DEVELOPMENT OF A STUDENT RESUME MANAGEMENT SYSTEM / JOB PLACEMENT SERVICE FOR THE FACULTY OF ENGINEERING, MAHIDOL UNIVERSITY

ATTAKARN THONGPRASARN

A THESIS SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF SCIENCE
(TECHNOLOGY OF INFORMATION SYSTEM MANAGEMENT)
FACULTY OF GRADUATE STUDIES
MAHIDOL UNIVERSITY
2000

ISBN 974-663-767-3

Thesis

entitled

DEVELOPMENT OF A STUDENT RESUME MANAGEMENT SYSTEM / JOB PLACEMENT SERVICE FOR THE FACULTY OF ENGINEERING, MAHIDOL UNIVERSITY

Mr. Attakarn Thongprasarn
Candidate

Lect. Silvio L. Emery, Ph.D.
Major-Advisor

Mr. Monthree Chulasamaya, M.D., Ph.D.
Co-Advisor

Asst. Prof. Sutatip Bhamarapravati.
Ph.D.
Co-Advisor

Prof. Liangchai Limlomwongse, Ph.D.
Dean
Faculty of Graduate Studies

Mr. Thanakorn Uan-on, D.Engr.
Chairman
Master of Science Programme in
Technology of Information System
Management
Faculty of Engineering

Thesis

entitled

DEVELOPMENT OF A STUDENT RESUME MANAGEMENT SYSTEM / JOB PLACEMENT SERVICE FOR THE FACULTY OF ENGINEERING, MAHIDOL UNIVERSITY

was submitted to the Faculty of Graduate Studies, Mahidol University

for the Degree of Master of Science (Technology of Information System Management)

on

April 3, 2000

Attakarn Thongprasarn

Mr. Attakarn Thongprasarn
Candidate

M. Chulasamaya

Mr. Monthree Chulasamaya, M.D.,Ph.D.
Member

Silvio L. Emery

Lect. Silvio L. Emery, Ph.D.
Chairman

Piyada Chitchumnong

Mrs. Piyada Chitchumnong M.Sc.
Member

Sutatip Bhamarapravati

Asst. Prof. Sutatip Bhamarapravati, Ph.D.
Member

Prof. Liangchai Limlomwongse, Ph.D.
Dean
Faculty of Graduate Studies
Mahidol University

Mr. Thanakorn Uan-on, D.Engr.
Dean
Faculty of Engineering
Mahidol University

3937439 EGTI/M : MAJOR : TECHNOLOGY OF INFORMATION SYSTEM MANAGEMENT; M.Sc. (TECHNOLOGY OF INFORMATION SYSTEM MANAGEMENT)

KEY WORDS : INTERNET APPLICATION / WEB APPLICATION / WEB DATABASE / SYSTEM ANALYSIS / SYSTEM DESIGN / INFORMATION SYSTEM

ATTAKARN THONGPRASARN : DEVELOPMENT OF A STUDENT RESUME MANAGEMENT SYSTEM / JOB PLACEMENT SERVICE FOR THE FACULTY OF ENGINEERING, MAHIDOL UNIVERSITY. THESIS ADVISORS: SILVIO L. EMERY, Ph.D. MONTHREE CHULASAMAYA, M.D.,Ph.D. SUTATIP BHAMARAPRAVATI, Ph.D. 76 p. ISBN 974-663-767-3

Thai ompanies need a solution to recruit new employees faster and cheaper than traditional procedures. Traditional methods of recruitment are time consuming, expensive and involve a lot of paper work. Graduating students of Faculty of Engineering, Mahidol University also needs a convenient method to find job vacancies and apply for jobs. Internet Technology can make recruitment less expensive and more convenient for both companies and students.

This study designed and developed a Web based Client/Server Resume Management System by using the system development life cycle model. The approach used was to make a system to assist companies and students to find each other and open negotiation. The server application runs on a WindowNT 4.0 platform with Internet Information Server 4.0 used as Web server. Microsoft Access 7.0 Thai edition was selected as the relational database management systems to store, manipulate and retrieve data. Active Server Pages technology was used to create this Web application.

The new system saves participating companies and graduating students time and cost. The overall satisfaction reported by companies and graduating student users was 85 and 81 percent respectively.

3937439 EGTI/M : สาขาวิชาเทคโนโลยีการจัดการระบบสารสนเทศ; วท.ม. (เทคโนโลยีการจัดการระบบสารสนเทศ)

อัตการ ทองประสาร : การพัฒนาระบบฐานข้อมูลนักศึกษาบนอินเตอร์เน็ตสำหรับคณะวิศวกรรมศาสตร์ มหาวิทยาลัยมหิดล (DEVELOPMENT OF A STUDENT RESUME MANAGEMENT SYSTEM / JOB PLACEMENT SERVICE FOR THE FACULTY OF ENGINEERING, MAHIDOL UNIVERSITY) คณะกรรมการควบคุมวิทยานิพนธ์ : Silvio L. Emery, Ph.D., มันตรี จุลสมัย, พ.บ.,Ph.D., สุธาทิพ ภมรประวัติ, Ph.D., 76 หน้า. ISBN 974-663-767-3

บริษัทต่างๆ ในประเทศไทยต้องการวิธีรับคนเข้าทำงานโดยเสียค่าใช้จ่ายและเวลาน้อยที่สุด เนื่องจากวิธีการที่ใช้อยู่ในปัจจุบันนั้นใช้ระยะเวลาที่นานและเสียค่าใช้จ่ายสูงนอกจากนี้ยังเกี่ยวข้องกับงานเอกสารจำนวนมาก นอกจากบริษัทต่างๆ จะประสพปัญหาดังกล่าวแล้วนักศึกษาที่เพิ่งสำเร็จการศึกษาก็ต้องการวิธีการที่จะทำให้การหางานเป็นไปอย่างสะดวกและรวดเร็ว การนำเทคโนโลยีสารสนเทศมาประยุกต์ใช้ช่วยให้ปัญหาดังกล่าวหมดไป

งานวิจัยนี้มีจุดประสงค์เพื่อทำการวิเคราะห์ออกแบบและพัฒนาระบบฐานข้อมูลบนอินเตอร์เน็ตสำหรับเก็บข้อมูลของบริษัทต่างๆ และนักศึกษาคณะวิศวกรรมศาสตร์ มหาวิทยาลัยมหิดลเพื่อเพิ่มประสิทธิภาพในการหาพนักงานใหม่ของบริษัทและเพิ่มประสิทธิภาพในการหางานของนักศึกษา งานวิจัยนี้เลือกใช้เทคโนโลยี Active Server Page (ASP) ในการพัฒนาโดยมี WindowNT 4.0 และ Internet Information Server 4.0 เป็นระบบปฏิบัติการและใช้ Microsoft Access 7.0 Thai Edition เป็นระบบฐานข้อมูลเชิงสัมพันธ์

ACKNOWLEDGEMENT

I would like to express my sincere gratitude and deep appreciation to my advisor, Dr. Silvio L. Emery, for his very kindness, helpful guidance, invaluable advice, supervision and encouragement throughout the study. The uses of his hardware from Dr. Silvio are also appreciated. I am equally grateful to to my co-advisors, Assistant Professor Dr. Sutatip Bhamarapravati, for her very kindness, constructive comment, encouragement and supervision. She was always nice and friendly. I would like to thank Dr. Monthree Chulasamaya for his guidance and constructive comments.

I am particularly indebted to the Royal Bangkok Sports Club, Thailand for the scholarship, which enabled me to undertake this study. I would like to thank all of my respondents for their cooperation and I wish to thanks all of my best friends for their encouragement and support.

I would like to express my profound gratitude to my mother for her love, devotion and encouragement that have inspired me to reach the goal.

CONTENT

LIST OF TABLES

LIST OF FIGURES

LIST OF FIGURES (Cont.)

CHAPTER I

INTRODUCTION

Introduction

The Internet is a worldwide network of computers, which has evolved into an electronic media source for retrieving and sending information between businesses and consumers. The World Wide Web (WWW) is a graphical interface for the Internet and enables individual computer systems and networks of computers to receive and distribute large amounts of information via the Internet. The Internet was developed originally as a research project to provide a reliable, robust network of computers via packet switching technology for the U.S. Department of Defense by ARPA (Advanced Research Project Agency) and was known as ARPANET. One of the key requirements of ARPANET that has made it popular is that the network could continue to operate in the event that some of the computers on the network were offline, destroyed or otherwise disabled.

The WWW was originally created at CERN (Centre European Research Nuclear) with the goal to provide a global, flexible, rapid means of publishing physics research papers. It allows individuals and organizations to publish information in the form of hypertext documents (Web Pages) for public or controlled access. The management of WebPages is the responsibility of the organization or person publishing the data. This document management process for a large number of Web documents is a complex and labor-intensive task. For this reason, when large amounts

of data need to be published, it has become possible to dynamically create the user requested web page by interfacing the user with a database system. This alleviates the custom programming and file maintenance associated with keeping a large number of similar web pages (similar format but different data) on-line.

Databases in the past were limited to users within an organization via the organization's Local Area Network or Wide Area Network system (LAN, WAN). Currently, it has become possible for organizations to allow the public to use their databases from anywhere in the world, via the Internet and the Internet's graphical portion, the World Wide Web (WWW).

New and innovative technologies are being created for the WWW, including database publishing on the Web. Such a database can be distributed, edited, updated or deleted rapidly and inexpensively when compared to other media such as television, radio or print (newspapers, catalogues etc.). In addition, database publishing also allows for two-way interaction between the database and the user, through a combination of Hypertext Markup Language (HTML), scripting languages such as VBscript and JavaScript, ActiveX controls and Java applets, Active Server pages and components, and database connectivity. Web database publishing is becoming increasingly popular because it is key to develop a graphical user interface for the database that will stay consistent across different platforms (platform independent) so that the database is more universally accessible. With this in mind Internet users are taking advantage of a new form of media that can be completely tailored to their specific needs with minimal cost, time and resources. From a marketing standpoint, this allows businesses to target small groups of consumers, which were not accessible to the mass marketing necessary for other media.

The Internet provides information on a need-to-know basis, giving the user complete control over the information that required. This allows users to skip data that they are not concerned with, and pinpoint the needed information quickly. From a management standpoint, this also allows organizations to enhance such functions as Human Resource Management, Accounting, and Electronic Commerce.

With properly designed Web pages, a Web browser can provide access to published databases. Using a Web browser's graphical user interface, a user can access a database by simply filling in the data they want and pressing a button. The returned data can then be presented on a database generated web page in a readable, attractive format. Organizations and companies can apply this capability as a new more effective and economical tool for finding and recruiting personnel. Companies can now implement systems that can accept job applications and resumes over the Internet, advertise positions on the WWW, or search published databases for high quality, pre-screened, candidates. In effect this results in a larger more competitive, efficient labor market, which has considerable advantages to both employers and job seekers.

Statement of problem

Each department manager in a company has the recurring need to hire a new employee. As the need for additional employees becomes more acute, the necessity to recruit new employees forces the company to seek qualified candidates. The traditional procedure used by companies to find new professional employees include advertising in newspapers, visit Universities, participate in Job Fairs, then personnel staff selects qualified person from amount many applications for interviews. Occasionally, companies may employ an employment agency to advertise for, screen

and interview potential employees. This process is time consuming and expensive, since all kinds of unsuitable applicants must be eliminated before the interview stage. Searching for new employees involves a lot of paper work and some qualified candidates may be missed or never contacted. The Internet and World Wide Web can provide a major cost saving in this process and can target qualified people more efficiently than traditional media, by providing access to a larger qualified applicant pool and by placing direct control of the process in the hands of the department manager.

With a resume management system, companies can select qualified person from a web database of qualified, available candidates, rather than sorting through hundreds of thousands of application letters, resumes etc. The efficiency of hiring will be improved and make it more likely that the right person is found for the position. Such resume service is also beneficial for job seekers, since they only need to submit their information once, but can be considered by any of the companies using the system. For today's graduating students, no such system exists. With the tight job market, companies downsizing, graduates today must spend more time and money, be more competitive and work harder to find a good job in the labor market. Universities could do more to assist their students to find jobs after they have trained them then ever before. By developing and sponsoring a resume management system for their graduated students, Universities can make recruitment less expensive and more convenient for companies to recruit graduates via the Internet. With more companies searching for employees, students also have better chances for higher paying jobs.

Objective of study

To design and develop a cross-platform Web application for resumes management system and career service system for senior students and alumni of the Faculty of Engineering, Mahidol University.

Scope of work

1. System analysis and design for resume management system and career service system for senior students and alumni of the Faculty of Engineering and Information Technology program, Mahidol University.
2. Web database design and development that contains resumes of senior, graduated students and alumni of Faculty of Engineering, Mahidol University and vacancies, and job listings.
3. Web-base user interface design and development.

Expectation of study

1. To develop a Web application for resume management system and job placement service system for the Faculty of Engineering, Mahidol University.
2. To demonstrate the advantages of using Application Program Interfaces (APIs) for database publishing rather than the traditional use of Common Gateway Interface programs (CGI).

Advantage of a Student Resume Management System

Classified advertisement in newspapers cost between 870-890 Baht per square inches per day (not include 10% VAT). Participation at a Job fair cost between 2,500-5,000 Baht per season. According to personal interview, the budget for companies to recruit engineering and IT positions is around 20,000 – 50,000 Baht per position. At interview stage, companies are spend about one week or more for the selection of applicants for interviews. By using a student resume management system in place of the existing manual process, a major cost saving and time saving is possible.

CHAPTER II

LITERATURE REVIEW

Information Technologies that can be used for a Web based resume management system include Computer Network, Database system Management and System Analysis and Design. The following sections briefly describe these technologies

Internet and World Wide Web

The Internet is a network of networks. It is the infrastructure used by the World Wide Web. TCP/IP (Transmission Control protocol/Internet Protocol) is the data communications protocol used to organize computers and data communications equipment for the Internet. TCP/IP has four function layers: Application layer, Transport layer, Internetwork layer and Network Interface layer (1). A "layer model" of TCP/IP is shown in Fig.2.1

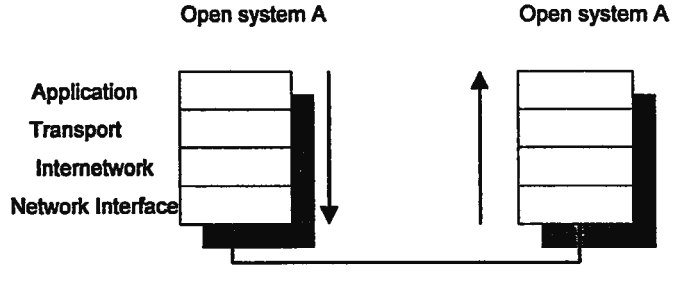


Figure 2.1 TCP/IP layer model (1)

- Network Interface Layer

  The Network Interface Layer has responsibility to deal directly with the networking hardware such as network cards (1).

- Internetwork Layer

  The Internetwork layer is handle to routing by using Internet Protocol (IP). It use IP addresses to specify source and target hosts on the Internet (1).

- Transport Layer

  The Transport Layer provides reliability, flow control and some error recovery by Transmission Control Protocol (TCP). TCP is a connection-oriented, end-to-end reliable protocol providing logical connections between pairs of process (1).

- Application Layer

  The Application Layer deals with standards specific to the application. It is responsible for giving the user the tools and means to use the program. The common application for TCP/IP is TELNET (Teletypewriter Network), FTP (File Transfer Protocol), HTTP (Hypertext Transport Protocol), DNS (Domain Name System), SMTP (Simple Mail Transfer Protocol) and SNMP (Simple Network Management Protocol) (2).

A packet starts at the application layer, and works through Network Interface layer. It is sent over the network interface layer to destination computer by using IP numbers. The reverse process occurs on the receiving end and to be restored to its original form at the application layer of the destination machine.

Client/Server Architecture

The client/Server architecture has been developed to deal with new computer environments in which a larger number of personal computers, workstations, file servers, print server, and other equipment are connected together via a network (LAN/WAN)(3).

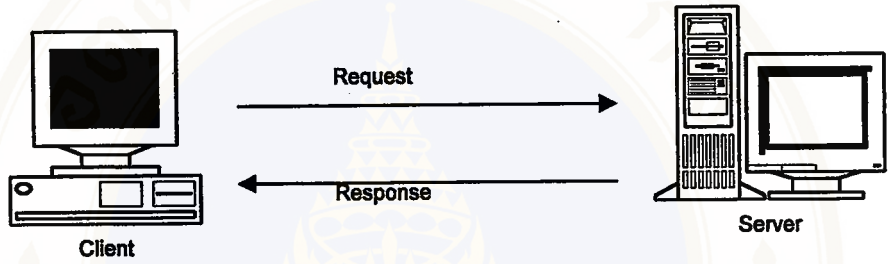


Figure. 2.2 Client – Server Architecture (3)

The Web is inherently a client/server application. In Web application, the browser was used as a client that sends a request for a web page, interprets the HTML document, and displays to the user. The Web server receives the request through the hypertext Transport Protocol (HTTP) and returns the required information in HTML format that the client can read by using Web browser (3).

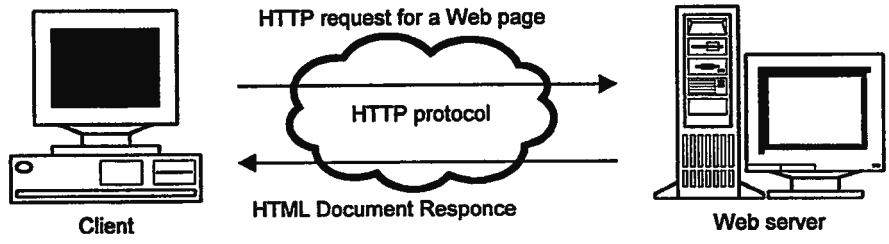


Figure 2.3 The Web-based Client – Server Architecture (3)

Hypertext

Hypertext is a tool that links information together. Hypertext links (Hyperlinks) create associations between disparate sources; a word in one Web document is able to link with its text definition, a video clip, a sound bite, or a separate document that explores the word as a unique subject (4).

Markup language

A markup language is a set of instructions, which directs the formatting of a document being typeset or displayed (4).

Structured Generalized Markup language (SGML)

Structured Generalized Markup language (SGML) is developed by the International Standards Organization (ISO). It is a neutral formatting language that annotates a document to provide formatting instructions, hypertext links and definitions for the document's component (4). In SGML, a document is split into three distinct parts as SGML declaration, document type declaration (DTD) and document instance

Hypertext Markup language (HTML)

Hypertext Markup Language (HTML) is a simple markup language used to create hypertext documents that are portable from one platform to another (5).

HTML is an SGML application conforming to International Standard ISO 8879 - Standard Generalized Markup Language. As an SGML application, the syntax of

conformity HTML documents is defined by the combination of the SGML declaration and the document type definition (DTD) (5).

HTML is a plain text document that uses the ISO-Latin-1 Coded Character Set (ISO 8859-1:1987 Information Processing 8-bit single-byte coded graphic character sets –Part 1:Latin alphabet No.1) to render the texts (4). The specific HTML items are denoted using tags and enclosed in a pair of <>. These tags instruct the browser to display the information. Tag can be used in three ways.

- <tag>
- <tag> text <tag>
- <tag attribute = argument>text </tag>

The beginning and end of and HTML document is marked by the <html> and </html> tag, respectively. The HTML document can be divided into two parts: the header and the body. The basic for an HTML document is shown as follow

```
<HTML>                  - start html form.
    <Head>              - starts header part.
    </Head>             - end of header part.
    <Body>              - start body part.
    </Body>             - end of body part.
</HTML>                 - end of html form.
```

The <title> tag is a most common tag that used in Header parts, it is used to specify the document title. There are many common HTML tags for body parts such as tables, frames, lists, menus, images, hyperlinks, and paragraph marks.

Static HTML Document

Static HTML document is a HTML document that never change and not support any interaction with the Web user at the other end of the client/server connection across the Internet (4). It needs to re-edit the HTML document to update information.

Dynamic HTML Document

Dynamic HTML document is a HTML document that is generated by an application on the server at the moment of request by Web browsers (4). It allows the transmission of updated information automatically. An example of dynamic HTML document is an automated weather report Web page.

Interactive HTML Document

Interactive HTML Document is a HTML document that allow two-way communication interface between server and client (3). It also referred to as a form, which contain controls such as data entry field, check boxes, or push buttons. It allows user interacts with the HTML document by entering data in fields, pushing buttons, or clicking check boxes (4). User input from the client will be pass to the server by using any script such as CGI script or script languages (JavaScript, VBScript).

Uniform Resource Locators (URL)

Using a Uniform Resource Locator (URL) to uniquely address the different resources available on the Internet. A URL is the addressing scheme used to identify a resource in a Web application such as Web server, FTP server, and so on. A URL address is composed of six parts (5):

1. Service identifier followed by a colon.
2. The characters "//"
3. Path to the resource's filename (optional)
4. The type of the resource (optional)
5. An internal marker within the resource (optional)
6. The search/selection specification (optional)

A Uniform Resource Locator (URL) has this general syntax:

service identifier:[//host. domain[:port][/path][/filename]][newsgroup][email address]

where *service identifier* is a protocol used in network communication.

Table 2.1 Common protocol

Protocol	Explanation
File	file on your local system, or a file on an anonymous FTP server
Ftp	file transfer on an FTP server
Http	Hypertext transmission for a resource on a World Wide Web server
Gopher	a resource on a Gopher server
News	an Usenet newsgroup

Table 2.1 Common protocol (cont.)

Telnet	a connection to a telnet-based service
Mailto	a link for sending electronic mail

Table 2.2 Example of Uniform Resource Locator (URL)

URL	Example
File://c:/pub/index.html	Links to a session in a Web browser to open a file, index.html from its directory
ftp://ftp.mahidol.ac.th/	Links to an FTP site, ftp.mahidol.ac.th, to its top-level directory.
Http://www.mahidol.ac.th/ pub	Shows the URL to a Web site, www.mahidol.ac.th, to the directory pub.
Gopher://mahidol.ac.th	Link to a gopher site.
News:news.mahidol.ac.th	Link to a news server of mahidol university.
Telnet://mahidol.ac.th	Telnet to mahidol host
Mailto:g3937439@student.mahidol.ac.th	Links to a session in a Web browser set up for sending electronic mail to g3937439@student.mahidol.ac.th

Script languages

Script languages are interpreted languages provided to allow processing by the browser (3)(6). They were created to provide a method for the user to interact with the web page (6). The browsers can perform tasks such as verification of the form contents. These languages are Object-based, and depend on an event associated with an object, a particular function or statement can be executed.

Script languages such as JavaScript and VBScript are a new class of distributed processing language, that is strictly client-based (3). The codes for such script languages are embedded within the HTML document by using the <script> and </script> tags separate the script from the rest of the HTML as example as follow.

```
<HTML>
<HEAD>
<TITLE> Script language </TITLE>
</HEAD>
<SCRIPT LANGUAGE = "VBScript">
<!--
    ...VBScript code is here...
!-->
</SCRIPT>
<HTML>
```

The script languages are able to understand by supportable browser such as VBscript was supported by Internet Explorer 3.0 and higher, JavaScript was supported by Internet Explorer 3.0, Netscape Navigator 3.0 or higher and Netscape communicator.

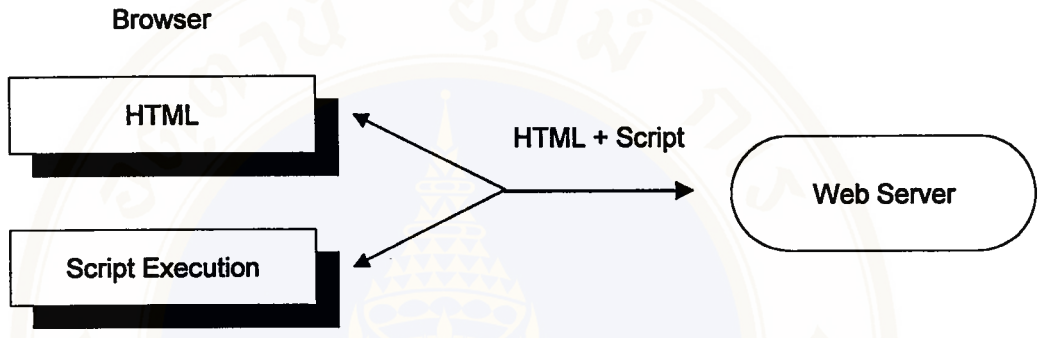


Figure 2.4 Script language architecture

Common Gateway Interface (CGI)

Web pages were originally designed to be static document, CGI programs used for processing requests on the server and distribute information to the client machine, CGI programs, or script are executable files that can be built using language such as UNIX shell script, PERL, C, and so on (3).

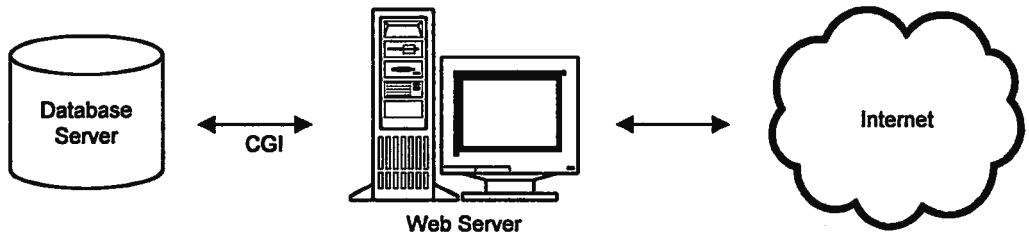


Figure 2.5 Common Gateway Interface (CGI) model

Application Programming Interface (API)

Application Program Interface (API) programs are other was to provide a gateway between client and server machine in Web-base application. It is more efficient than CGI programs, it uses Open Database Connectivity (ODBC) for sending and retrieving information between Database Server and the Internet. API programs are confined to their respective web server platform (6).

Table 2.3. The most popular APIs (6)

API	Vendor	Server Platform Supported
ISAPI	Microsoft	Microsoft Internet Information Server
NSAPI	Netscape	Netscape Commerce/Communication Server
WSAPI	O'Reilly & Associates	O'Reilly & Associates Website

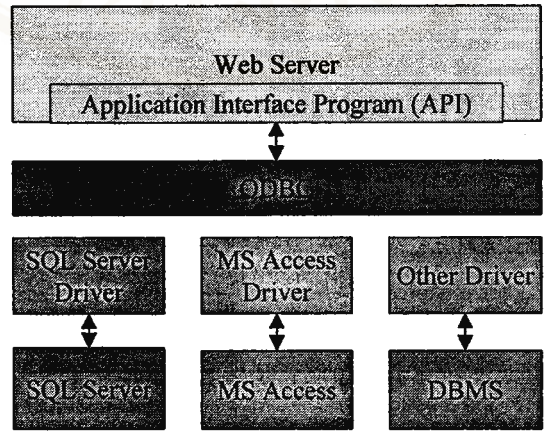


Figure 2.6 Application Program Interface Model for (API) (6)

Active Platform

Active Platform was developed by Microsoft. It uses ActiveX controls as a mechanism to interact with users and to automate to Web Servers. It has two parts: Active Client and Active Server (7).

Active Server is the middle tier, providing application processing using Active Server Pages (ASP). The core technologies of Active Server include NT Server, Microsoft Transaction Server (MTS), data management services, directory services, Web services, and network services. Other components of Active Platform, such as data management services, ODBC to access data sources like DB2, Oracle, and SQL Server (7).

The Active Client is cross-platform application to deliver technology to abroad range of operating systems. It uses standard HTML and a scripting engine using Microsoft's VBScript and JScript (Microsoft's version of JavaScript). The Active client was built into Microsoft Explorer 3 and 4, and it can be part of your client/server application through ActiveX (7).

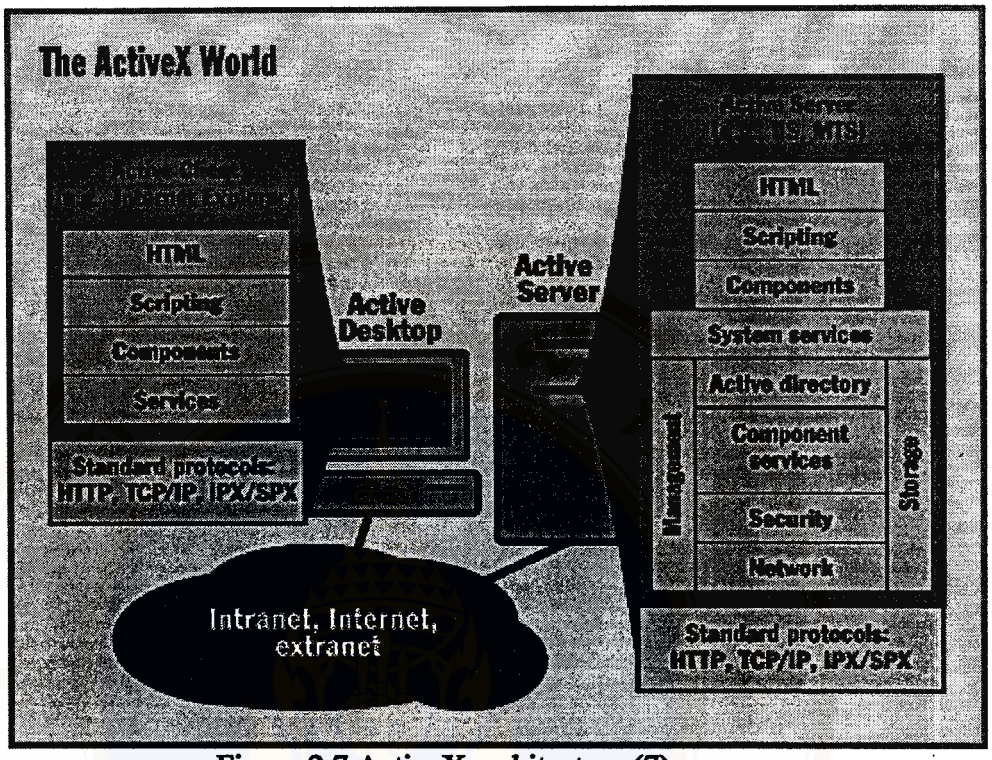


Figure.2.7 ActiveX architecture (7)

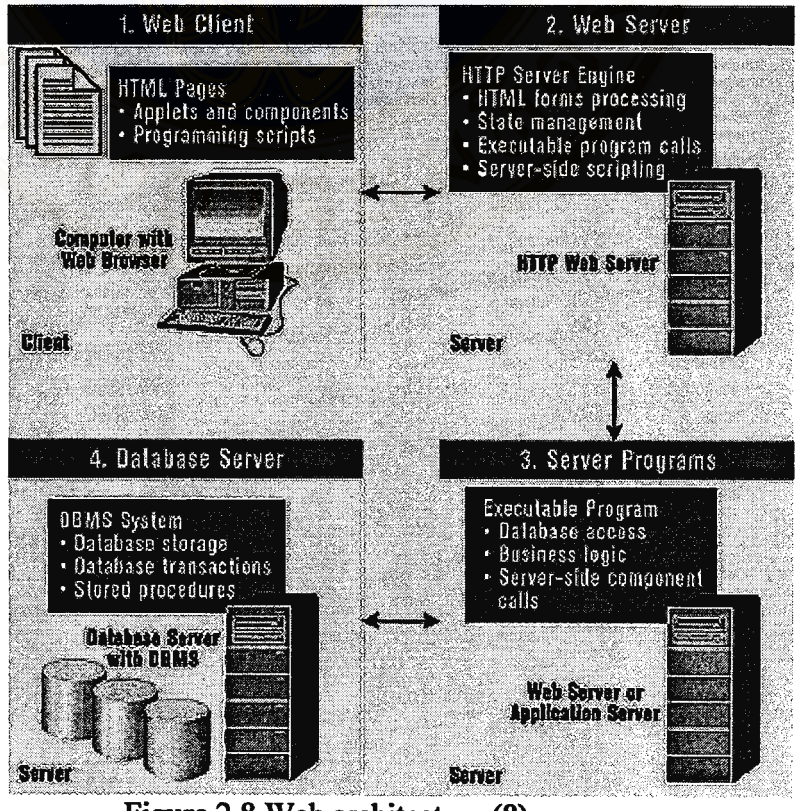


Figure.2.8 Web architecture (8)

Information Management System and Databases

Information Management System is the component responsible for the transmission and processing of information for the benefit of some recipient (9).

A Database system is basically a computerized record keeping system. It is a computerize system whose overall purpose is to maintain information and to make that information available on demand (10).

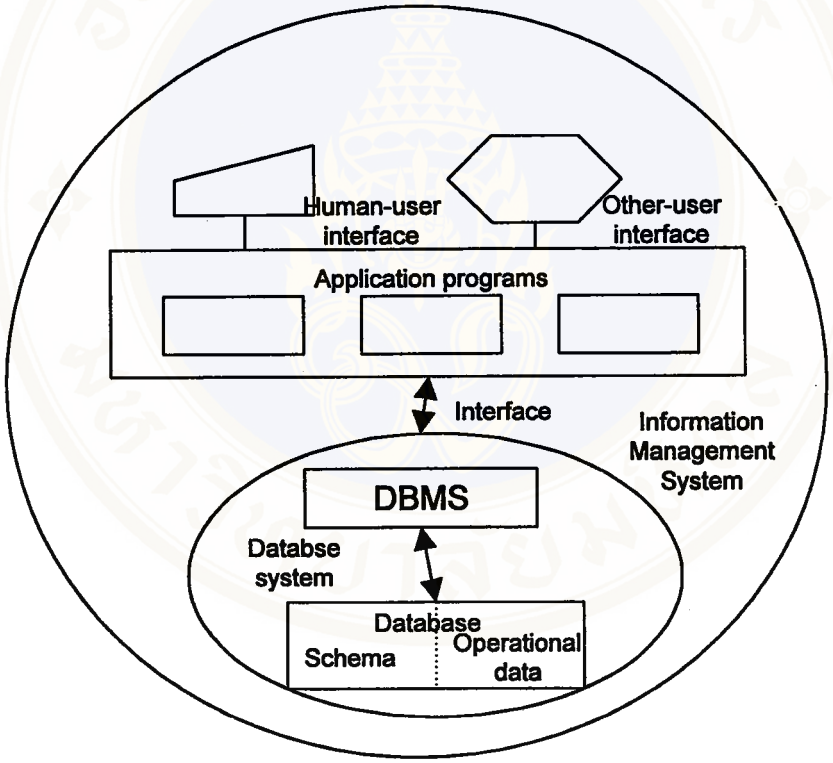


Figure 2.9 Relationships between database and information system concepts

Database System Architecture

The ANSI/SPARC architecture is divided into three levels (10)

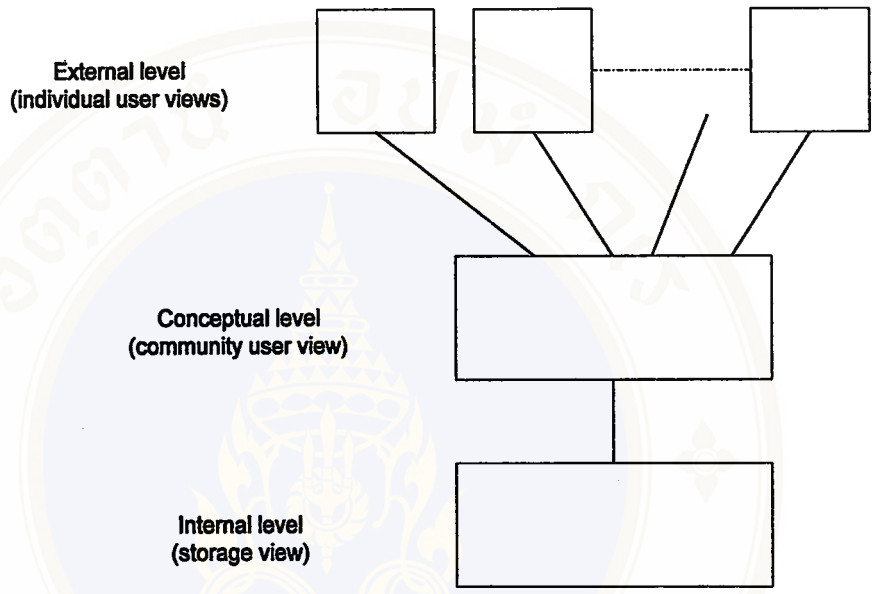


Figure. 2.10 The three levels of the database system architecture (10)

- The internal level is the one closet to physical storage; it is the one concerned with the way the data is physically stored (10).
- The conceptual level is an abstract information model of the universe of the database system, and a level of indirection between external and internal level (9).
- The external level is a data object perceived by a particular application view of a database (9).

Database Management System (DBMS)

A Database Management System (DBMS) is software, which supports the creation, manipulation, and administration of database system (9). Classes of database management system user can illustrate as fig. 2.11.

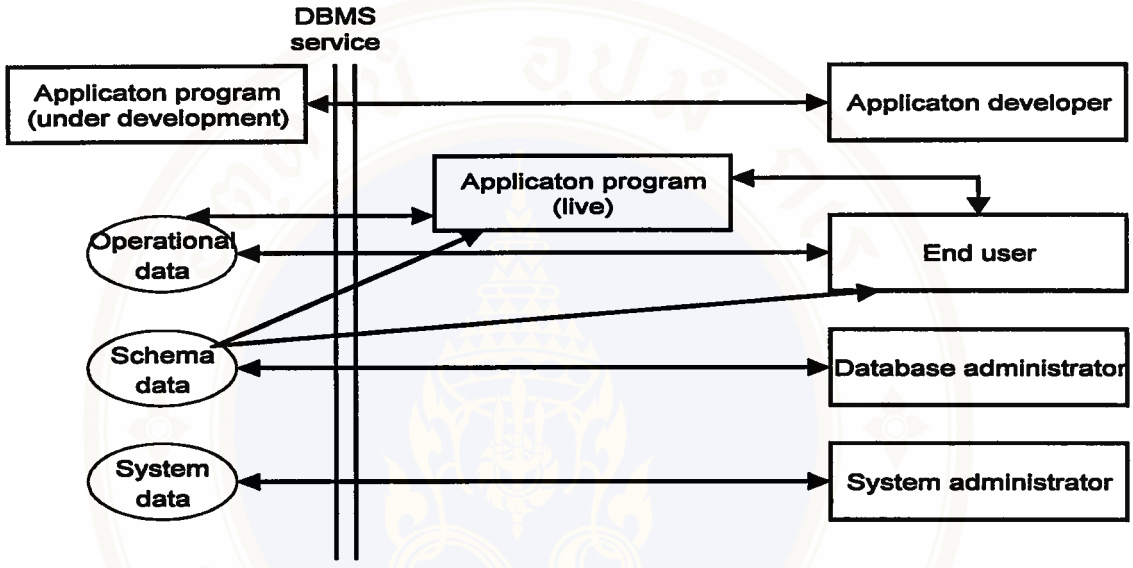


Figure.2.11 Classes of DBMS user

Database Management System components and interfaces

The components of a DBMS and their interfaces with other information system components are shown in fig.2.12.

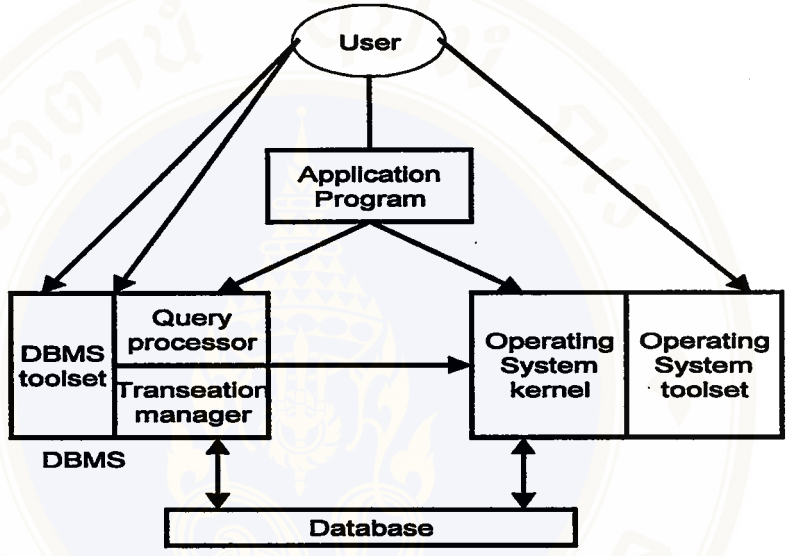


Figure.2.12 Database Management System component and interfaces (9)

A DBMS can be considered to have three components.

- The *query processor*, which accepts users' manipulation requests and translates them to a form in which they can be executed; this might involve compilation, or translation to some intermediate form that can be interpreted (9).
- The *transaction manager*, which manages the execution of database manipulation requests. Its tasks are to ensure that concurrent access to data objects does not result in conflict, that failures do not compromise database integrity, and that privacy rules are not infringed (9).

- The *toolset,* which provides various facilities for performing tasks such as database creation, database restructuring, performance monitoring and tuning, and application development (9).

DBMS process architecture

The DBMS process architecture describes the implementation of multi-user DBMS in the operating system. There are three basic approaches to allocate operating system processes to DBMS transactions, process model, centralized model and distributed processing model. (See fig.2.13)

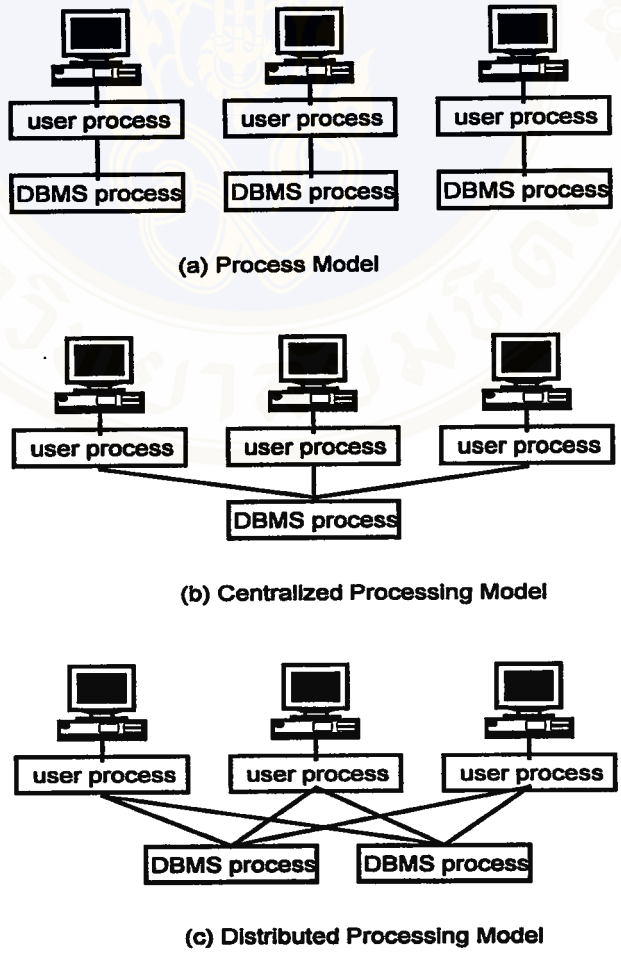


Figure.2.13 Different DBMS process architectures (9).

Relational database system

Relational database system is a collection of information arranged in units called tables. Tables organize the data in a row/column format (3). The relational data model can be characterized by three features (13).

1. The data structures are simple. These are two-dimensional tables, called relations (or tables), whose elements are data items. A relation can be viewed as a file; a row of a relation, called tuple (or row), can be viewed as a record; and a column of a relation, called attribute (or column), can be viewed as a data item. The relationship linking two relations is specified by a common attribute in both relations.
2. A set of eight operators (union, intersection, difference, Cartesian product, select, project, join, and difference), are used in relational algebra. Other operators facilitate data definition, data retrieval, and data update. Each relational operator takes one or two relations as input and produces one relation.
3. A set of integrity constraints defines consistent states of the database.

Properties of Relations

There is one column in the relation for each attribute of the relation. Each such column is given a name that is unique in the relation (13).

1. The entries in the column come from the same domain (13).
2. The order of the columns or attributes in the relation has no significance (13).
3. The order of the rows is not significant (13).
4. There are no duplicate rows (13).

Database system development

The states involved with database system development are described below (12).

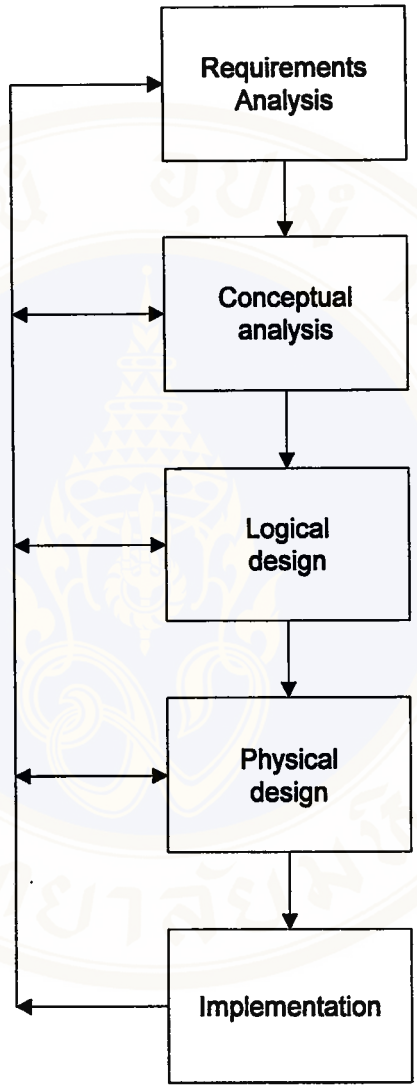


Figure 2.14 Development model for database systems (12).

Conceptual analysis or data modeling: this stage involves formulating the data objects in term of a data-modeling formalism, to produce a specification for database requirement (12).

Logical design: this stage maps a conceptual description of data objects into a collection of implementation-independent database structure (12).

Physical design: this stage involves accessing design to data-structure (12).

Implementation: this stage involves building the database and making it available to its application users (12).

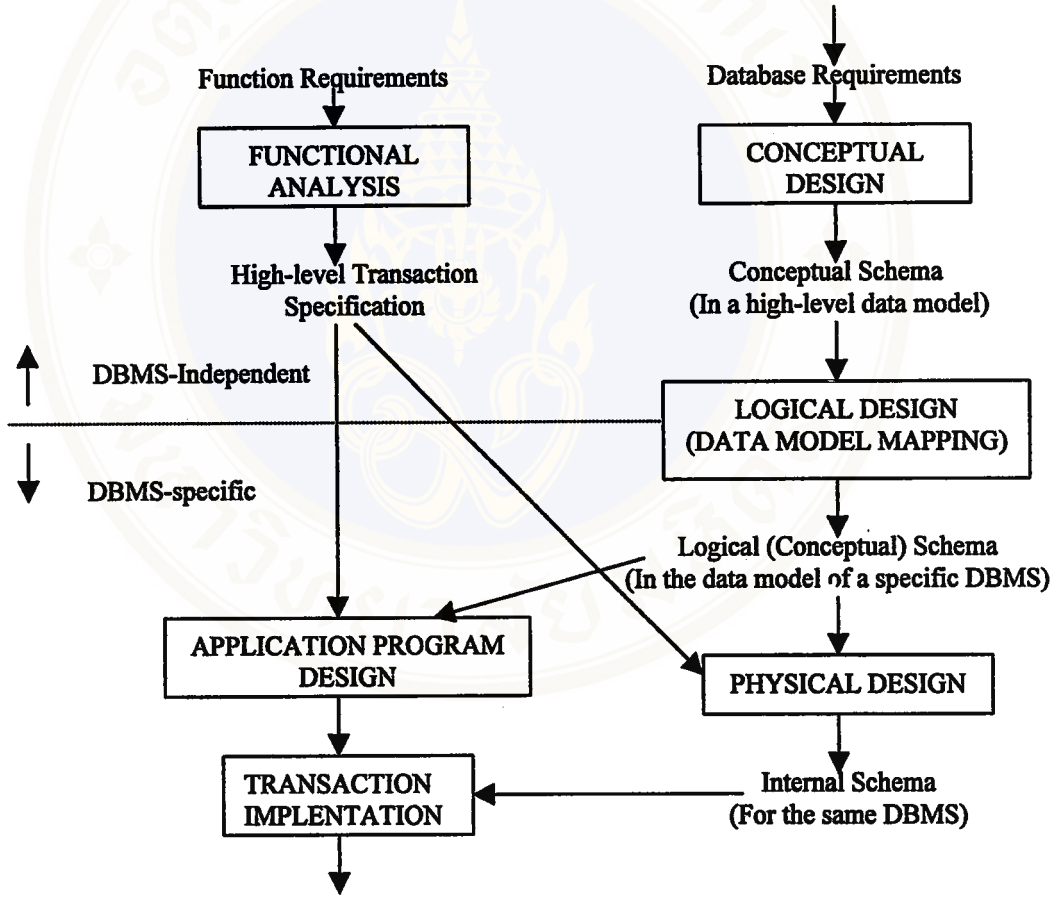


Figure 2.15 Phases of database design (simplified). (12)

Structured Query Language (SQL)

SQL offers a standardized and consistent interface to data manipulation. It incorporates all the functions a database system must perform into a single language. Examples of such functions include creation of data objects, insertion of data, querying the data, and data modification. Join queries, sub-queries, and unions are special types of queries that exploit the true potential of the relational data model (3).

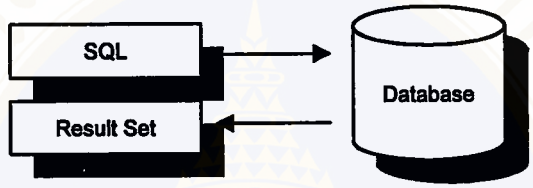


Figure 2.16 The role of SQL in database system

For Client/Server architecture, the server is responsible for management of the data in a physical sense, and it responds to requests made by its authorize clients. The client program provides the graphical user interface and should give the user a high-level view of the database. The client is responsible for making queries to the database, usually in SQL, and presenting the results sent back by the server (3).

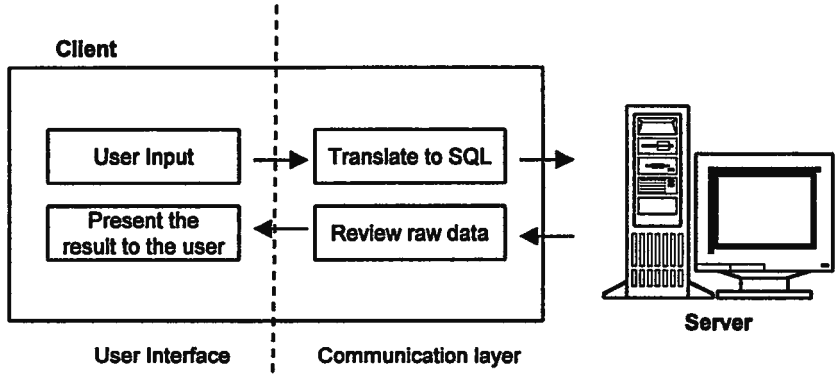


Figure 2.17 SQL layer

System Development

System development is the activity of creating new or modifying existing any system such as business system, and so on (11).

System development process

Different approaches have used to developing information system but most approach has five common phases: investigation, analysis, design, implementation and maintenance and review (11). It is typically called a system development life cycle (SDLC)

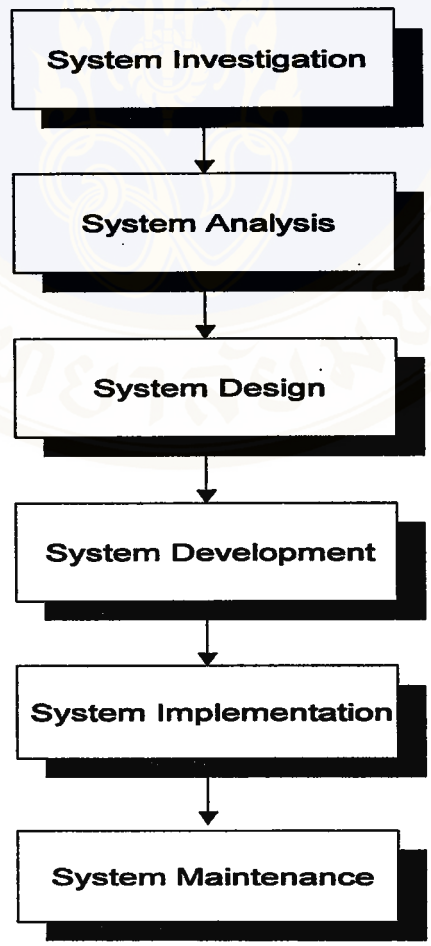


Figure 2.18 System development life cycle.

Data-flow diagram (DFD)

Data-flow diagram is used to describe how data can, or should flow between and around various objects. There are four primary symbols that use for Data-flow diagrams (11).

- Data flow: Data-flow line includes arrows that show the direction of data element movement.
- Process symbol: The process symbol reveals a function that is performed.
- Entity symbol: The entity symbol shows either the source or destination of the data element.
- Data store: A data store reveals a storage location of data. A data store is any computerized or manual data storage location, and can be magnetic tape, disks, a filing cabinet, or a desk. It is any computerized or manual data storage location.

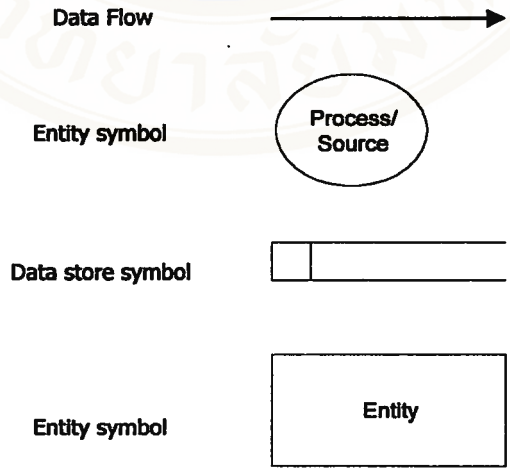


Figure 2.19 Symbol used for DFD

CHAPTER III

METHODOLOGY

The methodology used for developing the resume management system and job placement service is the SDLC (4,13). The SDLC has six phases as system investigation, system analyzes, system design, system development, system implementation and system maintenance.

System Investigation

- This phase will verify existing system for recruitment new employee and data collection for company's requirement (sampling size = 20 companies) and existing system to apply job for student of faculty of engineering, Mahidol University by using questionnaires.

System Analyze

- To analyze resource requirement for Web-base application as Web Server, Database Server and Client Web browser.

System Design

- To create logical and physical data-flow diagram for cross-platform Web application, Data Modeling for relational database, System Modeling.
- To design Web-base User Interface, input and output form.
- To design Web security by using password for access control of each users.

System Development

- To Install and configure Web Sever and Database Server.
- To write the code for the resume management system and job placement service system.

Materials requirement was

1. Software
    - **Windows NT server 4.0 Operating System for Server.**
    - Internet Information Server 4.0
    - Microsoft FrontPage 98 or later.
    - Microsoft Visual InterDev 6.0
    - Windows 95 Operating System for Client.
    - Web Browser (Internet Explore 4.0 or later)
    - Graphics Processing Software such as Adobe PhotoShop 4.01.
    - Visio 4.0 or later.
2. Hardware
    - Computer for Server (Minimum Specification: Pentium CPU, Memory 128 Mb, Hard disk capacity 4.3 GB)
    - Computer for Client (Minimum Specification: Pentium CPU, Memory 16 Mb, Hard disk capacity 1.2 GB)
    - Network cards, cable, connector and Hub.
    - Mouse and Printer.

- To test system before running on the World Wide Web (WWW), the system will be tested on LAN as prototype system. This phase Intranet Server will be used as Web Server. The network diagram for Pilot system is shown in Fig.3.1

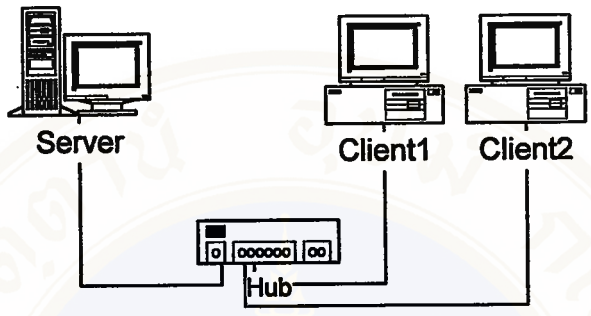


Figure.3.1 Network diagram for Pilot system

This phase consist 1 computer for server and at least 2 computers for client and also include Hub for network connectivity.

System Implementation

- To install resume management system and job placement service in to Web server.

- To input student 's resume (20 students), company profile and check error of data entry as pilot implementation.

- To test resume, job searching, response time and data correction.

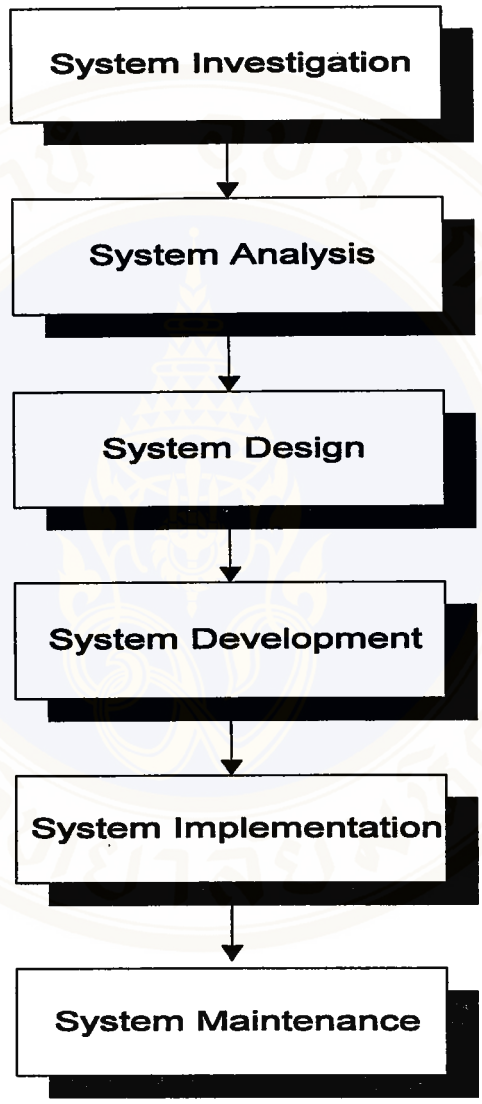
- To test security for access control.

System Maintenance and Review

- To test the system on the web to keep the system operating as efficiently, error free, and effectively as possible.

- To evaluate and modify the system that was delivered through system testing.

Step of work.



CHAPTER IV

RESULTS

1 System Investigation

1.1 User requirement

Sample Data was collected from among a list of companies and the students of Faculty of engineering, Mahidol University. Data on companies were collected by means of interviewing selected companies. Five type of companies were used, consisting of employment agencies, companies with less than 100 employees, companies with between 100-1,000 employees, companies with between 1,000-10,000 employee and companies with more than 10,000 employee, A total of 20 companies were interviewed. Sample student data was collected by use of questionnaires. The percentage of students responding, who were willing to use this system was 90% and the percentage of employers who were willing to use this system was 95%. Overall user acceptance was estimated to be greater than 92%.

Employer requirements were

- Reduction of cost and time needed to hire a new employee.
- Convenient system to screen and recruit qualified students.

Major student requirement was

- Convenient method to find Job opening and apply for jobs.

1.2 The existing system

The traditional options available for companies to recruit new employees are advertise in newspapers and bulletin board at university, participate in Job Fairs or

word of month. The personnel department has to assemble and then select a group of qualified persons from many application letters. The next step is to interview each member of the selected candidates. Frequently, companies use employment agencies to take care of these steps. Recently, Companies may choose to pay a fee to get resumes via the Internet. In Thailand such resumes are supplied by an online employment agency called JobsDB.com (established 1999). Figure 4.1 shows current methods, used by responding to the survey. Figure 4.2 shows approximate hiring expenses of companies.

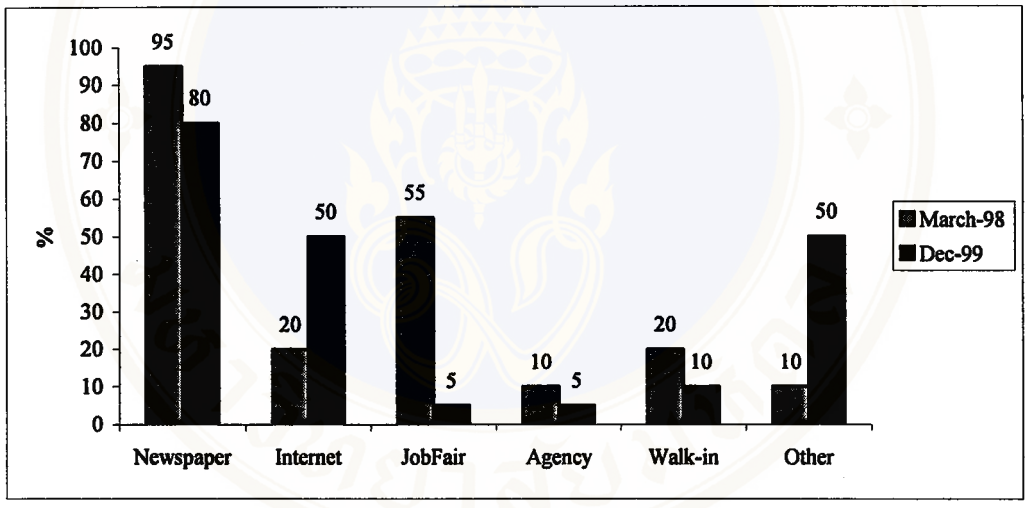


Figure 4.1 Traditional ways for companies to recruit new employees

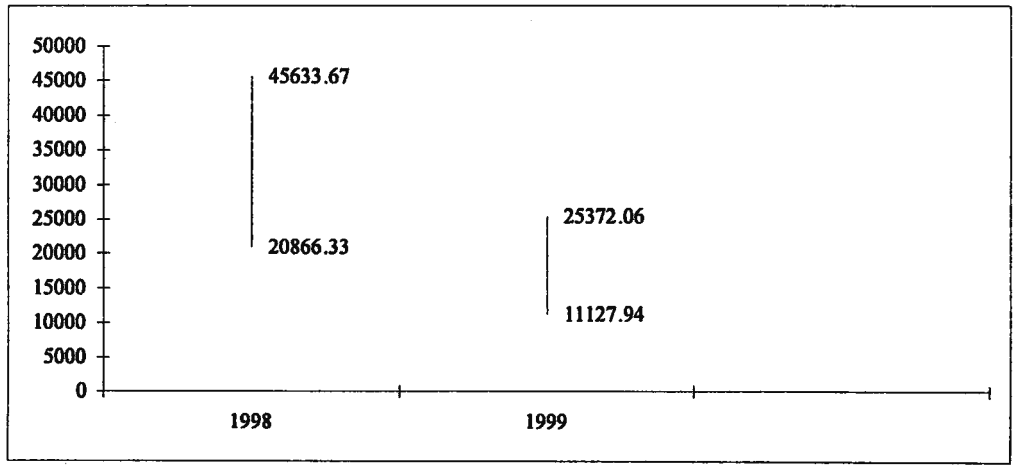


Figure 4.2 Approximate hiring expenses of companies.

For graduating student, traditional ways to apply for a job were sending out application letters, participating in a Job Fair, walk in application, sending out application letters using E-Mail and applying for a job via online employment agency (Figure 4.3). A figure 4.4 shows expected expense in applies for a job reported by student in survey.

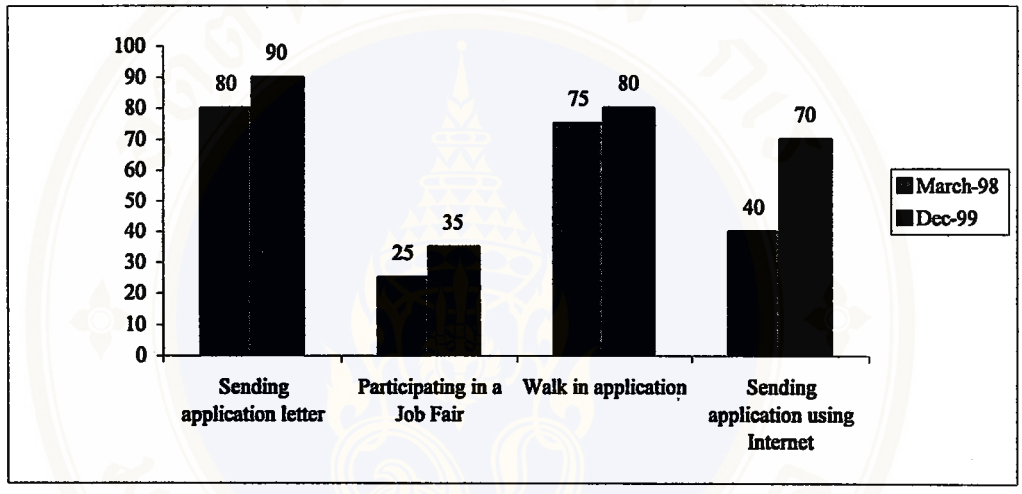


Figure 4.3 Traditional procedure for students to applies for a job

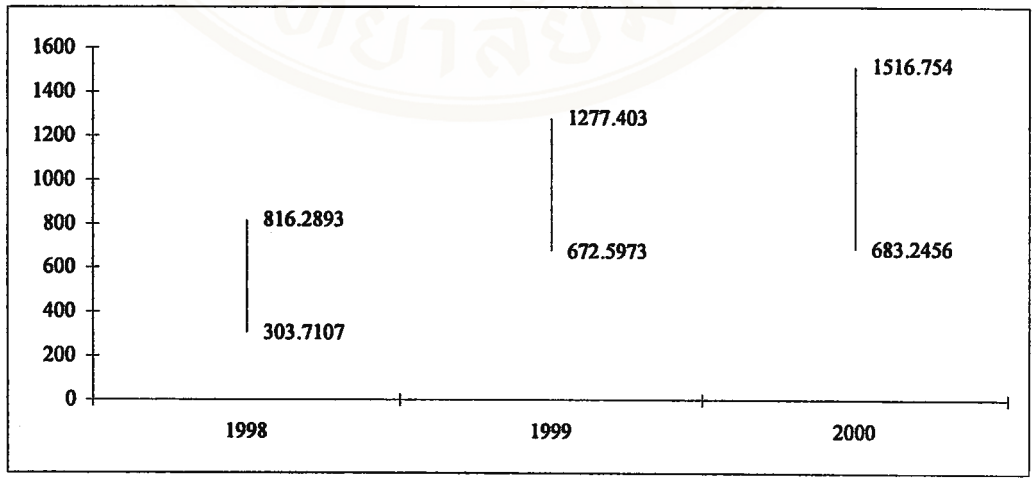


Figure 4.4 Approximated expenses in applying for a job by student.

2 System analysis and design

The proposed system needs to assist students in exposing their resumes to the largest possible amount of companies who might consider hiring them. The proposed system should also make it more convenient for companies to recruit qualified students. The web database was designed to record resumes of graduating students from the faculty of engineering, Mahidol University. It would also record information from participate companies and their job vacancies. The designed system consists of three main entities, student, company and faculty of engineering, Mahidol University as shown in Figure 4.5 and Figure 4.6

Process 0: Graduating Student Process (Figure 4.7)

Graduating student process was divided into two functions, which were student resume management and job information retrieval. The student management function consisted of adding new student resumes, correcting resumes, viewing resumes and deleting resumes. The job information retrieval function involved job searching to find jobs posted by companies, check-matching job to find job which best fits student qualifications and searching by company to find company information.

Process 1: Company Process (Figure 4.8)

This process includes company information management function and candidate searching function. The company information management consists of adding company profile for new company, posting job vacancy, correcting company profile and job vacancy, viewing company profile and job vacancy, deleting company profile and vacancy job. The candidates searching function involves searching and checking qualified students, checking among applicants that are interested in applying for a job in each company.

Process 2: Faculty of Engineering process (Figure 4.9)

This process includes checking participated companies, successful student to apply jobs and qualification of students, which were need by companies.

Database Design

The data collected in the database came from potential user requirments as determined in interviews. The collected data were organized into a relational database model using Microsoft Access 97. Normalization was used to simplify the database design. Relationships in the database were described in Figure 4.10 and entity tables of all table is shows as table 4.1.

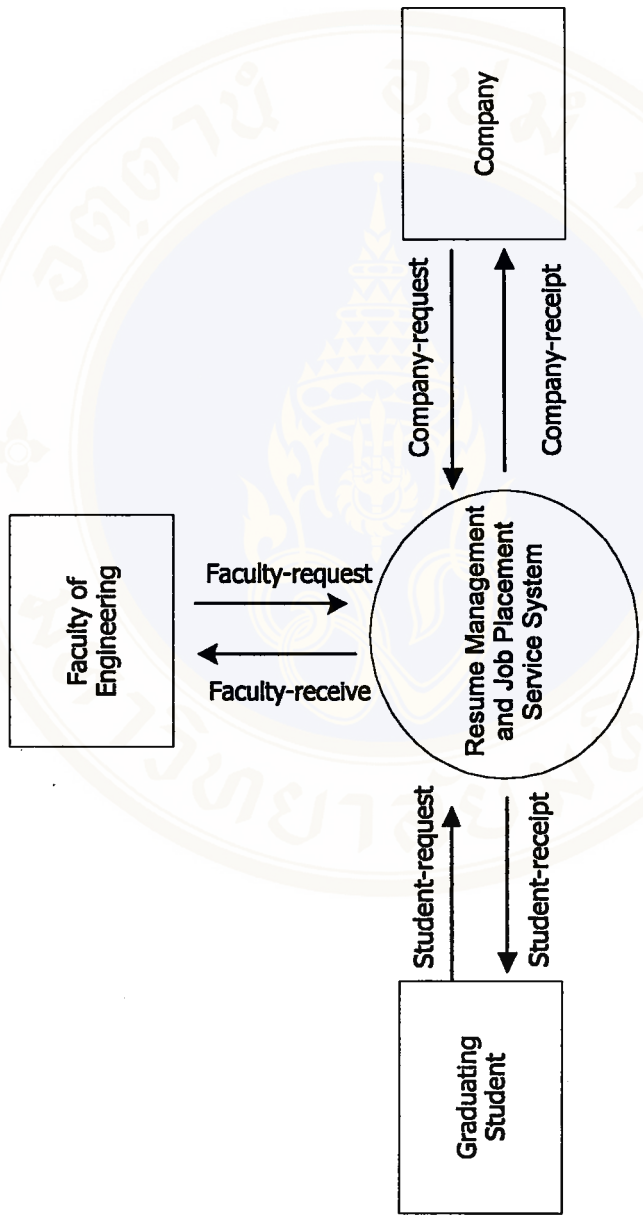


Figure 4.5 Context Diagram for Resume Management and Job Placement service system

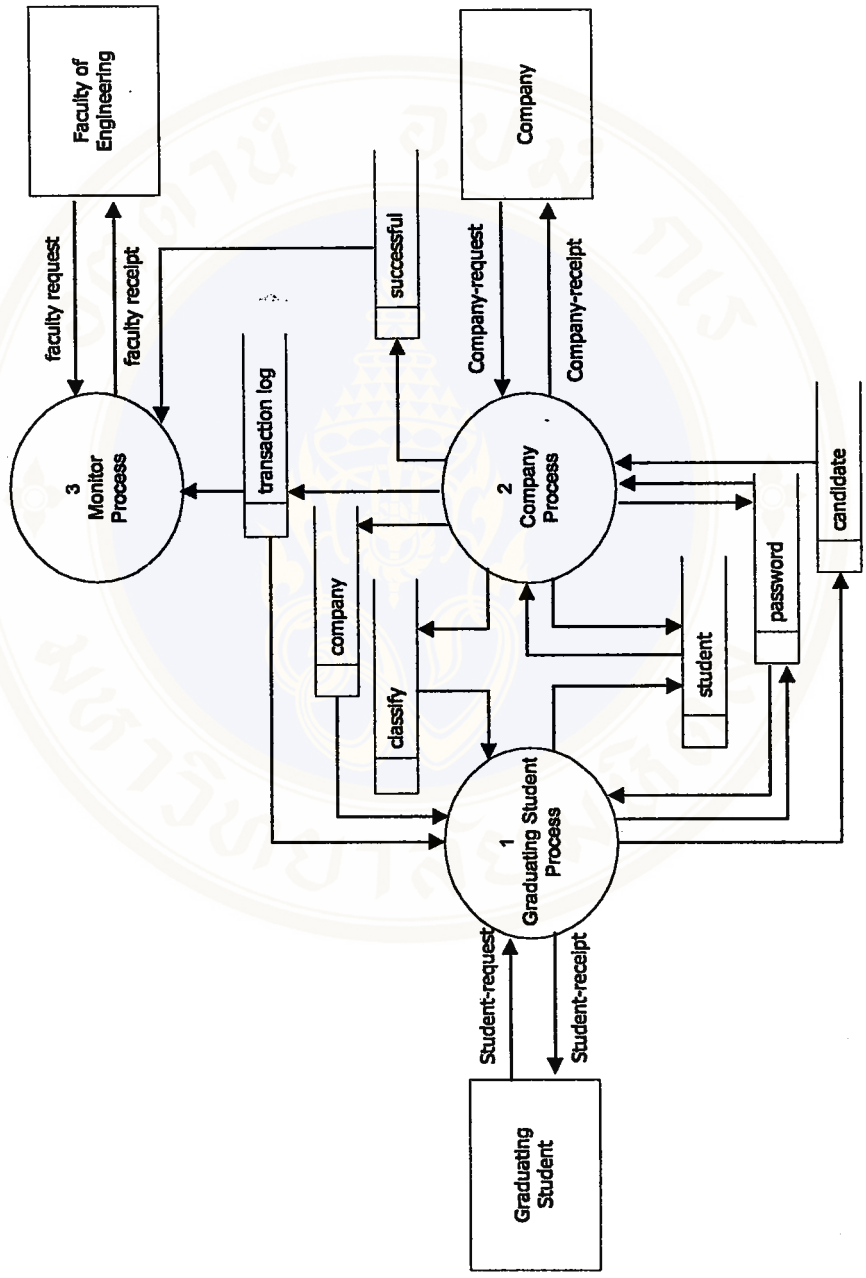


Figure 4.6 First-Level for Resume management and Job Placement service system

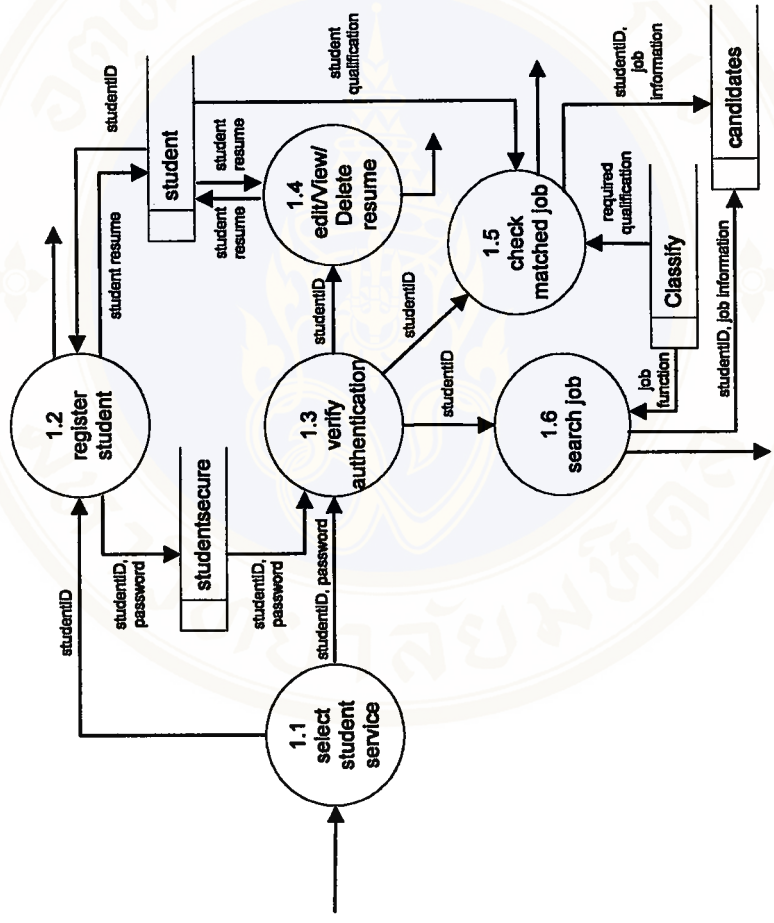


Figure 4.7 Second-Level DFD for Resume management and Job placement service system of student process

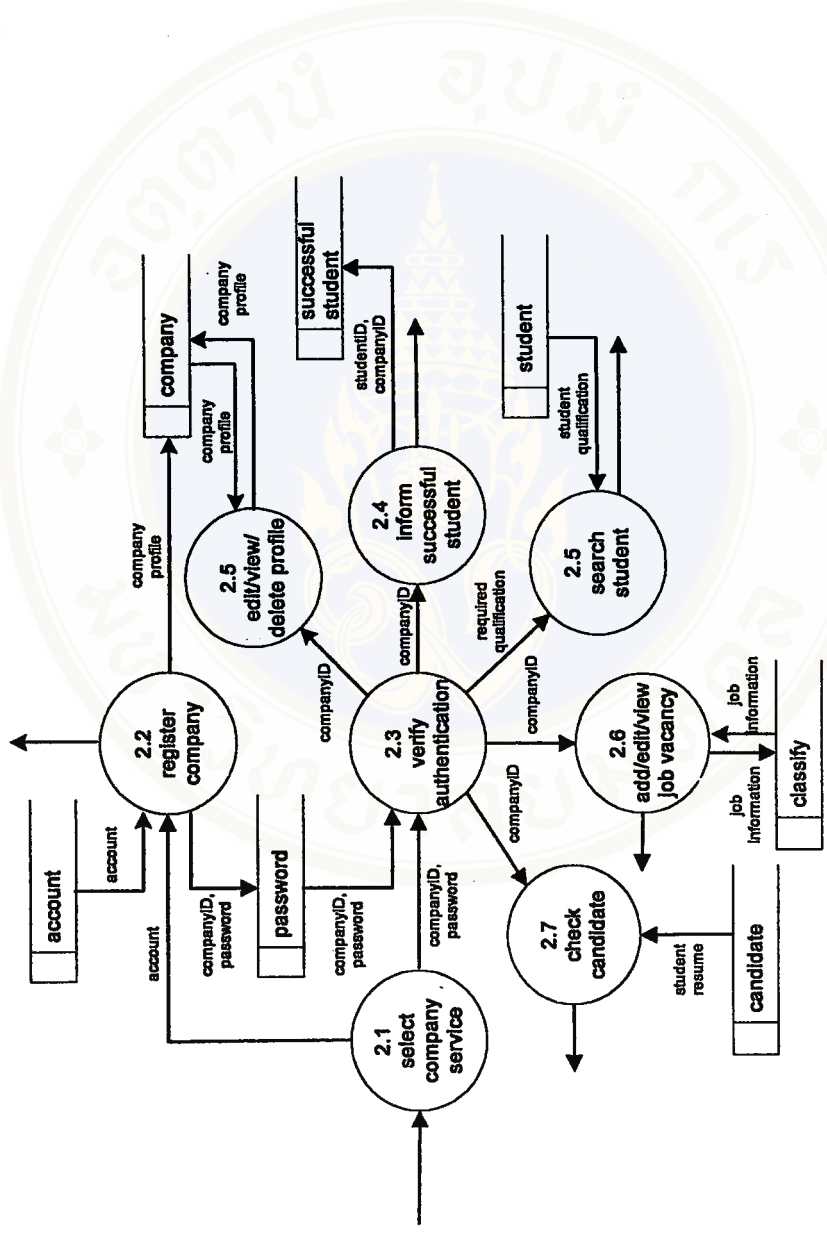


Figure 4.8 Second-Level DFD for Resume management and Job placement service system of company process

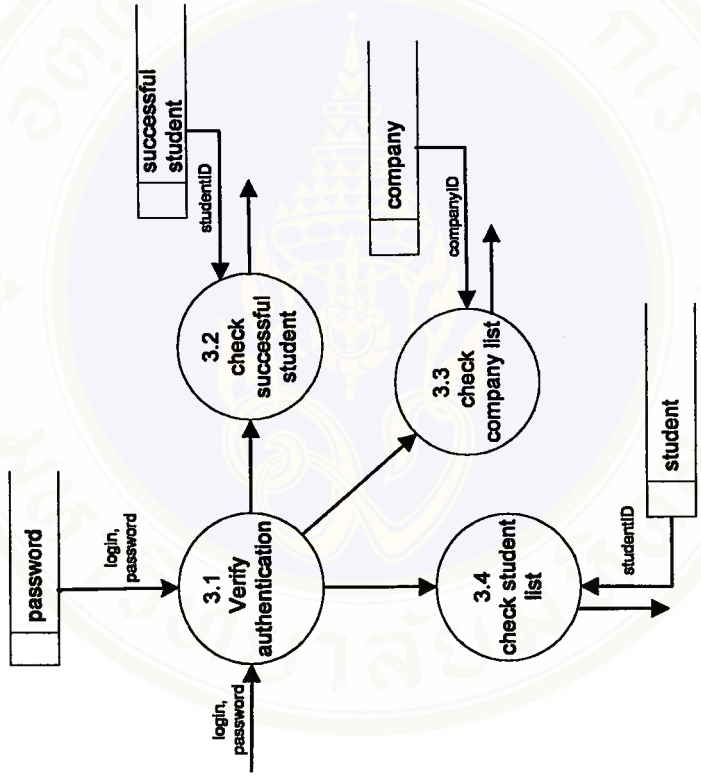


Figure 4.9 Second-level DFD of Resume management and Job placement service system of faculty of Engineering process

Table 4.1 Activity description for student process, company process and faculty of Engineering process.

Process No.	Process Name	Activity
1.1	Select student service	Check student selection.
1.2	Register student	Insert students resume in to student table and related table.
1.3	Verify authentication	Compare studentID, password between StudentSecure table and user input.
1.4	Edit/View/Delete	Update/Retrieve/Delete students resume from student table and related table.
1.5	Check matched job	Retrieve job from classify table where job qualification=student qualification.
1.6	Search job	Retrieve jobs from classify table.
2.1	Select company service	Check company selection.
2.2	Register company	Insert company profile in to company table and related table.
2.3	Verify authentication	Compare companyID, password between CompanySecure table and user input.
2.4	Inform selected student	Insert successful studentID into successful table.
2.5	Search student	Retrieve student from student table.
2.6	Add job vacancy	Insert job vacancy into classify table.
2.7	Check candidate	Retrieve candidate from candidate table.
3.1	Verify authentication	Compare admin login, password between AdminSecure table and user input.
3.2	Check successful student	Retrieve data from successful table.
3.3	Check company list	Retrieve data from company table.
3.4	Check student list	Retrieve data from student table.

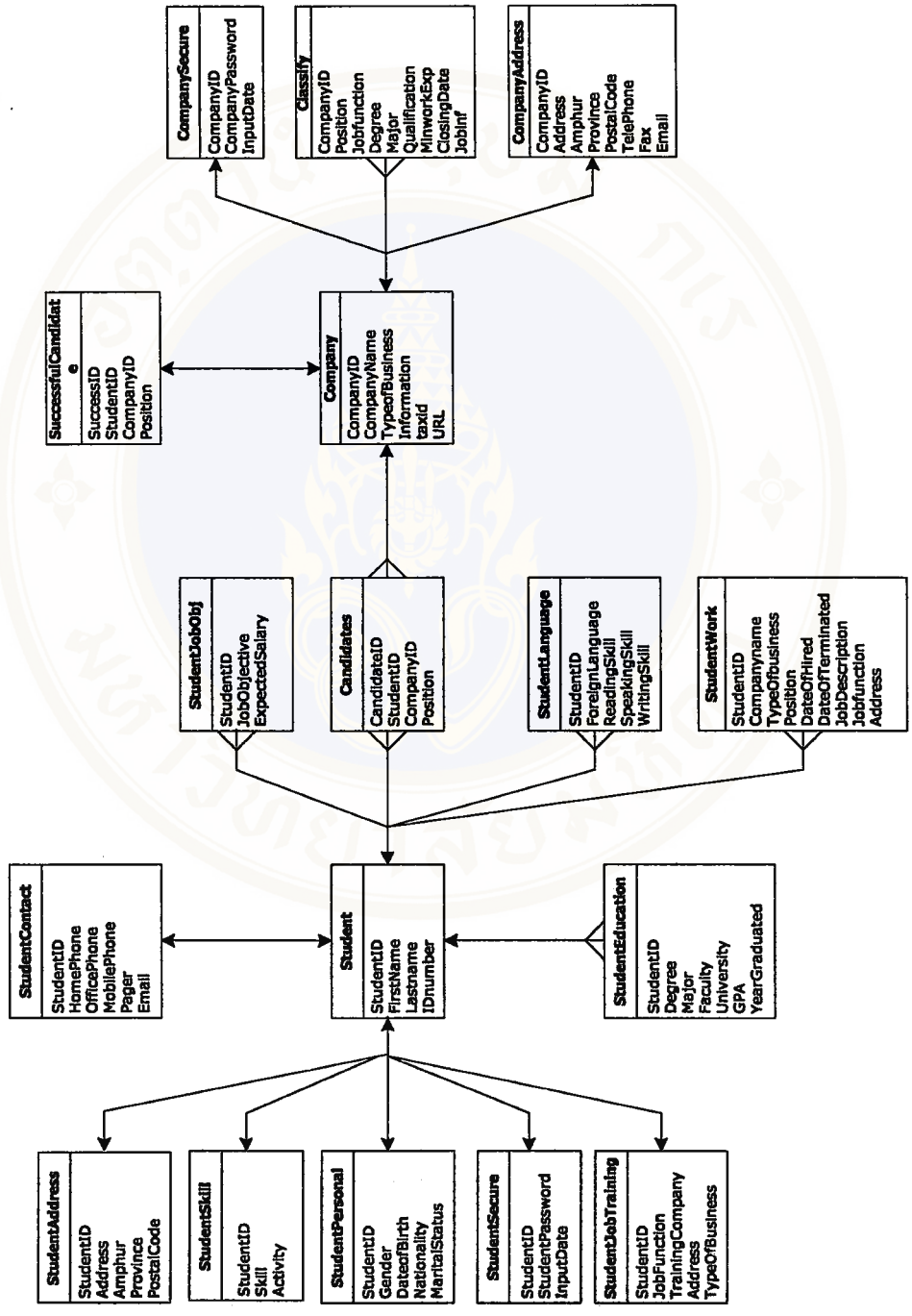


Fig 4.10 Entity Relationship Diagram

Table 4.2 List of Entity tables for resume management system and job placement service

Table No.	Table Name	Description	Detail
4.1	Student	Keeps record for main table of graduating students.	See appendix III, Table 4.1
4.2	StudentAddress	Keeps record of address of graduating students.	See appendix III, Table 4.2
4.3	StudentSkill	Records student's skill.	See appendix III, Table 4.3
4.4	StudentContact	Keeps student's contact information.	See appendix III, Table 4.4
4.5	StudentJobTraining	Keeps student's job training history for engineer students.	See appendix III, Table 4.5
4.6	StudentEducation	Keeps student education history	See appendix III, Table 4.6
4.7	StudentJobObjective	Keeps student job objective and expected salary.	See appendix III, Table 4.7
4.8	StudentLanguage	Keeps student's foreign language skill.	See appendix III, Table 4.8
4.9	StudentSecure	Keeps student's password.	See appendix III, Table 4.9
4.10	StudentWork	Keeps student's work experience data.	See appendix III, Table 4.10
4.11	StudentPersonal	Keeps student's personal data.	See appendix III, Table 4.11
4.12	Successful	Keep successful student	See appendix III, Table 4.12
4.13	Company	Keeps registered company information.	See appendix III, Table 4.13
4.14	CompanyAddress	Keeps registered company's address	See appendix III, Table 4.14
4.15	CompanySecure	Keeps company's password.	See appendix III, Table 4.15
4.16	Classify	Keeps job vacancies posted by companies.	See appendix III, Table 4.16
4.17	Candidate	Keeps candidates lists from online application	See appendix III, Table 4.17

3 System Development

Current type of Web browser that used by companies and students is shown as figure 4.11

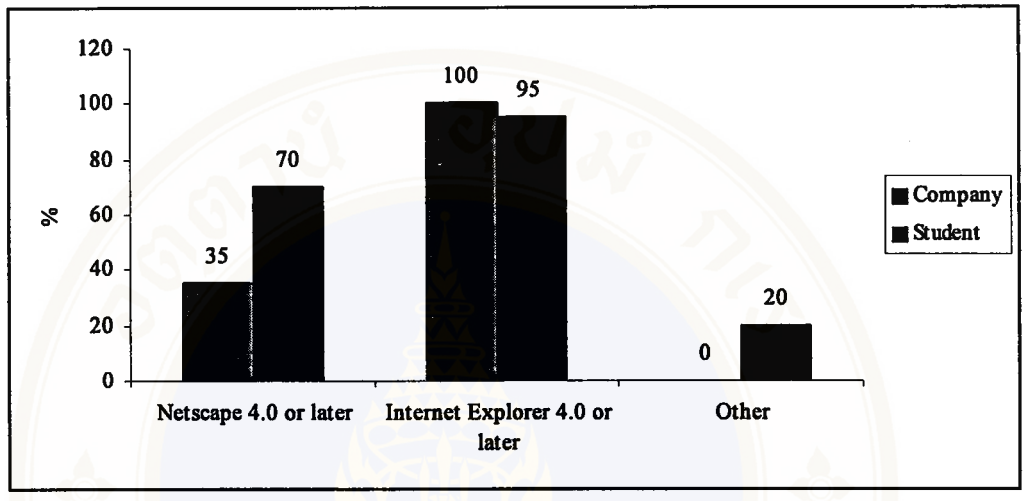


Figure 4.11 Current type of Web browser used by companies and student.

Database was designed based on user requirements. Top-level database E/R diagram is figure 4.10. To provide student access forms, the database was designed as client/server application for the Internet. Data entry forms were designed as HTML application. Web page is designed using hierarchical structure (12). Student and company forms were written using HTML tag, Jscript and Vbscript that program with Visual Interdev 6.0 tools. The totals numbers of web pages used by the resume management and job placement service system are 54 pages occupying 578 KB of storage.

This Web application use static and dynamic web pages with forms that require or respond to user actions. The static pages are html files and server scripts were implemented as asp files. All forms are made up of HTML and Active Server Page

(ASP) to get user input. JavaScript and VBscript program are also embeded in a Web page to perform specific processing functions, such as:

- Controlling what happens when a user clicks a button, enters text, or submits a form.
- Navigating to a specific page based on a condition such as user preference.
- Collecting and storing user information in order to customize Web applications dynamically.
- Creating new database records
- Querying a database and displaying results.
- Updating database records

Data Source Name less (DSNL) is a technique to connect Database Management System (DBMS) directly. With this technique, Open Database Connectivity (ODBC) Data Source Name file was not required for database connection. This means that this system can be installed in a Web server without having to specifically configuration.

Web page security design

In order to protect web page of this system from unauthorized users, a simple authentication process using usernames and passwords was used. Users have to enter their login name and password on the login Web page. After they are identified as valid users, they can have access to different services depending on user type. Figure 4.12 shown the top level flow chart of the sign-on procedure.

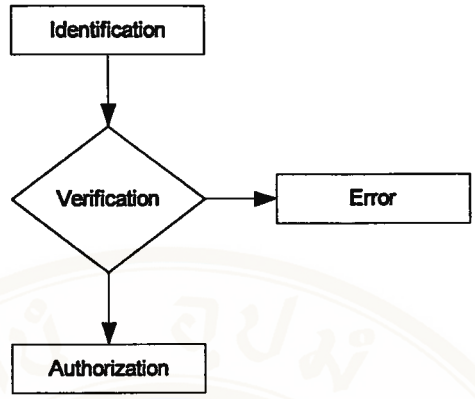


Figure 4.12 The level of the sign-on procedure.

Additional security features are directories marked read-only which contains all script files. This is used to protect the deletion or modification of the web pages from unauthorized users.

4 System Implementation

A pilot implementation strategy (13) was used for this system. With pilot implementation, small pilots can be introduced until the complete new system is operational (4).

In order to implement this system, minimum specification of hardware, software and peripheral device are acquired as following

4.1 Minimum Hardware and Software requirements for pilot implementation for Web Server

4.1.1 A computer with Pentium 233 MHz with

- 128 Mbytes of RAM

- 4.3 Gbytes of Hard disk
- 16X speed of CD-ROM
- Network Card

4.1.2 Operating System: WindowNT Server 4.0

4.1.3 Internet Server Software: Internet Information Server 4.0 (IIS4.0)

4.1.4 DBMS: Microsoft Access

4.2 Minimum Hardware and Software Requirement for pilot implementation for Client Computer

4.2.1 A computer with Pentium 100 MHz with

- 16 Mbytes of RAM
- 1.2 Gbytes of Harddisk
- 4X speed of CD-ROM

4.2.2 Operating System: Window95/98

4.2.3 Web Browser: Internet Explorer 4.0 or later

5 System Maintenance

After pilot implementation, the system was checked once a day to correct errors and bugs that claimed from user.

6 System Evaluations

The final step for development of this system is to evaluate this system. Evaluation data was collected by asking user after they use it. The items of the system evaluation and the results of evaluation are shown in table 4.16 and table 4.17.

Table 4.3 The results of the system evaluation from companies.

Question	Score					
	Very Good	Good	Fair	Fair Poor	Poor	Total (%)
	5	4	3	2	1	
1. Data Entry of the System						
- Input formats (font, color, appearance)	4	5	1			86
- Convenience of data entry	4	6				88
- Input formats arrangement	3	6	1			84
- Preventing, detecting input error	4	5	1			86
Approved Data entry Score (%)						**86.0**
2. Data Processing						
- Response Time	3	5	2			82
Approved Data Processing Score (%)						**82.0**
3. Output of the System						
- Output formats (font, color, appearance)	2	7	1			82
- Output formats arrangement	4	6				88
Approved Output of the system Score (%)						**85.0**
4.Other						
- Ease of Use	2	7	1			82
- Overall reliability	2	6	2			80
- Level of Utilization	3	6	1			84
Approved Miscellaneous Score (%)						**82.0**

Table 4.4 The results of the system evaluation from students.

Question	Score					
	Very Good	Good	Fair	Fair Poor	Poor	Total
	5	4	3	2	1	
1. Data Entry of the System						
- Input formats (font, color, appearance)	5	15				85
- Convenience of data entry	3	17				83
- Input formats arrangement	6	14				86
- Preventing, detecting input error	6	11	3			83
Approved Data entry Score (%)						**84.25**
2. Data Processing						
- Response Time	5	1	14			71
Approved Data Processing Score (%)						**71.0**
3. Output of the System						
- Output formats (font, color, appearance)	5	15				85
- Output formats arrangement	9	8	3			86
Approved Output of the system Score (%)						**85.5**
4.Other						
- Ease of Use	6	12	2			84
- Overall reliability	1	18	1			80
- Level of Utilization	7	13				87
Approved Miscellaneous Score (%)						**83.6**

CHAPTER V

DISCUSSION

The Student Resume Management System and Job Placement Service for the Faculty of Engineering was developed by following system development life cycle (SDLC) (4,13) as the following.

System investigation.

The existing systems was determined by interviewing a number of companies and students both undergraduate and master degree student of Technology of Information System Management, Faculty of Engineering, Mahidol University.

The traditional resume placement for student requires answering job vacancy advertisement in newspapers or attending job fair. Resumes of students who have more resources could possibly reach wider audience. The result showed a need for a resume management system and job placement service system which could timely place resumes to large audiences. If such a placement system does not cost too much for the students who seek job, it will be a very desirable system.

Companies with job vacancies normally place newspaper advertisements or participate in Job fairs. There is no time saving mechanism to match qualification of job applicants to the description of the vacant job. A lot of resources is required for each single successful recruitment. Companies would like to have a more time and cost saving way to fill in their job vacancies.

System analyses and design

The new system was design by using Microsoft Active Server Page technology. It allows easy connection between Web servers to different Database Management System (DBMS). This Active Server Page (ASP) is compatible only with Microsoft's product. Therefore, the new system cannot operate on UNIX operating system and other Web server.

System Development

User Interface is created by using Visual InterDev tool because of it is a very powerful tool for Web application development. All user interface best viewed by using Microsoft Internet Explorer 4.0 or its later version because Dynamic Hypertext Text Language (DHTML) is not supported for lower version and not 100% compatible with Netscape.

With Data Source Name Less (DSNL) programming technique is used to connect DBMS on WWW, this system can be developed as a software package. Since database configuration is not required when install this system. This system can be installed in any free web server on the Internet. It also allowed possible upsizing of DMS, for example from Microsoft Access to SQL server.

System Implementation

The pilot implementation was used for this system. Currently, the number of registered students and registered company are small.

The response time of new system also depend on Internet connection, If transmission rate of Internet connection is too low so response time will be increased respectively.

System Maintenance

A system administrator is needed to routinely monitor and maintain the system. Simple tasks such as expanding disk space, cleaning up expired account and expired job vacancies.

In general, the new system functions as an interactive job classified advertisement as well as a recruitment service. It offers a low cost alternative for company recruitment process and for students seeking jobs using a current technology.

Students who registered and placed their resume with the system are allowed to browse job vacancy listing, view company list, view company information, manage their own resume and place job application online. With the search engine function, student can view existing job postings according to criteria which are job type or matching-jobs that best fit their qualification. The attracticeness of this system for student use is that information is entered only once but can reach many prospective employers.

Registered company can manage its own company profile and update its vacancy postings. The company can also search qualified student resume from either the pool of student resume in the database or from the list of students applying for that particular position. Moreover, search engine offers company to search qualified student by using some criteria, such as gender, major of study, computer skill or GPA. The efficiency of hiring will be improved. The search engine make it more likely for the company pick out a few applicants for an interview easily.

The new system provides registered companies advantages of time and cost savings. The use of the system will drasticly reduce cost and time spent to screen

resume of candidates manually in the past. Table 5.1 shows the amount of time used when companies screened resume using the developed system compared to using manual system. It showed 10 to 50 folds increase in operating efficiency and table 5.2 showed cost saving between using manual procedure and new system.

Table 5.1 Compare time usage to screen resumes between the two systems.

Task	Time in minutes	
	Manual System	New System
Screen 20 resumes	20	1

Table 5.2 Compare company cost of obtaining candidates for interview between tradition procedure and the new system

Cost	Baht	
	Traditional procedure	New System
Advertisment	10,000	0
Labor cost to screen 20 resumes *	14	1
Internet fee	0	20
Total	10,014	21

Total cost saving= 9993 Baht.

*Calculate from salary of the administrator staff = 9,600 Baht

The advantage for registered students is the time saving to find and apply for job. Student can find job vacancies by searching new system for a hit list using less time and money than buying newspaper and look up the ads. One resume can reach many perspective employers who signed up with the system. One can also applies to many jobs online at the same time.

Since this project was initiated in March 1999, there have been a few local internet websites which invite people to post their resumes. Websites which are so called "Internet employment agency" such as Jobpilot, Loxinfo and SiamJob are not real interactive recruitment services. They only keep records for candidate resume and job vacancies. They do not allow companies to search qualified candidates online. Although Jobsdb.com allows company to search qualified candidates online, however search criteria are limited only to work experience history. Jobsdb.com does not have search job matching function. This shows that the new system present here give more advantage to users.

The resume management system and job placement service for the faculty of engineering, Mahidol University can implement for all graduated students for all faculty of Mahidol University. By sponsoring a resume management system for graduated student, University can make it more convenient for companies to recruit graduates via the Internet and student will find a good job easier.

As a result, the idea of the developed system could grow into a real business forum serving both employers and job seekers alike.

CHAPTER VI

CONCLUSION

This study designed and developed a Resume Management System and Job placement Service by using ASP technology with DNSL techniques. It runs an WindowNT4.0 platform and Internet Information Server (IIS4.0) as server and internet server respectively. Microsoft Access 7.0 Thai Edition was selected as the relational database management systems format to store, manipulate and retrieve data. The system can be upsized to SQL server by using Upsizing tools. DHTML written on Jscript was used for the detection of error input from user. VBscript was embedded in a Web page to perform specific function of Web Sever and database.

The system was evaluated by small group of companies and students. The overall satisfaction by students and companies are 85 and 81 percent respectively.

REFERENCES

1. Monhseni P. Web Database Primer Plus. Corte Madera (CA): Waite Group Press; 1996.
2. Whittington R. P. Database System Engineering. New York: Oxford University Press; 1988.
3. Date C. J. An Introduction to Database System. 6thEd. NP: Addison-Wesley Publishing; 1995.
4. Stair RM. Principles of Information System. 2nd Ed. Massachusetts: Boyd & Fraser Publishing; 1995.
5. Hoozer MV. Teach Yourself Microsoft Visual Interdev in 21 days. Indianapolis: Sams.net Publishing; 1996.
6. Linthicum DS. Active Platform. Byte 1997;3:58-60.
7. Whisler V., Soiland J. Developing Web Application with Microsoft Visual Basic and Microsoft Visual InterDev. MIND 1997;8:72-75.
8. Dobson R. A Visual Basic for Web Work. Byte 1997;3:23-24.
9. Kirtland M. Microsoft Visual Studio 97:A suite to satisfy your craving for integrated internet tools. MIND 1997;5:66-69.
10. Shewchuk J, Leake G. Microsoft Visual InterDev: The new way to web. MIND 1997;3:55-57.
11. Johnson S. Designing Real-World Apps with Active Server Pages. MIND 1997;3:40-43.
12. Kahn L, Logan L. Build Your Own Web Site. Redmond WA: Microsoft Press; 1996.

13. Gordon SR, Gordon JR. Information System A Management Approach. New York: The Dryden Press; 1996.

14. Garcia RM. Redesigning Print For The Web. Indianapolis: Hayden Books; 1997.

15 WWW.Microsoft.com/vstudio/whitepaper/tutorial.htm., 1999.

Appendix I

Questionnaire

APPENDIX I

QUESTIONNAIRE FOR COMPANY

- General Information

Name&Lastname _____

position_____

Email Address_____

Company name _____

Kind of business_____

Number of employees_____

Company Address_____

_____

Telephone_____

FAX_____

- Information for Personal Department

1) How many people do you hire per year? _____

2) What type of education and work experience do you expect your prospective employees to have for engineer and IT position? Select all available

☐ Bachelor's degree with work experience _____years

☐ Master's degree with work experience _____years

3)How do you currently find new employees? Select all available

☐ To announce in newspaper

☐ To announce in Internet

☐ To participate in Job fairs

☐ To hire employment service

☐ Other, please specify

4) How many applicantion letters on average do you screen before making an offer to an applicant?_____

5) On average, company expenses to find and hire a new employee are

☐ less than 5,000 Baht

☐ 5,000 – 10,000 Baht

☐ 10,001 – 20,000 Bath

☐ more than 20,000 Baht

6) Have Internet access are available for Personal Department?

☐ Yes ☐ No

7) Does your organization personal department recruit using the WWW ?

☐ Yes ☐ No

8) Would your organization be interested in doing so?

☐ Near future 1-3 month ☐ 4-6 months

☐ Next year ☐ No plan

9) Would your personal staff be interested in training for using the WWW?

☐ Yes ☐ No

10) How does your organization communicate with applicants?

☐ Telephone, Pager ☐ Mail

☐ E-mail ☐ Other _____

11) If graduating students resume are available on Web, Would you want to search them by qualifications?

☐ Yes ☐No

12) If Resume management system have service charge, Do you want to use it?

☐ Yes ☐ No

13) How much cost of service charge for Resume management system would you prefer? _____Baht

14) What data about candidates would you like to see in the resume management system ?. Select all available that necessary for selecting candidate to an interview or desired data for seaching)

☐ Position required

☐ Minimum salary required

☐ Permanent Address

☐ Present Address

☐ Age

☐ Weight/Height

☐ Date of birth

☐ Place of Birth

☐ Time of Birth

☐ Religion

☐ Race

☐ Nationality

☐ Thai I.D. Card No.

☐ Province Issued

☐ Date Issued

☐ Date Expired

☐ Marital Status

☐ Education data

☐ Language skill

☐ Typist skill

☐ Computer skill

☐ Job training history

☐ Work experience

☐ Other,

---

15) What kind of data would you want to search from resume management system for address of candidate? Select all available)

- Information for Computer System

1)Does your organization have Internet access?

☐ Yes ☐ No

2)Web Browser for Internet accesses: (select all of available)

☐ Netscape Communicator 4.0 or later.

☐ Netscape Navigator version _____

☐ Microsoft Internet Explorer version _____

☐ Other_____

3) Do your organization have own web site?)

☐Yes ☐ No

If yes, please give URL address:

_____

4) Have IS staff are available in your organization?

☐ Yes ☐ No

QURSTIONNAIRE FOR STUDENT

- General Information

Name &Surname _____

Education level

☐ Bachelor 's degree ☐ Master degree

1) Can you use Web browser for Internet?

☐ Yes ☐ No

2) Where do you always use the Internet?

☐ At Home ☐ At University ☐ At Office

☐ Other, Please input_____

3) Web Browser for Internet accesses: (select all of available)

☐ Netscape Communicator 4.0 or later.

☐ Netscape Navigator version _____

☐ Microsoft Internet Explorer version _____

☐ Other_____

4) Which procedure do you use for apply job? (select all of available)

☐ To send application letter

☐ To Participate Job fair

☐ To apply in person

☐ Other, Please input_____

5) If resume management system for graduating students are available on Web, Do you want to use it?)

☐ Yes ☐ No

6) What would you perfer to format and present your resume?)

☐ Present your resume as HTML document generated from your MS Word file.

☐ Enter information from your resume and use the resume management formatted output.

☐ Both

7) What information would you be reluctant to place in the resume management system?

☐ None ☐ Picture

☐ G.P.A ☐ Date of birth

☐ Other,please specify)_____

8) How much time would you be willing to spend entering your data into the system?

☐ 1–5 min ☐ 6-10 min ☐ 11-15 min

☐ 16-20 min ☐ More than 20 min

9) What do you think the cost of using this type of system should be?

_____ Baht

Appendix II

Entity table for Resume management system and

Job placement service

APPENDIX II

Entity table for Resume Management System and Job placement service

Table 4.1 Student table

Field	Data Type	Field Size	Description
#StudentID	Text	8	Student ID. Number
FirstName	Text	20	Student`s First name
LastName	Text	25	Student`s Last name
IDnumber	Text	13	ID number use for recall password

Table 4.2 StudentAddress table

Field	Data Type	Field Size	Description
#StudentID	Text	8	Student ID. Number
Address	Text	30	Student`s address
Amphur	Text	15	Amphur of student`s address
Province	Text	20	Province of student`s address
PostalCode	Text	6	Postal code

Table 4.3 StudentSkill Table

Field	Data Type	Field Size	Description
#StudentID	Text	8	Student ID. Number
Skill	Memo	-	Student`s Skill
ExtraActivity	Memo	-	Student's extra activity

Table 4.4 StudentContact Table

Field	Data Type	Field Size	Description
#StudentID	Text	8	Student ID. Number
HomePhone	Text	15	Home Telephone
OfficePhone	Text	20	Office Telephone
MobilePhone	Text	15	Mobile Phone
Pager	Text	15	Pager number.
Email	Text	35	E-mail address

Table 4.5 StudentJobTraining Table

Field	Data Type	Field Size	Description
#StudentID	Text	8	Student ID. Number
#JTCompanyname	Text	25	TrainingCompany
Jobfunction	Text	50	Job function when training
TypeOfBusiness	Text	30	Type of business of company
Address	Text	50	Address

Table 4.6 StudentEducation Table

Field	Data Type	Field Size	Description
#StudentID	Text	8	Student ID. Number
#Degree	Text	15	Qualification level
#Major	Text	20	Major of studying
#Faculty	Text	20	Faculty of studying
#University	Text	20	University of studying
GPA	Text	4	GPA after graduated
YearGraduated	Text	4	Year of graduated

Table 4.7 StudentObjective Table

Field	Data Type	Field Size	Description
#StudentID	Text	8	Student ID. Number
#JobObjective	Text	30	Student`s Objective
ExpectedSalary	Currency	-	Expected Salary

Table 4.8 Studentsecure Table

Field	Data Type	Field Size	Description
#StudentID	Text	8	Student ID. Number
StudentPassword	Text	10	Student's password
InputDate	Date/Time	-	Date of input resume

Table 4.9 StudentEducation Table

Field	Data Type	Field Size	Description
#StudentID	Text	8	Student ID. Number
#ForeignLanguage	Text	10	Foreign Language
ReadingSkill	Text	9	Level of Reading Skill
SpeakingSkill	Text	9	Level of Speaking Skill
WritingSkill	Text	9	Level of Writing Skill

Table 4.10 StudentPersonal Table

Field	Data Type	Field Size	Description
#StudentID	Text	8	Student ID. Number
#Companyname	Text	30	Name of Company
TypeOfBusiness	Text	30	Type of business
#Position	Text	30	Position name
DateOfHired	Date/Time	-	Date of Hired
DateOfTerminated	Date/Time	-	Date of Terminated
JobDescription	Memo	-	Job Description
JobFunction	Text	50	Job Function
Address	Text	50	Address of company
Telephone	Text	10	Telephone

Table 4.11 StudentPersonal Table

Field	Data Type	Field Size	Description
#StudentID	Text	8	Student ID. Number
Sex	Text	7	Gender of student
DateOfBirth	Date/Time	-	Date of birth
Nationality	Text	15	Nationality of student
MaritalStatus	Text	7	Marital Status of student

Table 4.12 Successful Table

Field	Data Type	Field Size	Description
#SuccessfulID	Text	Number	Candidate ID.
StudentID	Text	8	StudentID
CompanyID	Text	8	CompanyID

Table 4.13 Company Table

Field	Data Type	Field Size	Description
#CompanyID	Text	8	Company login name
Companyname	Text	30	Company name
TypeOfBusinees	Text	30	Type of business
CompInf	Memo	-	Information of company
TaxID	Text	15	Company Tax ID.number
URL	Text	20	Company's URL Website

Table 4.14 CompanyAddress Table

Field	Data Type	Field Size	Description
#CompanyID	Text	8	Company login name
Address	Text	30	Company`s Address
Amphur	Text	15	Amphur
Province	Text	20	Province
PostalCode	Text	6	PostalCode
Telephone	Text	40	Telephone
FAX	Text	20	FAX
Email	Text	30	Email

Table 4.15 CompanySecure Table

Field	Data Type	Field Size	Description
#CompanyID	Text	8	Company login name
Password	Text	15	Company`s password
InputDate	Date/Time	-	Date of first register

Table 4.16 Classify Table

Field	Data Type	Field Size	Description
#CompanyID	Text	8	Company login name
#Position	Text	15	Position of vacancy job
#Jobfunction	Text	50	Job function of vacancy job
Qualification	Memo	-	Skill Requirment
Degree	Text	17	Education qualification level
Major	Text	50	Field of education
MinWorkExp	Text	2	Minimum work experience
JobInf	Memo	-	Job Description
ClosingDate	Date/Time	-	Date of first register

Table 4.17 Candidates Table

Field	Data Type	Field Size	Description
#CandidateID	Text	Number	Candidate ID.
StudentID	Text	8	StudentID
CompanyID	Text	8	CompanyID
Position	Text	30	Apply Position

Appendix III

Budget for System Implementation

APPENDIX III

Budget for System Implementation

Item	Prize(Bath)
Computer set (PentiumIII, RAM 128Mb, HD 13GB)	40,000
Modem 56K	4,000
Domain Name Registration fee http://www.yourname.co.th http://www.yourname.com	 1,500 3,000
Web hosted setup fee	2,000
Web hosted monthly fee	2,000

Self server type

+ WindowNT software

+ Microsoft Access97

BIOGRAPHY

NAME	Mr. Attakarn Thongprasarn
DATE OF BIRTH	3 April 1972
PLACE OF BIRTH	Nakhon Ratchasima, Thailand
INSTITUTIONS ATTENDED	Mahidol University, 1990-1994: Bachelor of Science (Physic) Mahidol University, 1996-2000: Master of Science (Technology of Information System Management)
SCHOLARSHIP	RBSC Post Graduate Scholarship from The Royal Bangkok Sports Club
POSITION & OFFICE	1994-1996, Dept of Production Engineering, NEC Technology (Thailand) Co., Ltd. Nava Nakorn Industrial Estate II, Pathumthani