Online Bakery Shop System
(OBSS)

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Abstract

Online Bakery Shop System (OBSS) is an internet-based electronic commerce system developed with the objective of providing purchase and management service through World Wide Web. It is an application that makes use of the web multiple-tier client/server architecture.

OBSS can be divided into 2 modules, which are the shopper and administrator module. The shopper module will provide facilities to the customer to brows and order cakes online. Shopper can also choose the cake clothing they prefer. Besides, shopper module will provide bakery lesson with different recipe and instructions to the shopper. In the administrator module, administrator can view, edit, update and delete records in the database. In addition, administrator is able to do business analysis by using OBSS.

The system architecture of OBSS can be divided into client, web server and database server. The client which is the web browser can access information by connecting to the web server. Whenever the client wants to retrieve information from the database server, it has to submit the request to the web server that will interact with the database server. The database server process the request and result is sent back to the web server and finally to the client.

OBSS is develop using Microsoft Visual Studio .NET technologies on the Microsoft Windows 2000 Server platform, utilizing database created by Microsoft SQL Server 7.0. Since current client/server based database system will be transforming to web-based database system, thus the system of this nature will become essential to everyone in t he future.

ACKNOWLEDGEMENTS

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INTRODUCTION

1.1 Project Overview

In the old days, when customers want to order a cake, they usually do it by using phone call. In that case, they don't actually see the product before they order it. When they get their order, it might not fulfill their satisfaction. Some time when customer went up to the shop, they might also face problem waiting for their product to be ready. These problems can be solve if the customer can visually see the product and specify their needs for the item they want order. That is when Online Bakery Shop comes in.

Online Bakery Shop, as its name indicates, is an e-commerce site where people can make their orders online. It is build upon the concept of real world bakery shop. Customers can view image of all available products at the shop and can select the product they want to buy. If the customer is ordering a cake, the system will allow them to select the clothing of the cake. Then customers will have to give their identity and location of delivery when summit the order. Beside purchasing, the website also provide bakery lessons to the web surfer who visit the website, teaching the some tips and tricks to make delicious cookies or cakes by themselves.

The system can mainly be divided into three parts:

1. E-commerce Part

   This is the main part of the system that include the purchasing process start from customer visit the website, select their purchase item, summit their order and how the system process the order.

2. Cake's Clothing Design Part

   The clothing design part is a sub component of the system that let the customers design the clothing of the cake they order. This includes the side design, top design and the grading that the customer wants to write on the cake.

3. Bakery Lessons Part

   This part will focus on the bakery lesson witch include the recipe that will be put online, user feed back, and updates.

1.2 Project Definition

Online Bakery Shop System (OBSS) is an intranet/Internet based system where ordering goods and management of the store will be done electronically on the web. OBSS is a virtual bakery shop that focuses on selling bakery product online. Using a standard Internet browser, anyone who had access to the Internet could browse the online catalog and order their favorites bakery product online using OBSS. Shopper is able to search for their favorite's product by using the search engine and OBSS will provide all the relevant information such as product type, flavor, size, decorations and others. If the shopper intends to buy the bakery product, he or she could order it online and fill in the shipping information. The payment method implemented in the OBSS is by paying money when the shopper receives the product they buy. Beside, shopper can learn how to do bakery by themselves by visiting the online Baking Lesson provided by OBSS. The lesson will be updated once or twice a month, providing recipes, tips and tricks to bake like a professional baker.

OBSS uses the latest web technologies and tools to develop an online business for the current physical bakery shop. It provides a solution for businesses that are ready and brave enough to take e-commerce challenge. They will be able to explore a broader market and thus being more competitive to their rival. OBSS is divided into 2 main modules which are the customer's module and the administrator's module.

The customer's module will allow customer to search and browse bakery product online. Beside, customers can register to be a member of the OBSS which will enable them to order bakery product online. Customer will be able to order bakery product online, receive information about any promotions that is held and visiting the baking lesson online. For customers who order cakes, there will be a sub module for them to do their cakes clothing decoration.

The administrator's module will enable the administrator to manage the daily operations in more easy and efficient way. The administrator can maintain and analyze the information, view and modify the data that is retrieved from the database system.

1.3 Project Motivation

The growth of the Internet as a valuable channel in human lifestyle today encourage people to optimize it usage for use on it. These enable user to access the Internet at anytime anywhere connectivity through modem and other computer devices. The increasing popularity of the e-commerce in recent year is because of it easy and useful explorer the Internet by mouse clicks.

The main benefit of this project is easy, fast and secure access to relevant love interactive Internet information and other. E-commerce based services are global, easy to explorer and are independent of the other e-commerce web site. It provides up-to-date information when you are on the move.

E-commerce services also have a user-friendly and ease of use design that enable user to get information through the computer screen in the simplest way. With this feature, the user can get use of the service and application similar to the ones you find in the Internet in a very thin customer. The administration part also can easily handle the system as what they did in the normal Internet services.

1.4 Project Objectives

1.4.1 Problems in Traditional Business

In the conventional way of business transactions, there are a lot of problems that has emerged such as inefficiency, inaccuracy, insecurity, delay and others. For example, in the traditional bakery shop business, the sellers would have to control their inventory manually. Everyday, they need to count their stock manually in order to know how much stock are used, sold and left in the store. Beside, if they wish to analyze the business performance, they would have to collect all the information of the bakery products they have sold manually. As a result, it would be very difficult to do so as it would consume a lot of time and paperwork. If the seller intend to keep track of the customer detail, which most of them don't do, it would be a difficult job as the they have to enter all the customer details into the customer no record from manually and update it when the customer notify them about the changes in customer profiles. This would waste a lot of money and time as the seller has to do a lot of paperwork.

Besides, the coverage area for the business is very limited. Shopper who is staying far away from the store is not interested to visit the store, as it is inconvenient. Thus, the store would miss a lot of business opportunity and eventually will result in a loss to the store. The

seller would have to invest a large sum of money in order to start a bakery store business. This is due to a large amount of money would be spent on shop rental and decoration in order to attract customers. In security point of view, seller might encounter the credit card frauds which will bring loss to their business.

In the shopper's aspect, they would waste a lot of time and money in shopping in a physical bakery store. This is due to shoppers had to spend time visiting the physical store to select and buy their product. Some times the product available in the shop might not fulfill shopper's satisfaction and they might just leave the shop without buying anything. Then if they did, they have to carry the product all their way home back home. In addition, shopper would have to waste their time and money for being caught in a heavy traffic or having difficulties looking for a parking lot. Beside, when they order a product by phone call, they will have no idea what the product to look like because they did not visually see the product before. When they get the product, it might look far different from what they had expected.

1.4.2 Objective

Due to the above problems and inconvenience, OBSS is developed to explore the following objective:

- Provide a broader market area for a business without having to increase human resource.
- Maintain a business transaction in a more efficient and easier way.
- Conducting a business in a paperless environment.
- Provide a scalable solution whereby future enhancements and modifications can be done easily.

1.5 Project Scope

OBSS will consists 2 main modules which are:

a. Customer's module – includes:

- Provide online Bakery products catalogues for shopper to view.
- Enable online Bakery product ordering capability.
- Enable customer to keep track of tier order online.
- Enable customer to decorate cake's clothing.
- Provide login and register function of their order online.
- Provide an online baking lesson.

b. Administration's modules – includes managing:

- Provide login function to authenticate administration's login.
- Enable administrator to manage customer order.
- Enable administrator to do inventory control efficiently.
- Enable administrator to keep track on the customer's information.
- Enable administrator to do business analysis.
- Enable administrator to perform database maintenance in-house.

Due to some constraints and limitation such as time, cost and knowledge, the project scope is narrowed down to the following scopes:

- The product that is sold in the Online Bakery Shop is cakes only.
- The coverage area of free delivery for the meantime will only cover PJ area market only.
- All shopping transactions and store management will be done online except for payment, which will be done when the customer receive the item they bought.

1.6 Research Plan and Method

- Research via Internet (exiting online bakery store)
- Study books on how to maintain e-commerce store and effective problem solution.
- Survey on how available system of this type had been developed and how it functions.
- Acquire knowledge on software and hardware, which will be used to develop and reside the system.

- Research on how this system can be developed using current or latest emerging technologies.
- Research on development tools, server and operating system.

1.7 Project Schedule

Figure 1.1 shows the schedule for the development and implementation of this project.

Activity	Jun 2002	Jul 2002	Aug 2002	Sept 2002	Oct 2002	Nov 2002	Dec 2002	Jan 2003	Feb 2003
System Study									
Requirement Analysis									
Design									
Coding									
Testing									
Documentation									

Figure 1.1: OBSS Project Schedule

1.8 Expected Outcome

This project should develop a fully functional e-commerce system that may provide professional information and resources on problems analyzing and solving. The system has the ability to receive user request and suggestion for additional information of their choice. Interactivity among users and the system will guarantee an ever-growing e-commerce system.

Chapter

2

LITERATURE REVIEW

2.1 Overview

The process of developing the Online Bakery System (OBSS) involves researches based on understanding e-commerce concepts and current most frequent business problems. This research also includes computerized information for system building and also non-computerized information for data gathering.

2.2 System Development Life Cycle (SDLC)

The System Development Life Cycle (SDLC) is intended to provide a set of guidelines for the successful completion of application system development projects. The SDLC consists of seven distinct phases as shown in Figure 2.1 below:

Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7
Planning	Definition	Analysis	Design	Build	Transition	Warehouse

Figure 2.1: SDLC Phases

Planning

This phase of the SDLC is requires to determine the feasibility of particular project proceeding, or not. This phase will produce a high-level overview document of the proposed project. It will contain information relating to the project's requirements and will enable the formalization and definition of the project.

Definition

This phase of the SDLC defines exactly what, who, when and how the project will be carried out. This phase will take the deliverable from previous phase, expand on the high-level project outline and provide a specific and detailed project definition.

This phase is the first activity of the project after obtaining approval and funding to proceed. The description of this phase here assumes that the following associated activities have been completed:

- The preparation and distribution of an RFP.
- The selection of a contract development team.
- The appointment of a Project Manager.

This phase provides an effective way of communicating to project stakeholders, the project scope and schedule as well as any risks or constraints related to the project.

Analysis

This phase of the SDLC is required to understand and document the user's needs for the system. This phase will document, in significantly more detail than the project statement, the scope, objectives and requirements of the current or proposed system.

The emphasis throughout this phase is on what the system is to do. During the analysis and specification, the technical aspects and constraints should be considered, but should not be influenced by implementation characteristics. The technical aspects of the system are addressed in the Design Phase.

During this phase the data conversion requirement, at a high level, will become known. This will commence a parallel set of SDLC phases for the data conversion associated with the system. Data conversion will follow Phase 3 to 6 of the SDLC. Depending on the size and complexity of the total project (system and data conversion) the data conversion application could be either incorporated as a section or component of the main system design deliverable, or a separate data conversion deliverable of its own.

Design

This phase of the SDLC continues on from the Detailed System Analysis and describes how the proposed system is to be build. The design is specific to the technical environment that the system will be required to operate in and the tools to be used in building the system. The result of this phase will significantly impact the Build and Implementation Phase of the system.

Build

This phase of the SDLC deals with the development, unit testing and integration testing of the system (application) modules, screens and reports. In addition, this phase will address the

preparation and establishment of the technical environment for development, testing and training of user representatives.

This phase is usually carried out in parallel with the development of user procedures and user documentation from the Implementation Phase. Both of these will be required for module testing, upon the completion of the Build Phase. Coordination of the activities of the Build and Implementation Phase is a key responsibility of the Project Manager.

Transition

This phase of the SDLC is to prepare for and carry out the implementation of the developed system through user and acceptance testing to a full production system.

Warehouse

This phase of the SDLC addresses the publication of the system's data into the Ministry's Data Warehouse for manipulation and decision support. The Warehouse Phase actually comprises, as appropriate, all the deliverables associated with SDLC Phase 1 [Planning] through 6 [Implementation].

2.3 Introduction to Internet

The Internet is the largest computer network in the world – "a network of networks". The Internet consists of thousands interconnected networks of computers that allow all sorts of computers to interact to one another. The Internet first begins back in 1960's when the United States Department of Defense researched ways of decentralizing computer networks to survive military attack.

From the humble beginning (there were initially only a handful of large computers "on the Net"), today we have a massive network-of-network, growing at such a phenomenal rate that providing any usage figures would be meaningless.

The Internet provides a myriad of services, such as the World Wide Web (www), e-mail, USENET, FTP, Gopher and Telnet. During the early '90s, the WWW started taking off. Today WWW is one of the fastest growing services on the Internet.

2.3.1 A Brief History of World Wide Web

The web was born in early 1989 as a result of efforts by researches at the European Laboratory for Particle Physics (CERN) in Geneva, Switzerland [McGee, 1996]. Their goal was to create an online system that would allow non-technical users to share data without the need to use arcane commands and esoteric interfaces. Within two or three years, users outside CERN were designing and creating powerful browsers. By 1993, the Web and its browsers had become the way to move around the Internet.

World Wide Web uses hypertext and multimedia technique to make the Web easy for anyone to roam, browse and contribute to applications like Mosaic, Netscape, created the capability to "browse the Web" and see a mix of text and graphic all tied together with hypertext style links. This created the current wave of interest in the Internet, and the demand for access spurred numerous small companies to start provides service. Two protocol architectures have served as basis for the development of interoperable standards: the TCP/IP protocol suite and the OSI reference model.

2.3.2 TCP/IP

TCP/IP is an Internet based standard and is the framework for developing a complete range of computer communication standards. Communication task for TCP/IP can be organized into five independent layers:

1. Application layer – contains the logic needed to support the various user applications. For each different type of application, such a file transfer, a separate module is needed that is peculiar to that application.
2. Transport layer – the two most important protocols in this layer are TCP and User Datagram Protocol (UDP). TCP provides reliable data delivery service with end-to-end error detection and correction. UDP provides low-overhead, connectionless datagram delivery services.
    - TCP – TCP is reliable, connection-oriented and byte-stream protocol. It is the most commonly used protocol for services on the Internet. Telnet, FTP, SMTP and HTTP are some of the TCP based services. TCP provides a reliable, bi-directional connection between two end points.
    - UDP provides a connectionless service for application-level procedures. UDP dose not guarantee delivery, preservation of sequence, or protection against duplication. UDP enables a procedure to send messages to other

procedures with a minimum of protocol mechanism. Some transaction-oriented applications make use of UDP; one example is SNMP (simple network management protocol), the standard network management protocol for TCP/IP networks.

3. Internet Layer – Procedure to allow data to traverse multiple interconnected networks, in the case where two devices are attached to different networks.
4. Network Access Layer – is concerned with the exchange of data between an end system and the network to which it is attached. The sending computer provides the network with the address of the destination computer, so that the network may route with the data to the appropriate destination.
5. Physical Layer – covers the physical interface between a data transmission device and a transmission medium or network. This layer is concerned with specifying the characteristics of the transmission medium, the nature of the signal, the data rate and related matters.

2.4 E-Commerce

E-commerce (electronic commerce or EC) is the buying and selling of goods and services on the Internet, especially the World Wide Web. In practice, this term and a newer term, e-business, are often used interchangeably. For online retail selling, the term e-tailing is sometimes used.

E-commerce can be divided into:

- E-tailing or "virtual storefronts" on Web sites with online catalogs, sometimes gathered into a "virtual mall"
- The gathering and use of demographic data through Web contacts
- Electronic Data Interchange (EDI), the business-to-business exchange of data
- e-mail and fax and their use as media for reaching prospects and established customers (for example, with newsletters)
- Business-to-business buying and selling
- The security of business transactions

2.4.1 E-tailing or The Virtual Storefront and the Virtual Mall

As a place for direct retail shopping, with its 24-hour availability, a global reach, the ability to interact and provide custom information and ordering, and multimedia prospects, the Web is rapidly becoming a multibillion dollar source of revenue for the world's businesses. A number of businesses already report considerable success. As early as the middle of 1997, Dell Computers reported orders of a million dollars a day. By early 1999, projected e-commerce revenues for business were in the billions of dollars and the stocks of companies deemed most adept at e-commerce were skyrocketing. Although many so-called dotcom retailers disappeared in the economic shakeout of 2000, Web retailing at sites such as Amazon.com, CDNow.com, and CompudataOnline.com continues to grow.

2.4.2 Market Research

In early 1999, it was widely recognized that because of the interactive nature of the Internet, companies could gather data about prospects and customers in unprecedented amounts - through site registration, questionnaires, and as part of taking orders. The issue of whether data was being collected with the knowledge and permission of market subjects had been raised. (Microsoft referred to its policy of data collection as "profiling" and a proposed standard has been developed that allows Internet users to decide who can have what personal information.)

2.4.3 Electronic Data Interchange (EDI)

EDI is the exchange of business data using an understood data format. It predates today's Internet. EDI involves data exchange among parties that know each other well and make arrangements for one-to-one (or point-to-point) connection, usually dial-up. EDI is expected to be replaced by one or more standard XML formats, such as ebXML.

2.4.4 E-Mail, Fax, and Internet Telephony

E-commerce is also conducted through the more limited electronic forms of communication called e-mail, facsimile or fax, and the emerging use of telephone calls over the Internet. Most of this is business-to-business, with some companies attempting to use e-mail and fax for unsolicited ads (usually viewed as online junk mail or spam) to consumers and other business prospects. An increasing number of business Web sites offer e-mail newsletters for subscribers. A new trend is opt-in e-mail in which Web users voluntarily sign up to receive e-

mail, usually sponsored or containing ads, about product categories or other subjects they are interested in.

2.4.5 Business-to-Business Buying and Selling

Thousands of companies that sell products to other companies have discovered that the Web provides not only a 24-hour-a-day showcase for their products but a quick way to reach the right people in a company for more information.

2.4.6 The Security of Business Transactions

Security includes authenticating business transactions, controlling access to resources such as Web pages for registered or selected users, encrypting communications, and, in general, ensuring the privacy and effectiveness of transactions. Among the most widely-used security technologies is the Secure Sockets Layer (SSL), which is built into both of the leading Web browsers.

2.5 Client/Server Computing

2.5.1 Overview of Client/Server

The term client/server was first used in the 1980s in reference to personal computers (PCs) on a network. The client/server software architecture is intended to improve usability, flexibility, and scalability as compared to centralized, mainframe, time sharing computing.

A client is defined as a requester of services and a server is defined as the provider of services. A single machine can be both a client and server depending on the software configuration.

In a network, the client/server model provides a convenient way to interconnect programs that are distributed efficiently across different locations. Computer transactions using the client/server model are very common.

The client/server model has become one of the central ideas of network computing. Most business applications being written today use the client/server model. So does the Internet's main program, TCP/IP.

In the usual client/server model, one server, sometimes called a daemon, is activated and awaits client requests. Typically, multiple client programs share the services of a common server program. Both client programs and server programs are often part of a large

program or application. Relative to the Internet, your Web browser is a client program that requests services (the sending of Web pages or files) from a Web server (which technically is called a Hypertext Transport Protocol or Hypertext Transfer Protocol Server) in another computer somewhere on the Internet. Similarly, your computer with TCP/IP installed allows you to make client requests for files from File Transfer Protocol (FTP) server in other computers on the Internet.

2.5.2 Client/Server Architecture

As a result of the limitations of file sharing architectures, the client/server architecture emerged. This approach introduces a database server to replace the file server. Using a relational database management system (DBMS), user queries could be answered directly. The client/server architecture reduces network traffic by providing a query response rather than total file transfer. It improves multi-user updating through a GUI front end to a shared database. In client/server architecture, Remote Procedure Calls (RPCs) or standard query language (SQL) statements are typically used to communicate between the client and server. The following section discusses a few client-server architectures.

2.5.3 Two Tier Architectures

The two tier architecture is intended to improve usability by supporting a forms-based, user-friendly interface. The two tier architecture improves scalability by accommodating up to 100 users (file server architecture only accommodate a dozen users), and improves flexibility by allowing data to be shared, usually within a homogeneous environment. The two tier architecture is frequently used in non-complex, non-time critical information processing system.

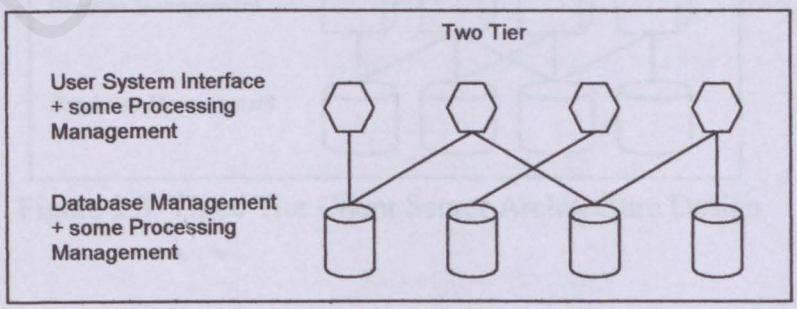


Figure 2.2:Two Tier Client Server

In general, the user system interface client invokes services from the database management server. The database management server usually provides the portion of the

processing related to accessing data (often implemented in store procedures). Clients commonly communicate with the server through SQL statement or a call-level interface. It should be noted that connectivity between tiers can be dynamically changed depending upon the user's request for data and services.

It is possible for a server to function as client to a different server – in hierarchical client/server architecture. This is known as a chained two tier architecture design.

2.5.4 Three Tier Architectures

The three tier software architecture emerged in the 1990s to overcome the limitations of the two tier architecture. The third tier (middle tier server) is between the user interface (client) and the data management (server) components. This middle tier provides process management where business logic and rules are executed and can accommodate hundreds of users (as compared to only 100 users with the two tiers architecture) by providing function such as queuing, application execution, and database staging.

The three tier architecture is used when an effective distributed client/server design is needed that provides (when compare to the two tier) increased performance, flexibility, maintainability, reusability, and scalability, while hiding the complexity of distributed processing from the user. These characteristics have made three layer architectures a popular choice for Internet application and net-centric information systems.

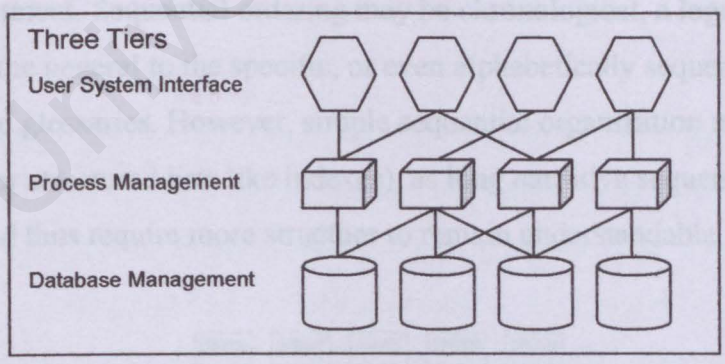


Figure 2.3: Three Tier Client Server Architecture Design

The third tier provides database management functionality and is dedicated to data and file services that can be optimized without using any proprietary database management system languages. The data management component ensures that the data is consistent through the distributed environment through the use of features such as data locking, consistency, and

replication. It should be noted that connectivity between tiers can be dynamically changed depending upon the user's request for data and services.

The middle tier provides process management services (such as process development, process enactment, process monitoring, and process resourcing) that are shared by multiple applications.

2.6 Web Site Design and Structures

In World Wide Web, we can hardly escape references to hypertext and hypermedia. These days the computer press is full of very fuzzy thinking about how Web-based information can somehow "link everything to everything." The implication is that with the Web we can probably dispense with one of the most challenging aspects of presenting information, how to put it into logical order and create an interesting and understandable resource for the user. Nothing could be further from the truth. If we have only a hazy idea how one section of your site relates to other areas, if we have no comprehensive narrative or clear sense of organization, our readers will know it soon enough, and most of them will leave in pursuit of better organized material.

2.6.1 Sequence

The simplest way to organize information is in a sequence, where we present a linear narrative. Information that naturally flows as a narrative, time line, or in logical order is ideal for sequential treatment. Sequential ordering may be chronological, a logical series of topics progressing from the general to the specific, or even alphabetically sequenced, as in indexes, encyclopedias, and glossaries. However, simple sequential organization usually only works for smaller sites (or structured lists like indexes), as long narrative sequences often become more complex, and thus require more structure to remain understandable.

Figure 2.4: Sequence Structure

More complex Web sites may still be organized as a sequence, but each page in the main sequence may have one or more pages of digressions, parenthetic information, or links to information in other Web sites.

2.6.2 Grid

Many procedural manuals, lists of university courses, or medical case descriptions are best organized as a grid. Grids are a good way to correlate variables, such as a time line versus historical information in a number of standard categories such as "events," "technology," "culture," etc. To be successful, the individual units in a grid must share a *highly* uniform structure of topics and subtopics. The topics often have no particular hierarchy of importance. For example, "tuberculosis" is not more or less important a diagnosis than "hilar adenopathy," but ideally both case descriptions would share a uniform structure of subtopics. Thus the user could follow the grid "down," reading about tuberculosis, or cut "across" the grid perhaps by comparing the "diagnostic imaging" sections of both hilar adenopathy and tuberculosis. Unfortunately, grids can be difficult to understand unless the user recognizes the interrelationships between categories of information, and so are probably best for experienced audiences who already have a basic understanding of the topic and its organization. Graphic overview maps are very useful in grid-like Web sites.

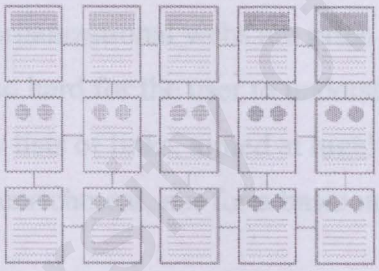


Figure 2.5: Grid Structure

2.6.3 Hierarchy

Information hierarchies are one of the best ways to organize complex bodies of information. Hierarchical organization schemes are particularly well-suited to Web sites, because Web sites should always be organized as off-shoots of a single home page. Most users are familiar with hierarchical diagrams, and find the metaphor easy to understand as a navigational aid. A hierarchical organization also imposes a useful discipline on your own analytical approach to your content, as hierarchies only work well when you have thoroughly organized your material. Since hierarchical diagrams are so familiar in corporate and institutional life, users find it easy to build mental models of the site:

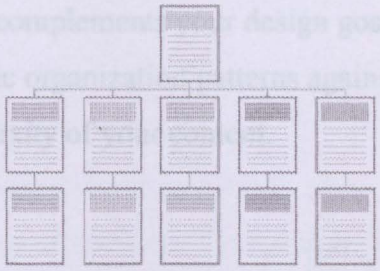


Figure 2.6: Hierarchical Structure

2.6.4 Web

Web-like organizational structures pose few restrictions on the pattern of information use. The goal is often to mimic associative thought and free flow of ideas, where users follow their interests in a heuristic, idiosyncratic pattern unique to each person who visits the site. This organizational pattern develops in Web sites with very dense links both to other information within the site, and information on other World Wide Web sites. The goal is to fully exploit the Web's power of linkage and association, but web-like organization structures can just as easily propagate confusion and fuzzy thinking about the interrelationships of your information chunks. Ironically, organizational webs are often the most impractical structure for Web sites, because they are so hard for the user to understand and predict. Webs work best for small sites dominated by lists of links, aimed at highly educated or experienced users looking for further education or enrichment, not for a basic understanding of your topic.

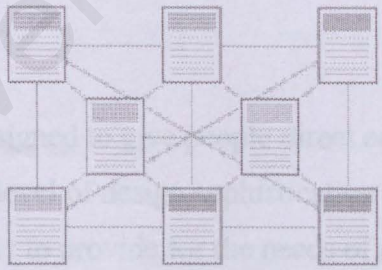


Figure 2.7: Web Structure

2.6.5 Summary

Most complex Web sites share aspects of all four types of information structures. Except in sites that rigorously enforce a sequence of pages, your users are likely to use any Web site in a free-form "web-like" manner, just as most non-fiction or reference books are used. But the nonlinear usage patterns typical of Web surfers do not absolve you of the need to organize your thinking and present it within a clear,

consistent structure that complements your design goals for the site. The chart below summarizes the four basic organization patterns against the "linearity" of your narrative, and the complexity of your content.

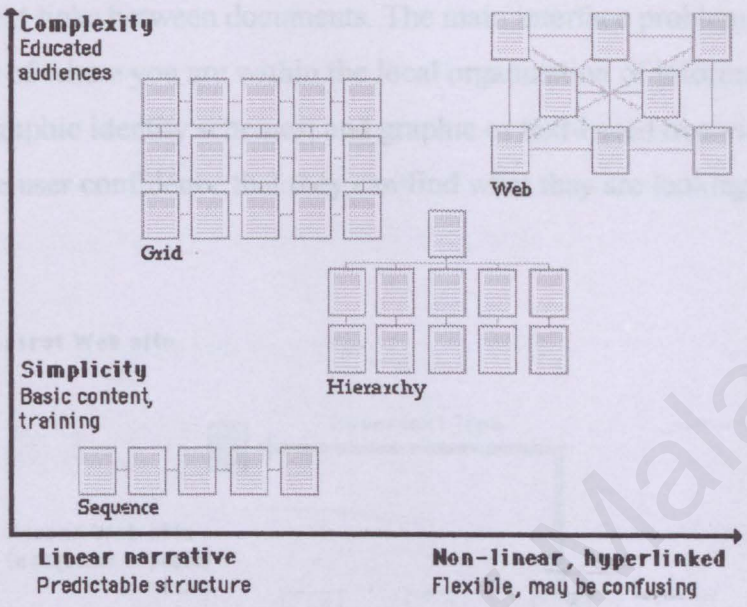


Figure 2.8: Web Side Structures

2.7 Website Interface Design

2.7.1 User-centered Design

Graphic user interfaces were designed to give people direct control over their personal computers. Users now expect a level of design sophistication from all graphic interfaces, including Web pages. The goal is to provide for the needs of all of your potential users, adapting Web technology to their expectations, and never requiring the reader to simply conform to an interface that puts unnecessary obstacles in their paths.

This is where your research on the needs and demographics of your target audience is crucial. It's impossible to design for an unknown person whose needs you don't understand. Create sample scenarios with different types of users seeking information from your site. Would an experienced user seeking a specific piece of information be helped or hindered by your home page design? Would a novice be intimidated by a complex text-based menu? Testing your designs and getting feedback from users is the best way to see whether your design ideas are

giving users what they want from your site.

2.7.2 Build Clear Navigation Aids

At the current state of web technology most user interactions with Web pages involve navigating hypertext links between documents. The main interface problem in Web sites is the lack of a sense of where you are within the local organization of information. Clear, consistent icons, graphic identity schemes, and graphic or text-based overview and summary screen can give the user confidence that they can find what they are looking for without wasting time.

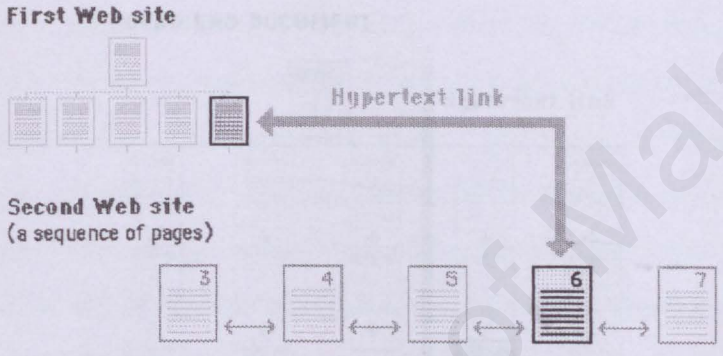


Figure 2.9: Navigating Hypertext

Users should always be able to easily return to your home page, and to other major navigation points in your local site. These basic links, that should be present on every page of your site, are often graphic buttons that both provide basic navigation links, and help create the graphic identity that signals the user that they are still within your site domain. For example, in the Netscape corporate site this bar of buttons appears at the foot of every page:

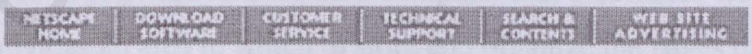


Figure 2.10: Navigation Buttons

The button bar is useful (lots of choices in a small space), predictable (it is always there, at the bottom of every page), and provides a consistent graphic identity to every page in the Netscape site.

2.7.3 No Dead-end Pages

Every Web page should contain at least one link. "Dead-end" pages – pages with no links to any other local page in the site – are not only a frustration to users, they are often a lost opportunity to bring browsers into other pages in your site.

Web pages often appear with no preamble: readers often make or follow links directly to subsection pages buried deep in the hierarchy of Web sites. Thus they may never see your Home Page or other introductory information in your site. If your subsection pages do not contain links back up the hierarchy, to the home page or to local menus pages, the reader is essentially locked out of access to the rest of your Web site:

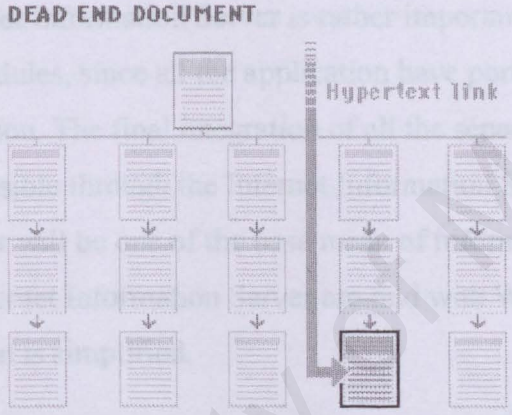


Figure 2.11: Dead End Document

2.8 Web Server

Web server is a piece of software running on a computer that distributes web pages to users on demand, and provides an area in which to store and organize the pages of a web site. The machine that runs the web server software could be a remote sitting at the other side of your network, or even on the other side of the world, or it could very own home machine. The term client-server probably overuse but in fact when use to describe the working of the web, it's almost perfect.

2.8.1 Internet Information Server version 5.0 (IIS 5.0)

Microsoft's Internet Information Server can be used to perform as the web server on the Service Tier of the Online Bakery Shop. Primary, the advantage of using Internet Information Server is:

- Simple to configure and use
- Being a powerful tool that runs well on Windows 2000 server
- Supports the usage of other Microsoft technologies, such as ASP that allows the Online Bakery Shop achieves the requirement of being scalable, portable and flexible.

The usage of the Internet Information Server is rather important as it is responsible for tying together separate modules, since all the application have portions requiring web transport and script execution. The final integration of all the separate modules will enquire all the modules to be accessible through the Internet Information Server. In other words, the Internet Information Server will be one of the base mean of information flow. Also the security features of the Internet Information Server are tied with Windows 2000 Server and therefore user consolidation is simplified.

2.9 Database

A database is an organized collection of data in form of records. It can also be defines as an organized collection of data in form of records in an organization common to all users, and is stored with minimal or no duplication.

2.9.1 Advantages of Databases

From the definition of the term database, it has the following advantages:

- **Enhanced Security**

Due to the fact that all the data in an organization from different departments is stored in a central place it is easy to ensure that maximum security is implemented.

- **Reduced Redundancy**

Redundancy comes about when data is duplicated. This is a major disadvantage because it will mean additional cost of storing the same data and also security expenses.

- **Organization Structure**

Database present the real working of an organization on the basis that the output of one department can very likely be the input of another department.

2.9.2 Microsoft SQL Server 2000

Microsoft SQL Server 2000 is a product that meets the data storage and analysis requirements of the largest data processing systems and commercial Web sites. The same product can provide easy-to-use data storage and analysis service to an individual or small business. SQL Server 2000 offers:

- A modern relational database engine that can scale from running on an individual desktop to running largest Web sites. SQL Server 2000 is integrated with Microsoft Windows 2000 fail over clusters to provide exceptionally reliable data servers, and integrated with Windows 2000 authentication and encryption to implement secure systems.
- Integration into the Microsoft data access environment. SQL Server 2000 provides native support for ADO, OLE DB, and ODBC. SQL Server also introduces integrated support for Web-based application development, supporting HTTP access using URLs, and returning data as XML documents.
- An integrated set of Analysis Services tools for performing complex data analysis and data mining of data warehouse.
- Replication services, which allow sites to place copies of data on multiple computers to improve overall system performance while keeping the data synchronized.
- Data Transformation Services (DTS) that make it easier to build OLAP data warehouse. DTS provides powerful services that allow records of individual transaction to be transformed into summary information stored in a data warehouse.
- English Query, which applications can use to answer ad-hoc user questions. When given a string containing a question about the data in a database or data warehouse, English Query returns an SQL or MDX statements that can be run to get the answer.
- Full-Text Search, which extends the pattern matching capabilities of SQL Server 2000 beyond the simple pattern matching available in the SQL language, including searches in files stored outside of SQL Server database.

- Meta Data Service, which provide facilities for storing, viewing, and retrieving descriptions of the objects in your application and system.

2.9.3 Microsoft Access 97/2000

The Microsoft Access 97/2000 is a full-featured multi-user relational database management system that designed for the Microsoft Windows operating systems (such as Windows 9x, Windows NT, Windows 2000). Access 97/2000 is extremely visually oriented and easy to use. It makes extensive use of drag-and-drop and visual design for queries, forms, and reports. Access 97/2000 comes with an integrated development (IDE), including incremental compilation, a fully interactive visual debugger, breakpoints, and single step-through. These capabilities combine to make Microsoft Access an extremely powerful platform for developing client-server database solutions.

2.10 Developing Tools

2.10.1 Microsoft .NET

Microsoft .NET is software that connects information, people, systems, and devices. It spans clients, servers, and developer tools, and consists of:

- The .NET Framework programming model that enables developers to build Web-based applications, smart client applications, and XML Web services applications which expose their functionality programmatically over a network using standard protocols such as SOAP and HTTP.
- Developer tools, such as Microsoft Visual Studio® .NET, which provide a rapid application integrated development environment for programming with the .NET Framework.
- A set of servers, including Microsoft Windows® 2000, Microsoft SQL Server™, and Microsoft BizTalk® Server, that integrates, runs, operates, and manages XML Web services and applications.
- Client software, such as Windows XP, Windows CE, and Microsoft Office XP, that helps developers deliver a deep and compelling user experience across a family of devices and existing products.

2.10.1.1 NET Framework

The .NET Framework is the programming model of the .NET environment for building, deploying, and running Web-based applications, smart client applications, and XML Web services. It manages much of the plumbing, enabling developers to focus on writing the business logic code for their applications. The .NET Framework includes the common language runtime and class libraries.

2.10.1.2 Common Language Runtime

The common language runtime is responsible for run time services such as language integration, security enforcement, memory, process, and thread management. In addition, it has a role at development time when features such as life-cycle management, strong type naming, cross-language exception handling, dynamic binding, and so on, reduce the amount of code that a developer must write to turn business logic into a reusable component.

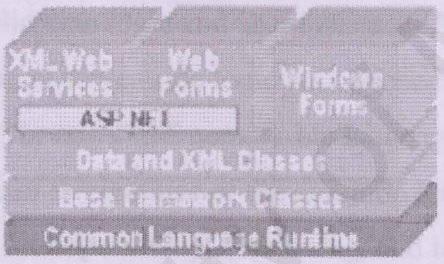


Figure 2.12: Common Language Runtime

2.10.1.3 Class Libraries

Base classes provide standard functionality such as input/output, string manipulation, security management, network communications, thread management, text management, user interface design features, and other functions. The Microsoft ADO.NET data classes support persistent data management and include SQL classes for manipulating persistent data stores through a standard SQL interface. XML classes enable XML data manipulation and XML searching and translations. The Microsoft ASP.NET classes support the development of Web-based applications and XML Web services. The Windows Forms classes support the development of Windows-based smart client applications. Together, the class libraries provide a common, consistent development interface across all languages supported by the .NET Framework.

2.10.1.4 Microsoft Visual Basic .NET

Microsoft Visual Basic® .NET is the newest, most productive version of the Visual Basic tool set that enables developers to address today's pressing application development issues effectively and efficiently. Visual Basic .NET enables you to create rich applications for Microsoft Windows® in less time, incorporate data access from a wider range of database scenarios, create components with minimal code, and build Web-based applications using the skills you already have.

2.10.1.5 ASP .NET

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

2.10.2 Java Server Page

Java Server Page (JSP) is a technology for controlling the content or appearance of Web pages through the use of servlets. Sun Microsystems, the developer of Java, also refers to the JSP technology as the Servlet application program interface (API). JSP is comparable to Microsoft's Active Server Page (ASP) technology. Whereas a Java Server Page calls a Java program that is executed by the Web server, an Active Server Page contains a script that is interpreted by a script interpreter before the page is sent to the user.

An HTML page that contains a link to a Java servlet is sometimes given the file name suffix of .JSP.

2.11 Operating Systems

2.11.1 Windows 2000 Server

The Windows 2000 Server operating system integrates Internet technologies across all services, from File and Print to advance application services. This helps ensure organizations can more effectively exchange information with users worldwide.

Windows 2000 Server meets the needs of a broad spectrum of users, from corporate intranets to Internet Information Server 5.0 (IIS) is fully integrated at the operating system level, Windows 2000 Server lets organizations add Internet capabilities that weave directly into the rest of their computing infrastructure.

2.11.2 Windows NT

Windows NT is a Microsoft Windows personal computer operating system designed for user and business needing advanced capability. NT's technology is the base for the Windows 2000. Windows NT is actually two products: Microsoft NT Workstation and Microsoft NT Server. The Server Workstation is designed for users, especially business users, who need faster performance. The Server is designed for business machines that need to provide services for network-attached computers. The server is required, together with an Internet server such as Microsoft's Internet Information Server (ISS), for a Windows system that plans to serve Web pages.

2.11.3 Windows XP

Windows XP is a whole new kind of Windows for consumers. Under the hood, it contains the 32-bit kernel and driver set from Windows NT and Windows 2000. Naturally it has tons of new features that no previous version of Windows has, but it also doesn't ignore the past--old DOS and Windows programs will still run, and may even run better.

2.12 Web Browser

A browser is an application program that provides a way to look at and interact with all the information on the World Wide Web. The word "browser" seems to have originated prior to the Web as a generic term for user interfaces that let us navigate through and read files online. Technically, a Web browser is a client program that uses the Hypertext Transfer Protocol (HTTP) to make requests of Web servers throughout the Internet on behalf of the browser user. Two most useful web browsers are Netscape Navigator and Microsoft Internet Explorer. These two browsers are the only two browsers that the vast majority of Internet users are aware of.

Chapter

3

METHODOLOGY AND SYSTEM ANALYSIS

3.1 Introduction

System analysis phase is conducted to analyze the techniques and methodologies used to build OBSS. In addition, investigation and analysis are done to determine the functional and non-functional requirements of OBSS. Besides, it is used to determine the programming language, database, and hardware needs for OBSS. Upon completing the analysis, a combination of various kinds of tools will be determined and used to build OBSS.

3.2 Techniques

Several techniques are used in the system analysis phase in order to capture the functional and non-functional requirements in the OBSS. The techniques used are:

- Interview

  Interviewing with exiting bakery shops in order to understand the business flow and the system that is currently used.
- Bookstores

  Obtain information about the technologies that is going to be used and determine the suitability of books from different author and publisher.
- Library

  Obtain information about the latest technology and relevant information about OBSS through a wide range of resources such as books, articles, journals, CDs and newspapers.
- Document Room

  Gain a deeper understanding about the steps that are taken in carrying out a thesis.
- Internet Surfing

  Access a wide range of information to gain a deeper understanding on the exiting technologies. Obtain information that is useful to OBSS.
- Newspaper and IT Magazine

  Getting update with the current technology information and news.
- Software Testing

  Different software is tested to evaluate the suitability of the software in implementing OBSS.

3.3 System Development Model

A synthesis of the Waterfall model has been identified as methodology to be used for the On-line Bakery Shop System (OBSS).

The overall development is broken into distinct phase much like the waterfall model, with the exception that prototypes are used during the development of the OBSS modules. The incremental aspect of the model comes in when additional functions are added iteratively to the waterfall module prototypes. Functions are added incrementally to the framework is quickly developed and later on added with more features.

The initial stages of the development model are conducted on a general basis covering most of the OBSS as a whole. Upon reaching the prototyping stage, individual modules are developed separately and prototyping is also conducted separately from each other. During this time, the future integration needs of the separate modules also have to be catered for and are handled during this time for future needs.

Once each of the individual modules has been sufficiently developed to a reasonable stage of completeness, they are brought together for the final integration into the complete OBSS, unifying the separate part and forming a coherent system. Final testing is then conducted on the OBSS as a whole. Following the conclusion of this project, the OBSS may be further added with more modules to increase its functionality.

The advantages in using waterfall model are:

- Additional future functionalities can be added effortlessly into the system.
- It makes explicit which intermediate products are necessary in order to begin the next stage.
- Allow all or part of the system to be constructed quickly to verify the requirement so that problems can be solved earlier.

Besides that, there are many analysis methods that are carrying out for the development of this project.

- Brainstorming
- Internet (browsing, newsgroup…)
- Try out the real on-line bakery shop system
- Reference books
- Group discussion

The Waterfall Model as described is depicted in the following diagram.

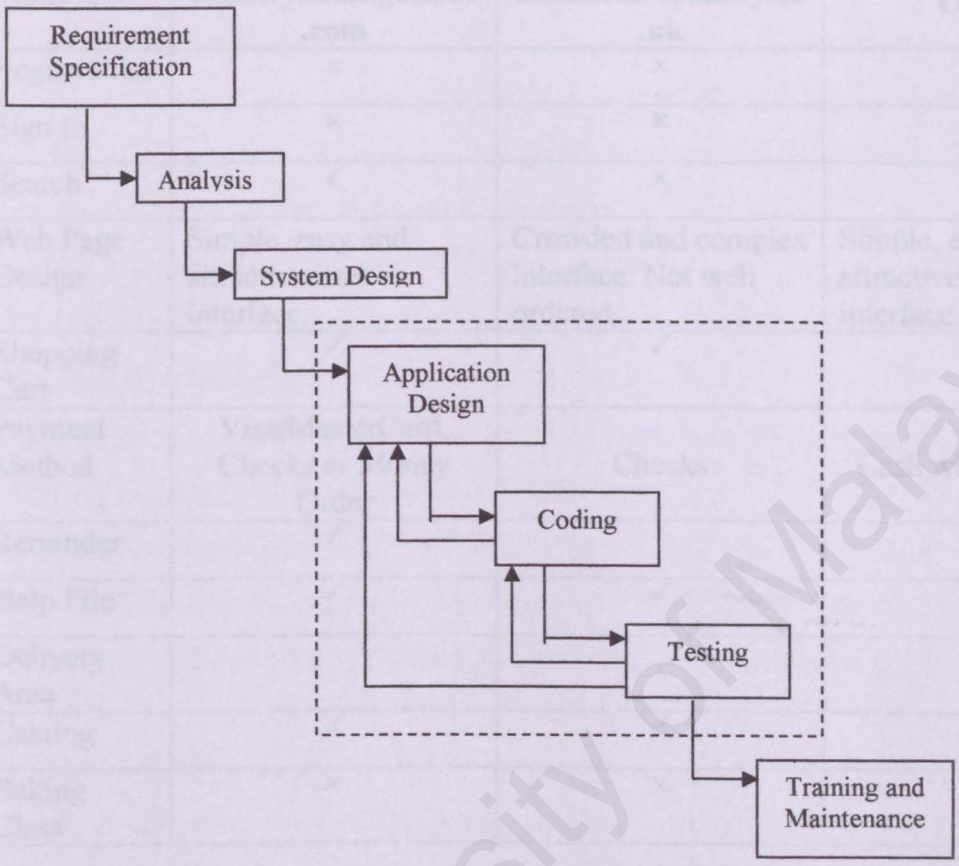


Figure 3.1: System Development Model

3.4 Analysis on Exiting System

Table 3.1: Analysis on Exiting System

Module	countrybakingonline .com	blackfriarsbakery.co .uk	OBSS
Registration	×	×	✓
Sign In	×	×	✓
Search	✓	×	✓
Web Page Design	Simple, easy and attractive user interface.	Crowded and complex interface. Not well ordered.	Simple, easy and attractive user interface.
Shopping Cart	✓	✓	✓
Payment Method	Visa/MasterCard, Checks or Money Order	Checks	Cash when receive
Reminder	✓		✓
Help File	✓	✓	✓
Delivery Area			
Catalog	✓	✓	✓
Baking Class	×	×	✓

3.5 System Requirements

3.5.1 Functional Requirements

The functional requirements specify what actions a design must provide in order to benefit the users of the system to justify its existence. OBSS functional requirements covering the following specifications:

3.5.1.1 Customer's Modules

1. Registration Modules

   This module will enable a user who is not the system's member to sign up as a new member. It also enable user who is a member to login to the system with his username and password.

2. Web Site Visit Modules

   In this module, the product catalogue is displayed to user. In the catalogue, information about products such as image, description and unit price will be shown. Shoppers can add products into her "shopping basket".

3. Shopping Basket Modules

   The shopping basket is simply a list of products the shopper has selected, the quantities, prices, attributes, and anything else related to the potential order. It offers option to clear the basket, remove item, and update quantities.

4. Check Out Modules

   In this module, the customer will typically enter in his shipping address information.

5. Bakery Class Modules

   This module will display a recipe and step by step instructions to make a delicious cake. It also provides a Q&A section for the customers.

6. Clothing Design Modules

   This module enable customers to customize the design of the cake that the order. This includes the cakes clothing and the greetings that customers want to write on the cake.

3.5.1.2 Administration Modules

1. Login Modules

   In this module, administrator is required to provide their username and password in order to gain access to the administrator page.

2. Order Processing Modules

   This module will enable the administrator to process the orders made by the customers. Administrator can update the order status, whether the cake is been process in the kitchen or delivered.

3. Database Maintenance Modules

   This module allows the administrator to manipulate all record in OBSS database system. The records that can be manipulated by the administrator consist of:

   - Customers information
   - Products information
   - Database backup

4. Information Update Modules

   Information that is going to be posted in bakery class of OBSS will be manipulated in this module. The administrator can update and edit the contents of the bakery class. In

addition, administrator can also reply the customers question in the Q&A section in this module.

3.5.2 Non-Functional Requirements

The non-functional requirement are constrains how the development should take place. The following are keys of non-functional requirements.

i. Reliability

The entire system must to the user as a consistency and an accuracy system. The system will also have the ability of error tolerance. Problems and system failures will be prevented and minimized to enable the system to be a reliable system. The system will stable and consistent in all environments.

ii. Integrity

This system allowed only authorized user to access the system. The valid users have to log on the system by using their user password. This will ensure the integrity of data and system.

iii. 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 a short time. This system will also enable the user handle their jobs efficiently by reducing time, manpower and other resources.

iv. Scalability

Due to the distribute nature of the project's implementation, the scalability issue can be addressed by separating the key modules. Each module can be scalability run on separate machines that can be the expanded or contracted as well as run from within a single machine. Database scalability issue can be resolved using distributed database architecture whereas web application scaling can be addressed by increasing by additional web server or others.

3.5.3 Run Time Requirements

3.5.3.1 Server Hardware Requirements

The server computer minimum requirements are:

- A server with at least Pentium 166 MHz processor
- At least 64MB RAM
- Network Interface Card and network connection with bandwidth of 10 Mbps or above
- Others standard peripherals

3.5.3.2 Server Software Requirements

To host and run the system, the server computer need to have various supporting software installed.

Table 3.2: Server Software Requirements

Software	**Description**
Windows 2000 Server	Server Operating System
Internet Information Server 5.0	Web Server
Active Server Page	Server Scripting Engine
Microsoft Internet Explorer 4.0 and above	Precondition for ASP installation

3.5.3.3 Client Hardware Requirements

The client hardware requirements are quite minimal as long as it has a reasonable amount of memory and a reasonable quality dial-up-connection line. The recommended configurations are:

- At least 16MB of memory
- Network connection through existing network configuration or modem (at least 28.8kpbs)

3.5.3.4 Client Software Requirements

The client software requirements fall on the browser used by the users. It requires a system that can run Microsoft Internet Explorer 4.0 or Netscape Navigator 4.0 and above or any other browser that support JavaScript.

3.6 Development Strategies

3.6.1 Windows 2000 Server

Windows 2000 Server is selected for the Online Bakery Shop System because it lets organizations:

- Share information more efficiently using the Web.
  In the past, performing standard file operations on a network file share was much easier than performing similar operations on a remote Web site. Now, Windows 2000 Server technologies such as Web Distributed Authoring and Versioning (WebDAV) make it as easy to carry out standard file operations on a Web share.
- Created Web-based business applications.
  Creating Web-based applications that integrate well into traditional business applications can be difficult. Windows 2000 Server overcomes this burden by sharing internet-aware application development tools with IIS, an efficiency that extends applications to the Web and eliminates awkward bridges between internal and external processes.
- Bring server operating system functionality to the Web.
  In addition to allowing organizations to extend basic file and print services to the Web, Windows 2000 Server supports applications, media, and communications and networking services from a common server platform. This convergence means that everything a company can do with Windows 2000 Server is automatically supported in a fully integrated Web environment.

3.6.2 Microsoft SQL Server 2000

Microsoft SQL Server 2000 is selected as the data storage for OBSS. Microsoft SQL Server 2000 is an enterprise-level database. As a client/server database, provides greater scalability and reliability for mission-critical data. Microsoft SQL Server can support thousands of users with terabytes of information and provide other enterprise-level database capability. For

example, SQL Server offers support by providing the ability to conduct administration and maintenance while the database is online. it also protects against data loss with a two-phase commit, which can be useful if a particular transaction is interrupted midstream due to power outage.

MSDE is fully compatible with the SQL Server 2000 code base, enabling developers to write one application that scales from a PC running the Windows 95 operating system to multiprocessor clusters running Windows NT Server, Enterprise Edition. Several technologies are included in MSDE, such as dynamic locking, which automatically choose the optimal level of lock (row, key range page, or table) for all database operations. This maximizes the tradeoff between concurrency and performance, resulting in optimal usage. Dynamic self-management enables the server to monitor and manage itself, allowing for hands-off standard operations. Merge replication allows users to modify distributed copies of a database at different times, online or offline, and combine all the work later into a single uniform result.

Through its use of SQL Server 2000 technology, MSDE allows users to pose questions in English instead of forming queries without complex SQL statements. In addition, MSDE supports parallel queries, allowing steps in a single query to be executed in parallel.

3.6.3 Microsoft .NET Platform

After analysis, Microsoft Visual Studio .NET is selected to develop the web system. Microsoft .NET is a set of Microsoft software technologies for connecting the world of information, people, systems, and devices. It is the most productive tool for rapidly building enterprise Web applications. Several advantages of Microsoft .NET platform:

- The .NET Framework

The .NET Framework is a set of technologies that form an integral part of the Microsoft .NET platform. It provides the basic building blocks for developing Web applications and Web Services.

- Platform Substrate

The .NET Framework must run on an operating system. Currently, the .NET Framework is build to work on the Microsoft Win32 operation systems. In the future, the .NET Framework will be extended to run on other platforms, such as Microsoft Windows CE.

- Application Services

When running on Windows 2000, application services, such as COM+, Message Queuing, Windows Internet Information Server (IIS), and Windows Management Instrumentation (WMI), are available to the developer. The .NET Framework exposes application services through classes in the .NET Framework class library.

- Common Language Runtime

The common language runtime simplifies application development, provides a robust and secure execution environment, supports multiple languages, and simplifies application deployment and management.

The common language runtime environment is also referred to as a managed environment, in which common services, such as garbage collection and security, are automatically provided.

- The .NET Framework Class Library

The .NET Framework class library exposes features of the runtime and provides other high-level services that every developer needs. The classes simplify development of .NET applications. Developers can extend them by creating their own libraries of classes.

- ADO .NET

ADO.NET is the next generation of ActiveX Data Object (ADO) technology. ADO.NET provides improved support for the disconnected programming model. It also provides rich XML support.

- ASP .NET

Microsoft ASP .NET is a programming framework that is built on the common language runtime. ASP .NET can be used on a server to built powerful Web application. ASP .NET Web Forms provide an easy and powerful way to build dynamic Web user interfaces (UI).

- Web Services

The .NET Framework provides tools and classes for building, testing, and distributing Web Service.

- User Interface

The .NET Framework supports three types of user interface:

  - Web Forms. Which work through ASP .NET
  - Windows Forms, which run on Win32 clients
  - Console applications, which for simplicity

- Languages

Any language that conforms to the common language specification (CLS) can run on the common language runtime. In the .NET Framework, Microsoft provides Microsoft Visual Basic, Microsoft Visual C++, Microsoft Visual C#, and Microsoft Jscript support. Third parties can provide additional language.

- Building Component in the .NET Framework

In the .NET Framework, components are built on a common foundation. We no longer need to write the code to allow objects to interact directly with each other. In addition, we no longer need to write component wrappers in the .NET environment, because components do not use wrappers. The .NET Framework can interpret the constructs that developers are accustomed to using in object-oriented language. The .NET Framework fully supports class, inheritance, methods, properties, events, polymorphism, constructors, and other object-oriented constructs.

3.6.4 Hypertext Markup Language (HTML)

In order to successfully develop a web page, HTML is the language used to define the content of Web pages. In its basic structure, HTML is quite simple, consisting of tags that precede or bracket various types of information. A web browser is able to read the HTML language in a page and translate it to a displayable image.

3.6.5 Dynamic HTML (DHTML)

One of the ways to ideally develop a web page that is attractive is using Dynamic HTML. It represents the combination of HTML, cascading style sheet (CSS) and scripting languages. DHTML enabling authors to dynamically change the rendering and content of a document and it gives authors the ability to create visually outstanding HTML documents that interact with the user without the burden of achieve effect such as:

- Hide text and images in document and keep this content hidden until a given time elapses or the user interacts with the page.
- Animate text and images in your document, independently moving each element from any starting point to any ending point, following a path that you choose or that you let the user choose.
- Create a ticker that automatically refreshes its content with the latest news, counseling information or other data.
- Create a form, then instantly read, process and respond to the data user enters in the form.

3.6.6 ODBC

ODBC allows a single uniform language to access different databases, instead of using the propriety language of each database by designing a standard set of API's. By using ODBC, we can deal with a level of abstraction above the particular database. Specifically, ODBC is an API for accessing, manipulating and creating database. It is based on the X/Open Call-Level Interface and uses SQL.

When we access a database through ODBC, the database must be registered as an ODBC datasource. By registering the database as a datasource, the application only needs to know its datasource name. The location of the database makes no difference, nor even what the type of database it is.

There are three types of datasource can be created:

i.) System datasource – one that is available to any user of the system.

ii.) User datasource – one that is only available to that user.

iii.) File datasource – a description of the database. It can be used to hook up to the database without having to register the database itself with the system.

Chapter

4

SYSTEM DESIGN

4.1 Introduction

System design is the process of describing, organizing, and structuring the component of a system at both the architectural level and a detailed level that will allow the construction of the proposed system. The important idea is that design describes, organizes and structures with a focus toward the construction of a new system.

In this phase, input, output, file and database were produced which include the designed if input data, data dictionary, file specification and report design.

4.2 Design Consideration

Design has been described as a multi-step process in which representation of data structure, program structure, interface characteristics and procedural detail are synthesized from information requirements. There are several criteria that must be fulfilled to achieve quality of design according to Roger S. Presssman [ROG97]. These criteria are as listed below.

1. A design should exhibit a hierarchical organization that makes intelligent use of control among elements of software.
2. A design should be modular; that is, the software should be logically partitioned into elements that perform specific and sub functions.
3. A design should contain both data and procedural abstractions.
4. A design should leads to modules that exhibit independent functional characteristics.
5. A design should leads to interfaces that reduce the complexity of connections between modules and with the external environment.
6. A design should be derived using a repeatable method that is driven by information obtained during software requirement analysis.

4.3 Site Architecture

When the shopper enters the store, they will typically follow a step for beginning their shopping process. Ideally they will look at product data through browsing the store.

OBSS hope this browsing phase culminates in items added to the shopping cart ready for purchase. The shopper then has the opportunity to manage their shopping cart then check out. The checkout process will collect all of their key data like shipping information. Once processed, they then can check their order history through a profile they set up online. Figure 4.1 diagrams the shopping process:

The navigation design into the system certainly needs to provide a way to jump between any state that is appropriate. But, for example, user cannot allow someone to go to the confirmation page if there are no items in their shopping cart. Likewise, if user goes to the shopping cart before adding any items to it, OBSS need to provide appropriate feedback to the user.

Finally, it is going to be critical that the system maintain state throughout the entire process. OBSS will need to be able to track the current shopper ID so it can maintain their shopping cart. Also, OBSS will need to be able to maintain state o data entered into the various forms. For examples, if the shopper gets to the payment page and decides they want one more item, we don't want them to have to enter their shipping information all over again.

To make this happen, OBSS will be utilizing session variables throughout the site to track data.

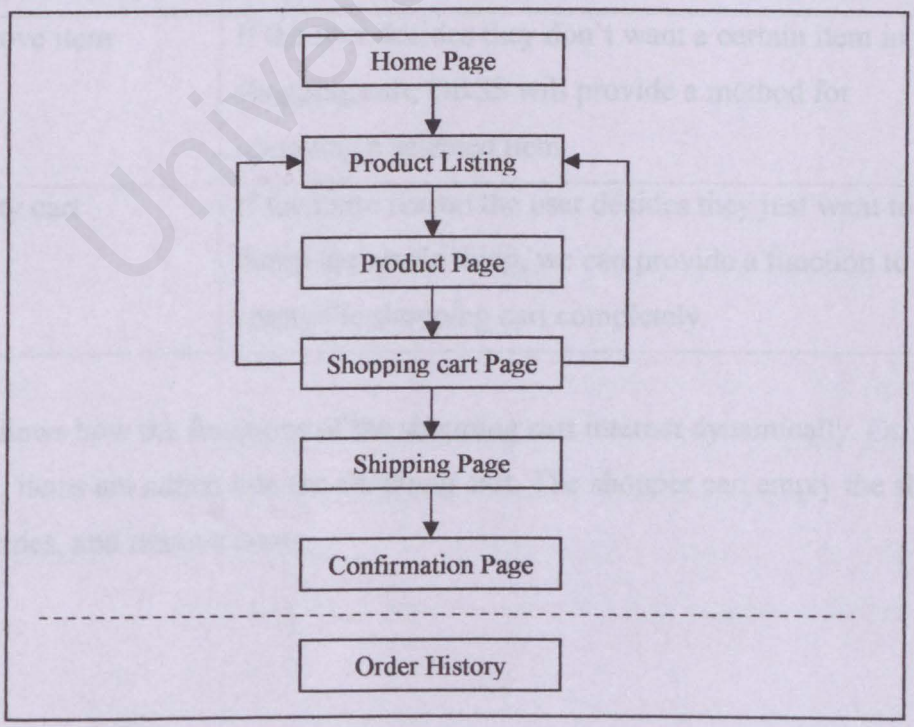


Figure 4.1 Shopping Process

4.3.1 Designing the Shopping Cart

The shopping cart is the foundational element of making the e-commerce store functional. This is where OBSS want the shopper to *park* products they are interested in, allowing them to decide later what they ultimately want to purchase.

The shopping cart is made up of several key functions that make it very dynamic aspect of the Web site. Table 4.1 shows the core functions that will be adding into the shopping cart section of the Web side.

Table 4.1: Shopping Cart Functionality

Core Function	Description
Add item to cart	When the shopper is on the product page and hits the Order button, some event will happen to add product to the cart.
Display cart	When the user actually hits the shopping cart page, OBSS will list all of the items they have added to their cart and display the quantities.
Update cart items	If the user wishes to change the quantity ordered of any item in the cart, OBSS will provide a capability of changing the item quantities.
Remove item	If the user decides they don't want a certain item in their shopping cart, OBSS will provide a method for removing a selected item.
Empty cart	If for some reason the user decides they just want to dump the whole thing, we can provide a function to empty the shopping cart completely.

Figure 4.2 shows how the functions of the shopping cart interact dynamically. On the top of the diagram, items are added into the shopping cart. The shopper can empty the shopping cart, adjust quantities, and remove items.

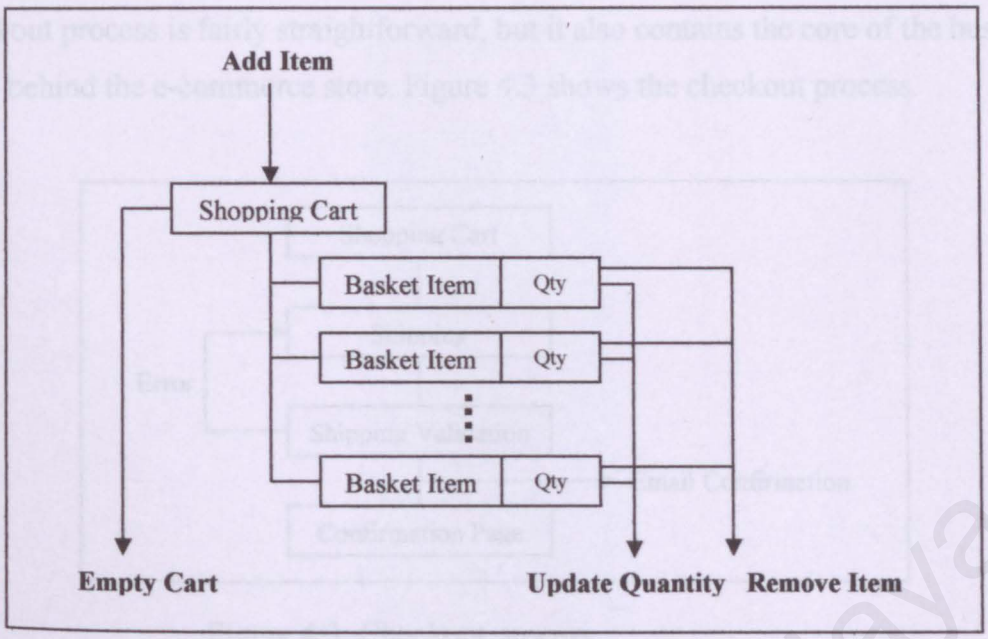


Figure 4.2: Shopping Cart Functions Interact Dynamically

4.3.2 Defining the Checkout Process

At the stage where shopper is ready to check out and place their order, it is important at this stage to make the process as smooth and seamless as possible and ensure all data is capture correctly.

There are several pages involved in this process. The user is essentially going to see two pages, but there is a lot happening behind the scenes. Table 4.2 outlines the checkout functions.

Table 4.2: Checkout Functions

Core Function	Description
Shipping	The first step is the shopper to enter in the shipping information for the order.
Validate Shipping	As soon as the shopper submits their data, we will need to validate it. We need to ensure that all of the appropriate data has been entered to have a complete order.
Confirmation	Once the shopper has successfully completed the order, the confirmation page will give an order number to the new customer.

The checkout process is fairly straightforward, but it also contains the core of the business rule logic behind the e-commerce store. Figure 4.3 shows the checkout process.

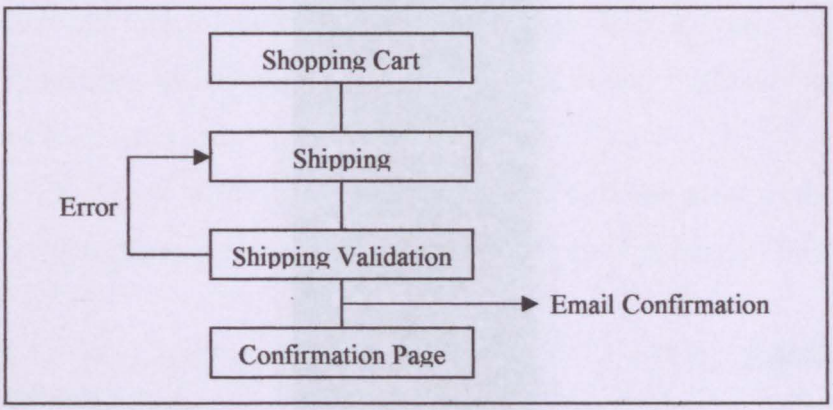


Figure 4.3: Checkout process

The checkout process starts with the shopping cart. As indicated, the shipping is the next step and then the validation is done on the shipping data. If there is an error on the shipping information, the shopper is sent back to the shipping page with an indication of an error.

If the shipping validation is successful, an e-mail receipt is sent to the shopper and the confirmation page is shown.

4.4 Interface Design

4.4.1 Building the Page Structure

A good store design should provide consistent navigation throughout the shopping experience. Key navigational elements include a link to the registration page, catalog page, the shopping cart, the checkout process, and bakery class. Figure 4.5 shows the page layout.

Figure 4.4: The Store's Navigation Interface

4.4.2 Building the Home Page

The home page for the store puts the header and footer into place and gives an entry point for the shopper. Then we put in the core information on the page, which I this case just a welcome message. Figure 4.6 shows the store home page in all of its glory.

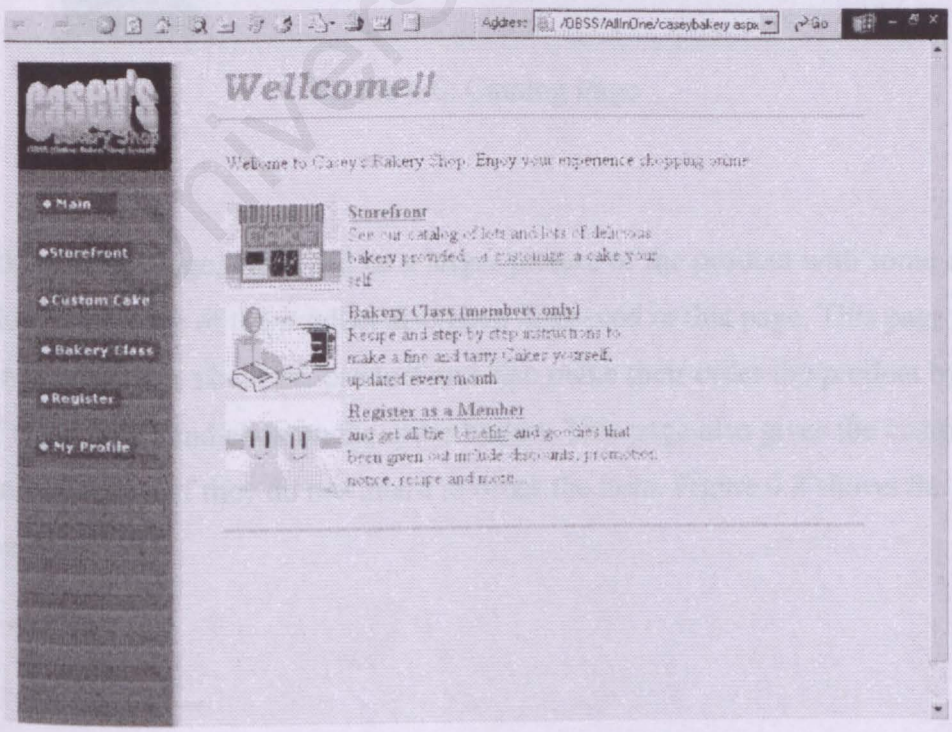


Figure 4.5: Default Page for the Store

Then the next page the customer will visit will be the catalog page. The catalog page will display several item of the store. OBSS do not try to put all item available at the store in one page because it will take longer time to download page. And, the page won't be too long for the customer to brows, which they have to drag up and down. Customers can see more catalogs by click on the next link.

In the catalog, image of the product will be shown with the name of the product which will link to the product page. Figure 4.7 shows the sample catalog page of the OBSS.

Figure 4.6: Catalog Page

In the product page, there will be a larger picture of the product with some description of the product. The price of the product also been displayed in this page. This page let the customers to know more about the product and also make their order the product by insert the quantity of the product and click on the order button. This page also gives the customers to return to previous page if they do not intent to order the item. Figure 4.8 shows the product page for the customers.

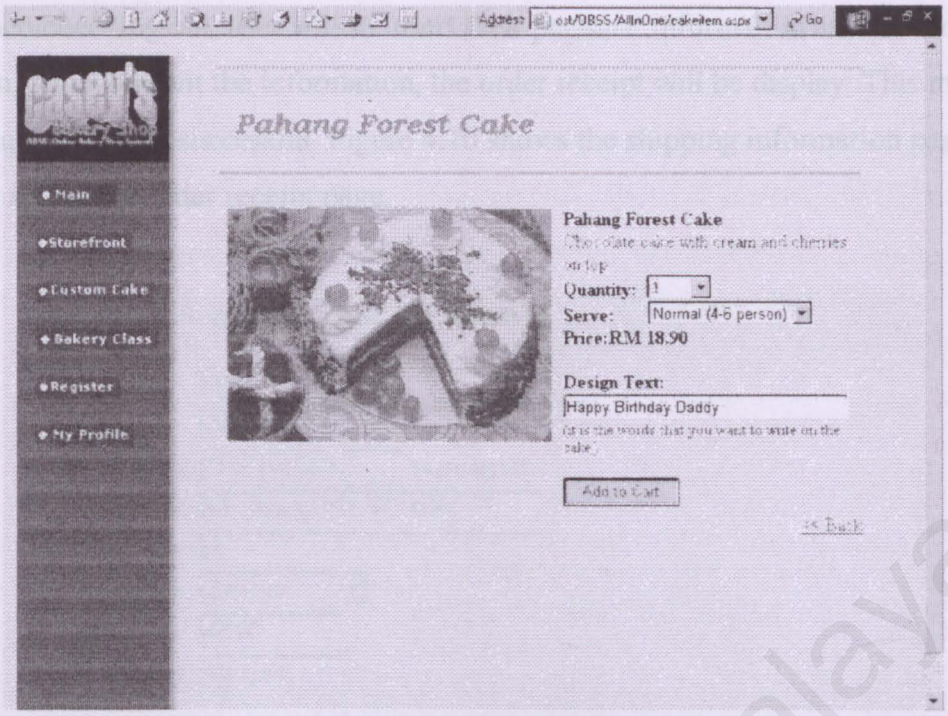


Figure 4.7: Item Page

After making the order, the shopping cart page will be shown. This page shows the items that been order by the customers with its item code, name, quantity and price. User can change the quantity here by modify the numbers of the items quantity and click the update button to update the shopping cart. This page also let the customers to remove an item or clear the shopping cart. The shopping cart page provide check out function for the customers if the finish their shopping, and also a link that will link to the catalog page if the customer wish to continue shopping. Figure 4.9 shows the shopping cart page.

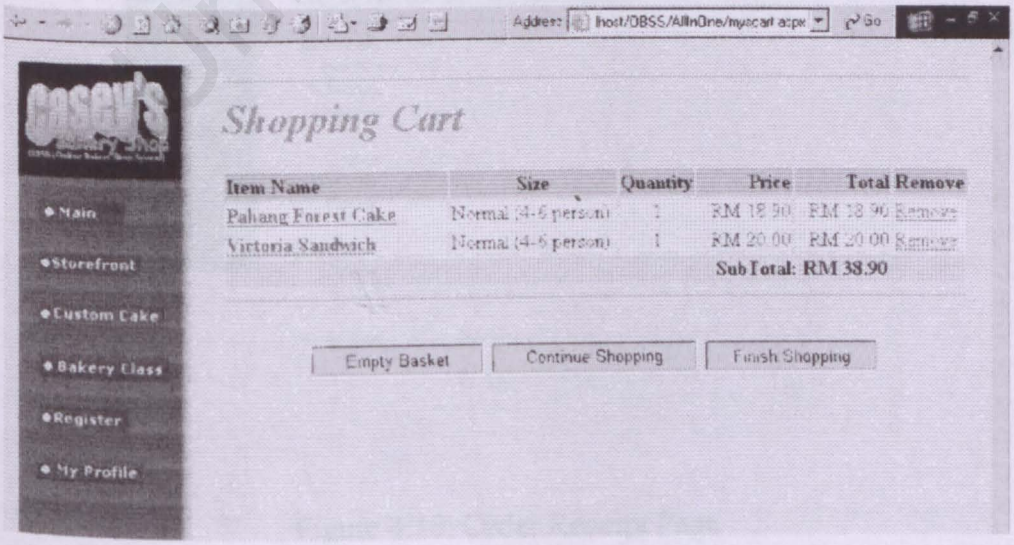


Figure 4.8: Shopping Cart Page

When checking out, user will to insert their personal information and the shipping information. After summit the information, the order receipt will be display. This means that the order has been done successful. Figure 4.10 shows the shipping information page and figure 4.11 shows the order receipt page.

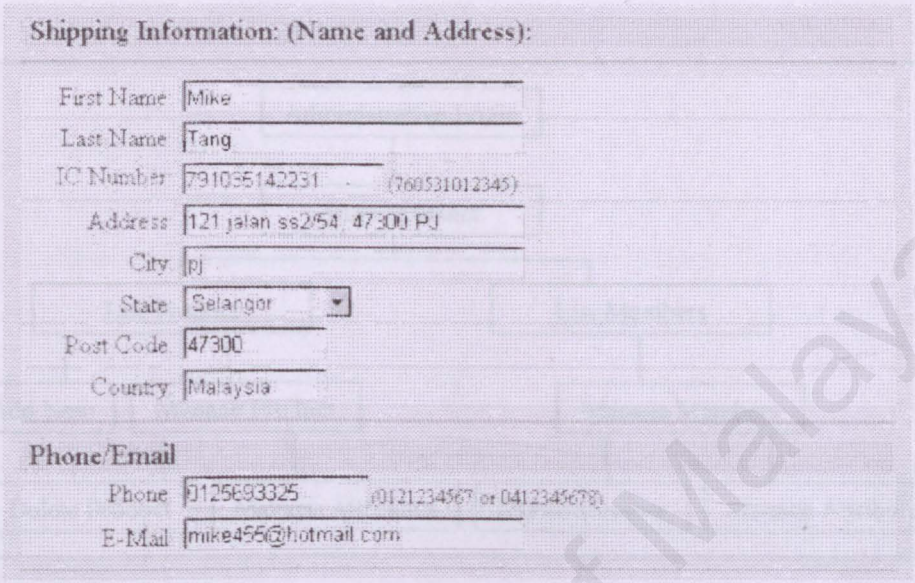


Figure 4.9: Shipping Information Page

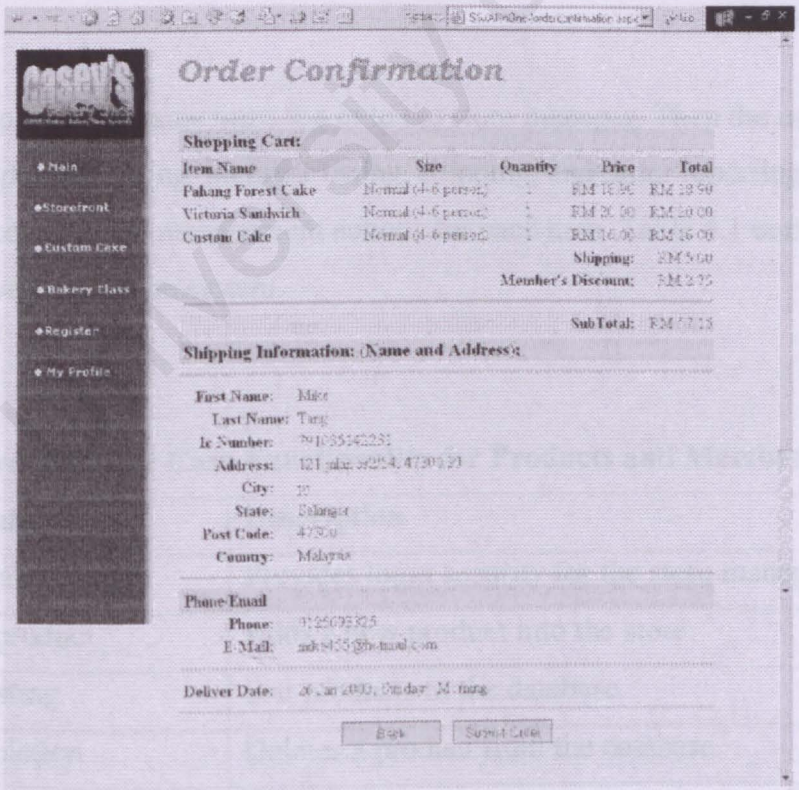


Figure 4.10: Order Receipt Page

4.5 Designing the Store Manager

The store manager is a complex application for working with the database behind OBSS online store. There is a series of functionality been build that will provide the fundamental tools for product management. Figure 4.2 lays the key functional items to be created.

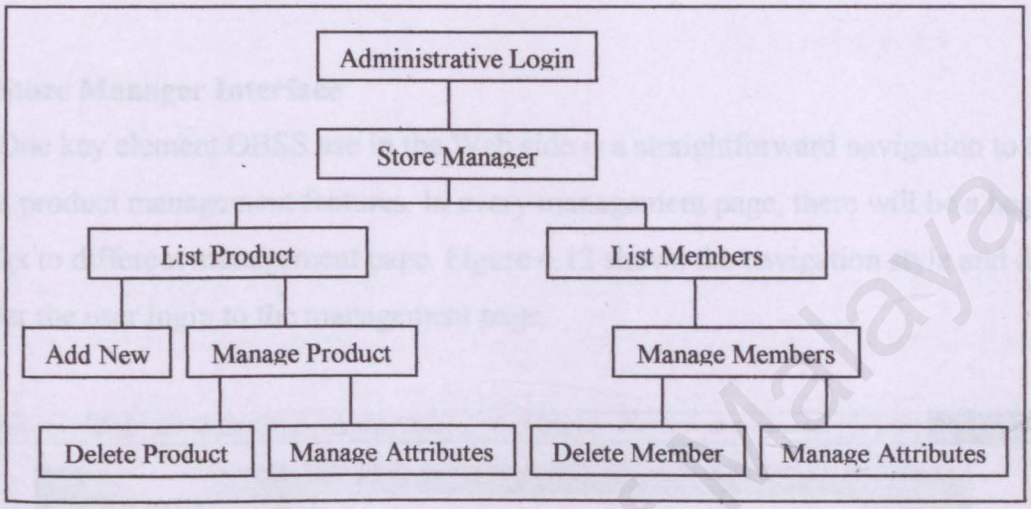


Figure 4.11 Store Manager Functionality

At the top level, the user must log in to the store manager. Then the user will have initial options – product listing, member listing, shipping, and order reporting. From there the functional tree expends into management actions for each area. Table 4.1 outlines the core functionality developed in the system.

Table 4.3: Store Manager Core Functionality for Products and Members

Functionality	Description
Administrative Login	Provides login security for the store manager.
Add new product	Adds a new product into the store.
Product listing	List products in the database.
Product deletion	Deletes a product from the database.
Product update	Updates the product data.
Product attribute management	Adds, updates, and deletes products attributes.

Member listing	List members in the database.
Member deletion	Deletes a member from the database.
Member update	Updates the member data.
Member attribute management	Adds, updates, and deletes members' attributes.

4.5.1 Store Manager Interface

One key element OBSS use in the Web side is a straightforward navigation to the different product management features. In every management page, there will be a header with links to different management page. Figure 4.12 shows the navigation style and default page after the user login to the management page.

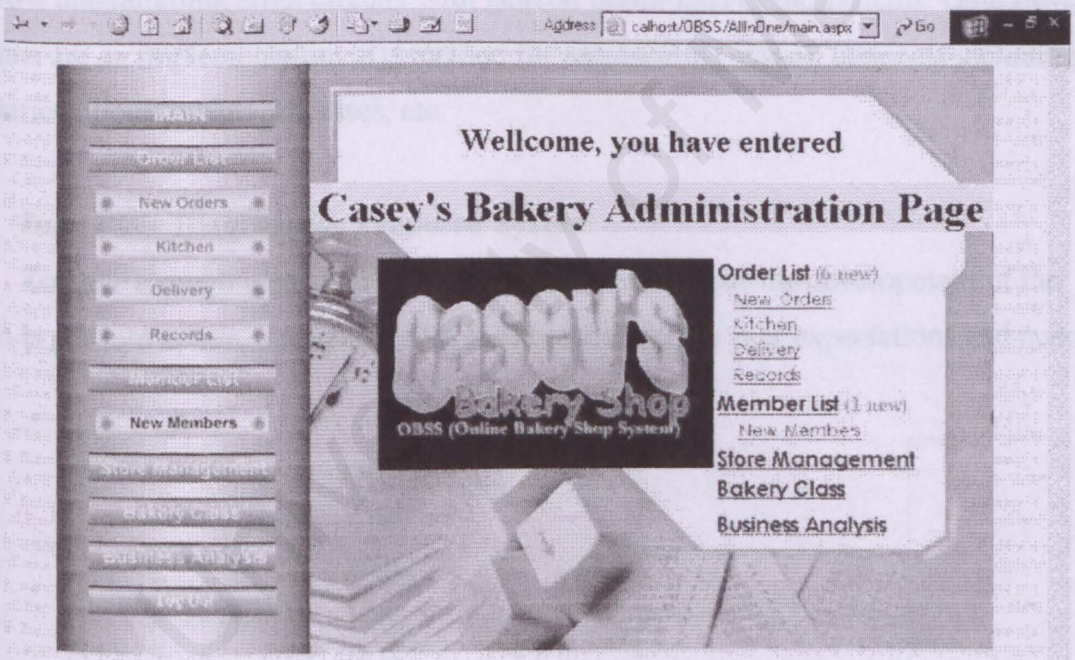
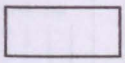
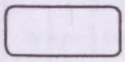
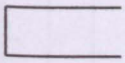


Figure 4.12 Default Page for Store Management

4.6 Data Flow Diagram

Data flow diagrams are a network representation of a system. They are the cornerstone for structured system analysis and design. The diagrams use four symbols to represent any system at any level of detail. The four entities that must be represented are illustrated below.

Table 4.4: Data Flow Diagram Convention

Symbol	Name	Description
	Entity	Source or destination outside the specified system boundary
	Process	Transforms of incoming data flow(s) to outgoing data flow(s)
	Storage	Data repositories for data that is not moving
	Data Flow	Movement of data in the system

Data flow diagrams do not show decisions or timing of events. Their function is to illustrate data sources, destinations, flows, stores, and transformations. The capabilities of data flow diagramming align directly with general definitions of the systems. Data flow diagrams are an implementation of a method for representing system concepts including boundaries, input/output, processes, etc.

4.6.1 Data Flow Diagram for Proposed System

To have a rough idea about how the system flow before the development of the system is put into action, a rough DFD is build according the user expectations and needs.

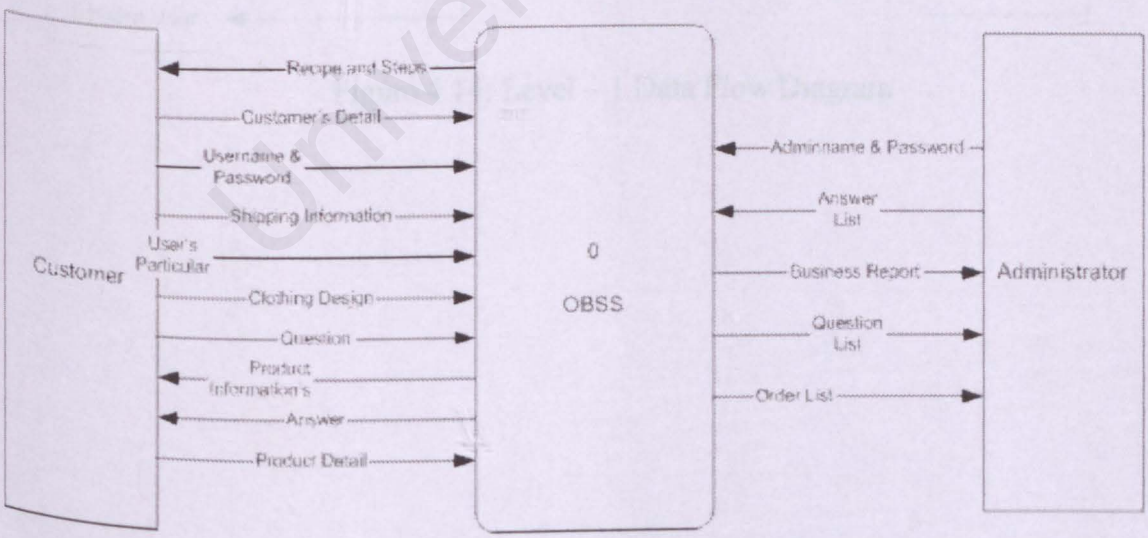


Figure 4.13: Context Diagram

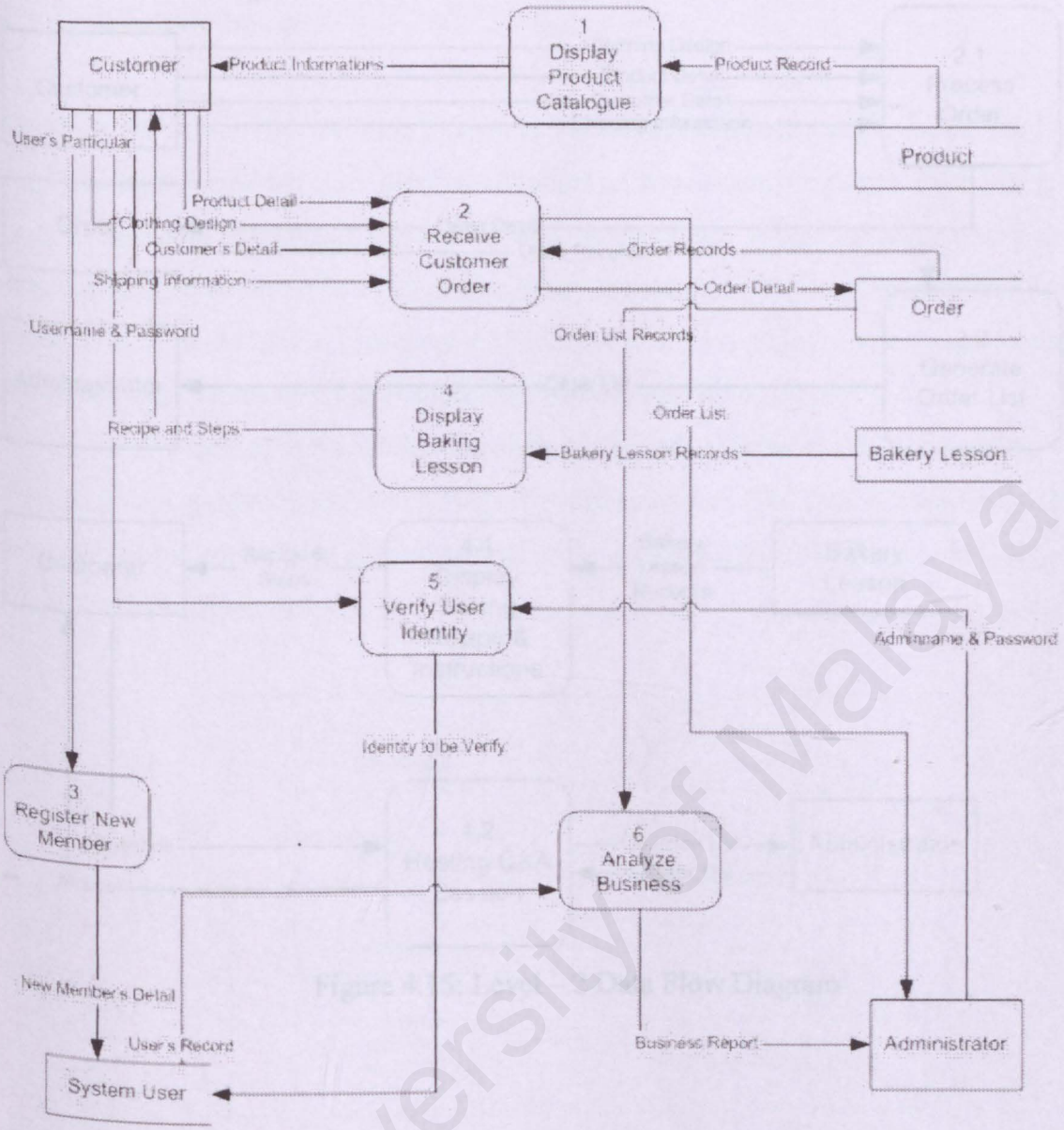


Figure 4.14: Level – 1 Data Flow Diagram

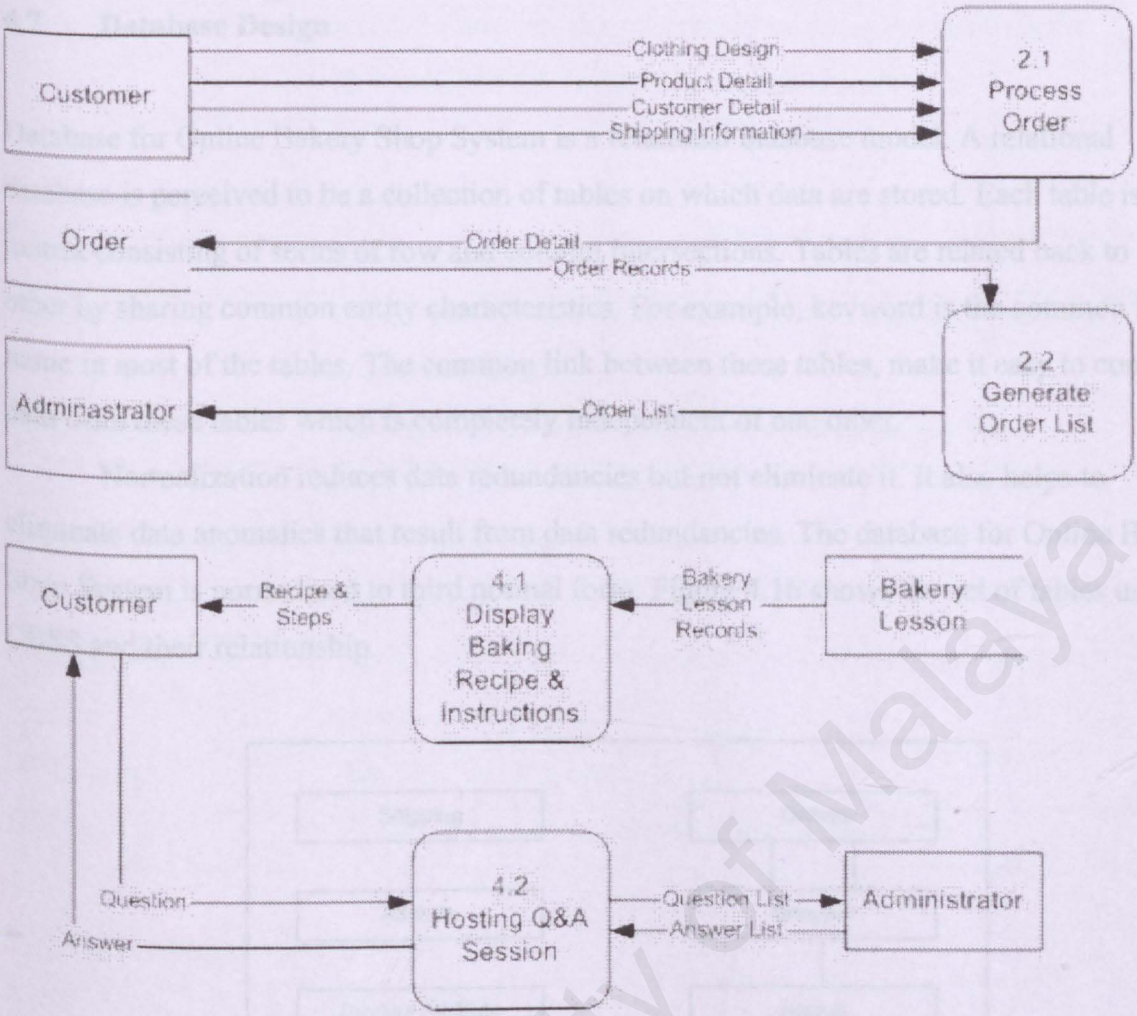


Figure 4.15: Level – 2 Data Flow Diagram

4.7 Database Design

Database for Online Bakery Shop System is a relational database model. A relational database is perceived to be a collection of tables on which data are stored. Each table is a matrix consisting of series of row and column intersections. Tables are related back to each other by sharing common entity characteristics. For example, keyword is the common field name in most of the tables. The common link between these tables, make it easy to connect data from these tables which is completely independent of one other.

Normalization reduces data redundancies but not eliminate it. It also helps to eliminate data anomalies that result from data redundancies. The database for Online Bakery Shop System is normalized to third normal form. Figure 4.16 shows the set of tables use in OBSS and their relationship.

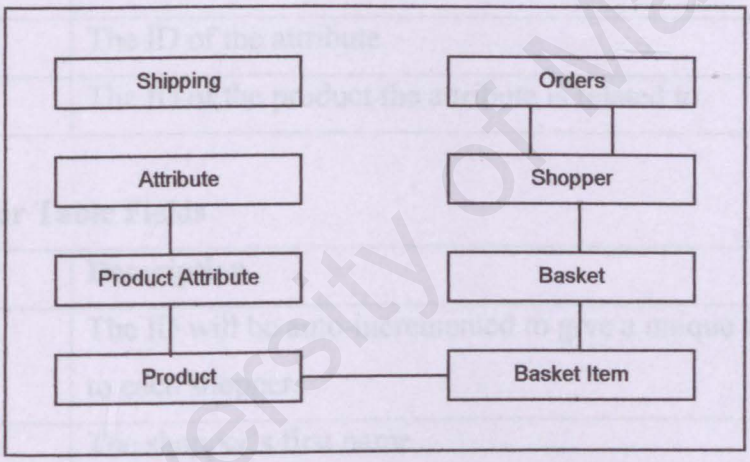


Figure 4.16: OBSS database diagram

The tables in OBSS are as follow:

Table 4.5: Product Table Fields

Field	Description
idProduct	The ID will be auto-incremented to give a unique identifier for the product.
chrProductName	The name of the product as displayed to the shopper.
txtDescription	A description of the product. The information will be stored as text, but HTML tagging can be place in the text for display purposes.
intPrice	The price of the product. To avoid rounding issues with

	decimal numbers, the price is stored as an integer with the cent stored in the 1s and 10s digit positions.

Table 4.6: Attribute Table Fields

Field	Description
idAttribute	The ID will be auto-incremented to give a unique identifier to each attribute.
chrAttributeName	The name of the attribute as displayed to the shopper.

Table 4.7: Product Attribute Table Fields

Field	Description
idProductAttribute	The ID will be auto-incremented to give a unique identifier to each combination.
idAttribute	The ID of the attribute.
idProduct	The ID of the product the attribute is related to.

Table 4.8: Shopper Table Fields

Field	Description
idShopper	The ID will be auto-incremented to give a unique identifier to each shopper.
chrFirstName	The shopper's first name.
chrLastName	The shopper's last name.
chrAddress	Address of the shopper.
chrCity	City of the shopper's address.
chrState	State of the shopper's address.
chrCountry	Country of the shopper's address.
chrPostCode	Post code of the shopper's address.
chrPhone	Phone number of the shopper.
chrFax	Fax number of the shopper.
chrEmail	E-mail address of the shopper.
dtEntered	Date the shopper information was entered.
chrUserName	User name of the shopper. This will be utilized in accessing the shopper's profile.

chrPassword	Password used by the shopper to access their profile and order status.

Table 4.9: Basket Table Fields

Field	Description
idBasket	The ID will be auto-incremented to give a unique identifier to each basket.
intQuantity	The total quantity of itetm on the shopping basket.
dtCreated	The date the basket was created.
idShopper	The ID of the shopper for whom the basket was created.
intOrderPlaced	Flag that will indicate if the basket was ordered by the shopper.
intSubTotal	Subtotal cost of the basket without shipping or other charges.
intTotal	Total cost of the order with all cost included.
intShipping	Shipping cost of the order.

Table 4.10: Basket Item Table Fields

Field	Description
idBasketItem	The ID will be auto-incremented to give a unique identifier to each basket item.
idProduct	ID of the product added to the basket.
intPrice	Price of the product when added to the basket. Note that this price may be a sale price.
chrName	Name of the product.
intQuantity	Quantity of the product ordered.
idBasket	ID of the basket that these items belong to.
chrSize	Stores the size value.
chrColor	Stores the color value.

Table 4.11: OrderData Table Fields

Field	Description
idOrder	The ID will be auto-incremented to give a unique identifier to each order.
idShopper	The ID of the shopper placing the order.
chrShipFirstName	The first name of the person the product will be shipped to.
chrShipLastName	The last name of the person the product will be shipped to.
chrShipAddress	Address where the product will be shipped.
chrShipCity	City where the product will be shipped.
chrShipState	State where the product will be shipped.
chrShipCountry	Country where the order will be shipped.
chrPostCode	Post code to which the product will be shipped.
chrShipPhone	Phone number at the ship to location.
chrShipFax	Fax number at the ship to location.
chrShipEmail	E-mail address for the person the product is being shipped to.
chrBillFirstName	First name of the billing contact.
chrBillLastName	Last name of the billing contact.
chrBillCity	City of the billing contact.
chrBillState	State of the billing contact.
chrBillCountry	The country of the billing contact.
chrBillPostCode	Post code of the billing contact.
chrBillPhone	Phone number of the billing contact.
chrBillPhone	Phone number of the billing contact.
chrBillEmail	E-mail address of the billing contact.
dtOrdered	Data the order was placed.

Table 4.12: Shipping Table Fields

Field	Description
idQuantity	The ID will be auto-incremented to give a unique identifier to each rate range.
intLowQuantity	The low-end number of product for this range.
intHighQuantity	The high-end number of product for this range.
intFee	Shipping fee for cost range.

Chapter

5

IMPLEMENTATION

5.1 IMPLEMENTATION

5.2 DEVELOPMENT ENVIRONMENT

5.3 DEVELOPMENT OF PROPOSED SYSTEM

5.4 SYSTEM TESTING

5.5 ERROR ENCOUNTER

5.1 Implementation

System implementation is a process of developing a system based on the given requirements. In order to do that, appropriate tools and suitable language are needed to code the programs. A number of software was chosen in this case.

5.2 Development Environment

Development environment has certain impact on the development of a system. Using suitable hardware will help speed up system development. The hardware and software tools used to develop and documented the entire system is as discuss below.

5.2.1 Hardware Requirement

The hardware's used to develop this project are listed below:

- Intel Pentium Celeron Processor 1.70 GHz, 400-MHz System Bus, 128-KB L2 Advanced Transfer Cache.
- DFI PM10-EC P4 main board: Onboard Audio and Graphics.
- Apacer 256 SD-RAM.
- 54x Misumi Dual Mode CD-ROM.
- Maxtor 40GB HDD ATA133 7200RPM
- 1.44 MB Floppy Drive.
- WIN98 Keyboard.
- a4tech Mouse.
- 15' Color SVGA Monitor.
- Canon BJC-1000SP Printer.

5.2.2 Software Tools/Component requirements

Software Tools for Design and Report Writing

Adobe Photoshop 6.0 and Microsoft Paint were used to do the graphical editing and Microsoft Word xp was used to do the documentation and user manual.

Software Tools for Development

Combinations of software were used to develop the OBSS system. They are listed below:

Software/Tools	Usage	Description
Microsoft Windows 2000 Advanced Server	Development platform/environment.	Operation System. Come with Internet Information

		Service (IIS)
Microsoft SQL Server 2000	System Database	Data storage and database management.
Microsoft Visual Studio .Net	System developing includes ASP.net and VB.net code.	Microsoft latest system development tools for Windows and Web applications.
Adobe Photoshop 6.0	Image editing	A powerful Adobe image editing tools to manipulate image in different format.
Microsoft Notepad	Text editing.	Fast and easy text editing tools.
Microsoft Paint	Image editing.	For simple image editing.

5.3 Development of Proposed System

The following section will discussed the development of this system which is more focusing on the analysis of the usage and development tools that had been used.

5.3.1 Database Development

OBSS require a large and powerful database therefore Microsoft SQL Server 2000 is used on developing this project. Microsoft SQL Server 2000 is a very powerful database server which can support large amount of records and its security features are very reliable. Due to the information stored for OBSS are highly confidential and need high reliability, Microsoft SQL Server 2000 features meets the requirement.

5.3.2 User Interface Development

The user interface for this system was developed using Microsoft Visual Studio .Net whereas the graphics s created using Adobe Photoshop 6.0 and Microsoft Paint. All images that are used in the interface were transformed into 'jpeg' or 'gif' format to reduce the image file size and decrease the web page loading time. The image sizing and format transforming were efficiently been done by using Adobe Photoshop 6.0. Only the simple image been created or edited using Microsoft Paint to save time.

5.3.3 Application Development

The OBSS application can be divided into two parts, which are the user web-application and the administrator web-application. The development of both applications includes creating user interfaces, logical functions coding and database programming.

Structured Programming

Structured Programming is a technique for organizing and coding computer programs in which a hierarchy of modules is used, each having a single entry and a single exit point, and in which control is passed downward through the structure without unconditional branches to higher levels of the structure. Three types of control flow are used: sequential, test, and iteration. Structures Programming reduces the complexity created when program jump forward and backward to another parts of the program, obscuring the logic and flow of the program.

The Microsoft Visual Studio .Net supported programming by providing sequential, iteration (FOR, WHILE, DO UNTIL statement and etc.).

Modular Programming

Modular Programming is the concept that similar functions should be contained within the same unit of programming code and that separate functions should be developed as separate units of code so that can easily be maintained and reused by different programs. In ASP .net and Visual Basic .net, this can be done by creating a module file that can contain all functions and variable declared.

In OBSS, most aspx(.net ASP code file) page, it will come along with a module which has the same name as the aspx page. Inside, it will store the functions and variable that will be used in the aspx page. By doing this, the code can be easily traced during debugging because any error from that page can only come from that page and its module.

Beside that, there is a global module that can be shared by all modules which contain functions to manipulate the database. The functions include the basic database "SELECT, UPDATE, and DELETE" events. With these functions, it gives the flexibility to manipulate any table in the database easier and more efficient.

5.4 System Testing

Testing is a process of verification and validation of a system. Somehow, verification and validation have different activities.

5.4.1 Testing Procedure

- Unit test to confirm that the code matches the specification
- Functional testing to confirm the defined functions perform as required by the business
- Negative testing to prove that the system will deal with program exceptions and erroneous data
- Performance, stress and volume testing to ensure that the system function within pre-defined acceptable tolerances
- Operational testing to ensure that the system can be managed
- Integrated testing to confirm that the new application will work successfully without adversely impacting on other operational systems

5.4.2 Verification Procedures

- Following a defined process to cover all the activities within the systems development life time cycle development where each stage is reviewed and signed off prior to the commencement of the next stage
- Standards guiding the structure and content of all deliverables to ensure completeness and conformity (which aid readability and understanding)
- Presentations to the user for understanding of the business requirements
- Prototypes to evolve and improve the product being build and to confirm that the communication between IT and the business has been successful
- Monitoring of time and money spent during the development process to ensure that the business case for doing the development is still solid
- Management of change to the system being developed either for additional or different business requirements to meet revisions to the design or technology being used

5.4.3 Validation Procedures

- Person review by the author of all deliverable
- Peer review of deliverable
- Code inspection against the specification
- Entry and exit criteria for each stage of development

5.4.4 Testing Techniques

There are two technique applied in the testing of this system: white-box testing and black-box testing.

White-box Testing

White-box testing is control structures of a procedural design. It can derive test cases to ensure all independent paths are exercised at least once, all logical decision are exercised for both true and false paths, al loops are executed at their boundaries and within operational bounds and all internal data structures are exercised to ensure validity. It also may find assumptions about execution paths incorrect, and so make design errors. White-box testing can find these errors. Typographical errors are random. Just as likely to be an obscure logical path as on a mainstream path. White-box testing is sometimes referred to as structural testing. Because white box tests involve the individual component of a system, they require an implicit knowledge of the system's inner workings. In implementation, white-box test introduce a given set of inputs to a component or individual function of a system and compare the output to an expected result. Testing is generally not done through a user interface, but by using the debugging features of the given development environment.

Black-box Testing

Black box testing is testing that is focus on what the software is supposed to do. Thus, in black box testing we are checking to see if the functionality is correct, without concerning ourselves with how the software achieves this.

Black-box testing attempts to find errors in the following categories:

- Incorrect or missing functions
- Interface errors
- Errors in data structures or external database access
- Performance error
- Initialization and termination errors

5.4.5 Testing Strategies

The testing process is implemented throughout the development of this system. It is implemented in stage because the system itself is composed of procedure and functions. The testing process consists of unit testing, integrating testing and system testing.

Unit Testing

Unit testing also called module or component testing which consist of:

- Testing individual software units independently of the other units in the same software application
- Software component integration testing

Unit testing is recognized as one the most efficient ways to reduce the density and proliferation of errors in a software application. Unit Testing used to be expensive because of all the effort spent manually extracting individual source code modules from a program, writing stubs and drivers, running test cases, decrypting traces and redoing all this once source have changed.

The unit testing involves:

- Testing the interface to ensure that the information flows properly into and out of the program unit.
- Testing the boundary conditions to ensure that the component is operating correctly at boundary values.
- Make sure that all independent paths in a control structure are tested at least once.
- Testing all error handling paths.

Integration Testing

Integration Testing is the testing of combined parts of an application to determine if they function together correctly. The parts can be code modules, individual applications, and client and server application on a network. This type of testing is especially relevant to client/server and distributed systems.

System Testing

System testing is actually a series of different test whose primary purpose is to fully exercise the computer-based system. At the final stage, the software is incorporated into a large system. System testing is to ensure that the system is functioning well under a large system.

Performing system testing on this system is to ensure that all the system elements have been integrated and performed the functions as required.

5.5 Error Encounter

There are a few finds of problems that encountered during the testing phase of the development of OBSS.

- **Database Connection and Query Errors**

This type of error occurred due to the error of the connection string that is used to connect to the database. Incorrect SQL statement also caused fault and error when querying from database table, causing the data table not been updated or wrong data retrieved from the database.

- **Null Errors**

This type of error is cause by improper declaration of object. In Visual Studio .net, every object that is declared must be initiated and set as a new object before assign any value to it. This error will be detected during debugging using the Visual Studio compiler.

- **Syntax Errors**

It is a common error occurred in system testing. It is usually caused by incorrect keyword or missing some punctuation when constructing the code.

- **Logic Errors**

It is the error occurred when the application does not perform the way it was intended to perform.

Chapter

6

SYSTEM EVALUATION AND CONCLUSION

6.1 Problem Encountered

6.1.1 Difficulty in Designing the Web Application Design

Due to limited knowledge in web programming, some problem had been encountered during the system design. There are many limitation and differences between Windows Application Programming and Web Application programming. At the beginning, the first design was set but some module cannot be implemented in the web application. The design had been modify for few time using different approach. Revision had been done on some samples on the Internet and some book from the library. In the end the system requirement finally can be implemented effectively.

6.1.2 Difficulty in Mastering the Programming Language

The programming language that been chosen for developing this system is still very new in the market. Although there are many books and resource that can be found in the market but some of them have lots of errors and bug. Discussions have been made with some of the course mates who are using the same language. Different book had been taken as reference to compare with each others. A lot of times have been put on practicing to language. The language can only slowly be mastered after continues practice.

It also take a lot of time to learn new built in components of the programming language. Some module was first been created were then been change again by using the new learned component. This has caused some delay on the development progress but by using the new component, the system was easier to handle.

6.1.3 Unfamiliar Errors

The frequent problem encountered during the development process is the error messages that prompt out during debugging the program. The same error encountered many times before the error was finally been detected. After encountered the error for some time, the rest of error can easily been handled and correct.

6.1.4 Too large Project Scope

The project scope includes the client site system and the administrator site system. Each site also includes different sub systems which make the scope too big and difficult to focus on each sub system. A better system can be developed if the project is divided to several developers because each person can put more concentrate on the part which they are responsible is.

6.2 System Strengths

- **Security**

Security is the most important aspect in the system. System security s implemented using ID and password. A valid ID and password is required to access and make change in the system database. Members login and admin login was separated to prevent unauthorized user try to logging in the admin system. Then every page of the admin site need authorization to entered. Even the administrator had login to the system, if the page was not active for 5 minutes, the login ID will automatically expired. Then the administrator had to login again. Then every session object in the system will be dispose right after its use. With Microsoft Windows 2000 server as the server operating system, all client machines that connect to it must have a trusted connection or granted permission to manipulate the database inside it.

- **Consistency**

The screen design maintains its consistency throughout the system. All the colors of the background and the font type is the same throughout the whole system. All the buttons and hyperlinks are always displayed at the same position although the user switches from one document to another. Thus users faced less difficulty seeking for a particular option, which there require.

- **Impendent of Operating Platform**

This system can operate in any platform as long as the browser been used support JavaScript®. JavaScript® has been used as client scripting for interface design and form validation and data manipulation. Using client side scripting can reduce the workload on the

server and ASP.Net has been used because it also support JavaScript® which is the most widely use scripting among others.

- **System Transparency**

System transparency refers to the condition where the users do not need to know where the database resides, how is the system structure, its database management system and anything related to the system build. This feature is very important to avoid confusion that could lead to destruction of the important data. ASP.Net features that compile the VBScript into dll makes the code behind impossible for the client to view. The client can only view the HTML tag that been created after then server process.

6.3 System Limitation

OBSS does not support all the functions like other e-commerce system. This is due to lack of experience in web programming, e-commerce perspective and also lack of knowledge in the programming tools.

- **Cannot do On-line Payment**

  Due to lack of knowledge and resource about on-line payment, the OBSS system does not support the on-line payment functions. Customer can only do the payment for their order when the product is delivered to them.

- **User Can Not Obtain Password through the Web**

  The user cannot directly obtain their password if they have forgotten their password. This limitation exists due to central maintenance by administration and also for the security purpose.

- **No E-mail Module**

  Administrator cannot directly email the customer using the system. He has to use other email service from other web side to do so.

- **Limited Custom Cake Option**

  The option for custom cake was too limited due to insufficient amount of time during development of the system. The modification of the module involves big change in the system structure.

6.4 Future Enhancements

System development is a dynamic process. This system was developed in less than three month. While developing this system, new ideas have come across. However, due to time constraint, not all the new ideas can be incorporated into the system. Some of the new ideas that come across are as follow:

- The interface of the system should be enhanced to be designed in more standardized way which shows the professional of designing a system.

- Provide more efficient online user guides to user to the system.

- An email service can be integrated into the system to benefit all the users and administrators as well. F there are new and important announcement or events, then the user may received latest notification through email.

- Provide password encryption to protect the password from "Hackers". This will increase the system security level.

- More alternative and flexibility should be given to the customer to design their custom cake.

- Intelligent should be put to the business analysis module so that it will help the administrator to do some decision making.

- The system user boundary should be expanded to let more people using the system in different type of access level.

6.5 Knowledge Gained

Valuable knowledge was gained throughout the development of this system. Author has exposed to client-server development environment, database distributed system, programming and concepts as well as LAN configuration.

User has learned new skill on the new developing application tools which is the Microsoft ASP.Net, Microsoft SQL Server 2000, Adobe Photoshop 6.0 and others.

User has experience and gained deeper knowledge of software development process and project handling.

User also gains a through understanding about e-commerce concepts and approach.

6.6 Overall Conclusion

Overall, the objective of the project had been achieved though there are still plenty rooms for improvements. OBSS has being developed to fulfill the purpose as an online e-commerce web site for selling products and manage the business online. Then it provides users to design their custom cakes. It can help the administrator to manage, monitor the business gain advantage in the market.

OBSS has a simple interface that is easy for the users. The system does show consistency in the interface design. This system will be beneficial for all level of computer user.

The bakery store maintenance will be an easy work for the administrator because there is an administration application provided for the administrator to maintain the orders, page and data.

As a conclusion, Online Bakery Shop System is an interactive web system that may helps the shop owner to publish their product online, manage their inventory electronically, and increase the efficiency of management and wiser decision making.

APPENDIX

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Online Bakery Shop System (OBSS)

User Manual

Content of OBSS User Manual

List of Figure

Chapter 1

Introduction

1.1 OBSS Client Side System

OBSS client side system is the online system that can be accessed by any user of Internet using the web browser. It let the user to make their order on the sold product, register as a system member and visit the online bakery class. Figure 1.1 shows the structure of the OBSS Client Side System.

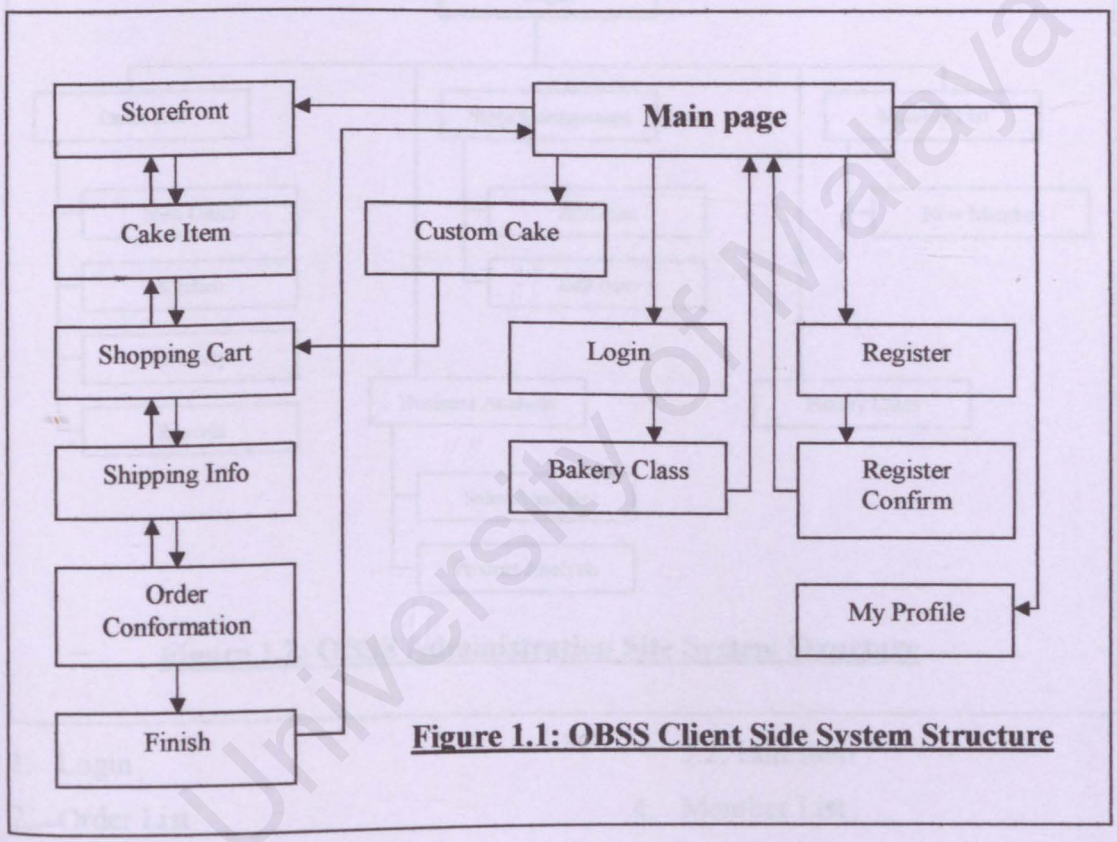


Figure 1.1: OBSS Client Side System Structure

1.) Main Page
2.) Storefront
3.) Cake Item
4.) Custom Cake
5.) Shopping Cart
6.) Shipping Info
7.) Order Confirmation
8.) Finish Order
9.) Login
10.) Bakery Class
11.) Register
12.) Register Confirm
13.) My Profile

1.2 OBSS Administration Site System

OBSS Administration Site System is also an online system but can only be access by the system administrator with authorized identity. Administrator can perform the administrative and management work using the system. These works include managing the orders, members' registration, e-shop storage, bakery class and view the business analysis. Figure 1.2 shows the OBSS Administration Site System structure.

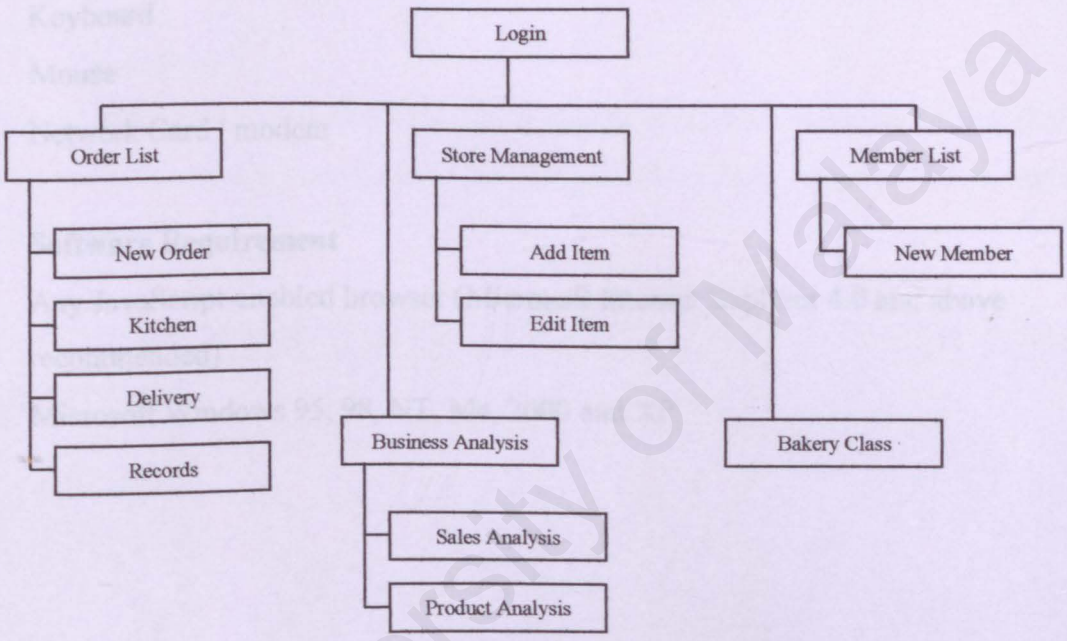


Figure 1.2: OBSS Administration Site System Structure

1. Login
2. Order List
   - 2.1. New Order
   - 2.2. Kitchen
   - 2.3. Delivery
   - 2.4. Records
3. Store Management
   - 3.1. Add Item
   - 3.2. Edit Item
4. Member List
   - 4.1. New Member
5. Business Analysis
   - 5.1. Sales Analysis
   - 5.2. Product Analysis
6. Bakery Class

1.3 Hardware Requirement

The minimum requirements to run Online Bakery Shop System are:

- A IBM compatible pc with Pentium II processor and above
- 32 MB RAM
- CPU (hard disk, main board, power supply)
- VGA Card (able to support 800x600 resolution)
- Monitor
- Keyboard
- Mouse
- Network Card / modem

1.4 Software Requirement

- Any JavaScript-enabled browser (Microsoft Internet Explorer 4.0 and above recommended)
- Microsoft Windows 95, 98, NT, Me, 2000 and XP.

Chapter 2

Online Bakery Shop System (OBSS) – Client Site System User Manual

2.1 Starting OBSS

To start the OBSS system, you first need a computer with basic operating requirement, a web browser, and a connection to the Internet. Type the address of the OBSS client system, which is: "http://obss/caseybakery.aspx" and you can start browsing the system.

2.2 Main Page

The first page that will be shown for the above address is the main welcome page of the bakery shop. Figure 2.1 shows the main page of the Casey's Bakery Shop (which is the general name of the OBSS system).

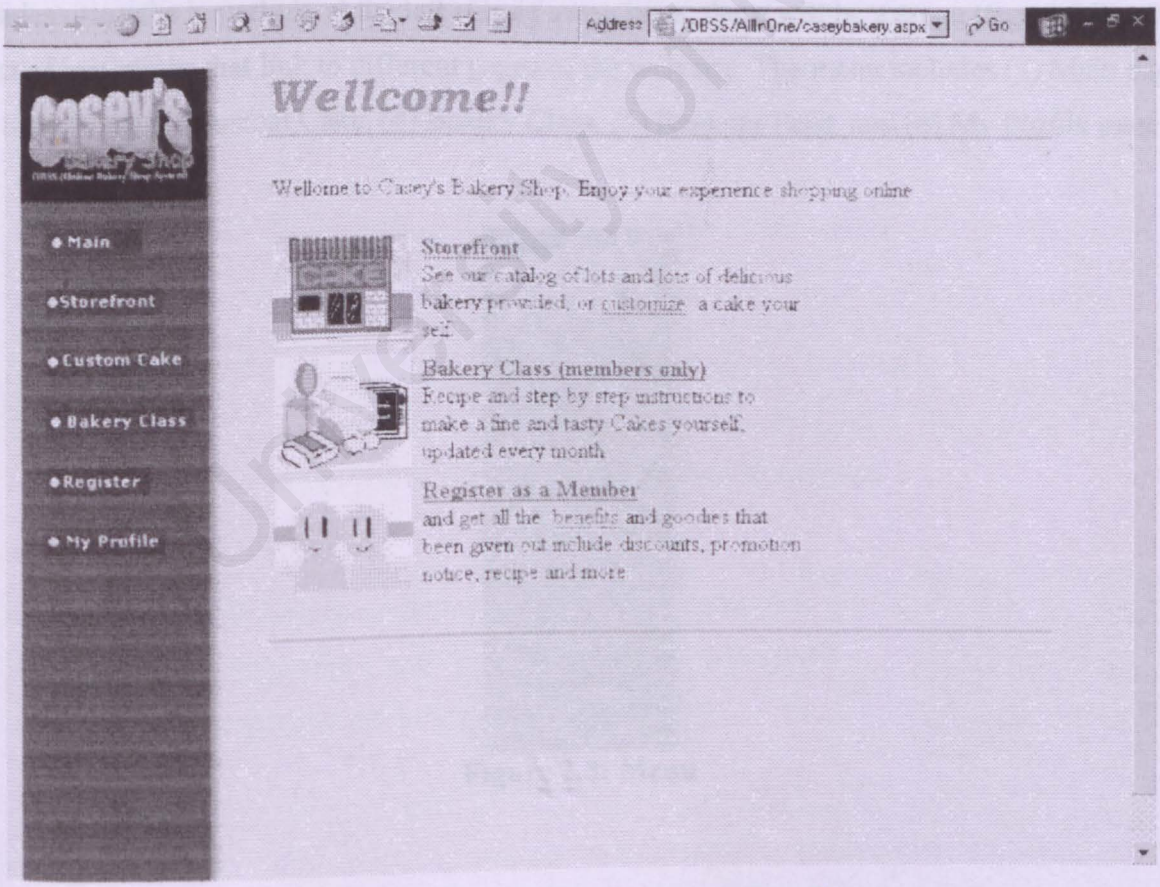


Figure 2.1: Casey's Bakery Shop Main Page

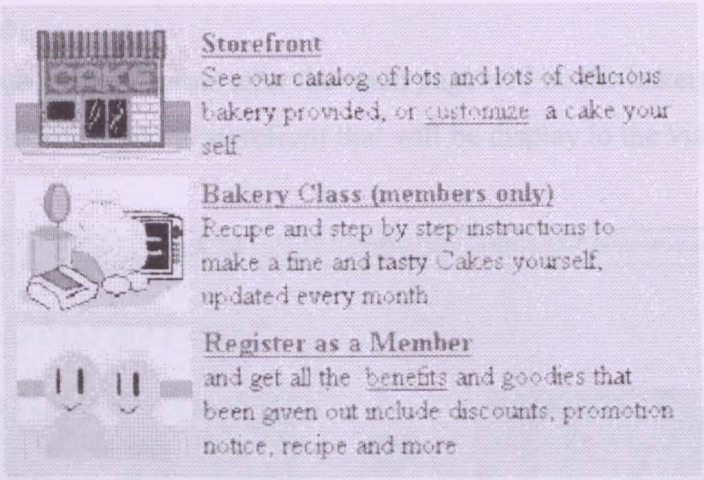


Figure 2.2: Main Page Hyperlink

From the main page, you can click on the hyperlink or the picture to go to the selected page.

Besides using the hyperlink, at the left side of every page, there will be a menu (figure 2.2) with a list of hyperlinks that link to different pages of the web site. The menu includes (1) Main page, (2) Storefront, (3) Custom Cake, (4) Bakery Class, (5) Register Page, and (6) My Profile page.

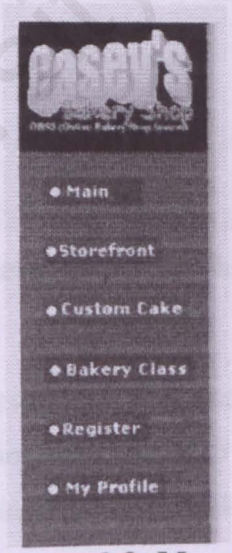


Figure 2.3: Menu

2.3 Storefront

The page usually brows by the visitors after the main page will be the bakery shop's storefront. Figure 2.4 shows the interface of the storefront that will be display to the visitors.

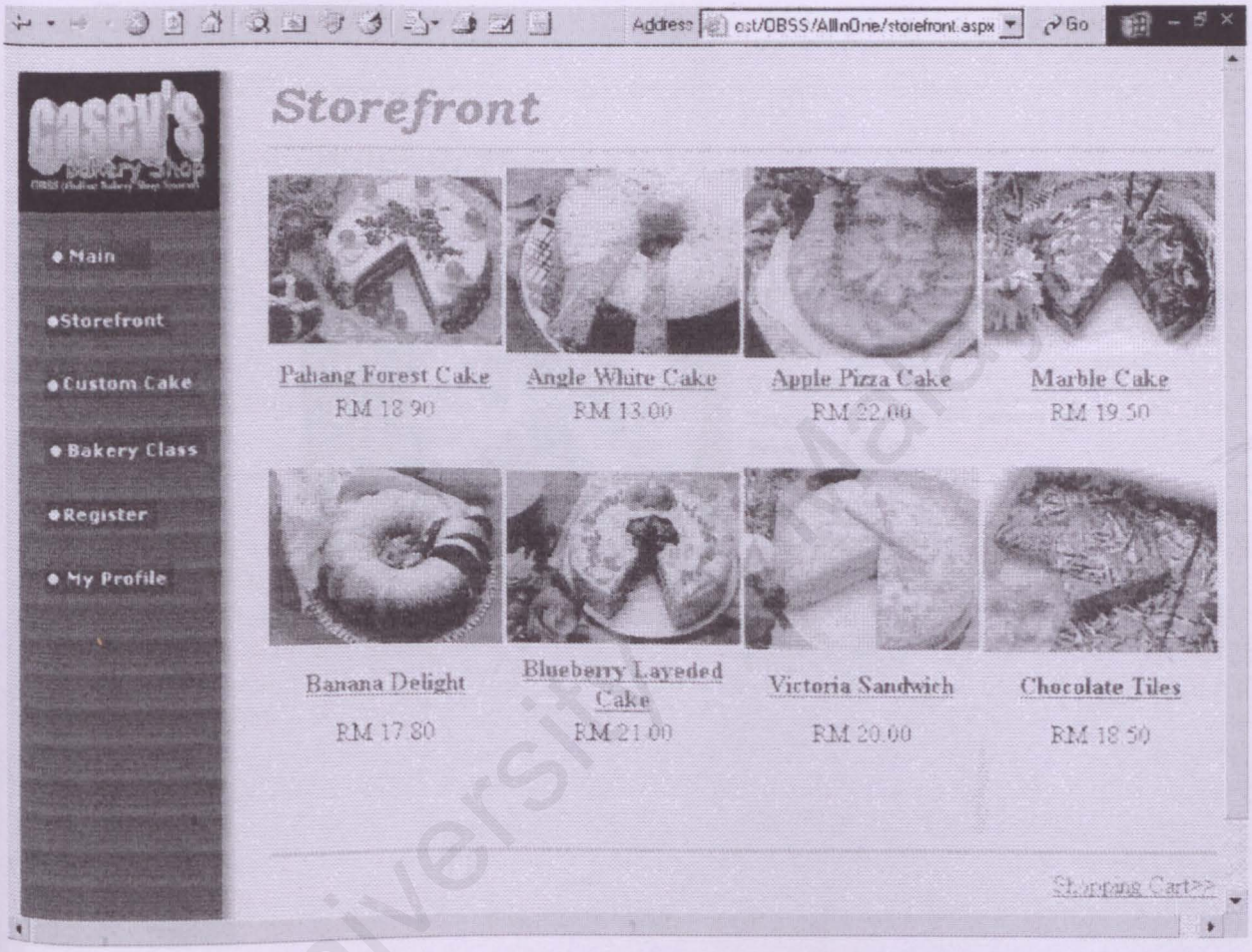


Figure 2.4: Casey's Bakery Shop Storefront

In the storefront, list of cake items that available for the customers will be shown of this page along with the cake price. You can select your desire cake item by click on the cake name hyperlink.

Figure 2.5: Storefront Item

2.4 Cake Item

After selected a cake item from the storefront, you will then come to the Cake Item page. Figure 2.6 shows the interface of the Cake Item page.

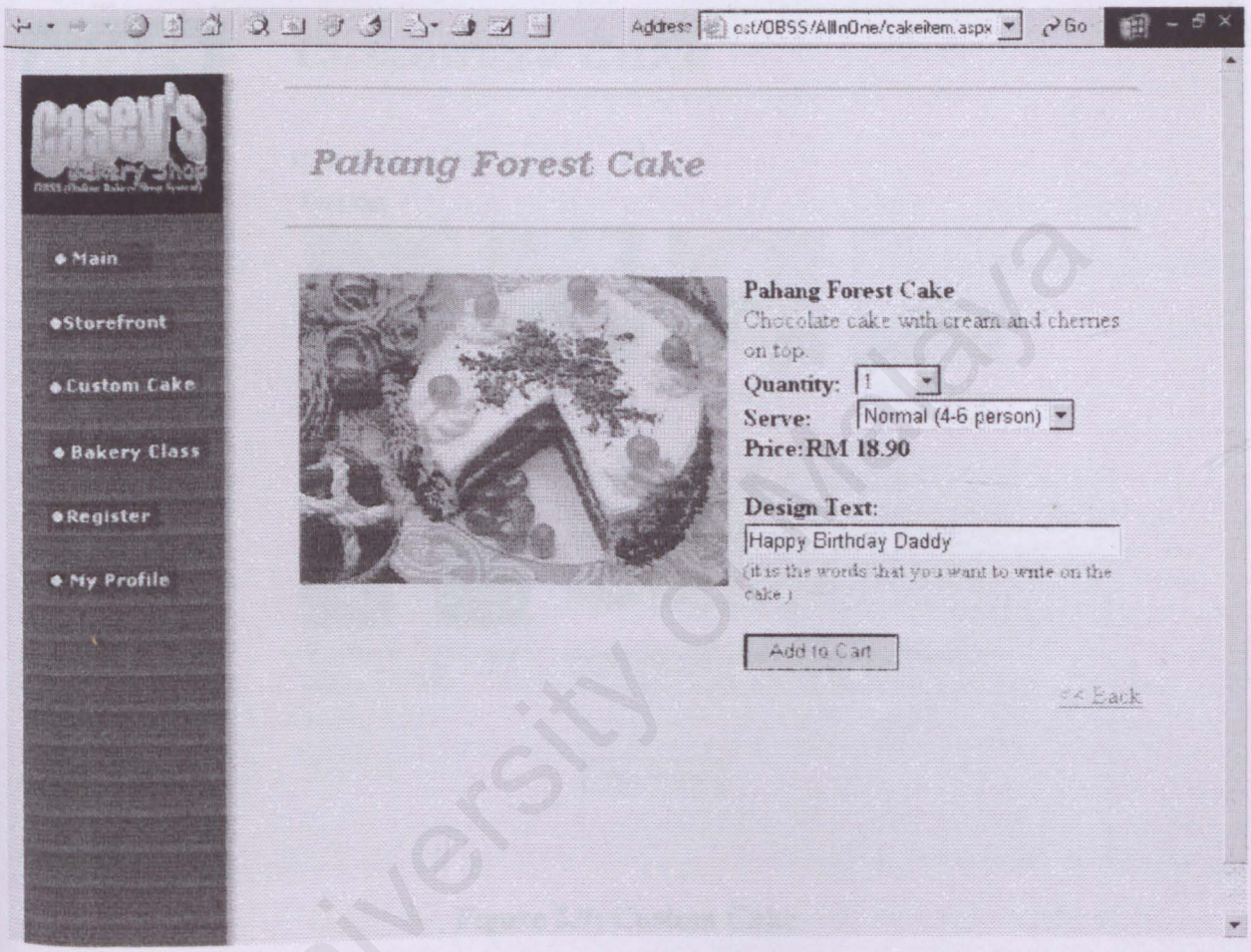


Figure 2.6: Cake Item

In this page, you can see the description of the selected cake item. You can also change the quantity and the size of the cake item that you want to order.

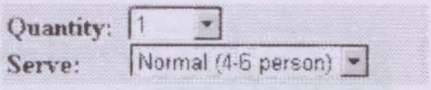


Figure 2.7: Cake Item Quantity and Size

Then you can also type in the design text that you want to write on the surface of the cake. Then you can click on the Add to Cart button to add the cake item into your shopping cart.

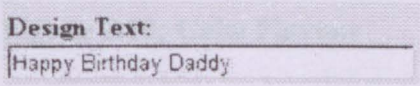


Figure 2.8: Design Text

2.5 Custom Cake

If you like to customize your cake, you can go to the Custom Cake page. It provides some options for you to design you custom cake. Figure 2.9 shows the interface of Custom Cake page.

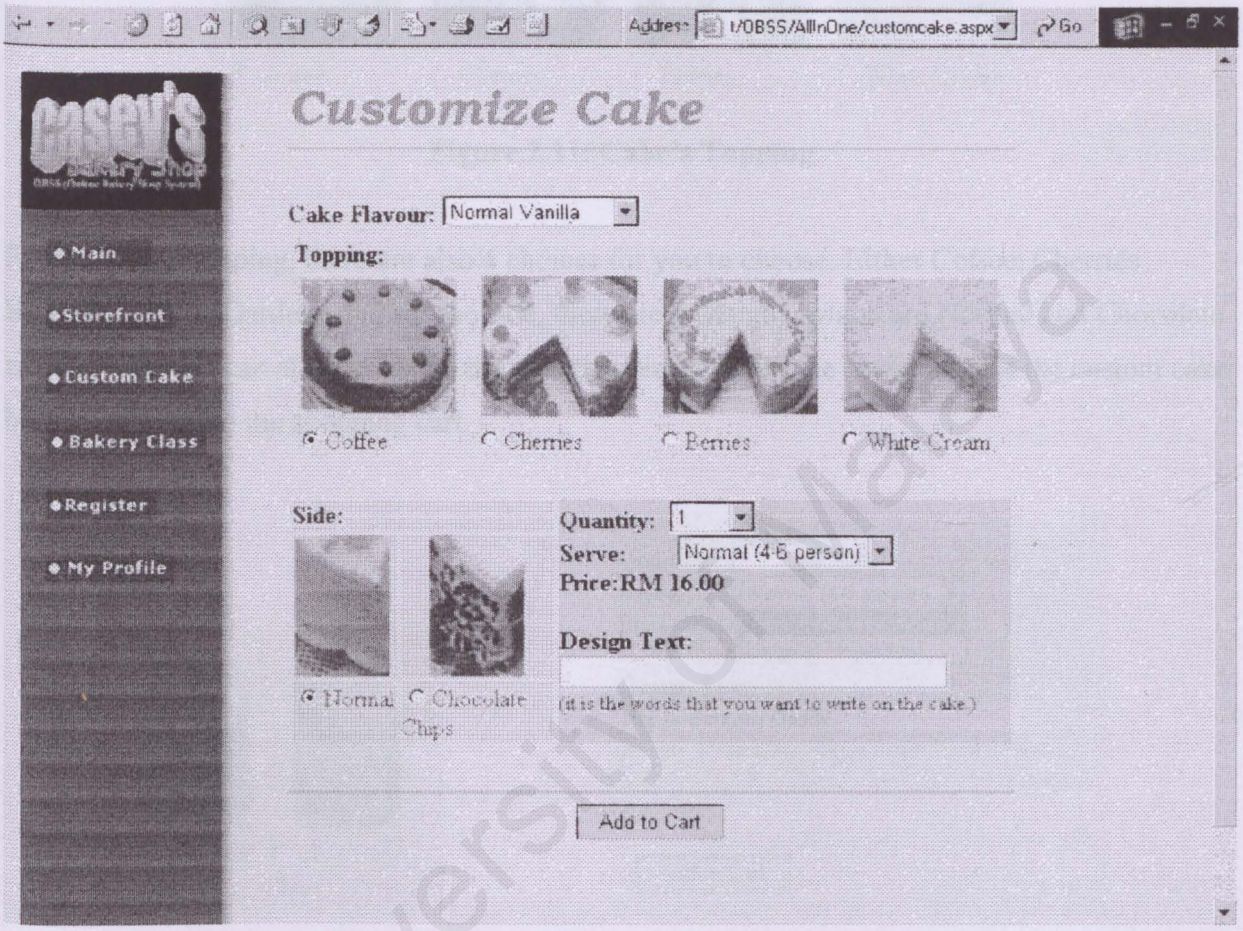


Figure 2.9: Custom Cake

First thing you can choose from the custom cake page is the flavour of the cake. There are 4 flavours for you to choose, which is: Normal Vanilla, Orange Flavour, Chocolate Flavour and Coffee Flavour.

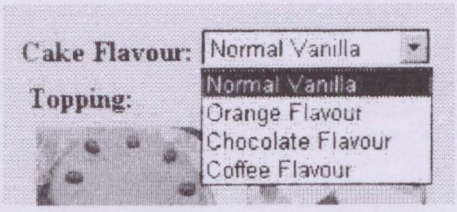


Figure 2.10: Cake Flavour

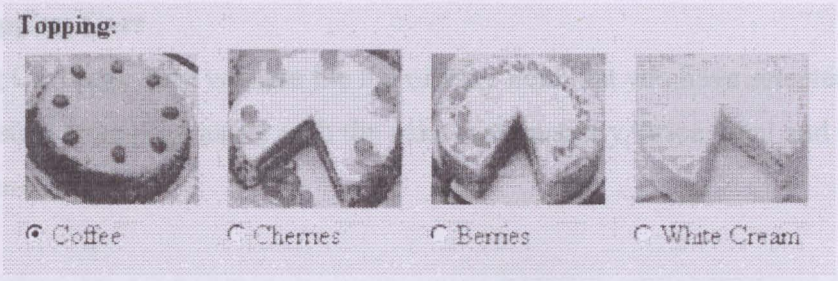


Figure 2.11: Cake's Topping

For the cake's topping, there are also 4 choices for you to choose. Either Coffee, Cherries, Berries or White Garden. And for the side, there are 2 designs, which are Normal and Chocolate chips. Then, you can also decide on the quantity, size and edit the design text of the custom cake before adding it to the shopping cart.

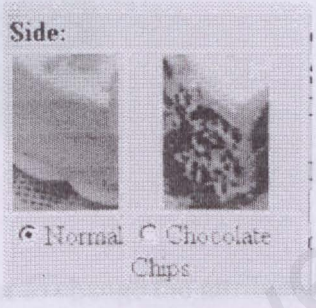


Figure 2.12: Side Design

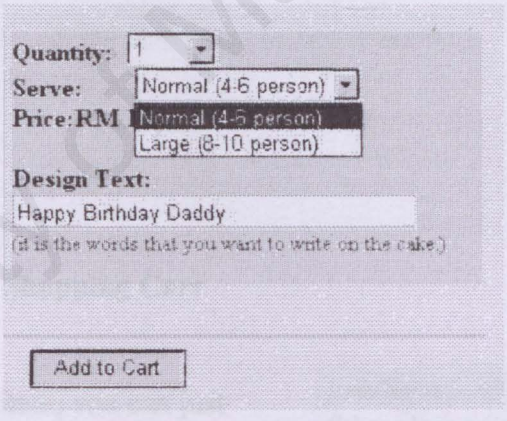


Figure 2.13: Quantity, Size and Design Text

2.6 Shopping Cart

In the Shopping Cart page, you will see the list of cake item that you have selected from the storefront or custom cake page along with the cake size, quantity, price, total and subtotal price as shown in figure 2.14.

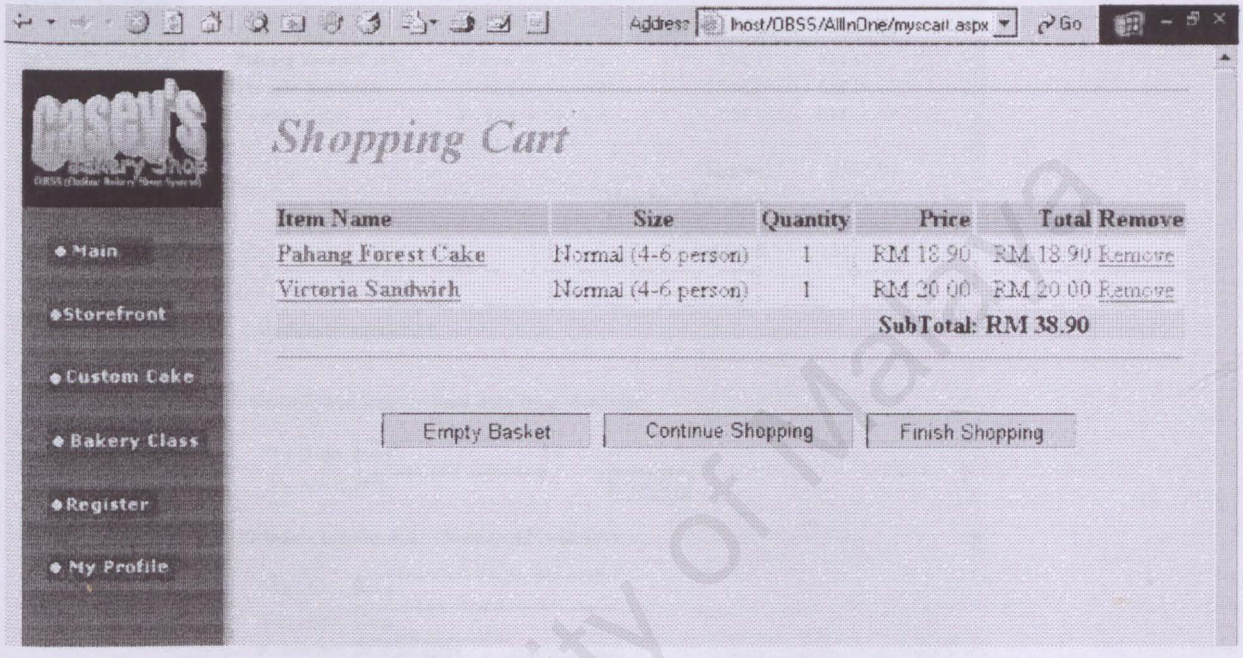


Figure 2.14: Shopping Cart

If you want to change the attributes of the cake item, you can just click on the item name of the cake item to go the cake item page or custom cake page.

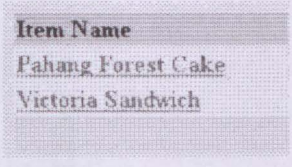


Figure 2.15: Item Name

To remove an item from the cart, just click the remove hyperlink.

To empty the basket, click the Empty Basket button.

To continue shopping, click Continue Shopping button and go back to Storefront page. If you have decided to leave, then click the Finish Shopping button to go to the Shipping Info page.

Figure 2.16: Remove Item

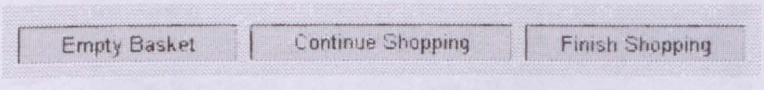


Figure 2.17: Shopping Cart Buttons

2.7 Shipping Info

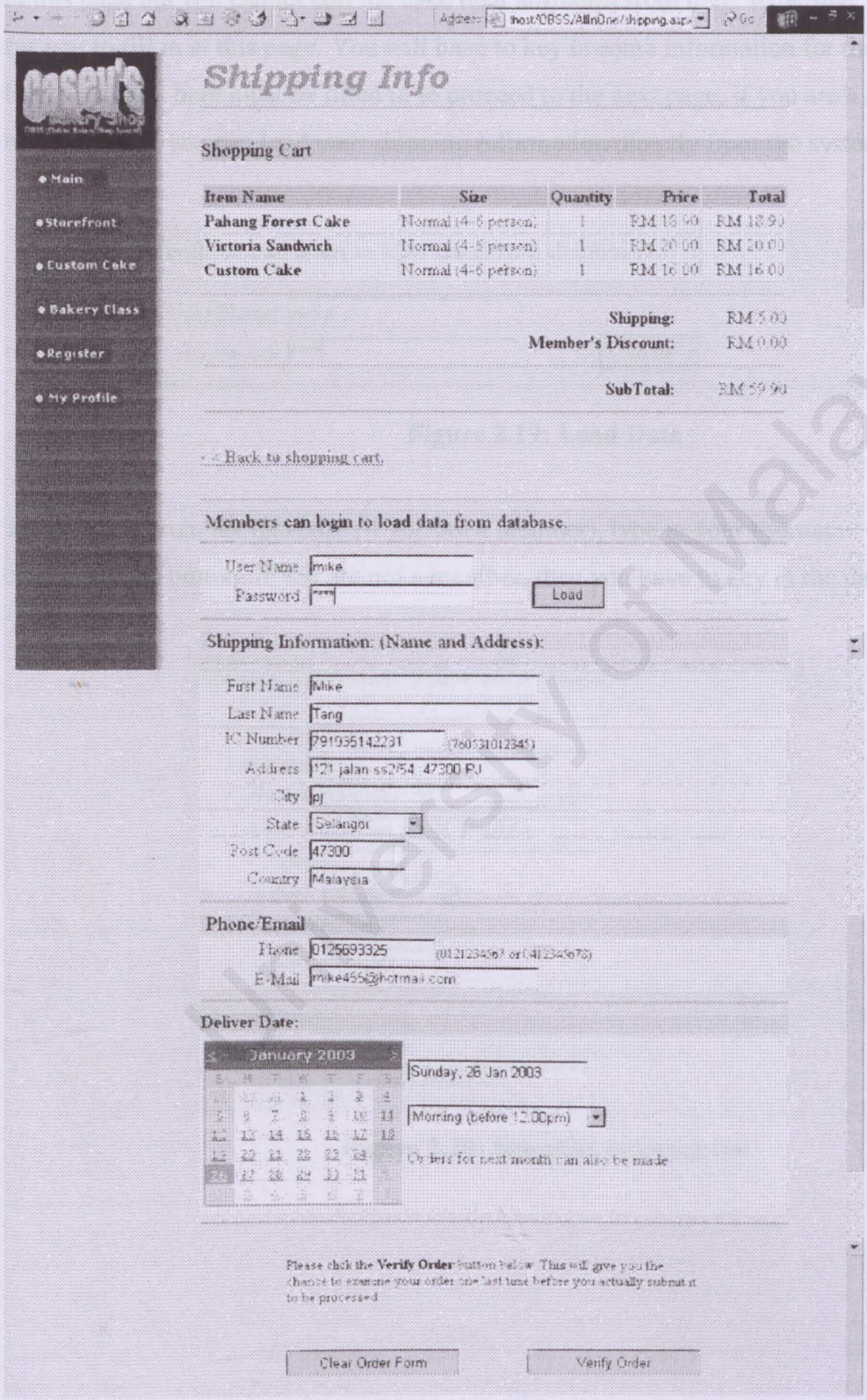


Figure 2.18: Shipping Info

Figure 2.18 shows the interface of the Shipping Info page. The shopping cart will also be shown in this page but you cannot edit the cake item attributes from here. After that, there is a form here for you to fill in at this page. You will have to key in some information for the delivery purpose. Every text box here must be filled in to proceed to the next page. If you are a registered member of the system, you can load your shipping information directly from the system database.

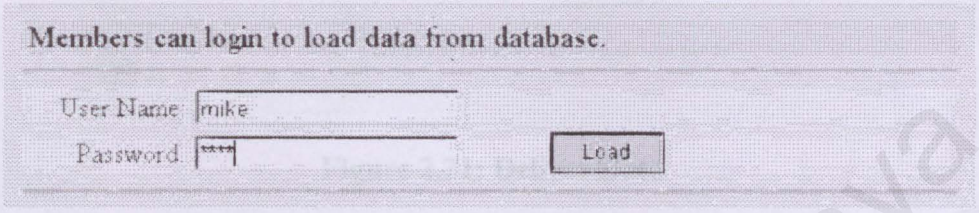


Figure 2.19: Load Data

To load data from the database (if you are a member), type in your username and password, then click the Load button. If you are not a member, then you have to key in the data manually.

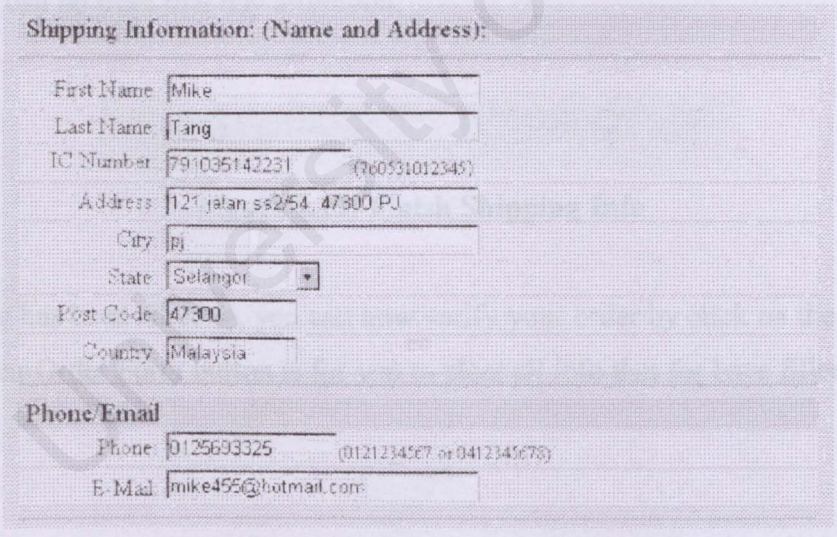


Figure 2.20: Shipping Information

After that, there is another data you have to insert, that is the deliver date. Figure 2.21 shows the interface of the deliver date part of the Shipping Info page.

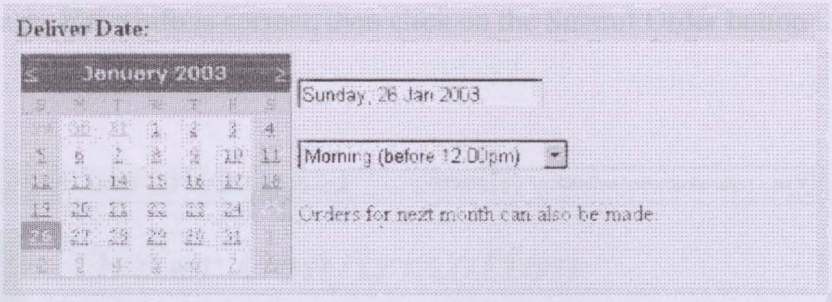


Figure 2.21: Deliver Date

Select a date from the calendar and the date will be display at the text box. Then select the period of when you want to cake to be deliver, which is in the morning or afternoon. For deliver date, you cannot select any day before today. If you are making order in the afternoon, the deliver date you can select will start from the next day morning. If you are making order in the morning, then the deliver date can be from that day afternoon.

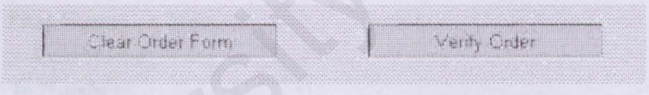


Figure 2.22: Finish Shipping Info

After everything has been filled in, you can now verify your order by click on the Verify Order button. The Clear Order Form button is for you to clear all info that for have filled in above.

2.8 Order Confirmation

The Order Confirmation is a page which let you review the order form one more time before you submit the order. If you still want to change anything, click the Back button to go back to the Shipping Info page. If the info is correct, then click on the Submit Order button to submit the order.

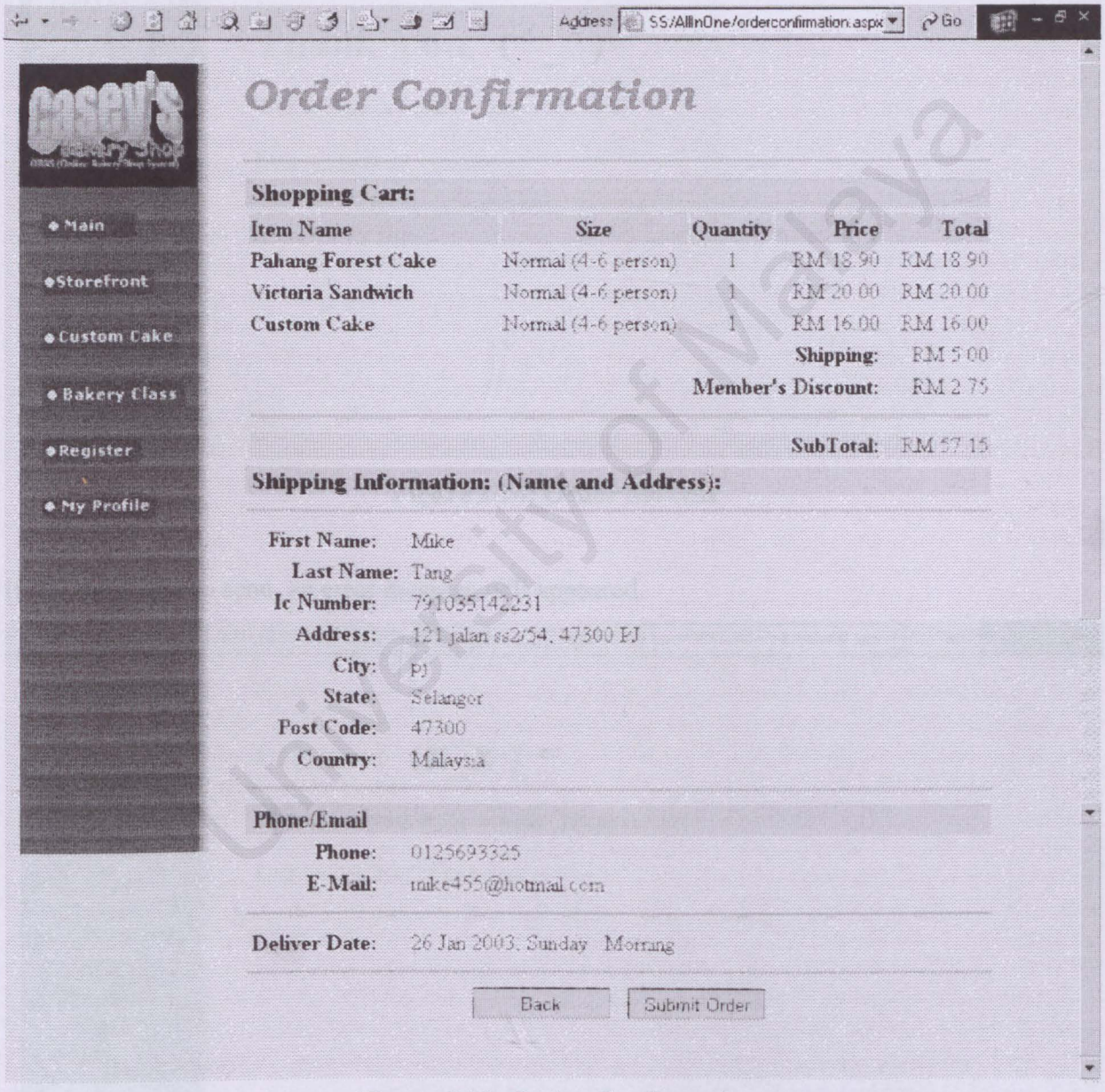


Figure 2.23: Order Confirmation

2.9 Finish Order

If the order had been successfully sent, a message will be shown that tell you the order is success. If your order is accepted, you will get an e-mail of notification. Figure 2.24 shows the message that will appeared if the order success.

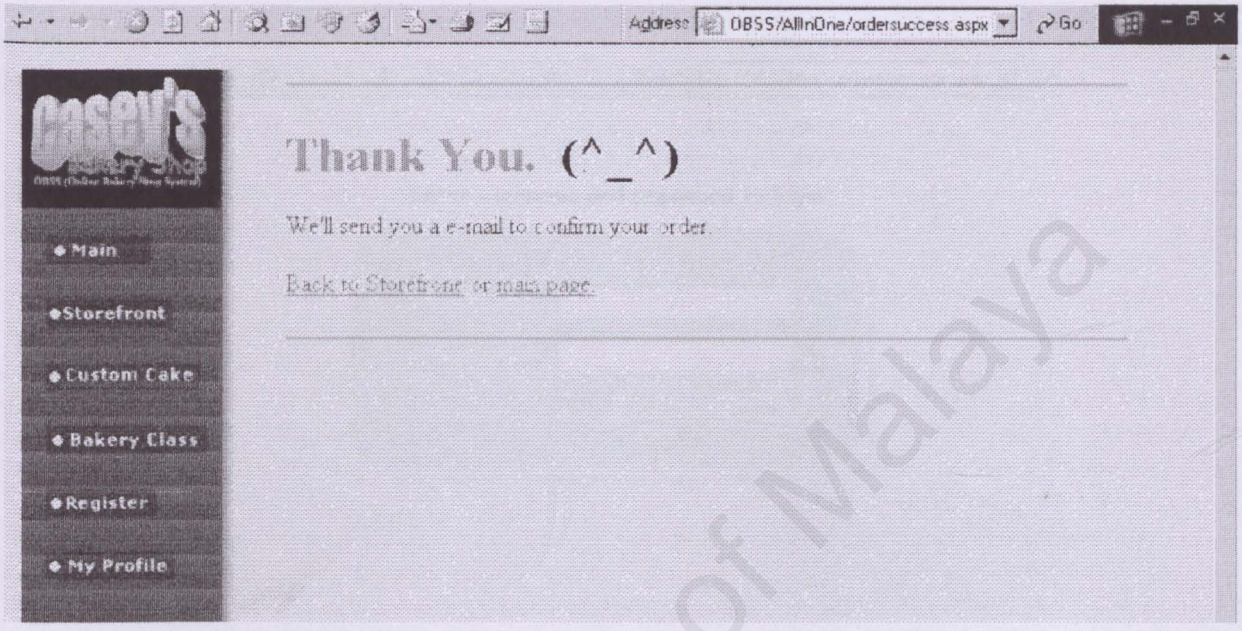


Figure 2.24: Order Success

If the order fails to send, an error message will appeared.

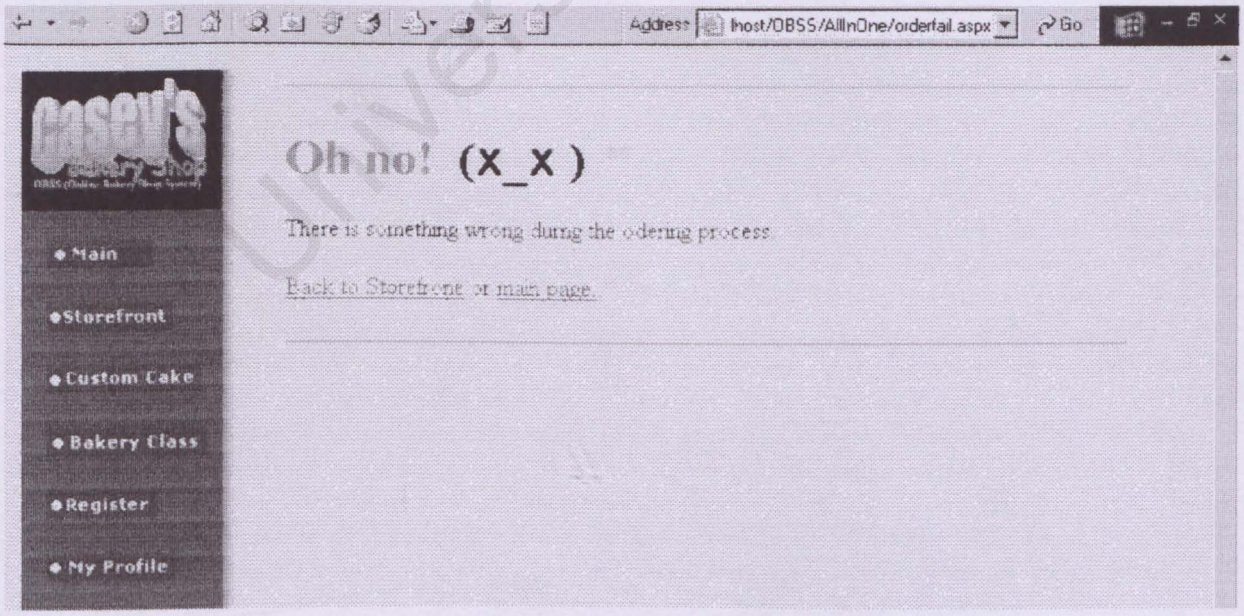


Figure 2.25: Order Fail

2.10 Login

To enter certain page of the web site, you will need to login as a member because those page are authorize for members only. The pages which was authorize are the Bakery Class page and My Profile page. Figure 2.26 shows the interface of the login page of the system.

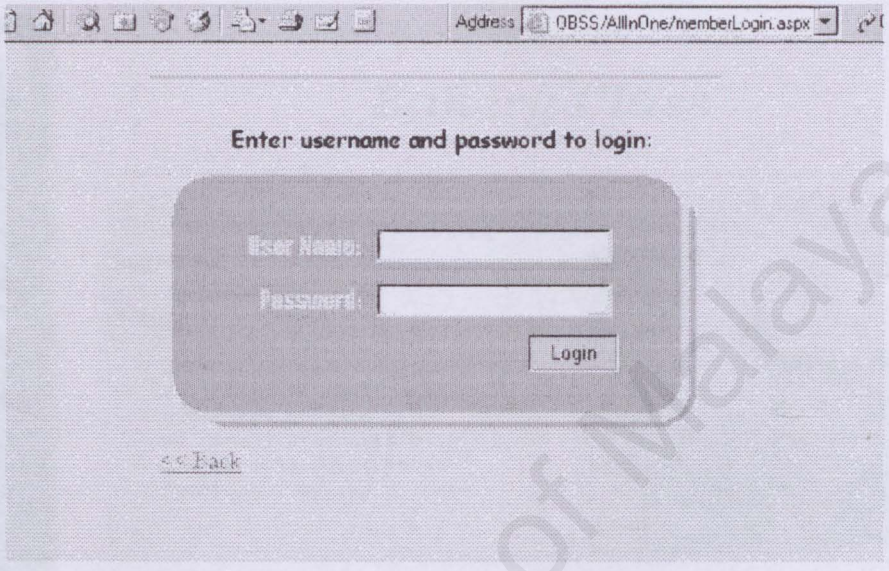


Figure 2.26: Login Page

2.11 Bakery Class

The Bakery Class page will display a new recipe every week. It includes the ingredients and instructions for baking the cake. Figure 2.27 is the interface of the Bakery Class.

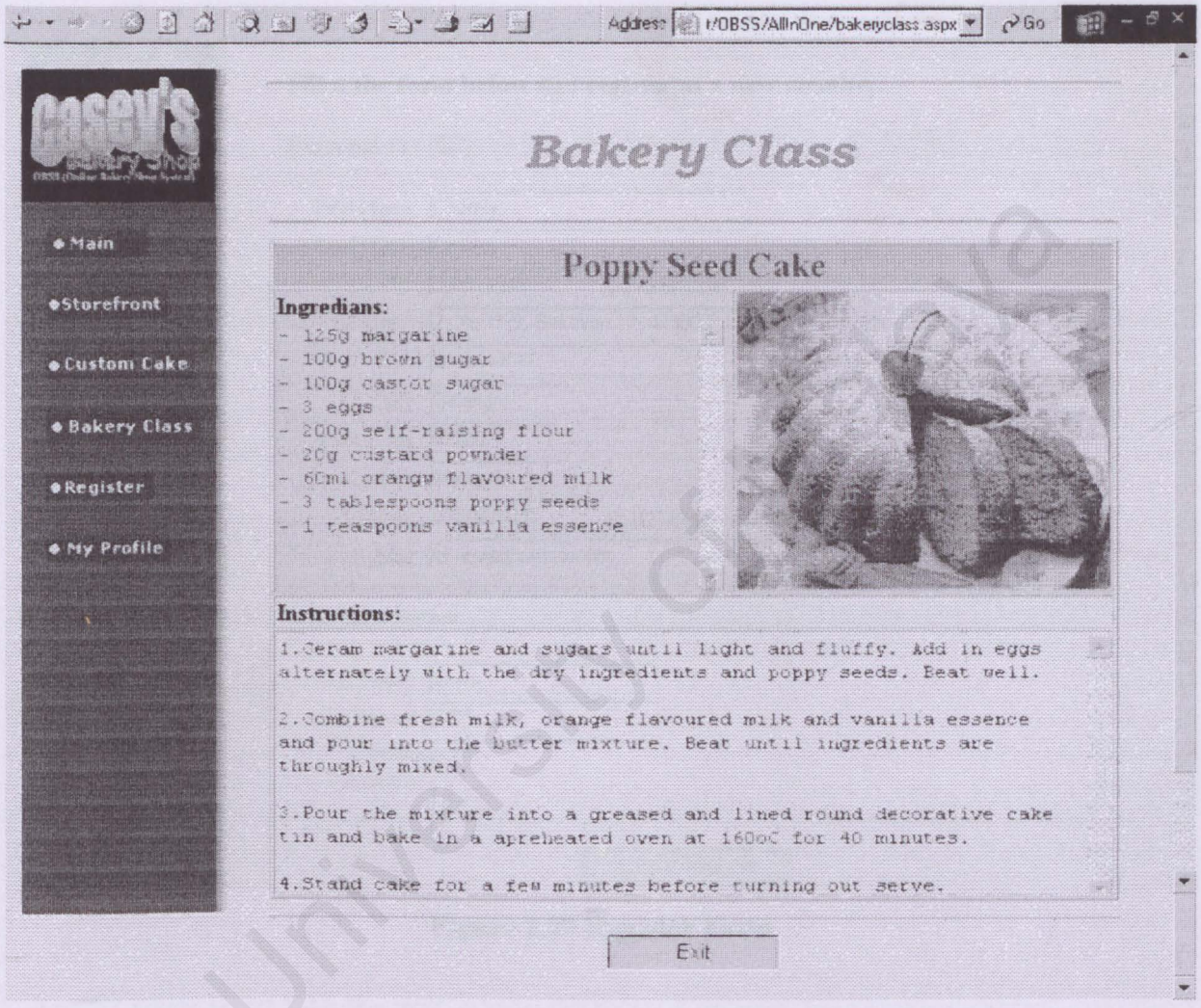


Figure 2.27: Bakery Class

2.12 Register

If you want to register as a member, go to the register page and fill in the registration form and register online. Figure 2.28 is the register form for the visitors.

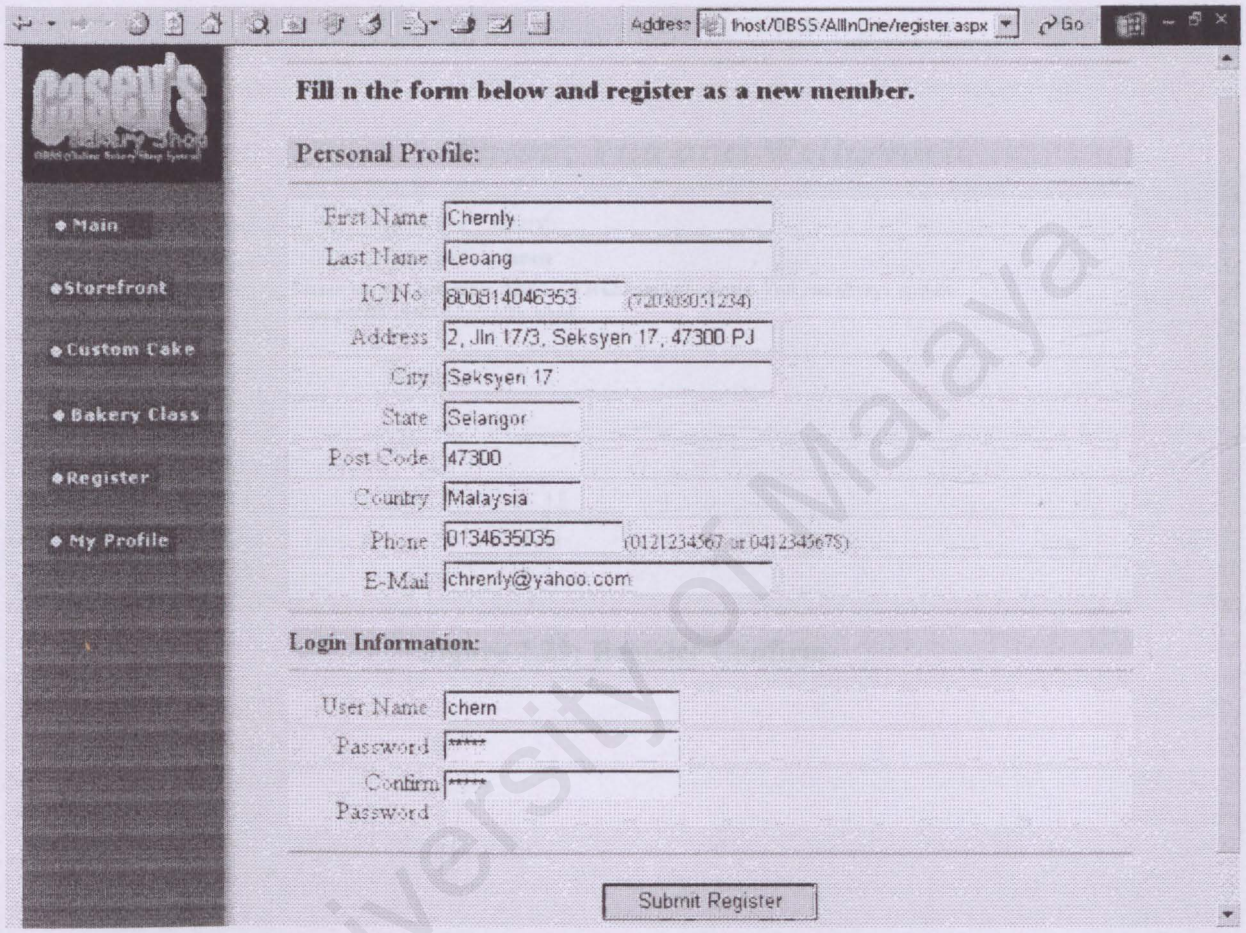


Figure 2.28 Register Form

2.13 Register Confirm

After you have submitted your register form, a notice will be displayed. Your username and password will be shown again. Be sure not to forget your username and password.

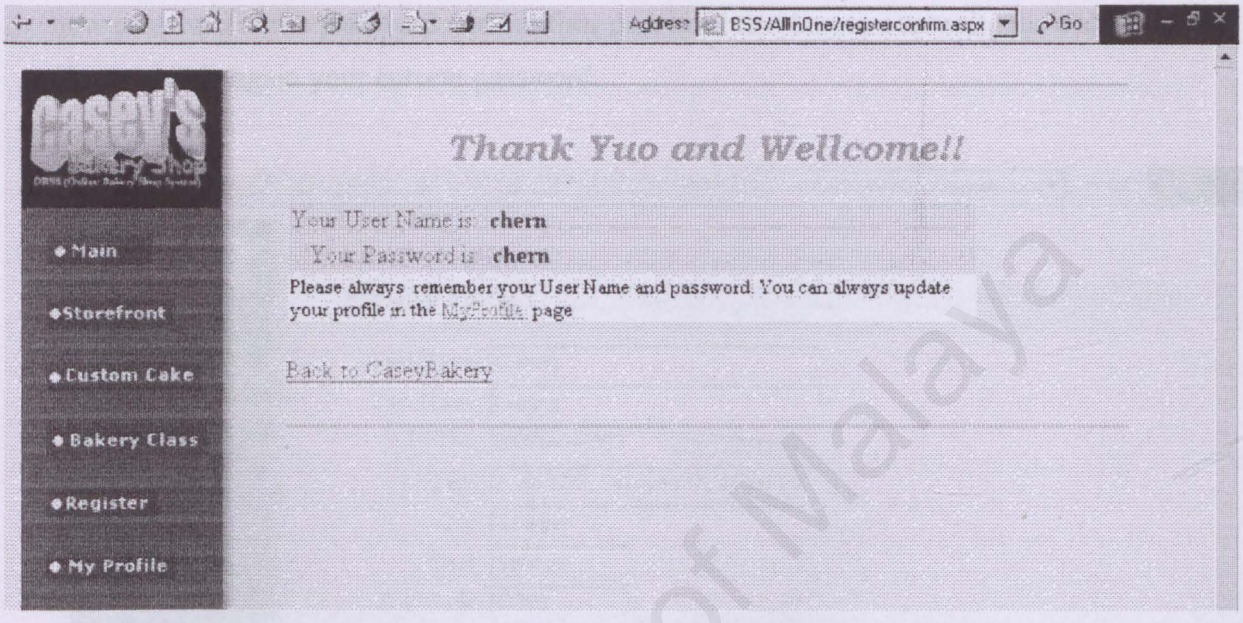


Figure 2.29: Register Confirm

2.14 My Profile

My Profile page is where you can update your profile anytime you visit the web site. After login, your current profile will be displayed. After modify your profile, click the Update Profile button to update the data in the system database. For changing password, type in the new password in the password and confirm password text box to overwrite the old password. If not, type in again your current password.

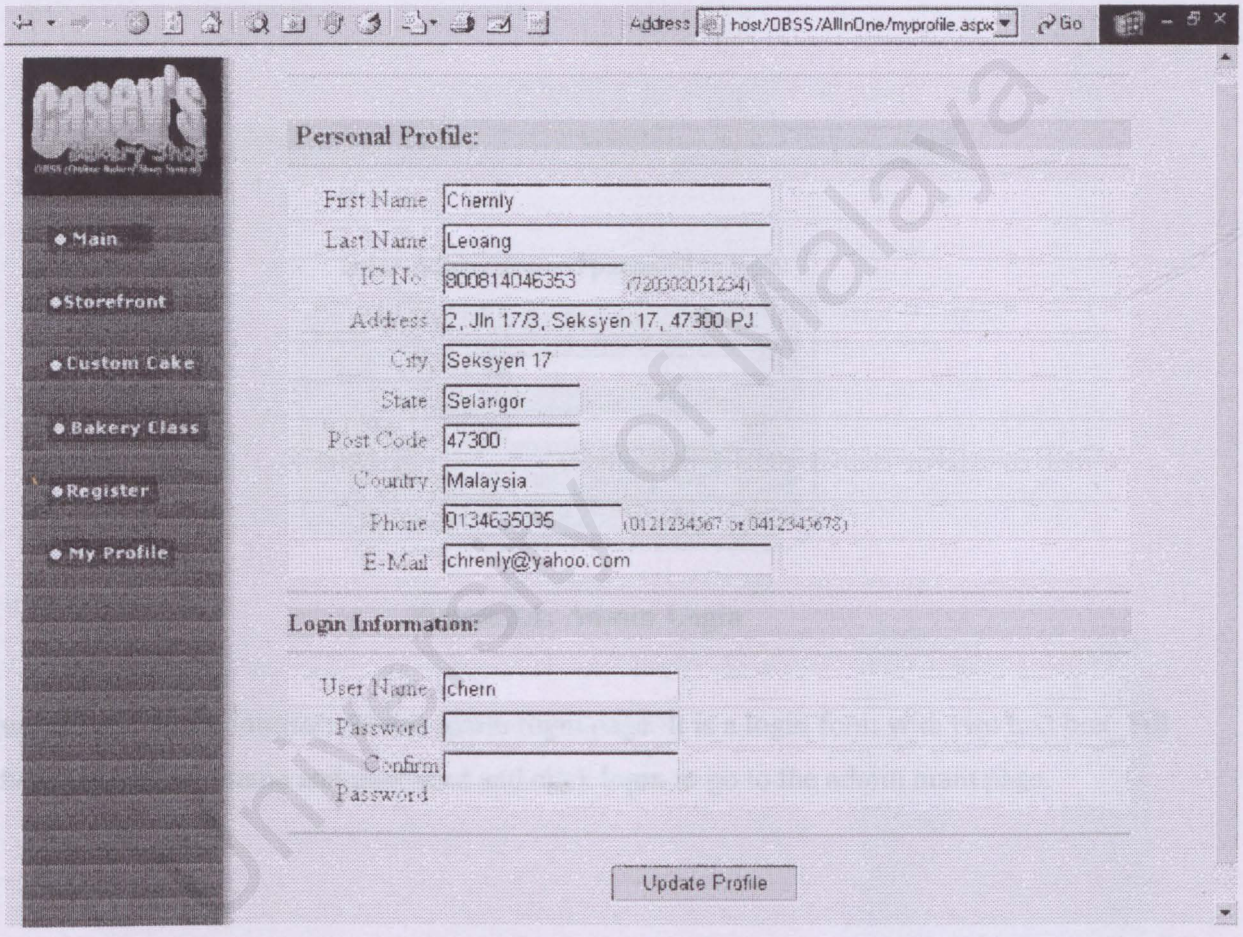


Figure 2.30: My Profile

Chapter 3

Online Bakery Shop System (OBSS) – Administrator Site System User Manual

3.1 Starting Administration Page

To start the administration page, type "http://obss/login.aspx" on the address bar of the browser and start browsing. The login page of the administrator page will appear. Every page in the administrator site is authorized. So you need the admin username and the password to login to the system.

3.2 Login

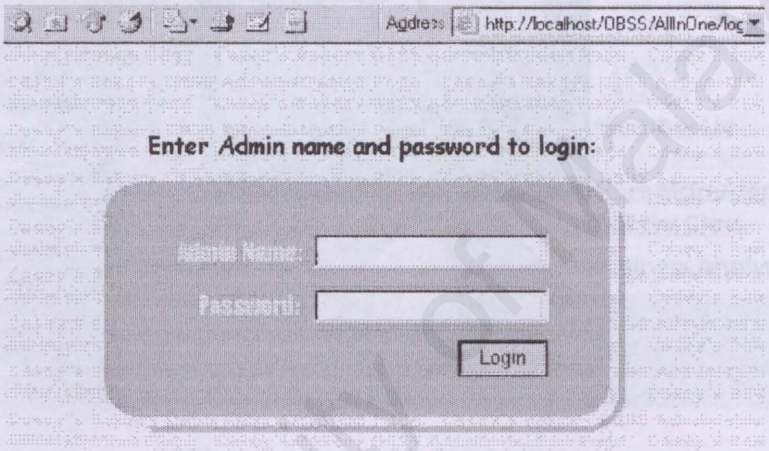


Figure 3.1: Admin Login

Figure 3.1 shows the interface of the admin login page. It is a login form with two text box. Fill in the correct admin name and password and click login to go to the admin main page.

3.3 Admin Main Page

The first page that will show up after login is the admin main page as shown in figure 3.2.

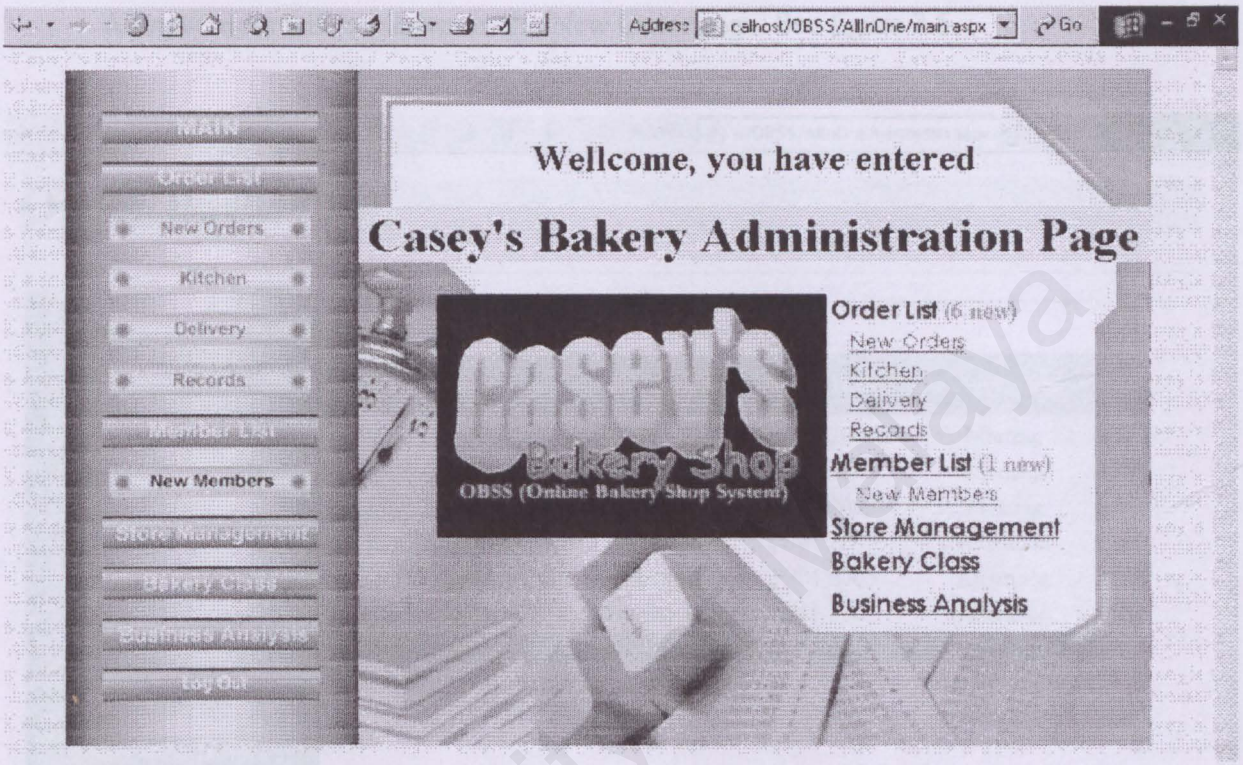


Figure 3.2: Admin Main Page

In this page, there will be a side menu (figure 3.3) that will show up in every page. This menu will link to every module of the administration system. Then the hyperlinks on the menu bar (figure 3.4) also serve the same purpose and it have a notice on new orders and members registered.

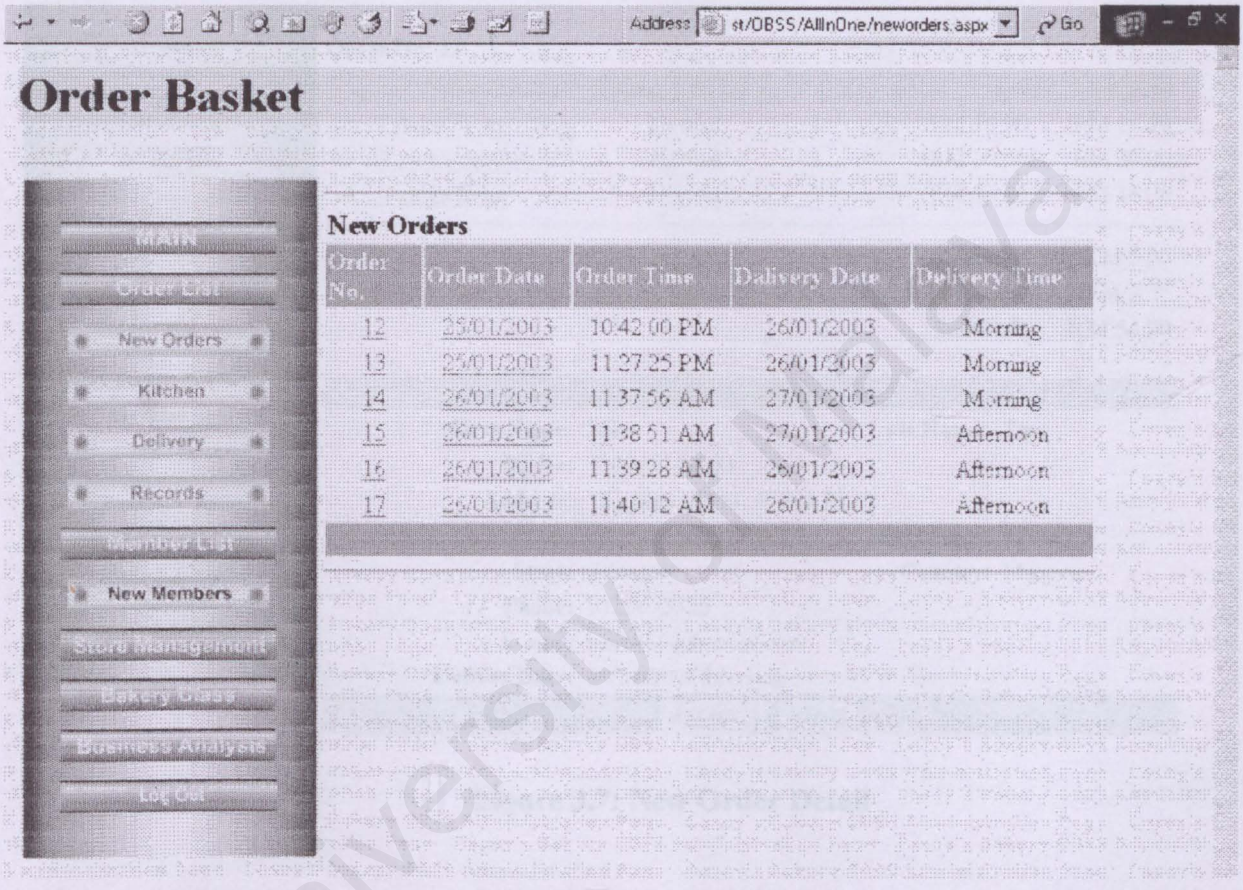
Figure 3.3: Side Menu

Figure 3.4: Main Menu

3.4 Order List

3.4.1 New Order

All new order will be shown in the New Order page. See figure 3.5.



Order No.	Order Date	Order Time	Delivery Date	Delivery Time
12	25/01/2003	10:42:00 PM	26/01/2003	Morning
13	25/01/2003	11:27:25 PM	26/01/2003	Morning
14	26/01/2003	11:37:56 AM	27/01/2003	Morning
15	26/01/2003	11:38:51 AM	27/01/2003	Afternoon
16	26/01/2003	11:39:28 AM	26/01/2003	Afternoon
17	26/01/2003	11:40:12 AM	26/01/2003	Afternoon

Figure 3.5: New Orders

Detail of every order can be view by click on the order no. or the order date link.

Order No.	Order Date
12	25/01/2003
13	25/01/2003
14	26/01/2003
15	26/01/2003
16	26/01/2003
17	26/01/2003

Figure 3.6: New Order Link

Details of the new orders will be shown like figure 3.7.

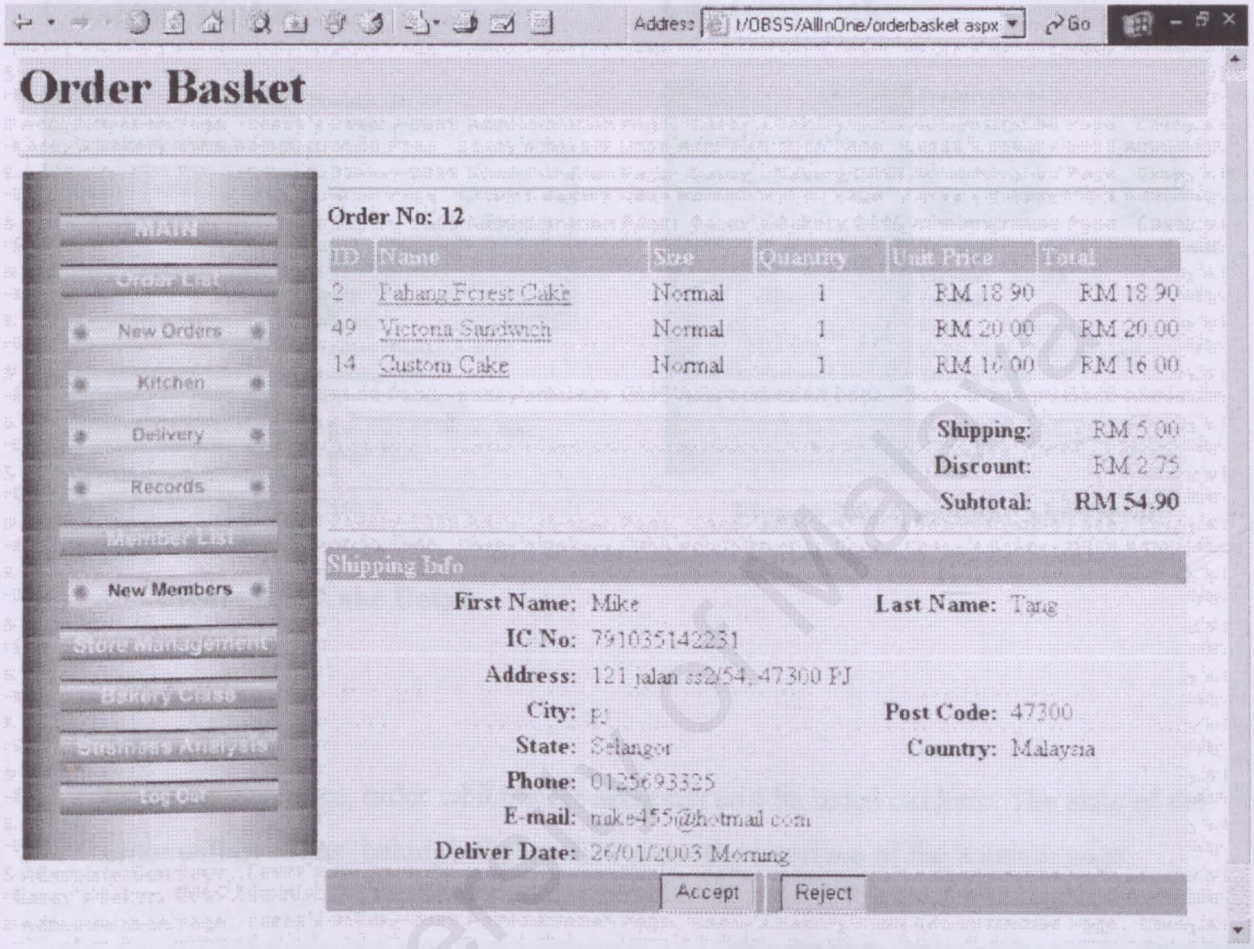


Figure 3.7: New Order Detail

Then by click on the link in the item name of the list, you can view the cake item which been ordered by the customer. Figure 3.8 shows the detail of normal cake and figure 3.9 shows the detail of Custom Cake.

You can either accept the order or reject it by click on the Accept or Reject button. Those orders which were accepted will be sent to the kitchen page. Form here you might want to send an e-mail to the customer to notify him about his order status.

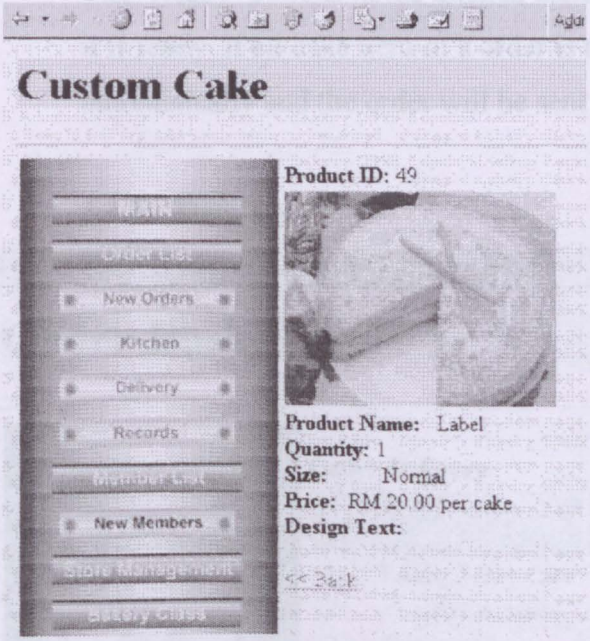


Figure 3.8: Cake Detail

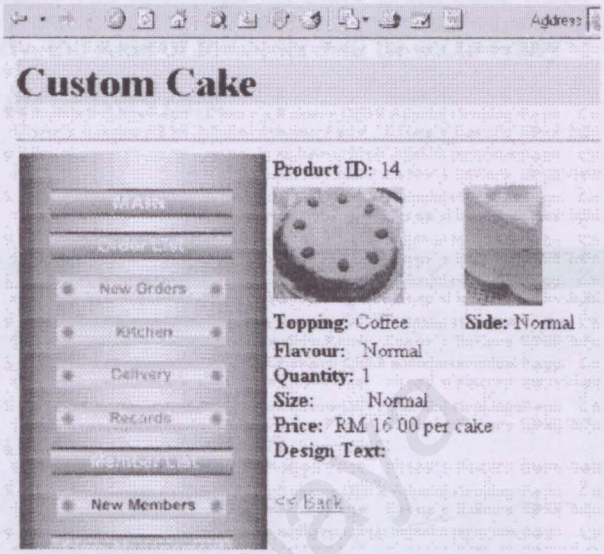


Figure 3.9: Custom Cake Detail

3.4.2 Kitchen

In the kitchen page, order which were accepted will be listed out here. The state of the order will be set as 'baking'. Figure 3.10 show the interface of the Kitchen page.

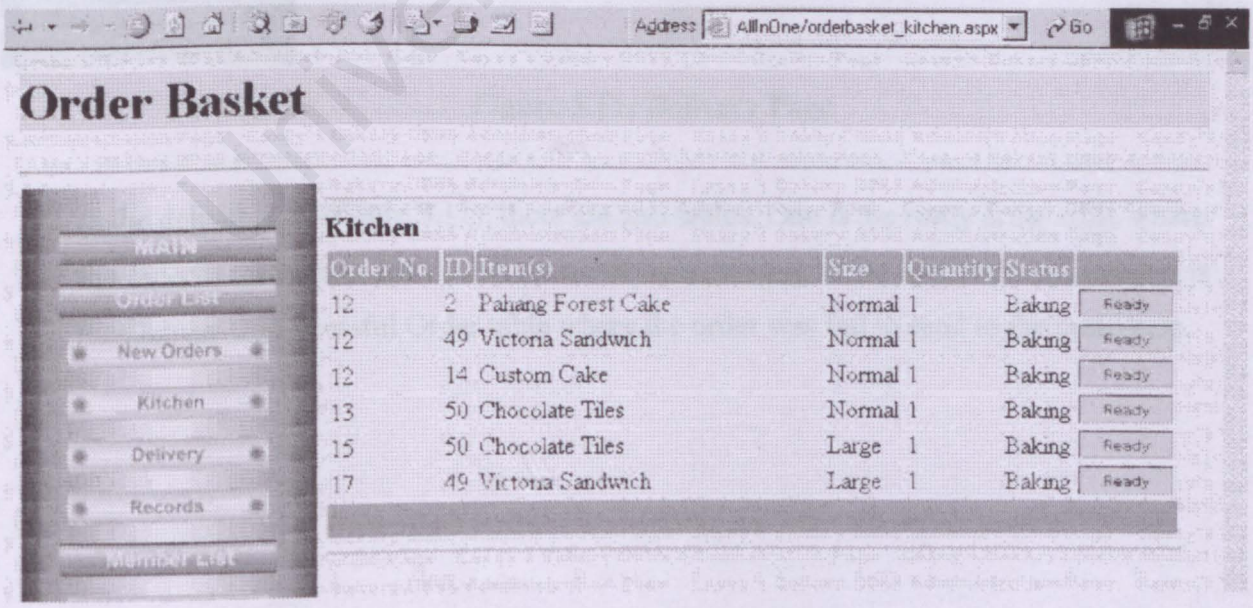


Figure 3.10: Kitchen Page

The 'Ready' buttons in the kitchen table enable you to change the state of the cake when it is ready. If all cake item of a order is ready, the state of the order will be set to ready automatically and the order will be sent to the delivery page.

3.4.3 Delivery

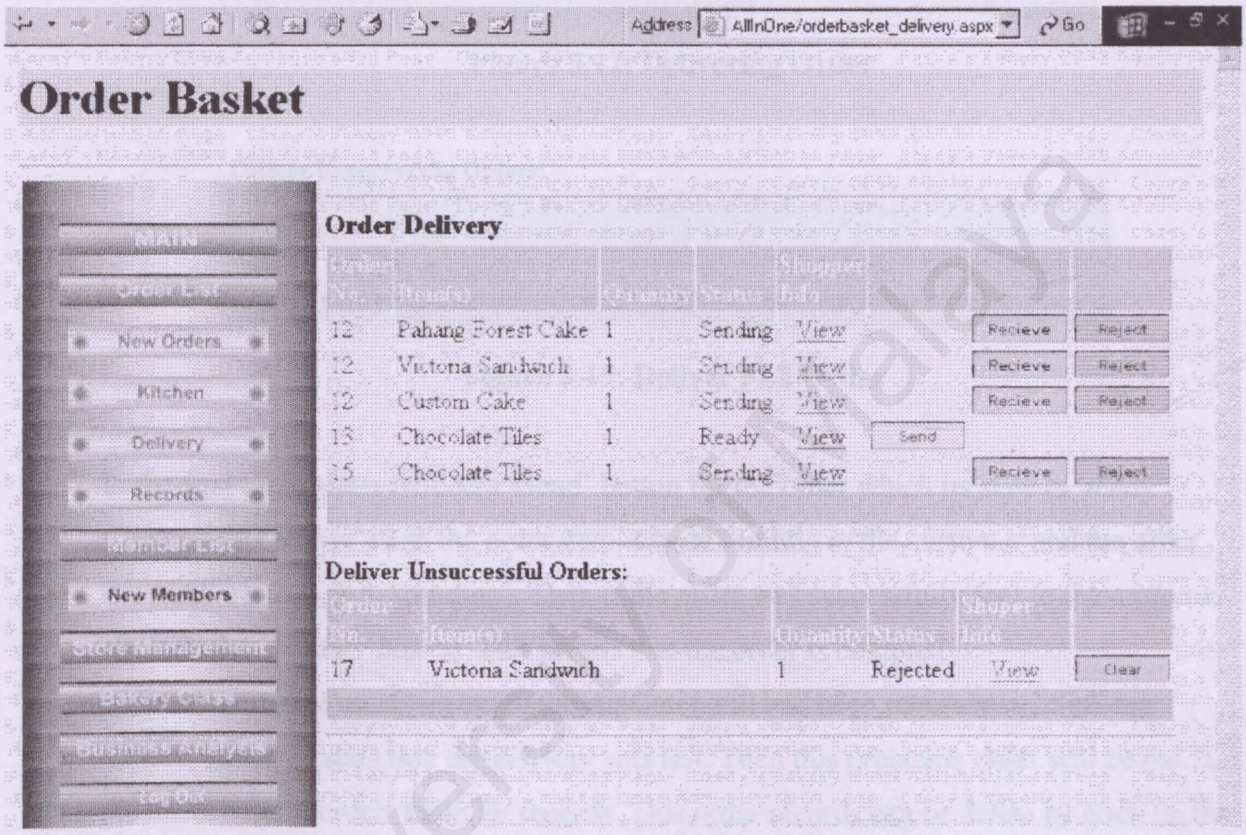
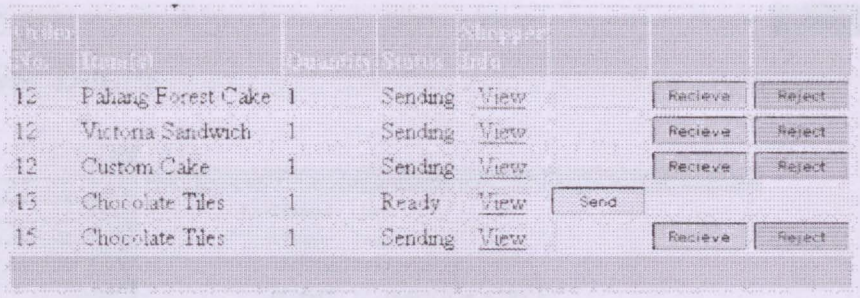


Figure 3.11: Delivery Page

In the deliver page (figure 3.11), there are two tables. One is the ready order table where the order is ready from the kitchen or on the way sending to the customer and, another is the Deliver Unsuccessful Order table where the order was fail to send to the customers.



Order No	Item(s)	Quantity	Status	Shipped Info			
12	Pahang Forest Cake	1	Sending	View		Recieve	Reject
12	Victoria Sandwich	1	Sending	View		Recieve	Reject
12	Custom Cake	1	Sending	View		Recieve	Reject
13	Chocolate Tiles	1	Ready	View	Send		
15	Chocolate Tiles	1	Sending	View		Recieve	Reject

Figure 3.12: Delivering Order

Deliver Unsuccessful Orders:

Order No	Item(s)	Quantity	Status	Shipped Info	
17	Victoria Sandwich	1	Rejected	View	Clear

Figure 3.13: Deliver Fail Order

In the first table, there will be a 'Send' button for the order which its state is 'ready'. Click on this button when the order item is been sending to the customer and the order state will be change to 'sending'. Then if the order was successfully sent to the customer, click on the 'receive' button. This means that the order is complete.

If the order item cannot be sent to the customer and had been return back, click the 'reject' button to state that the delivery was fail. Then this problems order will be put in the unsuccessful orders table for records. This order records can be delete by click on the 'clear' button the right column of the table.

For both table, there is a 'view' link in every row. This link will link to the detail of the customer who made the order. Click on the link and the customer detail page will appeared.

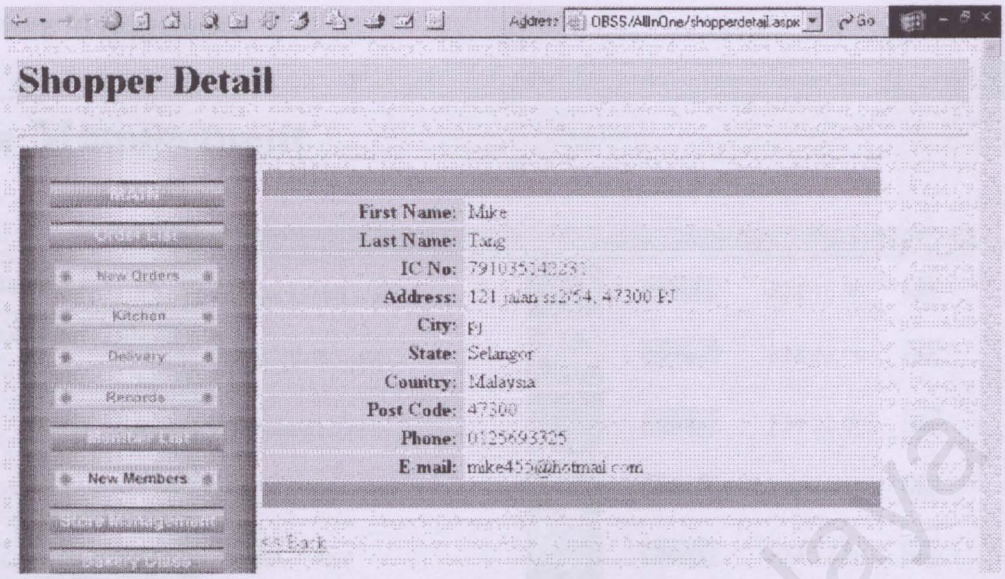


Figure 3.14: Shopper Detail

3.4.4 Records

The record page will display the order history according to the order date. Figure 3.15 shows the interface of record page. You can select a date in the list to view the record of the selected date.

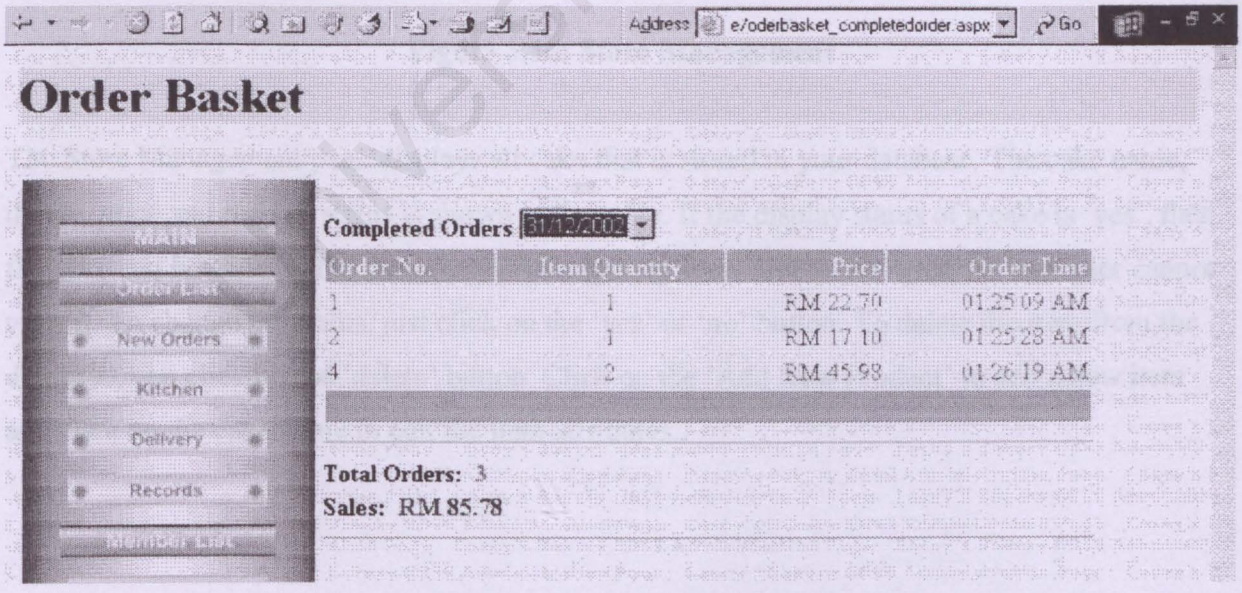


Figure 3.15: Order Records

3.5 Store Management

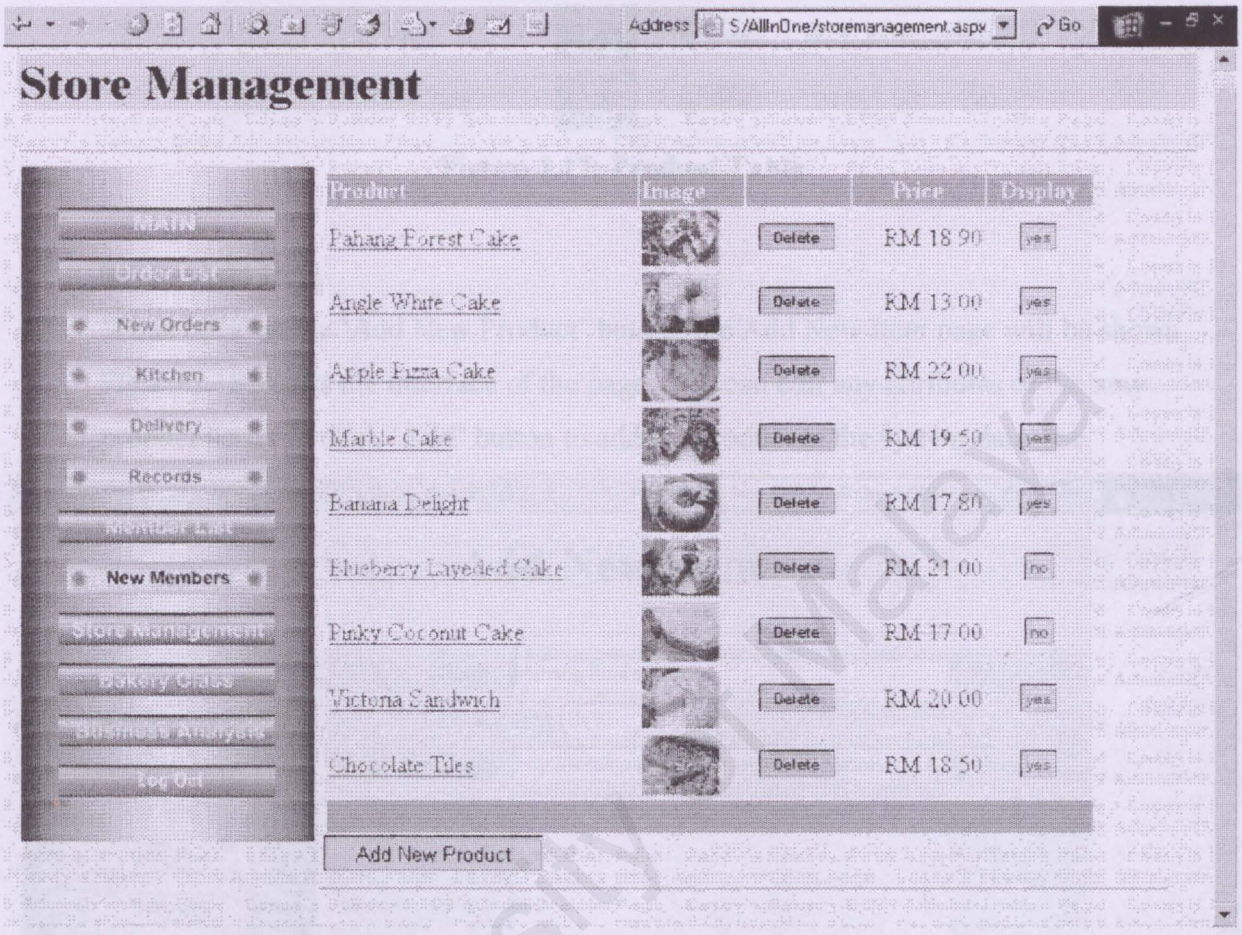


Figure 3.16: Store Management

The Store Management page displays all cake that is stored in your database. The cake name, image, price and display status is shown in the table. If the display status of a cake is 'yes', then the cake can be view by the customers on the bakery shop. If it is 'no' then the customer cannot view it. To change the status, just click on the 'yes' or 'no' button. To delete the item from the database, you click on the 'delete' button. Click on the 'Add New Product' to add a new item and click on the cake name to edit the item attributes.

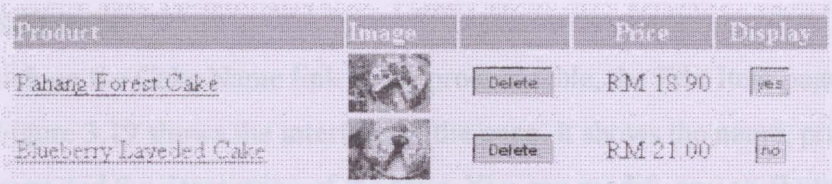


Figure 3.17: Product Table

3.5.1 Add Item

When click on the 'Add New Product' button, the Add New Item page will be shown. Figure 3.18 shows the interface of the page. You can edit any attributes of the new product here and click 'Add' button to add the product to the system database.

Figure 3.18: Add New Product

3.5.2 Edit Item

When click on the Cake Name link in the product table, the Edit Item page will be shown. Figure 3.19 shows the interface of the page. It shows the name, price, image URL, image and the description of the cake. You can modify any attributes of the product here and click 'Save' button to update the product attributes in the system database.

Figure 3.19: Edit Item

3.6 Member List

In member list page, the information of the system members will be shown in a table. The table has the members' name, login name, password, e-mail address and registered date. You can click on the member's name link to view the member's profile. Click on the 'delete' button will delete the member's data in the database. Figure 3.20 shows the interface of the Member List page.

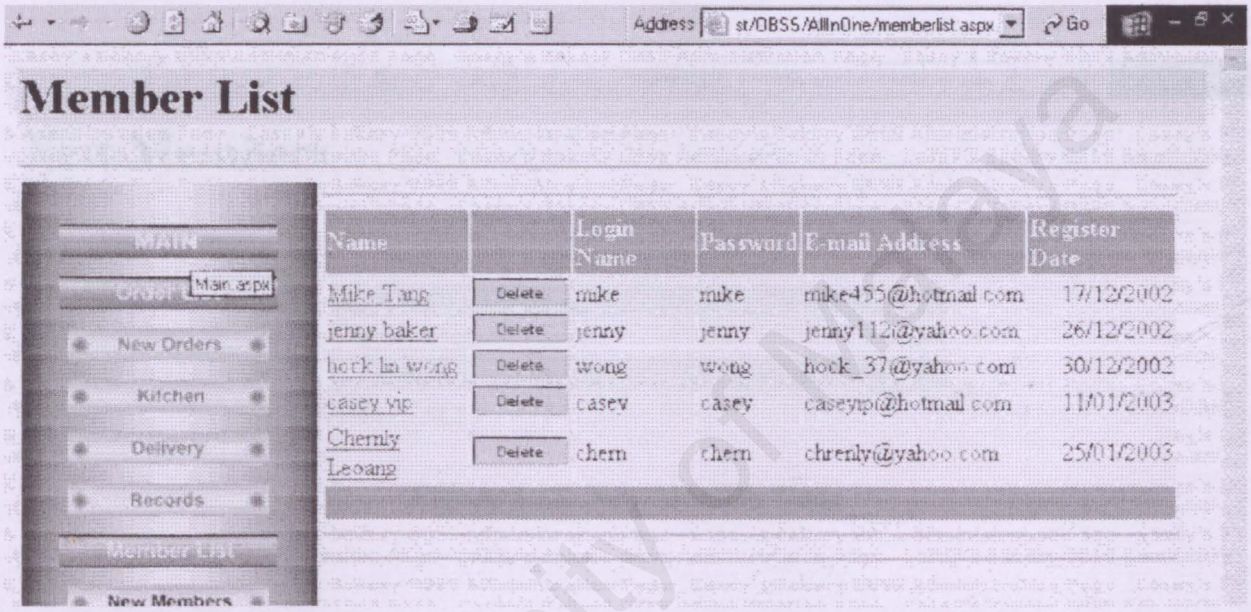


Figure 3.20: Member List

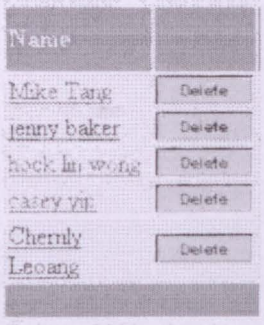


Figure 3.21: Name Link and Delete Button

3.6.1 New Member

Figure 3.22 shows the interface of the New Member page. In the new member table, the name and the state where the new member came from will be displayed. Click on the new member's name and go to the members profile page (figure 3.23). In the profile page, click the 'Verify' button to accept the new member or 'Reject' button to cancel the registration.

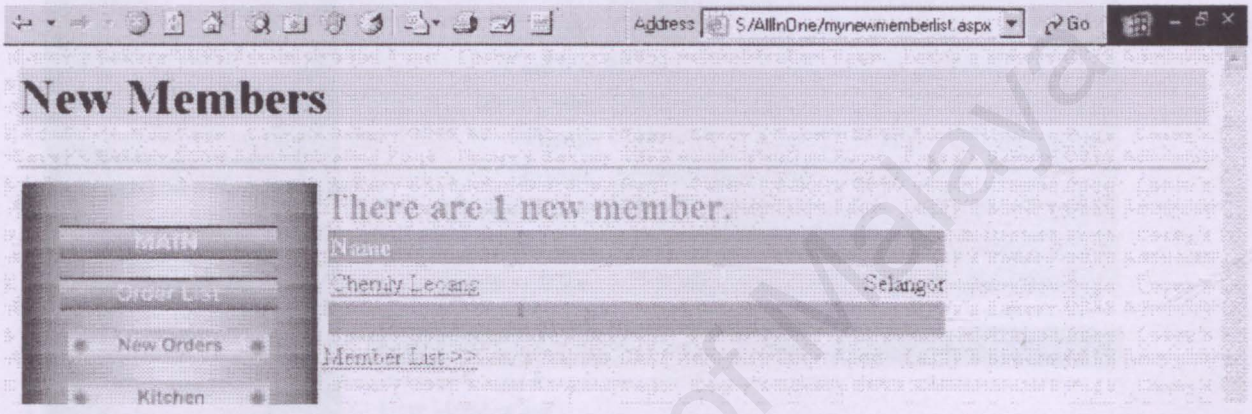


Figure 3.22: New Member Page

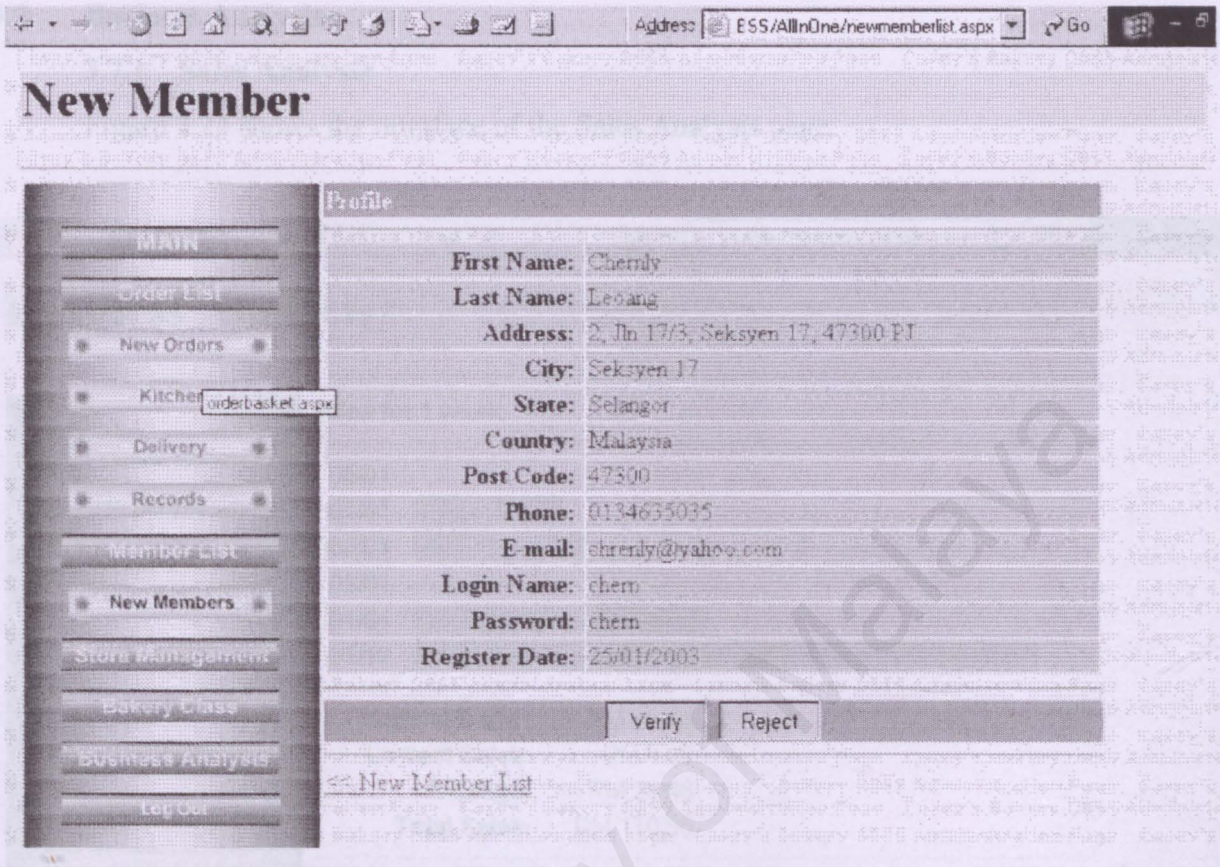


Figure 3.23: New Member Profile

3.7 Business Analysis

3.7.1 Sales Analysis

Figure 3.24 shows the interface of the Sales Analysis page.

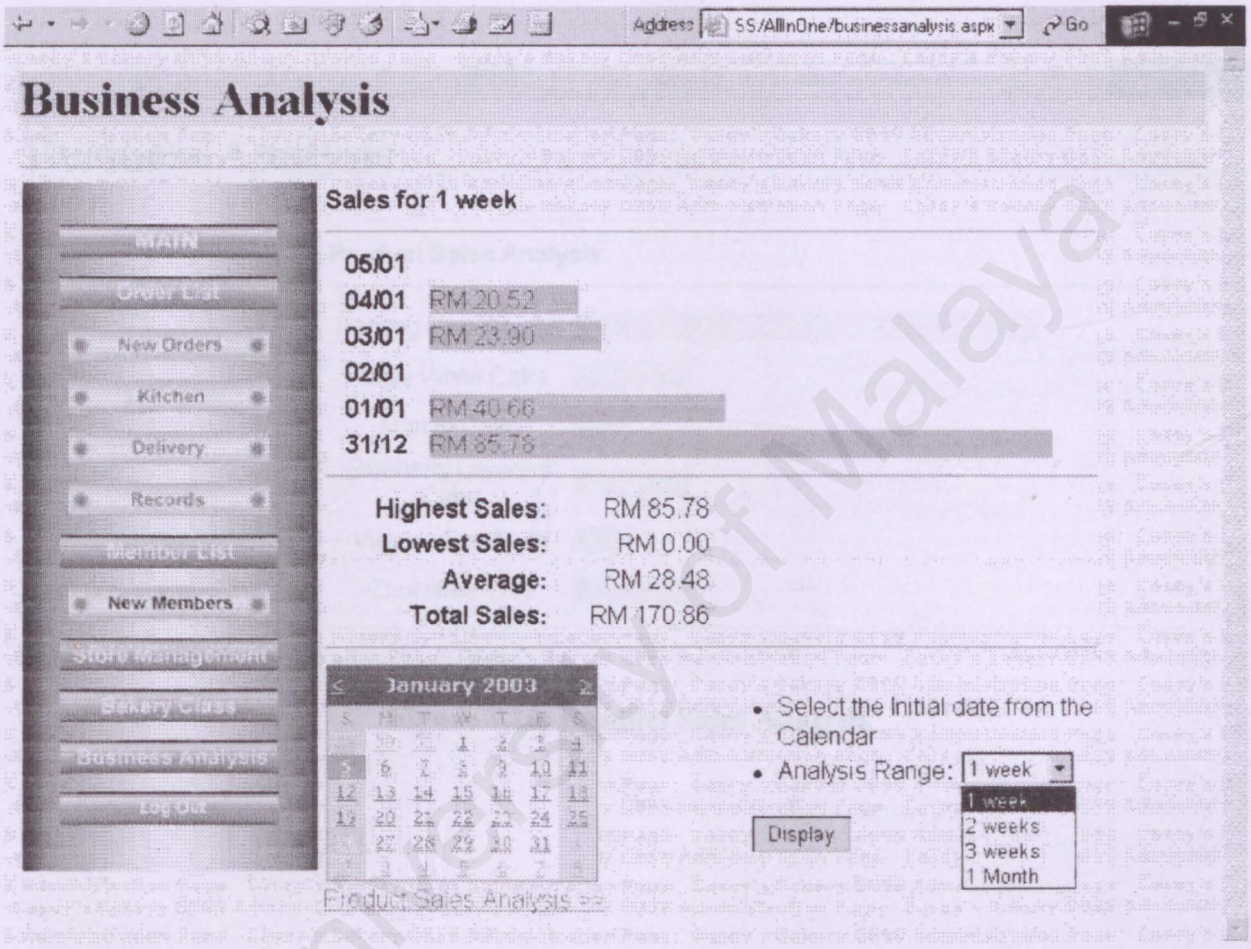


Figure 3.24: Sales Analysis

In the Sales Analysis page, there is a histogram of the Sales for certain period. To use this module, select the analysis range and the initial date of the analysis. The click the 'display' button to view the result. You can view analysis result for 1 week, 2 weeks, 3 weeks or 1 month. To view the result of product sales analysis, click on the 'Product Sales Analysis' hyperlink.

3.7.2 Product Analysis

Figure 3.25 is the Product Sales Analysis. The histogram will shows the frequency of the cake tem been ordered by the customers. This will show the most famous cake item by the customers.

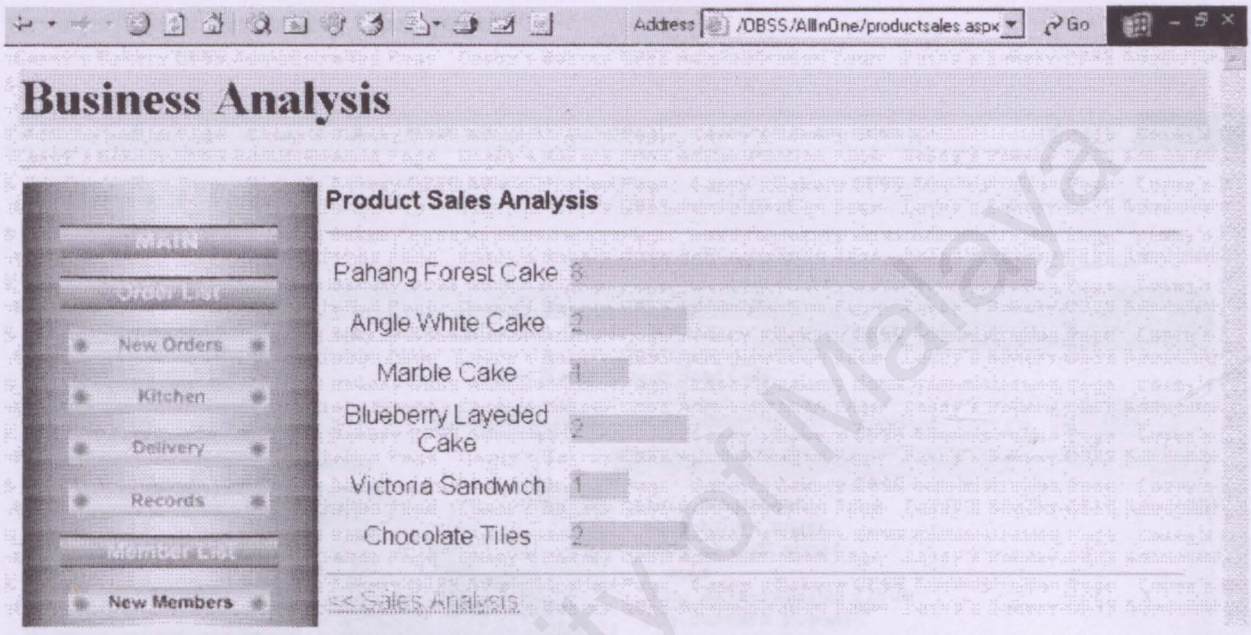


Figure 3.25: Product Sales Analysis

3.8 Bakery Class

The Bakery Class page is for you to edit the content of the recipe that will be display to the members in the client site. Here you have to edit the cake name, image URL, ingredients and instruction of the cake recipe. After edit, you can either update the previous recipe or save the new recipe as a new file. The file can be retrieve from the 'Previous File' list box. Figure 3.26 is the interface of the Bakery Class page.

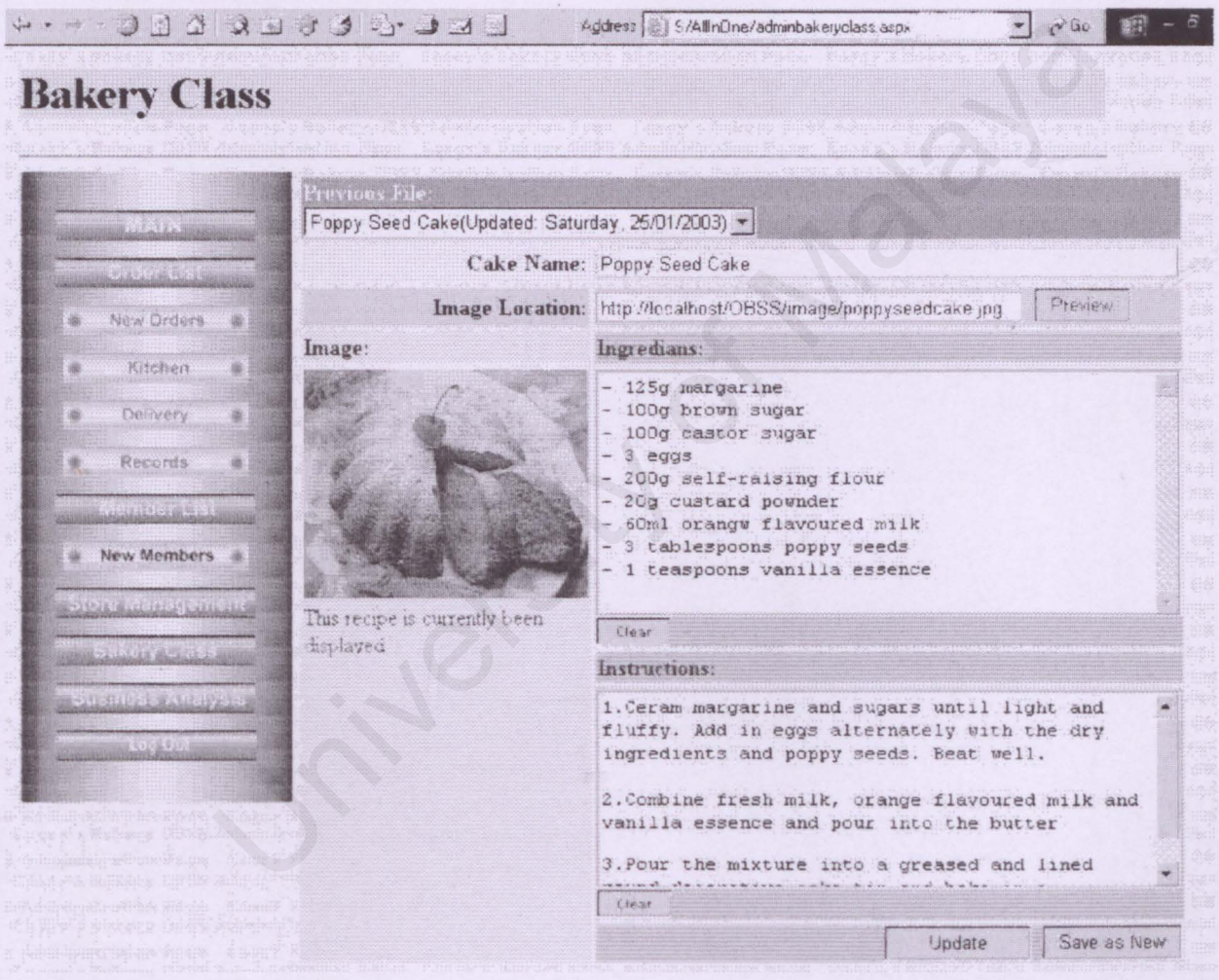


Figure 3.26: Bakery Class