WEB-BASED INFORMATION SYSTEM OF MALAYSIAN'S CHINESE RECIPE (E-RECIPES)

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ABSTRACT

With the tremendous growth of the World Wide Web, more and more information is being put on the Internet. No matter what type of information, it is including the field of education, business, news and entertainment. The Internet creates an information-rich environment of various resources, which can be obtained any time and from any place.

E-Recipes is an information system Web site that provides and promotes Malaysian's Chinese Recipe and other relevant information to the eyes of people all around the world. The main objective of this project is to develop an attractive, dynamic interactive, informative and user-friendly online recipe Web site using FrontPage 2000 and Macromedia Dreamweaver 3. A standard interface across Web pages will be adopted to give a pleasant and easy learning to browse the site.

The development of E-Recipes emphasized to be a browser and platform independent. This was accomplished by using both of JavaScript and VBScript to code the client side processing in order to support a wider range of type of Web browsers while Active Server Pages was choosing to code the server side processing respectively. Internet Information Server 4.0 (IIS) that runs on Windows NT server platform was chosen in this project as the Web server. It is aimed to have a high-performance back-end database that is Ms Access for providing recipe information.

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CHAPTER 1: INTRODUCTION

1.1 INTRODUCTION

The World Wide Web is the fastest growing segment of the Internet. Its graphical interface and hypertext capabilities have caught the fancy of Internet users and the media like no other Internet tool in history. The information available on the web ranges from the esoteric to the absurd [1].

As we have step into a new millennium, we are being exposed to many new technologies that are having a profound effect on our daily life and Internet is become one of it. Technology has also been incorporated in the food sector. Apart from high-tech cooking utensils, recipe books have also been given a new look through the use of technology. Recipe were previously available in text form only, such as in recipe books, magazine columns and newspaper articles. Pictures of the finished products were sometimes included. Method of preparation that listed down without any diagrams to help the uninitiated. The recipe was also rarely included calorie value of the ingredient. Usually, magazine and newspaper provided very limited recipe on the specific columns and the number of recipes also deficient.

There are a lot of recipe books in the market especially cookery corner in the bookstore. Most of these books have been made up with the colorful and attractive dishes pictures. This has cause the price of recipe books very high if compare with other books.

Some of the people like to collect recipes by cutting down the recipes from other books, magazines or newspaper. When the number of recipes grows larger, search for particular recipe could also be difficult and slow.

Now, with the advent of the Internet and World Wide Web, the traditional recipe book has seen a major transformation. A vast amount of recipes amounting to thousands can be found of one website. These recipes usually included graphics, images and animation other than text. The availability of recipes in web page format hopes to solve storage problems, increase accessibility and expedite the search process.

1.2 PROJECT SIGNIFICANCE

Web is an empowering tool. On the web, everyone is equal. Anyone can access to over a million pages of information on the web. The types of information available on the Internet are as diverse as the people interested in it. You can log on to many libraries, read literature, magazines and newspaper, get a weather forecast, get travel advice, exchange or view recipes, listen to music and learn about the environment. Information is delivered directly into the hands of the people-unfiltered, uncensored and previously unseen 'A Web-Based Information System of Malaysian's Chinese Recipe' is one example of web page that providing online recipes.

The main importance of this system is introducing different dishes of Chinese cooking to the user from all over the world without the border of countries. Besides that, the uniqueness of Malaysian's Chinese recipe can be inherited by descend especially for those who had migrated to foreign countries. Lastly, this Web based information system provides flexibility and convenience to all users with the availability of Internet services. So, many users will be overwhelmed with this proposed information system.

Some of the advantage through this website are:

1.2.1 USER'S BENEFIT

- Save cost of transportation to the bookstore and avoiding traffic jam.
- Easier to browse through the recipe online than walking through the whole store or from one to another store.
- Save times and money in purchasing a cookbook because the recipes can get from the web site.
- Convenient for users who can browse the recipes at home rather than going to the store.
- Searching can be made any time of the day where it's open 24 hours unless there is a server breakdown.

This project will help to access a big database of recipes through the Internet and physically don't have to go through many recipe books. The recipes will be available by a click of a button and will not age through frequent handling as what that happens with paper.

1.3 OBJECTIVE OF THE PROJECT

The main objective of this project is promoting the Malaysian's Chinese cuisine to the eyes of people all around the world. It intends to create information-rich environment of Chinese cuisine, which can be obtained at any time and from any place to save the user's time. The potential users are those who want to browse and search for Malaysian's Chinese recipe.

Moreover, this system will provide the relevant information about Chinese cuisine instantly. This resourceful information about the originated of Chinese festival and the list of famous Chinese restaurant in Klang Valley also can be used as a source to win the hearts of the users whom browse through the Internet. With this Web site, Chinese food lovers can know where all the delicious foods are and at the same time, this information services provided would automatically give the local traders a free publicity regarding their business and the services they offer through this World Wide Web application.

For the user all over the world, this Web site can let the users know more about the style and the way of cooking Chinese food. Besides that, this will help them to have a clearer picture and know more about the uniqueness of Chinese food. They can taste different kinds of delicacies without traveling to Malaysia. Indirectly, it promotes Malaysia as a cultural nation country through the most popular and sophisticated telecommunications, the World Wide Web. It also keeps away the users from the need to visit bookstore and therefore, can result in cost and time saving. Lastly, the aim of this project is to design and develop a simple

management systems where database can be maintain easily and new recipe can be stored updated frequently in a cheaper and faster way.

1.4 SCOPE AND LIMITATION OF THE PROJECT

This project is developed as a web-based system that involving a client-server environment and coordination between text, graphics, images, pictures, 3D and animation.

1.4.1 SYSTEM ACCESS

Can be accessed anywhere from the Internet. Any users are allowed to browse through the site.

1.4.2 STORAGE

A database in the server machine contains recipes, information of Chinese restaurant in Klang Valley and the caloric chart. The database are kept using a database software and information are retrieve using SQL statements.

1.4.3 USER

The users of this system are those who want to search for Chinese recipe through the Internet. Users are given choices of browse and select the pages they want. All information is to be display over the Internet browsers.

1.4.4 DATA DISPLAY

This system will provide expansive and attractive information of Chinese recipe and others information that are all related to the recipe in an attractive screen display. The information is about the history of Chinese food, originated of Chinese festival, history of the relevant dishes, Chinese restaurant with online map, introduction of chopstick and calorie chart.

1.4.5 GUEST BOOK

In this module, users are allowed to give feedback or comments on the performance of this Internet application by signing on the guest book form of the website through an Internet browser. Users are prompted for name, homepage url, email address and comments.

1.4.6 SEARCH ENGINE

In this module, users may use this utility to search or request for a particular recipe or ingredients.

1.4.7 ADMINISTRATOR

This module is only accessible by the administrator. Information maintenance about the recipe such as new recipe, restaurant and other types of information can be updated easily, efficiently and effectively. Functions available in this module are

- Addition of new pages
- Deletion of old pages
- Edition of existing pages

1.4.8 LIMITATION

Due to enormous features that a website might comprise, therefore certain features or aspects will not included in this project. The limitation of this project is as

1. The main limitation is the availability of the Internet service. Without the Internet site, this information system cannot be viewed through the Web by anybody.
2. The project system will not include all the Chinese recipes that exist in the market and also will not include all the Chinese restaurant in Klang Valley.
3. Users are not allowed to edit the information in guest book.

1.5 PROJECT SCHEDULE

To achieve the project objectives, a project schedule was planned to manage the time and activities that needed to be accomplished. The activities involve in the project includes the following :

1. Planning - 2 Weeks
2. Literature Survey - 6 Weeks
3. System analysis - 6 Weeks
4. System Design - 11 Weeks
5. Coding - 11 Weeks
6. Testing - 8 Weeks
7. Enhancements - 6 Weeks
8. Documentation - 6 Weeks

The overview of project schedule is showed as in Appendix A.

1.6 REPORT LAYOUT

The purpose of this layout is to give an overview of the major phases Involved during the development of the project. Below is the proposal layout:

CHAPTER 1 : INTRODUCTION

This chapter gives an introduction of the project, the project significance, objectives, project scope and the project schedule.

CHAPTER 2 : LITERATURE REVIEW

This chapter covers all the literature survey done on this project, the client/server computing system, the Internet and the WWW.

CHAPTER 3 : SYSTEM ANALYSIS

This chapter discusses the functional and non-functional requirements of this project. It also included details of the comparison of various web technologies.

CHAPTER 4 : SYSTEM DESIGN

This chapter describes the design considerations. Processing design, database design and the web page design of this project.

CHAPTER 5 : SYSTEM IMPLEMENTATION

In this chapter, the system coding procedures, like coding approach and coding style are explained. This is followed by development environment requirements involving hardware requirements and software tools requirements.

CHAPTER 6 : SYSTEM TESTING

The necessary testing processes are carried out to evaluate the system's functional and nonfunctional requirements. This is to assure that the developed system meets the system objectives and requirements mentioned earlier.

CHAPTER 7 : SYSTEM EVALUATION

This chapter will touch some of the problems encountered during the development phases and the solutions to it. Then, there is discussion about system's strength, limitation and future enhancement. Finally, few word about the overall system development to conclude this documentation.

CHAPTER 2
LITERATURE REVIEW

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

A literature review of a project is important as it places in the context of others, which might have similar characteristics. It helps the developer to know some of the existing features offered by a similar system.

Another important purpose of a literature review is to sufficiently equip the developer with some knowledge of the strengths and limitations of several development tools. This is a real challenge before a final decision can be reached to start developing the system. This can help the developer to choose the right tool to develop the system.

In the process of developing E-Recipes, this part of the research has been done to understand various new concepts, which especially focus on the information and information system. Study the fields of Internet, World Wide Web (WWW), Web based application component, client/server concepts and architecture are also important. A research also has been carried out to compare the current existing system with the E-Recipes Information System, which will be developed. New features are added in E-Recipes.

2.2 APPROACH

A system is a regularly interacting or independent group of elements forming a unified whole. Thus, a system is a collection of related parts treated as a unit where its components interact [2]. Therefore, different systems can be developed in different ways. To develop a system, a lot of information need to be gathered about the system itself, the procedures involved to develop the system and the methodologies used develop the system. All this information can be obtained from various sources.

Basically, each source will yield different information and facts and it depends on how the search is being done. For example, if Internet is being used to find an information, each keyword or phrase that is being searched will yield various site which is totally different from one site to another. Information can be obtained from system users, computer programs, procedure manuals and report, forms and documents.

2.2.1 RESEARCH PLANS AND METHODS

To develop the E-Recipes system, several methods are used to gather the required data. Besides that, analysis on the system requirements which consist of functional requirements and non-requirements had been carried out based on the feedback and the results that received from the data gathering process. One of the activity in this process is using questionnaires.

2.2.2 RESEARCH AND REVIEWS

This activity consists of books, journals, conference paper and articles reviewing, summarizing related information, finding the Web related technologies, comparison of software tools which is required for the system and other relevant tasks that will be useful in this project.

2.2.3 SURFING THE INTERNET

Internet surfing in today's world is a very efficient way of gathering information. There are many Web site available that provide useful and expertise information, which are extremely needed for the E-Recipes system. The main objective of this activity is to analyze the features, characteristics, interfaces, system design and user friendliness of the Web applications.

2.3 HISTORY OF CHINESE FOOD

The Chinese nation has a civilized history of 5,000 years and has created a splendid traditional culture. Cooking has occupied a lofty position in Chinese culture throughout the history. Thus, to regard the Chinese cooking culture as an art, or a science is entirely justifiable. The great Chinese philosopher Lao Zi once said of the cooking art: "Governing a great nation is much like cooking a small fish."

The Chinese culinary culture has a distant source and has been developed for many centuries. The legend has it that the Chinese cooking culture originated with Yi Yin, a virtuous and capable minister of the Shang Dynasty (ca. 15th to 11th century B.C.). It can be seen that China initiated the culinary art as early as the Shang and Zhou (ca. 11th century to 221 B.C.) times. With the growth and development of productivity and economy during various periods, people have been always exploring new cooking techniques—from brevity to variety, from rudimentary to advanced stage, from day-to-day snacks to feasts, even to palatial dishes and delicacies. During the period from the Spring and Autumn Period (ca. 770-476 B.C.) and the Warring Stated Period (ca. 475-221 B.C.), to the Sui-Tang period, the Chinese dishes began to be separated by Southern and Northern tastes.

During the period of the Tang (618-907 A.D.) and the Song (960-1279 A.D.) dynasties, people went in a great deal for nutritional medical value of different plants: fungus, herbs, vegetables. Many varieties of "medicinal food" have been cooked for prevention and cure of diseases, or for health care and recovery [19].

2.4 CHINESE FOOD IN ITS CULTURAL CONTEXT

To the Chinese, food is a central aspect of their cultural inheritance. To illustrate this, one needs only to look at the history of 'food science' in China. It is generally agreed that the first systematic development of food hygiene and nutrition was developed by Lao Tzu—founder of Taoism. At roughly the same time Confucius developed the art of cooking. So it can be seen that there is a very strong link between food and the indigenous religions of China. Indeed, it was Confucius who taught that social ritual was a medium for teaching virtue, and consequently he who laid down the rules to be followed in recipes and the correct customs and etiquette to be observed at the table. As a result, traditional classical Chinese teaching promoted the belief that a true scholar not only mastered the art of poetry, calligraphy, music and strategy, but also was a master of fine cuisine, which included food, wine and tea. Confucius said "Everyone eats and drinks, but few can appreciate taste". To be a true scholar required mastering taste. As a result, a great wealth of material was written on food, taste and cooking.

The art of cooking surely lies in taste. The Chinese believe that the most important elements that help us appreciate taste are color, aroma, flavour and texture. All of these elements must be combined to make a harmonious whole: it is the ability to create this harmony that the Chinese believe to be the art of cooking.

- **Color**

  Color is individual to each ingredient, and can change during cooking. At the same time the intensity of color can change according to the color of the other ingredients in the dish.

- **Aroma**

  Aroma and flavour are very closely related. The most common ingredients used in Chinese cooking to bring out the aroma of ingredients are spring onions, garlic, ginger and wine.

- **Flavour**

  Each school of cuisine has its own classification of flavours; however there are five primary flavours: sweet, sour, salty, bitter and piquant.

- **Texture**

  There are generally accepted to be five primary textures in Chinese cuisine: tenderness, crunchiness, crispiness, smoothness and softness. The selection of contrasting textures is as important as the selection of different flavours.

Very few Chinese dishes have only one ingredient, as this would offer no contrast and therefore no opportunity to harmonise. This goes against the principle of Yin and Yang. So usually, there will be a main ingredient and a number of supplementary ingredients.

2.5 WHAT IS INTERNET

The simplest definition of the Internet is that it's the largest computer network in the world. A January 1997 estimate set the Internet at 16.1 million "hosts" (or computers). Two years earlier, the estimate was only 4.8 million hosts.

Technically speaking, the Internet is actually a network of many smaller networks that exist all over the world, but this organization is as invisible to the user as the telephone companies who cooperate to help us place international calls [3].

2.6 WHAT IS WORLD WIDE WEB

The World Wide Web is the first global interactive network. Although part of the Internet, it's radically different because it uses hypertext and graphics together to display information, allowing users to cross the globe with a single click of the mouse.

The Web is accessible in 84 countries on all seven continents. The information available on the Web ranges from the esoteric to the absurd. Web sites are maintained by universities, companies, public institution, states, cities and even high schools. Powerful search engines allow rapid information location and retrieval, making the Web ultimate tool for both research and interactive entertainment [1].

2.7 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 machine sitting at the other side of the network, or even on the other side of the world, or it could be the own home machine [4]. More often, the computer is called a server and is running more software than just Web server software.

Some examples of Web servers are Apache, a Web server for both 32-bit Windows and UNIX-based operating systems; Microsoft's Internet Information Server (IIS), which comes with the Windows NT server; and Netscape's FastTrack and Enterprise servers. Other Web servers include Novell's Web Server for users of its NetWare operating system and IBM's family of Lotus Domino servers, primarily for IBM's OS/390 and AS/400 customers.

Web servers often come as part of a larger package of Internet- and intranet-related programs for serving e-mail, downloading requests for FTP files, and building and publishing Web pages.

Considerations in choosing a Web server include how well it works with the operating system and other servers, its ability to handle server-side programming, and publishing, search engine, and site building tools that may come with it [20].

2.8 WEB DATABASE

2.8.1 WHAT IS A WEB DATABASE?

Like any regular database management system, a Web database is a data store or information repository that can be accessed via a query language or programming API. Unlike conventional database system, however, access to Web databases typically is not achieved by typing instructions at a command line or by using interfaces that are custom designed for use on a specific computer platform.

Web databases are databases accessed via other Web applications—specifically, forms developed using standard (almost) HTML. Using facilities available in HTML, applications programs on the Web server are accessed through a server-side mechanism known as the Common Gateway Interface (CGI). This interface enables you to create applications that integrate database functionality and provide access to organizational data repositories on behalf of Web clients (a user and browser). Applications can be designed solely for the purpose of querying a database and returning specific information.

Also, the application can incorporate information pulled from a database for use as part of a larger application. The capability to integrate a database into applications that can be accessed by users utilizing a Web browser is what makes a database a Web database.

2.8.2 WEB DATABASE APPLICATION DESIGN ISSUES

When you design a Web site, you are likely to encounter myriad of problems, obstacles, and technical challenges. It is difficult to offer a blanket of solutions to these problems. Every site differs in its goals and objectives, the types and amounts of information it intends to serve the number of users expected, and the comparison of the development staff.

Designing a Web based database is very similar to designing a database prior to the advent of the Internet. However, there are several issues that must be considered when designing Web-based databases. The following is a brief list of issues relating to that:

- **Performance** – Internet user do not want to have to wait for their queries to process. Any queries that take more than a couple of seconds will probably frustrate that user and possibly cause him or her not use your Web site. Therefore, you may need to use a demoralized design to achieve acceptable performance.

- **Backup** – The Internet is available 24 hours a day, 7 days a week. Your Web site must be continuously available. This can complicate your backup strategy, which can impact your database design. If you choose to denormalized your design, you may increase the physical size of your database. The longer is takes to backup the system, the longer the database may be unavailable or unresponsive.

- **Language** – The Internet is worldwide, which means that your Web site may be viewed in foreign countries. Do you need to support multiple languages? If so, this can impact your database design because you need to track data in different languages.

2.9 OVERVIEW OF WEB RELATED TECHNOLOGIES

2.9.1 CLIENT/SERVER COMPUTING

A client/server system is "a networked computing model that distributes processes between clients and servers, which supply the requested service" [5]. A client/server network connects many computers, called clients, to a main computer, called a server. A client can be defined as a networked information solicitor, usually a desktop computer or workstation, that can query database and/ or other information from a server. The Client handles the presentations logic, processing logic, and much of the storage logic. The client provides the graphical interface, while the server provides access to shared resources, typically a database. Objects break up the client and server sides of an application into smart components that can work across networks [6].

A server can be defined as a device that manages application programs and is shared by each of the client computers that are attached to the local area network (LAN). The server is usually a high-powered workstation, a minicomputer, or a mainframe, that stores information for use by networked clients. A file server is computer that manages file operations. It is shared by each of the client computers attached to the local area network. This connection allows the client computers to share the server computer's resources, such as printers, files and programs. The server runs software that coordinates the information flow among the other computer, called clients. The file server is like an additional hard drive for each of

the computers attached. If most of the processing occurs on the client rather than on a server, the client is called a fat client [5][7].

Shareable resources are managed by the server processor which offers services to the client. The clients make a request to server for data processing using a predefined language Structured Query Language (SQL) over the communication network connecting clients and servers. The server after processing the query sends the results or reply back to client. In some cases, the server may request another server becoming its client (on behalf of original client and so on) and the results or replies from its server are send back to its original clients. For each of the query requests via SQL statements, only the results are sent back to the clients [8].

The major difference between the server and the client computers is that the server is ordinarily faster and has more storage space. The server generally performs most of the processing tasks. Some servers are dedicated to performing a specific task such as printing or managing files. A "thin" server is intended for the home user and provides access to the Internet. A client/server network typically provides an efficient means to connect ten or more computers together. Because of the size of a client-server network, most client/server networks have a network administrator who oversees this system [9].

In a file server environment, each client computer is authorized to use the database management system (DBMS) when a database application program runs on that computer. The primary characteristic of file server architecture is that all the data manipulation is performed at the client computers not at the file server. The file

server acts solely as a shared data storage device. Software at the file server queues access requests, but it is up to the application program at each client computer to handle all data management functions [5].

2.9.2 SERVER SIDE & CLIENT SIDE SCRIPTING

In computer programming, a script is a program or sequence of instructions that is interpreted or carried out by another program rather than by the computer processor (as a compiled program is).

Scripting languages are an intermediate stage between HTML and programming languages such as Java, C++, and Visual Basic. HTML is generally used for formatting and linking text. Programming languages are generally used for giving a series of complex instructions to computers. Scripting languages fall somewhere in between, although scripting languages function more like programming languages than simple HTML docs. The primary difference between scripting languages and programming languages is that the syntax and rules of scripting languages are less rigid and intricate than those of programming languages. Scripting engines are the COM (Component Object Model) objects that process scripts [21].

Some languages have been conceived expressly as script languages. Some examples of script languages are Perl, REXX (on IBM mainframes), JavaScript, and Tcl/Tk. In the context of the World Wide Web, Perl, VBScript, and similar script languages are often written to handle forms input or other services for a Web

site and are processed on the Web server. A JavaScript script in a Web page runs "client-side" on the Web browser.

In general, script languages are easier and faster to code in than the more structured and compiled languages such as C and C++ and are ideal for programs of very limited capability or that can reuse and tie together existing compiled programs [22].

2.9.2.1 SERVER SIDE SCRIPT

A script that is interpreted by the Web server is called a server-side script. A server script is an instruction set that is processed by the server, and which generates HTML. The resulting HTML is sent as part of the HTTP response to the browser [4].

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

- Process input, typically search strings, and output a document containing the results of the search.
- Validate users identification and password information and grant readers access to restricted areas of the web site.

- Process input from image maps and direct the reader to associated documents.
- Add the reader's feedback or survey responses to a database or index.
- Track visitors to Web pages and post continually updated numbers to the Web page as it is accessed.
- Generate documents based on the type of browser the reader is using.
- Perform post-submission processing and possibly output results for the reader.

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

2.9.2.2 CLIENT SIDE SCRIPTS

A script that is interpreted by the browser is called a client-side script. A client-side script is also an instruction set, but it is not processed by the Web server. Instead, it is sent to the browser (as part of the HTTP response) and is processed by the browser, the result is then displayed by the browser on the monitor.

One clear way to extend the power of the HTTP protocol is by increasing the processing power of the client. If the client's Web browser was able to interpret logical instructions (program code) as well as render HTML, for example, such task as form input validation might be accomplished on the client side without a roundtrip to the server. If the client can interpret program instructions and execute

logic local to the client machine, the server load can be lessened and the overall flow of data from client to server made more efficient. The program code is embedded in the HTML masquerading as a comment-hopefully so that noncompliant browsers will ignore the code altogether. Both Netscape Communications Corporation, with its JavaScript product and Microsoft, with its VBScript product, offer this type of HTML extension [4].

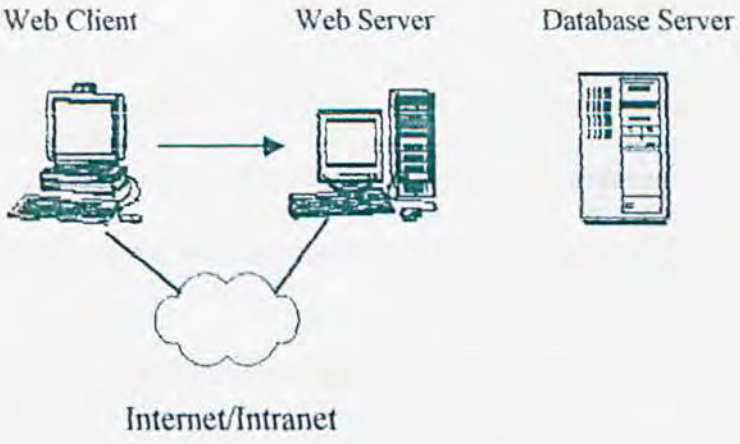
2.9.2.2.1 ADVANTAGES OF USING CLIENT SIDE SCRIPT

There are two clear advantages of client-side scripting over server-side scripting. First, the response times are often quicker, because the script is interpreted on the browser machine—so there is no network involved. This is a big advantage for repeated calculations because there's roundtrip to ask the server to calculate things. Second, executing script on the browser means that there's less script to be executed on the web server; reducing the web server's workload can be advantageous if lots of people use your web site [4].

2.9.3 WEB SITE ARCHITECTURE

Client/server applications that are deployed from a Web site require an architecture that is robust, secure, and scalable, and that can accommodate rapidly changing technologies.

Figure 2.1 shows The Architecture of a Web Solution



Using the Microsoft Distributed Component Object Model (DCOM), program components can be easily deployed on remote servers.

2.9.4 WEB SITE DEVELOPMENT MODELS

2.9.4.1 THE SERVICES MODEL

When designing a Web site, we can use a service-based application model. The term service-based means that the functionality of an application is specified as collections of services that meet specific user needs. A service-based application is typically comprised of three categories: user services, business services, and data services.

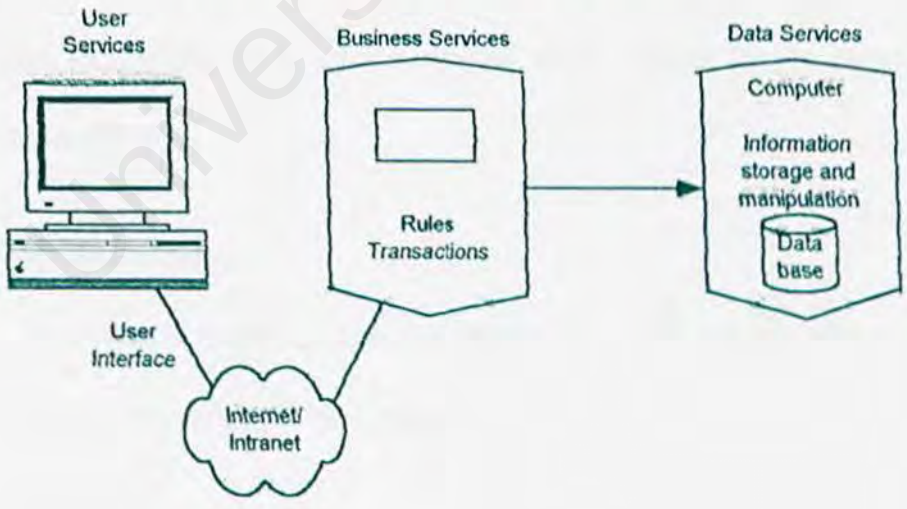
- User services provide an application with its user interface. This usually includes things like drawing the User Interface and basic formatting and field rules. The user of a service can be a person or another service.

Therefore, the interface for a service can provide a graphical user interface or a programmatic interface.

- Business services enforce business rules and handle transactions. These services may impose constraints or apply transformations to change user input or raw database information into usable business information.

- Data services provide storage and low-level manipulation of data in a database. Examples of data services include create, read, update, and delete, which are used by business services to modify a database. A business service does not need to know where data is located, how it is implemented, or how it is accessed. These tasks are handled by data services. The following Figure 2.2 shows The Services Model:

Figure 2.2 shows The Services Model



After determining what capabilities we need for our Web site, we can then decide how to implement the site. Using services to define the division of functionality in our Web site provides the following benefits:

- **Clear and consistent development goals**

  By dividing our Web site into services, we enable a Web development team to easily envision the direction of development. The functionality of each service, implemented as a component, is clearly defined.

- **Better manageability**

  Because services divide the functionality of our Web site into distinct tasks, any changes in the implementation of one service will not introduce changes to another service component.

- **Isolation of functionality**

  The functionality of a specific service is encapsulated, so any error in the implementation of a service can be easily traced to the corresponding component.

- **Division of labor**

  Identifying services enables us to determine which member of the Web development team is best suited to build and complete the corresponding component.

2.9.4.2 APPLICATION MODELS

Over the past few decades, the architecture of applications, large enterprise, mission-critical ones, have evolved from single-tier to n-tier designs. The driving force for this change has been the following general goals: scalability, separation and encapsulation of functionality, maintainability, multi-user support, and the ability to be distributed.

The three types of tiers are generally described as user (first), business (second or middle), and data (third) service tiers. The concept of tiers emphasizes the logical segmentation of the services, and is not about implementing the services nor about the number of physical computers involved in deploying the solution.

- **Single-Tier Applications**

A single-tier application is simply a monolithic, stand-alone program that runs on the user's computer. This is the old mainframe and mini-computer model. There was virtually no logic at the desktop - instead, there was a dumb terminal. All that was sent down the wire to the terminal was the screen layout information. It may communicate with a database, but that database resides on the same computer (or perhaps on a mapped network drive). The key point about a single-tier application is that all three services—user, business, and data—are architecturally combined into a single program [10][11]. The following Figure 2.3 shows the Single-Tier Application:

Figure 2.3 shows The Single-Tier Client/Server Application

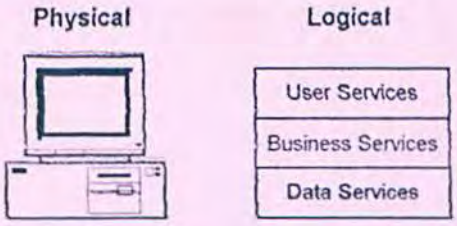


Table 2.1: Single-Tier Application Advantages and Disadvantages

Advantages	**Disadvantages**
Requires very little bandwidth on your network in order to have fast response times = great for international or WAN situations where bandwidth can be expensive.	Very expensive hardware wise. In the old days, these often even required special plumbing for cooling water.
Also exceptionally reliable. You'll find mainframes out there that haven't been "down" in literally years.	Typically proprietary in nature – much more difficult to share information with other systems.
Deployment of new software is extremely easy – just install on the host system, and every user has the new version – no running from machine to machine for the upgrade.	Very limited number of "off-the shelf" software packages available. Since the number of potential customers is few, the cost of these packages tends to be extremely high.

- **Two-Tier Client/Server Applications**

The simplest type of distributed computing is the two-tier client/server application. In this type of application, the database (and perhaps a portion of the data services) is separated from the user interface and business logic. Typically, the database is placed on a dedicated server.

Two-tier client/server applications are the most common type of client/server applications built today. They offer significant benefits over single-tier applications

because data processing is centralized and becomes a shared resource among potentially many users [10][11]. The following Figure 2.4 shows the Two-Tier Client/Server Applications:

Figure 2.4 shows The Two-Tier Client/Server Applications:

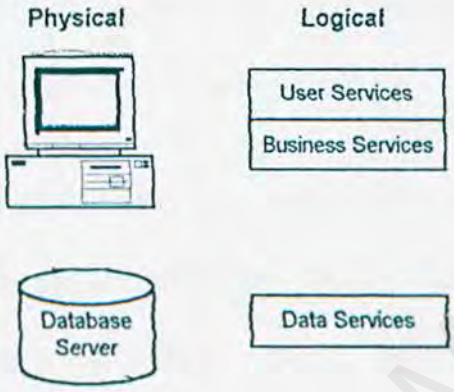


Table 2.2: Two-Tier Application Advantages and Disadvantages

Advantages	Disadvantages
Distribute the workload to a large number of relatively cheap clients.	Bandwidth hog – clogs networks up very quickly.
If you have one user who needs more speed, you can purchase a faster system just for them rather than a larger expensive host system that everyone is going to take a piece of.	Installations are time-consuming and difficult to coordinate. New software or versions of software must be installed on multiple machines. Version upgrades can be particularly problematic since old clients are not always compatible with the new server components and vice versa. All clients may have to be upgraded at one time, which can create quite a serious logistics problem.
The same money that buys the computing power on the client side also buys power for other productivity applications such as word processing and spreadsheet applications.	

- **Three-Tier Client/Server Applications**

Over time it has become apparent that the two-tier client/server model is simply not flexible or powerful (scalable) enough to handle many larger applications. Maintaining a dialog between each client workstation and the central database server can result in high network traffic and poor performance, for example when many users try to do simultaneous access to a database.

Three-tier client server applications help address these issues by putting another layer between the users and the database - the application server. This type of central application service can manage network traffic and database server loads more efficiently.

The users are responsible for user interface only, and the difference is that the business and the data services are logically separated from each other. In addition, this approach moves the logical model into a distinctly separate realm from the physical model. This means that they can run on the same server, but do not have to. This adds a significant level of stability and scalability since you can split the workload onto two (and, depending on how it's done) servers. In addition, this model has a tendency to be more extensible, since changes and addition affect smaller pieces of code (instead of one hugs build of everything, you can just rebuild the affected components).

Typically, the application layer handles most of the business services, and may be implemented on its own server computer, separate from the database. One of the

main advantages of a three-tier architecture is the ability to extract the business logic from the user and data tiers and into the middle tier, where it is easier to maintain [10][11]. The following Figure 2.5 shows the Three-Tier Client/Server Applications:

Figure 2.5 shows The Three-Tier Client/server Applications:

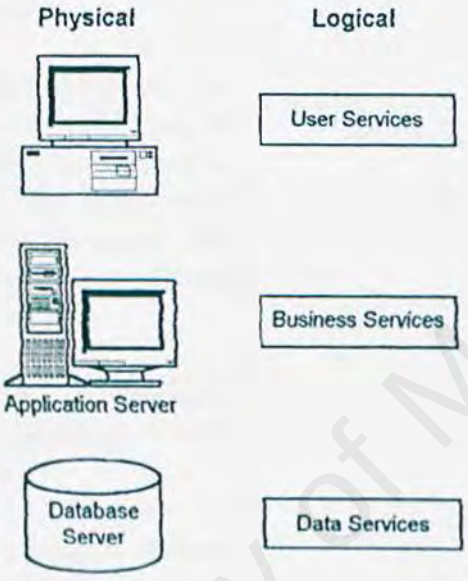


Table 2.3: Three-Tier Application Advantages and Disadvantages

Advantages	Disadvantages
Some upgrades can be done entirely at the server level.	Other upgrades still require a "touch" on every client computer – upgrades and new installs are both very tedious and difficult logistically.
An increasing number of homogeneous products are available off the shelf – pre-made software is cheap.	There is typically still considerably more down time than in a host system.
Since only the information to be displayed is sent on the network, there is little network bandwidth comparative to the two-tier model. The load may, however, be higher between the business-logic and data-services systems if they are on different servers.	
Allows for (actually encourages) component-based development which *can* increase reusability.	
Two medium servers are often cheaper than one larger server. The separation of business and data services makes two servers an option.	

- **Web-Based Applications**

Web-based applications, by their browser/server nature, follow the two- or n-tier model. The application models discussed so far leave a substantial part of the application on the client workstation. Conversely, applications designed for the World Wide Web place as little of the application as possible on the client, and keep all the processing centralized on one or more servers. The following Figure 2.6 shows the Web-based Applications:

Figure 2.6 shows The Web-based Applications:

2.10 SECURITY ISSUES

Ever since the first computers were connected with networks, security has been a major concern of network operating system vendors, developers and administrators. Implementing a security plan can help protect a computer system and its data from loss, corruption and unauthorized use. The Internet has made addressing security concerns even more critical. Now all computers connected to the Internet directly (termed hosts) or indirectly though a proxy server are potential victims of security attacks.

Security threats can be divided into four broad categories based on the consequences of the attack. The types of security threats are system modification attacks, invasion of privacy attacks, denial of service attacks, misdirection attacks and antagonistic attacks.

A complete security strategy will include deterrence, protection, detection and response measures. Because of the ubiquitous nature of the Web, security issues can be much more complex than those of a typical file server environment. When planning a Web site, you must consider various aspects of Web technology and develop a security plan based on specific scenarios. For example, consider the following aspects of a Web site and the resulting security implications:

- **Client issues**

  Generally, the client's main concern is that the browser or the downloaded dynamic content does not endanger the user. Client compatibility is an important security concern, especially in a heterogeneous client environment such as the Web. For example, although basic (plain text) authentication is not as secure as the Windows NT Server Challenge-Response (NT/CR) mechanism, the former is supported by all commercial Internet browsers, whereas NT/CR is currently supported only by Internet Explorer.

- **Server Issues**

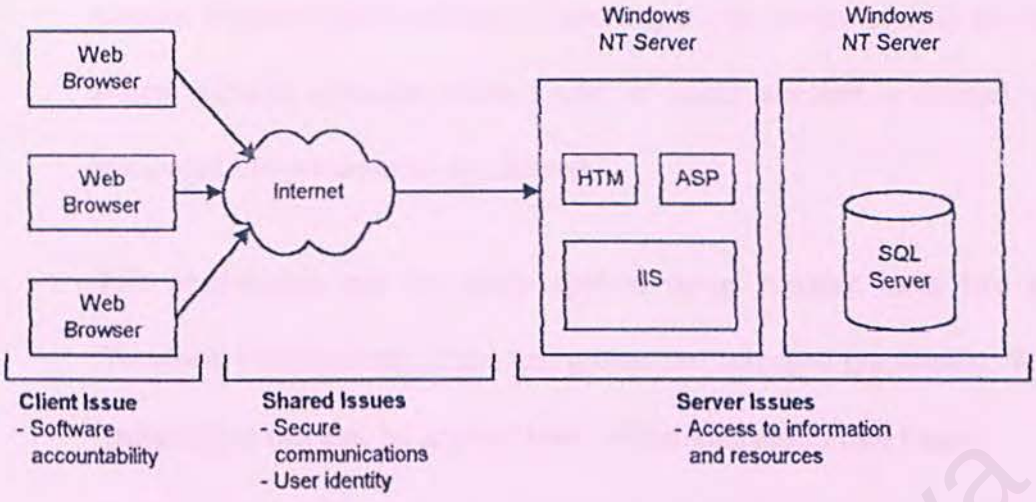
  For the server, the most important security concerns are determine who can access your Web site, what files a user can access and what type of access rights—read, write, or execute—the user has to each.

- **Shared issues**

  Secure communications and user identity are critically important for both client and server. Certain security issues and technologies apply differently to internal (trusted) users versus external (inherently non-trusted). In fact, a whole class of products—Internet proxies and firewalls—was created to bridge the different concerns of these two types of access.

  The following Figure 2.7 shows the architecture of a Web site and highlights important security issues.

Figure 2.7 Web Site Architecture Security Issues



A key concern of Internet site managers is the security of their site and the critical business information on it. The same protection available with Microsoft® Windows NT® Server for files and applications is available for Microsoft Internet Information Server 4.0 (IIS), with no extra work for system administrators.

IIS 4.0 helps you:

- **KEEP DOCUMENTS AND APPLICATIONS SECURE**

  IIS 4.0 is integrated with Windows NT Server file security to provide the highest levels of protection.

  -Every file and application must be accessed by a Windows NT user account—either the IIS anonymous user or user that has been authenticated to the server.

  -Windows NT tracks users by a unique security identification, not user name. So if a user account is deleted, and a new one created with the same

name, the new user can't inherit any permissions belonging to the old account. Because the Windows NT directory is also integrated with the file system security manager, when a user or group account is deleted, all associated file permissions are deleted.

-File permissions can be easily applied using familiar tools like the Windows File Explorer. Users and groups are managed graphically. Web permissions can also be applied from within Microsoft Front Page.

- **IDENTITY AND AUTHENTICATE USERS**

Organizations need to provide secure access to information on their networks and servers. Therefore, user authentication is an important aspect of a Web server. Windows NT Server and IIS offer administrators a flexible number of options to authenticate a user.

  - **Windows NT Challenge/Response**

    IIS 4.0 provides support for the Windows NT Challenge / Response authentication, which uses a cryptographic technique to authenticate the password. The actual password is never sent across the network, so it is impossible for it to be captured by an unauthenticated source. Challenge / Response is supported by Microsoft Internet Explorer version 2.0 and higher.

  - **Basic authentication**

    Basic Authentication is not as secure as Windows NT Challenge / Response, but Basic Authentication is supported by almost every

Web browser on the market. Basic authentication sends the user name and password in clear (unencrypted) text that can be stolen by others on the Internet.

- **Digital certificates**

  Digital certificates give users a secure method of logging on to a Web site without having to remember logon identifications and passwords. IIS 4.0 goes a step further and provides two methods for mapping the digital certificates to Windows NT Server user accounts.

- **Certificate mapping**

  This method maps the actual certificate to the Windows NT Server user account and requires a copy of the certificate. This is an ideal approach when the Web site issues its own certificates using a certificate server such as Microsoft Certificate Server that is included in the Windows NT 4.0 Option Pack.

- **Wildcard mapping**

  In this case, the server is not required to possess the certificate and authenticates based on certain information stored in the certificate such as "SubjectName." IIS 4.0 also includes an ActiveX component that automates the wildcard mapping using an Active Server Page. For example, a business could set up an ASP that asks the user if they wish to map their certificate to their Windows NT

Server user account. If the user chooses to do so, the information in the certificate is mapped to the appropriate Windows NT Server user account.

- **Using digital certificates programmatically**

  Client authentication in IIS 4.0 goes beyond pure authentication and access control. Information in the certificate is exposed to both ASP and ISAPI applications. This allows developers to create custom ASP and ISAPI applications that can serve personalized content, control access, or query backend databases based on the information fields in the client certificate.

- **KEEP DATA CONFIDENTIAL AND SECURE OVER THE NETWORK**

  IIS 4.0 provides privacy, integrity, and authentication in point-to-point communications through Microsoft's Secure Channel technology.

- **SECURE SOCKETS LAYER**

  IIS 4.0 provides support for industry-standard Secure Sockets Layer (SSL) 2.0 and 3.0 for secure communication as a base feature. Administrators apply Secure Channel services to their Web site by simply selecting a check box in the IIS Internet Service Manager. A server certificate is presented to a client so that the client may authenticate the identity of the IIS 4.0 server. When running SSL, a server is required to have a server certificate. While it is not necessary, the IIS 4.0 server can also request a client certificate. SSL

takes it from here, negotiating a secure connection with any browser connecting to the site. This ensures secure communications between client and server.

- **SERVER GATED CRYPTO**

Server Gated Crypto is an extension to the secure sockets layer (SSL) security protocol, provides a bank's Internet server with the ability to "switch on" 128-bit encryption if an SGC digital certificate is present. A separate SGC upgrade enables the client software to query the server for the presence of an SGC digital certificate during a digital "handshake" with the bank's server. If the client software detects a digital certificate, the session is established using 128-bit encryption. If a certificate is not detected, the client and server negotiate the highest level of mutually available encryption.

Server Gated Crypto allows international banks to build computer infrastructures based on the Microsoft® BackOffice® family that interoperate with a range of popular client software, including Microsoft Internet Explorer 3.02, Internet Explorer 4.0, Microsoft Money 98 and Netscape Navigator 4.0, no matter where their customers might be [23].

2.11 DATA ACCESS TECHNOLOGIES

It's not unusual these days to find businesses that want to access databases, mail, directory, telephony, exotic, legacy data, or Internet content—all from the same application or system. The problem is that each of these data sources has its own proprietary or merely different data access interface—if an interface exists at all. Some require API access, others can be accessed by using one of the more familiar data access paradigms. Once the data arrives, it must be morphed into some common format, or your applications have to adapt themselves to the different structures and data access interface requirements.

2.11.1 UNIVERSAL DATA ACCESS

Universal Data Access (UDA) is a new Microsoft architecture that provides high-performance access to a variety of data formats (both relational and nonrelational) on multiple platforms across the enterprise. UDA gives a simple programming interface that can be used with almost all of today's programming languages and tools. This allows you to use the tools you're comfortable with while developing complete applications based on this new architecture.

UDA is based on open industry specifications and doesn't require the use of a single vendor's products or solutions. In fact, UDA works with all of today's major database platforms. A key feature is that it doesn't require the expensive and time-

consuming process of moving existing data into a single data store for the new data solution. On the contrary, UDA is capable of leveraging and extending current data stores as part of the complete solution.

Developers can take advantage of UDA through the Microsoft Data Access Components (MDAC) including ActiveX Data Objects (ADO), Remote Data Services (RDS), OLE DB, and ODBC. These components provide the easy-to-use interfaces that make UDA a reality [24].

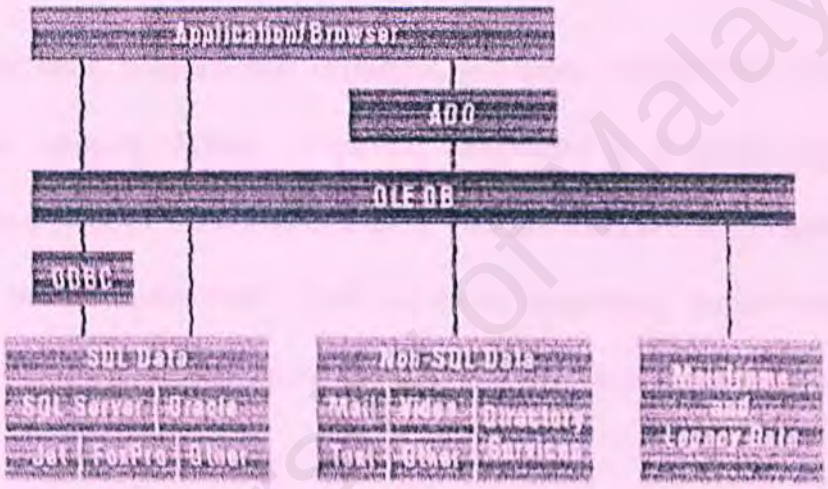


Figure 2.8 UDA Architecture

2.11.1.1 OLE DB

OLE DB is a set of interfaces that are designed to provide data access to all data, regardless of type, format or location. It effectively "componentizes" database and related data processing functionality, breaking it up into interoperable components that can run as middleware on the client or server across a wide variety of applications. The OLE DB architecture provides for components such as direct data

access interfaces, query engines, cursor engines, optimizers, business rules and transaction managers.

OLE DB components can be broken down into three categories: data providers, data consumers, and service components. The key characteristic of a data provider is that it owns the data it exposes to the outside world. While each provider handles implementation details independently, all providers expose their data in a tabular format through virtual tables. A data consumer is any component—whether it be system or application code—that needs to access data from OLE DB providers.

Development tools, programming languages, and many sophisticated applications fit into this category. Finally, a service component is a logical object that encapsulates a piece of DBMS functionality. One of OLE DB's design goals was to implement service components (such as query processors, cursor engines, or transaction managers) as standalone products that can be plugged in when needed [25].

2.11.1.2 ACTIVEX DATA OBJECTS (ADO)

ADO is a technology that can be used by Web page developers to add database access to their online content. Database access opens up a world of information that can be used to customize Web site offerings based on user preferences, past usage history, or up-to-the-minute news. Database applications, with ADO, can now be written as online applications accessed anywhere over the global Internet.

ADO provides a layer between your Active Server Page and the underlying database. To work with a database, we can write code that sets properties and invokes methods of ADO objects.

ADO communicates with databases using OLE DB. OLE DB can access both SQL and non-SQL databases or data sources. If a database vendor supplies an OLE DB Provider for ODBC, ADO uses the Provider to communicate with the database. If a database vendor supplies an OLE DB Provider, ADO communicates directly with the database. The Provider for ODBC is the default.

Because of its easy-to-use, lightweight interface to all kinds of data sources, and the growing need for an interface spanning many tools and languages, ADO is still being enhanced to combine the best features of RDO and DAO. What is the real difference between ADO and RDS. ADO is a server side system (though it can be used locally as well in place of RDO). It allows you to create database Web pages, which need nothing special on the end users, system (no worry about ActiveX). Using ADO allows for greater RecordSet definition then does RDS. RDS, on the other hand, allows for a client-side cached data session. This helps eliminate network overhead and allows control data binding.

2.11.1.3 REMOTE DATA SERVICES (RDS)

RDS, previously known as the Active Data Connector, is a set of controls that enable a Web page to dynamically update itself with information from a database server. It is a client-side component that interfaces with ADO and provides several important features such as providing cursors, remote object invocation, explicit recordset remoting, and implicit remote recordset functionality such as fetch and update. RDS is responsible for client-side services such as caching and updating data and binding data to controls. RDS controls use ADO as their data source, then the cursor engine in RDS talks OLE DB with ADO. RDS is a valuable component of the UDA architecture because it is responsible for improving client-side performance [24].

Figure 2.9 RDS Architecture

2.11.2 OPEN DATABASE CONNECTIVITY (ODBC)

Open Database Connectivity (ODBC) is a standard or open application programming interface (API) for accessing a database. It was designed to allow the programmer to use a set a common set of routines to access the data stored in databases, regardless of the type of database in which the data stored. This meant that once the programmer was connected to the database using ODBC, they could manipulate the data without worrying exactly where the data was stored, or which type of database was storing it [4].

By using ODBC statements in a program, you can access files in a number of different databases, including Access, dBase, Oracle, SQL Server and DB2. In addition to the ODBC software, a separate module or driver is needed for each database to be accessed.

ODBC is based on and closely aligned with the Open Group standard Structured Query Language (SQL) Call-Level Interface. It allows programs to use SQL requests that will access databases without having to know the proprietary interfaces to the databases. ODBC handles the SQL request and converts it into a request the individual database system understands [36].

The steps for accessing a database from a Web page is:

- Define the data source and the ODBC driver to the ODBC driver manager.
- Use a form on an HTML page to request information from the user.
- Create a script to process the form and access the database.

Figure 2.10 (ODBC Structure)

2.12 BACKGROUND SURVEY

2.12.1 ANALYSIS OF EXISTING SYSTEM

Some sites related to Chinese recipe that were observed and also analyzed in this project are:

- http://www.hkrecipes.com
- http://www.chinesefood.org
- http://home.westman.wave.ca/~hillmans/links.html
- http://www.chinavista.com/culture/cuisine/b5recipes.html
- http://www.chinesefood.about.com/food/chinesefood/mbody.htm
- http://www.catcha.com.my/content.phtml?5&010&catcha&index.my

Each of the sites mentioned above offers different types of features and focus on different categories specifically to serve its user needs. A survey was made on contents, multimedia features, visual attractiveness, uniqueness, links and search engine.

- **CONTENTS**

  The contents of most Web site are informative and clearly understood but the display of the contents and their sequences are not well organized, most of the recipes are not category in a group. Users will find it hard to look for information related to another information because lack of guidelines and not properly displayed.

- **MULTIMEDIA FEATURE**

  Lack of graphics, images and pictures related to the recipes reduce the clearest for users to have a better look at the picture of recipe and the arrangement of dishes. Most of the sites do not have the audio effects.

- **VISUAL ATTRACTIVENESS**

  The weakness in the main two features mentioned above will automatically decrease the visual attractiveness. When users encounter this feature lacking in the Web site surfed, the chances for the users to come back to these Web sites are very low.

- **UNIQUENESS**

  Each Web site has their own way of attracting users. The use of beautiful images, pictures and buttons are well applied in some of the Web sites especially in the main page. But mediums used to explain information are still text-based.

- **LINKS AND SEARCH ENGINE**

  The links to related information are well organized and provided for users to find more information on related subject. The links to other Web sites are also provided with variety of choices. But it is hardly to find a search engine in a Web site for user to search for particular recipes.

2.12.2 SUMMARY

Due to all of the disadvantages and inconveniences in the existing recipe Web sites, it is a good step to re-invent a E-Recipes system that can improve those weaknesses. So far, there isn't any profound Web site available on the NET that is powerful but yet simple in search engine, dynamic interaction and informative.

More new features need to be added to support and improve the dynamic interaction between the users and the Web server. Besides that, it is also need to improve the way of displaying information and add in more graphics. This will result into being a user-friendly interface and more attractive to the user.

E-RECIPES SYSTEM

- **CONTENTS**

  E-Recipes will have rich contents of information that clearly understood and are well displayed. The sequence of the contents will be well organized and properly arranged to make sure users are satisfied in getting the needed information. The usage of attractive fonts and buttons will be widely applied in this system.

- **INTERACTIVE AND USER-FRIENDLY INTERFACES**

  E-Recipes system will provide luxurious images, graphics and pictures for maximum attractions and entertainment for users while surfing the Web. Besides that, having the online map for the user and tourists to find the

directions to the restaurants. The use of graphically user interfaces with extraordinary graphics, images and buttons in the E-Recipes system will be a new approach compared to similar existing Web sites.

- **EFFECTIVE LINKS AND SEARCH ENGINE**

  The organizations of internal links and external links to other Web sites in E-Recipes system will be well done and the various links that were gained in these existing Web sites will be maintained in this system. The functions of the search engine in the system will be developed similarly to the existing systems but the usage will be more enhanced and effective.

The enhancement of the existing Web site's features and extra features that will be added in E-Recipes system such as graphical user interface will absolutely make this system a unique and enjoyable "visit" for anyone who surfed it. The applications of various animated and stilled graphics will visually attract users to come back to the Web site.

CHAPTER 3

SYSTEM ANALYSIS

CHAPTER 3: SYSTEM ANALYSIS

3.1 INTRODUCTION

Installing a system without proper planning and analyzing leads to great dissatisfaction and frequently causes the system to fall into disuse. Hence, System analysis is an essential and important phase that is used to determine clearly of all the necessary requirements before proceeding into subsequent phase. This phase usually requires a certain period time to complete for a small-scale project such as this project.

In this phase, all information gathered, on development tools, Web technology and programming languages are analyzed. Then a decision is made to choose appropriate tools or technologies for this project.

Besides, a requirement analysis is also carried out as well as study on existing system. Lastly in this phase, an analysis on run-time requirement is made to ensure smooth development in later stages.

3.2 SYSTEM DEVELOPMENT METHODOLOGY

The development methodology for this project based on the System Development Life Cycle (SDLC). The model chosen is the "Waterfall model" with prototyping approach. As we know, system development generally passes through a series of phases or stages. Each phases in "Waterfall model" is presented discretely and never accomplished as a separate step. Several activities can occur simultaneously and activities may be repeated. It suggests to the developers the sequence of events they should expect to encounter. It can also be very useful in helping "new" developers to lay out what they need to do and what are the tasks that must be focus on. Besides that, the developers could use the model, to gauge how close the project was to completion at a given point in time.

Phases or activities were planned and divided according to planning, requirement and analysis, system design, coding, implementation and testing, operation and maintenance. Prototyping is actually an external process and it has its own development cycle which will be developed earlier in the actual development process.

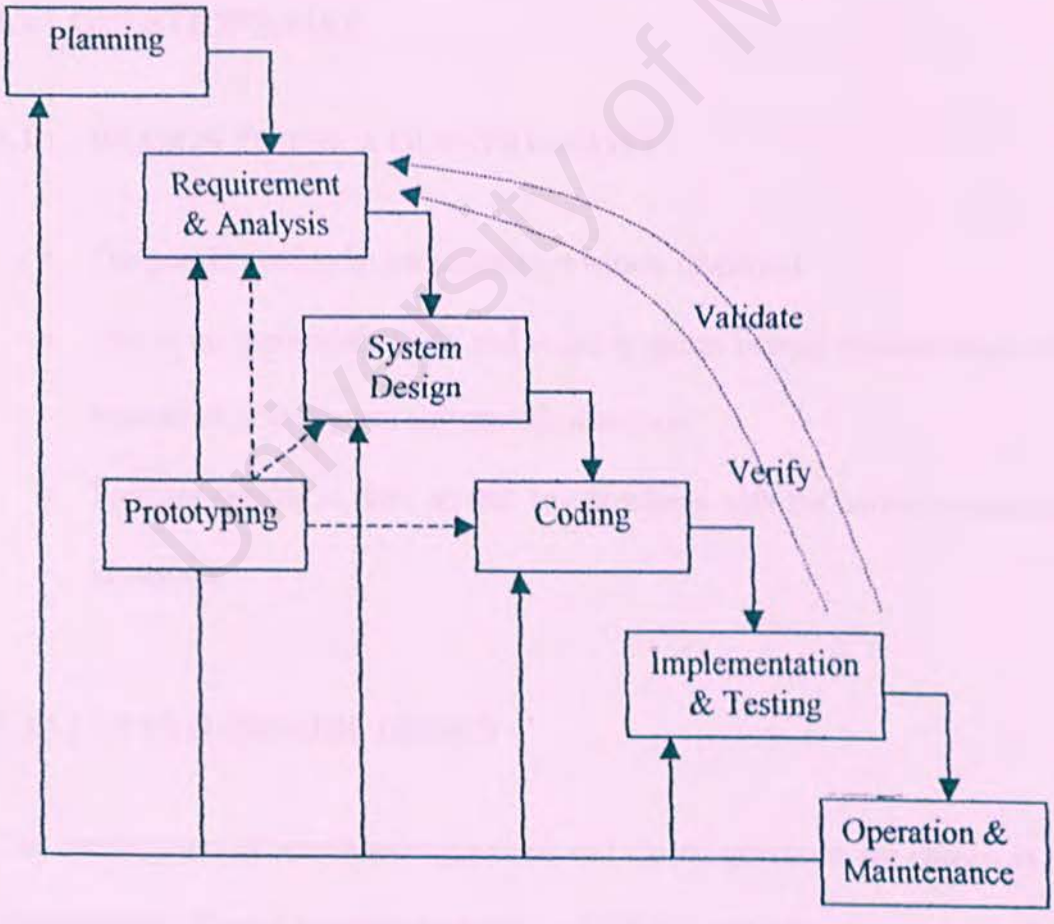
Prototyping is usually an iterative process. A prototype is a small portion of the system built to examine some aspect of the proposed system. For example, the developer may build a prototype model and evaluates it from user's feedback. The process iterates in the same phase until both parties are satisfied. Then the

developer will move to the following phase and repeat the prototyping process [12].

There are several advantages in using the Waterfall model with prototyping:

- Allows all or part of the system to be constructed quickly to understand or clarify the requirement.
- Understands the feasibility of a design or approach.
- Reduces risk and uncertainty in the development process.

Figure 3.1 shows The Waterfall Model with Prototyping



3.3 REQUIREMENT ELICITATION

There are varieties of techniques to determine what the users really want. Among the information-gathering techniques are questionnaires and observation of the environment in which the system is to be installed.

Questionnaires had been distributed to the students in FSKTM, students' parent and also working people, who are the potential users of this system to gain their opinions about the implementation of online recipe system.

3.3.1 QUESTIONNAIRE

3.3.1.1 REASON TO USE A QUESTIONNAIRE

- The people need to be questioned are widely dispersed.
- This is an exploratory study and wants to gauge overall opinion before the systems project is given any specific direction.
- Problem sensing is done so that any problems with the current system are identified.

3.3.1.2 QUESTIONNAIRE DESIGN

The combination of open-ended questions and closed questions are chosen in the questionnaire. Closed question is chosen to limit the response options available to

the respondents and eventually ease the analysis and interpretation of their responses without using a computerized content analysis program. Open-ended question is chosen to gather all possible responses to the questions from the respondents. The design of the questionnaire is attached in Appendix B.

3.3.1.3 THE RESPONDENTS

People with twenty years old and above are the potential users of this system. The responses from all the respondents are analyzed.

3.3.1.4 QUESTIONNAIRE RESULTS

50 questionnaires were distributed to the students in FSKTM, students' parent and also working people. Responses gained through these closed questions are quantified and tabulated. Responses to questionnaires using open-ended questions are analyzed and interpreted in other ways.

3.3.1.4.1 Internet Surfing

Table 3.1 Statistical Result on How Frequent Respondents Surf the Internet

Respondents surfing Internet	Total (x/50)	Percentage (%)
Not at all	6	12
Seldom	21	42
Often	23	46

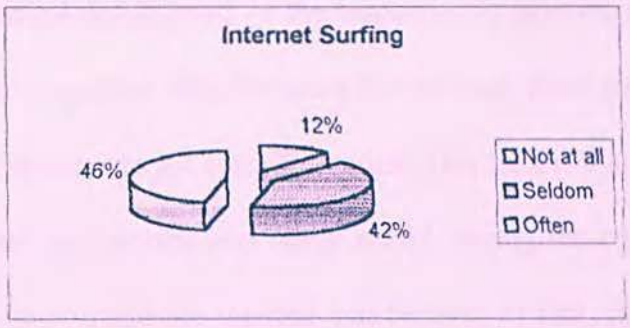


Figure 3.2 Percentage of Respondents Surfing the Internet

The statistical reveal that majority of the respondents always surf the Internet. Figure 3.2 shows that 46% of the respondents surf the Net always, 42% of the respondents surf it seldomly and 12% of them never surf the Net.

Because of the fact that most of the respondents are always exposed to Internet, they are familiar with the Internet. There is no problem to put the recipe information system online. It is unnecessary to have any special and dedicated training to use this online system.

3.3.1.4.2 Methods of Finding Information

Table 3.2 Statistical Result on the Methods of Finding Information

Methods of finding information	Number (x/50)
Verbal with public	30
Newspaper and magazines	42
Friends	12
Internet	36

From the statistical result, most of the respondent's gain the information through newspaper and magazines. Besides using this method, there are 36 respondents are using Internet services to get the information. This means that finding information through Internet are popular and really useful among the respondents. They are familiar with how to use the Internet and because of that, this online recipe will make them more easier and faster for them in finding the related recipe information. With this Web site, it keeps away the need to visit bookstore and therefore, can result in cost and time-consuming.

3.3.1.4.3 Knowledge on Cooking

Table 3.3 Statistical Result on the Knowledge of Cooking.

Respondents knowledge on cooking	Total (x/50)	Percentage (%)
Worst	0	0
Poor	25	50
Good	23	46
Excellent	2	4

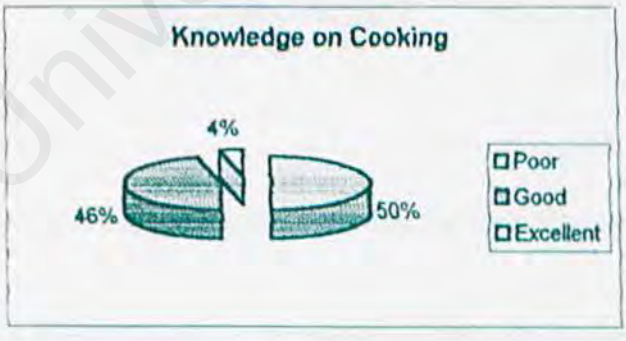


Figure 3.3 Percentage of Respondents Knowledge on Cooking

The statistical reveal that majority of the respondents have standard knowledge on cooking. Figure 3.3 shows that 50% of the respondents have poor knowledge on cooking, 46% are good in cooking and only 4% of them are very well in cooking. The percentages showing that knowledge in cooking are very important and useful in living days.

3.3.1.4.4 Knowing the Web Sites on Recipe

Table 3.4 Statistical Result on Knowing any Web Sites on Recipe

Respondents know any Web sites on recipe	Total (x/44)	Percentage (%)
Yes	18	41
No	26	59

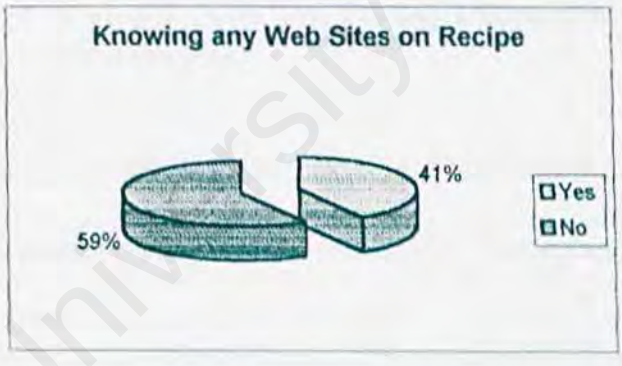


Figure 3.4 Percentage of Respondents Knowing the Existing Web Sites on Recipe

Figure 3.4 shows that 41% of the respondents know about the existing Web sites on recipe. This percentage show that there are not so many respondents knowing the existing Web sites on recipe, may be this is because of the online recipe services are not so common and familiar among them.

3.3.1.4.5 Methods of Knowing the Web Sites Related to Recipe

Table 3.5 Statistical Result on Methods of Knowing any Web Sites

Methods of knowing the Web sites related to recipe	Number (x/18)
Search Engine	12
Article in newspaper/magazine	8
Advertisement	3
Word-of-mouth	7
Link from another site	5
Other	3

Most of the respondents know about the Web sites on recipe through search engine, because this is the easiest way to find out all the Web sites related to recipe. So, there is no problem to find out and get the recipe information through Internet.

3.3.1.4.6 Ease of Moving Around Site, Finding Information and Confusion while Visiting the Site

Table 3.6 Statistical Result on Ease of Moving Around Site

Ease of moving around site	Total (x/18)	Percentage (%)
Worst	0	0
Poor	8	44
Good	9	50
Excellent	1	6

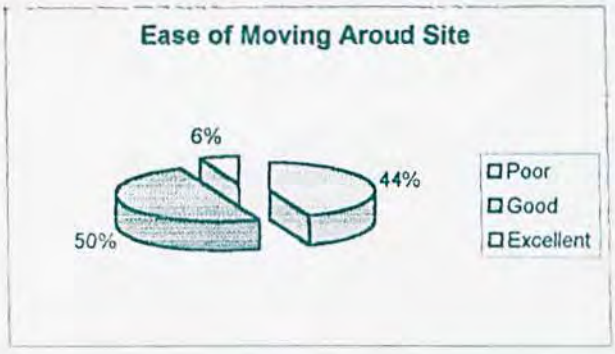


Figure 3.5 Percentage of the Ease of Moving Around Site

Table 3.7 Statistical Result on Ease of Finding Information

Ease of finding information	Total (x/18)	Percentage (%)
Worst	0	0
Poor	8	44
Good	10	56
Excellent	0	0

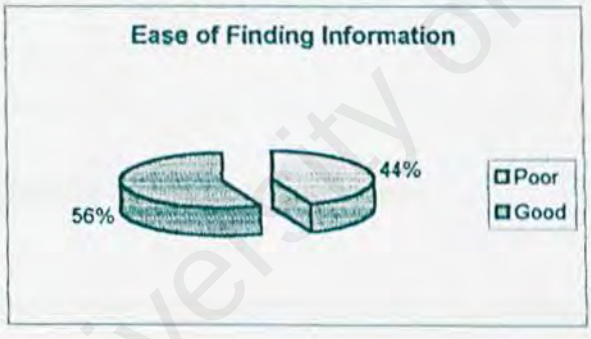


Figure 3.6 Percentage Ease of Finding Information

Table 3.8 Statistical Result on Confusion while Visiting the Sites

Confusion while visiting the sites	Total (x/18)	Percentage (%)
Yes	5	28
No	13	72

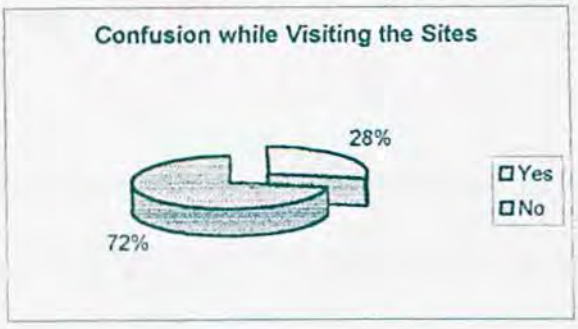


Figure 3.7 Percentage of Respondents Confusion while Visiting the Sites

Figure 3.5 and figure 3.6 showing that the ease of moving around site and finding information are only in medium stage. This may be because of the displaying of the Web sites' contents and their sequences are not well organized, most of the recipes are not category in a group. This problem can lead to the confusion of users when visiting the sites. According to the responses, these problem will be consider and improve during the process of designing the Web site.

3.3.1.4.7 Suggestions Given by Respondents

Below are some of the suggestions given by respondents about the recipe Web sites:

- Provides more attractive pictures.
- Provides search engine to search the recipe.
- Provides more information related to recipe.
- Linking to other recipe Web sites.

3.4 REQUIREMENT ANALYSIS

There are two types of requirement analysis: functional and non-functional, which play an important role to help developers determine pre-design related information.

3.4.1 FUNCTIONAL REQUIREMENT

Functional requirement explains what the system will do, independent from the implementation of the solution. It describes an interaction between the system and its environment. To determine functional requirement, a decision has to be made on what states are acceptable for the system to be in.

There are two components recognized as the most important functional requirements for this project: Administrator Module and User Module.

3.4.1.1 ADMINISTRATOR MODULE

This component is an administrator module, which allows database/Web administrator to maintain information on the server and also make continuous improvement. The administrator module has the following sub-modules. These sub-modules are ***Authentication and Authorization, Add New Administrator, Database Maintenance and Guest Book Maintenance***.

i. **Authentication and Authorization**

Only the administrator will be allowed to access this section by providing a password.

ii. **Add New Administrator**

This module will allow adding in new administrator or deleting existing administrator.

iii. **Database Maintenance**

This section will allow the administrator to maintain the information in the database.

iv. **Guest Book Maintenance**

This module will allow the administrator to receive the feedback and reply the user.

3.4.1.2 USER MODULE

This component consists of several sub-modules to provide all functions needed to enable users at home to search information related to recipe. These sub-modules are ***Information, Search Recipe and Guest Book***.

i. Information

This module allows user to browse through the information about the recipe including the history of Chinese food, introduction of chopstick, calorie chart and Chinese restaurants.

ii. Search Recipe

This module allows the users to search or request for a particular recipe or ingredient. Users only need to type in keywords in the search engine and all the recipes that matching the keyword will be listed out.

iii. Guest Book

In this module, users are allowed to post comments, problem or suggestion on the performance of this Internet application by signing on the Guest Book form of the Web site. To send the comments, user has to complete a form and submit it. User also can view the comments regard to E-Recipes in the same page.

3.4.2 NON-FUNCTIONAL REQUIREMENT

It relates to modules that will not have effect on the system in order to operate and produce the required output.

3.4.2.1 User Interface

A standard user interface across all Web pages refers to the consistency usage of color, font size, position of text, graphics and also functional menus. It helps users and business get the information they need in and out of the system by addressing user interface objectives, which also results in being a user-friendly Web site to user.

3.4.2.2 User-friendliness

Building a good flow of navigation can help users to be able to understand with little effort or at ease about what is going on as users navigate through hyperlinks and procedure steps.

3.4.2.3 Response Time

All desirable information should be available to users at any point of time. The requirement for up-to-date or timely information is also important.

3.4.2.4 Reliability

A system is considered reliable if it does not produce dangerous or costly failures when used in ways that the designer might not expect it to be used and the system must be able to handle these situations.

3.4.2.5 Accuracy

Accuracy refers to the precision of the information provided. It provides various accuracy measures to maintain the accuracy of the information.

3.4.2.6 Maintainability

Maintainability can be defined as the ease with which software can be understood, corrected, adapted or enhanced in the future.

3.4.2.7 Modularity

The working of the system was broken into modules so that distinct functions of E-Recipes could be isolated from one another. This characteristic makes testing and maintenance much easier. Modular approach will lead to easy modification in the future.

3.5 DATABASE CONSIDERATION

3.5.1 RELATIONAL DATABASE

A database containing tables with the same column (field) in two or more tables is a relational database.

A basic example could be a database containing information of a company's sales details. A separate customers and sales tables would exist, each customer would be given a unique id, this customer_id column would be present in both tables.

The fact that relationships exist between columns in the database makes it a relational database [26].

Two DBMS were analyzed in this session.

3.5.2 MICROSOFT ACCESS

Microsoft Access is a desktop DBMS. The first version of this product was brought out by Microsoft in 1990. Since that time this DBMS has come to dominate the desktop DBMS market. Access forms an important element of Microsoft's Office suite of products.

Microsoft Access is a DBMS designed for use on personal computers. Access provides facilities for creating tables, queries, forms and reports. Database applications can be created using the Microsoft Access Macro language or the Microsoft Visual Basic for application language. Access can be run as a standalone system on a PC or as a multi-user system across a network of PCs. However, when used as a multi-user environment, Access suffers from some key limitations. For instance, it lacks a fully formed method of transaction management as available in such systems as Oracle, it has key limitations in terms of the volume of information it can manage satisfactorarily and suffers from the lack of certain

constructs essential for good database administration such as a system catalog. For these reasons, Access tends to be used mainly for low-volume, small to medium complexity systems with a defined set of no more than 20 users. When applications grow beyond these levels then many organizations prefer to use Microsoft's enterprise level DBMS, SQL Server, often in association with Access front-ends.

The facilities of Access can be divided into two groups: those devoted to data management (the database kernel), and those devoted to application development (the database toolkit). Access has proven popular as a rapid application development tool. Its ability to construct both database schemas and application components such as data entry screens quickly makes it an effective tool for prototyping information systems. In many projects, Access is used to build early versions of systems as a means of encouraging organizational learning. Once requirements have stabilized systems are then frequently upsized onto Microsoft's enterprise level DBMS, SQL Server, or Access is used as a front-end to other 'industrial-strength' DBMS such as Oracle.

Microsoft Access also provides a number of so-called Wizards – facilities which enable the user to quickly create standard database system objects such as tables, forms and queries [13].

Benefits

Features such as the Help Wizard make it easy to find answers to questions about using Access, and help users get the most from their software tools.

Standard Features

- **Database Wizard**

  It automatically builds tables, queries, forms and reports.

- **Simple Query Wizard**

  This feature sorts through database information, including data from multiple tables, and then determines how to bring it all together to answer your questions.

- **Hyperlink Data Type**

  It supports the storage of hyperlinks as a native data type.

- **Publish to the Web Wizard**

  This feature allows users to publish any object in the database either statically or dynamically. It also allows users to save settings used to output the objects.

- **HTML Importing and Linking**

  Users can point to an HTML document containing a table of data and the Import/Export Wizard reads the information and either imports it directly into a new table or appends the records to an existing table.

- **Image Control**

  An image control provides a simple way to include graphical information on forms or reports and improves the display performance of the image.

3.5.3 MICROSOFT SQL SERVER 7.0

The previous version of SQL Server is version 6.5 and it runs only on Windows NT Server. Version 7.0 is now out and is a complete rewrite. It is a much more significant upgrade than the mere 0.5 increment would suggest. It is also far more scalable than the previous version; not only will it run on large, enterprise level, NT Server systems but it can also be run on a stand-alone (non-networked) laptop computer running Windows 95/98 as well as on everything else in-between.

SQL Server 7.0 is structured on several design philosophies that offer more intuitive data management, eliminate or dramatically reduce thresholds and limits, and improve database performance. Most changes such as auto-configuration, self-tuning, auto-upgrade statistics, improved statistic generation, and query plan auto-recompilation are automatic. SQL Server 7.0 is a scalable, reliable, flexible and high-performance database management system. It allows the use of a large and complex database, and will handle large volumes of traffic. Microsoft recommends the use of SQL server for high traffic sites with processor intensive queries. It is capable of supporting thousands of concurrent users, processing millions of transaction per day.

Ms SQL Server is a suitable database engine for powering Web site. Combined with Microsoft Internet Server and the SQL Server Internet Connecter, customers have complete Internet database publishing capabilities. It supports for heterogeneous replication to non-SQL Server databases including Microsoft

Access, ORACLE and so on. SQL Server's replication uses ODBC as the connection mechanism.

It's new assistant called Microsoft Management Console (MMC), which is the replacement for Enterprise manager in version 6.5. MMC gives you the administrative access your need for your server. The MMC is also the new standard interface for all Microsoft server applications. The Enterprise Manager is now a snap-in to the MMC, which can also allow you to administer your NT, IIS and MTS applications as well. Besides, it also has recursive triggers and this new feature lets you manage more than one update to a given column. You can use recursive triggers when an update trigger would make a change that would in turn fire another trigger [10].

Benefit of Standard Features

- **Self-management**

  SQL Server 7.0 can automatically configure its memory usage, grow and shrink disk space usage, and repair itself. You can let SQL Server control memory usage, locks, connections, open objects, and so forth, or configure them yourself.

- **Maintenance**

  The SQL Server 7.0 DBCC command is dramatically faster, replaces the NEWALLOC option, and can actually repair data. In addition, SQL Server

7.0 incorporates a *fast failure* philosophy, where it's considered better to fail and repair as soon as an error occurs, rather than leave corruption in the database. Accordingly, SQL Server can automatically detect and repair some errors that would have crashed SQL Servers before.

- **Security and Backup**

  SQL Server 7.0 security is much more integrated with Windows NT. Database roles replace groups, and fixed server roles can be used to delegate system administrator (sa) tasks. SQL Server 7.0 now uses the industry-standard *fuzzy backup* strategy, which makes backups much faster and makes possible a new differential database backup option.

- **The Storage Engine**

  The larger page size of 8K seems to have had a ripple effect throughout SQL Server 7.0's storage structures. Extents are now 64K (eight pages), and a single row in a page can occupy 8,060 bytes, up from 1,962 bytes in prior releases. Character and binary columns can extend to 8,000 bytes, up from 255. Row locking is default in SQL Server, and SQL Server will automatically escalate to page or table locking depending on its analysis of the query.

- **Stored Procedures**

  Compilation of stored procedures in SQL Server 7.0 delays resolving the names of objects in a stored procedure until runtime (called *delayed name*

resolution), so you can compile stored procedures that reference objects such as tables and other stored procedures that don't yet exist [27].

3.5.4 SUMMARY

Ms Access is used in this project because it integrates data from spreadsheets and other databases, and is the easy way to find answer, share information over Intranets and the Internet. This relational database tool can be integrated easily with Ms Frontpage 2000. Many simple and user-friendly features in building tables, queries and forms that can be customized to suit project needs.

3.6 SERVERS CONSIDERATION

3.6.1 WINDOWS NT SERVER 4.0

Windows NT Server is an ideal platform for building custom applications because it contains strong Web services with Internet Information Server 4.0 (IIS services). It provides an open, flexible environment for implementing powerful, highly customizable applications that share interfaces and other common elements that make them work together.

Windows NT Server also provides an outstanding platform for a wide range of services and applications and to be a superb, high-performance, high availability network operating system. It also includes features designed to make it easier to install, use and manage than ever before. It is the cornerstone of Microsoft's commitment to reducing customer's "total cost of ownership" because it greatly simplifies the tasks associated with managing your network environment.

Windows NT Server offers a complete set of utilities for server administration. Administrative wizards give a single pane view of eight commonly used administrative functions, allowing for centralized administration of common server and directory services tasks.

Microsoft continues to develop Windows NT Server. Enhancements in Microsoft® Windows® 2000 Server will include the Active Directory, a new directory service that unifies the access and management of network and operating system