ONLINE FLOWERS AND GIFTS SHOP

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ABSTRACT

With the tremendous growth of the Internet and the expansion of the World Wide Web, more and more information is being put on the Internet. The Internet creates a global marketplace that breaks the barrier of time, place and distance, within which conducts Electronic Commerce.

E-Commerce is a system that includes not only those transactions that center on buying and selling good and services to directly generate revenue, but also those transactions that support customer service, or facilitating communications between business partners.

This thesis describes a developed system to automate purchasing of goods online. The Online Flowers and Gifts Shop names 'My E-Florist' is an e-commerce site that promotes and sells various flowers and gifts on the Internet. The main objective of this project is to develop an attractive, interactive and user friendly online selling website.

My E-Florist is divided into 2 main sections: Customer Section and Administrator Section. Customer Section allows the Internet users to browse and make order on the available items. On the other hand, the Administrator Section includes the user interfaces for authorized online shop's administrators to maintain their database and others administrative tasks.

This project will review the methods, technologies and development tools that are used to set up an Electronic Commerce site. At the end, this project will implement all the requirements into a real system and analysis the strengths and weaknesses of the system. It is hope that the major problems faced by current system in an organization can be solved through this project.

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CHAPTER 1:

INTRODUCTION

1.1 OVERVIEW

The term "Electronic Commerce" might sound strange, but it is already a form part of our lives: withdraw cash from automatic teller machines and check out account balances by phone. These every day examples might not show how other businesses and organizations have incorporated electronic commerce into their overall business strategies but it is needs to assure their survival in the new global marketplace.

The tremendous growth of the Internet particular the World Wide Web (WWW) has led to a critical mass of consumers and firms participating in a global online marketplace. The rapid adoption of the Internet as a commercial medium has caused firms to experiment with innovative marketing ways to consumers in computer-mediated environment. These developments on the Internet are expanding beyond the utilization as a communication medium. Today Internet has become a new marketplace.

The electronic services (such as email) can be used by many professional organizations for various purposes. Business can implement new sales and marketing channels through the use of the World Wide Web. The WWW provides electronic means for organizations to display materials such as product catalogs, price lists, and brochures, all online. As Internet security issues are revolved, businesses are selling more and more products online, directly to their customers. Using email is an effective way to rally members and to advise Congress of association views on current legislative issues.

1.2 PROBLEM DEFINATION

The aim of this project is to create and develop an interactive and dynamic online flowers and gifts shop. The target user of this system is the Internet user all around the world who wish to purchase flowers and/or gifts online.

Traditionally, when a person wishes to buy some flowers or buy a gift, he or she has to walk in to the particular florist or gift shop to look at the product before making any decision. Very often, customer will go around different shops to compare between them, which is time consuming. Another option to purchase is making inquiry through the phone. However, this is not likely to be the preference, as the buyer does not have visual contact on the product.

Traditional commerce provides less customer services such as delivery service and wrap service. A person need to wrap and delivery the flowers or gifts to the recipient himself or herself, which is also time consuming. Nowadays people live in a busy environment. They are doing thing in a faster and efficiency manner. So, set up an e-commerce site that provides all those services will surely attract customers.

Besides that, some others deficiencies of traditional commerce are due to environment factor, human behavioral and business issues. For example, in the environment factor, there are a lot of environment issues such as the weather, the distance of the shopping malls, and the traffic jam problem, which cause the ineffective of purchase thing. Human behavioral such as laziness and timeless will force them to go shopping online. Setting up an online shopping system business is much more easier. Less capital and labor, not many management problems occur in a small online shopping system business.

The emergence of the electronic commerce and the Internet as the medium has provided a new dimension to the personal computer industry.

1.3 PROJECT MOTIVATION

Electronic Commerce (E-commerce) is the latest BUZZ word in town. As one of the seven Flagship Applications of the Multimedia Super Corridor (MSC), where the Government is developing the infrastructure to accommodate and facilitate electronic activities. E-commerce will soon become an essential way of conducting business, retailing and shopping in Malaysia. Internet thus offers a borderless marketplace for both merchant and consumer.

On-line shopping store is now making an explosive impact in Malaysia. Electronic-business (E-business) offers tremendous market opportunities for commercial organizations in both the areas of business-to-consumer and business-to-business.

In fact, smart organizations are already aware that through e-business, they can extend beyond Malaysia and reach out globally to potential customers. At the same time, they stand to benefit from huge savings in labor and operational cost by conducting their business electronically. All it takes is a merchant server linked to the payment gateway system. The merchant can now receive purchase orders electronically 24 hours a day from any part of the world.

In Malaysia, there are at present some 300,000 registered Internet users supported by Jaring and TMNet (Source: Computimes 18 May 1998). Considering that more than one registered user in a home may use the ID and that more than one registered user exists in corporate IDs, the number of Internet users is actually much bigger. Based on a multiplier of 4, the actual number of Internet users in Malaysia could be as high as 1.2 million. All of them are potential online shoppers. The Malaysian market for E- business is projected to grow to about RM 2.45 billion by the year 2000 (Source: IDC)

On-line shopping presents shopping from all over the world at your fingertips any time of the day. The online flowers and gifts shop, with its exciting variety, is set to become an integral feature in the 21 century lifestyle.

1.4 PROJECT OBJECTIVE

The true purpose of this project is to first and foremost garner an understanding of the E-Commerce concept and then implement in a real world situation. Of course, in pursuing this undertaking, there would be certain constraints in term of availability of technology as well as the various functions and criteria desired from the system. The project aim to cover these limitations as well as also expose possibilities and perhaps even predict some future trends.

Among the most desired objectives of this project are:

i. Provide an attractive and interactive commercial web site to promote and sell company's products (flowers and gifts) and attract consumers to go shopping online.
ii. To offer convenient and secure payment services to customers. Customers are allowed to make their payment using credit card, check or money order.
iii. To improve the convenience, accessibility and quality of interactions with customers.
iv. To be reliable. My E-Florist ensures the reliability of service and information with fewer mistakes as the transactions are carried out electronically.
v. To provide a user-friendly interface to allow every process to be accomplished on a computer-based environment.
vi. To allow seller to handle all purchases and selling procedures with minimum mistake.
vii. To allow system administrator to handle and maintain the customers, employees and products databases.

1.5 PROJECT SCOPE

The target user of this system includes all the Internet users that would like to purchase flowers and gifts online. The shopper or the administrators of the business are also users of this system. The project scope is divided into two main sections : Customer Section and Administrator Section.

1.5.1 Customer Section

Customer section is a series of web pages that allows multiple accesses from users to view and making order to products (flowers and gifts). Customer homepage provide the following features:

i. Allow customers or users to browse the products according to categories.
ii. Allow customer to add all the ordered items to his or her shopping cart, and submit the order form together.
iii. Provide a simple search engine to allow users search by keyword for the products they want.
iv. Allow customer to register to the system and update user information when desired.
v. Allow customer to send their feedback to the store.
vi. Allow customer to check for their previous order via order lookup.

1.5.2 Administrator Section

Administrator interfaces will allow authorized administrators to update the database for the products and the user and administrates the system. This include:

i. Maintaining and updating all items in database.
ii. Maintaining customers purchased records.
iii. Maintaining customers records.

iv. Maintaining administrator records.

1.5.3 System Access

Can be accesses anywhere from the Internet. Any users are allowed to browse through the site and make order with and without register to the system. But for the shipping area, it is restrict to Malaysia area only.

1.5.4 Storage

A database system to store the product information, customer information, order information, employee information and others are kept in the server. The database are kept using a database software and information are retrieve using SQL statements.

1.6 PROJECT LIMITATION

Due to enormous features that an E-Commerce site might comprise, therefore certain features or aspects will not be included in this project. The limitations of the Online Flowers and Gifts Shop are:

1. This project will not include a very wide range of products (flowers and gifts) that exists in the real market.
2. This project does not integrate or incorporates with any merchant account or relationship with the banking system. Therefore any input of credit card number is for demonstration purpose only and there is no transaction taking place. All payment is store in database.
3. Administrator section may not be sufficiently enough for the development of Online Flowers and Gifts Shop. No reports are generated for the administrators.
4. No encripytion of sensitive data such as credit card number.

1.7 SIGNIFICANT OF RESEARCH

This project contributes to both the seller and customer or buyer for any product browsing and purchasing transaction.

1.7.1 Contribution to the seller

As mentioned earlier, this project is aims to automate the flowers and gifts shop processes. It is closely tied to the database for its dynamic contents. With database connectivity and capability, this application manages the resources efficiently and effectively through the control of the database. Moreover, this application is able to reduce paperwork involve for the product browsing and purchasing.

1.7.2 Contribution to the buyer

It serves as an alternative approach from the traditional way of purchasing of computer items. Customer looks for the product's information at their fingertips. This feature has better edge compared to the traditional way of purchasing as it takes longer time and involve more expenses to look for the product concerning information.

1.8 PROJECT SCHEDULE

In order to achieve the project objective by time, a project schedule was planned as a guideline to manage the time and tasks needed to be accomplished. The project schedule for developing My E-Florist online shop system are divided into several phases.

My E-Florist Project Schedule (June 2000 – Feb 2001)									
Key Activity	**Jun**	**July**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**
Literature Survey									
System Analysis									
System Design									
Viva									
Submit Proposal									
Coding									
Testing									
Documentation									

Table 1.1 My E-Florist Project Schedule

1.9 CONCLUSION

A good management of the project development will lead to project success and produce a high quality system. So, it is need to planning and scheduling the project development to ensure that it is carried out the required standard. All of this planning is the first phase of the project development to give a brief idea of the development system to ensure that it is consistent with the project goal and requirements.

CHAPTER 2:

LITERATURE REVIEW

2.1 APPROACH

A lot of information is needed before development of a system can be done. This information can be obtained from a variety of sources. Each source usually yields a different kind of information and requires a different search method to get that information. Some of the common sources of information are system users, forms and documents, computer programs, procedure manuals and reports.

A number of ways can be used to gather information from system users namely through interviews, using questionnaires and through observation of user activities and behaviors. Computer programs can be used to determine the details of data structures or processes. Procedure manuals specify user activities in a business process.

For this project, many books and previously done project reports were used to gain information. Many websites were visited to get information on things such as software to be used, existing e-commerce sites and many others. Basically all the sources that were used can be divided into printed resources and electronic resources. In the next section, the finding from all these resources will be described in detail. Most of the sources came from the electronic books and sites on the WWW.

Some of the keyword that were used to search in the Internet are:

- E-Commerce
- Online Flowers and Gifts Shop
- Online payment method
- Security
- ASP tutorial
- ASP sample application
- Database connectivity
- Online transaction processing
- Others

2.2 ELECTRONIC COMMERCE

2.2.1 Introduction

Electronic Commerce or E-Commerce, is known as the ability to a wide range of communiqués and data easily with trading partners (Adams, 1994). It is about buying and selling information, goods, and services over computer network to supply and retrieve the information necessary to support those transactions.

E-Commerce is a system that includes not only those transactions that center on buying and selling good and services to directly generate revenue, but also those transactions that support and customer service, or facilitating communications between business partners.

Electronic commerce, it is a vision for bringing a whole range of services into the information age on a global scale. In the past two decades, financial and business to business processes, from order processing to electronic funds transfer, have been automated and are now routinely handled by computer. Now, in the mid-1990's, many corporations see the possibilities for improving their businesses even further and are embracing the Internet as way to achieve this change.

2.2.2 History of Electronic Commerce

Although electronic commerce is often thought of as a recent development, it has actually evolved slowly over a long period of time. The first business telephone transactions date from the late 1800's. The first credit cards were issued midway through this century.

The Internet, electronic mail and automatic teller machines (ATM) date from the 1960's. One major form of electronic commerce is the electronic data interchange (EDI), which was implemented in the 1970's. However, the arrival of nearly

ubiquitous personal computers and data communications networks in the 1990's has given electronic commerce an enormous boost. The defining event was probably the development of the Internet's World Wide Web from 1989 on that made network computing accessible to a much wider audience. As networking of computers intensifies, so will the potential for electric commerce. (The Iowa IITT Task Force, 1996)

2.2.3 Advantages Of Electronic Commerce

Electronic commerce builds on the advantages and structures of traditional commerce by adding the flexibility offered by electronic networks. By operating with digital information in electronic networks, Electronic Commerce brings with it some new opportunities for conducting commercial activities. For example, by using digital information for commercial activities, electronic commerce makes it easier for different groups to corporate. The group could be departments sharing information within a company to plan a marketing campaign, companies working together to design and build new products or offer new services, or businesses sharing information with their customers to improve customer relations. It improves accuracy of information and reduces possible error to approximately 92% via less human intervention, as it needs less paper work, less data entry, and less duplicity [Forrester Research, 1997].

The summarizes of the major benefits of E-Commerce are as below:

- Improve customer service,
- Improve the accuracy or reliability of information,
- Rapid turnaround times,
- Elimination of paper documents and printed publications,
- Reduced manpower and cost such as travel cost, work force cost and system maintenance or enhancement cost,
- Increased competition among sellers,
- Increased knowledge among consumers,

- Reduced need for inventories,
- Enable easier access to information,
- Increase the flexibility of information requests,
- Increase customer relation,
- Increase volume of information output,
- Increase return on financial assets,
- Speed up transactions or shorten products cycles.

2.2.4 Electronic Commerce vs. Traditional Commerce

If we compare the traditional way of doing business to Electronic Commerce, many of the steps are the same but the way that information is obtained and transferred along the cycle is different. Many different media were needed in the traditional method, making coordination more difficult, and increasing the time required to process the order. But with Electronic commerce, everything starts out and stays digital; only different application are needed to transfer and process the data as it winds its way though the order process.

The below figure shows the differences of the new and old way of purchasing an item:

Sales Cycle Step	Traditional Commerce	Electronic Commerce
Acquire product information	Magazines, flyers, online catalogs	Web pages
Request item	Printed forms, letters	Email
Check catalogs, prices	Catalogs	Online catalogs
Check product availability and confirm price	Phone, fax	
Generate order	Printed form	Email, web pages

Send order (buyer); Receive order (supplier);	Fax, mail	Email, EDI (Electronic Data Interchange)
Check Inventory at warehouse	Printed form, phone, fax	Online database
Schedule delivery	Printed form	Email, online database
Generate invoice	Printed form	Online database
Confirm receipt	Printed form	Email
Send invoice (supplier); Receive invoice (buyer)	Mail	Email
Schedule payment	Printed form	EDI, online database
Send payment (buyer)	Mail	EDI

Table 2.1: The Differences of New and Old Ways of Purchasing An Item

2.2.5 The Deficiencies and Risks of Electronic Commerce

The web also comes to a number of important deficiencies and risks in marketing communications. For the supply side, firm risks and deficiencies arise primarily from the structural characteristics of the medium and are associated with web technology and the interactive nature of the medium. These included

i. The changing of business environment and technology

A more extensive involvement business in electronic commerce will be able to incorporate electronic commerce in purchasing, financial, and accounting systems.

ii. The privacy and security problem

Many users do not trust the web as a payment channel. The payers need assurance that their credit card number will not be used for malicious purpose while the sales person need to assure that the card owner will not deny the acquisition.

iii. The legal questions and public-social policies

There are number of questions arise in marketing through the web: validity of an electronic signature, non-reputability, legality of an electronic contract, risk, trademark and copyright violations, loss of right to trademarks, loss of right to trade secrets and liability. Besides, there are also governments' soles, regulations, economics policies and censorship.

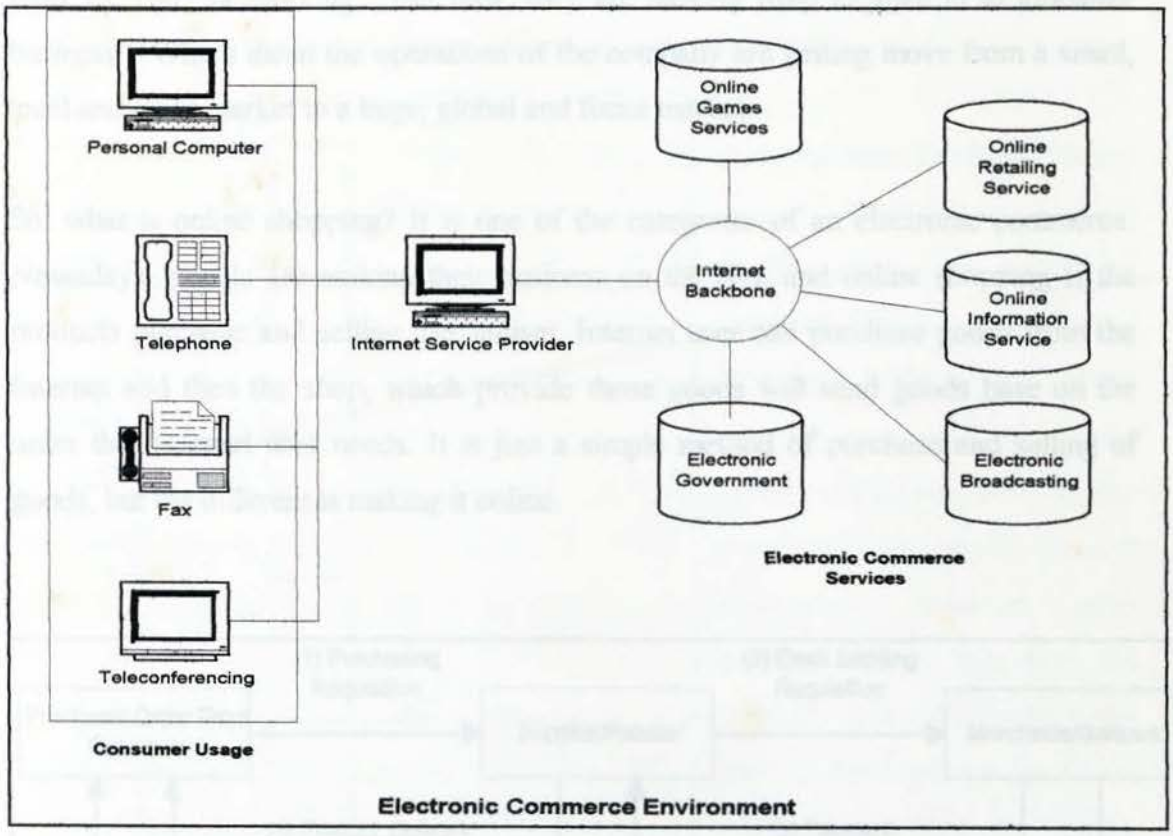

Figure 2.1: The Electronic Commerce Environment

2.3 ONLINE SHOPPING SYSTEM

2.3.1 Introduction

Nowadays, "online" is very popular in used by most of the companies. Past years, most of the companies are moving their company operating from manual to computerize, then from computerize system, which like those standalone PC into what we call "networking". But now, they are moving from localize in to globalize business". Which mean the operations of the company are getting move from a small, local and mass market to a huge, global and focus market.

So, what is online shopping? It is one of the categories of an electronic commerce. Nowadays, people are making their business on the Net, and online shopping is the products purchase and selling mechanism. Internet user can purchase goods from the Internet and then the shop, which provide those goods will send goods base on the order that Internet user needs. It is just a simple method of purchase and selling of goods, but the different is making it online.

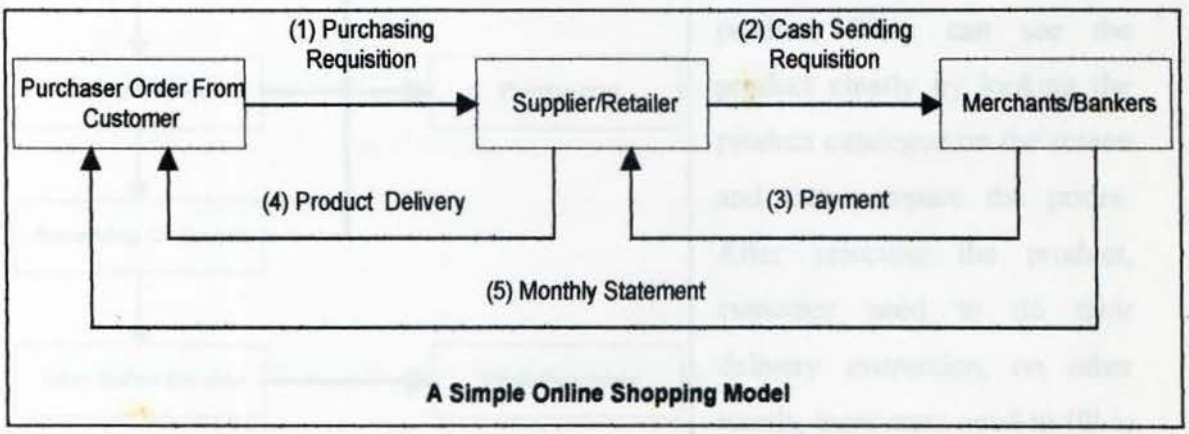

Figure 2.2: A Simple Online Shopping Model

2.3.2 Consumer Perception of Business Operation Model

Consumers always prefer those retailers can provide cheap, valuable, convenience and high quality products. Besides that they also prefer to have good service provide by retailers. In order to know how exact to match with those customer prospective, we need to have a clearly idea on how consumer perception on this business.

On the consumer perception, it has been separated into three phases, which is pre-purchase decision phase, purchasing phase and post-purchase phase.

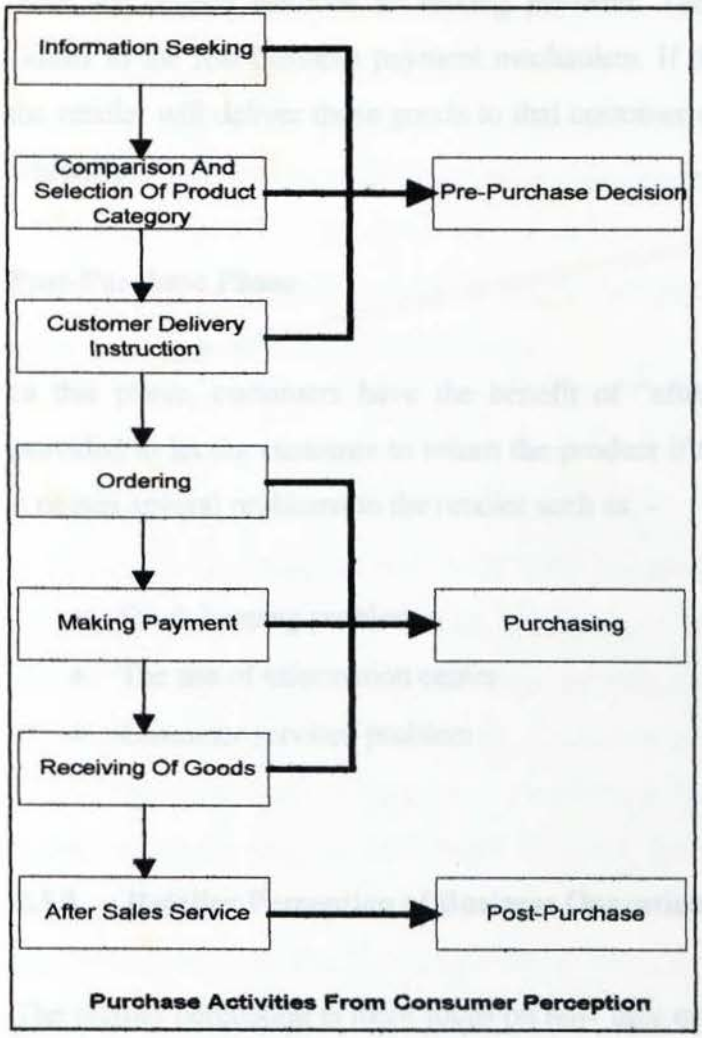

Figure 2.3: Purchase Activities From Consumer Perception.

Pre-Purchase Decision Phase

In this phase, the customers need to browse through the Internet in order to seek for the product their need. They can select their needs base on the product category and comparison between each product. They can see the product clearly by looking the product catalogue on the screen and can compare the prices. After selecting the product, customer need to do their delivery instruction, on other words, customers need to fill in the delivery form to let the

Purchasing Phase

After the pre-purchase phase, which mean customer have finished selecting, now is the time for them to place the order. The pre-purchase decision phase is like those who shop at real supermarket, they put the products they need on the basket or cart, but they still can make decision whether they want to pay for it or not. So, customers will decide to place order now or not.

After placing order, they need to make payment to this retailer. On online shopping, there are several methods to making payment. The payments at Internet are quite similar to the real business payment mechanism. If the payment has been made, then the retailer will deliver those goods to that customer or the recipient who the customer wishes to.

Post-Purchase Phase

In this phase, customers have the benefit of "after sales service". This service is provided to let the customer to return the product if the product has any problem. But it causes several problems to the retailer such as: -

- Stock keeping problem
- The use of information center
- Customer services problem

2.3.3 Retailer Perception of Business Operation Model

The retailer perception is more focus on how they operate their business. In a tradition way, the retailer get the purchase order from the customer then they deliver those goods base on the purchase order and deliver them to customer. For most of the retailer, they are trying to achieve: -

- Low cost of business operation.
- Balancing of services.
- Important to customer feedback and improve of services.

Concerning online shopping model, these objectives are very difficult to be achieved because most of the operation method in online are not flexible. For example, the communication between customer and sales people is really not existed and any direct feedback or direct customer satisfaction is hardly to capture during the dealing of business. Besides that, the biggest problem is because of product and service quality is not same as compared with tradition way. The tradition way is more focus on the sales of products. And at online shopping, in order to retain the competition of product selling, so the operation of business, which start from customer order until product deliver must be balance and make the customer satisfy the customer.

In this business operation model, it is also categorize into three phases, in order to easily identify what retailer perception is.

Pre-Purchase Phase

In this phase, first thing we talk about is the identifying of business operation. Most of the retailer must concern how they operate their business in the sense of hiring of people, the capital issues, and the stock keeping and control issues. This will affect their business if they not plan it well. Then they need to advertise the product they selling, "no advertise, no customer". How can a customer know what a company is selling without selling or introduced to them? So on online mechanism, there are several ways to advertise the products, such as advertise on web pages, sending of electronic mail, and direct selling method like TV, magazine and others. The most importing is to attract customer, and customer can make their order on the net.

So when customers inquire about the product, they can go for online shopping. They make order also can base on the online shopping mechanism.

Goods Purchasing Phase

Most of the retailer they order those product directly from the vendors because one of the objective of online shopping is to reduce the keeping of stock. In order to achieve this, most of the retailer trying to order the stock when customers are needed. Besides of reduce of stock keeping, also can reduce of operation cost, and the used of space.

When the retailer receives customer orders, first thing is to prioritize of the order, because, in some cases, the customer might need to product urgently or some of the product can't be hold for a long time such as foods, flowers, drinks and others. In order to satisfy the customer, this is the best way to serve them. Then is to order the product from the vendors and waiting the product arrived. After the product arrived, now is the time to deliver to customer.

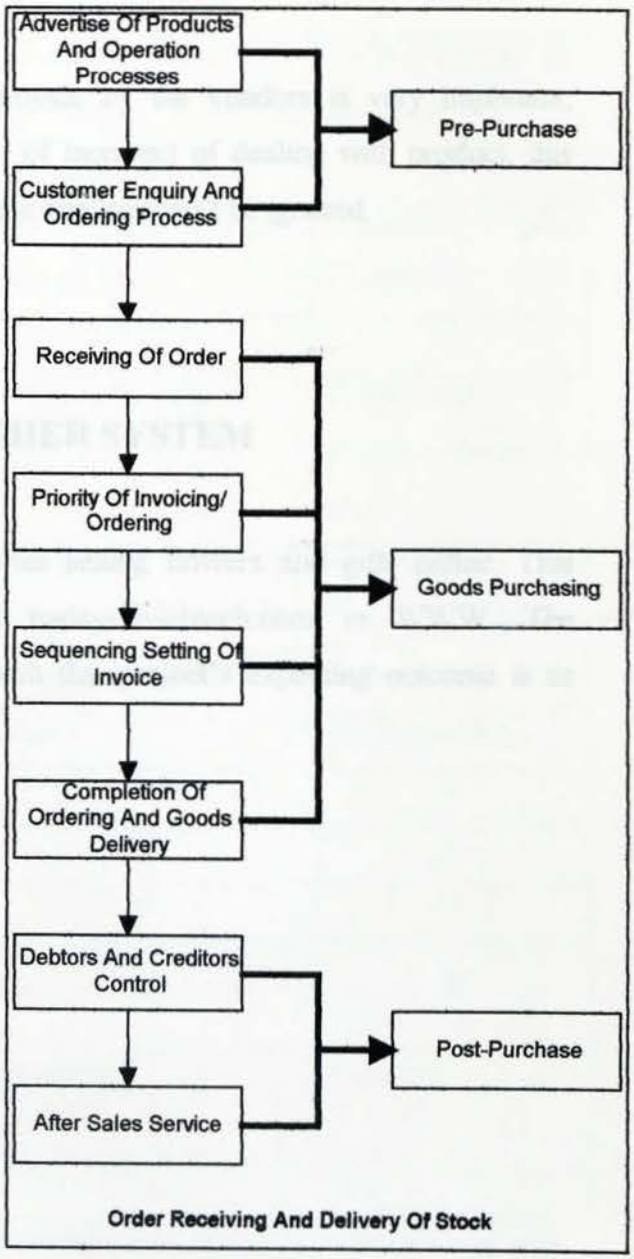

Figure 2.4: Process Order Activities From Retailer Perspective.

Post-Purchase Phase

After the products were delivered, retailer need to keep track of accounts, which dealing with the purchasing and selling of products. This is very important because it

is the way to let them know whether they have made any profit or loss. Mostly this is the job for account and financing department for the company.

Finally, the after sales service, which provide by the vendors is very important, because if there have any broken product of incorrect of dealing with product, this must be solve it faster and smoothly. So these services can't be ignored.

2.4 COMPARISON WITH OTHER SYSTEM

This section review other related web sites selling flowers and gifts online. This project reviewed MyFlowers.com and malaysiawebtech.com in WWW. The comparison among the three web sites with this project's expecting outcome is as below:

Functions	MyFlowers.com	Malaysiawebtech.com	My E-Florist
Registration	√	√	√
Sign In	√	√	√
Search	X	Advance search by keyword, occasion, category and price.	Simple search by keyword
Web page design	Attractive, user friendly	Not attractive, less user friendly	Attractive, user friendly
Shopping cart	X	√	√
Payment method	Credit card	Credit card, money order or check	Credit card, money order or check
Order process	1 step	4 steps (receiver, sender, payment and confirm order)	4 steps (receiver, sender, payment and confirm order)
E-Card	√	√	X
Reminder	√	√	X
Help file	√	√	√
Customer service form	X	√	√
Delivery area	Includes Malaysia, Taiwan, Hong Kong ……	Malaysia	Malaysia

Table 2.2: The comparison between MyFlowers.com, malaysiawebtech.com and My E-Florist.com.my

After reviewing the three web sites, the expected outcome was outlined. My E-Florist was based on the advantages and disadvantages of the two well-known commercial web sites in WWW.

2.4.1 Analysis

Some of the common characteristics of the e-commerce sites mentioned above are:

- Registration

  Allow users to register as a member of the shop where they will gain a specific login name and password. This is to store shopper/buyer information for recurring purchases, information recall, special promotion to registered users and administrative bookkeeping.

- Sign In

  Users use their login name and password to login to the system, where they can then review and update their personal information. They are also offered to some special discount or promotion that specific for registered member only. For some e-commerce sites, they only allow registered users to make order. But My E-Florist allows both registered and non-registered users to make order.

- Browsing capability

  Browsing capability means allows users to browse through the web pages or products according to its category.

- Shopping cart

  The defining characteristic of a shopping cart script is that it preserves state throughout the shopping experience. The user enters the site is given some unique token (often called a cookie). It can retain the contents of a cart, compute total price, shipping and others. Each time the user sends a request to the server, the script passes the cookie along so the server knows which client is calling.

- Search engine

  Allows user to search a particular product without browsing through the whole website by just entering keywords.

- Capturing Order Information
  The information associated with each item in the order should be collected when users put the items into shopping cart. In the simplest case, the only information to collect is what the user want.

- Allowing users to review and modify the order
  Users will want to look at the contents of the shopping cart from time to time. They will want to see the total cost of the order, including any additional charges such as shipping cost. Users also may want to change the quantity of an item ordered including deleting the item.

- Multiple payment type
  Users have a choice of payment whether through credit card or manually (money order, check or post).

- Help file and customer service
  This section is to help user or guide them in ordering or browsing/search. It also provides a section for customer service for those who want to contact the store or who want to make complain or having difficulties in order.

2.5 SECURITY

2.5.1 Type Of Securities

Internet security means not only keeping unauthorized users from reading, changing and deleting information of a database of company's data published on the net. This also means keeping hackers and intruders away from data interception.

HTTP, which stands for Hypertext Transfer Protocol, is what allows the World Wide Web to communicate. Since HTTP is so flexible and popular, many companies are

trying to use HTTP to transfer sensitive data. Examples of this data would be credit card numbers, purchase order numbers, or confidential data, such as personnel records.

Unfortunately, HTTP is not a secure protocol, therefore it is prone to different attacks such as data tapping, IP spoofing and data interception. In order to make HTTP safe enough for confidential traffic to pass over a network, a means of encrypting and authenticating data connections is required. Below are the security elements in electronic commerce.

i. System Security

This type of security is built into a personal computer or just a system only. And system security is used to control access to resources such as files, program, data and others, which located on a server or back end system. In order to access to these resources, people need ID, which like a key to access to those resources. Based on ID, system administer can assign the resources to people. This will make the system more secure because not all people can access all the resources. And also for office employee can base on their ID to have the correct service that the system provides.

Here is the scenario of system security: - In a Unix system, system administer assign student to access to several resources only, and himself can fully access to all the resources in that Unix machine. Student can access to those resources likes programming application, few of the system command and some of the Unix application. This is the control of resources to reduce the dangerous of student to hack or playing around of those resources. And it is good in term of locking those important resources out of student.

ii. Network Security

Network security provides protection against attackers who try to access information or gain control over machines or resources within a private network. The most way to protect private networks that are connected to the Internet from attacks is with firewalls.

Firewalls are single points of connection between a private and public network that allow communications between them to be monitored and secured. Firewalls differ in their implementation and the degree of protection they offer. Here are some of the elements that can support by the firewalls:

- Secure IP Tunnels

  Secure IP tunnels use an encapsulation scheme to insert IP packets and their headers into encrypted IP packets. IP tunnels let administrators set security policy without requiring users to get involved. With IP tunnels, the firewall at the sending end of the tunnel encloses the sender's information into encrypted packets and sends the packets to the receiving firewall. The receiving firewall removes the encapsulation. The path between firewall forms a secure "tunnel" through the Internet. The firewall administrators determine the levels of protection and the types of information protected at the IP address and port level. Obviously, the ends of the tunnel have to agree, or the packets will be unintelligible and discarded. Secure IP tunnels are an effective way to implement a security policy between a reasonable number of homogenous firewalls.

- IP Filters

  IP filters allow or deny IP packets flowing between the private (secure) network interface and the public (non-secure) network interface. IP filters can be used to restrict traffic to a known set of users and applications. With filtering, packets can be allowed to pass or be discarded based on source or destination IP addresses, direction of flow, source or destination TCP or UDP (user datagram protocol) port, type of IP protocol, and whether the packet is

coming from or going to the firewall or being routed through the firewall. IP filtering is the basic protection mechanism for the firewall. While it is not by itself totally sufficient, IP filtering provides the infrastructure on which the other implementations are built. Attackers commonly try to attack routing tables to learn more about the site or to eavesdrop or masquerade as an authorized user. Using filtering, SNG can protect against common attacks on routing tables.

- Proxy Servers

  Proxy servers are used to control access to or from the private network relaying only acceptable communications from known users. Users in the private network can access an application (like FTP) in the proxy server. Users authenticate themselves to the proxy server and can then access the application on the desired machine in the public network. SNG proxy servers can also be used from the public network to access applications in the private network, but this exposes login names and passwords to attackers in the public network. SNG Proxy services include TELNET and FTP (FTP is not available from the public network).

- Secured services, like the Domain Name Service or mail handling

  Running the Domain Name Server on the SNG firewall hides private network hosts from the non-secure world and prevents name resolution requests from flowing across the gateway uncontrolled. SNG also provides a simplified send mail daemon that acts as a mail relay.

  When administrators define a SNG Domain Name Service, they can also specify a secure network mail gateway. Only the SNG mail server is advertised outside the private network. The SNG mail gateway can forward mail to a standard mail gateway within the private network, providing the best of both worlds: full-function mail services within the private network with a secure mail interface to the public network.

iii. Transaction Security

Transaction security refers to the secure of data transfer through the Internet to conduct a transaction privately and with authentication. It required the transaction could be secure with digital signatures. Digital signatures refer to the messages that send through and received by the receiver must be proved by the sender to say that it is the correct message that send by him.

What type of transaction that needs to be secured? The following security facilities are necessary to be secured:

- Message confidentiality

  The message content is private and not allows other flow through the Internet during the message is sent. Encryption is used to ensure that the message content is confidential, and no one can decrypt unless the receiver decrypts it.

- The information exchange requires integrity

  It means that your messages are not altered as they flow from end-point to end-point. You can be assured that the message received is the same as the message you sent.

- Both sender and receiver require accountability

  The sender and receiver agree that they took part in the exchange. The receiver knows that the sender signed the contract and the receiver cannot deny that he received the contract. Digital signatures assure accountability providing proof of origin and proof of receipt.

- Authentication is required

  The receiver must not only trust that the contract was signed, but that it was signed y the proper person. The sender also knows who the receiver is, and not the one he doesn't knows. Authentication ensures that someone is who he or she is.

2.5.2 Security Elements

There are several elements that used on the security purpose. Without those element, the online security won't be succeeded be implemented. Those elements are:

- Authentication

  It is the process that to verifying the identity of the party at the other end of your Internet connection. Server authentication allows the client to verify that they are communicating directly with bank and not another third party. Client Authentication is the process that the server (bank) verifies the identity of the client. In order to proceeds authentication Certificate Authority is being used, which is possible to identify the identity of both parties.

- Certificate Authority (CA) and Digital Certificates

  Digital certificates are like electronic identification cards. Digital certificates consist of:

  i. A person's public key
  ii. Name and address information, also known as their Distinguished Name
  iii. The issue data and expiration date
  iv. The digital signature of a certifying authority or CA

  The certificate authority's send their public key and their Distinguished name to customers' web browser or server. With these public key and distinguished name, it allows customer to verify the certificate authority's signature in the certificate.

  In CA, it consists of Secure Socket Layer (SSL) And Secure Electronic Transaction (SET). Without these two elements, the Certificate Authority won't be existed.

- Encryption

  Encryption is the transformation of data into a format that can be safely transmitted, without certain key or rules, no one can easily intercepting and

reading the message. Once encrypted, data must be decrypted using the decryption key. The keys used for encryption and decryption are usually kept secret to further ensure privacy.

- HTTPS

  HTTP stands for HyperText Transport Protocol. And HTTPS is HTTP that running under Netscape's Secure Sockets Layer, SSL. By using HTTPS, messages which transfer will be secured and safe.

- Public key Cryptography

  It is a technique that uses a pair of keys, one public (distributed), one private (secret) for encryption and decryption. The public key is used to encrypt and verify data; the private key is used to decrypt and sign data. Data encrypted with a public key can only be decrypted with the corresponding private key; data encrypted with a private key can only be decrypted with the corresponding public key.

- Session Key

  A session key is an encryption code that is used to protect data as it travels across the Internet. It is called a session key because it is generated at the beginning of a communications session for use during that specific transaction.

- Secure Electronic Transaction (SET)

  SET system is formed by VISA, MasterCard and IBM company, which corporate together to establish the Internet security system especially used in electronic commerce. SET is using the new encrypting technology, so it provides safety and reliable payment system on the net. Because of this reason, it is widely used for online business, for example, online shopping.

  SET involves four responsible units, cardholder, SET Companies, Certification Authority Company and business units.

i. Cardholder

Those customers contain VISA or MasterCard can purchase products on the net.

ii. SET Companies

VISA, MasterCard and IBM Company, which is the units to implement this system.

iii. Business Units

Business units involve retailer, banker, online bookshop, online shopping mall, online ticketing and so on. Those units are responsible to make business on the net.

iv. Certification Authority Company

It is the companies that provide "Digital Certificate" to those business units. The purpose of it is to prove whether the business units are legal existing or not. It allows customer to have confidant to purchase product on net and can allow them to verify that particular company base on the certificate. Base on this certification, secure transaction and data transmission is provided.

- Secure Socket Layer (SSL)

SSL allows important information, such as credit card numbers, to be transferred securely. By incorporating SSL into your site, customers will feel more secure ordering products and services. It is a program later created by Netscape for managing the security of message transmissions in a network. It uses the public key cryptography method, encryption method and also includes digital certification (Please refers to above category).

This is handled by using a secure protocol to transfer information between the server and client. There are currently two popular secure protocol in use.

2.6 ELECTRONIC PAYMENT SYSTEM

An electronic payment system is needed for compensation for information, goods and services provided through the Internet such as access to copyright materials, database searches or consumption of system resources. It is also needed as a convenient form of payment for external goods and services such as merchandise and services provided outside the Internet. It helps to automate sales activities, extends the potential number of customers and may reduce the amount of paperwork.

Arguably the most important part of electronic commerce occurs when buyers part with their money. Not only do buyers have to decide they want merchandise (an issue in all forms of commerce), they need to have confidence that the money they pour into the Internet will actually come out the other end to the merchant and not be stolen or lost along the way. Buyers also have to have confidence that merchant is reputable and will deliver the goods as promised. When a credit card number is passed over the opened net, they are likely to be picked up by thieves. In fact, the information is vulnerable in at least four ways:

- Over the phone line
- On the net itself
- At the merchant's server
- In the merchant's organization

Some visitors are concerned about more than the loss of their credit card information. They suspect that the merchant, the financial institution, or even a third party with a packet snuffer might track their purchases and use the information in ways they did not intend.

Therefore, the requirements for a payment method scheme are:

i. **Security**

Payment systems are very likely to become a target for criminal attacks. Therefore the web page where the user input the credit card number is usually encrypted using the Secure Socket Layer (SSL) technique so that someone trying to interrupt the data will get scrambled info instead.

ii. **Flexibility**

Different models for different situations (anonymity, accountability, risk).

iii. **Computational efficiency**

Support for micropayment; per-transaction cost must be small enough so that they are insignificant.

Fundamentally, the major reason for developing an Electronic Payment System is that it provides organization and consumer a means of integrating individual commercial services into an electronic marketplace. Most models of the Electronic Payment System and schemes can be categorized as follow:

i. Third party-based system

Use third parties to establish trust between the 2 negotiating parties, by providing authorization for both parties. Example:

- Electronic cheques based system (Netcheque, 1996)
- Electronic clearing house based system (First Virtual Holding, 1994)
- CyberCash (1996)

ii. Card based system

The direct use of credit card/debit card access the Internet. Two main card based Internet payment systems are:

- Credit card (Mastercard, 1995, Visa, 1996, etc.)
- Smart card (Mondex Card, 1996)

iii. Secure web server based system

Both consumer and merchants use the same web server, which is supported by a security protocol for transfer and funds. Well-known security protocol are Secure HyperText Transfer Protocol (SHTTP) and Secure Socket Layer. Example is Netmarket (1994).

iv. Electronic token based system

Example:

- Digicash (E-cash) (1994)
- Payme Protocol Set (1995)

v. Financial EDI based system

Electronic Data Interchange (EDI) is the computer exchange of business documents between organizations in standardized format. Financial EDI involves the electronic exchange of financial documents such as payment and remittance advice standard format which computer can read. Example is: CommerceNet (1996)

i. Micropayment based system

Micropayment are small value transaction and comprise the majority of payment on the Internet at present. Item purchased can cost fraction of a cent or less than a dollar in value. Because of the high transaction fees, only the few payment method can actually support micropayment. Example is Milicent (1996).

2.6.1 Credit Card Payment

Another type of payment that used on the E-commerce is credit card payment. It is quite common to be used because most of the people already have credit card. When a customer need to used credit card to pay for their orders, several stages will go through:

1. Customer needs to show his personal information.
2. Retailer validates customer card.

3. Retailer bases on the information that gives by the customer, as the card center to handle the transaction.
4. Card center will inform the customer-related bank to make the payment.
5. Bank will validate the customer information and give permission to retailer, which mean the card is validated and transaction is allowed.

During the process time, customer and that company, each of them will have one private key and one public key to ensure the security purpose. Public key will send to card center and private key will be used to generate new encrypt number. In somebody still the card and he need to use it, without the customer password, he can't used it. The card center will base on the customer information and the amount that needed and enclose both validated details with the private key. All the detail will be sent to the bank and bank will use the public key the decrypt the information and transfer the amount to that company's account.

In this case, non-of them can modify the information. And during the process, customer can't disagree anymore because during the time he press the password, which mean he agree for the process and the company also can't cheat because they don't have the customer's password. They also can't make the transaction twice because the information encloses with the dealing time and date.

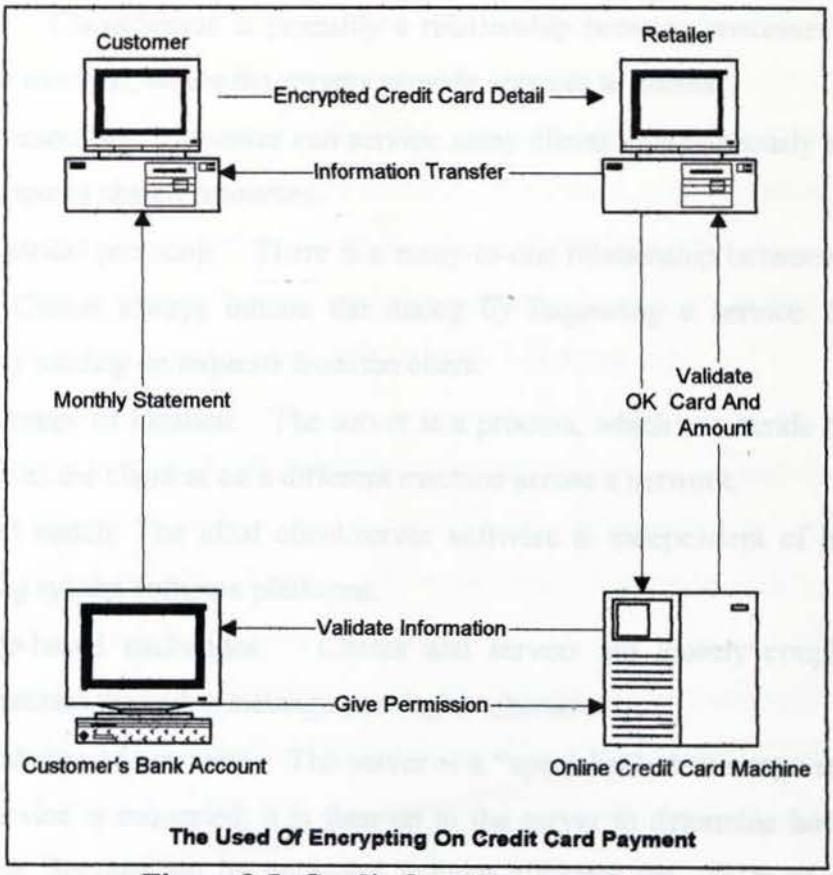

Figure 2.5: Credit Card Payment System

2.7 CLIENT/SERVER SYSTEM (CSS)

An increasingly common network application is a client/server system. A client/server system is a type of network that connects a user's computer (called a client) to one or more host computers (servers). A client often a personal computer, it requests services from the server, shares processing tasks with the server, and displays the results of the processing tasks. Servers can be computers of all sizes; they store both application programs and data files, and are equipped with network operating software to manage the activities of the network.

2.7.1 Characteristic of Client/Server System

A client/server system may have the following distinguishing characteristics:

- Service: Client/Server is primarily a relationship between processes running on separate machine, where the servers provide services to clients.
- Shared resources: A server can service many clients simultaneously and regulate their access to shared resources.
- Asymmetrical protocols: There is a many-to-one relationship between clients and server. Clients always initiate the dialog by requesting a service. Servers are passively waiting on requests from the client.
- Transparency of location: The server is a process, which can reside on the same machine as the client or on a different machine across a network.
- Mix and match: The ideal client/server software is independent of hardware or operating system software platforms.
- Message-based exchanges: Clients and servers are loosely coupled system, which interact through a message-passing mechanism.
- Encapsulation of services: The server is a "specialist". A message tells a server what service is requested; it is then up to the server to determine how to get the job done. Servers can be upgraded without affecting the clients as long as the published message interface is not changed.
- Scalability: Client/Server systems can be scaled horizontally or vertically. Horizontal scaling means adding or removing client workstations with only a slight performance impact. Vertical scaling means migrating to a larger and faster server machine or multiservers.
- Integrity: The server code and server data is centrally maintained, which results in cheaper maintenance and the guarding of shared data integrity. At the same time, the clients remain personal and independent.

2.7.2 Server-side and Client-side Scripting

A script is software that is invoked by the server via this interface. It need not be a stand-alone program, but could be a dynamically loaded or shared library or even a subroutine in the server.

2.7.2.1 Server-side Script

The primary reason to use server side script is to automate what would otherwise be a manual and probably time-consuming process. The reader gets simplicity, automated responses to input, easy ways to make submissions, and fast ways to conduct searches. Server-side scripts enable user to automatically process orders, queries and much more. Server-side scripts are used to do the following tasks:

- Process input, typically search strings, and output a document containing the results of the search
- Validate user identification and password information and grant readers access to restricts areas of the Web site
- Process input from image maps and direct the reader to associated documents
- Add the reader's feedback or survey responses to a database or index
- Track visitors to Web pages and post continually updated numbers to the Web page as it is accessed
- Generate documents based on the type of browser the reader is using
- Perform post-submission processing and possibly output results for the reader

Examples of server side script are Common Gateway (CGI) and Active Server Page (ASP).

2.7.2.1.1 How Server-side Scripts Works

Server side scripts are used to process input submitted by readers of your web publications. The input usually consists of environment variables that web server passes to the server-side script. Environment variables describe the information being passed, such as the version of ASP used on the server, the type of data, the size data, and other important information. Server-side scripts can also receive command-line arguments and standard input. To execute a ASP script, the script must exist on the

server that is reference to. User should posses a server that is both capable of executing gateway scripts and configures to handle the type of script you plan to use.

Basically, there any transaction between a client and server has many parts. These parts can be broken down into nine steps as follows:

i. The client passes input to a server.
ii. The server sets environment variables pertaining to input.
iii. The server passes input as variables to the named ASP script.
iv. The server passes command line input or a standard input stream to the ASP script if one is present.
v. The script processes the input.
vi. The script returns output to the server. This output always contains a qualified header and contains a body if additional data is present.
vii. The server sets environment variables pertaining to output.
viii. The server passes output to the client.
ix. The client processes input from the server.

2.7.2.2 Client-side Scripting

One clear way to extend the power of the HTTP protocol is by increasing the processing power of the client. If the client's web browser was able to interpret logical instructions (program code) as well as render HTML, for example, such tasks as form input validation might be accomplished on the client side without a roundtrip to the server. This is quite a bit different than the CGI paradigm, whereby any client data submission must travel to the server, which then spawns a CGI process to handle the client data. If the client can interpret program instructions and execute logic local to the client machine, the server load can be lessened and the overall flow of data from client to server made more efficient. The program code is embedded in the HTML masquerading as a comment, hopefully so that noncompliant browsers will ignore the code altogether. Both Netscape Communication Corporation, with its

JavaScript product, and Microsoft, with its VBScript product, offer this type of HTML extension.

2.7.2.2.1 Why Use Client-side Script

Creative use of server-side scripts (which run on web servers) has made it possible to create more interesting and effective interactive sites, but some applications really demand programs or script that are executed by the client.

One of the reasons client-side script was developed was to provide web authors a way to write small scripts that would execute on the users' browser instead of on the server. For example, an application that collects data from a form and then posts it to the server can validate the data for completeness and correctness before sending it to the server. This can greatly improve the performance of the browsing session, because users don't have to send data to the server until it's been verifies as correct. It also helps to reduce network bandwidth, either over the Internet or an Intranet, by performing data checks locally and not sending it to a server until it has been verified to be correct.

2.8 TECHNOLOGY CONSIDERATION

Before developing My E-Florist, several key technologies were considered to be used in the implementation. This section describes briefly each of the technologies that were brought into consideration for use.

2.8.1 Operating System Server

2.8.1.1 Windows NT Server 4.0

Windows NT is a relatively new operating system. Microsoft is committed to making it transcend the 20th century. Currently, Microsoft is engaging into two Windows NT products: Windows NT Workstation and Windows NT Server.

Windows NT Server is designed to run high-end engineering or mission-critical client/server applications. It also come with additional packages such as network monitor tool, TCP/IP server services, Internet Information Server (IIS), and more – is targeted at the enterprise network operating system market.

Windows NT Server is a multitasking and multi-user operating system that plays a dynamic role in the information age. It has the following important features:

- It can run different applications simultaneously. Windows NT native applications are the 32-bit Win32 applications. Win32 provides Windows NT Server with power, robustness and speed.
- It is a portable operating system that can be run on computers with various types of CPUs, such as Intel's x86, IBM/Motorola's PowerPC, and DEC's Alpha or MIPS.
- It is a secure operating system supporting integrated C2-level security. It also supports computers with multiple CPUs, which enables developers to run more tasks simultaneously in a shorter period of time.

- Its built-in networking protocols and services are completely 32-bit. They consist of TCP/IP for the Internet, dial-up networking, NetBEUI, peer-to-peer networking, and client services for NetWare.

- Windows NT Server is the most complete platform available for building and hosting web-based applications, and the easiest server operating system available. It's flexible and compatible that can reduce hardware and software costs. It is also reliable and easy to manage.

2.8.1.2 UNIX

UNIX is a multi-task operating system. It originates in the early 70's and is currently the most popular operating system found on multi user installations. In fact most of the Internet is stored on UNIX based computers. UNIX exists in several different 'flavors' (three different types of UNIX may be running currently in the department), but currently moves are being made to standardize UNIX (The ongoing work on POSIX, an international standard UNIX, is influencing this movement). UNIX is an ideal platform for running mail servers, networked files systems and so on, often at very low cost. UNIX users normally share processing time on a central computer, or cluster of computers. Often they will be sitting at a low-cost terminal or a local PC, their programs being executed remotely. This is a very cheap solution for a large number of users. UNIX can also be run on Personal Computers, there are an ever-growing number of people using UNIX or UNIX like operating systems such as Linux on PC's.

It must be said that over the past few years others operating systems such as Windows NT have gained a lot of ground in areas that have traditionally relied on UNIX systems, UNIX however will still be around for the foreseeable future. This is not only because there is a large dependency on legacy software, or because technicians and hackers enjoy using it, but also because there are some situations where UNIX is still suited to user requirements. UNIX is used for

- Sending and receiving e-mail, forwarding mail, redirecting mail, mapping a particular mail group to a list of specific users.
- Storing files, including users personal files as well as publicly accessible software achieves.
- Managing centralized databases, serving information to users remotely e.g. Ingres, Oracle, etc.
- Running a web server, storing web pages. The UNIX machines are normally left on 24 hours a day.
- Implementing Shared network file systems – although all user files may be stored on a single fixed disk connected to one particular computer. The files can still be accessed in a completely transparent way from any UNIX machine within the local network.
- Teaching – UNIX provides an environment for the controlled management of modules and courses, e.g. Project work can be collected by simply copying files, information and help can be mailed to specific groups, or placed on the World Wide Web, user quotes can be set.
- The Common Gateway Interface (CGI) – CGI scripts can be set up so that programs on our machine can be executed across the World Wide Web, this allows information services to be provided in real time.
- Remote services – Computers running UNIX normally support certain remote services, allowing users to request information from the computer without actually logging in. A good example of this is the 'remote finger' command.
- Software Development – All UNIX systems have a C compiler, and many other languages are available as well, e.g. Perl, Common Lisp, Prolog and FORTRAN.
- Computational Mathematics – Under UNIX, it is very easy to set up computational jobs, that will be run overnight, or for many days. Output can be written to a file and viewed at a later time.

2.8.2 Web Server

2.8.2.1 Internet Information Server

Currently, there are many available web servers running at the Windows NT platform, for examples, Netscape FastTrack, Novell Netware, Internet Information Server (IIS) and so on.

Microsoft Internet Information Server is an Internet file and application server included with the Microsoft Windows NT Server operating system. IIS can be used alone as a web server, or in conjunction with compatible technologies to set up

Internet commerce, to access and manipulate data from a variety of data sources, and to build web applications that take advantage of server script and component code to deliver client-server functionality.

Because of its integration with Windows NT Server, IIS guarantees the network administrator and application developer the same security, networking, and administration functionality as Windows NT Server. Above and beyond its use of familiar Windows NT Server tools and functionality, IIS also has built-in capabilities to help administrator secure web sites, and to develop and deploy server-intensive web applications.

Integration with the Windows NT Server Operating System

IIS is an integrated service of the network operating system that:

i. Does not cost extra.
ii. Uses the Windows NT Server user directory so user information is available to every server.
iii. Uses file system security so user do not have to manage two sets of permissions.
iv. Integrates monitoring and management.
v. Offers the choice of Windows-based administration or HTML administration from any web browser.

vi. Provides high performance and scalability to handle any web site.

vii. Has superior price-to-performance over comparable UNIX system.

2.8.2.2 Allaire ColdFusion Server 4.0

ColdFusion Server is the deployment platform for delivering ColdFusion Web applications. Running as a multithreaded process with native support for load balancing and failover, ColdFusion Server provides a highly scalable foundation for high-volume, content-rich, transaction-intensive Web applications.

The benefits of using Coldfusion Server are as follow :

- Rapid Development - Develop and deliver complex applications quickly and easily with an intuitive programming environment and an easy-to-administer application server.
- Scalable Deployment - Deliver reliable, complex sites and applications with the multithread service architecture, load balancing, failover, and state-of-the-art application server technology, including JIT compiling and database connection caching.
- Open Integration - Incorporate the full range of Internet and enterprise technologies applications with ODBC; native database drivers; support for COM, CORBA, and EJB; as well as integration with other Web technologies.
- Complete Security - Control access to your servers for development and administration and use advanced security features to protect applications during runtime. Host multiple applications on the same server with Server Sandbox Security.

2.8.3 Programming Technologies and Languages

2.8.3.1 HyperText Markup Language (HTML)

In order to publish information for global distribution, a universally understood language is needed, a kind of publishing mother tongue that all computers may

potentially understand. The publishing language used by the World Wide Web is HTML.

HTML gives the following abilities to authors:

- Publish online documents with headings, text, tables, lists, photos, etc.
- Retrieve online information via hypertext links, at the click of a button.
- Design forms for conducting transactions with remote services, for use in searching for information, making reservations, ordering products, etc.
- Include spreadsheets, video clips, and other applications directly in their documents.

HTML was originally developed by Tim Berners-Lee while at CERN, and popularized by the Mosaic browser developed at NCSA. During the course of the 1990s, it has blossomed with the explosive growth of the web. During this time, HTML has been extended in a number of ways. Since the web depends on web page authors and vendor sharing the same conventions for HTML, this has motivated joint work on specifications for HTML.

In late 1994, HTML 2.0 was developed under the aegis of the Internet Engineering Task Force (IETF) to codify common practice. HTML+ (1993) and HTML 3.0 (1995) proposed much richer versions of HTML. Despite never receiving consensus in standards discussions, these drafts led to the adoption of a range of new features. The efforts of the World Wide Web Consortium' HTML Working Group to codify common practice in 1996 resulted in HTML 3.2 (January 1997).

Most people agree that HTML documents should work well across different browsers and platforms. By achieving interoperability, cost is lowered since content provides need to only develop one version of a document. If the effort is not made, there is much greater risk that the web will devolve into a proprietary world of incompatible formats, ultimately reducing the web's commercial potential for all participants.

Each version of HTML has attempted to reflect greater consensus among industry players so that the investment made by content providers will not be wasted and that their documents will not become unreadable in a short period of time. HTML has been developed with the vision that all manner of devices should be able to use information on the web: PC's with graphics displays of varying resolution and color depths, cellular telephones, hand held devices, devices for output and input, computers with high or low bandwidth, and so on.

2.8.3.2 Common Gateway Interface (CGI)

The Common Gateway Interface (CGI) was one of the first methods used to create dynamic HTML. CGI enables direct communications between the HTTP server and executable scripts. Programming in CGI provides a standard communication and processing mechanism between the requesting client browser, the gateway program, and the HTTP server. The CGI programs help to create a standard interface with the HTTP server to eliminate having to learn the specifies of HTTP.

CGI programs are usually written in a scripting language such as the Practical Extraction and Report Language or Perl. The early Perl Script were created to run in UNIX because the early HTTP servers only existed on the UNIX platform. However, with the emergence of HTTP servers for NT, the Internet Information Server supports Perl 5.0 scripts. To initiate CGI executable, simply reference the name of the executable scripts and pass any required parameters.

Benefits of Using CGI

- Platforms

  CGI runs on many UNIX platforms and Windows NT.

- CGI supports multilingual

  Some of the typical languages include

  i. C/C++

ii. Perl

iii. Tool Command Language (TCL)

iv. Any UNIX shell

v. Visual Basic

vi. AppleScript (scripting language for Apple Macintosh System 7)

Many people prefer to write CGI in a scripting language such as Perl or a shell rather than a compiled language. This is because scripts do not require compiling, which results in easier incremental development and debugging.

The programs to interpret the script and their environments usually take up less room on the server.

- Calling external library

  There are hundreds of modules, sample code, and complete applications available for any of the more common languages, especially Perl and C/C++. There are also libraries of routines for retrieving information stored by the daemon and returning information to the web daemon. Web daemons are programs that run in the background in the web server. They lie around, waiting to be useful. Web daemons can be used, not only on the Internet but also over a local network.

- Mature protocol

  Unlike any other evolving technologies, CGI is a relatively mature protocol. Most web servers use it (some with variations). Because of the explosion of the Internet, many people have experience with it on all types of platforms and servers.

Negative of Using CGI

i. Security issue

One of the biggest negative of using CGI for web programming is a security issue. Running a CGI program is like inviting the world to run a program on

your system; therefore, there are security considerations when using CGI programs. Because of the possibility of this abuse by CGI programs, most HTTP daemons limit the directories in which CGI programs reside. Most HTTP daemons require an identity number that limits the program's access to other parts of the system.

Hackers can take advantage of poorly protected host systems. CGI programs, therefore, should check data before passing it on. Hackers even breach security holes in some mail systems. Because CGI programs run entirely on the host

computer, they can be a drain on host and network resources. If the user receives a form on his browser and enters information, the information, in whatever state, is transmitted to the CGI program through the HTTP host, and the CGI program edits the information. If errors are found, the information returns over the network to the user for correction. Users edit on the host computer, forcing incorrect information transmit over the network before discovery.

ii. Resource drain and performance issues

When a Perl script is called on the web server, the web server treats the Perl script as a separate executable process. This executable program is not limited to just one script it can consist of multiple scripts running on separate machines. However, because the hosting server treats CGI applications as separate executable, a new process on the server is very expensive resource task and can cause significant resources drain and performance issues, especially when considering scalability issues as tour web sites and applications grow. Furthermore, CGI applications suffer from the inability to share information a cross applications. This is because each new CGI process is created within its own memory space and cannot dynamically share information with other memory spaces of other instantiated CGI programs.

2.8.3.3 Active Server Pages (ASP)

With the emergence of electronic commerce, many companies have invested millions of dollars to do business on Internet. Dell is one of the successful companies in converting the traditional personal computer industry to become online business using Active Server Pages or ASP.

Benefit of Using ASP

There are many benefits in using ASP. These benefits make ASP one of the most powerful tools available for developing sophisticated web applications.

i. Languages: ASP supports multilingual

Microsoft ASP currently supports two languages, VBScript and Jscript, and has a mechanism to support others like Perl script in short. ASP has more advantage as multilingual.

ii. Session Maintenance

The ability to save and retrieve variables per user session is one of the most important features of ASP. It is one of the big advantages this technology has over CGIs.

iii. Database Connectivity

ASP provides extensive database connectivity. Microsoft ASP connects to a database via Open Database Connectivity or ODBC. ASP technology pools the database connections for better performance and provide access to database cursors. Additionally, it provides for the execution of Structured Query Language or SQL statements and stored procedures. Through ODBC, it allows access to the database whose support ODBC protocol such as Microsoft Access and Microsoft SQL Server.

iv. Calling External Library

ASP enables server-side scripts to call an external library. ASP provides interfaces to C++, Visual Basic and Java.

v. ASP development is easy to learn

ASP adds a level of interactivity to a web site. All that is required taking advantages of ASP is familiarity with Visual Basic or a web scripting language such as JScript/JavaScript or VBScript. Because VBScript resembles BASIC in many ways, it is easy to learn even to a person who is new to programming. As for JScript, its syntax is very much familiar to the C/C++ syntax.

ASP development environment makes it easy to leverage existing investment. ASP helps leverage company investments to the Internet. Database features of ASP can be used to create a web interface to any ODBC compliant database such as Microsoft Office.

vi. ASP development environment makes it easy to leverage existing skills

ASP simplifies the lives of web application developers by providing a mechanism for creating sophisticated web applications using a familiar scripting language such as VBScript, JScript or Perl. This helps developers who have already invested resources in learning a scripting language such as VBScript, JScript or Perl.

vii. ASP development is compile free

Prior to ASP, the development of a typical interactive web application required the compilation of an application using a traditional application development environment such as Visual C++. After the application compiled, it is copied to the CGI directory of the web server. Even the slightest change to the application required a recompilation of the entire application (or a code module) and the replacement of the previous version of the executable file. This is unnecessarily resource intensive in a production environment. ASP solves this problem by providing a more direct and easier way to create web application. After an ASP application is developed, programmers do not have to compile it. Simply save the file with the .asp extension, and the ASP Dynamic Link Library or DDL will

process the file when a user requests it. Caching is used to enhance the performance of ASP.

viii. ASP environment is extensible

ASP is fully extensible, and is shipped with several built-in components that can be used for tasks such as allowing database access and creating rotating advertising banners. In addition to the built in ASP components, programmers a can develop their custom components using Visual Basic.

ix. ASP protects proprietary business algorithms and information

Unlike client-side scripting, ASP is capable to prevent proprietary business algorithms and information exposed by the user. As mentioned earlier, retailers do not have the interest to make this information public to its customer. When ASP is used, users no longer have access to proprietary business algorithms and information because ASP code executed on the server and only he output is sent to the user.

Microsoft ASP has a visual development environment for developing ASP applications. It includes wizards for database access and site management tools. The two well-known visual development environments are FrontPage and Visual InterDev. With these tools, it makes the development of the web application and the view of the whole development integration easier. Besides, Microsoft ASP also provides script-debugging feature, which shipped together with the Option Pack of Windows NT. Microsoft Debugger 1.0 can be used to debug pages built with ASP technology.

Negative using ASP

Microsoft ASP only runs on Windows 95 and NT platforms. Therefore, if the Internet/intranet platform is NT, ASP may be a perfect fit. However, if the Internet/intranet users other platforms like UNIX platforms, OS/2, or Novell, other choice like server-side JavaScript is the answer.

2.8.3.4 ColdFusion Markup Language (CFML)

The ColdFusion Markup Language (CFML) is a highly advanced tag-based, server scripting language for building Web applications. CFML uses a syntax that closely resembles HTML and XML, so it is ideally suited to programming applications that use these markup languages. For new developers, tag-based CFML syntax makes complex programming easy. Advanced developers will find more than 70 tags and 200 functions in CFML, as well as structured exception handling and integration with COM, CORBA, and EJB.

CFML is the most advanced server scripting language available for the Web. CFML provides a wide range of common programming constructs, a powerful function library, and complete expression syntax. And, since it is based on tags, CFML offers three major advantages over other server-side scripting languages. It tightly integrates with HTML and XML, which makes the process of developing Web applications easier and faster. CFML provides a high level of encapsulation for complex processes, eliminating the need for excessive scripting and increasing developer productivity. Finally, CFML is easy to extend with new ColdFusion Extensions (CFX) and Java™ objects, which serve as reusable components.

2.8.3.5 VBScript

Microsoft Visual Basic Scripting Edition (VBScript) is a subset of the Microsoft Visual Basic language. It is implemented as a fast, portable, lightweight interpreter for use in World Wide Web browsers and other applications that use Microsoft ActiveX controls, Automation servers, and Java applets. VBScript is currently available as part of Microsoft Internet Explorer and Microsoft Internet Information Server.

When used in Microsoft Internet Explorer, VBScript is directly comparable to Microsoft JavaScript (not Java). Like JavaScript, VBScript is a pure interpreter that processes source code embedded directly in the HTML. VBScript code, like JavaScript, does not produce standalone applets but is used to add intelligence and

interactivity to HTML documents. For programmers who already know Microsoft Visual Basic, VBScript is a valuable alternative to JavaScript in activating web pages.

There are three separate classes of objects available within VBScript:

- Objects provided by the VBScript engine
- Objects provided by Internet Explorer
- Objects provided by the web page author

The VBScript engine provides the core run-time functionally – a subset of the full Microsoft Visual Basic language – including a minimal set of basic objects. Microsoft Internet Explorer provides the vast majority of objects used in scripting in general, anything that is specific to the Internet is provided by Internet Explorer and anything that is generally useful is provided directly in VBScript. The web author can insert additional Objects through the <OBJECT> HTML tag.

2.8.3.6 JavaScript

JavaScript is a scripting language that allows truly interactive Internet applications to be constructed. The biggest advantage of JavaScript is it can be written directly within a HTML file. It is meant to complement and not necessarily replace the current standard for World Wide Web interactivity, CGI. JavaScript is most popularly used to check variables in input boxes. It verifies that all of the input boxes on a given form are filled and contain valid data range. JavaScript can also capture incoming e-mail addressed from web site visitors.

Although easier than Perl and CGI scripting, JavaScript also has its limitations. The most important of which is that JavaScript cannot write a file to the web server's hard disk. Thus, CGI must still be used to create interactive forms that append data to a file. Another disadvantage of JavaScript is that there is not any compliant database. Data stored in arrays as a replacement to database file.

To create an HTML file, no special kind of software is required. Any kind of text editor can be used. JavaScript can be written into an HTML file using the same method. HTML forms the basic design of a homepage, whereas JavaScript adds interactivity and performs validation on inputs keyed in by Internet users.

2.8.4 Web Development Tools

2.8.4.1 Microsoft Visual InterDev

The World Wide Web has made the Internet come alive for many new users. In the initial stages, users realized that they could view numerous documents on various topics from all over the world. Through the WWW, people have access to a plethora of knowledge. Not only can we read about many interesting topics on the web, but we also can find information about our favorite products and services.

Once we have gained this knowledge, we will invariably want to act on it. Some companies have built web-based applications, enabling us to buy their products and services electronically over the Internet. Other companies enable us to fill out registration information to begin receiving certain services. The point is, applications enable the user to act on the knowledge they have gained. Businesses can capitalize on opportunities sooner by becoming closer to the customer through a virtual marketplace. Visual InterDev provides all the necessary tools to build these vital applications for the web.

Visual InterDev is a comprehensive, web-based applications development tool. Visual InterDev provides an integrated environment that brings together various technologies to work towards a common goal of building robust and dynamic applications for the web. Visual InterDev achieves this integrated development environment through the use of the Developer Studio shell interface, first used in Microsoft's Visual C++. We can open and work on Visual C++ and Visual J++ projects while simultaneously creating our Visual InterDev project. This feature greatly enhances productivity, especially when we're building COM and DCOM components and incorporating these components into our Visual InterDev application.

Visual InterDev enables the developed to build applications that are dynamic and interactive. Visual InterDev enables the developer to built dynamic web pages through the use of client and server side script. VBScript is the default scripting language, but JavaScript also can be used. Database integration is vital to any application. Visual InterDev provides a rich and robust set of visual database tools to immediately enhance our productivity. Visual InterDev supports the major ODBC-compliant databases, both on the desktop and the server.

Managing our web site once it has been developed is a very crucial function. Visual InterDev provides a set of tools to view and maintain our web site. These tools are similar and compatible with the site management tools found in Microsoft FrontPage.

Visual InterDev supports the major object-based technologies that exist for developing web-based applications, including ActiveX controls and Java applets. Visual InterDev supports the use of third party ActiveX controls and enable us to integrate our own custom ActiveX controls. Visual InterDev also provides Design time Controls that enables us to set control properties when designing our application and then use this functionality at runtime without the overhead of a typical ActiveX control.

The benefit of web-based applications hinges on providing a universal client to all users that make requests of a centralized application stored on the server. This application is comprised of HTML pages, client- and server-side script, object-based controls, and other server-side components that provide robust application processing. With a client-server application, we still have a client component that we have to install with every new enhancement and change to our application. With a web-based application, the browser and, hence, the client remain unchanged, and the application changes are made centrally, in one place at one time on the server. Administration, software distribution, and version control are significantly simplified under this model.

A problem occurs under the web-based model in the Internet doesn't inherently support interactive sessions with the user like the client-server model. Visual InterDev

supports the use of server-side components to accomplish a persistent dialogue with the user and, thus, an interactive session.

Visual InterDev provides the tool to take advantage of the new web-based model of computing. Some development tools focus on supporting a single Internet technology. Others support several technologies for web-based development but don't provide visual tools to accomplish these tasks. Visual InterDev exceeds existing web

development tools by providing a way to integrate multiple technologies and supplies visual tools to greatly enhance a developer's productivity. Visual InterDev also surpasses and extends the reach of client-server tools to the Internet and the web.

2.8.4.2 ColdFusion Studio 4.0

ColdFusion Studio is an integrated development environment (IDE) with an array of highly productive visual tools for creating Web applications. Built on the award-winning HTML editor in Allaire HomeSite, ColdFusion Studio incorporates visual database, programming, and debugging tools as well as support for remote team development, project management, and deployment. ColdFusion Studio is licensed separately from ColdFusion Server.

The benefits of using Coldfusion Studio are as follow :

- Move Fast - Use the wide array of visual programming, database, and debugging tools to build advanced applications quickly and easily.
- Maintains Quality - Take advantage of syntax validation, browser awareness, and interactive debugging to build high-quality, complex systems.
- Keep Control - Manage team development with source control integration, shared projects, and Web-based remote file and database access.
- Stay Free - Extend ColdFusion Studio to support new XML tags, ColdFusion Extensions, custom wizards, or any specialized functionality you need.

Features in ColdFusion Studio that need for development are :

1. Rapid Development
   - Advanced Editor - Use the advanced editing facilities based on the award-winning technology in HomeSite to create applications with HTML, WML, XML, JavaScript, and CFML.
   - Visual Database Tools - Create complex SQL statements to select, insert, update, or delete data from any database with the drag-and-drop ease of a visual query builder.
   - Two-Way Visual Programming - Prototype and modify pages with powerful visual design tools.
   - Web Application Wizards - Get started quickly with Web application wizards for creating basic applications.
   - Code Reuse - Save code snippets in a shared repository for quick reuse across pages or applications.

2. Quality Assurance
   - Interactive Debugging - Find and fix problems in your applications with interactive, remote, visual debugging.
   - Dynamic Page Quality Assurance - Validate links, HTML, and CFML in dynamic pages to guarantee high-quality applications.
   - Tag Property Inspection - Work with HTML, CFML, and XML tags with a configurable tag property inspector.
   - Code Sweeper - Maintain clean and consistent code with optional automatic code formatting.

3. Open Extensibility
   - Extensible Tag Editors - Take advantage of new XML languages or ColdFusion Extensions with extensible support for tag editing.
   - Custom Wizards - Create your own wizards with XML and ActiveX to handle common coding efforts or special training needs.
   - Visual Tool Object Model - Extend your IDE with macros and new components scripted with VBScript, JScript, and COM.
   - Customizable Workspace - Design your own workspace with customizable keyboard shortcuts, menus, and more.

4. Advanced Project Management
   - Physical Folders - Easily map projects to physical folders to manage complex applications.
   - Auto-Inclusive Folders - Automatically include new files in a project with auto-inclusive folders.
   - Virtual Folders - Create virtual folders to easily organize files that are not stored in the same physical directory.
   - Resource Browsing - Sort and find files based on file extensions for quick access to common resources across project folders.
   - Source Control Integration - Manage team development using standard SCCI-compliant, source control products, such as Microsoft Source Safe.
   - Scriptable Deployment - Deploy complex applications quickly and easily from projects to multiple servers via FTP or HTTP. Save, reuse, and customize deployment scripts.
   - Remote Team Development - Access servers and projects remotely via HTTP with secure connections and advanced user security to control access.

2.8.4.3 Microsoft FrontPage 98

Microsoft FrontPage and other GUI HTML tools add value to creating Active Server Pages by adding the visual components that are missing from Visual InterDev. Visual InterDev does enable developers to launch HTML GUI creation tools, such as FrontPage, to generate the visual aspects of a Web page. The page can then be used as stand-alone HTML page to host static content or can be used to generate a skeleton or template page to properly place and control dynamic content from ASP scripts.

This technique of using GUI tools to quickly generate HTML can save a lot of time and frustration spent on getting complicated HTML page layout properly adjusted. After the page is created, the HTML source code can be edited to create the dynamic content on the page while relying on the HTML tags to quickly geberate the look and feel of the page.

2.8.5 Database Development Tools

2.8.5.1 Microsoft SQL Server 7.0

Microsoft SQL Server 7.0 is a single process, multithreaded relational database server primarily intent for transactional processing. It is a key component in answering data management requirement, which require a large amount of information and serve many different simultaneous users. Microsoft SQL Server 7.0 is based on the client/server architecture, which divides processing into two components: a front-end, or client component, that run on a local workstation and a back-end, or server component, that runs on a remote computer.

The server can communicate with any ODBC compliant software program that resides on a computer connected to the network. Request to the server are made in the Structured Query Language (SQL), a non-procedural language that has become the standard for use with relational database. It is also tightly integrated with the Microsoft Back Office family product to enable organization to improve the decision's making process and the streamline of the business process.

Microsoft SQL Server 7.0 provides innovations in performance, reliability and scalability as below:

i) Scalability

SQL server is designed to accommodate more data, transactions and users with ease. It is scalable from laptop to multiprocessor clusters to accommodate terabytes of data and thousands of users. It also provides dynamic row-level locking for high-end online transaction processing (OLTP) and data warehousing systems. The query processor in SQL Server also provides powerful support for large databases and complex queries.

ii) Internet, Intranet and Commerce

The cutting-edge features and seamless integration with Microsoft Windows NT and Microsoft BackOffice make SQL Server an important factor in Internet, Intranet and electronic commerce strategy. The full-text search can support the linguistic search to create special indexes of pertinent words and phrases in

selected columns of selected table. Furthermore, the Web Assistant enhances the SQL Server Web Assistant to easily generate HTML and WML files from SQL Server data. The Internet replication is also easier than ever with anonymous subscriptions and built-in support for Internet distribution. It supports Internet database integration and allows the user to automate the publishing of database information in the HTML documents, built active web sites and conduct the processes on the Internet.

iii) Desktop, Mobile and Distributed System

Microsoft SQL Server is designed so that organizations can give employees and customers to ability to work with data reliably from simply everywhere. The SQL Server Desktop provides a single code base for all platforms, which from a laptop running Windows 95 to clustered systems running Windows NT Server. The Enterprise Edition also provides 100 percent application compatibility.

iv) Ease of Use

Microsoft SQL Server makes it easy for database administrators to build, manage and deploy business applications. It automates standard database administration operations. It automates standard database administration operations and adds some sophisticated new tools to simplify the managing complex operations. For example, the Dynamic Self-Management automates many routine tasks. The Multiple-site management by using the SQL Server Enterprise Manage also can designate a master server that communicates and distributes jobs, alerts and event messages to targeted servers. The profiling and tuning tools also help to simplify the process of finding the process of finding and fixing database problems by capturing and replaying server activity.

v) Data Warehouse

The SQL Server will ensure that information in all level of an organization can flow smoothly and inexpensively. The data transformation services make it easy to import, export and transform heterogeneous data using OLE Database, Open Database Connectivity (ODBC) or text-only files. This means that it provides automatic distributed update capability across two or more SQL. Furthermore, the

repository integration and the Open Information Model help integrate and share meta-data about SQL Server database, Online Analytical Processing (OLAP) and Data Transformation Services. It also maintains referential integrity and ensures that operation can be recovered in the event of numerous type s of failure.

2.8.5.2 Oracle 8i

Oracle is the world's leading vendor of database software. It is able to have all data and documents stored in a small number of high performance databases benefits customers by centralizing all their data, making information management and access easier, move reliable and less expensive. There are some key features of Oracle 8i as below:

- The ground-breaking capabilities of Oracle 8i's Internet File System (IFS) provides a single, easy to use data management interface for all data types, thus minimizing customers' reliance on a proprietary operating system. Oracle is an open solution and it supports all kind of platform.
- Oracle's advanced security features allow for enforced granular privileges, advanced auditing, enhanced access control, secure distributed processing and replication and the ability to use additional external authentication mechanisms.
- Oracle uses a Java-based utility that provides everything needed to get a pre-tuned and pre-configured Oracle 8i database up and running. Oracle Enterprise Manager provides a single integrated management console for central administration of multiple servers. It also contains some advance functionality for tuning and diagnosing the database and managing complete change in the database environment.

2.8.5.3 Microsoft Access

Microsoft Access is the most simplest database development tool. The advantages of using Microsoft Access are as below:

- Access is very easy to use for those who've never worked with databases before.
- It is inexpensive to purchase
- Because it is created by Microsoft, it works well with ASP and IIS.
- Regardless of the databases used, the methods for accessing it in ASP are very similar.

However, if one working on a site that will require lots of databases access and have a high volume of hits, then one probably want to consider a more powerful client/server database. Client/Server databases are designed to perform well, even with heavy use, and to provide the security measures needed to keep sensitive corporate data. They also cost a lot of money.

2.8.6 Data Access Technology

In order to access, retrieve and share information efficiently throughout the E-Commerce site, data access technologies gave to be considered. Among the most complete set of data access technologies are provided by Microsoft. Microsoft's set of data access technologies includes VB SQL, Open Database Connectivity (ODBC), Data Access Object, Remote Data Object, Active Data Objects (ADO) and OLE-DB.

2.8.6.1 VB SQL

Every machine using Microsoft Visual Basic gain access to DB Library. This interface provides efficient point-to port access to MS SQL Server for programmers. However, the use of this technology is declining as less programmer-intense solutions are available.

2.8.6.2 Open Database Connectivity (ODBC)

ODBC is an open standard API that is fully aligned with XOPEN & ISO standards. It allows applications to access different SQL data sources at run time without

recompiling the application for each target database. ODBC is based on a concept of database drivers that perform conversion between the ODBC API and the version of SQL employed by relational database. During run time, the ODBC driver will communicate with other drivers, doing so through a standard interface called the Service Provider Interface (SPI). ODBC is a network independent technology because it employs replaceable network libraries.

2.8.6.3 Data Access Object (DAO)

The Data Access Object (DAO) concept was released in 1992 as part of Microsoft Access desktop database. It focuses on efficient management of desktop data and decision support level access to remote RDBMS data. It is based on Microsoft Jet database engine. Jet is a combination of a full function query processor data store, and functions as a local cursor engine that provides robust functionality for use with data sources. It includes distributed database's query, update local data management and access to a variety of data including all popular Index Sequential Access Methods (ISAMs) and to all ODBC-based data. DAO's access to remote data involved the use of Jet engine's entire set of extended functionality.

2.8.6.4 Remote Data Object (RDO)

Because of considerations to optimize speed and control, developers ignored JET when creating transaction centric application to a RDBMS. Therefore, Remote Data Objects (RDO) was created to overcome this problem. It is an object interface that directly calls ODBC for optional speed, control and ease of programming RDO provides access to server side cursor as to minimize network traffic.

2.8.6.5 Active Data Objects (ADO)

ADO is a new technology for data access based on existing technologies and endowed with increased flexibility. The concept of ADO is based on the ability to be used in an environment whose base set of object interfaces is standardize and easily extensible as new application requirements. Therefore, multiple implementations of ADO are

allowed – each with specific usage such as desktop, client-server and distributed transactions. The ADO is an evolution of both DAO and RDO into a single and simplified and extensible interface that will full data manipulation capability and a downloadable, lightweight implementation available to Internet clients at runtime.

2.8.6.6 OLE-DB

OLE-DB is a C/C++ language component architecture that was designed primarily for used by third party software developers. The purpose of the OLE SQL is to extend the reach of application capability beyond the limitation of ODBC. It is a COM-based API with features that provide access to both SQL and non-SQL data sources and to provide an environment where database components can be replaceable.

2.9 CONCLUSION

Normally, a system development is abstract and complex. So, a complete literature review must be carried out to gather all the information of the theories, methods and tools which are needed to develop the project. This may identify the most compatible tools or methods to be used during the development phase. Besides that, all the possibility and consideration also must take into account during the analysis for the project development.

CHAPTER 3:

METHODOLOGY AND SYSTEM ANALYSIS

3.1 METHODOLOGY

3.1.1 Software Prototyping Model

The development strategy for this project is based on software prototyping model. Prototyping development is an idea of developing and initial implementation, exposing this to user comment and refining this through many versions until an adequate system has been develop. Since the prototyping model allows all or part of a system to be constructed quickly to understand or clarify issued, it has the same objective as an engineering prototype, where requirements or design require repeated investigation to ensure that the developer, user and customer have a common understanding both of what is needed and what is proposed. Rather than have separated specification, development and validation activities, these are carried out concurrently with rapid feedback across these activities.

This model is based on seven steps shown in Figure 3.1.

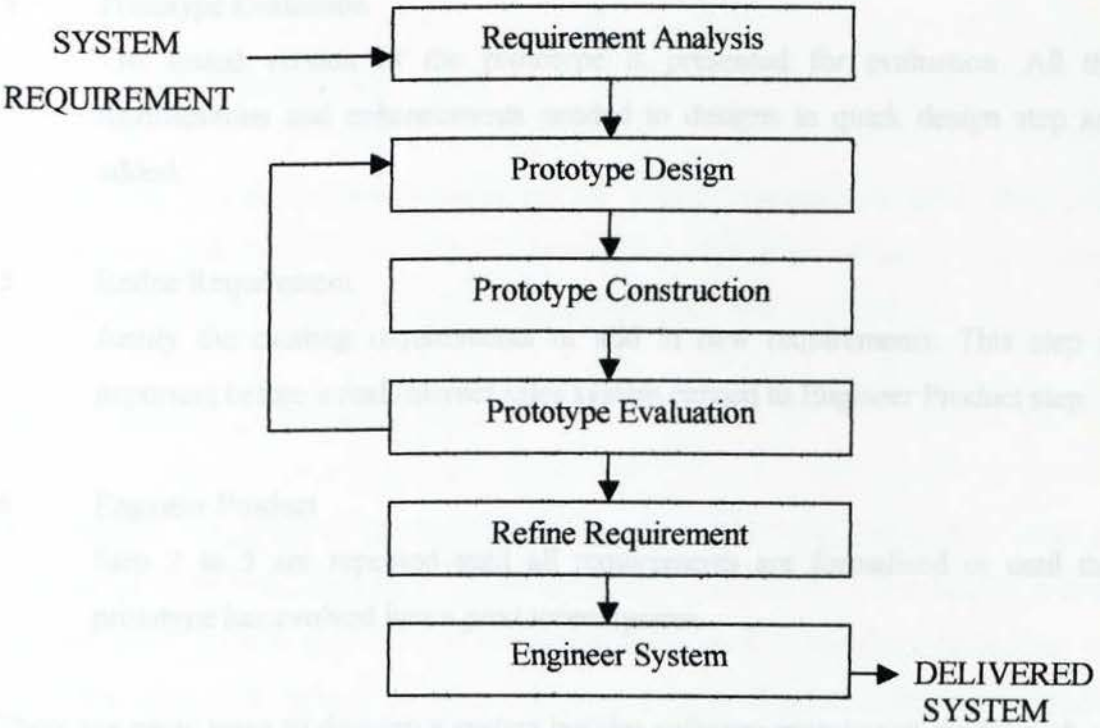

Figure 3.1: The Prototyping Model

1. Requirements Analysis

   At this stage, the system's services, constraints and goals are established. Carry out literature review and research on related topics such as current E-Commerce trends, software, programming languages and development tools and technologies. Analysis is made on all requirements done by the developer.

2. Prototyping Design

   Prototyping Design or quick design is made on transaction processing cycle, web page, user interface and database. This design were based on the requirements analysis done in previous step and may be enhanced in later phase.

3. Construction of Prototype

   Transaction processing cycle, web page, user interface and database (known as prototype) is created, tested and redefined, based on the designs done in previous step.

4. Prototype Evaluation

   The tested version of the prototype is presented for evaluation. All the modifications and enhancements needed to designs in quick design step are added.

5. Refine Requirement

   Justify the existing requirements or add in new requirements. This step is important before a real Internet sales system carried to Engineer Product step.

6. Engineer Product

   Step 2 to 5 are repeated until all requirements are formalized or until the prototype has evolved into a production system.

There are many ways to develop a system besides software prototyping model such as Waterfall model. For this project, prototype methodology is a better strategy due to the lack knowledge of the Internet programming with client/server approach and

implementation of security. Besides that, this system can be created quickly, often within a matter of a few days or weeks. And usually, it is also relatively inexpensive to build, compare with the cost of a conventional system.

3.2 REQUIREMENT ANALYSIS

3.2.1 Introduction

The requirement analysis phase is the first major step towards the solution of a data processing problem. The process involves understanding the broader aspects of the system that would be required to solve the problem. During this phase, the user's requirement with respect to the future system are carefully identified and documented. These requirements concern both functional and non-functional requirement. During the requirement analysis phase, system designer address the question as to how to achieve the user requirements in term of system components and their interaction. Such is postponed until design phase.

3.2.2 System Requirement

This section states the requirements of the online flowers and gifts shop. The requirements stated serve as the basic for the acceptance procedure of this system. This document is also intended as a starting point for the design phase.

3.2.3 Functional Requirement

A functional requirement describes an interaction between the system and its environment. Further, functional requirements also describe how the system should behave given certain stimuli. The important thing is the questions addressed by functional requirements have answers that are independent of an implementation of a solution to the problem. This project divides the functional requirement into two sections: Customer Section and Administrator Section.

3.2.3.1 Customer Section

The Customer Section is a web site that contains all of the information about the company, sales items, prices, special links and others features. Besides the web page must be interactive and attractive, we must consider some requirements as below:

1. Flexible Hypertext Link

   Consumers can browse any page in any sequence that they desire. Each link to the subsequent page is places at strategic location on every page. The links are expected to give more convenience to the customers.

2. Apply Membership

   A customer can open an account to this system. Every registered member is given a promotion code and is offered to some special discount. The customer needs to provide unique login name to ensure there will be no duplication between different customers. If the system found that the login name provided by the customer has already been adopted, the system will alert the customer to reselect a login name.

   Concerning the password, there will be an extra field in the form in order to get the password twice for reconfirmation purpose. The customer may also need to provide their personal information like e-mail address, phone number, area code and number, street, city, state, postal code and country.

3. Shopping Cart

   When a customer shops with this application, he or she can store the selected items into a temporary storage namely shopping cart or basket provided by the system. Information concerning product such as product name, product price , product quantity and total will be store and if the customer press the button "shopping cart", all these information will be displayed on the screen. In the shopping cart, customers can add new item(s) to the cart, remove item(s) or change the quantity of item.

4. Login

Customer, who is already member of this application, can sign in to the system by providing their login name and password. This system will perform validation to the customer login name and password. If any problem encounter during login, an error message will shown and provides a guide for the customer to correct the error.

After logged in to the system, customer is able to update their personal information and/or change password.

5. Checkout

This feature enables a customer to do online payment for the selected item(s) that have been stored in the shopping cart. Customer needs to provide information of the recipient and their own too. The system will display the order summary of the stored item(s) in the shopping cart as well as customer and recipient's information. Customer is allows to edit those information prior to confirm order or cancel order.

Customer needs to choose a preferable payment mode either credit card, check or money order. Customer needs to provide details of the chosen payment mode such as credit card number and due date to complete the purchasing process.

However, this system will not perform actual online payment transaction as this is already outside the system. This system will only simulate the actual process.

6. Search

This system provide simple search engine that allows customers to search for the desired items by keywords. He or she can enter the likely name of the item that he or she wants. A user cans also searching a product by selecting a specify category of the items.

7. Help File and Customer Feedback Service

At any one time, customer can make the request to the system help file that explains services provided by the system and how to go about with every feature

described earlier. The customer feedback service is function to provide a form for customer to contact, make complain and ask questions to the storekeeper.

3.2.3.2 Administrator Section

This section is required to provide business information and process all the transactions and maintenances. It allows administrator to manipulate records in the My E-Florist database. The administrator must enter his or her user name and password for verification before accessing the system. After validation of user identity, the user can choose which module he or she wishes to access. This section is divided into 4 modules:

1. Product Maintenance

   This module keeps and maintain all retail items information in the database such as product ID, product category, description, price, quantity on hand and so on. A product image can be displayed for each item. This module allows users to perform functions such as view product information, add new product, update product information and remove product.

2. Customer Maintenance

   Customer plays the most important role in any merchandising firm. Customer information is keep in database in order to keep track with customers and to contact them whenever a new product promoted or special offers via email or ordinary mail. Customer information such as customer name, email address, address and so on are stored in the database. The following functions are provided in this module: view customer record, delete customer and trace customer feedback.

3. Order Maintenance

   The Order Maintenance Module keeps and maintains all order records in the database system. This module should be flexible to process orders from the Internet and perform credit and cash transactions. It also keep tracks of all transactions dates which includes order date and shipment date.

- Order date is date whereby customer places an order.
- Shipment date is date when goods are sent to customer.

This module also allows employees to view the customer, recipient and order items information of a particular order. Employees allow to delete or cancel order within this module.

4. Employee Maintenance

This module is to keep and maintain all the authorized users' information of the system. Information such as user name, user ID, user login name and password are stored in the database. This module allows administrator to add new empoyee, change employee password, update employee information and delete employee records.

Employees are divided into two groups: Administrator and Officer. Employees privilege is set where Administrators have the higher privilege to access employee maintenance section while officers are allow to access the change employee password function only in this section.

3.2.4 Non-Functional Requirement

Non-Functional requirements are defined as constraints under which the system operate and the standards, which must be met by the delivered system. My E-Florist includes the following non-functional requirement:

1. Reliability

A system is said to be reliability if it runs properly for a very long period of time without failure. The entire system must to the user as a consistency and an accuracy system. A reliable system does not produce dangerous or costly failures when it is used in a reasonable manner, that is, in a manner that a typical

user expects is normal. The system will stable and consistent in all environments.

2. Efficiency

This system will ensure efficiencies, in system execution and data storage. The simplicity of the system will enable the new user familiar with the system in short time. This system will also enable the users handle their jobs efficiently by reducing time, manpower and other resources.

3. Flexibility

Flexibility refers to the system's expandability to adopt new technologies and resources as well as implementation in changing environments. As the project's implementation is based on web technologies, it is foreseeable that newer web technologies that can work with existing web technologies will have no problem integrating into the web site.

4. User Friendly

This system can be considered as attractive and an easy-to-use application because user only have to click on the hypertext or image by using the mouse. Grouping the product depends on category make visitor or customer easier to get, and compare what items they want. The use of suitable and meaningful icons will help the user to use the system with more confidence.

5. Modularity

Modularity is a key factor in good program design. The working of the system was decomposed into modules so that distinct functions of modules could be from each other. Modularity has the advantage of making testing and maintenance much easier. Modularity of program was applied from the beginning as this will lead to easy modification in future. The modular in design approach means other shell modules may also be easily combined or joined at a later time.

6. Response Time

The response time to retrieve the information such as products information can be considered within a reasonable interval time. It means that all desirable information should be available to users at any point of time. The requirement for up-to-date information is also a necessity.

3.3 ANALYSIS OF TECHNOLOGICAL REQUIERMENTS

Following the appropriation of requirements for the project, the programming languages, development tools and technologies chosen for implementation are chosen based on their ability to meet the stated requirements. From the programming languages, development tools, and technologies studied in Chapter 2, the followings were to be use for implementation in this project.

3.3.1 Operating System

3.3.1.1 Windows NT Server 4.0

Windows NT Server is the most complete platform available for building and hosting web-based applications, and the easiest server operating system available. It's flexible and compatible that can reduce hardware and software costs. It is also reliable and easy to manage.

The reason Windows NT is used as operating server is:

- Backward compatibility with Windows 3.X and DOS
- Windows NT Server is a high-performance, reliable, secure and easy-to-manage server for sharing information and running applications in the most demanding businesses.
- User friendly environment and easy to use compare to other operating server such as UNIX.
- Integrates with IIS as its web server
- Backed up by the world most largest software industry, Microsoft
- Portability

- Scalability
- Multitasking environment
- Security enhanced because it uses NTFS security
- Fault tolerance

3.3.2 Web Server

3.3.2.1 Internet Information Server 4.0 (IIS)

Microsoft Windows NT Server 4.0, with its built-in web server Internet Information Server 4.0, is the easiest way to publish information and bring business applications to the net especially for those who want to sell online. IIS transmit information by using HyperText Transfer Protocol (HTTP). It also can be configured to provide File Transfer Protocol (FTP) and gopher service.

The reason IIS is used because:

- Windows NT Server can enlist integrated web services to easily extend these strengths of an intranet.
- Innovative web publishing features, customizable tools, and new wizard technologies unique to the IIS 4.0, make Windows NT Server with IIS the easiest way to publish information and share it securely over the Internet.
- Powerful management tools in IIS will help to easily maintain web sites, manage content, and analyze usage patterns to improve site as it evolves.
- Customizable management tools, flexible administration options and analysis tools.
- Integrates easily with ASP to host ASP applications.
- Because it uses NTFS security when it's run under the Windows NT Server 4.0, IIS is more a secure platform for hosting ASP applications.

3.3.3 Programming Languages

3.3.3.1 Server-side scripting language

3.3.3.1.1 Active Server Page (ASP)

This technology was chosen for building dynamic and interactive web pages. It was chosen over other forms of scripting due to:

- Its simpler implementation and greater flexibility.
- It is suitable for publishing and collecting data on the web.
- Provides a way for building secure transactions, server-based applications and web sites.
- Can interact with almost any existing dynamic web page technology such as CGI, ISAPI, and scripts written in PERL, Python and Awk.
- Supports client-server programming. Furthermore, the combination of ASP, client-server scripting and objects can be used to create client/server application.
- Is able to create client side code dynamically on the server.
- ASP provides easy access to databases via ADO (Active Data Object).
- ASP development is compiles free (does not require a compiler).
- ASP protects proprietary business algorithm and information.

3.3.3.1.2 VBScript

VBScript is chosen as the client-side application scripting language. The reasons VBScript is chosen are:

- It is powerful and can be used to process data submitted by users with the aid of ActiveX controls specially designed for Microsoft Active Server Pages.
- It is lightweight. VBScript code is lightweight, fast and has been optimized to be transmit via the network.
- VBScript is easy to use compared to scripting languages such as JavaScript. VBScript is easier to use because it is based on the easy-to-learn BASIC language.
- VBScript is very compatible with ASP. It is also default scripting language for ASP.

3.3.3.2 Client-side scripting language

3.3.3.2.1 JavaScript

JavaScript is also chosen as the client-side scripting language as:

- It allows truly interactive Internet applications to be constructed.

- It is popularly used to check variables in input boxes.
- Subroutine can go over the data and point out errors to the user before HTML form is submit to a web browser.

3.3.4 Database Management System

3.3.4.1 Microsoft SQL Server 7.0

The reason why Microsoft SQL Server 7.0 is chosen instead of others such as Microsoft Access and Oracle 8i is because:

- It provides tight integration with Windows and Windows-based applications.
- It supports development of active web sites and the Internet processes.
- It also can support a high volume of concurrent users.
- Lowers the cost and complexity of distributed computing.
- Its tight integration with IIS Server, can be queried and updated via popular web browsers.
- Encrypts data automatically. Password, data stored procedures, views and triggers can easily be encrypted.
- Full-text search. Supports a linguistic search of character data stored in the database, which operates on words and phases, not just character patterns.

3.3.5 Web Development Tool

3.3.5.1 Microsoft Visual InterDev

Microsoft Visual InterDev was chosen because it enables the developer to build applications that are dynamic and interactive. Visual InterDev enables the developer to build dynamic web pages through the use of client and server-side script. Visual InterDev provides a rich and robust set of visual database tools to immediately enhance our productivity.

Visual InterDev provides the tools to take advantage of the new web-based model of computing. Some development tools focus on supporting a single Internet technology.

Others support several technologies for web-based development but don't provide visual tools to accomplish these tasks. Visual InterDev exceeds existing web development tools by providing a way to integrate multiple technologies and supplies visual tools to greatly enhanced a developer's productivity. Visual InterDev also surpasses and extends the reach of client-server tools to the Internet and the web.

3.3.6 Other related software tools to be used

Other related software used are as follows:

1. Internet Explorer 5.0 as the browser to view web pages.
2. Paint shop Pro 5.0 and Adobe PhotoShop 5.5 to create attractive images for the web pages.
3. Microsoft FrontPage 98 for ASP and HTML document layout design.
4. Microsoft Word 2000 and Visio Professional for documentations.

3.4 CONCLUSION

This requirement specification and analysis part give more precise description of the functionality and the constraints on the system after the feasibility studies on the overall available technologies. It is an important phase to ensure that the project will meet the real requirement of the project and to reduce the misunderstading and misinterpretation of the whole system.

CHAPTER 4:

SYSTEM DESIGN

4.1 INTRODUCTION

System design is a plan to build a system that meets the requirements needed to deliver the problem solution and helps to achieve the organization's goal and objective. Good design is the key to successful project. This is a stage in the system development process where the requirements for the system are translated into the system characteristics. In My E-Florist, the stages in the design process are as follow:

1. Architecture Design
   The sub-system making up the system and their relationships is identified and documented.

2. Database Design
   The data structures used in the system implementation are designed in detail and specified.

3. User Interface Design
   Services are allocated to different components of the system and the interfaces of these components are designed. This enable user interacts with the system.

4.2 ARCHITECTURE DESIGN

My E-Florist is designed to leverages the traditional client/server architecture and extends it to the web. This large system is decomposed into sub-systems that provide some related set of services. Thus, architecture design is the initial design process of identifying these sub-systems and establishing a framework for the sub-system control and communications. As part of the architectural design process, some of the activities such as system structuring are usually necessary.

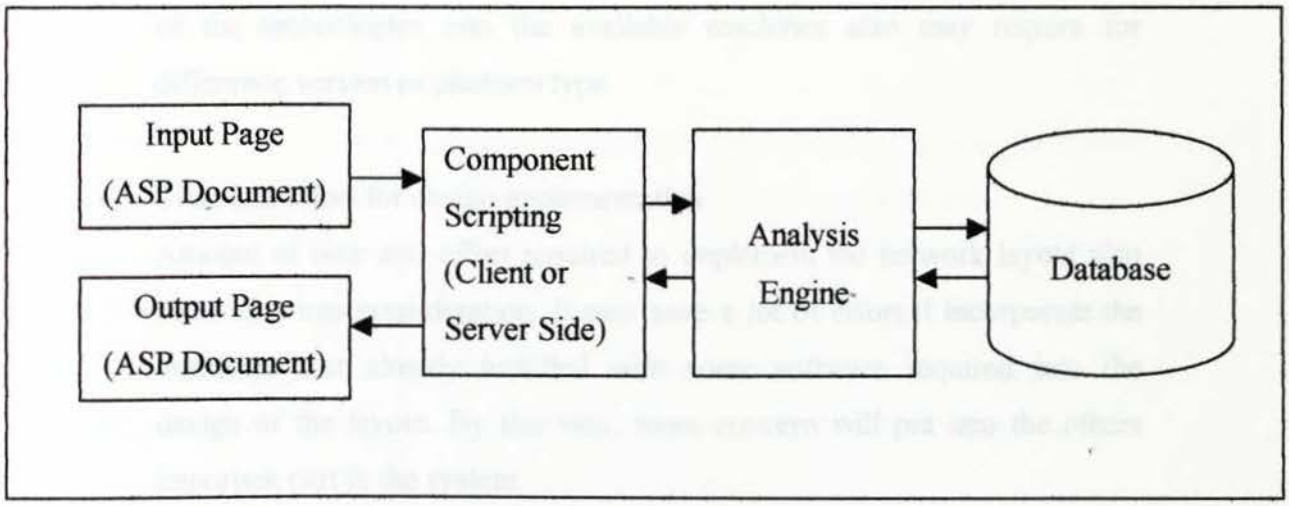

Figure 4.1: System Architecture

4.2.1 Network Setup design

For the network setup designing, there are a few consideration have to take into account.

- The ability of the network setup to suit or conform to the overall environment architecture that is going to be use.

- The availability of hardware resource and current network layout
  The issue of the capacity of each available machine must be brought into consideration. It is include the machine's processing power, storage space and working memory. Besides that, it also needs to concern about the number of physical machines that are available for development.

- The available technologies that can be leverage
  All of the technologies that can be used to implement the overall system in the network also must be considered while designing the layout. By this way, we may concern about the dependencies among all the technologies. For example, some of the involved technologies will depend upon other technologies and will not run in their absence. Furthermore, the installation

of the technologies into the available machines also may require for difference version or platform type.

- Time and effort for design implementation

  Amount of time and effort required to implement the network layout also must take into consideration. It may save a lot of effort if incorporate the machines that already installed with some software required into the design of the layout. By this way, more concern will put into the others important part in the system.

After keeping all of the considerations, the network layout of the Online Shopping System was designed. This design encompasses the machines that will eventually be utilized as the servers in the environment as well as what software they would be equipped with. The network layout is described in the *figure 4.2.*

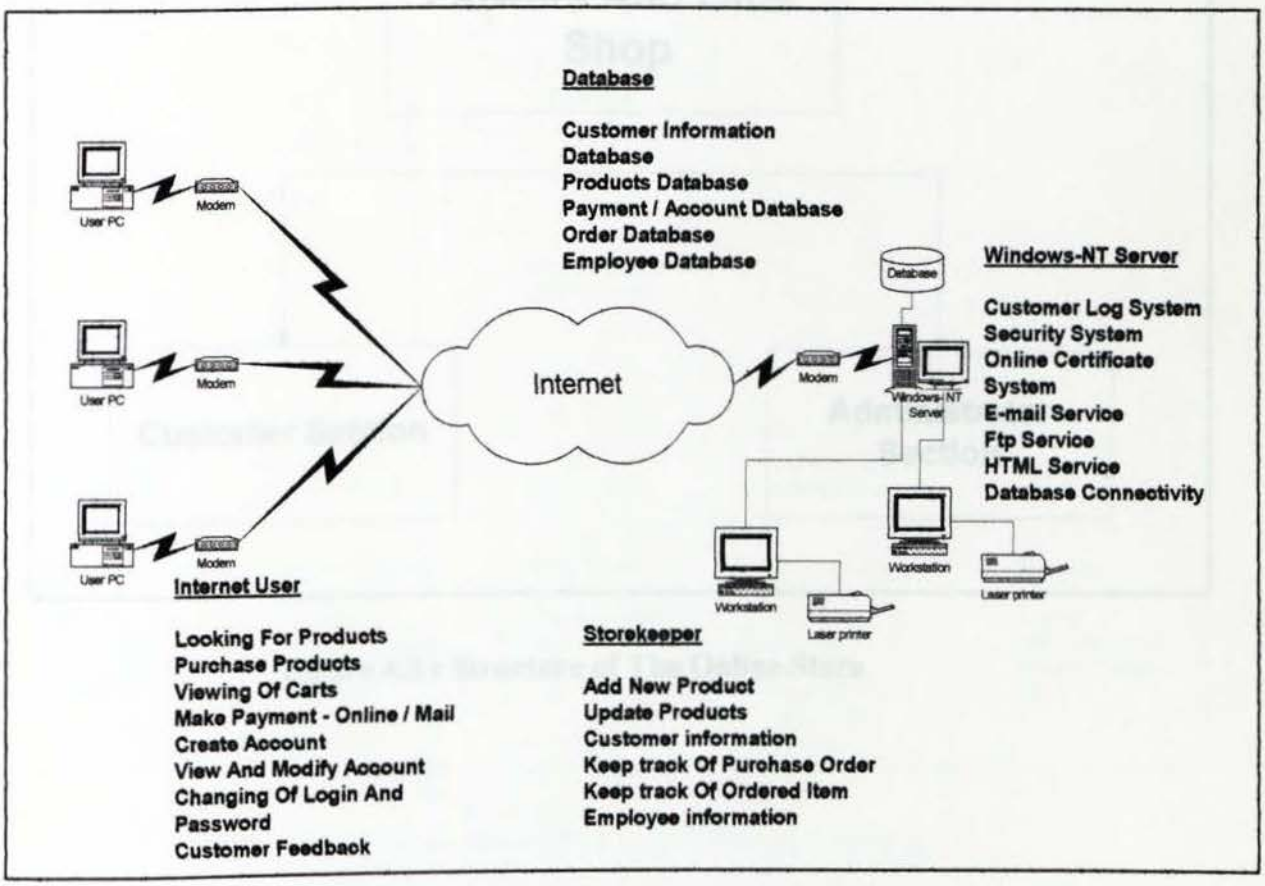

Figure 4.2: Network diagram of Online Shopping System

4.2.2 System structuring

The system is structured into a number of principal sub-systems where a sub-system is an independent unit. Communications between sub-systems are identified.

Decomposing a system into a set of interacting sub-systems is an important phase. Structure chart is used to depict the high level extraction of a specified system. The usage of structure chart is to describe the interaction between independent sub-systems.

My E-Florist is divided into two major sections: Customer Section and Administrator Section. The details of each section is represented in the structure charts below:

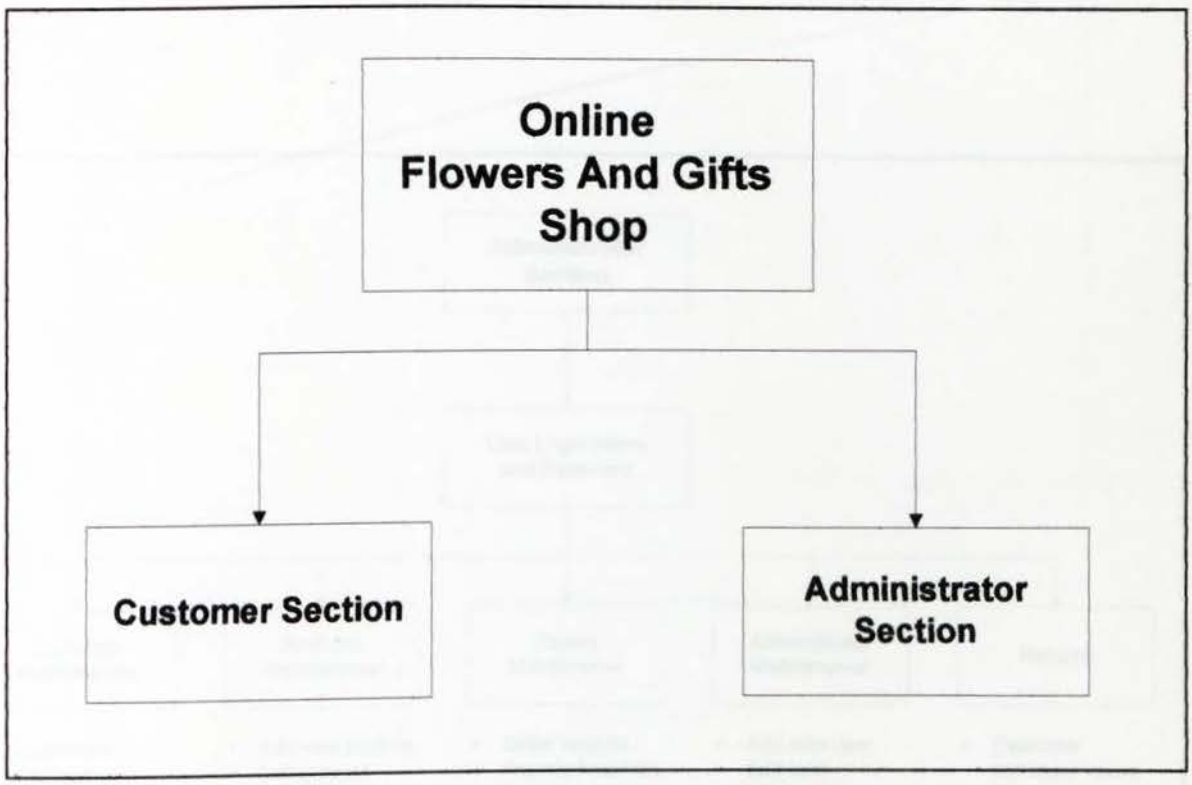

Figure 4.3 : Structure of The Online Store

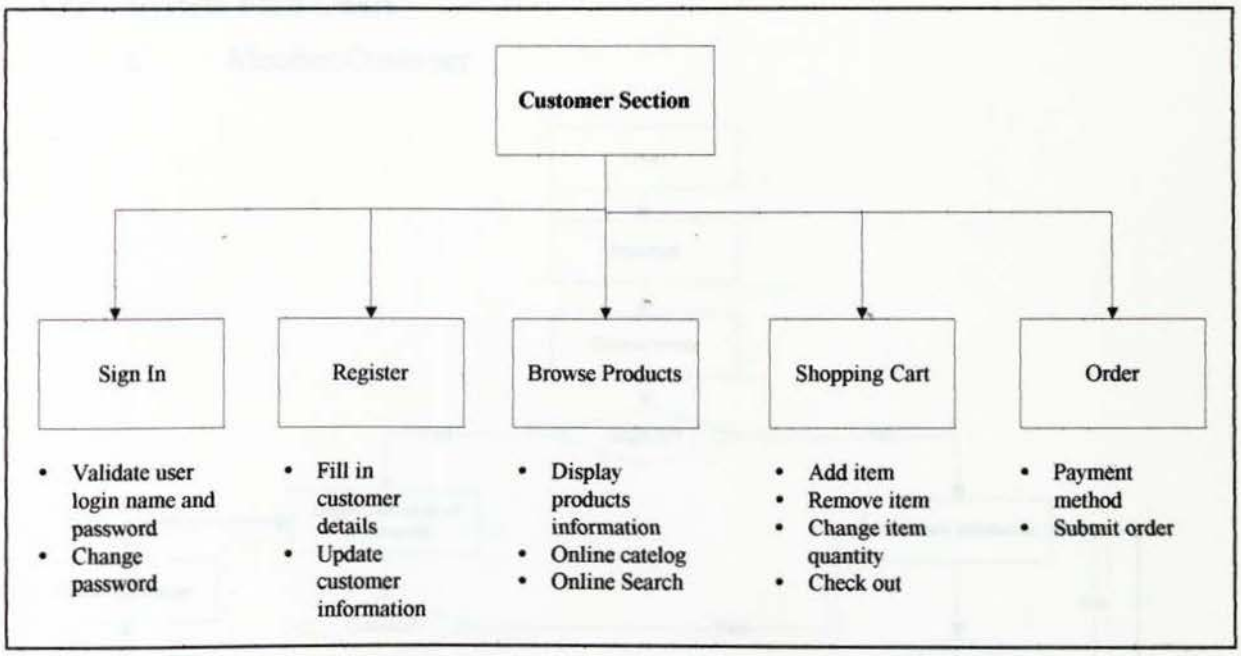

Figure 4.4 : Structure of The Customer Section

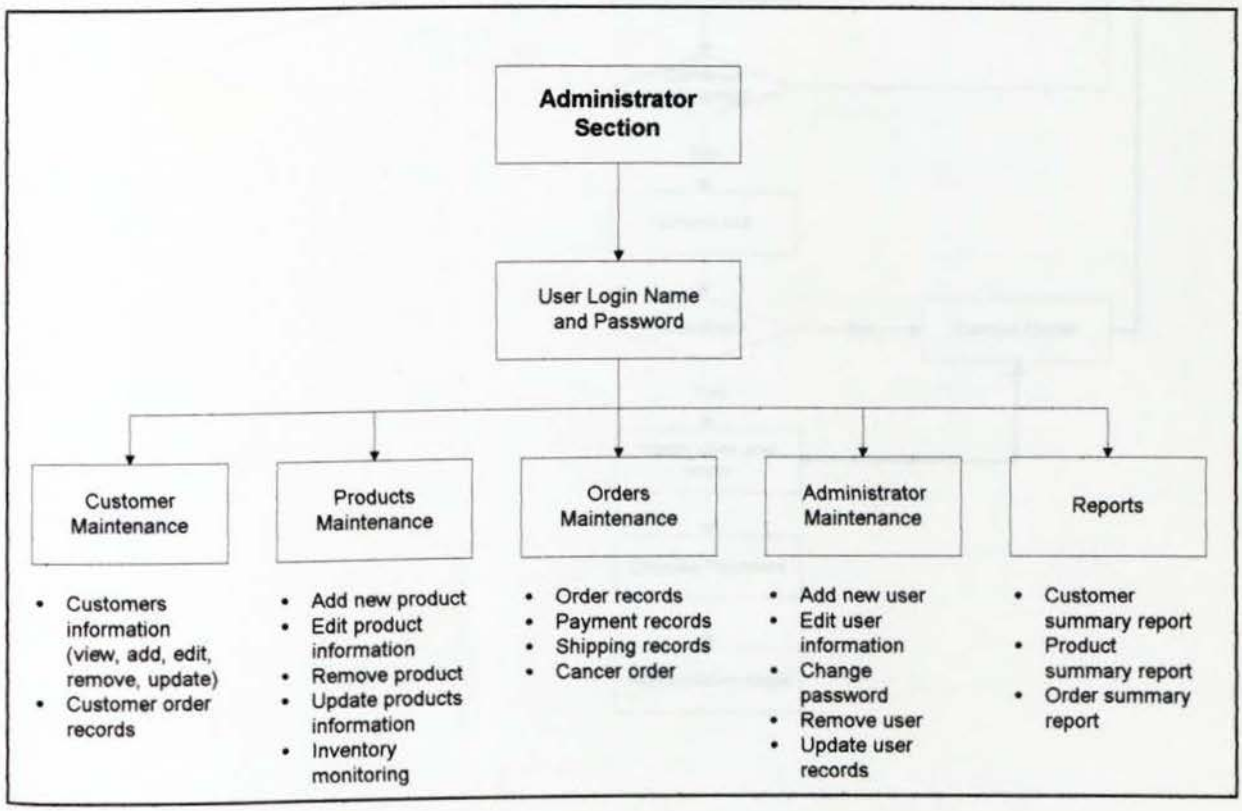

Figure 4.5 : Structure of The Administrator Section

4.2.3 System Flow Chart

i. Member Customer

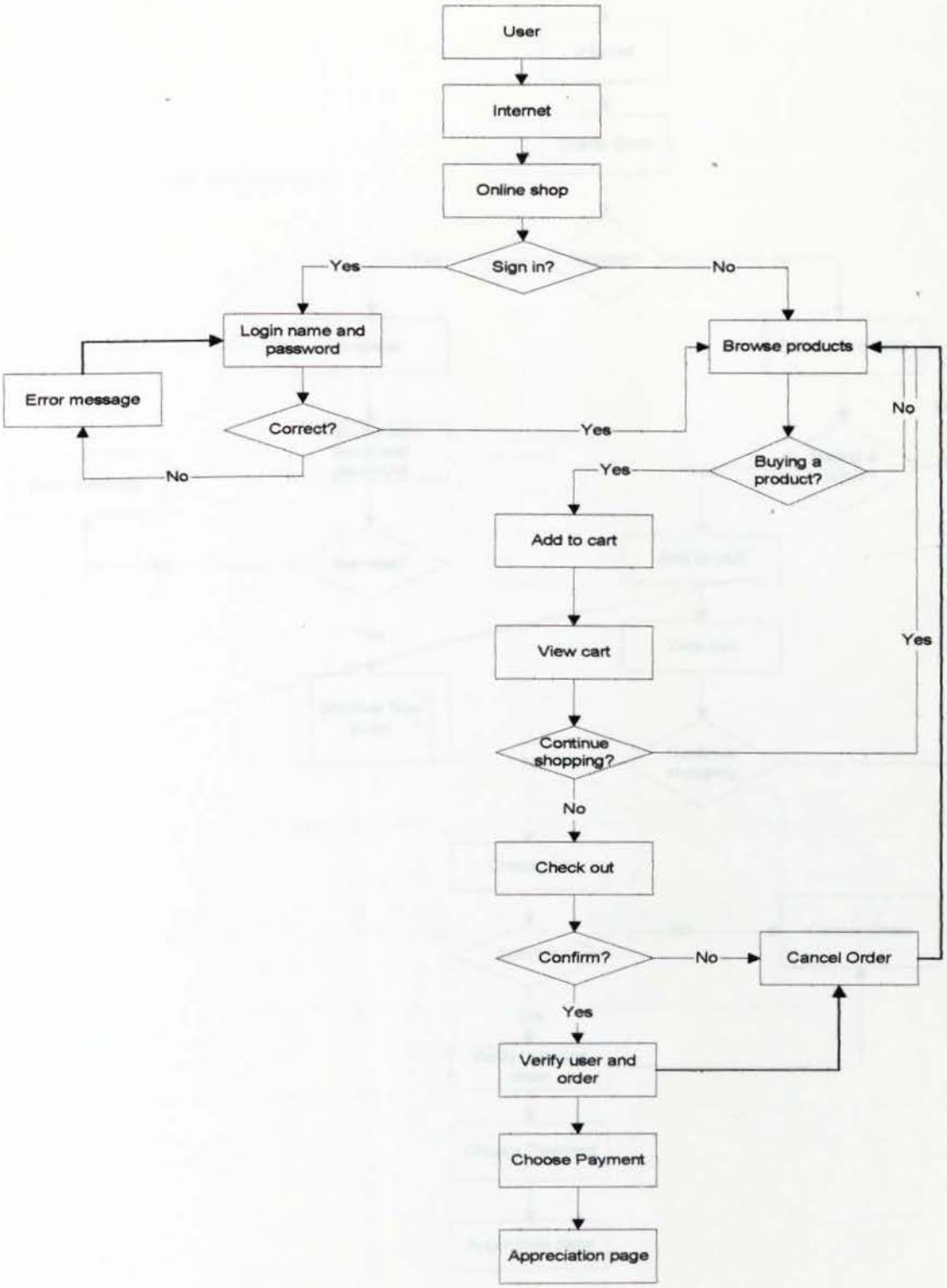

Figure 4.6 : Flow Chart for Member Customer

ii. Non-Member Customer

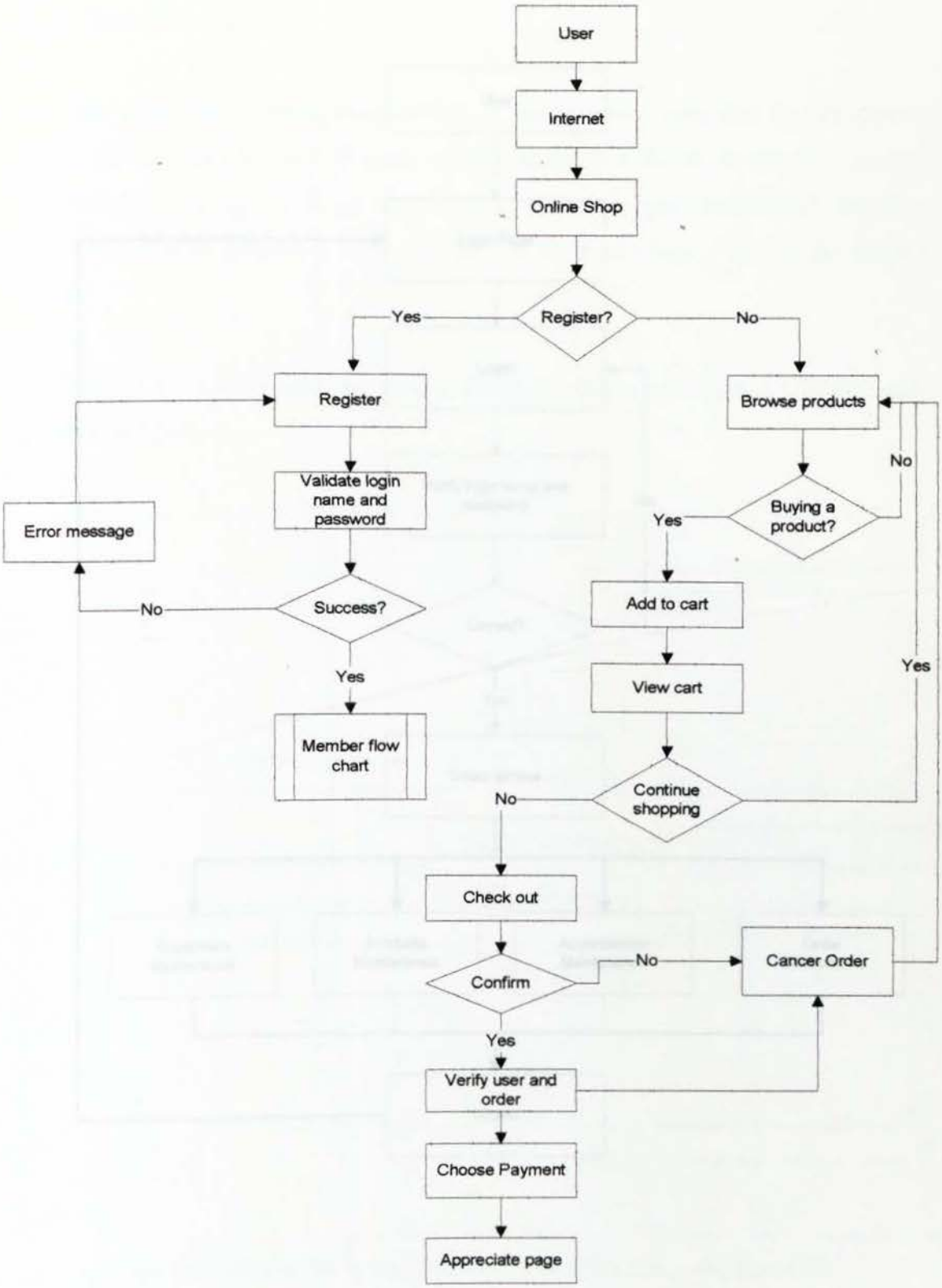

Figure 4.7 : Flow Chart for Non-Member Customer

iii. Administrator

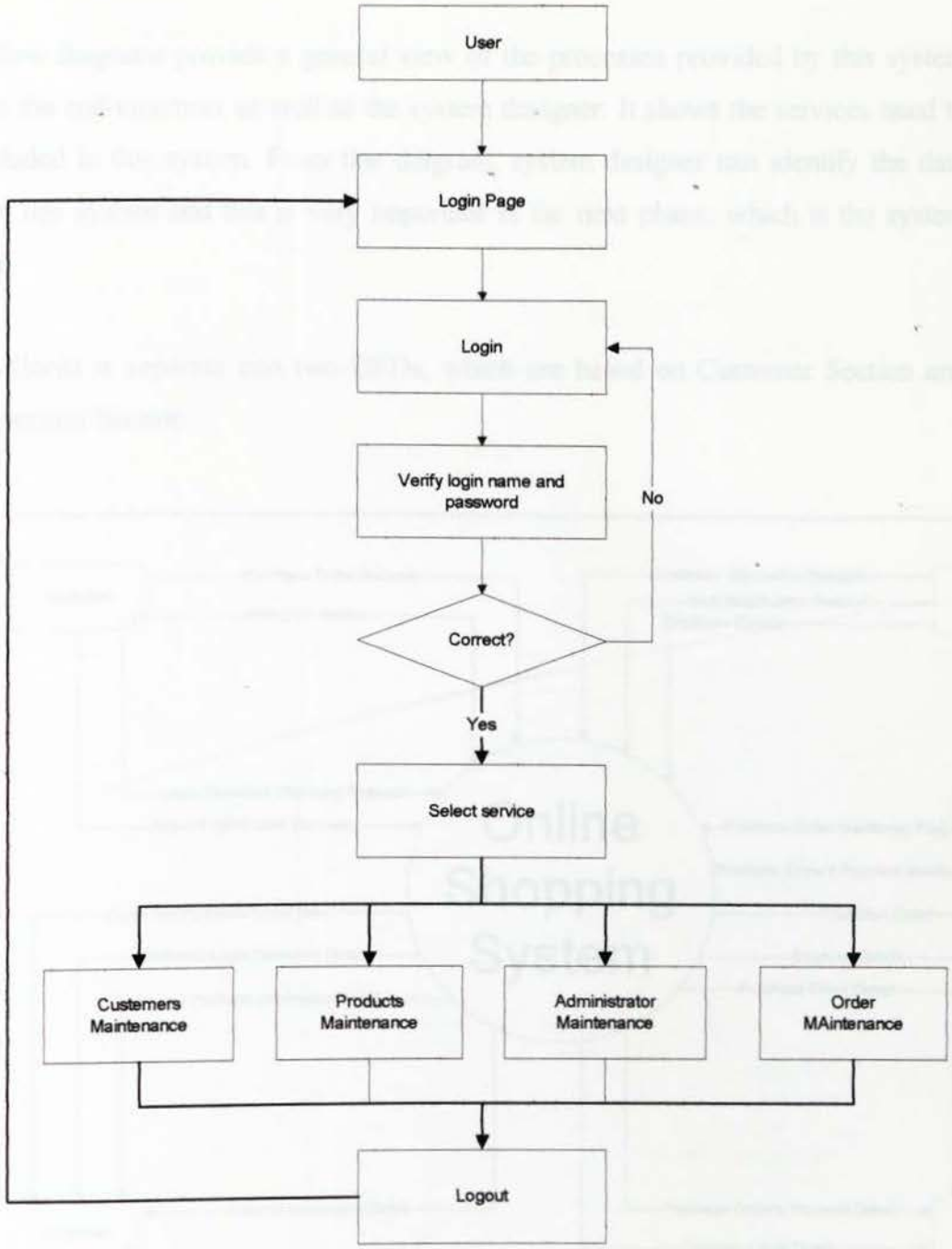

Figure 4.8 : Flow Chart for Administrator

4.2.4 Data Flow Diagram

Data flow diagrams provide a general view of the processes provided by this system to both the end-customer as well as the system designer. It shows the services need to be included in this system. From this diagram, system designer can identify the data flow in this system and this is very important in the next phase, which is the system design.

My E-Florist is separate into two DFDs, which are based on Customer Section and Administrator Section.

Figure 4.9 : Online Shopping System Data Flow Diagram (Level 0)

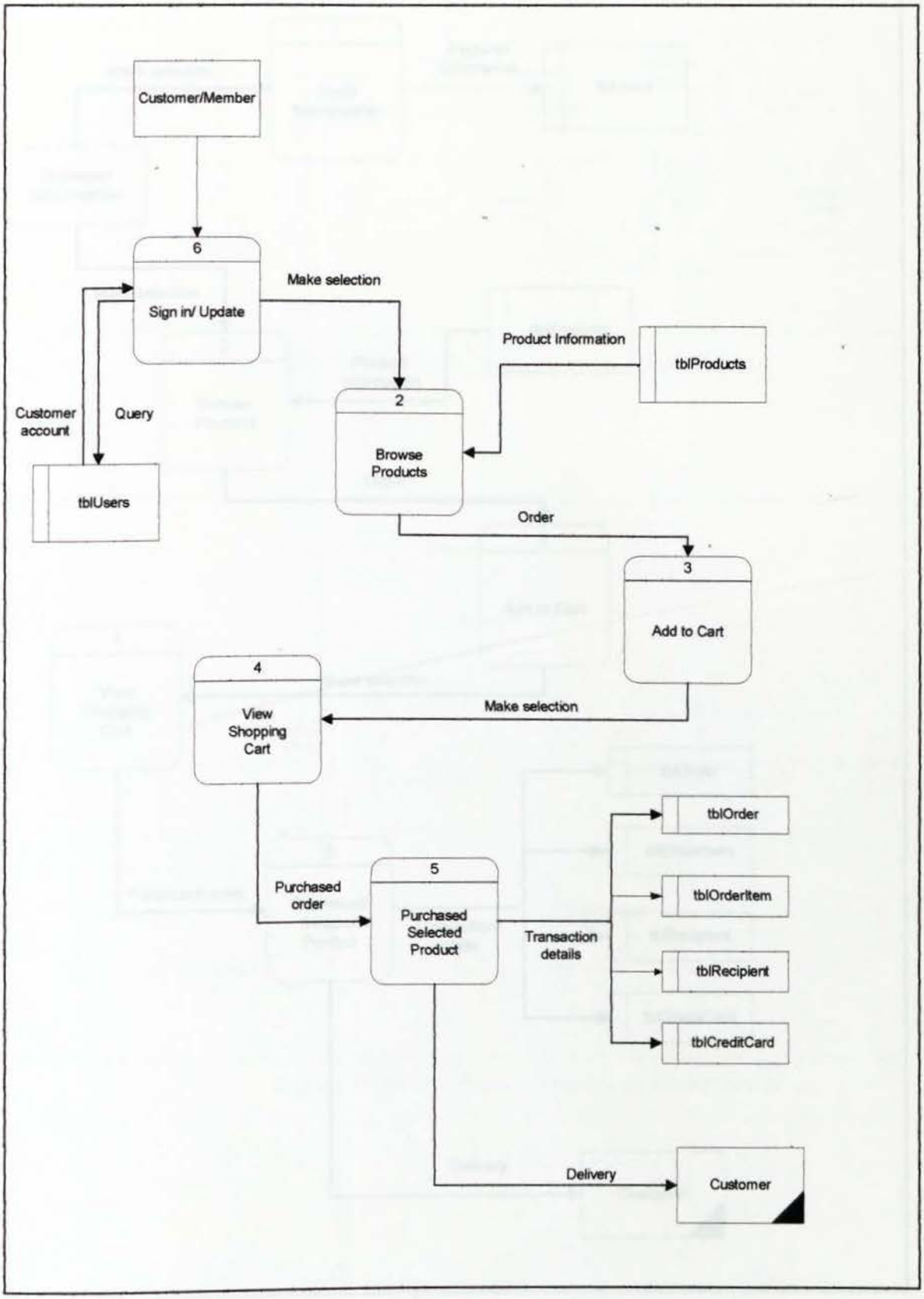

Figure 4.10 : DFD for Member Customer (Level 1)

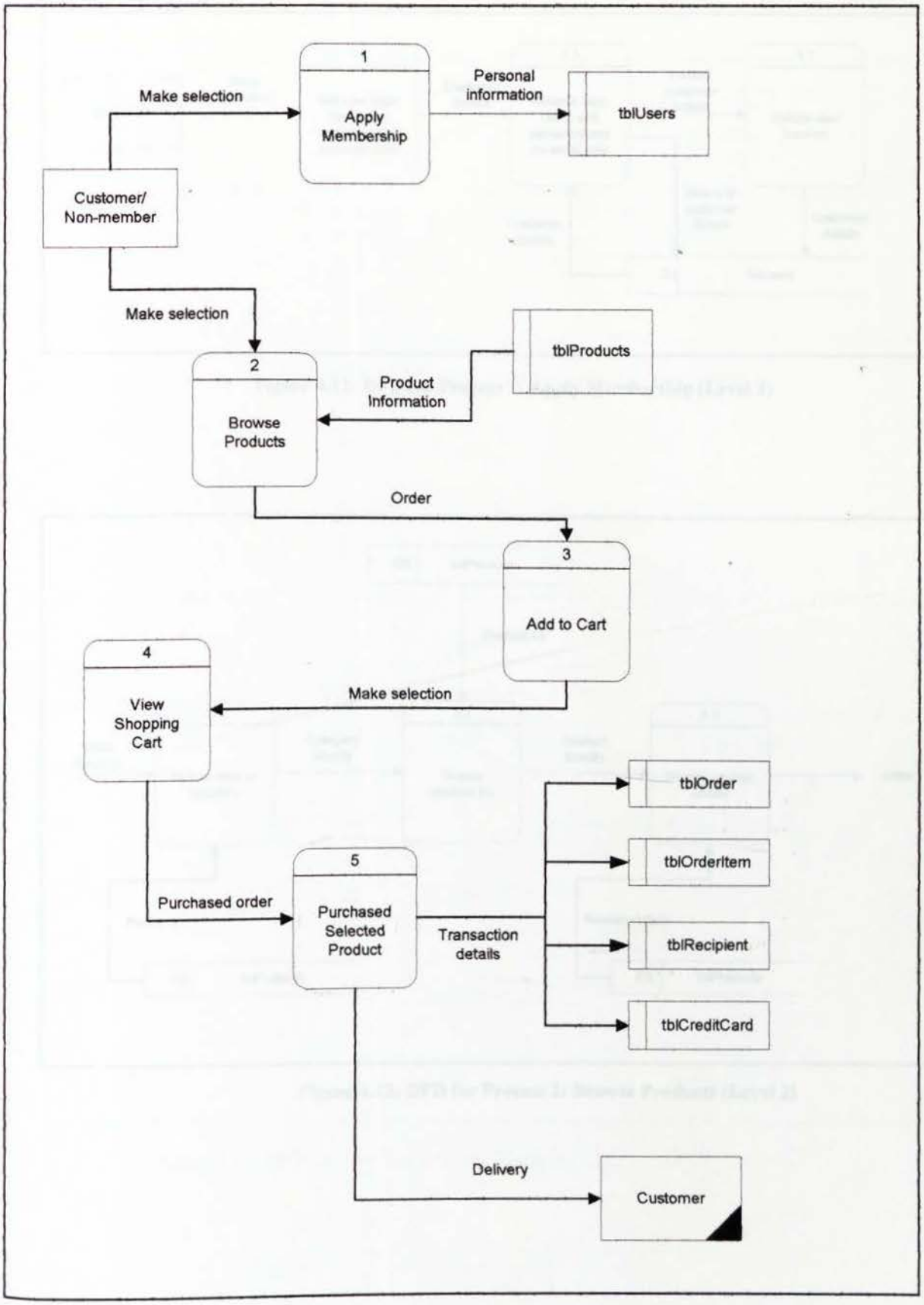

Figure 4.11 : DFD for Non-Member Customer

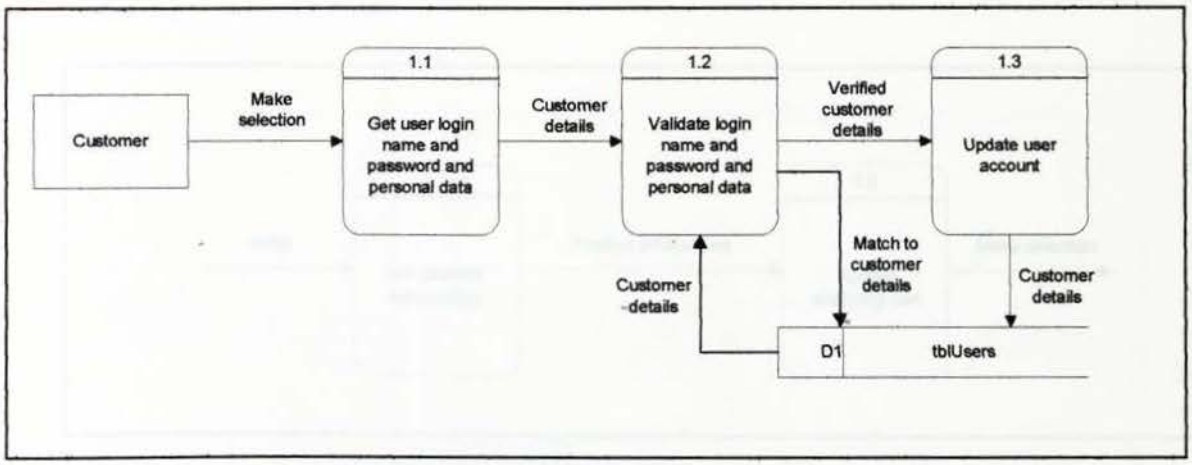

Figure 4.12: DFD for Process 1: Apply Membership (Level 2)

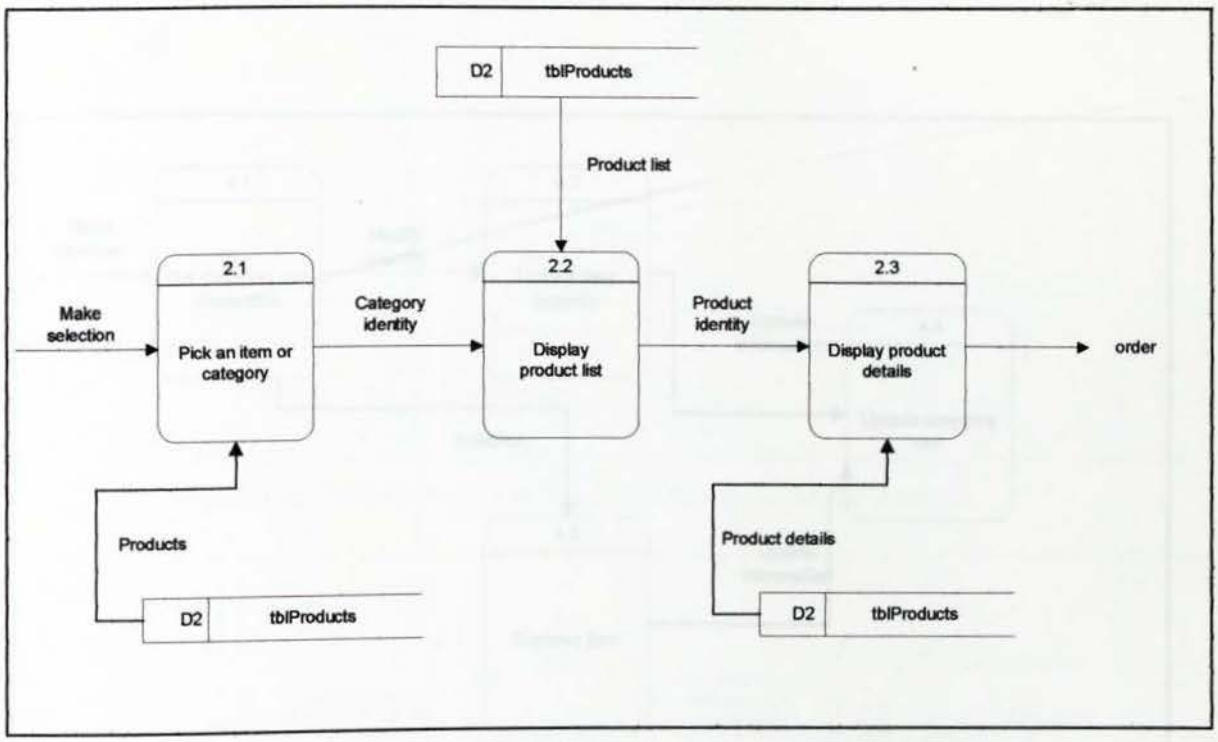

Figure 4.13: DFD for Process 2: Browse Products (Level 2)

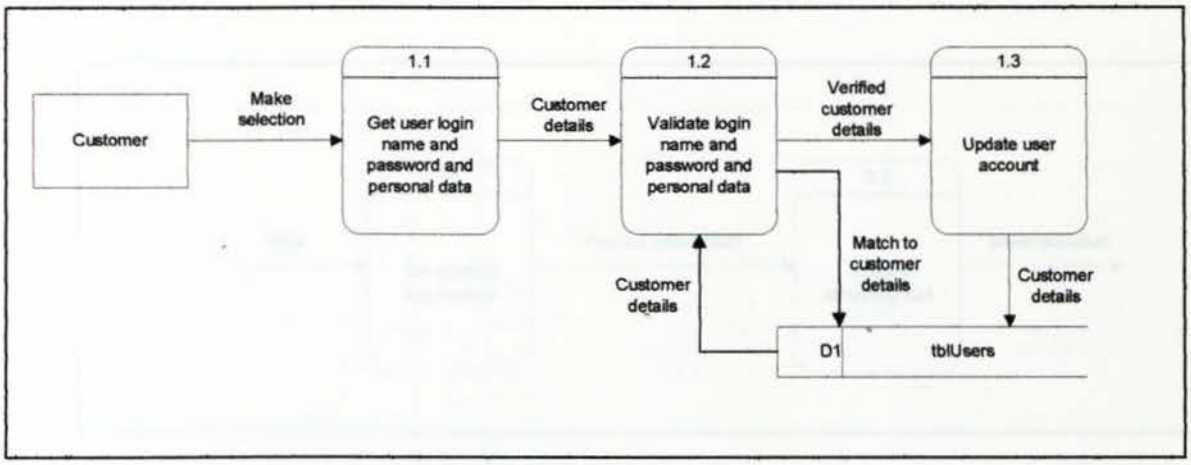

Figure 4.12: DFD for Process 1: Apply Membership (Level 2)

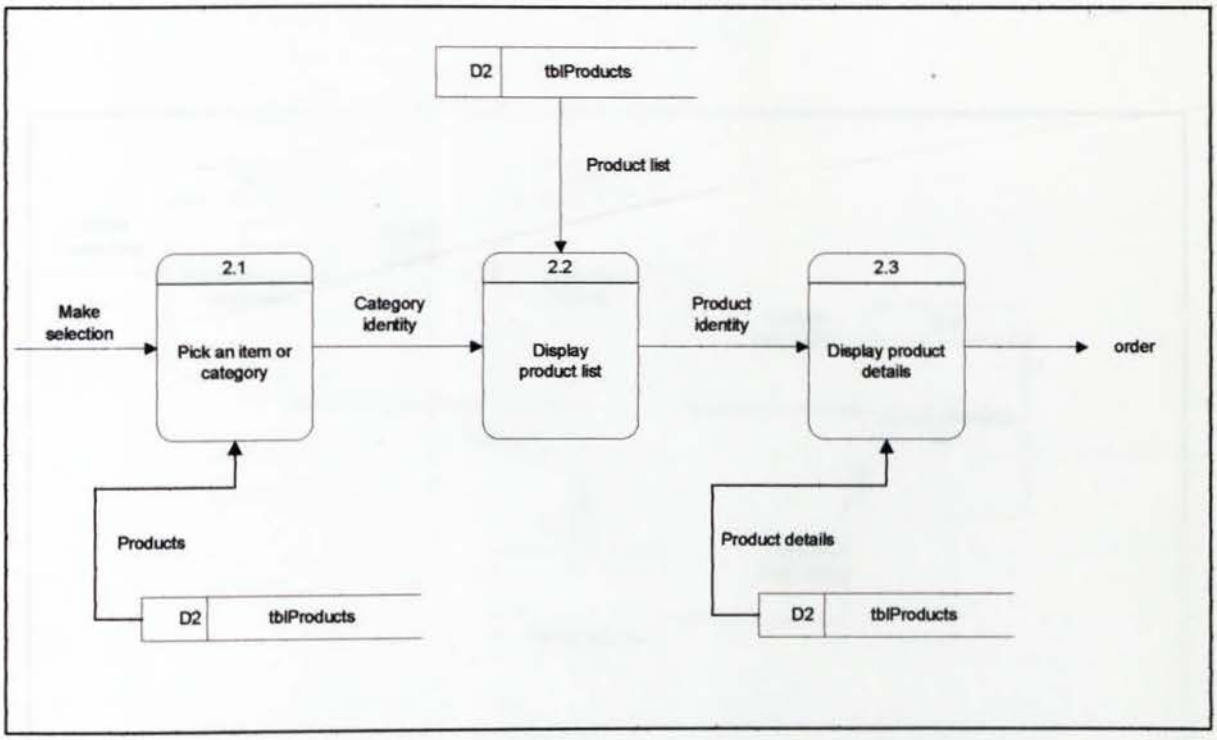

Figure 4.13: DFD for Process 2: Browse Products (Level 2)

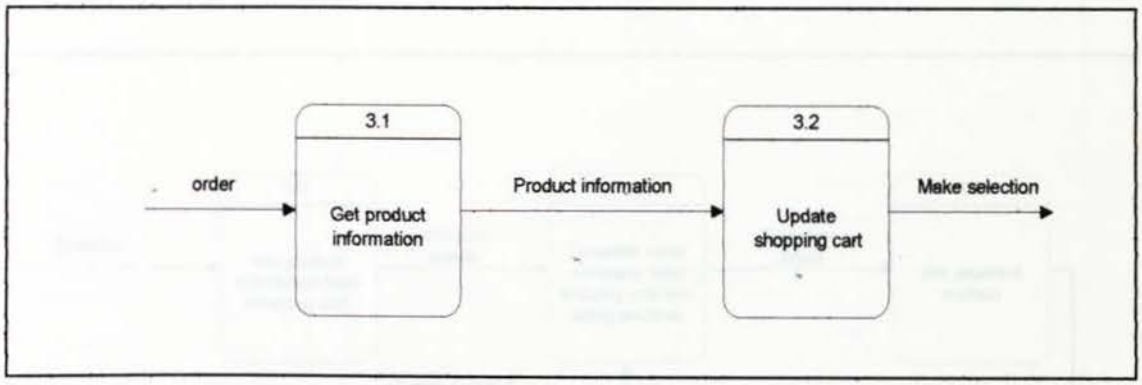

Figure 4.14: DFD for Process 3: Add To Cart (Level 2)

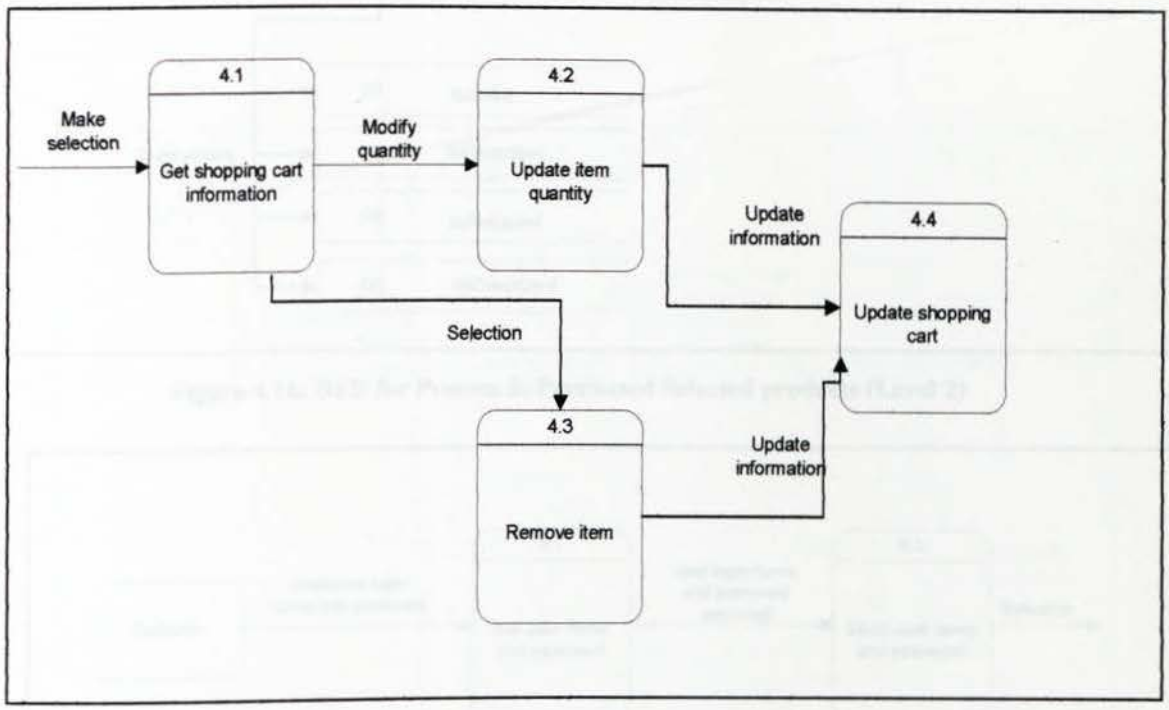

Figure 4.15: DFD for Process 4: View Shopping Cart (Level 2)

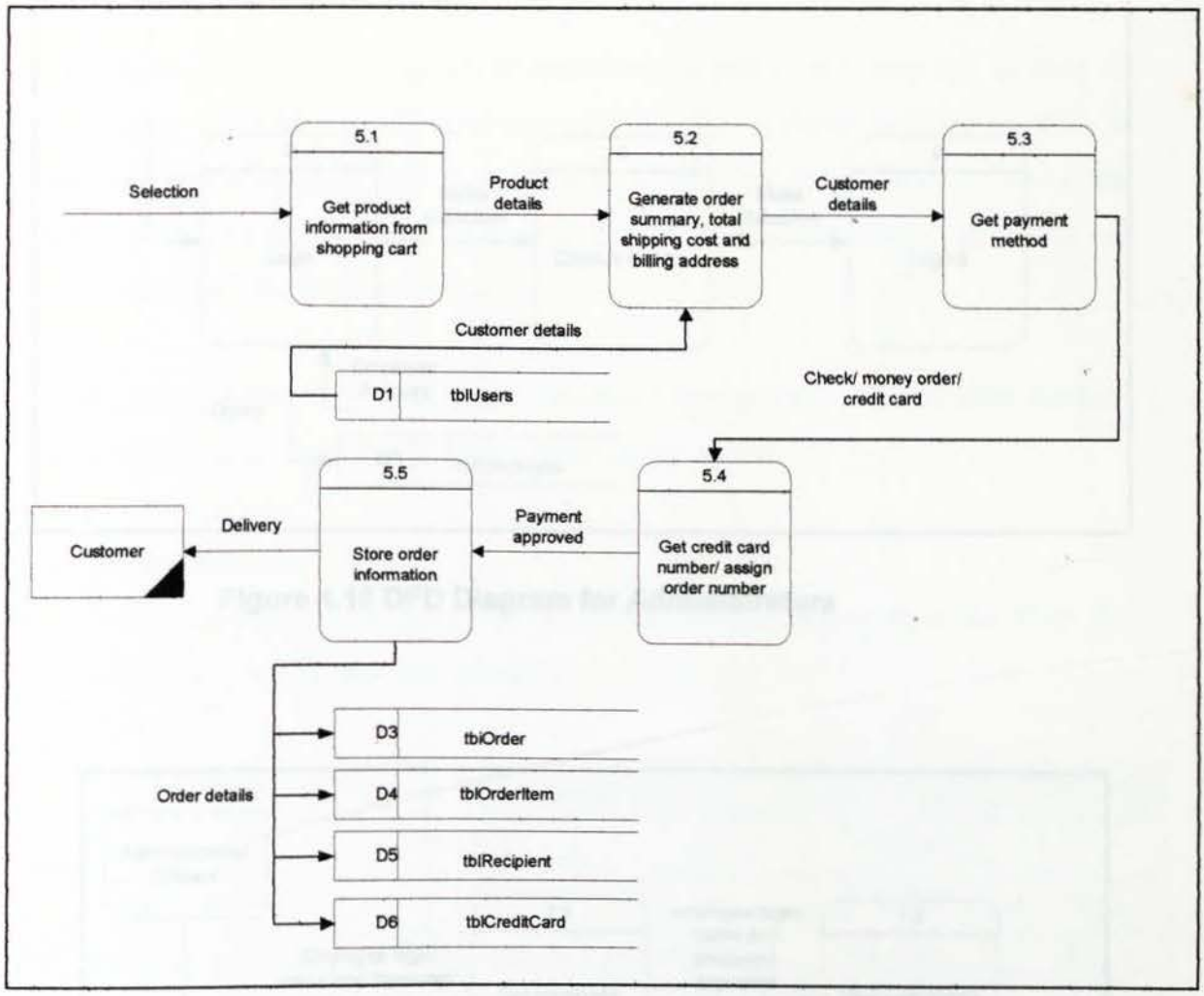

Figure 4.16: DFD for Process 5: Pruchased Selected products (Level 2)

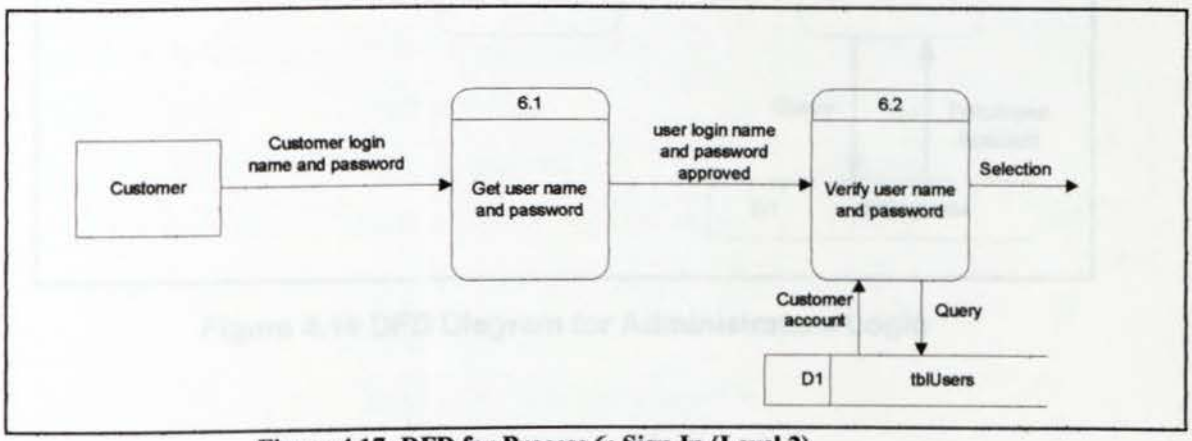

Figure 4.17: DFD for Process 6: Sign In (Level 2)

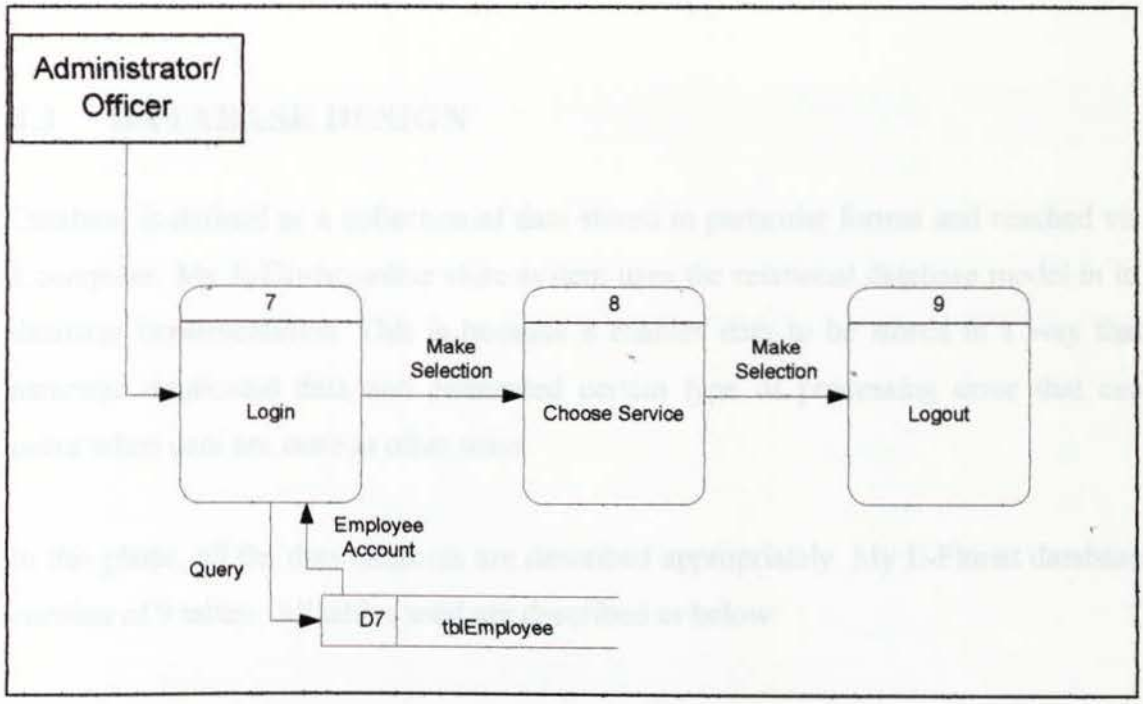

Figure 4.18 DFD Diagram for Administrators

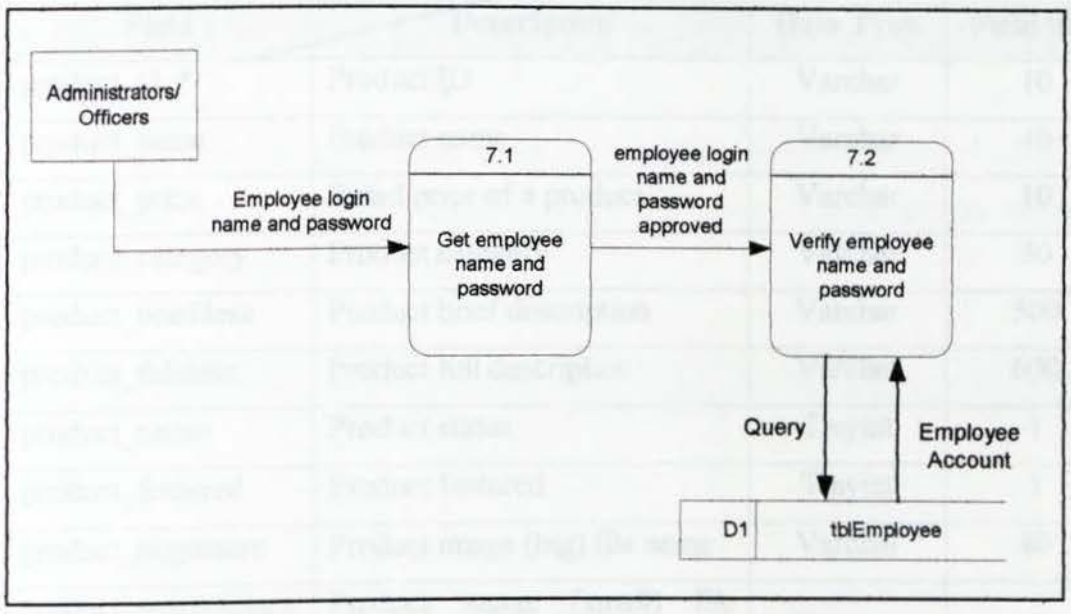

Figure 4.19 DFD Diagram for Administrators Login

4.3 DATABASE DESIGN

Database is defined as a collection of data stored in particular format and reached via a computer. My E-Florist online store system uses the relational database model in its database implementation. This is because it enables data to be stored in a way that minimize duplicated data and eliminated certain type of processing error that can occur when data are store in other ways.

In this phase, all the data elements are described appropriately. My E-Florist database consists of 9 tables. All tables used are described as below:

1. tblProducts table

This table stores all the products' information which are publish to the Web. The primary key of this table is product_id.

Field	Description	Data Type	Field Size
product_id *	Product ID	Varchar	10
product_name	Product name	Varchar	40
product_price	Retail price of a product	Varchar	10
product_category	Product category	Varchar	30
product_briefdesc	Product brief description	Varchar	500
product_fulldesc	Product full description	Varchar	600
product_status	Product status	Tinyint	1
product_featured	Product featured	Tinyint	1
product_bigpicture	Product image (big) file name	Varchar	80
product_smallpicture	Product image (small) file name	Varchar	80

Table 4.1 : tblProducts table

2. tblUsers table

This table details information of customer. The primary key of this table is user_id which is generated automatically when a new user entered the database.

Field	Description	Data Type	Field Size
user_id *	User ID	Int (Auto)	4
user_username	User name	Varchar	30
user_password	User password	Varchar	30
user_email	User email address	Varchar	50
user_address	User address	Varchar	100
user_ city	User city	Varchar	30
user_zip	User zip code	Varchar	8
user_state	User state	Varchar	30
user_country	User country	Varchar	30
user_phone	User phone number	Varchar	10
user_register	Register/Non-register user	Tinyint	1
user_lastOrder	User last order date	Datetime	8

Table 4.2 : tblUsers table

3. tblOrder table

This table stores the information about the purchase order make by customers. The primary key of this table is order_id which is generate automatically when a new order was added to database.

Field	Description	Data Type	Field Size
order_id *	Order ID	Int (Auto)	4
order_userID	User ID	Int	4
order_entrydate	Date when order is made	Datetime	8
order_shipdate	Date when order is shipped	Datetime	8
order_paymethod	User payment method	Varchar	20
order_grandtotal	Total amount of order	Varchar	10
order_status	Order status	Tinyint	1

Table 4.3 :tblOrder table

4. tblOrderItem table

This table store the purchase items' information ordered by a customer. The primary key of this table is orderitem_orderID.

Field	Description	Data Type	Field Size
orderitem_orderID *	Order ID	Int	4
orderitem_productID	Product ID for ordered item(s)	Varchar	10
orderitem_quantity	Quantity of each product ordered	Int	4

Table 4.4 : tblOrderItem table

5. tblRecipient table

This table stores recipient's information whom the customer want to send the purchased item to. The primary key of this table is rec_orderID.

Field	Description	Data Type	Field Size
rec_orderID *	OrderID	Int	4
rec_name	Recipient name	Varchar	30
rec_address	Recipient address	Varchar	100
rec_city	Recipient city	Varchar	30
rec_zip	Recipient zip code	Varchar	8
rec_state	Recipient state	Varchar	30
rec_phone	Recipient phone number	Varchar	10
rec_email	Recipient email address	Varchar	50
rec_message	Message to recipient	Varchar	500
rec_request	Special request by user	Varchar	500

Table 4.5 : tblRecipient table

6. tblCreditCard table

This table stores the credit card information for purchase order paid by credit card. The primary key of this table is creditcard_orderID.

Field	Description	Data Type	Field Size
creditcard_orderID *	Order ID	Int	4
creditcard_name	Card holder name	Varchar	30
creditcard_type	Credit card type	Varchar	20
creditcard_no	Credit card number	Varchar	20
creditcard_expiredate	Credit card expire date	Datetime	8

Table 4.6 : tblCreditCard table

7. tblFeedback table

This table stores feedback information send by customers. The primary key of this table is feedback_id which is generated automatically when a new feedback was entered into database.

Field	Description	Data Type	Field Size
feedback_id *	Feedback ID	Int	4
feedback_email	Email address of user	Varchar	50
feedback_comment	User comment	Text	16
feedback_entrydate	Date when feedback is sent	Datetime	8
feedback_problem	Type of problem	Varchar	50

Table 4.7 : tblFeedback table

8. tblEmployee table

This table stores the information for the administrators. The primary key for this table is employee_id.

Field	Description	Data Type	Field Size
employee_id *	Employee ID	Varchar	15
employee_username	Employee login name	Varchar	15
employee_password	Employee login password	Varchar	15
employee_name	Employee name	Varchar	30
employee_level	Employee level	Tinyint	1

Table 4.8 : tblEmployee_Payment table

4.4 USER INTERFACE DESIGN

The goal of user interface design is to provide the best way for users to interact with computers, or what is commonly known as Human Computer Interaction (HCI). The HCI general principles are as below:

- Consistency

  Consistent format for command input, data display, menu selection, and placing of control objects.

- Confirmation and Verification Message

  Ask for verification of any non-trivial destructive action such as delete record.

- Recoverability

  Ability of the user to take corrective action once an error has been recognized.

- Forgive Mistake

  The system should protect itself from user error that might cause it to flow.

- Reverse Action

  Allow user to return to the previous state (before change).

- Functions Grouping

  Categorize activities by function and organize screen geography accordingly.

- Responsiveness

  How the user perceives the rate of communication with the system. For example, the mouse pointer changes to hourglass or displays a wait message when the system is processing data.

As My E-Florist is a web-based application, web pages design is also important to take into considerations. Some of the consideration need to be taken into while designing the user of web pages. They are:

- Page layout and presentation, that is, does the page look like it is supposed to when rendered by the browser?

- Does the page appear as it is supposed to when rendered by different browsers? This is important when using nonstandard HTML tags (extensions) where different browsers may handle these nonstandard tags differently.

Figure 4.20: Web pages design of the online store

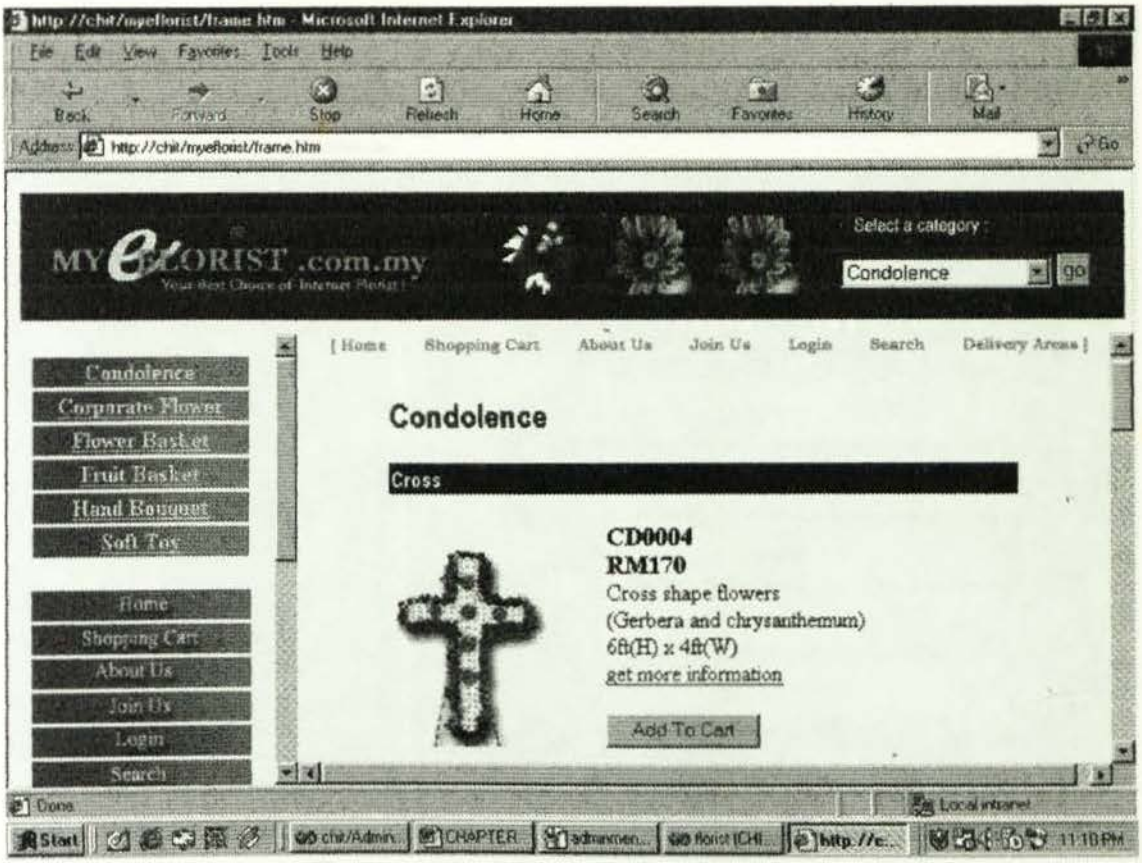

Figure 4.21 Product display screen

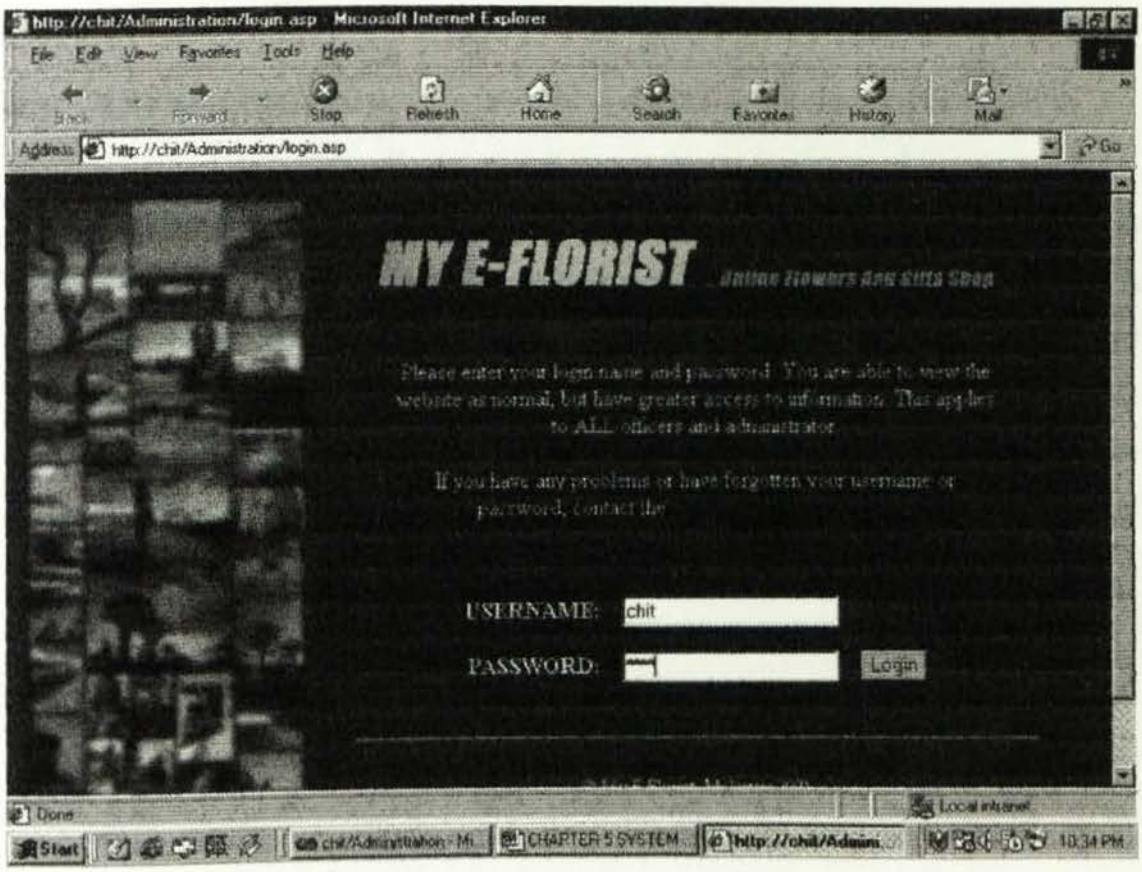

Figure 4.22: Employee login screen

Figure 4.23: Admin main menu screen

4.5 CONCLUSION

System design is a critical part for the whole project. A good design is a key to successful software project. For the system design in this project development, it covers a range of solutions with the difference combination of hardware, software and human operation. The solution chosen in this system design phase is the most appropriate technical solution that meets well with the system requirements. The design in this project development will translate all the requirements into the system characteristics and give a clear picture of the whole project.

CHAPTER 5:

SYSTEMS IMPLEMENTATION

5.1 INTRODUCTION

The implementation phase follows immediately after the design phase, and it is in this phase that the plans in the design are transformed into reality. This chapter looks into these transformations.

5.2 DEVELOPMENT ENVIRONMENT

In system development environment, two major configurations should be considered: hardware and software.

5.2.1 Hardware configurations

The hardware used to develop this system are described as below:

- Pentium III 450Mhz Processor
- 64MB SDRAM
- 6.4GB Hard Disk
- 1.44 MB Floppy Disk
- 40X CD-ROM
- 15" Monitor
- Other standard desktop PC components

5.2.2 Software configurations

The software configurations used to develop this online store are described in the table below:

Software	Description
Windows NT Server 4.0	Server operating system

Internet Information Server 4.0	Web server host
Microsoft SQL Server 7.0	Server database
Windows 95/98	Client operating system
Microsoft Visual InterDev	Coding for ASP and HTML documents
Microsoft FrontPage 2000	ASP & HTML document layout design
Internet Explorer 5.01	Viewing web page
Adobe photoshop 5.5	Image design and implementation
Paint	Image design and implementation

Table 5.1 Summary of software tools used

Microsoft Word 2000 is used to write the report because of its wide availability and suer friendliness. Beside that, Visio Professional is use to draw various types of charts.

5.3 PROGRAM DEVELOPMENT

Program development is the process of creating the programs needed to satisfy an information system's processing requirements. Program development consists of the following 5 steps: reviewing the program documentation, design the program, code the program, test the program and completion the program documentation.

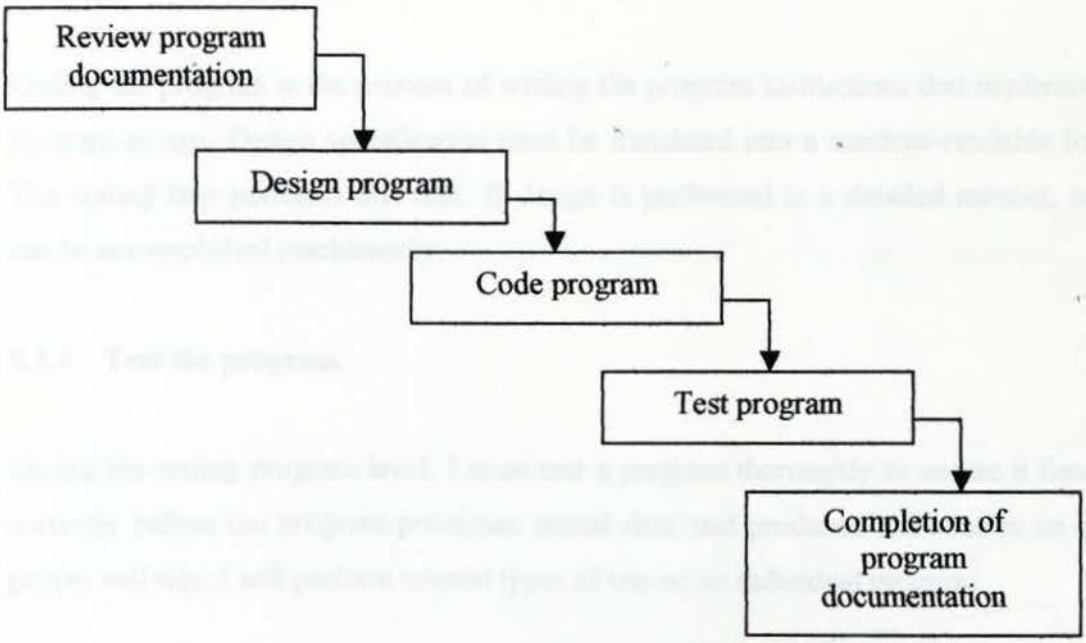

Figure 5.1: The five steps of program development

5.3.1 Review program documentation

The first step in the program development is to review the program documentation that was prepared during the previous phases. The program documentation of online ordering system consists of a simple process description, report layouts, data dictionary entries and the source documents. This documentation helps me to better understand the work that need to be covered during this coding phase.

5.3.2 Design the program

After the program documentation review, I need to design the program, which is the second level of program design during the system development. For this second level of program design, I have to decide how program can accomplish what it must be done by developing a logical solution to the programming problems. The logical solution, or logic, for a program is a step-by-step solution to a programming problem.

5.3.3 Code the program

Coding the program is the process of writing the program instructions that implement the program design. Design specification must be translated into a machine-readable format. The coding step performs this task. If design is performed in a detailed manner, coding can be accomplished machinically.

5.3.4 Test the program

During the testing program level, I must test a program thoroughly to ensure it functions correctly before the program processes actual data and produces information on which people will rely. I will perform several types of test on an individual program.

5.3.5 Document the program

Accurate and complete program documentation is essential for the sucessful operations and maintenance of the information system. This documentation includes the system user manual that may be needed by most of the customers as well as the system administrators.

5.4 PROGRAM CODING

5.4.1 Coding Approach

A program with a technique called top-down, stepwise-refinement, an approach that is essential to the development of well-structured program. This approach enables the programmer terminates the top-down, stepwise refinement process when the pseudocode algorithm is specified. This approach was adapted due to the dependency of the function to logging in each module.

5.4.2 Coding style

Coding style is an important attribute of source code and it determines the intelligibility of a program. An easy to read source code makes the system easier to maintain and enhance. The element of coding style includes internal (source code level) documentation, method for data declaration and approach to statement construction.

5.4.3 Code documentation

Code documentation begin with the selection of identifier (variable) names, continues with the composition of connectivity and end with the organization of the program. Use blank line or identation so that comment can be distinguished from code.

i. Internal documentation

Internal comment provides a clear guide during the maintenance phase of the system. Comments provide the development with means of communicating with readers of the source code. Statement of purpose indicating the function of the module and a descriptive comment that is embedded within the body of the source code is needed to describe processing function.

ii. Naming convention

Naming convention provides easy identification for the programmer. The naming convention is created with coding consistency and standardization in mind.

iii. Modularity

In order to reduce complexity, facilitate changes result in easier implementation by encouraging parallel development of different part of a system.

5.5 DEVELOPMENT OF MY E-FLORIST

5.5.1 Web page development

Though My E-Florist is a web application, all the coding is done using HTML and ASP documents before presented to the web. Languages used include HTML, JavaScript and VBScript.

Preparation of HTML and ASP documents involves endless cycle of testing and modifying the ASP source codes, loading the file in the browser for viewing and validating and then going back to make further changes where necessary. Microsoft Visual InterDev, FrontPage are used for preparation for these documents and the images and animated graphics are created using Paint and Adobe Photoshop.

5.5.2 Client Side Scripting

JavaScript is the only language used to code for client side. In here, the scripts written are mostly to perform validation and calculation on input text. There are two clear advantages of client side scripting over server side scripting. First, the response times are often quicker because the script is interpreted on browser machine. Second, it reduces the web server's workload.

The follwing is an example of using JavaScript in user registration form:

```
.....
<SCRIPT ID=clientEventHandlersJS LANGUAGE=javascript>
<!--
function form2_onsubmit() {
missinginfo = "";
if(form2.newusername.value == ""){
missinginfo += "\n Name";
```

```
}
if(form2.newpassword.value == ""){
missinginfo += "\n Password";
}
if(form2.email.value == ""){
missinginfo += "\n Email";
}
if ((form2.email.value.indexOf('@') == -1) || (form2.email.value.indexOf('.') == -1)) {
missinginfo += "\n Correct email address";
}
.....
if (missinginfo != "") {
 missinginfo ="_____\n" + "You did not fill in your:\n" +
missinginfo + "\n_____" + "\nPlease re-enter and submit
again!";
alert(missinginfo);
return false;
}
else return true;
}
//-->
</SCRIPT>
.....
```

This script is used to check variables in input boxes of user registration form and display error message if any error encountered.

5.5.3 Server Side Scripting

As mention in previous chapter, ASP is a server side script that is embedded in the HTML coding. ASP codes are located within the delimiter <%.....%> in the HTML script. ASP codes are invisible to the client and are executed in the server, hence was named server side script. Some of the ASP objects used in the development of this project are:

- Request Object
  The Request object represents all information sent from a browser to a server including form variables and query strings.

- Response Object
  The Response object represents all information sent from a server to a browser including HTML content sent by an ASP page.

- Server Object
  The Server object enables the use of various utility functions on the server.

- Session Object
  The Session object represents information about a particular user session.

- Application Object
  The Application object represents information that can be shared among all users of an Active Server Page Application.

Server side scripts are written using VBScipt to allow server side processing. VBScript was choosen here because it is easier to code compare to JavaScript. Server side processing here includes the retrieve and updating of database where data must pass back to server.

5.5.4 Database Connection

My E-Florist database is initially created using Microsoft SQL Server 7.0. The SQL Server Enterprise Manager is used to create a new database called "florist" to store the data of My E-Florist. Creating the database involve defining the relations within the database. The field name, key, and data type for each relation are defined in the database.

ADO (ActiveX Data Object) connection is used as a means of database connection. ADO provides the means by which program code accesses the databse. ADO connects to a database through an OLE DB provider. OLE DB provider is Microsoft new lower-level database interface that provides access to many different kinds of data. The OLE DB provider exposes these data to ADO, which in turn allows connection to data using Data Control or Object Interface.

Example of database connection in browsing a product:

Note : ' is used to create a comment

```
<%
' Get the Product ID
productID = TRIM( Request( "pid" ) )

' Open the Database Connection
Set Con = Server.CreateObject( "ADODB.Connection" )
Con.Open "DSN=florist", "sa", "chit"

' Get the Product Information
sqlString = "SELECT * FROM tblProducts WHERE product_id='"+ productID +"'"

' Open the Recordset
Set RS = Server.CreateObject( "ADODB.Recordset" )
```

```
RS.ActiveConnection = Con
RS.Open sqlString
%>
<!--view the product table-->
.....
<!--After viewing the table, close the connection and recordset -->
<%
RS.Close
Con.Close

Set RS = Nothing
Set Con = Nothing
%>
```

5.6 CONCLUSION

Nearly all the design phases that have been presented to this point were directed towards a final objective: to translate representation of software into a form that can be "understood" by the computer. The primary goal of this phase is the production of simple, clear source code with internal documentation that will ease the processes of verification, debugging, testing, modification and further enhancement.

CHAPTER 6:

SYSTEMS TESTING

6.1 SYSTEM TESTING

Testing is performed to ensure that the programs are executed correctly and conforms to the requirements specified. When develop a system, testing usually involves several stages.

In the development of My E-Florist online shop system, it has undergone 3 stages of testing. They are unit testing, integrated testing and finally system testing as show in figure 5.2

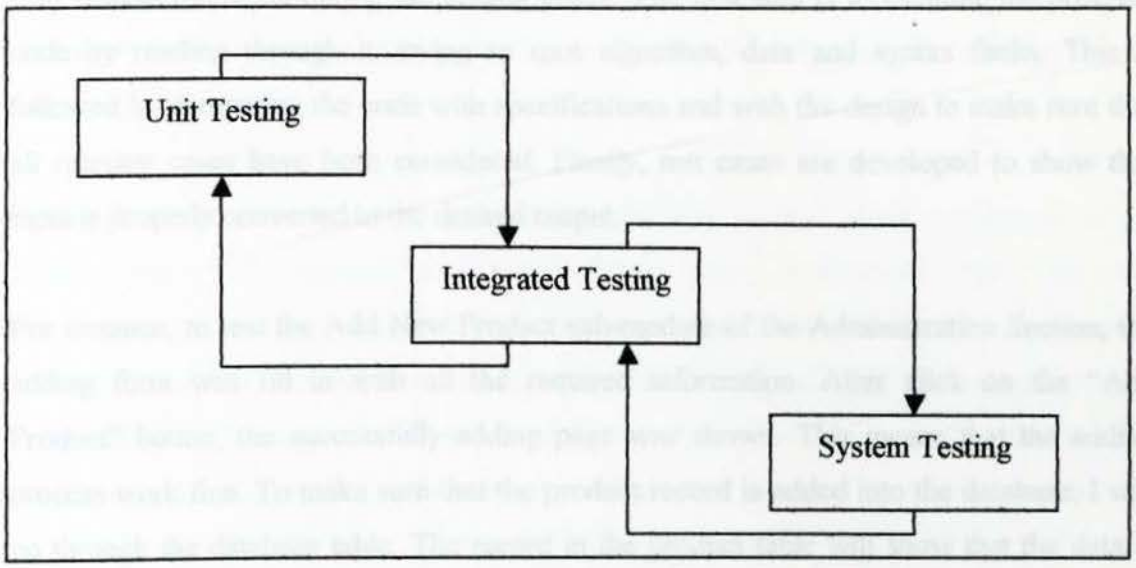

Figure 6.1 Testing stages

In figure 6.1, the arrows from the top of the boxes indicate the normal sequence of testing. The arrows returning to the previous box indicate that previous testing stages may have to be repeated because of some problems. The stages in the testing process are:

6.1.1 Unit Testing

Historically, quality software is relied on testing of each of the function or module. This practice called unit testing, which is extremely time consuming. For this system, unit testing concentrates on the smallest unit of software design, which is the module. Each module is tested on its own, isolated from the other modules in the system. Unit testing verify that the module functions properly with the types of input expected from studying the component's design. After each module has been tested, the interaction of these components must be tested again.

Unit testing was done during the coding phase. The first step is to examine the program code by reading through it, trying to spot algorithm, data and syntax faults. This is followed by comparing the code with specifications and with the design to make sure that all relevant cases have been considered. Finally, test cases are developed to show that input is properly converted to the desired output.

For instance, to test the Add New Product sub-module of the Administration Section, the adding form was fill in with all the required information. After click on the "Add Product" button, the successfully adding page was shown. This means that the adding process work fine. To make sure that the product record is added into the database, I will go through the database table. The record in the product table will show that the data is inserted into database successfully. Then, I will check again in the web site whether the inserted product record can be retrieved. I found that everything work fine in this stage. So, it can conclude that this module work correctly and achieve it objective.

Besides the functionality of the module, all buttons in the form are tested so that they can function correctly. For example, when user click on the "Cancel" button of Add Product form, this will bring the user back to the Product Info Menu or when user click on the "Reset" button of the same form, all input fields are cleared.

The system also tested for error handling, this is done to ensure that the specific module executes the recovering process when an error occurs. For instance, the Add New Product sub-module should be able to continue its function after encounter duplication product ID in the database. Finally, all possible independent program paths are executed to ensure that the control structures are implemented correctly.

6.1.2 Integrating Testing

Integration testing is a systematic technique for constructing the program structure while 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. This testing will ensure that the interfaces such as the module calling sequence in the system are arranged correctly.

In My E-Florist, the bottom-up integration approach is used. Each component at the lowest level of the system hierarchy is firstly tested individually. Then, the next components to be tested are those that call the previously tested ones. This approach is follwed repeatedly until all components are included in the testing. For example, in the Administration Section, the Customer module, Product module, Order module and Employee module are tested individually, then all the four modules are tested together.

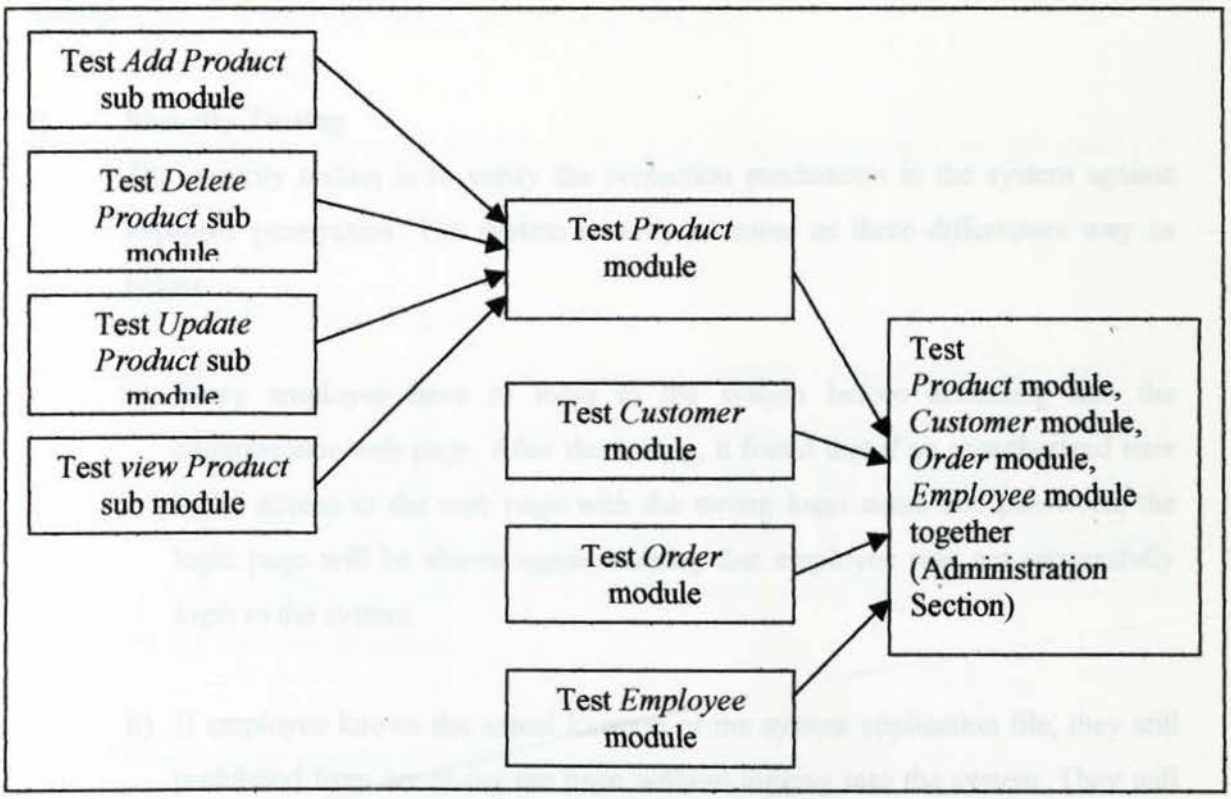

Figure 6.2 Example of Bottom-Up Integration Testing For Administration Section

6.1.3 System Testing

The last testing procedure is system testing. Testing the system is different from unit testing and integration testing. Once the entire system is validated, it must be combined with other system elements such as hardware, end-user and databases. System testing verifies that elements are functioning properly and the overall system performance and objectives are achieved.

System testing is also design to reveal bugs that cannot be attributed to individual component, or to the interaction among components and other objects. System tests study all the concerns issue and behaviours that can only be exposed by testing the entire

integrated system or major part of it. This online shop system undergone two types of testing:

i) Security Testing

The security testing is to verify the protection mechanism in the system against improper penetration. The system security is tested as three differences way as below:

a) Every employee have to login to the system before accessing into the administrator web page. After the testing, it found that if an unauthorized user try to access to the web page with the wrong login name and password, the login page will be shown again meaning that employee was not successfully login to the system.

b) If employee knows the actual location of the system application file, they still prohibited from accessing the page without logging into the system. They will prompt to the system login page.

c) The user with the administrator privilege will be allowed to access the administrator task in this system such as add employee, delete employee and update employee information.

ii) Performance Testing

It is designed to test the run-time performance of system within the context of an integrated system. It occurs through all steps in the testing process.

6.2 ANALYSIS OF THE TEST RESULTS

From the testing process that has been carried out, it can summarized the test results as follow:

- Achieve the main objectives of the project

  Generally, the main objectives of the project as described earlier have been achieved. The system can handle and maintain the customers, product, order and employee databases. It is a system, which is able to handle the purchasing and selling procedures. This is an important and major activity in a business organization. Besides it provides safeguard to prevent the unauthorized users from accessing or modifying the system/database.

- Enhancement on the user interfaces

  The user interface for the system should be more attractive and user-friendly in order to attract the user to use the system. As some of the user may not computer-literate, so it's important to provide the user interface as eacy to use as possible. The customer may reluctant to represent the buttons may help to improve the user interface.

- Enhancement on the product information module

  Since this is an online ordering system, the product information must be clear. This includes the picture and description of the product and also its functionality. This information not only can give the overall clear picture for the customer but also can convince them to order the product.

6.3 CONCLUSION

Software testing is a critical element of software quality assurance and represents the ultimate review of specification, design and coding. It is often referred as verification and validation. Therefore, system testing must be carried out carefully in order to achieve the objectives of the project.

CHAPTER 7:

SYSTEM EVALUATION

CHAPTER 7:

SYSTEM EVALUATION

7.1 INTRODUCTION

This chapter highlight some problems found during the development of My E-Florist Online system and the solutions to these problems. This chapter also includes discussion about the system strengths, limitations and possible future enhancements.

7.2 PROBLEMS AND SOLUTIONS

The basic knowledge needed as a foundation in building a web application involves studies on the Internet, electronic commerce, and Internet security. A lot of system analysis has been done on technological and programming concepts to grasp the concept of Internet programming. The following are some of the major problems encountered during the development of My E-Florist and their solutions.

1. **Difficulty in choosing a development technology, programming language and tools.**

   There are many ways and tools available to develop a web based database system currently as stated in the earlier chapters. Choosing a suitable technology and tool proves to be a critical process as difference tool has its strengths and weaknesses. Besides, the availabiility of the required tool for development is also a major consideration. For instance, a tough decision was needed to choose between Active Server Pages and ColdFusion as both technologies are designed for web development.

   To determine which approach to use, seeking advises and views from project supervisor and coursemates engaging in similar project are carried out. In addition, surfing through the Internet and visiting the FSKTM library help clarify some doubts.

2. **Determining scope of system to be build**

   It is impossible to build a full-scale complete system within the given time frame. Without experience in electronic commerce was another problem for determining the scope of the system.

   To solve this problem, references and analysis the web site which implementating electronic commerce, and discussion with project supervisor were held. Prototyping model is another strategy that allows developer to redefine the scope of the system.

3. **No experinece in programming languages used**

   Since there were no prior knowledge and experience in programming using ASP and HTML, a problem in organizing the codes in a page to let it more readability was faced. In addition, these new programming languages and concepts never taught in the corse undergo. Besides, due to time constraint, learning and developing process was done in parallel. Therefore, without a strong base of the language, it took some times to solve problems that were encountered during system development.

   Problems were solve through research on related material and referring to few reference books available in the market. Discussion with friends using the same technologies was a great help in solving most of the problems faced. A more direct method was through trial and error during coding.

4. **Slow response time**

   Some of the modules in the system such as shopping cart module need to reponse in minimum amount of time. If all the information such as list of favourites items of each user is stored in database, the response time will be very slow.

   In order to speed up the response time, personalized favourites items list is stored in session rather than in database. With the session objects, the item list could be easily

retrived as long as the user session is not end. This help to save the storage of the database.

7.3 SYSTEM STRENGTHS

The following points illustrate the strengths of the My E-Florist online ordering system:

1. **User Friendly**

   In overall, My E-Florist could be evaluated as a simple to use application. Unlike command-based environment, such as MSDOS, the Online Flowers and Gifts shops provides simple, user friendly and graphical based interface for users to deal with it. Users required only minimum typing and inputs when interaction with the system. Besides, sufficient instruction and guidance are provided to guide and assist user. For example, error messages will be displayed to guide user whenever a blank or invalid input is encountered by the system.

2. **Easy order facility**

   My E-Florist is designed such a way that simplify the user ordering process by providing free shipping, shopping cart and quick order facilities. Shopping cart keeps track of user-selected item(s) while user browse the system or products. Besides, it also enable the user to modify the content of the list of items such as changing the quantity of certain items or removing certain items from the list. The system will recalculate the content of shipping cart when users update the shopping cart.

3. **Error messaging**

In this online store system, error messages will display immediately whenever an error is encountered. Message boxes or error pages are displayed to allow users to identify their error effectively and to guide users to correct their error.

4. **Identification and Authentication**

Identification and authentication protect some modules of My E-Florist. For instance, a member can only update their information after login with his/her username and password. So, unauthorized user is prohibited from accessing the record stored in database.

Besides, a custom password-authentication system is created to prevent unauthorized employee from accessing the page that they don't have permission to view. More importantly, the authorize users are prohibited from accessing the functionality which is out of their privilege.

5. **Relatively Fast Response Time**

Each web page is design to be lightweight. These pages load in a reasonable amount of time to ensure users need not wait too long to view the pages. Large graphical image is avoided and the use of Active Server Pages makes the data retrieving from server more efficiently.

7.4 SYSTEM LIMITATIONS

Beside the strengths, My E-Florist online ordering system also has some limitations due to the time constraint and other factors, as listed below:

1. **Lack of security features**

In real online business environment, the payment system is the most complicated part of the system. This part includes several security issues, alliances with credit card company and banks, technical problems by using SSL (Secure Socket Layer) or SET (Secure Electronic transactions) and the problems of fraud, which faced by most online businesses. Due to the time and facility constraints, security features are not included in the online payment module as stated in the proposal earlier.

2. **No report generated for administrator section**

Due to time constraint, My E-Florist does not provided reports generation module such as order summary reports and customer summary reports for the administrators to keep track of their business as proposed in the proposal earlier.

3. **Backup and restore function**

The backup and restore function was not considered in this system. This system is very important if a disaster occurred causing damage to the system and database. So, the contingency planning is needed because the disaster will cause major loses to the organization. The backup must be scheduled in proper manner so that the important and critical data must be backup in daily basic.

7.5 FUTURE ENHANCEMENT

A system development knows no boundaries as new requirements and better implementation methods continue to arise and evolve. These are several enhancements that could extent the usability of the developed system.

1. **Increase security implementation**

A greater amount of security can be implemented in My E-Florist by the adding in security features during transferation of information such as credit card number and others. The system security can be increased by enforcing SET and SSL technologies to verify customer creditcard number. By employing these technologies, customer identification can be recognized by the banking system and therefore online payment can be made. Hence, reduce the possibility of fraud. Besides, customer payment information can be guaranteed safe and will not be intercepted by other unauthorized party since encryption technique is provided by SSL and SET technologies.

2. Implementation of Credit Card Payment System

At the end of this project, the credit card payment system was not implemented. In real environment, the payment system is the most complicated part of the system. To implement the payment system in this project, the developer has to master in the security issues in transactions. Besides, the developer must also have knowledge of SSL and SET.

3. Report generating and printing

As mention in system limitations, My E-Florist does not support report generating and printing facilities. For future enhancement, My E-Florist needs to provide report generating and printing facilities. It should able to print out the order summary, bill, label, and others reports and documentation. With its own printing facility, the layout of the print out documents will have a better control.

4. Advertisement

Currently, My E-Florist does not provide advertisement. This feature may add to My E-Florist so that its income not only comes from the selling money, but also from advertisement.

7.6 KNOWLEDGE AND EXPERIENCE GAINED

A lot of knowledge was gained throughout the development of My E-Florist online shop and it provides extra information that cannot be obtained from the textbooks. These included client/server system within the Internet environment, concepts of programming, as well as Internet technologies and tools.

Programming in ASP, HTML, JavaScript and VBScript prove to be a valuable experience. ASP technology turned out to be most suitable technologies to develop such a system and has great potential to be a dominant server ISAPI filter in future replacing CGI. However, besides programming skills and techniques, good software engineering techniques cannot be neglected. Here, theories and knowledge gained throughout computer science studies like system analysis, design and software engineering were literally put into practice.

7.7 SUMMARY

This is the last phase in the system development, which evaluate and review process for the end system. The evaluation will help the developer to understand more about the system strengths and limitations. Then, a more complete and comprehensive system can be developed in the future enhancement.

7.8 CONCLUSION

The My E-Florist Online Flowers and Gifts Shop System is a start to computerize the operations and transactions in the business organizations towards the effort of paperless concept. Although development the whole system is not easy task because various objectives has been targeted, but it still can be considered as a contemporary effort to achieve the goals. Overall, this project has achieved and fullfill the objectives and requirement as determined during the analysis phase.

In the process of developing the system, invaluable insight was gain into complexities and intricacies of programming. The application of software engineering principles throughout the development has served to further enhance the required skills for developing a sound system. Adherence to a development schedule is very important in order to get a job or a task done on time. This experience will definitely prove useful in future system development.

Although not a very complex system, the successful development of the online store system is the first step towards the future development of system definitely. The problems and experiences gained during the system developemnt should be useful in my future endeavors. It is hopes that this system can provide a foundation upon which more innovative and comprehensive system may be built to perform multiple tasks and fullfills various user requirements.

REFERENCES

[1] http://www.medusa.fsktm.um.edu.my/~online/ilmiah/guide

[2] Mike West and Eric Purchase. **Electronic Commerce Platforms and Applications**. GartnerGroup, 1999.

[3] Jerry Cashin. **E-Commerce Success. Building a Global Business Architecture**. Computer Technology research Corp. 1st edition. 1999.

[4] http://www.Ecommerceadvisor.com

[5] http://www.1giftbasket.com

[6] http://www.flowershop.com.au

[7] http://www.malaysiawebtech.com/flower/

[8] http://www.myflowers.com.my

[9] http://www.rsa.com/about/

[10] http://developer.netscape.com/docs/mauals/security/sslin/

[11] http://www.netscape.com/assits/security/ssl/index.html

[12] http://www.tdbank/creditctr/creditfq/creditfq.html

[13] Ian Sommerville, Lancaster University. **Software Engineering**. Addition-wesley Longman Limited. 5th edition. 1995.

[14] Gobinathan A/L Arumainathan. **A Prototype For Online Sports Store**. Faculty of Computer Science and Information Technology. Session 1999/2000.

[15] Stephan Walter and Jonathan Levine. **Teach Yourself E-Commerce Programming with ASP in 21 Days**. Sams Publishing. April 2000.

[16] Chris Ullman, David Buser, Jon Duckett, Brain Francis, John Kauffman, Juan T.Llibre and David Sussman. **Beginning ASP 3.0**. Wrox Press Ltd. 1999.

[17] http://www.asp101.com

[18] http://www.learnASP.com

[19] http://www.allaire.com

[20] Ben Forta. **The ColdFusion 4.0 Web Application Construction Kit**. Que, 1998

APPENDIX A:

SAMPLE CODING

1) User Login Page

i) login.htm (The HTML Page)

```
<HTML>
<HEAD>
<META NAME="GENERATOR" Content="Microsoft Visual Studio 6.0">
<TITLE>Login</TITLE>
</HEAD>

<BODY>
<TABLE align=center bgColor=white border=0 cellPadding=2 cellSpacing=0
style="HEIGHT: 451px; WIDTH: 436px" width="80%">
<TR>
  <TD height=30 vAlign=top>
  <TABLE border=0 cellPadding=2 cellSpacing=0 height=30 width="100%">
  <TR bgColor=#006699>
      <TD><FONT color=#ffffff face=Arial size=3><B>Member
      Login</B></FONT></TD></TR></TABLE>
      <P align=center><FONT color=#000066 face=Arial size=2>Welcome to our
      Member Area. As our member you be able to:-</FONT></P>
      <BLOCKQUOTE>
     <UL>
      <LI>
       <DIV align=left><FONT color=#000066 face=Arial size=2>Faster and
      Easier shopping</FONT> </DIV>
     <LI>
     <DIV align=left><FONT color=#000066 face=Arial size=2>Enjoy Special
      Discount</FONT> </DIV>
     <LI>
     <DIV align=left><FONT color=#000066 face=Arial size=2>Receive Exclusive
      Special Offer</FONT> </DIV>
     <LI>
```

```
 <DIV align=left><FONT color=#000066 face=Arial size=2>And many
more</FONT> </DIV>
 </LI>
</UL>
<P align=center><FONT color=#000066 face=Arial size=2>To become our
members, <A href="register.asp">Click Here to apply</A>.</FONT></P>
<DIV align=left>
<HR width="100%">
</DIV>
<FORM action=validatelogin.asp method=post id=form1 name=form1>
<TABLE align=center bgColor=#ccffcc border=1 cellPadding=0 cellSpacing=0
 style="HEIGHT: 105px; WIDTH: 263px" width=350>
<TBODY>
<TR>
  <TD>
  <TABLE align=center bgColor=#ccffcc border=0 cellPadding=0
  cellSpacing=0 style="HEIGHT: 156px; LEFT: 31px; TOP: 0px; WIDTH:
  258px" width=350>
  <TBODY>
  <TR>
        <TD>  </TD>
         <TD>  </TD>
  </TR>
  <TR>
         <TD>
         <DIV align=right><FONT color=#333333 face=Arial
        size=2><B>User Name :</B></FONT></DIV></TD>
        <TD><INPUT name=username> </TD>
  </TR>
  <TR>
        <TD>
        <DIV align=right><FONT color=#333333 face=Arial
        size=2><B>Password :</B></FONT></DIV></TD>
```

```
                <TD><INPUT name=password type=password> </TD>
        </TR>
        <TR>
                <TD colSpan=2>
                <DIV align=center><BR><INPUT name=Submit type=submit
                value=Enter>
                <INPUT name=Submit2 type=reset value=Reset>
                </DIV></FORM></TD>
        </TR>
        </TBODY>
        </TABLE>
        </TD>
    </TR>
    </TBODY>
    </TABLE>
    </BLOCKQUOTE>
 <P> </P>
 </TD>
</TR>
</TBODY>
</TABLE>
</BODY>
</HTML>
```

ii) validatelogin.asp (The ASP Page)

```
<%@ Language = VBScript%>

<!--# Include File = "storefuncs.asp" -- >

<%
'Get Login Information
username = TRIM( Request( "username" ) )
password = TRIM( Request( "password" ) )

'Open Database Connection
Set Con = Server.CreateObject ( "ADODB.Connection" )
Con.Open "DSN=florist", "sa", "chit"

'Get User ID
userID = checkpassword( username, password, Con )

IF userID > 0 THEN
'Add Cookie
addCookie "userID", userID
%>

<HTML>
<HEAD>
<META NAME="GENERATOR" Content="Microsoft Visual Studio 6.0">
</HEAD>
<BODY>

<TABLE align=center bgColor=white border=0 cellPadding=1 cellSpacing=0
width="80%">
<TBODY>
<TR>
```

```
<TD>
<TABLE border=0 cellPadding=2 cellSpacing=0 height=30 width="100%">
<TBODY>
<TR bgColor=#006699>
    <TD><FONT color=#ffffff face=Arial size=3><B>Member Area
    </B></FONT></TD>
</TR>
</TBODY>
</TABLE>

<P><FONT color=#000066 face=Arial size=2>Welcome to our Member
Area, as our member, you are subjected to 10% discount for every item
purchased. Please reference this number as your promotion number:
<%=userID%>

<P><FONT color=#000066 face=Arial size=2>We hope that you will enjoy
your shopping with us!</FONT></P>

<br><FONT color=#000066 face=Arial size=2>Update personal
information?<A class=LeftB href="updateinfo.asp?userID=<%=userID%>"
title="Update Member Information">Click Here!</A></FONT>

<br><FONT color=#000066 face=Arial size=2>Change password?<A
class=LeftB href="changePassword.asp?userID=<%=userID%>"
title="Change Password">Click Here!</A></FONT>

<br><FONT color=#000066 face=Arial size=2>Continue shopping?<A
class=LeftB href="home.asp">Click Here!</A></FONT>
</TD>
</TR>
</TBODY>
</TABLE>
<P> </P>
```

```
<%
ELSE
'Display Error Message
        errorForm "You have enter the wrong password. Please go back and reenter
        again!", "login.htm"
END IF
%>

</BODY>
</HTML>
```

iii) storefuncs.asp (The ASP Page)

```
'=====================================
 ' Common Functions
'=====================================

' Open the Database Connection
Set Con = Server.CreateObject( "ADODB.Connection" )
Con.Open "DSN=florist", "sa", "chit"

FUNCTION fixQuotes( theString )
        fixQuotes = REPLACE( theString, "'", "''" )
END FUNCTION

' Add Cookies
SUB addCookie( theName, theValue )
        Response.Cookies( theName ) = theValue
        Response.Cookies( theName ).Path = "/"
        Response.Cookies( theName ).Secure = FALSE
END SUB
```

```
'Validate User Password
FUNCTION checkpassword( byVal username, byVal password, byRef Con )
sqlString = "SELECT user_id FROM tblUsers " &_
        "WHERE user_username='" & username & "' " &_
        "AND user_password='" & password & "'"
SET RS = Con.Execute( sqlString )

' Return check value
IF RS.EOF THEN
    checkpassword = - 1
ELSE
    checkpassword = RS( "user_id" )
    addCookie "username", username
    addCookie "password", password
END IF
END FUNCTION

' Function Get Selected Option
FUNCTION SELECTED( firstVal, secondVal )
    IF cSTR( firstVal ) = cSTR( secondVal ) THEN
        SELECTED = " SELECTED "
    ELSE
        SELECTED = ""
    END IF
END FUNCTION

'Display Error Message
SUB errorForm( errorMSG, backpage )
 %>

 <html>
 <head><title>Problem</title></head>
 <body bgcolor="lightyellow">
```

```
<center>
<table width="500" border=1 cellpadding=5 cellspacing=0>
<tr>
 <td>
 <font face="Arial" size="3" color="darkblue"><b>
 There was a problem with the information you entered:
 </b></font>
 <font size="2" color="red"><b>
 <br><%=errorMSG%>
 </b></font>
 <br>
 <form method="post" action="<%=backpage%>" id=form1 name=form1>
 <input name="error" type="hidden" value="1">
 <%=formFields%>
 <input type="submit" value="Return" id=submit1 name=submit1>
 </form>
 </td>
</tr>
</table>
</center>
</body>
</html>

<%
Response.End
END SUB

'Return Form Field Variables
SUB formFields
        FOR each item in Request.Form %>
        <input name="" type="hidden" value="<%=Server.HTMLEncode ( Request (
        "item" ) )%>">
        <%
```

```
        NEXT
END SUB

'Check valid email address
FUNCTION invalidEmail( email )
        IF INSTR( email, "@" ) = 0 OR INSTR( email, "." ) = 0 THEN
                invalidEmail = TRUE
        ELSE
                invalidEmail = FALSE
        END IF
END FUNCTION

'Check Username Already Exist
FUNCTION alreadyUser( theUsername )
        sqlString = "SELECT user_username FROM tblUsers " &_
                "WHERE user_username='" & fixQuotes( theUsername ) & "'"
        SET RS = Con.Execute( sqlString )
        IF RS.EOF THEN
                alreadyUser = FALSE
        ELSE
                alreadyUser = TRUE
        END IF
        RS.Close
END FUNCTION

'Get Order Status
FUNCTION showOrderStatus( theStatus, theShipDate )
SELECT CASE theStatus
        CASE 0
                showOrderStatus = "Pending"
        CASE 1
                showOrderStatus = "Problem with Credit Card"
        CASE 2
```

```
            showOrderStatus = "Product not in stock"
        CASE 3
            showOrderStatus = "Shippid on " & theShipDate
        CASE ELSE
            showOrderStatus = "Unknow"
END SELECT
END FUNCTION
%>
```