WAP ALUMNI REGISTRATION SYSTEM

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To my mother, father, grandma and brother with love

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ABSTRACT

Nowadays, mobile computing is said to be a new style of information access emerging at the intersection of two current trends; producing portable device in computer industry and wireless communication in telecommunication industry. This process will give a lot of benefits to human being in terms of its mobility and availability. Wireless Application Protocol (WAP) is a set of standards designed to extend Internet services to mobile phones, pagers, and personal digital assistants (PDAs). In view of these, the present study was conducted to use WAP in the alumni registration process. The main objectives of this study are to enable graduate students register alumni and share information using WAP technology via a cell phone or PDA. The system was develop using Microsoft Visual Web Developer, Openwave Simulator, Internet Information Services (IIS) as a web server and Microsoft Access as database management. The system also use Wireless Markup Language (WML) integrated with Active Server Pages (ASP) as a scripting language. This project involves four main phases. The first phase was doing a literature review; which all software and hardware specifications needed are met. The second phase is development and programming the codes for client and administrator side. The third phase is simulation and testing into real cell phone and the last phase is writing off the report.

ABSTRAK

Di era ini, pengkomputeran mudah alih dikatakan sebagai cara terbaru yang muncul di pasaran kini. Terdapat dua kaedah bagi memenuhi pengkomputeran mudah alih iaitu; penghasilan peralatan mudah alih dalam industri komputer and komunikasi tanpa wayar. Proses ini akan memberi pelbagai kemudahan kepada manusia dalam konteks mudah alih dan ketersediaannya. WAP adalah satu set piawaian yang direka untuk menyalurkan kemudahan Internet tanpa wayar kepada telefon bimbit, alat kelui, dan PDA. Berdasarkan pandangan ini, kajian telah dibuat untuk menggunakan teknologi WAP bagi tujuan pendaftaran alumni. Objektif utama kajian ini adalah untuk memastikan graduan dapat mendaftarkan diri mereka sebagai alumni dan berkongsi maklumat menggunakan teknologi WAP menerusi telefon selular atau PDA. Sistem ini telah dibangunkan menggunakan perisian *Microsoft Visual Web Developer*, *Openwave Simulator*, *Internet Information Services (IIS)* sebagai pelayan dan *Microsoft Access* sebagai pengurus pangkalan data. Sistem ini juga menggunakan teknologi *Active Server Pages (ASP)* yang digabungkan bersama *Wireless Markup Language (WML)* sebagai bahasa pengaturcaraan. Keseluruhannya, projek ini merangkumi 4 fasa utama; iaitu fasa pencarian maklumat, dimana semua keperluan perisian dan perkakasan dipenuhi. Fasa kedua ialah pembangunan dan pengaturcaraan perisian dan kod untuk pelayan dan juga pelanggan. Fasa ketiga ialah proses simulasi dan pengujian terhadap telefon bimbit sebenar, dan fasa terakhir ialah penulisan laporan.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ADO   - ActiveX Data Object

ASP   - Active Server Pages

COM   - Component Object Model

CSS   - Cascading Style Sheets

DHCP   - Dynamic Host Configuration Protocol

DHTML   - Dynamic Hypertext Markup Language

DSN   - Data Source Name

DTD   - Document Type Definition

EDGE   - Enhanced Data Rate for GSM Evolution

FTP   - File Transfer Protocol

GB   - Gigabyte (1 trillion byte)

GPRS   - General Packet Radio System

HTML   - Hypertext Markup Language

HTTP   - Hypertext Transfer Protocol

IIS   - Internet Information Services

IP   - Internet Protocol

ISP   - Internet Service Provider

ISBN   - International Standard Book Number

ISP   - Internet Service Provider

MIME   - Multi-Purpose Internet Mail Extension

OLE DB   - Object Linking and Embedding Database

PDA   - Personal Digital Assistant

SQL   - Structured Query Language

TCP/IP   - Transmission Control Protocol/Internet Protocol

UMTS   - Universal Mobile Telecommunications System

WAP   - Wireless Application Protocol

WML   - Wireless Markup Language

XHTML   - Extensible HTML

XML   - Extensible Markup Language

LIST OF APPENDICES

CHAPTER 1

INTRODUCTION

1.1   Project Background

After graduation, graduates will detach and live their own. But to keep their relationships, they need alumni as a communication platform. So this system will help them to register their alumni using the fastest and easiest way via Wireless Application Protocol (WAP) technology. It also can help administrator to manage their alumni page easily, so that the graduates can get the latest news and information regarding their alumni.

1.2   Project Objectives

The objectives of this project are:

i.   To enable graduate students register alumni using WAP technology.

ii.   To enable graduate students share an activity and information regarding their alumni.

This project also comes with administrator site management system. The advantages of administrator site are:

i.   Easy for administrator to key-in data regarding alumni activities and information;

ii.   Data entered by alumni member are easily managed and intended for data analysis process;

iii.   Let the information spread between alumni member and university.

1.3   Project Scopes

The scope of this project is to ensure alumni become a communication platform between graduate students. Figure 1.1 below shows the flowchart of overall software system design for this project.
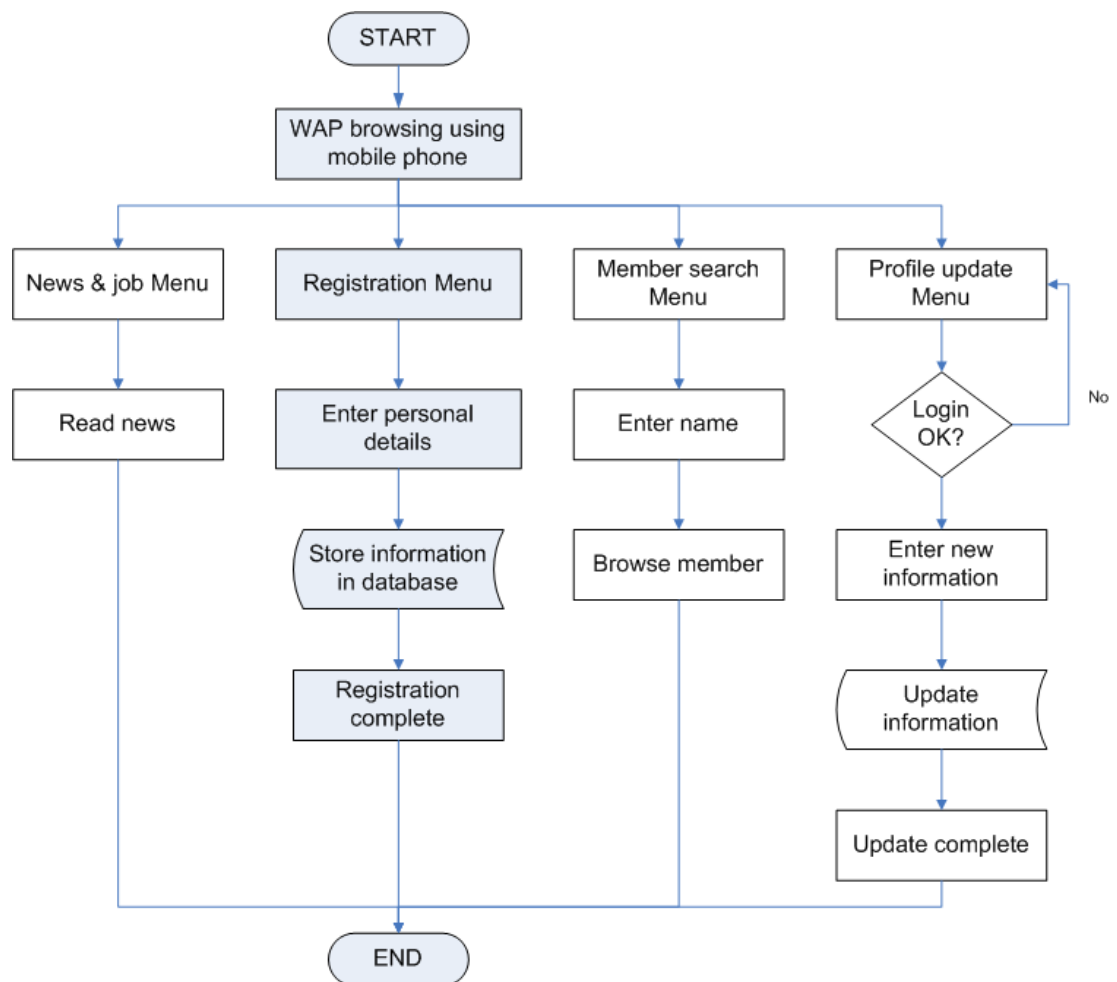
Figure 1.1: Flowchart of software system design for
WAP Alumni Registration System

The process started when user browse into WAP Alumni Registration page using any WAP-enabled device such as hand phone or a Personal Digital Assistant (PDA). When the connection is established between the microbrowser and web server, the main menu will appear. User can make selection between these four menus; news and job, registration menu, member search menu and the last one was update profile menu. After that they point the microbrowser to registration menu and

start to fill their personal details like name, address, password, contact number, matrix number, occupation and year of graduation. Password is used to update the profile in profile update menu. If the registration is success, the data (personal details) will be stored in database. If it fails, user must enter the data back accordingly to ensure the registration is succeeded. To search for existing member, user can choose member search menu and they must key-in at least 2 characters, the result like name, phone number and address will come out if the user existed in database. The other menu will let user to read recent news and job vacancy regarding their alumni.

1.4   Problem Statement

The majority of graduate students are not interested in joining Alumni. Instead, some of them really don't know about alumni. This phenomenon also occurs at Universiti Malaysia Pahang.

Student must go to Student Affairs office to get an Alumni form, fill-up the form and submit back to complete the registration process. But some of them think the process to become an alumni member is inconvenient. So, hopefully this problem can be reduce after developing this system.

CHAPTER 2

LITERATURE REVIEW

2.1   Introduction

This chapter reviews about Web programming technologies and languages, web server, dynamic page and the device used in developing this system.

2.2   Alumni

Previous research suggests students who are active in life of college campus, primarily through voluntary association in student activities and organizations are likely to be more philanthropic toward their alma mater than those who less involved, or not involved at all. According to Breazeale, institutional commitment created from student social involvement continues after graduation. Breazeale also stated that the student should [1]:

i.   Be made aware of Alumni Association, by making registration easier.

ii.   Develop leaders among the graduate student.

iii.   Involve alumni members in the affairs of the university.

One key assumption to ensure future alumni support lies in making entertainment students graduate with a positive overall attitude about their educational experience. Graduate who leaves with negative feelings about their alma mater will most likely never respond to request for financial support.

For this study, Alumni refer to persons with records on the internal database of Universiti Malaysia Pahang. Mostly, alumni registration is done by completing the form. Now in the new era of computer and telecommunication industry, the registration can be made by cellular phone anywhere.

2.3   Web Programming Technologies and Languages

2.3.1   Hypertext Markup Language (HTML)

Hypertext markup language (HTML) with its hypertext transfer protocol (HTTP) represents the third generation of Internet navigation technology. HTML can format Web pages for transferring and presenting text, graphics, sound, and full motion images on the Web. Users can view, save, or print Web pages containing text, graphics, sound, full-motion images, and hyperlinks from their web browsers. However, web pages formatted with HTML can only deliver information in a static presentation without interactivity. An interactive capability, for example would allow the user to do calculations, make purchases, pay bills, or manage bank accounts on the web.

2.3.2   Dynamic Hypertext Markup Language (DHTML)

In response to the demand for this type of dynamic, interactive and data-driven Web applications for e-business transactions, researchers have developed the fourth generation of Internet navigation technology, Dynamic hypertext markup language. DHTML is a combination of HTML and scripting languages such as JavaScript and Visual Basic Script. The basic purpose of DHTML is to embed scripts into HTML files to make Web page dynamic and interactive. With DHTML, developers can create Web applications that involve their users and enable them to carry out a wide variety of activities. For example, alumni registration system, class

attendance system, ticket and hotel reservation, bank account management and online purchasing via Web.

2.3.3 Wireless Application Protocol (WAP)

Wireless Application Protocol (WAP) is a specification for a set of communication protocols to standardize the way that wireless devices, such as cellular telephones and radio transceivers, can be used for Internet access, including e-mail, the World Wide Web, newsgroups, and Internet Relay Chat (IRC) [2]. WAP is the fifth generation of Internet navigation technology that enables people to enjoy wireless Web browsing and e-business transaction by using properly cell phone or a PDA.

Within the United States and Europe, the Wireless Application Protocol is the most widely used protocol for Wireless application. In contrast, in Japan, the most widely protocol is I-MODE whose use is driven by NTT DoCoMo. I-MODE is a technology similar to WAP, but it uses data capabilities only found on that network. Meaning that, this technology just can be used in NTT DoCoMo, Japan networks only.

To create a WAP-based site, developers normally use languages such as Wireless Markup Language (WML), a subset of Extensible Markup Language (XML). But for I-MODE site, developers use cHTML (compact HTML) or a compressed form of HTML.

WAP structure is very similar to the well-established International Standards Organization (ISO) network model with a transport protocol similar to the generally fixed-line HTTP. However, in this case, it is focused on broadcast requirements, which use less bandwidth. The WAP protocol architecture is shown in Figure 1.2 alongside a typical Internet Protocol stack. It consists of layers, which describe and specify the application/browser (WAE), sessions (WSP), transactions (WTP),

security (WTLS), transports (WDP), and bearers (SMS, USSD, CSD, IS-136, CDMA, GPRS, etc.)[5].
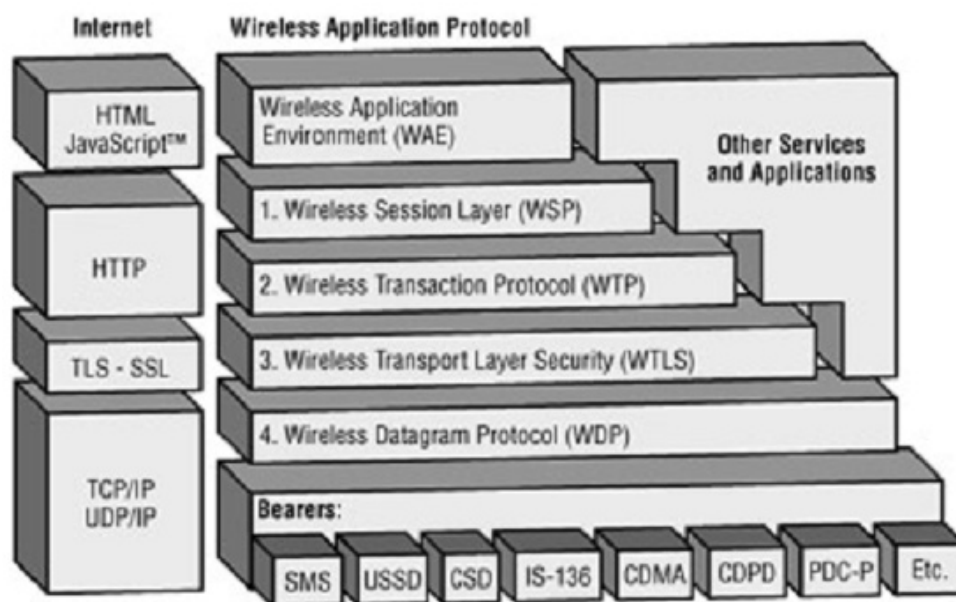
Figure 2.1: WAP protocol architecture [5]

Following are brief descriptions of the main features of the Wireless Application Protocol layers:

i. Wireless Application Environment (WAE)

The *WAE* is the top layer of the WAP stack and is of most interest to content developers because it contains, among other things, device specifications and the content development programming languages, WML and WMLScript. It is an application environment that is based on a combination of mobile telephony technologies and the World Wide Web.

The purpose of the WAE is to establish an environment to build applications and services. The WAE includes a microbrowser environment that defines how the wireless device interprets and presents WML and WMLScript. It also contains components that specify the following:

- WML for creating WAP applications.
- Wireless Telephony Application Interface (WTAI), which provides telephony services for WML decks running on phone-based devices

- Content formats that define a set of data formats, including images, phone book records, and calendar information.

WAE depends upon a WAP-compatible proxy server to translate between WAP and HTTP transactions and WAP and Internet Protocols.

ii.   Wireless Session Protocol (WSP)

The *WSP* is a sandwich layer that links the WAE to two session services: one connection oriented service that operates above the Wireless Transaction Protocol and one connectionless service operating above the Wireless Datagram Protocol. It is basically a binary-formatted tokenized version of HTTP, designed to provide low bandwidth browser handling on long latency networks. Unlike HTTP, WSP has been designed by the WAP Forum to provide fast connection suspension and reconnection. It has also been designed to provide content push capabilities that allow unsolicited transmission of data to user agents, which in turn allows WAP device users to be alerted, for example, to incoming e-mails, telephone calls, and faxes.

iii.   Wireless Transaction Protocol (WTP)

The *WTP* runs on top of a datagram service such as User Datagram Protocol (UDP) and is part of the standard suite of TCP/IP protocols used to provide a simplified protocol suitable for low bandwidth wireless stations. It offers three classes of transaction service: unreliable one-way request, reliable one-way request, and reliable two-way request response. WTP supports protocol data unit concatenation and delayed acknowledgment to help reduce the number of messages sent, and to attempt to optimize the user experience by providing the information that is needed when it is needed.

iv.   Wireless Transport Layer Security (WTLS)

WTLS incorporates security features that are based upon the established Transport Layer Security (TLS) protocol standard. It includes data integrity checks, privacy, service denial, and authentication services. Developers can access WTLS by using HTTPS instead of HTTP in the URL.

v.   Wireless Datagram Protocol (WDP)

The *WDP* allows WAP to be bearer-independent by adapting the transport layer of the underlying bearer. The WDP presents a consistent data format to the higher layers of the WAP protocol stack, thereby offering the advantage of bearer independence to application developers.

vi.   Bearers

Below the WDP sit all of the *bearer* networks. These include Short Message Service (SMS), a facility for sending short messages; Unstructured Supplementary Service Data (USSD); Code Division Multiple Access (CDMA), for the reuse of scarce radio resources in adjacent areas; and Cellular Digital Packet Data (CDPD). Through the Internet Protocol stack, the WAP client communicates with the WAP gateway, which sits between the wireless carrier's network on one side and the public Internet or corporate intranet on the other. Gateways can be located within carrier or corporate firewalls or both. In addition to taking care of various housekeeping tasks such as keeping track of the WAP client's bookmarks and managing its cache, the WAP server handles the interface between the two sets of network protocols, wireless (WAP) and wired (TCP/IP).

2.3.4 Wireless Markup Language (WML)

WML is markup language like HTML. WML is a Document Type Definition (DTD) of XML. Pages or services created using HTML do not very well on small handheld devices (cell phone), since they were specifically develop for use on desktop computer with larger color screen. Also, low bandwidth wireless bearers wouldn`t be suitable for delivering the large files that HTML pages consists of. Therefore, WML is develop to overcome these restrictions.

WML provides a navigation model for devices with small display screens and limited input facilities (no mouse and a limited keyboard). In order to save valuable bandwidth in wireless network, WML can be encoded into a compact binary format for transmission between the phone and the network and vice-versa. Encoding WML is one of the tasks performed by the WAP gateway, which is the entity that connects the wireless domain with the Internet [3].

2.4 Web Server

2.4.1 Architecture

A web server, also known as HTTP servers, provides the infrastructure for the World Wide Web. A Web server functions as a service center for information sharing, data exchange and management within Internet or Intranet. Figure 2.1 below shows the Architecture of a dynamic and data-driven website.

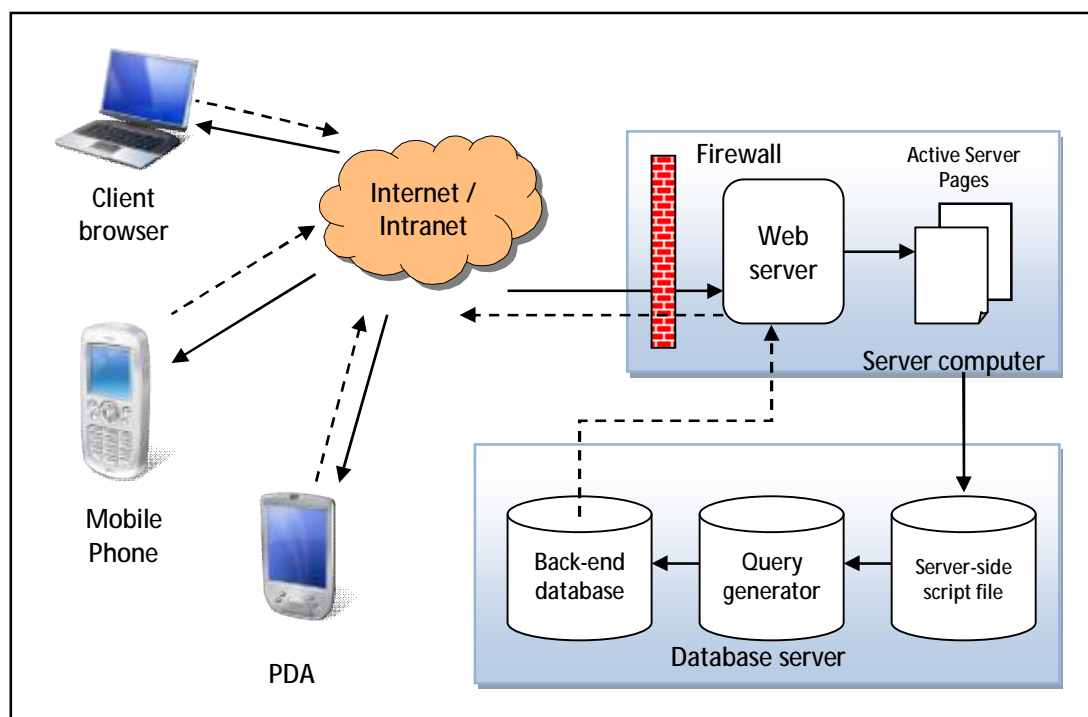**Figure 2.2**: Architecture of a dynamic, interactive, data-driven website [3]

2.4.2 Internet Information Services (IIS)

Microsoft® Internet Information Services 5.1 (IIS) is a Web server that works with Windows XP Professional platform to deliver Web-based applications. IIS is a free, secure platform for building database-driven web page based on Active Server Pages (ASP) technologies [4].

2.4.3 External web server

External web server is a web hosting service that runs by other people with a complete mainframe system. Their server also will have a permanent unique Internet Protocol (IP) number. So that, user can access stored web page by typing full HTML address or IP address directly. Usually this service required user to subscribe and pay fees for web server maintenance. But this type of web hosting service is very reliable, fast, bigger space and supports a lot server language compared to free web hosting.

2.5 Dynamic page

2.5.1 Active Server Pages (ASP)

Microsoft Active Server Pages (ASP) is a server-side scripting environment that can be use to create interactive Web pages and build powerful Web applications. ASP is an open, compile-free, language-independent application technology that combines HTML, server-side scripting and robust database publishing for creating powerful, dynamic Web application [6]. Figure 2.3 below show ASP and ADO Object Model Structure.
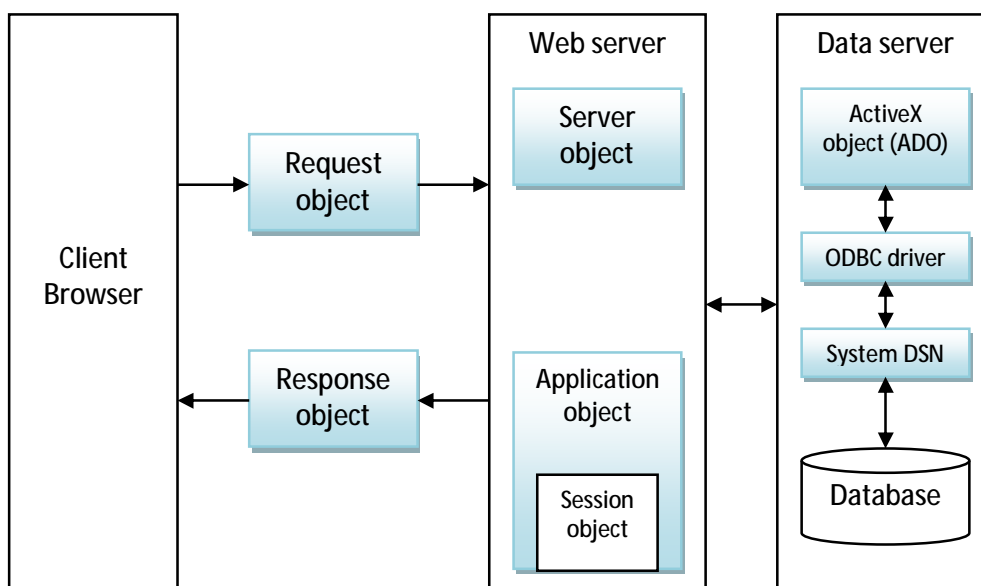
Figure 2.3: ASP and ADO Object Model Structure [6]

When the server receives a request for an ASP file, it processes server-side scripts contained in the file to build the Web page than, it sent back to the browser. In addition to server-side scripts, ASP files can contain HTML (including related client-side scripts) as well as calls to COM components that perform a variety of tasks, such as connecting to a database or processing business logic.

ASP creates this connection with the help of five primary ASP objects. It connects, or relates these objects to ActiveX Data Objects (ADO), as shown in figure 2.3. ADO is a high-level data access programming interface to an underlying data access technology (such as OLE DB), implemented by COM. While Object Linking and Embedding Database (OLE DB) is a data-access interfaces providing consistent access to Structured Query Language (SQL) and non-SQL data sources across the enterprise and the Internet [4]. The five ASP Objects are Request object, Response object, Server Object, Session object and Application object.

2.5.2 Database

Database has major impact on the growing use of computers; it plays a critical role in an almost every area where computers are used, including business, engineering, medicine, law, education and library science.

Microsoft Access, SQL Server and Oracle are all Web-compatible databases and are similar in functionality. In this project, Microsoft Access was chosen to be used as a database management. The significant are the data is not quiet big compared to e-commerce application (the migration of the data between WAP device and server it is not critical). Microsoft Access also provides additional tools for analyzing the data itself; like error checking and improved sorting control.

2.6   Device

2.6.1   Phone Simulator

Phone simulator is a program that implements a WAP microbrowser, but is designed to run on a non-WAP device, such as a Windows PC. Simulators are often used by developers to speed up the development process, as well as to reduce the costs of using WAP during testing each time a change is made. It is an application to test how wireless applications work. The simulator includes the same browser, messaging, and other application code that is embedded in real mobile phones. The phone simulator is installed with built-in WAP gateway and use Internet connection to browse WAP page in web server.

2.6.2   Mobile phone

Mobile phone is a telephone which is connected to the telephone system by radio, rather than by a wire, and can therefore be used anywhere where its signals can be received. The phone that used in this project must support WAP technologies and must subscribe to the Internet service using either General Packet Radio System (GPRS), Enhanced Data Rate for GSM Evolution (EDGE) or Universal Mobile Telecommunications System (UMTS). The mobile browser or a microbrowser that embedded in cell phone will connect to WAP gateway first, before WAP gateway transfer the request using HTTP to web server. The respond will transferred back to WAP gateway and lastly to microbrowser. Figure 2.4 shows how to display WAP content using a gateway and a simulator.
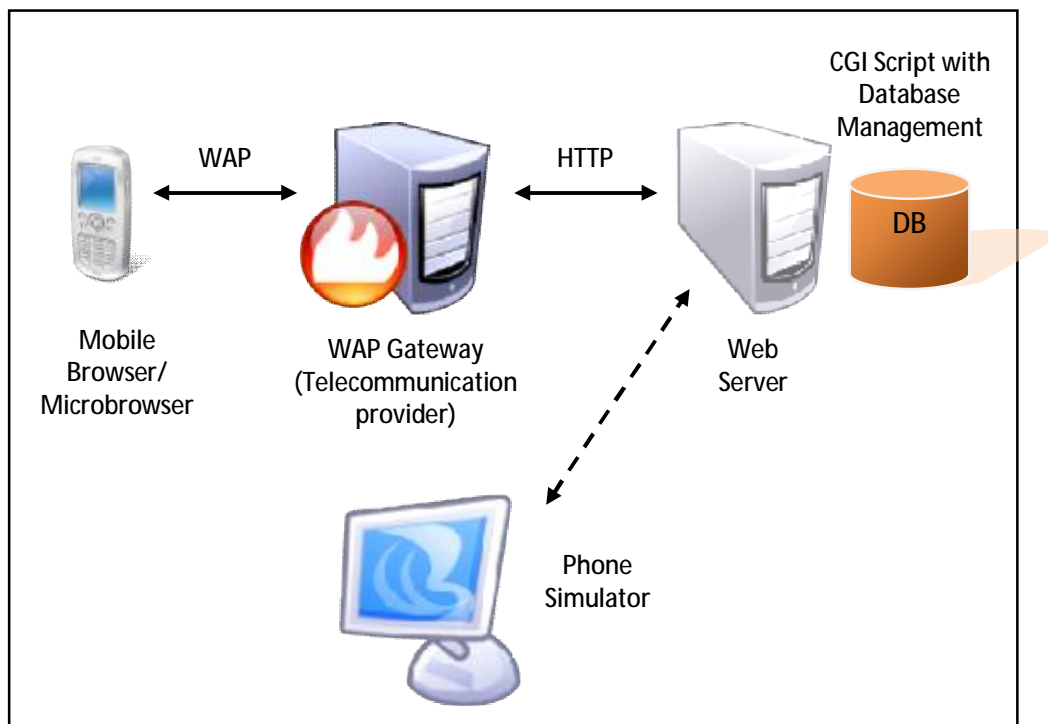
Figure 2.4: Displaying WAP content using a gateway and a simulator

2.7   Comparison

Technically, WAP technology has been used since 5-7 years ago. A lot of mobile application or a system has been develop based on WAP technology. But the different between each system is the scripting language itself used to develop a dynamic WAP content. Examples of scripting language used nowadays are ColdFusion, ASP, PHP and Perl. These scripting techniques were used to create a powerful dynamic Web application. In this section, a comparison was made to compare between an available system and current research that implemented WAP technology. The element that counted in this evaluation is scripting language, server and data management software.

The first system is Pharmaceutical Information Processing. The system was used to test a practical approach that ported a relational database of Danish pharmaceutical catalogue using open source software [7]. The system was develop using PHP 3.0 as scripting language and Apache 1.3 as a server. For database

management, this system used MySQL 3.22. The advantages of using MySQL database over MS Access are My SQL handles multiple user connections better and is far better suited to web applications. So, it is suited to the system since the system will have a lot of user and a connection between WAP device and a web server.

The second system is Malaysian Airline System (MAS) flight schedule. This system will let user to know the exact time and date when the flight will depart. It was develop using ASP 3.0, Apache 1.3 and SQL Express database.

The third system is a Robot Interface Using WAP Phone. The system was develop by CSIRO Manufacturing Science & Technology for online control and monitoring of a robot. This system is quiet different with other type discussed in above because this system involved with robot interface. There are other communication layer used called Remote Tool Control (RTC) to let WAP communicate with robot [8]. Table 2.1 below show the complete comparison between available systems that implemented WAP technology.

Table 2.1: A comparison between available WAP-enabled systems

WAP System Element	Pharmaceutical Information Processing	MAS Flight Schedule	Robot Interface Using WAP Phone	UMP Alumni Registration
Scripting Language	PHP 3.0	ASP 3.0	PHP 3.0	ASP 3.0
Server Management	Apache v1.3 on Linux Server	Apache v1.3	QCAT webserver	IIS v5.1
Data Management Software	MySQL v3.22	SQL Express	n/a	Microsoft Access 2003

CHAPTER 3

METHODOLOGY

3.1   Introduction

The WAP Alumni Registration System developed is a web and mobile based online application that is to help graduate student register their alumni via mobile phone. It consists of mobile page of alumni`s activities and mobile online forms for the users to key in their personal details and submit the form. The data are processed by the system, and then submitting the request to the server.

The system uses a database to store all personal information like name, address, graduation year, email, contact number and occupation from the user. This sensitive information is not shown to normal user but only can be accessed by administrator only using a password.

The development model that is used in developing this system is the flow model. This model consists of five different stages that are Literature Review, Requirements Definition, Server and Client-Side Development, Integration and Simulation Testing, and finally Data Analysis. This could be seen through the model in Figure 3.1.
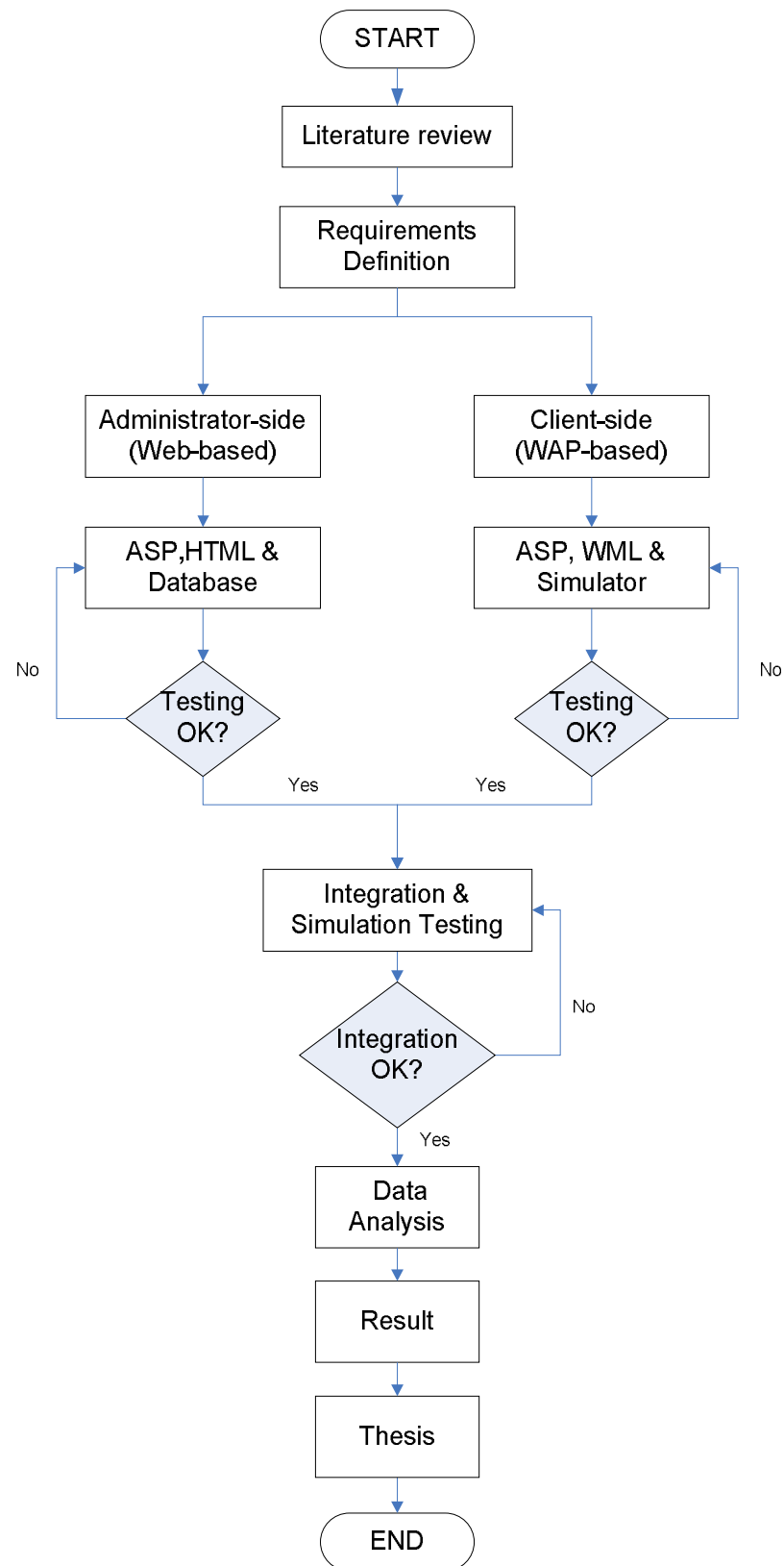
Figure 3.1: Project flow model

The system is a fully online system that cannot be obtained in offline mode. The system could not be downloaded and used when the user`s WAP device is not connected to internet. However, there is an exception. During the testing phase, the system can be accessed in local web server (using IIS and it is offline from the internet). The reason for this is because the system process the information submitted by user in the web server and transfer back the request to user in separated process. So that, the sources code cannot be viewed from client browser and hence, cannot be stolen. To establish the connection between cell phone and internet, the user must first subscribe to GPRS, EDGE or UMTS (3G) service and using WAP compatible phones.

3.2 Requirements Definition

3.2.1 Development Platform

The system is developed using Microsoft Visual Web Developer Express Edition. The mark-up language used is Wireless Markup Language (WML), Hypertext Markup Language (HTML) and the web forms are done using Active Server Pages (ASP). The scripting for the system is done using Microsoft Visual Web Developer.

3.2.2 Database Requirement

The system requires less extensive of database. This is because all the information regarding alumni member like name, address, contact number, email, occupation just stored on web server in one way. Meant that, the database will not be able to update by user, just administrator can manipulate the data.

The database is designed using Microsoft Access 2003 as it could be easily integrated into Active Server Pages (ASP) script using a Database Connection Network (DSN)-less connection.

3.2.3 Web Server

Both of the internal and external web servers for this project must support Active Server Pages (ASP) to ensure that the server and client-side of scripting works. For internal web server, IIS 5.1 was used since it guaranteed supports the ASP scripting. These two technologies are designed by Microsoft to brings the power of web computing for their Windows`s user.

For external web server in this project, NoFeeHost web hosting was chosen based on these features:

i.   Free and lifetime membership
ii.   Support Active Server Pages (ASP) 3.0
iii.   100 MB space storage
iv.   Support Microsoft Access database
v.   Using Windows 2003 IIS 6
vi.   Support File Transfer Protocol (FTP)

3.2.4 Hardware and Software Specification

Generally, the hardware required in this project are a computer and a cell phone. The computer requirements used in this project are:

i.   Intel Pentium M 1.4 GHz
ii.   1GB Random Access Memory (RAM)
iii.   At least 1 GB free hard disk space
iv.   Microsoft Windows XP Professional Edition with IIS 5.1

The cell phone requirements are:

i.   WAP-enabled (using either GPRS, EDGE, 3G services)

ii.   A display with minimum resolution of three lines of twelve fixed-width characters

iii.   Support text entry

iv.   A minimum of two programmable user interface mechanism

The other software used for this project are:

i.   Openwave V7 Phone Simulator

ii.   Internet Explorer Browser

iii.   CuteFTP 8.0 Professional

Openwave V7 Phone Simulator is a windows-based application that used to test how wireless application work. The simulator includes the same browser, messaging, and other Openwave application code that is embedded in real mobile phones. The version of this Openwave Simulator can display content delivered in a number of formats, including XHTML Mobile Profile 1.0 (XHTML-MP) with Cascading Style Sheets (CSS), and Wireless Markup Language (WML).

Internet Explorer browser is free, and comes with any Microsoft operating system that used as a platform to surfing the internet. In this project, Internet Explorer is used to display the administrator side of the system. The reasons of using this browser compared to another browser are lot of people was using this browser as their default browser and it consumed less memory of Random Access Memory (RAM). Thus, the environment of Internet Explorer can be taken as reference in developing this system.

CuteFTP 8.0 Professional is a powerful tool that used to maintain the web sites in external web server. Using this software, administrator can easily and securely upload and download the files within the external web server.

3.3   Administrator-side Development

3.3.1   Microsoft Access 2003

This software is used to create database of graduate student. A database is a collection of information that's related to a particular subject or purpose, such as indexing the books in library by its title or ISBN. Microsoft Access 2003 is database management system software.

Using Microsoft Access, user can manage all the information from a single database file. Within the file, the data can be divided into separate storage containers called tables. User also can view and update the data using online forms; find and retrieve the desired data by using queries; and analyzed or print data in a specific layout by using reports.

There are four steps in designing the database for this project:

i.   Determine all field

Gather all the data that application will use and study how the output will use the data. In this project, the related fields are Name, Address, Year Graduated, Phone Number, Matrix ID and Occupation.

ii.   Group related field

All this fields are group into *users* table. These fields are entered accordingly based on the desired system design and all the data type is determine correctly to ensure there is no error when integrating with ASP codes.

iii.   Create table

The other table created is *reg_user* and *news. Reg_user* table is to stored table for username and password's field for admin to access the administrator site.

iv.   Normalized the data

Normalize the data means to eliminate redundancy. Redundancy will leads to errors. The solution to avoid this problem is normalizing the data.

3.3.2 Active Server Pages (ASP) coding

i.   DSN-less connection

There are many methods to link-up the document with the database management system (DBMS) such as using (Open Database Connectivity) ODBC DSN which is come along with IIS 5.1 and DSN-less connection using SQL OPEN statement. For this project, the method used is DSN-less connection. The reasons using this method are easier to link-up with Access database and the syntax will take only 3 lines. This method also well-suited with the web server since web server required a DSN-less connection to link-up the database.

```
1 CONNECT="Provider=Microsoft.Jet.OLEDB.4.0;Data Source=" &
2 Server.MapPath("db\USERMAN.MDB")
3 Set DBCONN=Server.CreateObject("ADODB.Connection")
4 DBCONN.OPEN CONNECT
```

Figure 3.2: DSN-less connection tag

The first and second line is to specify the type of database and the location of database file used. At line 2, the server map path is used to specify the location of the database include its subfolder. In this case USERMAN.MDB is the Access database name. The last line is to open a connection to selected database.

ii.   SQL statement

Structured Query Language (SQL) Statement is used to make or call a data to do some operation like *update*, *insert* or *delete* a record in the database. SQL statement tag in figure 3.3 tells the server to do a delete operation.

```
1 sql = "DELETE newsno FROM news WHERE newsno= " & padam &""
2 conn.Execute(sql)
3 conn.close
```

Figure 3.3: SQL statement tag

The first line of statement tag tells the server to delete a *newsno* record from *news* table based on *newsno* condition. *Newsno* is the reference number for each record. *Newsno* condition will be passed from another files using *postfield* method and administrator will choose what number of record they want to delete. If the number is available with the existing record, then it can be deleted.

The second line tells the server to execute/run the SQL statement. While the last line tells the server to closed-up the connection with the database.