WEB-BASED HELPDESK FOR A GOVERNMENT OFFICE

by

Ms. Duanpen Sompholthaveekul

A Final Report of the Six-Credit Course
CE 6998-CE 6999 Project

Submitted in Partial Fulfillment
of the Requirements for the Degree of
Master of Science
in Computer and Engineering Management
Assumption University

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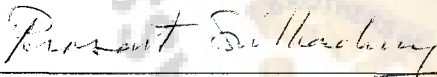
March 2003

Project Title   Web-Based Helpdesk for a Government Office

Name   Ms. Duanpen Sompholthaveekul

Project Advisor   Rear Admiral Prasart Sribhadung
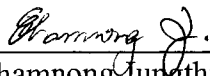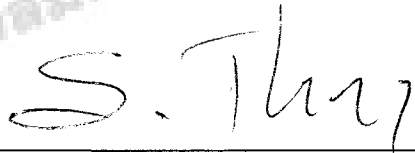
Academic Year   March 2003

The Graduate School of Assumption University has approved this final report of the six-credit course, CE 6998 – CE 6999 PROJECT, submitted in partial fulfillment of the requirements for the degree of Master of Science in Computer and Engineering Management.

Approval Committee:

_____   _____
(Rear Admiral Prasart Sribhadung)   (Prof.Dr. Srisakdi Charmonman)
Advisor   Chairman

_____   _____
(Dr. Chamnong Jungthirapanich)   (Assoc.Prof. Somchai Thayarnyong)
Dean and Co-advisor   MUA Representative

March 2003

ABSTRACT

This project is the development of a web site for an Intranet web-base application for a helpdesk in a government office. Roles and responsibilities of a helpdesk are answering calls from users and helping them to solve their problem.

This project has transformed existing helpdesk tasks which are completely manual into a web-base application by analyzing the existing system and redesigned it into a web-base system using 3 tier architecture via local area network (LAN). This report covers complete analysis and design of the web-base application using SDLC (System Development Life Cycle) technique. The analysis part includes SWOT analysis of the system which is analyzed to identify the current problems and to define the areas for improvement. Designing the proposed system covers the architecture design, database design, data flow design, web page design, network design and output design. The cost-benefit analysis includes net present value, cost of existing system, cost of proposed system and pay-back period within 1 year to help the helpdesk manager to make a decision for investing in this system.

Successful implementation of the project shows that, this accomplishment can increase the efficiency of the helpdesk task. However, the system still requires some modifications to fit the organization's changing needs and to keep the application working effectively.

ACKNOWLEDGEMENTS

The writer indebted to the following people and organizations.Without them, this thesis would not have been possible.

The writer wish to express sincere gratitude to her advisor, Rear Admiral Prasart Sribhadung, for the constructive comments and advice throughout the project development.

She would like to thank the helpdesk manager of Thai Customs Department, Khun Apichart Sritrakul for his comments and advice and also thanks helpdesk staff for using and testing the system prototype.

Special appreciation is due to her family for their fervent and continuous encouragement. Above all, she is forever grateful to her parents whose willingness to invest in her future has enabled her to achieve her educational goal.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ix

I. INTRODUCTION

1.1 Introduction

At present, the Government Office in Thailand has set up the policy to change working from a manual system to be the computerized system. By using the computer, the Government officer can reduce the complexity of their work, so they can give service to people faster than the manual system. It is very important to solve the problems that happen to any software application or any computer hardware promptly to make the computerized system working continuously and smoothly. So, the Government Office should have the helpdesk team to act as the computer care center, to receive the problems from users, analyze that problem and then, inform the solution department (contract company) which is responsible for maintening each computer set or application. Not only that, the helpdesk team must check whether the problem has been solved or not. So, all problem cases that called from user can be solved in a short time.

Helpdesk call center must have the database to keep the record of problem called from users, analyze record and record of solving data. This data is useful to the helpdesk team for checking the status of problem and finding to inform the solution department. The data can be reported to the Government Office manager to analyze and plan the future project base on the problem that happened to the computer and application of the organization.

The way to keep the record in the database is to develop the application to keep, query and report that data. Web base application is a good way of application to connect the database in web site form which can be developed as 3 tier architecture via local area network (LAN). Users, who are Government officers, Government Office manager,

solution team and helpdesk team can use the helpdesk web site anywhere by using the web browser, such as Internet Explorer in their computer.

The web base helpdesk is the project to develop web site in from Intranet web base application for Government office. It will record the problem called from users, finding data, and solving data from the solution department and then, generate the report. In conclusion, web base helpdesk will serve the helpdesk team to check and following the problems that happened to the computerized system and inform the solution department to fix problems promptly.

1.2 Objectives

(1) To apply concepts learnt in the Master of Science in Computer and Engineering Management in practice to develop the web site of computer care center.

(2) To study the problems that occur in the computerized system, the way to keep record of these problems, the form of the report and other requirements for the Government officers.

(3) To develop a web site which is the web based application for helpdesk team to serve the requirement from users.

(4) To generate report of the problems that occur for the Government Office manager.

1.3 Scope

(1)   This project will develop the web site to serve the requirements of Thai Customs Department, one of the government agencies under the Ministry of Finance.

(2)   The web site developed will include the query report function, adding record, finding (analyzing problems) record and solving record of the problems.

(3)   Each user can use this application at different levels by using their usemame to log into the web site.

(4)   Providing web site management strategies include web design, database management and security policy.

(5)   The report will cover complete analysis and design of the web base application using SDLC development life cycle.

1.4 Deliverables

Deliverables for this project will be as follows:

(1)   **The web site of web base application for Government Office.**

(2)   **The example of the report that generated from the application.**

(3)   **The final report in details covering the scope mentioned earlier.**

II. THE EXISTING SYSTEM

2.1 Background of the Organization

The Government Office is the organization which main objective is to serve people and government requirements. The Thai Customs Department, is one of the government agencies under the Ministry of Finance. Its main roles and responsibilities include:

(1)   Collection of Customs taxes and duties;

(2)   Supervision of imports and exports too ensure compliance with relevant laws and regulations;

(2) Collection of import and export taxes on behalf of other government agencies such as Value Added Tax (VAT), excise tax and municipal tax;

(3)   Prevention and suppression of smuggling, tax and duty evasion including other Customs' offences; and

(4)   Formulation of tax measures for export promotion.

In addition, the Thai Customs Department is also entrusted with the following responsibilities:

(1)   Formulation of tariff policies taken into consideration current economic situation; and

(2)   Compilation and publication of export-import statistics and other Customs-related information.

There are about 6,000 government officers in the Customs Department. About 2,500 of them work in the main office at Klong Tuey, Bangkok. Others work in each Customhouse in regional areas.

2.2 Existing Business Function

The Thai Customs Departments is presently organized into three groups:

Group 1 is responsible for general supports and services which are not responsible by Offices/Bureaus of Group 2 and Group 3. Office of the Secretary, Finance Division, Human Resources Management Bureau and Internal Audit Unit are in this group.

Group 2 is responsible for foreign affairs, tax policies and performance evaluation, standard criteria for Customs procedures, development of information technology, and tariff reductions/exemptions. The Information Technology Bureau is in this group.

Group 3 is responsible for Customs clearance procedures, tax and duty collection, import and export inspection, promotion of export, and investigation and suppression of Customs offences both in Bangkok and regional areas.

The Organization's characteristic of the Thai Customs Department is divided in to Bureau, Division, Group and Section which can be easy to manage.

The Organization chart Figure 2.1, is the main Organization chart of the Thai Customs Department which has 4 main departments:

(1) The first department covers Regional Customs Office 1 which concerns with the customs house in central and in the East of Thailand. Other bureaus which are covered by this department are Bangkok Customs, Human Resources Management, Finance Division and Lam Cha Bang Port Bureau.

(2) The second department covers Investigation and Suppression, Legal Affairs, Duty Refund, Customs Privilege, Customs Standard and Customs Tariff Bureau.

(3) The third department covers Bangkok International Airport Customs, Office of Customs Counsellor, Policy and Planning and Regional Office 4 Bureau which concerns the customs house in the South of Thailand.

(4) The last department covers Regional Office 2 and 3 which are the customs houses in the East-West and in the North of Thailand. Other Bureaus are Bangkok Port, Goods Analysis Standard and Information Technology and Communication Bureau.

For the Information Technology and Communication Bureau is shown in Figure 2.2. Information Technology Bureau is divided to 3 groups:

(1) Group of System Development and Planning division which covers Technology Planning and System Application Planning. System Application of the Thai Customs Department is divided into 2 groups which are HCE Application and DCE Application.

(2) Group of Information Service division which has the Data Center group and EDI (Electronics Data Interchange) group.

(3) Operation and Network Communication division which has 3 main group. Network Communication group for planning and controlling network system for Customs Department, System and Security for control of the security in the computer system and the last group, System Hardware group which controls all computers in the Customs Department.

Helpdesk Service is in the System Hardware Group of the Information Technology and Communication Bureau. The Helpdesk Organization comprises of:

(1)   Helpdesk Manager

   The one who manages all helpdesk tasks and report to the IT Department Manager.

(2)   Helpdesk Staffs

   (a)   Operators

   Helpdesk operators are the people who answer the phone calls, record calls, analyze problems and inform the problems which cannot be solved by themselves to other solution team. There are 10 operators for answering calls from users (Government Officers, Exporters, Importers).

   (b)   Network Team

   Responsible for checking the network communication and inform the solution team when it has the problem.

   (c)   Application Team

   The team for answering and checking the problems that happened when using appliCations.

   (d)   General

   General Team of helpdesk service are people who have direct contact with the Customs officers and help them to operate their work.

The Administrative Organization Chart of the Thai Customs Department

Office of the Secretary

Internal Audit Unit

Central Administration

Office of the Director General

Deputy Director - General 1
- Regional Customs Office 1
- Bangkok Customs Bureau
- Human Resources Management Bureau
- Finance Division
- Lamchabang Port Bureau

Deputy Director - General 2
- Investigation and Suppression Bureau
- Legal Affairs Bureau
- Duty Refund Bureau
- Customs Procedures and Valuation Bureau
- Customs Standard Bureau
- Customs Laboratory

Deputy Director - General 3
- Bangkok International Airport Customs Bureau
- Office of Customs Counsellor Bureau
- Regional Customs Office 4
- Policy and Planning Bureau

Deputy Director - General 4
- Information Technology and Communication Bureau
- Regional Customs Office 2
- Regional Customs Office 3
- Bangkok Port Bureau
- Goods Analysis Standard Group

Figure 2.1. Organization Chart of Thai Customs Department.

8

Information Technology and Communication Bureau

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Communication Director	

Operation and Network Communication

Network Communication Group

System and Security Group

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Helpdesk Contract

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System Development

HCE Section
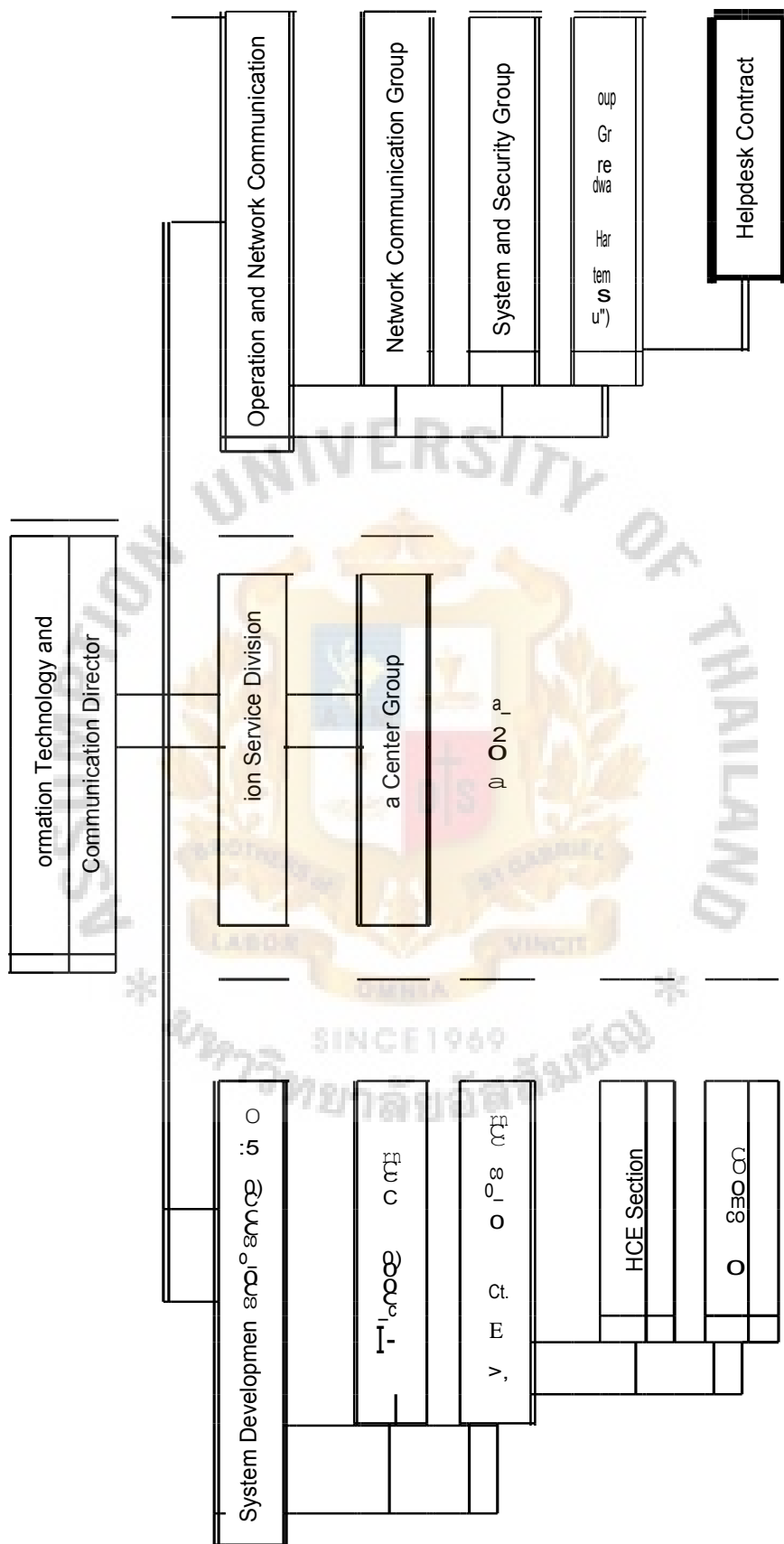
Organization Chart of Information Technology and Communication Bureau.

9

2.3 SWOT Analysis

The SWOT Analysis is to analyze about Strengths, Weaknesses, Opportunities and Threat of the system. This analysis can be summarized as follows:

2.3.1 Strength

There are many strengths in the helpdesk system. Main strength obviously found is to reduce costs of the organization. Cost of paper using, cost of telephone calling, cost of salary of helpdesk staffs are examples of costs that can be reduced. Reducing these costs make more profit to the organization.

The helpdesk system can reduce the error of communication by increasing the communication channel via web page. Not only that, this system can serve and help helpdesk staffs to solve user's problem rapidly. These reasons show that, the helpdesk system can make more efficiency in helpdesk team:

2.3.2 Weakness

It has some weaknesses in the system. The first one is cost of investment. First invested capital to develop the helpdesk system is quite high but it can gwe a return and get more benefits after using the system.

The other weakness is about network load. Because this helpdesk system will run on the existing network of the organization, it can effect the existing system. The helpdesk system has to be tested about the network load after installation to make the least effect.

The other weakness is about data. All data were kept in form of softcopy. If any error happens to the computer system, data may be lost.

2.3.3 Opportunity

To develop web base helpdesk system, to is increase the opportunity to the government officers to inform their problem via web page. For some customs departments, such as Airport Bureau, it opens 24 hours, so customs there can inform their problems all the time via the web page. This is increasing the communication channel between helpdesk staff and government officers.

2.3.4 Threat

Threat of helpdesk system is about unauthorized access. If the web page or database are accessed by unauthorized users, the data will be lost or will be stolen.

2.4 Current Problem

The current system is completely manual. The problems occur as follows:

(1)   Error of communication

(2)   Error of manual recording

(3)   Cost of paper use and phone call

(4)   Information is not update

(5)   Difficult to generate report and check problem call

2.5 Area for Improvement

The solution for improved current system is to be a computerized system. It will increase the efficiency of helpdesk performance. This area is depends on the organization budget and policy.

(1)   Speed up work processing

(2)   Reduce cost of using paper and telephone calls

(3)   Reduce error in communication

(4)   Reduce work load

(5)   Efficiency (improve quality of service)

11

2.6 Existing System

The existing system of helpdesk for the Thai Customs Department is completely manual. All users who have problems will only inform their problems to helpdesk by calling, the same as when helpdesk staff informed the problem call to a solution team, they have to use telephone calls, too_

All exchanged information will occur by using telephone calls and all transactions will be recorded on paper. Reports must be generated by helpdesk staff. To count, categorize, summarize will be done by people, not computer, so that, the existing system of helpdesk is a completely manual system as mentioned above.
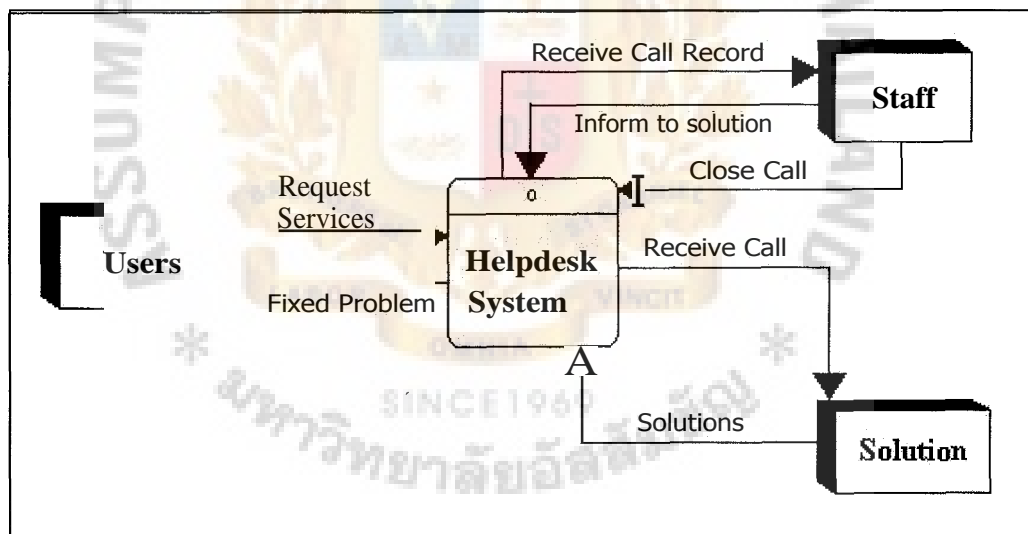
2.6.1 Context Diagram

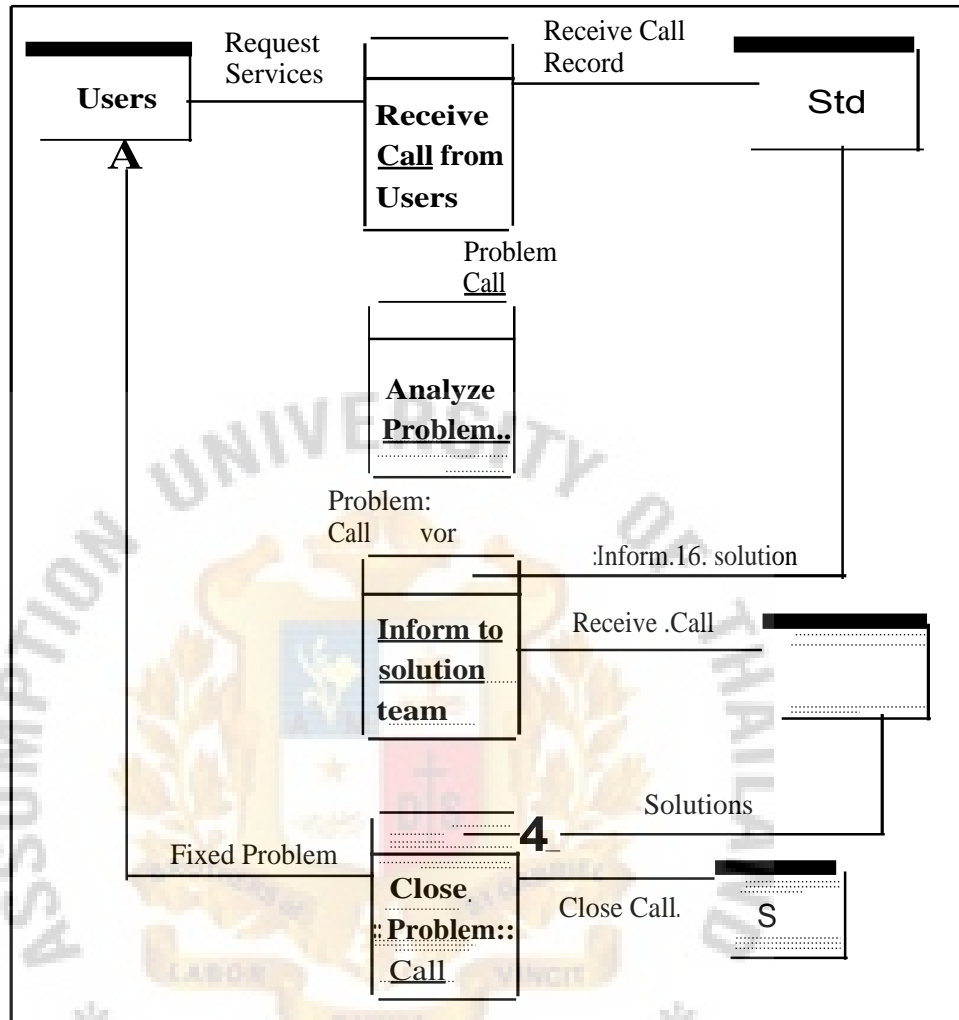Figure 2.3. Context Diagram of Existing System.

2.6.2 Data Flow Diagram

Figure 2.4. Data Flow Diagram of Existing System.

13

Ill THE PROPOSED SYSTEM

3.1 User Requirements

3.1.1 Working Process

The process of working a new system is easier than the manual system. It reduces the working complexity and will increase working efficiency.
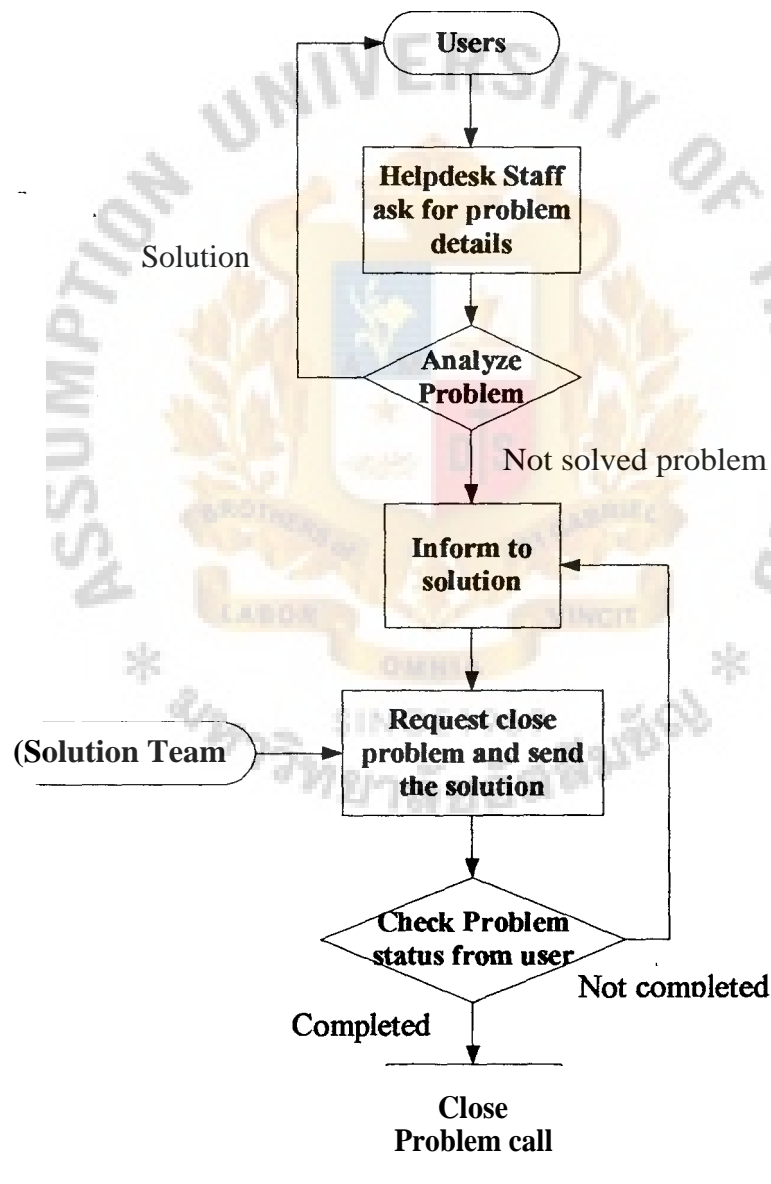

Figure 3.1. The Working Process.

3.1.2 Requirements

Others user requirements can be summarized as follows:

(1)   The new system must have the database to record all problem calls by users.

(2)   The application of the new system must be web based applications which can be used anywhere that connects to the organization's local area network (-AN).

(3)   The application must be easy to be used by users.

(4)   For the manual system, users can only inform the problem call via the telephone call. The new system allow users to inform their problem call and check their call status via the web page.

(5)   The IT manager and Helpdesk staffs would have to generate report with many different criteria via web page. The call information must be queried anytime to serve ad hoc event.

(6)   The data of any call must be updated. Database has to store current event of the call, status of the call must be correct and all users who use system at the same time must receive the same information.

(7)   The database have to be backed up as frequently as possible.

(8)   The system must have to control the level access and authorization. Different users have to access different levels.

(a) Government officers who act as IT officers have to see all problem calls where as other users could see only their informed call. All government officer users can only inform their problem via the web page, but they will not be able to update any call information.

(b) Helpdesk staffs have to see all problem calls, status updated and all current information. They would have to be able to update all the problem calls.

(c) The solution team would see only their concerned call that is informed by helpdesk staffs. They can update their solution status but would not be able to update other details of the call.

(9) Helpdesk system has to be able to use data of the inventory database system which stores the record of all computers that exist in the organization.

(10) The application must be secure and have fast response to users.

- (11) The system has to keep the access log. Every time that data update occurs, the system has to store name of users who update that data.

3.2 Context and Data Flow Diagram

The system design of helpdesk system covers context diagram, data flow diagram, architecture design, entity relationship diagram (ER-diagram), database design, web page or screen design and report and output design.

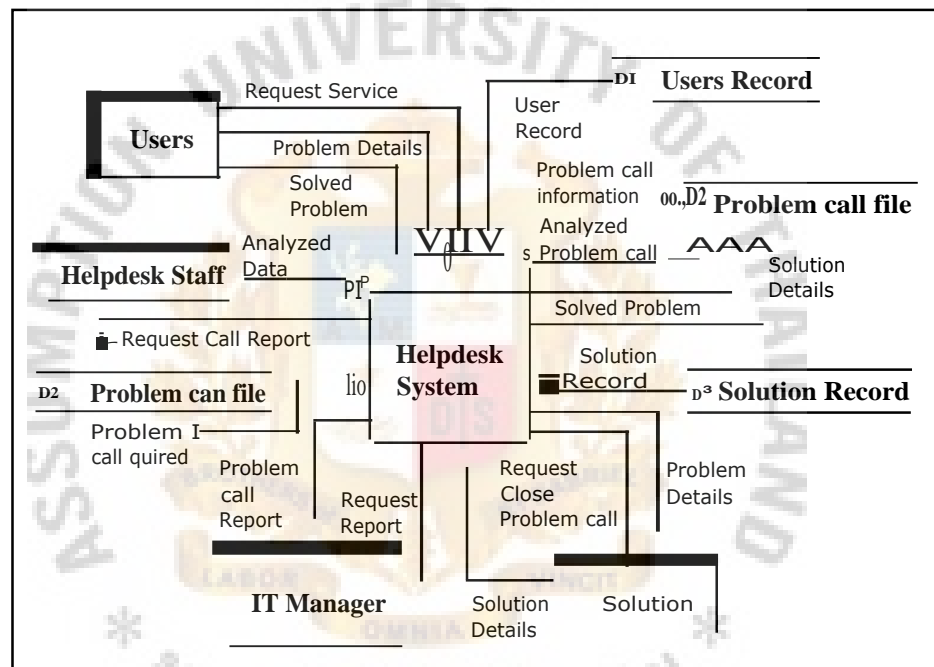The context and data flow diagram is show in Figure 3.2. and Figure 3.3.

3.2.1 Context Diagram

Figure 3.2. Context Diagram of Proposed System.
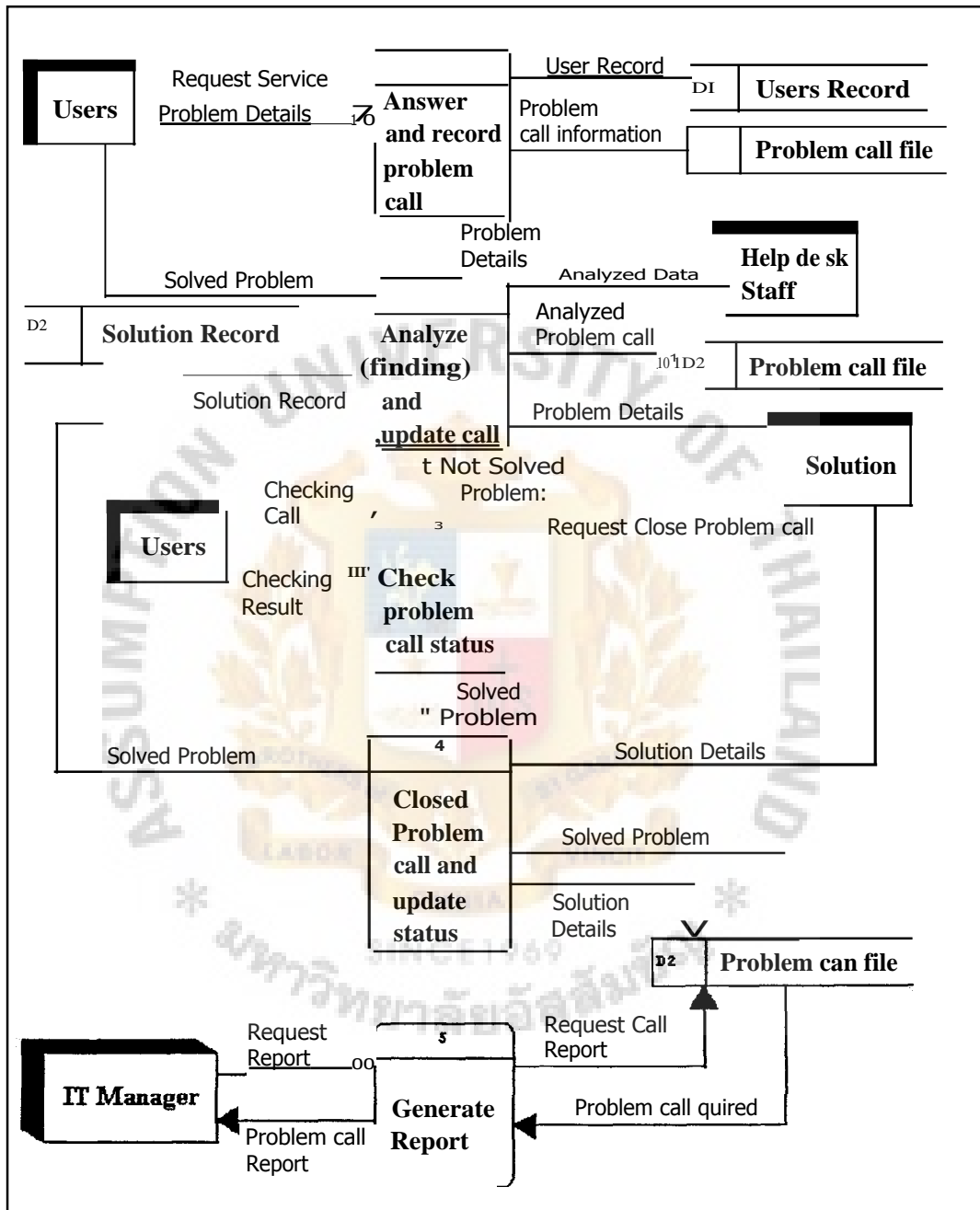
3.2.2 Data Flow Diagram

Figure 3.3. Data Flow Diagram of Proposed System.

18

3.3 Architecture Design

This system uses 3 tier architecture which divided the system into 3 parts (tiers). The advantage of using 3 tier is, if any tier has any problem, administrator can change or treat only that tier without affecting other tiers. The problem occurs in any tier will not affect others, too.
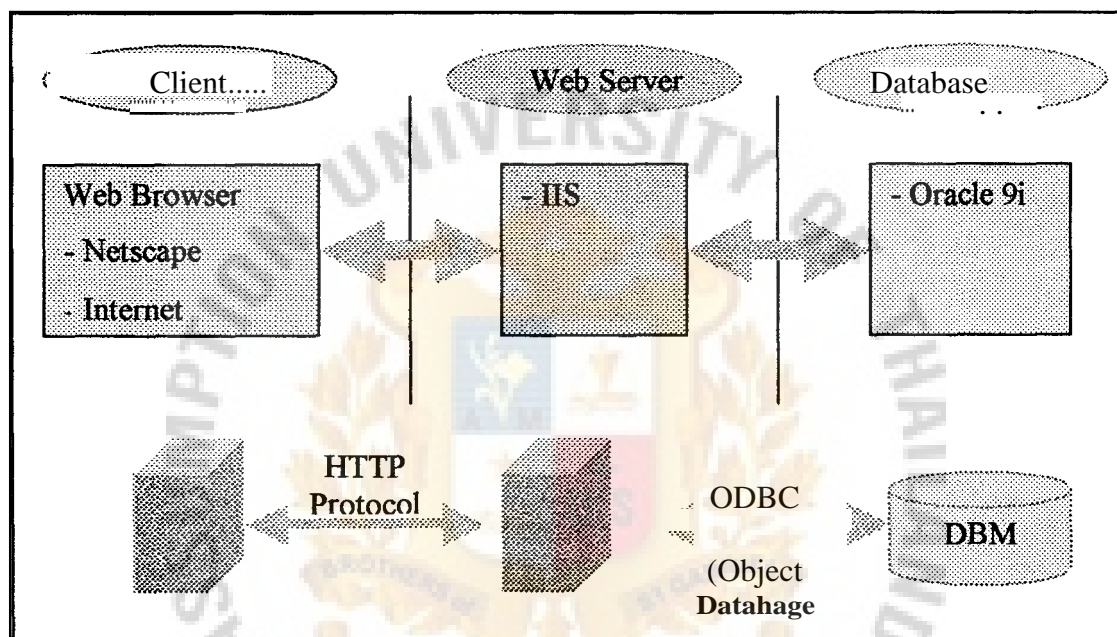

Figure 3.4. Architecture Design.

The first tier is called "Client" which is a client of the system. Computer which acted as client must have web browser such as Netscape or Internet Explorer. These web browsers can translate HTML format to be the web page screen that users can understand.

The second tier is web server. Web Server for this project is HS web server which is the web server from Microsoft. Client will send the requirement page via HTTP

19

protocol which is specified by URL. Then, web server gets this requirement and send that page to client.

The third tier is database server. Database server acts as a data storage. Web server will send the query statement via ODBC (Object Database Connectivity). Then query statement, SQL language, will be sent to DBMS (Database Management System) and database will send back the result via ODBC, too. Oracle **9i** is DBMS that was chosen for this system.

3.4 Entity Relationship Diagram (ER Diagram)

Figure 3.5. Entity Relationship Diagram.

3.5 Database Design

There are 15 tables in the database. This system uses Oracle9i to be database management system. Each field in the table covers as follows:

CHECK DATA

This table keeps record which are types of problem asking from users.

Table 3.1. CHECK DATA Table.

NAME	TYPE	REMARK	DESCRIPTION
CD ID	NUMBER(5)	NOT NULL , PK	The identity of checking data
CD FROM	VARCHAR2(30)		Company Name that call_
CD_Q	VARCHAR2(4)		Number of checking data
CD DATE	DATE		Date and time of checking data

DEPARTMENT

Department is the table that record all of department name of the organization.

Table 3.2. DEPARTMENT Table.

NAME	TYPE	REMARK	DESCRIPTION
ID	NUMBER(10)	NOT NULL , PK	The identity of department
DEPT1	VARCHAR2(90)	NOT NULL	Main department name
DEPT2	VARCHAR2(90)		Part Name
DEPT3	VARCHAR2(90)		Section Name
DEPT4	VARCHAR2(60)		Small department name
DEPTNAME	VARCHAR2(120)	NOT NULL	Short name of Dept

21

HELPDESK

This table keeps record of username and password to access into the system.

Table 3.3. HELPDESK Table.

NAME	TYPE	REMARK	DESCRIPTION
HELPID	VARCHAR2(6)	NOT NULL , PK	The identity of users
HELPNME	VARCHAR2(70)	NOT NULL	Name of users
HELPUSER	VARCHAR2(8)	NOT NULL	Username
HELPPASSWD	VARCHAR2(8)	NOT NULL	Password
AUTORIZED	VARCHAR2(1)		Authorization flag

MAILTIME

Record date and time of call which inform to the solution team by sending an e-mail.

Table 3.4. MAILT1ME Table.

NAME	TYPE	REMARK	DESCRIPTION
CALLNO	NUMBER(5)	NOT NULL , FK(MASTERCALL NO)	No. of call which sending to the solution team
MAILDATE	DATE	NOT NULL	Date and time of mail leaved from helpdesk
RCVDATE	DATE	NOT NULL	Date and time of mail from solution team that request closed call

22

PROJECT

The record of each computer project.

Table 3.5. PROJECT Table.

NAME	TYPE	REMARK	DESCRIPTION
FINDID	VARCHAR2(2)	NOT NULL , PK	The identity of each project
PROJ NAME	VARCHAR2(30)	NOT NULL	Name of computer project

OBJECT

Record the name of each computer object such as harddisk, monitor, keyboard, etc.

Table 3.6. OBJECT Table.

NAME	TYPE	REMARK	DESCRIPTION
OBJECT	VARCHAR2(20)	NOT NULL	The name of each computer object

USERS

Users table keeps **all record of government officers.**

Table 3.7. USERS Table.

NAME	TYPE	REMARK	DESCRIPTION
USRID	VARCHAR2(6)	NOT NULL, PK	The identity of government officers
USRNME	VARCHAR2(40)	NOT NULL	Name of government officers
USRLST	VARCHAR2(40)	NOT NULL	Last name of government officers

23

Table 3.7. USERS Table. (Continued)

NAME	TYPE	REMARK	DESCRIPTION
USRDEPT	NUMBER(8)	NOT NULL , FK(ID.DEPARTMENT)	Department of government officers

VAN

Record of VAN users who calls to asking for some government data from helpdesk.

Table 3.8. VAN Table.

NAME	TYPE	REMARK	DESCRIPTION
VAN ID	VARCHAR2(4)	NOT NULL , PK	The identity of VAN users
VAN NAME	VARCHAR2(20)	NOT NULL	Name of VAN company
HD NAME	VARCHAR2(40)	NOT NULL	Name of VAN users
VAN TEL	VARCHAR2(40)		Contact telephone number
VAN FAX	VARCHAR2(15)		Fax number

SOLUTION

Record the name of solution team.

Table 3.9. SOLUTION Table.

NAME	TYPE	REMARK	DESCRIPTION
SOLID	**VARCHAR2(6)**	**NOT NULL , PK**	The identity of the solution
SOL NAME	VARCHAR2(80)	NOT NULL	Name of solution
SOL DEPT	VARCHAR2(16)	NOT NULL	Company or department of the solution

Table 3.9. SOLUTION Table. (Continued)

NAME	TYPE	REMARK	DESCRIPTION
SOL_TEL	VARCHAR2(20)		Contact telephone number
SOL_EMAIL	VARCHAR2(40)		E-mail address of the solution

HI) MEMBER

Keep the record of helpdesk member and their responsibilities.

Table 3.10. HD MEMBER Table.

NAME	TYPE	REMARK	DESCRIPTION
HELD	VARCHAR2(6)	NOT NULL , FK(HELPID.HELPDESK)	The identity of users (helpdesk)
HD DEPT	VARCHAR2(15)	NOT NULL	Type of the helpdesk member

MASTER

This table is the main table which record all problem calls. The number of each call will be run as running number from the program. The details of all call will be recorded and can be queried from this table.

Table 3.11. MASTER Table.

NAME	TYPE	REMARK	DESCRIPTION
CALLNO	NUMBER(5)	NOT NULL, PK	The identity number of call

Table 3.11. MASTER Table. (Continued)

NAME	TYPE	REMARK	DESCRIPTION
CALLDATE	DATE	NOT NULL	Date and time of call when recorded
USERID	VARCHAR2(6)	NOT NULL, FK(USRID.USERS)	The ID of users who inform the call
CUSTNAME	VARCHAR2(80)	NOT NULL	Name of users who inform the call
DEPTCODE	NUMBER(8)	NOT NULL, FK (ID.DEPARTMENT) -	Department code of users who inform the call
DEPTBRF	VARCHAR2(20)		Remark of department
TEL	VARCHAR2(30)		Contact telephone number of users
PLACE	VARCHAR2(6)		Description of place or position that the problem occur
PROBDESC	VARCHAR2 (1000)	NOT NULL	Description of the problem
PROBTYPE	VARCHAR2(20)		Problem type such as HARDWARE, SOFTWARE, etc.

Table 3.11. MASTER Table. (Continued)

NAME	TYPE	REMARK	DESCRIPTION
COMPLETE	CHAR(1)	NOT NULL	Status of the problem (Complete or Not complete)
OBJECT	VARCHAR2(35)	FK(OBJECT.OBJECT)	Name of computer object that problem occur such as HARDDISK, MONITOR, etc.
SERIAL	VARCHAR2(30)		Serial number of the computer that has the problem
FINDID	VARCHAR2(30)		Sticker number of the computer that has the problem
URGENT	CHAR(1)	NOT NULL	Urgently status of the problem call (Yes or No)
HELPDSK	VARCHAR2(30)	NOT NULL, FK (HELPID.HELPDESK)	Name of helpdesk staff who receive and record the call
IP CLIENT	VARCHAR2 (500)	NOT NULL	IP Address of users
SENTDTE	DATE		Date and time of the problem call

Table 3.11. MASTER Table. (Continued)

NAME	TYPE	REMARK	DESCRIPTION
SOLID	VARCHAR2(6)	FK (SOL _ID.SOLUTION)	ID of solution who solve the problem
SOLTEL	VARCHAR2(20)		Contact telephone number of solution
COPER	VARCHAR2(70)		Name of co-operation
CAUSE	VARCHAR2 (1000)		Cause of problem
OLVEDATE	DATE		Date and time when solution start solving problem
FINDATE	DATE		Date and time when solution finish solving problem
SOLUTION	VARCHAR2 (1000)		Description of the solution
CLOSENAME	VARCHAR2(8)		Name of helpdesk staff who closed the problem call

SOLVE

This table record the action of helpdesk staff and solution team which concern with the problem.

Table 3.12. SOLVE Table.

NAME	TYPE	REMARK	DESCRIPTION
CALLNO	NUMBER(5)	NOT NULL, FK (CALLNO.MASTER)	Number of problem action
SF DATE	DATE	NOT NULL	Date and time of the record of the problem action
CONTENT	VARCHAR2(1000)	NOT NULL	Description of action case
TYPE	CHAR(1)	NOT NULL	Solution or analyzing (finding) action (S : Solution , F: Finding)
USER ADD	VARCHAR2(70)	NOT NULL	Short name of department

HD PROFILE

Record profile of the helpdesk staff. Profile is about the action of their work.

Table 3.13. HD PROFILE Table.

NAME	TYPE	REMARK	DESCRIPTION
HD NO	NUMBER(6)	NOT NULL, PK	Profile list number

Table 3.13. HD PROFILE Table. (Continued)

NAME	TYPE	REMARK	DESCRIPTION
HD ID	VARCHAR2(6)	NOT NULL, FK (HD _ID.HDM EMBER)	ID of the helpdesk staff
PROFILE DATE	DATE	NOT NULL	Date and time of the profile
PROFILE DETAIL	VARCHAR2 (3000)	NOT NULL	Description of the profile

HD TITLE

The title of the question and answer of the problem that record from helpdesk staff to serve government officer users.

Table 3.14. HD TITLE Table.

NAME	TYPE	REMARK	DESCRIPTION
CODE	VARCHAR2(6)	NOT NULL , PK	The identity of each question
OWNER	VARCHAR2(75)	NOT NULL, FK (IID _1:13.11D MEMBER)	ID of the helpdesk staff
DATE	DATE	NOT NULL	Date and time of each question that helpdesk staff record
HEADER	VARCHAR2(750)	NOT NULL	Header of the question

3.6 Web Page Design

3.6.1 Web Page Hierarchy

Web page hierarchy can be shown as follows:
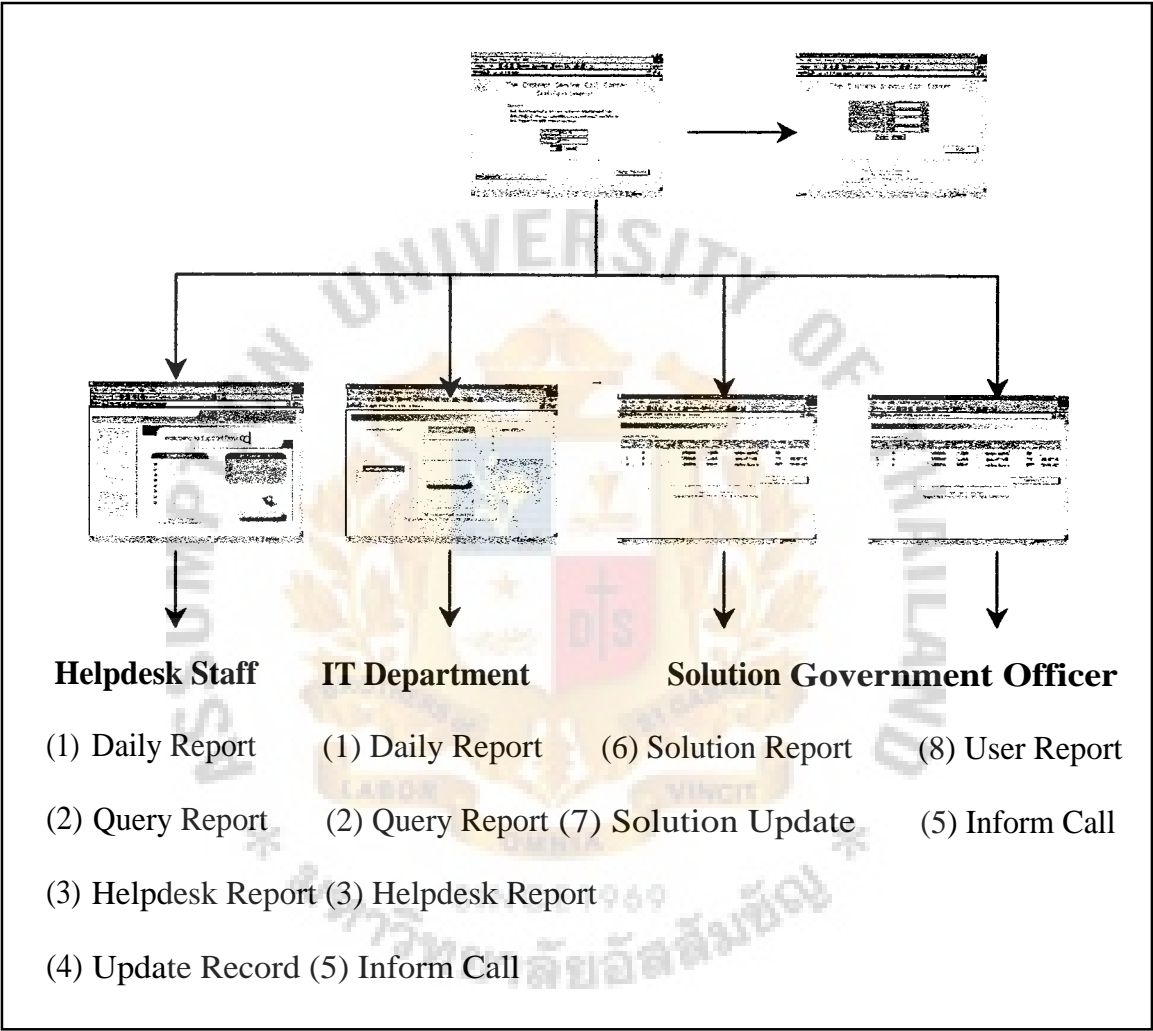
Figure 3.6. Screen Hierarchy.

The web page hierarchy can be divided into 4 main groups of users which are:

(1)   Screen group for helpdesk staffs

(2)   Screen group for IT department officers

(3)   Screen group for solution teams

(4)   Screen group for government officers

These screens can be accessed by username of each user from the main page which is in login screen.

Helpdesk Staff

Helpdesk staff must have the authorization to:

(1)   Query daily report to display the problem call each day using various condition of queries.

(2)   Summarize problem calls in terms of monthly report.

(3)   Record the task that helpdesk staff has done in each day.

(4)   Record all call problems, record analyzed data and closed problem calls.
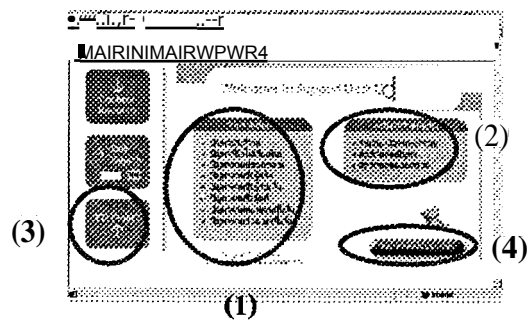
(1) Daily Report
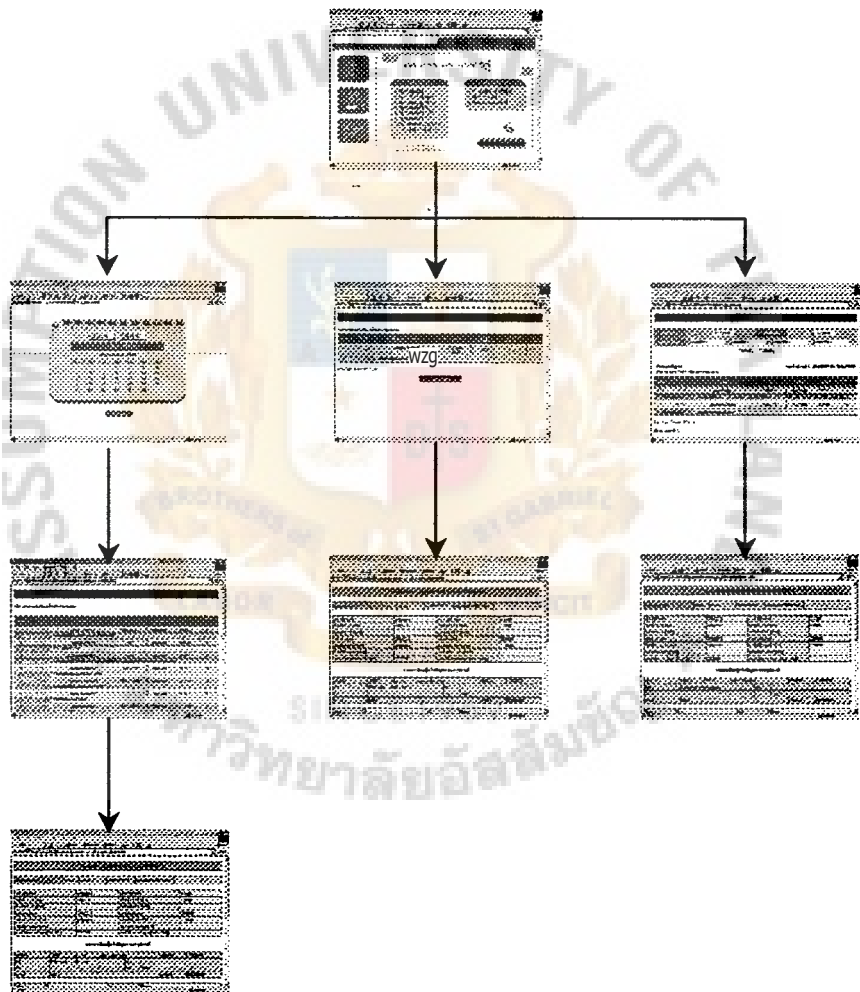
Figure 3.7. Daily Report Hierarchy.

(2) Query Report
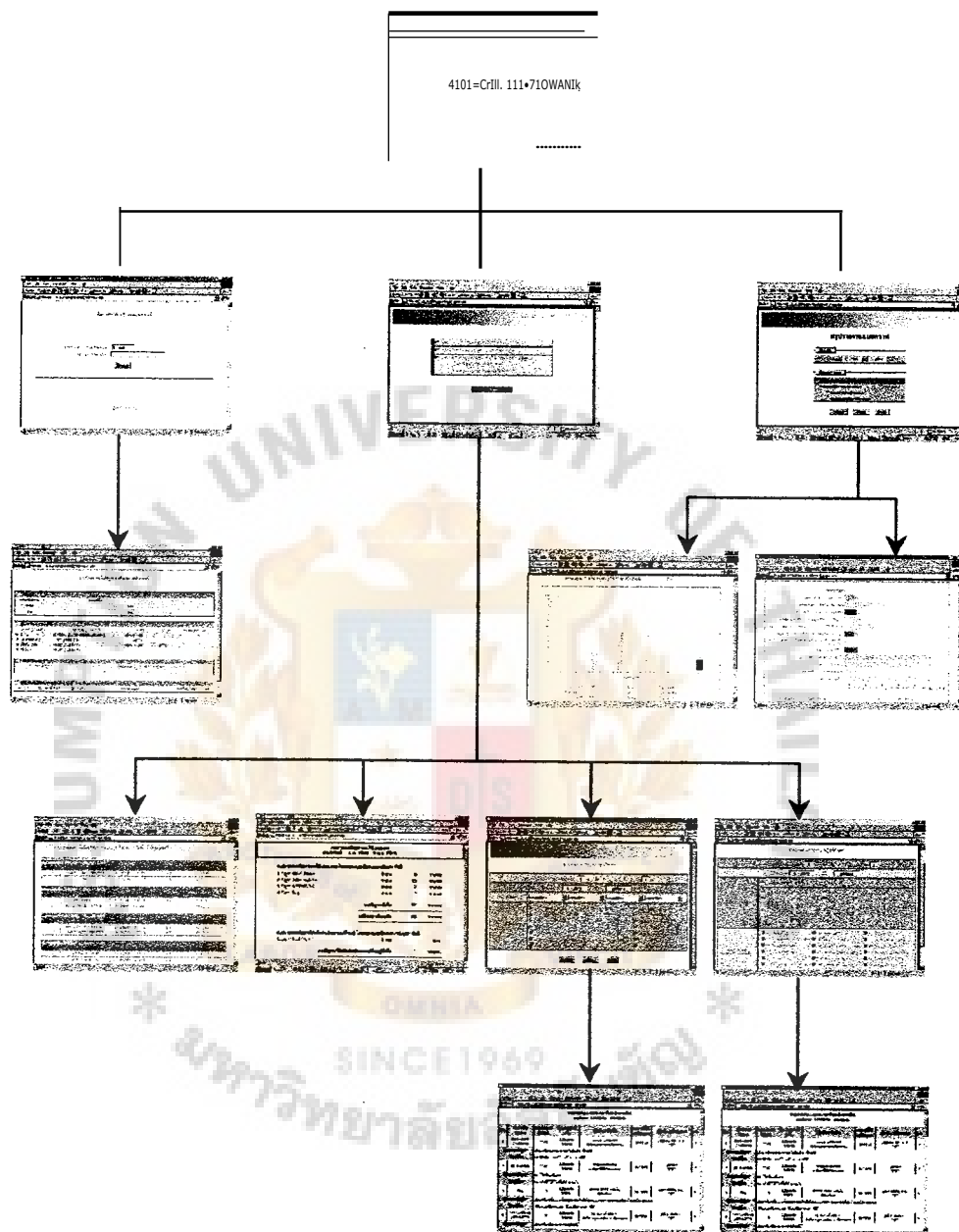
Figure 3.8. Query Report Heirarchy.

(3) Helpdesk Report
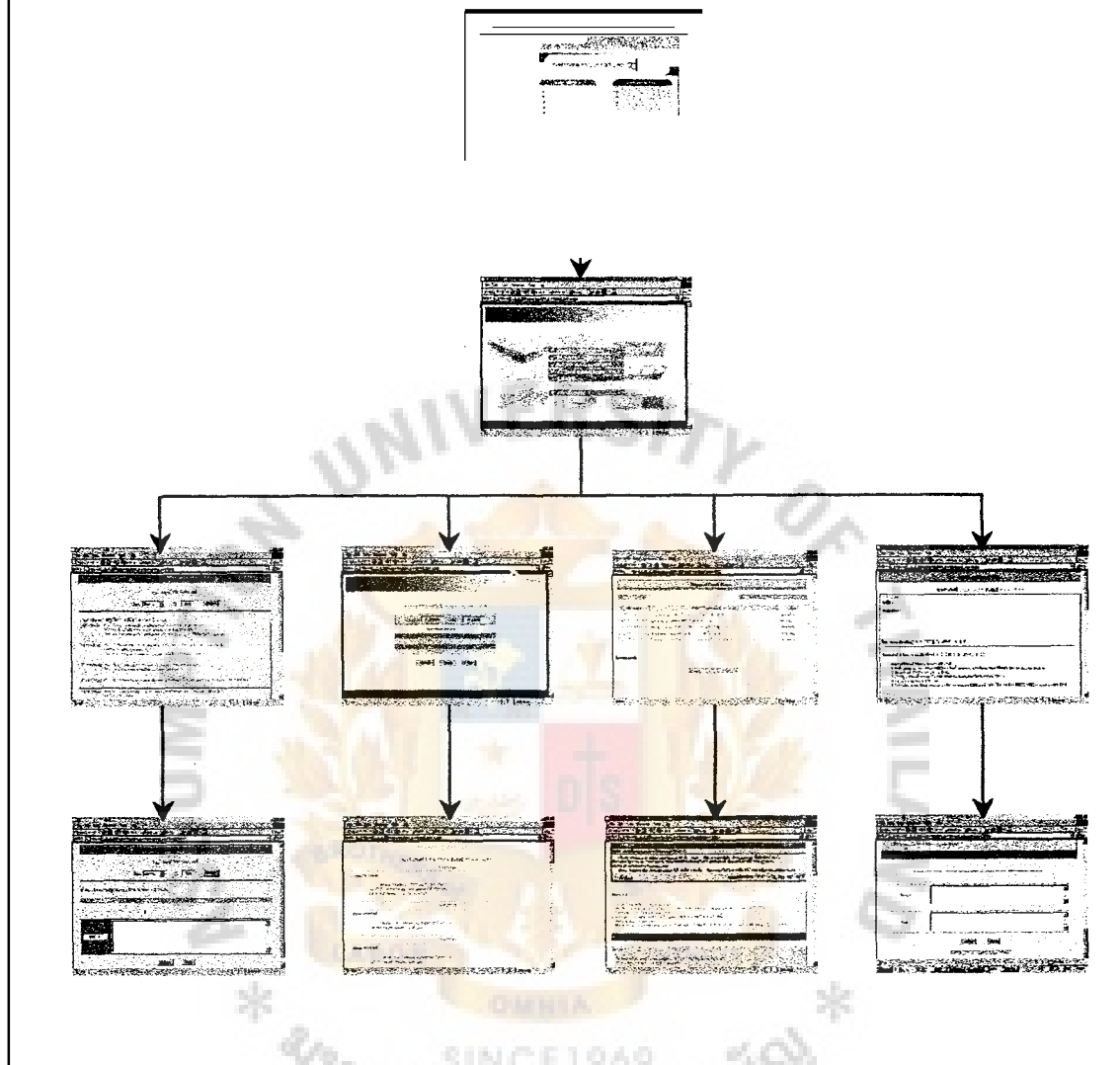
Figure 3.9. Helpdesk Report Hierarchy.

(4)   Update Record
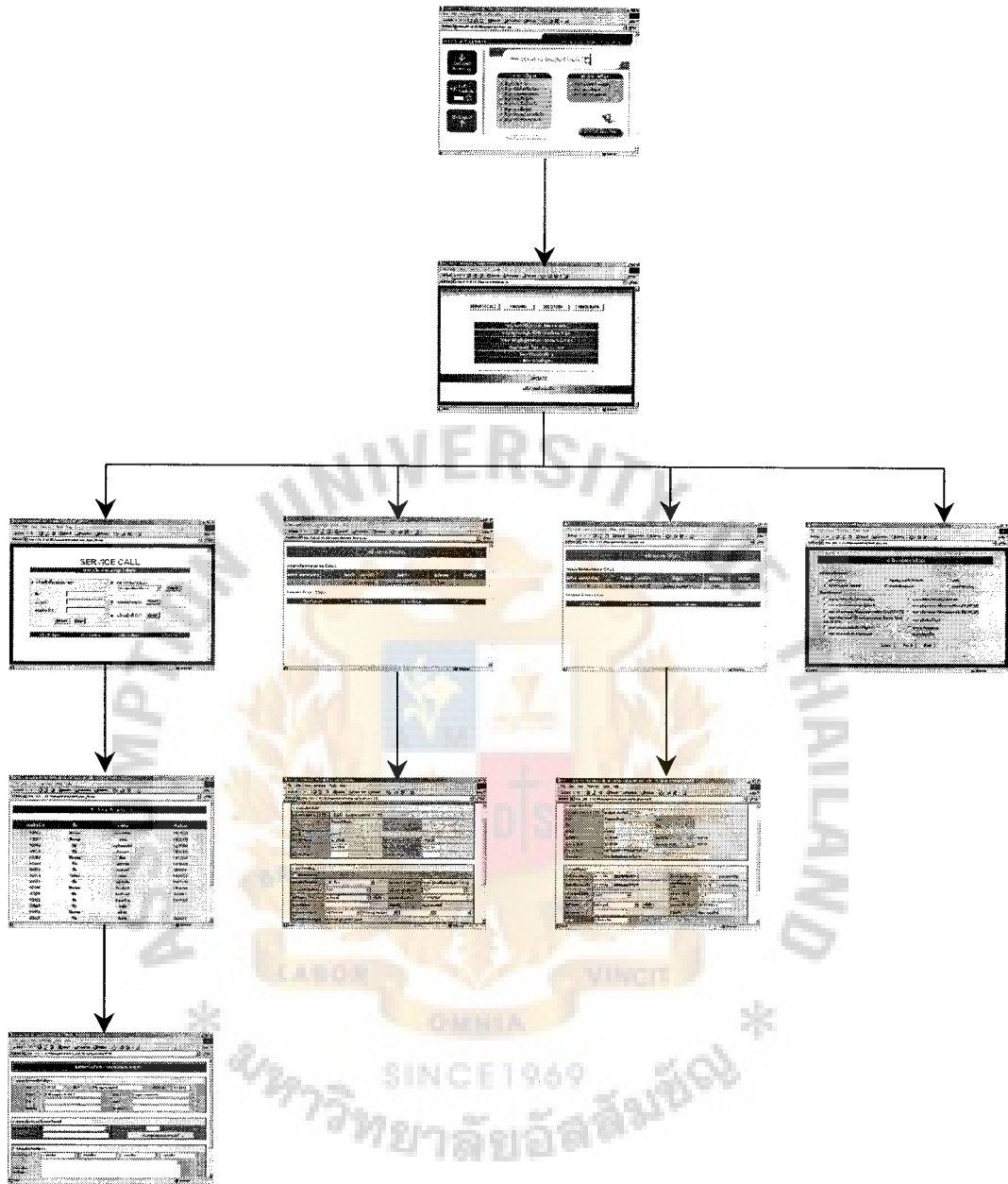
Figure 3.10. Update Record Hierarchy.

37

IT Department

For Information Technology Department officers, there are 4 main functions which has the authorizations to be done.

Page group number (1), (2) and (3) are in the same group as helpdesk staffs. IT officers can query and see all problem calls records both daily and monthly. The working report of helpdesk staff can be seen by IT officers, but they can not update any record.

There is another page group, number (5), that IT officers can access. It is to inform the problem call to helpdesk staff via the web site.
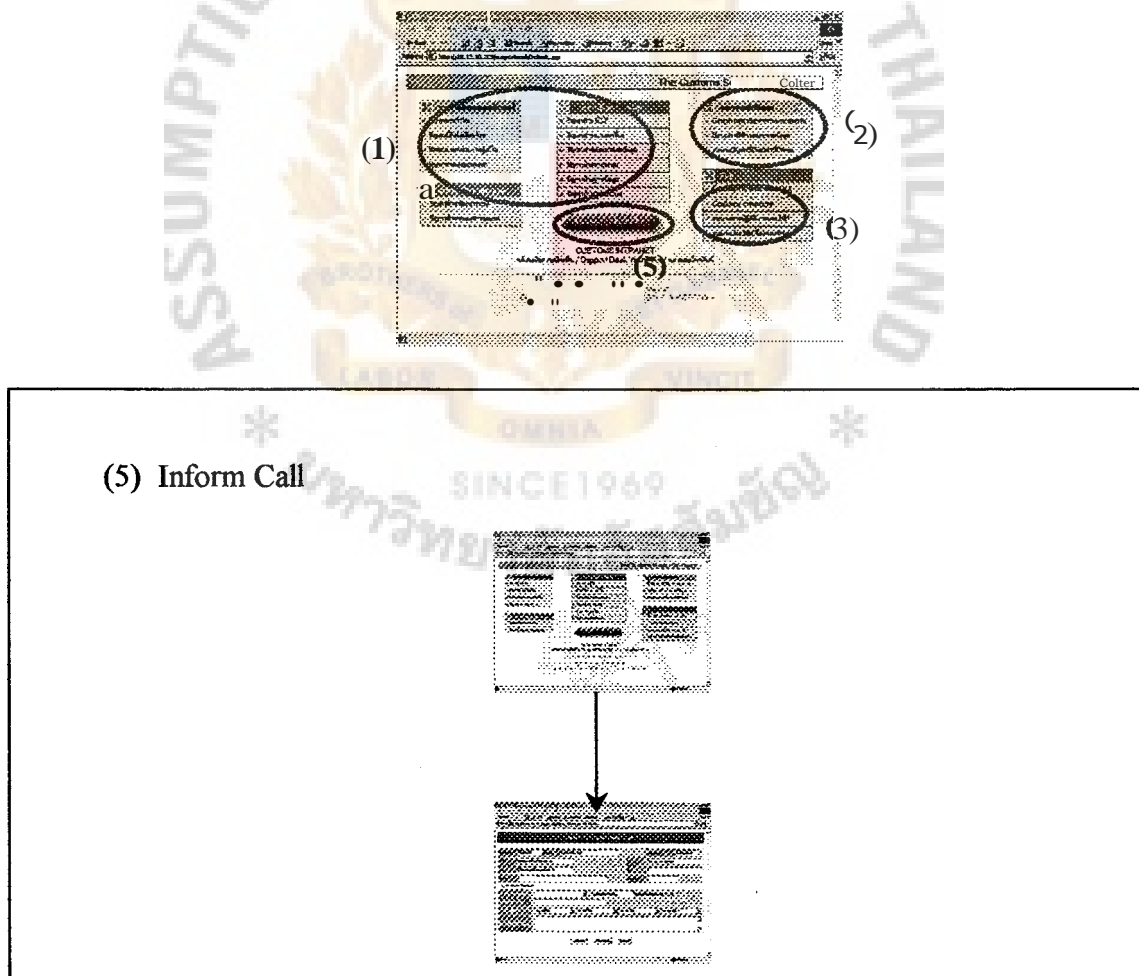
Figure 3.11. Inform Call Hierarchy.

Solution Team

The authorization for solution team is not the same as the page group of others. There are 2 functions for solution team, using page group number (6) and (7).

(6)   It is the solution report. Solution team can query their problem call on their page. Each solution team can query only problem call which is in their responsibility.

(7)   These page groups are for updating the problem call records. Solution team will record their information when they solve the problem via these screens.

(7)   (6)
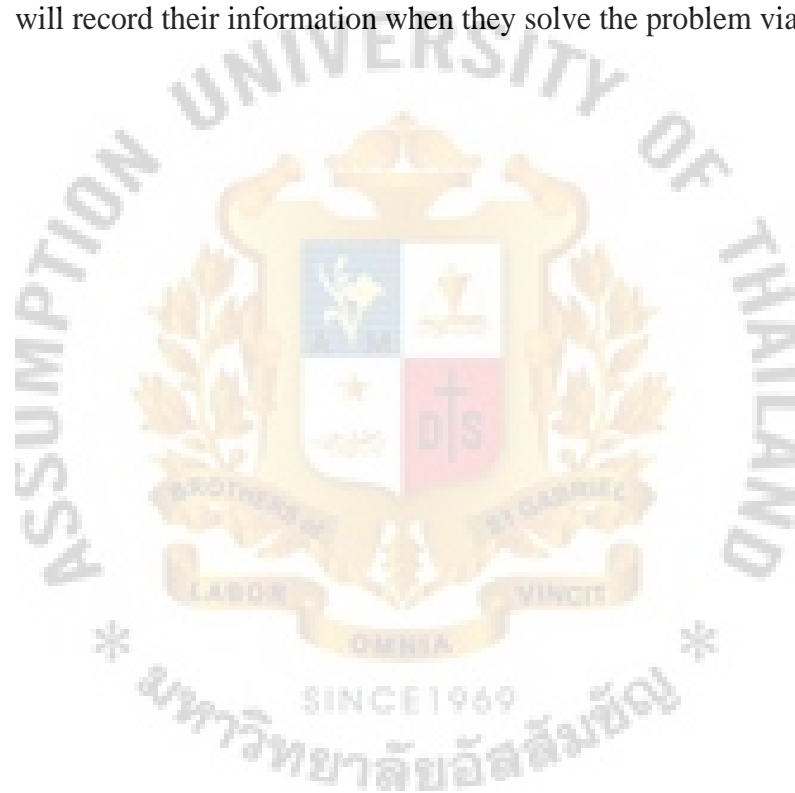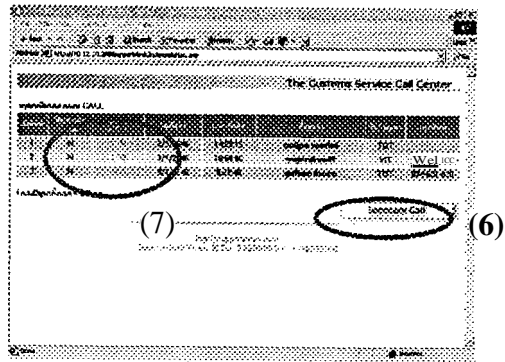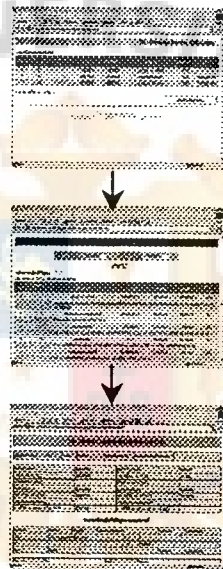
(6) Solution Report

Figure 3.12. Solution Report Hierarchy.
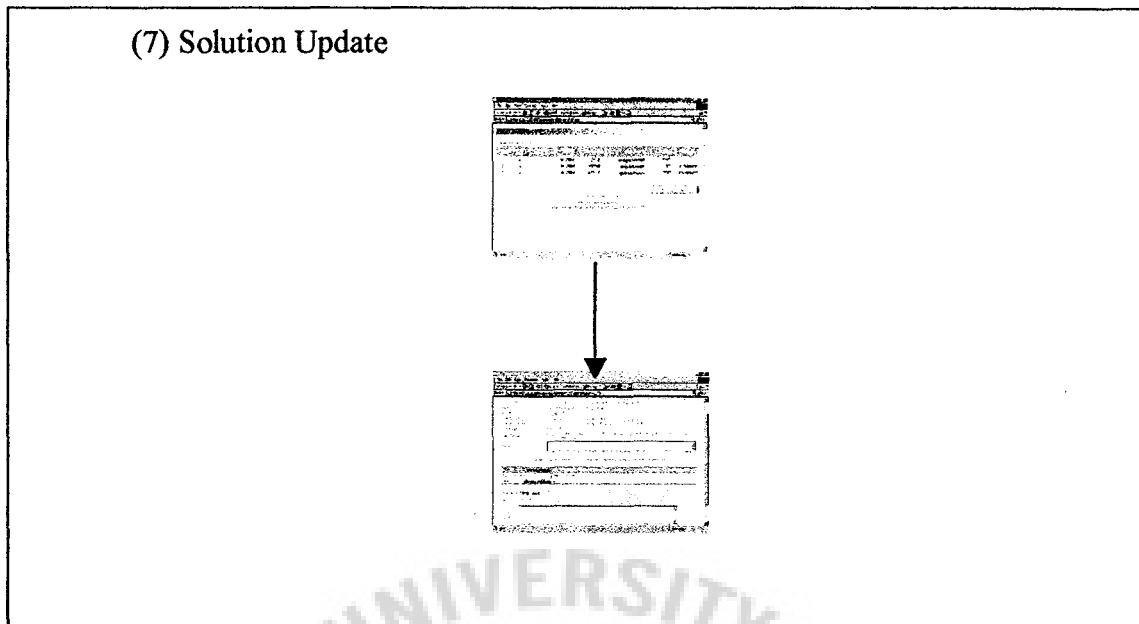
(7) Solution Update

Figure 3.13. Solution Update Hierarchy.

3.6.2 Web Page Design

To design the web page, this project groups the screen page into 4 main groups as mentioned above. Following this will be the web page screen of helpdesk system.

Figure 3.14 is login page of helpdesk system. It is a first page access of the system. User has to input their username and password. The system will check and verify that username and password and then, display next page to user according to user's authorization.

User can change password by themselves via a changed password screen, shown in Figure 3.15.

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The Customs Service Call Center
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*n6u Support Desk 11'115 Username treifitnlivet

Username: admin01
Password:

Login   Cancel

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Figure 3.14. Login Page.

The Customs Service Cali Center

Username:
Password:
New Password:
Confirm New Password:

Submit   Cancel

BACK

The Cuebems Thai Government
Bangkok Thailand
Tel : 0-2350-1000-9 , 0-2667-7310-9

Done   Internet

Figure 3.15. Change Password Page.

Helpdesk Staff

Figure 3.16. Helpdesk Staff Index.

This page is the first page for helpdesk staff after login to the web site. This page shows all menu that must be used by helpdesk staff.

When user clicks the menu to query daily report, the system will show pages as in Figure 3.17, Figure 3.18, Figure 3.19, Figure 3.20, Figure 3.21.

Figure 3.17. Calender.

Figure 3.18. Daily Report List.

Figure 3.19. Problem Call Detail.

Figure 3.20. Uncompleted Call List.

45
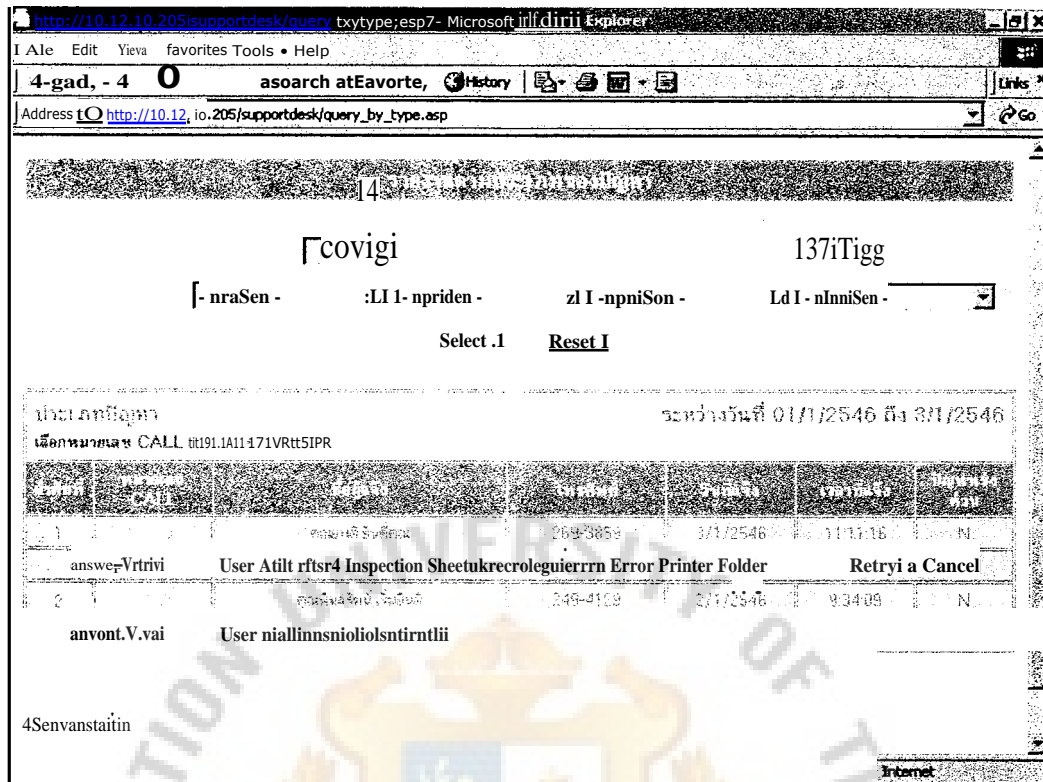
Figure 3.21. Daily Report by Problem Type.

Helpdesk staff can query the history of problem call which user had informed helpdesk by using sticker number of the computer. The screen is displayed in Figure 3.22 and Figure 3.23.

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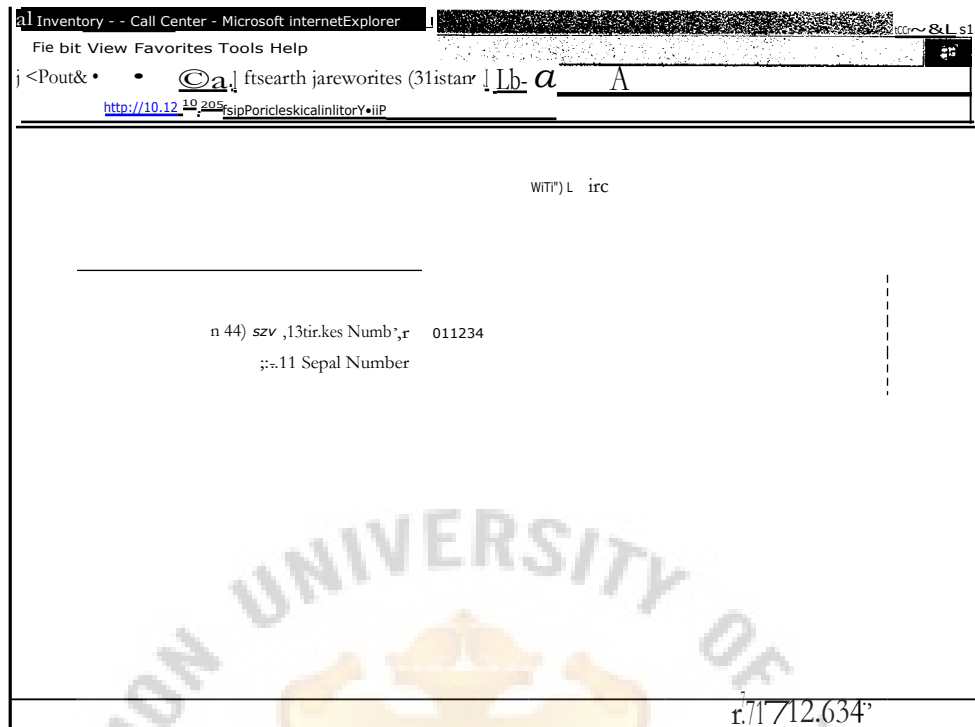
Figure 3.22. Form Searching History Call.

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	K4001 /UNISYS		494559030	011236	
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Figure 3.23. History Call.

Helpdesk staff can access the monthly report page of helpdesk system, too. The screen which displays monthly report can be shown as follows:
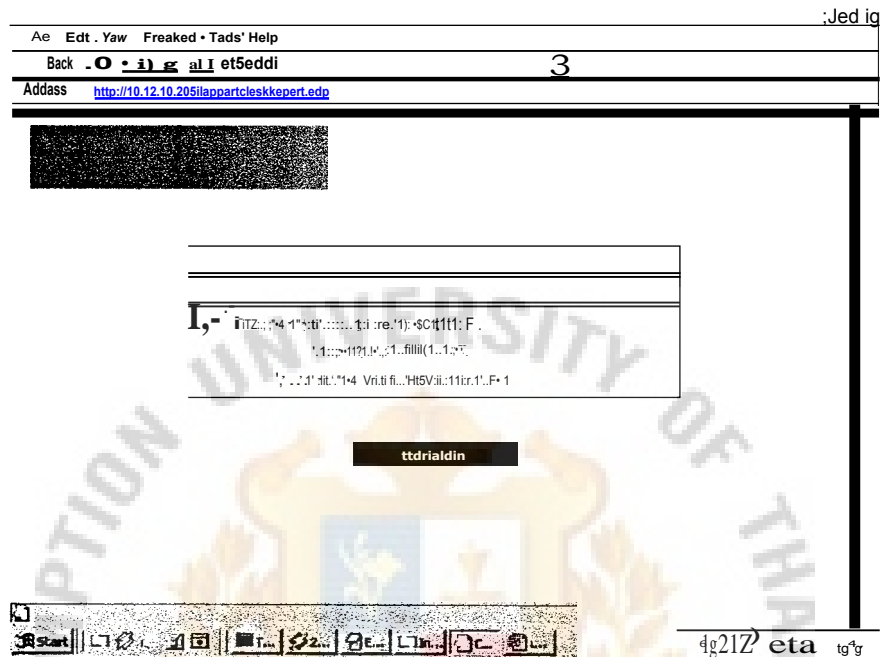
Figure 3.24. Menu of Monthly Report.

Figure 3.25. Exceed Call Report.

Figure 3.26. Summary Call Report.
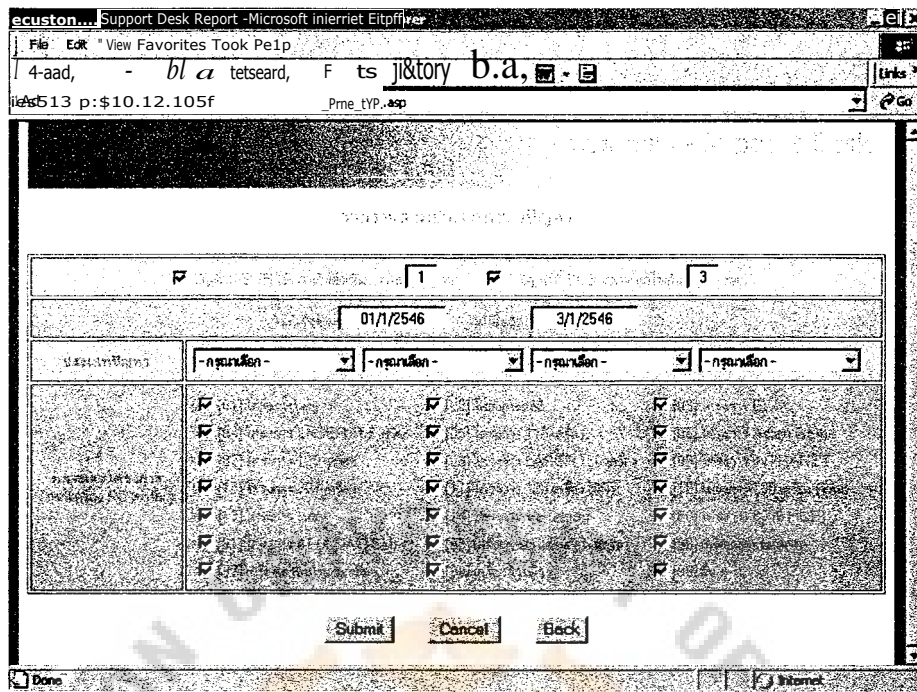
Figure 3.27. Query Monthly Report by Problem Call.
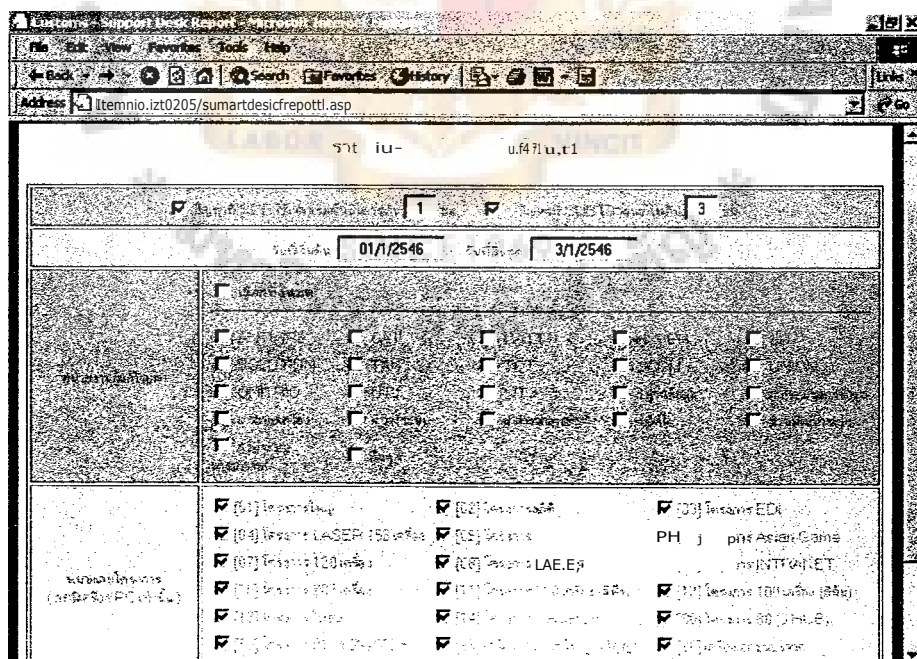
Figure 3.28. Query Monthly Report by Solution Team.

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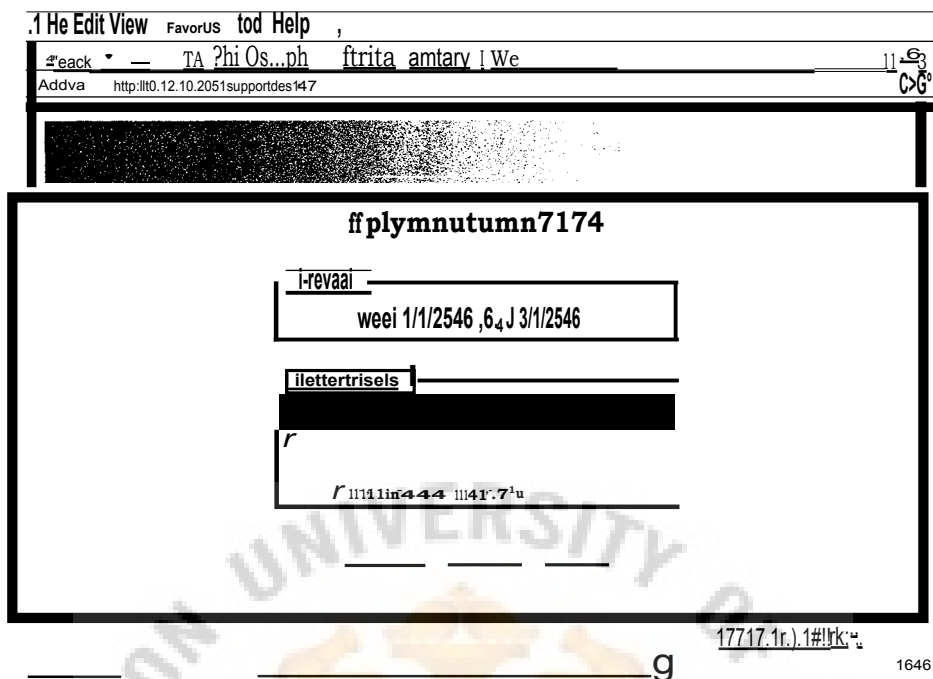
Figure 3.29. Query Monthly Report by Graph.

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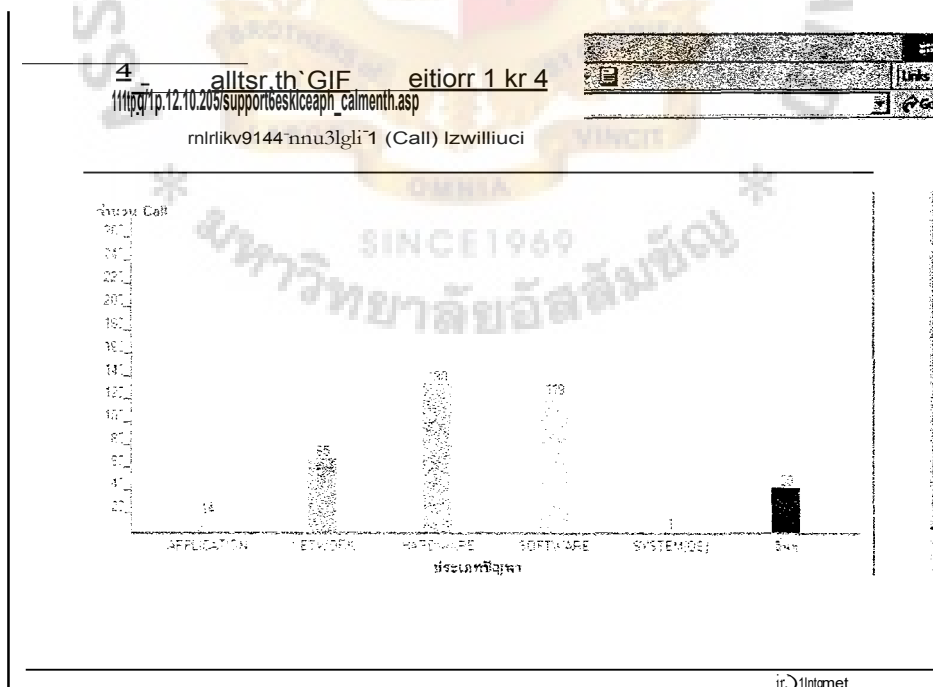
Figure 3.30. Graph Report by Problem Type.
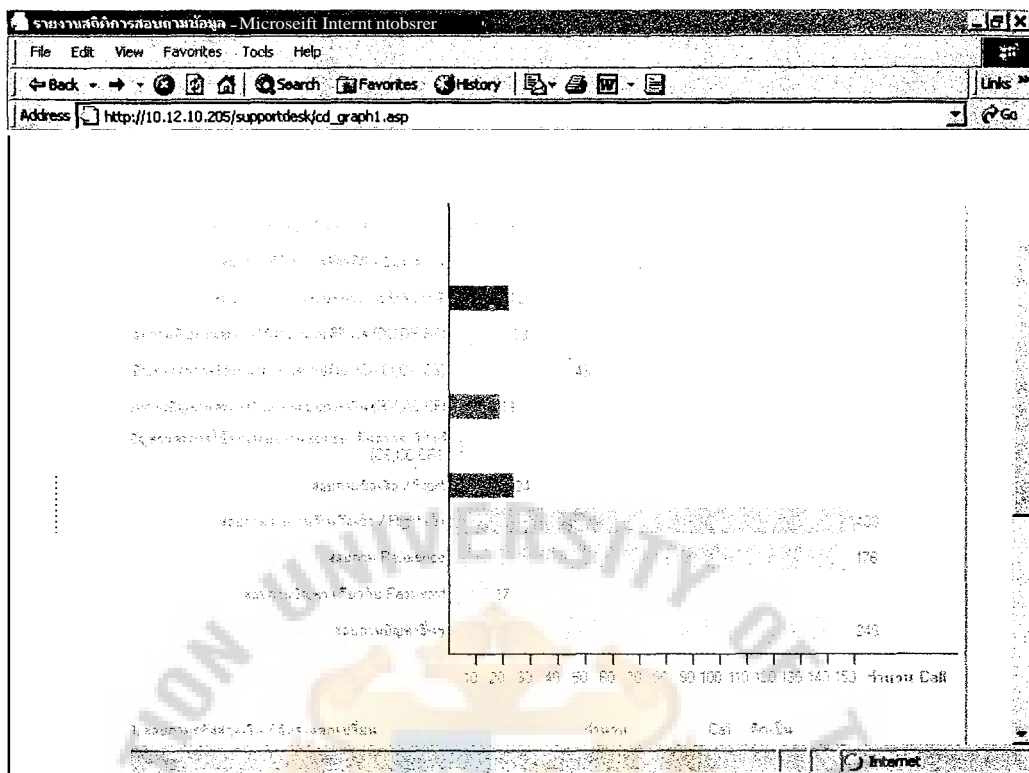
Figure 3.31. Graph Report by Asked Problem.

The most important task of helpdesk staff is to record, analyze and close problem calls from user. Figure 3.32 is the menu page of recorded call data.

Figure 3.32. Menu of Record Problem Call.

Figure 3.33 to Figure 3.36 show pages of adding call function.

Figure 3.33. Select User Information.

Figure 3.34. List of Users.

Figure 3.35. Form Add Problem Call.

Figure 3.35. Form Add Problem Call. (Continued)

Figure 3.37 to Figure 3.39 display pages of analyzed call functions. The list in

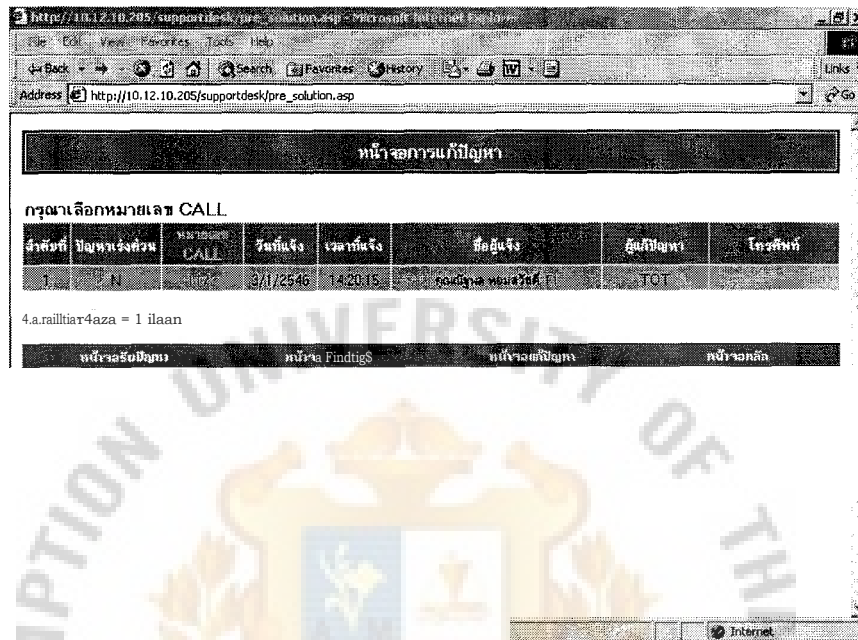Figure 3.37 only display calls that have not been closed.

Figure 3.36. List of Uncompleted Call for Analyze.

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Figure 3.37. Form of Analyze Problem.

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[Submit]   [Cancel]   [Back]

Figure 3.37. Form of Analyze Problem. (Continued)

58

The same as analyzed function. List of calls in Figure 3.40 is uncompleted calls

for closed problem calls.

Figure 3.38. List of Uncompleted Call for Close.

Figure 3.39. Form of Closed Problem.

Figure 3.40. Form of Causeing Problem.

60

Another screen of recording call is a form to add the call that is just only asking for information, not a problem call. A form is shown in Figure 3.43.

Figure 3.41. Form of Adding Asking Information.

The last menu page that helpdesk has responsibility to do is Helpdesk Report. Helpdesk report will cover all be helpdesk tasks that are done by helpdesk staff. The screen which shows helpdesk report can displayed as follows:

Figure 3.42. Menu of Helpdesk Report.

Figure 3.43. Helpdesk Task Daily.
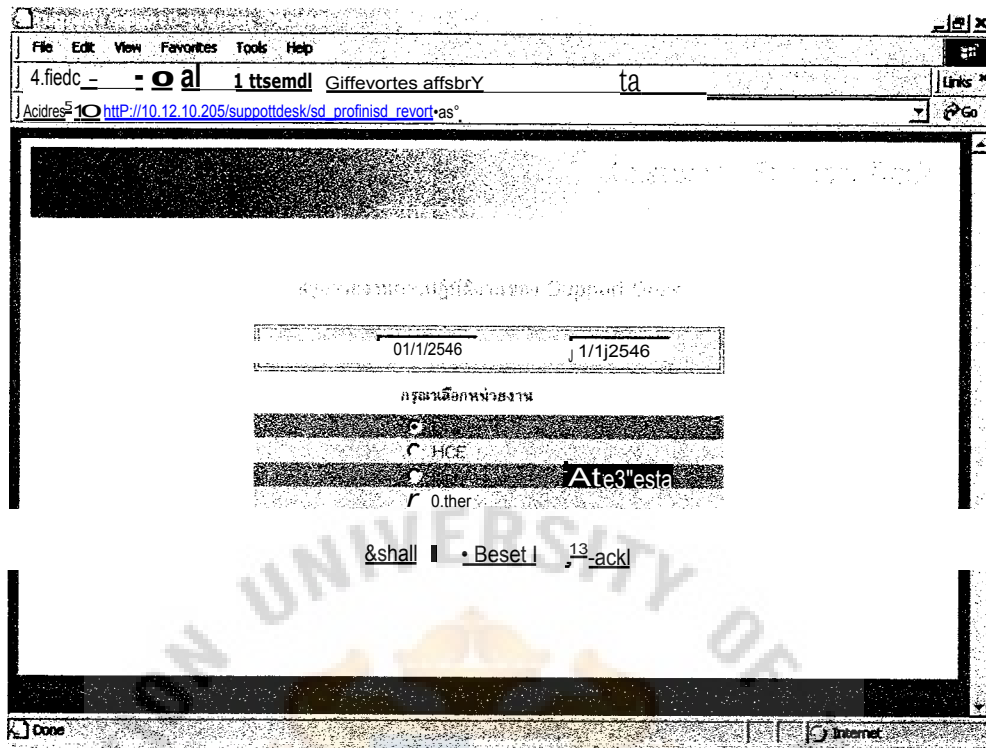

Figure 3.44. Record Helpdesk Task.

Figure 3.45. Query Summary of Helpdesk Task.
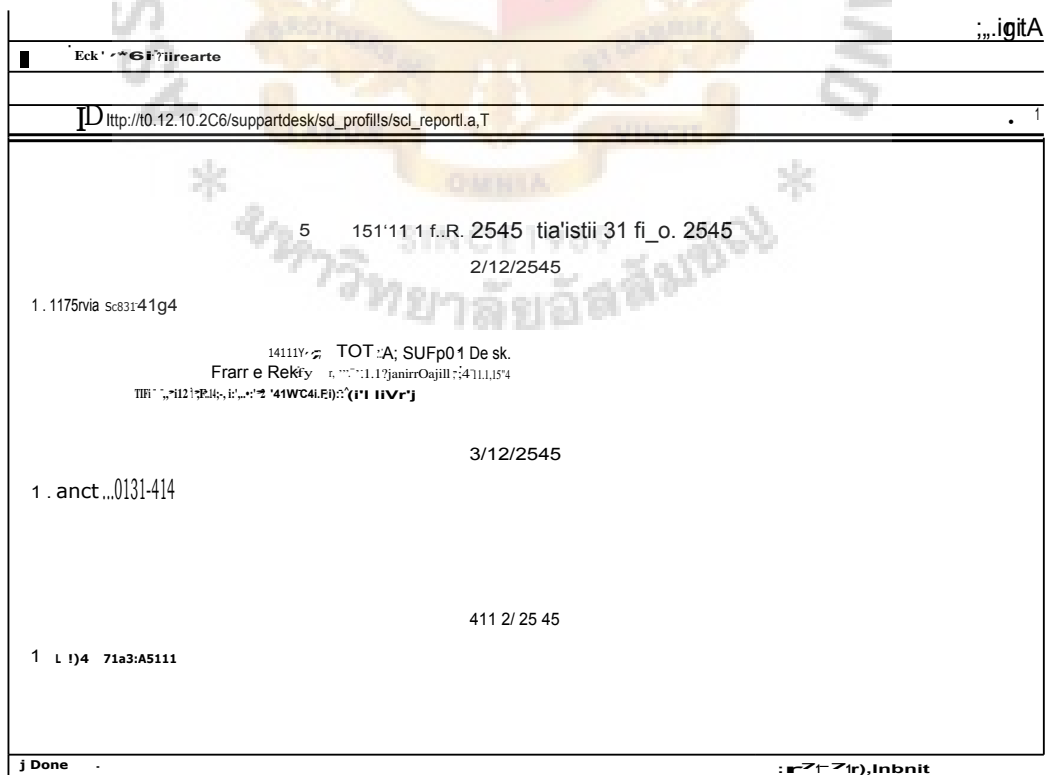
Figure 3.46. Summary of Helpdesk Task.
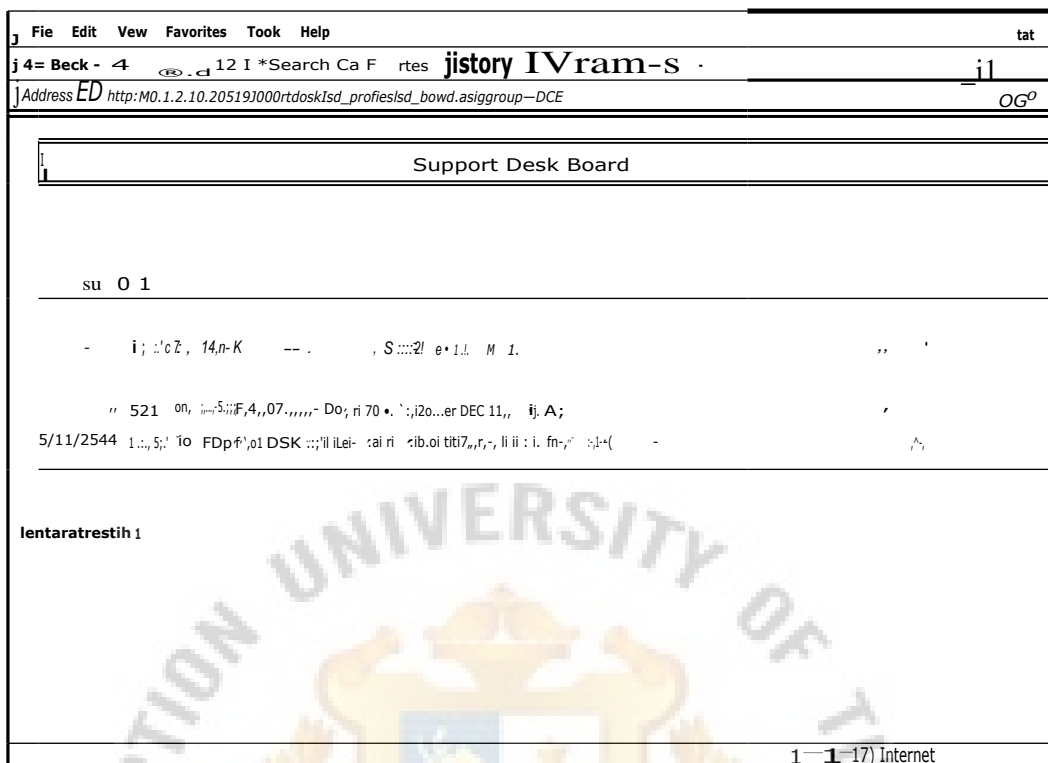
Figure 3.47. Helpdesk Advising List.
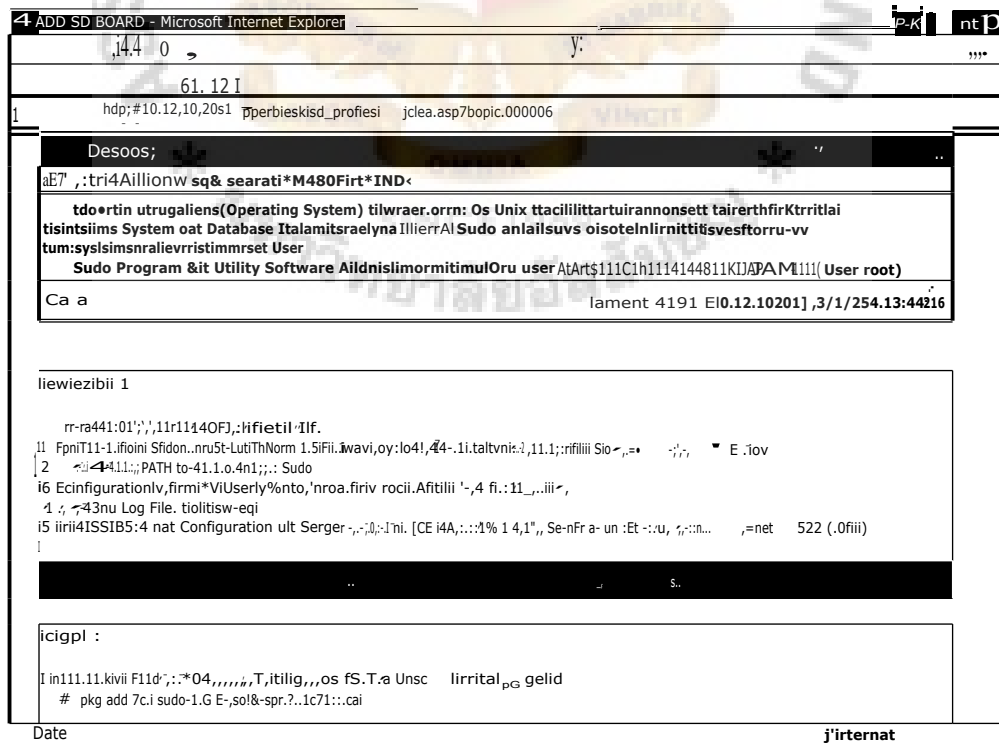
Figure 3.48. Helpdesk Advising Detail.
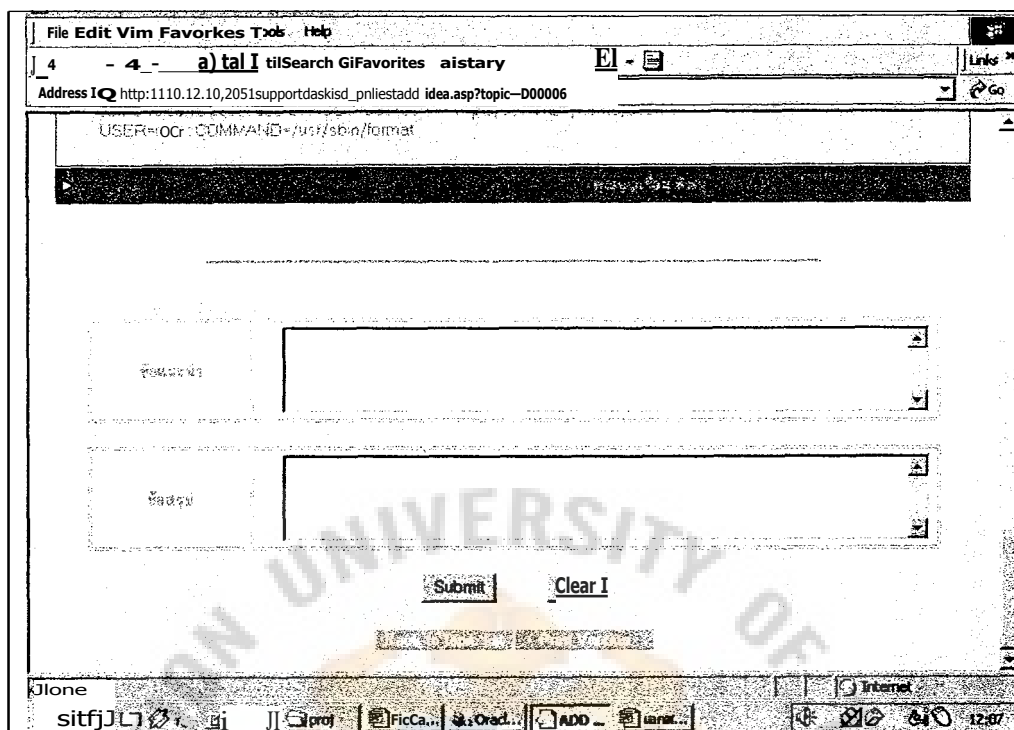
Figure 3.49. Add Helpdesk Advising.

Figure 3.50. Summary of Helpdesk Advising.

IT Department Officer

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Support. Desk Town. ® Tet. : 0-2309-1000-9 .. 0-2602-731 0-9
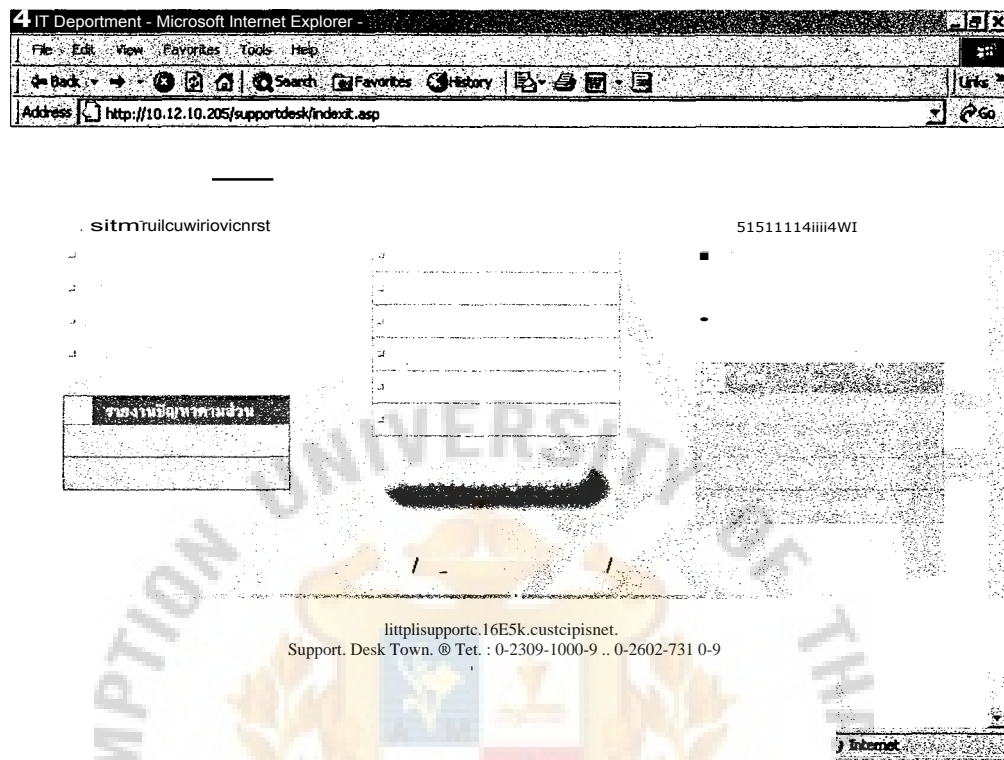
Figure 3.51. IT Department Screen Index.

IT Department users, have the authority to access all the report pages that helpdesk staff can access. But they do not have permission to edit or change any data, they can just only see the report.

Another page that IT Department users can use is Inform Problem Call screen. Users can use this screen to inform the problem to helpdesk staff via this page, the same as general government officer. This page is shown in Figure 3.52.

Figure 3.52. Form to Inform Problem Call.

Government Officer

Government officers can use the same screen in Figure 3.51 to inform problem calls to helpdesk staff. Another page that government officer has permission to access is a page to check their own call which has been informed to helpdesk. User can check status of their call by using this page as in Figure 3.52 and Figure 3.53.

Figure 3.53. List of Informed Call.

Figure 3.54. Informed Call Detail.

69

Solution

The screen for solution is not the same as other user groups. Each solution team can only see problem call of their team. Solution company A, can see only problem call that is sent to solution company A. Solution has to update problem call solution technique and communicate with helpdesk staff via solution screen which is shown in Figure 3.54 and Figure 3.55.

Figure 3.55. List of Informed Call.

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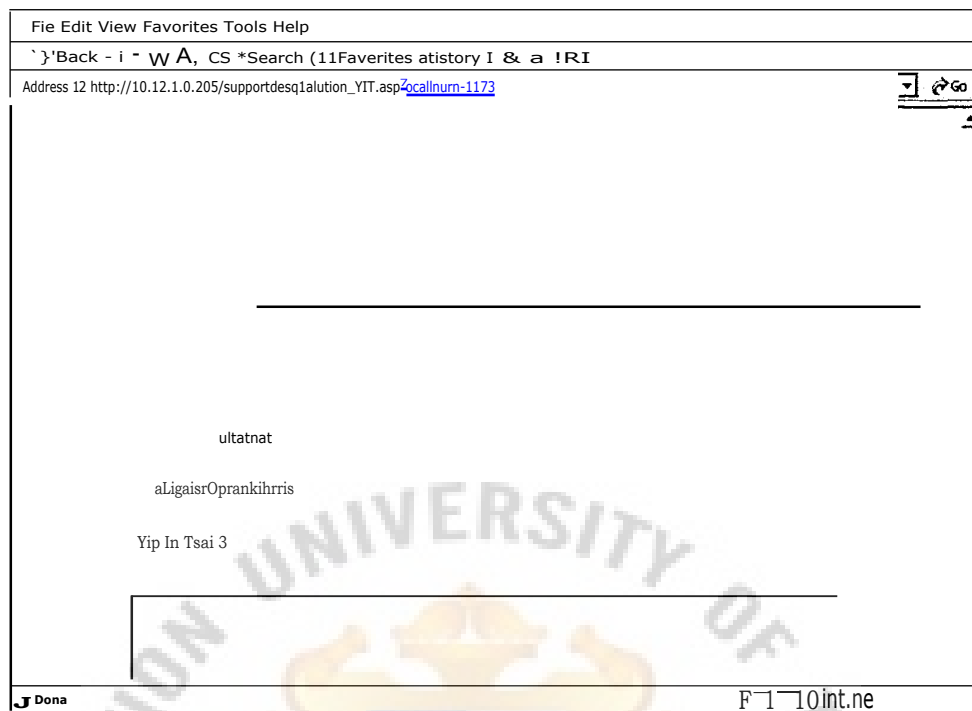
Figure 3.56. List of Informed Call.

71

Figure 3.56 and Figure 3.57 display all problem call that was sent to the solution team.

Figure 3.57. List of Problem Call for Solution.

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Address IQ http://10.12.10.205/supportdesIsiquery br_callrio.asp7gcalintrr 1173

The Customs Department Service Call Form

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3/¹/₂546   16:58:00
3/1/2546   17:02:46
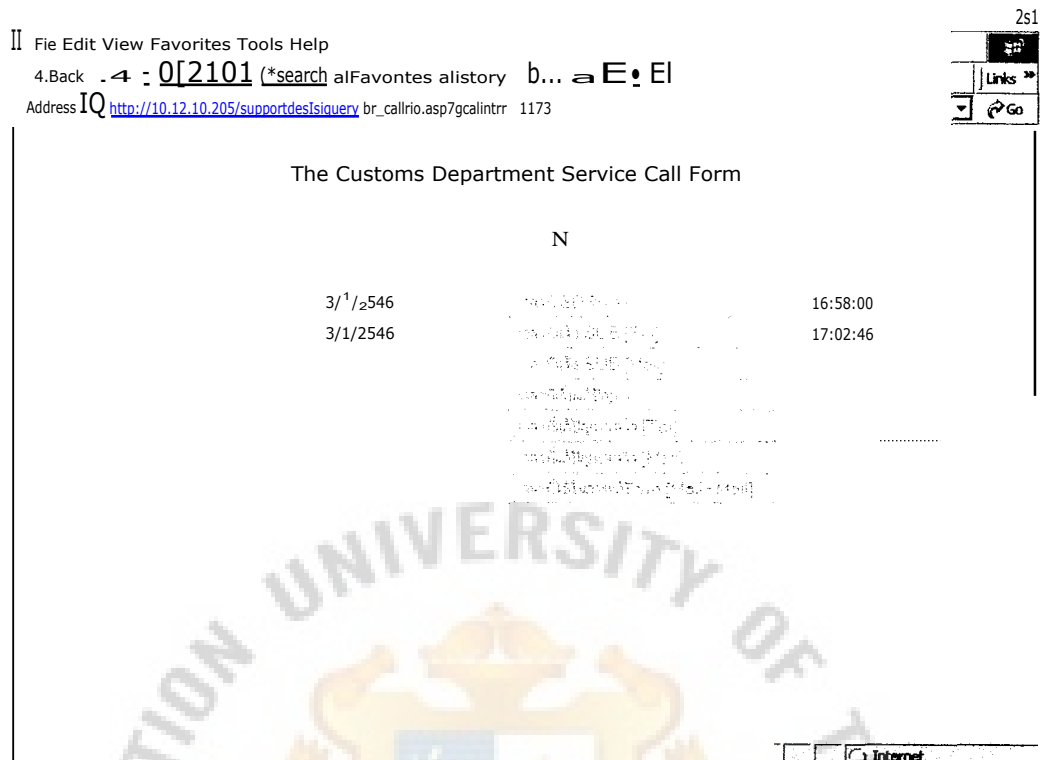
Figure 3.58. Detail of Problem Call for Solution.

3.7 Report and Output Design

There are many reports in the helpdesk system. Each report can be queried from database with different conditions. Users can send the condition with remarks or input their requirement in the web site. Then, web site will generate report by query results from database and display on web page.

These are some examples of important reports from helpdesk system.

3.7.1 Daily Report

Daily Report shows deeply in details of each call. Users can select date or number of problem call to display this report. This report has 5 parts. One is information of user who makes the call. The other is the information of this call record which is call number, time of call, time of solving problem, etc. Then, the third is the information about computer that has problem such as serial number, project number, etc. The fourth is the details of the problem which covers type of problem, description of problem, solution name, etc. Then, the last part is the information in details of the solution technique by solution team and details of analyzed data from helpdesk staff.

The Customs Department Service Call Form

วันที่ SD รับแจ้ง	14/2/2546		10:32:31
วันที่แจ้ง SUB [Te]	14/2/2546		10:34:31
วันที่แจ้ง SUB [Yci]	14/2/2546		10:36:00
วันที่ซ่อมปัญหา	1⁴/₂/2546	เวลารวมจบปัญหา	10:34:31
วันที่แก้ปัญหาเสร็จ [Tei]	14/2/2546	เวลาที่แก้ปัญหาเสร็จ [Te?]	11:20:00
	14/2/2546	เวลาที่แก้ปัญหาเสร็จ [Yei]	12:21:45
; [TB - Te']	. 00:45:29	เวลาที่ใช้ในการแก้ปัญหา [Moli - Me:]	01:45:45

รหัสผู้แจ้ง	106106	ชื่อผู้แจ้ง	รหัสสังกัด	602030
สำนัก		ส่วน		
ฝ่าย		งาน		
สถานที่			โทรศัพท์	7104-9

โครงการ		รหัส

ผู้แก้ปัญหา			โทรศัพท์
ผู้รับแจ้ง		CLENT t;	
ผู้ประสานงาน			

ประเภทปัญหา	
ลักษณะปัญหา	
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Figure 3.59. Daily Report.

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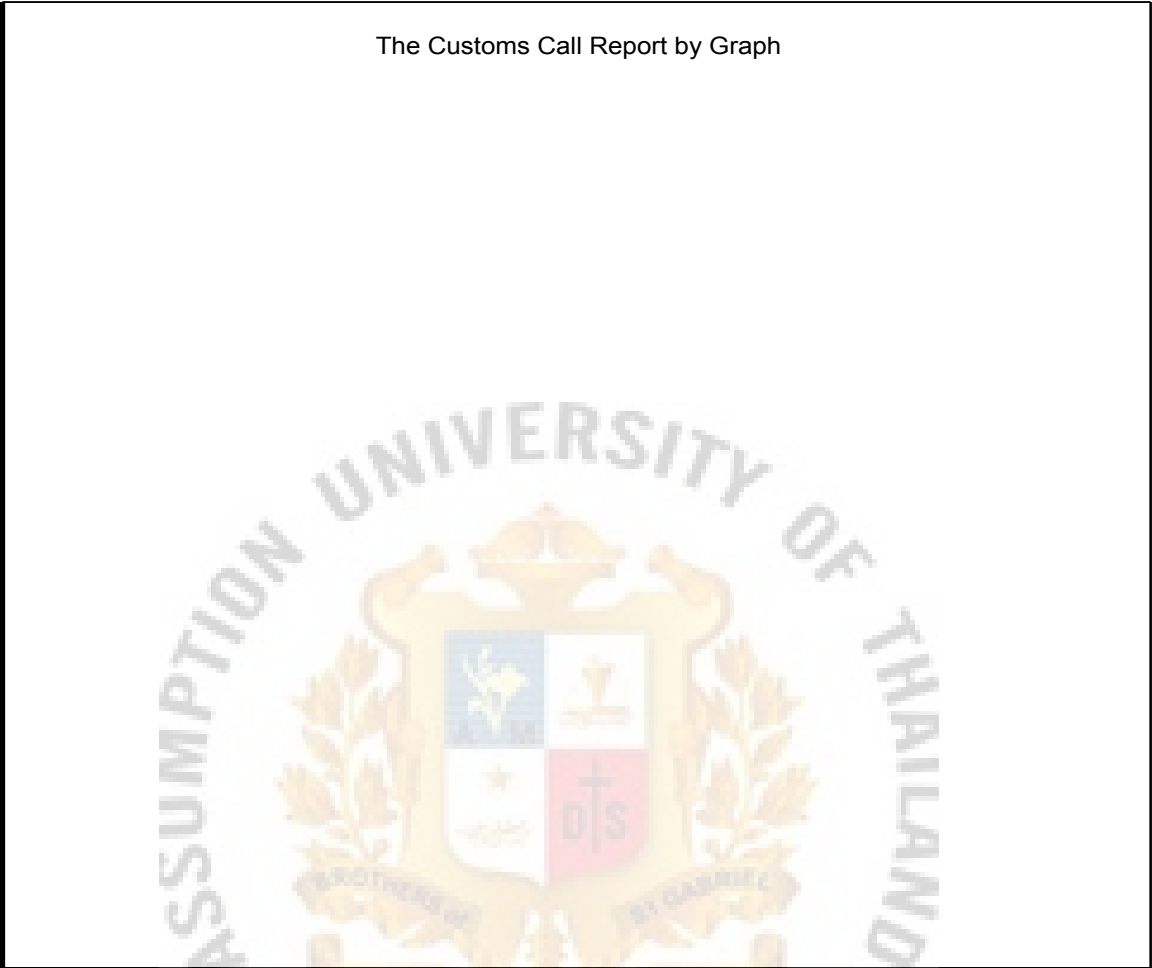3.7.2 Graph of Problem Call Type

The Customs Call Report by Graph

Figure 3.60. Graph of Problem Call Type.

3.7.3 Graph of Asking Information

Figure 3.61. Graph of Asking Information.

3.7.4 Monthly Report

Figure 3.62 Monthly Report.

3.7.5 Summary Report

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Figure 3.63. Summary Report.

3.7.6 Helpdesk Report
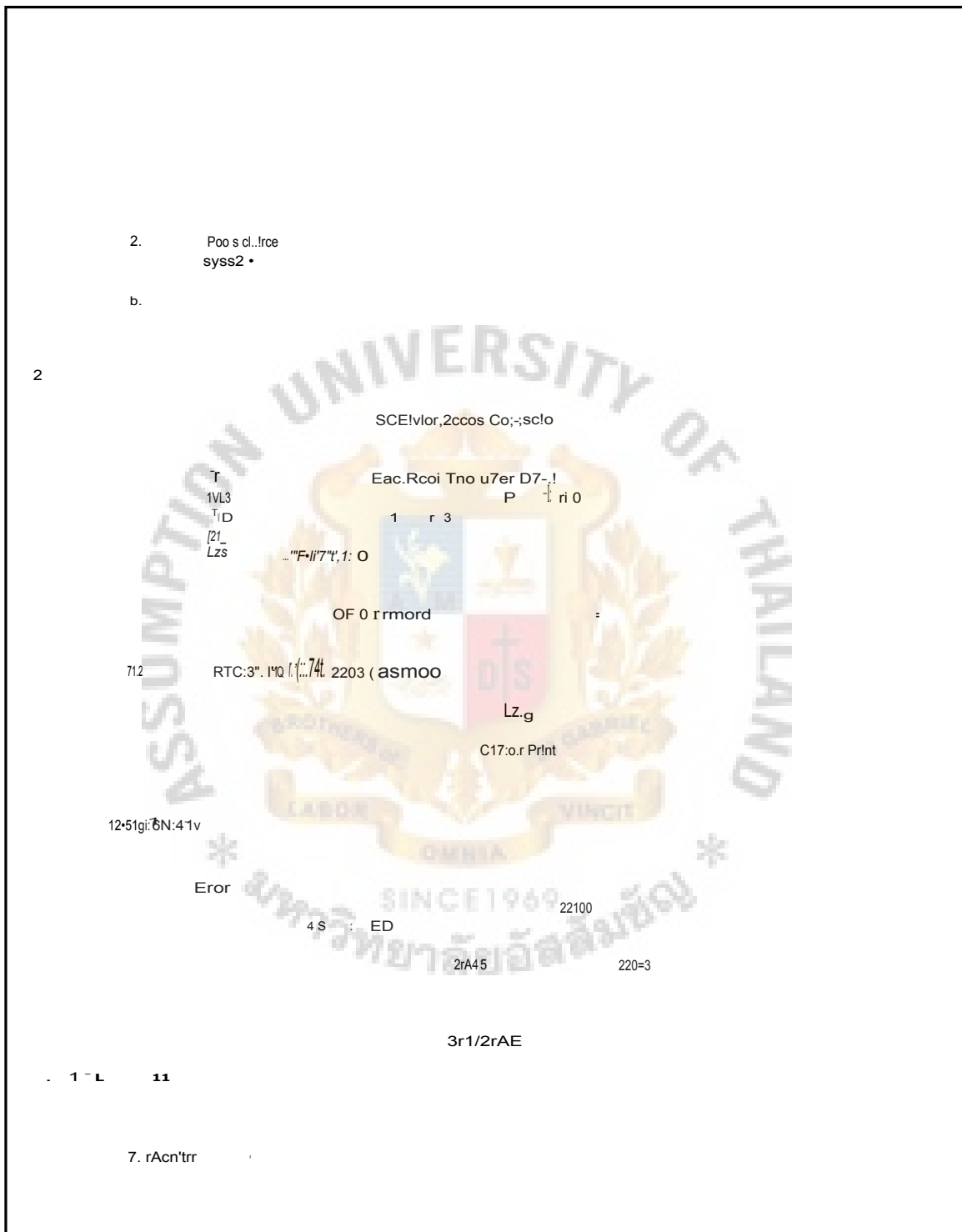
Figure 3.64. Helpdesk Report.

3.8 Network Design
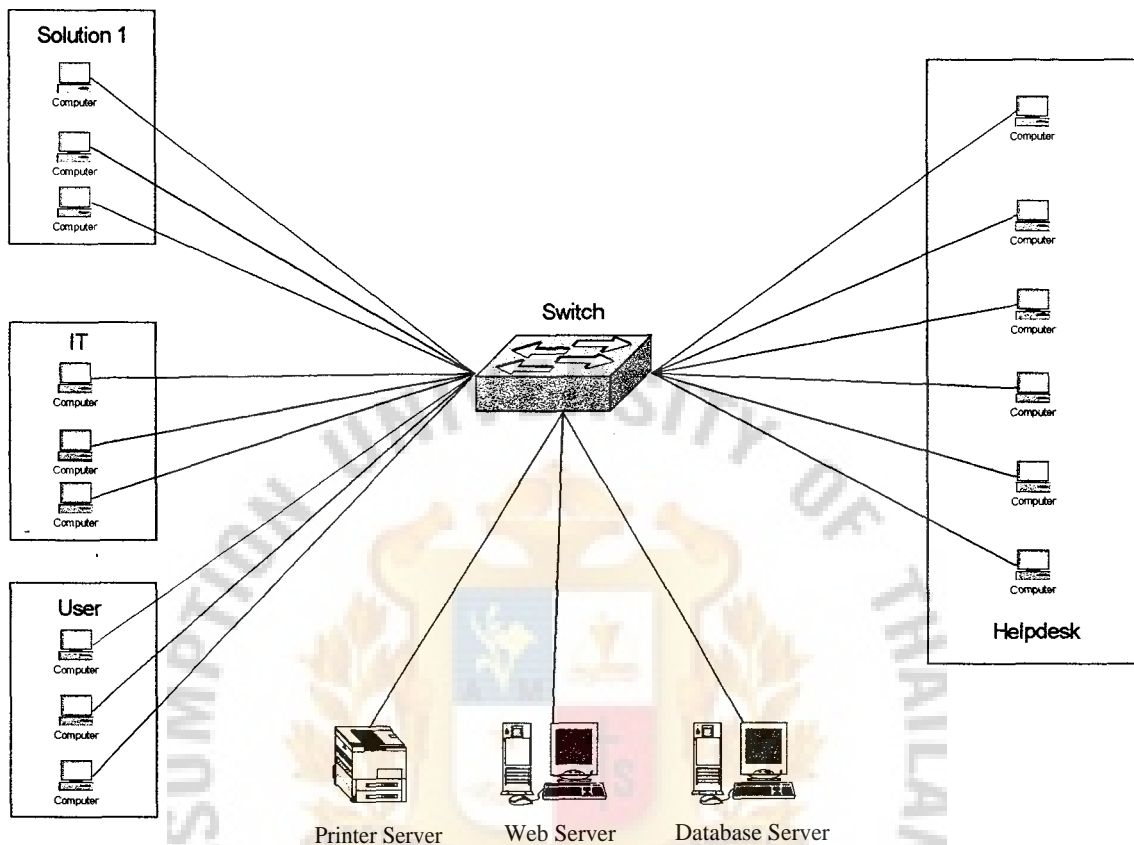
Figure 3.65. Network Design.

Client in this system is all computers that connect with the organization's local area network. These computers can use a helpdesk web page via existing network connection line. Computers of helpdesk staffs and helpdesk system server will be plugged in the existing organization's network by using switch.

To use existing network will be less costly but administrator has to ensure the network-load and bandwidth. If it effects the existing work, may be the new system should run on a new network, and should not be plugged in the existing network of the organization.

3.9 Hardware and Software Requirements

From architecture design described in 3.2.3, the hardware and software requirement can be categorize into 3 groups. The first is for server use objective. The second is for clients use and the last is for developers. The first group which is used as server must have 2 computers, web server and database server. The specification of these hardware and software can be summarized as follows:

3.9.1 Hardware Requirement

Table 3.16. Hardware Requirement.

SERVER : WEB SERVER	
TYPE	**SPECIFICATION**
CPU	Intel Pentium 4 or higher Memory 512 MB or higher Harddisk 5 GB or higher Network Adapter Ethernet 10/100
Monitor	15" or higher
Mouse , Keyboard	
UPS	
SERVER : DATABASE SERVER	
TYPE	**SPECIFICATION**
CPU	Sun 450E Memory 1 GB or higher Harddisk 10 GB or higher Network Adapter Ethernet 10/100
Monitor	17" or higher

Table 3.16. Hardware Requirement. (Continued)

TYPE	SPECIFICATION
External Tape Drive	
CLIENT	
TYPE	SPECIFICATION
CPU	Intel 486, Pentium or higher Memory 64 MB or higher Harddisk 200 MB or higher Network Adapter Ethernet 10/100
Monitor	15" or higher
Mouse , Keyboard	
Printer	
DEVELOPER	
TYPE	SPECIFICATION
CPU	Intel Pentium III or higher Memory 256 **MB** or higher Harddisk 10 GB or higher Network Adapter Ethernet 10/100
Monitor	15" or higher
Mouse , Keyboard	

3.9.2 Software Requirement

Table 3.17. Software Requirement.

SERVER : WEB SERVER	
TYPE	**SPECIFICATION**
Operating System (OS)	Windows 2000 Server
Web Server	IIS (Windows 2000 Server)
Container	Oracle ODBC (Database Connectivity)
SMTP mail	ASP Smart Mail
SERVER : DATABASE SERVER	
TYPE	**SPECIFICATION**
Operating System (OS)	Solaris 7 (UNIX)
Database Management System	Oracle 9i
CLIENT	
TYPE	**SPECIFICATION**
Operating System (OS)	Windows 95, Window 98, Window 98 ME, Window 2000 Professional, Window XP
Web Browser	Netscape 5 or Internet Explorer (1E) 5 or higher version
DEVELOPER	
TYPE	**SPECIFICATION**
Operating System (OS)	Window 2000 Professional / Server
Web Server	IIS (Window 2000)
Container	Oracle ODBC (Database Connectivity)
Web Design Tools	Dream Weaver, Edit Plus, PhotoShop

3.10 System Security and Controls

(1) Authentication

Authentication is like the heart of this system. Users who can use this system must have their own username and password. For government officers, the system will use the unique id number (6 digits for Thai Customs Department) which is the same number for logging into the other computer system. If username and password is incorrect, user can not access helpdesk web page.

(2) Authorization

To input username and password to log into the system, not only for authenticated users, username can specify the authorization level of each user, too. The system will check the permission and authorization level of user and return page accessibility.

(3) Session Control

Session control is the time value that allows clients to open web site without doing anything. It is useful for user who forget that he still uses his username to log into the system. If it does not have session control, may be somebody will connect it to web page and update any data with the username that still exists in the system.

(4) Keep Log of IP Address and username when user accesses **the system**

This security helps administrator to know that which user accesses the system and access from which computer. Because this system is Intranet system, IP address can specify the computer and place that user log in. The log that is kept will tell administrator of time, date and which page in the web site that user uses.

85

(5)   Database Control

Database control is to control transactions which is sent to a database. Generally, almost all DMBS (Database Management System) has this function. All transactions sent into database will be queued and database control function will control data in and data out from database.

(6)   Backup

It is very important to backup data in database. It is to protect losing data if any problem occurs with the hardware or software of database server. Helpdesk system has a script to backup data from database all night. It can confirm that data will not lost.

3.11 Cost — Benefit Analysis

Cost-Benefit analysis will show the worth of investment. The table below can explain that there is high cost of investment in first year. But it can return profits back in year 2, a very fast payback period. Net present is a plus value, so this project is worth **to** invest.

Table 3.18. Cost of Manual System.

Cost items	Years				
	1	2	3	4	5
Fixed Cost					
Office Equipment Cost					
Type writer 2 units @ 8500	17,000	-	-	-	-
Telephone 10 units @ 1200	12,000	-	-	-	-
Facsimile 2 units @ 9000	18,000	-	-	-	-
Total Fixed Cost	**47,000**	-	-	-	-
Operating Cost **Helpdesk Staff salary 15 person @ 20000**	3,600,000	3,600,000	3,600,000	3,600,000	3,600,000
Total Annual salary	**3,600,000**	**3,600,000**	**3,600,000**	**3,600,000**	**3,600,000**
Office Supplies & Miscellaneous Cost					
Paper	30,000	30,000	30,000	30,000	30,000
Utility	30,000	30,000	30,000	30,000	30,000
Miscellaneous	40,000	40,000	40,000	40,000	40,000
Total Office Supplies & Miscellaneous Cost	**100,000**	**100,000**	**100,000**	**100,000**	**100,000**
Training Cost	**50,000**	**50,000**	**50,000**	**50,000**	**50,000**
Total Annual Operating Cost	**3,750,000**	**3,750,000**	**3,750,000**	**3,750,000**	**3,750,000**
Total Manual System Cost	**3,797,000**	**3,750,000**	**3,750,000**	**3,750,000**	**3,750,000**

Table 3.19. Cost of Proposed System.

Cost items	Years				
	1	**2**	**3**	**4**	**5**
Fixed Cost					
Hardware Cost					
Web Server	70,000	-	-	-	-
Database Server	500,000	-	-	-	-
Workstation 10 units @ 50000	500,000	-	-	-	-
Laser Printer 2 units @ 30000	60,000	-	-	-	-
UPS	4,000	-	-	-	-
Total Hardware Cost	**1,134,000**	-	-	-	-
Software Cost					
Microsoft Windows 2000 Server	40,000	-	-	-	-
Oracle 9i	80,000	-	-	-	-
Microsoft Windows 98	30,000	-	-	-	-
Total Software Cost	**150,000**	-	-	-	-
Total Fixed Cost	**1,284,000**	-	-	-	-
Operating Cost					
Maintenance Cost	-	-	-	200,000	100,000
Total Maintenance Cost	-	-	-	**200,000**	**100,000**
Implementation Cost					
Training Cost	60,000	60,000	60,000	60,000	60,000
Setup Cost	50,000	-	-	-	-
Total Implementation Cost	**110,000**	**60,000**	**60,000**	**60,000**	**60,000**
Helpdesk Staff salary 10 person @ 20000	2,400,000	2,400,000	2,400,000	2,400,000	2,400,000
Total Annual salary	**2,400,000**	**2,400,000**	**2,400,000**	**2,400,000**	**2,400,000**
Office Supplies & Miscellaneous Cost					
Paper	10,000	10,000	10,000	10,000	10,000
Utility	20,000	20,000	20,000	20,000	20,000
Miscellaneous	20,000	20,000	20,000	20,000	20,000
Total Office Supplies & Miscellaneous Cost	**50,000**	**50,000**	**50,000**	**50,000**	**50,000**
Total Annual Operating Cost	**2,560,000**	**2,510,000**	**2,510,000**	**2,510,000**	**2,510,000**
Total Computerizes System Cost	**3,844,000**	**2,510,000**	**2,510,000**	**2,510,000**	**2,510,000**

Table 3.20. Payback Analysis of Proposed System.

Cost items	Years					
	0	1	2	3	4	5
Development Cost	-1,394,000	-	-	-	-	-
Maintenance Cost		-	-	-	-200,000	-100,000
Discount Factor 12%	1.00	0.89	0.80	0.71	0.64	0.57
Time Adjusted Cost	-1,394,000	-	-	-	-128,000	-57,000
Benefit derived from operation	0	2,000,000	2,500,000	3,000,000	3,500,000	4,000,000
Discount Factor 12%	1.00	0.89	0.80	0.71	0.64	0.57
Time Adjusted Benefit	0	1,780,000	2,000,000	2,130,000	2,240,000	2,280,000
Cumulative time-adjusted Costs	-1,394,000	-1,394,000	-1,394,000	-1,394,000	-1,522,000	-1,579,000
Cumulative time-adjusted Benefit	0	1,780,000	3,780,000	5,910,000	8,150,000	10,430,000
Cumulative lift-time adjusted costs+benefit	**-1,394,000**	**386,000**	**2,386,000**	**4,516,000**	**6,628,000**	**8,851,000**

Table 3.21. Net Present Value of Proposed System.

Cost items	Years					
	0	1	2	3	4	5
Time Adjusted Cost	-1,394,000	-	-	-	-200,000	-100,000
Total Present Value of Lifetime Cost	-	-	-	-		-1,579,000
Time Adjusted Benefit	0	1,780,000	2,000,000	2,130,000	2,240,000	2,280,000
Total Present Value of Lifetime Benefit	-	-	-	-		10,430,000
Net Present Value	-	-	-	-		**8,851,000**

The pay-back period can be displayed in graph as Figure 3.68
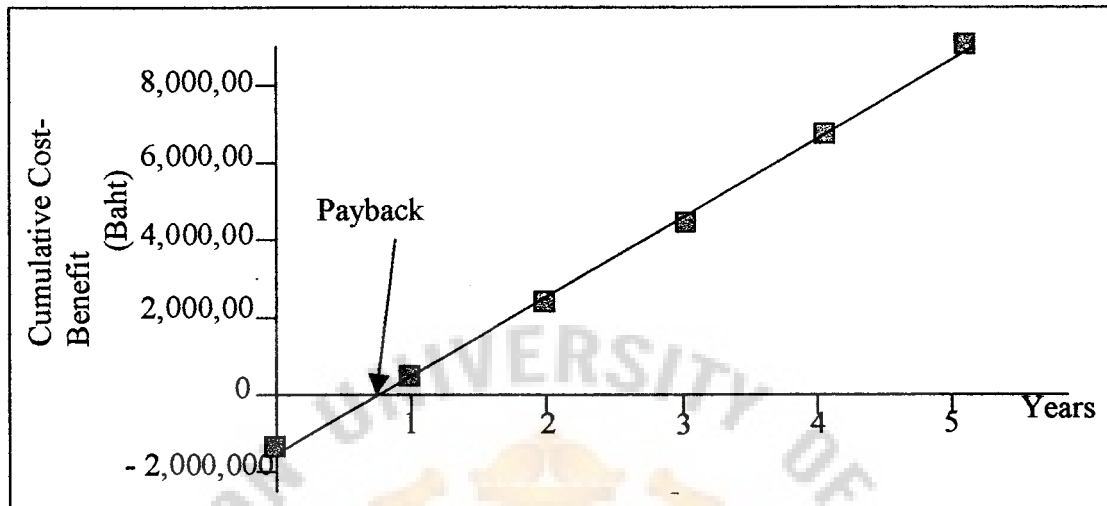

Figure 3.66. Graph of Pay-back Period.

IV. PROJECT IMPLEMENTATION

4.1 System Implementation

There are 6 major activities to implement the new system. Coding, testing and installation are the first 3 phases that have to be performed after technical design and prototyped are approved. After installation has been completed, documentation, training and support, the last 3 phases have to be performed in the system implementation.

The purpose of the system implementation is to convert the physical system specification into working and reliable software and hardware, document the work that has been done, and provide help for current and future users.

Coding is the process whereby the physical design specifications are turned into working computer code. For coding process, this system uses ASP (Active Server Page) with the HTML (Hyper Text Markup Language) to generate the web base application. Once coding has begun, the testing process can begin.

4.2 System Testing

The testing process can begin and proceed in parallel with the coding. A test case is a specific scenario of transactions, queries, or navigation paths that represent a typical, critical, or abnormal use of the system. If the results of a test case do not compare favorably to what was expected, the error causing the problem must be found and fixed.

This cycle of finding problems, fixing errors, and rerunning test cases continues until no additional problems are found. Then the system installation has been performed.

For the helpdesk system, there are 4 testing process, network testing, database testing, response time testing and web application testing.

91

(1) Network Testing

Network testing has been performed to test network load when the new system begun. The test administrator has to check and monitor the load of the existing network compared with the load of network after using the new system.

Because this system uses the existing network channel, the bandwidth of the communication must be enough to run the new system without affecting other existing systems in the organization.

(2) Database Testing

This system uses Oracle 9i to be . database management system. This database management system has its own module to control and manage the data stored in the database. To test the database working, the test administrator has to test the load of database by testing the maximum number of transactions accessed to database.

The database management system has been tuned in to bear the maximum number of transactions that can occurr. Then testing whether database can bear with that load or not and what happens under extreme on-line transaction loads or a large number of concurrent users is called stress testing.

To force the database to fail in order to verify that recovery is properly performed is the recovery testing which can verify the reliability of the database management system.

(3)   Response Time Testing

Because the response time can indicate the performance of the system, to measure the response time on the range of possible environment is one of the performance testings which can measure the performance of the system.

The test administrator has to test the response time by sending the criteria searching to query some data from the database and measure the time that data response.

Testing the response time should be performed at various times and various environments to get the response time in different network loads and database loads.

(4)   Web Application Testing

Web application testing can be performed together with coding process. Programmers have to test their program and check error detection and correction during programming.

Security testing, which tries to access the web page without login to the system or tries to access with unauthorized users, has to be tested in the web application testing. This testing verifies that protection mechanisms built into the system is perfect from improper penetration.

The helpdesk system test will perform testing process in 3 modules categorized by group of users. Helpdesk staff module is the first that has been tested. The test administrator will test by recording the problem call, record analyzed call and record closed call. Not only that, to update the problem call and generate call report has to be tested in this module. Next, the module for government officer has been tested. This module must test action to inform a problem call and display users call status. The last one is solution module that has to test by recording the solution of problem call and

request to close the call. Then, all 3 modules will be tested together to test whether they are smoothly working.

Once the system tests have been satisfactorily completed, acceptance testing will be performed by testing the system in the environment where it will eventually be used. The purpose of acceptance testing is for users to determine whether the system meets their requirements.

4.3 System Installation

The process of installation is to move from the current manual system to the new one. There are 4 different approaches to installation.

(1)   Direct Installation: Changing over, from the old system to the new one by turning off the old system when the new one is turned on.

(2)   Parallel Installation: Running the old system and the new one at the same time until management decides the old system can be turned off.

(3)   Single location Installation: Trying out a new system at one site and using the experience to decide if and how the new system should be deployed throughout the organization.

(4)   Phased Installation: Changing the old system to the new one incrementally, starting with one or a few functional components and then gradually extending the installation to cover the whole new system.

Phase installation has been chosen to implement the web base helpdesk system. The system module has been categorized into 3 groups as in testing process.

At first, the system will install hardware and software as follows:

(1)   Web Server

To setup web server, it must install Windows 2000 Server to be operating system and configure IIS to be web server. Then, create home directory of the web site and install program of the web page there.

(2)   Database Server

Database Server is run on UNIX system, this project uses Solaris 7.0 to be operating system. Install Oracle 9i to be database server and configure it to connect with web server. Then, create the database and load all existing data in to the database.

(3)   Client

Client computer uses web browser like Internet Explorer which existed in their computer, except that some client uses a very old version of windows operating system. It has to be upgraded to Internet Explorer from version 3.0 to be version 4.0 or 5.0.

Then, the first group of users who are the helpdesk staffs can use the new system. They turn off the manual system and record the problem call informed by telephone calling to the database via web page. All the working process will be recorded and stored into the helpdesk database.

Once the helpdesk staffs can use the new system fluently, group of government officer users will be the second group placed into the operation. The government officers can inform their problem via the web page. Then, helpdesk staffs can receive that action and follow up their working process.

Then, the last group of users, solution team, can use the new system. Once this group uses the system, the installation process will be completed.

4.4 Training and Supporting Users

The training course of the new system is necessary for most users. Training course will be provided for administrative users and end-users. Administrative users are users who have responsibility to check, control, and monitor the computer server, which is web server and database server. Training course for administrator will provide knowledge of hardware of the system and software which is IIS and Oracle 9i.

End-users, are government officers, solution team and helpdesk staffs. They have to be trained to use helpdesk web site system via Intranet. Document of the system must be generated to support users. The document must be of 2 types, one is for administrator, another is for end-users.
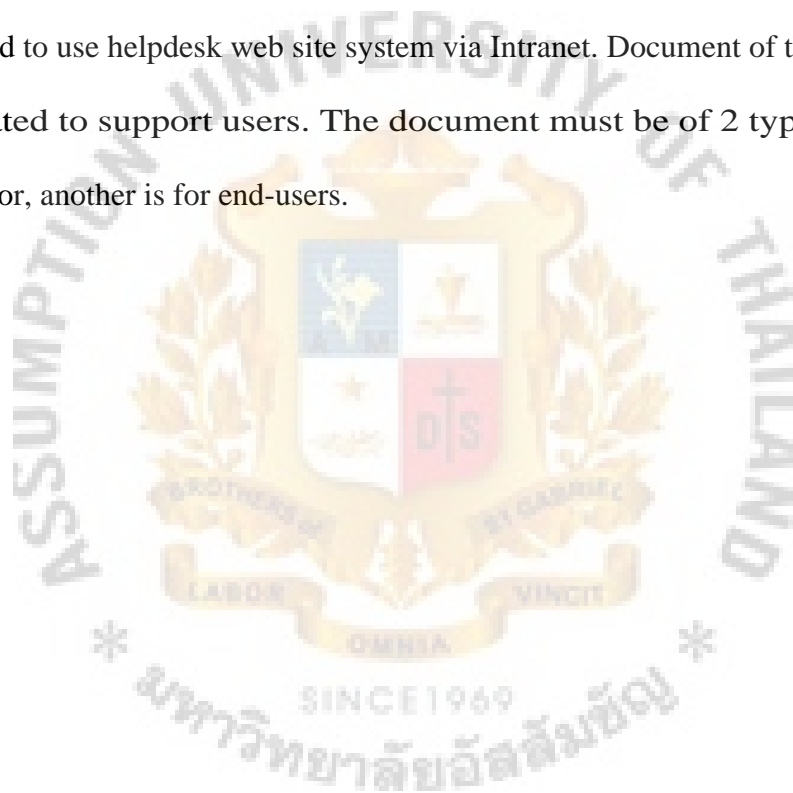
V. CONCLUSIONS AND RECOMMENDATIONS

5.1   Conclusions

For the existing system, the necessary functions are done manually. All data record was kept in papers. Since most businesses are concerned with documents, so it is very necessary to keep all papers as reference and support information. To keep these papers, it requires a lot of storage area and it is time consuming to do routine work to find any record of problem call.

The problems that occur in existing system of helpdesk are errors of communication, errors of manual recording, cost of paper using and phone call, information is not update and it is difficult to generate reports and check a problem call status. The new helpdesk system is developed to solve these problems.

The helpdesk system can provide more efficient service to Thai Customs Government and help helpdesk staffs to do their work conveniently and quickly. The manpower is also reduced. The main tasks of helpdesk system cover to record all data which is concerned with the problem calls such as timestamp of call, user information, solution team and solution data, etc. New web-base helpdesk makes an opportunity to allow users to inform their problem via a web site and helpdesk staff can communicate with solution team via a web site, too. The system also supports decision making by providing many kinds of reports which are useful for management.

Although the cost of development computer information system is high from the beginning, it can return the profit back in a short time. The pay-back period is within the first year. After investment, the system can be used for many years with little cost of maintenance and some modifications. From cost-benefit analysis, the net present value is positive, so this system is worth making an investment.

This helpdesk web-base system is developed for Thai Customs Department. It can be improved and made into some modifications to use in other Government Offices.

5.2 Recommendations

To implement the new system takes much time and many factors to accomplish the objective. Development of the system cannot go smoothly if executive and officers are not involved in development. Therefore, user and executive must participate in almost every phase including analyzing, designing and implementing the system, due to users being the ones who know exactly what they would like the proposed system should be to match their objectives.

To use this system, it is recommended to backup the database frequently. Administrator can create script file in a database server to backup data automatically. To backup as frequently as possible will ensure that data will retains if any problem that occurs in a database server.

At this time, this system is used only in Intranet but if the organization opens the network port to be accessed by world wide (Internet), this system can be used via a web site, too. As an original concept, users who can access the system must specify their username and password when logging into the system to prevent unauthorized access.

APPENDIX A

DATA FLOW DIAGRAM

DATA FLOW DIAGRAM OF HELPDESK SYSTEM

<u>Context diagram</u>
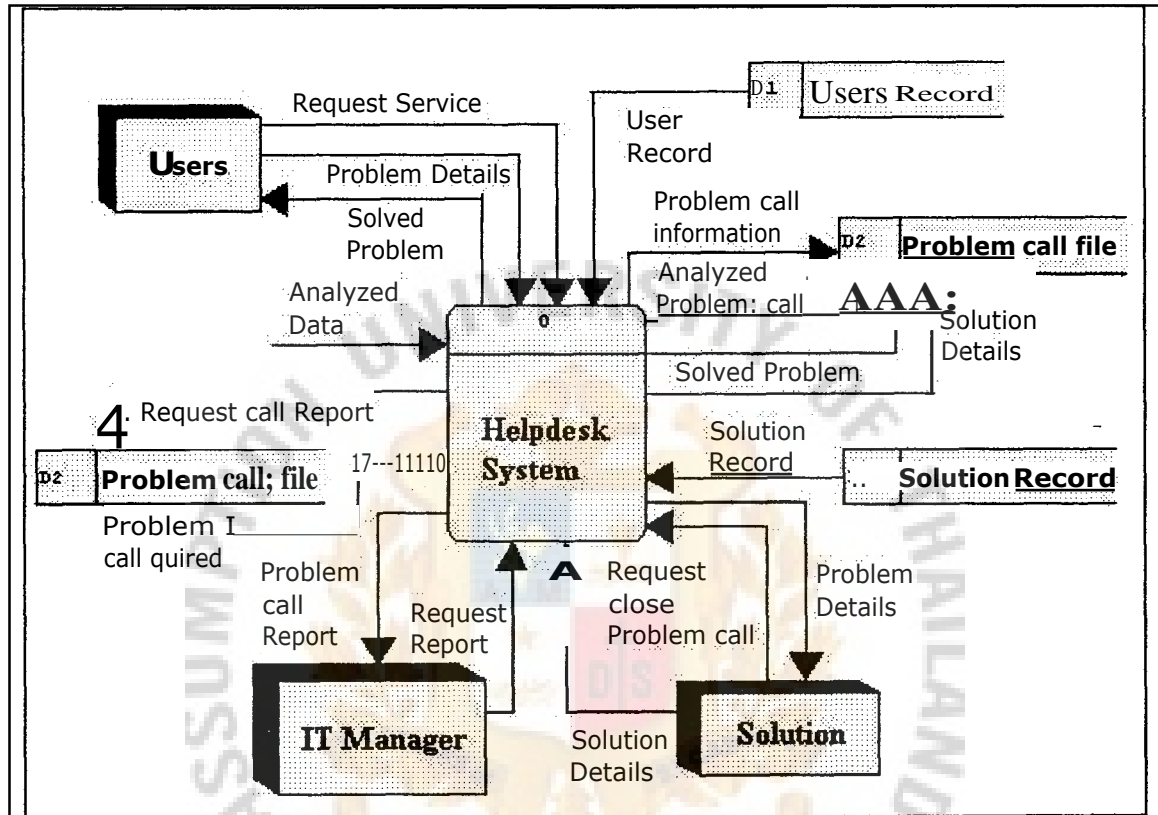
Figure A.1. Context Diagram.

Data flow level 0:helpdesk system
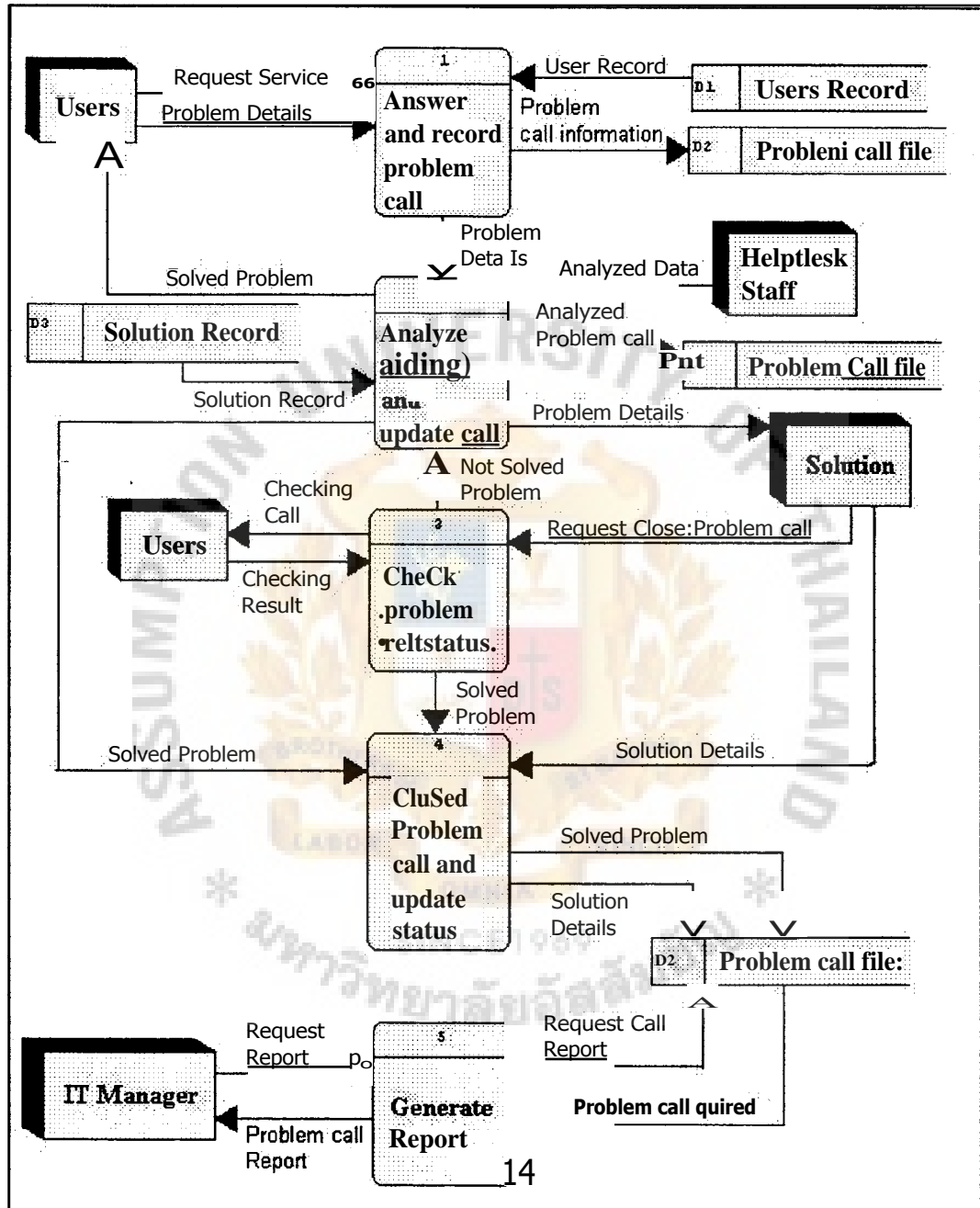
Figure A.2. Data Flow Level 0.

Data flow level 1: 1.0 Answer and record problem call
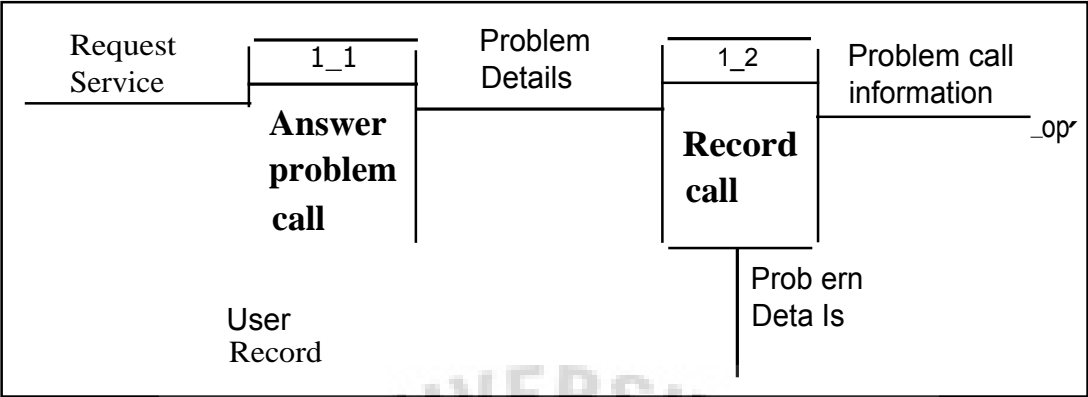
Figure A.3. Data Flow Level 1.0.

Data flow level 1: 2.0 Analyze(finding) and update call
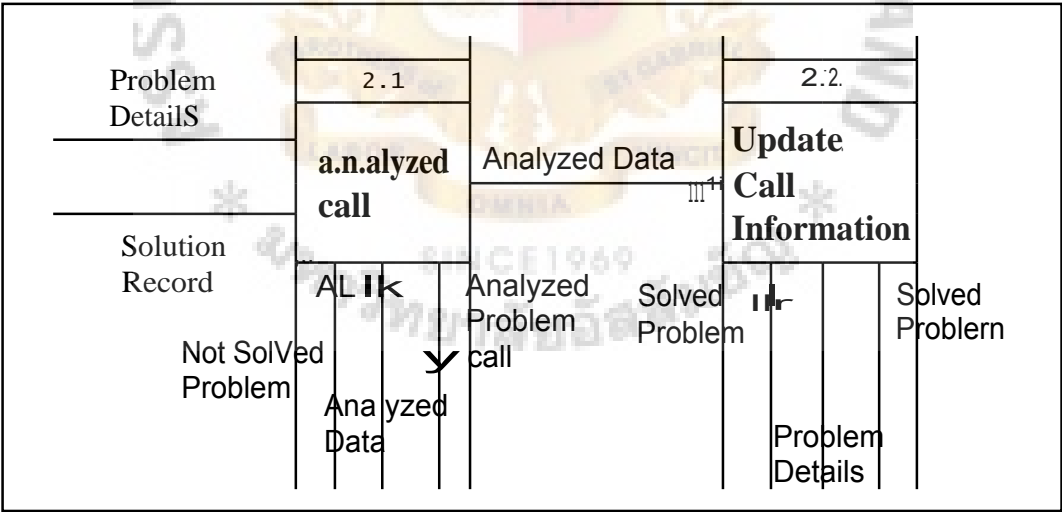
Figure A.4. Data Flow Level 2.0.

Data flow level 1: 3.0 Check problem call status
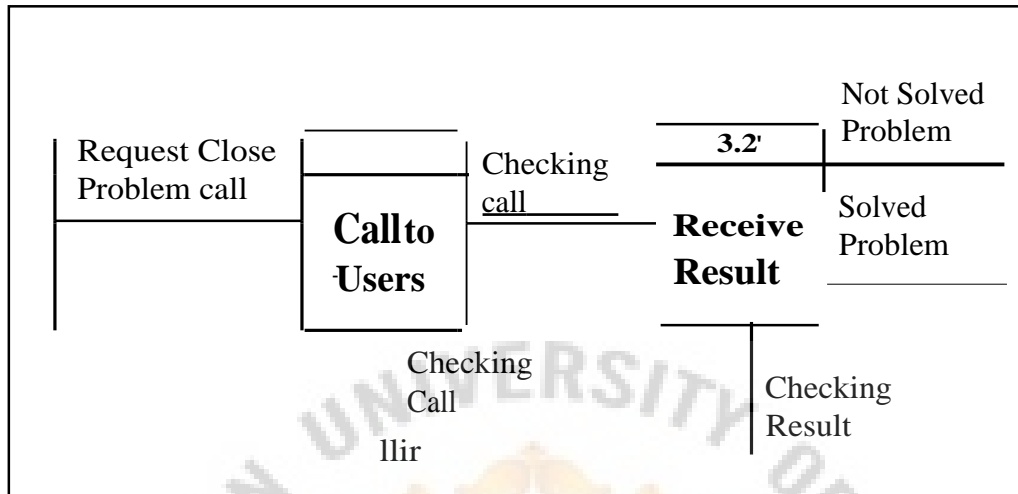
Figure A.5. Data Flow Level 3.0.

Data flow level 1: 4.0 Closed problem call and update status
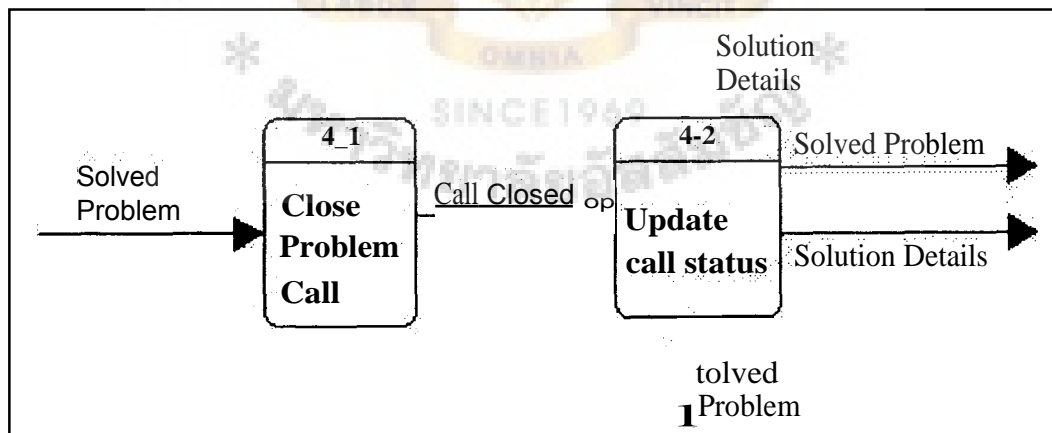
Figure A.6. Data Flow Level 4.0.

103

Data flow level 1: 5.0 Generate report
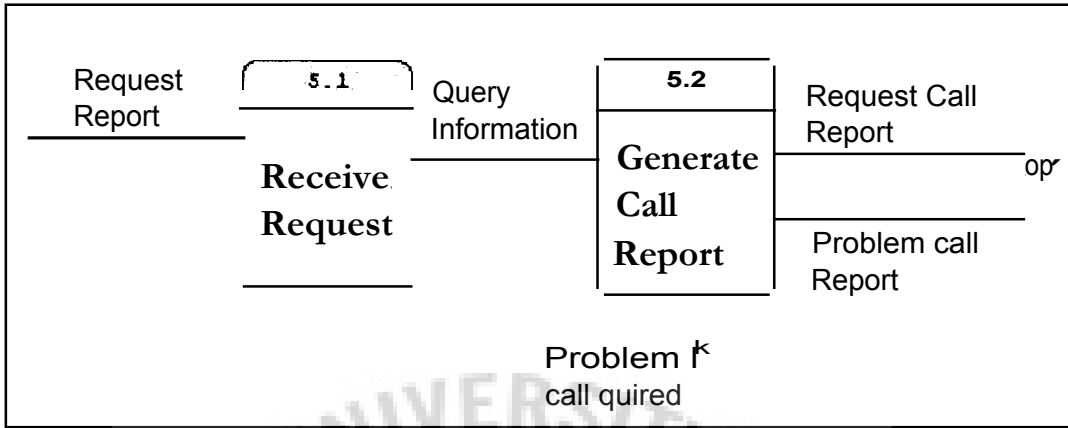
Figure A.7. Data Flow Level 5.0.

Data flow level 2: 1.1 Answer problem call
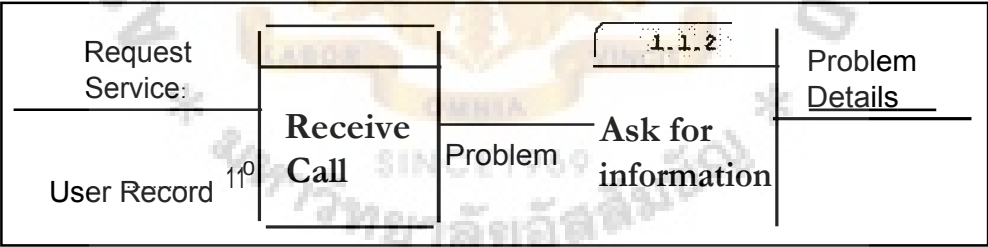
Figure A.8. Data Flow Level 1.1.

Data flow level 2: 1.2 Generate report
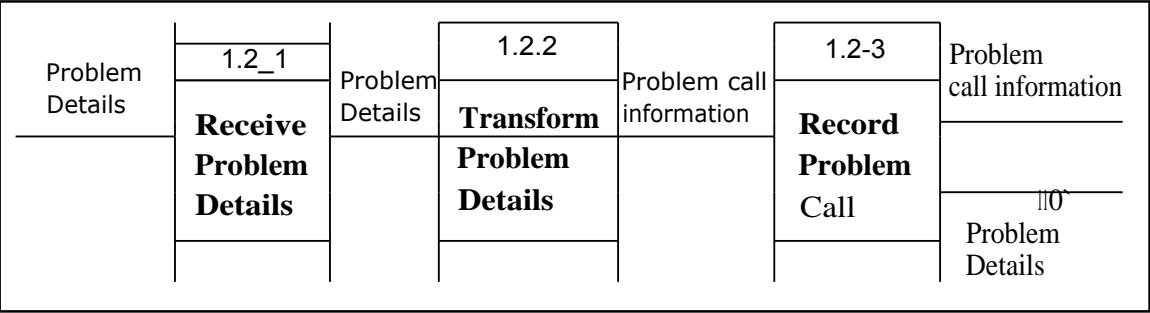
Figure A.9. Data Flow Level 1.2.

Data flow level 2 : 2.1 Analyzed call
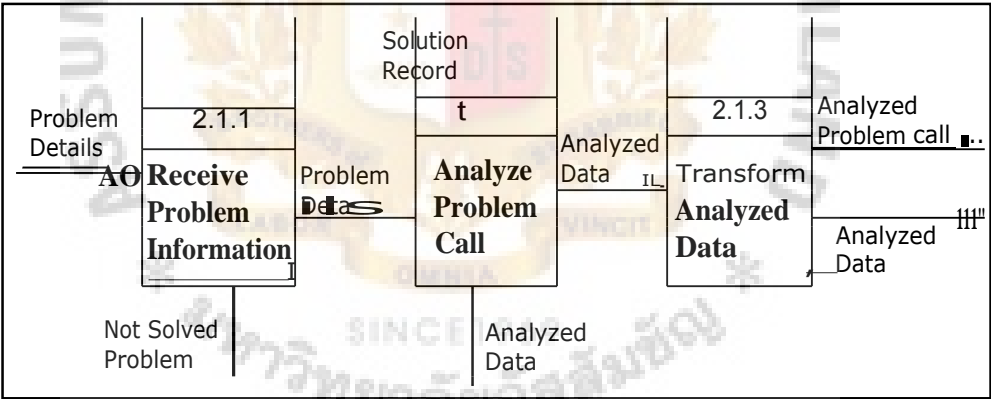
Figure A.10. Data Flow Level 2.1.
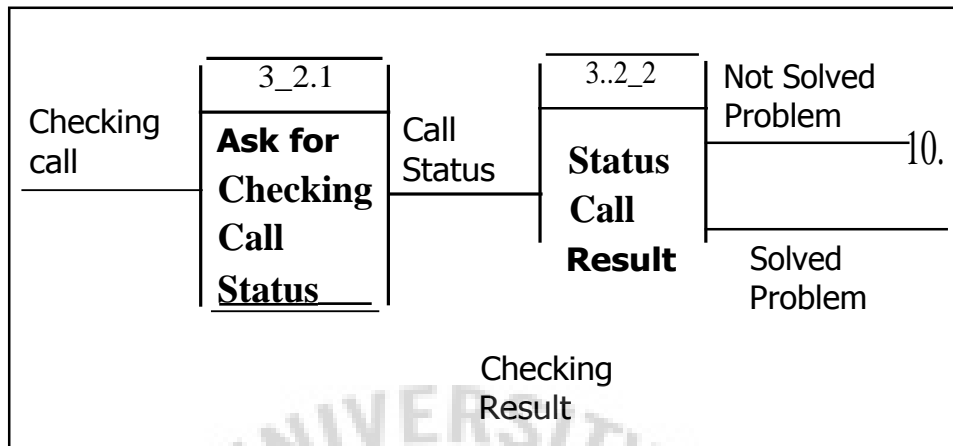
Data flow level 2 : 3.2 Receive result

Figure A.13. Data Flow Level 3.2.

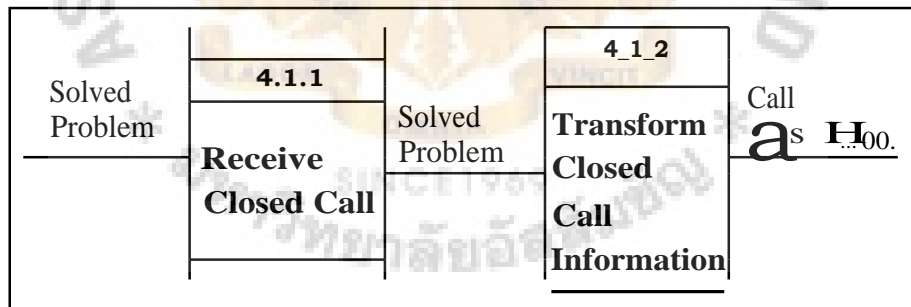Data flow level 2 : 4.1 Close program call

Figure A.14. Data Flow Level 4.1.
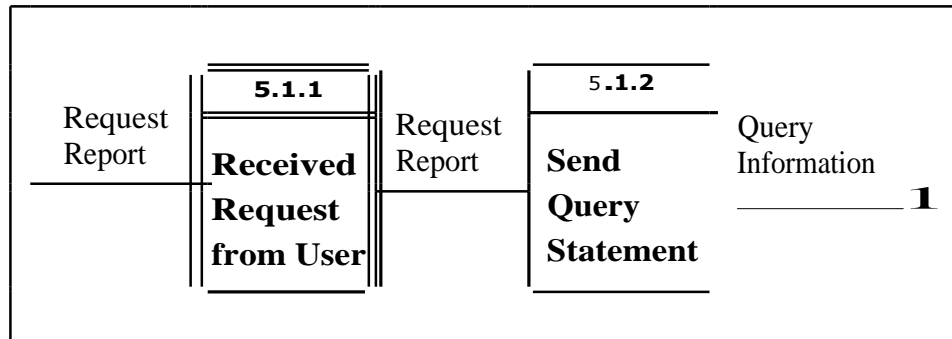
Data flow level 2 : 5.1 Receive request

Figure A.15. Data Flow Level 5.1.
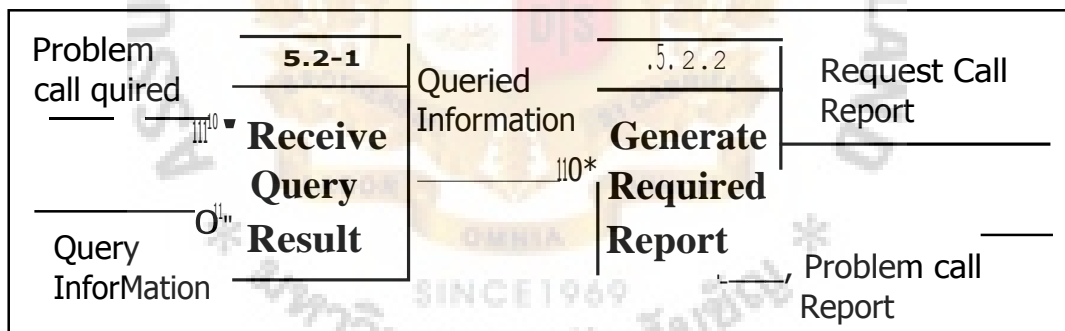
Data flow level 2 : 5.2 Generate call report

Figure A.16. Data Flow Level 5.2.

108

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