System

Shown below is the basic flow of the E-Inventory System that has been implemented :-

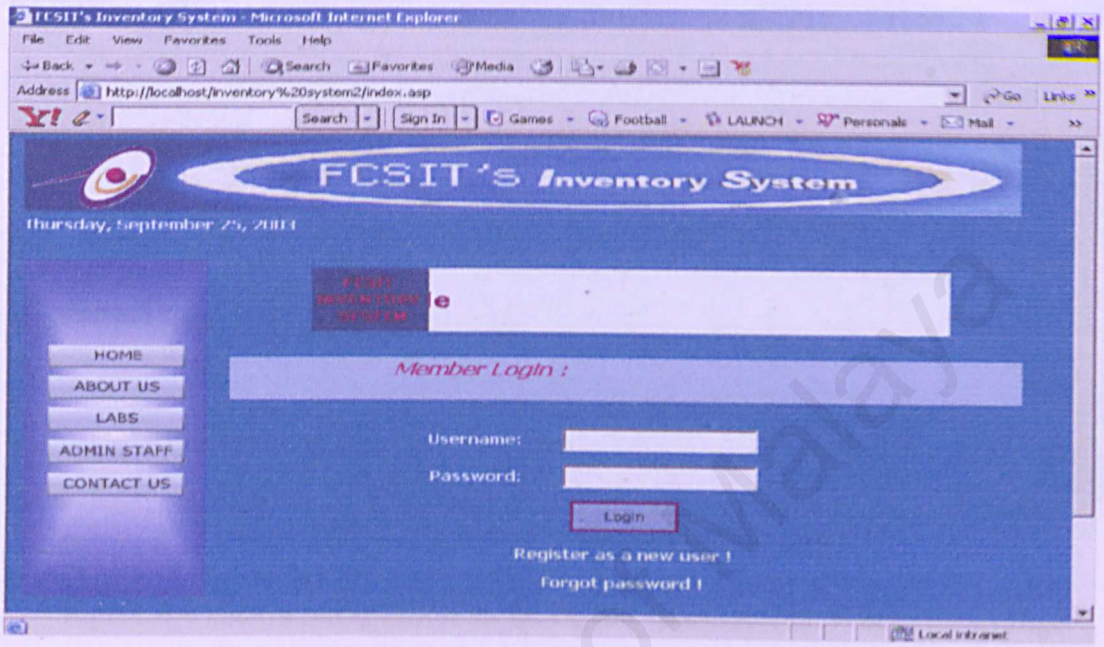


Figure 4.2: E-Inventory System (FCSIT) Main Page

Figure 4.2 shows the main page of the system, where users have to login. Or can view some other links without login.

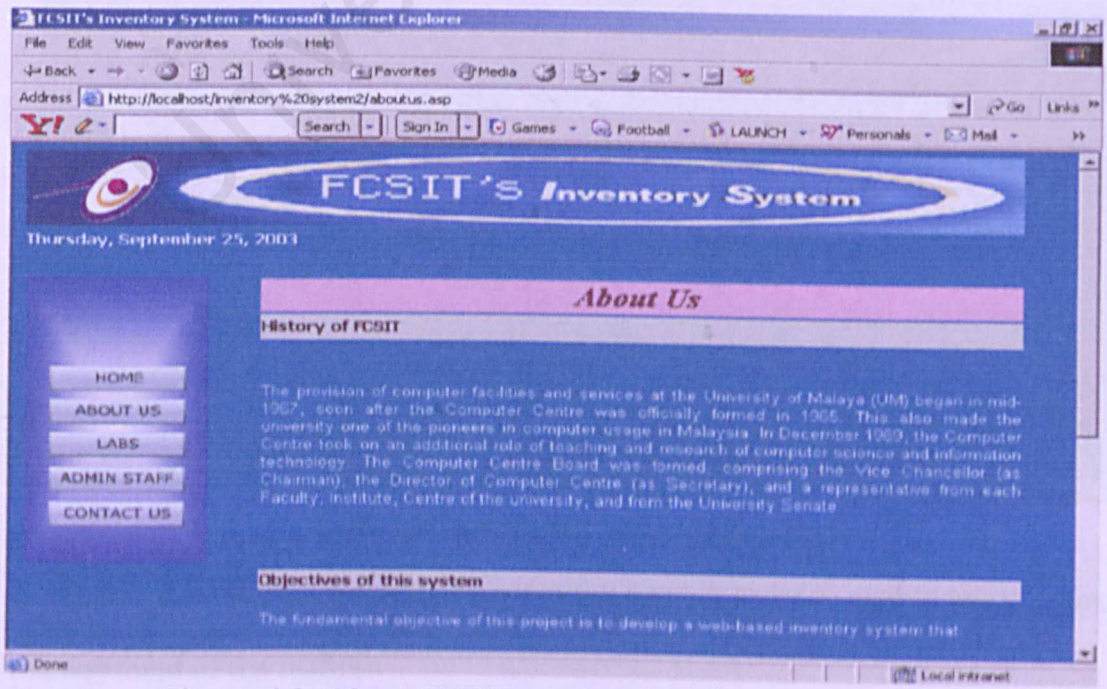


Figure 4.3: About FCSIT and These System Objectives

Figure 4.3 shows a brief elaboration about FCSIT and objectives

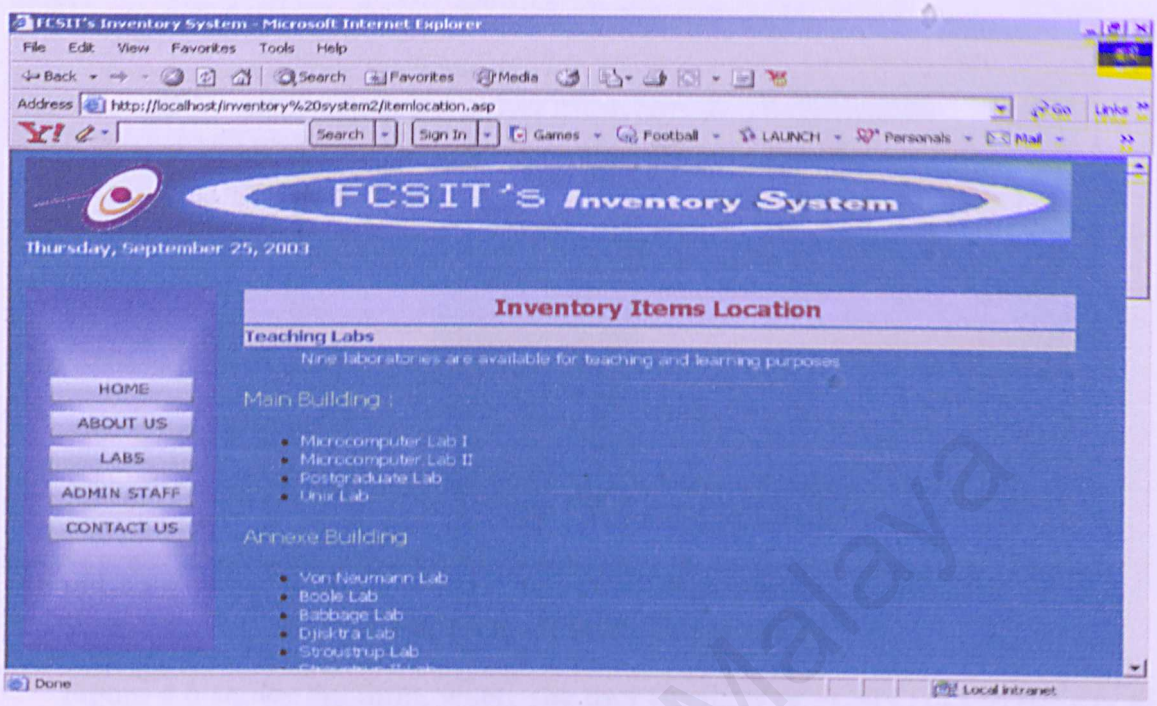


Figure 4.4: Laboratories Information

Figure 4.4 shows information about FCSIT laboratories. Where its arrange according blocks.

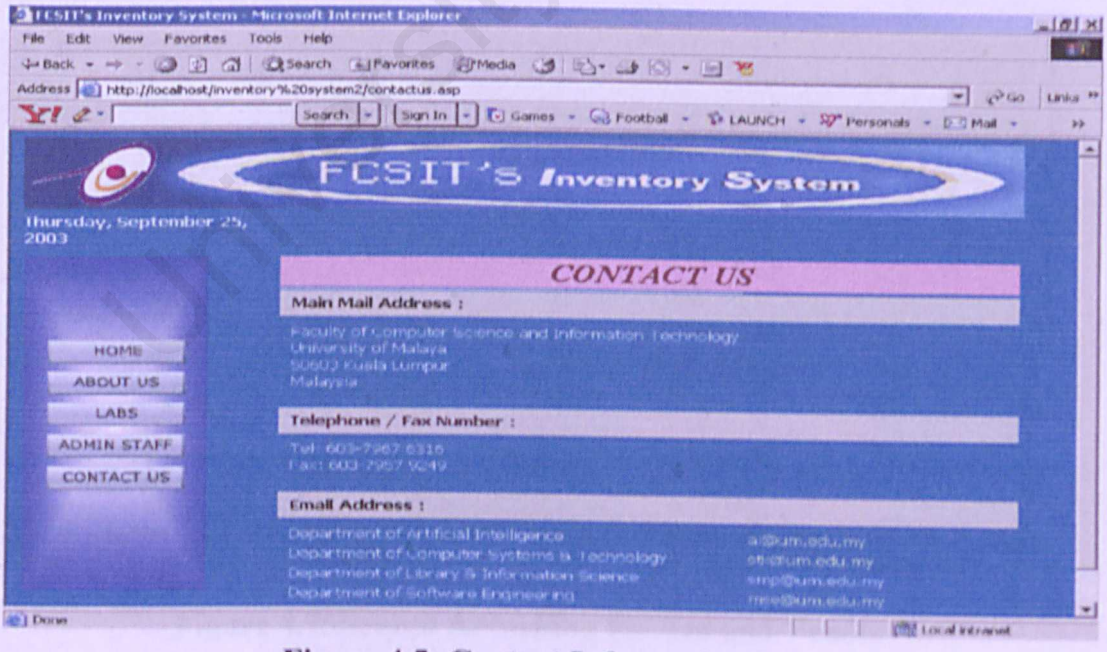


Figure 4.5: Contact Information Page

Figure 4.5 shows the contact information page in order to enable users to contact the management of the FCSIT.

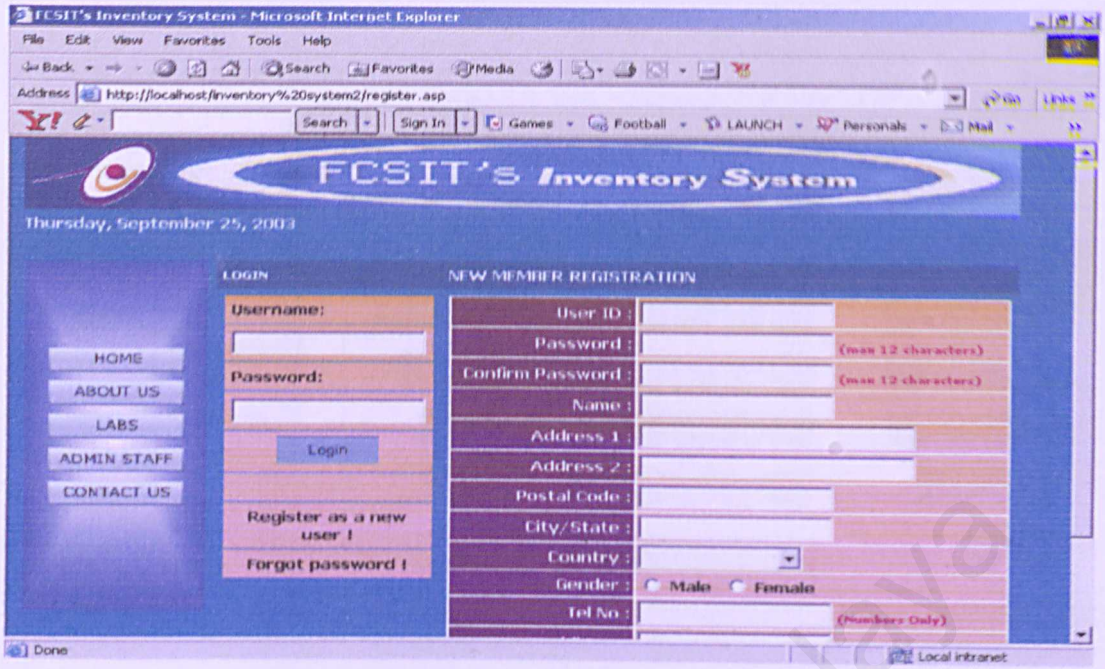


Figure 4.6: New Member Registration

Figure 4.6 shows the form, where the user (lecturer of FCSIT) has to register to view more details.

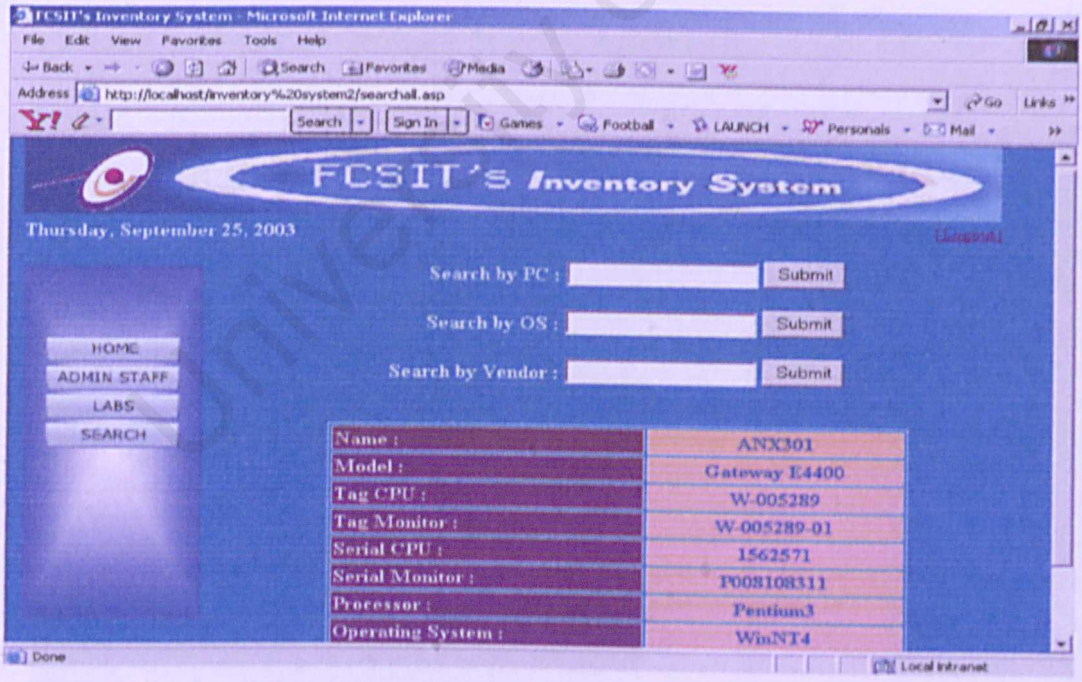


Figure 4.7: Search According PC, OS and Vendor

Figure 4.7 shows searching for computer, operating system and vendor. Only user can view these details.

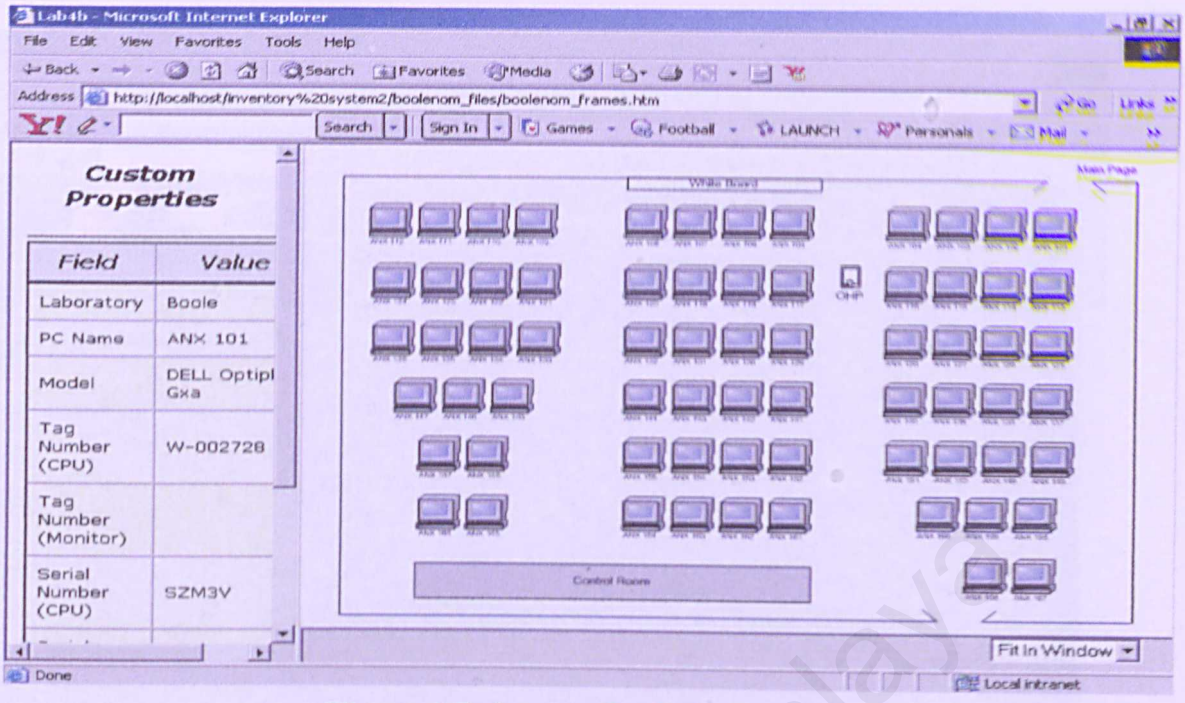


Figure 4.8: Layout Boole Laboratory

Figure 4.8 shows the layout of Boole Laboratory. Where user can view items description like pc name, model, and tag number.

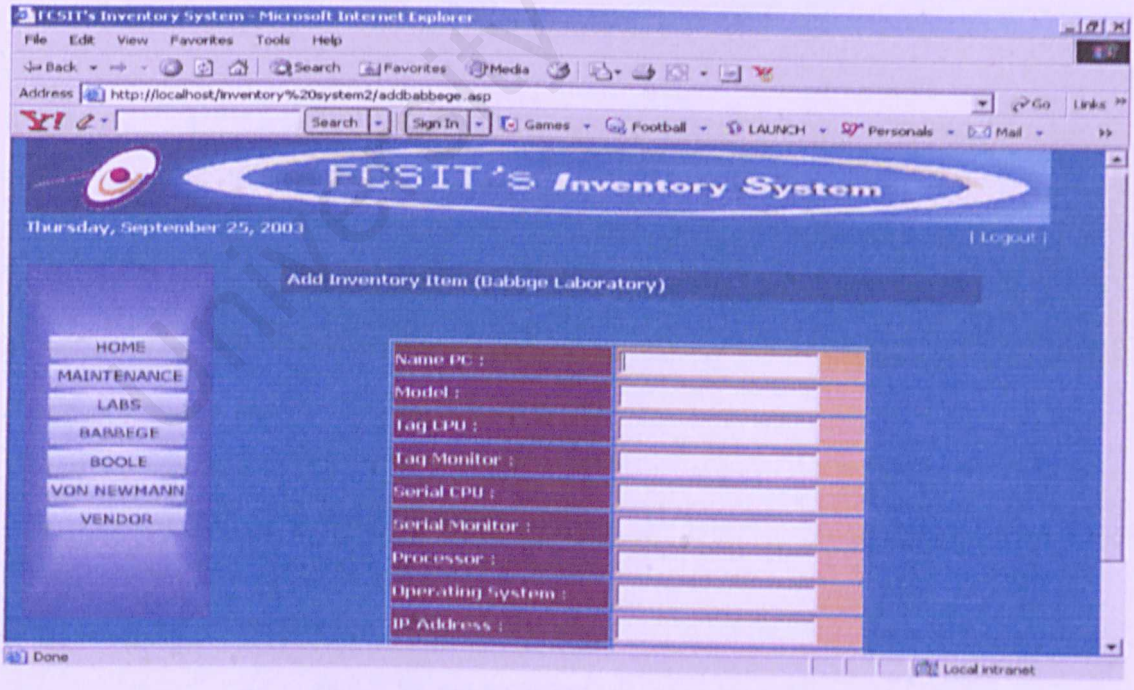


Figure 4.9: Add Inventory Item

Figure 4.9 shows the form where administrator has to fill in to add item in the laboratory.

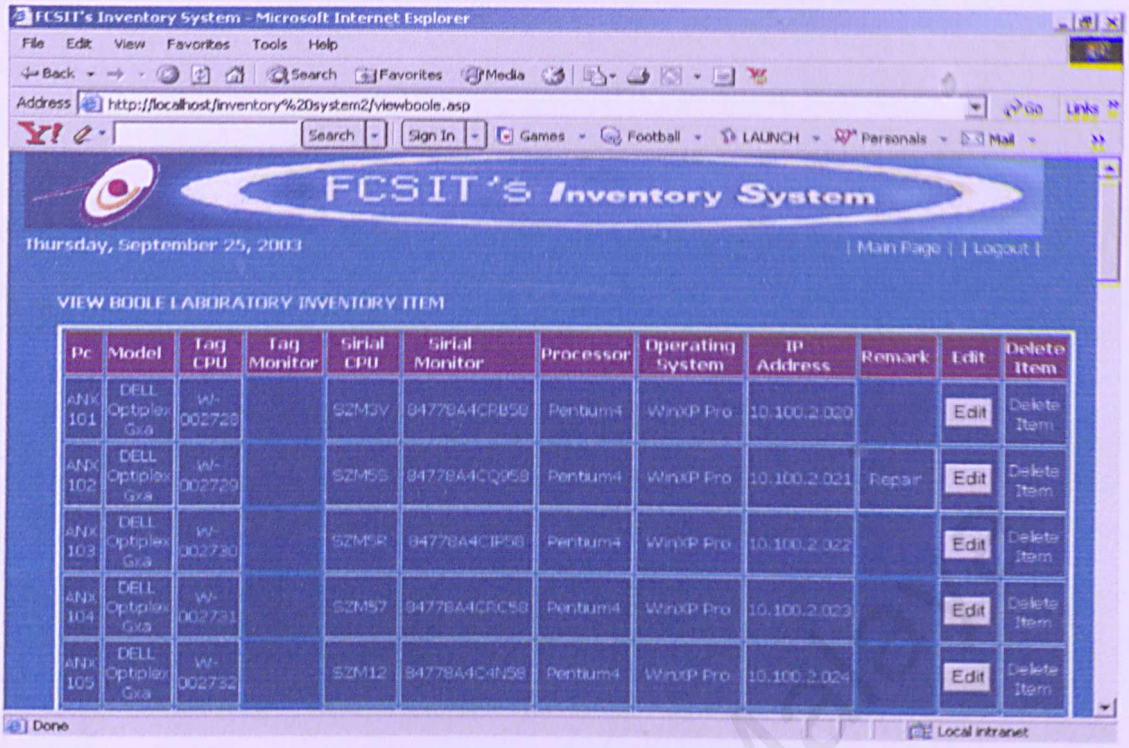


Figure 4.10: Viewing Laboratories Inventory item

Figure 4.10 shows laboratories inventory item in details. Where administrator can view the details, edit the items details or delete it.

CHAPTER 5
SYSTEM TESTING

Chapter 5: System Testing

5.1 Introduction

The main function of testing is to establish the presence of defect in a program. Meanwhile, testing is used to judge whether or not the program is usable in practice. Nevertheless, testing can only demonstrate the presence of error. It cannot show that there is no error in the program. Therefore, suitable approach must be chosen to reduce the possibility or error in a program. Several rules serve well as program testing objectives.

a) Testing is a process of program execution with explicit intents to find errors and run-time program bugs.

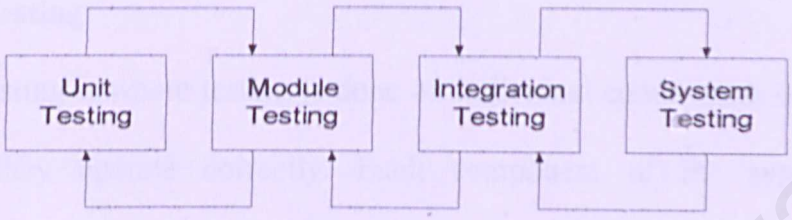
b) An effective test case is one that contains unexpected testing record sets with high probability of detecting undiscovered errors during the program design and development phase.

c) A successful test is also not one that uncovers only few expected error, but it is which constantly provides new challenges to its programmers over time.

The different between testing modules during the development phase and testing them during software integration is that error can be fixed as they are found the integration phase must be recorded and the bugged module must be returned to its development team or programmers for further correction based on its errors logs. E-Inventory System has gone through three stages of testing before it is completed. These three stages are the component testing, integration testing and acceptance testing.

5.2 Testing Process

In general, the testing process of the system can be shown in the following figure.



Testing Process

The testing procedure will be started from component testing to ensure the codes implemented in the system will properly fit the system requirements. This is follow by the integration testing, which is tested for the overall functionality and performance of a few modules that are integrated together. Lastly, the testing procedure, user is required to test the system carefully to ensure that the implemented system will function according to their requirements. If any mistake or defects are discovered at any stage, the previous stages might need to be repeated for correction and modification.

5.3 Testing Approach

The testing approach adopted in this system is the bottom-up approach. Using this approach, each module at the lowest level of the system hierarchy is tested individually. Then, the next module to be tested is that module that calls the previously tested module. This approach is followed repeatedly until all modules have been tested.

5.4 Component Testing

The details of how each stage takes place in E-Inventory System are described in the following sections.

5.4.1 Unit Testing

Unit testing is where testing is done on individual components of the system to ensure that they operate correctly. Each component of the system is tested independently, without other system components. Unit test is very time-consuming and labor intensive stage of any software development. Several techniques have been used in the unit testing for the E-Inventory System: -

5.4.1.1 Code Review

Before the function is run in the browser, codes are reviewed line by line to discover any syntax error as well as semantic error. If errors are discovered, they are corrected immediately.

5.4.1.2 Code Differ In Colour

By using the Macromedia Dreamweaver MX, the code will be in different color. For instance, JavaScript codes will be in red color and ASP codes will be in grey. If the code contains errors, it will appears in bright yellow.

5.5 Module Testing

Module testing is implemented after the unit testing stage to uncover error in each unit. A module is a collection of dependent components. During this stage, all the related units or functions will be integrated and tested in the module level. In

performing module test, different test cases are applied to the module and the test results are recorded. If errors occur in this level, each unit will be retested till there is a solution to the problem. This is done because although each sub module performs its task correctly, the end result produced may be incorrect when all the sub modules work together.

5.6 Integration Testing

5.6.1 Sub-System Testing

The sub-system testing is done after the module testing whereby the entire module would be integrated and tested further. The sub-system testing is done to check the functionality of the integrated modules. The most common problems that arise when modules are integrated together are module interface mismatch. Therefore, the main concern in integration test is to exercise the interface repeated to defect any interface mismatch problem. Several important aspects are checked to reduce the possibility of interface problem as listed below:

- The necessity to perform a checking that redirects the user to the correct module
- Whether the type of parameter tallies with the type of parameter received
- Whether information passed is sufficient for the receiving module to perform its task
- The necessity of the type conversion.

5.7 System Testing

The system testing process is concerned with finding errors, which result from anticipated interactions between sub-systems and system components. It is also concerned with validating that the system fulfills the functional and non-functional requirements. System testing can be categorized into a few types: -

5.7.1 Stress Testing

This is to determine that the program fulfills the requirements defined for it. It is equally important to ensure that the program works, as it should under extreme conditions. In order to perform stress testing, execute the system in a manner that demands resources in abnormal quantity, frequency, or volume.

5.7.2 Performance Testing

For real-time and embedded systems, software that provides required function but does not conform to performance requirements is unacceptable. Performance testing is designed to test the run-time performance of software within the context of an integrated system. Performance testing occurs throughout all steps in the testing process.

5.8 User Testing

User testing or acceptance testing is the final testing procedure in the E-Inventory System whereby users will be actively involved in testing system to ensure that the system meets their requirements. The main purpose of this testing is to verify whether the system has fulfilled the user's requirements. Besides that, the functionality

of the system is demonstrated to the end users and the users are given the chance to experience and explore the system themselves.

Some of the comments that are given by user are as below:

- The system is easy to understand and have a short learning curve.
- Should add all the necessary function for inventory control system.
- The user interface is nice but can do some enhancement to it to give a more user friendly look.
- Other inventory control function such as inventory value counting can be included.
- More types of inventory reports can be prepared in this system.

5.9 Analysis of test Results

From the all testing process that has been carry out, the test results can be summarized as follow:

- Achieving the main objectives of the project.

  Generally the main objectives of the project as described in Chapter 1 have been achieved. The system can maintain all the inventory transactions. This is an important and major activity in an organization.

- Enhancement on the user interfaces

  The user interface for the system should be more attractive and user-friendly in order to attract the user to use the system. So using more graphics and attractive icon to represent the buttons may help t improve.

5.10 Conclusion

At the end of the testing phase, the system should be able to perform the task required and free of most errors. The user should use the system. However, there are still some critical problems and errors, which would occur only after using the system for some time. Therefore, work of testing should not just end in this phase but have to done every now and then to make sure the system functions well.

CHAPTER 6
SYSTEM EVALUATION

Chapter 6: System Evaluation

6.1 Introduction

Evaluation is the ultimate phase of developing a system and an important phase before delivery the system to the end users. Evaluation was related to user environment, attitudes, information priorities and several other concerns that are to be considered carefully before effectiveness can be concluded. At all phases of the system approaches, evaluation is a process that occurs continuously, drawing on a variety of sources and information.

6.2 Problems Encountered and its Solutions

6.2.1 Problems In Tools and language Selection

Since developing an E-Inventory System is a new technology, it is difficult in selecting the most appropriate tools and software for the development of FCSIT Inventory System in the beginning stage. It is because the process of choosing the suitable technology and tools for project development is a very critical process as different tools has its strength and weaknesses.

Hence, to learn more information in web-based application in the system, in depth studies and research on the programming language and tools using were conducted in the earlier stage of the development. The studies and research activities including Internet surfing, reference books, review the current systems in the market and others.

6.2.2 Difficulties In Determining System Scope

Without experience in web-based development, it is difficult to define the scope of the system in the early stage. Due to the insufficient knowledge and time constraint, it is impossible to built a full-scale complete system within the given time frame.

To solve this problem, reference and analysis on current web sites has been conducted in order to understand the system design of each web site and try to adopt some of the ideas into the system design of E-Inventory System.

6.2.3 Lack of Knowledge In the Language and Tools Chosen

Due to the time constraint, it is very difficult in learning the chosen language and tools. Without a strong base of the language, I need more time in looking for solution to solve technical and non-technical problems that were encountered during the development of E-Inventory System. It consumes a lot of time in the beginning stage of development to learn the new programming language. All these need some research on the component before knowing how to use the component and how to apply it in the modules. To solve these problems, Internet was the most vital source. There are lots of source codes and free tutorials in the World Wide Web.

6.2.4 Slow System Response Time

There are some modules in this system especially those are connected to database need to be able to response in the minimum amount of time.

6.3 Evaluation By The End User

As FCSIT Inventory System is proposed to produce a more efficient and effective inventory management, the final stage of system development which is the system testing becomes critical and it needs feedbacks from all respective users in judging the correctness of these functionalities, precise data flow as well as enhance interface of the system.

Anyway, as the scope of FCSIT Inventory System is large, development was conducted with the objective to cover the scope briefly, which means that the whole system was developed quickly to have the overall structure and potential of the system but the system was not refined to show its full efficiency.

The overall feedback from the end users is good and FCSIT Inventory System is expected to serve the targeted group well after refining.

6.4 System Strengths

6.4.1 Simplicity of User Interface

By employing the graphical user interface, FCSIT Inventory System can be evaluated as an easy-to-use system. Unlike those command-based environment, FCSIT Inventory System is more user friendly to interact with sufficient instruction and guidelines are provided to assist users. Users are required only minimum typing and inputs when they interact with the system.

6.4.2 Efficiency of the System

The system administrator module developed is a user-friendly and efficient program. Both the administrator and inventory staff can easily add new records, update and delete existing records in their respective fields.

6.4.3 Error Messaging

In this system, the error message will display immediately when an error occurs. This allows users to identify their errors effectively. For examples; when a required field is not entered during and updating session to the records, the system will notify the particular user about this.

6.4.4 Consistency

All the pages are designed in a way that all the links are arranged in the same position although the user switches from one page to the other. This allow the user to perform better while using the system.

6.4.5 System Transparency

System transparency refers to the condition where the user does not need to know where the database resides, how is the system structure or anything related to how the system was built. This is important because without transparency, confused user might lead to the destruction of the system.

6.4.6 Maintainability

The system is saved in files, thus making it relatively easy to maintain. All the classes and objects are coded in a standardized form to ensure the readability which eventually will increase maintainability.

6.5 System Weakness

6.5.1 Lack of Security Features

Encryption and the security of the login module is still considered as a hazard for the system to be implemented. Better encryption techniques and security policy should be implemented in the future.

6.5.2 Platform and Browser Limitations During The Implementation Phase

The FCSIT Inventory System implementation depends heavily on the use of Microsoft Technology. The current implementation of the FCSIT Inventory System is limited to the Windows 2000 and XP Operating System and Internet Explorer 5.0 as client browser. Due to the constrain of time and technical knowledge, they system cannot perform properly under other operating system, such as Linux.

6.5.3 Very Limited Reporting Function

The available reporting module that is very limited in function. It has to load all the record in to the data grid in the browser first before users can print them. If too many records are to be shown, then the downloading time will extend and memory from the client side will be exhausted. A third party software should be seek to ensure a more efficient reporting module to handle large amount of data.

6.5.4 Lack of Functional Modules

The available functional module in the system is very limited. This is because of the lack of knowledge and experience in the handling of a web-based inventory management system.

6.5.5 User Cannot and Retrieve Password Through The Internet

This limitation is actually trade off for the security of the system. This is caused by the central maintenance of the login module by the administrator to control the users.

6.6 Future Enhancements

System development is a very dynamic process which requires the developer to consistently checking on the system to ensure that it is running smoothly. The system was developed under three months which does not allow the developer to implements all the new ideas that come about during the implementation stage. Below are some of the enhancement that the developer wish to implement in the future;

- Implement password encryption to increase the security of the session
- Enhance the reporting module to be able to have more function
- Administrator should be able to backup the database through the system
- Automatically notify users who are just added to the system through mail.

6.7 Conclusion

The lure of greater efficiency, lowered costs and higher quality drive must of an organization to gain competitive edge in business from the knowledge of Information Technology. FCSIT Inventory System is a start to computerize the operations/ transactions in the business organizations towards the effort of paperless concept.

A lot of knowledge was gained throughout the literature review, requirements analysis and the initial system development of the project. Information gathered through various sources is extra knowledge for me that cannot be obtained from the courses

taught in faculty. Adherence to a development schedule is very important in order to get a job done on time. This experience will definitely prove useful in future system development.

Overall, the FCSIT Inventory System has achieved and fulfilled the objectives and requirements of a web based inventory system as stated in the project proposal. The use of web based approach brings along many benefits including the ability to access information anywhere and at anytime of the day. Administrator can perform administering tasks online anywhere at anytime. This will ease the administrator to expand the business throughout the whole Malaysia. This also meets the university's objective in bringing education to the public throughput the nation and also expanding its facility.

Finally, there are still many rooms for the improvement in the FCSIT Inventory System, in terms of implementing a comprehensive and complete inventory system. With the initial step taken, enhancements could be made by inserting more features when implementing the system in the time to come. It is hoped that this system will be a success and provides a foundation upon which more innovative and comprehensive system may be built to perform multiple tasks and fulfill various user requirements.

References

Internet Society (ISOC) Al 1 "*About the Internet A Brief History of the Internet*" Available at: http://www.isoc.org/internet-history/brief.html#Introduction (29th Mac 2003)

Gary P. Schneider and James T. Perry. "*Electronic Commerce*", Course Technology, 2000.

Liang, C. C., Cheng, F. and Wang, E. H., "*Reengineering University Information Services*", Yuan Ze University's Experience, *CAUSE/EFFECT*, vol. 21, no. 4, 1998.

Grant Norris, James R. Hurley, Kenneth M. Hartley, John R. Dunleavy, John D. Balls. "*E-Business and ERP: Transforming the Enterprise*", John Wiley & sons, 2000.

Jerry Chin. *"E-Commerce Success: Building a Global Business Architecture"*, Computer Technology Research Corp, 1999.

The Global Marketplace For Electronic Components, Available at: http://www.usbid.com, (28th Mac 2003)

University of Malaya a Tradition of Excellence Available at: http://www.um.edu.my, (5th Aprill 2003)

The Meng Hai, (2000/2001) *Office Equipment Inventory System.* Degree thesis. University Malaya.

Ng Yuet wean, (2000/2001*) Hardware Inventory System.* Degree Thesis. University Malaya.

Alter, S., *"Information System: A management Perspective"*, The Benjamin/Cummings publishing Company Inc., 1996.

Kalakota, R., *"What are the characteristics of client/server architecture?"*, Available at: http://www.cis.ohio-state.edu/hypertext/faq/usenet/client-server-faq/faq-doc-14.htm (5th April 2003)

Tay Liang Chung, (2001/2002) *Online Inventory System.* Degree Thesis. University Malaya.

L.S. Pfleeger, *"Software engineering: Theory and Practice"*, Prentice Hall, 2001.

Appendix A

Schedule of Project

To achieve the project objectives, a project schedule is planned to manage the time for the tasks that is needed to complete.

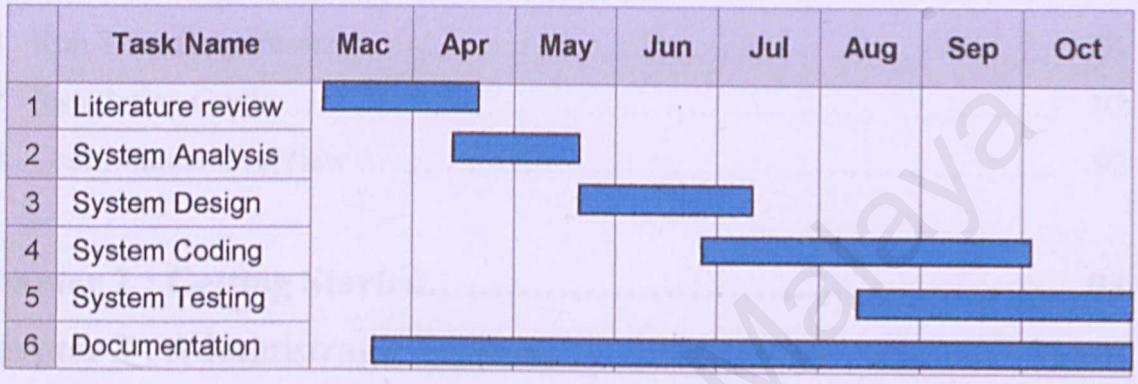


Table 7.1 Gantt chart explaining project runtime

Appendix B

Tables Of Contents

List Of Figures

Appendix B : User Manual

Chapter 1: Introduction

E-Inventory System for FCSIT is system that would allow user to view information about FCSIT and administrator can keep inventory record. As a administrator can add, delete, update and view inventory items.

1.1 Run Time Requirements

Hardware requirements to run the E-Inventory System for FCSIT are as follows :-

1. A computer with at least Pentium 166MHz MMX processor.
2. At least 64MB RAM.
3. Network Interface Card (NIC) and network connection with recommended bandwidth at 10Mbps.
4. Standard computer peripherals.

Software requirements to run the Online Music Store are as follows :-

1. Windows 95 and above.
2. Internet Explorer 5.5 and above

1.2 Installation Guide

These are step-by-step installation guides.

First insert the CD into the CD-Rom. Then open CD-Rom drive in your pc and right-click on <inventory system2> and click <copy>.

Then paste inventory system2 to your c:\inetpub\wwwroot.

Make sure all the files in inventory system2 are writeable. To do that, right click inventory system2 and click properties. Then uncheck attributes read only. Also make sure the databases are writeable to.

1.3 User Manual Overview

Chapter 1 – Introduction

Brief description about the E-Inventory System for FCSIT and the run time requirements and also an installation guide.

Chapter 2 – Getting Started

Gives a simple explanation about how to get started with the E-Inventory System for FCSIT.

Chapter 3 – Administrator Section

Explains modules in the administrator section of the E-Inventory System for FCSIT.

Chapter 2: Getting Started

How To Use The E-Inventory System for FCSIT

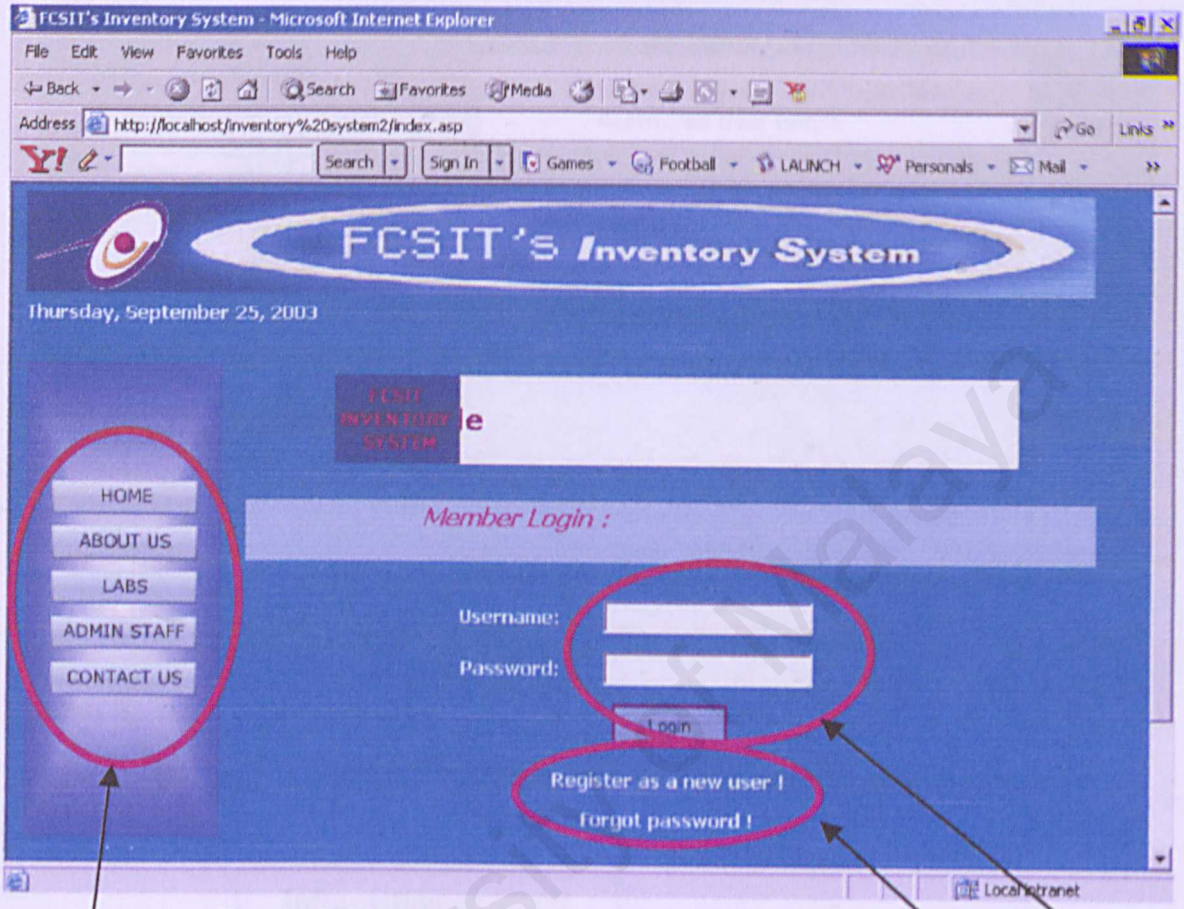


Figure 2.1(a): Main Page for E-Inventory System

The figure above shows the main page of the E-Inventory System for FCSIT. You need to type in: http://localhost/inventory system2/index.asp to view the page. From here, you can login at the login section or can register as a user to use the system. The registration only for FCSIT staff. Other only can view simple details about FCSIT.

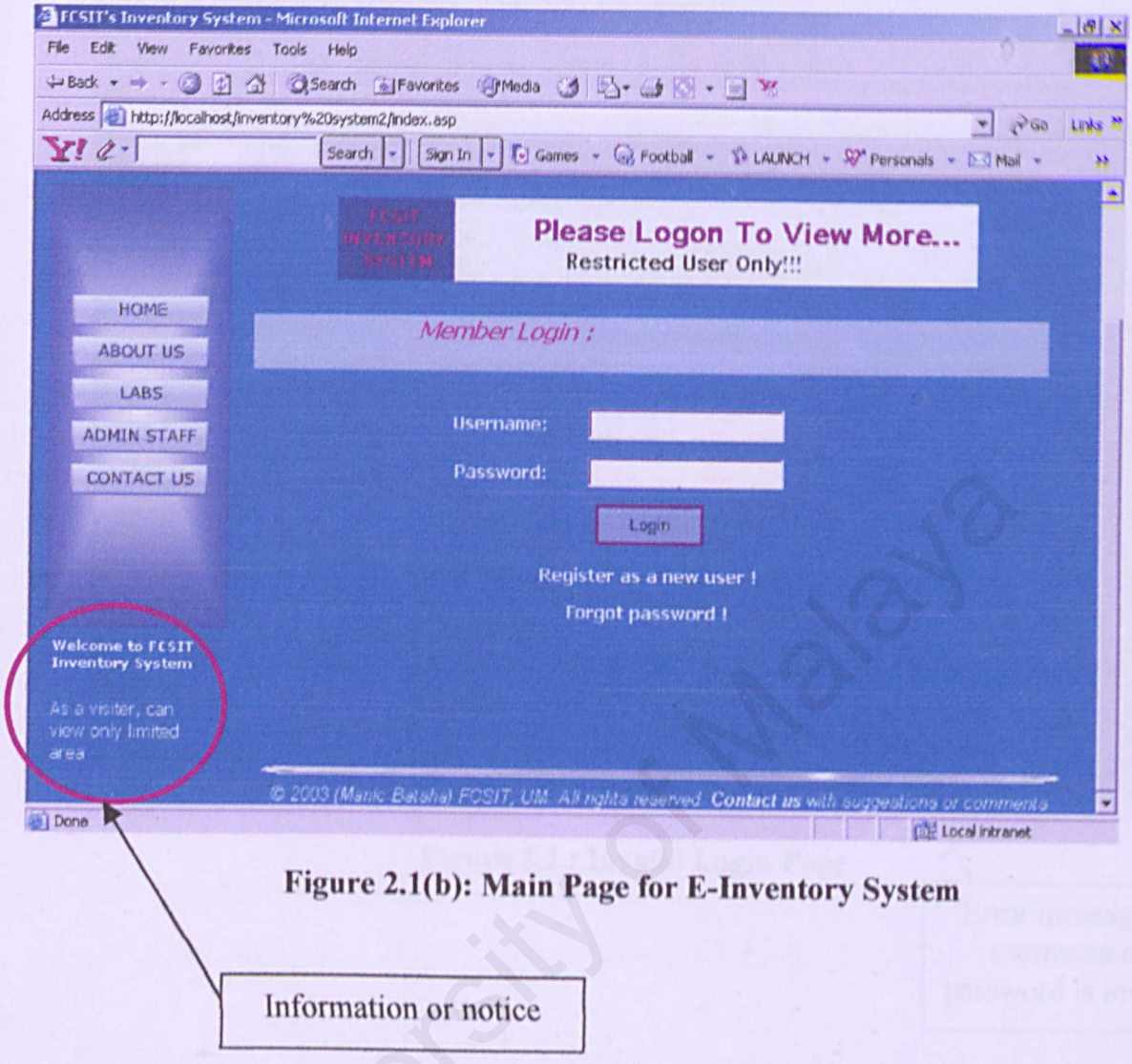


Figure 2.1(b): Main Page for E-Inventory System

Figure 2.1(b) shows the main page of E-Inventory System for FCSIT . The text gives some information about the system. It's a marquee text which is contain welcoming notes and some useful information for users.

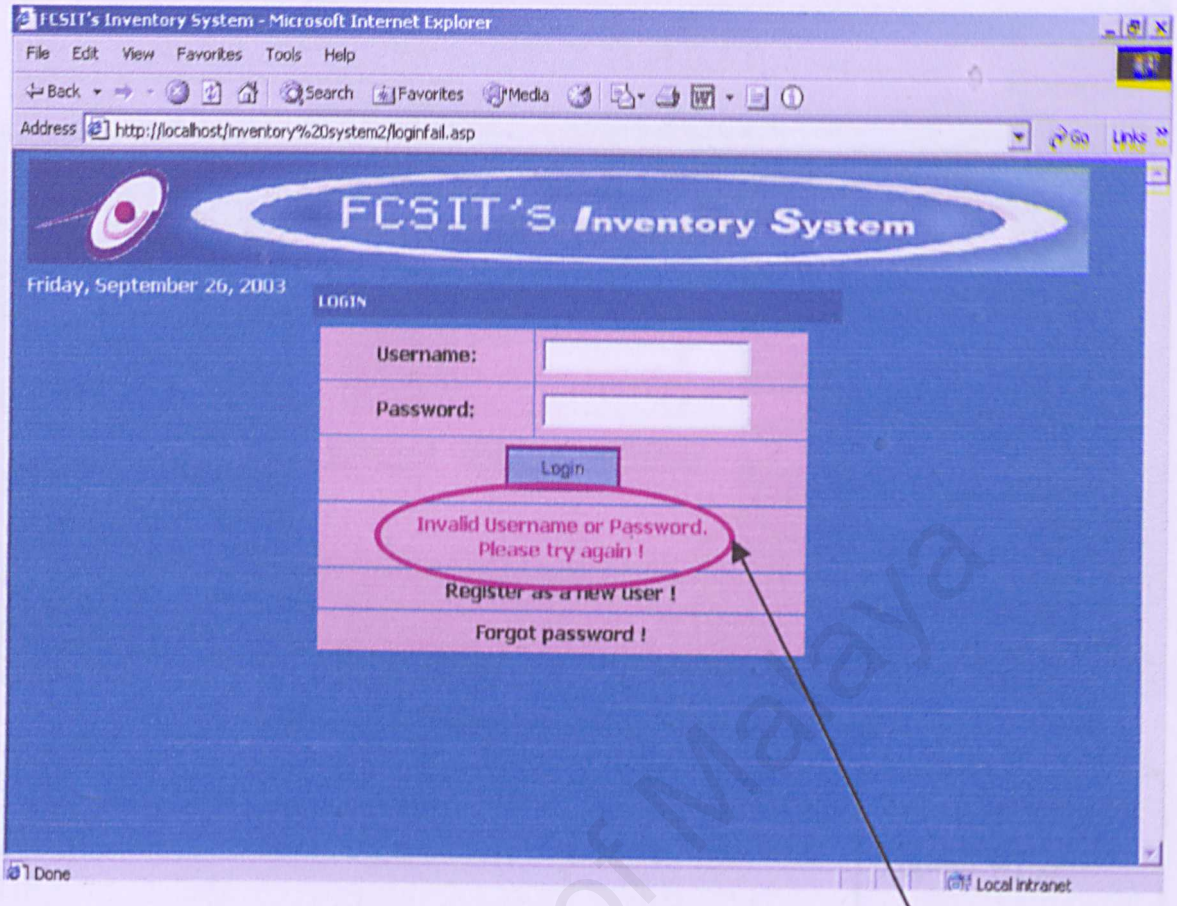


Figure 2.2 : Invalid Login Page

When you log in, the system will validate your username and password. If your username or password is incorrect, the system will redirect you to the invalid login page as shown in figure 2.2.

If you forget your password, you can retrieve your password by clicking on forgot password link. When you click at this link, a pop-up window will appear as shown in figure 2.3 in below.

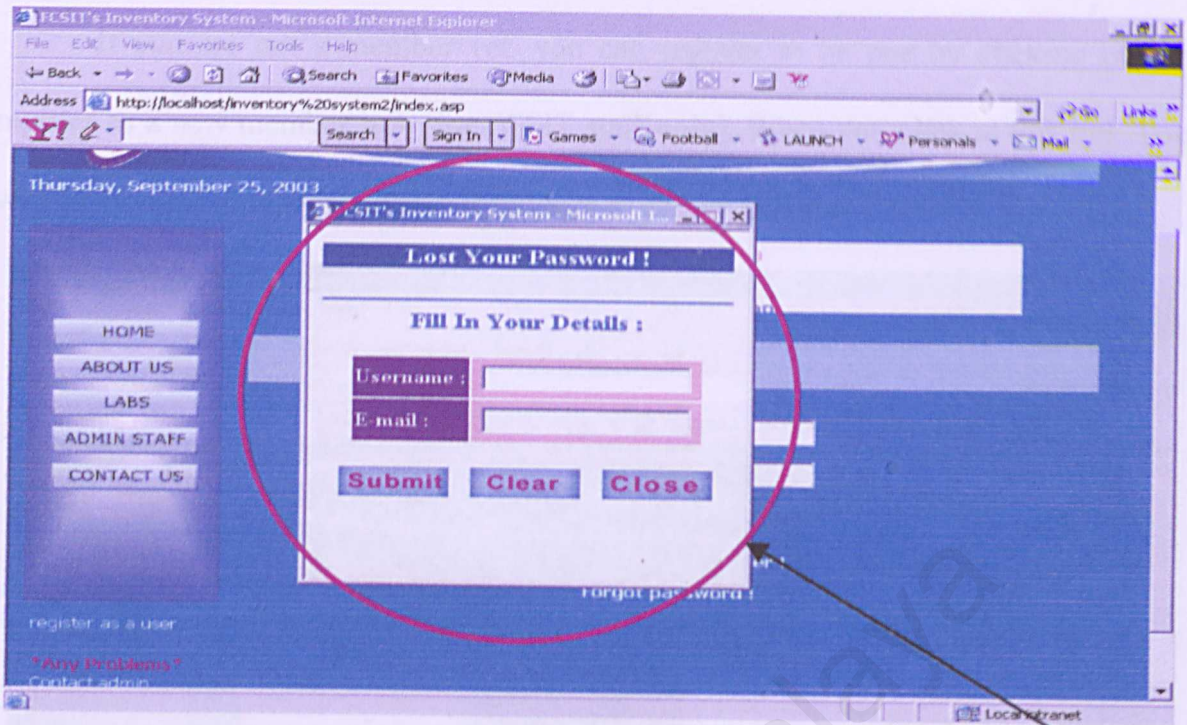


Figure 2.3: Forgot Password Pop-up Window

You just have to fill in your username and your e-mail address and the system will retrieve your password as shown in figure 2.4.

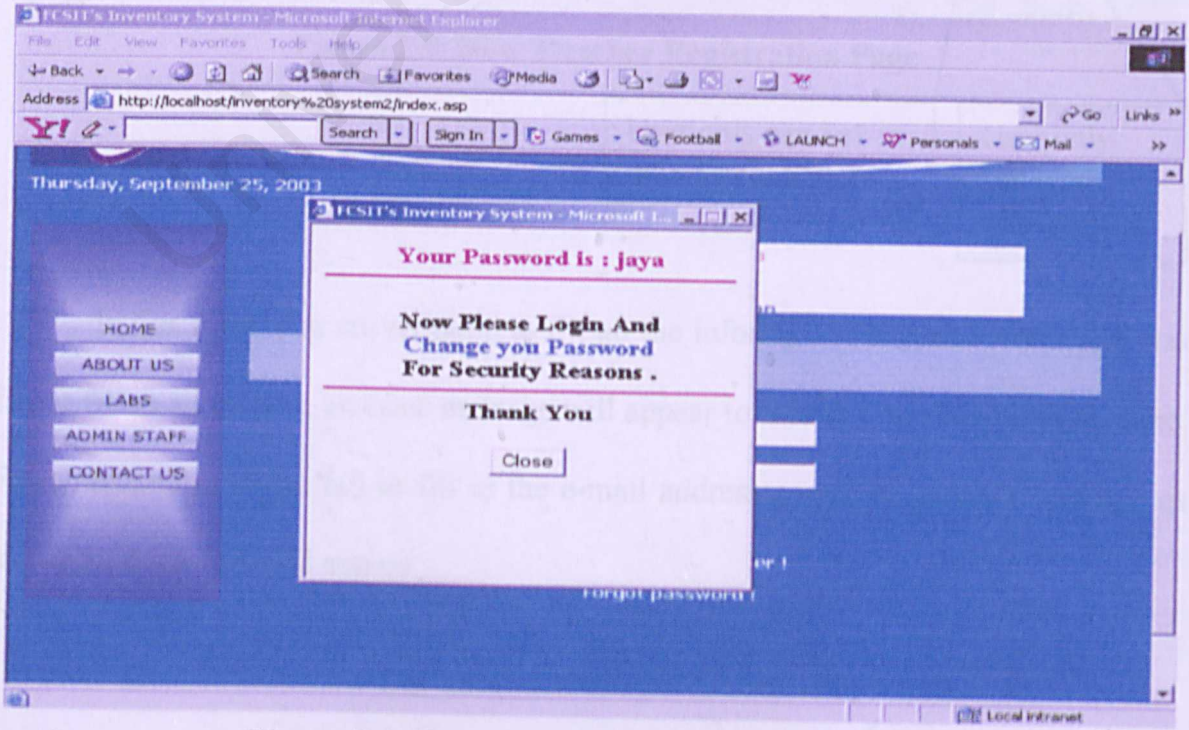


Figure 2.4: Password Retrieval Pop-up Window

If you are not a member yet, you can register to be one by clicking on the register as a new member link (for FCSIT staff only). When you click at this link, you will be directed to the registration form page as shown in figure 2.5.

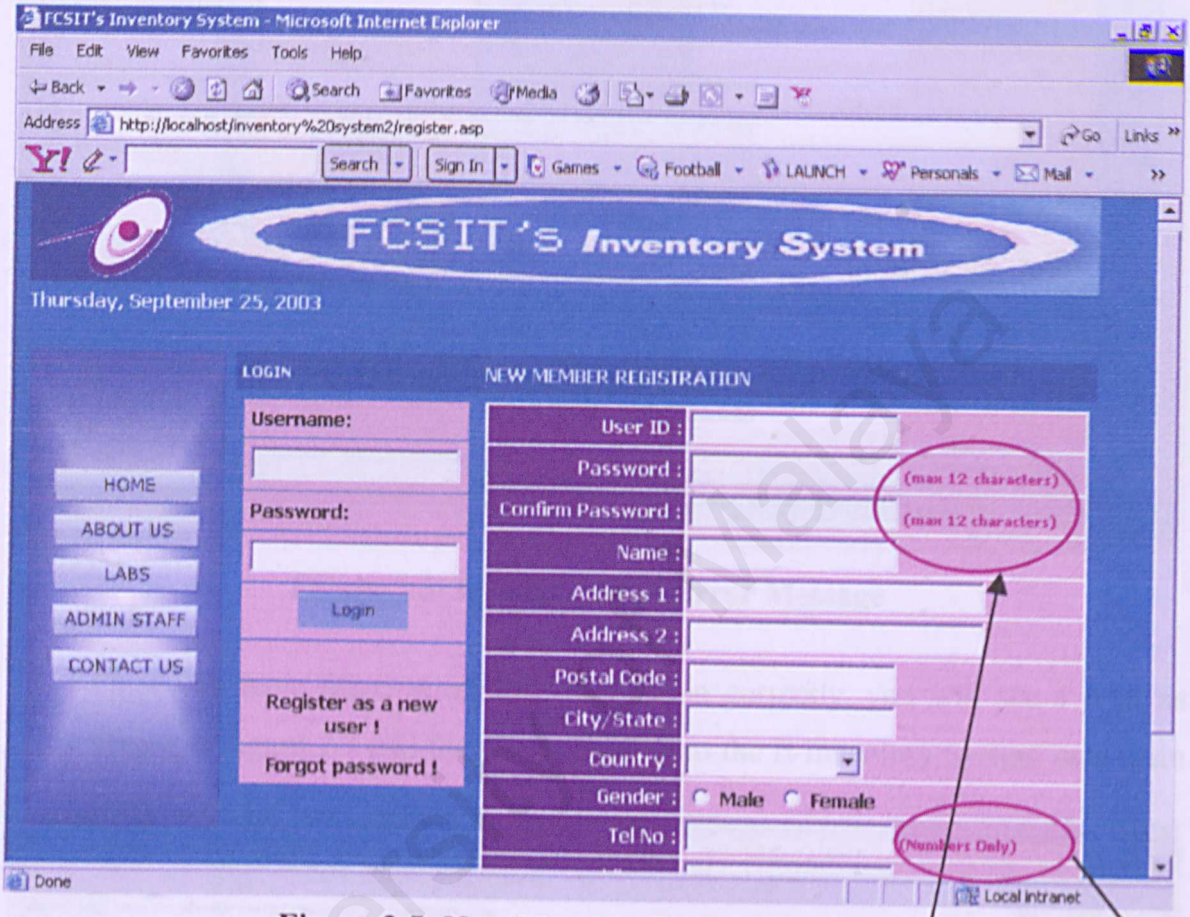


Figure 2.5: New Member Registration Page

In this form, you are required to fill all the information needed correctly. If you fail to fill in all correct, an error message will appear to inform you about your mistake. For an example, if you fail to fill in the e-mail address correctly, an error message as shown in figure 2.6 will appear.

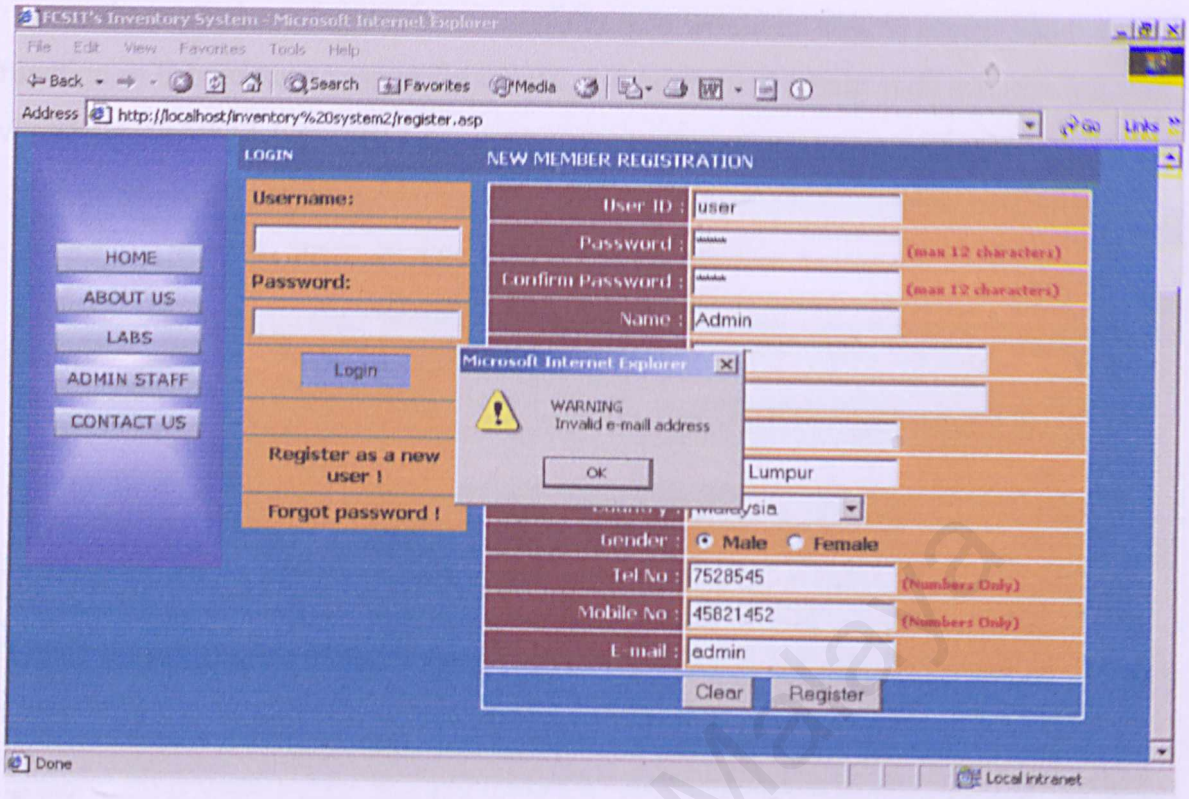


Figure 2.6: Invalid E-mail Error Message

Once you have filled in all the information correctly, you will see a page as shown in figure 2.7 and then be redirected to the E-Inventory System user main page.

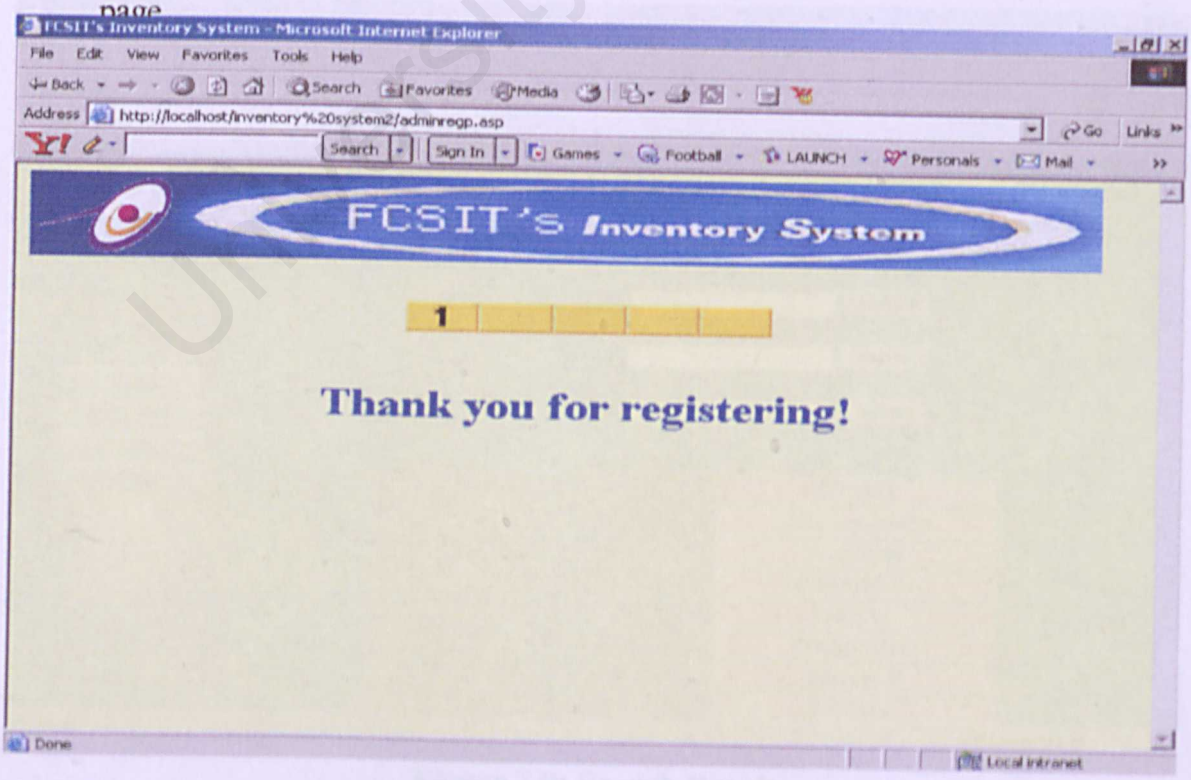


Figure 2.7: Registration Successful Page

Once you have logged in successfully, you would be able to access some extra function in E-Inventory System for FCSIT. Like can view admin staff information, can view layout of the laboratory.

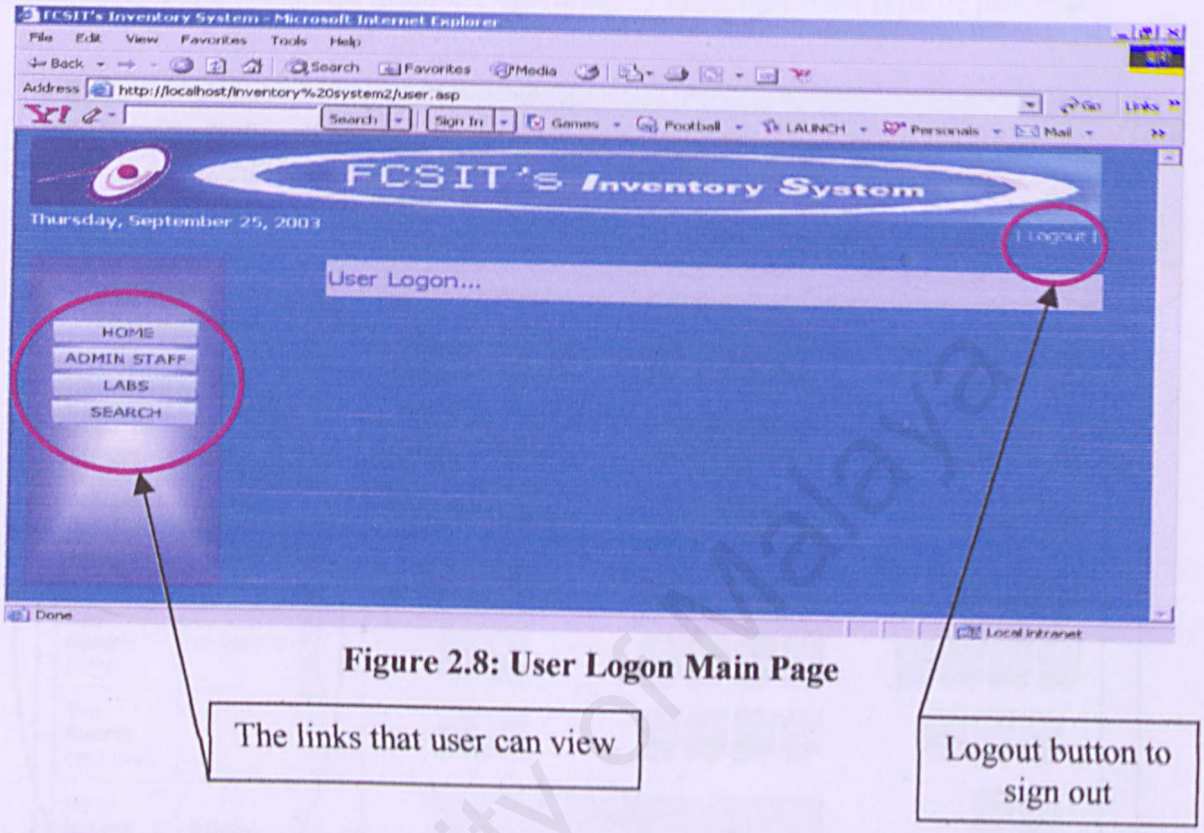


Figure 2.8: User Logon Main Page

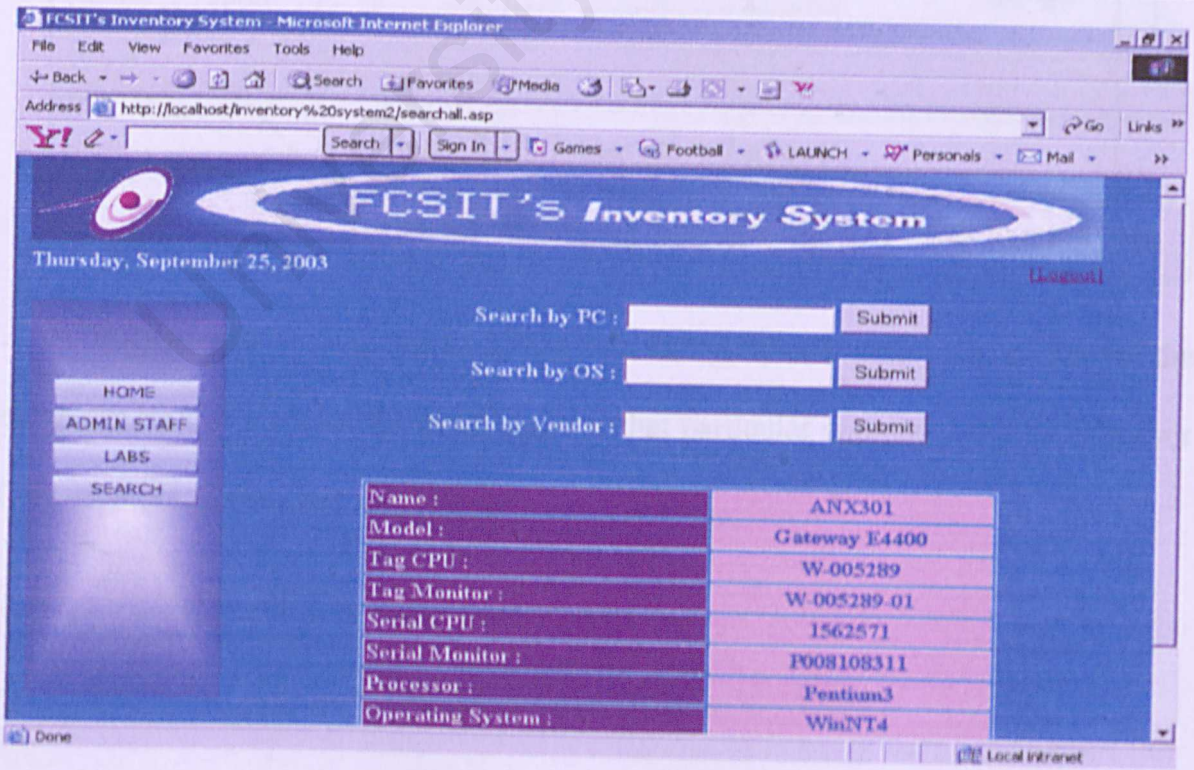


Figure 2.9: Search Result

Figure 2.9 shows search results according compute name. Where user can view full details of searching computer. Like model, CPU tag number, monitor tag number, serial number for CPU and monitor, operating system, and what type of processor.

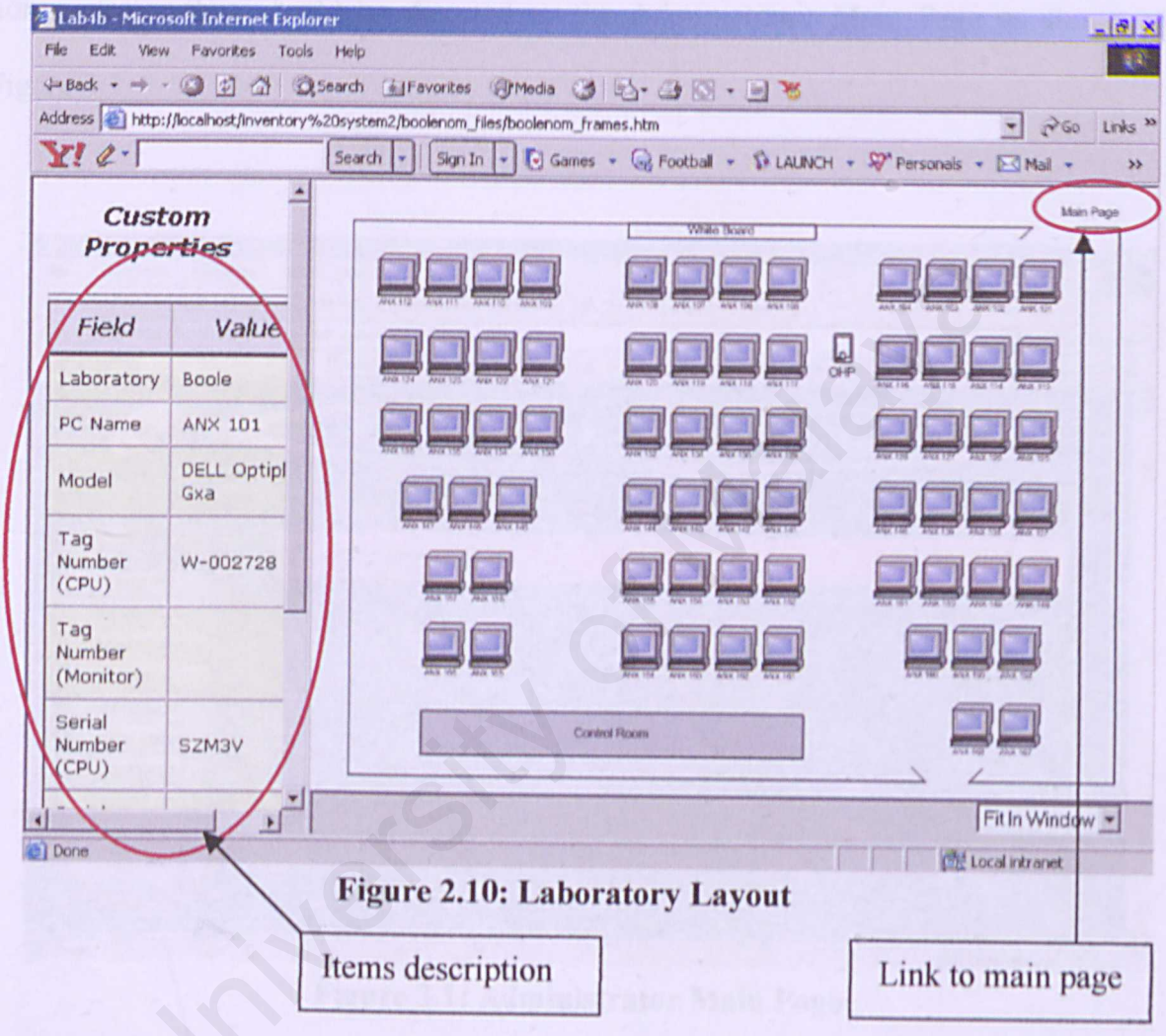


Figure 2.10: Laboratory Layout

Figure 2.10 shows, layout of the laboratory. If user role over mouse on the computer icon, it's shows the description of that particular computer. If user role over OHP icon it's shows OHP description.

Chapter 3: Administrator Section

The administrator of the E-Inventory System for FCSIT would be able to access the administrator site by logging in at the E-Inventory System main page. The administrator then would be directed to the Administrator Main Page as shown in Figure 3.1.

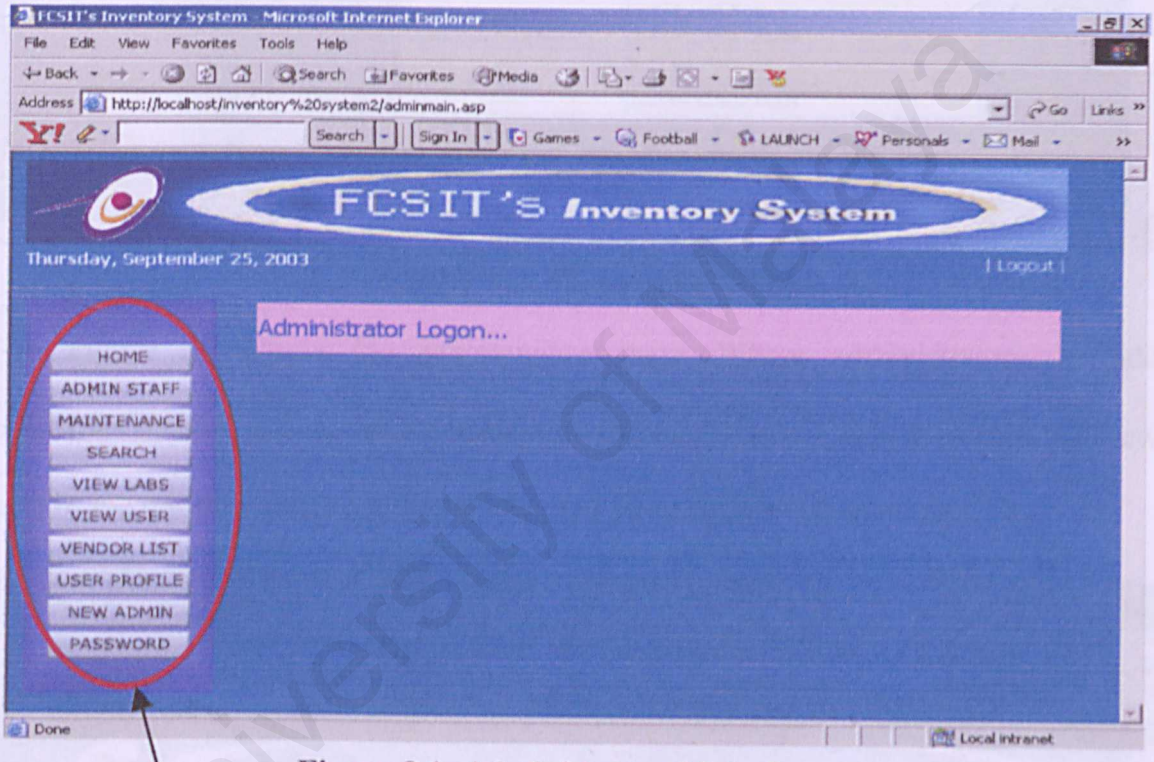


Figure 3.1: Administrator Main Page

Administrator as full access

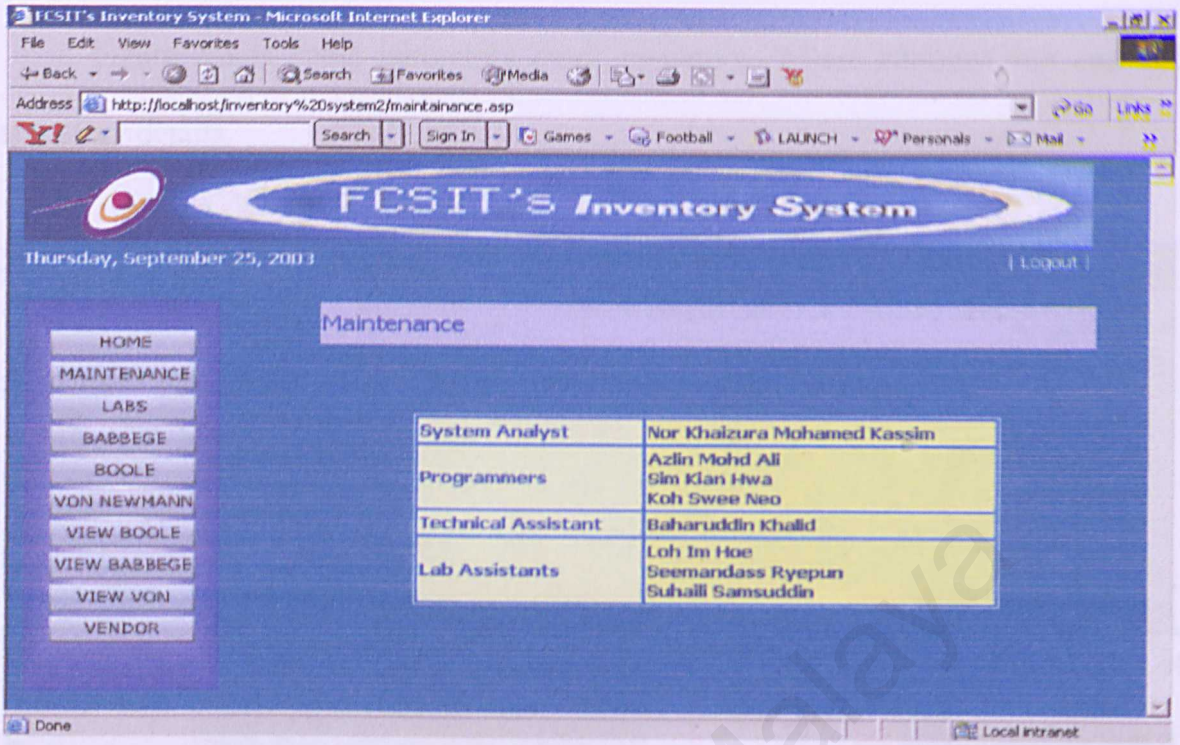


Figure 3.2: Maintenance Page

Figure 3.2 shows the maintenance page. Where administrator can add laboratories details, and can add laboratories inventory item. Other than that can view report of the items, and can add vendor list and view vendor information.

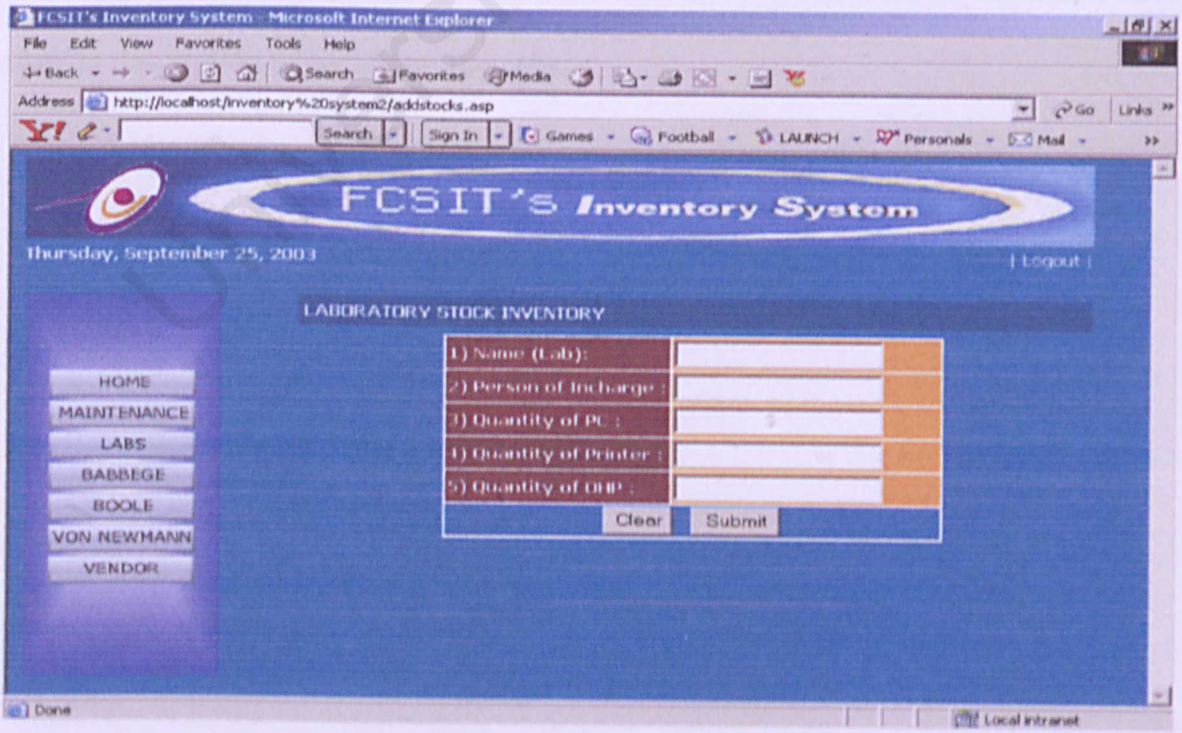


Figure 3.3: Laboratory Stock Inventory

Figure 3.3 is about laboratory stock inventory. Where administrator can add laboratory details.

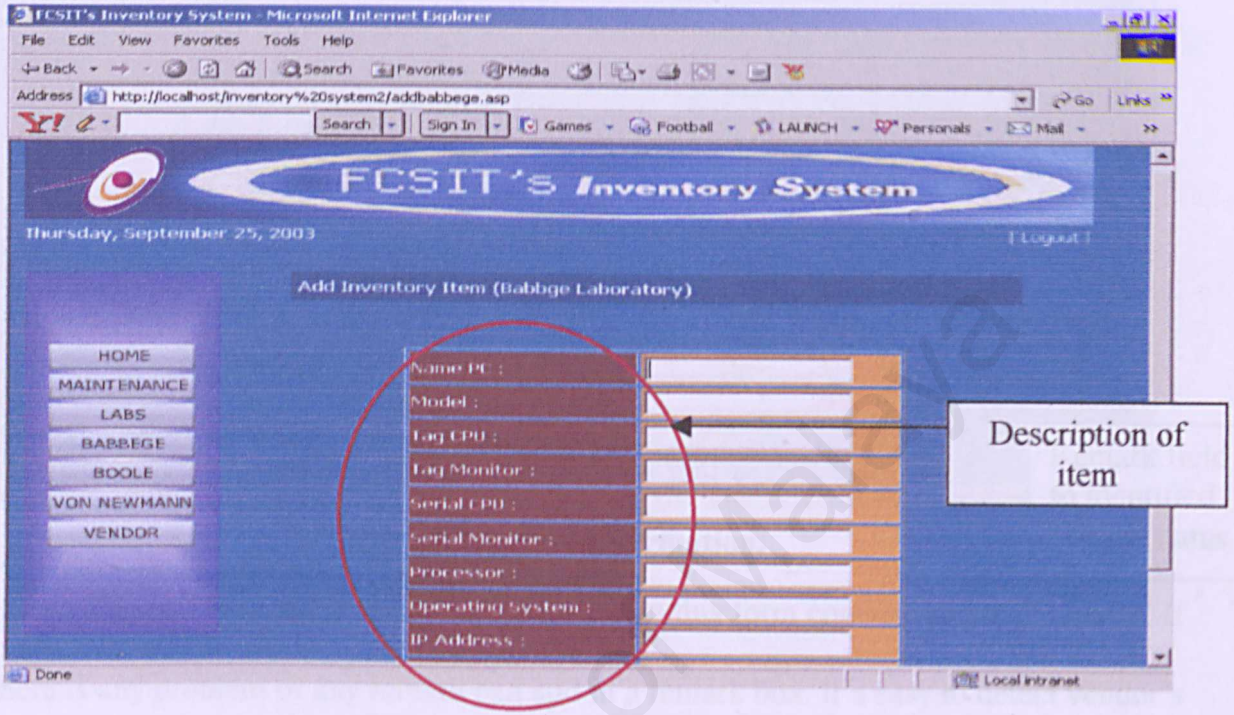


Figure 3.4: Add Inventory Item

Figure 3.4 is shows, add inventory item for labs. In this form administrator have to key in description of each item in a labs.

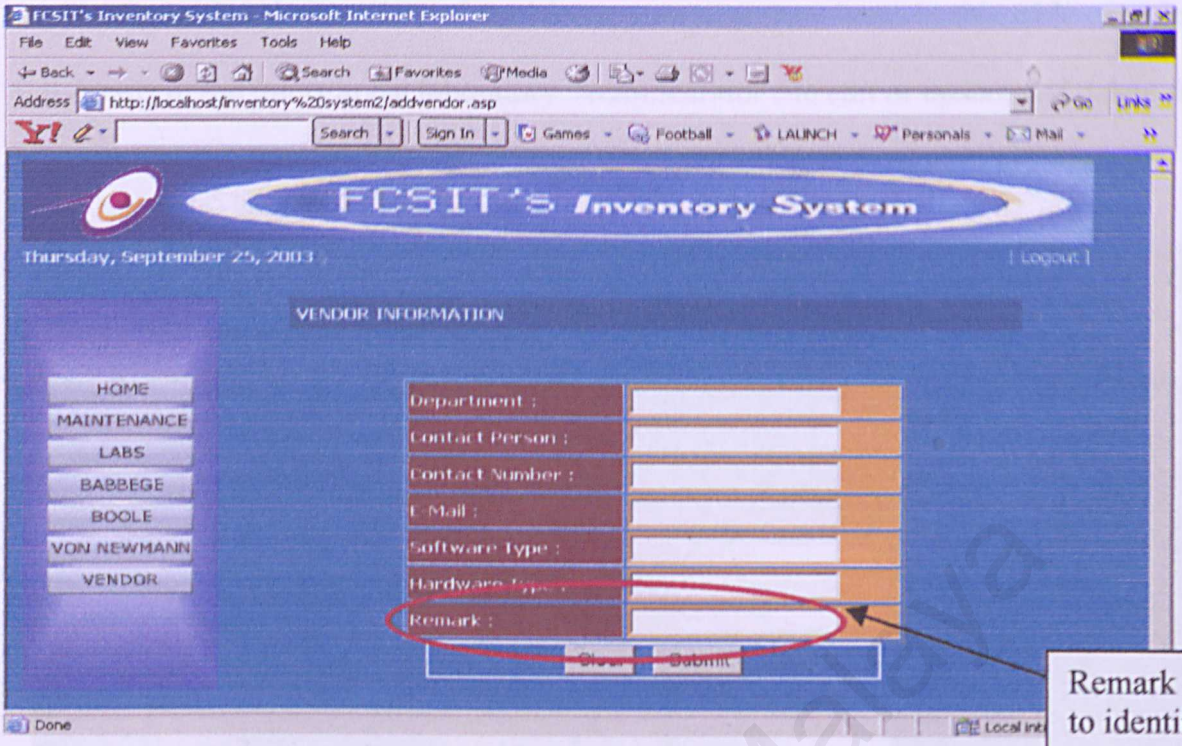


Figure 3.5: Vendor Information.

Figure 3.5 is about vendor information. In this form contain details of vendor. If there is any problem or any remark can add in a remark box. It's easy to detect vendor's status and what are the items they supply.

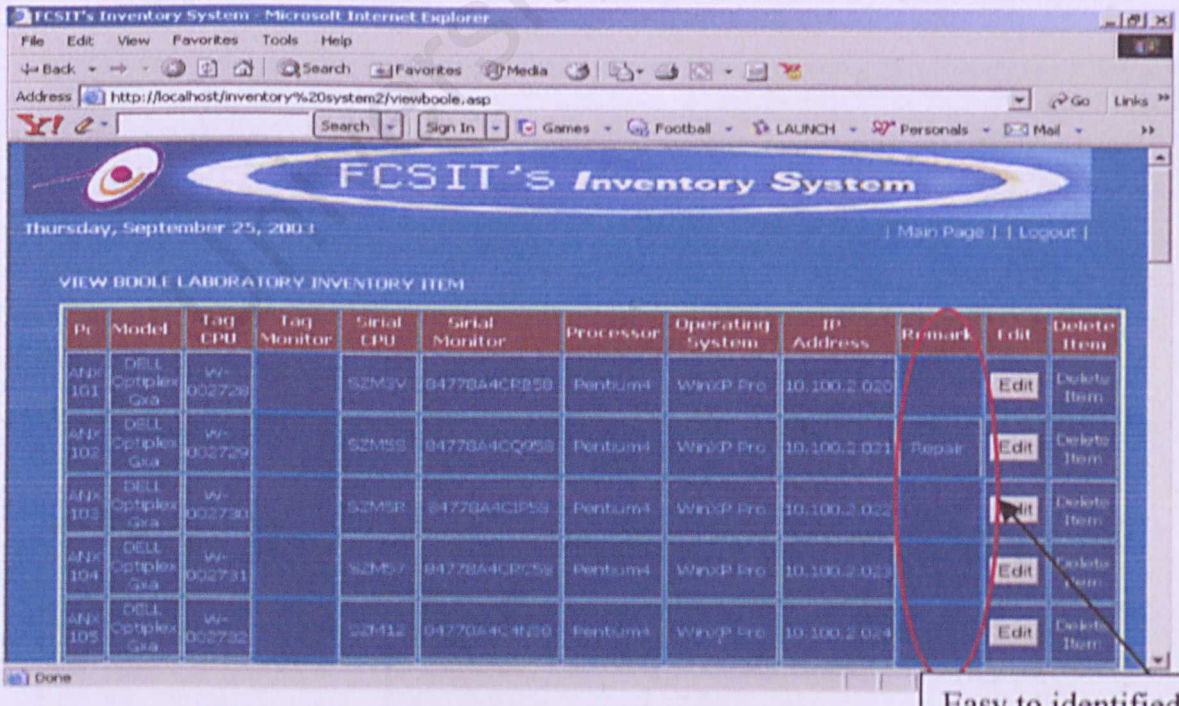


Figure 3.6: View Laboratory Inventory Item

Figure 3.6 shows, view of the laboratories inventory item. In this table can view full details of the items in the laboratory. Administrator can edit or update and delete the item.

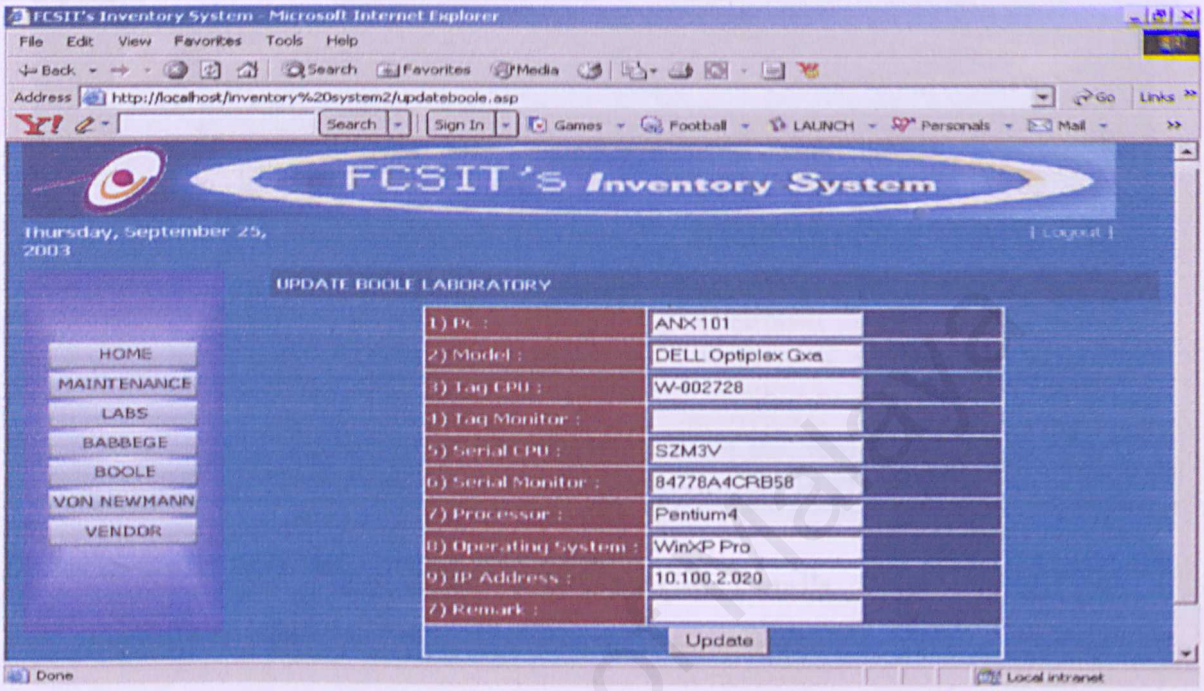


Figure 3.7: Update Laboratory Information

Figure 3.7 shows update form that can update laboratory items description.

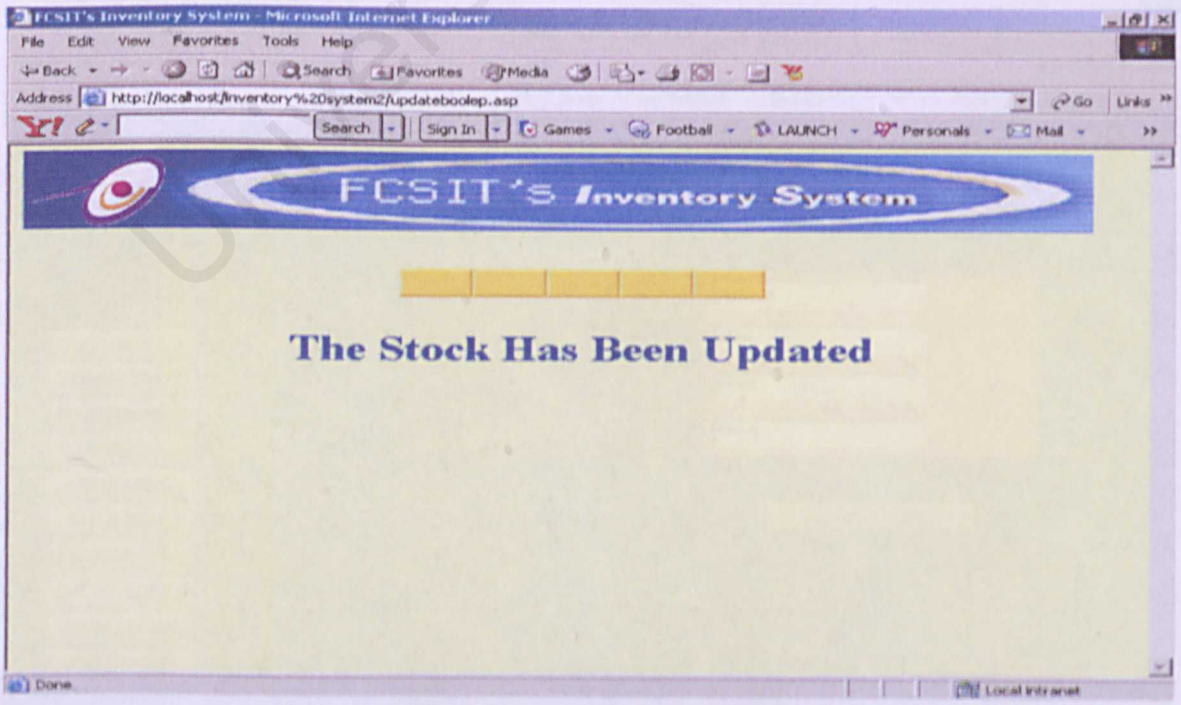


Figure 3.8: Updating Reports

Figure 3.8 it reporting page, where after updating laboratory item description.

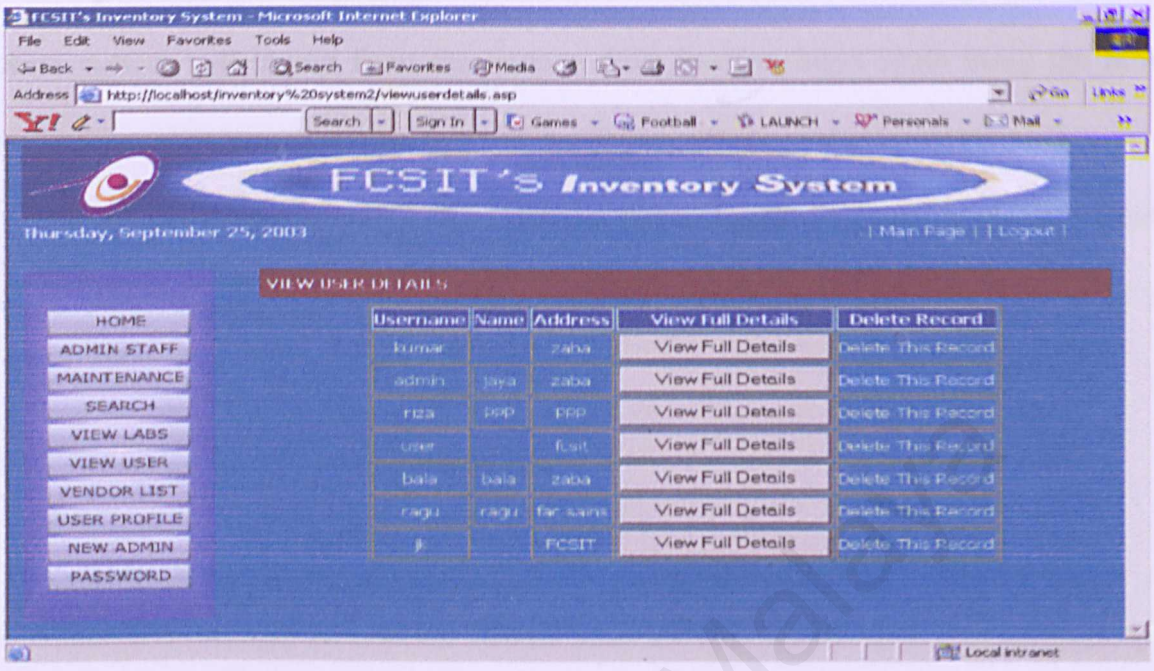


Figure 3.9: View User Details

Figure 3.9 is about viewing user details. Administrator can view and delete user, but cannot update other users information.

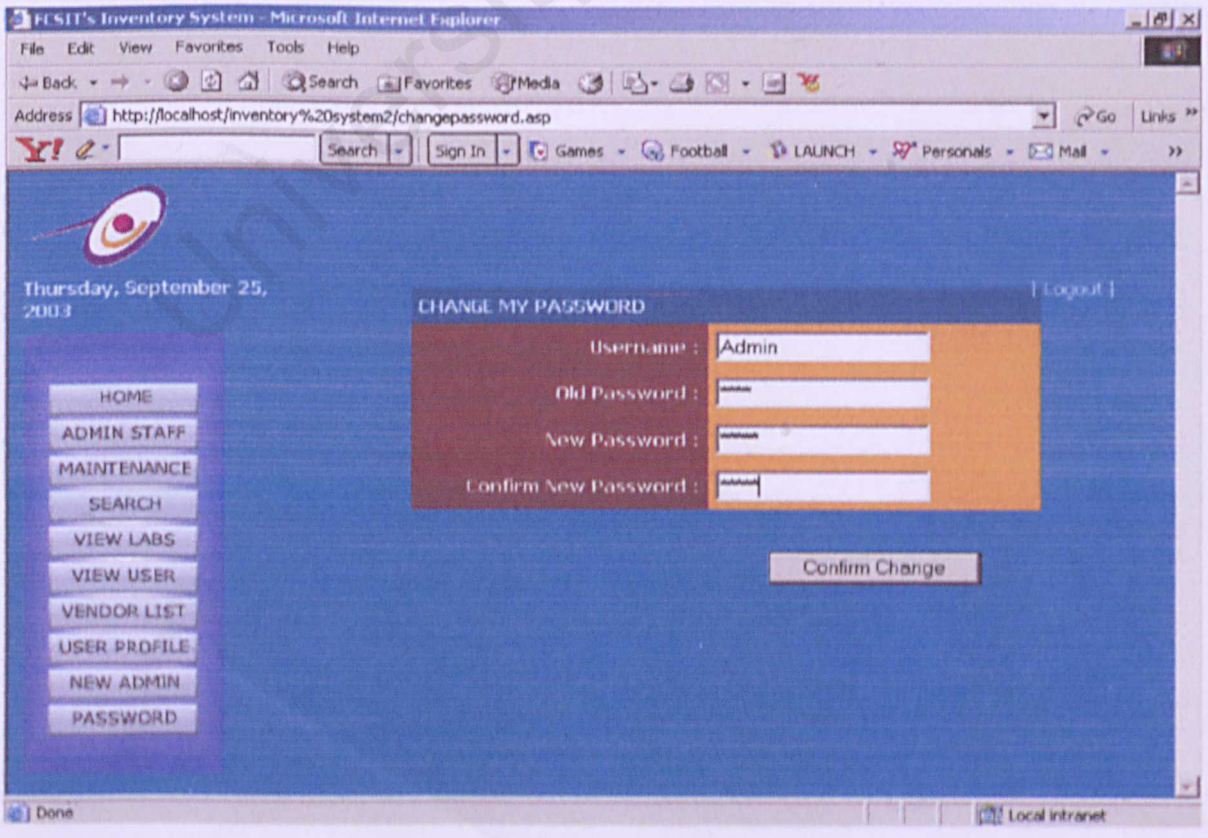


Figure 3.10: Change Password

Figure 3.10 is shows form for change password. After the changing password process system will logout from the system. User have to login again using the new password.

Once the administrator is done, he just has to logout by clicking on the logout link.