# TELEPHONE DIRECTORY ON INTERNET SYSTEM

by

Mr. Thammanoon Prayaraj

A Final Report of the Three - Credit Course
CS 6998 System Development Project

Submitted in Partial Fulfillment
of the Requirements for the Degree of
Master of Science
in Computer Information Systems
Assumption University

November, 2000

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|---|---|
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| Academic Year | November 2000 |

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The Graduate School of Assumption University has approved this final report of the three-credit course, CS 6998 System Development Project, submitted in partial fulfillment of the requirements for the degree of Master of Science in Computer Information Systems.

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## ABSTRACT

The objective of the project is to present the proposed Web Site of Shinawatra Directories Company Limited. This system provides for people who want to search the telephone number on the Internet and the system also provides other useful information for the user.

The Telephone Directory on the Internet System is proposed to be one media type of Telephone Directory for user. It contains all information from the Telephone Directory book. The application of the system is developed by HTML, ASP, VB Script. We use MS Access for data base file. From the Graphic User Interface, user can search information of Residential from telephone numbers, Names and Surnames easily. In additional, for Business, user can find from Business Classification. The other functions provided for the users are search information of Mobile, Local Long Distance and Overseas calls and users can select the source and destination of calling to find area code, service charge rates and details.

From the Web Page users can fill the form to request for Telephone Directory CD-ROM. This data will be used to create the report. Distribution Department will use this report to set amount of Telephone Directory CD-ROM and use to control the distribution. The system will create the historical report of web site visitors that can be used for administration and to improve the web site from user's recommendation.

Finally, the purposed of this project is it can be useful and give convenience for the user. The user's recommendation will be used to improve and make the system better.

## ACKNOWLEDGEMENTS

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# I. INTRODUCTION

## 1.1 Background of the Project

Shinawatra Directories Company Limited received the concessionaires from the Telephone Organization of Thailand from 1991 until 2005. It publishes the Telephone Directory for owners of the telephone number. They have benefits from advertising of the customers in the Telephone Directory. The Telephone Directory is separated into 2 categories.

(1) Book Telephone Directory: Show the name, address and telephone of telephone owner. It is separated into many books depending on the regional, area code and status of telephone number, Such as White Pages and Yellow Pages Book for each part of Thailand.

(2) CD-ROM Telephone Directory: It uses Graphic User Interface which people can use to find out the information easily. It also gives a lot of useful for users. For now, there are only White Pages Bangkok CD-ROM and Yellow Pages of Bangkok CD-ROM.

People are not interested in using the Telephone Directory become it is not convenient and takes time to search for the information they need. The increase of telephone numbers is also a big problem, because now the number of telephones will be up to 5.26 million numbers in the next three years. Because of the Large amount of telephone's numbers, the Telephone Directory has to be divided into many books depending on the regional and area codes.

The cost of production and distribution also increase we should give more budgets for distribution, employees and material in production. Especially the cost of paper is very high. It's very difficult to find the supplier in Thailand that can supports enough

order for production. Then we have to order from other countries, which means that the price is very high and it takes a long time for transportation.

We try to find the solution to this problem of our business. CD-ROM is one kind of media that can save the cost of production and also more useful and more friendly to the people who use the Telephone Directory. Besides, today Computer and the Internet are the technology that many people can use and relate to. So we use CD-ROM in the production. It's the alternative for the people who request this type of Telephone Directory. It provides many functions for the people to use it easily.

The Internet Web site is also are alternative form. It can meet the objectives of the company. It can use lower the cost of production and make Telephone Directory look more interesting. Many people can use it easily by just connecting to the Internet. It also has many functions like CD-ROM and provides many kinds of data for the user.

**1.2 Objectives of the Project**

(1) To make Telephone Directory more interesting for the users. Web page can make user more satisfied by providing the graphic interface, which has animation and colorful screen.

(2) The Telephone Directory on Internet System is more globally useful, because it can be used by many people from many countries to search the telephone numbers in Thailand.

(3) Another benefit from the Telephone Directory on the Internet is that it's an interesting media for the customers who want to have the advertisement on the Internet, and the customers no need to pay more money to have their own Internet Web Site.

(4) To save the production cost of the company. This kind of media uses lower cost than the book Telephone Directory.

## 1.3 Scope of the Project

(1) Software for access to the Database and system document.

(2) Create the Internet Web Site that can support many kinds of functions for searching the telephone numbers and information.

(3) Display the fees of local or international calls by receiving the parameter from the user.

(4) Give other useful information for the user that relates to Telephone Directory. (Such as, How to apply for the new telephone number, The emergency telephone number, etc.).

(5) Link to web site of Shinawatra Company group, such as Phonelinks that the user can use to send the message to the pager and also link to customer's web sites from link of customer's advertisement.

(6) Summarize the history of the user that visits the web site by report.

(7) Receive the comments from the user on the Internet to improve the system.

(8) Create the request form for Telephone Directory CD-ROM.

(9) Create the Summarize CD-ROM Request Report

(10) Create the Summary by Junction CD-ROM Request Report.

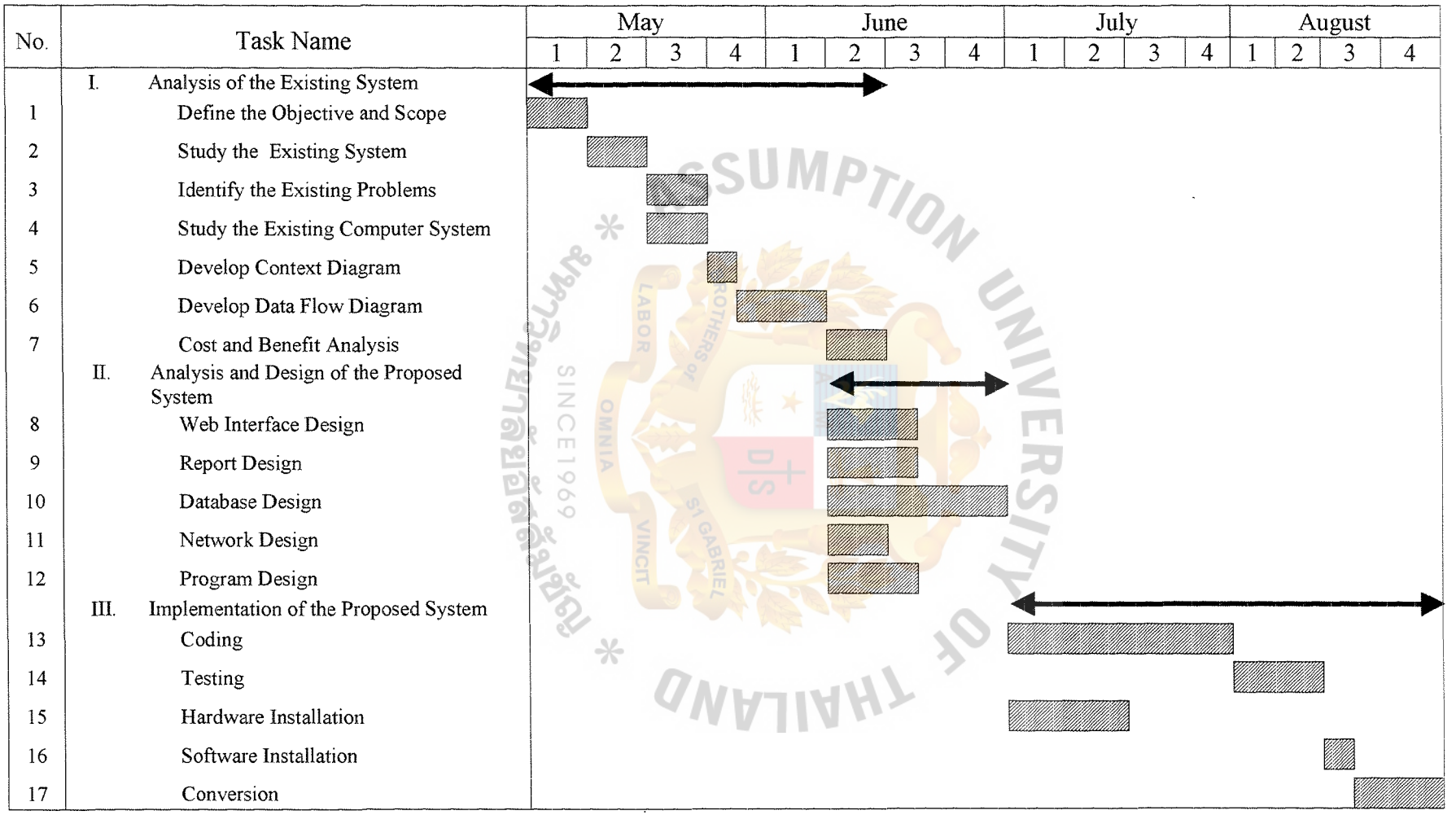


Figure 1.1. Project Plan of Telephone Directory on Internet.

# II. THE EXISTING SYSTEM

## 2.1 Background of the Organization

Shinawatra Directories Company Limited (SDY) is the Company that received the concessions from Telephone Organization of Thailand. It takes over from AT&T Company Limited in 1991 and now manages the database of the telephone number's owner information and publishes both the White Pages Telephone Directory and Yellow Pages Telephone Directory. We have many kinds of Telephone Directory media and services to make the Telephone Directory more interesting and useful for the user such as Book, CD-ROM and we have the Audiotex that provides and services the information on the telephone or facsimile for the user.

2.1.1 Evolution of Product & Service

| | | |
|---|---|---|
| January, 1996 | : | Produced the Metropolitan (Bangkok & Circumferences) White Pages, CD-ROM. |
| August, 1997 | : | Produced the Metropolitan (Bangkok & Circumferences) Yellow Pages, CD-ROM. |
| January, 1998 | : | To include of White Pages Directory and Yellow Pages Directory Provincial Book to make it easy and more useful for the user. |
| February, 1998 | : | Became the provider of WAND for advertising the products of importer and exporter on the Internet. |
| June, 1998 | : | Set up the information service center for answering the questions of user by the telephone. |

August, 1998 : Created a new service called "Yellow Talk", which provides the useful of information by telephone and facsimile.

2.1.2 Product and Service

(1) Book Telephone Directory

(a) White Pages Directory: There are the information of business and residents. It consists of names, addresses and telephone numbers and advertising of business sorted by name. It can be classified into 2 categories.

(1) Metropolitan Telephone Directory: It has the information of Telphone numbers in Bangkok, Nontaburi, Patumthani and Samutprakarn. It was divided in to 12 books based upon the Districts. We publish Thai and English language Telephone Directory.

(2) Provincial Telephone Directory: It has only in Thai. It was divided into many books based upon the telephone area codes and sorted by province names. It has both White Pages part and Yellow Pages part in the same book.

(b) Yellow Pages Directory: There is only the information of the business. It consists of names, addresses, telephone numbers and advertising of the business. It is sorted by categories of service or product and business name. It can be classified into 2 categories.

(1) Metropolitan Telephone Directory: It is the same as Metropolitan White Pages. In the case of books in Thai it's also

divided into 12 books but it has only one kind in English Language.

(2) Provincial Telephone Directory: It has 2 categories.

(a) Regional Book: It's divided into 5 regions (North, Northeast, East, Central, and South). In the book there are the information of names, addresses, telephone numbers and advertising of the provincial customers and some of Bangkok customers. It's separated by products category and sorted by company name.

(b) Local Area Book: Divided into 20 areas based upon the area code of telephone number. These is also the same information as Regional Book.

(2) CD-ROM Telephone Directory

You can find the information of telephone numbers in Bangkok, Nontaburi, Patumthani and Samutprakarn. We have both Thai and English CD-ROM which are valid for 1 year. It has 2 categories.

(a) White Pages CD-ROM: It has the information of residents, businesses, government and government enterprises. It has many functions for the user to use, such as searching by the name of telephone's owner.

(b) Yellow Pages CD-ROM: It has the information of businesses that provides names, addresses, telephone numbers and advertising of the customers. It has the functions that can help the user to find out the store or company that they want.

(3) Audiotex Services. "Yellow Talk"

This service provides the information of products and services by electronic voice and fax on demand. It is free for everyone who is interested to call in day. The following items are the Service of Audiotex.

(a) Talking Ad: Provides the information of products or services that the users want to know from telephone or facsimile.

(b) Information Guide: Provides many kinds of information, such as Entertainment, Tourist Festival Calendar, Bangkok activities and Lottery, etc.

(c) Consumer Guide: Provides the useful information for life living.

(d) Buyer Tips: Provides the suggestion for the decision of the consumer that want to buy product.

## 2.2 Existing Business Functions

The purpose of this project focuses on the function of Information system of Electronic Data Processing (EDP) Department. Before we have mentioned the new system on the Internet that can meet the purpose of the company. We have the main function of information system that supports the organization. We can classify the main functions that support the organization as follows:

(1) Services Order system (SO)

The function of this system creates and updates the data in the Database. The organizations that SDY receive the data from are Telecom Asia Corp. (TA), Thai Telephone and Telecommunication Corp. (TT&T), Computerize Directory Assistant System (CDAS). After that we will rebuild the structure of data to create report and index files. The data entry will use these reports to check the errors and update them to index file. The next step

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is matching the index file and update to our Database. In each month SO system will receive data to update to the Database (about 30,000 - 60,000 records). The data will came into the system between 1 October - 30 September in each year and will be published in the Telephone Directory in the next year.

(2) Canvass Preparation system (CP)

We use this system to create the data and make the reports for sales representatives. It will search the customer records in the Database who has bought the products in the recently year. After that it will summarize the price of the customer records and generate reports sorted by the price. The report will be sent to Marketing Department to classify the customer records. The next step, CP system will bring the classified customer's data received from Marketing Department to assign automatically to the sales representatives and generate the reports to Marketing Department. After the Marketing Department accept this report, the next step is to move the canvass, then CP system will move current canvass in the Database to be the last canvass of next year and then prepare the Database for the new canvass. The last step is printing the contact for the sales representatives offer to the customer.

(3) Production Support system (PS)

The data entry of Service order Department will use this system to correct the data of customer's advertisement. After sales representatives sent back the contact of the customers who want to advertise on Telephone Directory, the data entry will key in the information of advertising to the

Database. At the end of the day they will use this system for report to check the contact of customer. They are 2 following reports.

(a) Text report: It shows text and format of advertisement that will occur in the telephone Directory.

(b) Canvass report: It shows the item (type of advertisement), products (book), price, and summarize of advertisement.

(4) Sale Follow up system (SFU)

This system will provide the data and reports for the Marketing Department. After a new canvass of customer record is created SFU system will summarize the canvass information for each sales representative and generate report weekly. Marketing Department will use this report to pay the commission to the sales representative.

(5) Control Paging Text system (CPT)

This system will prepare and create data for Pagination system. Before we produce the Telephone Directory we should check an errors of the data in the database. This process will check the integrity of the data, the rules of the data and the completeness of the data. The errors will be fixed by the data entry. The final process will create the data for the Pagination system to generate the layout files of Telephone Directory.

(6) Pagination system

Today we produce the Telephone Directory by automatic system. In the production process we use the Xyvision application which runs on the Unix Operating System. From the data that receive from CPT, the system will produce the layout of the page file. After that the layout file will be

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approved and the errors will be fixed. The final result is the printing films to produce the Telephone Directory.

(7) Account Receivable system (AR)

This system is for the process of customer's payment. This system will create invoice for the customer after the customer send in the contact form. After receiving the payment from customer Accounting department will key in the data to the system. System will update balance and print AR report for Accounting department.

(8) Distribution Support system (DST)

This system produces the ticket and coupon to control the amount of the Directory sent to the users. The system will retrieve data from the Database and compare them with the user request from the request form. User can request Book Directory or CD-ROM Directory. So, the system will set the type of Telephone Directory according to the user request. DST should produce the report of Book Directory and CD-ROM Directory amount. Distribution department will use this report to set the budget. After producing the ticket or coupon will generate the control of distribution report and the summarized amount of Book Directory and CD-ROM reports.

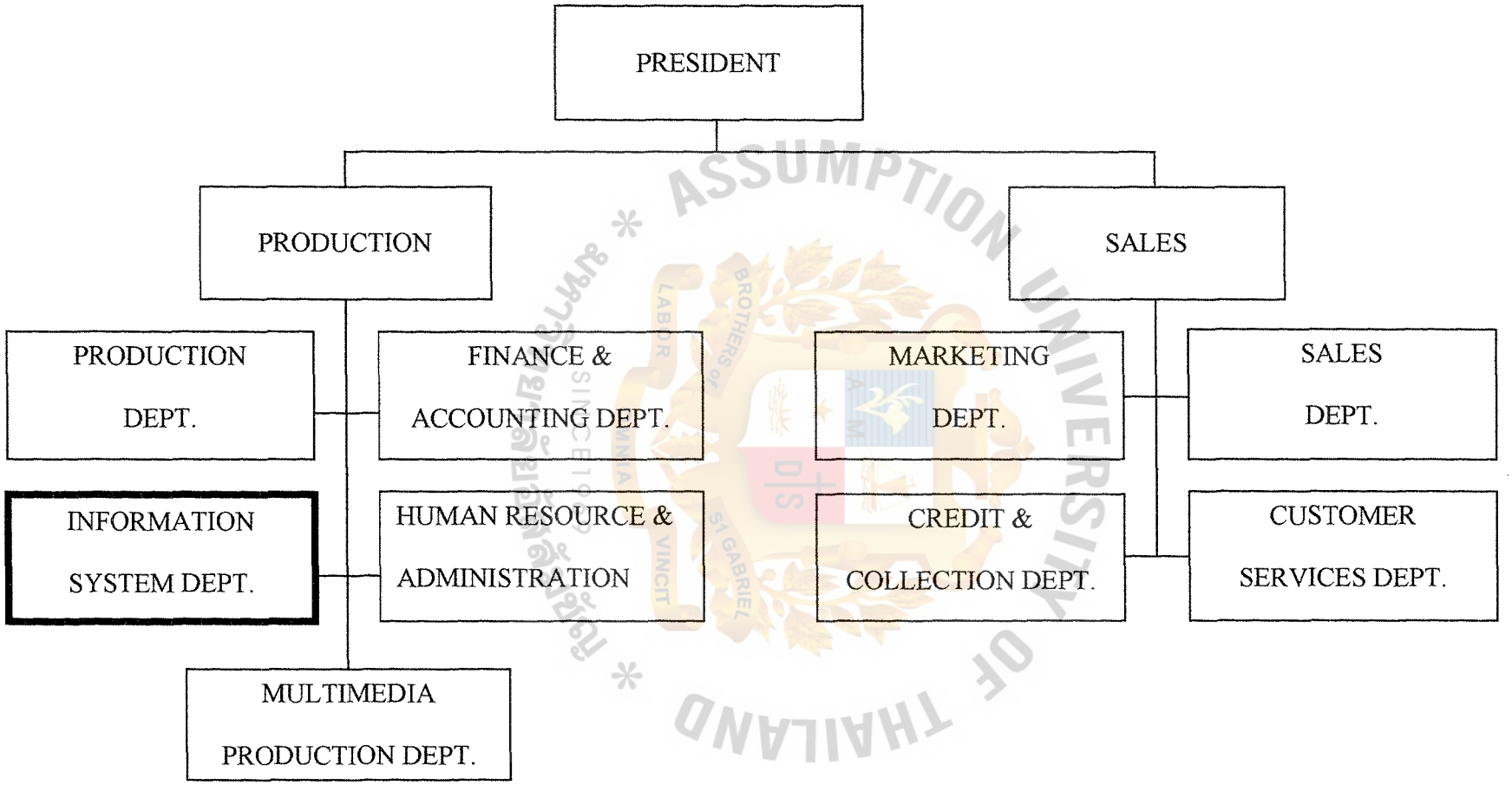


Figure 2.1. Organization Chart of Shinawatra Directories Company Limited.

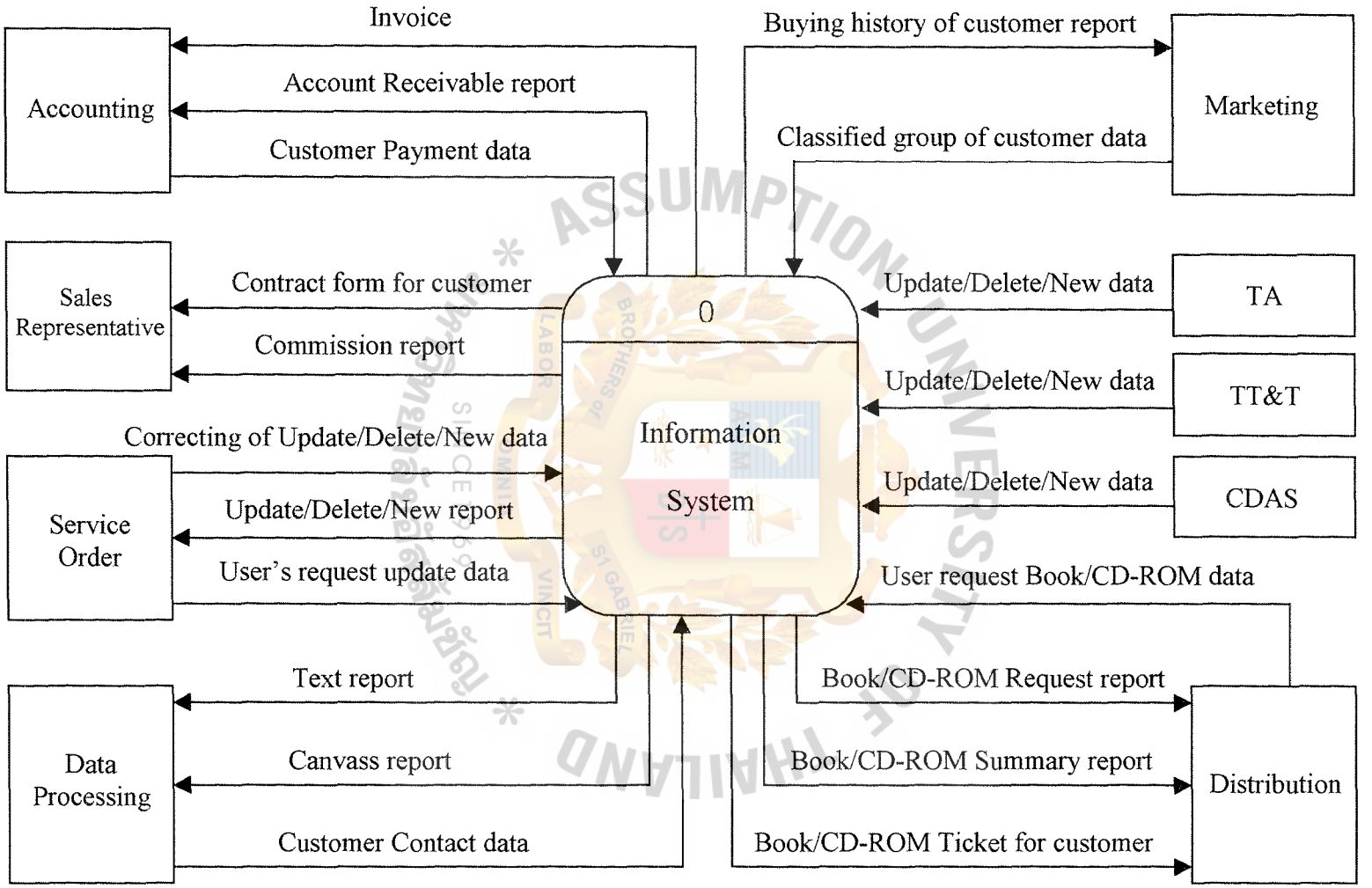


Figure 2.2. Context Diagram of Information System.

# III. THE PROPOSED SYSTEM

Telephone Directory on Internet System is proposed to make the people more interested in the use of the Telephone Directory. Because, it can meet a lot of people from anywhere who use the Internet. The Graphic of application also can make the advertisement more interesting.

## 3.1 User Requirements

Telephone Directory on Internet System is a new media of Telephone Directory and it is the optional for the user to use the Telephone Directory. By using the concept of CD-ROM Directory that has the Graphic user interface, they have many functions for looking to the telephone number information and other information that can be useful for the user.

In this project will produce the system for Bangkok White Pages. It gathers useful information for the user. It contains the information of the telephone numbers of residents, businesses, governmental organizations, state enterprises, emergency telephone numbers, necessary and often used telephone numbers in all areas such as public fire station, hospital, service offices of water supply or electricity, etc.

## 3.2 The Proposed System

In order to support the requirements of the user and provide new features, it can be classified the function of the "Telephone Directory on the Internet System" as follows:

(1) Searching for telephone number

(a) Emergency listing

(1) Emergency numbers

(2) Police and Fire Station numbers

(3) Hospital numbers

(b) Residential listing

(1) Searching by name, surname, name and surname.

(2) Searching by telephone number

(c) Business listing

(1) Searching by name

(2) Searching by telephone number

(d) Government Office and Government Enterprise listing

(1) Searching by name

(2) Displaying of the public utilities listing

(a) Telephone services

(b) Water works

(c) Airlines

(d) Social services

(e) Bus stations

(f) Communication authority of Thailand

(g) Electricity

(h) Railway stations

(i) Telephone organization of Thailand

(3) Listing of telephone service center

(4) Displaying of the telephone charge rates

(a) Rates of service charge

(b) Methods of paying fee

(5) Listing of telephone service

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(6) Displaying of information of Mobile Telephone

(a) How to subscribe

(b) Payment of mobile telephone service fee

(c) Mobile telephone service charge rates

(7) Accepting and displaying information of local long distance calls

(a) Local long distance calls

(b) Service charge rates

(c) Area code for automatic long distance phone

(8) Accepting and displaying information of overseas calls

(a) International telephone service

(b) Overseas calls charge rate

(c) Overseas calls code

(9) Linking to other web site that concern to the system

(10) User request Telephone Directory form

(11) User recommendation form

(12) Summarize of visitor web site report

## 3.3 System Design

### 3.3.1 Overview of the Proposed System

The proposed system is developed to run on Windows System by using Microsoft Access Software to store the data of telephone number and other information. These data will be retrieved by user request from input screen. The applications that create web page for interface with the user and show the advertisement of customer are HTML, Active Server Pages (ASP).

The system can receive the parameter from the user to retrieve only the data that they want. For maintenance and management the system will create the Microsoft Access report of visitor history and user's recommendation.

3.3.2 New System Design

The proposed system is designed to meet the user requirements and solve the problems found in the existing system. For the system design, we use the Logical Data Flow Diagram by starting with the Context Diagram (Shown in Figure A.1) to represent the entire proposed system. For more detail than the context diagram, Data Flow Diagram Level 0 (shown in Figure A.2) has been used, and each process on Diagram 0 is explored to more detailed Child Diagram or Data Flow Diagram Level 1 which is shown in Figures A.3 – A.10. The detail of each process of the proposed system are as follows:

Process 1.0 Display Emergency Telephone Number:

Display the emergency telephone number that could be used from user in the emergency situation.

Process 2.0 Display Police & Fire station Listing:

Display the listing of police and fire station information. It contains the information of police office telephone number and fire office telephone number.

Process 3.0 Display Hospital Listing:

Display the listing of Hospital information. There are information of name, location, and telephone number.

Process 4.0 Search Residential:

Accept the key of searching (name or telephone number) and value of searching. For searching by name or surname it can support word matching (exactly matching or search partially matching).

Process 5.0 Search Business:

It has the same function as Residential. But, for business we can also search by business classification (Main-Class and Sub-Class). Business listing can have some advertisement of customer and link to customer's web site.

Process 6.0 Display Government Office and Government Enterprise Listing:

Display the Government office and Government Enterprise name. Web page can link to the Web Site of these organizations which have their information.

Process 7.0 Display Name of Public Utilities Listing:

The Listing is sorted by name and group and by the organization. User can select group of organization that they want to see. The group of Public Utilities are: Telephone service, Water works, Airlines, Social service, Bus station, Communication authority of Thailand, Electricity, Railway station, Telephone Organization of Thailand.

Process 8.0 Display Telephone Subscriber Service Center Listing:

Display the information of the telephone service center that sorted by the name. The information consists of name, telephone number, billing collecting telephone number and location.

Process 9.0 Display Telephone Service Charge Rates:

The information that displays consists of type of service, charge rates, description and detail of payment.

Process 10.0 Display Services Name of Telephone Authority of Thailand:

List the type of service and detail of each service, such as information about PIN PHONE, TOT CARD, SPC, etc.

Process 11.0 Display Information of Mobile Telephone Calls:

(1) The information of mobile telephone is how to subscribe, Payment of mobile telephone service fee, etc.

(2) Accept source and destination to find out Area Code and charge rate of Mobile.

Process 12.0 Display Information of Local Long Distance Calls:

(1) The information about Local long distance calls. For example, Local long distance calls by operator, Local long distance calls by automatic, etc.

(2) Accept source and destination to find out Area Code and charge rate for each period time of Local long distance calls and detail.

Process 13.0 Display Information of Overseas Calls:

(1) The information about Overseas calls. For example, Overseas calls by operator, Overseas calls by automatic, etc.

(2) Accept and Display information of Overseas calls. User can select the country name that will be called from Thailand to find out the charge rate and country code of each location, etc.

Process 14.0 Receive Request of Telephone Directory CD-ROM:

Create the form of request CD-ROM. User can request both White Pages CD-ROM and Yellow Pages CD-ROM by selecting in Thai or English language.

Process 15.0 Receive User's Recommendation (Guest Book):

Create the table and collect the recommendation information of visitor that visits the web page.

Process 16.0 Link to Other Web Site:

Link to the customer Web sites from the logo of customer's advertisement to other Company and Web sites such as the Shinawatra group company.

Process 17.0 Summarized Report of User Request CD-ROM:

Create the summarized report of user request CD-ROM and print the report to Distribution Support Department. This report is used to set the amount of CD-ROM that will be produced.

Process 18.0 Summarized by Junction Report of User Request CD-ROM:

Create the summarized report of user request CD-ROM by group into the Junction of Telephone number. This report is used to control the distribution of CD-ROM.

Process 19.0 Summarized Report of Web Site Visitor:

Summarized the history of Web Site visitors. The report will be used for management and maintenance The Web Site.

3.3.3 File Layout

The proposed system file does not use the concept of Relational Database because these tabled are the temporary files. The tables will be created for each process of the year. The data to create the table come from the Relational Database of existing files. These following items are the table of system.

(1) Res : For storing the Residential record, consists of fields: Customer_ID, Name and Surname.

(2) Res_Tel_Idx : For storing the Residential Telephone Number, consists of fields: Tel_no and Customer_ID.

(3) Res_Addr : For storing the Residential Address, consists of fields: Addr_ID, Addr_Text, Tel_text and Customer_ID.

(4) Bus : For storing the Business consist of fields: Customer_ID, Name, Bus_ID, URL and Ads_ID.

(5) Bus_Tel_Idx : For storing the Telephone Number, consists of fields: Tel_no and Customer_ID.

(6) Bus_Addr : For storing the Business Address, consists of fields: Addr_ID, Addr_Text, Tel_Text and Customer_ID.

The rest of these table, there are the reference takes and transaction table. The table name of this type following:

(7) Main_Class : For storing the Business Classification, consists of fields: Main_ID and Main_Name.

(8) Sub_Class : For storing the Sub Main Classification, consists of fields: Bus_ID, Main_ID and Bus_Name.

(9) Mob_Rates : For storing the Mobile Charge Rates, consist of fields: Mob_Source_Name, Mob_Dest_Name, Mob_Rate, Mob_Source_Code and Mob_Dest_Code

(10) Local_Rates : For storing the Local Long Distance Charge Rates, consist of fields: Loc_Source_Name, Loc_Dest_Name, Loc_Source_Code, Loc_Dest_Code, Loc_Charge_Rate1,Loc_Charge_Rate2and Loc_Charge_Rate3.

(11) Oversea_Rates : For storing the Overseas Charge Rates consist of fields: Ovs_Name, Ovs_Code, Ovs_Charge_Rate1, Ovs_Charge_Rate2, Ovs_Charge_Rate3, Ovs_Charge_Rate4, Ovs_Charge_Rate5, Ovs_Charge_Rate6, Ovs_Charge_Rate7, Ovs_Charge_Rate8 and Ovs_Charge_Rate9.

(12) Req_CD : For storing the User's Request CD-ROM consist of fields: Tel, Name, Surname, Address, Language, WP_Type, YP_Type and Date..

(13) Guest : For storing the User's Recommendation consist of fields: Name, Surname, Text and Date.

### 3.4 Hardware and Software Requirements

The new system is the extension of Information System (IS). So, it will connect and use the some resource from the existing system. The details of hardware and software that are required for the new system are given as follows:

(1) Hardware Requirement

| | | | |
|---|---|---|---|
| (a) | Web and Mail Server | 1 | Unit |
| | COMPAQ PROLIANT 1600 | | |
| | Pentium III/500 MHz | | |
| | 128 MB/ECC RAM | | |
| | 9.1 GB (450 MHz) | | |
| | 44X CD-ROM | | |
| | 104 Keyboard PS/2 | | |
| (b) | Monitor | 1 | Unit |
| | 15" Compaq Monitor | | |
| | SVGA AGP 4 MB | | |
| (c) | UPS | 1 | Unit |
| | Fuden UPS 600 VA | | |
| (d) | LAN Accessories | | |
| | 3COM 10/100 PCI Card | 1 | Unit |
| | UTP CAT 5 "AMP" | | |
| | RJ-45 Connector | 2 | Units |

(2) Software Requirements

(a) Network Operating System

(b) Windows NT Server

(c) Microsoft SQL Database Server

(d) Microsoft Office 2000

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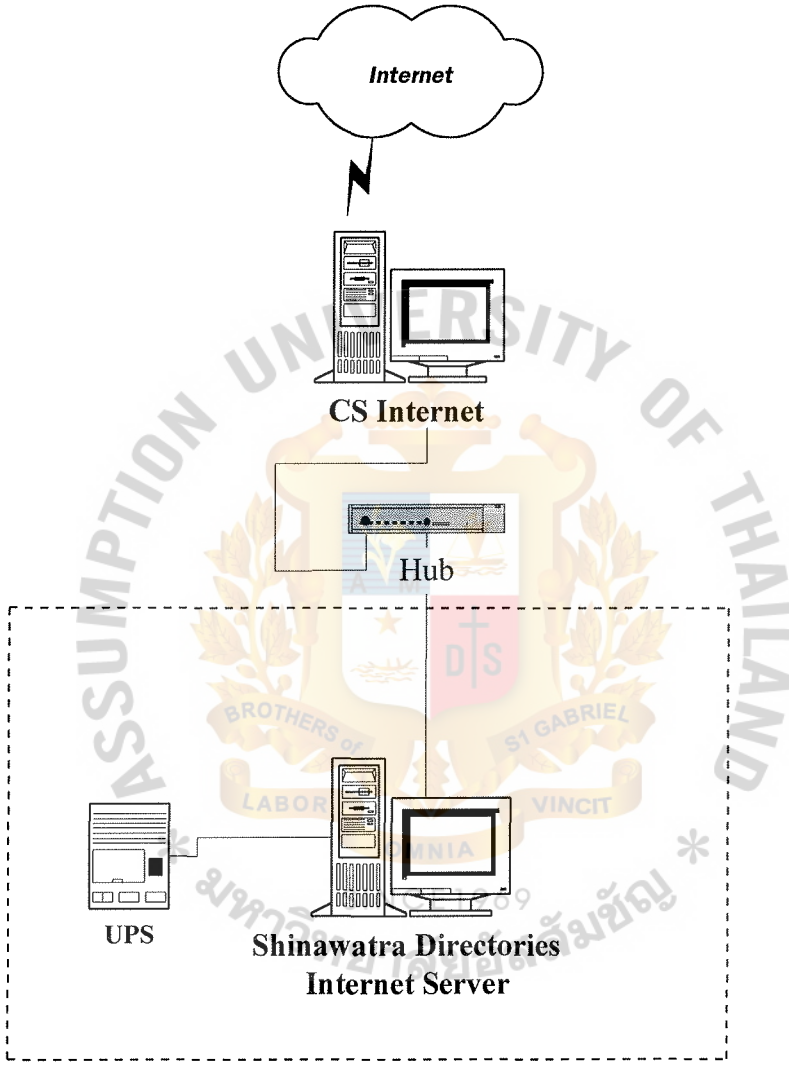


Figure 3.1. Hardware Configuration of the Proposed System.

## 3.5 Cost and Benefit Analysis

### 3.5.1 Cost Analysis

For the proposed system there are four main costs involved which are:

(1) Investment Cost

(2) Implementation Cost

(3) Annual Operating Cost

(4) Employee Costs

The details of these costs are as follows:

1. Investment Cost

Table 3.1. The Hardware Specification, Baht.

| Hardware Cost Estimate | Unit | Price/Unit | Total |
|---|---|---|---|
| Web server | 1 | 160,000 | 160,000 |
| Monitor | 1 | 7,400 | 7,400 |
| UPS | 1 | 3,900 | 3,900 |
| LAN Accessories | | 3,200 | 3,200 |
| Total Hardware Cost Estimate | | | 174,500 |

Table 3.2. The Software Specification, Baht.

| Software Cost Estimate | Unit | Price/Unit | Total |
|---|---|---|---|
| Window NT Server | 1 | 14,000 | 14,000 |
| Microsoft SQL Database server | 1 | 24,000 | 24,000 |
| Network Operating System (Upgrade) | 1 | 4,700 | 4,700 |
| Microsoft Office 2000 | 1 | 20,000 | 20,000 |
| Total Software Cost Estimate | | | 62,700 |

Total Investment Cost 237,200

| | | | |
|---|---|---|---|
| 2. | Implementation Cost | | |
| | User Training | 40,000 | Baht |
| | Total Implementation Cost | 40,000 | Baht |
| 3. | Annual Operation Cost | | |
| | Operation Cost | 5,000 | |
| | Internet subscriber fee | 25,000 | |
| | Maintenance Cost | 20,000 | |
| | Total Annual Operation Cost | 50,000 | Baht / year |
| 4. | Salary | | |
| | Web master 1 employee | 20,000 | Baht / month |
| | Total employee salary | 20,000 | Baht / month |
| | Or | 240,000 | Baht / year |
| | Total Annual Operation Cost | 290,000 | Baht /year |

Annual Cost = [(Investment Cost + Implement Cost) / Estimated System Life Year]
+ Annual Operation Cost

According to the annual cost formula, we assume that estimated system life year of the proposed system is 5 years.

The Proposed System Annual Cost = [ (237,200 + 40,000) / 5 ] + 290,000

= 345,440 Baht

3.5.2 Benefit Analysis

The Benefits from the proposed system can be classified as Tangible Benefits and Intangible Benefits.

Tangible Benefits

Tangible Benefits come from the advertisement of customer. The advertisement on the web page can be classified as following:

(1) Banner

Show the Banner of customer on the top of Web Page that has dimension of 468x60 pixels. It can be connected to the web site of customer. The cost of Banner is upon these types of web page.

(a) Business Page: The Banner will be placed on this web page. This has the function of searching for the business information. This group of customer is related to the commercial.

(b) House Page: Support the searching of resident information which has a lot of things users can use.

(c) Classify Page: It looks like the Business Page. It's on the web page that specifies type of business.

(2) Graphic Page

It Shows the Advertisement of customer which has the picture and more information. It will show the detail of business that the user wants and can contact easily. This page is called the business name listing and can links to the customer's web site.

(3) Link Homepage

The Link of Homepage for customer's web site. It's linked by the word on web page which has not the business name. It costs a little for customer.

The Benefits from the new system can be declared by each type of customer's advertising. The amount of advertisements can be limited by properly displaying in each page.

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Table 3.3. The Tangible Benefit Cost, Baht.

| Type | Price (/Year) | Customer amount | Total (/Year) |
|---|---|---|---|
| 1. Banner Advertising | | | |
| Business Page (Limited of 3 customers) | 50,000 | 3 | 150,000 |
| House Page (Limited of 3 customers) | 40,000 | 3 | 120,000 |
| Classify Page (Limited of 3 customers) | 15,000 | 3 | 45,000 |
| 2. Graphic Page (more than 10 customers) | 8,000 | 10 | 80,000 |
| 3. Link (more than 50 customerss) | 5,500 | 50 | 275,000 |
| Total Benefit | | | 670,000 |

Intangible Benefits

The propose of the new system is to prepare the business for concession of Telephone Directory because in the near future the concession will opened. The Company should have the new strategy in the business operation. The E-commerce is also the reason for creating this system because it is more popular on the Internet.

All of these topics are the Intangible Benefits from the new system.

(1) It can be the choice for user who wants to use Telephone Directory. User can get the convenience and be more satisfied with the Telephone Directory.

(2) To make the product and company well known to the people who use the Internet. Many people can use the Telephone Directory on Internet from many countries to find out the telephone numbers information and products in Thailand.

(3) It can links to another web site of our company. It's the media of Buyer and Supplier to find the product and buy on Internet.

(4) This type of Telephone Directory can reduces the cost of production and safe the resources. It's good for the environment.

3.5.3 Payback Period

The payback period is the number of years it must be retained to recover the initial investment with stated return. To find this payback period, we use the formula as follows:

$$P = I / [(1-T)]$$

Where P = Payback Period

I = Investment Cost1

R = Average annual return on investment

T = Corporate tax rate in percentage (30%)

Average Annual Return on Investment = Total Benefit – Annual Cost

= 670,000 – 345,440

= 324,560 Baht

Payback Period = 237,200 / [(1-0.3) 324,560]

= 1.04 years

Payback Period (after taxed) for the proposed system is 1.04 years.

3.5.4 Breakeven Analysis

Breakeven analysis is the way we used to compare estimated cost of the proposed system and the existing system in order to determine which is the year that the cost of both system are equal. The estimated cost we used in this analysis are based on the following assumption:

(1) Salary increase by 10% per year

(2) Operation Cost increase by 10% per year

(3) Maintenance Cost increase by 10% per year

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From the accumulating cost of the new system (shown in Table 3.4 the graph are plotted (show in Figure 3.2). We should that at first year the cost is more than the benefit that received from the new system. Because, it use the high initial investment cost and also it was the first year of product, so it can not be reached from the customer. Then the cost of new system are equal to the benefit from the business within 1.04 years which is Breakeven point. After Breakeven point, the company still use a minimum cost for maintenance, but the Benefits that received from the business still more than the maintenance cost.

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Table 3.4. Cumulative Cost Comparison between the Existing System and the Proposed System, Baht.

| Cost Items | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 |
|---|---|---|---|---|---|
| Existing System | | | | | |
| 50 Sales Rep. salary (10% yearly increase) | 250,000 | 275,000 | 302,500 | 332,750 | 366,025 |
| Sales Rep. Operating Cost (10% yearly increase) | 300,000 | 330,000 | 363,000 | 399,300 | 439,230 |
| Other Expenses (10% yearly increase) | 8,500 | 9,350 | 10,285 | 11,314 | 12,445 |
| Total Existing System Cost | 558,500 | 614,350 | 675,785 | 743,364 | 817,700 |
| | | | | | |
| Cumulative Existing System Cost | 558,500 | 1,172,850 | 1,848,635 | 2,591,999 | 3,409,698 |
| | | | | | |
| Proposed System | | | | | |
| 40 Sales Rep. salary (10% yearly increase) | 200,000 | 220,000 | 242,000 | 266,200 | 292,820 |
| Sales Rep. Operating Cost (10% yearly increase) | 240,000 | 264,000 | 290,400 | 319,440 | 351,384 |
| Hardware | 34,900 | 34,900 | 34,900 | 34,900 | 34,900 |
| Software | 12,540 | 12,540 | 12,540 | 12,540 | 12,540 |
| Implementation Cost | 40,000 | - | - | - | - |
| Operating Cost (10% yearly increase) | 50,000 | 55,000 | 60,500 | 66,550 | 73,205 |
| Total Proposed System Cost | 577,440 | 586,440 | 640,340 | 699,630 | 764,849 |
| | | | | | |
| Cumulative Proposed System Cost | 577,440 | 1,163,880 | 1,804,220 | 2,503,850 | 3,268,699 |

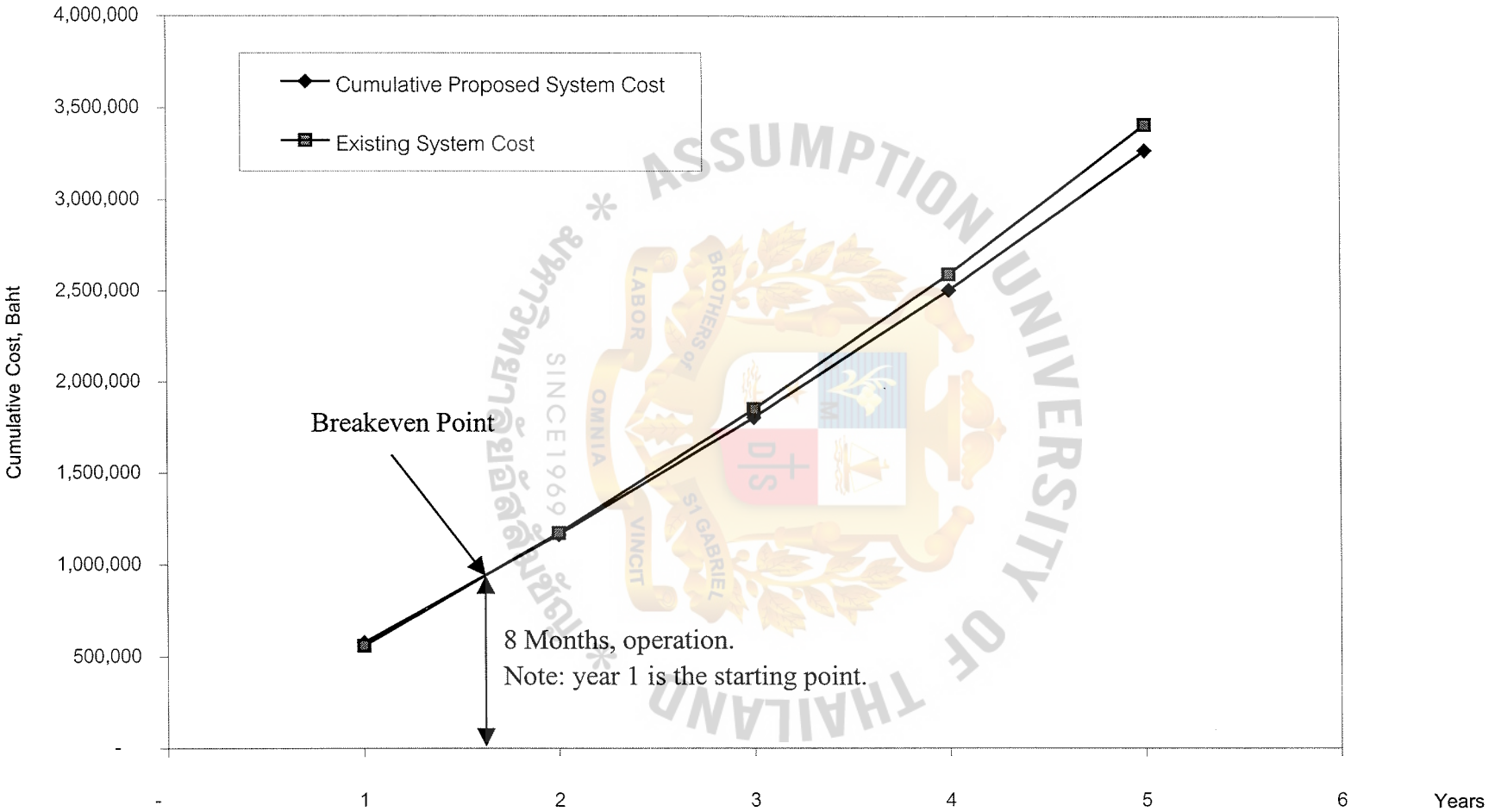


Figure 3.2. Breakeven Analysis between Existing System and Proposed System.

### 3.6 Security and Control

According to the proposed system, we have the security and control system for ensuring the confidentiality, integrity and availability of components of the systems. There are 3 parts of the security and control which affect the direction of work in the system. These are Hardware Controls, Software Controls and Data Controls.

Hardware Controls:

(1) Always keep the doors locked after used and restrict visitor's access to personnel room.

(2) Suitable physical site planning that reduces the risk of natural disaster.

(3) The computer will be kept in an air-conditioned room, which has fire alarm and a thick wall, to protect the damage the case of fire.

Software Controls:

(1) Using ID/Password of personnel and group for access the system and programs. Only the authorized users can access to the resource and the functions of the system that the system permit.

(2) Total virus protection across the enterprise by anti-virus program and use firewall to protection of networks outside attack.

Data Controls:

(1) Control the level of the user's access to the data such as, modify data, delete data, insert a new data and which table that the user can access.

(2) Encrypt on the data that will be transfered among the networks. By this way we can protect the data from unauthorized users.

(3) Backup the data into the second storage device such as tape to prevent the data loss and to make a recovery when data are damaged.

(4) Install UPS to guarantee uninterrupted power supply from electricity problems that can be the cause of data damaged.

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# IV. PROJECT IMPLEMENTATION

Implementation are the activities that make the mew system can be used and support to the used and support to the proposed of organization. These are activities that use be done.

## 4.1 Conversion

The data of the new system should be covered to the new tables. The application will use these tables in the process. Because, we need to protect the database from the risk and we should to prepare data to properly in use that will reduce process time. This data will be stored in the Internet server that has a security by using the Internet firewall and encryption of this data.

## 4.2 Testing

Testing is performed to proved that the new system can be work smoothly and make satisfactory for the user. In order to ensure that the system can be completely performed, we should to test in the following of this item.

Software Testing : Testing in all of individual modules subprogram and program for the instruction to corrects the errors and ensure that the system can work properly when they are integrated into the whole system. Also, we should to test for the user's familiar and satisfy on the web pages design and user interface.

Network Testing : Checking for the connection of network to ensure that the network are available and prevent the interception of the connection from the network problem.

Time Testing : Testing the time to use in process and communication that

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can be accepted. To improve the speed of Working time.

Data Testing : Checking the result from process to prove that the application works completely and conversion of data is correct.

Backup and Restore : Preparing for the routine of backing up the data is damaged. This testing for ensure that the data can be available and protect the loose of data.

### 4.3 Evaluation

After the new system is implemented the final phase is used to give feedback and evaluate the performance from the new system.

We should find the people to test the system and receive a comment from them. While it is being test the problem can occur if the user is not familiar to our products (Telephone Directory) and they can be also confused if they use it for the first time. But, for the people who have used the Telephone Directory and one more familiar with a new products, they can receive a convenience from it.

We also have comments form for the user on Internet. All of these comments that we receive, will be used to improve the web site to have better performance and be more interesting.

In order to evaluate the proposed system we use the processing time of searching and displaying the information of telephone number. These are the environment and factor of processing time.

Master tables of process.

- Business 150,000 Records.
- Residential 2,690,000 Records

Testing computer specification.

- Pentium II 450 MHz
- Internal Modem 56 Kb

The processing time of searching information in each case can be displayed as following:

Table 4.1. Evaluation of Processing Time.

| Table | Key of searching | Processing time (sec.) |
|---|---|---|
| Business | Telephone number<br>Name<br>Name & Surname | 11<br>14<br>12 |
| Residential | Telephone number<br>Name<br>Name & Surname<br>Business Classification | 13<br>16<br>15<br>18 |

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# V. CONCLUSIONS AND RECOMMENDATIONS

## 5.1 Conclusions

The existing system of publishing the Telephone Directory book and CD-ROM, costs operation cost and employee salary. The cost is very high, especially for the price of paper to produce the Telephone Directory book. However, it was the commitment of the company and TOT that the company should to distribute the Telephone Directory books for the Telephone number's owner. Any-way the company would like to has a new product that uses a lower cost and can be the best choice for users. The existing system is also still process on its way by does not change any process.

The proposed system has been introduced in order to meet objectives of the company. The proposed system lowers the cost of production and can use some resources from the existing system. The company can use the same sales representatives to present a new product to the customer. The advantage that the company can receive from the new system is using a lower cost of setup system and increase the revenue by reducing the operation and investment cost. For the user this system is the special service that provides convenience.

In order to complete the implementation, testing was performed to prove the system is free of errors in program. The sales representatives are introduced to be familiar with the system functions so that they can explain how the system is good for the users and customers.

Cost and benefit analysis shows payback period of this proposed system is 1.03 years. The proposed system can offer the efficiency of investment and make the products and company will known by the people who want to search telephone number information on internet.

## 5.2 Recommendations

From the evaluation of this proposed system, we can see that the new system provides the convenience for the user operation. It has many functions and information that the user can use. In the proposed system, the screen and information are created in English language. It will be better if it has both of Thai and English language, because it will be easy for Thai people.

The system should to provide the commercial to the customer on the Internet. It will reduce the cost of operation such as, the transportation and telephone charge. The E-commerce also help for the business competition. The rapid operation will be the advantage for the company.

The promotions should be done by providing free E-mail accounts giving souvenir from the sponsor. These promotions can make the system more popular and will make more profit for the company.

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# APPENDIX A

CONTEXT / DATA FLOW DIAGRAMS OF THE PROPOSED SYSTEM

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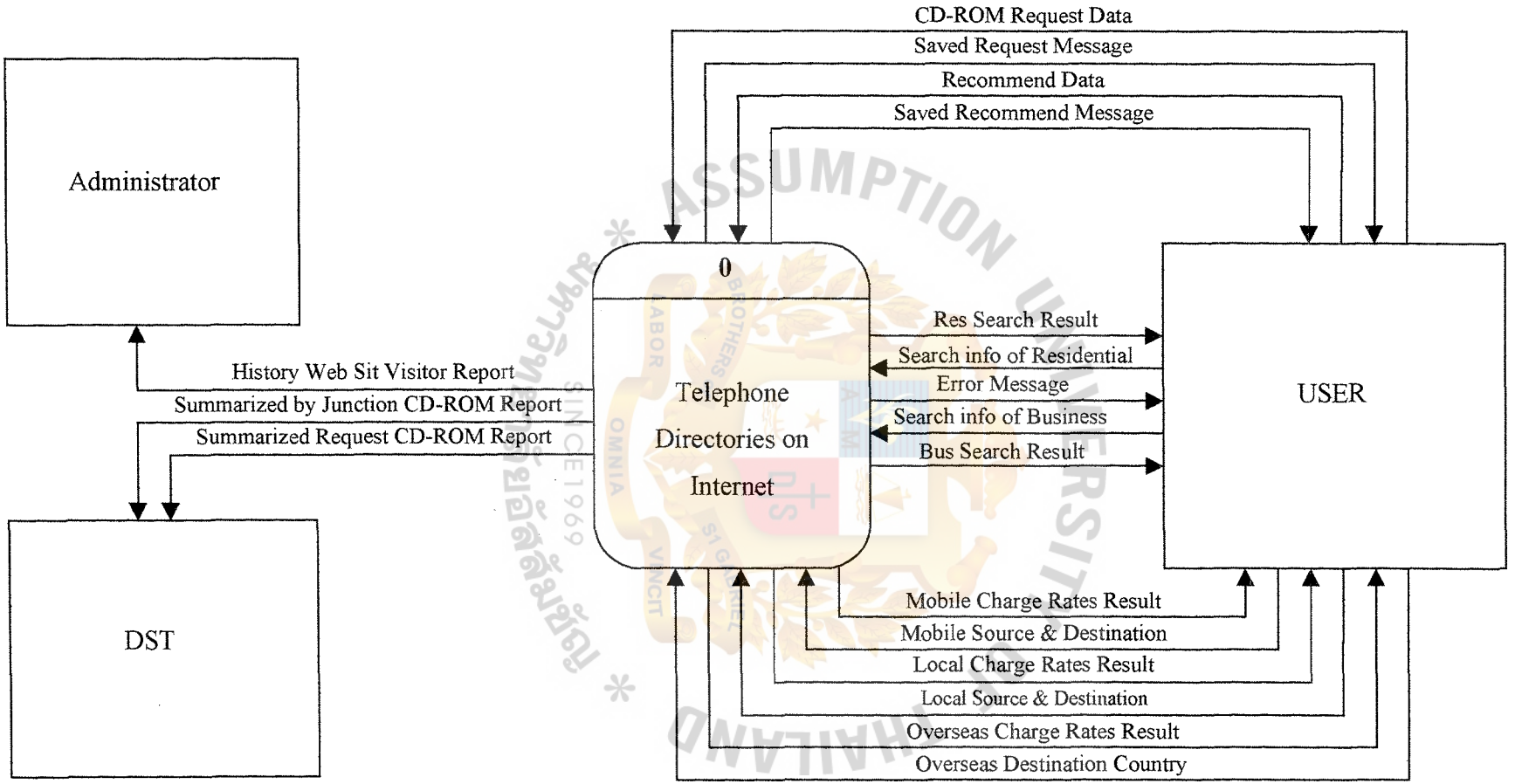


Figure A.1. Context Diagram of the Proposed System.

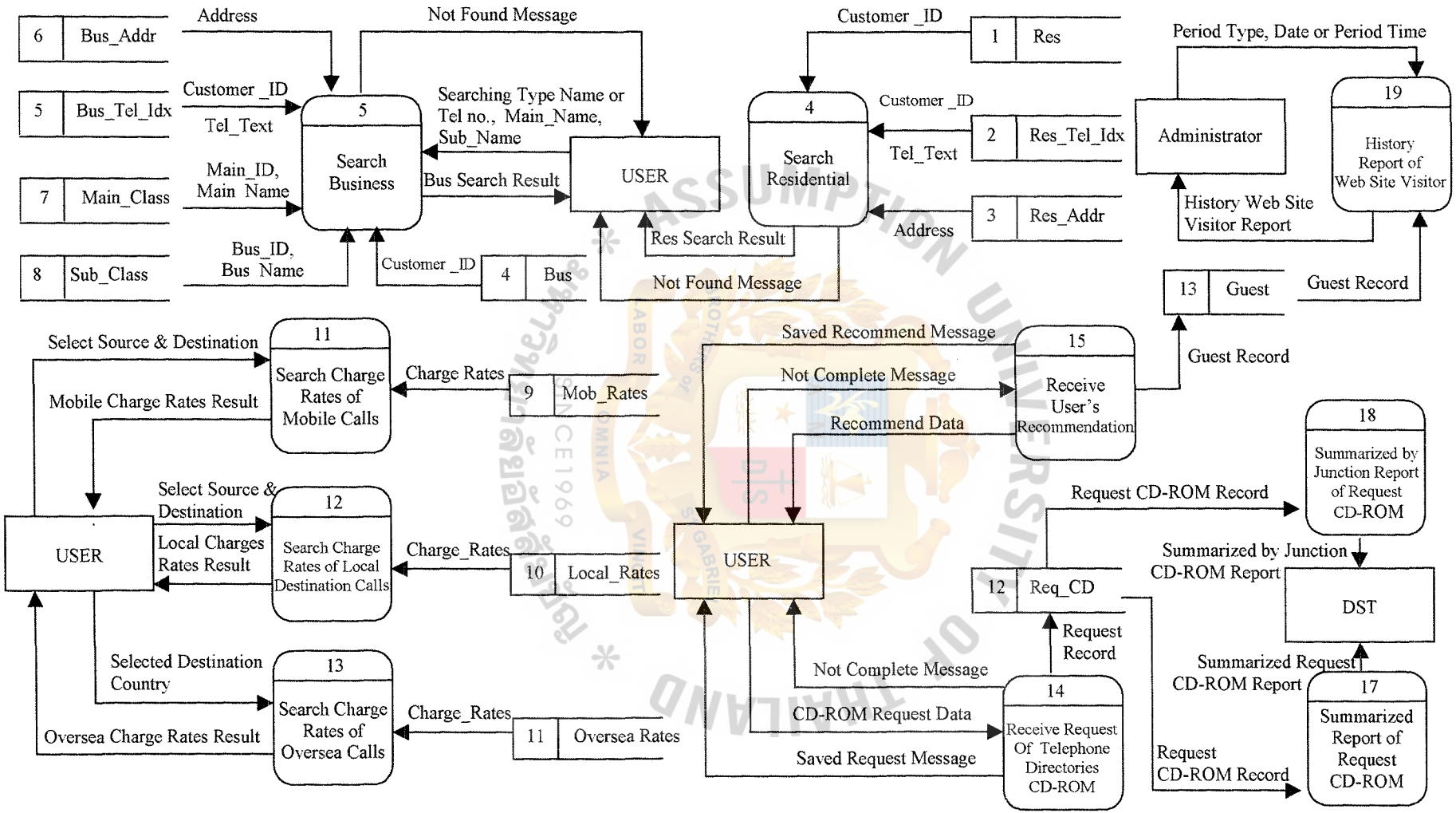


Figure A.2. Data Flow Diagram of the Proposed System (Part 1).

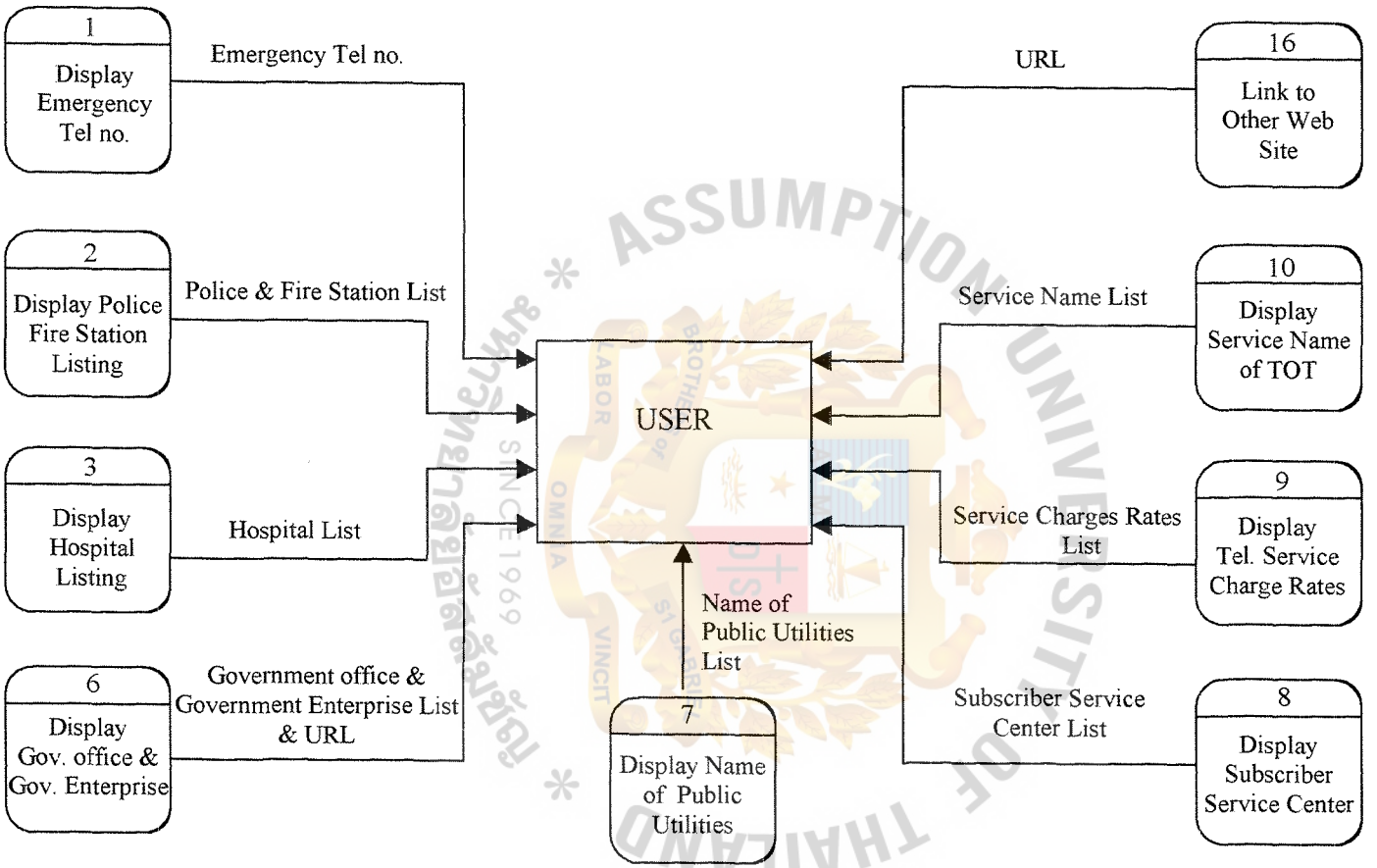


Figure A.3. Data Flow Diagram of the Proposed System (Part 2).

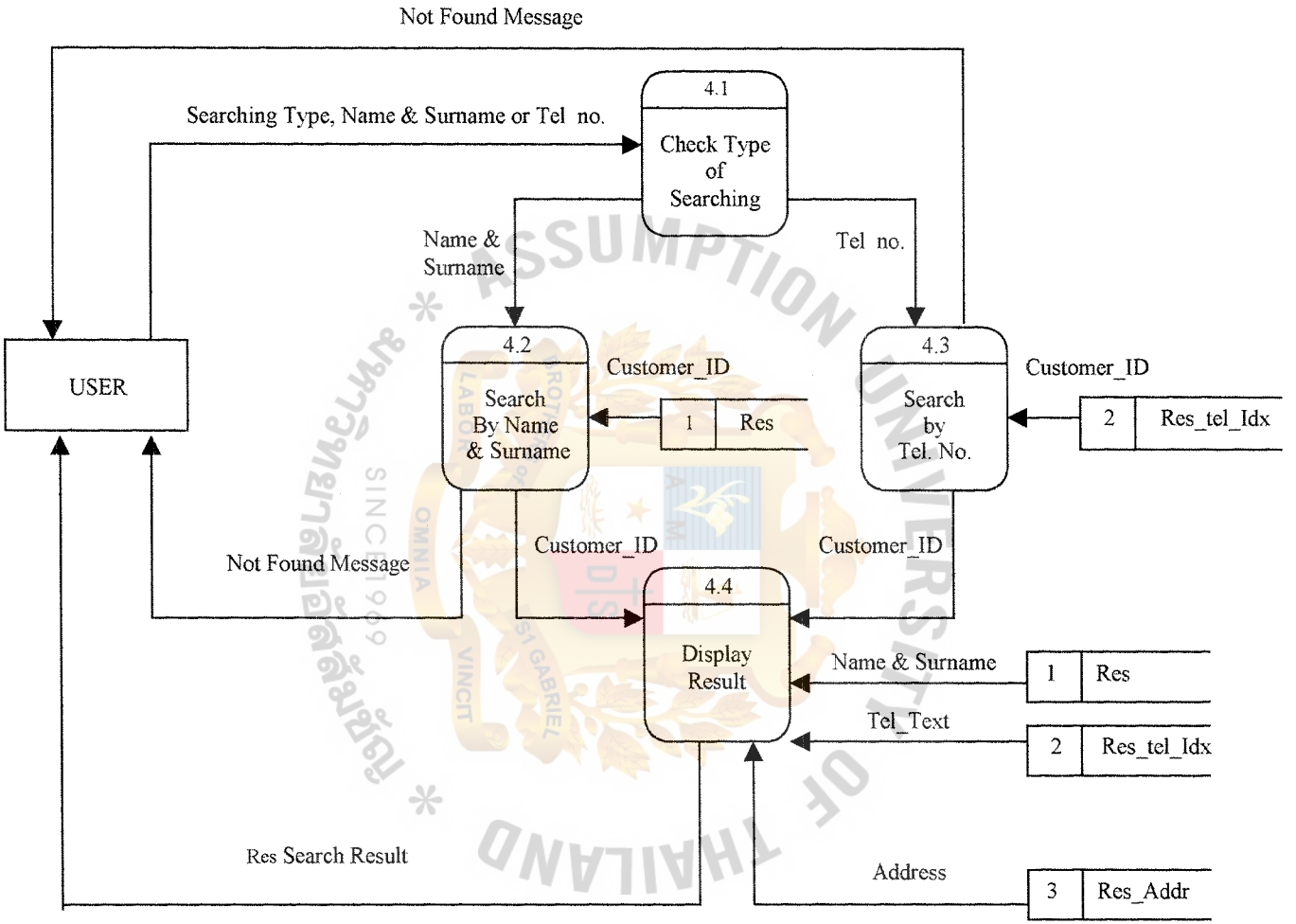


Figure A.4. Data Flow Diagram Level 1: Process 4 (Search Residential).

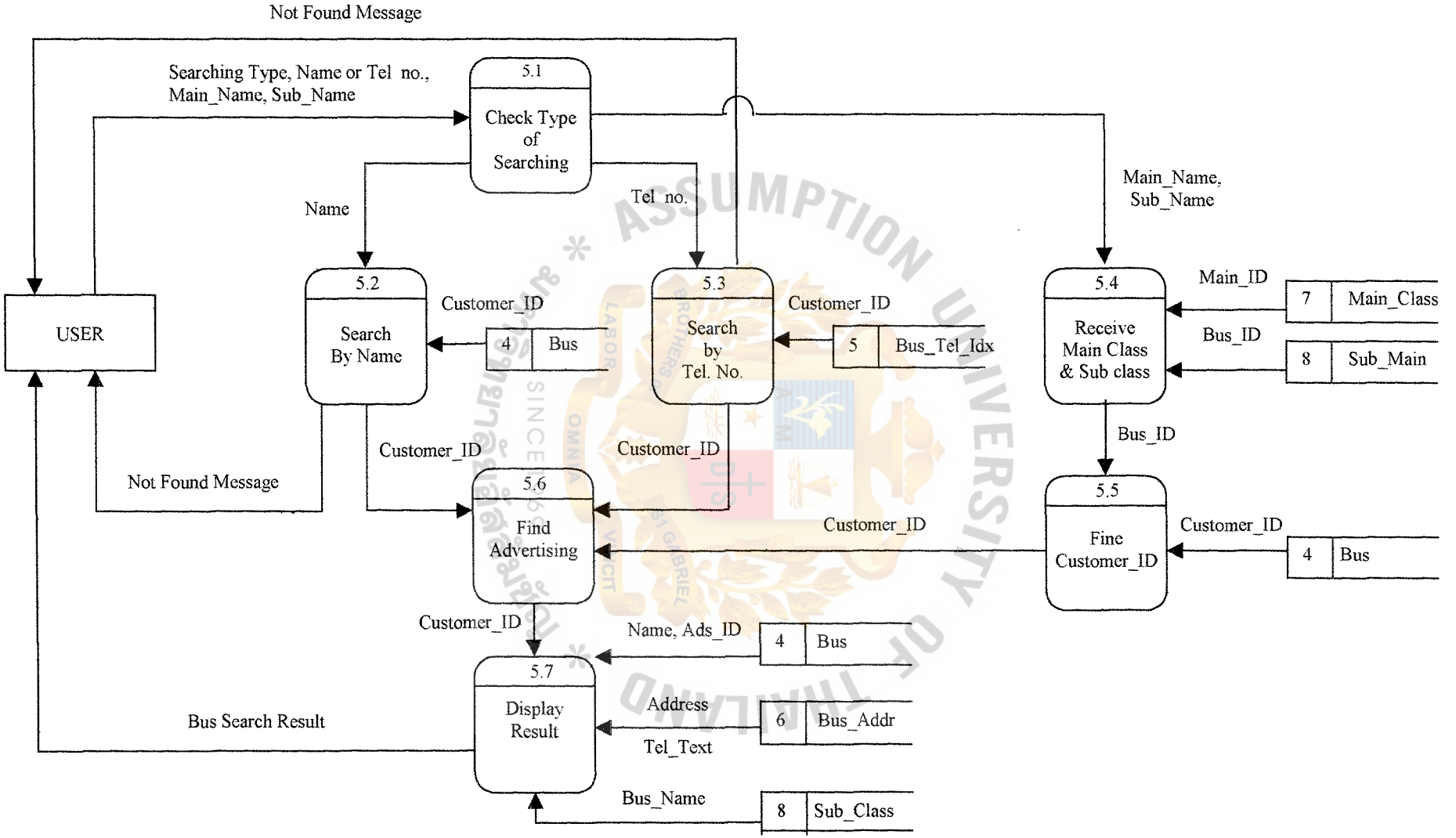


Figure A.5. Data Flow Diagram Level 1: Process 5 (Search Business).

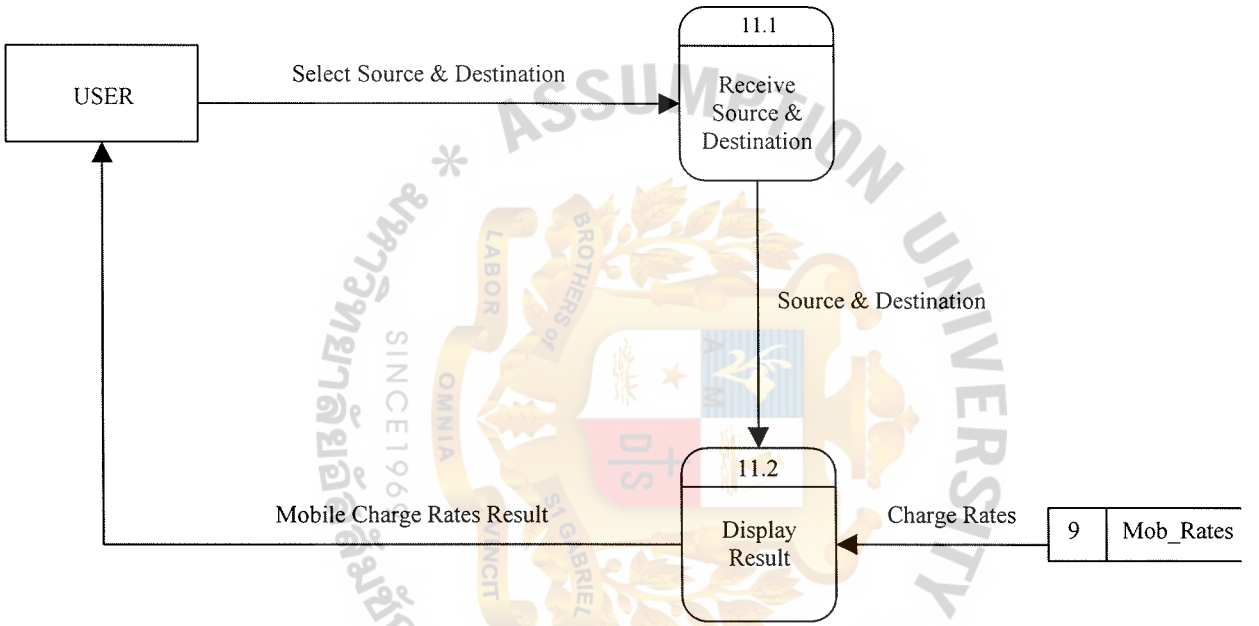


Figure A.6. Data Flow Diagram Level 1: Process 11 (Search Charge Rates of Mobile Calls).

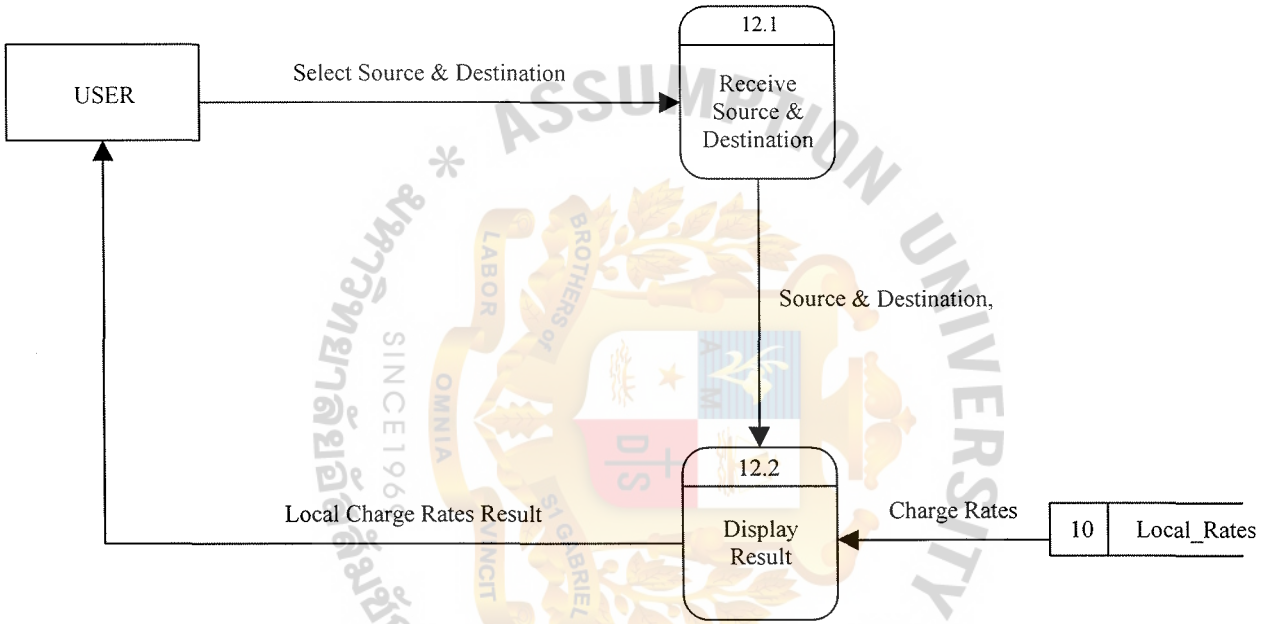


Figure A.7. Data Flow Diagram Level 1: Process 12 (Search Charge Rates of Local Destination Calls).

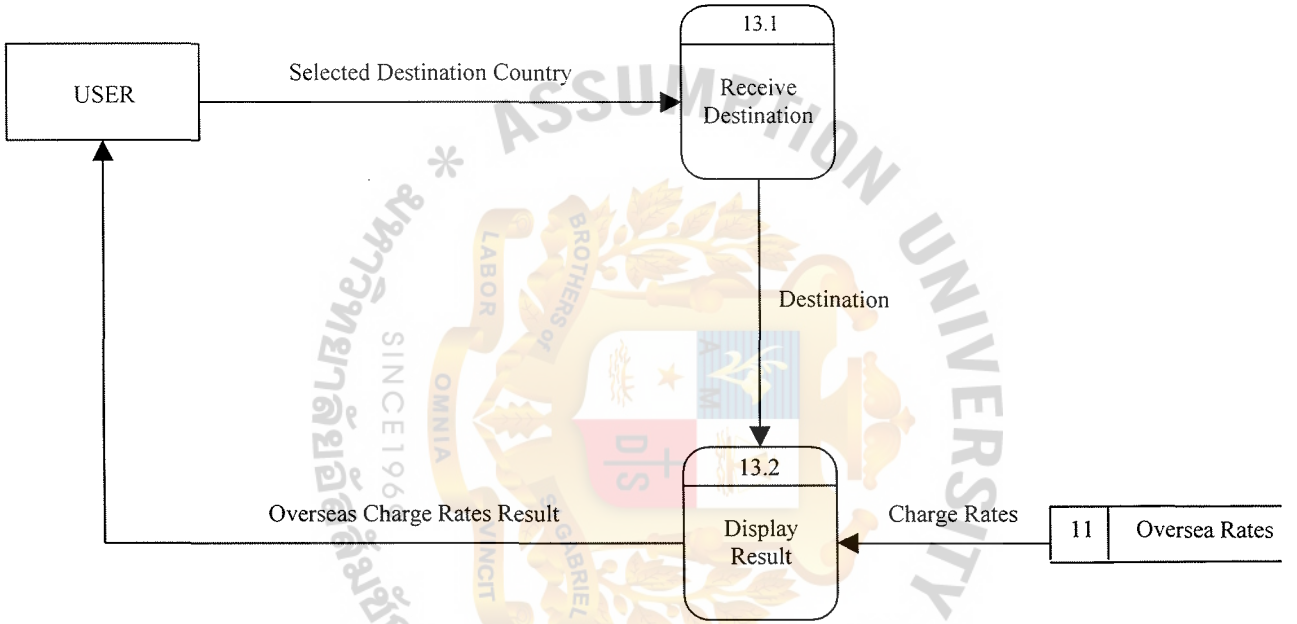


Figure A.8. Data Flow Diagram Level 1: Process 13 (Search Charge Rates of Oversea Calls).

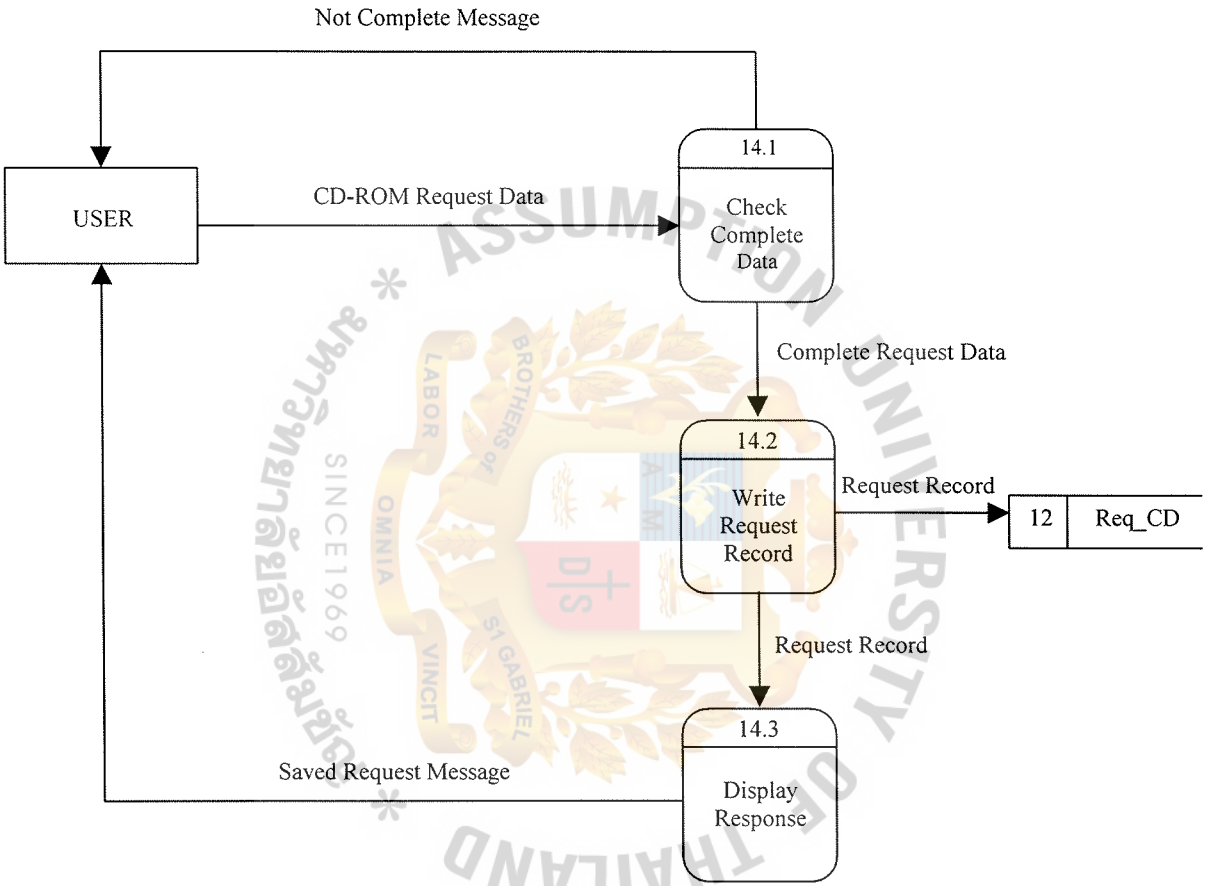


Figure A.9. Data Flow Diagram Level 1: Process 14 (Receive Request of Telephone Directories CD-ROM).

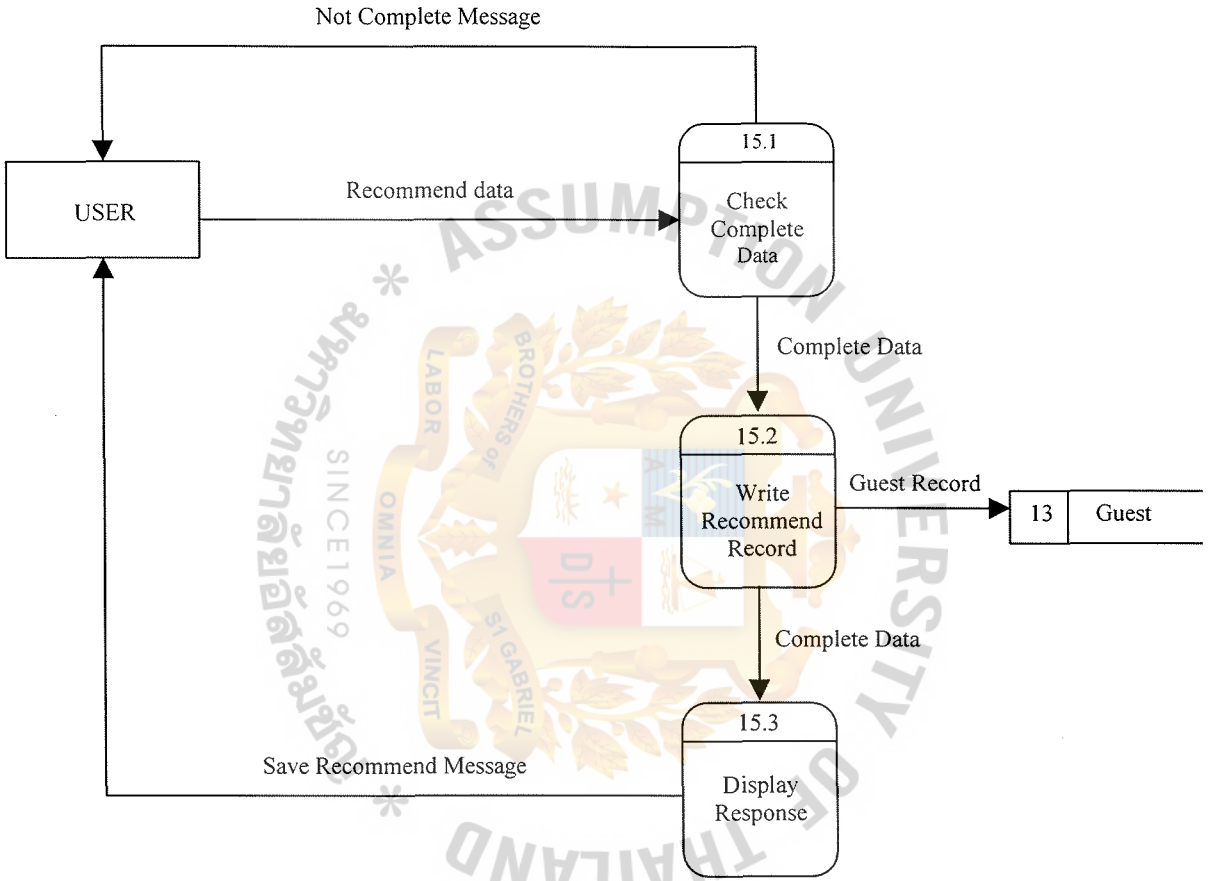


Figure A.10. Data Flow Diagram Level 1: Process 15 (Receive User's Recommendation).

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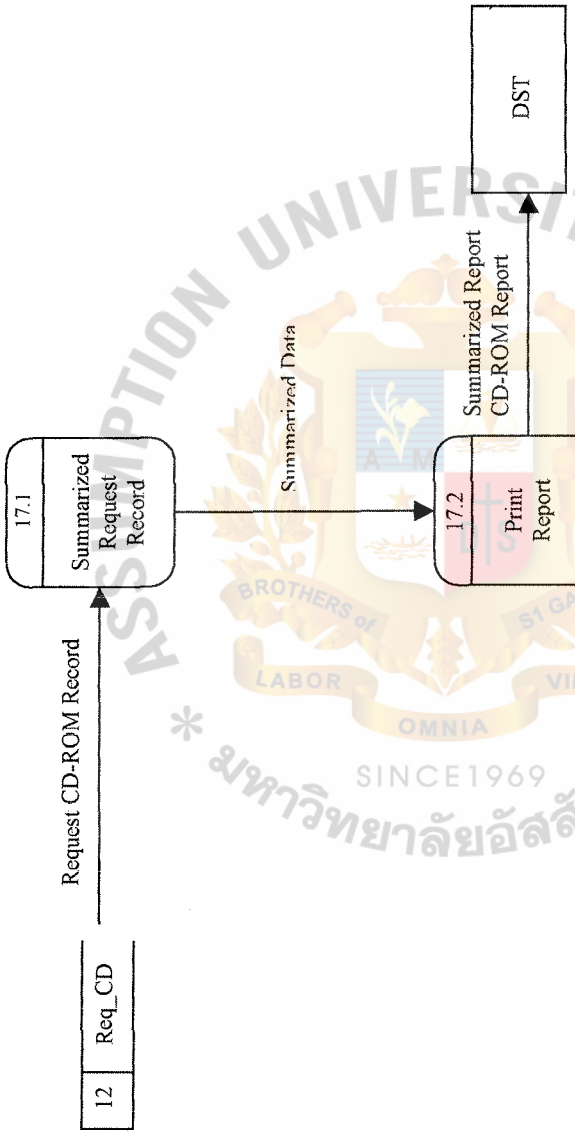


Figure A.11. Data Flow Diagram Level 1: Process 17 (Summarized Report of request CD-ROM).

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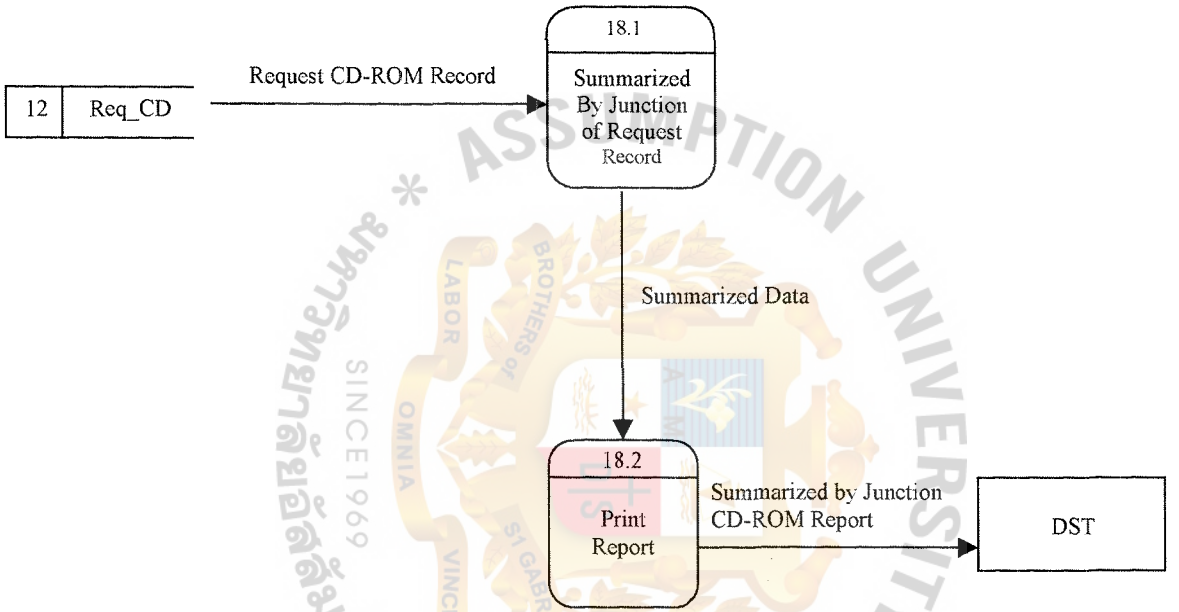


Figure A.12. Data Flow Diagram Level 1: Process 18 (Summarized by Junction Report of request CD-ROM).

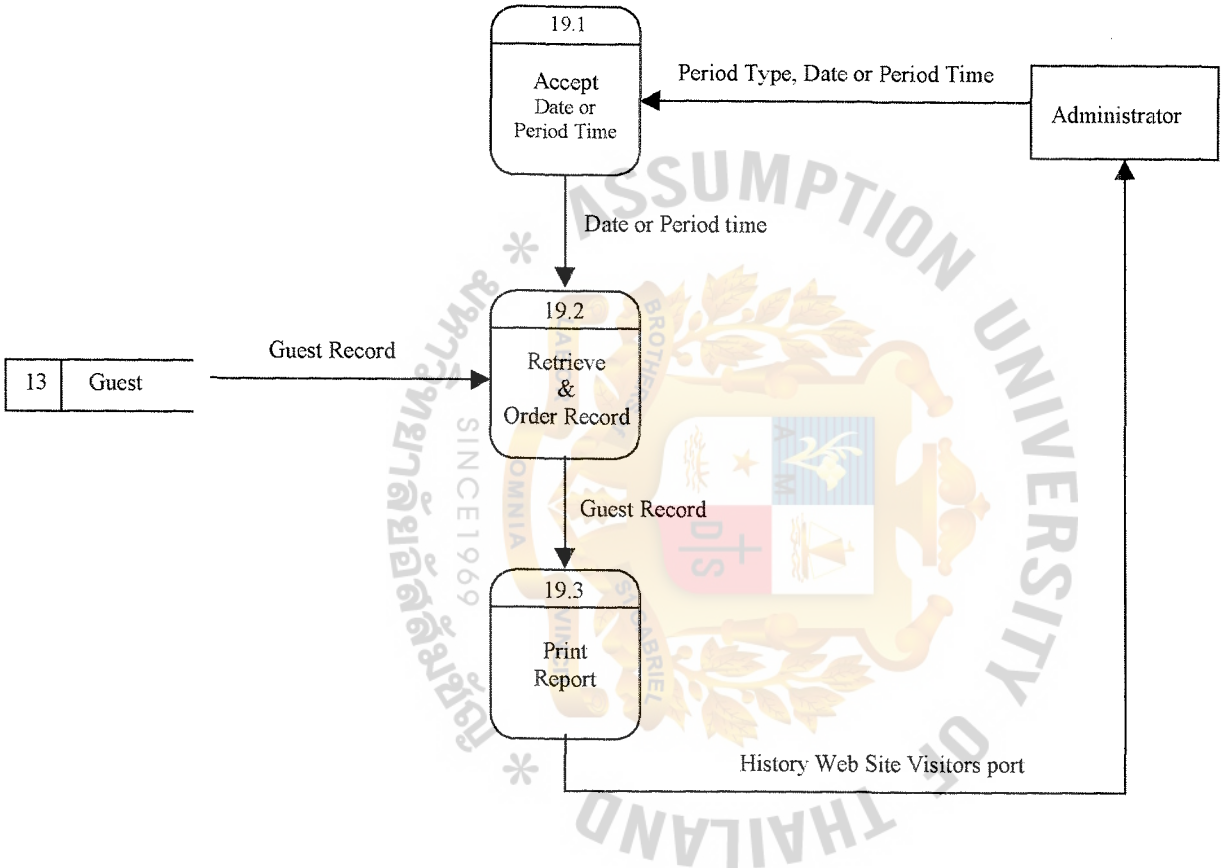


Figure A.13. Data Flow Diagram Level 1: Process 19 (History Report of Web Site Visitors).

# APPENDIX B

DATA DICTIONARY

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## DATA DICTIONARY OF THE PROPOSED SYSTEM

Type: Data Store

1. Res = Customer_ID +
   Name +
   Surname

2. Res_Tel_Idx = Tel_no +
   Customer_ID

3. Res_Addr = Addr_ID +
   Addr_Text +
   Tel_Text +
   Customer_ID

4. Bus = Customer_ID +
   Name +
   Bus_ID +
   URL_Text +
   Ads_ID

5. Bus_Tel_Idx = Tel_no +
   Customer_ID

6. Bus_Addr = Addr_ID +
   Addr_Text +
   Tel_Text +
   Customer_ID

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Type: Reference Table

7. Main_Class = Main_ID +
Main_Name

8. Sub_Class = Bus_ID +
Main_ID +
Bus_Name

9. Mob_Rates = Mob_Source_Name +
Mob_Dest_Name +
Mob_Source_Code +
Mob_Dest_Code +
Mob_Rate

10. Local_Rates = Loc_Source_Name +
Loc_Dest_Name +
Loc_Source_Code +
Loc_Dest_Code +
Loc_Charge_Rate1 +
Loc_Charge_Rate2 +
Loc_Charge_Rate3 +

11. Oversea_Rates = Ovs_Name +
Ovs_Code +
Ovs_Charge_Rate1 +
Ovs_Charge_Rate2 +
Ovs_Charge_Rate3 +

Ovs_Charge_Rate4 +

Ovs_Charge_Rate5 +

Ovs_Charge_Rate6 +

Ovs_Charge_Rate7 +

Ovs_Charge_Rate8 +

Ovs_Charge_Rate9

Type: Transaction Table

12. Req_CD = Tel +

Name +

Surname +

Address +

WP_Type +

YP_Type +

Date

13. Guest = Name +

Surname +

E-mail +

Text +

Date

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# APPENDIX C

PROCESS SPECIFICATION

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## PROCESS SPECIFICATION

Process No. : 4

Process Name : Search Residential

Description : Accept type and value of searching (Name or Telephone Number). Display output if record found. Listing of Telephone Number will be grouped by address.

Input Data Flow : Type of Searching and Name or Telephone Number

Output Data Flow : Residential Accord display on screen

Process 4.1 : Check Type of Searching

BEGIN

ACCEPT Type of Searching & Values

IF Search by Name

THEN DO Process 4.2

ELSE

DO Process 4.3

ENDIF

END

Process 4.2 : Search by Name and Surname

BEGIN

FIND Resident Name and Surname

IF record not found

THEN DISPLAY "record not found"

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ELSE

MOVE Customer_ID TO V_Customer_ID

DO Process 4.4

ENDIF

END

Process 4.3 : Search by Telephone Number

BEGIN

FIND Resident Telephone Number

IF record not found

THEN DISPLAY "record not found"

ELSE

MOVE Customer_ID TO V_customer_ID

DO Process 4.4

ENDIF

END

Process 4.4 : Display Result

BEGIN

SELECT Name, Surname, Address. Tel_Text

FROM Res, Res_Tel, Res_Addr

WHERE Customer_ID = Customer_ID

DISPLAY Name, Surname, Address, Tel_no

END

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Process No. : 5

Process Name : Search Business Telephone Number

Description : Accept type and value of searching (Name, Telephone Number and Business Classification). Display output if record found. Listing will be grouped by Business Classification and Address. If customer has Advertising . It will be showed.

Input Data Flow : Type of Searching and Name or Telephone Number or Main Class & Sub Class

Output Data Flow : Business Record display on Screen

Process 5.1 : Checking Type of Searching

```
BEGIN
    ACCEPT    Type of Searching, Values
    IF        Search by Name
              THEN DO Process 5.2
    ELSE IF
              THEN DO Process 5.3
    ELSE
              DO Process 5.4
    END IF
END
```

Process 5.2 : Search by Name and Surname

```
BEGIN
    FIND      Business Name
```

IF record not found

THEN DISPLAY "record not found"

ELSE

MOVE Customer_ID TO V_Customer_ID

DO Process 5.4

ENDIF

END

Process 5.3 : Search by Telephone Number

BEGIN

FIND Business Telephone Number

IF record not found

THEN DISPLAY "record not found"

ELSE

MOVE Customer_ID TO V_Customer_ID

DO Process 5.6

ENDIF

END

Process 5.4 : Receive Main Class & Sub Class

BEGIN

SELECT Main_Name, Main_ID

FROM Main_Class

DO WHILE not EOF

READ Main_Class

DISPLAY Main_Name

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```
        END DO
        ACCEPT    Main_Name
        GET       Main_ID
        MOVE      Main_ID TO V_Main_ID
        SELECT    Bus_Name, Bus_ID
        FROM      Sub_Class
        WHERE     Main_ID = V_Main_ID
        DO WHILE not      EOF
        ACCEPT    Bus_Name
        GET       Bus_ID
        MOVE      Bus_ID TO V_Bus_ID
    END

Process 5.5          :  Find Customer_ID
    BEGIN
        SELECT    Customer_ID
        FROM      Bus
        WHERE     Bus_ID = V_Bus_ID
        DO WHILE not EOF
            READ      Bus File
            DO    Process 5.6
            DO    Process 5.7
        END DO
    END
```

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Process 5.6 : Find Advertising

BEING

FIND Bus_Ads

IF record not found

THEN MOVE Null to V_Ads_ID

ELSE

MOVE Ads_ID TO V_Ads_ID

END IF

END

Process 5.7 : Display Result

BEING

SELECT Bus_Name, Name, Tel_Text, Address

FROM Bus, Bus_Tel, Bus_Addr, Sub_Class

WHERE Customer_ID = V_Customer_ID and

Bus_ID = V_Bus_ID

DISPLAY Bus_Name, Name, Tel_Text, Address

END

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Process No. : 11

Process Name : Search Charge Rates of Mobiles calls :

Description : Accept source and destination (Province Name) to find out area code and Charge Rates of mobile call.

Input Data Flow : Source and Destination

Output Data Flow : Mobile Charge Rates

Process 11.1 : Receive Source & Destination

```
BEGIN
    ACCEPT    Source_Name
    MOVE      Source_Name TO V_source_Name
    DISPLAY   Source_Code
              Dest_Name
    MOVE      Dest_Name TO V_Dest_Name
    DISPLAY   Dest_Code
END
```

Process 11.2 : Display Result

```
BEGIN
    SELECT    Mob_Rate
    FROM      Mob_Rates
    WHERE     Mob_Source_Name = V_Source_Name AND
              Mob_Dest_Name = V_Dest Name
    DISPLAY   Mob_Rate
END
```

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Process No. : 12

Process Name : Search Charge Rates of Local Long Distance Calls :

Description : Accept source and destination (Province Name) to find out area code and Charge Rates in each period time of local long distance calls.

Input Data Flow : Source and Destination

Output Data Flow : Local Long Distance Charge Rates and detail

Process 12.1 : Receive Source & Destination

```
BEGIN
        ACCEPT    Source_Name
        MOVE      Source_Name TO V_source_Name
        DISPLAY   Source_Code
                  Dest_Name
        MOVE      Dest_Name TO V_Dest_Name
        DISPLAY   Dest_Code
END
```

Process 12.2 : Display Result

```
BEGIN
        SELECT    Loc_Charge_Rate1, Local_Charge_Rate2,
                  Loc_Charge_Rate3
        FROM      Local_Rates
        WHERE     Loc_Source_Name = V_Source_Name AND
                  Loc_Dest_Name = V_Dest_Name
```

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```
        DISPLAY    Loc_Charge_Rate1, Loc_Charge_Rate2,
                   Loc_Charge_Rate3
END
```

Process No. : 13

Process Name : Search Charge Rates of Oversea Calls :

Description : Accept destination (Country Name). That will be called from Thailand to find out Country Code and charge rates in each period time.

Input Data Flow : Destination

Output Data Flow : Overseas Charge Rates and detail

Process 13.1 : Receive Destination

```
BEGIN
        ACCEPT    Dest_Name
        MOVE      Dest_Name TO V_Dest_Name
        DISPLAY   Dest_Code
END
```

Process 13.2 : Display Result

```
BEGIN
        SELECT    Charge_Rate1, Charge_Rate2, Charge_Rate3
        FROM      Oversea_Rates
        WHERE     Ovs_Name = V_Ovs_Name
        DISPLAY   Charge_Rate1, Charge_Rate2, Charge_Rate3
END
```

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Process No. : 14

Process Name : Receive Request of Telephone Directory CD-ROM :

Description : Create the form of request Telephone Directory CD-ROM. By accept telephone number and language of each CD-ROM type (White Pages and Yellow Pages).

Input Data Flow : Request data

Output Data Flow : Req_CD Record

Process 14.1 : Check Complete Data

```
BEGIN
    ACCEPT      Tel_no, WP_Type, YP_Type
    DO WHILE Tel_no not valid
        DISPLAY     "Invalid Tel no."
        ACCEPT      Tel_no
    END DO
END
```

Process 14.2 : Write Request Record

```
BEGIN
    ACCEPT      Date FROM SYSTEM
    WRITE       Req_CD Record
END
```

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Process 14.3 : Display Message

BEGIN

DISPLAY "Record is saved"

RESET SCREEN

END

Process No. : 15

Process Name : Receive User's Recommendation:

Description : Create the form of user's recommendation.

Input Data Flow : Recommend data

Output Data Flow : Guest Record

Process 15.1 : Check Complete Data

```
BEGIN
        ACCEPT      Name, Surname, Text
        DO WHILE  Name, Surname, Text not valid
            DISPLAY     "Not Complete Data"
            ACCEPT      Name, Surname, Text
        END DO
END
```

Process 15.2 : Write Recommend Record

```
BEGIN
        ACCEPT      Date FROM SYSTEM
        WRITE       Guest Record
END
```

Process 15.3 : Display Message

```
BEGIN
        DISPLAY     "Record is saved"
        RESET       SCREEN
END
```

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Process No. : 17

Process Name : Summarize Report of Request CD-ROM:

Description : Print the report of user request CD-ROM. Summarize amount of WP Thai, WP Eng, WP Total, YP Thai, Yp Eng and Yp Total.

Input Data Flow : Req_CD File

Output Data Flow : Summarize Request CD-ROM Report

Process 17.1 : Summarize Request Record

```
BEGIN
    DO WHILE not EOF
        READ    Req_CD File
        SUM  WP Thai, WP Eng, WP Total
             YP Thai, YP Eng, YP Total
    END DO
END
```

Process 17.2 : Print Report

```
BEGIN
    GET    Summarize Date
    PRINT  Summarize Request CD-ROM Report
END
```

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Process No. : 18

Process Name : Summarize by Junction Report of Request CD-ROM

Description : Print the report of user request CD-ROM. By group into the junction of telephone number "(002-XXX)". For each junction sum WP Thai, WP Eng, YP Thai, YP Eng.

Input Data Flow : YP Eng

Output Data Flow : Summarize by Junction Report of Request CD-ROM

Process 18.1 : Summarize By Junction of Request Record

```
BEGIN
    DO WHILE not EOF
        READ    Req_CD File
        SUM WP Thai, WP Eng, YP Thai, YP Eng
        GROUP BY Junction
    END DO
END
```

Process 18.2 : Print Report

```
BEGIN
    GET   Summarize Record
    PRINT Summarize by Junction CD-ROM Request
END
```

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Process No. : 19

Process Name : Historical Report of Web Site Visitor

Description : Print the report of Web Site visitor recommendation (Guest Book) by accept a period time of data to print.

Input Data Flow : Guest File

Output Data Flow : Historical Report of Web Site Visitor

Process 19.1 : Accept Date or Period Time

```
BEGIN
    ACCEPT      Period Type, Date or Period Time
    DO WHILE Date not Valid
        DISPLAY     "Date Invalid"
        ACCEPT      Date or Period Time
    END DO
END
```

Process 19.2 : Retrieve & Order Record

```
BEGIN
    CASE OF 'EXACT'
        SELECT * FROM Guest
        WHERE       DATE = DATE_Values
        ORDER BY NAME
    CASE OF 'PERIOD'
        SELECT *
        FROM        Guest
```

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```
                WHERE       Date  >=  Date_start AND
                                  Date <=   Date_stop
                ORDER BY DATE, NAME
            END CASE
        END
```

Process 19.3 : Print Report

```
        BEGIN
            GET    Retrieved Record
            PRINT Historical Report of Web Site Visitor
        END
```

# APPENDIX D

STRUCTURE CHART

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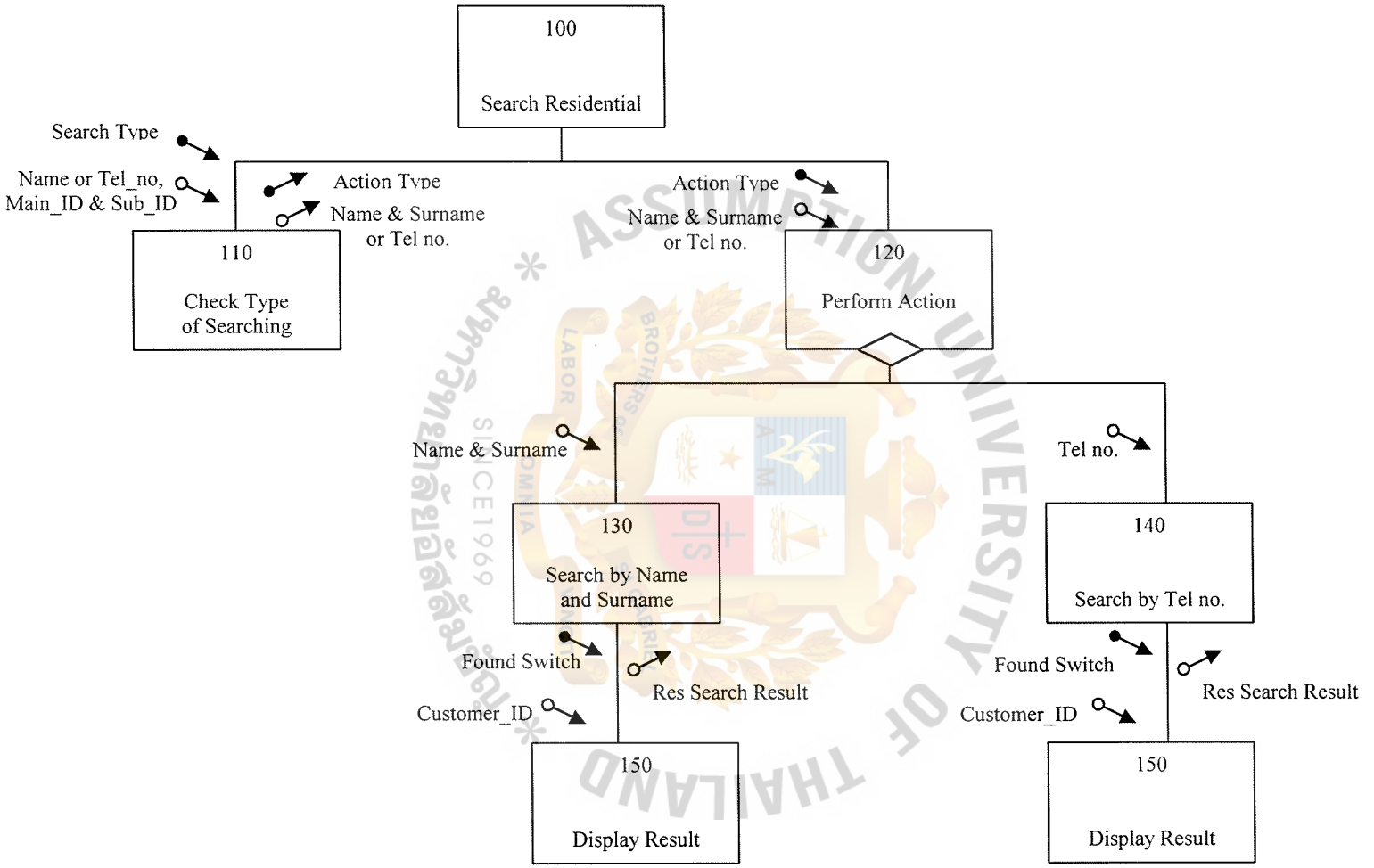


Figure D.1. Structure Chart for Search Resident.

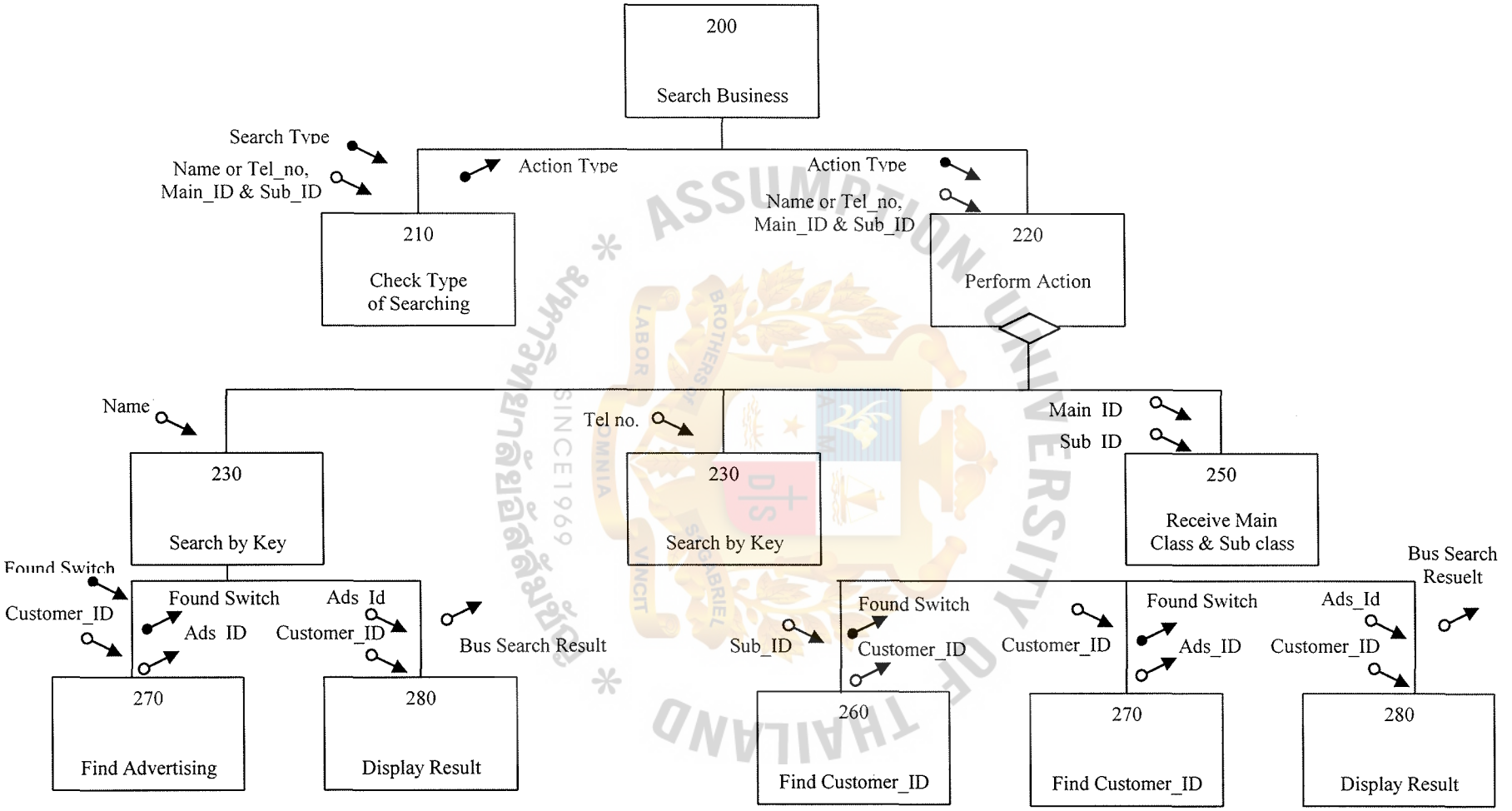


Figure D.2. Structure Chart for Business Search.

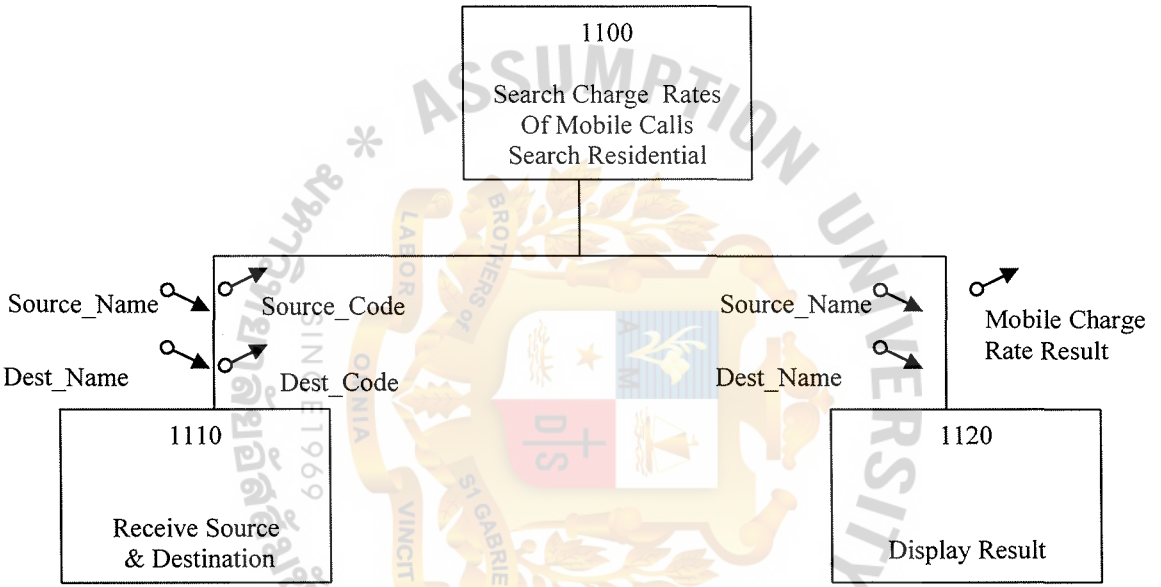


Figure D.3. Structure Chart for Search Charge Rates of Mobile Calls.

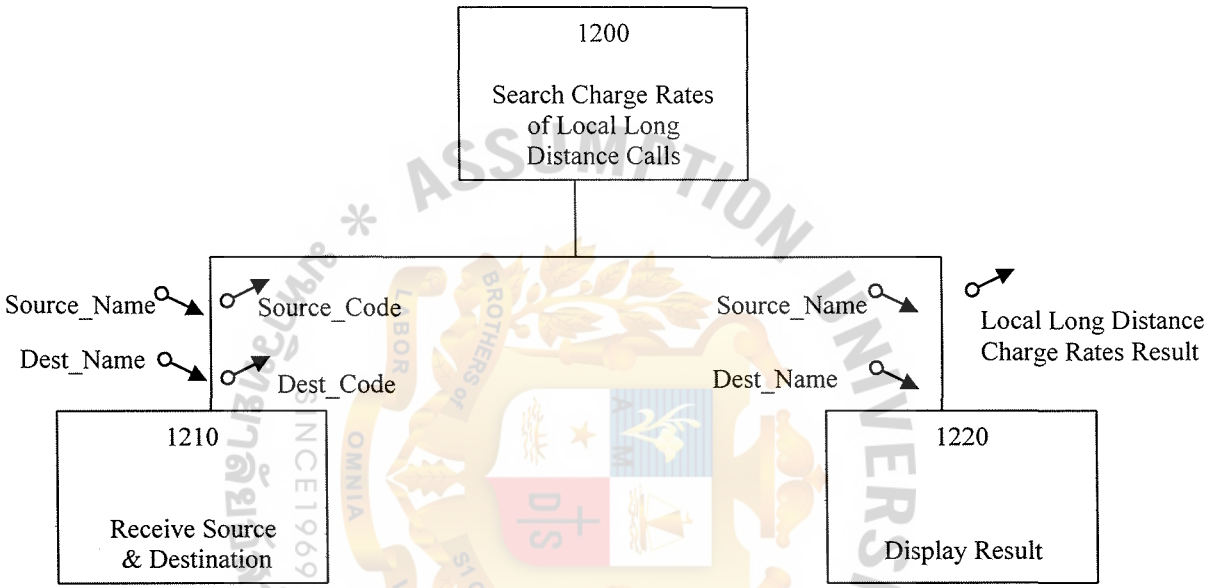


Figure D.4. Structure Chart for Search Charge Rates of Local Long Distance Calls.

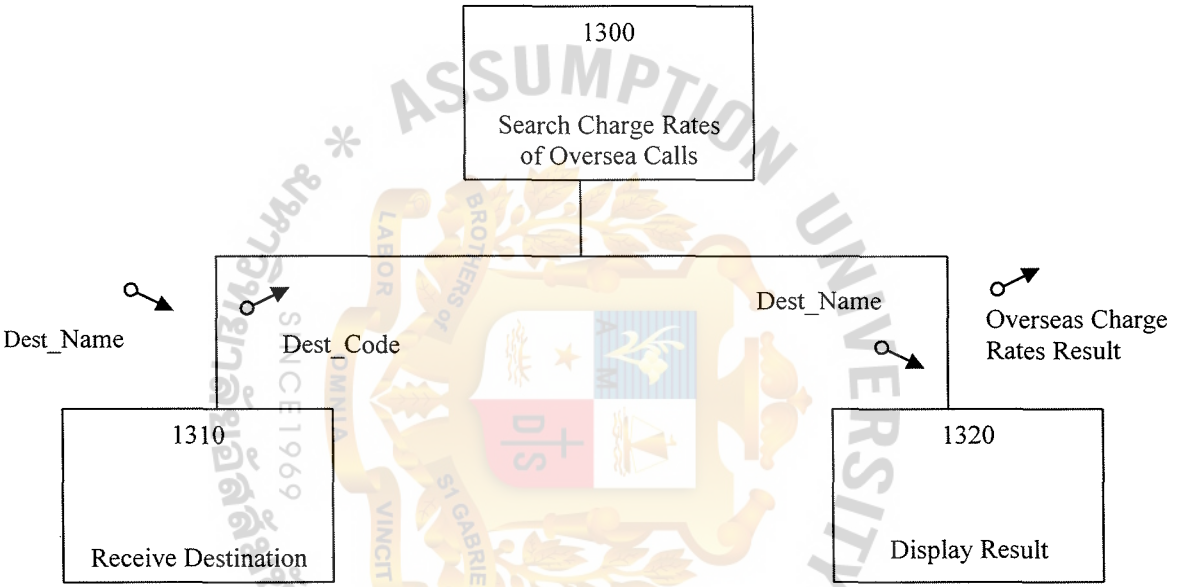


Figure D.5. Structure Chart for Search Charge Rates of Overseas Calls.

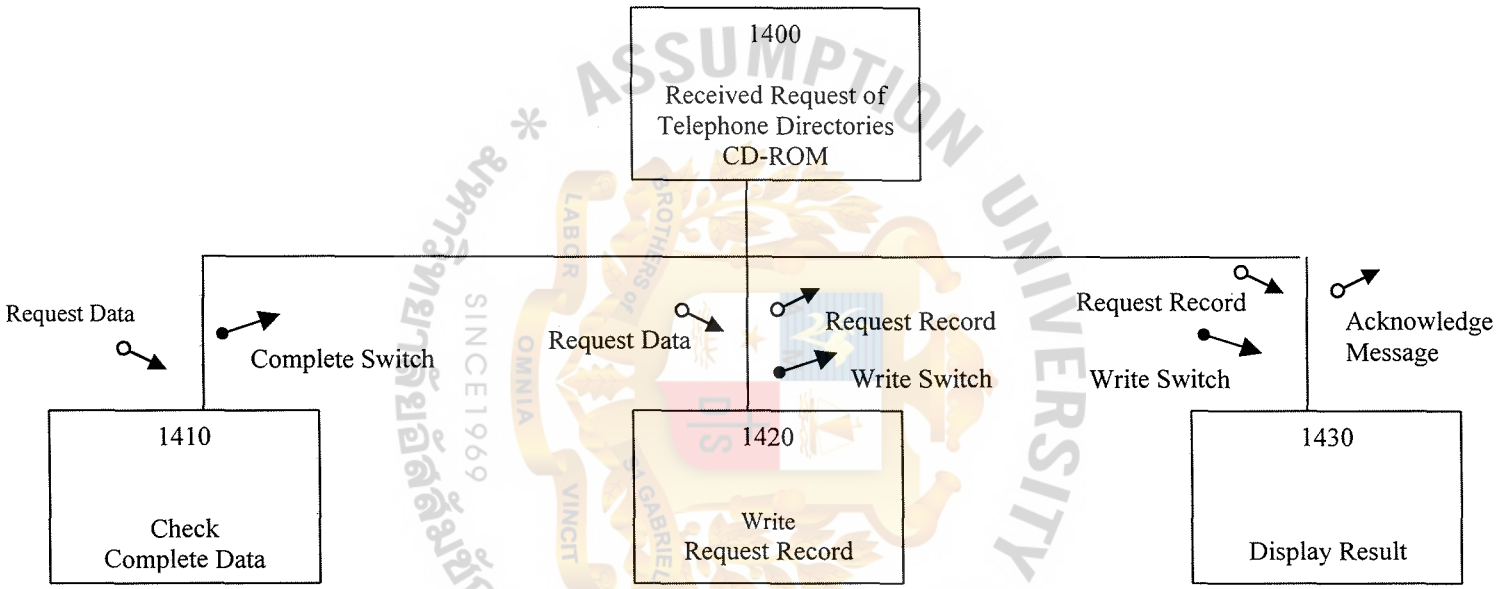


Figure D.6. Structure Chart for Received Request of Telephone Directories CD-ROM.

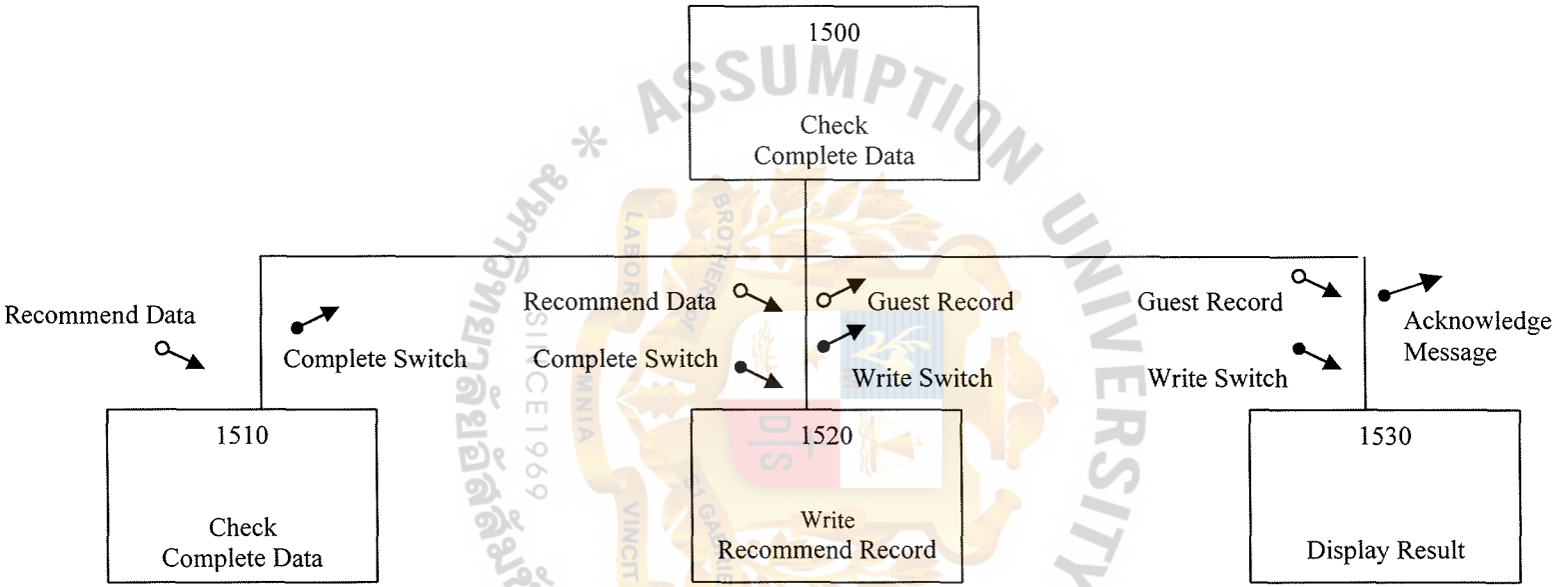


Figure D.7. Structure Chart for Received User's Recommendation.

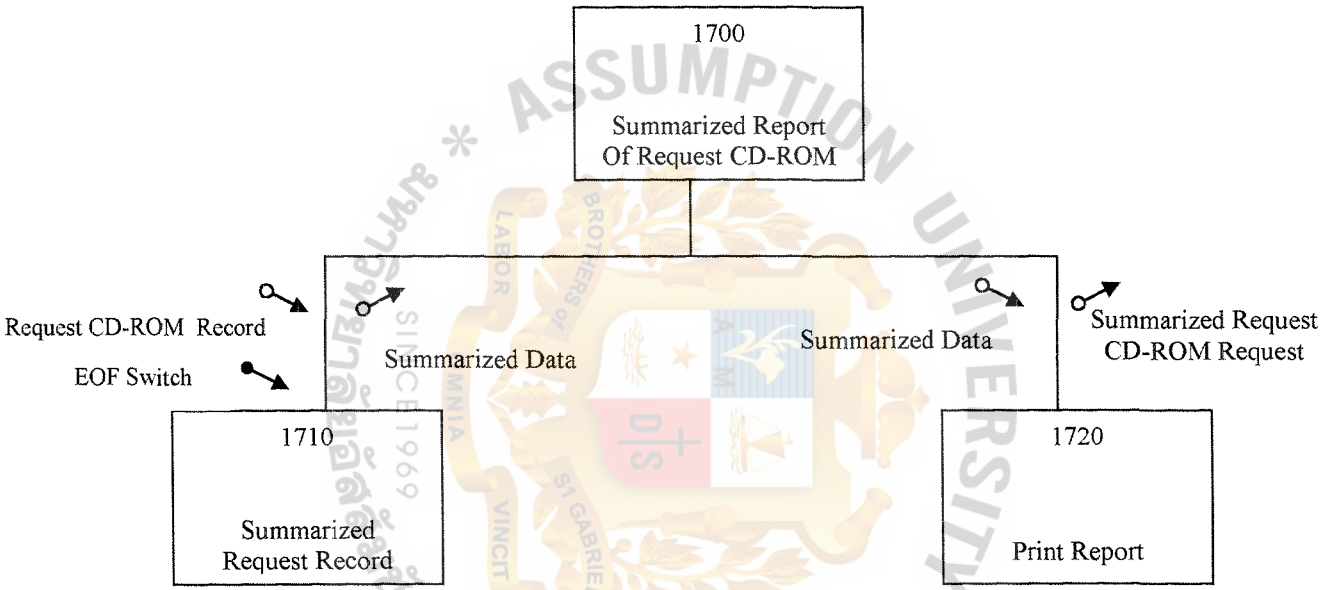


Figure D.8. Structure for Summarized Report of Request CD-ROM.

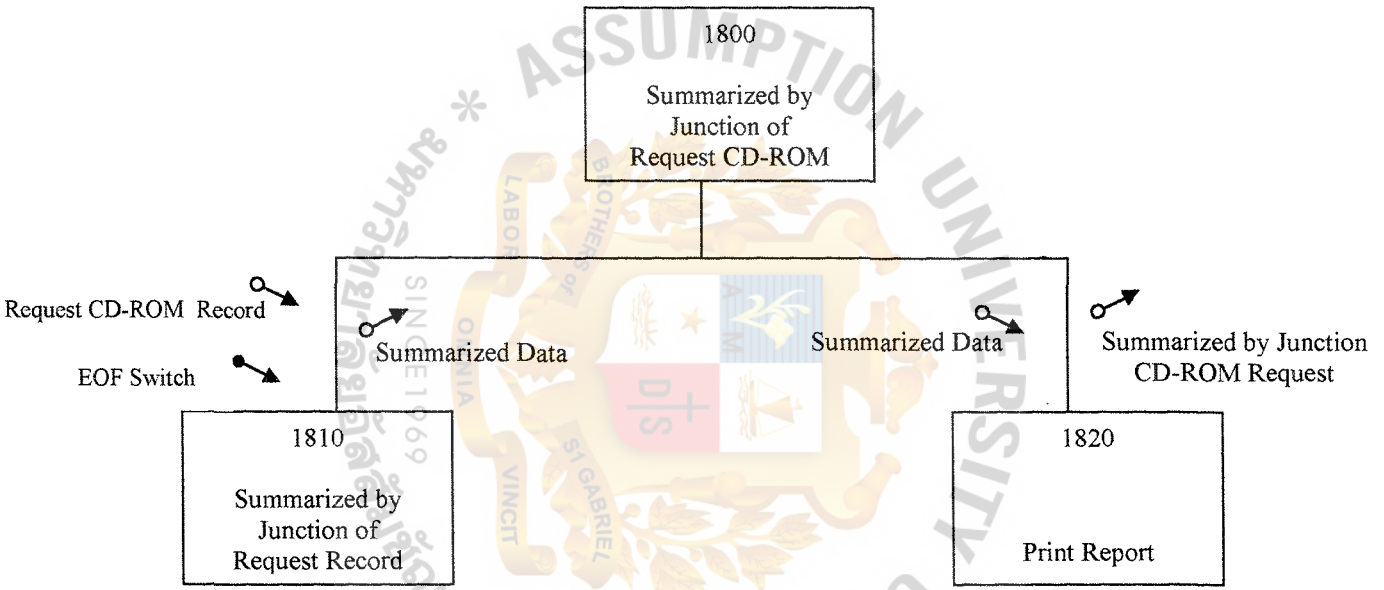


Figure D.9. Structure for Summarized by Junction Report of Request CD-ROM.

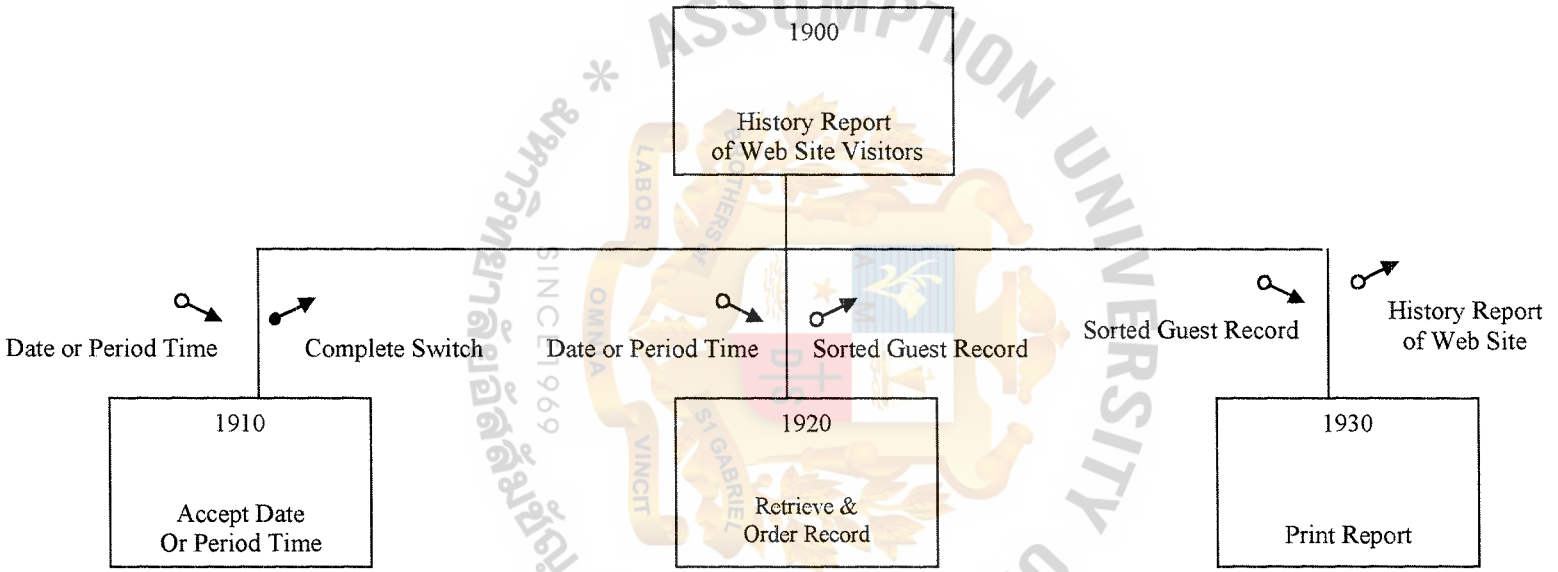


Figure D.10. Structure for History Report of Web Site Visitors.

# APPENDIX E

RELATIONSHIP DIAGRAM

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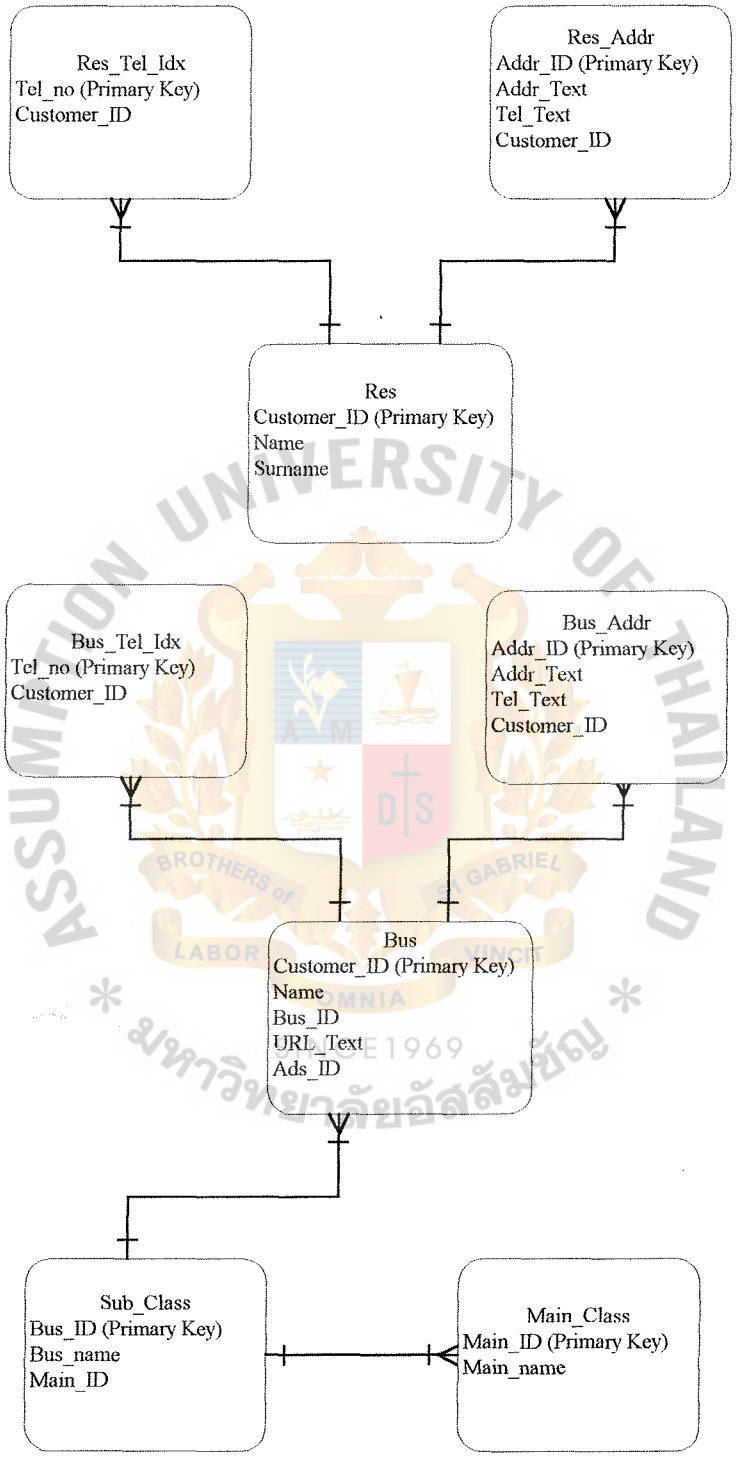


Figure E.1. Relationship Diagram.

# APPENDIX F

FILE LAYOUT

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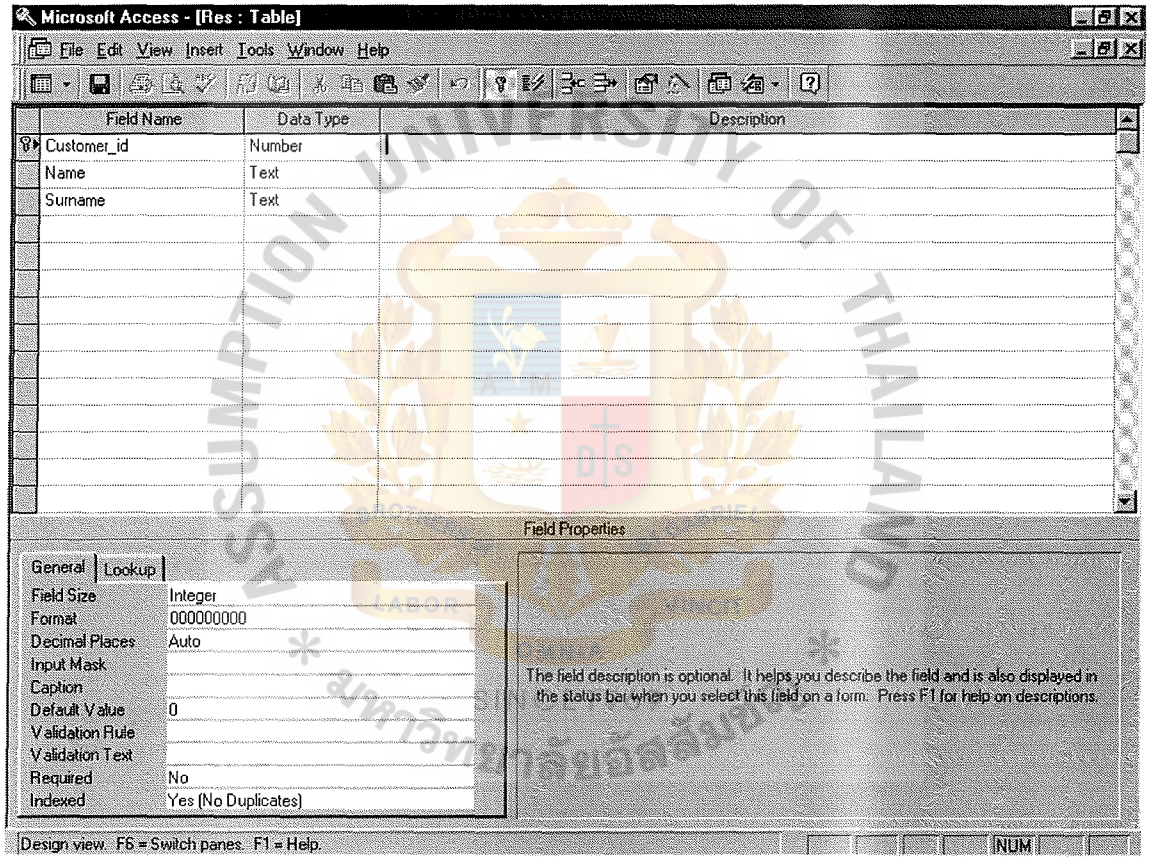


Figure F.1. Residential File.

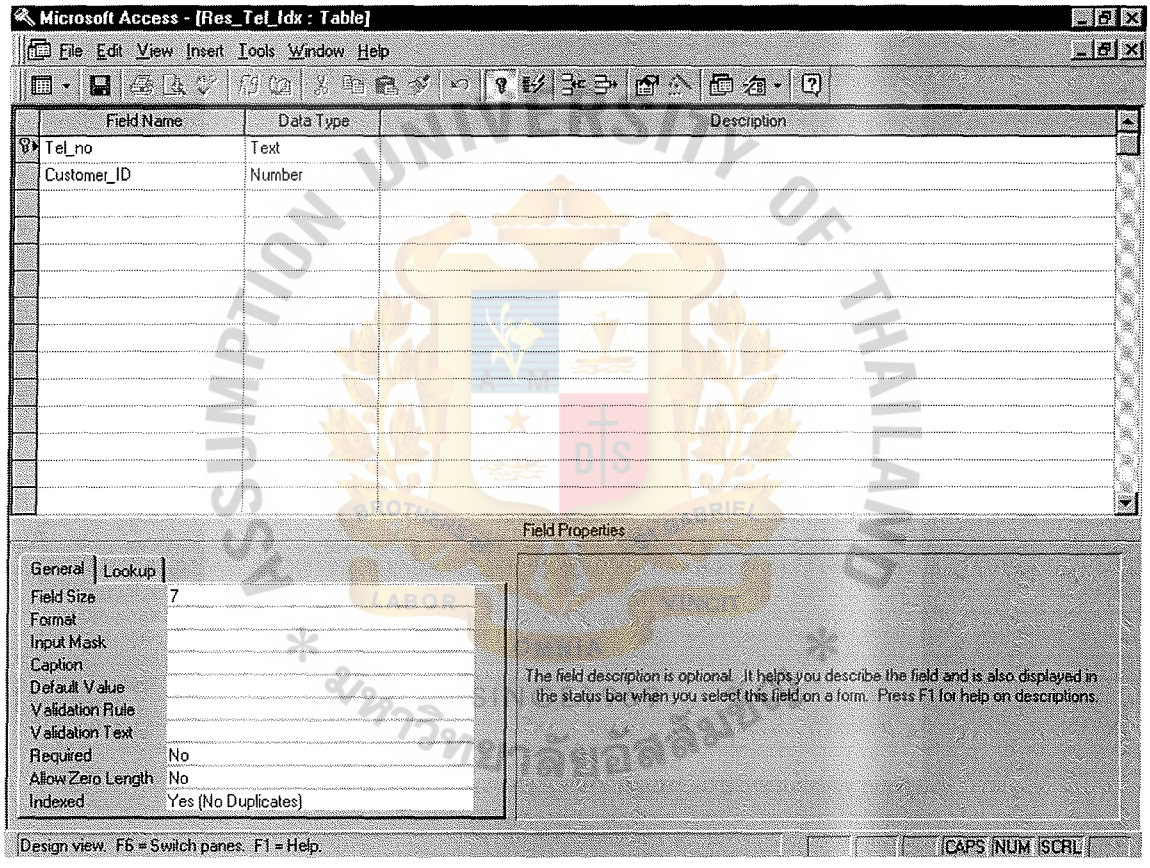


Figure F.2. Residential Telephone Number File.

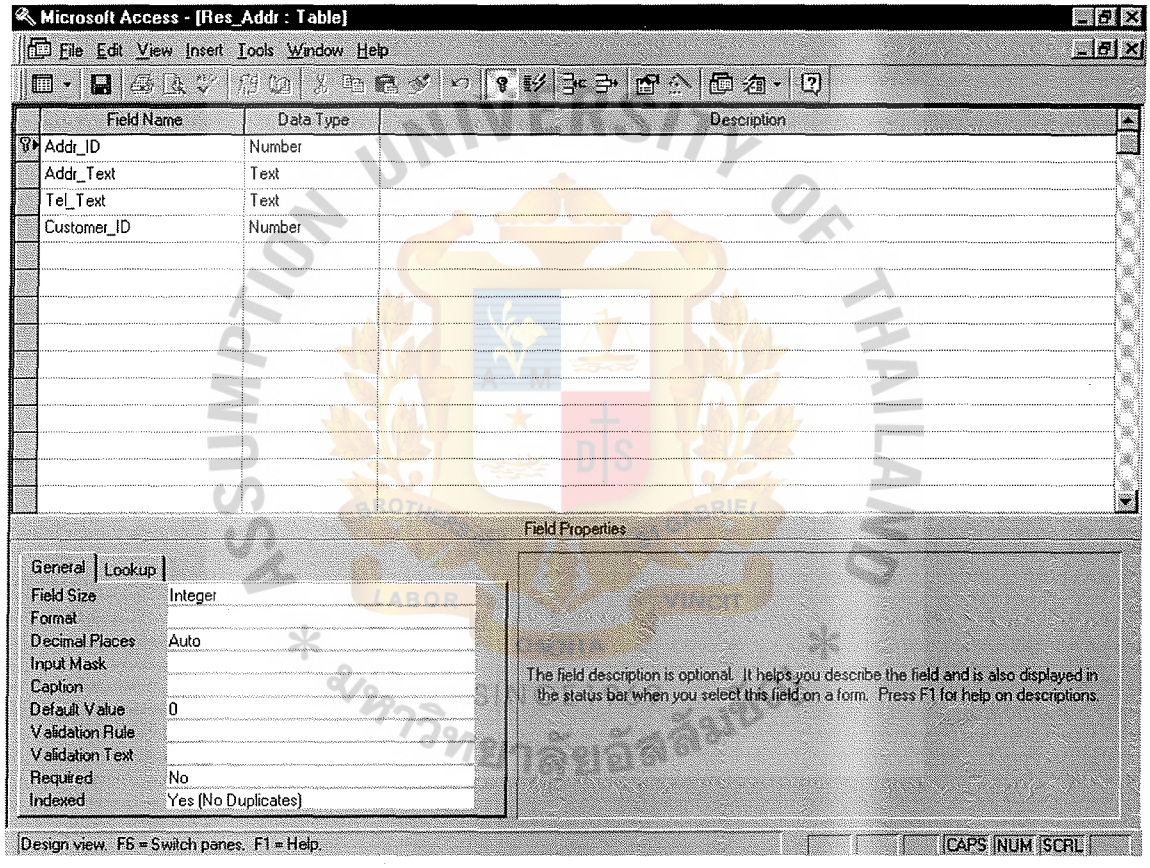


Figure F.3. Residential Address File.

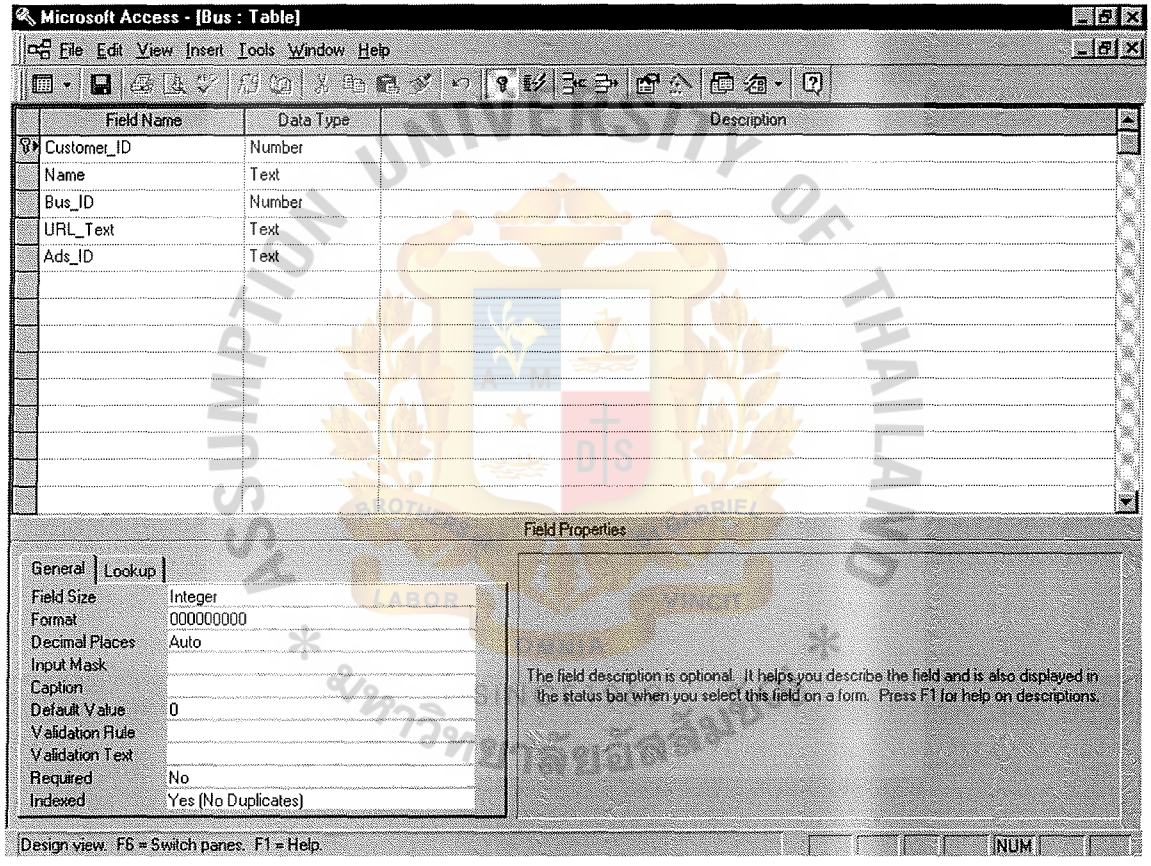


Figure F.4. Business File.

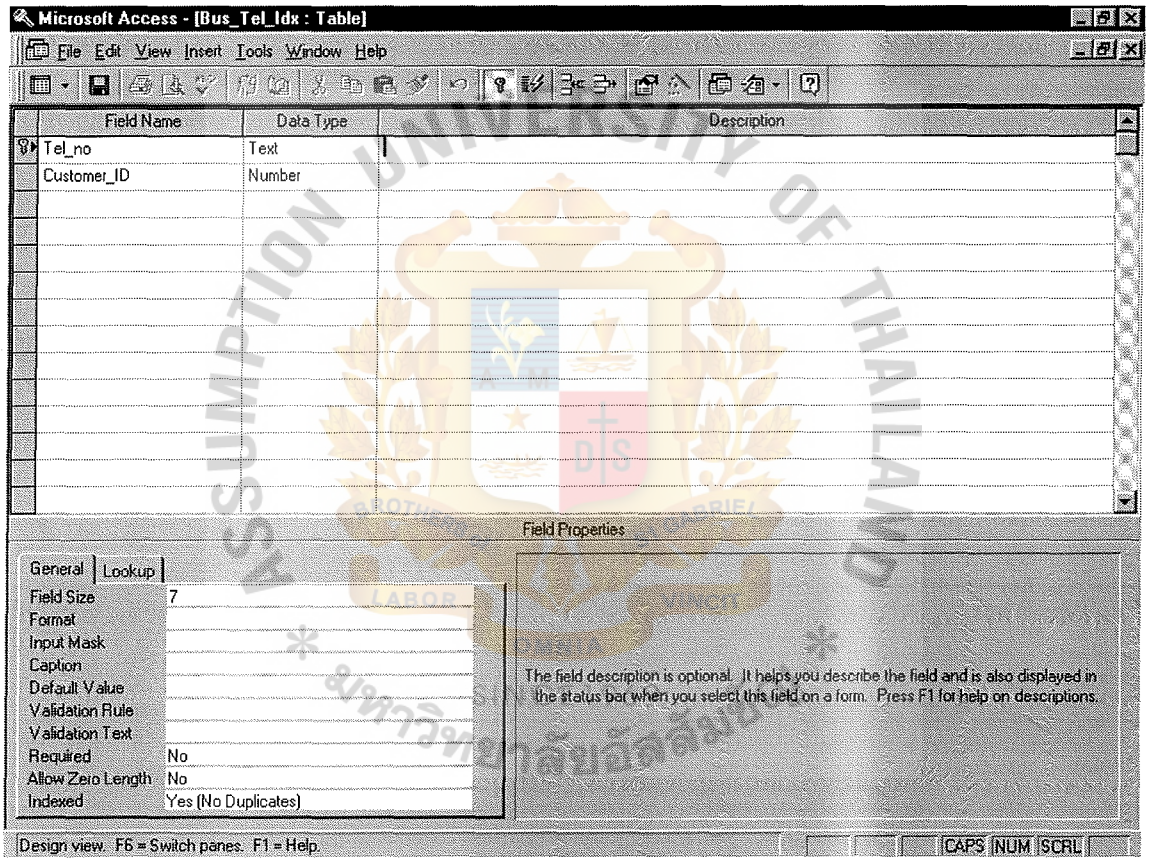


Figure F.5. Business Telephone Number File.

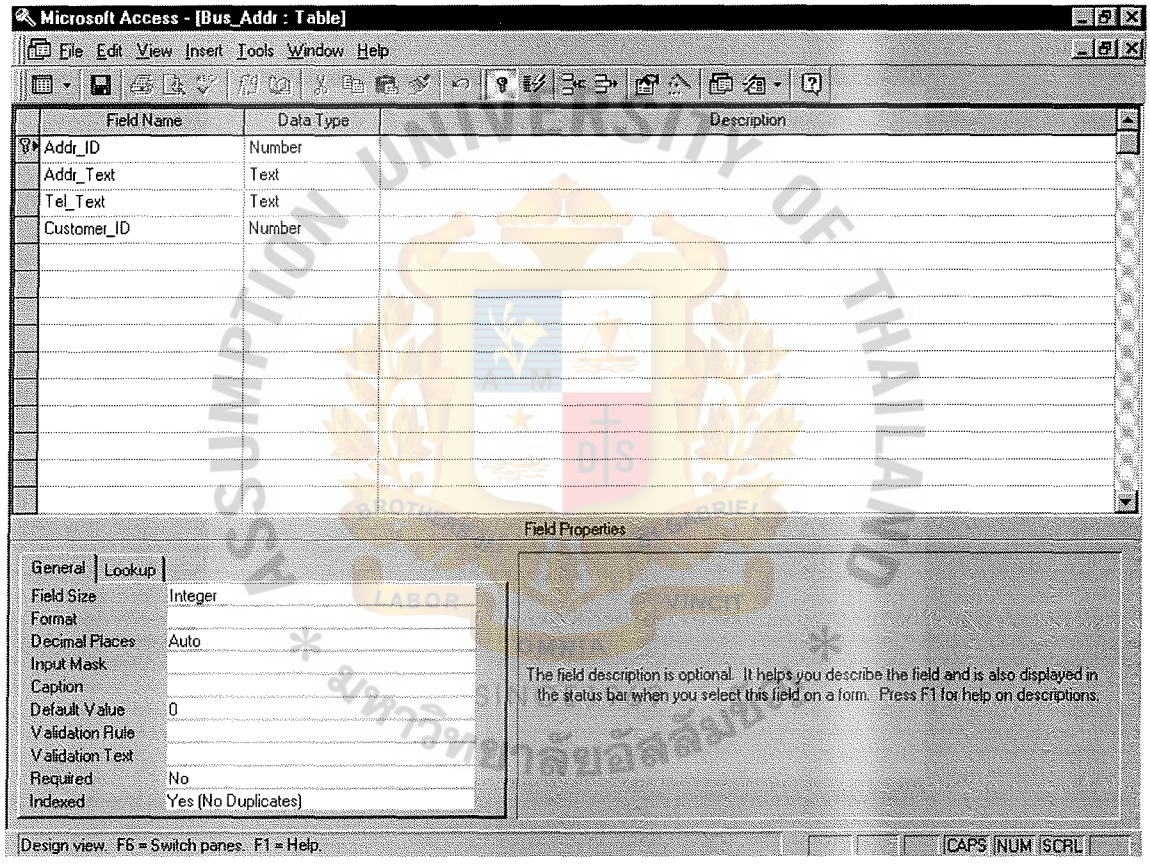


Figure F.6. Business Address File.

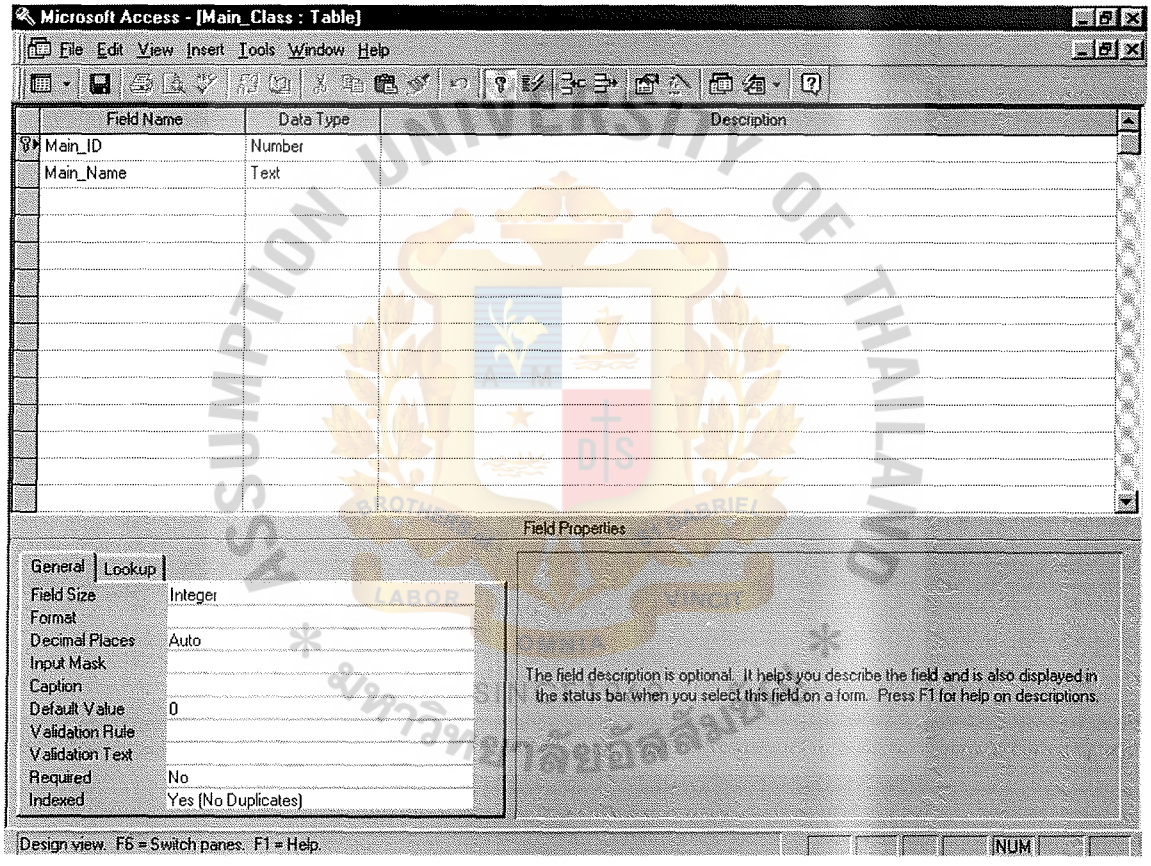


Figure F.7. Main Classification Business File.

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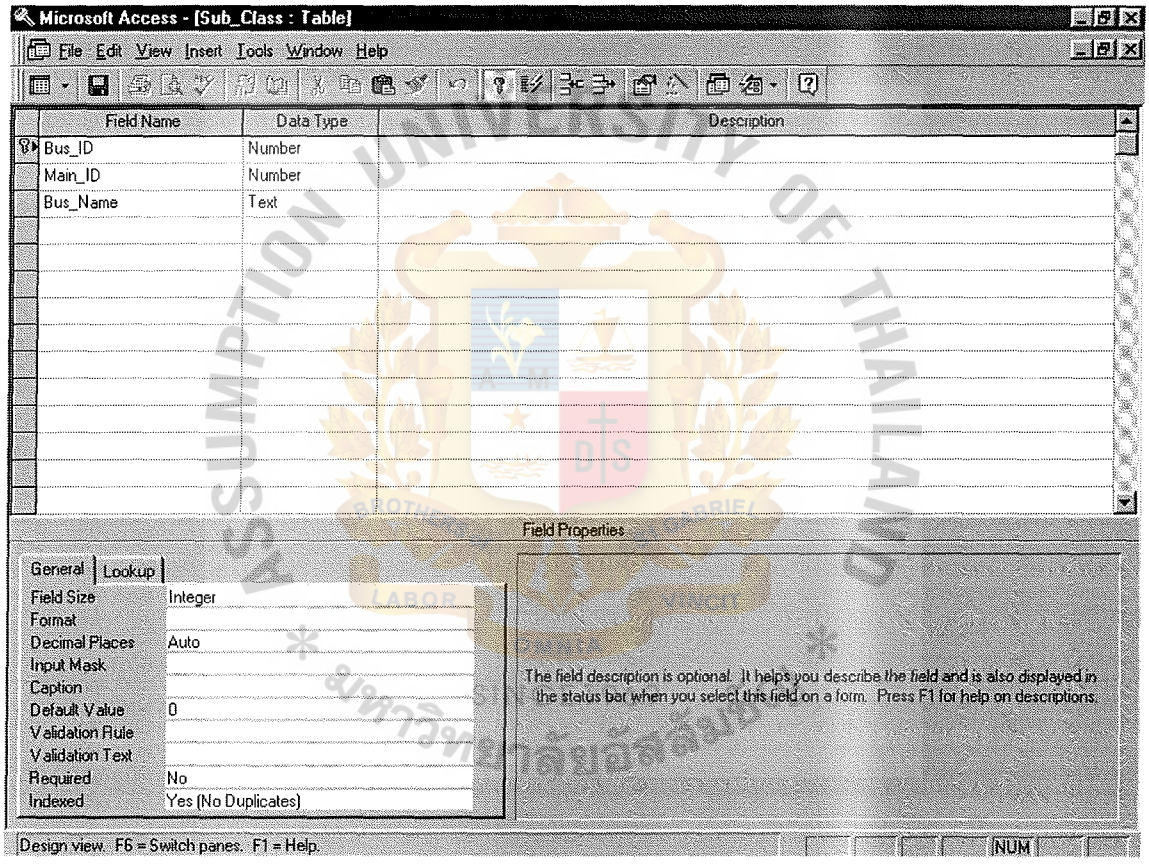


Figure F.8. Sub Classification Business File.

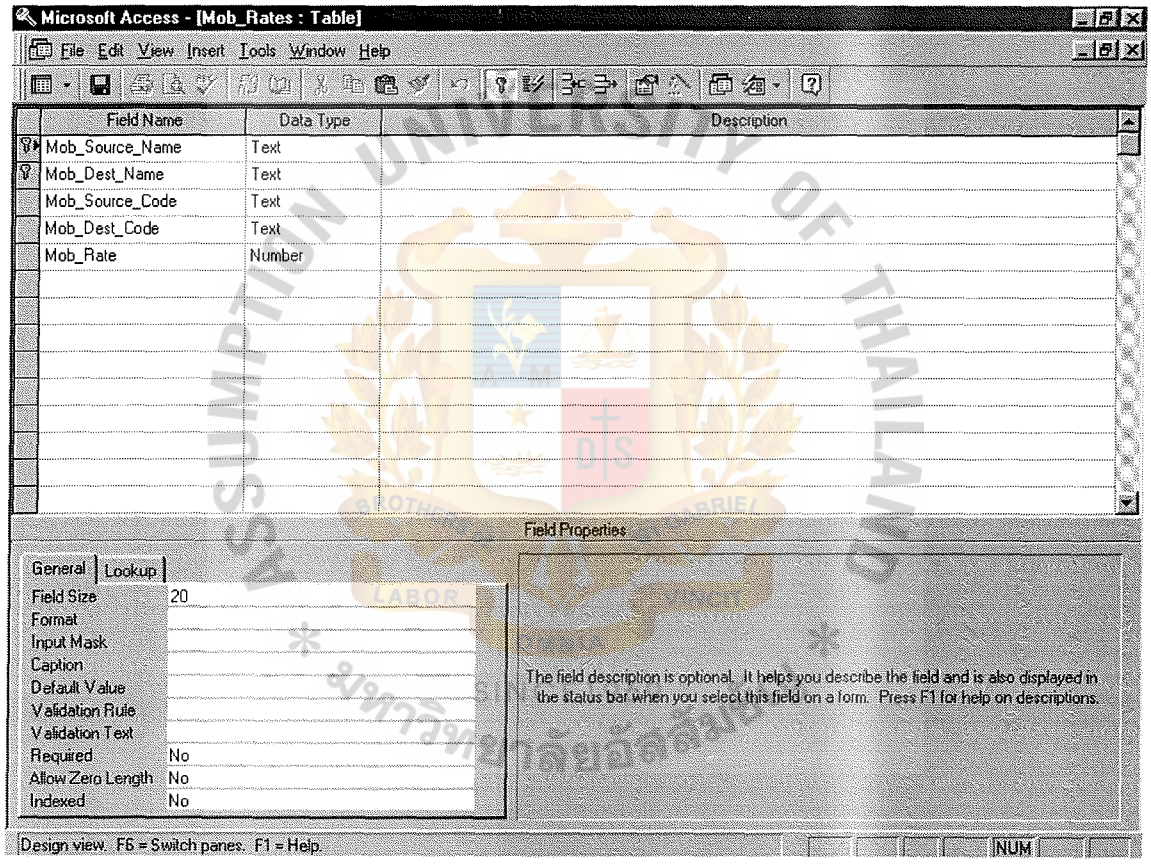


Figure F.9. Mobile Charge Rates File.

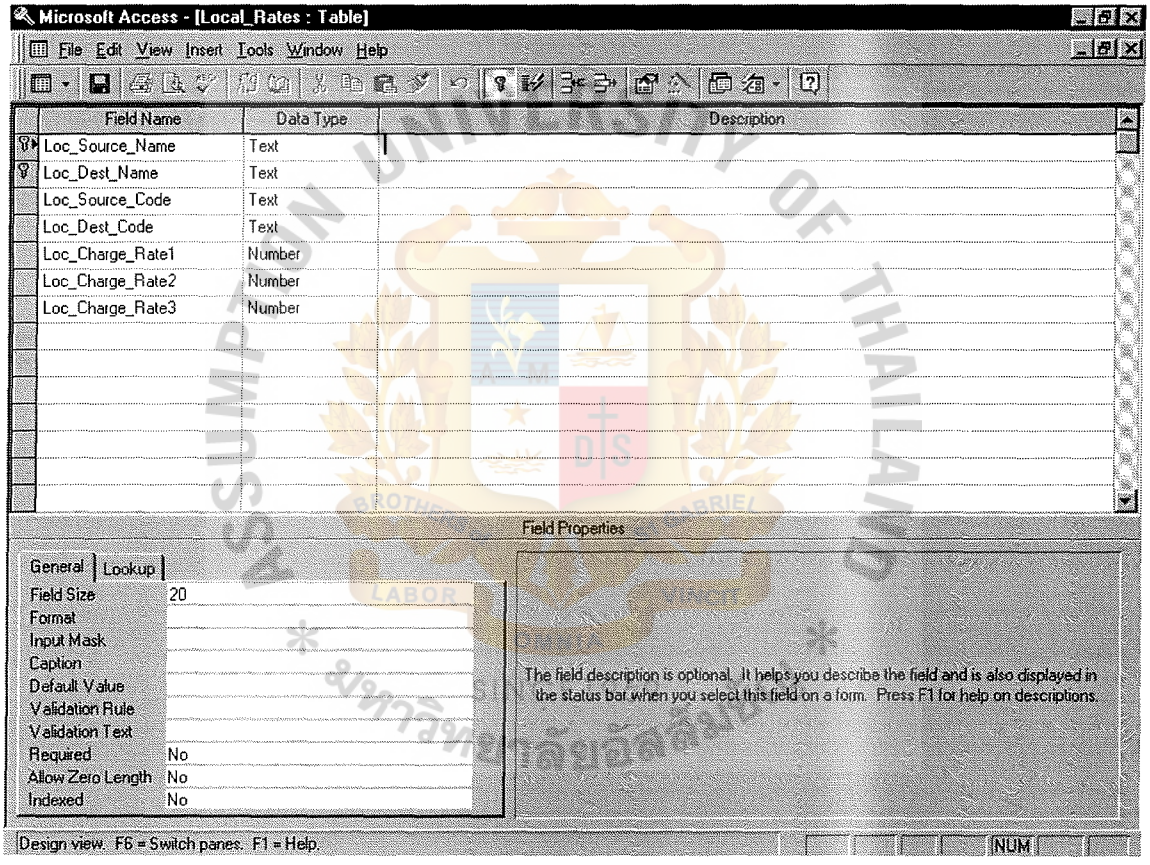


Figure F.10. Local Long Distance Charge Rates File.

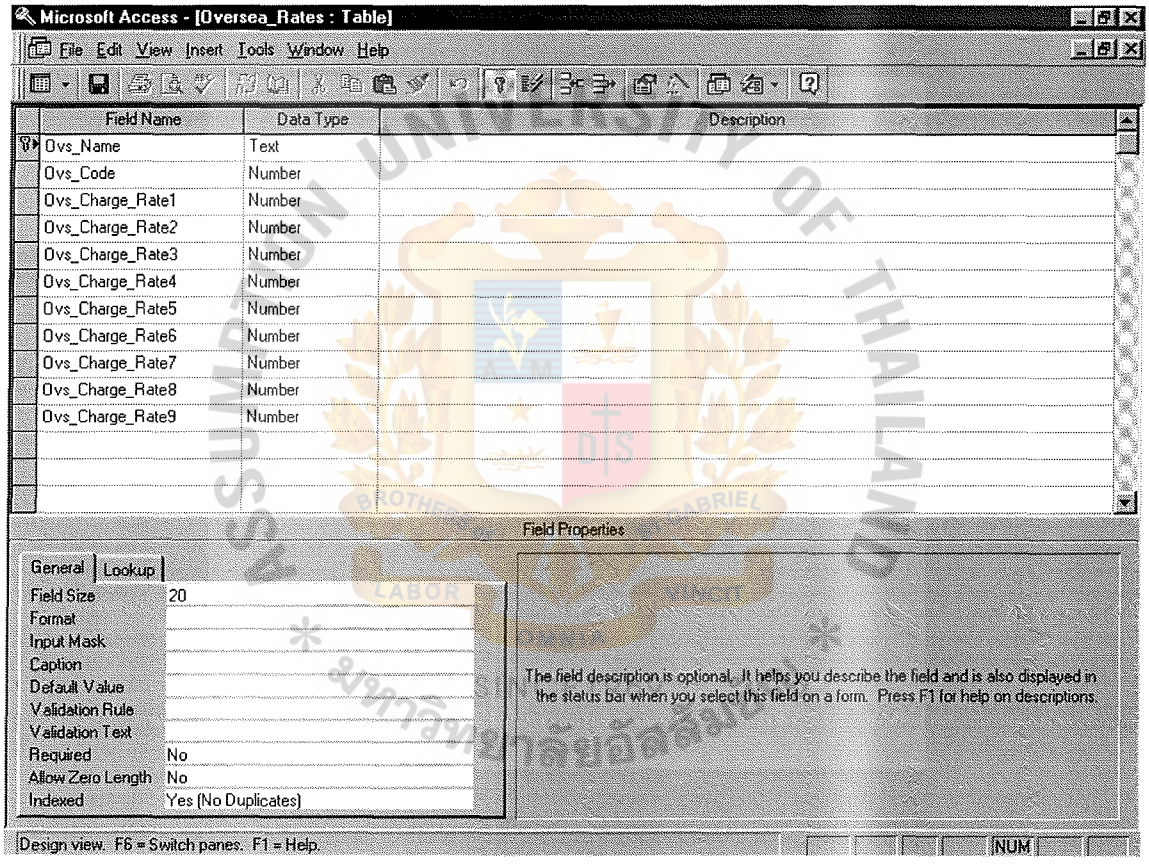


Figure F.11. Overseas Charge Rates File.

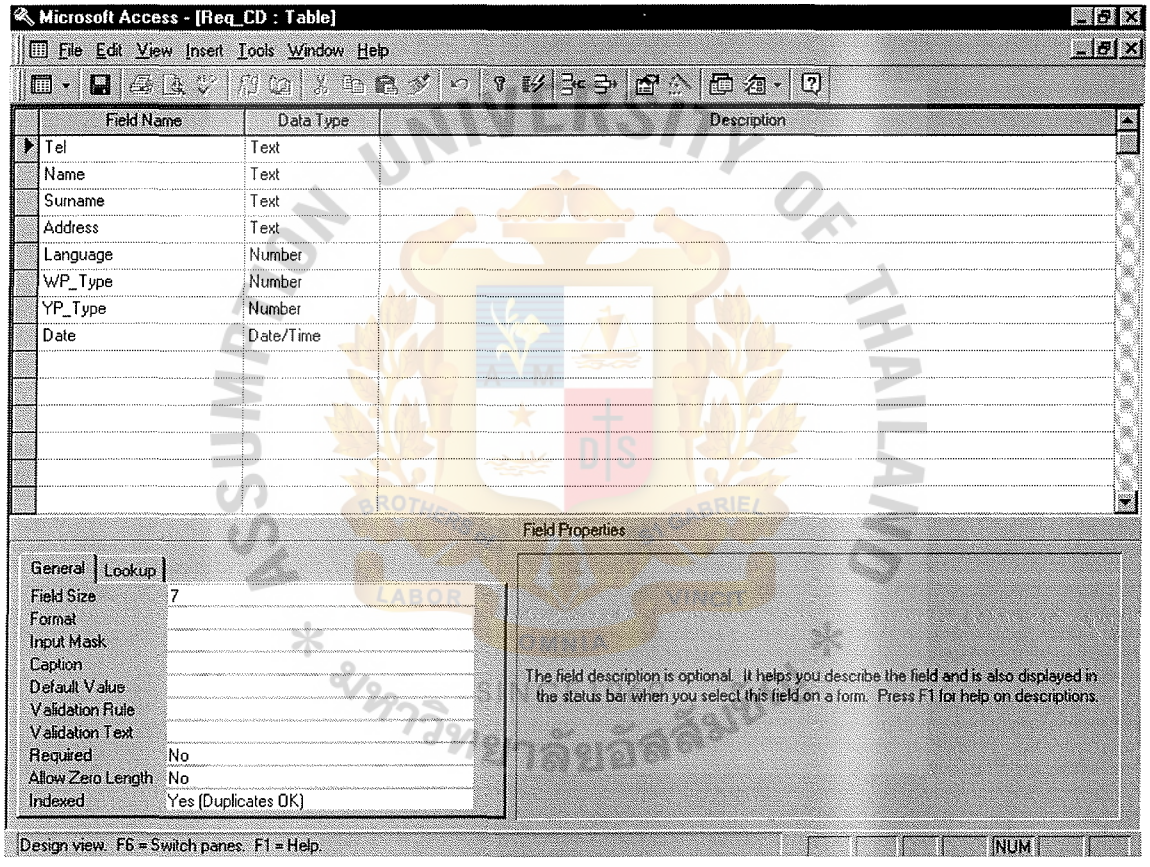


Figure F.12. Request CD-ROM File.

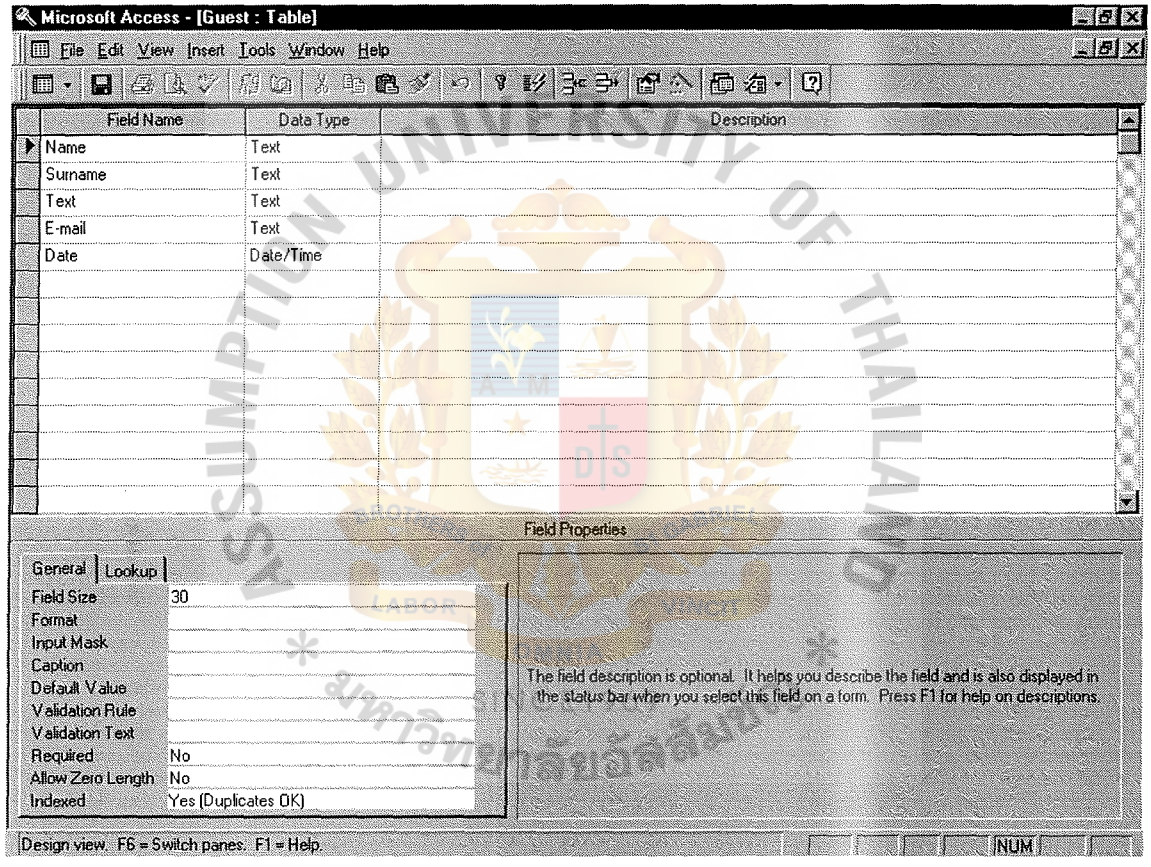


Figure F.13. Guest File.

# APPENDIX G

USER INTERFACE DESIGN / USER MANUAL

ASSUMPTION UNIVERSITY OF THAILAND
LABOR VINCIT OMNIA
SINCE1969
มหาวิทยาลัยอัสสัมชัญ

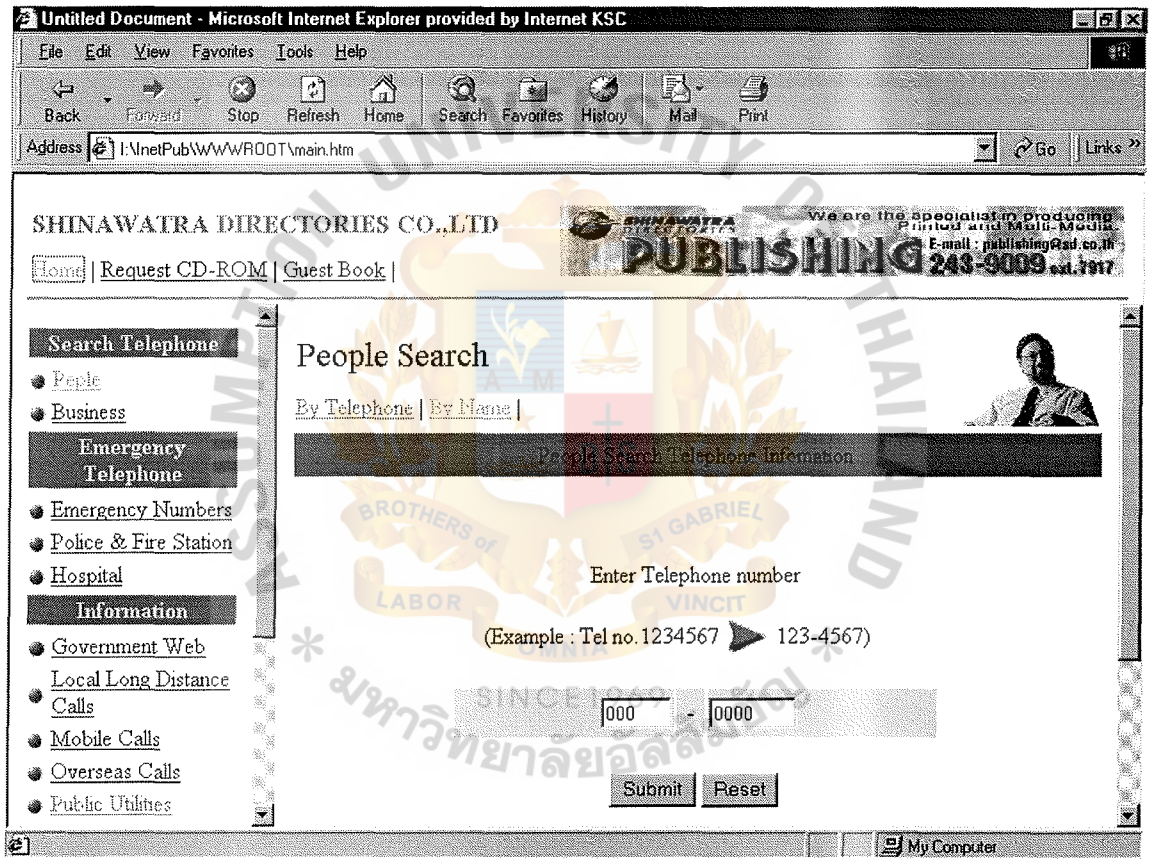


Figure G.1. Search People by Telephone Number.

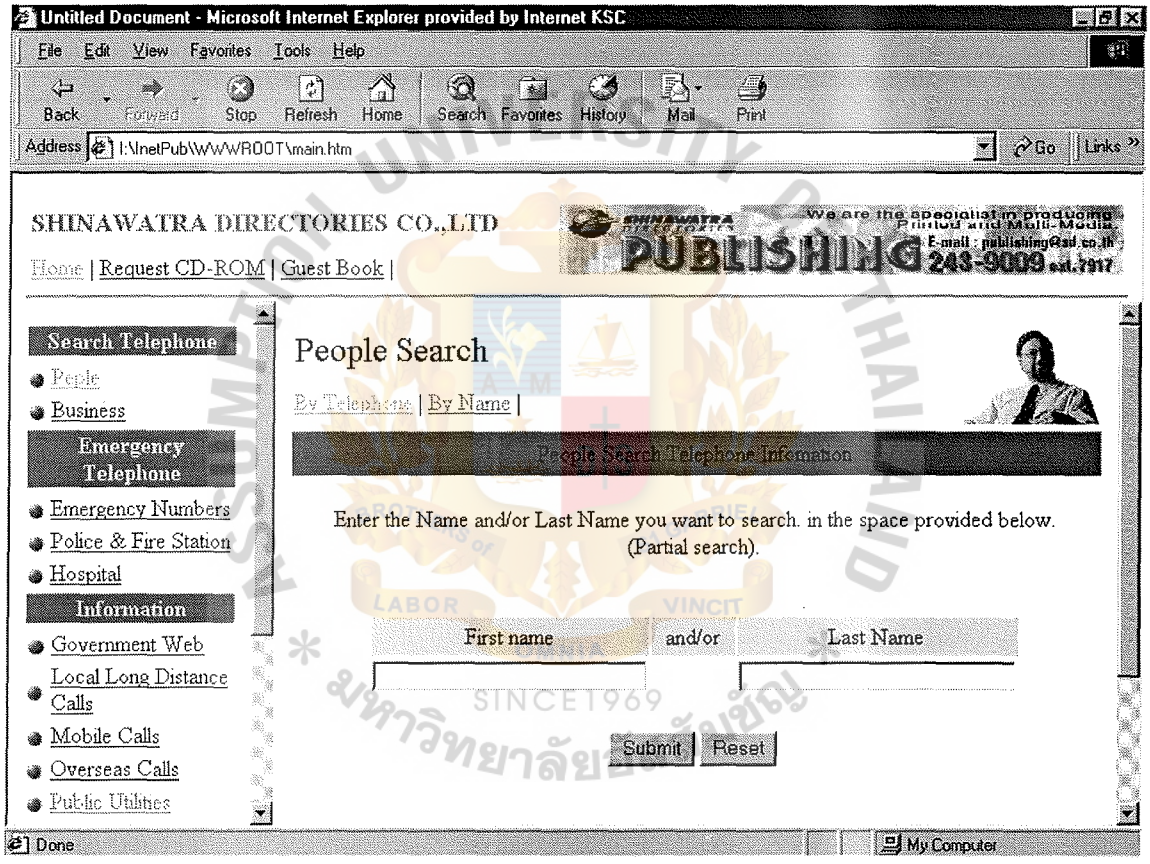


Figure G.2. Search People by Name.

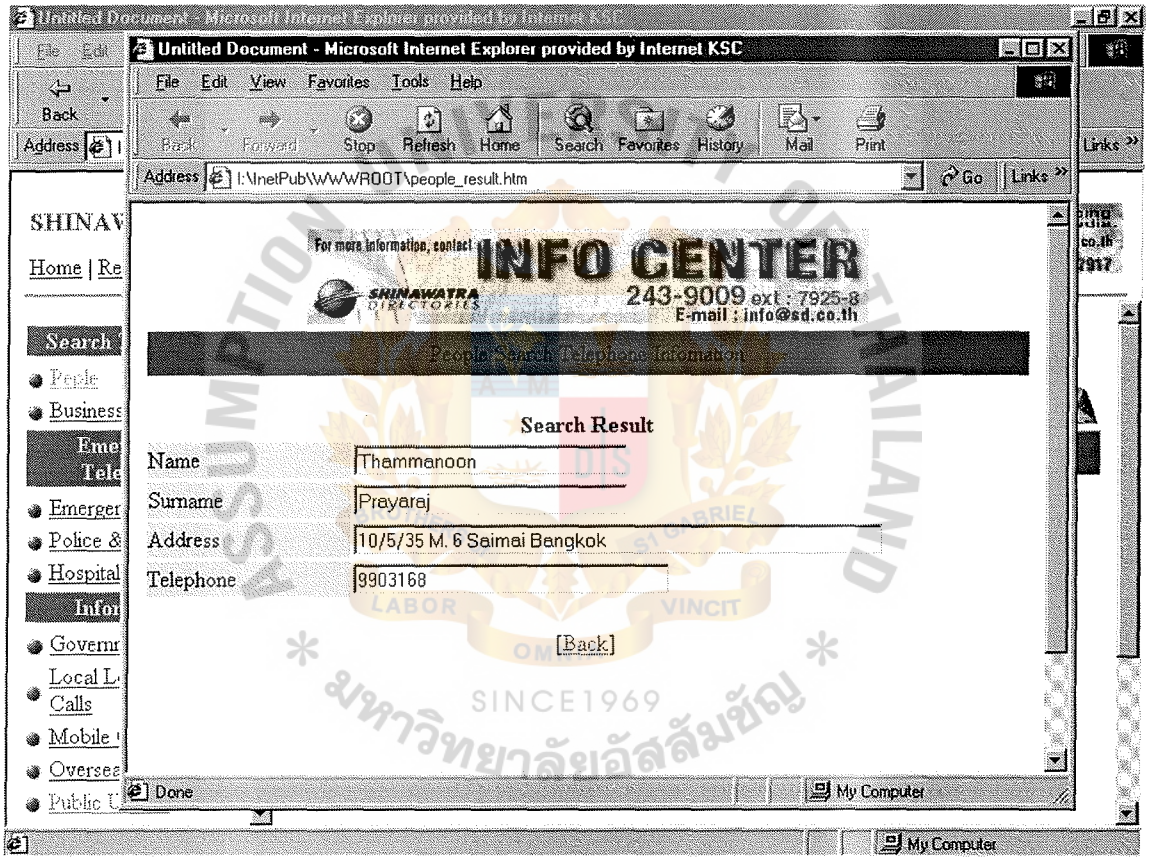


Figure G.3. Search Result of People.

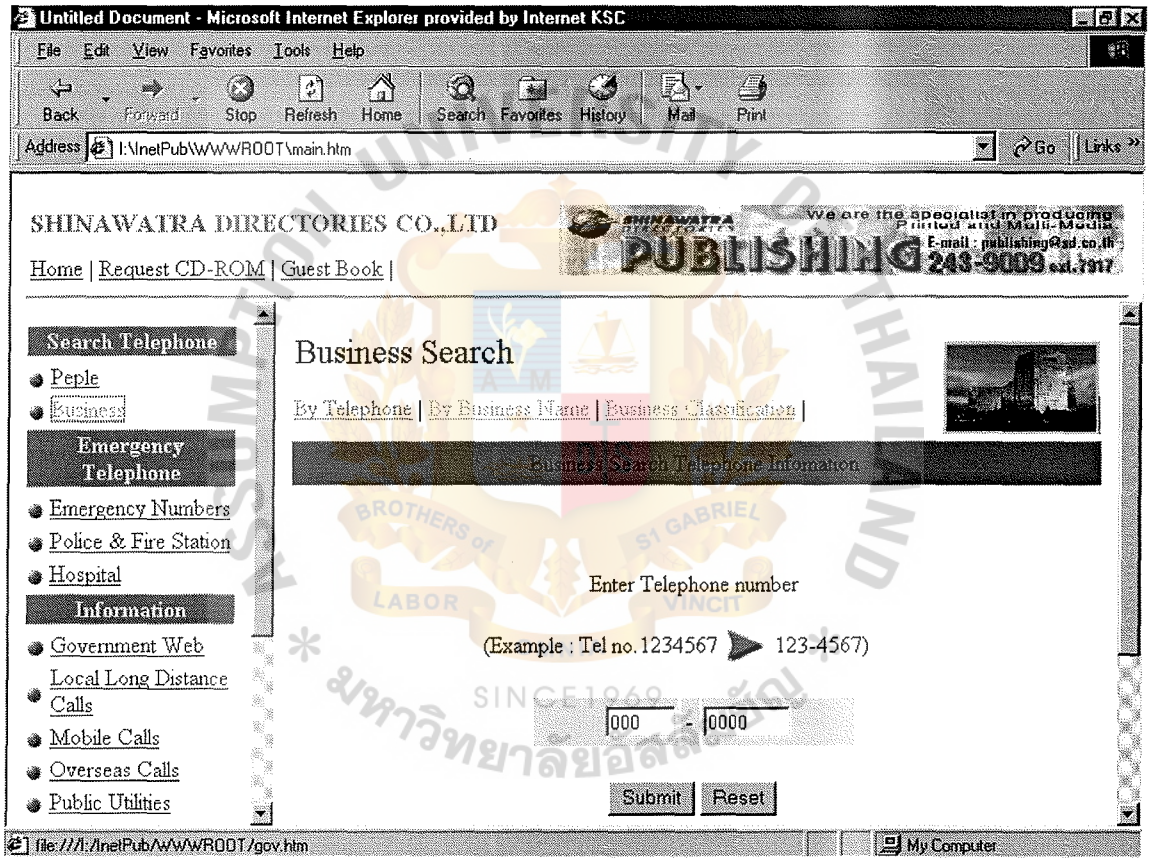


Figure G.4. Search Business by Telephone Number.

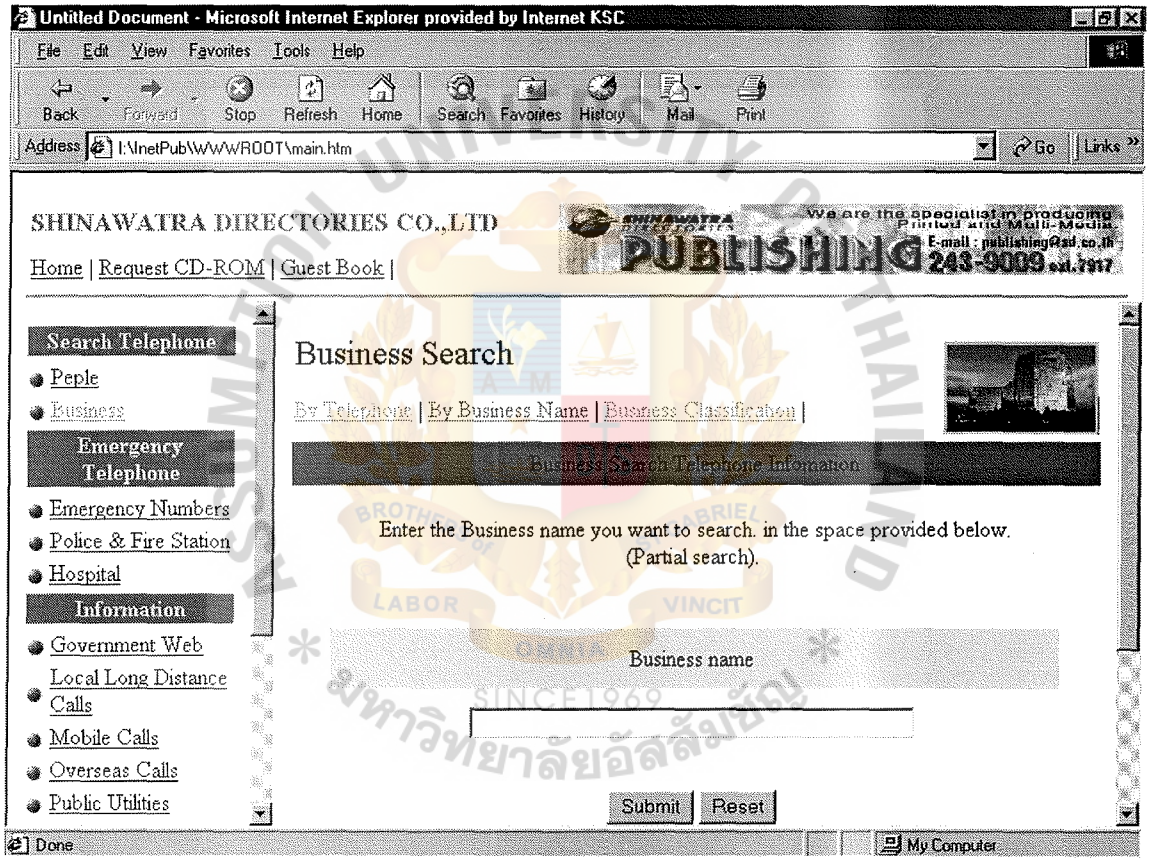


Figure G.5. Search Business by Business Name.

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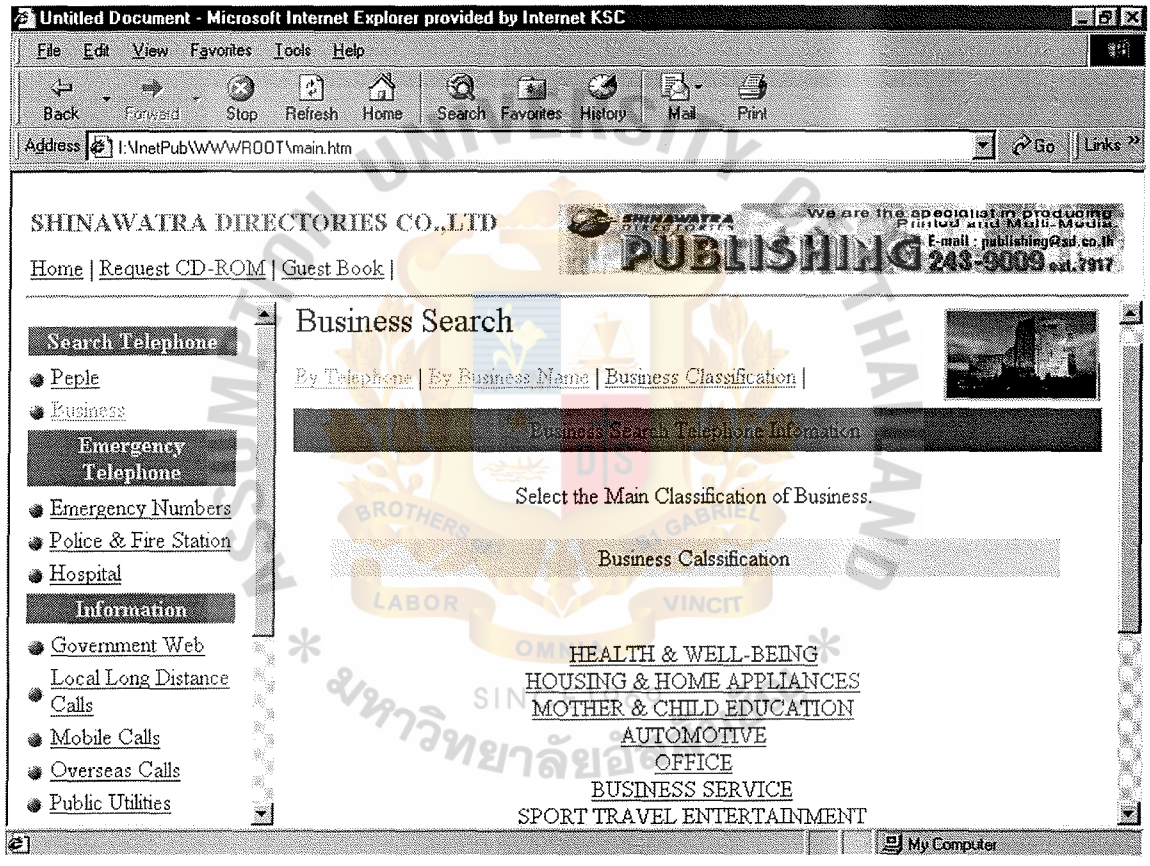


Figure G.6. Search Business by Main Classification of Business.

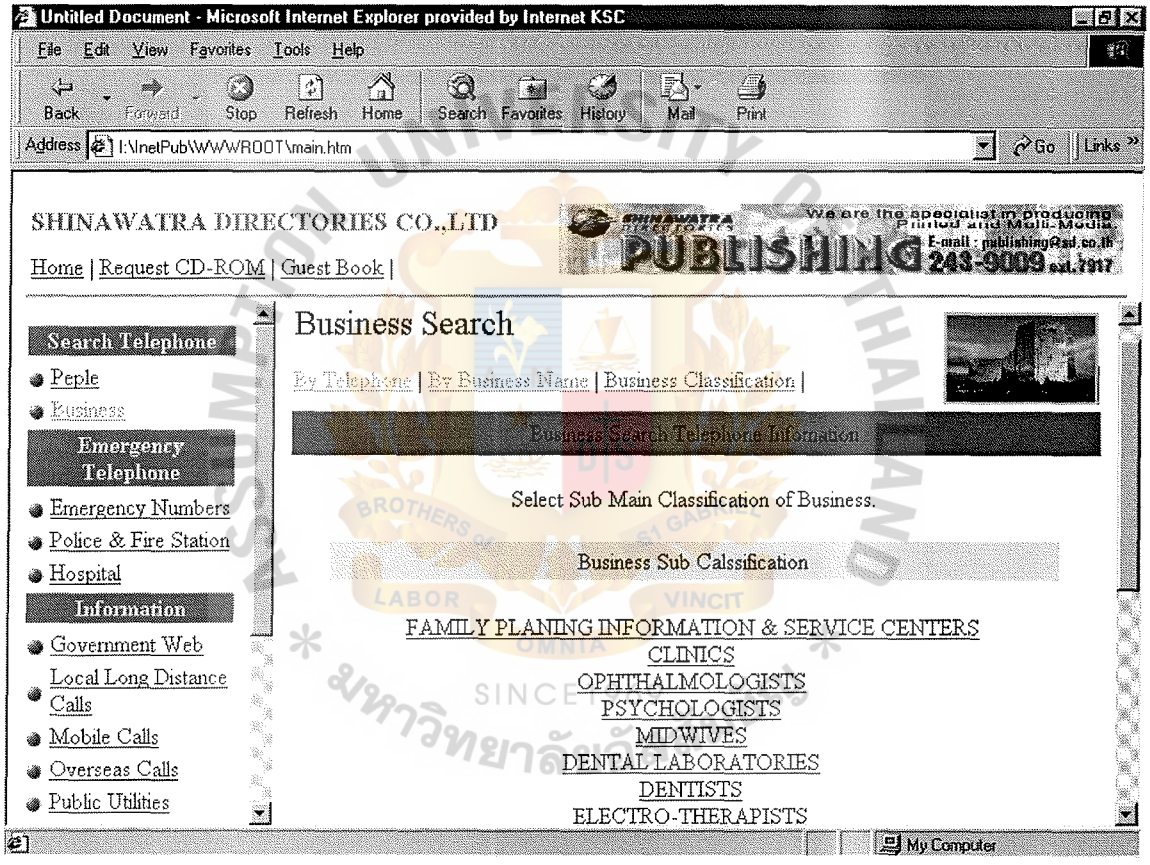


Figure G.7. Search Business by Sub Classification of Business.

Figure G.8. Search Result of Business.

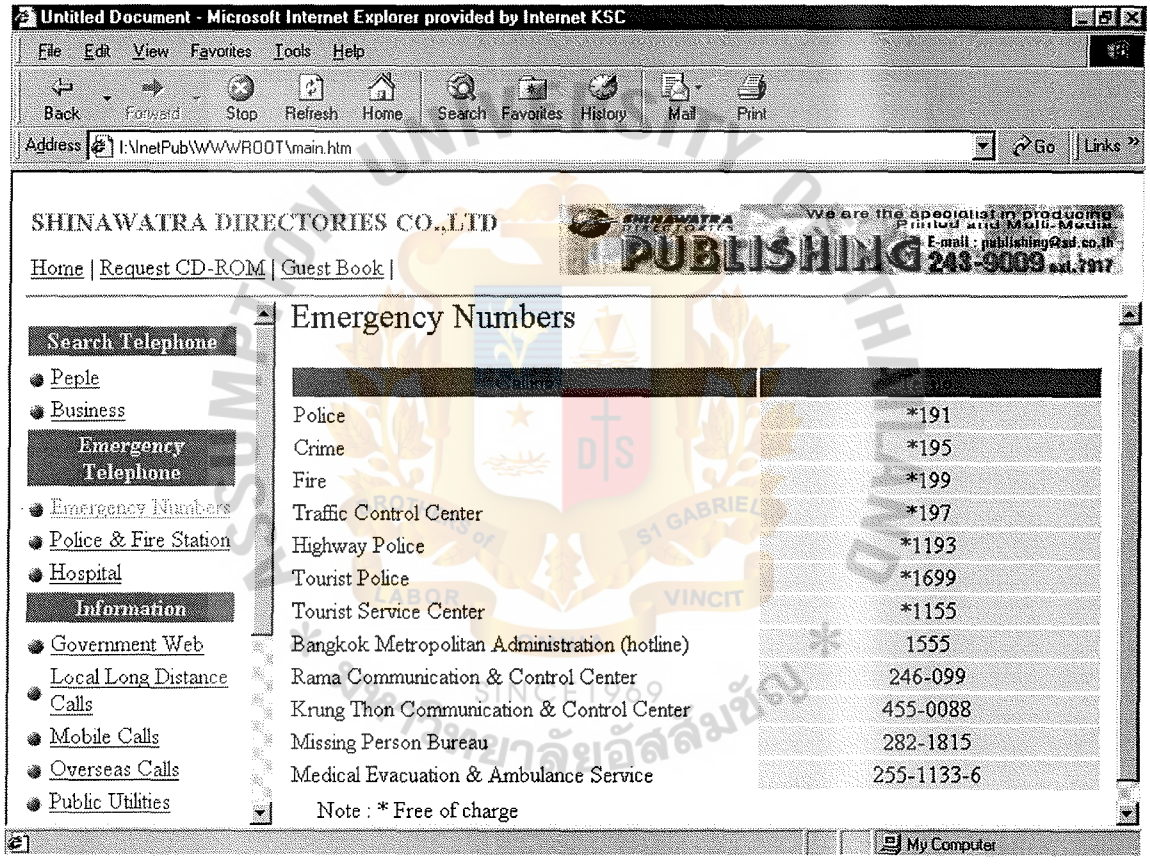


Figure G.9. Display Emergency Number Screen.

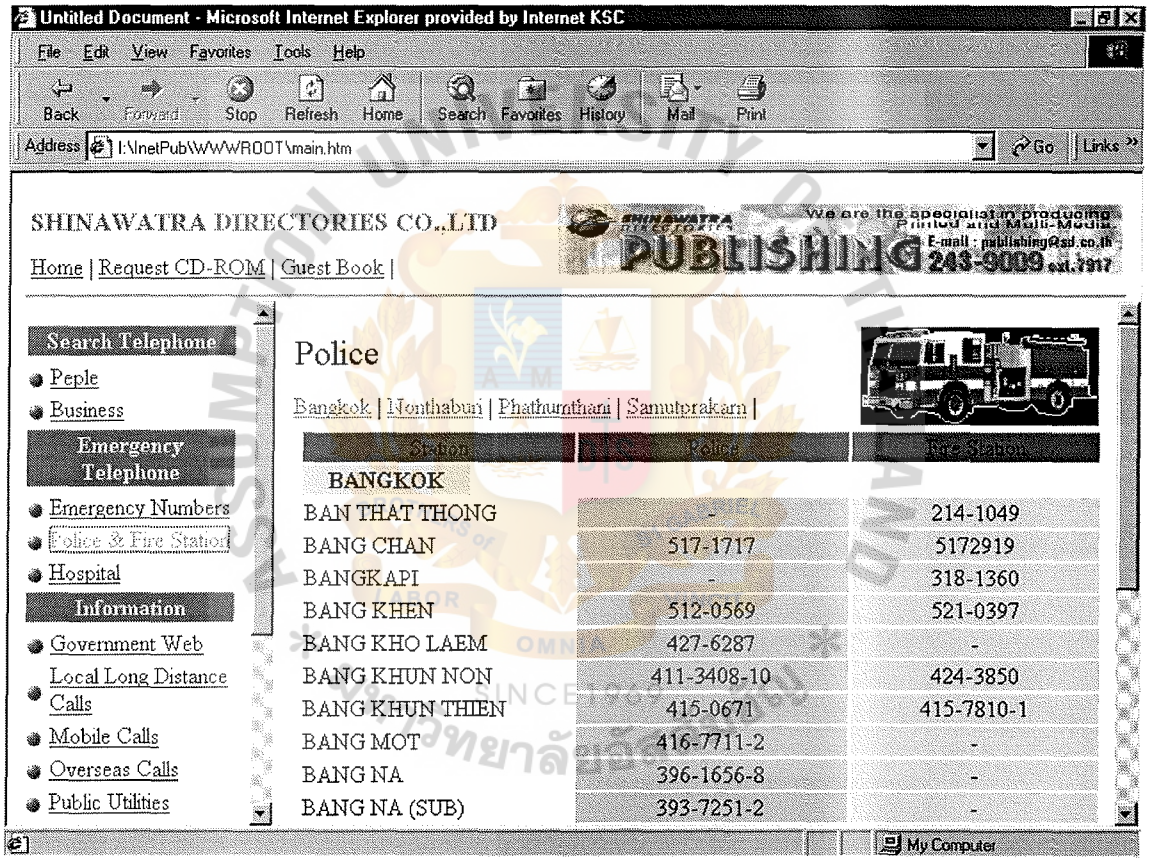


Figure G.10. Display Police & Fire Station Listing Screen.

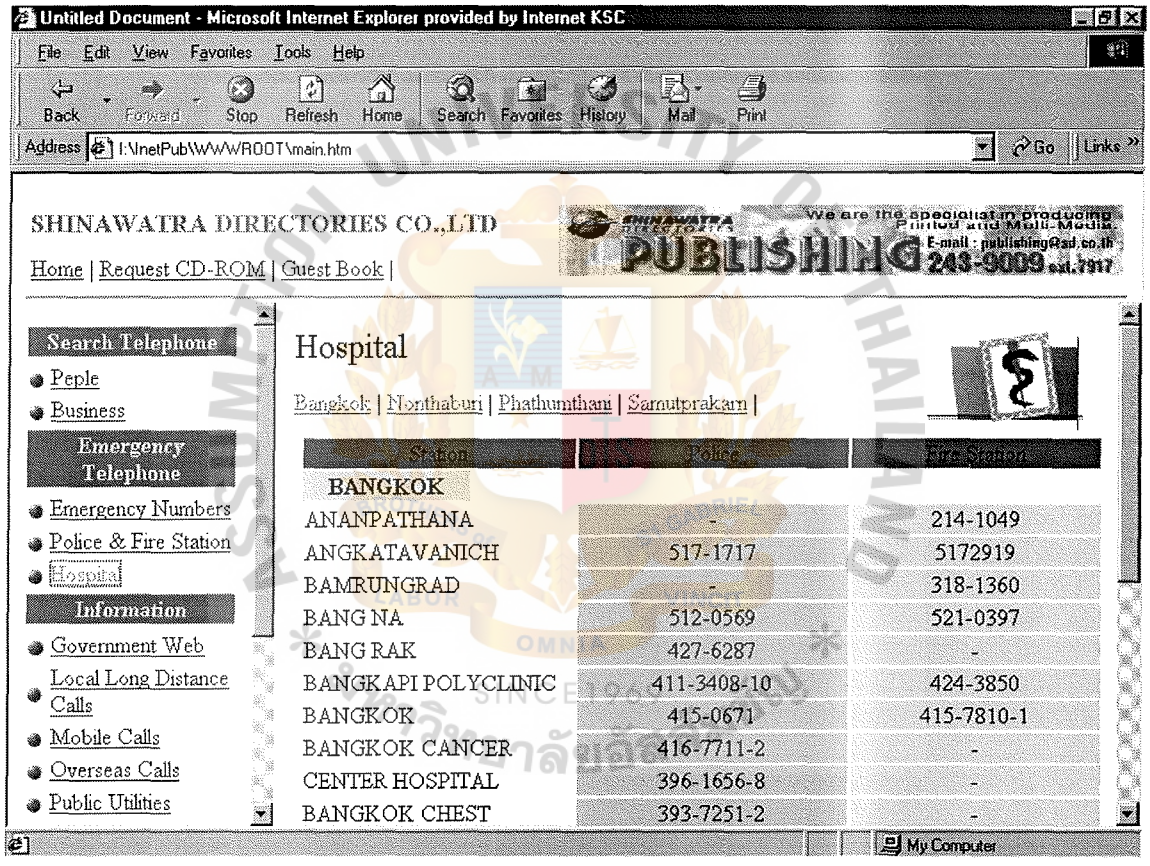


Figure G.11. Display Hospital Listing Screen.

Figure G.12. Display Government Web Site Screen.

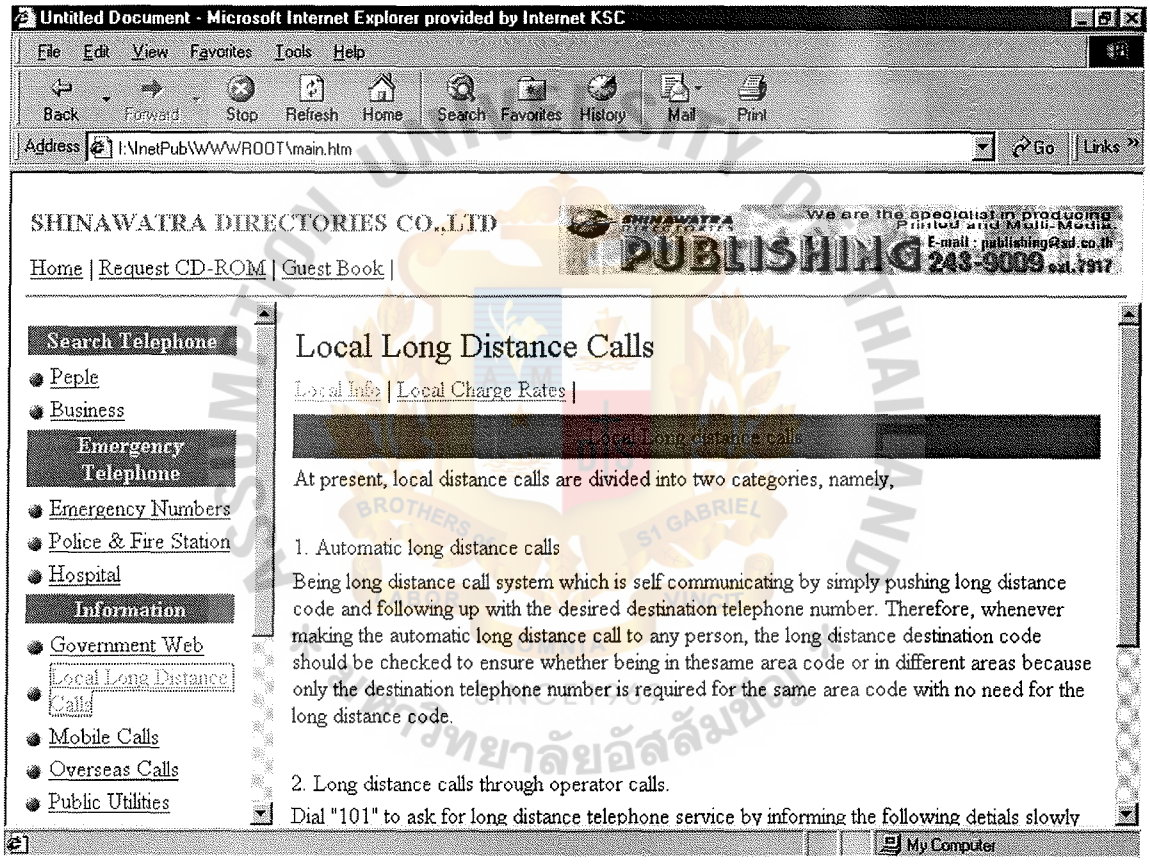


Figure G.13. Display Long Local Distance Calls Information Screen.

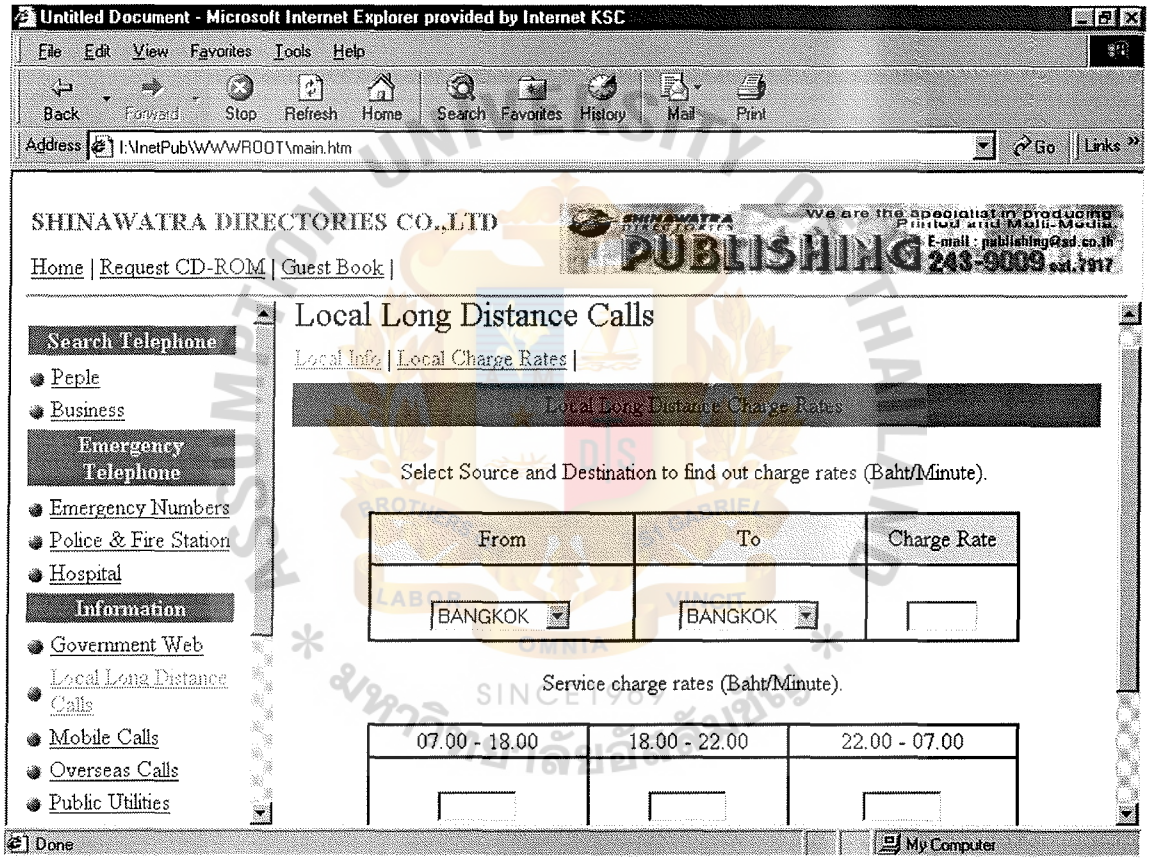


Figure G.14. Search Charge Rates of Local Long Distance.

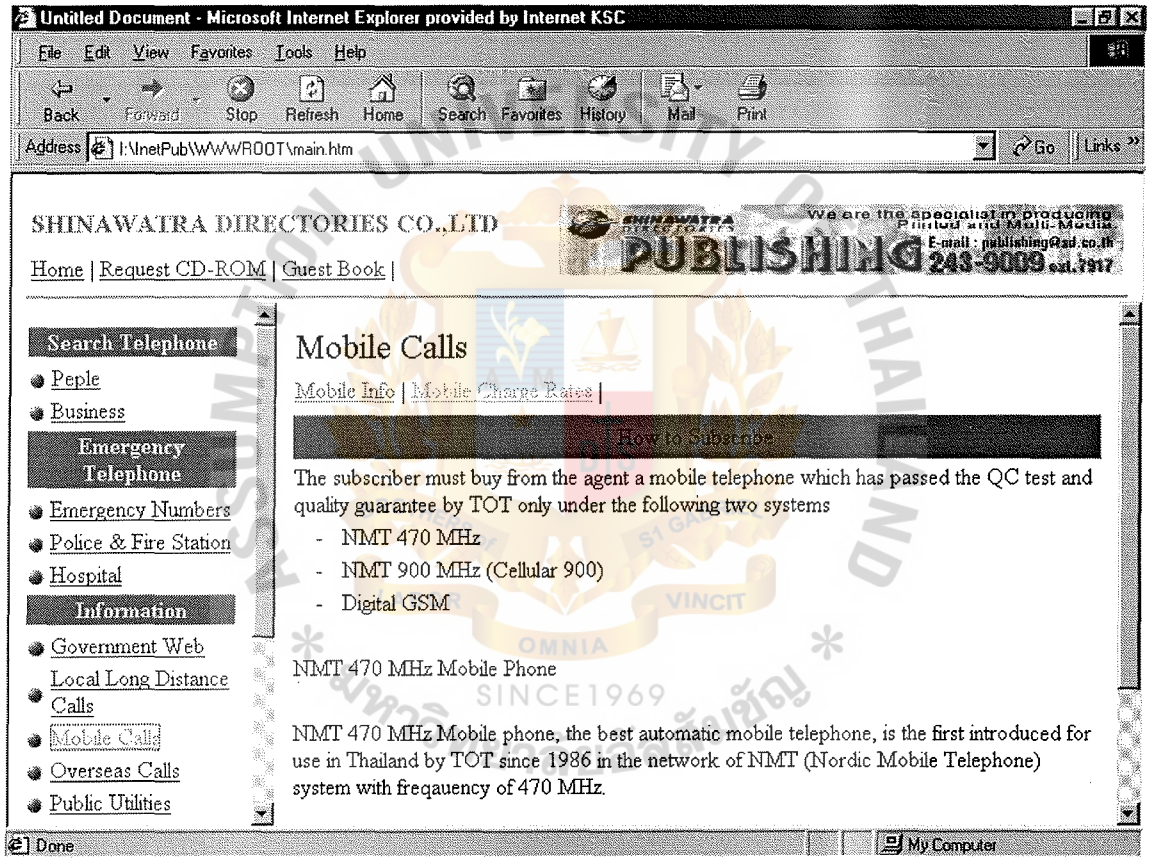


Figure G.15. Display Mobile Calls Information Screen.

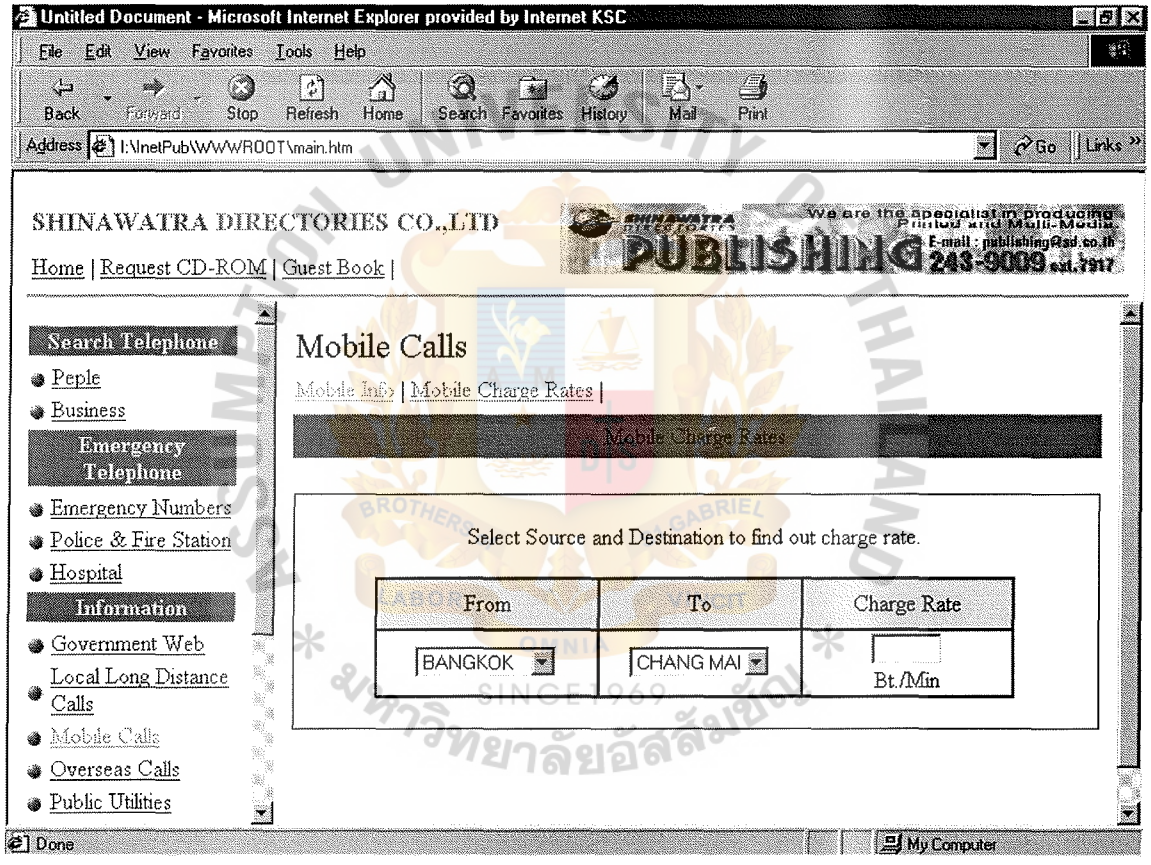


Figure G.16. Search Charge Rates of Mobile.

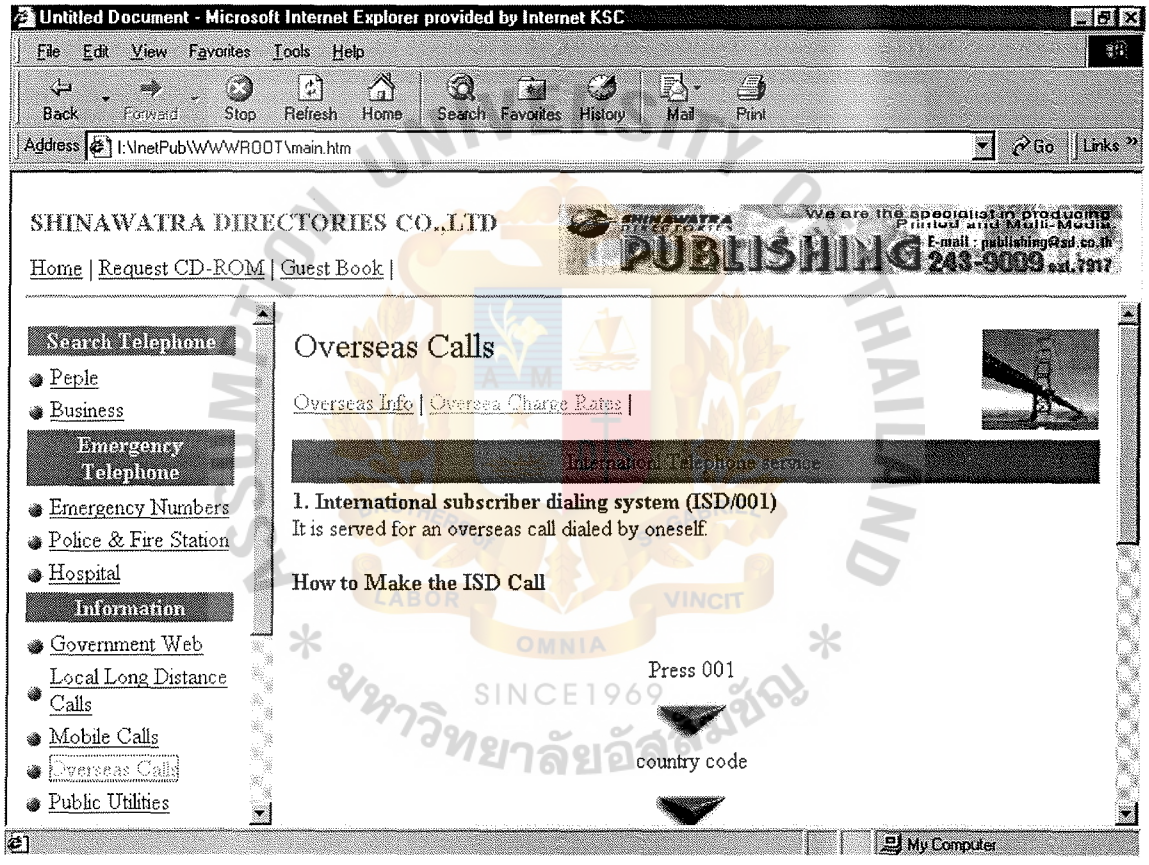


Figure G.17. Display Overseas Calls Information.

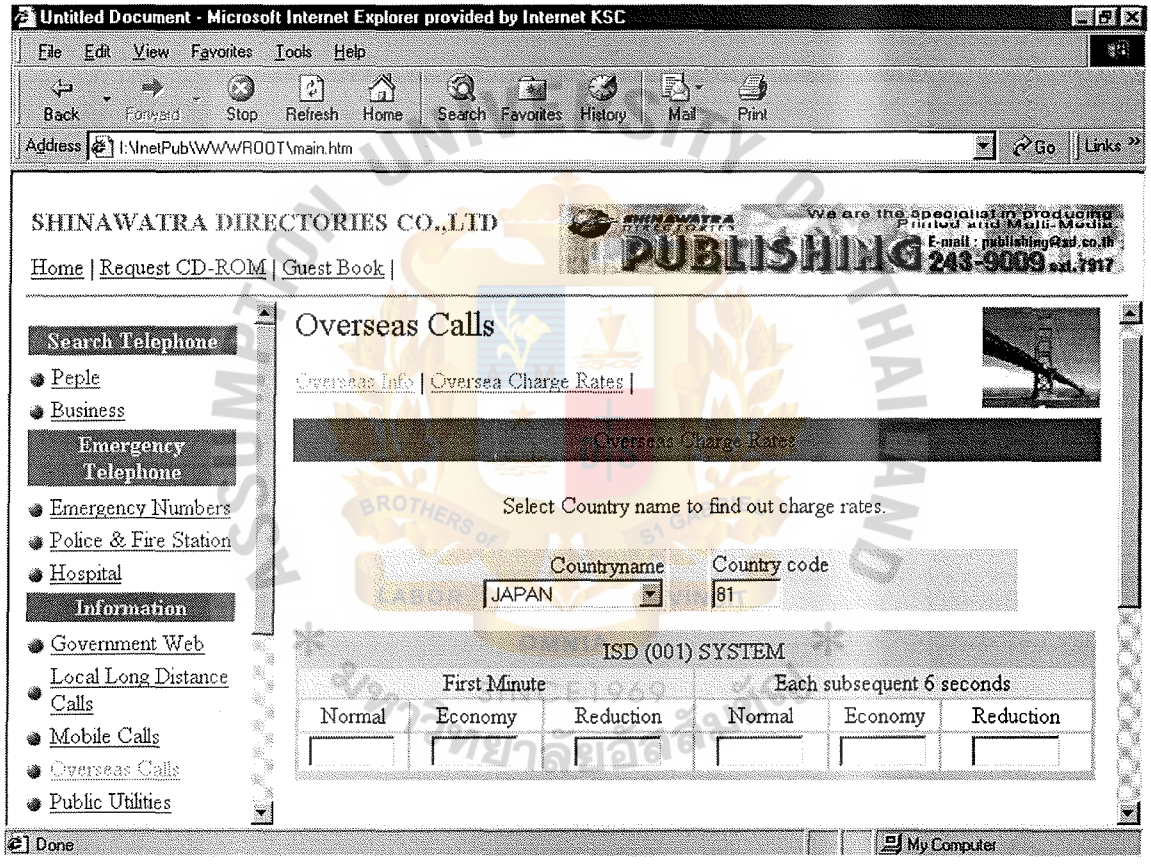


Figure G.18. Search Charge Rates of Oversea.

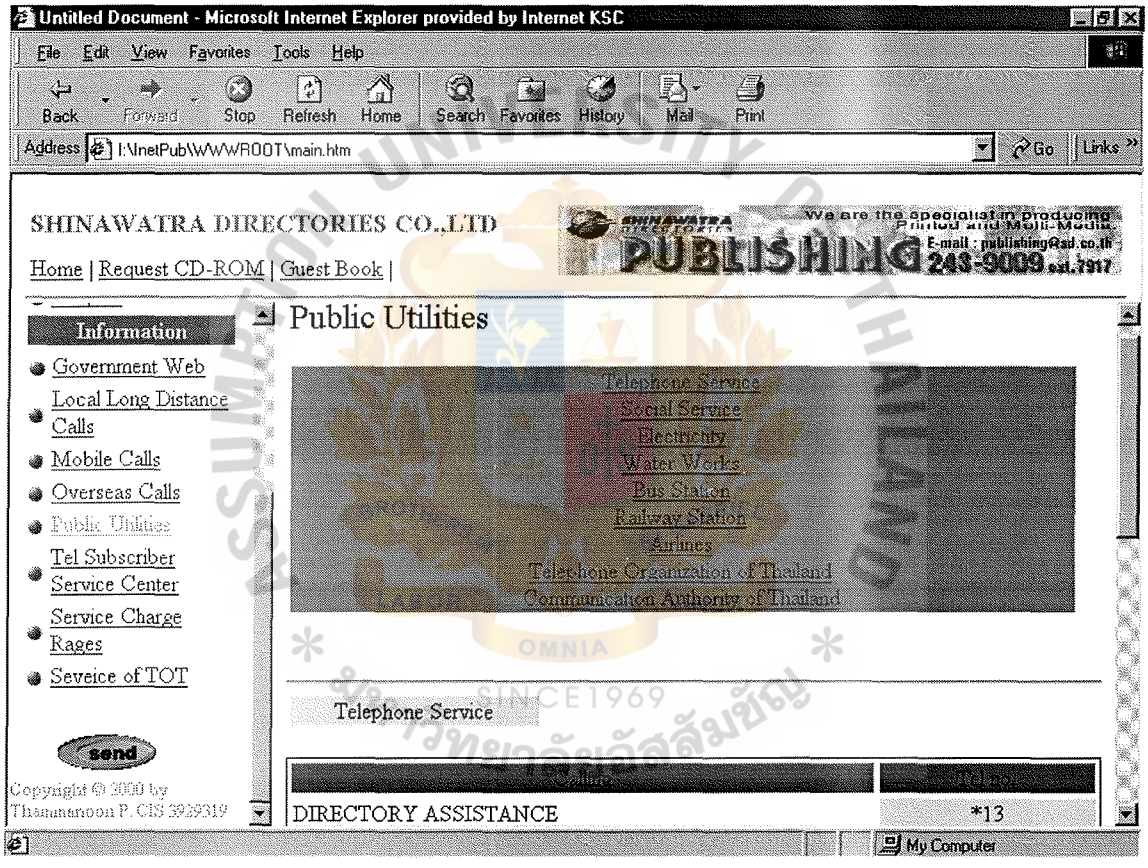


Figure G.19. Display Public Utilities Screen.

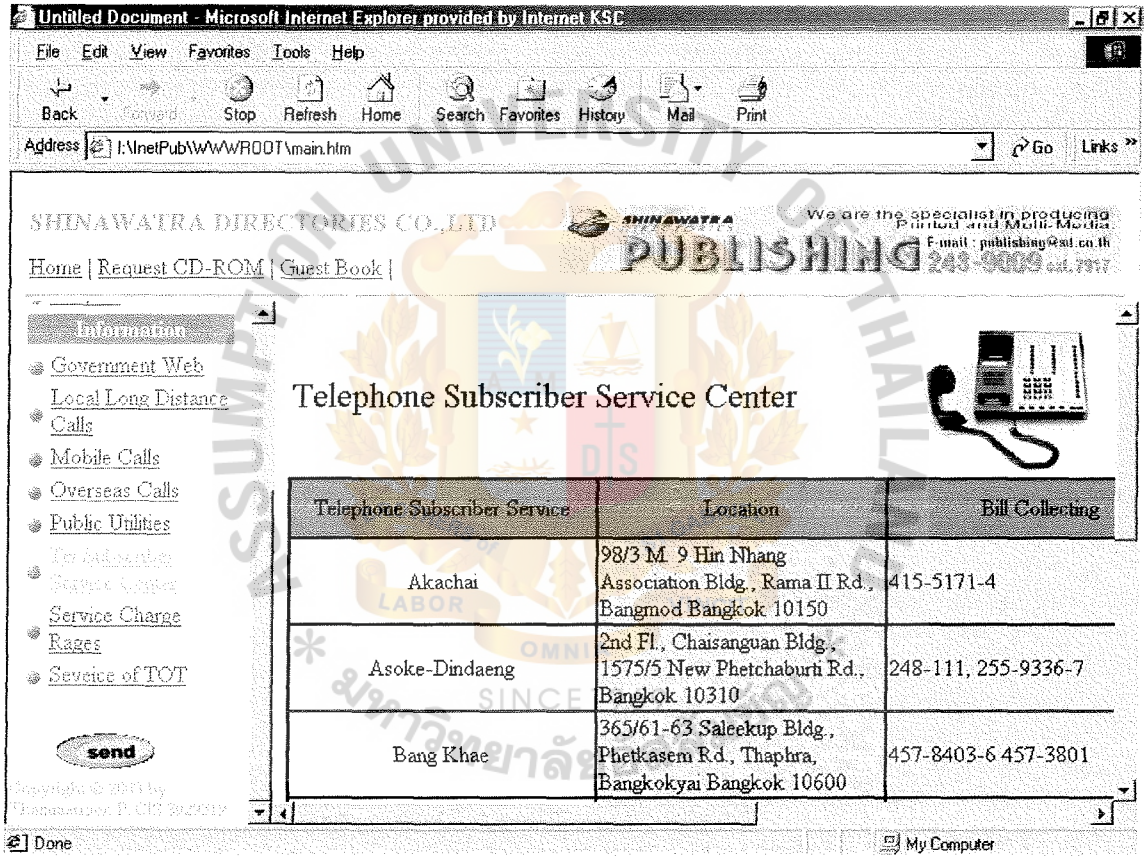


Figure G.20. Display Telephone Subscriber Service Center Screen.

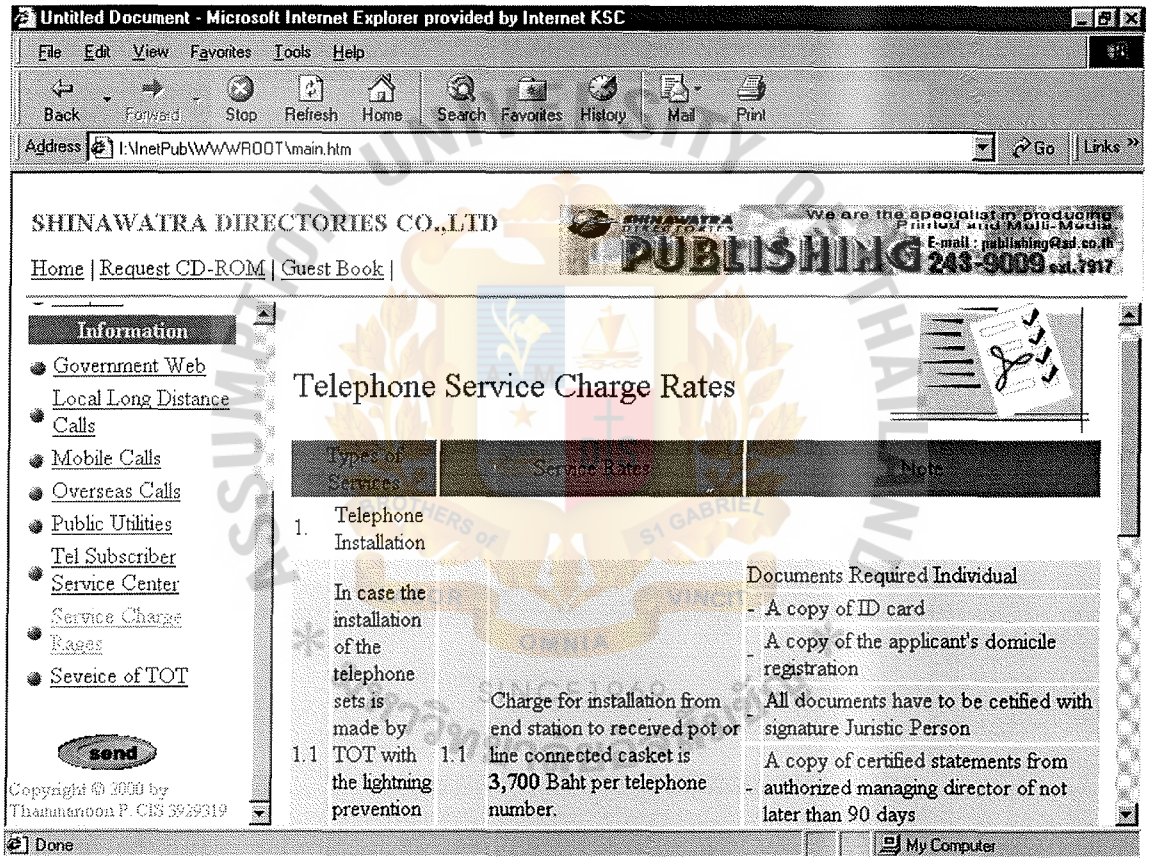


Figure G.21. Display Service Charge Rate Screen.

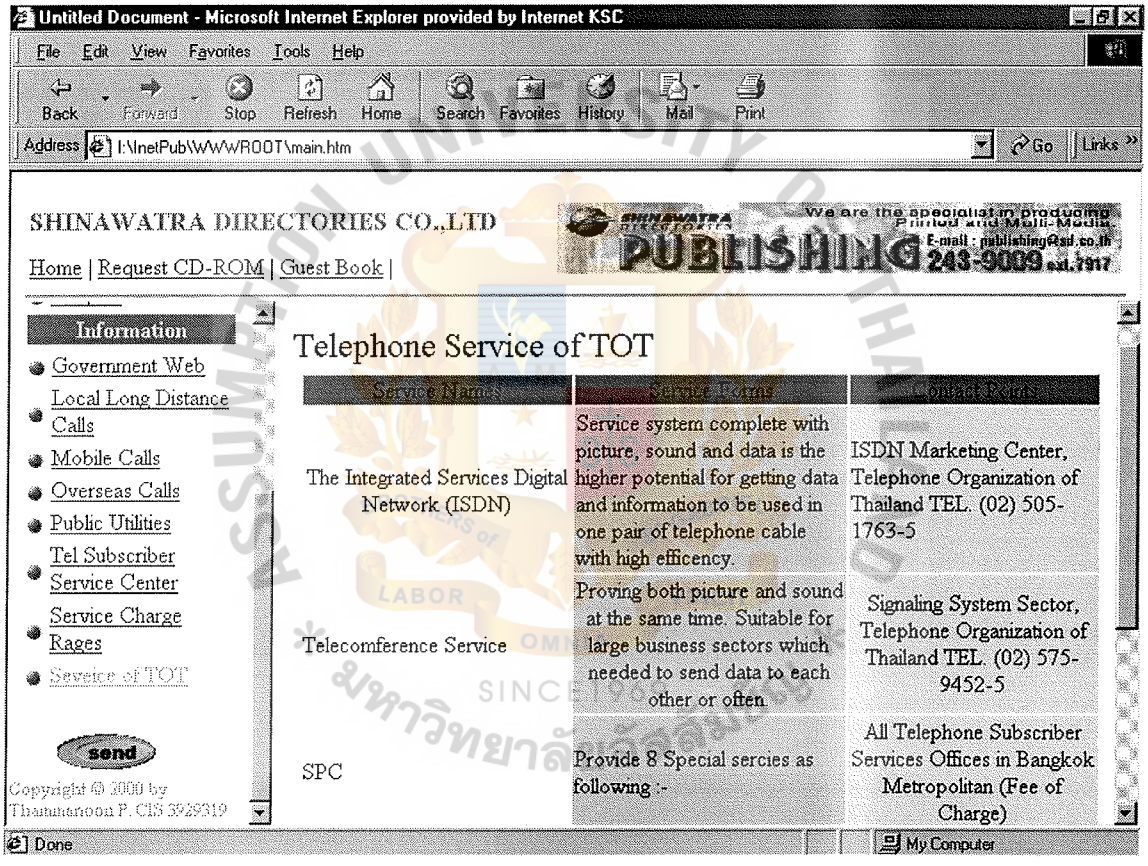


Figure G.22. Display Telephone Service of TOT Screen.

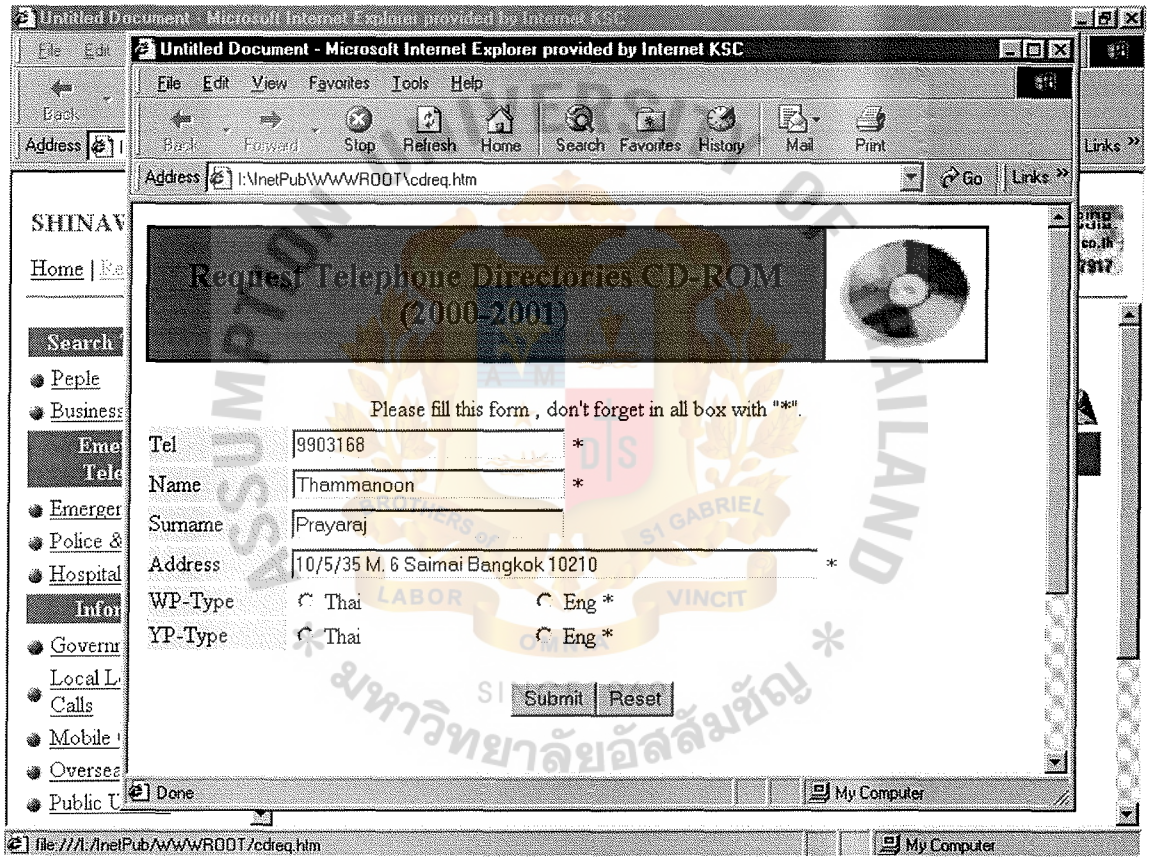


Figure G.23. Request Telephone Directories CD-ROM Form.

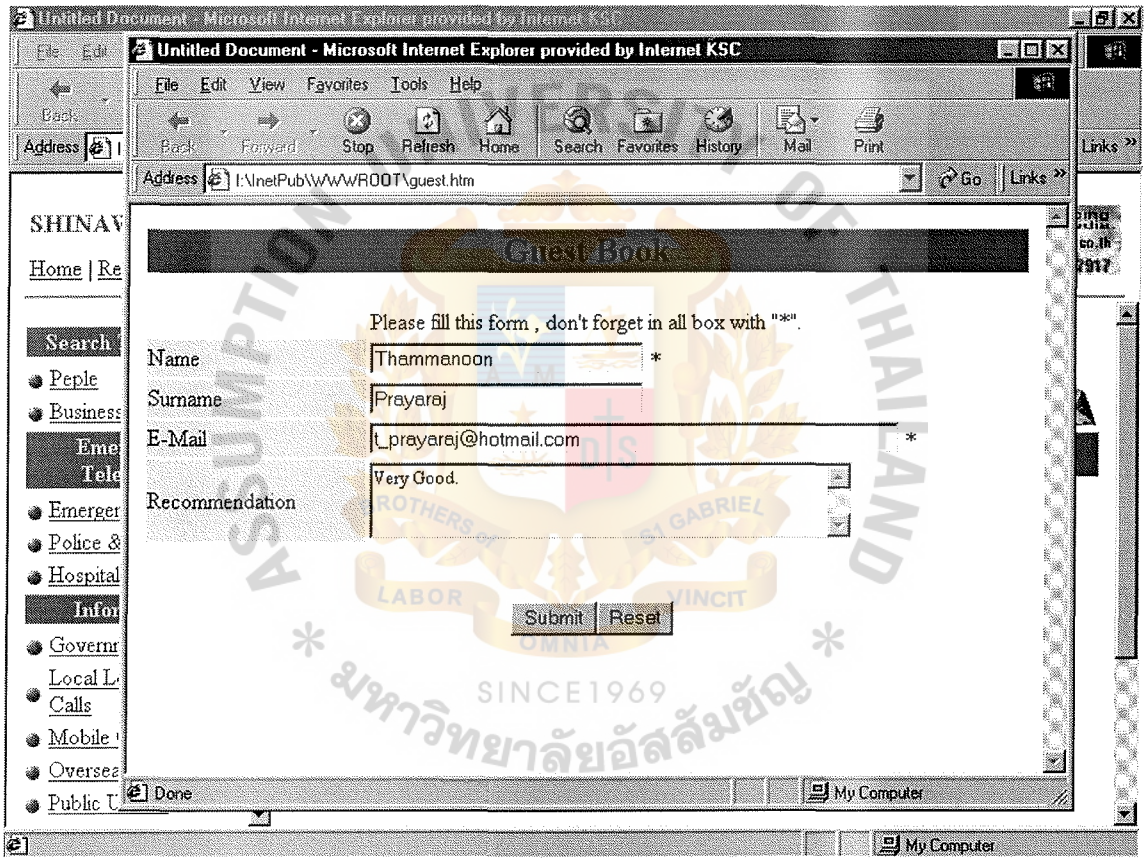


Figure G.24. Guest Book Screen.

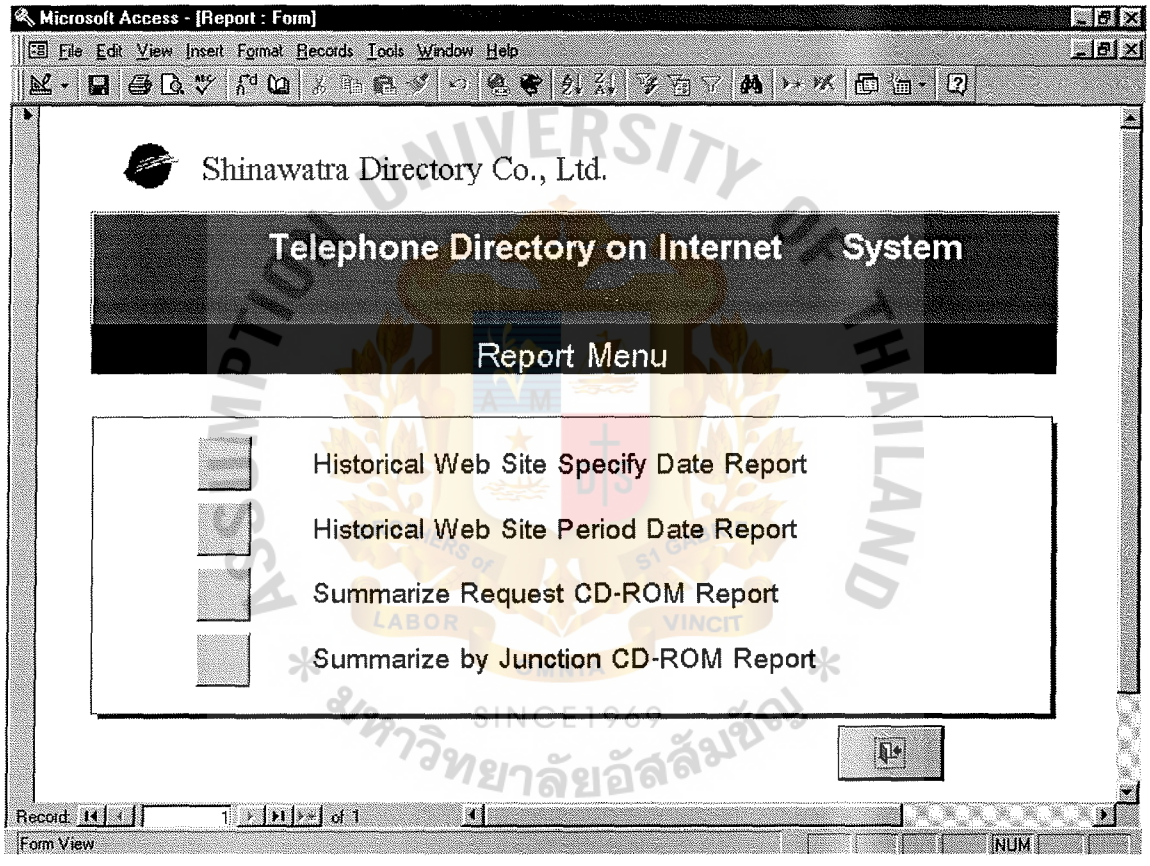


Figure G.25. Report Menu Screen.

# APPENDIX H

REPORT FORMAT

ASSUMPTION UNIVERSITY OF THAILAND
BROTHERS of ST GABRIEL
LABOR VINCIT OMNIA
SINCE1969
มหาวิทยาลัยอัสสัมชัญ

# Telephone directory on Internet System

## History Web Site Visitor Report

| No. | Date | Name | Surname | Text | E-mail |
|---|---|---|---|---|---|
| 1 | 18/9/00 | Jompol | Harnkaew | I want more CD-ROM | jompol@cscoms.com |
| 2 | 18/9/00 | Sunisa | Naja | It's O.K. | sunisa@teleinfomedia.net |
| 3 | 18/9/00 | Sukanya | Phomtam | Fine. | phomtam@hotmail.com |
| 4 | 18/9/00 | Thammano | Prayaraj | Very good ! | t_prayaraj@hotmail.com |
| 5 | 18/9/00 | Vipaporn | Savanapree | It shoud has more color | aoytmb@hotmail.com |
| 6 | 20/9/00 | Kanyarat | Saelor | No comment. | saelor@cscoms.com |

Total Records : 6

Figure H.1. History Web Site Visitor Report.

16 November 2000 Page 1 of 1

# Telephone directory on Internet System

## Summarized Request CD-ROM Report

| LANG | WP | YP |
|---|---|---|
| Thai | 20 | 17 |
| English | 6 | 8 |
| Total Amount | 26 | 25 |

Figure H.2. Summarized Request CD-ROM Report.

# Telephone directory on Internet System

## Summarized by Junction CD-ROM Report

| Language Group | Junc | Cnt | WP | YP |
|---|---|---|---|---|
| Language : Thai | | | | |
| | 210 - XXXX | 3 | 3 | 2 |
| | 273 - XXXX | 2 | 2 | 1 |
| | 340 - XXXX | 3 | 3 | 2 |
| | 478 - XXXX | 2 | 1 | 2 |
| | 497 - XXXX | 1 | 1 | 1 |
| | 510 - XXXX | 1 | 1 | 0 |
| | 599 - XXXX | 1 | 1 | 1 |
| | 623 - XXXX | 1 | 1 | 1 |
| | 634 - XXXX | 2 | 2 | 2 |
| | 741 - XXXX | 2 | 1 | 2 |
| | 823 - XXXX | 3 | 2 | 2 |
| | 913 - XXXX | 2 | 2 | 1 |
| Summary for 'Lang' = 1 (12 detail records) | | 23 | 20 | 17 |

Figure H.3. Summarized by Junction CD-ROM Report.

ASSUMPTION UNIVERSITY OF THAILAND
SINCE1969
มหาวิทยาลัยอัสสัมชัญ

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St. Gabriel's Library