A PROTOTYPE PORTAL FOR WORLDWIDE CHURCH OF GOD, MALAYSIA

BY

ROGINIDEVI A/P VENGGUMANY

(WEK 990107)

UNDER SUPERVISION

PROF. MAYDA. DR. P. SELLAPPAN

Faculty of Computer Science and Information Technology,

University of Malaya

MODERATOR

MR.CHIEW THIAM KIAN

Faculty of Computer Science and Information Technology,

University of Malaya

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Chapter 3: System Analysis & Methodology

Chapter 4: System Design

Chapter 5: System Implementation

Chapter 6: System Testing

ABSTRACT

With the tremendous growth of the Internet and the expansion of the Internet and the expansion of the World Wide Web, more and more facility and information is being put on the Internet. The Internet create a global communication that break the barrier of time, place and distance within which conducts a Prototype Portal for Worldwide Church of God, Malaysia. A Prototype Portal for WCG, Malaysia is a system that allows worldwide people to create their own community through the Internet for there propose like communicate to each other or sharing information. This thesis describe the system that allows Internet user sharing information, news, idea at anywhere at anytime through the Internet.

A Prototype Portal for Worldwide Church of God, Malaysia has several modules. Structure diagram used to show an overall subsystem of the project. Besides, this project will review the method, technologies and development tools (like waterfall model with prototyping, using ASP on widows 2000 platform, the web server with back-end database – Microsoft SQL Server 7.0) that are used to set up this system. At the end, this project will implement the entire requirement into a real system and analysis the strengths and weakness of the system. It is hope that the major problems faced by current system can be solved through this project.

ACKNOWLEDGEMENT

First of all, I would like to express my warmest gratitude to my supervisor Prof. Madya Dr P.Sellappan who has given me invaluable guidance throughout this thesis. I sincerely direct this appreciation for his enormous concern, innumerable pieces of advice, patience and insightful criticism.

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INTRODUCTION

CHAPTER 1: INTRODUCTION

1.1 PROJECT OVERVIEW

Internet is a worldwide system of computer network. The most widely used part of the Internet is World Wide Web. By using the web, people can access to million of pages of information .One can navigate all across the collection of data and required information, with just a few clicks of your mouse.

A Prototype Portal for Worldwide Church of God, Malaysia is a web-based application for a Christian denomination that provides any group especially the Christian committee with the ability to interact online with their community and communicate with each other. This application is a homepage for churches in Malaysia, which can get information relative to their work, structure and services of church in Malaysia. This application allow user to share ideas and knowledge over the Internet. It also provided a suite of powerful tools that enable a community effectively get organized, communicate, gain knowledge and information instead of using traditional way conversation through telephone or meeting up people face to face.

In general, A Prototype Portal for Worldwide Church of God, Malaysia provide features as following:

- User can get information on history and background of their denomination, its statistics, belief and other information.

- User can get services provided like searching for specific church in Malaysia, participating online in activities conducted, booking church online for function or ceremonies, giving donations online, sending in prayer request and giving comments or questions.

- Administrator would be able to login online with password. They can edit, update, add new entry, delete and create information for the user.

- Youth can also access this web site to share stories and memories, search for activities/camp to participate, upcoming event, view birthday and calendar and view photo gallery

- Linking to other websites like college website for students, local or international church website, service centers, feedback, send email.

1.2 PROJECT OBJECTIVE

The main objective of a prototype portal for Worldwide Church of God, Malaysia is to allow user to: -

- Effectively share knowledge and information online in a secure environment.
- Easy to use and no programming skills are required and no software to download or install.
- Enable administrator to access the web page for edit, view, send, update, delete, reply message or information.
- Create or join interactive youth activities or participate in camping.
- New user would be familiar with the powerful tool.
- Provide nice and interactive user-friendly graphic user interface to make people get connected and communicate among each other in more attractive ways.
- To study and investigate into the current Web search engine architecture, developing tools, implementations and the road ahead.

1.3 PROJECT SCOPE

A Prototype Portal for Worldwide Church of God, Malaysia is a home page for churches in Malaysia. It is divided into database server, web server, and administration & client side. The database is stored in a database server and client can access the data through the web server, which will interact directly with the database and retrieve information.

It will cover the following areas:

- Implement a password protected website for authorize access for valid user.
- Valid user can browse through the website to add, create, edit, update and delete entry.
- Develop a database system to house all data pertaining to the system.
- The administrator can maintain the site anywhere either in the office or at home.
- User can search through database to retrieve information
- Send comment, feedback and email

Table 1: Details of the Subsystems in the Prototype Portal For WCG, Malaysia

1. Online Service System

Features	Descriptions
Search Church	Search for churches in Malaysia by entering the name, zip code or state or city, state or part of the church name
Search Activities	Searching for activities held in your church by entering the state or name of church and its activity type.

Online Booking	Booking churches for ceremonies like wedding, funeral and with discount prices for membership.
Donation	Donations from church member, association members, donors and supporters through credit card, direct debit and other facilities.
Comments & Questions	User giving comments and asking questions
Prayer Net	A place for those wishing to leave their prayer request, knowing the people around the world will be praying for you. You can even view the prayer list and become a prayer partner.

2. Administrative Site

Features	**Descriptions**
Registration	Administrators need to register to get login name and password
Login	Administrators login to access this site
Add new	Adding current news, youth article, information about event/activities organized, venue, date and other information
Update & delete	Update news, events information, camp, article and other information for the committee
Email Directory	Can view admin information with their email contact

3. Information Sharing System /Youth pages

Features	**Descriptions**
Activities/Camp	Getting information on activities or camp to be held in churches.
Share Stories/Memories	Sharing stories and memories online among friends and others would be able to see your story and you would be able to read

	their stories
Calendar/Birthday	Committee members/youth would be able to view birthday date of their friends/relatives or anybody as a reminder of their birthdays with a pop up calendar to choose the birthday date
Photo gallery	Here you can view photos of any functions or ceremony like camping or hi-tea photos
Pin board	User can view the message board from their church

4. Other Links

Features	**Descriptions**
College Link	Linking to colleges web sites for students
Church Link	Link to other church web sites in Malaysia
Service Center Link	Link to service centers in Malaysia like children and family care center
Feedback	Getting feedback from the user
Send Mail	User can send mail to anybody, view inbox with login email address
Home	The Homepage
About Us	The background, history, belief, statistics and contact

A Prototype Portal for Worldwide Church of God, Malaysia is divided into 4 main subsystems

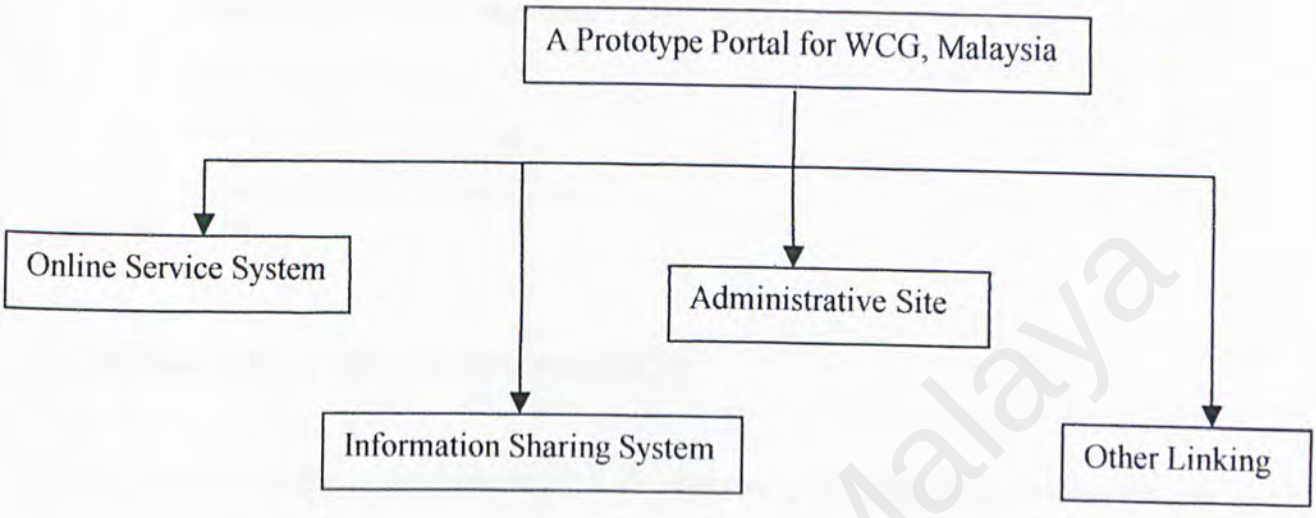


Figure 1: Subsystem for Prototype portal for WCG, Malaysia

1.4 PROJECT LIMITATIONS

Due to enormous features that a virtual community might comprise, therefore there will be certain features and aspects that will not be included in this project. They would be

- Features provide news and latest technologic information to community. Each community can select type of news and information in their community. This features required sponsor from others company.
- A video conferencing provide to community in order to get communicate more effectively. This features requires a high bandwidth Internet communication and is limited to current Internet technologies

1.5 TARGET AUDIENCE

- Youth or committee member who are interested and want to get closer with each other
- Christian Education committee
- Adult organization
- Social concern committee
- Worship & Music Committee

1.6 PROJECT PLAN AND METHODOLOGY

Having a project helps to implement the task effectively and efficiently. Moreover, we can meet the deadline of the project without hesitation. The following were the methods used for this project:

1.6.1 RESEARCH AND ANALYSIS

It has always been a wise way to create a good solution by looking around for existing ones. Learning from and then enhancing existing approach or method doesn't mean cheating. On the other hand, it helps to produce more quality solution. The research and development of this system will be in progress throughout two semesters.

1.6.2 BRAINSTORMING

To develop this system, I was not sure with what should the contents of my web site be? What to show, how and where to link? I do not want to just create a site and post it as my web site. The audience will judge the site on its contents, appearance, responsiveness and accessibility. Hence, brainstorming is important to define the contents of the web site. From surfing a few web sites and exchanging of ideas, emerged the site map, the contents

of the Prototype Portal for Worldwide Church of God, Malaysia. The site map became the structure for me to start programming the web pages.

Web – based system design is a new game to me. I need proper skills training to start my own. I embarked on basic learning and importantly am the 'technology transfer' through discussion with lecturer and friends that enables me to have a 'jump start'.

1.6.3 WATERFALL MODEL

In order to produce a system, that satisfies the needs of the end user, a development life cycle as shown in figure 1.2 is used in the development of Prototype Portal for Worldwide Church of God, Malaysia system. The waterfall model with prototyping is chosen as development methodology. This development life cycle consist of the 5 phases of required analysis, design, build, coding, testing and documentation.

The route of the development of this system starts at the phase of requirement analysis. This is the most important phase of the development life cycle. The requirement of the entire system are analyzed and specified to ensure that they fulfill the need of users requirement specifications.

After that, the development life cycle will come to the second phase, which is the software design. Software design is a process of devising and documentation the overall architecture for software system. It includes identifying the major component of the system, specifying what they are to accomplish and establishing the interfaces among the components.

Prototyping was used to verify the system requirement and system design. The next phase will be the coding phase where the design specification is translated into source codes that the computer can process. After the coding phase has been completed, a software system is put through the testing phase, before is can be released to the user.

Software testing embraces a wide range of activities that not only support the assessment of quality. At the last phase, various form of document are created and prepared at each development phase to guide users in understanding the concept and features inherent in the application.

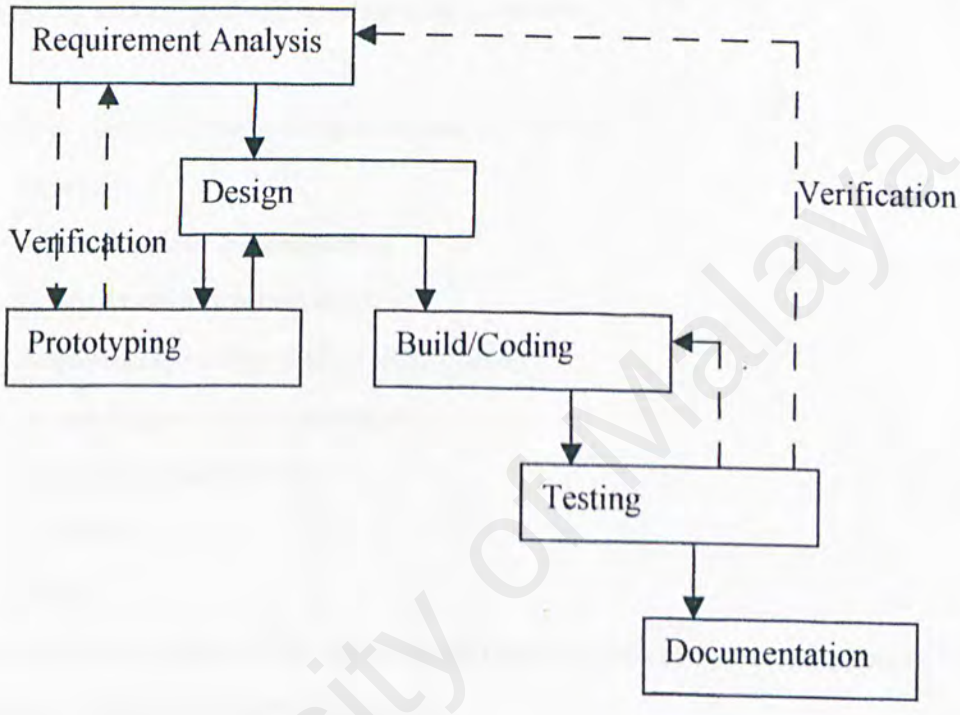


Figure 2: Project Development Methodology

1.7 PROJECT EXPECTED OUTCOME

The outcome of this project will be web-based system for Worldwide Church of God, Malaysia, where the program must show some improvements compared to the existing program. The system will be accessed via the web browser such as Internet Explorer and Netscape Navigator.

The expectations of this project are summarized as below:

- The system should contain 9 main section or linking
  - Home
  - About Us with 5 subsystems
  - Services with 6 subsystems
  - Administrative Site with 5 subsystems
  - Youth Pages with 5 subsystems
  - Link with 3 subsystems
  - Feedback
  - Email
- Simple and user friendly - the application must be easy to use and understandable for the user especially Internet beginner
- More attractive and interactive – besides having enough functions & features the graphic user interface must be nice and user friendly to increase the attractiveness
- Simple and clear instruction will be provided to guide user
- There would be a link to history and background of the organization
- Administrators can register for membership, update information, edit, create and add new entry.
- User can also give feedback regarding the organization
- Acceptable response time when user browse request web page from the web server.
- Data input errors will be checked and reported to user in a user-friendly manner.
- The database easily can be upsized to more capable system if the need for increased capabilities and functions arises in the future.

- Provide the potential for vastly improving the quality, quantity and effectiveness of shared information.
- Automation problem tracking and message box generation.
- Provide database maintenance and easy for enhancement
- Smooth and fast enough data transfer

1.8 RESEARCH CONDUCTED

In order to implement this web based system, research are conducted in the following areas:

- Existing web sites of the similar organization are explored.
- Web Application Development- Professional web application development strategies are studied. Latest technology are studied and compared in order to build a robust system.

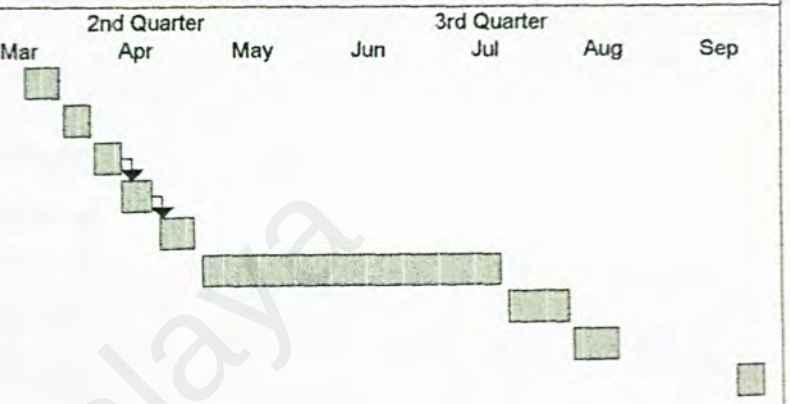
1.9 PROJECT SCHEDULE

A project is a planned undertaking of scheduled activities and its management to reach a goal. Since a project may involve extensive effort, it must be properly managed. Project management is the coordination of all aspects of the project so that it can be completed under the constraints defined. Since a Prototype Portal for Worldwide Church of God, Malaysia is a final year project, which need to be completed within a period of time. Planning is done to

- Define the goal
- Define and allocate resources
- Establish timetable, schedule work
- Track and monitoring project
- Report and document the project

Figure 1.3 show the schedule for the Prototype Portal for Worldwide Church of God, Malaysia development in order to meet the project milestone and systematic.

ID	Task Name	Duration	Start	Finish
1	Resource Searching and Reading	7 days	Mon 3/18/02	Tue 3/26/02
2	Project Proposal	5 days	Thu 3/28/02	Wed 4/3/02
3	Literature Review	5 days	Fri 4/5/02	Thu 4/11/02
4	System Analysis	6 days	Fri 4/12/02	Fri 4/19/02
5	System Design	7 days	Mon 4/22/02	Tue 4/30/02
6	Servers Installation, Database setup and Coding	56 days	Fri 5/3/02	Fri 7/19/02
7	System Implementation and Testing	12 days	Mon 7/22/02	Tue 8/6/02
8	System Evaluation	8 days	Thu 8/8/02	Mon 8/19/02
9	Report Writing	5 days	Fri 9/20/02	Thu 9/26/02



Project Schedule for WCG,Malaysia
Date: 30/4/2002

Task
Split
Progress
Milestone
Summary
Project Summary
External Tasks
External Milestone
Deadline

Figure 3 :Project Schedule for A Prototype ortal for WCG, Malaysia

LITERATURE REVIEW

CHAPTER 2: LITERATURE REVIEW

2.1 WHY IT IS IMPORTANT?

A literature review of a project is important as it places the project 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 also help the developer to choose the right tool to develop the system.

2.2 INFORMATION SOURCES

Fact-finding techniques are important to determine the right requirement for the project. A few research criteria have been set as the base to obtain all the necessary information For this system a set of criteria is laid out so that the amount of information obtained would not get out of hand and would always stay on track with the project. As a result, the following research techniques have been chosen.

Research and Site visits - Analyze the systems on the web. A study on the attractiveness of the interfaces was done. This technique helps to determine the appropriate software and architecture that is needed to build the system.

Reading- Information was gathered through search for reference material in the library regarding to web technologies and development tools. Besides, study on similar work of senior in the FSKTM – document room is done to learn the tools concept, approach and methodologies they used. Purchasing and borrowing reference material from course mates.

Internet Surfing- Internet is used in order to get the latest news and information regarding current virtual system and web technologies. Study on existence system in the market take a combination of ideas and information obtained to build the system.

Inquiries- made direct inquires to friends who are already experienced with the web for advice and guidance regarding the system.

Reference Books - The main areas of interest are books on Developing Web sites and also books on Human Computer Interaction.

2.3 DEFINITION OF THE SYSTEM

A Prototype Portal for WCG, Malaysia, also called web community system is a gathering place for the Christians that do not have physical existence. Its vision is to enrich, establish, equip and extend believers for effective Christian living and ministry through cell communities. In general, WCG, Malaysia is also to establish integrated ministries of evangelism, service and missions, which encompass Malaysia and the nation of the world community of people sharing interest, ideas, memories and feelings over the Internet. Besides, it can be defined as service provider to the community like searching online for activities and church throughout Malaysia, online donation and booking church and many more services.

A Prototype Portal for WCG, Malaysia is a web based application that provide as group of people with the ability to establish their own private interactive online community and communication, share knowledge, exchange information over the Internet.

2.4 TRADITIONAL WAY OF COMMUNICATION & SHARING INFORMATION

In traditional ways, people get to communicate and work together exclusively a face-to-face act or a simple chat over the phone. People talk to each other face to face to exchange information, share their ideas and get to know among each other. Besides, people also can have simple chat over the telephone to reach their goal. This is not a effective ways when people are distributed at a different place and want to get communicate and share information among each other. For example, somebody wants to share and discuss a document with his friend who is located very far from him. In traditional ways, we can travel to his friend's house and give the document or we can send the document through post services and discuss through telephone. This process wills take a long time to reach his goal. Clearly this is not an effective way for people to get communicate and work together. So, a more effective way has been carried out to overcome this problem and that is by developing a web-based system.

2.5 THE MOVE TO VIRTUAL CHURCH

With the emergence of the Internet as an international public utility that is sustainable virtual church become viable. Due to the client server architecture become widely used, people are moving from traditional way of conversation and communication, a face-to-face act or a simple chat over the telephone to a more effective ways. There is software called " Groupware " design to be used by group of people sharing information and working together in a different place. Groupware become the first step moving from traditional way to virtual church.

2.5.1 INTRODUCTION TO GROUPWARE

Groupware is a software design to be used by groups of people sharing information and working together. It allows a group of people used the same information, but often in different way depending on their particular needs. Today, groupware provide organization with the means to store, access and use critical communications and information. Groupware has defines itself apart from email package as an application platform for collaborative computing. The major groupware products in the industry today are Novell Groupware, Lotus Note and Microsoft Exchange.

Types of Groupware Information

The kind of information that enterprise typically place within a Groupware application falls into three categories.

- Discussion database for hosting conversation threads on particular topic
- Standard database application those are typically included within the Groupware package, which provide forum for basic document management, project management and policies and procedures.
- Custom database application for more specific and sophisticated purpose such as cash and budget management risk analysis and transaction review application.

2.6 EVOLUTION OF GROUPWARE TO WCG, MALAYSIA

Today, the Internet is a public, cooperative system, sustaining facility accessible to hundreds of millions of people worldwide. The World Wide Web becomes an easy to use in Internet Services to popularize his or her form of computer base network communication for a mass audience. Due to the cost of groupware and maintenance fees is very expensive, web based virtual church, called A Prototype Portal for Worldwide Church of God, Malaysia, and was been carried out. A Prototype Portal for WCG, Malaysia system is a web based application that provides Christians with the ability to establish their own private, interactive online community and communication, exchange information, share ideas and uses services provided over the Internet. User no need to install any software and can direct access through a web browser with an Internet communication. Besides, it is over platform, which means, user can access in any platform such as Ms Windows, Linux or Unix.

2.7 STUDIES ON EXISTING SYSTEM

2.7.1 Analysis on "Worldwide Church of God, Malaysia"[8]

URL: www.wcg.org

Advantages of this system

This is a web site for churches in Worldwide. Here user can access to 900 congregations worldwide and user can access many side to retrieve information. This web site has links to other international church web site and it has more linking to other side like worldwide news, events, donate and other side. A survey was made on functionality, interaction and also user-friendly flow of navigation on these web sites. From research, I found out that some of these sites implement very complex features on their system design. Some sites give a clear view on their system flow and their user interfaces are user-friendly.

2.7.2 Analysis on "Seventh-day Adventist Church in Canada"[9]

URL: http://www.sdacc.org/

Advantages of this system

This is a web site build for church in Canada. It will provide fast, easy access to the information you desire. This web site has linking to side like history, belief, staff email, feedback and all information that are related to church. You can even ask question regarding the web site. The routing to the specified page is short. User has to make a few clicks in order to enter the needed page. On interaction area, these web sites are user-friendly, as some of them do not produce any error reporting. It also has less graphic, which makes downloading time shorter.

2.8 INTERNET

The Internet, sometimes called simply " the Net, " is a worldwide system of computer networks- a networks of networks in which users at any one computer can, if they have permission, get information from any other computer (and sometimes talk directly to users at other computers). It was conceived by the Advanced Research Projects Agency (ARPA) of the US government in 1969 and was first known as the ARPANet. The original aim was to create a network that would allow users of the research computer at one university to be able to "talk to" research computers at other universities. A side benefit of ARPAnet's design was that, because messages could be routed or rerouted in more than one direction, the network could continue to function even if parts were destroyed in the event of military attack or other disaster.

Today, the Internet is a public, cooperative and self-sustaining facility accessible to hundreds of millions of people worldwide. Physically, the Internet uses apportion of the total resources of the currently existing public telecommunication networks. Technically, what distinguishes the Internet is its use of a set of protocols called TCP/IP (Transmission Control Protocol/Internet Protocol). Two recent adaptations of Internet technology, the intranet and the extranet, also make use of the TCP/IP protocol.

For many Internet users, electronic mail (email) has practically replaced the Postal Service for short written transactions. Electronic mail is the most widely used application on the Net. You can also carry on live "conversations" with other computer users, using IRC (Internet relay Chat). More recently, Internet telephony hardware and software allows real- time voice conversations.

The most widely used part of the Internet is the World Wide Web (WWW or also called "the Web"). Its outstanding feature is hypertext, a method of instant cross-referencing. In most web sites, certain words or phrases appear in text of a different color that the rest; often this text is underlined. When you select one of these words or phrases, you will be transferred to the site or page that is relevant to this word or phrase. Sometimes there are

buttons, images, or portions of images that are "click able". If you move the pointer over a spot on a web site and the pointer changes into a hand, this indicates that you can click and be transferred to another site.

Using the web, you have the access to millions of pages of information. Web 'surfing" is done with the web browser, the most popular of which are Netscape Navigator and Microsoft Internet Explorer. The appearance of a particular web site may vary slightly depending on the browser you use. Also, later versions of a particular browser are able to render more "bells and whistles" such as animation, virtual reality, sound and music files, than earlier versions.

2.9 WEB DATABASE

2.9.1 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 systems, however, access to web database typically in 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 development using standard 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 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 applications can incorporate information pulled from a database for use as part of larger application. The capability to integrate database into applications that can be accessed by users utilizing a web browser what makes a database a web database.

2.9.2 WEB DATABASE APPLICATION DESIGN ISSUES

When you design a web site, you are likely to encounter a 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 are expected and the composition of the development staff.

Designing a web based 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 users 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 the user and possibly cause him or her not to use your web site. Therefore, you may need to use a renormalized 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 renormalize your design, you may increase the physical size of your database, and this can increase the time frame required to back up your database. The longer it takes to back up 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 language.

2.10 OVERVIEW OF WEB-RELATED TECHNOLOGIES

2.10.1 CLIENT/SERVER COMPUTING

Client/Server describes the relationship between two-computer programs in which one program, the client, makes a service request from another program, the server, which fulfills the request. [1] When user connected to the Internet, user's computer becomes a web client in a worldwide client/server network. User's web browser software- Internet Explorer or Netscape Navigator, for example is the software that makes user's computer works as a web client. Client/ server architecture may be used on LANs, WANs and on the web. In each case, the client computers typically request service, including printing, information retrieval and database access. The partner in these activities is the server, which is responsible for processing the client's request.

The division of labor between web client and web servers is quite distinct. The web client, computer at the office or at home, request information from a particular web server on a distant computer. Using the Internet as transportation medium, the request is formulated into HTTP request and sends to the target computer, the server. A moment later, when the target server receives the request, it retrieves the page or other information that the server requested, formulates it as an HTML formatted page and send it back to the requested client via the Internet. When the requested information, an HTML page in this instance, arrives at the client computer, the web browser. Software determines that the information is an HTML page. It display s the page on the client machine according to the direction laid out in the page's HTML side. [2]

2.10.2 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 1.4 shows the architecture of a web solution.

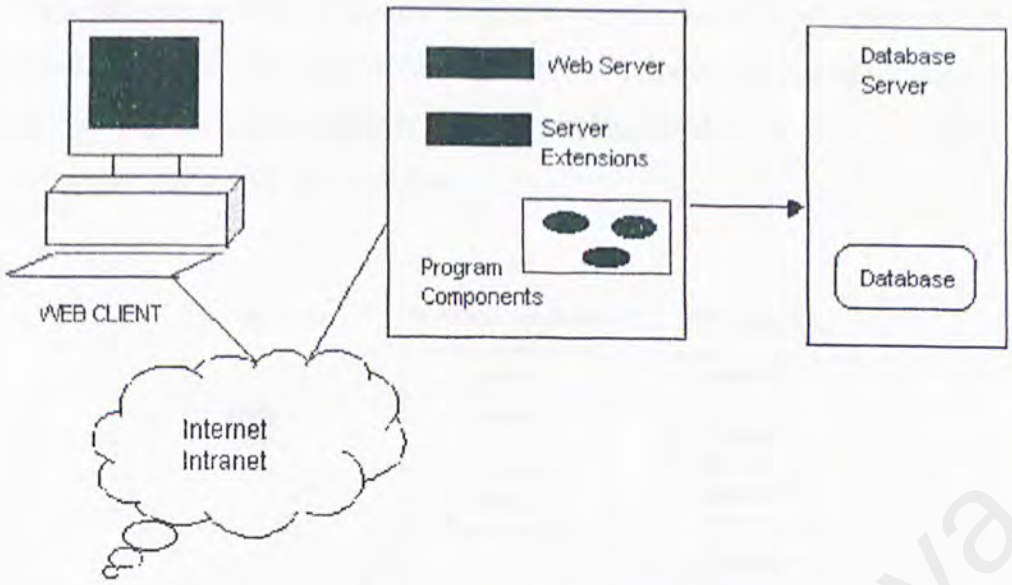


Figure 4: Architecture of a Web Solution

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

2.10.3 WEB SITE DEVELOPMENT MODELS

2.10.3.1 THE SERVICES MODEL

Web designing a web site, we can use a service – based application model. The term service- based means that the functionality of an application is specifies as collection 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. 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 rule 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. Example of data services include create, read, update and delete, which are used to know where data is located, how it is implemented, or how it is accessed. These tasks are handled by data services.

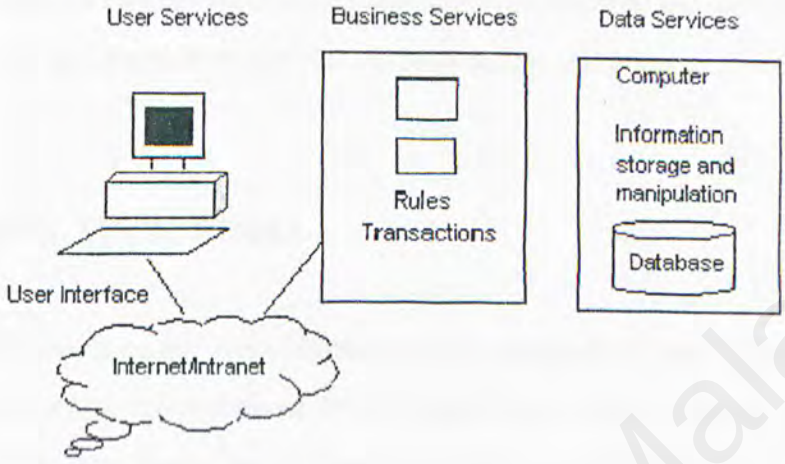


Figure 5: Services Model

Figure 1.5 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 deployment. 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.

2.10.3.2 APPLICATION MODEL

Over the past few decades, the architecture of applications, especially 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, business and data service tiers. The concept of tier emphasizes the logical segmentation of the services, and is neither 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. It may communicate with a database, but that database resides on the same computer. The key point about a single – tier application is that all three services-user, business and data are architecturally combined into a single program. Figure 1.6 shows the single-tier applications.

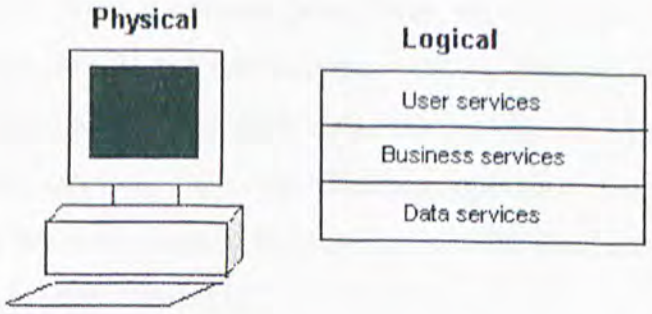


Figure 6: Shows the single-tier applications

- Two- Tier Client/Server Applications

A two-tier client/ server model involves only a client and server. All communication takes place between the client on the Internet and the target server at the other end. Of course, other computer are involved in the process of transporting packets of information across the Internet. Those details are part of the transportation facilities that is handled by TCP/IP. The conversation that occurs between a web browser and a web server is similar to any conversation between client and server generally. [2]

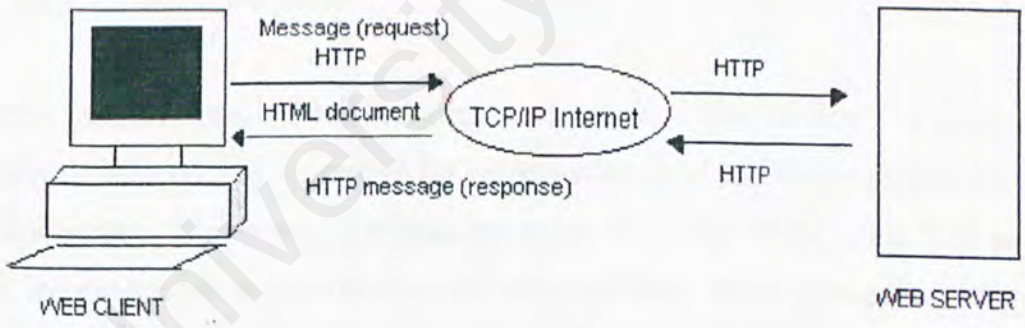


Figure 7: Message flow in two-tier client/server architecture

- Three – Tier Client/Server Applications

Three – tier client/ server architecture builds on the traditional two-tier approach. The first tier is the client, the second tier is the web server and the third tier consists of applications and their associated databases that supply non-HTML information to the

web server on request. From a software perspective, the three tiers and client processes (tier 1), web services (tier 2) and data services (tier 3). Interaction between client and server operate the same was as they do in a two tier architecture. The third tier provides comprehensive data services, including database operation supported by database software, enterprise resource planning soft services and the other services need to support a robust electronic commerce server.[2]

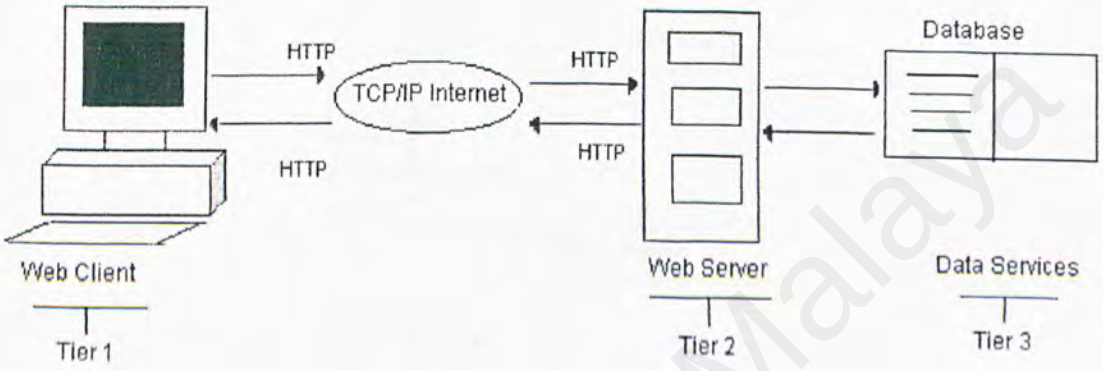


Figure 8: Message flow in three-tier client/server architecture

- Web- Based Applications

Web- based applications, by their browser/server nature, follow the two – or n-tier model. The applications 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.

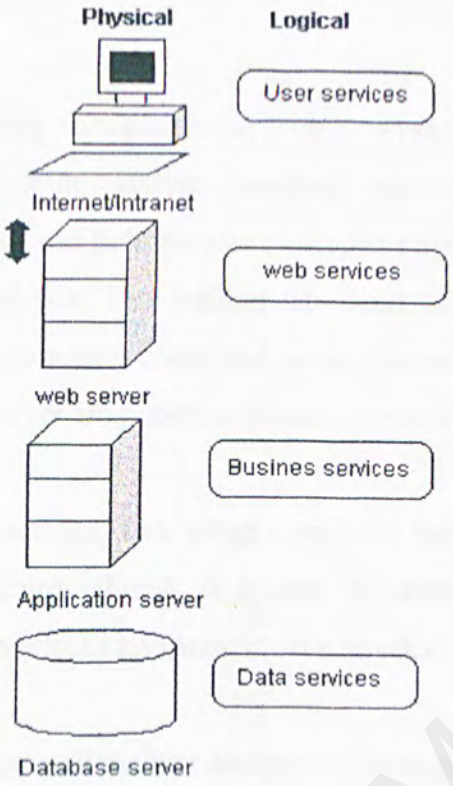


Figure 9: Shows the web- based applications

2.11 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 computer connected to the Internet directly (termed hosts0 or indirectly through 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 type of security threats is system modifications attacks, invasion of privacy attacks, misdirection attacks and antagonistic attacks.

The 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 download dynamic content does not endanger the user. Client comp ability is an important security concern, especially in a heterogeneous client environment such as the web. For example, although basic (plain text) authentication is not a secure as the windows NT Server Challenge- Response (NT/CR) mechanism, the former is supported by all commercial Internet browser, whereas NT/CR is currently supported only by Internet Explorer.

- Server issues

For the server, the most important security concern are to determine who can access you web site, what files a user can access and what type of access right- read, write or execute.

- Shared issues

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

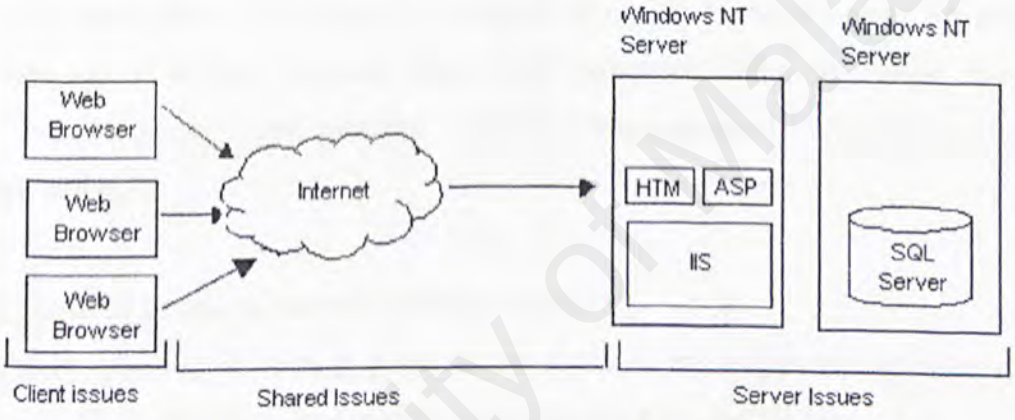


Figure 10: Architecture of a web site and Highlights important security issues

When designing a web – based solution using Microsoft tools, we can implement security using existing security features of both server and client products. Microsoft client and server security technologies comprise an extensible security model upon which we can build our solution.

Microsoft Client Solutions

Microsoft Internet explorer relies on a number of security technologies to protect the client from malicious attacks.

- The Internet Options dialog box in Internet Explorer allows the user to set the security level for Java applets, ActiveX controls, cookies, scripts, Certificate

Authorities (CAs) and other entities. With the Internet Explorer Administrator's Kit (IEAK), these options can be set during installation.

- The ActiveX Scripting architecture of Internet Explorer allows only safe embedded scripts to be executed from within a web page.

Microsoft Server Solutions

Every Microsoft server product has built – in access security that is integrated with Windows NT Server's Access Control Security. If satisfies two requirements

- Verification of user identity (authentication)

All users must have a Windows NT account to log on to the network. An account consists of a unique account name and password. This is called the NT Challenge/Response logon protocol. The User Manager tool is used to set users, groups and rights.

- Controlled access to resources (authorization)

Each user or group of users is given access rights to the computer's resources. The Windows NT Explorer is used to set access rights to files and folders.

Shared Solution

In addition, Microsoft Internet products support the Windows NT security model and extend it in the following ways:

- Inter Information Server (IIS) also allows anonymous and basic text log on of Internet users. The Internet Service Manager tool can be used to set security options for the web server.
- IIS and Internet Explorer support the Secure Sockets (SSL) 3.0. Private Communications Technology (PCT) 1.0 and Secure Electronic Transaction (SET) protocols for private point- to – point communication.

2.12 DATA ACCESS TECHNOLOGIES

It's not unusual these days to find businesses or organizations that want to access database, mail, directory, telephony, exotic, legacy data or Internet content- all from the same application or system. The problem is that each of these data access interface – if an interface exists at all, some require API access, others can access 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.

2.12.1 UNIVERSAL DATA ACCESS

Microsoft Universal Data Access is a platform for developing multi-tier enterprise applications that access diverse relational or non- relational data sources across intranets or the Internet. Universal Data Access consists of a collection of software components that interact with each other using a common set of system-level interfaces defined by OLE DB.

The key technologies of Universal Data Access are ADO and OLE DB. Any data access technology must be reliable, fast and it must have broad support for all kinds of data. Universal Data Access was designed to be all of this and more. So, why move from ODBC? The reason is that ADO and OLE DB after much more, both in terms of functionality and in terms of supported data sources. Through Universal Data Access, you can access to data you couldn't access in the past and maybe some data stores you're never even considered.

2.12.1.1 OLE DB

OLE DB is a Microsoft system – level programming interface to diverse data source. OLE DB specifies a set of Microsoft Component Object Model (COM) interfaces that

contain database management system services. These interfaces enable you to create software components that implement the Universal Data Access platform.

2.12.1.2 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 database 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.

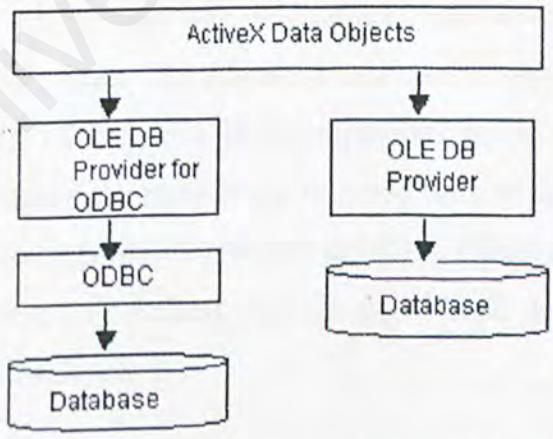


Figure 11: How ADO communicates with database

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 Record Set definition then does RDS. RDS, on the other hand, allows for a client-side cached data session. The help eliminate network overhead and allows control data binding.

2.12.1.3 REMOTE DATA SERVICES (RDS)

Remote Data Services (previously knows as Advanced Data Connector) is a set of controls that enable a web page to dynamically update itself with information from a database server. When a web page containing RDS control is retrieved, the advanced data control object, which is the client side control for the RDS, is downloaded and installed on the client. The advanced data control is visible and does not display on the page. In the Internet Explorer 4.0, HTML elements such as table, a span of text or and ActiveX Control can be used to communicate with the advanced control object to display data on the web page.

When the user submits a query on a web page on the client side script assign the query to the advanced data control object. The advanced data control object sends the query to the web server through and HTTP request. RDS components run the query on the web server. When the request is finished the records are returned back to the advanced data control object through HTTP. The records are encoded in MIME format to return data efficiently. As the records are received on the client, they are stored in the data cache, which exists as long as the web page is displayed.

2.12.2 OPEN DATABASE CONNECTIVITY (ODBC)

Open Database Connectivity (ODBC) is an Application Programming Interface (API) that allows a programmer to abstract a program from a database. When writing code to interact with a database, you usually have to add code that talks to a particular database using a proprietary language. If you want your program to talk to an Access, Fox and Oracle databases you have to code your program with three different database languages. This can be quite the daunting task causing much grief.

When programming to interact with ODBC you only need to talk the ODBC language (a combination of ODBC API function calls and the SQL language). The ODBC Manager will figure out how to contend with the type of database you are targeting. Regardless of the database type you are using, all of yours calls will be to the ODBC API. All that you need to do is have installed an ODBC driver that is specific to the type of database you will be using.

2.13 CONCLUSION

There are various issues that need to be taken into considerations during the initial step to develop a successful web application. After the survey, Worldwide Church of God, Malaysia should be able to integrate security features in its implementation. In addition, to develop a good web application, an understanding of the web-based client-server architecture is essential. A Prototype Portal For WCG, Malaysia will be implemented by using the three-tier system architecture as it is proven to be a successful architecture for much commercial web application.

SYSTEM ANALYSIS & METHODOLOGY

CHAPTER 3: SYSTEM ANALYSIS & METHODOLOGY

In order to get an overview of the system requirements of A Prototype Portal For WCG, Malaysia, and an extensive analysis is needed. This analysis intends to ascertain the functional and non-functional requirement of A Prototype Portal For Worldwide Church of God, Malaysia. These analyses also bring out consideration of the development tools and determine the methodology to use. Creating a process model (methodology) helps to find inconsistencies, redundancies and omissions in the process and in its constituent parts. A good methodology will be useful to see how the organizing process activities can make development more effective. This chapter will discuss the methodology used for the thesis project and the requirements analysis.

3.1 SYSTEM METHODOLOGY

A hybrid model consists of Waterfall Model and Prototyping, called Waterfall Model with Prototyping, has been chosen as Worldwide Church of God, Malaysia system process model. After refining the Waterfall model and Prototyping model to suit this project, justification has been done. This has shown in Figure 12. [3]

Requirement Analysis

Requirement Analysis is the first phase of this methodology. In this phase, all the information about this project is gathered. Information will be gathered through Internet and reading material such as books, magazines, journals and newspapers. This stage include analyzing the problem at hand and concludes with a complete specification of the desired external behavior of the system to be built, also called functional description, functional requirement and specifications by others

System Design

System Design is the next phase for this methodology. This stage decomposes the software system into its actual constituent (architectural) components and then iteratively decomposes those components into smaller and smaller subcomponents until the subcomponents located at the leaves of the resulting design tree which are small enough so that we would expect a person to be able to get his or her arms around it easily. It is also involve drafting out data flow diagram that resembles the functionality of the system and its subsystems. Prototyping is used in this phase together with the Waterfall model to reduce the uncertainty about what the system should do. Prototyping is therefore a means of requirement validation that lets the developers discover requirements errors or omission early in the process.

Program Design

Defines and documents algorithms for each module in the design tree that will be realized as code; also called detail design by other.

Coding

Transform algorithm defines during the detailed design stage into a computer understandable language. This is usually performed in 2 steps:
Converting the algorithm into high-level language (usually performed by people) and also converting the high- level programming into a machine language (usually performed automatically by a compiler); also called programming.

Unit & Integration Testing

Checks each coded module for the presence of bugs. Unit & integration testing purpose is to ensure that each as built module behaves according to its specification defined during detailed design. This stage also will interconnect sets of previously tested modules to ensure that the sets behave as well as they did as independently tested modules. Ideally each set of modules should correspond to a component is the design tree defines during unit testing.

System Testing

System Testing will checks that the entire system embedded in its actual hardware environment behave according to system requirements. During this phase, validation is done to ensure that the system has implemented all of the requirements, so that each system function can be traced back to particular requirements in the specifications. Besides, system testing phase also verify the requirements, ensures that each function works correctly.

Operation and Maintenance

The last phase of this methodology is the operation and maintenance. The system is installed and put into use. Maintenance involve fixing error, which are not discovered in the earlier stages of the life cycle, improving the implementation of the system units and enhancing the system's functionalists as new requirements are discovered. The maintenance process is actually a full development life cycle, if a coding change is made, then the design, coding and three testing stage must be performed. If a requirement change has occurred, then all the stages must be performed.

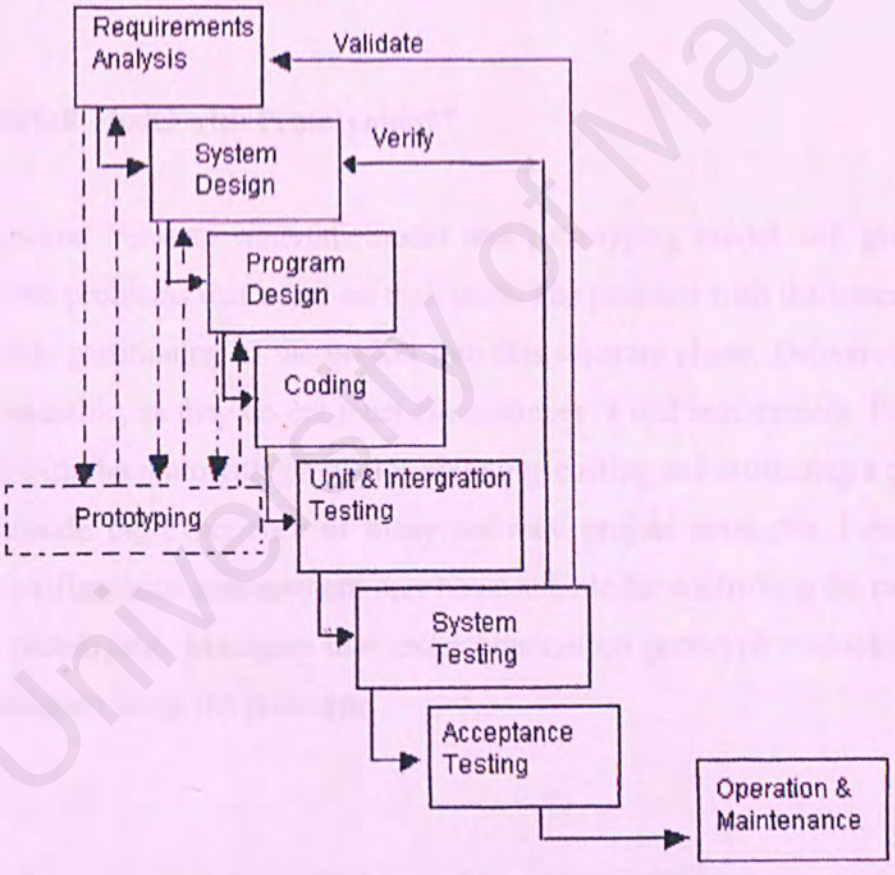


Figure 12: Waterfall model with Prototyping

The purpose on choosing the Waterfall model with prototyping is:

- It helps the developers to follow the sequence of events they expect to encounter.
- It presents a very high-level view of what goes on during development.
- Useful in helping developers to layout what they need to do
- It can help to reduce the uncertainty about what the system should do and therefore enhance the understanding.
- Prototyping is useful for verification and validation, where verification ensures that the system function properly and validation ensures that the system has implemented the entire requirement in the specification.

Why "Waterfall Model with Prototyping?"

This combination between waterfall model and prototyping model will give a better solution for the problems that occur on their own. The problem with the waterfall model is its inflexible partitioning of the project into this separate phase. Delivered system is sometimes unusable, as they do not meet the customer 's real requirement. Besides that, the problem with the prototyping model is planning, costing and estimating a prototyping project is outside the experience of many software project managers. Procedures for change and configuration management may be unsuitable for controlling the rapid change inherent in prototyping. Managers may exert pressure on prototype evaluation to reach the best conclusion about the prototype.

3.2 WEB TECHNOLOGIES AND DEVELOPMENT TOOLS ANALYSIS

3.2.1 WEB PROGRAMMING LANGUAGE CONSIDERATION

Choosing the correct programming language is a very important step in system development. Several of programming language is available today and each of the language has their own strength and weakness. A number of programming languages have been chosen to develop a web-based system for Worldwide Church of God, Malaysia. Due to the time constraint, the programming language chosen have to support easy development and with security embedded. Various aspects of programming language are considered before it is used to develop the system.

3.2.1.1 HYPERTEXT MARK-UP LANGUAGE (HTML)

HTML, which stands for Hypertext Markup Language, is a simple yet powerful markup language used to generate platform- independent hypertext documents that are viewable by a Web browser. The main thing that had made it so popular was its simple syntax. Therefore, it makes web programming work easy and simple but to certain extent.

Anyone with access to word processing software can design simple HTML pages almost immediately – as you can tell by proliferation of home pages being posted by thousands of individuals and companies worldwide. This ease of use has helped make the World Wide Web the great phenomenon that it is today.

As HTML specifications became more refined, however, and as advances in Web technologies become more readily available, you'll find rich and rapidly growing suite of tools at your fingertips for developing Web-based database applications and presenting data to the end user. To effectively present data, you'll need to take advantage of some of the more advanced features of HTML (that is, objects, tables, lists and so on).

Due to the fact that HTML couldn't provide the real programming power for web programmers, many alternatives such as JavaScript and VBScript are used for building dynamic interaction and content. The complements HTML. [4]

3.2.1.2 CONCLUSION

HTML remains the default selection for developing web pages. Although HTML is easy to use, it is rather simple, static and does not support some dynamic features or effects that need to be included in the web pages. Due to this reason, it alone will not be powerful enough to support sophisticate and an interactive web based application such as Worldwide Church of God, Malaysia. However, the combination of HTML, CSS and ASP will be possible to produce such as an interactive web application.

3.2.2 WEB SCRIPTING LANGUAGE CONSIDERATION

If you want to create scripts for your Web pages, the two primary scripting languages you use are VBScript and JavaScript.

3.2.2.1 VISUAL BASIC SCRIPTING (VBSCRIPT)

VBScript is a subset of VBA and VB, and it was designed to provide client-side scripting capabilities within Microsoft's Internet Explorer web browser. It brings active scripting to various environments, including web client scripting such as in Microsoft Internet Information Server. Like JavaScript, Visual Basic Script code can be embedded in HTML documents.

VBScript is powerful. Various capabilities of VBScript can be used to develop richly interactive Web pages that respond to user input in an intelligent manner. For example, when a user submits a form, a VBScript subroutine can be triggered to verify that the form is properly in with valid values. In the case of server-side CGI application,

VBScript can be used to process data submitted by users with the aid of ActiveX control specially designed for Microsoft Active Server Pages.

VBScript code is lightweight, fast and has been optimized to be transmitted via the Internet. Because VBScript code is lightweight, it can be quickly transmitted to users browsing a website.

Compared to scripting languages such as JavaScript, VBScript is easier to use because it is based on the easy- to-learn BASIC (Beginner's All Purpose Symbolic Instruction Code) language.

In fact, VBScript is a freely available scripting language. Microsoft has made VBScript freely available to software vendors so they can add scripting capabilities to their applications with the aid of VBScript.

Besides, VBScript supports any language (such as C++ and Java, for example) that enables objects to be compiled as ActiveX controls. On the client side, that is the browser, VBScript interact with ActiveX control to provide active and interesting content. Whereas on the server side, it is used such as in Active Server Pages (ASP) and integrated within HTML to provide a new level of functionality as ease of use in web site development.

The only learning curve in VBScript is to figure out how does the language integrates with the environment in which it is implemented or used. Such environment can be Windows Operating System.

3.2.2.2 JAVASCRIPT

JavaScript is a relatively new scripting language, developed by Netscape Communication and Sun Microsystems, which have rapidly gained popularity among Internet developers. JavaScript preceded the European Computer Manufacturers Association (EMCA) standard and it was the first web scripting language for dynamic interaction and content.

It is loosely related to Java, which is based on C++, except it is an interpreted language. JavaScript has, however fewer capabilities than full-fledged object-oriented languages like Java. It is not a cut-down or simplified language though but rather a more limited language. However, it is not a true object-oriented language and it is limited language. However, it is not a true object-oriented language and it is limited in performance wise when compared to Java, as it is not compiled.

JavaScript is easy-to-use and designed for creating live online application. It is analogous to VBScript. A JavaScript- complaint Web browser, such as Netscape Navigator and Microsoft Internet Explorer, is necessary to interpret JavaScript code. Like VBScript, JavaScript is based on programming language, in this case Java, the Web dealing. Unlike VBScript, JavaScript is completely object-based.

Basic online applications and functions can be added to web pages with JavaScript, but the number and complexity of available API functions are less than what is available with Java, JavaScript code, which can be included in a web page along with the HTML code, is generally considered easier to write that the Java language itself. [4]

3.2.2.3 CONCLUSION

VBScript has been chosen as the server side scripting language in implementing the Prototype Portal For WCG, Malaysia. It is due to the reason that ASP was chosen as the web application programming language to develop the system. As the server process the coding of ASP, the usage of VBScript or any other type of scripting language had no

effect whatever on the outcome displayed in web browser. It is because the HTML code page is produced from the processing of ASP pages. HTML pages will be support by all major browser. Due to the preceding two facts, VBScripts was chosen as the server side scripting of choice for the WCG, Malaysia.

The selection was done between the JavaScript and VBScript for client side scripting. JavaScript remained a firm choice as all major browser such as Ms Internet Explorer and Netscape 's Navigator could understand JavaScript. Ms Internet Explorer can only understand VBScript. Therefore, JavaScript is chosen as client side scripting language in the Prototype Portal for WCG, Malaysia.

3.2.3 WEB APPLICATION PROGRAMMING LANGUAGE CONSIDERATION

3.2.3.1 ACTIVE SERVER PAGES (ASP)

An Active Server page (ASP) is an HTML page that includes one or more scripts (small embedded programs) that are processed on Microsoft Web Server before the page is sent to the user. An ASP is somewhat similar to server-side include or common gateway interface (CGI) application in that all involve programs that run on the server, usually tailoring a page for the user. Typically, the script is the Web page at the server uses input received as the result of the user's request for the page to access data from a database and then builds or customizes the page on the fly before sending it to the requestor.

ASP is a feature of the Microsoft Internet Information Server (IIS), but since the sever-side script is just building a regular HTML page, it can be delivered to almost any browser. You can create an ASP file by including a script written in VBScript or JavaScript in an HTML file and then renaming it with the ". asp" file suffix. Microsoft recommends the use of the server-side ASP rather than a client-side script, where there is actually a choice because the server-side script will result in an easily displayable HTML page. Client-side script (JavaScript) may not work as intended on older browsers.

ASP is implemented as an ISAPI filter running within Microsoft Internet Information Server (IIS). When a web client makes a HTTP request to an IIS, the Active ISAPI filter will intercept the request. If the request is for an ASP file, Active Server takes over from IIS and then gets and parses the requested file from top-to-bottom sequence. Active Server will then run server-side scripts such as VBScript or any other supported languages and then return back an HTML file to IIS. Finally, IIS will send this data stream to the requesting web client. Whereas, if the request checked is for an HTML file, IIS takes over to get, process and send the file to the requesting web client.

The ASP technology enables the transition of static web sites into dynamic and data driven application. This is accomplished by creating server- side scripts that are executed as extensions of the Internet Information Server (IIS). ASP lets web developers to keep frequently changing information like process and products in database where it is easier to manage and to build Dynamic HTML pages with content dynamically extracted from the database. The proprietary source code in ASP applications remains on the server side and therefore does not affect client side browser compatibility.

With ASP, web page content does not have to be tied to an HTML page. The information can be in a text file and the contents of web page are easily updated without touching the HTML file. Besides, web site of hundreds or thousands of pages can be reduced to just a handful of ASP files. Whenever the developer wants to change the design of the site, he doesn't have to fix every single page.

ASP is an ecumenical programming environment. Its source code consists of either native ASP commands or scripting commands. Native commands are those that access the Active Server engine objects and components. [4]

3.2.3.2 COMMON GATEWAY INTERFACE (CGI)

The common gateway interface (CGI) is a standard way for a web server to pass Web user's request to an application program and to receive data back to forward to the user.

When the user request a Web page, the server sends back the requested page. However, when a user fills out a form on a web page and sends it in, it usually needs to be processed by an application program that processed the data and may send back a confirmation message. This method or convention for passing data back and forth between the server and the application is called the common gateway interface (CGI). It is part of the Web's HTTP protocol.

3.2.3.3 CONCLUSION

In this project, ASP is used due to the reasons of the comparison between ASP and CGI. Active Server Pages provides all of the functionality of CGI applications in an easier-to use and more robust environment. Active Server Pages is an easier way for your server to access information in a form not readable by the client and then act as a gateway between the two to produce information that the client can view and use.

With CGI, the server creates as many processes as the number of client requests received. The more concurrent requests there are, the more concurrent processes created by the server. However, creating process for every request is time-consuming and requires large amount of server RAM. In addition, this can restrict the resources available for sharing from the server application itself, slowing down performance and increasing wait times on the web.

Active Server Pages instead runs in the same process as the web server, more handling client requests faster and more efficiently. It is much easier to develop dynamic content and web applications with Active Server Pages.

Besides, ASP also does better than other web application tools. ASP leverages your existing skills and knowledge, data source, components and applications to quickly bring them to the web. Other tools create either static HTML, or lock you into a non-standard programming model or language. Active Server Pages is based upon the leading industry

standard, making it easy to build, maintain and evolve powerful interactive web applications.

3.2.4 WEB DATABASE MANAGEMENT SYSTEM CONSIDERATION

To build a flexible and robust web application, an appropriate database management system needs to be chosen to build the database. Selection will be based on consideration for effectiveness in handling multi-user access, the storage required and the ease of management.

Two Database Management System were analyzed in this session.

3.2.4.1 MICROSFOFT ACCESS 97

Microsoft Access is a relational database management system created by Microsoft for small office or home user for storing data in relational format. With data access interface paradigm such as Remote Data Object (RDO) and Data Access Object (DAO), Microsoft Access can be used as a database in a client/server on an n-tier architecture system. It provides you a good user interface with which to develop the tables and relationships. Creating a database can be done easily.

Microsoft Access gives you an excellent development environment with many of the capabilities of SQL server available for testing and implementation planning.

3.2.4.2 MICROSOFT SQL SERVER 7.0

Microsoft SQL Server 7.0 is scalable, high-performance database management system designed specifically for distributed client/server computing. Microsoft SQL Server provides tight integration with Windows and Windows- based applications helping

reduce the cost and complexity of deploying sophisticated applications. SQL Server is an ideal database engine for powering Web sites. Through tight integration with Internet Information Server, SQL Server can be queried and updated via popular Web browsers. SQL Server's native ODBC lets it interoperable smoothly with the Internet Database Connector interface included with Internet Information Server. [5]

3.2.4.3 CONCLUSION

A Prototype Portal for WCG, Malaysia will be developed using Microsoft SQL Server 7.0. It has been chosen because it can handle a large amount of data with max hold up to 32,767 databases. SQL Server is tightly integrated with the Windows 32 platform. Particular, it is designed to take advantages of the features of the Windows 2000 operating system for large-scale organization and enterprise database.
Compared with Microsoft Access, it has relatively higher data storage capacity.

3.2.5 WEB APPLICATION DEVELOPMENT TOOLS CONSIDERATION

3.2.5.1 MICROSOFT VISUAL INTERDEV

Microsoft's Visual InterDev is one of the first in what is sure to be a crowded market of tools to pour concrete, excavate tunnels, and build bridges between the hamlets of applications, architecture of interfaces and towers of data and functionality already out there. Visual InterDev is project management software for high-end Web development. It integrates many of the existing tools for Web development, and throws in a few hefty tricks of its own for good measure. Its main features are:

- Support for Microsoft's new Active Server Pages, a method for server-side scripts to generate HTML pages on the fly

- Support for database integration from desktop (Access and MS FoxPro) to high-end (ODBC compatibility)
- Support for VBScript and JScript (Microsoft's JavaScript implementation) in your HTML files
- Visual design tools, templates and wizards to help you do everything from generating SQL commands with a point-and-click interface to manipulating exposed ActiveX objects
- A color-coded HTML text editor
- Web project file management and link management tools
- Support for VBScript to automate repetitive tasks in Visual InterDev

3.2.5.2 MICROSOFT FRONT PAGE

Microsoft Front Page is a favorite web-authoring tool for designing static pages.
It is the latest incarnation of Microsoft 's popular Web site creation tool, brings new ease to Web publishing. Without any knowledge of HTML, you can use FrontPage to build and manage a beautiful and sophisticated Web site; complete with exciting effects you see on those other sites. It has hundreds of pages on the web that were created in FrontPage. FrontPage often gives more than one way to tackle a particular task. For example, choosing a menu item, clicking a toolbar button, pressing a key- board shortcut, or right clicking an item and then choosing an option from the pop-up menu that appears might all accomplish the same thing.

3.2.5.3 ADOBE PHOTOSHOP

The most successful Web pages use both text and graphic to enhance the user experience. The graphic design of a Web page can greatly influence the amount of time a user spends at a site. For instance, if a company 's Web site contains only text, it may not produce as many online sales. Web site graphic, such as buttons, banners or product images, define

the user experience and distinguish a company's site from its competition. While many images are available free for download on the Internet, creating original images helps make a Web site unique. Adobe Photoshop is an easy –to –use graphics package that offers the functionality of more expensive packages at an economical price. Graphics such as title images, banners, buttons and advanced photographic effect all can be created using this program.

3.2.5.4 MACROMEDIA FLASH

Macromedia Flash is an application that developers use to produce interactive, animated movie. Flash can be used to create Web-based banner advertisements, interactive Web sites and Web-based applications with stunning graphics and multimedia effects. An advantage Flash has over other multimedia development applications in that Flash has provides for drawing graphics, generating animation and adding sound and video. Flash movies can be embedded in Web pages, placed on CD-ROM as independent applications or converted into standalone, executable programs. Another advantage of using Flash to produce interactive content in that Flash includes tools for writing its scripting language, Action Script. Acton Script, which is similar to JavaScript, is the enabling technology for Flash interactivity.

3.2.5.5 CONCLUSION

ASP is recommended the usage of Microsoft Visual Interdev as its web application development tool. Microsoft Visual Interdev offers relatively more functionality than Microsoft FrontPage. Besides, it boasts strong link with Ms SQL Server, which makes it very easy to set up databases combining ASP and Ms SQL Server. In addition, Ms Visual Interdev is designed for developing the ASP web pages. Then, Ms FrontPage is use as a user interface designer because Visual Interdev does not provide powerful design tools. Besides, Adobe Photoshop is chosen as an image editor to create interactive image for the

Worldwide Church of God, Malaysia. Macromedia Flash is used to create simple interactive animations, which are used in the WCG, Malaysia.

3.2.6 OPERATING SYSTEM CONSIDERATION

3.2.6.1 MICROSOFT WINDOWS 2000

One of the great things about Windows 2000 is that it works so well in a mixed environment. Windows 2000 can:

- Communicate with other operating systems using common protocols. For example, because of its extensive protocol support, a Windows 2000–based server is able to communicate with UNIX and NetWare systems over local area networks (LANs) and the Internet.
- Access file shares and printers on other platforms. Windows 2000 Server provides the services to allow file and print sharing with NetWare and Macintosh systems, while supporting the add-on services that offer file and print sharing with UNIX and IBM systems.
- Integrate new applications with data sources. Windows 2000 Server includes technologies that let developers write software that connects new applications with existing ones. This means your current applications can share data and software code with new applications.
- Reduce the burden of administering multiple systems. For example, using the Active Directory™ service included with Windows 2000 Server, organizations can unify and manage the multiple directories found in most corporate networks.

3.2.6.2 CONCLUSION

Windows 2000 was chosen as the operating system of choice due to several advantages that are distinct when compare to other operating system. It is because Windows 2000 currently enjoy a dominant position as the preferred network operation by most corporations. Among the Microsoft Windows, Windows 95 and Windows 98 are not chosen because they are unable to provide web services and do not have a web server as Windows 2000 does. Although Windows NT 4 has the features to be the server, it is not selected because Windows 2000 is more stable and newer than Windows NT 4. Windows 2000 comprise of a user-friendly graphical user interface, which make it easy for both consumers and computer professionals to use. Besides, Windows 2000 support for innovative web publishing features, customizable tools and the new technologies make Windows 2000 the best Operating System available to publish information over the Internet especially in the Prototype Portal for WCG, Malaysia.

3.2.7 WEB SERVER CONSIDERATION

3.2.7.1 IIS (INTERNET INFORAMTION SERVICES)

IIS is a group of Internet Servers (including a Web or Hypertext Transfer Protocol Server and a File Transfer Protocol Server) with additional capabilities for Microsoft Windows 2000 Server operating System. IIS is Microsoft 's entry to computer in the Internet Server market that is also addressed by Apache, Sun Microsystems, O'Reily and other. With IIS, Microsoft includes a set of program for building and administrating web sites, a search engine and support for writing web based applications that access databases. Microsoft points out that IIS is tightly integrated with the Window NT and 2000 Servers in a num of way, resulting in faster web page serving.

3.2.7.2 CONCLUSION

Microsoft Internet Information Services selected as the web server for Prototype Portal For Worldwide Church of God, Malaysia, due to its suitability for medium size to large size doing high volume serving or corporate web developers looking for ease of use. It is bundle with Windows 2000 operating system and making it really easy to implement even when faced with a limited budget. It is easy to setup and result in faster and more secure web page serving. As ASP was chosen as the web application programming language, it was obvious that Internet Information Services (IIS) was chosen as ASP run on the IIS. Other web server were not chosen because they were not as suitable as IIS while running ASP as web application programming language.

3.2.8 WEB BROWSER CONSIDERATION

3.2.8.1 MICROSOFT INTERNET EXPLORER

Microsoft Internet Explorer is a graphical World Wide Web browser that is provided with the Microsoft Window Operating Systems. MSIE browser complete closely with an earlier browser, Netscape Navigator.

3.2.8.2 NETSCAPE NAVIGATOR

Netscape is one of the two most popular web browser and also the name of a computer. Netscape Communication, now owned by America Online (AOL). Netscape's browser originally was called "Navigator" and is still called that in the suite of software communicate of which it is now a part.

3.2.8.3 CONCLUSION

The preferred web browser to be used for testing and serving the Worldwide Church of God, Malaysia will be the Ms Internet Explorer 4.0 and Netscape's Navigator 4.0 as they are the major browsers nowadays.

3.2.9 SUMMARY OF WEB TECHNOLOGY AND DEVELOPMENT TOOLS

- Operating System – Windows 2000 Professional
- Web Server – Internet Information Services (IIS)
- Web Database System – Microsoft SQL Server 7.0
- Web Markup Language – HTML
- Web Application Programming Language – ASP
- Web Development Tools – Ms Visual Interdev 6.0, Ms FrontPage 2000, Adobe Photoshop 6.0, Macromedia Flash 5.0
- Server Side Scripting Language – VBScript
- Client Side Scripting Language – JavaScript
- Web Browser – Ms Internet Explorer

3.3 REQUIREMENTS 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.

3.3.1 NON- FUNCTIONAL REQUIREMENTS

Non – functional requirements are the constraints under which a system must operate and the standard that must be met by the delivered system. The non-functional requirements that should be met by a web-based system for a Prototype Portal for WCG, Malaysia are:

- Efficiency

  Efficiency in computer terminology means a procedure that can be called or accessed in an unlimited number of times to produce similar outcomes or output at a credible pace or speed.

- Robustness

  Robustness refers to the quality that causes a system to be able to handle or avoid disaster in the face of unexpected circumstances such as when given improper data.

- Reliability

  The system should be reliable which means that it does not produce dangerous or costly failure when it is used in a reasonable manner, that is, in manner that a typical user expects in normal.

- Effectiveness

  Effectiveness means that input or output screens serve specific purpose in the system.

- Accuracy

  Accuracy refers to design that ensures proper completion.

- Consistency

  Consistency means the screens group similar or relevant data from one screen to the next

- User friendliness

  The system should be able to build a flow of navigation that helps users in navigating to related URL with little efforts through hyperlinks and procedure steps. User interface should be user friendly to enhance the interaction between the users and the system.

- Response Times

  In order to provide an efficient online system, it should provide a fast response time to users. Unnecessary interaction between the server and the client will increase the response time. In order to have fast response time, having some of the input validation done in the client side by using the client side scripting language reduces the processing in the server. It is done in the case of Prototype Portal For Worldwide Church of God, Malaysia.

- Simplicity

  Simplicity refers to keeping forms and screens properly uncluttered in a manner that focuses the user's attention.

- Attractiveness

  Attractiveness infers that users enjoy using or attracted to use the system due to their appealing designs

3.3.2 FUNCTIONAL REQUIREMENTS

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

3.3.2.1 SECURITY SECTION

Login Module

An authentication and authorization process is vital to online system to ensure that only the authorized user is able to join or create community in the system. All Administrators are required to login into the web site with their username and password. This is to protect the community from unauthorized access.

Sign up Module

Module allow administrator to sign up as a new member of WCG, Malaysia. Administrator needs to fill up some information and request, username and password, which will use in authentication and authorization process.

3.3.2.2 ADMINSTRATION SECTION

Adding Information module

This module allow administrator to add in new entry for the community. This module will enable administrator to add in current news, articles, events, activities and other information for the user.

Delete Information Module

This module allow administrator to delete information, which was created, by the administrators. This module will list out all the information and the administrator will choose the right one to delete.

Update Information Module

This module offers the administrators to update their information such as updating news, article, events, activities and other information.

Adding Church Module

This module allows administrators to add in new church in the list or they become the new member for the organization.

View Church Directory Module

This module will view the admin detail with their email contact and admin can change their detail or delete it

3.3.2.3 SERVICE SECTION

Searching Module

This module allow the user to search for their church directory from the database and also search for the activities held in their church by entering the name of the church or select by activity type or by location and user can view the search result from the database.

Booking Module

Here user can book a church online for any ceremonies by giving them the date, time and for what ceremonies. Before booking a church user payment detail with credit card would be validated before doing their booking.

Respond Module

This module allow user to give respond/feedback or give comments about the web site and store it in the database.

Donation Module

This module allow user to give donation online through credit card or direct debit and store the information in the database. Here user payment detail like credit card will be also validated before submitting other details on donation.

3.4 RUN TIME REQUIREMENTS

This table shows the summary of Hardware and Software requirements that have been considered for this project.

Table 2: Summary of Hardware and Software requirements

	Server Requirements	Client Requirements
Hardware Requirements	• Pentium or AMD with 400Mhz and above computer • At least 128MB RAM • Minimum 10MB hard disk • Network connection with recommended bandwidth at 10Mbps or more • Standard input/output device	• Pentium or AMD with 133 Mhz and above computer. • At least 16MB RAM and above. • Standard input and output device
Software Requirements	• Windows 2000 • IIS 5.0 • ASP • Ms SQL Server 7.0	• Any platform with GUI. • Internet Explorer, Netscape's Navigator 4.0 and above

3.5 CONCLUSION

The increasing number of users gets connected to the Internet everyday has made Internet a significant place/marketplace for selling goods and providing services.

Web application requires a totally new development environment compared to the conventional client-server applications. According to some studies, web application would eventually take over most of the current commercial homepages. Knowledge gained through research and building such system would serve as an opportunity for me to experience using technique, paradigm and approaches learned from System Analysis & Design and Database courses in second year.

A real challenge in this project is to carry out research and analysis before a final decision can be reached to start developing the system. Studying on the scripting languages, existing systems, web servers, web technologies and many other are interesting and knowledgeable lesson. And, it may be good tool or experience for future challenges.

SYSTEM DESIGN

CHAPTER 4: SYSTEM DESIGN

4.1 OVERVIEW

System design is the specification or construction of a technical, computer based solution for the system requirements [6]. This phase concentrates on the design of the systems structure and Data Flow diagram (DFD).

4.2 OVERVIEW OF WCG, MALAYSIA

Users of Worldwide Church of God, Malaysia are linked to all the modules using the hypertext links. Figure below shows the structures of the Prototype Portal For Worldwide Church of God, Malaysia.

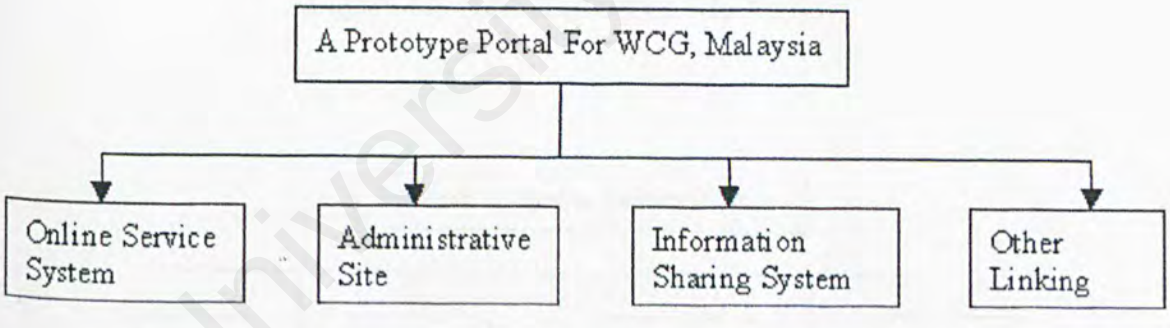


Figure 13: Overview of WCG, Malaysia Module

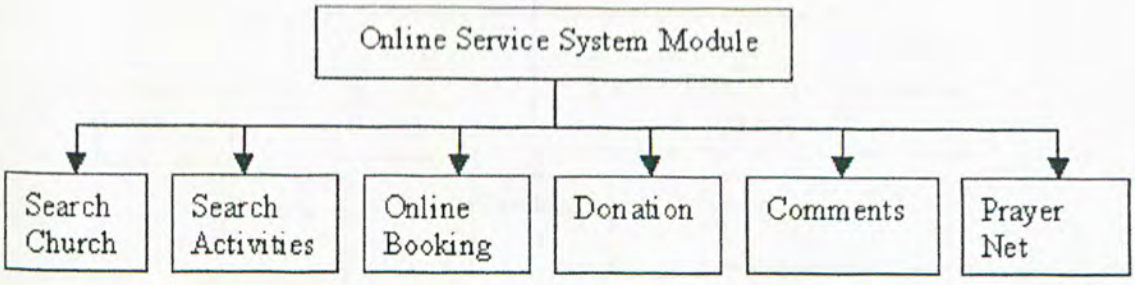


Figure 14: Online Service System Module

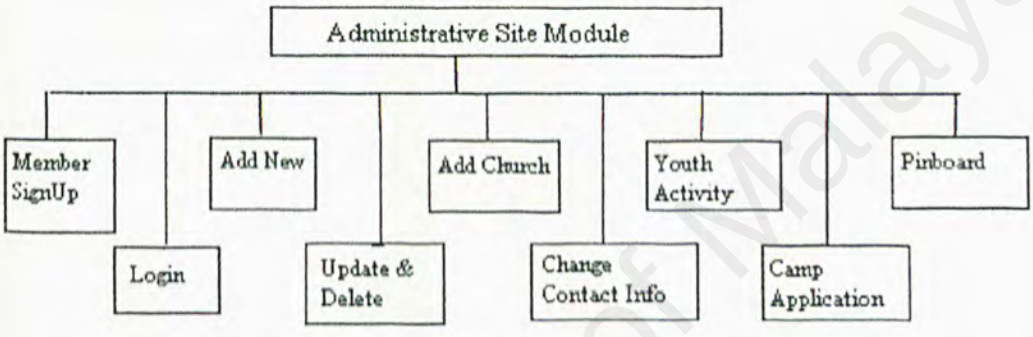


Figure 15: Administrative Site Module

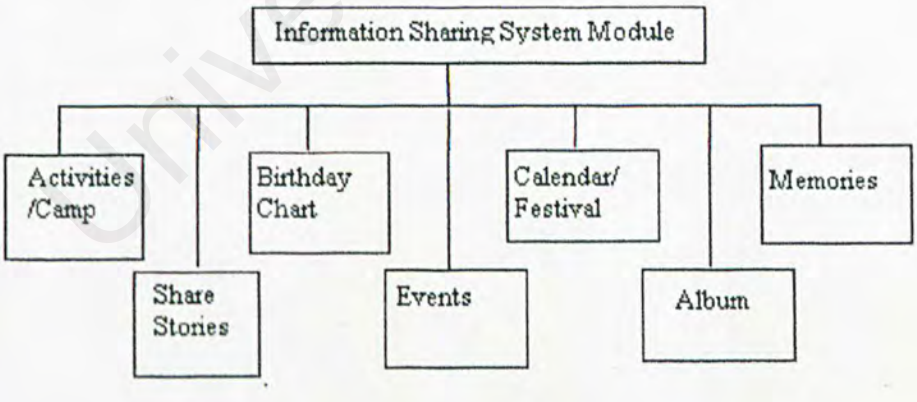


Figure 16: Youth Module

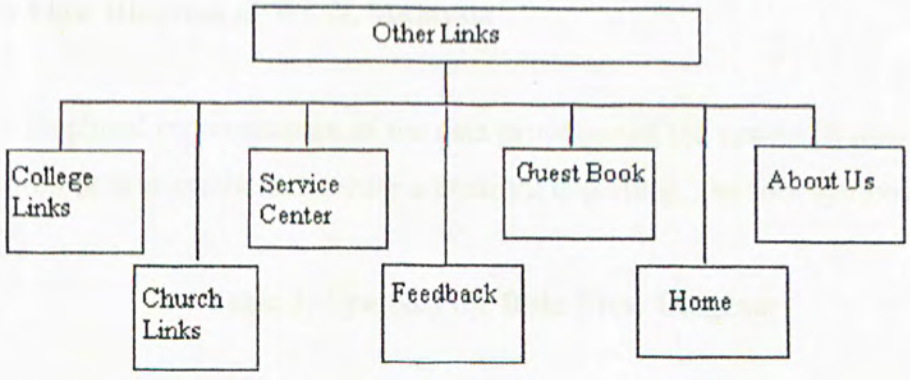


Figure 17: Other linking Module

4.3 Data Flow Diagram of WCG, Malaysia

DFD is a graphical representation of the data processes of the system. It uses the combination of four symbols to create a pictorial depiction. The four symbols are stated below [7]:

Table 3: Symbols for Data Flow Diagram

Symbols	Meaning	Description
	**Entity**	**Source or destination of the data**
	**Process**	**Occurrence of a transforming process**
	Flow of Data	**Movement of data from one point to another**
	**Data Store**	**Represent the storage of the data**

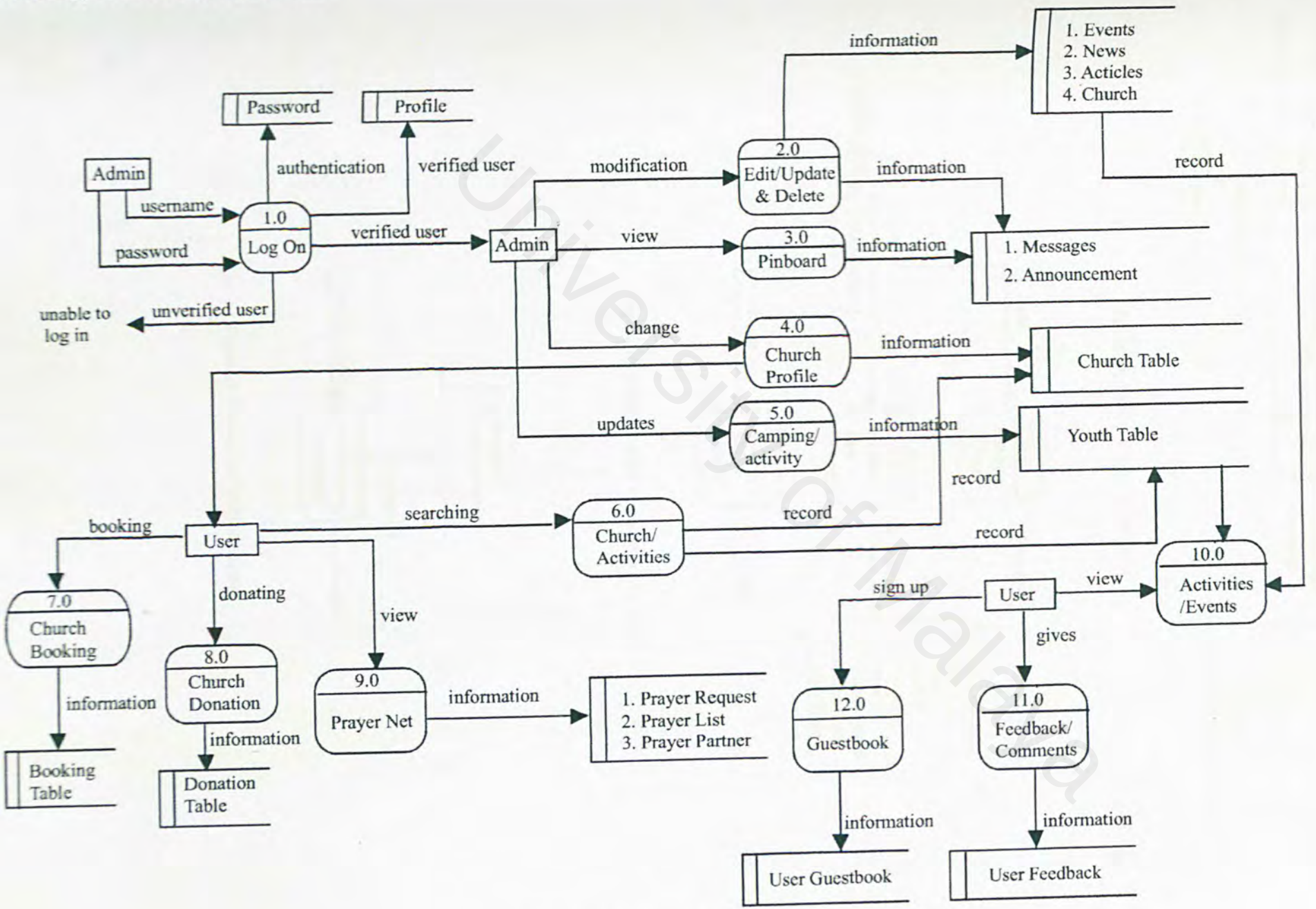


Figure 18 : DFD of WCG, Malaysia

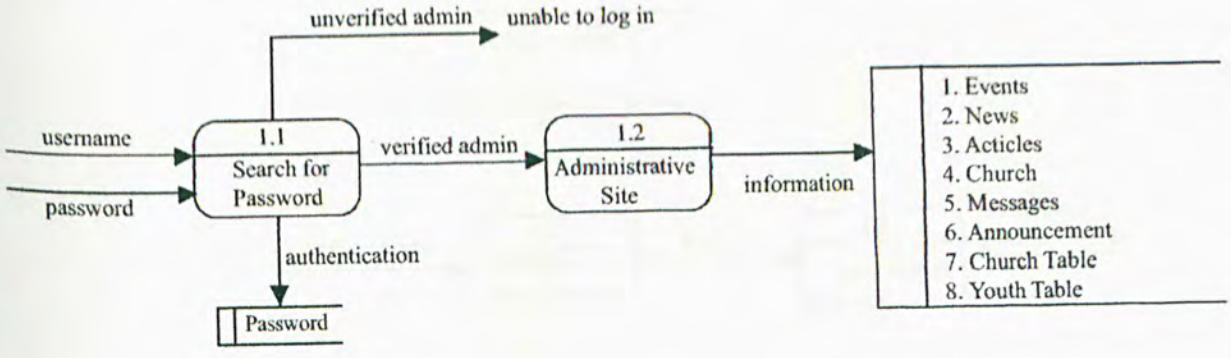


Figure 19 : Process 1 of WCG, Malaysia

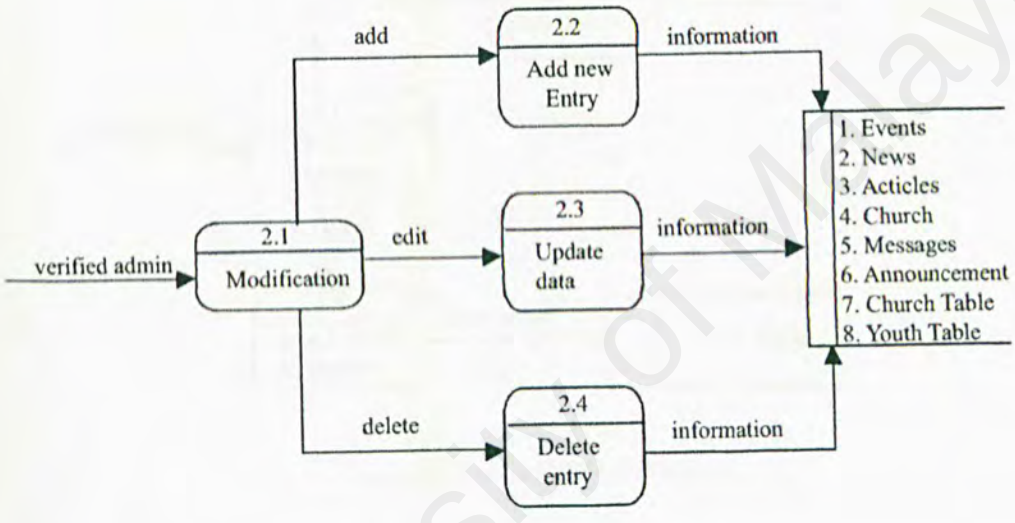


Figure 20 : Process 2 of WCG, Malaysia

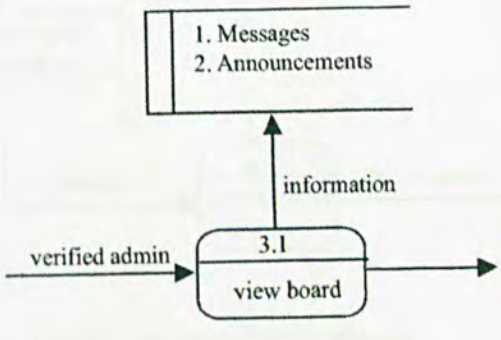


Figure 21: Process 3 of WCG, Malaysia

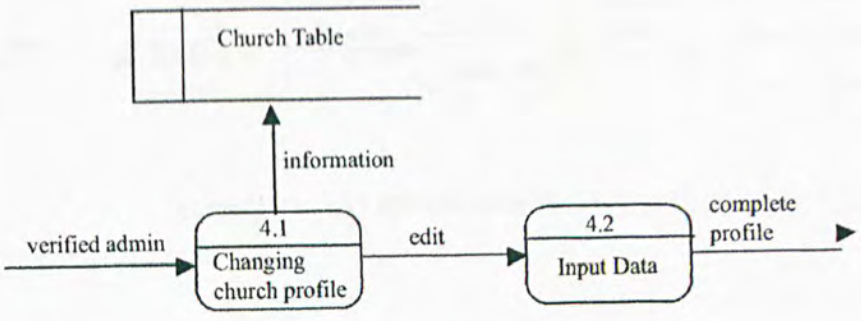


Figure 22: Process 4 of WCG, Malaysia

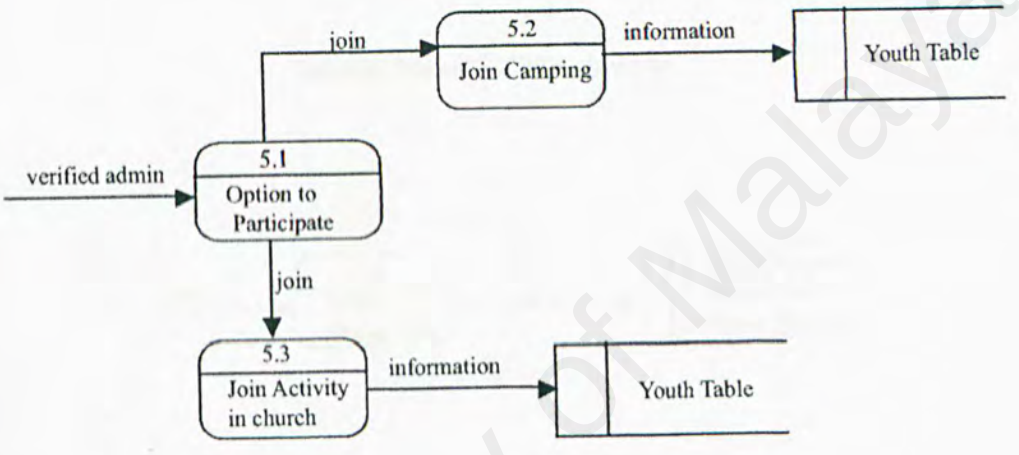


Figure 23: Process 5 of WCG, Malaysia

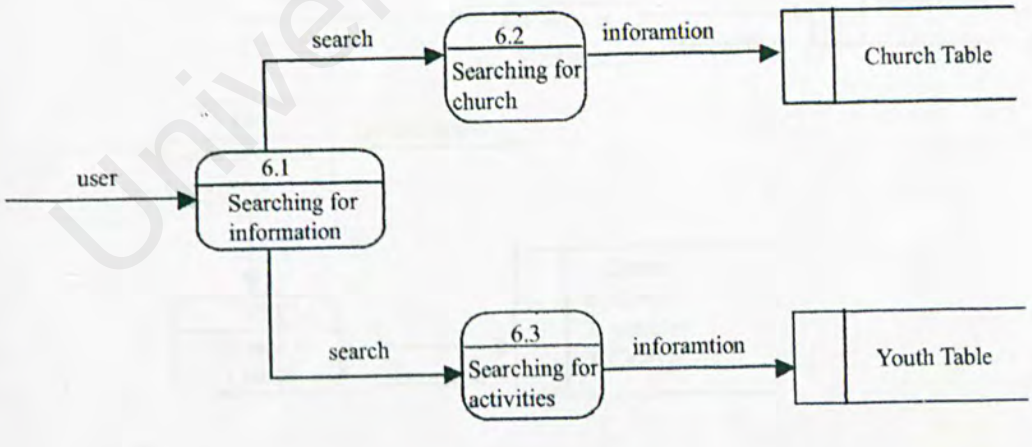


Figure 24: Process 6 of WCG, Malaysia

Figure 25: Process 7 of WCG, Malaysia

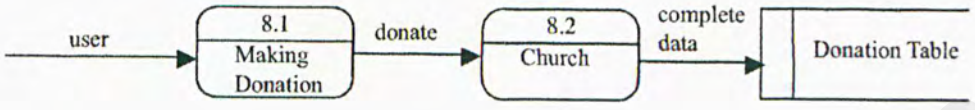


Figure 26: Process 8 of WCG, Malaysia

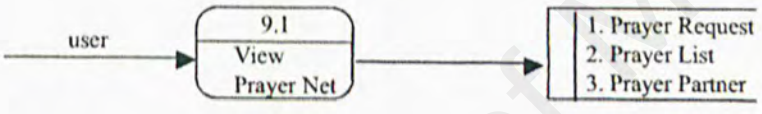


Figure 27 : Process 9 of WCG, Malaysia

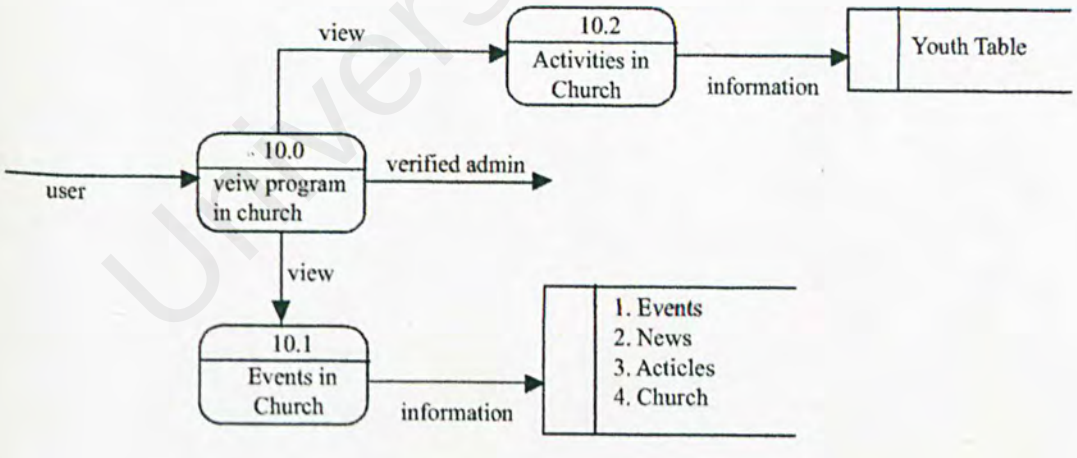


Figure 28 : Process 10 of WCG, Malaysia

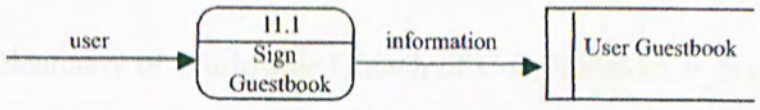


Figure 29: Process 11 of WCG, Malaysia

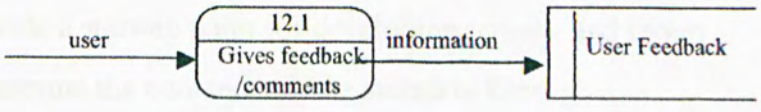


Figure 30: Process 12 of WCG, Malaysia

4.4 DATA DICTIONARY

The Data Dictionary of Worldwide Church of God, Malaysia is designed using the third normal form of normalization. Data Dictionary is a repository of for the elements in a system. It is a logical characteristic and current system data stores. Data Dictionary identifies processes where the data are used and where immediate access to information is needed. It also saves as the basic for identifying database requirements during system design .The Data dictionary may be used to:

- Validate the data flow diagram for completeness and accuracy
- Provide a starting point for developing screens and report
- Determine the contents of data stored in files.
- Develop the logic for data flow diagram process.

A data dictionary should contain specific categories of information including

- Name & aliases of the data item
- Description of the data item
- Permissible range of the entry
- It's allowable length information
- Any pertinent editing information

The Data Dictionary in the Online Service System of WCG, Malaysia is shown as below

There are 2 type of search method, which is for searching church, directory and searching for activity held in church

For searching church directory, there are 3 way of searching method, which are search by church name, by denomination and by location.

Table Name for search by denomination: SearchDeno
Function: This table used to store the information about churches in Malaysia by using denomination as keyword

Table 4: Table for Searching Church by denomination

Field Name	Type	Size	Description
Keyword_ID	int	4	Keyword id
Keywords	nvarchar	50	Search by this keyword
Church	nvarchar	50	Church name
Address	nvarchar	100	Address of your church
Phone	nvarchar	30	Contact by phone
Fax	nvarchar	10	Contact by fax

Table Name: event

Function: This table is use to store the information about the activities held in churches in Malaysia. It is also used for searching method to search for activities held in church

Table 5: Table for Searching Activity, Edit event, Update and Delete event

Field Name	Type	Size	Description
Email	nvarchar	30	Name of church for searching
First	nvarchar	50	First Name of the organizer
Last	nvarchar	50	Last Name of the organizer
Contact	nvarchar	50	Contact of the organizer
Address	nvarchar	50	Address of event held
State	nvarchar	50	State of event held
Zip	nvarchar	50	Zip code of event held
Church	nvarchar	50	Name of the church
Pastor	nvarchar	50	Church Pastor name
Type	nvarchar	50	Type of activity
Title	nvarchar	50	Title of activity

Day	nvarchar	4	Day event start
Month	nvarchar	16	Month event start
Year	nvarchar	6	Year event start
Days	nvarchar	4	Day event end
Months	nvarchar	16	Month event end
Year	nvarchar	6	Year event end
Price	nvarchar	50	Amount detail for the event
Sponsor	nvarchar	50	Sponsor for the event held
Directions	nvarchar	50	Direction of event held
Comments	nvarchar	50	Comments on events held
event_id	int	4	Autonumber id

Table Name: book

Function: This table is use to store the information about booking churches for any events.

Table 6: Table for Booking Church

Field Name	**Type**	**Size**	**Description**
Menu	nvarchar	50	Select menu
Person	nvarchar	50	Person to be in charged
Bride	nvarchar	50	Bride name
Bridegroom	nvarchar	50	Bridegroom name
Email	nvarchar	50	Email for contact
Home	nvarchar	50	Home phone contact
Office	nvarchar	50	Office phone contact
Hp	nvarchar	30	Hand Phone contact
Fax	nvarchar	50	Fax number contact
Address	nvarchar	50	User Address

Church	nvarchar	50	Church chosen
Church_add	nvarchar	50	Address of your church chosen
No_of_person	int	4	No of person attending
Day	nvarchar	30	Day of ceremony
Date	nvarchar	4	Date of ceremony
Month	nvarchar	16	Month of ceremony
Year	nvarchar	6	Year of ceremony
Service_time	nvarchar	50	Time of ceremony
Time	nvarchar	6	Time of your ceremony

Table Name: donation

Function: This table is use to store the information about donation made by member to the churches in Malaysia

Table 7: Table for Donation to Church

Field Name	Type	Size	Description
Title	nvarchar	50	Title for user
First	nvarchar	50	User Email address
Last	nvarchar	50	User contact number
Church_add	nvarchar	50	User address
Add	nvarchar	50	User city located
Postal	nvarchar	20	User state located
State	nvarchar	50	User postcode
Country	nvarchar	30	Name of church
Home	int	20	Amount donated
Office	int	20	Type of cards
Hp	int	20	Card's Number
Fax	int	20	Card expiry date
Email	nvarchar	100	Name of cardholder

Table Name: prayer

Function: This table is use to store the information about user's prayer request

Table 8: Table for Prayer Net

Field Name	Type	Size	Description
Name	nvrchar	30	Name of church
Full Name	nvarchar	20	Member Name
Email	nvarchar	20	Member Email address
Request	nvarchar	30	State prayer request

Table Name: question

Function: This table is use to store the information about user's questions

Table 9: Table for Ask Question

Field Name	Type	Size	Description
Name	nvrchar	30	Name of sender
Email	nvarchar	20	Email add of sender
Title	nvarchar	50	Title of question
Info	nvarchar	250	Details of your question

The Data Dictionary in the Administrative Site of WCG, Malaysia is shown as below

Table Name: admin_info

Function: This table used to store the information about member of church

Table 10: Table for Membership

Field Name	Type	Size	Description
admin_ic	nvarchar	20	Member ic number
Name	nvarchar	50	Member 's name
Address	nvarchar	50	Member address
Postcode	nvarchar	50	Postcode
City	nvarchar	30	Member city located
State	nvarchar	30	Member's state located
Tel	nvarchar	30	Member's contact num
Fax	nvarchar	30	Member 's fax num
Email	nvarchar	30	Member's email address
Day	nvarchar	4	DOB for day
Month	nvarchar	16	DOB for month
Year	nvarchar	6	DOB for year
Age	smallint	2	Age of member
Sex	int	2	Member's sex
Occupation	nvarchar	30	Member's occupation
Church Name	nvarchar	50	Member Church name
Church Add	nvarchar	50	Church Address
Church Url	nvarchar	50	URL for your church
Pastor	nvarchar	50	Church pastor's name

Table Name: User Login

Function: This table is use to store the login Id, password and other details

Table 11: Table for User Login

Field Name	Type	Size	Description
User_ic	nvrchar	20	User's IC num
Password	nvarchar	20	User's password
User Name	nvarchar	50	User name
User_id	int	4	User's id

Table Name: addchurch

Function: This table used to store the information for new church registering

Table 12: Table for New Church entry

Field Name	Type	Size	Description
Church_name	nvarchar	50	Name of the church
Church_email	nvarchar	50	Church email add
Church_url	nvarchar	50	Church Url add
Pastor_name	nvarchar	50	Pastor's name
Address	nvarchar	50	Address of the church
City	nvarchar	20	Church city
State	nvarchar	20	Church state
Zip	nvarchar	20	Church zip
Phone	nvarchar	20	Church phone num
Fax	nvarchar	20	Church fax num
fame	nvarchar	50	Member first name
lname	nvarchar	50	Member last name

Position	nvarchar	50	Position in church for member
email	nvarchar	50	Member email add
referred	nvarchar	50	How do you get to know this website

Table Name: pinevent

Function: This table is use to store the information on messages and announcement from the church

Table 13: Table for Pin Board

Field Name	Type	Size	Description
Title	nvarchar	50	Title of the message
Details	nvarchar	250	Details about the message
Website	nvarchar	30	Any related websites
Name	nvarchar	30	Senders name
Email	nvarchar	50	Senders email add
Day	nvarchar	4	Day message entered
Month	nvarchar	16	Month message entered
Year	nvarchar	6	Year message entered
Section	nvarchar	50	Section of message
pin_id	int	4	Auto number

Table Name: youth

Function: This table is use to store the information on user participation on activities/camping in their church.

Table 14: Table for Youth

Field Name	Type	Size	Description

Full Name	nvarchar	20	Participant name
Email	nvarchar	20	Participant Email address
Phone Number	nvarchar	10	Participant contact number
Address	nvarchar	20	Participant address
City	nvarchar	20	Participant city located
State	nvarchar	20	Participant state located
Zip	nvarchar	10	Participant postcode
Activity type	nvarchar	30	Choosing type of activity to join
Activity title	nvarchar	30	Title of the activity
Activity time	int	8	Time for activity to be held
Activity date	int	8	Date for activity to be held
Activity end date	int	8	End date for activity to be held
Activity price	money	5	Amount to participate
Age	int	5	Age of participant
Address	nvarchar	30	Place to be held
City	nvarchar	20	City of the place to be held
State	nvarchar	20	State of the place to be held
Zip	nvarchar	10	Postcode of the place to be held
Direction	nvarchar	30	Explanations of direction to the place

The Data Dictionary in the other linking of WCG, Malaysia is shown as below

Table Name: feedback

Function: This table used to store the feedback from the user

Table 15: Table for Feedback

Field Name	**Type**	**Size**	**Description**
Full Name	nvarchar	30	Name of user giving feedback

Email	nvarchar	20	Email contact of user
Phone Number	int	10	Telephone contact of user
Type of comments	nvarchar	50	Comments on the web site
Feedback	nvarchar	150	Your Feedback

4.5 GRAPHICAL USER INTERFACE

A GUI is a graphical (rather than purely textual) user interface to a computer. As you are browsing through the web site, you are looking at the GUI or graphical user interface of your particular web browser.

The term came into existence because the first interactive user interface to computer were not graphical; they were text-and –keyboard oriented and usually consisted of commands you had to remember and computer responses that were infamously brief. The command interface of the DOS operating system (which you can still get to from your Windows operating system) is an example of the typical user-computer interface before GUIs arrived.

Elements of GUI include such as: windows, buttons, pull-down menu, scroll bars, iconic images, the mouse and no doubt and many things that have not been invented yet. With the increasing use of multimedia as part of GUI, sound, voice, motion video and virtual reality interfaces seem likely to become part of the GUI for many applications.

However, most of today's PCs and workstations use GUIs like Microsoft Windows, UNIX Motif or the Macintosh desktop. Most of the end users prefer GUIs to the character-based terminal displays due to its attractive and ease-to-use principles.

4.5.1 USER INTERFACE DESIGN PRINCIPLES

The design of human-computer interfaces demands an understanding of human factors and interface technology. The design of the user interface for this system takes into account the need, experience and capabilities of the system users.

A few guidelines as below will be followed for this purpose:

- The interface should be appropriately
- The user should not be surprised by the system
- The interface should use term and concepts that are familiar to the class of user

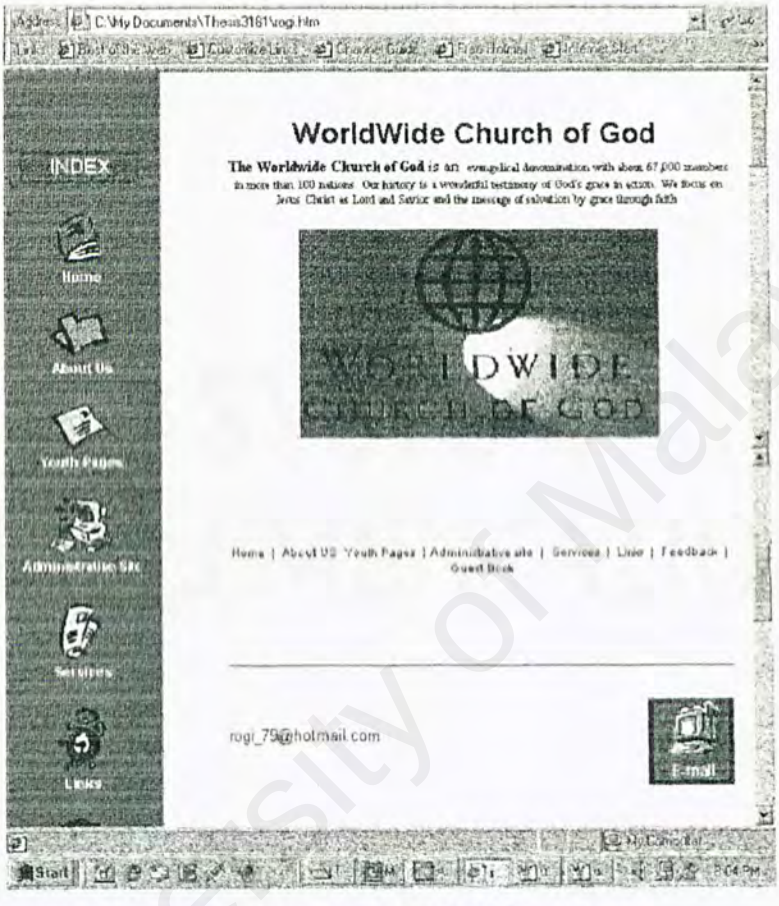


Figure 31: Sample Of Interface

4.6 SUMMARY OF SYSTEM DESIGN

This chapter concentrates on the system design of WCG, Malaysia. The overview of WCG, Malaysia, data flow diagram, data dictionary and interface design were described in detail. These designs are able to give the user and developer a detailed idea on the system. The DFD gives an overview of the processes involved in WCG, Malaysia.

SYSTEM IMPLEMENTATION

CHAPTER 5: SYSTEM IMPLEMENTATION

5.1 INTRODUCTION

System Implementation phase of the system development is concerned with translating design specification into a programming language. The primary goal of this phase is the production of a simple, clear source code with internal documentation that will ease the process of verification, debugging, testing, modification and future maintenance.

Since the prototyping method is applied in developing this web page, it generated many iterative steps that involve mostly the implementing and testing phase. The word 'implementing' referring to the development of a working model (prototype) within a short time.

5.2 DEVELOPMENT ENVIRONMENT

The development environment consists of hardware and software configuration. Using the suitable hardware and software is an important point that determines the successful of a project.

5.2.1 HARDWARE CONFIGURATION

The following hardware specification are used to develop this system:

- ✓ Intel Pentium (III) 500 Mhz processor
- ✓ 256 MB SD RAM
- ✓ 6.4 GB Hard Disk
- ✓ 15'' 256 color monitor capable of 800 X 600 resolution
- ✓ 1.44 MB Floppy Drive
- ✓ Speaker
- ✓ Other standard computer peripherals

5.2.2 SOFTWARE CONFIGURATION

The following software specification is used in the development of the system. They also include the software tools for documenting the system

Table 16: Software Configurations

Software	Usage	Description
Microsoft Windows 2002 Professional	System Development	Operating System
Microsoft SQL Server 7.0	System Development	Web Database
Internet Information Server 5.0 (IIS 5.0)	System Requirement	Microsoft Web Server
Microsoft Internet Explorer 5.0 & above	System Requirement	Web Browser
Adobe Photoshop & Flash	System Development	Graphics Editor
Microsoft Front Page	System Development	HTML editing
Microsoft Visual Interdev	System Development	ASP editing
Microsoft Word	System Development	Documentation
Notepad	System Development	HTML editing

5.3 PROJECT DEVELOPMENT

In the system development phase, the major work includes coding and debugging to solve the problems and errors encountered during the coding stage.

Though A Prototype Portal for Worldwide Church of God, Malaysia system is classified as a web application, all its information is still being coded into HTML & ASP document before being presented to the browser. Language used to develop the documents is HTML & VBScript. Server side scripts are inserted into these documents to allow server side processing.

The design must be translated into the form that can be understood by the machine. Basically, the development of the WCG, Malaysia is divided into 3 stages:

- Data Preparation
- Coding
- Integration

5.3.1 DATA PREPARATION

5.3.1.1 STILL IMAGES & ANIMATED GRAPHICS

Still images, mainly are button and bullet are included in the various pages within the web application. The objective of using these still images are to link to the related web site. These still images are in GIF & JPEG interleaved graphic format. All the images are created and edited using graphics editor such as Adobe Photoshop, Flash and Adobe Image Ready.

5.3.1.2 DATABASE CONNECTION

The Database for Prototype Portal for WCG, Malaysia is created using Microsoft SQL Server 7.0. Using Microsoft SQL, creating and modifying the tables make views and relationship made easily. All communication with a database takes place through an open connection. Before any information can be inserted into or retrieved from the database, a connection with the database must be opened using the open method to open the connection and close method to close the connection.

5.3.1.3 INPUT FORM DESIGN

WCG, Malaysia is web application that involves a lot of data input process by user that involve the database. Therefore, form design need to be done carefully so that the user knows how to use the system effectively. Microsoft Front Page was used to develop and design the form. Basically the tables in the HTML language were used to design the form layout and VBScript is used to validate the data input process.

5.3.1.4 HOMEPAGE INTERFACE DESIGN

The target audience of WCG, Malaysia is the entire Internet user. So, we need a lot of the interfaces to fulfill their requirements. Varieties of interfaces need to be done in order user to surf freely. Microsoft Front Page was used to design the interface. Still images, flash animation were also used to carry out varieties of beautiful and interactive interface.

5.3.2 CODING

5.3.2.1 INTRODUCTION

The design must be translated into the form that can be understood by the machine. The code generation step performs this task. If design is performed in a detailed manner, code generation can be accomplished mechanically.

HTML

HTML is mainly coded with using Microsoft Front Page 2000, which is a great HTML editor that provides many drag and drop functions and user-friendlier interface. This system is design mainly by using Microsoft Front Page.

VBSCRIPT

VBScript is designed to provide client-side scripting capabilities within Microsoft's Internet Explorer web browser. VBScript is also used to develop richly interactive Web pages that respond to user input in an intelligent manner. For example, when a user submits a form, a VBScript subroutine can be triggered to verify that the form is properly in with valid values.

ASP

A script that is interpreted by the web server is called a server side script. A server side script is an instruction set that is processed by the server and which generates HTML. The resulting HTML is sent as part of the HTML response to the browser. ASP is coded using Microsoft Visual Interdev. It is a server side scripting language used for creating dynamic web pages. In this project, all the server side scripting is written for process that involves the database.

5.3.2.2 CODING STYLE

Coding style is an important attribute of source code, it determine the intelligibility of a program. The ease of source code reading enables this web page to be easily maintained and enhanced. The elements of style include internal (source code level) documentation, methods of data declaration and the approach construction. The following lists some of the coding style used:

- Good coding techniques
- Structured coding technique
- Good internal comments
- Appropriate supporting documents
- Meaningful names for variable being used
- Indentation of codes
- Consistent convention in all the source code

5.3.2.3 PROCESS IN CODING

5.3.2.3.1 DATABASE CONNECTION

Prototype Portal for Worldwide Church of God, Malaysia is a web application that involves a lot of process of data In order to make a connection to database, these code are included into every page, which has a process of data. These coding will make a connection to database according to the database name, login id, and password and dsn name. If the database failed to connection, it will redirect to an error page indicate that the database fail to connect. The coding are coded as shown below:

```
set conn = server.createobject("adodb.connection")
   Conn.open "DSN=Church;UID=Admin;PWD=jayshree;DATABASE=Church"
```

5.3.2.3.2 GETTING USER INFORMATION

WCG, Malaysia has an administrative site, which is a password-protected site. Here we need a session ID to keep track member who have login and valid password. A coding is needed to get member information. The codes are listed below.

```
<%@  Language=VBScript %>
<% response.buffer=true%>
<%

   Dim Name1, Address1, Postcode1 ,ic_no1, City1, State1,
Username1,UserIC1,Password1
   Dim conn,SQLStr,rs,mySQL,rsUser


   Name1 =trim(request("Name"))
   Address1 =trim(request("Address"))
   Postcode1=trim(request("Postcode"))
   City1   =trim(request("City"))
   State1  =trim(request("State"))
   ic_no1 = trim(request("admin_ic"))
   UserIC1 = trim(request("User_ic"))
   Password1 = trim(request("Password"))
   UserName1 = trim(request("Name"))

  'Set connection object
   set conn = server.createobject("adodb.connection")
   Conn.open
"DSN=Church;UID=Admin;PWD=jayshree;DATABASE=Church"

   SQLStr ="INSERT INTO admin_info"
   SQLStr  =SQLStr  &  "(admin_ic,  Name,  Address,  Postcode,
City, State)"
   SQLStr =SQLStr & " VALUES('"
   SQLStr =SQLStr & ic_no1 & "','"
   SQLStr =SQLStr & Name1 & "','"
   SQLStr =SQLStr & Address1 & "','"
   SQLStr =SQLStr & Postcode1 & "','"
```

```
    SQLStr =SQLStr & City1 & "','"
    SQLStr =SQLStr & State1 & "')"

    Set rs = conn.execute(SQLStr)

    mySQL = "INSERT into UserLogin"
    mySQL = mySQL & "(User_ic,Password,UserName,UserLevel)"
    mySQL = mySQL & "VALUES ('"
    mySQL = mySQL & UserIC1 & "','"
    mySQL = mySQL & Password1 & "','"
    mySQL = mySQL & Username1 & "','"
    mySQL = mySQL & 1 & "')"


    Set rsUser = conn.execute(mySQL)

Response.Write "<font color=red size=4 face=times new roman>"
    Response.Write"</font>"
    response.redirect "../Main.asp"
    %>
```

regadmin.asp

This coding will include in every pages that need to get information after member have login.

5.3.2.3.3 AUTHENTICATE MEMBER (VERIFICATION)

This web site does not use cookies or session to store member password and login ID,. After a member enters their username and password, they will be direct to a password verification (validation) page to check their username and password. The coding below is included in login verification page to authenticate member. This code will process the username and password to check through the database whether it is a valid or invalid

5.3.2.3.4 UPDATE AND DELETE PROCESS

WCG, Malaysia is a web application that involves a lot of process of data with database. One of the processes is update and delete function. This function is for the administrative to update and delete information that need to be updates and delete from the database. These processes involve 2 pages , which is one to show the edit and delete button with its functions and the other page is to show the previous data keyed in by the user for the user to update the information.

Here is some example to update the user information and delete the information.

```
<%@ Language = VBScript %>
<% response.buffer = true %>
<html>
<head>
   <title>WCG, Malaysia</title>
</head>

<body bgcolor=White>
<%
   dim conn, mySQL, rsEdit, rsDel, rsAll
   dim action, ctr1, urlEdit, urlDel, clr1, admin_id
    Dim Name1, Address1, Postcode1 ,ic_no1, City1, State1,
Username1,UserIC1,Password1

   set conn = server.createobject("adodb.connection")
   Conn.open
"DSN=Church;UID=Admin;PWD=jayshree;DATABASE=Church"
   action = trim(request("action"))
   if action = "EDIT" or action = "DEL" then
      admin_id = trim(request("admin_id"))
   end if
   if action = "EDIT" then
   Name1 =trim(request("Name"))
```

```
   Address1 =trim(request("Address"))
   Postcode1=trim(request("Postcode"))
   City1    =trim(request("City"))
   State1   =trim(request("State"))
   ic_no1 = trim(request("admin_ic"))
   UserIC1 = trim(request("User_ic"))
   Password1 = trim(request("Password"))
   UserName1 = trim(request("Name"))

   end if
   select case action
      case "EDIT"
         mySQL = "UPDATE admin_info SET "
         mySQL = mySQL & "name = '" & name1 & "',"
         mySQL = mySQL & "address = '" & address1 & "',"
         mySQL = mySQL & "postcode = '" & postcode1 & "',"
         mySQL = mySQL & "city = '" & city1 & "',"
         mySQL = mySQL & "state = '" & state1 & "',"
         mySQL = mySQL & "admin_ic = '" & ic_no1 & "' WHERE
admin_id = " & admin_id
         'response.write mySQL
         set rsEdit = conn.execute(mySQL)
      Case "DEL"
         mySQL = "DELETE  FROM admin_info WHERE admin_id = " &
admin_id
         set rsDel = conn.execute(mySQL)
   end select

   mySQL = "SELECT * FROM admin_info"
   set rsAll = conn.execute(mySQL)
%>

<table width="400" border="0" cellspacing="0" cellpadding="0"
align="center" bordercolor="Navy" bgcolor="lavender">
```

```
    <tr>
  <td   align="center"   bgcolor="#666633"   colspan="2"><font
style="font-size: 12pt; color: #FFFFFF; font-family: Arial,
Tahoma,   Verdana,   Helvetica;   font-weight:   bold">Email
Directory</font></td>
    </tr>

  </table><br><br>
<div align="center">
<table width="80%" border="0" cellspacing="0" cellpadding="0"
align="center">
<tr bgcolor="#BCBC7A">
  <td                                    align="Center"><font
color="White"><b>No.</b></font></td>
  <td                                    align="Center"><font
color="White"><b>Name</b></font></td>
  <td                                    align="Center"><font
color="White"><b>Email</b></font></td>
  </tr>

<%
  ctr1 = 0
  while not rsAll.eof
  ctr1 = ctr1 + 1
  urlEdit     =     "Addemail.asp?action=EDIT&admin_id="     &
rsAll("admin_id")
  urlDel      =     "directory.asp?action=DEL&admin_id="     &
rsAll("admin_id")
  if ctr1 mod 2 = 0 then
    clr1 = "mistyrose"
  else
    clr1 = "lavender"
  end if
```

```
   %>
<tr>
   <td  align="Center"  font  style="font-size:  10pt;  color:
#000000; font-family: Arial, Tahoma, Verdana, Helvetica; font-
weight: bold" bgcolor='<%= clr1 %>'><%= ctr1 %></td>
   <td  align="Center"  font  style="font-size:  10pt;  color:
#000000; font-family: Arial, Tahoma, Verdana, Helvetica; font-
weight: bold" bgcolor='<%= clr1 %>'><%= rsAll("name") %></td>
   <td  align="Center"  font  style="font-size:  10pt;  color:
#000000; font-family: Arial, Tahoma, Verdana, Helvetica; font-
weight: bold" bgcolor='<%= clr1 %>'><%= rsAll("email") %></td>
</tr>
<%       rsAll.movenext
   wend
 %>
</table>
</div>
<%
   conn.close
   set conn = nothing
%>
<p align ="center"><b><a href="../main.asp">Home</a></b></p>

</body>
</html>
```

registershow.asp

In the registershow.asp , all the information , which is keyed in by the user in registration form, will be sent to the database and all the information will be retrieve from the database and viewed here. Here user can click to update or delete the information, which will make changes to the database. If the user wants to update information, they can get

back to the registration form with the previous data keyed in. Here it also needs a coding to keep the previous data .

```
<%@ Language=VBScript %>
<% response.buffer=true%>
<%
   dim mySQL, conn, rs, rsUL
   dim admin_id, ctr1

   set conn = server.createobject("adodb.connection")
   Conn.open
"DSN=Church;UID=Admin;PWD=jayshree;DATABASE=Church"
   admin_id = trim(request("admin_id"))

   mySQL = "SELECT * FROM admin_info WHERE admin_id = " &
admin_id
   set rs = conn.execute(mySQL)

   mySQL = "SELECT * FROM UserLogin WHERE user_ic = '" &
rs("admin_ic") & "'"
   set rsUL = conn.execute(mySQL)
   ctr1 = 1
%>
<form action="directory.asp" method="post">
<table     border="0"     cellspacing="0"     cellpadding="0"
bordercolor="#BCBC7A"              bordercolorlight="#000000"
bordercolordark="#FFFFFF">
     <tr>
  <td   align="center"   bgcolor="#666633"   colspan="2"><font
style="font-size: 12pt; color: #FFFFFF; font-family: Arial,
Tahoma,   Verdana,   Helvetica;   font-weight:   bold">Admin
Registration Form</font></td>
     </tr>
```

```
    <tr>
      <td bgcolor="#BCBC7A"><font style="font-size: 10pt;
color: #000000; font-family: Arial, Tahoma, Verdana,
Helvetica">Name</font></td>
      <td bgcolor="#DDDDBD"><input name="Name" type=text
value='<%= trim(rs("name")) %>'></td>
  </tr>

    <tr>
      <td bgcolor="#BCBC7A"><font style="font-size: 10pt;
color: #000000; font-family: Arial, Tahoma, Verdana,
Helvetica">Address</font></td>
      <td bgcolor="#DDDDBD"><textarea name="Address" rows=2
cols=20><%= trim(rs("address")) %></textarea></td>
  </tr>

  <input type="hidden" name="action" value="EDIT">
   <input type="hidden" name="admin_id" value='<%= admin_id
%>
<tr>
       <td colspan=2><br><br>
          <table width="100%" cellpadding=0 cellspacing=0
border=0>
           <tr align= left>
            <td width=50%><input type=Submit value="  Edit
"></td>
          </table></td>
        <td colspan=2><br><br>
          <table width="100%" cellpadding=0 cellspacing=0
border=0>
           <td          width="50%"><input          type=Reset
value=Clear></td>
```

addregister.asp

In addregister.asp the entire information previously added will be viewed and the newly updated information can be added in the same page by deleting the previous data and new data will be updated in the database.

5.3.2.3.5 MAILING SERVICE

WCG, Malaysia is a web application that enables members to send mail , view their inbox and also view the messages in the inbox. So the asp CDONTS mail object were used to create a sending email module. To use the CDONTS in ASP application, we have to have the SMTP Service correctly configured and able to deliver message. Here are some coding to that will allow users to send a simple e-mail message from the web page **SimpleMail.asp** and when the form is submitted , the page **SendMail.asp** is called where the majority of the work is done. This is the page that will actually send the mail message. This is just a simple application that utilizes CDONTS and the NewMailobject. Other that this, there is also application for logging in **Login. asp** where the user will enter their User/Display name and their e-mail address. After logging in with valid e-mail address, user can preview their inbox **Inbox. asp.** In addition to seeing what message are in their Inbox, users may want to be able to view one or more of their messages. The application **ViewMessage.asp** provide a way for users to open their messages by simply clicking on them in their Inbox.

```
<%@ LANGUAGE=VBScript %>
<HTML>
<HEAD>
<TITLE>Send Mail Page</TITLE><BODY>
<FONT SIZE=6><STRONG>Send Message </STRONG></FONT>

<FORM ACTION=SendMail.asp METHOD="GET" NAME=SendMail>
<TABLE BORDER=0 CELLPADDING=1 CELLSPACING=1 ID=TABLE1
WIDTH="90%">

   <TR>
      <TD><STRONG>From</STRONG></TD>
      <TD><INPUT NAME=SendFrom ><FONT
SIZE=2>(required)</FONT></TD>
   </TR>
   <TR>
      <TD><STRONG>To</STRONG></TD>
      <TD><INPUT NAME=SendTo><FONT
SIZE=2>(required)</FONT></TD>
   </TR>
   <TR>
      <TD><STRONG>Cc</STRONG></TD>
      <TD><INPUT NAME=SendCC></TD></TR>
   <TR>
      <TD><STRONG>BCC</STRONG></TD>
      <TD><INPUT NAME=SendBCC></TD>
   </TR>
   <TR>

   </TR>
   <TR>

<TD><STRONG>Subject</STRONG></TD>
      <TD><INPUT NAME=Subject></TD></TR>
```

```
   <TR>
      <TD><STRONG>Body</STRONG></TD>
      <TD><TEXTAREA ID=TEXTAREA1 NAME=BodyText
                STYLE="HEIGHT:    232px;    WIDTH:    451px"
rows="1" cols="20"></TEXTAREA></TD></TR>

</TABLE>

<INPUT TYPE="SUBMIT" VALUE="Send">
</FORM>

<%
   If Request.QueryString("MailSent") = "True" Then
    Response.Write "<font color=red size=4 face=times new
roman>"
     Response.Write    "Your    previous    message    was
sent.<br><br>"
   ElseIf Request.QueryString("MailSent") = "False" Then
     Response.Write    "Your    previous    message    was
<strong>not</strong> sent.<br><br>"
   End If
%>

<p>
<i><a href="../main.asp">Back to home...</a></i></p>
</BODY>
</HTML>
```

SimpleMail.asp

```
<%@ LANGUAGE=VBScript %>
<% Option Explicit %>
<%
Dim strReferer
Dim intPos

strReferer = Request.ServerVariables("HTTP_Referer")

intPos = Instr(strReferer, "?")
If intPos > 0 Then strReferer = Left(strReferer, intPos -1)

If (Request.QueryString("SendFrom") <> "") _
   And (Request.QueryString("SendTo")<> "") Then


Dim objSendmail
Set objSendMail = CreateObject("CDONTS.NewMail")

objSendMail.From =  Request.QueryString("SendFrom")
objSendMail.To =  Request.QueryString("SendTo")
objSendMail.Cc =  Request.QueryString("SendCC")
objSendMail.Bcc =  Request.QueryString("SendBCC")
objSendMail.Subject =  Request.QueryString("Subject")
objSendMail.Body =  Request.QueryString("BodyText")
objSendMail.Send
Set objSendMail = Nothing
Response.Redirect strReferer & "?MailSent=True"
Else
Response.Redirect strReferer & "?MailSent=False"

End If  %>
```

SendMail.asp

```
<%@ LANGUAGE=VBScript %>
<% Option Explicit %>
<HTML>
<HEAD>
<TITLE><% =Request.QueryString("UserName") %>'s Inbox</TITLE>
</HEAD>

<BODY>
<%
Dim objInbox
Dim colMsgs
Dim strUserName
Dim strUserEmail
Dim objCurSession

strUserName = Request.QueryString("UserName")
strUserEmail = Request.QueryString("UserEmail")

Session("UserName") = strUserName
Session("UserEmail") = strUserEmail

Set objCurSession = Createobject("CDONTS.Session")
objCurSession.LogonSMTP strUserName, strUserEmail

Set Session("CurSession") = objCurSession

Set objInbox = objCurSession.Inbox

Set colMsgs = objInbox.Messages

Response.Write "Welcome, " & Session("UserName") & _
          ". You have " & colMsgs.Count & " messages in your
inbox. <br><br>"
```

```
If (colMsgs.Count > 0) then
   %>
<TABLE BORDER=0 CELLPADDING=1 CELLSPACING=1 WIDTH=90%>
<TR>
   <TD><STRONG>From</STRONG></TD>
   <TD><STRONG>Subject</STRONG></TD>
   <TD><STRONG>Sent</STRONG></TD>
</TR>
<%
   Dim intLoop
      For intLoop = 1 to colMsgs.Count
%>
<TR>
   <TD><% =colMsgs(intLoop).Sender %></TD>
   <TD><A HREF="ViewMessage.ASP?MsgID=<% =intLoop %>">
      <% =colMsgs(intLoop).Subject %></A></TD>
   <TD><% =colMsgs(intLoop).TimeSent %></TD>
</TR>
<%
   Next
   End If

%>

</TABLE>
<p>
<i><a href="Login.asp">Back to login...</a></i></p>
</BODY>
</HTML>
   End Sub
%>
```

Inbox.asp

```
<%@ LANGUAGE=VBScript %>
<HTML>
<HEAD>
</HEAD>
<BODY>
<P>
<%
   Dim colMsgs
   Dim objCurMessage
   Dim objSession
   Dim intIndex

Set objSession = Session("CurSession")
Set colMsgs = objSession.Inbox.Messages

intIndex = Request.QueryString("MsgID")
%>
<TABLE BORDER=0 CELLPADDING=1 CELLSPACING=1 WIDTH="75%">
<TR>  <TD><STRONG>From:</STRONG></TD>
   <TD><LABEL><%=colMsgs(intIndex).Sender %></LABEL></TD></TR>
<TR>  <TD><STRONG>Subject:</STRONG></TD>
   <TD><LABEL><%=colMsgs(intIndex).Subject
%></LABEL></TD></TR>
<TR>  <TD></TD>
   <TD><TEXTAREA  ID=TEXTAREA1  NAME=TEXTAREA1  STYLE="HEIGHT:
390px; WIDTH: 547px" rows="1" cols="20" >
      <% =colMsgs(intIndex).Text %>    </TEXTAREA>
   </TD></TR>
</TABLE><p><i><a href="Login.asp">Back to login...</a></i></p>

</BODY>
</HTML>
```

ViewMessage.asp

5.3.3 SYSTEM INTEGRATION

The last stage of System Implementation is System Integration. Some changes either in coding or design will be made during the integration process. Although the application in this web page is using the same technique design, however there are still some changes in design. The changes that have been made are:

- Font size and font color
- Table background color
- Background color
- Add in some images

Besides the System Integration also did some changes in coding or functions. This contains:

- Add in security module
- Add in the related link

5.4 SUMMARY

The Implementation phase is divided into several stages. A total of 52 ASP files were built to accommodate the need of this system. During the implementation phase, system debugging is being carried out occasionally to prevent any of system bugs.

SYSTEM TESTING

CHAPTER 6: SYSTEM TESTING

Testing is a normal routine that involves testing on a newly developed or modified application program. Testing is vital in any program because it is during these stages that the strengths and weaknesses of a program surface.

WCG, Malaysia is considered a large system because it consists of many sub system that were built. There are 2 types of testing technique during the testing phase. There are the Black Box Testing and White Box Testing. Besides, there are 5 stages of testing process to be done to test the system thoroughly.

Figure 32 below shows the testing stage where the process starts from the component testing, integration testing and user testing. The black reverse arrow shows the reverse testing will take place as detects, error or fault are discovered at any one stages, program or coding. At this stage modifications are also required to correct the detects, error or fault which was discovered.

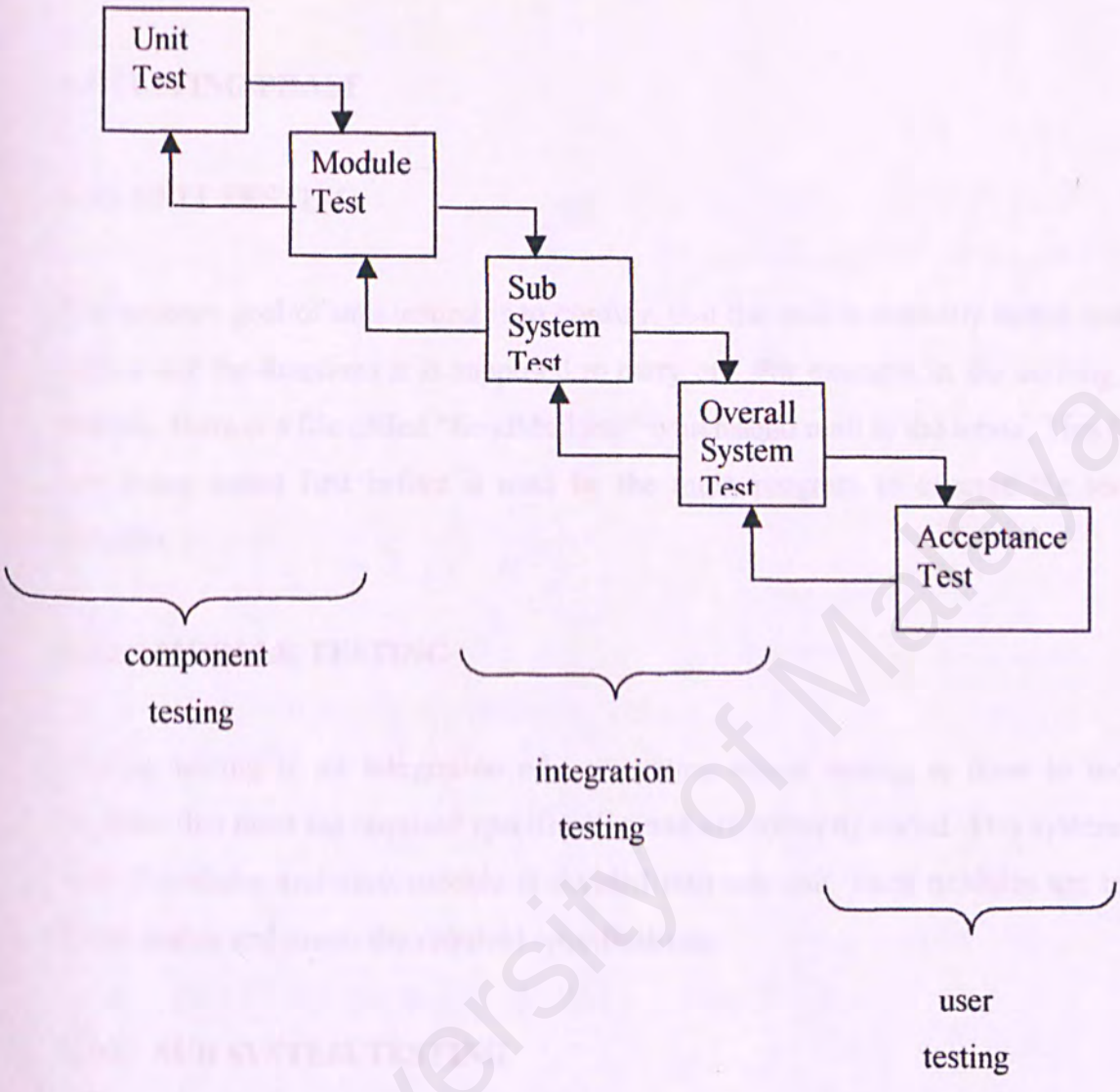


Figure 32: The Process of System Testing

6.1 TESTING TECHNIQUE

There are 2 type of testing technique used during testing phase. Black box and White box are test design methods. Black box test is to exercise or test the functions specified in the program or software. It derives its test cases from the program specification. White box is

to exercise or test the internal structure of the software. If derives its test cases from the knowledge of the program's internal structure.

6.2 TESTING PHASE

6.2.1 UNIT TESTING

The primary goal of unit testing is to confirm that the unit is correctly coded and that it carries out the functions it is supposed to carry out. For example in the mailing service module, there is a file called "SendMail.asp" which send mail to the inbox. This function was being tested first before it used by the main program to execute the send mail function.

6.2.2 MODULE TESTING

Module testing is an integration of unit testing where testing is done to individual modules that meet the required specification and are correctly coded. This system is built with 7 modules and each module is divided into sub unit. Each modules are tested its functionality and meets the required specifications.

6.2.3 SUB SYSTEM TESTING

Collection of modules will be integrated to form a sub system. The sub system may be independently designed and implemented. The sub system test process was focused on the detection of interface mistake. This is due to reason that interface error is the most common problem that arises in large system. The sub system testing was done by first browsing the web application without login or registration.

6.2.4 OVERALL SYSTEM TESTING

Here the sub system is integrated into an entire system. The testing was concerned with finding errors, which results from an anticipated interaction between sub system and

system component. It also concerned with validation that the system meets its functional and non-functional requirements.

6.2.5 ACCEPTANCE TESTING

Acceptance testing is a test with real data, in the real environment. This is carried out to evaluate the finished product. The purpose of acceptance testing is to demonstrate that a system is ready for operational use. Normally, the user in user environment performs the acceptance test. The goal is to demonstrate that the system is ready to use.
The user should select test cases for acceptance testing.

6.3 TEST CASE

A test case is a set of input data and expected result that exercises a system with the purpose of causing failures and detecting faults.
Besides reviewing the source codes, some test cases also have been used to test the system. This approach is used and observed. This strategy is needed to identify the variance between the prototype and the requirements. In this testing, different data is keyed in into the program. A number of users were given the opportunity to test the system using the test case and the result were evaluated

Table 17: Shows the sample test case that is being used as the test case in the development of WCG, Malaysia web site.

No	Test Condition	Expected Result	Fail/Pass	Remarks
1	Connecting to the system	Users should enter WCG, Malaysia main homepage with a minimal period of time	Pass	
2	Sign up as new user	User can submit the	Pass	Username

	member in administrative site	sign up form, register as a new and valid member		already exist cannot be used again
3	Search for church directory and church events	User can search according to their search criteria and the result will be previewed.	Pass	Search method can only be used one at a time
4	Registered member login	Valid user can login to a page with valid username and password	Pass	
5	Update and delete information	Admin site can update and delete their information	Pass	
6	Logout	Valid user can logout once their work is done and can only get back to the page after logging in.	Pass	
7	Send Mail	User can send mail and view their inbox with their send messages	Pass	User can only send mail by using the server 's name example: name@personne-x02qj1

6.4 SUMMARY

The overall system testing yields the expected results. Up to this stage the system is fully tested. In the next chapter the evaluation of the whole system is being carried out. The problem faced during the development of the system, the system strengths and the system limitation are discussed in detail.

SYSTEM EVALUATION

CHAPTER 7: SYSTEM EVALUATION

This chapter discusses the strengths, limitations and possible enhancements of this system. It also highlights some of the problems faced in designing and the processes involved while developing this web site. Solutions are projected to overcome these problems.

7.1 FEATURES AND STRENGTHS

WCG, Malaysia web site has been designed to accommodate the user requirements. There are several advantages of this system:

- Graphical User Interface

By taking advantage of graphics and HTML, this web site is designed to have better images. The combination of above stated makes this web site equipped with a good quality graphical interface.

- Ease of navigation

This web-based system is developed based on the principle of easy navigation. The locations of valid HTML are situated at the appropriate tables and pages. Therefore, users will find it easy to navigate.

- User Friendliness

This web-based system is user friendly, easily understood and have controls of system function flow by just clicking on button.

- User Feedback via Email

The web page is equipped with feedback form. With this, users are able to pen down their feedback and comments through mailing it to the developer. This is important as comments and suggestions are essential for future enhancements.

- System Transparency

It refers to 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 built. User has to know how to communicate with user interface.

- Interactivity

This web page gives users with interactivity with information.

7.2 SYSTEM LIMITATIONS

Besides its strengths, this web site has also some weaknesses and limitations due to the factors listed below:

- Web browser limitation

This web page is developed and tested using Microsoft Internet Explorer. It is not fully tested in all web browser such as Netscape Navigator or latest version of Microsoft Internet Explorer. Thus, it may not display correctly by using other web browser except Microsoft Internet Explorer.

- No Online Interactivity

Due to time constraints, this web page does not have online interactivity among users like chatting online.

- Limited searching method

This web page does not have advanced searching method that need some time to learn up the correct way of applying this application. Here it only has a simple searching method with only one keyword entered and searching for that keyword through the database.

- Email facilities not integrated

The email server is not integrated. If the user wants to send mail, they can only send to through the server name and not other mail service. Only with this the receiver can check their inbox and the messages in the server itself.

7.3 FUTURE ENHANCEMENTS

The system should be maintained throughout the lifetime of the system because the user requirements might vary from time to time. Enhancement in future will extend the usability of this system. Moreover the system limitation should be improved to enhance functionality.

Here are some suggestion and possible future enhancements:

- Attractive Web Page

It would become more reliable web site if it is enhanced to be more attractive and interactive by adding more meaningful and user friendly images, 3D images, animation images and sound.

- On-line Interactivity

The web site can be enhanced through on-line forums among the user to the web site.

- Integrated mailing capabilities

This system is currently able to receive mail within the server name and check mail with the server name too. So in future the user can receive mail by opening an account name at free email provider.

- More choice

Giving more choice to the users on picking up resources and add in more function features.

7.4 PROBLEM ENCOUNTERED AND SOLUTIONS

A number of problems were encountered throughout the development of this web site and solution has been sought during testing and reference check. The following are some of the major problem encountered during the system studies, analysis and development:

- Limited knowledge in web programming technologies

This is the first time I am developing web site using Microsoft FrontPage, ASP, HTML and other programming language. Lot difficulties were encountered as this project has to be done within a short period of time and a lot of technical issues need to be resolved.

- Difficulties in determine the scope of the system

This system is divide into few subsystem and its difficult to determine the project scope .To build a full scale complete system is impossible with given time but through advice and opinion from my supervisor to outline the scope of the project during the initial stage. Result of studying on the existing system has also given an outlook of the system scope.

- Problem in choosing tools and language

There is quite a number of scripting language and all the scripting language and tools allow user to achieve the same end result. So it's difficult to determine the most appropriate language and tools for the development of this project. To gain information of web based and determine the most appropriate language and tools to use, depth studies and research on the web based programming language was carried out in the earlier stage of development.

- Too Many Files

There are problem in linking the files because there are too many files to manage in the system. To overcome this problem, I have to divide the topics and the subtopics that are relevant to them into their own folder. This is easy for me to see the relationship between the files and to link them during the coding phase.

7.5 SUMMARY

A lot of time was spent on overcoming all the problem and constraints stated in this chapter. If the project duration were longer, much more could have been done with this project.

CONCLUSION

CHAPTER 8: CONCLUSION

A Prototype Portal for Worldwide Church of God, Malaysia is a web-based application for a Christian denomination that provides any group especially the Christian committee with the ability to interact online with their community and communicate with each other. The aim of this project is to develop a web site for the user to get information relative to their work, structure and services of church in Malaysia. This application also allow user to share ideas and knowledge over the Internet.

This project is very important and beneficial. In the process of developing this system, a lot of useful knowledge and valuable experience were gained. Programming in ASP, HTML and VBScript is something new and it is a valuable experience learning them. ASP technology turned out to be the most suitable technologies to develop such a system and has great potential to be a dominant server ISAPI filter in near future replacing CGI. Besides experience in graphical editing using Adobe Photoshop and Flash, it also provides me a great chance to learn these tools. The most important thing I have learned a lot is to find out the solution whenever I encountered problem in developing the system.

I have also learned how to set up a server like IIS with its connection to ODBC and SQL server. SQL server is something new compared to Microsoft Access which most of us are familiar with. I have gained a new experience in creating tables and relationship to table using SQL server. All the while I have only used Access to crate tables but now I know how to create tables using SQL server.

Finally, there are many individual skills, which I have learned from this project. Mainly it is the communication skill with people asking opinion, advice and help. Besides, this project has given me a profound impact in management. The entire problem faced and experience gained during the system development, would be useful in my future career since era is now moving towards web-based application.

According to the overall result, it can be concluded that the outcome of this system is achieved and fulfilled the project objectives.

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