

Perpustakaan SKTM

WEB-BASED COMPANY ENQUIRY SYSTEM

BY

ONG YOOK HONG (WQT 000014)

UNDER SUPERVISION OF

ENCIK MUSTAFFA KAMAL

MODERATOR

DR. ROSLI SALLEH

ABSTRACT

Nowadays, information technology has pervaded into almost every industry in the country. Business organization today are moving to computerized their current systems to ensure smoother operations in the daily running of the business. Web-based company Enquiry System is proposed as to give a new impulse for my organization to gain more competitive advantages.

The waterfall with Prototyping Model has been chose as the methodology of system development to develop the proposed system. Besides, the waterfall with prototyping model, a survey was carried out to gather more information. This system was used JSP as web programming language, IBM DB2 as the database and iPlanet Fast Track Edition 4.1 as the web server.

This system consists of two section module. The two sections are customers section and administration section. The customers section will enable the customers to registered and login. The administration section enables the administrator to view the status and generating reports.

Web-based Company Enquiry System is an online enquiry system for the small industries and services business, which is developed with the purpose to gain more competitive advantages and reduce the problem such as losing documentation and unable corresponding situation that currently facing by using manual system.

ACKNOWLEDGEMENT

First of all, I will like to give my hearty thanks to my supervisor, Mr. Mustaffa Kamal Bin Mohd. Nor for his unwavering support, advice, time and thoughtful contribution throughout this project.

I also like to express my appreciation to few of my supplier and customers who has taken time to provided important information of the current web site company.

Lastly, I would like to express my deepest gratitude to my course-mate and friends who had also made a substantial contribution to my thinking in producing this project.

Thank you

Table Of Contents

Abstract		i.
Acknowledgement		ii.
Table of Contents		iii.
List of Figure		xii
List of Table		xiii
Chapter I	Introduction	
1.1	Introduction to the project	1
1.2	Aims, relevance and Significance to the project	2
1.2.1	Aims	2
1.2.2	Relevance	3
1.2.3	Significance	4
1.3	Project scope, Limitation and Assumptions	5
1.3.1	Scope	5
1.3.2	Limitations	5
1.3.3	Assumptions	6

1.4	Research Plans and Method	6
1.5	Expected outcome	7
1.6	Project Schedule	8
1.7	Report Layout	9
Chapter II	Literature Review	
2.1	System Comparison	11
2.1.1	U.K Company Web Site	12
2.1.2	Singapore Company Web Site	16
2.1.3	Malaysia Company Web Site	18
2.2	Summary of the Research	21
2.3	Proposed Web-Based Company Enquiry System	22
2.4	Why a Web-Based Company Enquiry System Had Been Proposed ?	23
2.5	Business Organization in Malaysia Problem and Solution	24
2.6	The Internet and the World Wide Web	25
2.7	Definition of Web Site	26
2.8	System Classification	27
2.8.1	Simple vs Complex	28
2.8.2	Open vs Closed	28
2.8.3	Stable vs Dynamic	28

2.8.4	Adaptive vs Non-Adaptive	29
2.8.5	Permanent vs Temporary	29
2.9	Database	42
2.9.1	What is Database?	30
2.9.1.1	Why use Databases?	31
2.9.1.2	Database Organizing	32
2.9.2	What is Relational Database?	34
2.9.2.1	Why Use RDBMS?	35
Chapter III System Methodology		
3.1	System Methodology	36
3.1.1	Waterfall Model	37
3.1.2	Explanation on water model	38
Chapter IV System Analysis		
4.1	System Analysis	47
4.1.1	Requirements Analysis and Definition	39
4.1.2	System and Software Design	39
4.1.3	System Prototyping	40
4.1.4	Implementation and Unit Testing	40
4.1.5	Integration and System Testing	40

4.1.6	Operation and Maintenance	40
4.2	Requirements Analysis	41
4.2.1	Functional Requirements – Customer’s Section	42
4.2.1.1	Main Page	42
4.2.1.2	Information Module	42
4.2.1.3	Registered Users (External Users)	42
4.2.1.4	Checking Order Status (Under consideration to include)	43
4.2.1.5	Printings	43
4.2.1.6	E-mail	43
4.2.1.7	Registered On User Visit The Web Manage Module	44
4.2.2.	Non-functional Requirement	44
4.2.2.1	Reliability	44
4.2.2.2	User Friendly And Usability	45
4.2.2.3	Maintainability and Expandability	45
4.2.2.4	Modularity	46
4.2.2.5	Legislation	46
4.2.2.6	Robustness	46
4.2.2.7	Response Time	47
4.2.2.8	Implementation	47
4.2.2.9	Security	47
4.3	Analyst and Consideration on the Development	48
	Tools	
4.3.1	Web Architecture Review	48

4.10.1	Design Time Environment	64
4.3.1.1	Java Database Connectivity	48
4.3.1.1.1	What is JDBC ?	48
4.3.1.1.2	Advantages of JDBC	48
4.3.1.1.3	Why use only JDBC instead of JDBC-ODBC Bridge?	49
4.3.2	Client-Server Architecture	49
4.3.2.1	Two-tier Client-Server Model	51
4.3.2.2	Three-Tier Distributed Model	53
4.3.2.3	Advantages of using the Three-tier Architecture	54
4.4	Operating System	55
4.4.1	Window NT	55
4.5	Database	58
4.5.1	MYSQL	58
4.6	Web Server	60
4.6.2	iPlanet Web Server Fast Track Edition 4.1	60
4.7	Web Programming Languages	61
4.7.1	ASP (Active Server Pages)	61
4.8	Hardware Requirements	62
4.8.1	Design Time Environment	62
4.9	Run Time Environment	63
4.10	Software Requirements	64

4.10.1	Design Time Environment	64
4.10.2	Run Time Environment	65

Chapter V System Design

5.1	Architecture Design	66
5.1.1	Modular Decomposition	66
5.1.1.1	High cohesion and Low Coupling	67
5.1.1.2	Data Flow Diagram	68
5.1.1.3	Context Diagram	68
5.1.1.4	O Diagram	69
5.1.1.5	Child Diagram	71
5.3	Database Design (Data Dictionary)	75
5.4	User Interface Design	80

Chapter VI System Development & Implementation

6.1	Connecting Database	82
6.2	Coding Approach	83
6.3	Programming Styles	86
6.4	Data Manipulation	86
6.4.1	Enquiry Data Manipulation	86
6.4.2	View Cart Data Manipulation	87
6.4.3	Login Data Manipulation	88

6.4.4	Product Database	89
6.5	Scripting Language	90
6.5.1	Text Field UserName	90
6.5.2	Text Field Email Address	91

Chapter VII System Testing

7.1	Unit Testing	92
7.1.1	Unit Test Consideration	92
7.2	Testing Integration	94
7.2.1	Module Testing	96
7.2.2	Sub-system Testing	97
7.3	System Testing	97
7.3.1	Function Testing	97
7.3.2	Administrator Module	98
7.4	Performance testing	98
7.4.1	User Friendliness	99
7.4.2	Reliability	99
7.4.3	Maintainability	99
7.4.4	Scalability	99
7.4.5	Learn Ability	100
7.4.6	Speed	100
7.4.7	Robustness	100
7.4.8	Scurity	100

8.5.3	Integrated Advanced Search function	109
8.5.4	Add User Level	110
7.4.9	Accuracy	101
7.4.10	Correctness	101
7.5	User Acceptance Test	101

Chapter VII System Evaluation

Bibliography			112
8.1	Problems and Solution		103
8.1.1	Lack of Mastery of Knowledge		104
8.1.2	Hardware Limitation		105
8.1.3	Lack of Resources		105
8.2	Evaluation By End Users		106
8.3	System Strengths		106
8.3.1	View cart		106
8.3.2	System Transparency		107
8.3.3.	User-Friendliness		107
8.3.4	Availability And Convenience		107
8.4	System Constraints		108
8.4.1	Target Market		108
8.4.2	Limitation categories of Products		108
8.5	Future Enhancement		109
8.5.1	Widen Target Market		109
8.5.2	Expands The Products Line		109

8.5.3	Integrated Advanced Search function	109
8.5.4	Add User Level	110
8.5.5	Integrate Electronic Payment system	110
8.6	Knowledge and Experience Gained	110
Bibliography		
		112
		70
		71
		72
		72
		72
		73
		73
		73
		74
		74
		85

List of Table

List of Figure

Figure 1.1	Project Schedule	8
Figure 3.1	Waterfall Model With Prototyping	37
Figure 4.1	Web Architecture Models	51
Figure 5.1	Context Diagram	69
Figure 5.2	O Diagram	70
Figure 5.3	Child Diagram Process 1	71
Figure 5.4	Child Diagram Process 2	72
Figure 5.5	Child Diagram Process 3	72
Figure 5.6	Child Diagram Process 4	72
Figure 5.7	Child Diagram Process 5	73
Figure 5.8	Child Diagram Process 6	73
Figure 5.9	Child Diagram Process 7	73
Figure 5.10	Child Diagram Process 8	74
Figure 5.11	Child Diagram Process 9	74
Figure 6.1	Top-down structure of Web-based company Enquiry System	85

List of Table

Table 2.1	Advantages and disadvantages of Database Distribution Methods	33
Table 5.1	User Account Information	75
Table 5.2	Customers Profile	76
Table 5.4	Order Information	77
Table 5.5	Order Status	78
Table 5.6	Administrator Profile	79
Table 5.7	Price List	80

CHAPTER I

INTRODUCTION

1.1 Introduction to the Project

Nowadays, most of the businesses organization especially small businesses in Malaysia are still using the traditional way (i.e. filling system) to conduct their daily business operation, this maybe insufficient in term of space, quality, cost, internal management, and the most important things is the business itself. Most of the traditional business man are waiting for the business to come and not looking for business. And this concept already outdated, as nowadays, people using the facilities of computer to operate their business, Therefore, the purpose of this project is to eliminate the drawbacks in the traditional method beside increase customer satisfaction using thse internet.

This project actually is my own company project with is able to assit me for my daily company operation work especially in company business. As we are the small industry of manufacturer and distributer, we can not affort to have many sales staff in term of cost saving. And because of the nature of business is supplying goods to factory, our business similar like door to door business. Terefore, we need a lot of manpower to go for sales and not stagnant in a place.

The project is called Web-Based Company Enquiry System. The concept of the system is that customers can make their enquiry through the web site. Unlike other business, industry supply are not duelling in cash, majority customers required credit term. And the difficulty of this business is not supplying but is the penetrating the customers. Imagine a factory with thousands of workers. We do not know who is the buyer, when they required to change the suppliers, when they need new materials. So by this web site, it can help more or less the effort of the company strategy and the operation cost.

1.2 Aims, Relevance and Significance of the Project

1.2.1 Aims

In the competitive market today, the management for any organization needs to have its promotion widely spread among the customers in order to gain the competitive advantage. However, in today information technology (IT) century, there have others alternatives such as computerized the product category and make it available on the internet in order to compete with other competitors. Through computerization, all the customers, suppliers, employees and services information can be easily tracked and maintained.

It is hope that this system will be able to solve part of my company routine job, which include introducing product category, enquiry of certain new product, and also corresponding on the enquiry. Beside that, in the customers side, proper record of customers information during enquiry can make the service more efficient and the needs of customers.

This project is aimed to provide the goods service to customers and to evaluate the new customers. And it is important to ensure the company business through the enquiry from the customers in order to increase the company's performance from time to time. It is also important to provide adequate safeguards to protect the system from unauthorized users. The level of access by the top management of the organization is different from the normal users. This is to protect unauthorized users from modifying the contents of the database. Because this is a web-based system, so, authentication for registered customers enquiry must also be done to protect unauthorized user from enter the system.

The main objectives of the system can be summarized as follow :

- To provide a complete web-based small business system for marketing purpose.
- Handle and maintain the enquiry from the registered customers.
- Provide safeguards to protect the unauthorized users.
- To fully used of the advanced (IT) in information technology era.
- To create a user-friendly system for users.

1.2.2 Relevance

This project is relevance because in the century of information technology (IT) today, everything gets changing and speed with which today's information because yesterday's news is increasing at a staggering rate. Organization needs different software application or manpower to support their heavy transaction everyday. Implementing one complete web-based system in the organization can be more efficient way to carry out their duty.

Through web-based system, the cost will be definitely reduced. There is not necessary for one organization to hire another party to do their promotion by handout postal or handbill, what they need to do is through the internet. This will definitely widely spreads and the entire user who surfer the website will sure get the notice and this will not only limit for the local people. Thre manual management system will increase by using database to store all the important information including all the customers visits list, customers enquiry, customers information etc. So, it is beneficial for the organization to implement the system.

1.2.3 Significance

If the web-based system can be successfully implemented, it would provide the organization with an added advantage to its competitors. It will provide customers with a user-friendly system (GUI) that allows the customers to communicate their enquiry efficiency, effectively and correctly. Without a need others promotion method, the organization can widely spread to the customers, the organization not only can improve the business but also can reshedule the plan within an organization to refocus on expanding their business.

1.3 project Scope, Limitation and Assumptions

1.3.1 Scope

This project has its own scope of target users. Its mainly covers all user who wish to get a sources of goods in term of the goods specification, as well as the unit price, goods assemble, materials etc. Basically they can divide into four categories, which are the management, operators/employee, registration on customers enquiry and on line purchase (under consideration to develop).

Target Users

Management, the one who concern the most about the system is included in the list of users as they too can login to the system to manage the system. Besides that, the system enables them to view the statistics of the system like the number of the users login.

Operator or employee, the other group of users, can also login to system to do the routine enquiry by users.

Since this system is a web-based system, it can have its own customers. They are like any other customers except that they can also make order through the system. Besides that, they can also enjoy other promotion provided by the system.

1.3.2 Limitations

There are some limitation in this project due to the limited companies that provide the complete computerized website. Majority of the company just publish their products through the website, and the website just consist a few of web page for the product category. Hence it is difficult to identify the actual problem face by the companies

itself. However, currently this situation has been change dramatically because of the realization and the importance of Information Technology in the global business trend especialy in new and big companies. They have started to emphasis on computerization on their current system. So, it has given new impulses in doing this project.

1.3.3 Assumptions

There are two assumptions that related to characteristics of this project :

A) The word organization used in the context of the proposal report is refering to my company.

B) The staff of my company must know basic computing in order to do the routine checking on the web site published.

1.4 Research Plans and Methods

Research will begin with an analysis of the current manual system and some web-based systems implemented. This will provide a good understanding of how the current system works, comparisons between the manual and computerized systems and also provide the groundwork for the system designs.

Besides that, internet surfing relating to the organization provides web-based system must be in ongoing process. This because, it will give me more new idea about the business process and the actual facts or situation that I need to know about the internal process of the organization and how to develop a good user interface (GUI) to attract more customers.

Summary of research Plans and Methods

- Analyzing of the current systems in the business organization.
- Corresponding with assisting customers on the facilities given.
- Browning through internet and document room to find more information.

1.5 Expected Outcome

This project is expected to come out with one website that can enhance my current business. This system must allow users to sign-in and access, (considering on placing order) etc. Most important, it should be able to fullfill all users requirement and provide user friendly website.

It also expected that the system could achive the objectives as proposal reports. Each module in the system must be clearly identified and has a specific direction that can provide a good user interface and clear function to the users. The system also must be easy to maintain for the management.

1.6 Project Schedule

A Gantt Chart is an easy way to schedule tasks. It is essentially a chart on which bars represent each task or activity. The length of each bar represents the relative length of the task. Figure 1.1 below is an example of Gantt chart where time is indicated on the horizontal dimension and description of activities makes up the vertical dimension. This is the project planning for the system.

Task Name	Duration	Start	Finish	May'03	Jun'03	July'03	Aug'03	Sept'03	Okt'03	Nov'03	Dec'03	Jan'04	Feb'04
Literature review	3 wks	22/6/03	12/7/03										
Requirement analysis	3 wks	13/7/03	1/8/03										
System design	3 wks	28/7/03	16/8/03										
System prototyping	4 wks	30/9/03	25/10/03										
Development	8 wks	26/10/03	20/12/03										
Testing and maintenance	4 wks	21/12/03	17/1/04										
Documentation	36 wks	10/6/03	12/2/04										
Implementation	3wks	18/1/04	7/2/04										

Figure 1.1 : Project Schedule

1.7 Report Layout

The purpose of this layout is to give an overall overview of the major contents, which will include and involved during the development of this project. Below is the report layout:

Chapter 1 : Introduction

This chapter gives an overview of the project, which includes the aims, relevance, significance, limitation, project scope and some assumptions. In addition, this chapter also covers the project plan and method.

Chapter 2 : Literature Review

A few current published company website has been studied and compared to get more idea about the website conducted. Current available website was discussed and details of the comparison between the currently available systems on the internet and the proposed system. It also explain the current problems faced by the business organization in Malaysia and the solution for the problem.

Chapter 3 : System Methodology and System Analysis

This chapter explain on the methodology. And the system flow and system prototyping.

Chapter 4 : System Analysis

This chapter emphasized on the sistem analysis. It analyst the requiremenr and development tools available to choose the best tools / software to develop the system.

Chapter 5 : System Design

This chapter explains the conceptual design processes of the system. It will include the database and user interface design.

CHAPTER II

LITERATURE REVIEW

Recent advances in information technology have made the various industries in Malaysia to realize the need to upgrade or develop a new information technology system, including business organization. A lot of companies in western country have implemented the online company web site system to attract the customers.

In Malaysia, many medium and small industries are still using the traditional way to promote their products.

2.1 System Comparison

Analysis through the web site have been done. Both the foreigner and the local companies' web sites have been visited and analyzed to obtain a better view and understanding of how the company present their web site.


In addition, the study and analysis of current manual system also had been conducted through corresponding with my local suppliers to gain extra knowledge about the ways how they conduct the daily business and the problem they are facing.

Besides that, the advantages and disadvantages of these current small industries and the web-based system are compared as well.

Below are some companies' web sites taken from internet for the purpose of comparison

2.1.1 U.K. Company Web Site

http://www.kellysearch.com/gb-company-82622612.html


Kellysearch

LIST MY COMP
ANY

ABOUT
US

CONTACT
US

TO ADVERTISE
SE



Product/Service

United Kingdom

Go

Add your company to Kellysearch!
Click here, fill in the form, and we'll do the rest

 View company website

1.2.1 Kellysearch for H.L. Wilkinson & Co. Ltd

Textile merchant-converters

1.2.1.1 Address 1.2.1.2 Telephone, fax and web

49-51 Central St
London
EC1V 8AB

Tel: (020) 7253 5241
Fax: (020) 7250 1562

<http://www.hlwilkinson.co.uk>

[Map](#)

[London EC1 companies](#)

1.2.1.3 Request for quote / email this company

My email address:

My company:

Make an enquiry

Terms of use

10 product / service areas

Twine, Sisal

Companies: ABCDEFGHIJKLMNOPQRSTUVWXYZ

<http://www.hlwilkinson.co.uk/index.html>

Welcome to the H. L. Wilkinson website, contained within this website is information relating to products and services provided by our company. Please feel free to browse through, and should you have any queries or comments please contact us

Should you require further details or samples, please contact us by phone, fax or email :-

Telephone : +44 (0)20 7293 5241

Company Profile

H. L. Wilkinson is part of a group of companies. The ultimate holding company is English & Overseas Wool Trading Co. Ltd., established in 1936.

General information: info@hlwilkinson.co.uk

The company imports and exports textile raw material, which consists of fibre, yarns, twines, loom-state cloth, in cotton, linen, hemp, wool, hairs, sizal, jute, ramie, synthetics and other.

Our Customer base

We mainly supply to the industry and factories, however we can of course supply the clothing and upholstery trade.

Send mail to j.hackenbroch@btinternet.com with questions or comments about this web site.

Copyright © 2002 H. L. Wilkinson and Co. Ltd

Send mail to j.hackenbroch@btinternet.com with questions or comments about this web site.

Copyright © 2002 H. L. Wilkinson and Co. Ltd

Last modified: 04-11-02

2.1.2 Singapore Company Web Site

<http://www.hlwilkinson.co.uk/Contact.htm>

<http://www.kimannagencies.com/ORDER.htm>

Contact Information

Should you require further details or samples, please contact us by phone, fax or email :-

Telephone +44 (0)20 7253 5241

Fax +44 (0)20 7250 1562

E-mail

General Information: info@hlwilkinson.co.uk

Sales: sales@hlwilkinson.co.uk

Or write to :-

H. L. Wilkinson & Co. Ltd

49/51 Central Street

London EC1V 8AB

Send mail to j.hackenbroch@btinternet.com with questions or comments about this web site.

Copyright © 2002 H. L. Wilkinson and Co. Ltd

Last modified: 03-11-02

Website from U.K. doesn't shown a lot of animation. The web-page was direct mentioned to their product. And contact number.

2.1.2 Singapore Company Web Site

<http://www.kimannagencies.com/ORDER.htm>

KIM ANN AGENCIES

Blk 18, Jalan Sultan, #01-152 (S' 190018) TEL : 65-62911463/62972974 FAX : 65-62923189 EMAIL : kimannco@singnet.com.sg

HOTLINES: 65-62911463/65-62972974 FAX: 65-62923189 [ENQUIRY / ORDER](#) [LOCATE US](#)

http://www.singaporemirror.com/co_kimannpkg.htm

Singapore Mirror

[ABOUT US](#) [CONTACT US](#) [HOME](#)

[Products & Services](#) > [Packaging Material](#)

KIM ANN AGENCIES

Blk 18, Jalan Sultan, #01-152, Singapore 190018
TEL : 6291 1463/6297 2974 FAX : 6292 3189
Email : kimannco@singnet.com.sg
Website : www.kimannagencies.com

"At KIM ANN AGENCIES, you will be able to source and purchase from "A to Z" of all your packaging requirements. Your valuable visit is our honor, thank you !"

TAPES	PLASTIC STRAPPING	PLASTIC STRAPPING TOOLS	STEEL STRAPPING TOOLS
STEEL STRAPPING	PROTECTIVE FOAMS	MARKS & LABELS	PALLET TRUCKS

<u>CORNER PROTECTOR</u>	<u>PALLET STRETCH FILM</u>	<u>SHRINK WRAP</u>	<u>P.P./P.E BAGS</u>
<u>PLASTIC SHEETS</u>	<u>PLASTIC FILMS</u>	<u>TROLLEYS</u>	<u>CARTON BOXES</u>
<u>TWIST-TIE/CABLE-TIE</u>	<u>METAL SEALS/CLIPS</u>	<u>RAFIA/NYLON STRINGS</u>	<u>TISSUE PAPER</u>
<u>CARTON STAPLERS</u>	<u>STAPLES</u>	<u>P.P. CLOTH</u>	<u>GUNNY CLOTH</u>
<u>STATIONERIES</u>	<u>INDUSTRIAL PAPER</u>	<u>IMPULSE SEALERS</u>	<u>FOOD BOXES</u>
<u>AIR BUBBLE PACKS</u>	<u>BROWN PAPER</u>	<u>WATERPROOF PAPER</u>	<u>PAPER BAGS</u>
<u>ZIPPY-PAC</u>	<u>MIC-PAC</u>	<u>P.P.STRAPPING MACHINE</u>	<u>CORRUGATED PAPER</u>

Visit their website to find huge range of products they are dealing in.

Web-page from Singapore company also directs to the main point. It is simple and direct to the enquiry for the product. It did have the on line purchase means the web-based system using the database to control the transaction make by users.

2.1.3 Malaysia Company Web Site

<http://www.udmalaysia.com/>

 Company Profile	 Dinings	 Bedrooms	 Entertainment & Sofa	 Kitchen Cabinets	 Kitchen Worktop
 Pneumatic Tools	 Fasteners Series	 Double Diaphragm Pumps	 Furniture Hardware & Accessories	 Contact Us	



U.D. HOLDINGS SDN. BHD.





Sebangau-Isi
Industrial Park,
10000 Shah Alam,
Selangor Darul Ehsan,
Malaysia.
Tel: 603-5637 0928
Fax: 603-5637 0929

<http://www.udmalaysia.com/contact.htm>

* Please fill up the fields on below

Company Name

Contact Person

Designation

Address

Tel No.

Fax No.

E-Mail

Nature Of Business

Enquiry For

U.D. Holdings Sdn. Bhd.

(480107-T)

Syarikat U.D.

Trading Sdn. Bhd.

(85023-X)

U.D. Industries Sdn. Bhd.

(192321-U)

U.D. Panelform Sdn. Bhd.

(120394-P)

HEAD OFFICE:

P.O. Box 88, 84009

Muar, Johor.

PTD 6001, Batu 8,

Jalan Perindustrian 5,

Kawasan Perindustrian

Bukit Bakri,

84200 Muar,

Johor Darul Takzim,

Malaysia.

Tel: 606-986 5236

(Hunting Lines)

Fax: 606-986 5239

URL:

www.udmalaysia.com

Email:

udgroup@pd.jaring.my

**KUALA LUMPUR
BRANCH:**

28, Jalan Nilam 1/3

Subang Hi-tech

Industrial Park,

40000 Shah Alam,

Selangor Darul Ehsan,

Malaysia.

Tel: 603-5637 0928

Fax: 603-5637 0929



Email:
udkl@pd.jaring.my

**JOHOR BAHRU
BRANCH:**

18, Jalan Seroja
39, Taman Johor Jaya,
81100 Johor Bahru,
Johor Darul Takzim,
Malaysia.

Tel: 607-355 3921

Fax: 607-354 9788

Email:
udjb@pd.jaring.my

LUNAS BRANCH:

65, Lrg. Makmur 13/1,
Kws. Perusahaan
Taman Makmur,
09600 Lunas,
Kedah Darul Aman,
Malaysia.

Tel: 604-484 6668

Fax: 604-484 1211

Attractive but only the web page presented. It is just a picture image on the web page.

The web-page presented only for enquiry means it does not have any database for administrating purpose.

2.2 Summary of The Research

As what can be seen from the research, company web site always display the product and services only. According to the OXFORD Advanced Learner's Dictionary, Self service is a system of service in a restaurant, shop, etc in which customers take what they want and then pay for it [8]. Unlike the company business, they are not waiting for the customers to visit, but is the way to promote their product and services. So, the operate style is totally different from other business.

Most of the medium and small industries in Malaysia still using manpower to run the business. It is not the customers come and collect the goods, but is the business carry out with goods and services.

From my point of view, and corresponding with some of my supplier, there are still of medium and small industries never thought of using IT in their business. Infact, business trend in Malaysia goes on by knowing each other rather than using the Advanced of IT.

Out of three web site analyzed, only the web site from singapore taken their order through the web site presented. That means, but the other two only presented their product which is customer can login and visit their web site. They have better view on the web site in term of multimedia display, their web site is more creative and more attractive. Unlike the company from singapore. They have simple web site and direct to the point which is displaying their product, similar like the direct sales.

2.3 Proposed Web-based Company Enquiry System

From the research have been carry out, there are too little company promote their product through the web site compare to the foreign country especially the western country.

The proposed web-based company enquiry system basically divided into 2 sections: user section and administration sevtion. In the user section, it will contain authentication and authorization module, information module, information module, place order module (on order module- under consideration), register module, e-mail module. The authentication and authorization module is use to identify the registered customers and authorize them to access into the system. For the unregistered customers, this module will block them from entering the system.

Information module will provides all the information such as price list, type of services provided, area served and etc. At the contact module, the user can email/send feedbacks to the administration for enquiry any problem or doubt. The customers can registered as a approved customers at the registered module. In this module, user will be require to fill-in some detail such as name, password, e-mail, contact number, etc. After the customers had completed the registration, the customers will be taken as a approved customers and a number was given as a ID for the purpose on login in.

In the admistration section, it will contain the authentication and authorization module, staffs and suppliers profile module, place order module, view order and achange order status module. Report module and cancellation module. The authentication and authorization module in the administration is to differentiate between the normal staff and

the management. Staff and supplier profile module is use by the management to keep the record of the staffs and the suppliers more efficiency.

The purpose of the view order and change order status module is to view all the ordera and reply to the customers on the order status. Administrator can change the status if they accept the condition given.

2.4 Why a Web-based Company Enquiry System had Been proposed ?

After completed the research about the medium and small industries, there are too little company presented their product through the web site. Another thing had been found was the medium and small industries in Malaysia is family business and conducted by the family members.

My Web based company enquiry system had been proposed because at the present time, many campany in Malaysia especially like my business still using the traditional commerce style even the enviroment in the business trend already reach to the Information Technology era. So, by this web-based company enquiry system, it might help my company business to grow. Besides that , the idea of putting the web site on the internet is still new and fresh in our community. Therefore, it will attract more people to try and use the system.

The third point is the Internet usage is getting more common in our society and addition support of goverment policy to make one house at least owns one computer will

encourage the numbers of people using computer and also the Internet. So, this idea is feasible in our community nowadays and perhaps this system will get more popular in the future.

By using this web-based company enquiry system, it is more flexible in term of corresponding and responding to either parties. In term of time saving , document missing, costly on making phone call etc.

2.5 Business Organization in Malaysia-Problem And Solution

Currently, most of the medium and small size of organizations in Malaysia still using manual filling systems to record all the business transaction and processes. This means that they need a lot of files to keep track and maintain all the records such as invoices, delivery orders, payment requisitions, payment vouvher, purchase order etc. This is not a sufficient way as it is a very tedious work and needs a lot of manpower to handle them.

The records also difficult to update and some of the data may be duplicated or lost.

In the case of doing promotion, they are using local newspapers, radio, television, poster, hire third party and handout to make advertising. Although these traditional ways of advertising are accpable, but it is costly and small company may not be able to spend a large amount of money for advertising. As a result, they lose the power to compete with their competitors in the market.

The problem will exist if an individual organization keeps growing and the amount of stocks increase dramatically andn may have thousand of records. That is a lot of

information. As in any area or society, information's equal power, in this case the power to prescribe, prevent and remedy. But information also equals to problems specifically problem in gathering, storing and accessing. So, they need a proper computer system to enhance the accuracy of information contained in each record.

The next problem is storage and access. Paper files required large amount of storage space, but more important, they are easily misplaced or lost, required excessive time for retrieval, beside that, its only can be examined by a person at a time (and not even that if the records is in the transit or waiting to be refilled). Database can eliminate these difficulties. They are more convenient and can be accessed instantly.

The third problem is inventory control. Currently most of the business organization in Malaysia do not have a proper inventory control over their stocks. Usually what they did is the staff will physically examine the amount available of certain stocks, how much left and how much they need. All this stock examination is through observation only. The exact amount of stock available in the organization might not be accurate. A proper inventory system is needed to help the staff and management of the organization to have a better control on the stock keeping record.

2.6 The Internet and the World Wide Web

The name "Internet" is derived from the concept of "internetworking", that is, connecting host computers and their networks to form an even larger, global network. [9] and that is essentially what the Internet is: a large worldwide network of networks that use a

common protocol to communicate with each other. By using the Internet, user can communicate with other people throughout the world via electronics mail; read online versions of newspapers, magazines, academic journals, and books; join discussion groups on almost any conceivable topic, and obtain free computer software. In the recent year, the Internet has allowed commercial enterprises to connect. Today, all kinds of businesses provide information about their products and services on the Internet. Many of these businesses use the Internet to market and sell their products and services.

The part of the Internet known as World Wide Web, or simply, the web, is a subset of the computers on the Internet that are connected to each other in a specific way that makes those computers and their contents easily accessible to each other. The most important thing about the web is that it includes an easy-to-use standard interface. This interface makes it possible for people who are not computer experts to use the Web to access a variety of Internet resources.

2.7 Definition of Web Site

A web site is a related collection of World Wide Web (WWW) files that includes a beginning file called a home page. A company or an individual tells you how to get to their Web site by giving you the address of their home page. From the home page, you can get to all the other pages on their site. For example, the Web site for IBM has the home page address of <http://www.ibm.com>. (The home page address actually includes a specific file name like index.html but, as in IBM's case, when a standard default name is set up, users

don't have to enter the file name.) IBM's home page address leads to thousands of page.

(But a Web site can also be just a few pages.) [10]

Since site implies a geographic place, a Web site can be confused with a Web server. A server is a computer that holds the files for one or more sites. A very large Web site may be spread over a number of servers in different geographic locations. IBM is a good example; its Web site consists of thousand of files spread out over many servers in world-wide locations. But a more typical example is probably the site you are looking at, what is .com. We reside on a commercial space provider's server with a number of other sites that have nothing to do with internet glossaries.

A synonym and less frequently used term for Web site is " Web presence. " That term seems to better express the idea that a site is not tied to specific geographic location, but is " somewhere in cyberspace. " however, " Web site " seems to be used much more frequently. You can have multiple Web Sites that cross-link to files on each other's sites or even share the same files.

2.7System Classification

System can be classified along numerous spectrums. They can simple or complex, open or closed, stable or dynamic, adaptive or non-adaptive, and permanent or temporary.

2.8.1 Simple vs Complex

A simple system is one in which there are few elements and the relationships between the elements are uncomplicated and straightforward. A complex system. On the other hand has many elements that are highly related and interconnected. In reality, most systems fall on a continuum between simple and complex.

2.8.2 Open vs Closed

An open system interacts with its environment. In other words, there is a flow inputs and outputs across system boundry. A closed system is the opposite of an open one. There is no interaction with the environment within a closed system. In reality, there are very few closed system.

2.8.3 Stable vs Dynamic

A stable system is one in which changes in the environment result in little or no change in the system. For example, materials to support the system is fairly constant, the system would probably stable. However, the dynamic system is one that undergoes rapid and

constant change due to changes in its environment. Most computer manufacturers are dynamic because of the fast changing in computer technology.

2.9.1 What is Database ?

2.8.4 Adaptive vs Non-Adaptive

The concepts of adaptive and non-adaptive are related to stable and dynamic. An adaptive system is one that responds to a changing environment. In other words. An adaptive system is one that monitors the environment and undergoes change in response to changes in the environment. A non-adaptive system does not change with a changing environment.

2.8.5 Permanent vs Temporary

A permanent system is one that is or will be in existence for a long period of time, usually 10 years or more. A temporary system is one that will not be in existence for a long period time. Most corporation are permanent system because of the cost for developing a suitable system is high. [11] In terms of developing the database system, the outcome must be stable and simple system but can fullfill all the customers' needs as well as organization goals. Beside that, it is also important to make sure that system can perform efficiently and effectively as the way to convince the user requirements.

2.9 Database

2.9.1 What is Database ?

A database is a collection of data that is organized so that its contents can easily be accessed, managed, and updated. The most prevalent type of database is the relational database, a tabular database in which data is defined so that it can be reorganized and accessed in a number of different ways. A distributed database is one that can be dispersed or replicated among different points in a network. An object-oriented programming database is one that is congruent with the data defined in object classes and subclasses [12].

Databases contain aggregations of data records or files, such as sales transactions, product catalogs and inventories, and customers profiles. Typically, a database manager provides users the capabilities of controlling read/write access, specifying report generation, and analyzing usage. Databases and database managers are prevalent in large mainframe systems, but are also present in smaller distributed workstation and mid-range systems such as the AS/400 and on personal computers. Structured Query Language is a standard language for making interactive queries from and updating a database such as IBM's, DB2, Microsoft's Access, and database products from Oracle, Sybase, and Computer Associates.

2.9.1.1 Why Use Database?

Web-based company enquiry system is a system, which needs to handle and process data. So, an application such as database management system (DBMS) that can manage and access the data and maintaining its integrity. Database provides numerous advantages over the file-based system management by making it easier to eliminate most of the system's data consistency, data anomalies and data structural dependency problems.

2.9.1.2 Database Organizing

In case of knowledge information processing, data are more complex. There are following good points from the viewpoint of using integrated data communally as database.

- redundancy of data decreases due to integration and multi-purpose use of data.
- Easy to protect data from attacks of users without access capabilities.
- Unnecessary to create the same data for each program.
- Unnecessary to keep redundant data consistent.

Subsequently, what functions of database are required ? Let's start with the universal and basic function :

1. Data Definition Language (DDL) to represent integrated information of the real world.
2. Data Manipulation Language or DML to manipulate information in database.
3. Data independence to reduce influence on programs when data changes not only in contents but also in structures.

4. Integrity constraints to justify the contents of databases, which are not given to each user but to databases in order to prevent redundancy and omissions.
5. concurrency control to keep consistency of data when updated by plural users or user programs at the same time.
6. Recovery from database destruction an account of hardware, software and human errors or accident.

2.9.1.2 Database Organizing

In general terms, we can distinguish three ways of organizing data for use by an organization : centralized, replication and partitioning. Centralized database is house in a central computer facility. If the computing function is distributed, users and application programmes at remote locations may have access to centralized database. It is desirable when the security and integrity of the data are paramount, because the central facility is more easily controlled than a dispersed collection of data.

In the replicated database, all or part of the database is a copy at two or more computer.

In a partitioning database, the database exists as distinct and non-overlapping segments that are dispersed among multiple computer system. In general. There is no duplication of data among the segments of the partitioned database.

Simplified comparison of these three approaches of database organization is shown in table 2.4 [13]

Type of Distribution	Advantages	Disadvantages
Common database accessed by all processors (centralized)	No duplication of data; little reorganization required	Contention among multiple processors attempting to access data simultaneously. Data is large, so response time is slow, during disc failure, all processors lose access to data
Copy of the common central database stored at each processor (replicated)	Each processor has accessed to database without contention; fast response time; during failure, new copy can be obtained	High storage cost due to extensive duplication of data; updates of one copy must subsequently be made on all other copies; high database reorganization costs
Individual database for each processor (partitioned)	No duplication of data minimizes storage cost; size of database determined by application of node, not total corporate requirement; fast response time.	Ad hoc or management reports must be obtained from different databases.

Table 2.1 : Advantages and Disadvantages of Database Distribution Methods

2.9.2 What is Relation Database ?

A relational database is a collection of data items organized as a set of formally-described tables from which data can be accessed or ressembled in many different ways without having to reorganize the database tables. E.F. Codd at IBM invented the relational database in 1970. [14] The standard user and application program interface to a relational database is the *structured query language* (SQL). SQL statements are used both for interactive queries for information from a relational database and for gathering data for reports.

In addition to being relatively easy to create and access, a relational database has the important advantage of being easy to extend. After the original database creation, a new data category can be added without requiring that all existing applications be modified.

A relational database is a set of tables containing data fitted into predefined categories. Each table (which is sometimes called a *relation*) contains one or more data categories in columns. Each row contains a unique instance of data for the categories defined by the columns. For example, a typical business order entry database would include a table that described a customer with columns for name, address, phone number, and so -forth. Another table would describe an order: product, customer, date, sales price, and so forth. A user of the database could obtain a view of the database that fitted the user's *needs*. For example, a branch office manager might like a view or report on all customers that had

bought products after a certain date. A financial services manager in the same company could, from the same tables, obtain a report on accounts that needed to be paid.

When creating a relational database, you can define the domain of possible values in a data column and further constraints that may apply to that data value. For example, a domain of possible customers could allow up to ten possible customer names but be constrained in one table to allowing only three of these customer names to be specifiable.

The definition of a relational database results in a table of metadata or formal descriptions of the tables, columns, domains, and constraints.

2.9.2.1 Why use RDBMS ?

RDBMS or relational Database Management System performs the same basic functions provided by the hierarchical and network DBMS system plus a host of other functions that make the relational database model easier to understand and implement.

RDBMS have the ability to let the user or designer operate in a human logical environment. The RDBMS manages all of the complex physical details and most important of all is that RDBMS model achieves the structural independence not found in other database models. Furthermore, in the RDBMS model has a very powerful query language called Structured Query Language (SQL), which makes ad hoc queries possible. [13]

CHAPTER III

System Methodology

3.1 Methodology

According to Foldoc, Free On-Line Dictionary of Computer, methodology is an organized, documented set of procedure and guidelines for one or more phases of the software life cycle, such as analysis or design [14]. Whereas, Rumbaugh et al defined that a software engineering methodology is a process for the organized production of software, using a collection of predefined techniques and notational conventions. A methodology is usually presented as a series of steps, with techniques and notation associated with each step.[15]

Process model is very important during the software development process or software life cycle. It can form a common understanding of the activities, resources and constraints involved in software development. When a process model is created, it help to find the inconsistencies, redundancies and omissions in the process. As the problem are noted and corrected, the process becomes more effective and fucused on building the final system.[16]

People have developed software systems for decades, in the development process several different models for system development have been used. For instance, Waterfall Model,

V Model, Prototyping Model, Spiral Model and Transformation Model. These models provide guidance on the order in which a project should carry out its major tasks.

The process model for this Web-based company enquiry system is ‘Waterfall model with prototyping’, it is actually using waterfall model concept but the prototyping concept is added during the modules development.

3.1.1 Waterfall Model

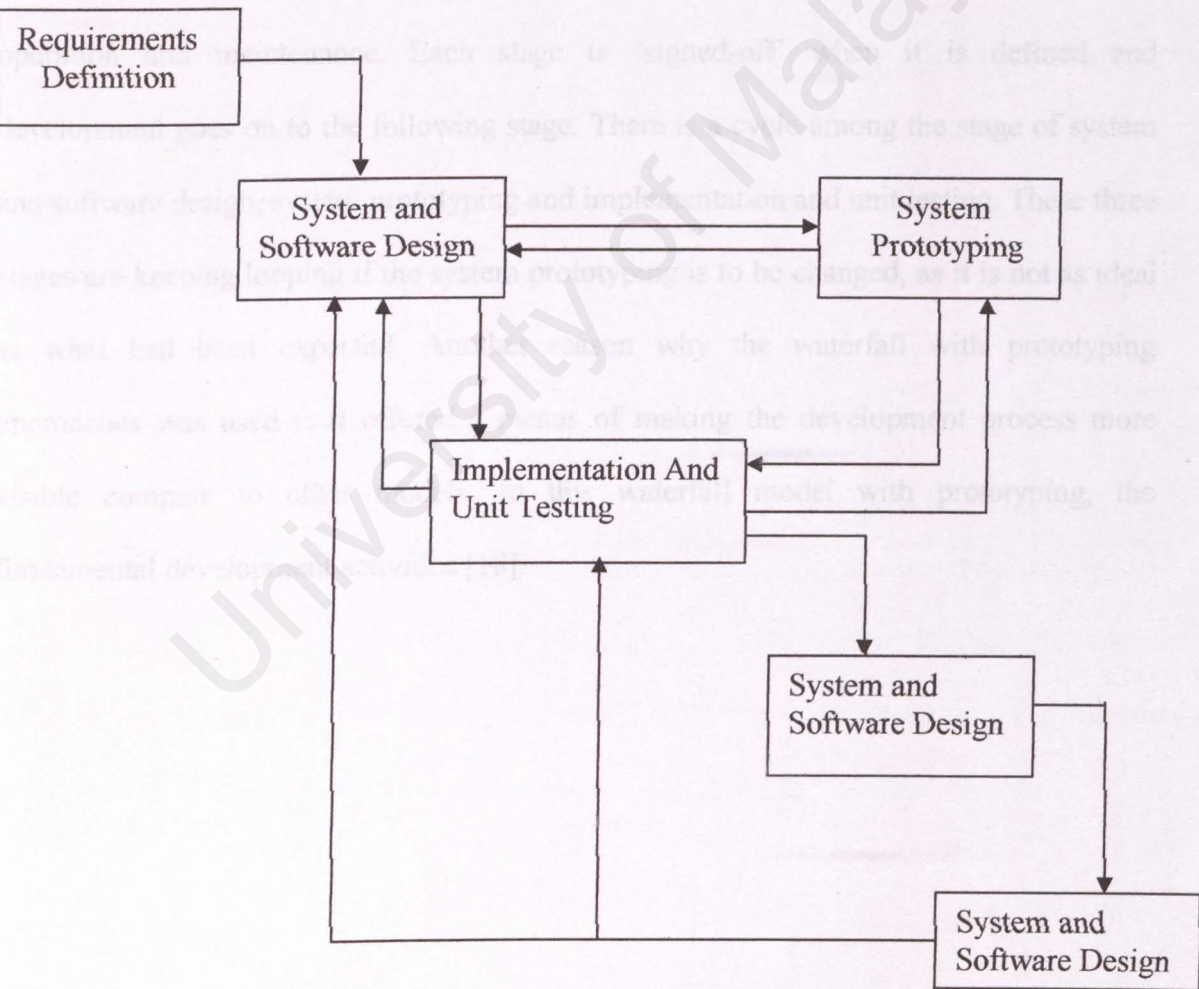


Figure 3.1 Waterfall model with prototyping

3.1.2 Explanation on Waterfall Model

The above figure is waterfall model with prototyping [17], which represent the company web site company enquiry system processes. The waterfall with prototyping approach was used because the system consists of separate process phases, which cascade from one phase to another, except the system prototyping state. The system consists several phases such as requirement analysis and definition, system and software design, system prototyping, implementation and unit testing, integration and system testing, and operation and maintenance. Each stage is 'signed-off' when it is defined and development goes on to the following stage. There is a cycle among the stage of system and software design, system prototyping and implementation and unit testing. These three stages are keeping looping if the system prototyping is to be changed, as it is not as ideal as what had been expected. Another reason why the waterfall with prototyping approaches was used is it offered a means of making the development process more visible compare to other models. In this waterfall model with prototyping, the fundamental development activities [18].

CHAPTER IV

System Analysis

4.1 System Analysis

4.1.1 Requirements analysis and definition

The web-based company enquiry system's services, constraints and goal are established by consultation with the system users (system developers and the supervisor). Those requirements are then being defined in a manner, that are understandable by both users and development staff (also is system developer)

4.1.2 System and software design

The web-based company enquiry system design process partitions the requirements to either hardware or software system. It establishes an overall system architecture. Web-based company profile system design involve representing the software system function in a form that may be transformed into one or more executable programs.

4.1.3 System prototyping

In this stage, system prototyping allows all or part of the web-based company profile system to be constructed quickly to understand or clarify issues. The requirements or design require repeated investigation to ensure that the developer, user, and customers have a common understanding both of what is needed and what is proposed. Besides, prototyping system information is a worthwhile for gathering specific information about users' information requirement. The initial reaction from users to the prototype were sought. Then, the user suggestion about changing or cleaning up the prototyped system, possible innovations for it, and revision plans detailing which parts of the system need to be done first or to prototype next were searched too [19].

4.1.4 Implementation and unit testing

During this stage, the web-based company enquiry system is realized as a set of program units. Unit testing involves verifying that each unit meets its specification. If the unit testing was fail, the system prototype is defined again or the system and software design stage is reprocessed again.

4.1.5 Integration and system testing

If unit testing is success, the individual program units or program, which had been developed, are integrated and tested as a complete system to ensure that the web-based

company profile system's software requirements have been met. After testing, the software is available for the use.

4.1.6 Operation and maintenance

Normal (although not necessarily) this is the longest life cycle phase. The web-based company profile is installed and put into practical use. Maintenance involves correcting errors, which were not discovered in earlier stages of the life cycle, improving the implementation of system units and enhancing the system's services as new requirements are discovered.

4.2 Requirements Analysis

Requirements analysis covers the area of functional and non-functional requirement of the web-based small business system for the small company. The functional requirement probably can be divided into two categories namely, customer section and administrator section. The customer's section is where the client can access the web site through Internet to make order and other transactions needed. While, the administrator section is basically the responsibility of the system administrator to manage and maintain the database.

4.2.1 Functional requirements-Customer's Section

4.2.1.1 Main Page

This is the front door to the system. It provides links to modules in the system and also the login page for users to sign in. It is also the gateway for users to use the system. This main page should be able to provide a clear picture on the flows of system so that those users can use the system with minimal ambiguity. Several features are included in the main page are such as user signup, system login, contact us, price list, place order (under consideration) and FAQs.

4.2.1.2 Information Module

This module will contain several parts such as company profile, price list, area served and service provided. At the company profile, it will display some company profile for user to view. While the price list part will list all the price charge for the services. Area served part will let users know which area are currently be served and services provided part will let users know what services is been served.

4.2.1.3 Registered Users (External Users)

Visitors to the system can register with the system to enable themselves to use the facilities and promotions provided. Once registered, the user will be able to access to the

system and scroll the web page provided by the system. The features that will be provided are such as secure login, managing personal information, modification of password, check the web site details etc.

4.2.1.4 Checking Order Status (Under consideration to include)

The users can check their order status by click on the order status icon. Then, the status will display on the screen and if the user wishes to view the order detail, they can do so by click at the order ID.

4.2.1.5 Printings

Besides just viewing order information, there are also include a function for users to print out the order form (filled) details. This is to be done by having a link for getting a printer-friendly format page for the related order.

4.2.1.6 E-mail

There are three types of emails in this system. The first one is for user to send the FAQs or any problems regarding the administration. The second type is the register forms that user use to register with the system. Third type is the ordering form; this will send the order to the administrator.

4.2.1.7 Registered On user Visit the Web Manage Module

This is the module that able the registered user for company management. They can change their information such as contact number, address, e-mail, etc. They also can change their password in this module. The users also can check or know their status in this module.

4.2.2 Non-Functional Requirements

Non-functional requirement are as important as functional requirement. A non-functional requirement describes the features will be included in the system to provides a feasibility and ease of the users. It also can be defined as constraints unser which the system must operate and standards, which must be met by teh delivery system soon. There are few issues in this area in respect to development ot the system.

4.2.2.1 Reliability

A system is said to have reliability if it does not produce dangerous or costly failure when it is used in a reasonable manner that a typical user expected is normal. The system to be developed must be reliable because reliability is one of the essential software qualities. It is crucial in maintenance and operational, as frequent breakdown of the system will increase the cost of maintenance and development for enhancing and debugging the

system. Therefore, it should process the input data and produce the expected output without any errors.

4.2.2.2 User Friendly and Usability

The system can be considered as attractive or an easy-to-use application because the users only have to click on the task or image by using the mouse. The usage of suitable and meaningful icons or buttons will help the user to use the system with more confidence. The user of menu should give the user sufficient information to use the system. Confirmation message and error messages for any non-trivial process such as updating or deleting any records should be displayed to make sure that the user could do final decision before certain action is taken.

4.2.2.3 Maintainability and Expandability

The system must also designed to be understood, corrected, adapted, and able to be enhanced without much difficulty so as to posses a high degree of maintainability and expandability. Architecture components, algorithm. Data structure and procedures design should be able to extend and modify with ease. This is important so that any future enhancements and expansion can be done easily.

4.2.2.4 Modularity

The response time to retrieve the information can be considered within a reasonable

Software architecture of the system should embodies modularity, that is, software is divided into separately named and addressable components, called module, which is integrated to satisfy problem requirements. This is done to isolate function codes from one another. This quality is essential so that testing; debugging and maintenance can be done easily.

The web-based company enquiry system will be developed using the microsoft xp. This

4.2.2.5 Legislation

because of the microsoft was fully use in Malaysia

All software, including platform used will be assured a licenced copy. None of any pirated software will be to use.

The more powerful and flexible the operating system, the more flexibility on the user to

4.2.2.6 Robustness

in Malaysia, many of the facilities of the company software

The system consists of five modules which will be completely tested to ensure each module achieve its expectation. The modules will be integrated into system and system testing will be started after process integration. Any errant that will be discovered during system testing will be solved immediately. This is to make sure the system is as robust as what had been expected before.

4.2.2.7 Response Time

4.3 Analyst and Consideration on the Development Tools

The response time to retrieve the information can be considered within a reasonable interval time. It means that all desirable information should be available to users at any point in time.

4.3.1.3 Java Database Connectivity

4.2.2.8 Implemention

4.3.1.1.1 What is JDBC ?

The web-based company enquiry system will be developed using the microsoft xp. This will be more advantage because of the microsoft was fully use in Malaysia.

The JDBC specification is similar to Microsoft's Open Database Connectivity (ODBC)

driver in terms of its structure and concept, which they both used for clients' access to databases.

The more powerful and flexible the operating system, the more flexibility on the user to login onto the web site. In Malaysia, majority of the facilities of the company software are using windows . therefore, any system which is able to comply to microsoft will be an advantaga to the user to scroll regularly.

The JDBC-ODBC Bridge can also be implemented, as there are advantages in using JDBC implementation that relies on the ODBC. This happen when an application will need to access databases that not be widely supported by other more vendor-specific JDBC drivers. This bridge is a layer that allows JDBC clients to connect through an ODBC client driver to access databases.

4.3 Analyst and Consideration on the Development Tools

4.3.1 Web Architecture Review

4.3.1.1 Java Database Connectivity

4.3.1.1.1 What is JDBC ?

JDBC (Java Database Connectivity) is an application program interface (API) specification for connecting programs written in Java to the data in popular database [20]. The JDBC specification is similar to Microsoft's Open Database Connectivity (ODBC) driver in terms of its structure and concept, where they both used for clients' access to databases.

4.3.1.1.2 Advantages of JDBC

Since many PC-based networks are already using the ODBC in their applications before the introduction of JDBC, the JDBC-ODBC Bridge can also be implemented, as there are advantages in using a JDBC implementation that relies on the ODBC. This happens when an application will need to access databases that not be widely supported by other more vendor-specific JDBC drivers. This bridge is a layer that allows JDBC clients to connect through an ODBC client library to access databases.

4.3.1.1.3 Why use only JDBC instead of JDBC-ODBC Bridge?

Sometimes ODBC may provide the right kind of services for applications because for some databases like MS SQL Server, ODBC may be a necessary means of access to JDBC, as most of Microsoft's database does not provide any JDBC drivers for databases connection. However, ODBC can add unnecessary layers of complexity to applications. It could also slow down the performance (i.e. time) of application while users perform activities like requesting and retrieving data from a database. This is because the connection is now going through two layers of database connectivity instead only the JDBC layer.

4.3.2 Client-Server Architecture

Many definition of the client-server architecture already exist, ranging from all Access application with a shore database to an all-encompassing transaction processing system across multiple platforms and databases. Anyway, throughout all of the permutations and combinations, some major themes still remain consistent, such as [21]:

1. The Requestor / Provider Relationship

The client and the server have well-defined roles, with the client requesting services and the server fulfilling the service requests.

2. Message-based

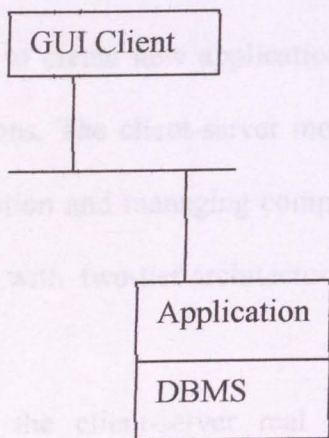
The communication between the client and server (or the client middle-ware server) is a well-defined set of rules (messages) that govern all communications, which is a set of transactions that the client sends to be processed.

3. Platform Independence

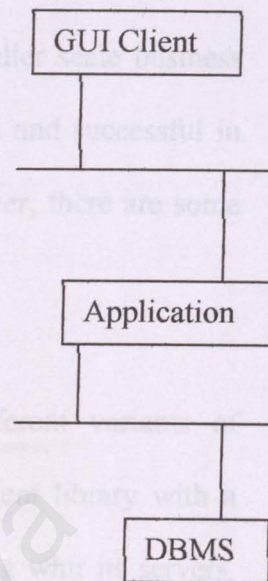
The server or the service provider is responsible for fulfilling the request and returning the requested information (or completion code) to the client, due to the clearly defined roles and message-based communication. The incoming transaction can be from a Window client, and OS/2 machine or a normal web browser.

4. Dynamic Routing

The Client can send a transaction to a service provider and have the request fulfilled without having to be aware of the server that ultimately fulfill the request. A database server, a mid-range data update, or a mainframe transaction might satisfy the data or transaction.



Two-tier Client-Server Model



Three-tier distributed Model

Figure 4.1 Web Architecture Models

4.3.2.1 Two-tier Client-Server Model

In the two-tier (client-server) model, a single multithreaded DBMS server starts up before any client program. Clients' request, which are in the forms of SQL queries or updates are received over the local area network (LAN) by the DBMS (Database Management)server, which then sends back SQL rows or status information in response to each request [12]. Much of the processing is actually performed on the client workstation, using the memory space and processing power of the client to provide most of the functionality of the system. In this two-tier architecture also the client has to be aware of the data resides and what the physical data looks like. The data may reside on one or more database servers in a mid-range machine or in a mainframe. The formatting and displaying of the information is provided by the client application as well. The server

will only routinely provide access to the data. The ease and flexibility Of there two-tier products to create new application continue to be driving many smaller scale business applications. The client-server model has proven to be very efficient and successful in co-ordination and managing computer and network resources. However, there are some problems with two-tier architecture, like for example:

1. In the client-server real world, each vendor provides different variants of Structured Query Language (SQL). Vendor also supply different client library with a different API (Application Programming Interface) for communicating whit its servers, such as OIC for Oracle or DBLIB for Sybase. Applications must have a completely different logic to communicate with DBMS servers from different vendors.
2. Application programmers have to write programming codes that deal with data fetching and updates on individual records, rather than high-level operations like on sets of records.
3. In a large organization, client programs may contain on thousands of network PCs. So, each time when a DBMS vendor comes out with a new version, client libraries must be updated on every PC, which is very expensive.
4. In large organization located around the world, many DBMS and application. s are distributed across machines all over the world on a relatively slow wide area network

(WAN). Within this kind of environment, each round trip between SQL request and rows returned can be significantly slow.

5. Client applications are usually deployed on desktop PCs with limited memory and operating systems become disk space. So, as client-server applications and the PC operating systems become larger and more complex, the cost for equipping every client Pc becomes very expensive.

4.3.2.2 Three-Tier Distributed Model

The three-tier architecture, also called the multi-tier model, extends the standard of the client-server architecture by placing a multithreaded application between the client and the DBMS. A three-tier application is also an application program that is divided into three major parts, with each of it distributed to different places in a network [2 1]. Those three major parts are as the following:

1. Workstation

Contain programs that provide the graphical user interface (GUI), application specific entry forms or interactive windows.

2. Business logic

Located on a LAN server or other shared computers. It acts as a server for client requests that comes from workstations. It also determines what data is needed, where the data is

located and also acts as a client in relation to the third tier of programming (DBMS) that is located on a server computer.

3. Database Management System

This third tier of the multi-tier model included the DBMS and programs to manage read and write access to it. The clients will now be able to communicate with the DBMS through the web server (which stores the business logic), using high-level, vendor-independent requests and replies. This application server is fully responsible for executing those requests, and makes calls when needed into the DBMS. As describe earlier in the multi-tier architecture, each of the major pieces of functionality is isolated. So the presentation layer is independent of the business logic, which in turn is separated from the data access layer. The multi-tier architecture would be able to solve most of the problems in the traditional two-tier client-server model if property implemented.

4.3.2.3 Advantages of using the Three-tier Architecture

Different programmers can develop each layer in the three-tier model concurrently. Each layer of programs can also be coded in different languages from the other tiers. As the programs for one of the tiers can be changed or relocated without affecting the other tiers, the three-tier architecture provides an easier way for an enterprise or software packager to continually evolve an application as new needs or opportunities arise [21]

4.4 Operating System

4.4.1 Window NT

The two letters tacked onto the end of the name stand for New Technology. The most obvious part of Windows is the graphical user interface-the colorful screen and those small, sometimes puzzling pictures referred to as icons.

Below are some of the features of the Window NT [22]:

1. Pre-emptive multitasking and scalability

The internals of Windows NT were written from scratch and centered on microkernel-style architecture similar to UNIX. This microkernel gave Windows NT preemptive multitasking. Additionally, Windows NT made use of process threads -an idea popularized by Carnegie Mellon's MACH operating system -- to support symmetric multiprocessing (SMP). The internal operations of Windows NT are designed to take full advantage of SMP systems (scalability).

2. Flat, 32-bit Memory Model

Windows NT is a 32-bit operating system that uses 32-bit addresses to access objects. This results in many advantages such as it enables NT to address 4,194,304KiB (four gigabytes) of memory.

3. No more DOS

Although there is no DOS, Windows NT is still able to run the vast majority of DOS program as long as they don't try to directly access the hardware or require special device drivers. It does this by creating a virtual DOS environment called the NT virtual DOS machine (NTVDM). The DOS program runs in this emulated DOS environment. NT traps the DOS calls and converts them to standard Win32 API calls.

4. Network Operating Systems

Windows NT is both an operating system and a network operating system. With LAN Manager, OS/2 was the operating system and LAN Manager was the network operating system. This integration of the CIS and the NOS has proved to be a formidable combination in Windows NT.

5. Reliability, Through Protected Memory Model

In Windows NT's memory model all processes get their own 32-bit address space. The 4GB space is divided in half, and the application can only really use the lower 2GB of space. The upper 2GB is for interfacing with other parts of the system. Every process effectively thinks it is the only thing running. There is no way for a process to read or write outside of its own memory space, either accidentally, or intentionally. This can prevent the system crashes and it provides security for each process.

6. Portability

It is this portability that enable Window NT to run not only on Intel x86 microprocessors but also on RISC chips, such as the DEC Alpha AXP, the MIPS R4400, and Motorola PowerPC. Part of the key to Windows NT's portability is the hardware abstraction layer (HAL), which hides the difference in actual hardware from the higher-level operating system software. The HAL makes all hardware look essentially identical to the rest of Windows NT.

7. Personality/Compatibility

Windows NT was designed to support multiple simultaneous personalities. Its interface became the primary personality. It also supports a POSIX personality, an OS/2 personality, and a DOS/Windows personality. Additional personalities, such as a full personality can easily be added.

8. Security

Windows NT was created to meet the United States National Security Agency's C2 level evaluation criteria. By creating Windows NT based on a defined security model, Microsoft was able to guarantee that Windows NT would meet the most demanding corporate security needs.

9. Fault-Tolerance

Windows NT has many features that provide varying levels of fault-tolerance for the system. Included in NT's list of fault-tolerant features are NT's journal-based, recoverable

file system (NTFS), disk mirroring and disk stripping with parity (RAID I and RAID 5), disk sector sparing, and support for an uninterruptible power supply (UPS).

10. Localization

Windows NT is available in localized versions for Brazilian, Chinese, Danish, Dutch, Finnish, French, Italian, Japanese, Korean, Norwegian, Portuguese, Russian, Spanish, and Swedish. In each of these versions, it was ensured that NT not only communicates in the particular language, but also employs standard idiom, uses correct punctuation in lists dates, time, and numerical and currency output.

11. License fees

However, Windows NT is a copyrighted piece of software that demands license fees when any part of its source code is used. Therefore, it required a sum of monetary outlay to obtain it.

4.5 Database

4.5.1 MYSQL

MySQL is a very fast, multithreaded, multi-user and cross platform database. It is available as an open source software. This means that anyone can study the source code and modify it (in certain conditions) to fit their needs. It can download for free with noncommercial purpose only. In order to embed MySQL into a commercial application, users must buy a commercially licensed version with a very cheap price.

The MySQL, relational database system was first released in January 1998. It is fully multi-threaded using kernel threads, provides application program interfaces (APIs) for C, C++, Eiffel, Java, Perl, PHP, Python, and Tel, allows for many column types, and offers full operator and function support in the SELECT and WHERE parts of queries.[23]

For the graphics aspect, MySQL does not allow the storage of graphical data. MySQL is also not able to store very large databases (VLDB) such as up to multi-terabytes. It only supports up to 50,000,000 records. Besides that, MySQL does not support database partitioning and LDAP. Anyway, the advantages of MySQL is it is very fast, reliable and easy to use [24]

In the aspect of implementation of ANSI standard, MySQL does neither transaction nor preserve referential integrity which means tables can be explicitly locked and unlocked for transactional access. And there are a lot of supports from websites for MySQL such as "Basic Email Support", "Extended Email Support", "Login Support" and "Extended Login Support". MySQL is also available on both Windows and Linux platform. And now, there are also Graphical User Interface add-ons for MySQL to make life easier for the administration to control the database.

4.6 Web Server

A web server is a program that, using the client/server model and World Wide Web's Hypertext Transfer Protocol (Hyper Text Transfer Protocol), serves the files that form web pages to web users (whose computers contain HTTP clients that forward their requests). Every computer on the Internet that contains a Web site must have a Web server program. The most popular Web servers are iPlanet Fast Track and Enterprise servers, and Apache, a Web server for UNIX-based operating systems.

Web servers often come as part of a larger package of Internet and intranet-related programs for serving e-mail, downloading requests for File Transfer Protocol files, and building and publishing Web pages. Consideration in choosing a Web server include how well it works with the operating system and other servers, its ability to handle server-side programming, and publishing, search engine, and site building tools that may come with

4.6.2 iPlanet Web Server Fast Track Edition 4.1

iPlanet Web Server, Fast Track Edition 4.1 is a web server that originates from the Netscape Corporation. It enables developers or programmers to quickly test Java applications and deploy a web site with the same reliability, manageability, and flexibility, as the award winning iPlanet Web Server, Enterprise Edition 4. 1. One of the more important thing is it is free.[25]

This web server is quite powerful in the sense of its supportability of Java Server 2.2 and Java Server Pages 1.1, which is considered the latest technology available in the market. Besides that, it also has a complete Graphical User Interface (GUI) that makes the administration of the web server easier to be implemented by users, who are new to Linux or shell. In terms of security, there is a 56-bit SSL (Secure Socket Layer) encryption support and LDAP (Light Weight Directory Access Protocol) technology with license to use iPlanet Directory Server for user authentication.

4.7 Web Programming Languages

4.7.1 ASP (Active Server Pages)

The Microsoft for purpose of building web applications developed ASP. Its concept and structure are similar to PHP where ASP scripts are also embedded in the HTML code of page, and then get parsed on the server-side. The strength of ASP is the ability to dynamically build a pure HTML web page based on a user's input and profile, the time and location the user accesses the page or the type of browser and operating system that is running on the user's computer. However, ASP applications are no portable. Active Server Pages are tightly integrated with Microsoft BackOffice suite of products must be running Internet Information Server (IIS) on a Windows NT server machine [26] or running a Personal Web Server (PWS) on either Windows 98 or 95.

3. Hard disk

ASP uses VBScript as a language in its coding. This will definitely benefit those who are with knowledge of Visual Basic programming, as VBScript is a sub component of it. ASP is not available as Open Source in the current market. In the aspect of performance, the speed of executing an ASP web page is just intermediate as in the same case as ASP where all its programming logic are embedded in the HTML. It needs a task of performance tuning on the database (optimize the SQL statements for better efficiency in handling queries) and code modification in order to load faster. ASP is quite competitive in the market, as it is easy to be developed and cater for fast changing needs of most of businesses and organizations.

4. Others

4.8 Hardware Requirements

4.8.1 Design Time Environment

Following are the hardware requirements for a server when developing the web application:

1. Processor

Pentium 11266 or greater and other x86 compatible processors like Intel, AMD and Cyrix are being used.

2. Random Access Memory (RAM)

The minimum requirement for design time is 64MB, but the high memory is better.

3. Hard disk

A minimum of 3.0GB disk space is required. This actually divided into 2.2GB for full installation of Red-Hat Linux version 7.1 operating system as a server (with [it!] interface). Another 400MB is being used for typical installation of the IBM DB2 version 7.2 database, its server, the Administration Client, the Application Development Client-, the documentation, the creation of sample database and the iPlanet Web Server Fast Track Edition 4. 1. An additional of 1 OMB disk space is being reserved for source codes and the following 390MB is for storing dummy data.

4. Others

Other computer peripherals being used are such as keyboard, mouse, monitor, SVGA card, sound card, network card, etc.

4.9 Run Time Environment

1. Processor

Intel Pentium 100N.4Hz or greater and other compatible x86 processors like AMD and Cyrix are being used.

2. Random Access Memory (RAM)

A minimum 64 MB is required.

3. Hard disk

A minimum of 50MB disk space is required.

4. Modem

A minimum of 28.8 kbps modem is required to connect to the Internet.

5. Others

Others computer peripherals are such as keyboard, mouse, monitor, SVGA card, sound card, speaker, network cards

4.10 Software Requirements

4.10.1 Design Time Environment

4.10.2 Run Time Environment

Following are the software requirements for setting up the server, in order to develop the web application.

1. Operating System

Window xp professional

2. Database

IBM DB2 Universal Database version 7.2 Enterprise Edition.

3. Web Server

IPlanet Web Server Fast Track Edition 4.1

4. Web browsers

Netscape Communicator version 4.0 and above or other compatible web browsers

5. Development tools

Sun Microsystems's Java Development Kit version 1.3 (JDK 1.3)

6. Text and HTML editor

Text editor and HTML editors, which enables the ease of producing HTML pages and Java Scripts.

4.10.2 Run Time Environment

1. Operating Systems

- Windows 95/98
- Windows NT/2000
- Linux x86
- Unix

2. Web browsers

Netscape Communicator 4.0 and above or other compatible web browser such as Internet Explorer, etc.

CHAPTER V

SYSTEM DESIGN

System design is an important part for the whole project. So, good design is the key to successful software project. This is the stage in the system development process where the requirements for the system are translated into the system characteristics. There are many stages in the design process such as architecture design, database design, user interface design, security and report design.

5.1 Architecture Design

A large system can be decomposed into sub-system that provides some related set of services. Thus, architecture design is the initial design process of identifying these subsystems and establishing a framework for sub-system control and communications.

As part of the architecture design process, the below activities are usually essential:

5.1.1 Modular Decomposition

This construction is based on assigning functions to components. A high-level description of the functions that are to be implemented and build lower-level explanations of how

each component will be organized and related to other components. Each identified component is decomposed into modules/functions. [17] A modular design reduces complexity, facilitates changes (a critical aspect of system maintainability) and also results in easier implementation of the system because parallel development can be carried out. To achieve a modular design, the following characteristics have to be followed:

5.1.1.1 High cohesion and Low Coupling

A system can consist of many modules. Two modules are highly coupled when there is a great deal dependent between them. On the other hand, loosely coupled modules have some dependence but the interconnections among them, are weak [17]. The goal of this system is to keep the degree of coupling as low as possible. If coupling is loose, then only a few other components will be affected by the change and might be candidates for modification or replacement. But if coupling is high, then large parts of the system may be perturbed by the change. For the purpose of this system, it is a complicated system, so it is hard to reduce the degree of coupling.

Cohesion refers to the internal "glue" with which a module is constructed. The more cohesive a module, the more related is the internal parts of the module to each other's and to its overall purpose. A common design goal is to make each module as cohesive as possible so that every part of a module's processing is related to the singular function.

5.1.1.2 Data Flow Diagram

Data flow diagram (DFD) characterizes data processes and flows in a system graphically.

DFD depicts the broadest possible overview of system inputs, processes, and outputs. A series of layered DFDs are used to represent and analyzed procedures within the proposed system.

For this project, DFD has been used to graphically characterize data processes and flows.

The flow of the proposed Web-Based Company Enquiry System is shown below:

5.1.1.3 Context Diagram

Context diagram is an overview, which includes basic inputs, the general system, and the outputs. This diagram helps the systems analyst grasp basic data movement.

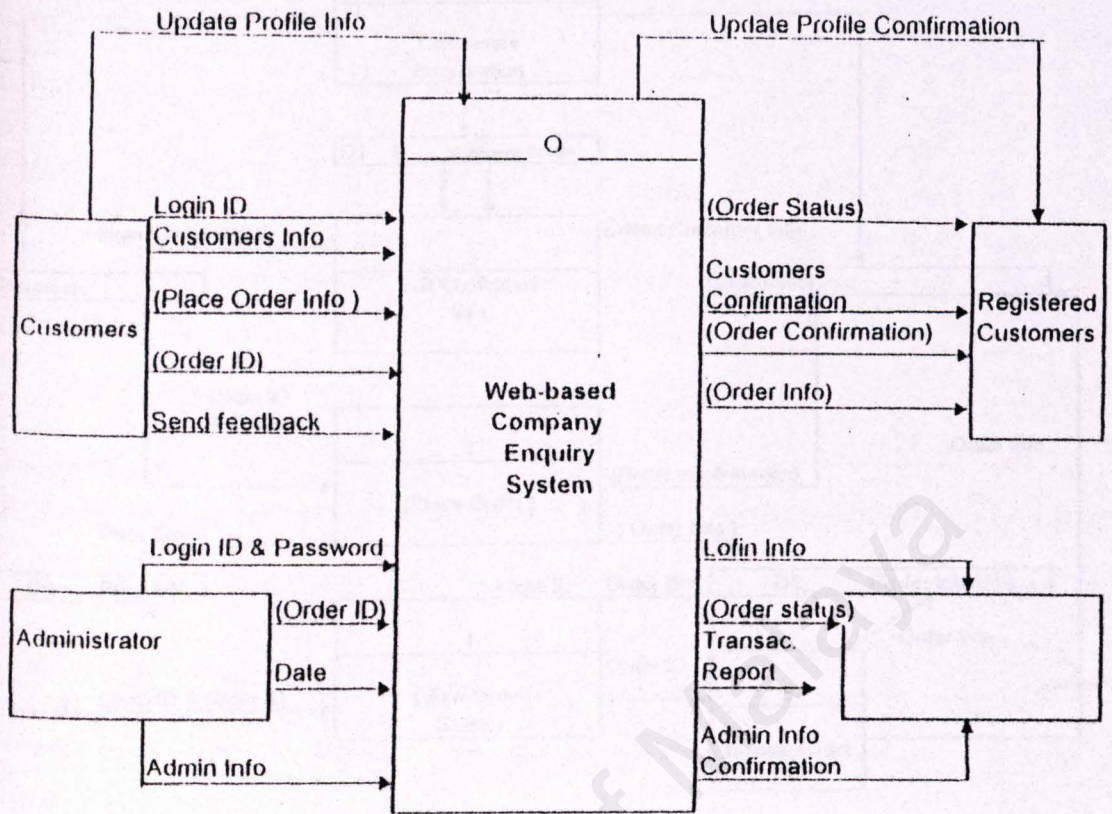


Figure 5.1 Context Diagram

5.1.1.4 O Diagram

Diagram O is the explosion of the context diagram. It shows all the major processes, data movement and data store at the highest level of detail. Figure 5.2 illustrates the diagram O for the proposed system.

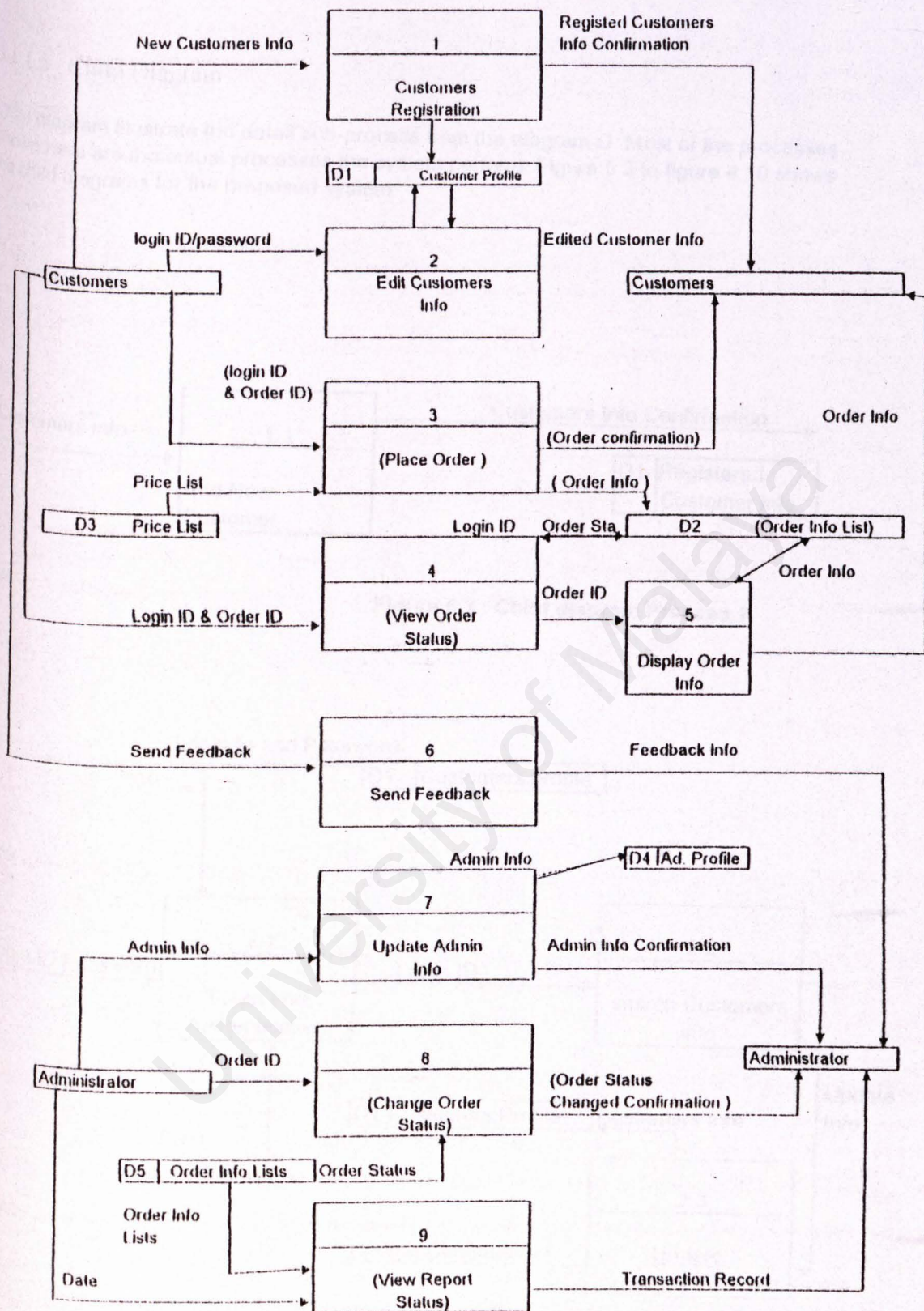


Figure 5.2 : O Diagram

5.1.1.5 Child Diagram

Child diagram illustrate the detail sub-process from the diagram O. Most of the processes shown here are the actual processes the system perform. Figure 5.3 to figure 4.10 shows the child diagrams for the proposed system.

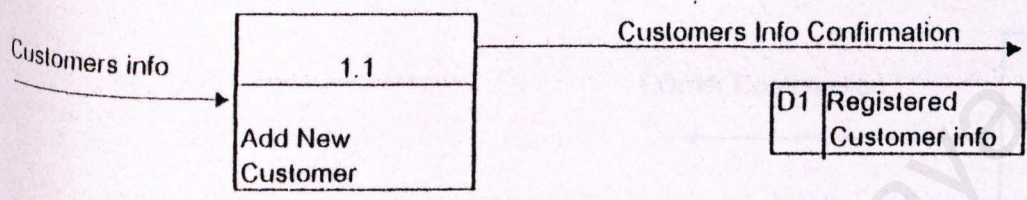


Figure 5.3 : Child diagram Process 1

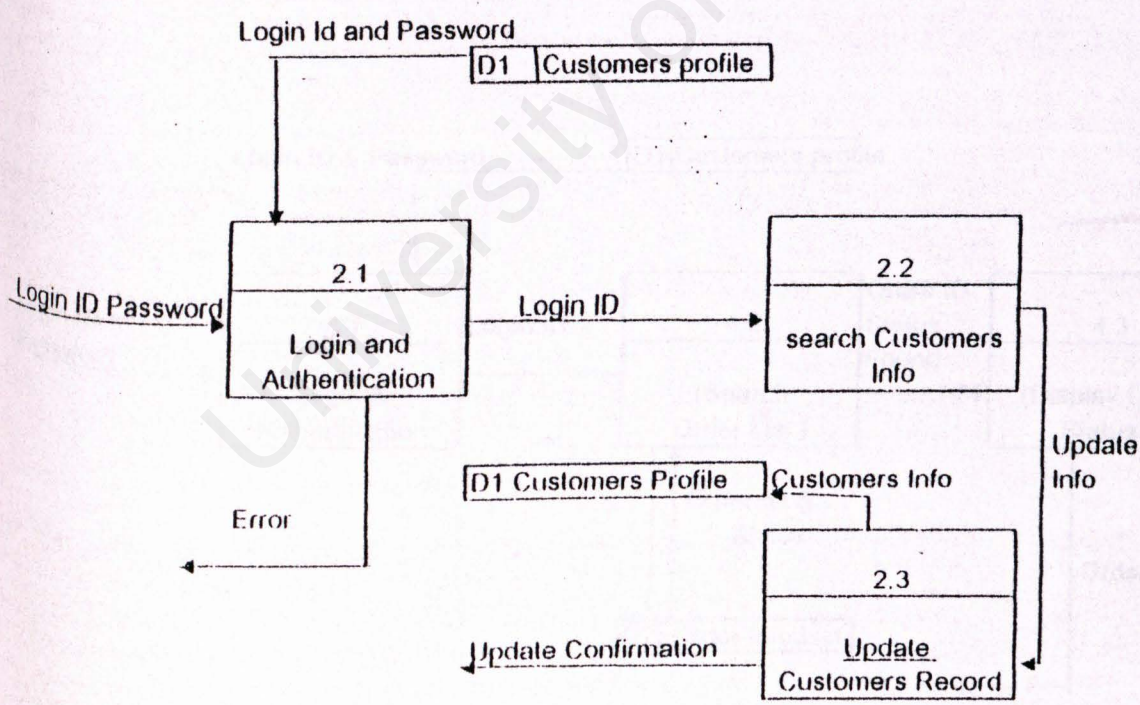


Figure 5.4 : Child Diagram Process 2

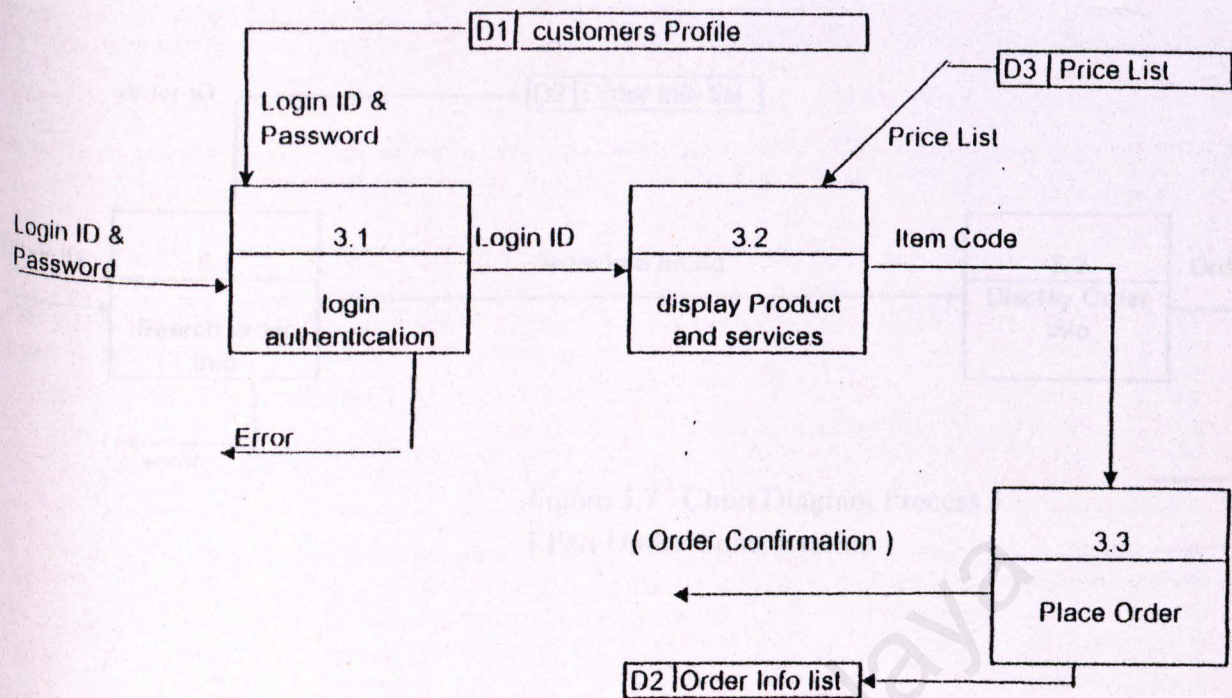


Figure 5.5 Child Diagram Process 3

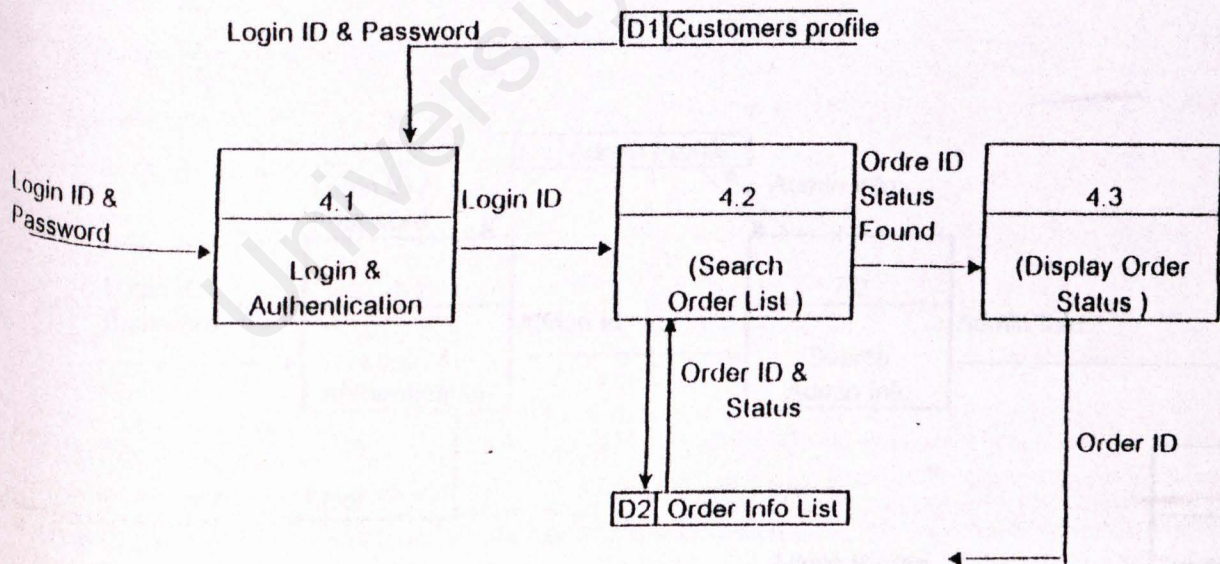


Figure 5.6 Child Diagram Process 4

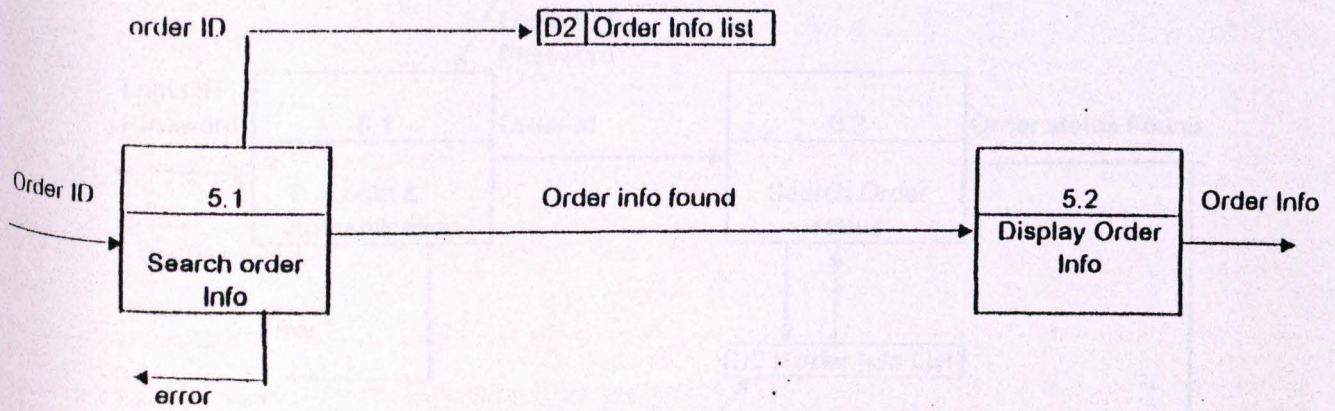


Figure 5.7 Child Diagram Process 5
(Part Under Consideration)

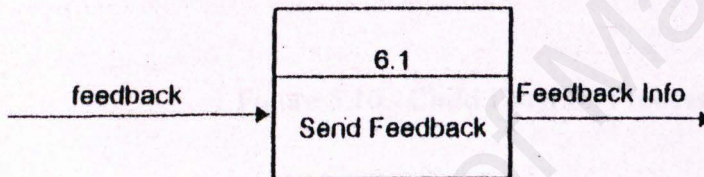


Figure 5.8 Child Diagram Process 6

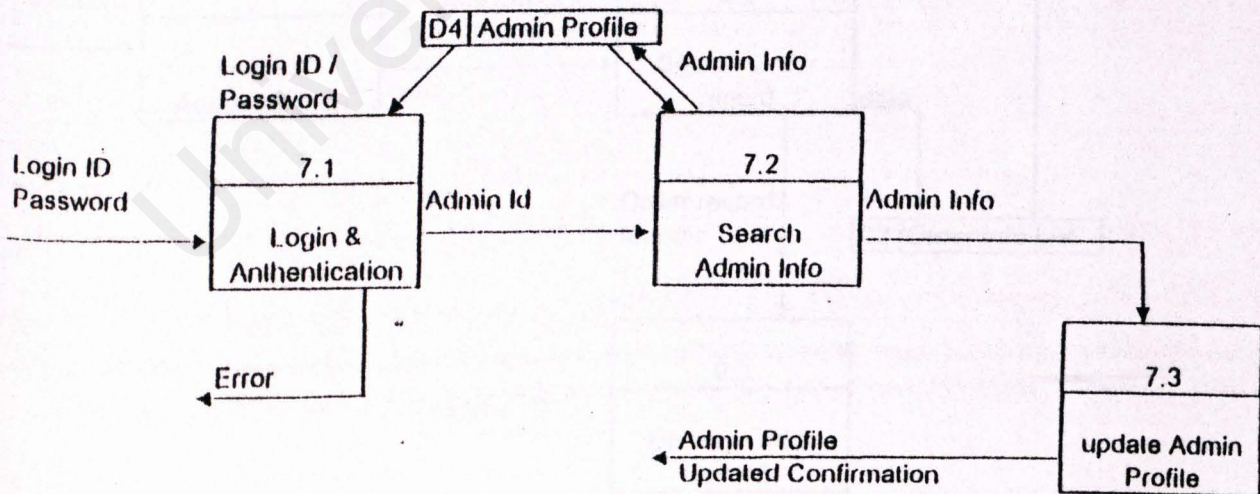


Figure 5.9 Child Diagram Process 7

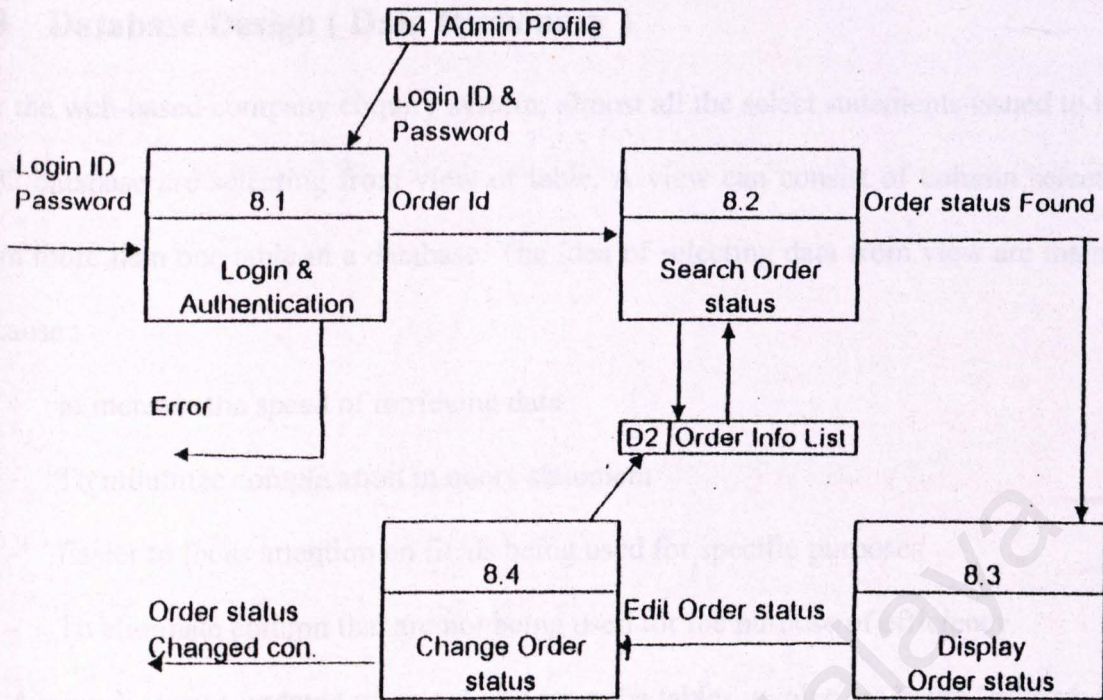


Figure 5.10 Child Diagram Process 8

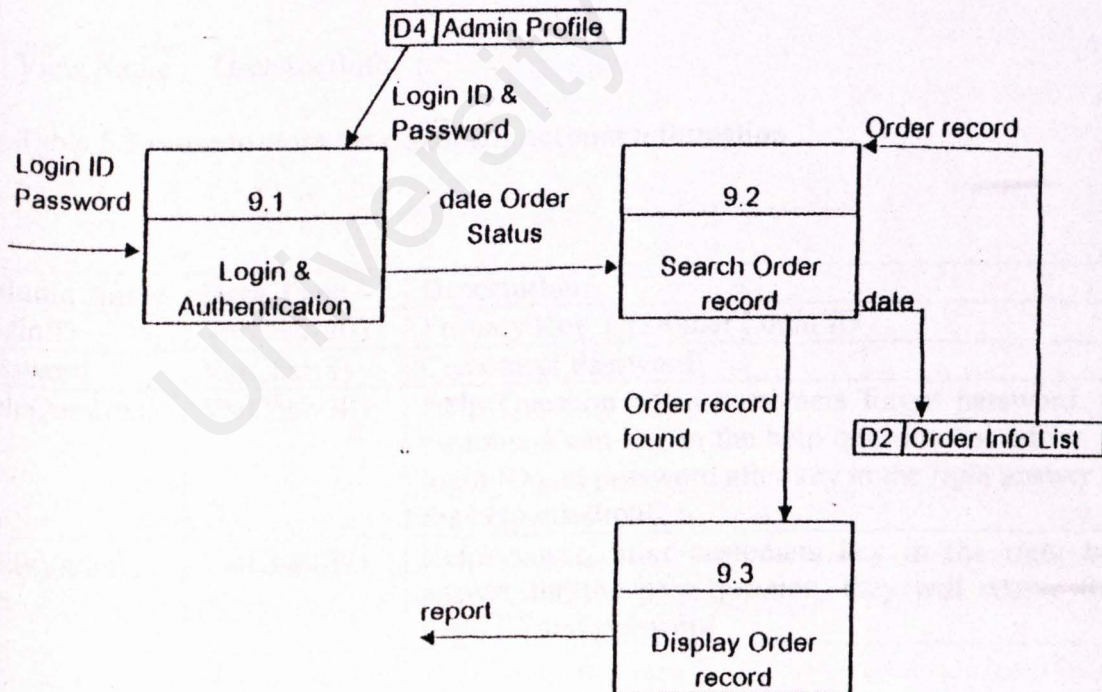


Figure 5.11 Child Diagram Process 9

5.3 Database Design (Data Dictionary)

For the web-based company enquiry system, almost all the select statements issued to the DB2 database are selecting from view of table. A view can consist of column selected from more than one table in a database. The idea of selecting data from view are mainly because :

- to increase the speed of retrieving data.
- To minimize complication in query statement
- Easier to focus attention on fields being used for specific purposes.
- To eliminate column that are not being used for the purpose of efficiency.

A view is always updated when column from the tables involve are being updated, so, there is no extra job at all for updating data in view. The following shows six different views used for the web-based company enquiry system :

View Name : UserAcctInfo

Table 5.1 is use to store the customers account information

Column Name	Data Type	Description
LoginID	VarChar(20)	Primary Key. Customer Login ID
Password	VarChar(8)	Customers Password
HelpQuestion	VarChar(30)	Help Question when customers forgot password, the customers can key in the help question for retrieve the login ID and password after key in the right answer for the help question.
HelpAnswer	VarChar(30)	HelpAnswer, after customers key in the right help answer for the help question, they will retrieve their login ID and password

Table 5.1 User account Information

View Name : Person Profile

(Under consideration on developing this module)

The table 5.2 used for store the registered customers profile and display the profile when the customers needs to update the information.

Column Name	Data Type	Description
Login ID	varChar(20)	Primary Key. Customer login ID
Name	varChar(30)	Customers's name
Surname	varChar(30)	Customer's Surname
E-mail	varChar(30)	Customers's e-mail address
Contact type	SmallInt	Contact number type such as house phone, mobile phone
Contact_No	varChar(15)	Contact Number
Address1	varChar(30)	Customers address
Customers	varChar(30)	Customers address
Postcode	varChar(5)	Postcode Number
City	varChar(20)	City Name
State	varChar(15)	State Name
Country	varChar(15)	Country Name

Table 5.2 Customers Profile

View Name : Order_info

(Under consideration on developing this module)

Table 5.4 used to store all the information about the order information that have been made by the customers

Column name	Data type	Description
OrderID	Char (5)	Primary Key. ID for the order.
Name	Char (30)	Customer name
Login ID	Char (20)	Customer login ID
Address	Char (30)	Customers address
Contact no	Char (15)	Customers contact no
Date	Data	Order date
Time	Time	Lead time
Spec	Char (50)	Specification
Remark	Char (50)	Remark
Item name	Char(30)	Item of the goods or service
Item price	Double	Unit price
Grand total	Double	Total order in currency
Order date	Date	Date of placing order
Order time	Time	Time of placing order

Table 5.4 : Order Information

View name : Order status

(Under consideration on developing this module)

Table 5.5 used to store status of the order made by the customers and will display it when the customers wish to view it.

Column Name	Data type	Description
Login_ID	Char (20)	The customers login ID
OrderID	Char (5)	Primary key. The ID for the order
OrderDate	Date	The date that order have been made
OrderTime	Time	The time that order have been made
OrderStatus	SmallInt	The various status of the order such as new, on hold, processing, etc.

Table 5.5 : Order status

View Name : Admin_Profile

Table 5.6 used to store the information about the administrator details such as the name, address, login ID, password, etc

Column Name	Data Type	Description
AdminID	varChahr(20)	Primary Key, the Admin ID
AdminPassword	varChahr(8)	Admin Password
Admin_name	varChahr(30)	Admin Name
Address1	varChahr(30)	Admin Address
Address2	varChahr(30)	Admin address
City	varChahr(20)	Admin stay address
State	varChahr(15)	Admin stay state
Country	varChahr(15)	Admin stay country
Salary	Double	Admin salary
Emplodate	Date	Date of admin has been employ

Table 5.6 Administrator Profile

View Name : Price_list

Table 5.7 used to store the entire price for all the products and services.

Column Name	Data Type	Description
Item_code	Char (10)	Primary key. The code number for the item
ServiceType	Smallint	Type of service require such as transportation.
Item _ Name	Char(30)	Name for he products
Item _ price	Double	Price for the item and services
Service _ code	Smallint	Products and services coding
quantity	SmallInt	Quantity of products or services

Table 5.7 Price list

5.4 User Interface Design

User interface design is not an easy task. It can be a tricky thing to design, because different people have different styles of perceiving, understanding and working. Marcus (1993) points out that an interface should address several key elements:

- Metaphors : The fundamental terms, images, and concept that can be recognized and learned
- A mental model : teh organization and presentation od data, functions, tasks, and roles.

- The navigation rules for models : how to move among data, functions, activities and roles.
- Look : the characteristics of the system's appearance that convey information to the user.
- Feel : the interaction techniques that provide an appealing experience for the user.[13]

The goal of these elements, and for the user interface, is to help user gain rapid access to the content of complex system, without losing their comprehensive as they move through information.

CHAPTER VI

SYSTEM DEVELOPMENT AND IMPLEMENTATION

The system implementation phase follows after the completion of the designing phase. Here the system is developed according to the specified requirements. This chapter focuses on the coding approach, the coding style and the techniques used, and the important scripting language involved. Besides, the debugging technique used is also discussed.

Some examples of the code included are in this chapter to provide a clear view of how the system works. Furthermore, the effective documentation for the system that tells users how the system works such as the help file is also developed in this phase.

6.1 Connecting Database

The HTML Server provides the connection of database with ease. Here the HTML provide the connection to the database either using the ODBC data source or direct connection to the database itself. Direct connection to the database serves a purpose, as the database file can be located in the same directory as the project itself.

With a simple code, HTML manipulate the javascript file.

```
<html>  
<head>  
<SCRIPT src="javascript/click.js" LANGUAGE="jscript.encode">
```


</script>
</head>

6.2 Coding Approach

this selection for coding approach is essential for adding in quality assurance of the system projects. The top-down approach and the modular approach are selected for the coding purpose.

Top-down design means looking at the large picture of the system and then exploding it into smaller parts of the sub-system (Kendall & Kendall). It allows the system analyst to ascertain overall system objective first, as well as how they are best met in an overall system. Then the system analyst moves to divides the system into sub-systems and the system requirements.

Once the top-down design approach is taken, the modular approach is useful in programming. This approach involve breaking the programming into logical, manageable modules. It works well with top-down design because it emphasizes the interfaces between modules and does not neglect them untill later in the system development. Each individual module should be functionally cohesive, so that it is charged with accomplishing only one function.

The top-down design is selected because it avoids the chaos of attempting to design system all at once. Besides, it also prevent the system analyst from getting so mired in details that he loses sight of what the system is supposed to do. The modular program

design makes modules easier to write and debug because they are virtually self-contained.

Tracing an error in a module is less complicated, since a problem in one module will not cause problems in other. Modules are also easier to maintain since modification usually will be limited to a few modules and will not spread over the entire program. Modules are also easier to grasp, since they are self-contained sub-systems. This means that a reader can pick up a code listing of any module and understand its function as shown in Figure 6.1 the Web-Based Company Enquiry System.

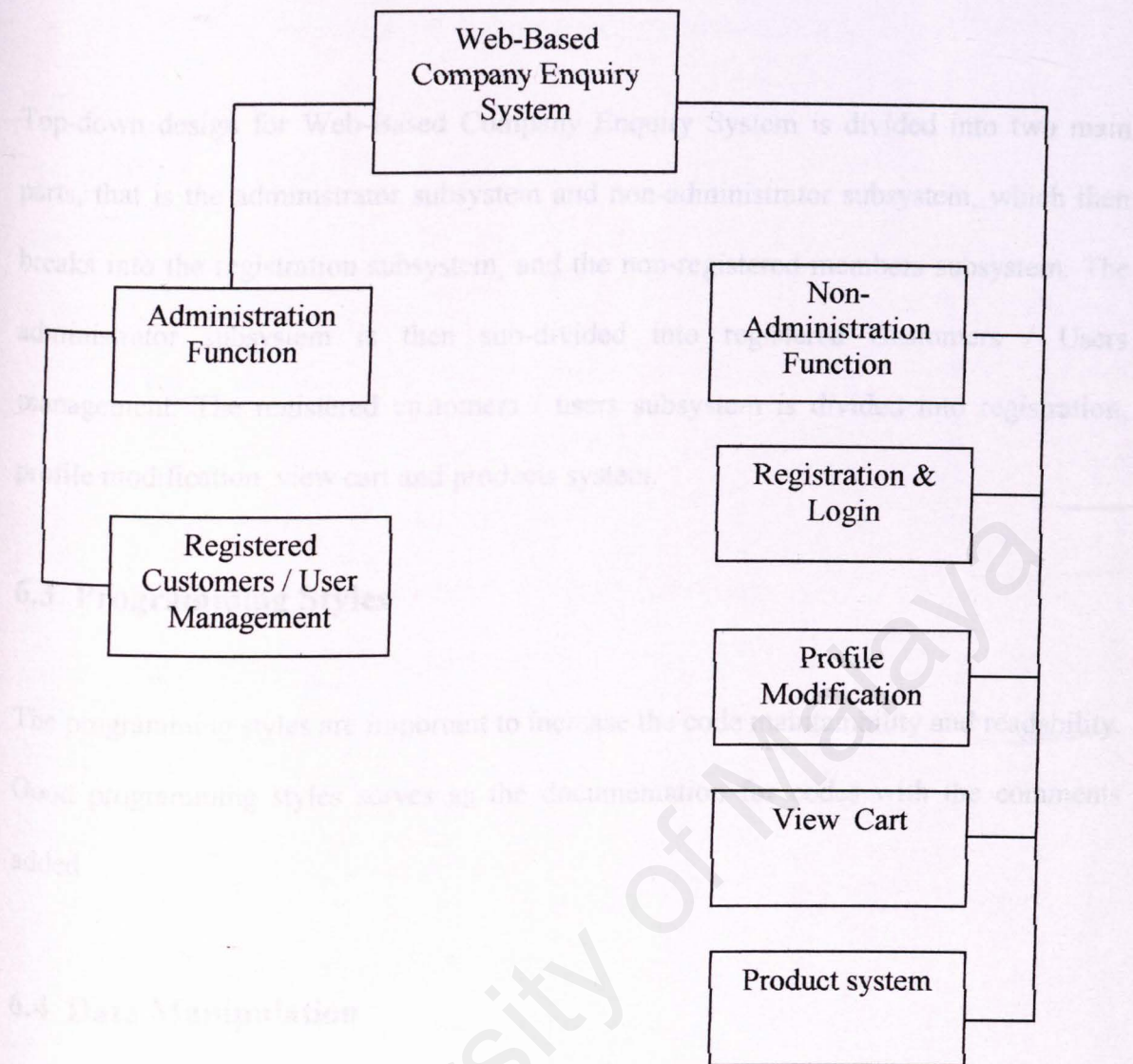


Figure 6.1 Top-down structure of Web-Based Company Enquiry System

Top-down design for Web-Based Company Enquiry System is divided into two main parts, that is the administrator subsystem and non-administrator subsystem, which then breaks into the registration subsystem, and the non-registered members subsystem. The administrator subsystem is then sub-divided into registered Customers / Users management. The registered customers / users subsystem is divided into registration, profile modification, view cart and products system.

6.3 Programming Styles

The programming styles are important to increase the code maintainability and readability. Good programming styles serves as the documentation for codes with the comments added.

6.4 Data Manipulation

The data in Web-Based Enquiry system is manipulated using query embedded in the code, this includes retrieving data from different files located, below are few examples:

6.4.1 Enquiry Data Manipulation

<head>

<title> Welcome to TREANSTECH Industries & Services </title>


```
<SCRIPT src="javascript/click.js" LANGUAGE="jscript.encode">
```

```
</script>
```

```
<script language="javascript" src="javascript/cookies.js">
```

```
</script>
```

```
</head>
```

```
<frameset border="0" rows="85,*" >
```

```
    <frame name="top" src="applet/home.html" noresize>
```

```
    <frameset border="0" rows="85%,*">
```

```
        <frame name="middle" src="news.html" noresize>
```

```
        <frame name="bottom" src="navigator.html" noresize>
```

```
    </frameset>
```

```
</frameset>
```

6.4.2 view cart Data Manipulation

```
<head>
```

```
<title> Welcome to TRANSTECH Industries & Services </title>
```

```
<SCRIPT src="javascript/click.js" LANGUAGE="jscript.encode">
```

```
</script>
```

```
<script language="javascript" src="javascript/cookies.js">
```

```
</script>
```

```
</head>
```

```
<frameset border="0" rows="85,*" >
```

```
<frame name="top" src="applet/home.html" noresize>
```

```
<frameset border="0" rows="85%,*">
```

```
<frame name="middle" src="news.html" noresize>
```

```
<frame name="bottom" src="navigator.html" noresize>
```

```
</frameset>
```

```
</frameset>
```

6.4.3 Login Data Manipulation

```
<head>
```

```
<title> Welcome to TRANSTECH Industries & Services </title>
```

```
<SCRIPT src="javascript/click.js" LANGUAGE="jscript.encode">
```

```
</script>
```

```
<script language="javascript" src="javascript/cookies.js">
```

```
</script>
```

```
</head>
```

```
<frameset border="0" rows="85%,*" >
```

```
<frame name="top" src="applet/home.html" noresize>
```

```
<frameset border="0" rows="85%,*">
```

```
<frame name="middle" src="news.html" noresize>
```

```
<frame name="bottom" src="navigator.html" noresize>
```

```
</frameset>
```

```
</frameset>
```


6.4.4 Product Database

```
//Products database file !
```

```
var prodID=new makeArray(250);
```

```
var c=0;
```

```
//Products database file !
```

```
var prodID=new makeArray(250);
```

```
var c=0;
```

```
//pallet product
```

```
prodID[c]=new product('Pallet: Size 1.0m x 1.0m','23.00','yanni'); ++c;
```

```
prodID[c]=new product('Pallet: Size 1.2m x 0.92m','35.00','foster'); ++c;
```

```
// canvas product
```

```
prodID[c]=new product('Canvas : 10"x10" ','10.50','westlife'); ++c;
```

```
prodID[c]=new product('Canvas: 10"x15" ','11.00','blue'); ++c;
```

```
prodID[c]=new product('Canvas : 15"x15" ','11.50','bsb'); ++c;
```

```
prodID[c]=new product('Canvas : 15"x20"', '12.00','b2men'); ++c;
```

```
// air bubble product
```

```
prodID[c]=new product('Air Bubble : 5"x5"', '0.50','kylie'); ++c;
```

```
prodID[c]=new product('Air Bubble : 5"x8" ','1.00','avril'); ++c;
```

```
prodID[c]=new product('Air Bubble : 5"x12" ','1.50','britney'); ++c;
```

```
prodID[c]=new product('Air Bubble : 8"x8" ','2.00','christina'); ++c;
```

```
prodID[c]=new product('Air Bubble : 8"x12" ','2.50','jlo'); ++c;
```

```
//tape
```

```
prodID[c]=new product('Tapes : Celullose Tape ', '10.90', 'craig'); ++c;
```

```
prodID[c]=new product('Tapes : D/S ', '19.50', 'ronan'); ++c;
```

```
prodID[c]=new product('Tapes : D/S1 ', '37.50', 'ricky'); ++c;
```

```
prodID[c]=new product('Tapes : Masking ', '2.50', 'justin'); ++c;
```

```
prodID[c]=new product('Tapes : Protection Tape ', '20.50', 'sting'); ++c;
```

6.5 Scripting Language

The scripting language used in the programming in Web-Based Company Enquiry system application is JavaScript. The scripting language is used for client side validation.

This could reduce the response time and redundant between client and server. Few important scripting languages used in Web-Based Company Enquiry System are shown below :

6.5.1 Text Field UserName

```
Function do_me(ffff){  
    Var  
    Valid=  
    "_abcdefghijklmnopqrstuvwxyz0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZ";  
    Var ok=false";  
    Var ftemp;
```



```
For ( var ffi=0;ffi<ffff.length;ffi++){
```

```
    Ftemp=""+ffff.substring(ffi,ffi+1);if (valid.indexOf(ftemp)=="-1")
```

```
    Ok=true;
```

```
}
```

```
return ok;
```

```
}
```

6.5.2 Text Field Email address

```
function IsEmail(str){
```

```
    //supports new top level tlds
```

```
    return YesNoFormat(RegExpFindNoCase("^[_a-z0-9]+(\\.[_a-z0-9-]+)*@"
```

```
[_a-z0-9]+(\\.[_a-z0-9-]+)*\\.([a-z]{2,3}|(aero|coop|info|museum|name))$",str));
```

```
}
```

CHAPTER VII

SYSTEM TESTING

7.1 Unit Testing

Unit testing focuses verification effort on the smallest unit of software design – the module. Using the description as a guide, important control paths are tested to uncover errors within the boundary of the module.

The relative complexity of tests and the errors detected as a result is limited by the constrained scope established for unit testing. The unit test is always white box-oriented, and the step can be conducted in parallel for multiple modules.

For example in Web-Based Company Enquiry System, the registration module, enquiry module, and stock module test are conducted in parallel.

7.1.1 Unit Test Considerations

As first the module interface is tested to ensure that information properly flows into and out of the program unit under test. Test of data flow across a module interface are required before any other tests is initiated. If data do not enter and exists properly, all other tests are moot. During my testing process, a number of interface test conducted are:

- To test attributes of arguments transmitted to called modules equal to attributes of parameters for example login by user id and password from users of a sub-system/module (eg. stock sub system) only can view stock sub system not others.

- To test end-of –file conditions handled for example logout function work properly when users of a particular sub-system logout
- To test file opened before use, validity occurs before choose series.
- OPEN/CLOSE statement correct.
- File attributes correct.

Second the local data structure is examined to ensure data stored temporarily maintains its integrity during all steps in an algorithm's execution.

The local data structure for a module test case should be designed to uncover errors in the following categories:

- Improper or inconsistent typing passwords by users from administration sub-system, and stock sub-system
- Erroneous initialization or default values of users Id's by users of system
- Incorrect variable names, for example key in unrecorded item name by stock sub-system
- Inconsistent data types for examples add customer information
- Underflow, overflow and addressing exceptions.

In addition to local data structures, the impact of global data on a module such as administration, and stock should be ascertained during unit testing.

As third steps, boundary conditions are tested to ensure that the module operates properly at boundaries established to limit or restrict processing. For example stock sub system users cannot access to administration sub-system.

Boundary testing is the last (and probably most important) task of the unit, test step.

Test cases that exercise data structure, control flow and data values just below, at, and just above maximum and minimum are very likely to uncover errors.

Finally all independent paths through the control structure are exercised to ensure that all statements in a module have been executed at last once. For example in stock module validation, choose department, change password, logout, choose service, view Item by location have been executed.

And lastly, all error-handling paths are tested.

7.2. Testing Integration

Integration testing is a systematic technique for constructing the program structure while at the same time conducting tests to uncover errors associated with interfacing.

The objective is to take unit-tested modules and build a program structure that has been dictated by design

For Web-Based Company Enquiry System, incremental integration was implemented.

The program is constructed and tested in small segments, where errors are easier to isolate and correct. Here interfaces are more likely to be tested completely, and a systematic test approach such as top-down test integration was conducted.

First module is integrated by moving downward through the control hierarchy. This process begins with the main control module that is registration module. After this modules subordinates and ultimately subordinate to the main control module such as enquiry module, view cart, submitting module were incorporated into the structure in a depth-first.

Depth-first integration integrates all modules on a major control path of the structure. Here I select registration module as a major path, because every sub-system user must registrar their login Id and password before they can access into the system. The integration process is performed in a series of three steps.

First the main control module that is registration module is used a test driver in every sub-system and all other modules such in administrative sub system registration module, enquiry module, and stock module were directly subordinate to the main control module.

For depth integration approach subordinate stubs such as login Id, registration password, change password, change personal particulars, add Id delete record, create Login id and password were replaced one at a time with sub system such as administrative sub-system all tests are conducted as each module is integrated for an example in registration sub-system, When the completion of each set of tests another stub is replaced with the module.

Generally, Web-Based Company Enquiry System divided into the following test phases :

- User interaction :

1. command selection
2. creating of password, user Id, location,
3. displays representation

4. error processing ; delete record,

5. representation.

- Data manipulation and analysis :

1. symbol creation packets (PKTS)

- Database management

1. Access : login, registration, password

2. Update : change password, change personal particular, create location, creating login Id and password add Id

3. Performance : Login Id login password, view product.

7.2.1 Module testing

A module is a collection of dependent components. A module encapsulates related components only and therefore can be tested without other system modules.

In administrative sub-system there are 3 module, there are registration module, enquiry module and stock module.

As first registration module test is conducted to ensure it can login users Id, and registration by using password.

Second module is tested to ensure it can change user's passwords and personal particulars. The same procedures of testing is conducted for other modules to ensure that it could function together seamlessly without any problem. Here every sub system modules were tested.

7.2.2 Sub-system testing

This phase involves testing collections of modules in the Web-Based Company Enquiry System which had been integrated into subsystems. Subsystems may be independently designed and implemented. The most common problem that arises in software system is subsystem interface mismatches

The sub-system test process should therefore concentrate on the detection of the interface errors by rigorously exercising those interfaces.

7.3 System Testing

System testing is actually a series of different tests whose primary purpose is to fully exercise the computer-based system. Although each test has a different purpose, all work to verify that all system elements have been properly integrated and perform allocated functions.

Once, information passed among components in accordance with the design. The system is tested as a whole, to ensure that it has the desired functionality. Three tests involved in the system testing, the function test performance test and user acceptance test.

When the system has all the tests, it is ready for installation and the installation test will take place.

7.3.1 Function testing

A function test checks that the integrated system performs its functions as specified in the requirements. The function test in Web-Based Company Enquiry system verifies that the application allows users to register, login, security password, search, manage personal data, while the administrators can maintain and manage the site. The function test is carried out by testing the creation of test data on all the functions in the Web-Based Company Enquiry System.

7.3.2 Administrator module

Test if this function allows users to login, register and retrieve password.

It is also to check the path of activities and allow the authorized user to perform the search function.

7.4 Performance Testing

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.

Once the functions work as specified the performance test compares the integrated components with the non-functional system requirements. Non functional requirements are user friendliness, reliability, maintainability, scalability, learn ability, speed, robustness, security, accuracy, and correctness.

7.4.1 User friendliness

This test is conducted to ensure the system have a user-friendly interface. Test also to ensure graphical user interface (GUI) approach. System also tested to ensure it provide simple menu for user to work through to the system. The system also tested to ensure it display a confirmation message for any non-trivial process, provide error handling and validation procedures, the system also checked whether it display an error message if an error occurs.

7.4.2 Reliability

This test is conducted to ensure the time for a system to function normal after a failure. The system is test to ensure not cause destructive error to user's machine.

7.4.3 Maintainability

The test is conducted to ensure the program can be corrected if an error is encountered, adapted if its environment changes, or enhanced if the customer designs a change in requirement. To test if the site can be easily maintained and managed by administrator.

7.4.4 Scalability

Capability is to test the system to migrate as a client or server to machines of greater or lesser power depending upon requirements.

7.4.5 Learn ability

Test the ease of use of the system and make sure level of the understanding of users is high once using the system. Test conducted to ensure customers to understand the system in order that the services provided by the system can be fully utilized.

7.4.6 Speed

Test the speed of the processing of the data by checking the response time in the debugging options provided by the Microsoft 2000 SQL Server to enable high performance of the system.

7.4.7 Robustness

Test is conducted to ensure the system is able to retain operating when fault data is inserted and return error message to user before the data is sent to server for processing.

7.4.8 Security

To test the system has security access each page. Different level of user has different accessibility to different pages. System also checked to ensure security access prohibits unauthorized access to page in the system.

7.4.9 Accuracy

To check whether system can be precision of the computation and control.

7.4.10 Correctness

This test is to ensure programme satisfactory and it specification and fulfill to the objectives and scope. Test also conducted to check proper coding, accurate planning, implementation and proper system testing.

7.5 User Acceptance test

It is virtually impossible for a software developer to foresee how the customer will really use a program. Instructions for use may be misinterpreted, strange combinations of data may be regularly used, output that seemed clear to the tested may be unintelligible to a user in the field.

When automatic stock retrieval system is built, a series of acceptance tests are conducted to enable the customer to validate all requirements. The test is conducted by the end users from TRANSTECH Industries & Services.

An acceptance test can range from an informal “ test drive “ to planned and systematically executed series of tests.

Here alpha testing was used to uncover errors that only the end user seems able to find.

The alpha test is conducted at site by a user. First the software Web-Based Company Enquiry System is used in a natural setting as a developer looking over the shoulder, of the users and recovering errors and usage problems. Here alpha test was conducted in a controlled environment.

CHAPTER VIII

SYSTEM EVALUATION

The objective of this chapter is to identify the various problems faced during the implementation of the Web-Based Company Enquiry System and also to evaluate the Web-Based Company Enquiry System as a whole. System evaluation is done by assessing the strength, the weaknesses and to access which feature could be enhanced in the future.

This system evaluation is elaborated in detail in this chapter. This phase is carried out when the implementation and testing phase end. Here, the system is evaluated as a whole.

The problems encountered when developing and implementing are explained. The solutions to the problems are also discussed here. This chapter also discusses about the system evaluation by end users.

The system strengths, and constraints and the future enhancements of the system are also discussed. Finally, the knowledge and experiences gained from this project are included in this chapter.

8.1 Problems and Solution

During the development of the system, the following problems were encountered. The problem listed here are the more obvious ones. There are other minor problem, which take up a lot of the project duration, which are not listed here.

8.1.1 Lack of Mastery of Knowledge

When developing the Web-Based Company Enquiry System project, the developer lacks of knowledge need to develop the application. For instance the developer has no experience with HTML. Therefore the Internet and the books are used as main reference to develop the Web-Based Company Enquiry System. The process development of this project is slow, as the developer has not fully masters the HTML in the first place. During the development of the system, the knowledge increase gradually. It will be much easier if there is a basic knowledge of HTML before developing this project.

Learning HTML from scratch was somewhat of challenge. Furthermore, the fact of learning CFML and HTML while coding simultaneously was daunting. As an example, I did not know whether custom tags are so powerful until I have experienced using them. It is very object oriented and saves up a lot of codes because of reusability. The existence of custom tags could only be hypothesized until I read the documentation and tutorials of the HTML to discover the exact commands.

HTML is a web application programming language, which is different, as users could access web pages simultaneously whereas a standalone application serves only one user at a time. This kind of web programming style and concept was difficult to comprehend

at first as i did not know how to identify the different users who visited the web-based company enquiry system website at any one time. Again, the functions were identified when there was substantial knowledge gained in the HTML functions.

This is the same with the other software used to help to develop this system. To solve this problem, the help file is very useful as a quick reference especially when using the Macromedia Dreamweaver and Adobe Photoshop. Both this software is used to design the web page. It is much easier to view codes and design at the same time.

Help from course mates are valuable as with some hints from them, the system is able to function better.

8.1.2 Hardware Limitation

There is a no hardware limitation when implementing and testing the system, only a digital camera is used to take picture of products and save it to the Web-Based Company Enquiry system folder. The picture was taken in order to present the product during the web presentation.

8.1.3 Lack of Resources

There is a limitation for using the resources available in the faculty. This is because there is limitation on the IT resources. Majority of the information was taken from the Internet.

8.2 Evaluation By End Users

The system evaluation by end users is carried out together with the user acceptance test. In the user acceptance test manual, comment lime is prepare for end users to put in their comments and suggestion about Web-Based Company Enquiry sytem.

End users responses are important because the end users are the people who interact with the system. The end users can provide comment or suggestion that are useful to enhance and improve the services.

From the response by the end users, improvement and modification are made to the system.

8.3 System Strengths

Web-Based Company Enquiry system has the strength as described below :

8.3.1 View Cart

The view cart technology has made the enquiry in Web-Based Company Enquiry Sytem convenient. With the view cart, users can easily manage the item they enquiry. They can make necessary subtraction and addition to the item and enquiry the items.

8.3.2 System Transparency

When using Web-Based Company Enquiry system, users do not know how the system structure is where the database resides and anything related to the system.

For instance, the information retrieved is similar to a system accessing the local database so that it does not confuse users. Therefore users do not need to know how the information is retrieved when they use Web-Based Company Enquiry System in searching the products.

8.3.3 User-Friendliness

The operation and interface of the Web-Based Company Enquiry System is design in a way that promises user-friendliness, the design is easy to understand and enquiry products via this web-based application will be easy. This is due to the ease of navigation, the clear pictorial concept of the web pages and also availability of clear test to help customers better understand the messages and the instructions of the Web-Based Company Enquiry System.

8.3.4 Availability and Convenience

As with all the web-based application, the Web-Based Company Enquiry System is available for users to visit 24 hours a day, 7 days a week. The availability is always there unless the server is down. Convenience is also an advantage, the website is always accessible and one can visit the website when and as it is convenient to them.

For the users, searching for products can never easy. Enquiry can be done via the Internet. No more hassle with travelling and no more time wasted on products enquiry.

8.4 System Constraints

Web-Based Company Enquiry System constraints as described below.

8.4.1 Target Market

Since Web-Based Company Enquiry System is a new establish company, the target market can only be limited to the Malaysia industry due to lack of experience in inport and export.

8.4.2 Limitation Categories of Products

Web-Based Company Enquiry System has only limited categories of products due to the new set up. However, this company will forcast for new market as the source of new product will adding on slowly.

8.5 Future Enhancement

In future, Web-Based Company Enquiry System can be enhanced in several perspectives as described below.

8.5.1 Widen Target Market

When Web-Based Company Enquiry System meets its stable and maturity stage, it can expand the business by widen the target market, not only to local market but also to overseas across Asia.

8.5.2 Expands The Products Line

Meanwhile Web-Based Company Enquiry System relies on only limited category of products. In the future, perhaps more categories of products shall be made available. The number of products for each category must also be increased. Or, perhaps, other products related like servicing can also be added into the database.

8.5.3 Integrated Advanced Search Function

For future enhancements when there are large number of categories exist, advance search or order system will be adding on to this system for more multitasking functional.

8.5.4 Add User Level

At the mean time, Web-Based Company Enquiry System only available in industries products enquiry. Later, for fix or regular customers, on order function will be adding on for the customers to make enquiry or purchasing on line instead of using fax now.

8.5.5 Integrate Electronic Payment System

Later, when Web-Based Company Enquiry system is implemented as real system, the electronic payment system can be modified to function in real time. This could be done when Web- Based company Enquiry system has registration with a merchant account. Thus the Web-Based Company Enquiry system electronic payment system could be connected to the merchant so that to perform the monetary transactions.

8.6 Knowledge and Experience Gained

Upon completion of this project, lots of knowledge and experience were gained. From the beginning till the end of the project, a student is exposed to the seven phases involved in bringing out the system.

Students had learned about the process of analysing, designing, implementing, testing and evaluating a system. These experiences are very useful and helpful in future when handling a project.

Furthermore, when developing the system, students can improve knowledge towards in using tests when the programming languages, the scripting language, the databases and designing tools.

From the development also, students can understand how a view cart functions. Students also learned how to build a view cart. Besides, students also learned the technique and skill in developing a project, the input manner of documenting the system, and the right way to implement a code and system.

The evaluation towards the system including the problems faced and the solutions to the system, the system evaluation by end users, system strengths, system constraints show the limitation of Web-Based Company Enquiry System. However, the system constraints can be improved in the future with the enhancements to the system.

Finally upon completion of this project, student has gained lots of knowledge and experience. A student has gained to develop a web application fully and get to be in so many position, like database designer, interface designer, programmer, tester and as a whole project developer. This is an important experience and knowledge, which is very useful in dealing with similar projects in the near future.

BIBLIOGRAPHY

- [1] <http://www.kellysearch.com/gb-company-82622612.html>
- [2] <http://www.hlwilkinson.co.uk/index.html>
- [3] <http://www.hlwilkinson.co.uk/Contact.html>
- [4] <http://www.kimannagencies.com/ORDER.htm>
- [5] http://www.singaporemirror.com/co_kimannpkg.htm
- [6] <http://www.udmalaysia.com/>
- [7] <http://www.udmalaysia.com/contact.htm>
- [8] OXFORD Advanced Learner's Dictionary (page 1067)
- [9] Leonard M, Jessup, Joseph S. Valacich, "Information system Foundation", QUE R Education and Training.
- [10] http://searchchwebmanagement.techtarget.com/sDefinition/0,,sid27_gci213352,00.html
- [11] Ralph M. Stair "principles of Information System, A manegerial Approach", High Holborn, London : Intrnational Thomson Publishing Europe, Second Edition, 1996
- [12] http://searchdatabase.techtarget.com/sDefinition/0,,sid13_gci211895,00.html
(Database definition)
- [13] Wong Hing, "Catalog Ordering System", document room, Faculty of Computer Science & Information Technology, University Malaya, Session 1999/2000.

- [14] http://searchdatabase.techtarget.com/sDefinition/0,,sid13_gci212885,00.html
(Relational database definition)
- [15] <http://foldoc.doc.ic.ac.uk/foldoc/> (Methodology definition)
- [16] FOLDOC. Free On-Line Dictionary of Computing. 1997, November 23.
WaterfallModel. At URL:<http://burks.brighton.ac.uk/burks/foldoc/63/123.htm>
- [17] Shari Lawrence Pfleeger, "Software engineering Theory and Practice", Prentice Hall, 1998, New Jersey
- [18] Ian Sommerville, "Software Engineering 5th ed", Addison-Wesley, 1998, United States of America.
- [19] Kenneth E. Kendall and Julie E. Kendall, "System Analysis and Design 4 th ed.", Prentice Hall, 1999
- [20] http://searchdatabase.techtarget.com/sDefinition/0,,sid13_gci214050,00.html
(JDBC definitioa)
- [21] <http://www.whatis.com>
- [22] Jason Gams et al, "Window NT 4 server Unleased", Sams, 1 August 1996
- [23] http://whatis.techtarget.com/sDefinition/0,,sid9_gci516819,00.html (MySQL definition)
- [24] <http://www.mysql.com/information/index.html>
- [25] http://www.iplanet.com/product/iplanet_web_fasttrack/home_2_1_11.html
- [26]] http://www.intranetjournal.com/article/200002/wd_02_25_00aa.html