Executive Information System for U-Solutions Co., Ltd.

by

Ms. Chunpen Jindapradist

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
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Project Title	Executive Information System for U-Solutions Co., Ltd.
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Academic Year	July 28, 2001

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 Executive Information System for U-Solutions Company Limited is a computer-based information system designed to help executives, senior managers and middle managers access to information relevant to their management activities. This can support strategic activities - setting policies, planning, and preparing budgets.

At present, the information is gathered from individual departments that provide executive's desired information in making decision. This proposed system is developed to take advantage over the existing system that cannot provide desired information to the executives and management levels when they need it. The computerized system is specially designed for supporting executive's decision - making and strategic planning.

In addition, it can increase the efficiency and effectiveness of management levels to evaluate work performance of their workers with the minimum expense of time and budget.

ACKNOWLEDGEMENTS

It's a great pleasure to acknowledge the assistance and guidance of people who contributed to this System Development Project and make this report success.

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At last, she would like to thank all staff and executives in U-Solutions Company Limited for giving her necessary data.

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U-Solutions Company Limited was founded in 1998 in Bangkok, Thailand. Its main business is providing a wide range of cutting -edge software solutions and integrated hardware components for toll revenue control system, parking management, reward and loyalty program and access control and time attendance system to both private enterprises and government agencies.

Since competitions have been increasing accompanied with rapid changes in customer demand, information is like a strategic weapon and very significant to executive's decision - making.

At present, executives' information is obtained from the specific information department concerned. Most of them are not summarized data and have no tools to project the trend and make analysis. It also takes time to gather or pull data from related departments because of different formats. Moreover, it seems that now it is difficult to manage record and keep up with work on process of each employee within the company. So the proposed system should be easy to use with summarized data and graphical user interface to facilitate management levels' decision making; just one click, users can get their desired information.

1.2 Objectives of the Project

The Executive Information System has been proposed to the company to meet the following objectives.

(1) To gather, analyze and integrate internal and external data into dynamic profiles of key indicators.

(2) To support managerial learning about the company, its work in process and its interaction with the external environment.

(3) To provide information to executives and management level on-line with timely access to information.

(4) To automate manual procedure to pull data from various sources.

(5) To provide data to users with more accuracy and consistency.

(6) To reduce time to manage and search for specific data.

(7) To provide up-to-date information to the company management in a simple and effective manner.

1.3 Scope of the Project

This project focuses on major characteristics of queries from users that can be defined as follows:

(1) Retrieval of specific information about the daily operational status of the organization' s activities.

(2) Monitoring and scanning of the environment to give executives rapid exposure to changes in the environment.

(3) Status information about company' s performance.

(4) Extensive Consolidation, drill-down queries which users can search for different levels of details.

(5) Highlighting of the information an executive feels critical.

(6) Providing of data from multiple sources with exception reporting, extensive graphics and trend analysis.

1.4 Deliverables

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(a) Background of the project

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(2) The Existing System

(a) Background of the organization

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1.5 Project Plan

This project plan of U-Solutions Company Limited: Executive Information System is shown in Figure 1.1.

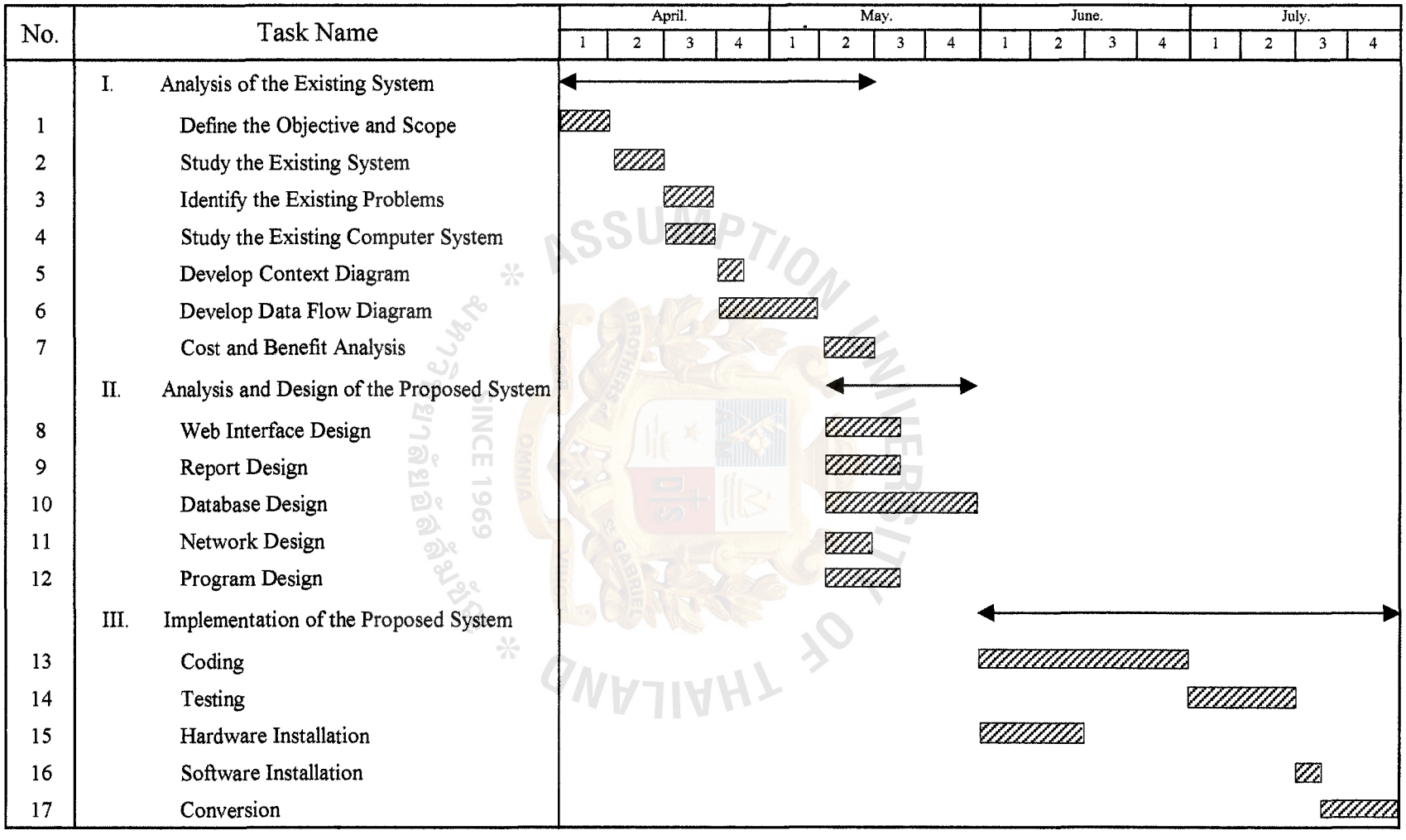

Figure 1.1. Project Plan of Executive Information System.

II. THE EXISTING SYSTEM

2.1 Background of the Organization

U-Solutions Company Limited was formed in 1998 in Bangkok, Thailand and currently employs over 50 young talented Thai professionals. More than 70 percent of them are IT experts and experienced engineers.

U-Solutions has focused on providing a wide range of cutting-edge software solutions and integrated hardware components for toll revenue control system, parking management, reward and loyalty program, and access control and time attendance system to both private enterprises and government agencies.

With the local expertise and cooperative support from our technical alliances, U-Solutions has been able to customize the system to suit our clients' needs. Our renowned clients include Shinnawatra Tower III, Department of Highway, Tesco Lotus Superstores, and Bangkok Transportation System (BTS).

It is the company's primary intention to provide stable ready-to-use system to clients. In addition, U-Solutions has always been conforming to latest technology. All U-Solutions 's solutions are capable to take advantages of Internet and smart card technology.

U-Solutions commits to provide not only world-class integrated system but the most competitive products and services in terms of pricing, functionality and availability as well.

U-Solutions aims to bring practical solutions for toll system and other closed-environment system to Thailand's industry as well as global market. It is believed that our quality system of management together with complete products and services would ensure perfect solutions to business partner's investments and business success.

2.2 Existing Business Function

2.2.1 System Logistic and Plan Design

After receiving the project from customers, individual key players of all departments in the company will meet to collaborate to reach for the conclusion of customer requirement. The project coordinator concludes the overview of the system and keeps it for subsequent use. It will also be copied for other departments within the company.

2.2.2 Specify the System Development Plan

Operation manager will take the responsibility to evaluate the capacity of technical people responsible to the project. Project coordinator will check all devices used to develop that system, evaluate the time to develop program and to install the whole system. Finally, both operation manager and project coordinator will depict all details in developing the project.

2.2.3 Purchase Devices and Materials

For acquisition function, hardware, software and maintenance, people altogether are responsible for listing all devices and materials used to develop the system. Some of devices and materials that are out of stock need to be purchased from suppliers by procurement department. It makes contact directly with suppliers and send inquiry of devices and material specifications. The suppliers send back a quotation, and after the negotiation, the goods will be delivered to the inventory section and store in inventory room. Invoice is then delivered to Accounting Department to bill the payment.

2.2.4 Design Prototyping

After getting System Requirement Specification , hardware people will find additional technical data (if needed). They will compose the hardware devices together for prototyping. After producing in small scale, technical testing, budget testing, time

testing and customer requirement testing must be done. This will be approved by Technical Board. Prototyping and demonstration set will be sent to manufacturers for installation.

2.2.5 Developing Program

Software people take responsibility for writing program and designing database structure, input / output and interface. After they get the system requirement specification and necessary data from hardware people, they will write the program especially for that job. The programmers will put the program onto the hardware device. The written program need to be modified if it cannot produce the correct result as needed when testing is done. User manual and technical manual will be made after this.

2.2.6 Install the Integrated System at Site

Installation of hardware and software is made immediately after integrating program and hardware device is finished and ready to be installed. The computer setup is made in customer's site. Installation people consist of hardware, software people and technicians. They will investigate the readiness of hardware device, program and customer's site. The plan for installation is made after inspection is finished which takes about two hours. Testing must be done at customer's site again to ensure the system completely works. If the system is launched to the customer's site and there is no problem at all, the user manual will be delivered to the user. If not, they will correct it immediately.

2.2.7 Maintenance

After installation has been made to customer's site, it will be put to maintenance program for periodic service. In addition, the company provides the maintenance program for ad-hoc problem. When the customer makes a call and informs about their problems, technical people will provide the solution to a problem. If they cannot solve

the problem right away, it will be dispatched to the operation manager who considers the additional maintenance program. He will consider additional data in solving problem. After correcting the problem, they will report the problem and result of maintenance to improve installation and maintenance program.

2.3 Current Problems and Areas for Improvement

Problems that occurred in the existing system are:

(1) No department handles summarized report needed by executive and management levels.

(2) It takes a lot of time to prepare report according to the requirement of executives and management levels.

(3) It is difficult and takes a lot of time to manage and retrieve dispersed data in different locations.

(4) It is difficult to maintain files kept in many locations.

(5) Data are recorded in text format and spreadsheet, which is not convenient and suitable for executives and management to analyze them.

(6) It is difficult to evaluate and measure employee's performance.

(7) Approval for financial issues consumes several hours.

2.4 Existing Computer System

At present, U-Solutions Co., Ltd. has standardized set of computers and necessary software to use in business activities. Because of the nature of its business, individual employees have computers on their desks. Technical people, in addition, have software specially use for their functions. Executive and management have their own computers and laptops with software suite attached in their computers. No specifically software has been used for extracting data from specific source used by them. All data are kept in various sources in the form of text, and some in graphic representation. This stores in a file folder and some in computer file in various locations in the company. Moreover, three printers are shared as network printer. And there are two HP Scanners in computer center and in client side. Table 2.1 and Table 2.2 show existing hardware and software:

Table 2.1. The Hardware Specification for Existing System.

Hardware	Specification
CPU	933 MHz, Intel Pentium III
Memory	256 MB, SDRAM
Hard Disk	15 GB DMA 100 7200 RPM
CD-ROM Drive	40X
Floppy Drive	1.44 MB
Network Adapter	Ethernet 10-Base T
Display Adapter	SVGA card
Display	14" SVGA monitor

Table 2.2. The Software Specification for Existing System.

Software	Specification
Operating System	Microsoft Windows 95
Web browser	Microsoft Internet Explorer 5.5
Application Software	Microsoft Office 95 , Microsoft Project, Crystal Report
Virus Scan	McAfee Virus Scan

III. THE PROPOSED SYSTEM

3.1 System Specification

Since information is a critical resource for the company's situation to take competitive advantage over emerging competitors and provide the best service to customers, executive and management need relevant information in timely, accurate and actionable manner about aspects of a business and external factors that are of particular interest to them.

From analyzing the existing system, the new system should get rid of redundant and unnecessary steps in searching data and making decision by replacing the proposed system that has the following features:

(1) The system that can focus on specific information user need and provide the solution instantaneously.

(2) The system that can prepare summarized report and graphical representation to facilitate the decision - making process of executive and management.

(3) The system that can reduce time in handling paper work.

(4) The system that can provide on-line information.

(5) The system that can provide data consistency and accuracy.

(6) The system that can help user to make inquiry more easier.

(7) The system that can reduce time in searching data that executive and management need.

(8) The system that has projection tool to facilitate decision - making process.

3.2 System Design

It deals with the physical or implementation -dependent aspects of a system or the system's technical specification built on the knowledge derived from the previous part - System Analysis part. This is analyzed and designed as follows:

(1) Context Diagram

The purpose of this tool is to represent the broad picture or scope of boundaries of the new system. It is constructed as the highest level model. In constructing, it can see easily who are involved in the system context and what information is passed between them and the computerized system. Appendix C shows the Context Diagram of Executive Information System.

(2) Data Flow Diagram

It is another tool helps system designer to design the computerized system. It shows data flows where it has been sent to and from the system, and within the system itself. On top of that, it indicates the processing functions that change some value of data, store and modify them. Data Flow Diagram can be seen in Appendix D section.

(3) Process Specification

It is created on data flow diagram basis. This can explain the logical concept about how input data is transformed into output data. It derives from sub process of data flow diagram. Appendix G displays the Process Specification of this proposed system.

(4) Structure Chart

It is a hierarchical diagram showing the control structure imposed on the system's processes. Its purpose is to facilitate the programmer to write the program, demonstrate which module is the boss and which is a

subordinate. This can help to implement and maintain the new system. Appendix E shows the Structure Chart of the new system.

(5) Database Design

It is significant to the Database Management System because data contained in database needs to investigate the relationship between each item. The relational database is used including attributes, records, keys and relationship between tables. Normalization to 3NF is applied to the database table to keep data accuracy and consistency as well as to maintain program. Each table is free from another. Entity Relationship Diagram is a tool to create the database model in terms of entity and relationship among them. In Appendix F, the Database Design is shown.

(6) Input Design

The screen is designed based on simplicity for users to key in data, consistency from one screen to another screen with attractiveness and cleanliness. The computing skill is not a matter for this new system. Users just key in their requests and wait for response.

There are three sections on the screen: first, the heading section which displays the name of function that will be performed. Second, the middle section is the box of data which is the main part of the screen used for entry user's data. This section allows domains of attributes to be unpredictable and contains scrolling to move up and down. Instruction of inputting questions is shown in the above of this area. The last section is bottom section which displays command button given to users to continue or exit the function of that process. Appendix A - Figure A.9 and A.10 shows the Input Design of the proposed system. However, it is included in User Interface Design Part.

(7) Output Design

The presentation of output report of requested data can be shown in both screen and printed report. The output is designed for users mostly in graphical oriented and summarized report specifically designed to support decision-making process. Moreover, system users can explore the information to find the root causes of those issues. So the report also has underlying details of information system users need. The output report is one of the tools in analyzing data used by executives and management.

The output design can be classified into three sections. The heading section consists of the title of report, page number, date and time of preparing the report. The middle part of the output screen consists of the actual output report of requested data. The last section is command button which consists of the print command, next request and exit command. However, the printed report is shown in Appendix B. It displays the actual data executives and management need.

3.3 Hardware and Software Requirement

Because the company already has the hardware in Technical Assistant Center that can be modified to be as a backbone database server. So the company does not need to invest a lot in extra hardware cost since upgrade existing PC can be done in the computer center. For software, the company invests only in DBMS (Database Management System Software) - SQL Server 7.0 and MS Windows 2000 server as an operating system software so that user can make query from any work sites within the company. The hardware and software specifications for the proposed Database Server are shown in Table 3.1 and Table 3.2 respectively.

Table 3.1. The Hardware Specification for the EIS Server.

Hardware	Specification
CPU	933MHz, Pentium III
Cache	512 MB or higher
Memory	256 MB 100 MHz, ECC, SDRAM
Hard Disk	40GB
CD-ROM Drive	52X or higher
Floppy Drive	1.44 MB
Network Adapter	Ethernet 100-Base T, HUB&LAN Card UTP
Display Adapter	SVGA card
Monitor	15" monitor
Printer	Hewlett Packard Laser Jet
Uninterruptible Power Supply (UPS)	IBM Office Professional 300 UPS 230 V

Table 3.2. The Software Specification for EIS Server.

Software	Specification
Operating System	Microsoft Windows 2000 Server
Web Server	Microsoft Internet Information System 5.0
Application Server	Microsoft Active Server Pages
Database Server	Microsoft SQL Server 7
Virus Scan	McAfee Virus Scan V5.15

In Executive Information System, the client machines will have capacity only high enough to access database server and display what they request in a timely manner. However, the client machines should have specification more than accessing to data. They should run any office automation software such as word processing and excel which everyone in the company familiar with it. Thus, in client machines there is no more application software suitable for them other than the application that provides tool for accessing data like MS OFFICE 2000.There are already two shared network printers in the client sides. The hardware and software specifications for individual client machines are shown in Table 3.3 and Table 3.4 respectively.

Table 3.3. The Hardware Specification for Each Client Machine.

Hardware	Specification
CPU	933 MHz, Intel Pentium III
Memory	256 MB or higher, SDRAM
Hard Disk	15 GB DMA 100 7200 RPM
CD-ROM Drive	40X or higher
Floppy Drive	1.44 MB
Network Adapter	Ethernet 10-Base T
Display Adapter	SVGA card
Display	14" SVGA monitor

Table 3.4. The Software Specification for Each Client Machine.

Software	Specification
Operating System	Microsoft Windows 95
Web browser	Microsoft Internet Explorer 5.5
Application Software	Microsoft Office 2000 Professional Edition
Virus Scan	McAfee Virus Scan

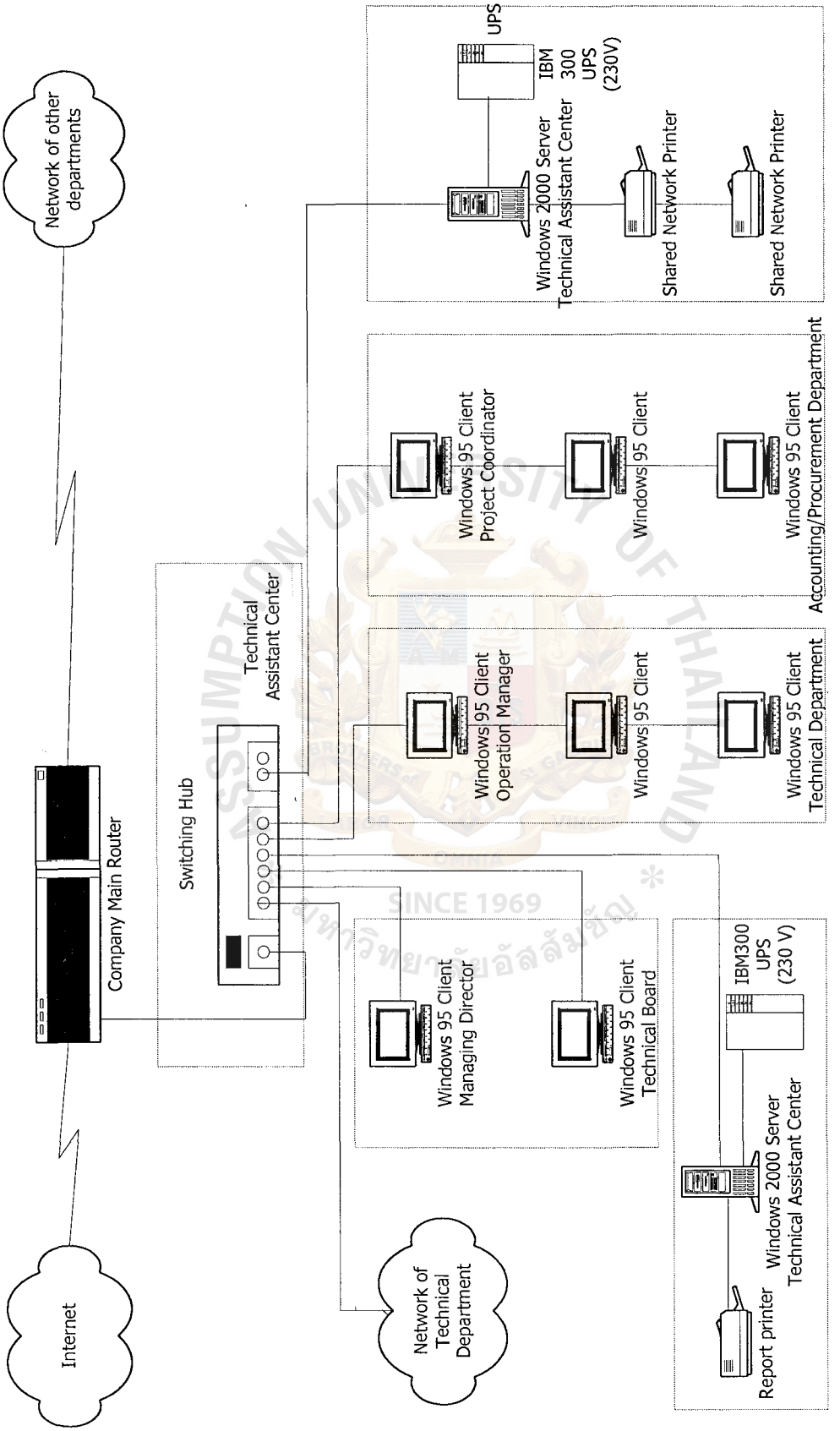

Figure 3.1. Network Configuration of Executive Information System for U-Solutions Co., Ltd.

3.4 Security Control

Because security is one of the main criteria in developing this system, there are three categories of security control to ensure the system is protected properly.

(1) Physical Security

Database server located in Technical Assistant Center prevents unauthorized access and intruder access to the computer room. ID card must be shown before getting allowed. Moreover, the officer in the room will record individual people who enter to the computer room.

(2) System Security

No data resides in other client PC. Only the system administrator in Technical Assistant Center can access to the computer system to modify data by agreement with Technical Board and Management.

(3) Application Security

User ID and password must be filled in to any request. Only assigned password can access to the computerized system. In addition, Log File will keep details of accessing to utilize the computer resources of individual users.

3.5 System Cost Analysis

(1) Cost of Manual System

Table 3.5. Manual System Cost Analysis, Baht.

Cost items		Years				
		1	2	3	4	5
Fixed Cost						
Calculator	6 units @ 2,000	12,000.00	–	–	–	–
Total Fixed Cost		12,000.00	–	–	–	–
Operating Cost						
Salary Cost:						
Operation Manager	1 person @ 25,000	25,000.00	27,500.00	30,250.00	33,275.00	36,602.50
Staff:						
Purchasing Officer	2 persons @ 10,000	20,000.00	22,000.00	24,200.00	26,620.00	29,280.00
Receiving Stock clerk	2 persons @ 9,000	18,000.00	19,800.00	21,780.00	23,958.00	26,353.80
Total monthly salary Cost		63,000.00	69,300.00	76,230.00	83,853.00	92,236.30
Total Annual Salary Cost		756,000.00	831,600.00	914,760.00	1,006,236.00	1,106,835.60
Office Supplies & Miscellaneous Cost:						
Stationary	Per Annum	4,000.00	4,400.00	4,840.00	5,324.00	5,856.40
Paper	Per Annum	7,000.00	7,700.00	8,470.00	9,317.00	10,248.70
Utility	Per Annum	7,000.00	7,700.00	8,470.00	9,317.00	10,248.70
Miscellaneous	Per Annum	5,000.00	5,500.00	6,050.00	6,655.00	7,320.50
Total Annual Office Supplies & Miscellaneous Cost		23,000.00	25,300.00	27,830.00	30,613.00	33,674.30
Total Annual Operating Cost		779,000.00	856,900.00	942,590.00	1,036,849.00	1,140,509.90
Total Manual System Cost		791,000.00	856,900.00	942,590.00	1,036,849.00	1,140,509.90

Table 3.6. Five Years Accumulated Manual System Cost, Baht.

Year	Total Manual Cost	Accumulated Cost
1	791,000.00	791,000.00
2	856,900.00	1,647,900.00
3	942,590.00	2,590,490.00
4	1,036,849.00	3,627,339.00
5	1,140,509.90	4,767,848.90
Total	4,767,848.90	-

(2) Costs of Computerized System

Table 3.7. Computerized System Cost Analysis, Baht.

Cost items	Years				
	1	2	3	4	5
Fixed Cost					
Hardware Cost:					
Computer Server Cost	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
Client Cost	-	–	–	–	–
Hub 10/100mbs 24 ports	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00
UPS (Local Power Supply)	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
Total Hardware Cost	24,000.00	24,000.00	24,000.00	24,000.00	24,000.00
Maintenance Cost:					
Maintenance Cost	–	–	–	20,000.00	23,000.00
Total Maintenance Cost	–	–	–	20,000.00	23,000.00
Software Cost:					
Computer Server Cost	50,000.00	–	–	–	-
Network Cost	12,000.00	12,000.00	12,000.00	12,000.00	12,000.00
Application S/W Cost	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
Total Software Cost	72,000.00	22,000.00	22,000.00	22,000.00	22,000.00
Implementation Cost:					
Advanced Training Cost	40,000.00	-	-	-	-
Set up Cost	10,000.00	-	-	-	-
Total Implementation Cost	50,000.00	-	-	-	-
Total Fixed Cost	146,000.00	46,000.00	46,000.00	66,000.00	69,000.00
Operating Cost					
People-Ware Cost:					
Operation Manager 1 person @ 30,000	30,000.00	33,000.00	36,300.00	39,930.00	43,923.00
Staff:					
System Administrator 2 persons @ 12,000	24,000.00	26,400.00	29,040.00	31,944.00	35,138.40
Total Monthly Salary Cost	54,000.00	59,400.00	65,340.00	71,874.00	79,061.40
Total Annual Salary Cost	648,000.00	712,800.00	784,080.00	862,488.00	948,736.8
Office Supplies & Miscellaneous Cost:					
Stationary 200 per month	2,400.00	2,640.00	2,904.00	3,194.40	3,513.84
Paper 300 per month	3,600.00	3,960.00	4,356.00	4,791.60	5,270.76
Utility 300 per month	3,600.00	3,960.00	4,356.00	4,791.60	5,270.76
Miscellaneous 200 per month	2,400.00	2,640.00	2,904.00	3,194.40	3,513.84
Annual Office Supplies & Miscellaneous Cost	12,000.00	13,200.00	14,520.00	15,972.00	17,569.20
Total Operating Cost	660,000.00	726,000.00	798,600.00	878,460.00	966,306.00
Total Computerized System Cost	806,000.00	772,000.00	844,600.00	944,460.00	1,035,306.00

Table 3.8. Five Years Accumulated Computerized Cost, Baht.

Year	Total Computerized Cost	Accumulated Cost
1	806,000.00	806,000.00
2	772,000.00	1,578,000.00
3	844,600.00	2,422,600.00
4	944,460.00	3,367,060.00
5	1,035,306.00	4,402,366.00
Total	4,402,366.00	-

(3) The Comparison of the System Costs between Computerized System and Manual System

Table 3.9. The Comparison of the System Costs, Baht.

Year	Accumulated Manual Cost	Accumulated Computerized Cost
1	791,000.00	806,000.00
2	1,647,900.00	1,578,000.00
3	2,590,490.00	2,422,600.00
4	3,627,339.00	3,367,060.00
5	4,767,848.90	4,402,366.00

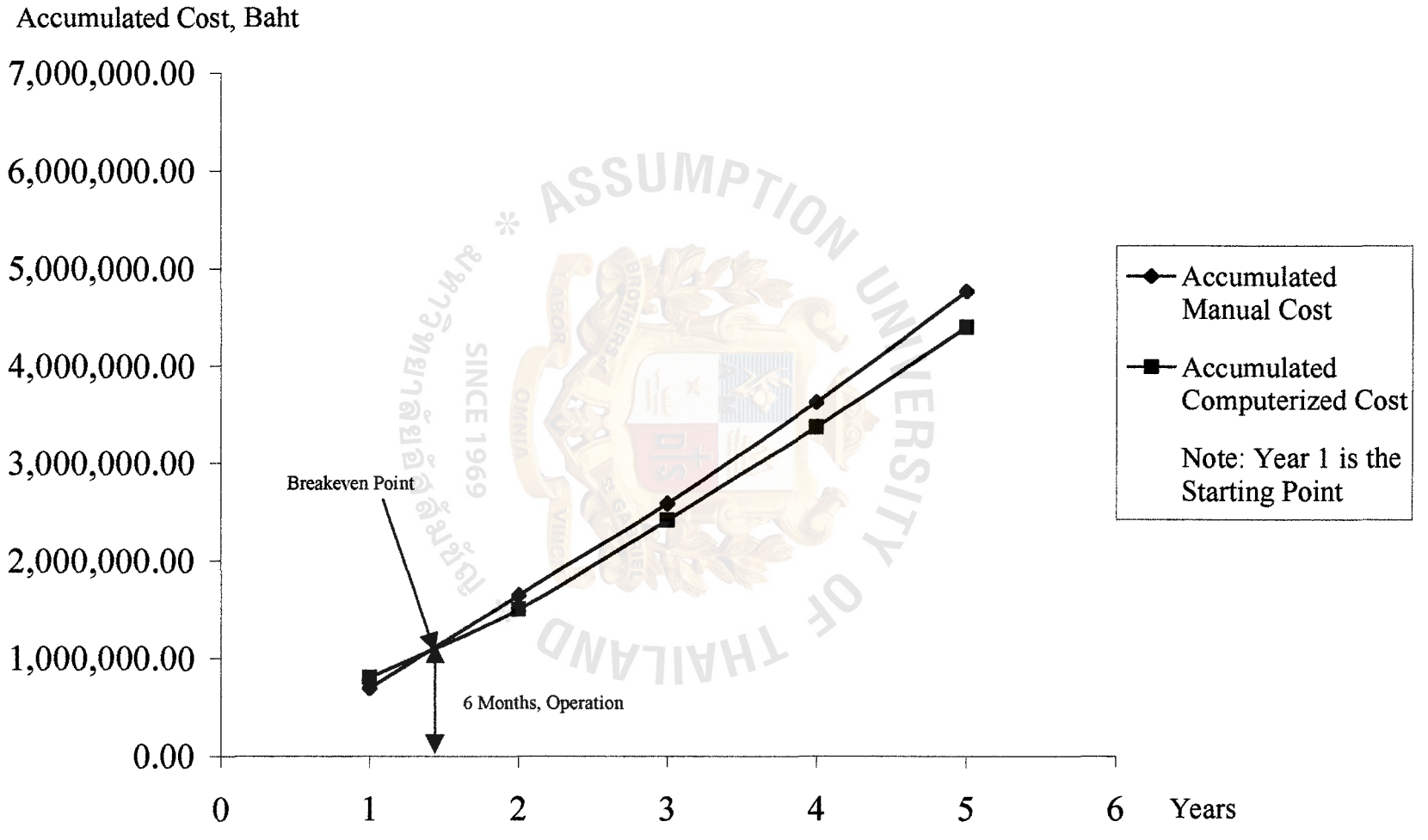

Figure 3.2. Cost Comparison between Manual and Proposed System.

3.6 Candidate Solution Analysis

Table 3.10. Candidate Matrix.

Characteristics	Candidate 1	Candidate 2	Candidate 3
Portion of System Computerized : A description of that portion of the system that would be computerized in this candidate.	Query package would be purchased for managing user's request.	Individual departments develop to support the collection of data of their department.	Same as candidate 1
Benefit : The benefit of each alternative that would be realized to make decision.	This solution can be implemented quickly because it is a purchased solution.	Fully support user's requirement in query process for the EIS.	Same as candidate 1
Servers and Workstations : A description of the servers and workstations needed to support this candidate.	IBM Server, Pentium III 1GHz., RAM 256 MB for server, Pentium III 933 MHz., RAM 256 MB for client.	Compaq second hand, Pentium III 500 MHz., RAM 128 MB for server, Pentium III 933 MHz., RAM 256 MB for client.	Upgrade PC Pentium III 933 MHz., RAM 256 MB for server, Pentium III 933 MHz., RAM 256 MB for client.
Software Tools Needed : Software tools needed to design and build the candidate. Not generally applicable if application software packages are to be purchased.	Oracle Application to provide report writing and integration.	Visual Dephi 6.0	Visual Basic 6.0
Method of Data Processing : Generally some combination of : online, batch, deferred batch, remote batch, and real-time.	Client/Server	Client/Server	Client/Server
Output Devices and Implications : The devices that will be used , special output requirements.	HP Laser Jet Printers	Same as candidate 1	Same as Candidate 1
Input Devices and Implications : A description of input methods to be used, input devices, special input requirements, and input considerations.	Keyboard and mouse HP Scanners	Same as candidate 1	Same as candidate 1

Table 3.10. Candidate Matrix (Continued).

Characteristics	Candidate 1	Candidate 2	Candidate 3
Storage Devices and Implications : Brief description of storage devices that will allow information to be retrieved from database.	Oracle 7.0	Microsoft Access 97	MS SQL Server 7.0
Training : A description of the alternative way of training and preparing executives and management levels for the new computerized system.	To train executives and management levels who use the new system directly.	Same as candidate 1	Same as candidate 1
Technical staff : A description of the alternative way for the company to hire people who have knowledge about the new technology.	To hire the new employees who have the knowledge of SQL Server 7.0 and can manage the new computerized system.	Same as candidate 1	To hire the existing employees in Technical Assistant Center but pay them in extra salary.

Table 3.11. Alternative Candidate Requirement Analysis.

Characteristic	Candidate 1	Candidate 2	Candidate3
Portion of System Computerized			
- Query Package	X		X
- Individual departments		X	
Benefit			
- Implement quickly	X		X
- Fully support user's requirement		X	
Server			
- IBM Server, Pentium III 1 GHz.	X		
- Compaq used, Pentium III 500 MHz.		X	
- Upgrade PC, Pentium III 933 MHz.			X
Workstation			
- Pentium III 933 MHz.	X	X	X
Operating System			
- Microsoft NT	X		
- Microsoft Window 95		X	
- Microsoft 2000 Server			X
Software Tools			
- Oracle Application	X		
- Visual Delphi 6.0		X	
- Visual Basic 6.0			X
Method of Data Processing			
- Client/Server	X	X	X
Output Devices and Implications			
- HP Laser Jet Printers	X	X	X
Input Devices and Implications			
- Keyboard and mouse	X	X	X
- HP Scanners	X	X	X
Storage Devices and Implications			
- Oracle 7.0	X		
- Microsoft Access 97		X	
- MS SQL Server 7.0			X

Table 3.12. Feasibility Analysis Matrix.

Feasibility Criteria	Wt.	Candidate 1	Candidate 2	Candidate 3
Operational Feasibility Functionality: A description of to what degree the candidate would benefit the company and how well the system would work. Political: A description of how well received this solution would be from both executives and management users as well as organization Perspective.	30%	Fully support user's requirement functionality. IBM Server is too expensive which is not recommended by Technical Board. Score: 70	Same as candidate 1 The quality of hardware is similar to the existing PC but more expensive so system developers did not recommend Score: 80	Same as candidate 1 Upgrade PC is recommended by system developers and Technical Board because of its lower prices and its capacity to support the new computerized system. Score: 100
Technical Feasibility Technology: An assessment of the maturity, availability (or ability to acquire), and desirability of the computer technology needed to support this candidate. Expertise: An assessment of the technical expertise needed to develop, operate and maintain the candidate system.	30%	Pentium III is widely accepted and compatible with other platforms. New employees are trained to support the new system and they need times to adjust to the new system context. Score: 80	Same as candidate 1 Same as candidate 1 Score: 80	Same as candidate 1 System administrators already have knowledge and experience to operate the new system. Score: 90
Economic Feasibility Cost to Develop (Baht): Payback Period: Net Present Value:	30%	482,400.00 - -360,161.4 Score: 40	450,000.00 3.10 years 116,372.1 Score: 60	295,000.00 1.5 years 662,535.6 Score: 90
Schedule Feasibility An assessment of how long the solution will take to design and implement.	10%	4 months Score: 90	6 months Score: 80	4 months Score: 90
Ranking	100%	66	74	93

3.7 Benefit Analysis

It can be divided benefits the company will get into two categories as follows:

(1) Tangible Benefits (per annum)

(a) Estimated amount of reduction in travelling cost (3,000 * 12)

36,000.00 baht

(b) Estimated amount of reduction in salary (756,000 - 468,000)

288,000.00 baht

(c) Estimated amount of eliminating of searching steps (500 * 12)

6,000.00 baht

(d) Estimated amount of increasing throughput (10,000 * 12)

120,000.00 baht

Total Amount of Tangible Benefits 450,000.00 baht

(2) Intangible Benefits

(a) Better management of large amount of data.

(b) Data is available when users need.

(c) It is convenient to manage and control data in one central location.

(d) It can reduce time to manage data and prepare report.

(e) Users can have more times to do other works.

(f) Reducing time to search for required information.

3.8 Payback Analysis

The concept of payback analysis derives from estimating the breakeven point when costs plus benefits equals to zero. Candidate 3 is the best alternative for payback period since it takes only 1.5 years for the benefits to overtake the costs compare to candidate 1 and 2. Candidate 1 cannot payback in 5 years so it is a bad investment to invest in it. Candidate 2 takes 3.10 years to recover its investment which longer than candidate 3. So investing in candidate 3 is a good choice for this analysis. Figures H.1, H.2 and H.3 in Appendix H show Payback Analysis of each candidate respectively.

3.9 Net Present Value Analysis

It is the way to adjust all the costs and benefits back to present value of money (baht). From Table H.6., it can be said that candidate 3 provides the net present value of 662,535.60 baht which greater than candidate 1 of - 360,161.40 baht and candidate 2 of 116,372.10 baht. So candidate 3 is a good investment since it gives the highest positive NPV - the best investment.

IV. PROJECT IMPLEMENTATION

4.1 Overview of Project Implementation

Implementation of an effective EIS requires clear consensus on the objectives and measures to be monitored in the system and a plan for obtaining the data on which those measures are based. To ensure the new proposed system can meet the desired goals and objectives as well as the user's requirement, system implementation must be done in a planned and orderly conversion from a current existing system to the new proposed information system. The implementation process begins as soon as management has accepted the new computerized system. The following is the implementation process.

(1) Hardware Installation

The computer and equipment already exists in client and server sides. The company needs only one more additional server to ensure that if one server fails the other one can work immediately. To save investment cost, upgrade PC will be used as a backbone database server located in the computer center. According to the cost/benefit analysis section, to establish database server, CPU 933 MHz. PENTIUM III, 256 RAM will be used. Hardware test will be made to ensure the proper operation of the new hardware.

(2) Software Installation

For installation of software, there are two sides to consider. First, at the server side, SQL Server 7 will be bought from vendors because it is convenient and ready to be used easily in the company with the knowledge of existing employees in the Technical Assistant Center who can use this software to manage the database. Second, at the client side, MS OFFICE 2000 Professional Edition should be bought from vendors because MS

ACCESS is one of the software suites that users can access to the database of the company. In addition, it is a user-friendly software that can provide accessing to database with a minimum expense in investment cost.

(3) Network Installation

Computers in the company are connected together through the LAN network. LAN card and cable are connected to the computer to allow the new computer to be seen in the computer network. Modification in the database can be done only at the server side but any request can be made at any computers in the company.

(4) System Test

After hardware and software installation is done, the new system must be tested to ensure that application program written in isolation works properly when it is integrated into the whole system. It is done by integrating all sub programs and testing them as one unit. Conducting system testing will take a period of one week.

(5) Training

After hardware and software testing has been done, training will be provided to all users - executives, senior managers and middle managers. Because EIS is designed to be user-friendly computerized system to be used by executives and management levels in the company, training takes a period of about three hours. The objective of training is ensuring the proper use of the proposed system that could reduce misunderstanding and misuse of the system and prepare them for a smooth transition.

4.2 Conversion

Once a successful system test has been completed, the preparation for the new system into operation begins. It consists of two major steps as follows:

(1) File Conversion

The existing system will export all necessary data into the new system format. However, It should be prevented from unauthorized users and controlled inputting the wrong data during file conversion.

(2) System changeover

Parallel Conversion - both existing and new systems are operated for one month to ensure that all major problems in the new system have been solved before the old system is discarded. When executives, management and middle managers need information, they can use their computers to search for their required data as well as ask their employees. This will not cause confusing or getting trouble to them since the new proposed system is like another choice or tool for management to get their required data faster than the manual system. In addition, management training will make the system users accustomed to it as well as make them use the new system correctly, properly and wisely.

V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

This new proposed system- Executive Information System for U-Solutions Co., Ltd. is developed for the purpose to get rid of tedious steps in finding, collecting and analyzing specific data for executives and management. According to the conversion of the old system to the new proposed system, it can prove that eventually executive and management are free to do other managerial and more productive works. On top of that, other employees can utilize the system by accessing online to data, or even to print out necessary reports at their own desks. So all of them can reduce time cost to acquire data and prepare reports.

Table 5.1. The Degree of Achievement of the Proposed System.

Process	Existing System	Proposed System
Search specific information	At least 20 mins.	2 mins.
Gather related data	At least 1 hr.	Less than 20 mins.
See employee's performance	At least 30 mins.	2 mins.
Check inventory status	At least 10 mins.	2 mins.
Summarize report	At least 3 hrs.	2 mins.
Approval for financial issue	At least 3 hrs.	Less than 5 mins.
Analyze data	At least 3 hrs.	Less than 5 mins.
Total	At least 11 hrs.	38 mins.

Table 5.1 indicates the important process of users in their business activities which can be described as follows:

(1) Searching Specific Information

Since the new system does not need to search data in various locations and in different formats like the manual one does, it takes less time.

(2) Gathering Related Data

Management needs some data related to other sources of data, he takes at least one hour to collect them together. Compare to the new system that can provide data immediately since all data are kept in one central location.

(3) Knowing Employee's Performance

Because the new system keeps employee's data in one central location, management is easy to know their work-in-progress within 2 minutes via the computerized system.

(4) Checking Inventory Status

Inventory staff needs at least 10 minutes to go and check the inventory items in inventory room while the proposed system needs only 2 minutes to know the inventory status since it does not need to go and check in it.

(5) Summarizing Report

Summarized report is frequently required by the management. Unlike the existing system, the proposed system can provide summarized data immediately.

(6) Approval for Financial Issue

When financial issue is concerned, executive needs all details about the thing he will sign. The new system can provide all details he needs immediately compare to the manual one that need a lot of times and many documents to consider.

(7) Analyzing Data

The proposed system has a graphical representation of data that management can use to analyze data faster than plain text in the manual system.

However, the new system should have a plan to convert a web-based system to handle request through World Wide Web. Executive and management as well as employees will no longer to stay in the company to make request. Instead, they can make query at any remote sites with Internet access and a web browser program.

In addition, the website should provide electronic bulletin board so that it acts as the center of communications. Any departments can make announcement to every level within company to let them know about company's activities.

For System maintenance, since the nature of Executive Information System is susceptible to the changing context of internal and external factors such as changing needs of information of users, the system administrator needs to revise and update its database to serve user's requirement and ensure that the system can satisfy the correct result to users. EIS will fail if it cannot provide whatever executives and management need.

5.2 Recommendations

For the new computerized system, the writer recommends utilizing it in an efficient manner and improves the system better by using Touch Screen Technology - the most simple, intuitive, and easiest to learn of all PC input devices. This technology allows user touches the screen to select options presented on the screen. It is being used to improve human - computer interaction. It can increase the throughput and reduce the possibility of entering data.

As business operations shift increasingly to the Internet and the Web, the company is being forced to move its customer support and service operations online. The benefits of such a move can be substantial, since the virtual world operates nonstop, and provides unlimited opportunities for customer interaction.

Applying a knowledge management initiative makes it possible for the company's customers to obtain information just by searching for it. Customers and technical people of the company can answer many of their own questions through their own work sites and support agents such as technical people can devote more time and resources to handle complex issues. Moreover, this technology makes it possible to deliver expert knowledge to all sites within an organization and also help mitigate the effects of personnel turnover and job changes since captured knowledge remains accessible at all times. Finally, it delivers the latest and most-up-to-date answers and information across the enterprise, because knowledge sharing and replication ensures that all captured knowledge is current and available.

However, without management support, proper training, and a committed effort to make implicit knowledge explicit, this technology will be ineffective. But the company can successfully avoid it by choosing the right people, processes, technology, and knowledge to implement a knowledge management solution. The solution includes software that can capture and organize knowledge elements, along with the necessary support and training to insure a successful launch of its solution within an organization.

APPENDIX A

USER INTERFACE DESIGN

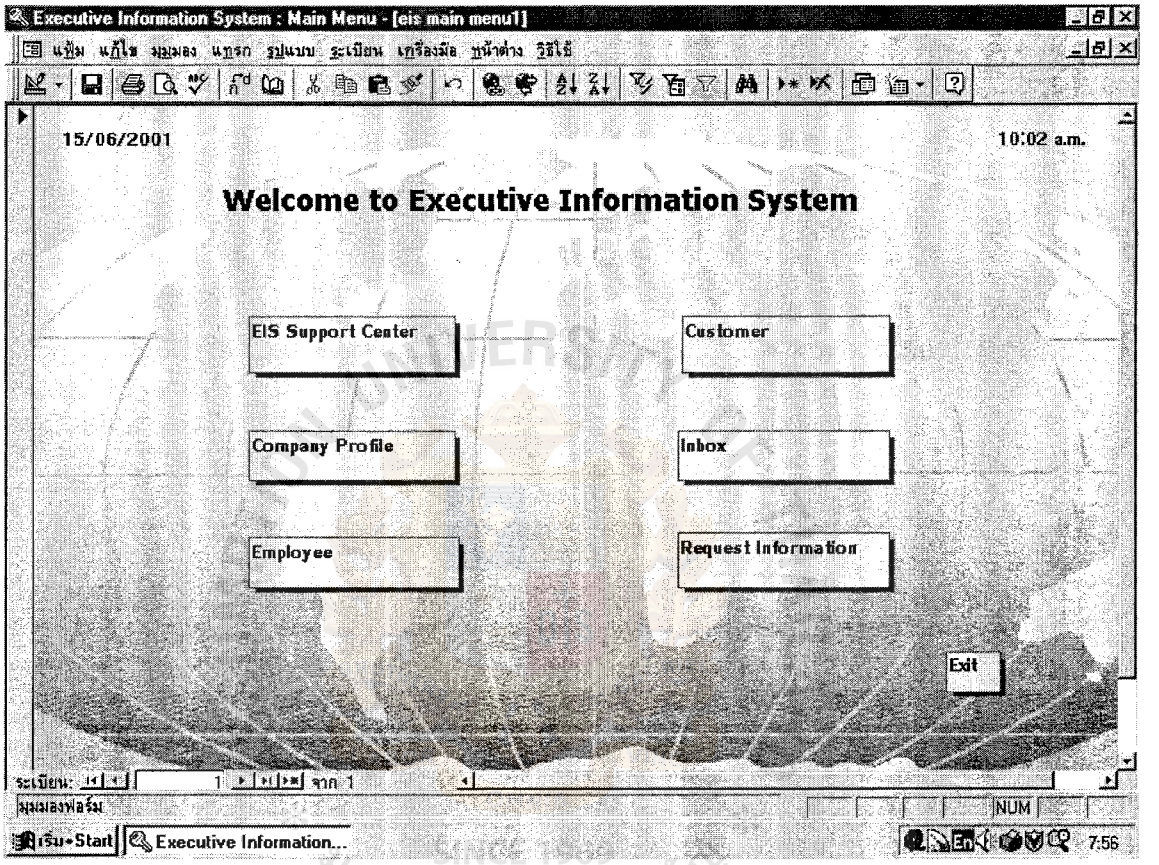

Figure A.1. Executive Information System Main Menu.

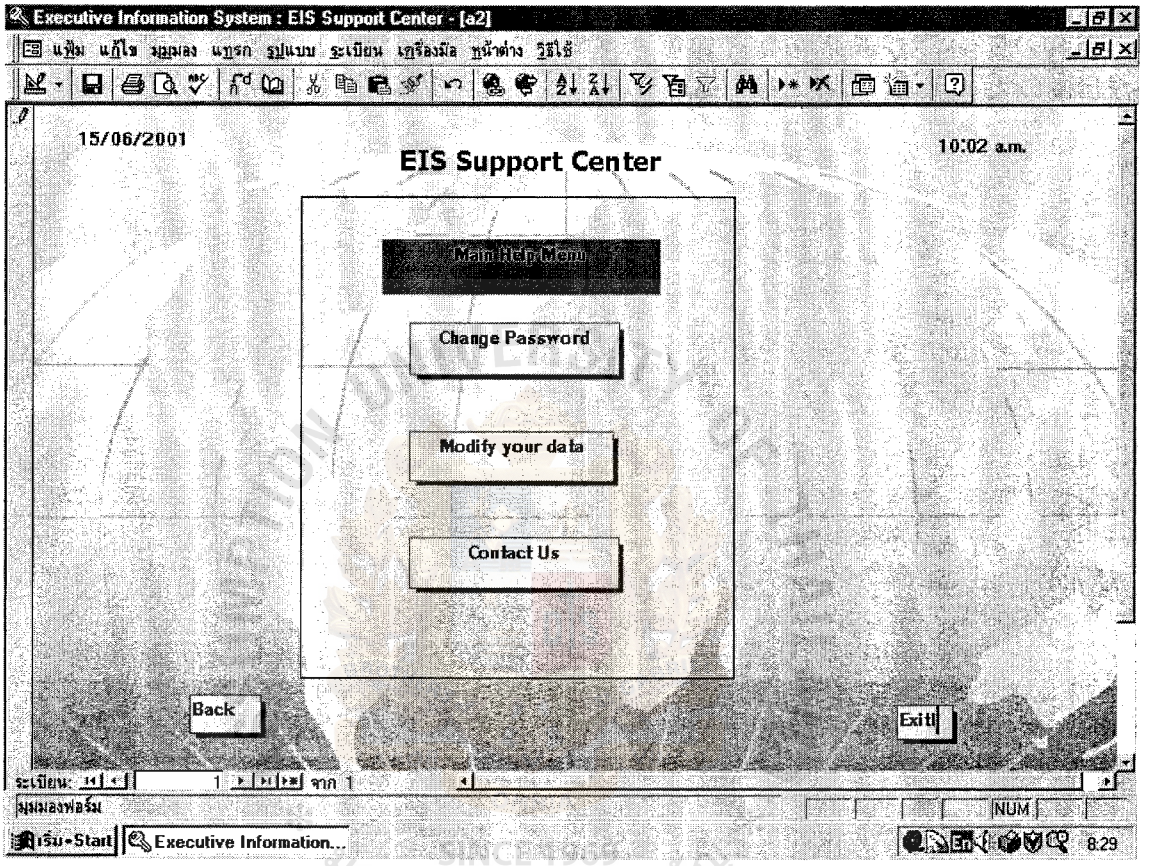

Figure A.2. Executive Information System - EIS Support Center.

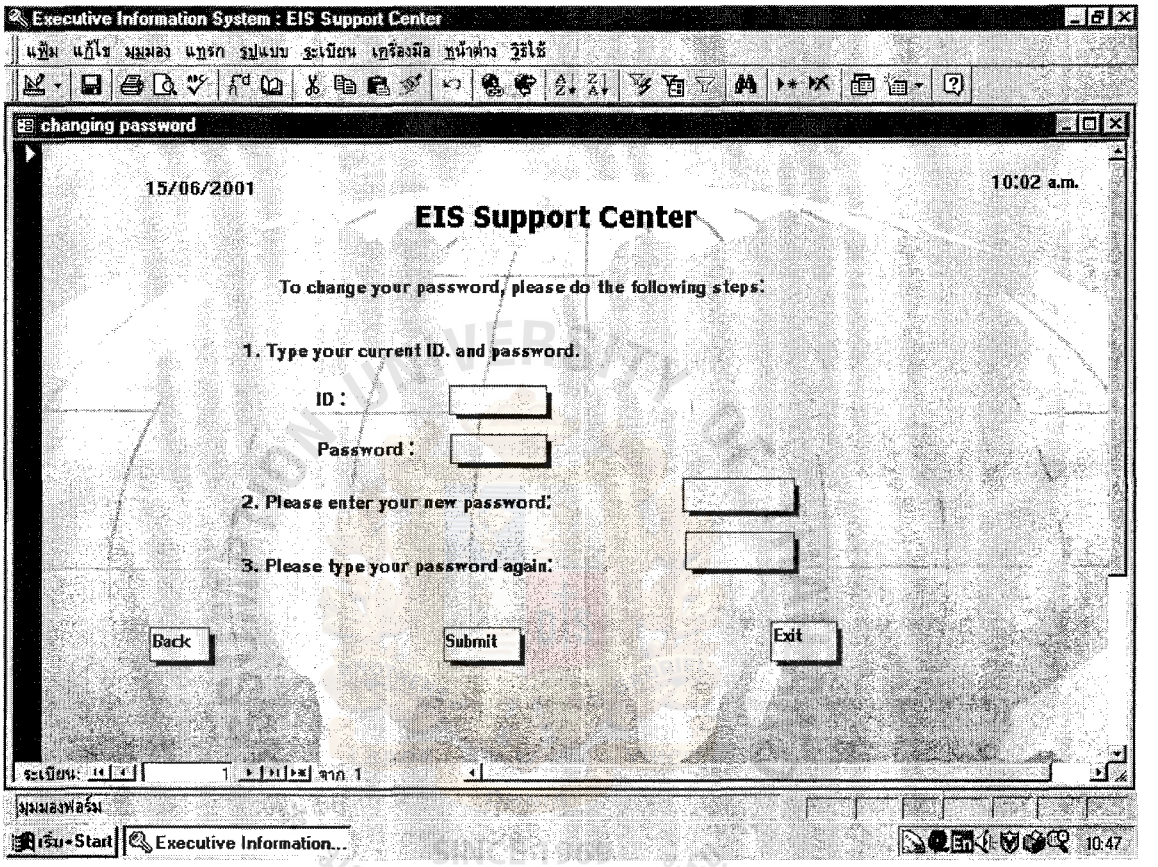

Figure A.3. Executive Information System - Changing Password Screen.

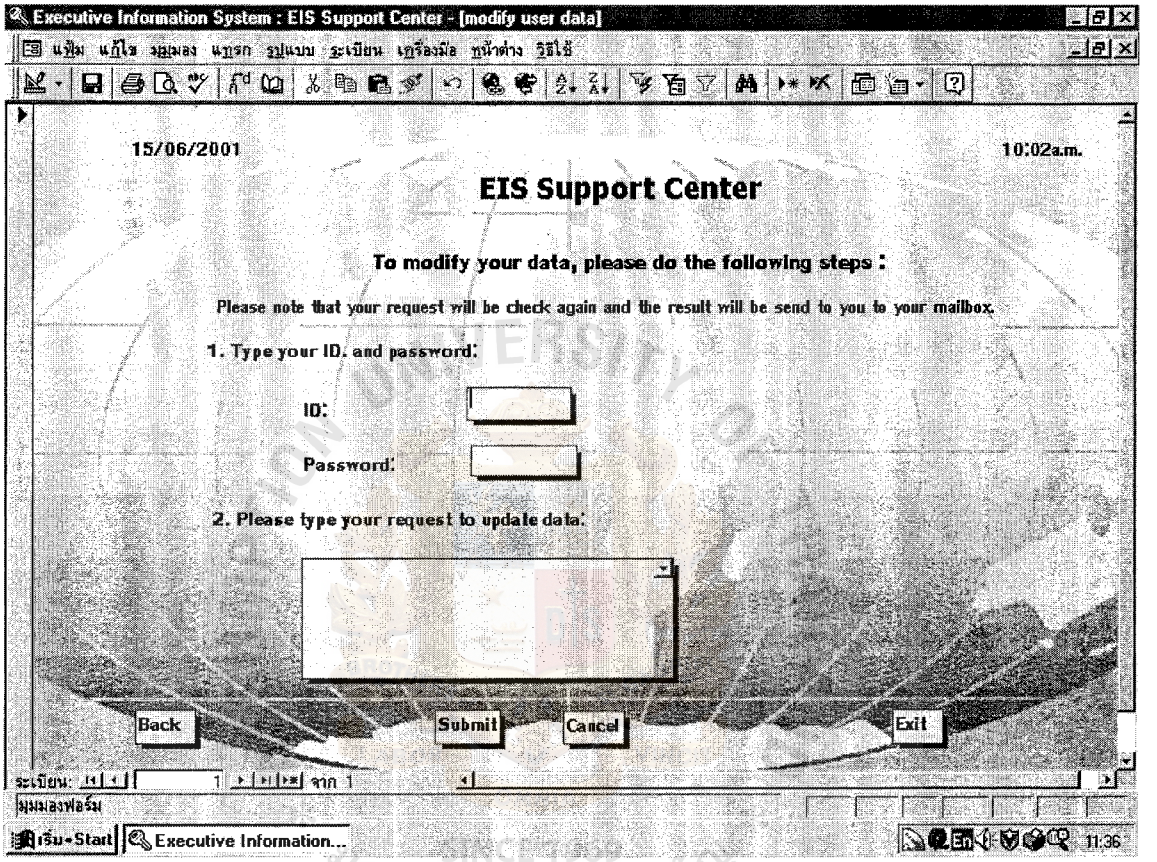

Figure A.4. Executive Information System - Modify User Data Screen.

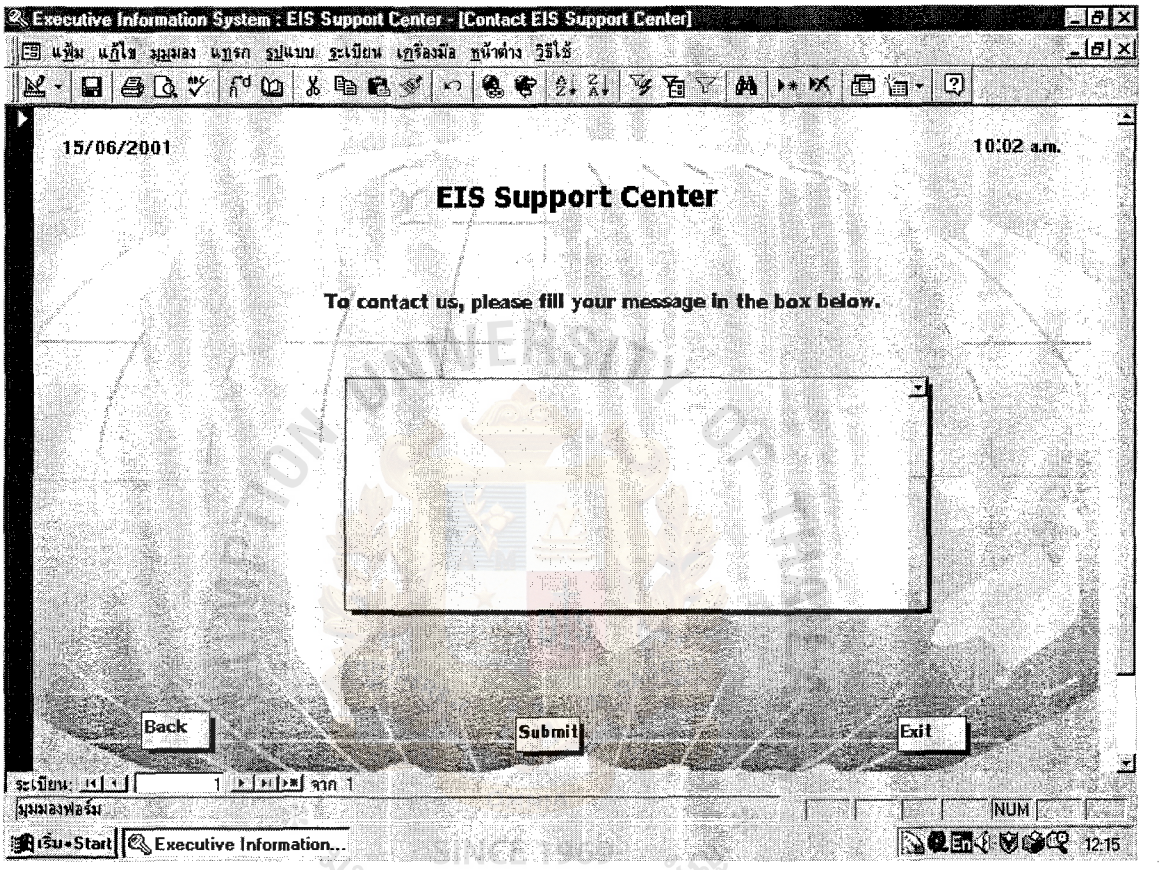

Figure A.5. Executive Information System - Contacting EIS Support Center.

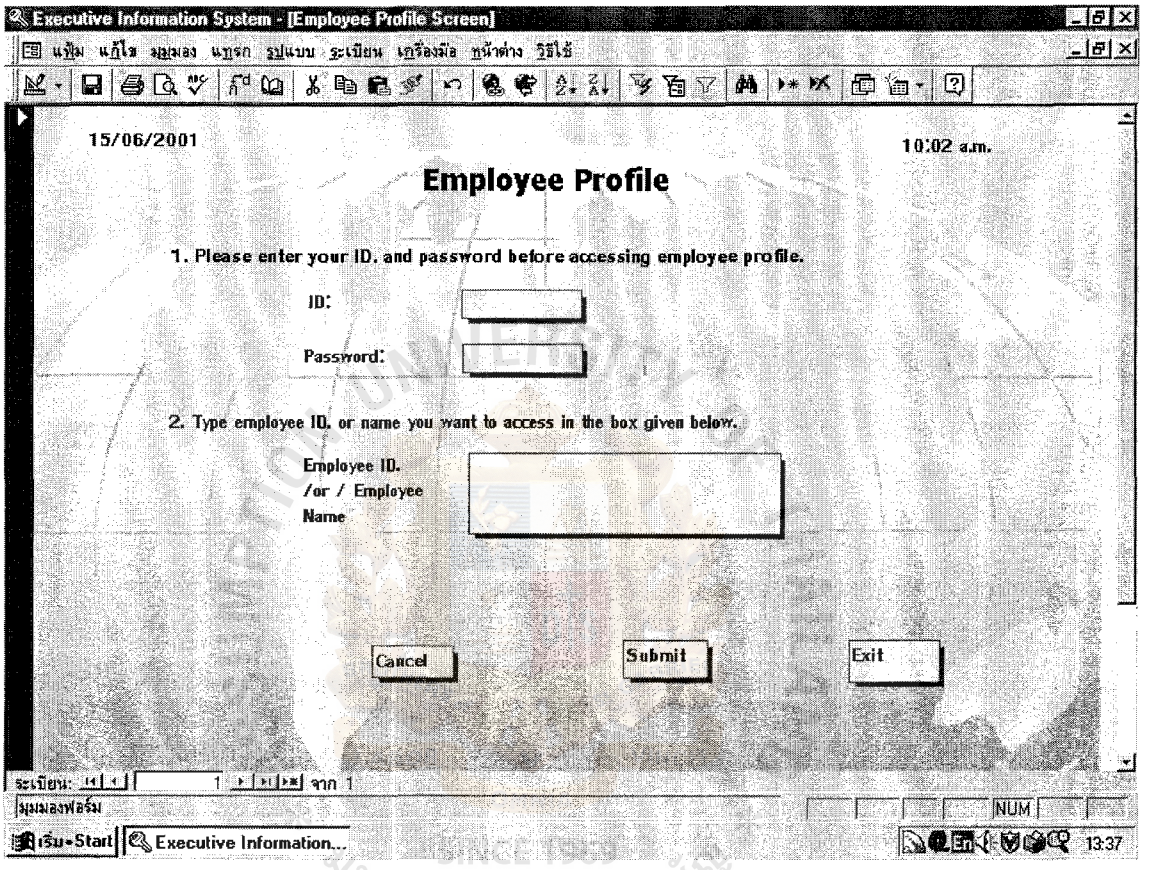

Figure A.6. Executive Information System - Employee Profile Menu.

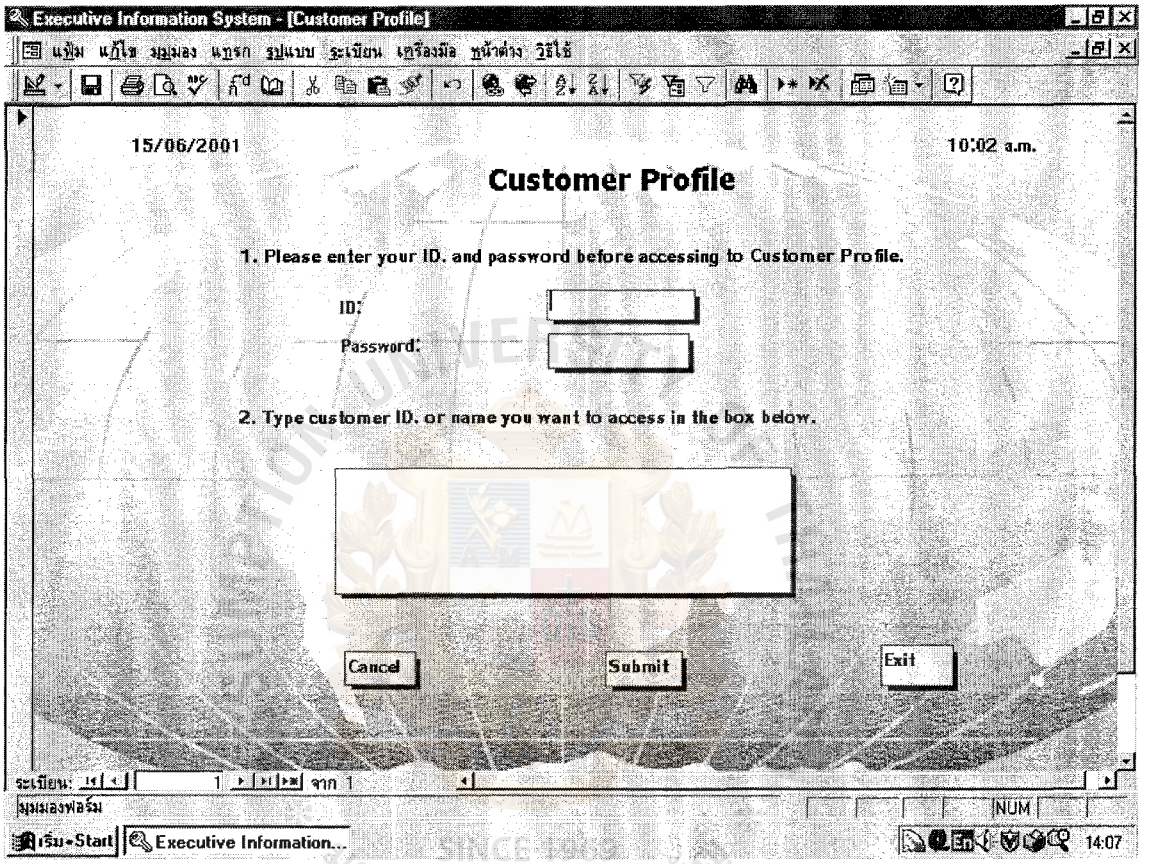

Figure A.7. Executive Information System - Customer Profile Menu.

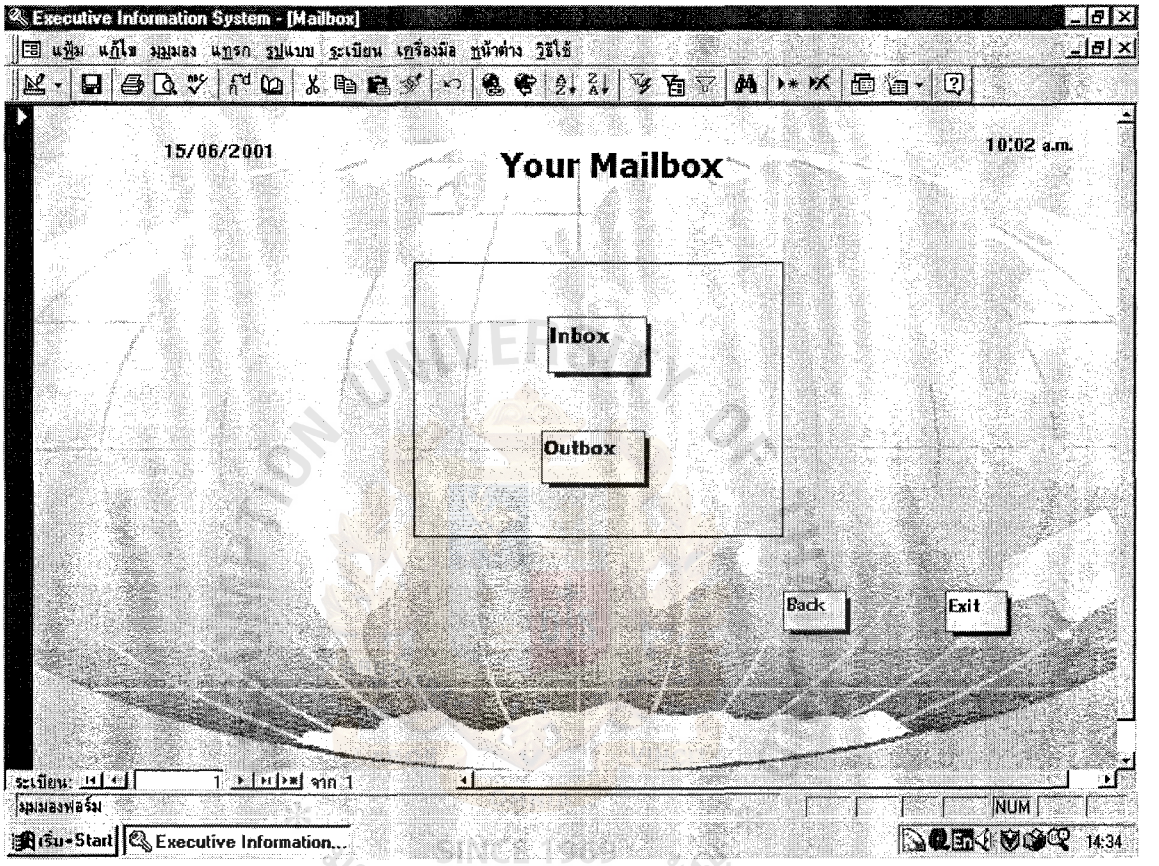

Figure A.8. Executive Information System - Mailbox Menu.

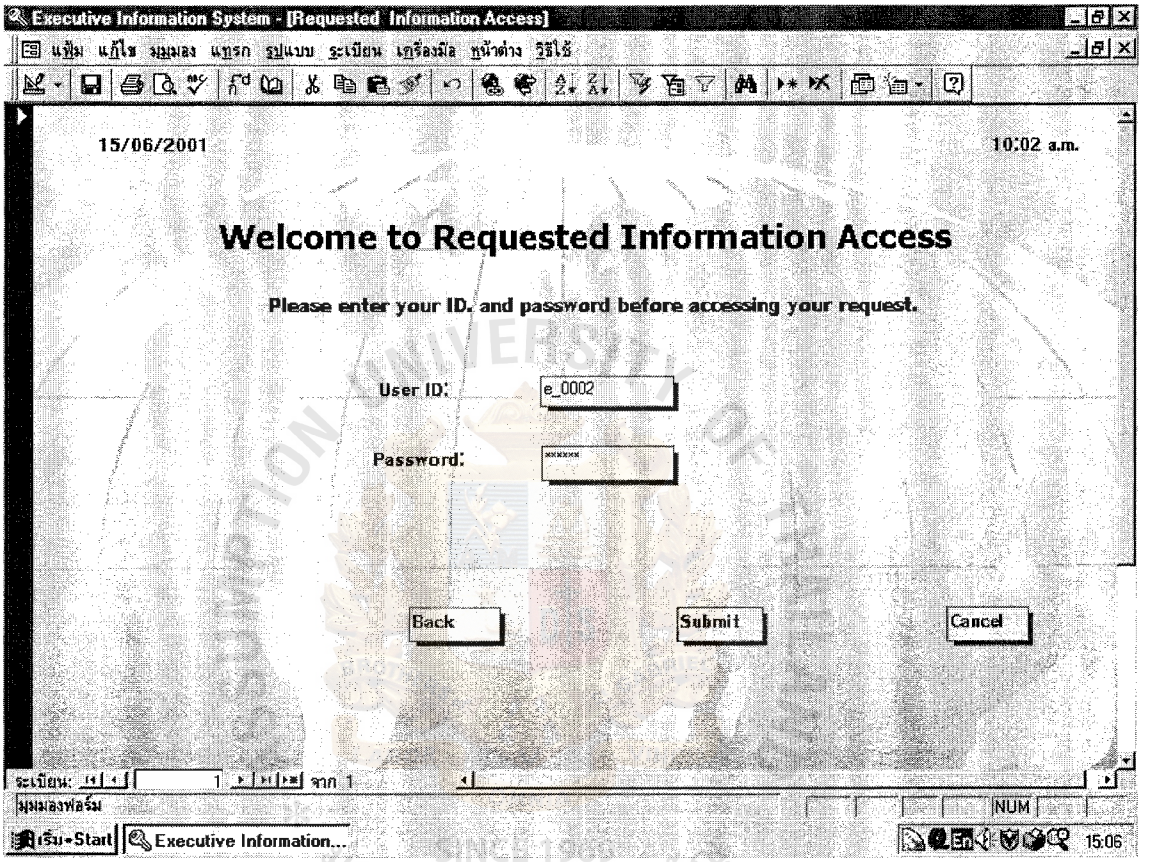

Figure A.9. Executive Information System - Requested Information Access Screen.

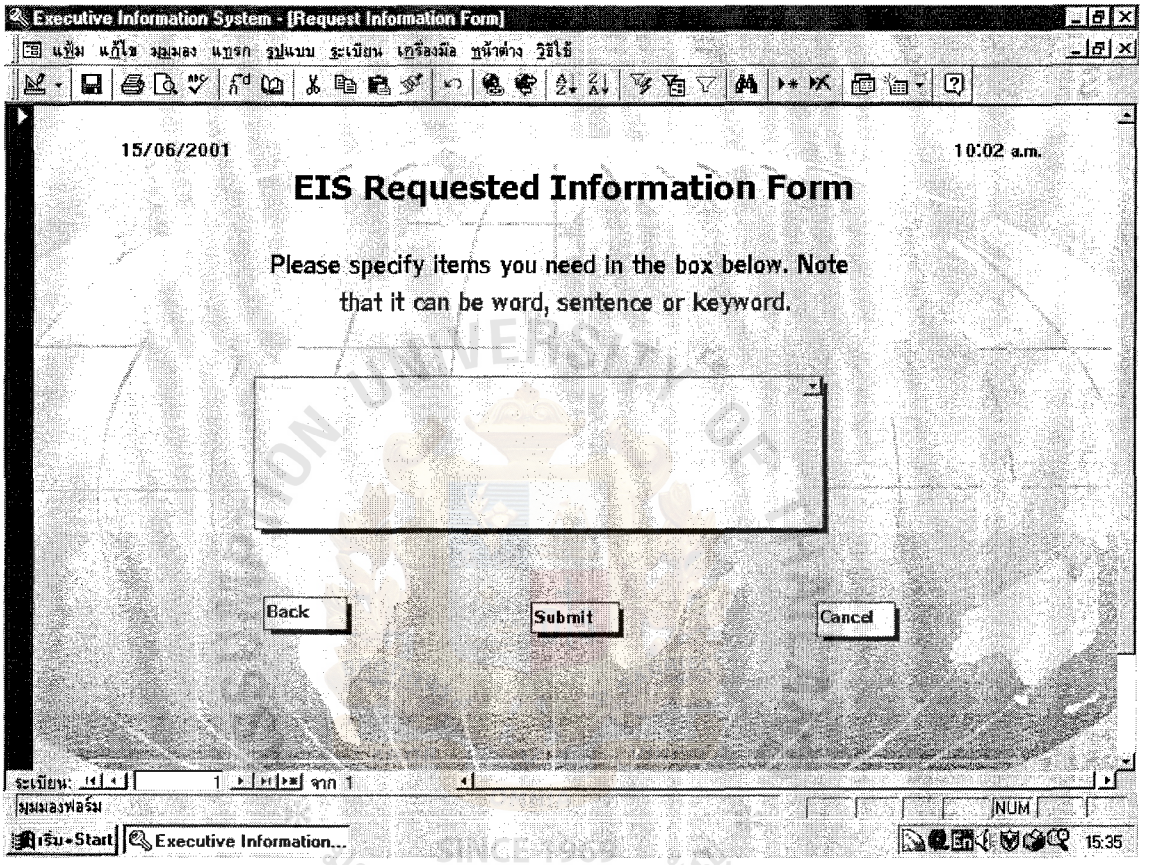

Figure A.10. Executive Information System - Request Information Form.

APPENDIX B

REPORT DESIGN

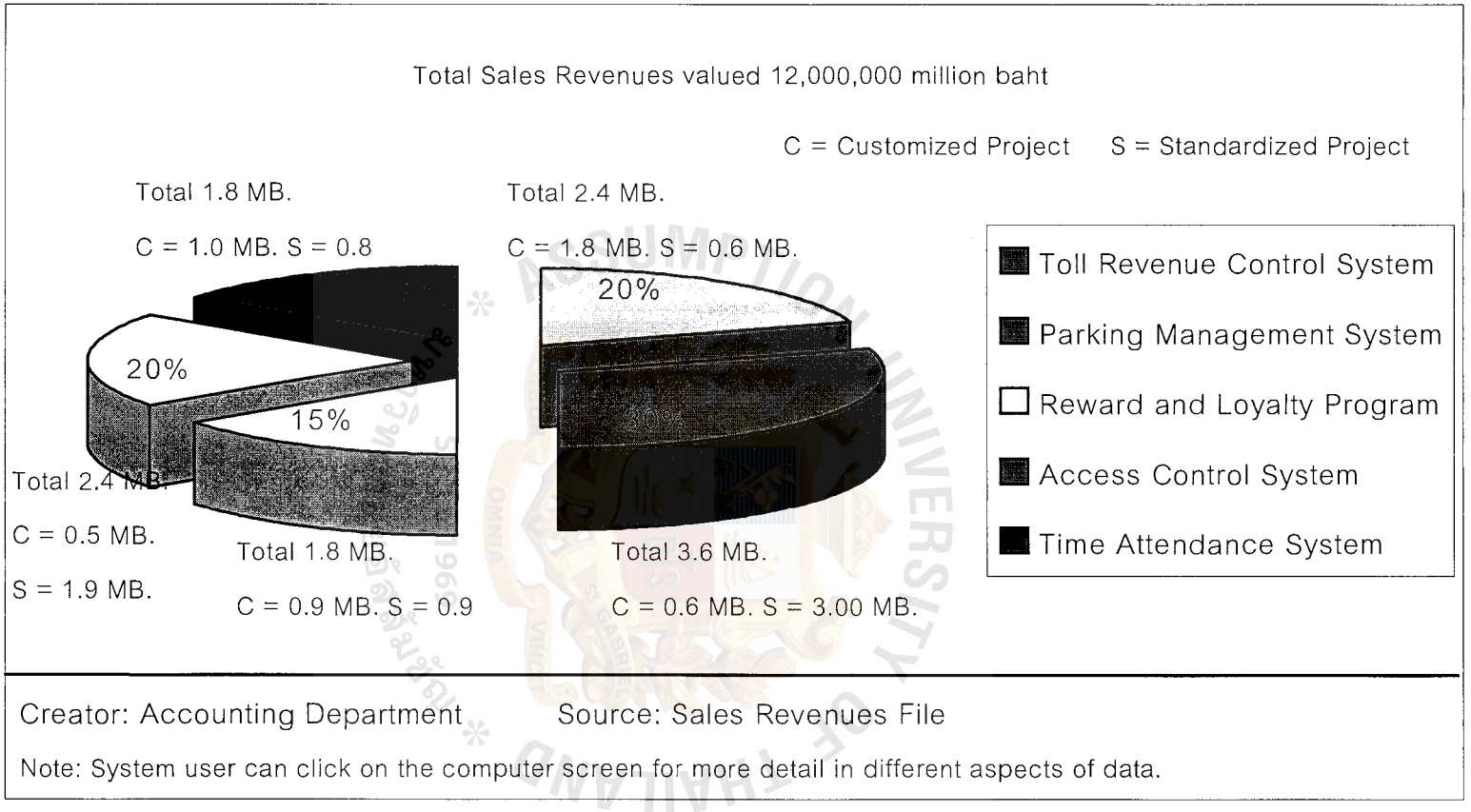

Figure B.1. Sales Revenues in the Year 2000.

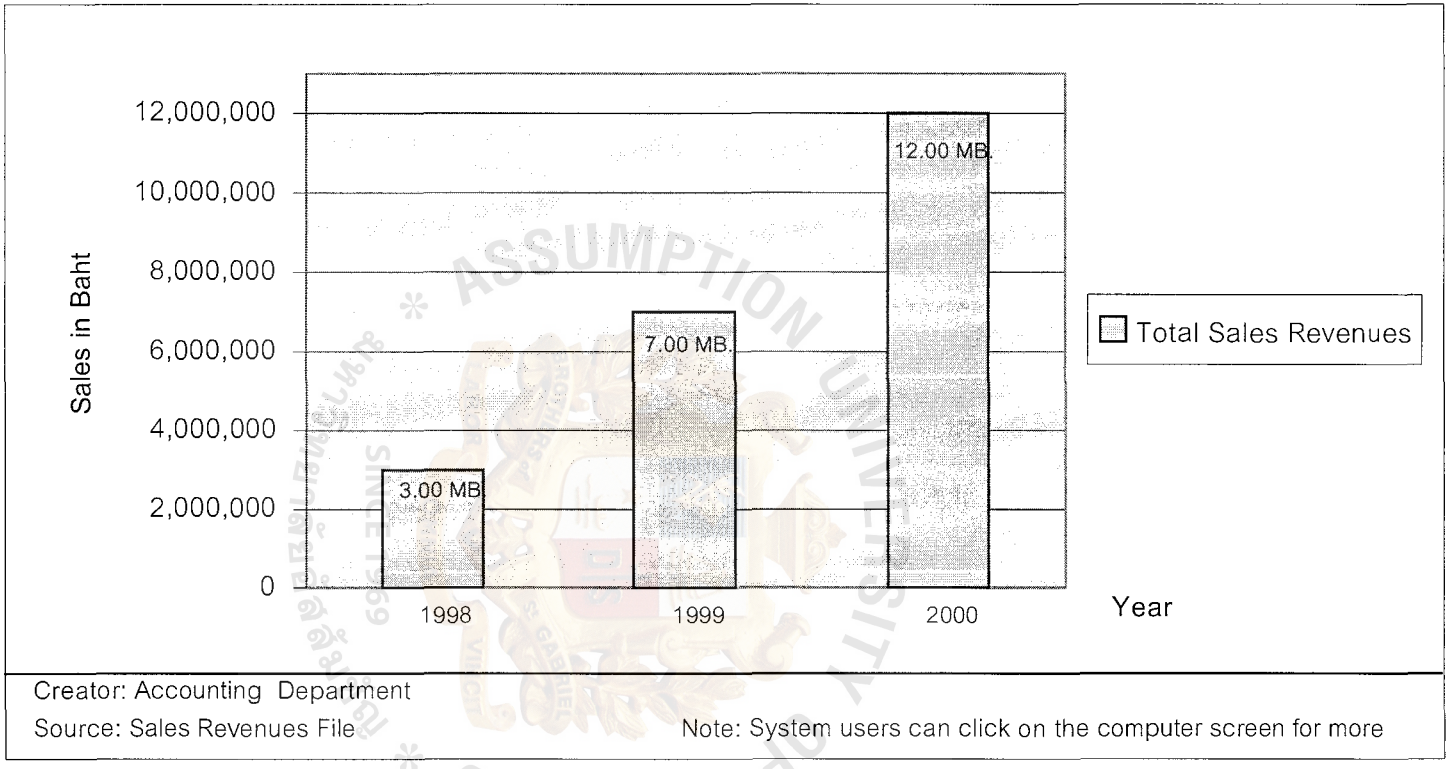

Figure B.2. Total Sales Revenues of the Previous Years.

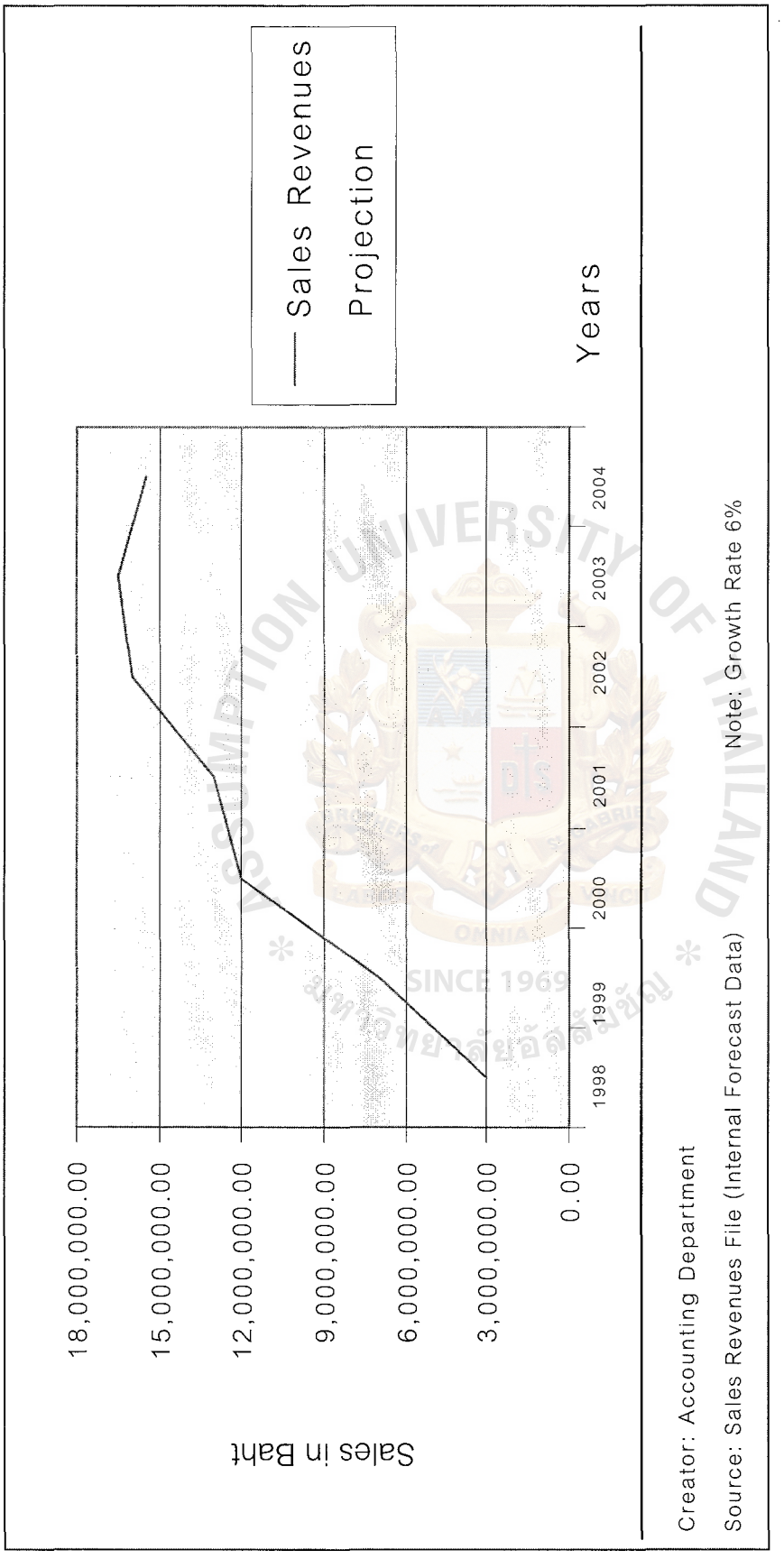

Figure B.3. Sales Revenues Projection.

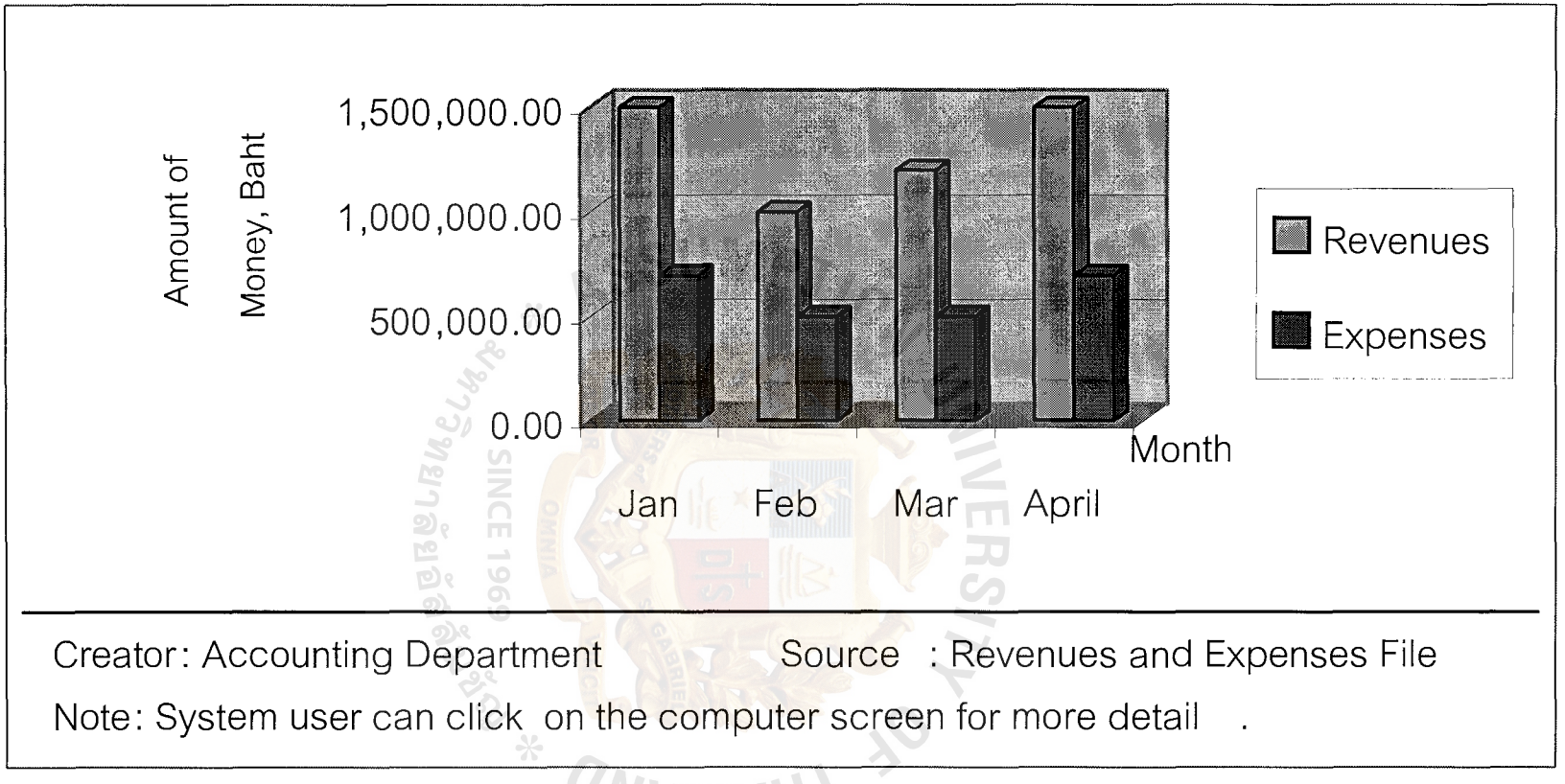

Figure B.4. Total Revenues and Expenses in Quarter 1 of the Year 2001.

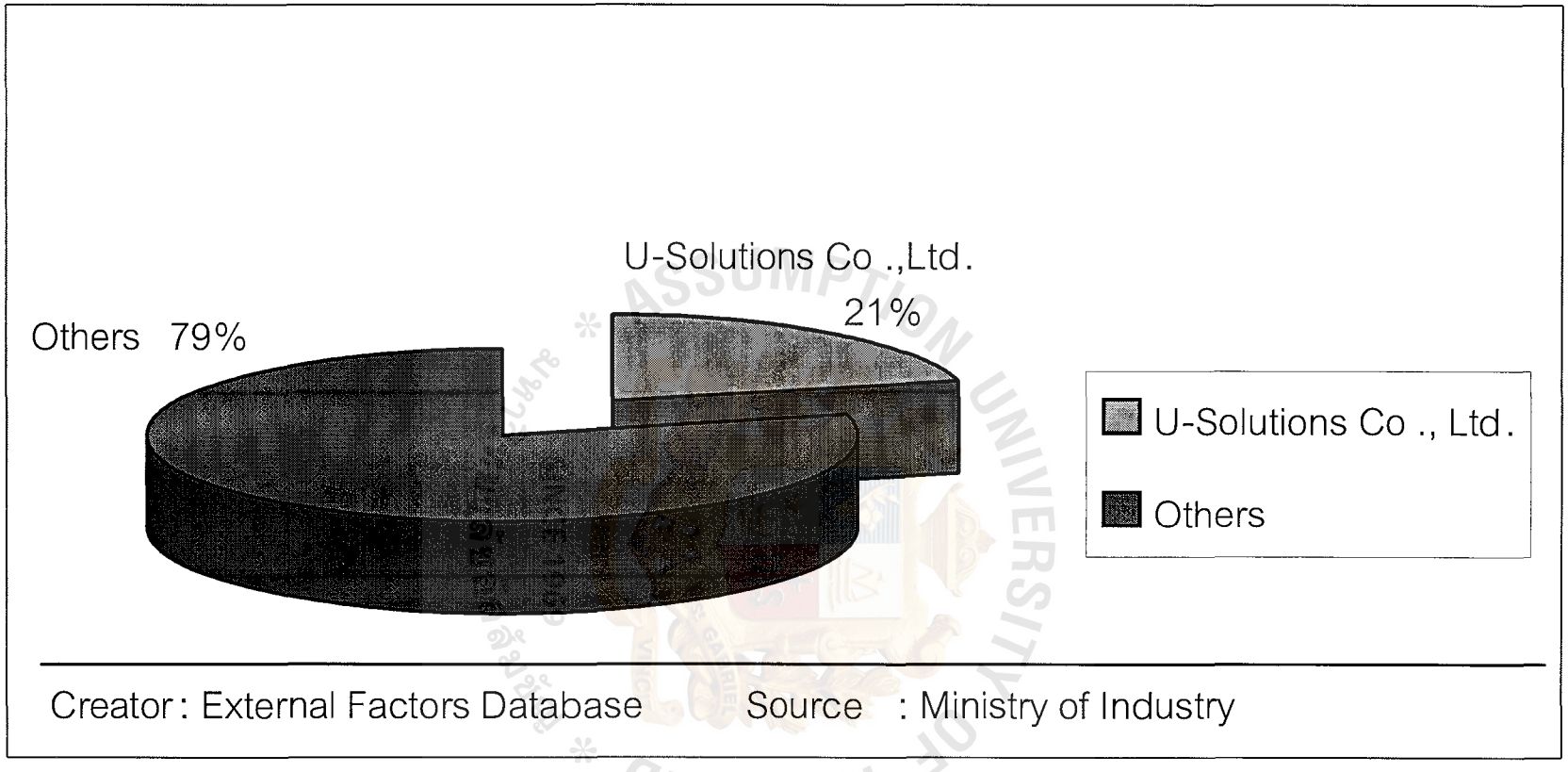

Figure B.5. Market Share Analysis of the Company.

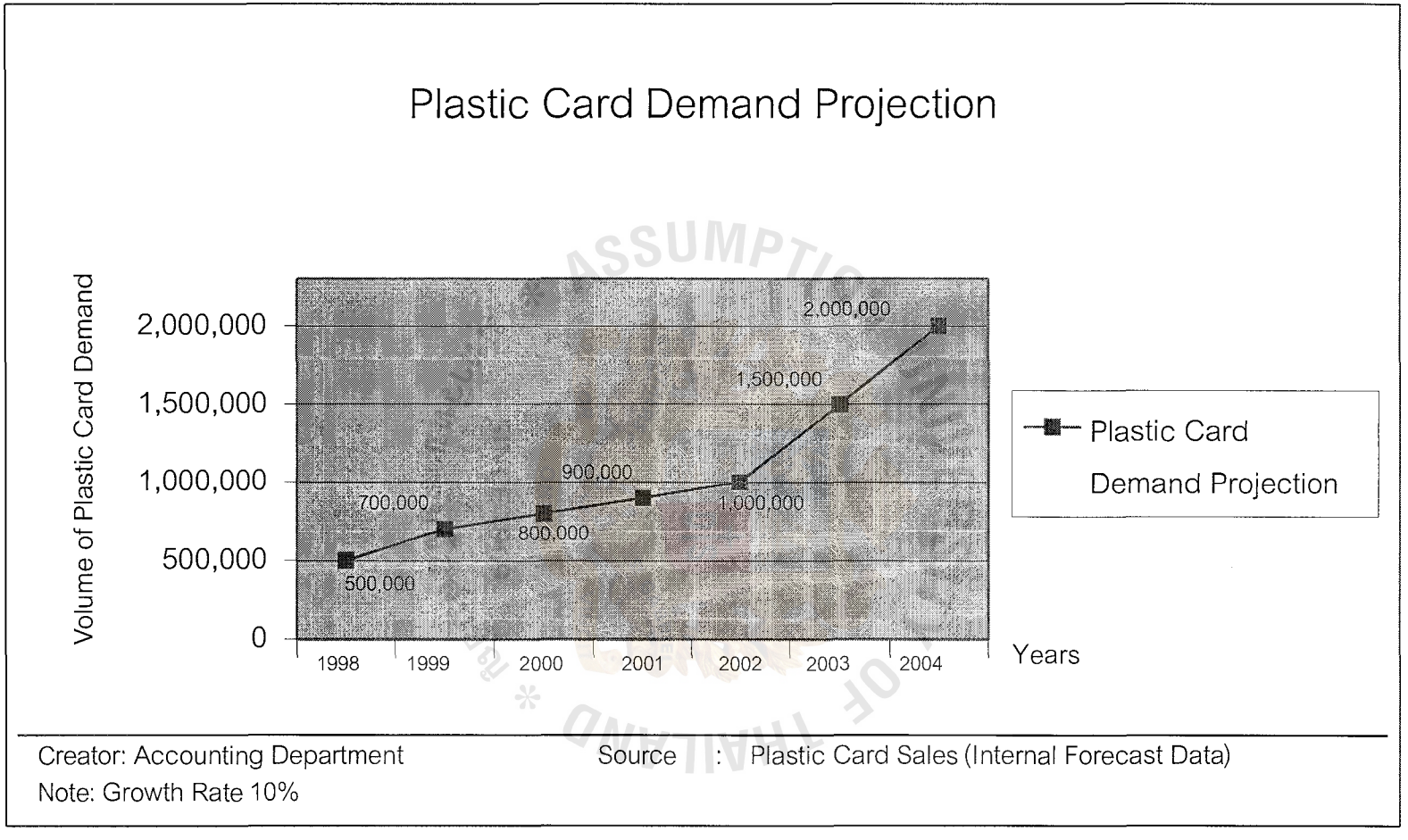

Figure B.6. Plastic Card Demand Projection.

Employee Performance

Name: Ms. Chunpen Jindapradist **Position**: Software Designer **Department**: Technical Department **Phone No.**: EXT. 306

Responsible for Project:

1. Parking Management at Sirinrat Building.
   Fulfillment Period: 15/05/2001 - 30/05/2001 (16 days)
   Project Status: 40% completed.
   Time Left: 7 days

2. Time Attendance System for Chaiyo Corporation.
   Fulfillment Period: 18/05/2001 - 3/06/2001 (17 days)
   Project Status: 60% completed.
   Time Left: 11 days

Creator: Technical Department Source: Technical People File

Figure B.7. Employee Performance.

Overtime Working Report

at the end of 15/06/2001

Creator: Accounting Department
Source: Overtime Working File

Employee_ID.	Position	Name	HR.	Rate/Hr.	Total
e_0012	Software Designer	Ms. Chunpen Jindapradist	6.00	100.00	600.00
e_0032	Technician	Mr. Chaiyatorn Tangwongsa	3.00	100.00	300.00
e_0036	Technician	Mr. Kasem Chanya	3.50	100.00	350.00
e_0063	Accountant	Ms. Porntip Ramratcha	3.00	85.00	255.00
	Total		15.50 Hours		1,505.00 Baht

Figure B.8. Overtime Working Report.

Employee in Technical Department

Employee ID.	Name	Lastname	Position	Status	Phone No.	Date of Admission
e_0010	Ms. Chunpen	Jindapradist	Software Designer	Single	938-7446	5/4/98
e_0011	Ms. Chomdao	Khampan	Software Designer	Single	644-4978	8/4/98
e_0012	Mr. Ekasit	Wiwattana	Software Designer	Single	318-2385	1/5/98
e_0013	Mr. Chaiwat	Eikarat	Software Designer	Married	731-2385	3/5/98
e_0014	Ms. Sasitorn	Chaiwaraporn	Software Designer	Single	376-9286	6/1/99
e_0015	Mr. Chaiyo	Eiamwara	Software Designer	Single	258-9018	6/1/99
e_0020	Mr. Pipat	Pocharoen	Hardware	Married	832-0909	7/1/99
e_0021	Mr. Ekachai	Namchai	Hardware	Single	362-6568	8/4/98
e_0022	Mr. Kamol	Prompol	Hardware	Married	736-3592	9/4/98
e_0023	Mr.Somchai	Sawasdee	Hardware	Single	282-3906	16/4/98
e_0024	Mr. Warin	Makumnaj	Hardware	Single	375-4042	11/1/99
e_0025	Ms. Urai	Rakdee	Hardware	Single	939-4326	12/1/99
e_0026	Mr. Charoen	Rakdamsan	Hardware	Single	939-4327	13/1/99

Figure B.9. Employee in Technical Department.

Customer Account Reporting

Customer ID.	Customer Name	Customer Type	Credits Earned (baht)	Customer Balance
c_0001	Ammagarden	Private Enterprise	300,000.00	150,000.00
c_0002	Aram Company	Private Enterprise	150,000.00	75,000.00
c_0003	Bangkok Transportation System	Government Agency	8,000,000.00	4,000,000.00
c_0004	Chaiyo Corporation	Private Enterprise	150,000.00	75,000.00
c_0005	Department of Highway	Government Agency	12,000,000.00	6,000,000.00
c_0006	Eccle Tower	Private Enterprise	350,000.00	150,000.00
c_0007	Interconnection Partnership	Private Enterprise	300,000.00	150,000.00
c_0008	Indra Regent Company	Private Enterprise	250,000.00	100,000.00
c_0009	Malisa Complex	Private Enterprise	150,000.00	75,000.00
c_0010	Sirinrat Building	Private Enterprise	250,000.00	100,000.00
c_0011	Shinnawatra Tower III	Private Enterprise	7,000,000.00	3,000,000.00
c_0012	Telephone Organization of Thailand	Government Agency	3,000,000.00	1,500,000.00
c_0013	Tesco Lotus Superstores	Private Enterprise	500,000.00	200,000.00

Figure B.10. Customer Account Reporting.

APPENDIX C

CONTEXT DIAGRAM

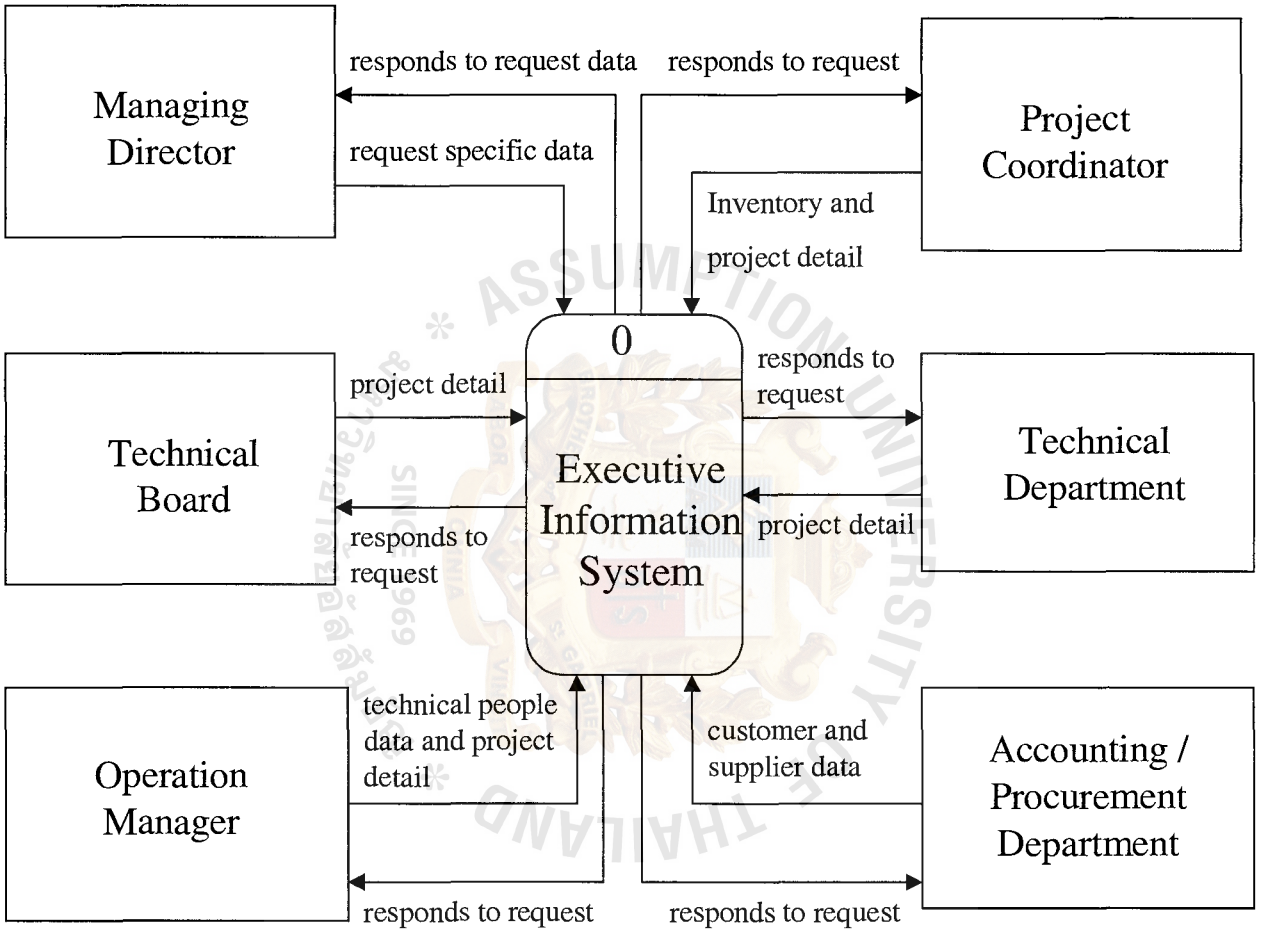

Figure C.1. The Context Diagram of Executive Information System.

APPENDIX D

DATA FLOW DIAGRAM

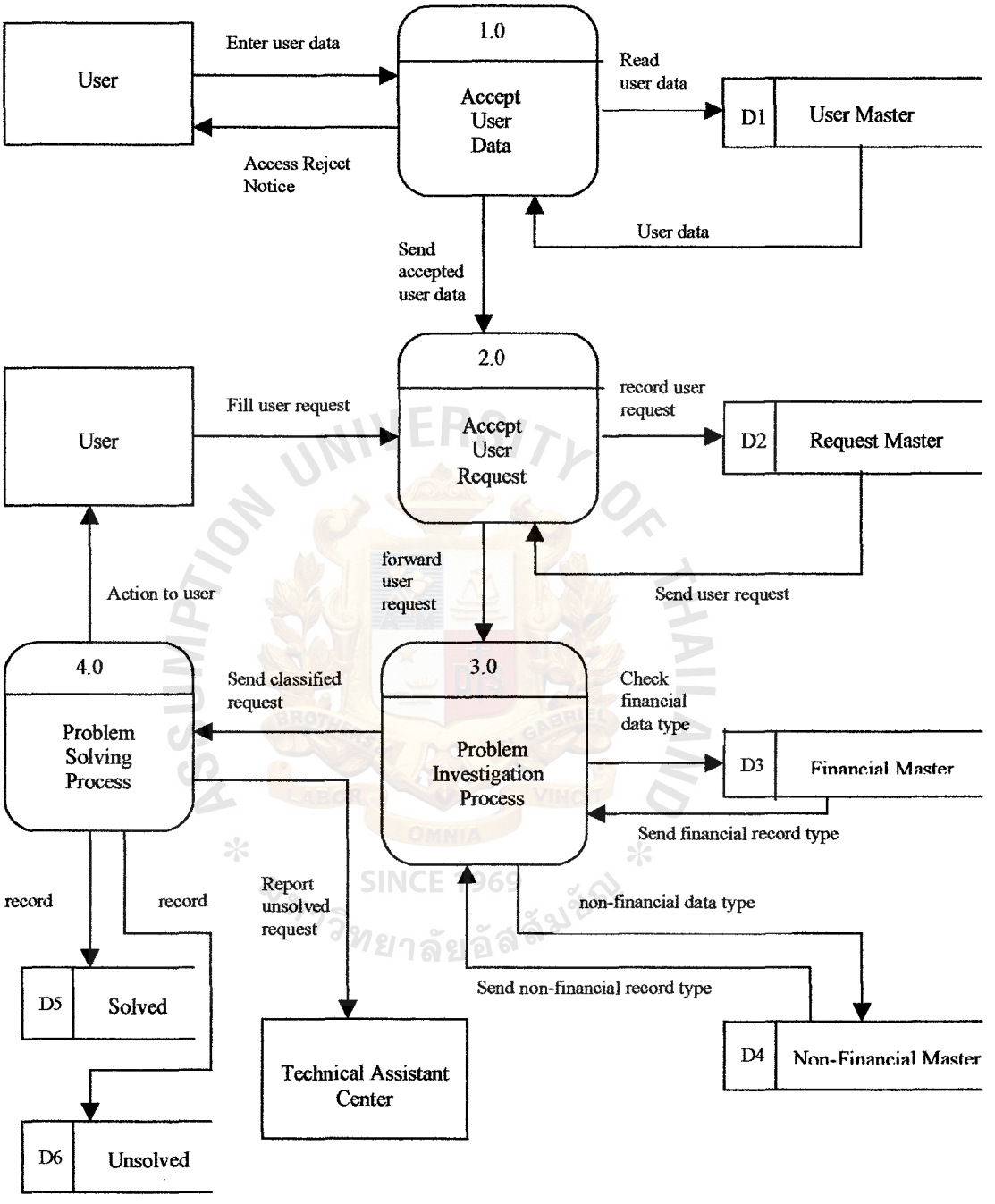

Figure D.1. Level 0 Data Flow Diagram of Executive Information System.

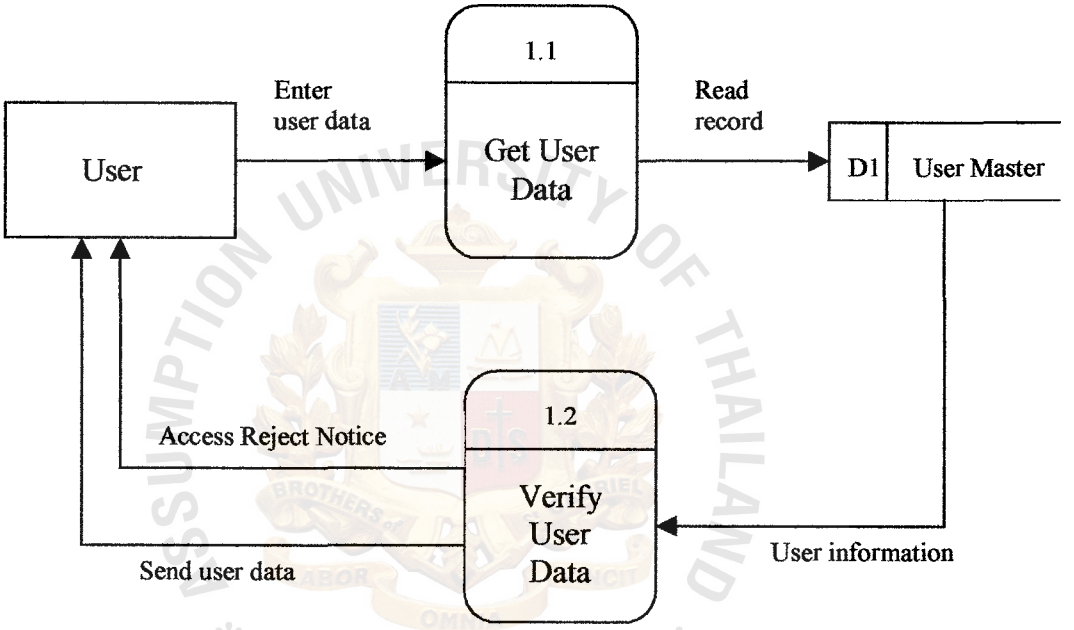

Figure D.2. Level 1 Data Flow Diagram of Accepting User Data.

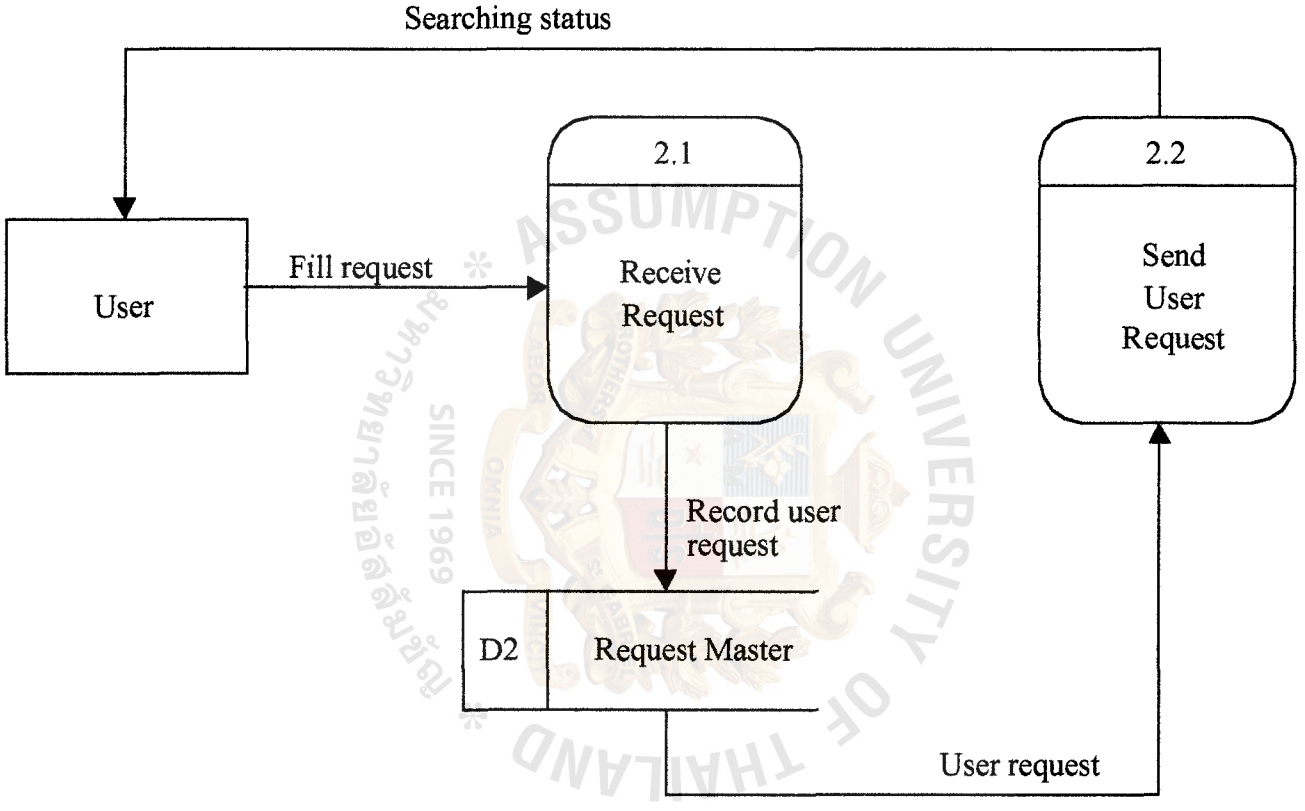

Figure D.3. Level 1 Data Flow Diagram of Accepting User Request.

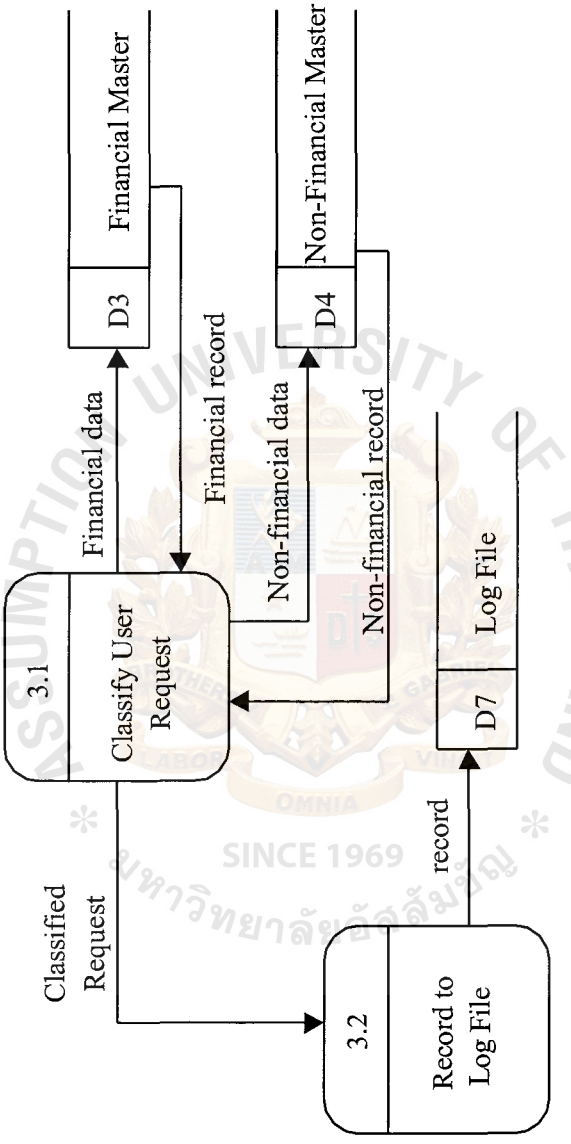

Figure D.4. Level 1 Data Flow Diagram of Problem Investigation Process.

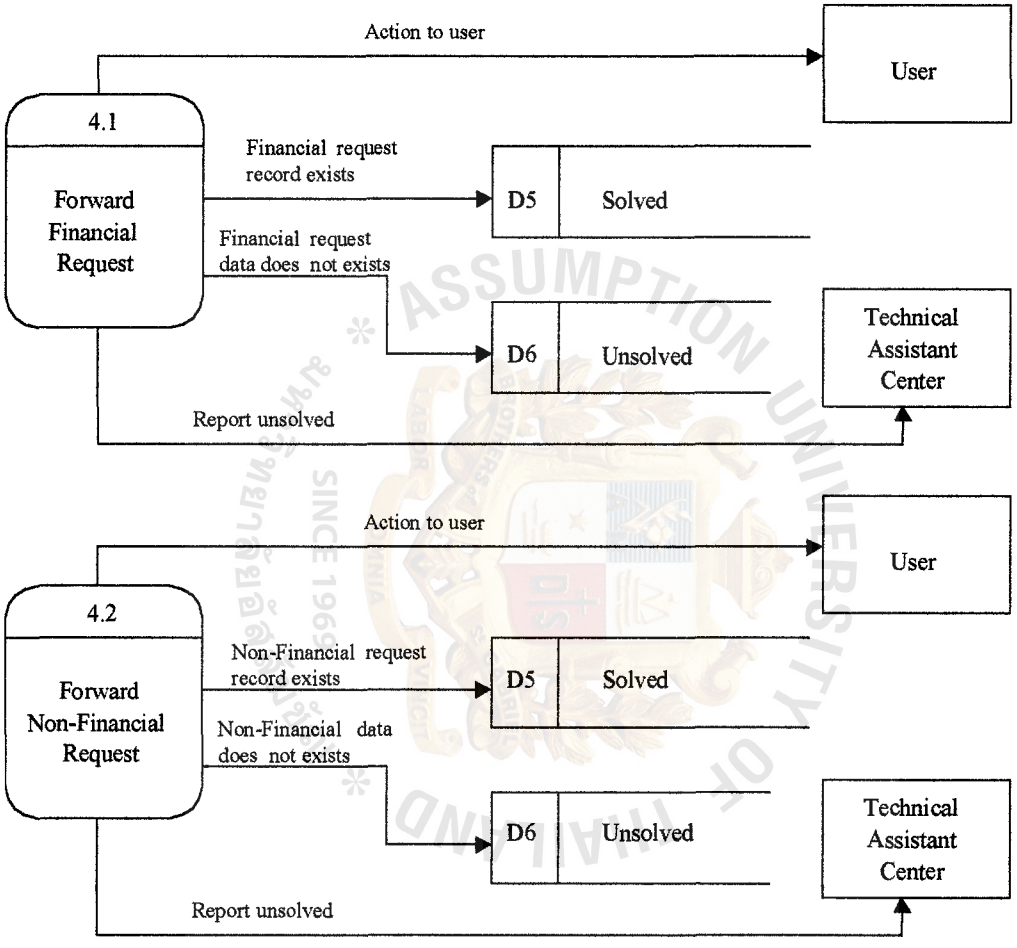

Figure D.5. Level 1 Data Flow Diagram of Problem Solving Process.

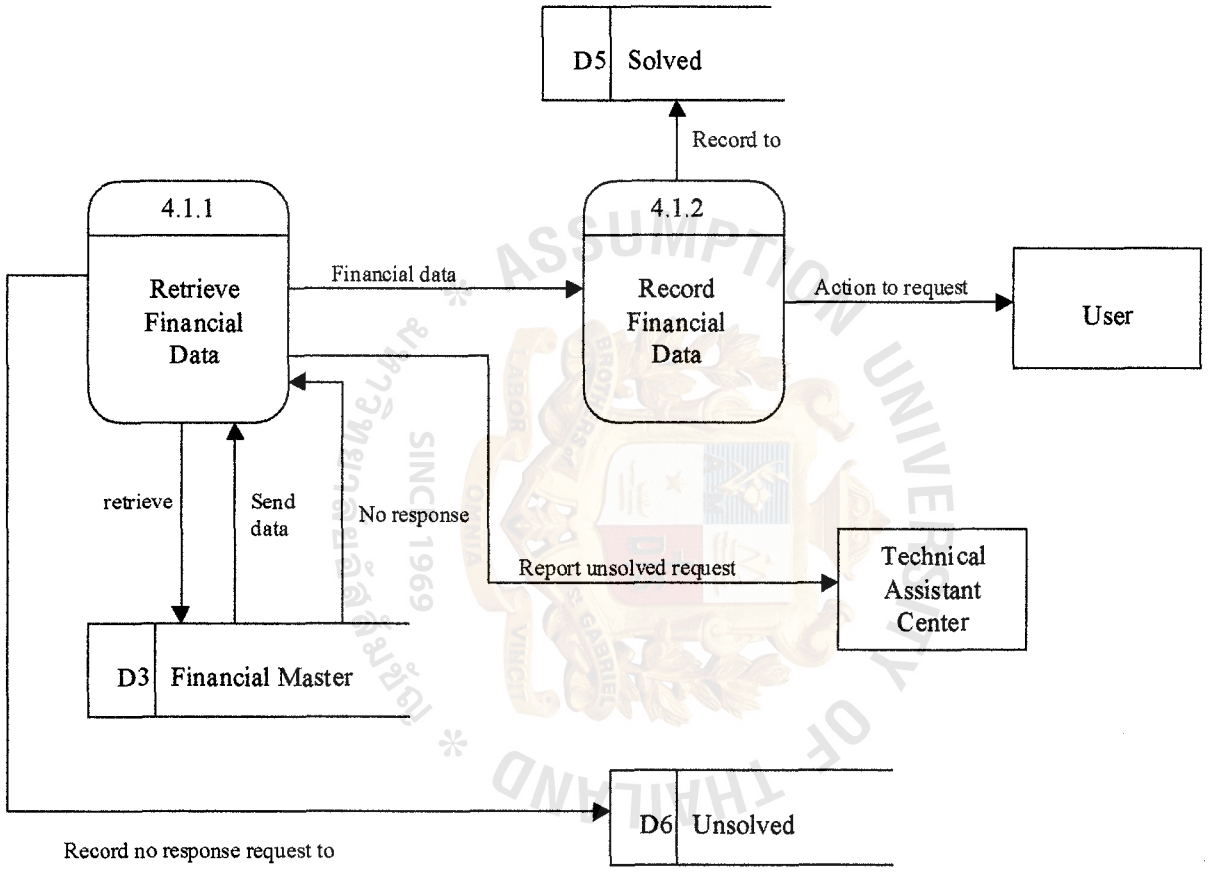

Figure D.6. Level 2 Data Flow Diagram of Forwarding Financial Request.

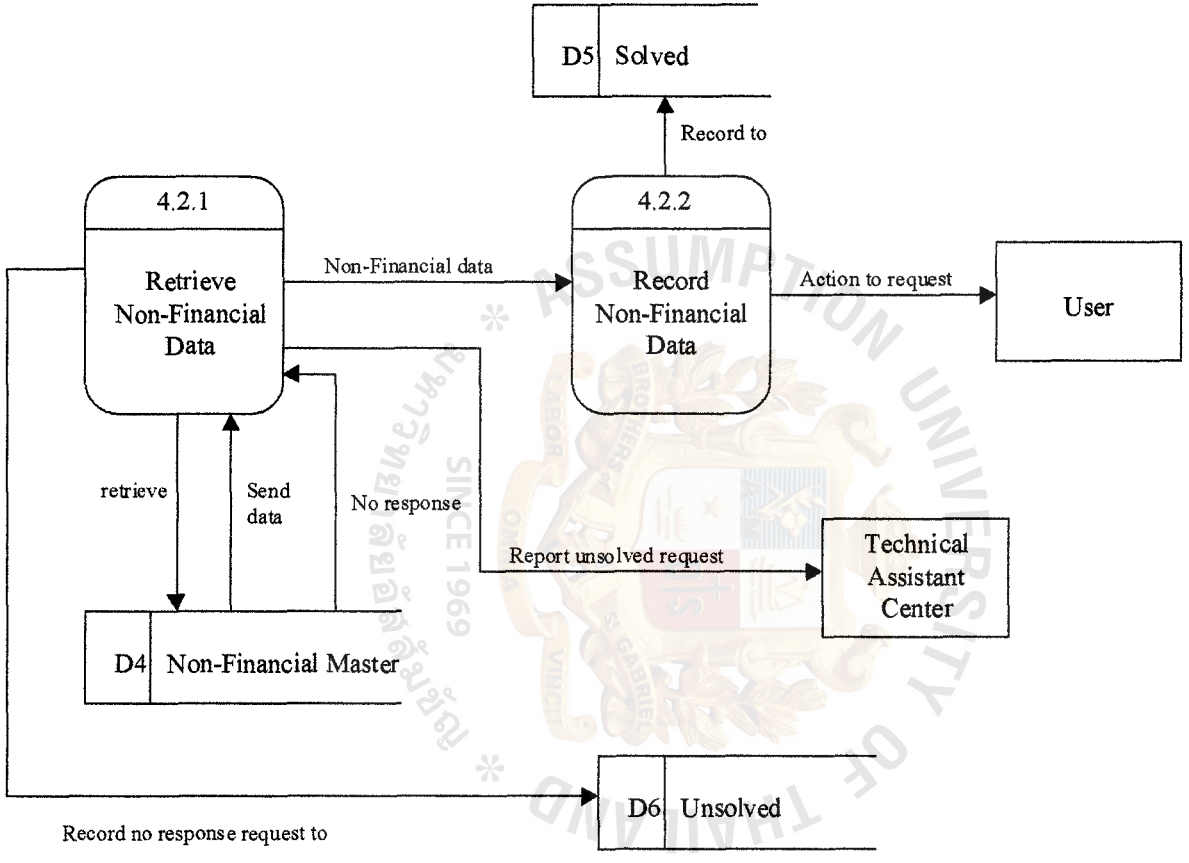

Figure D.7. Level 2 Data Flow Diagram of Forwarding Non - Financial Request.

APPENDIX E

STRUCTURE CHART

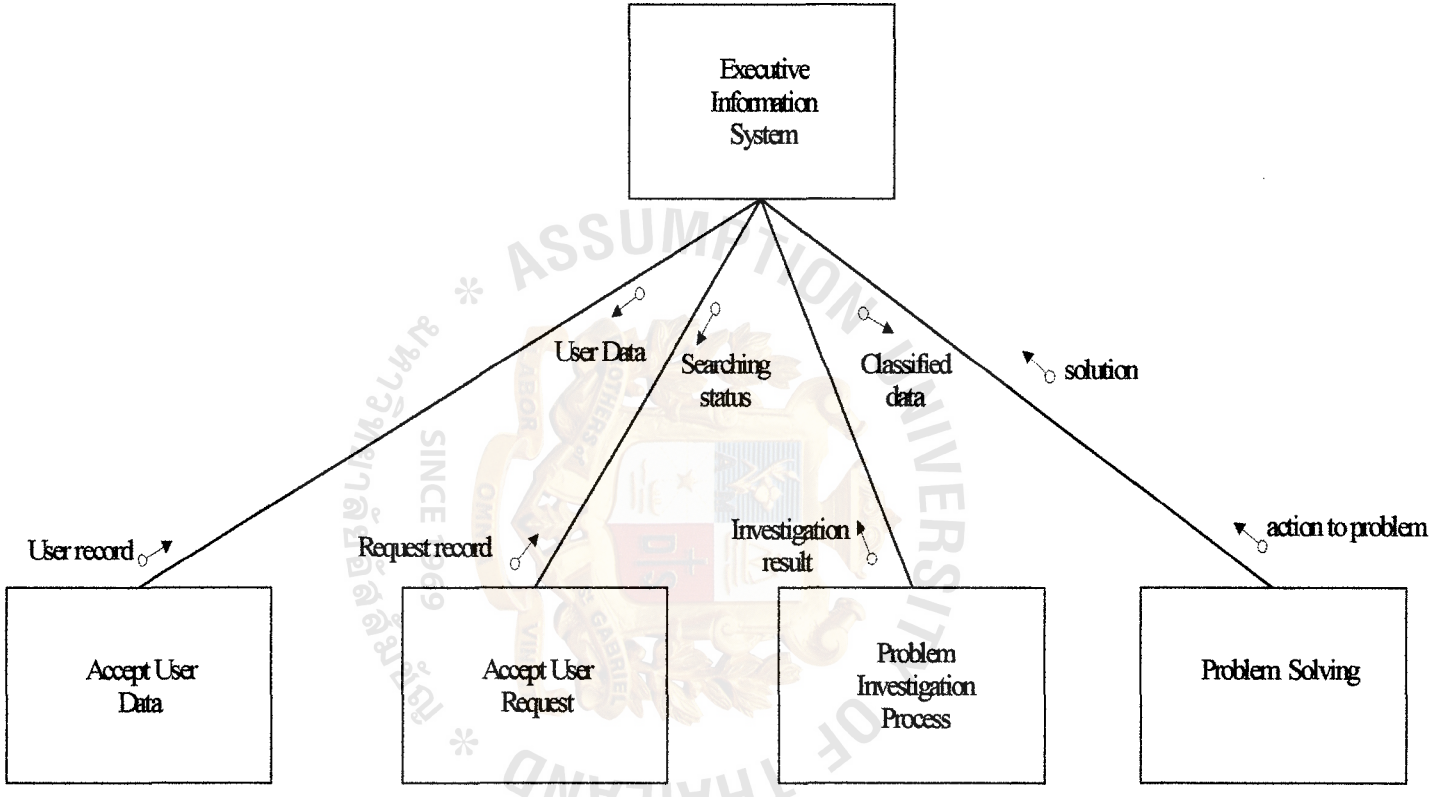

Figure E.1. Structure Chart of Executive Information System.

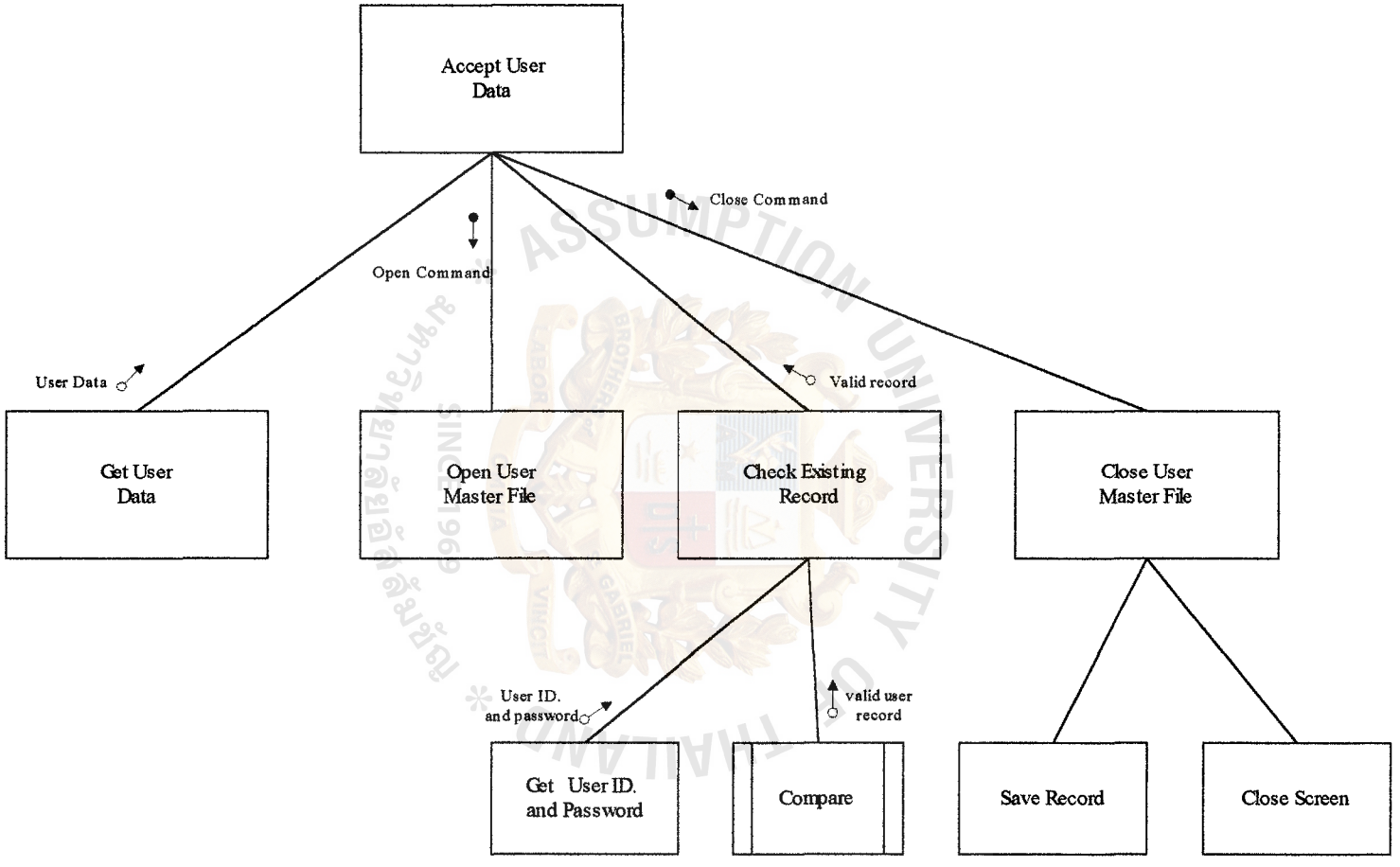

Figure E.2. Structure Chart of Accepting User Data.

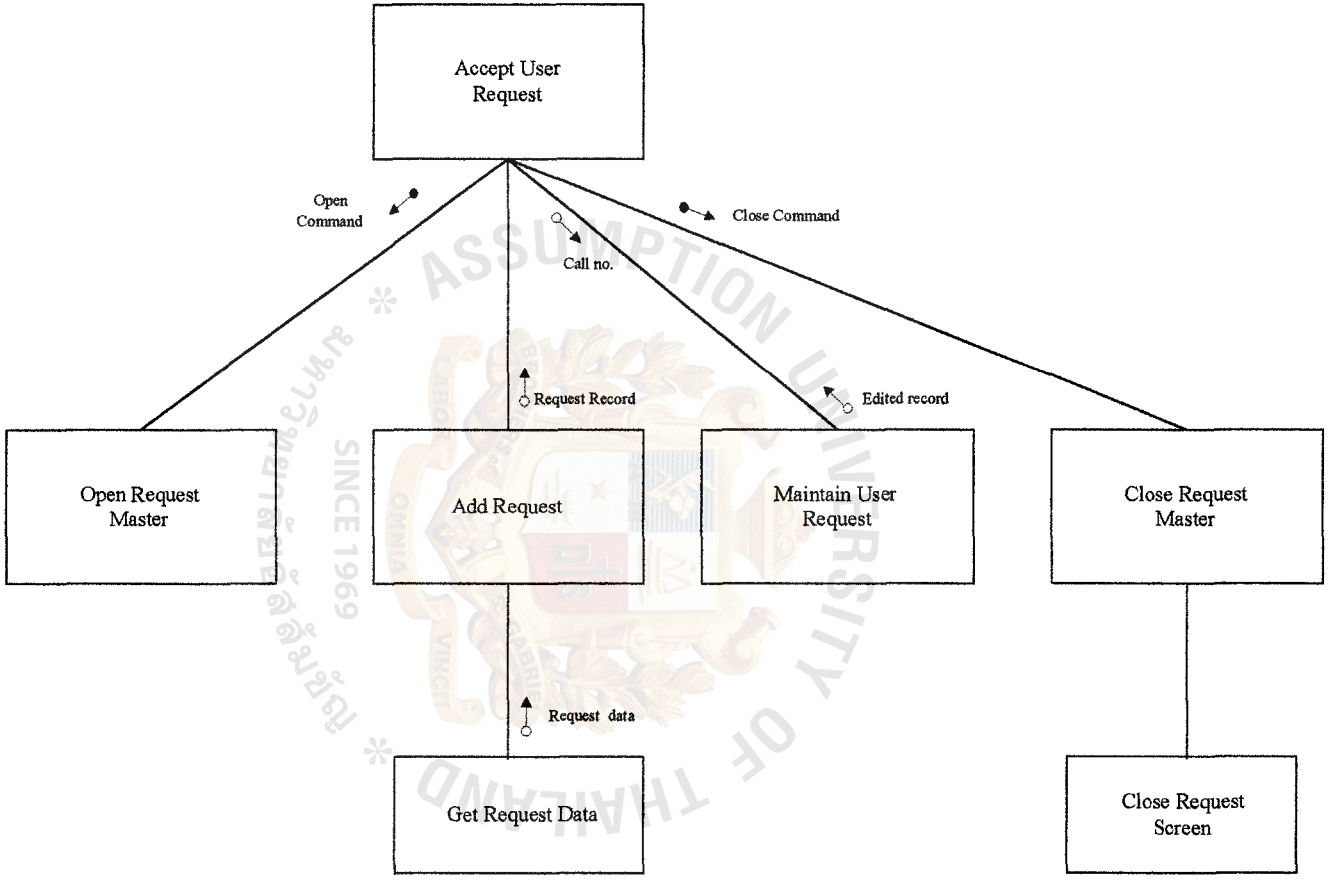

Figure E.3. Structure Chart of Accepting User Request.

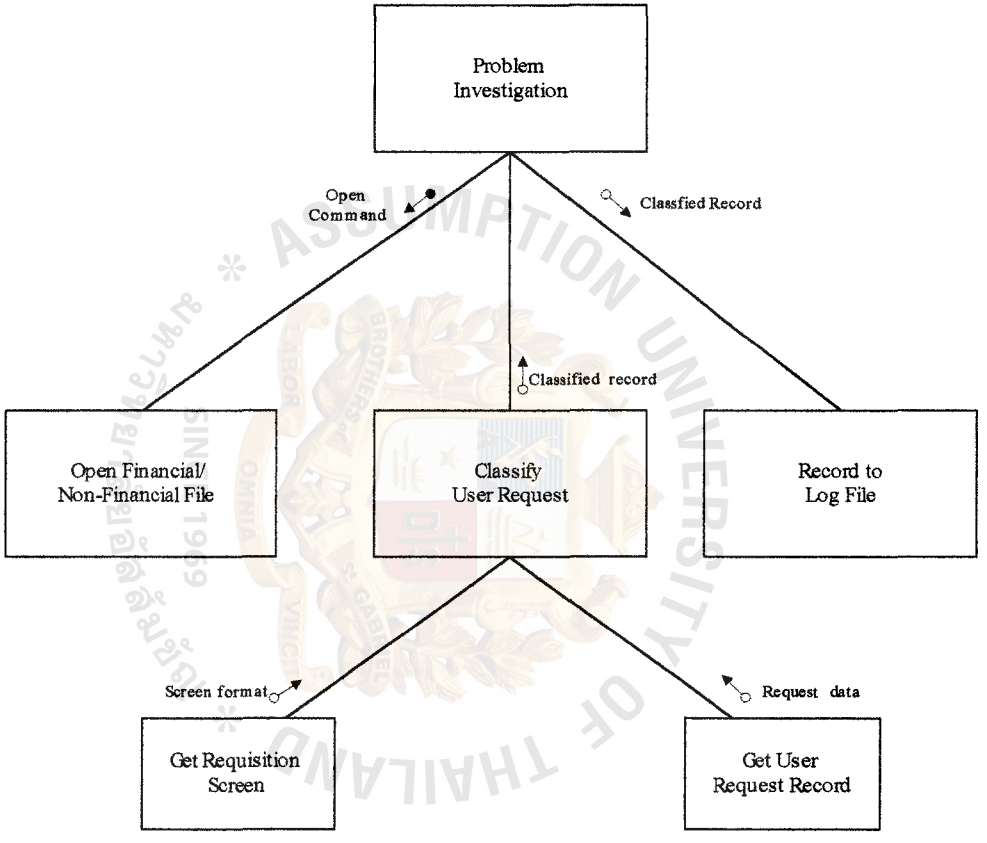

Figure E.4. Structure Chart of Problem Investigation Process.

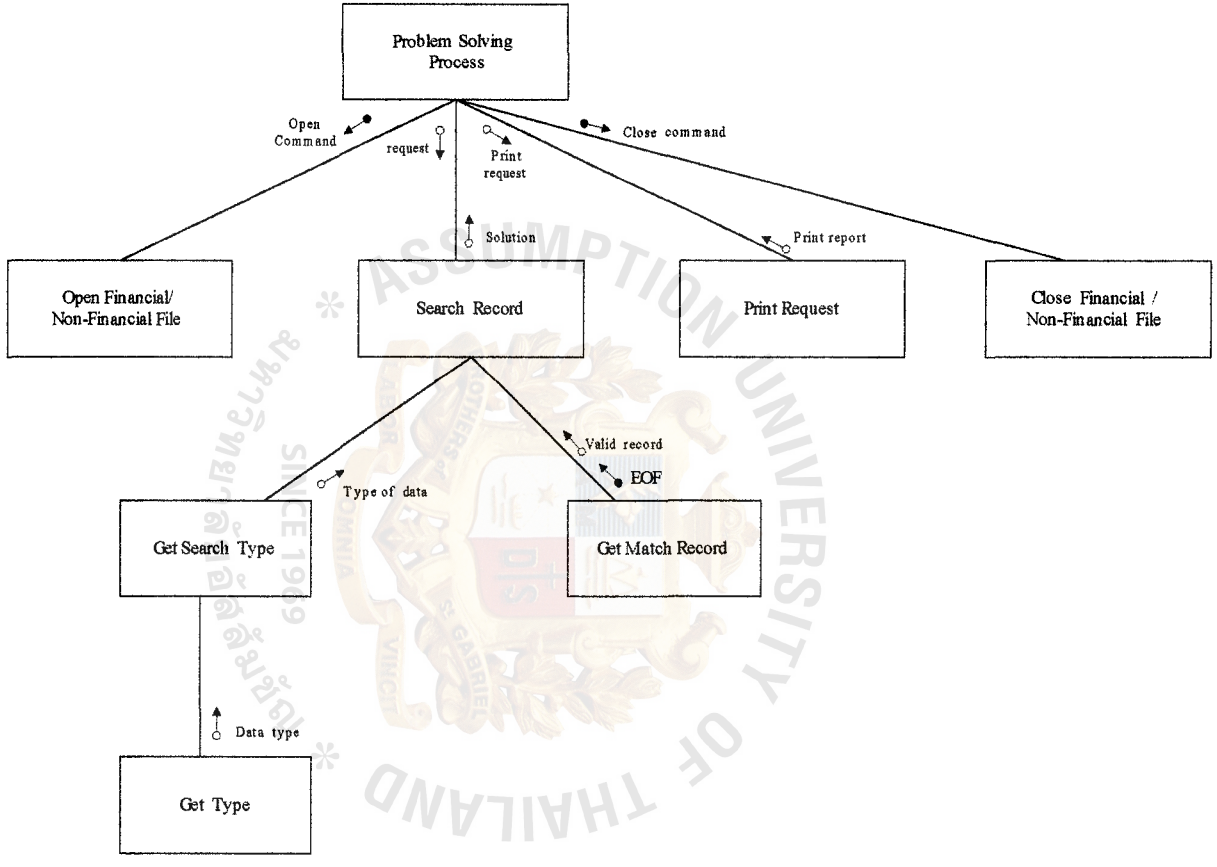

Figure E.5. Structure Chart of Problem Solving Process.

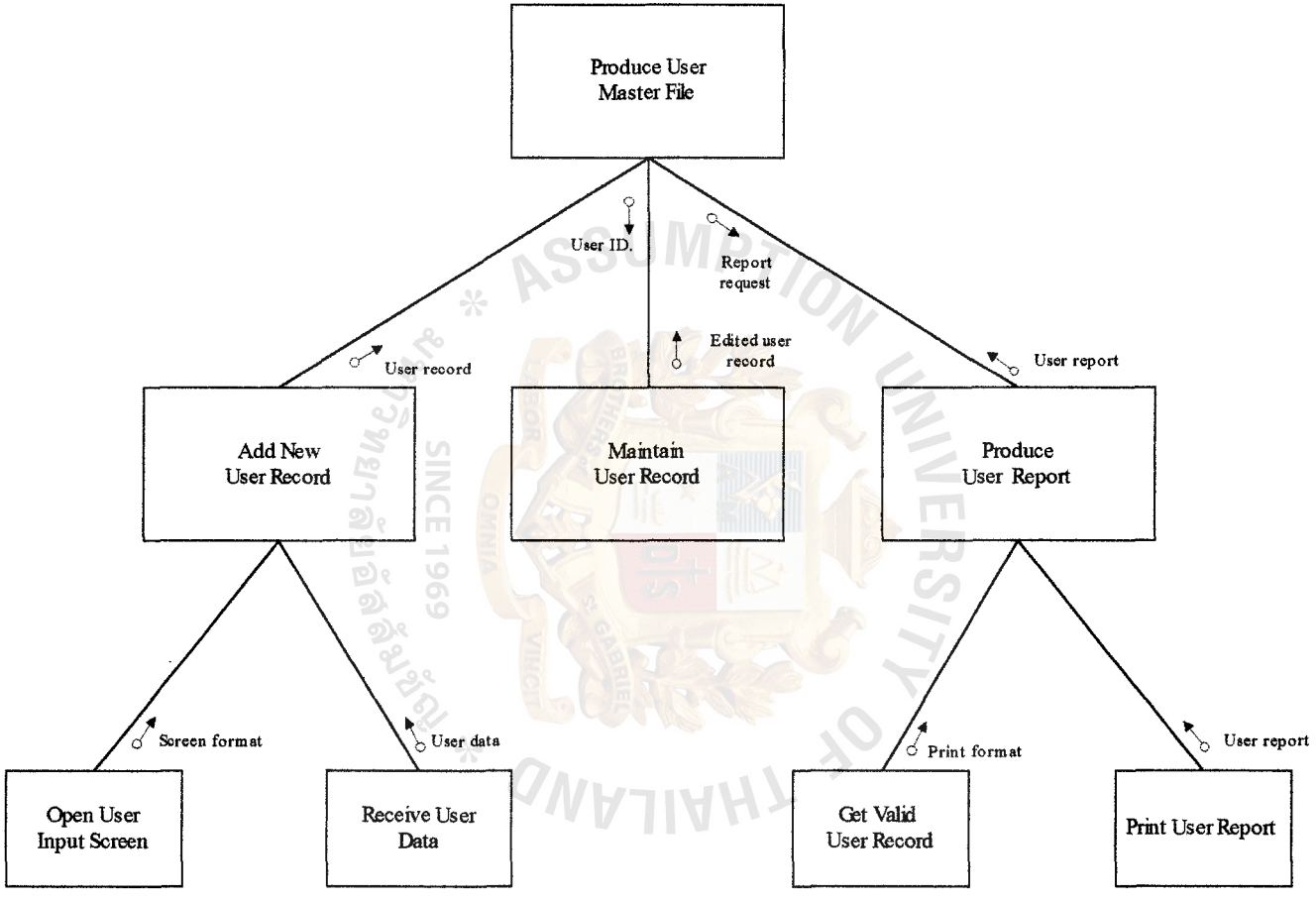

Figure E.6. Structure Chart of Producing User Master File.

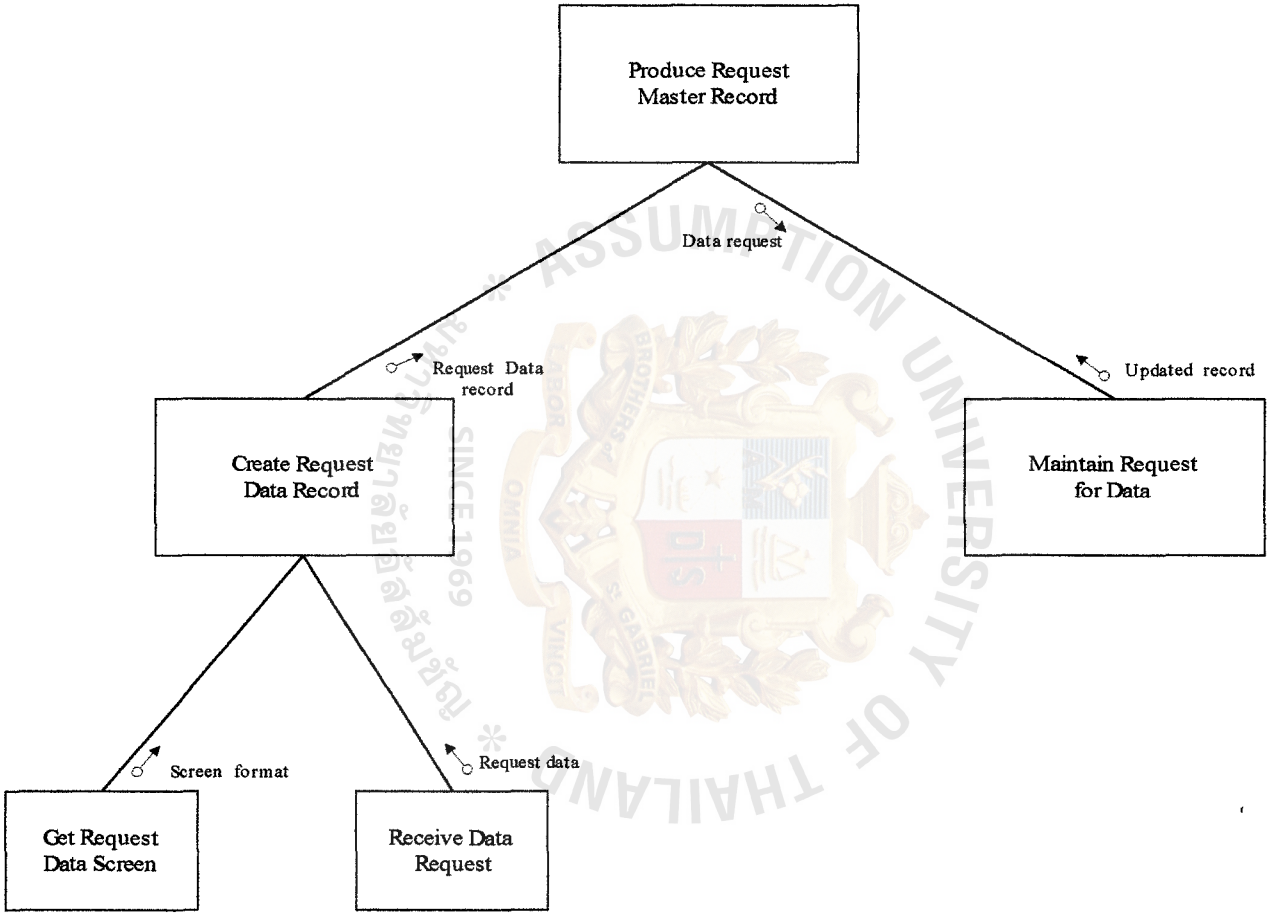

Figure E.7. Structure Chart of Producing Request Master Record.

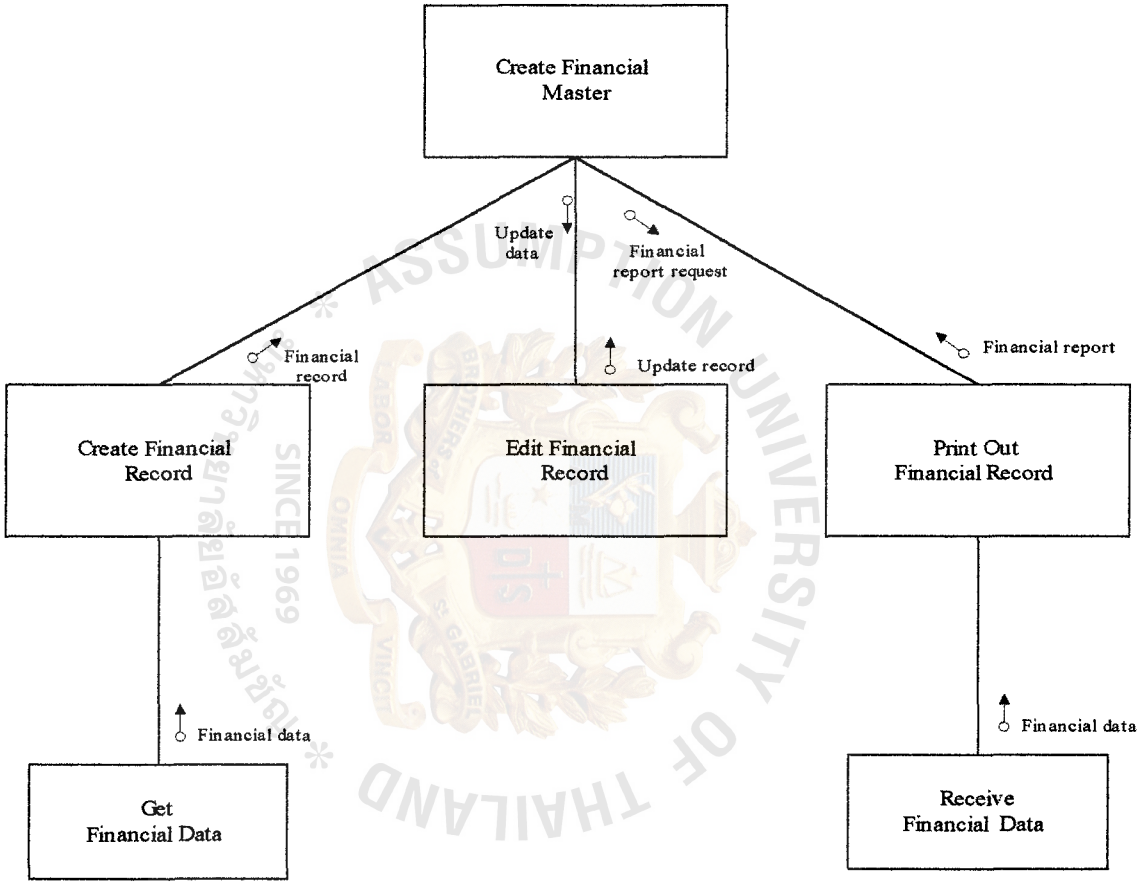

Figure E.8. Structure Chart of Creating Financial Master File.

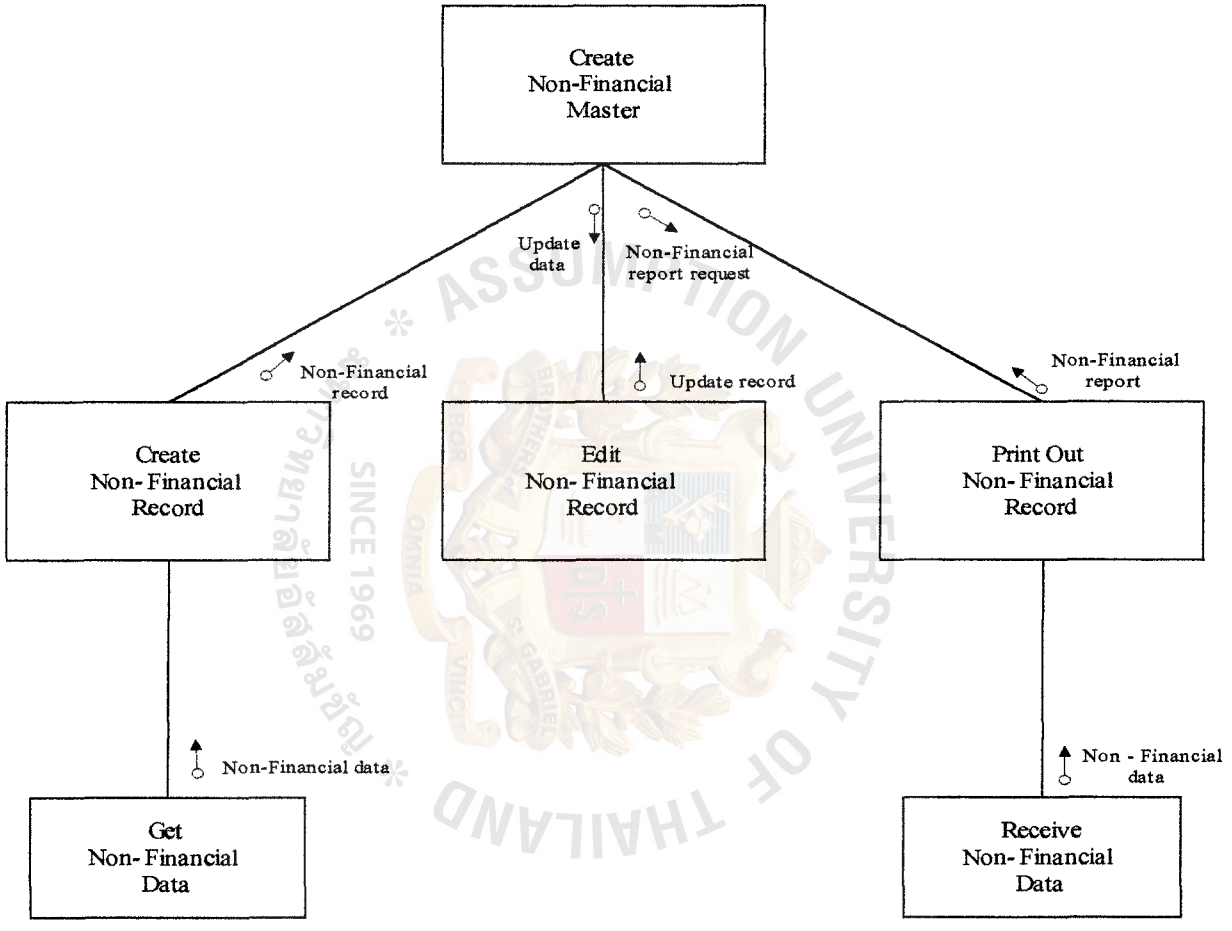

Figure E.9. Structure Chart of Creating Non-Financial Master File.

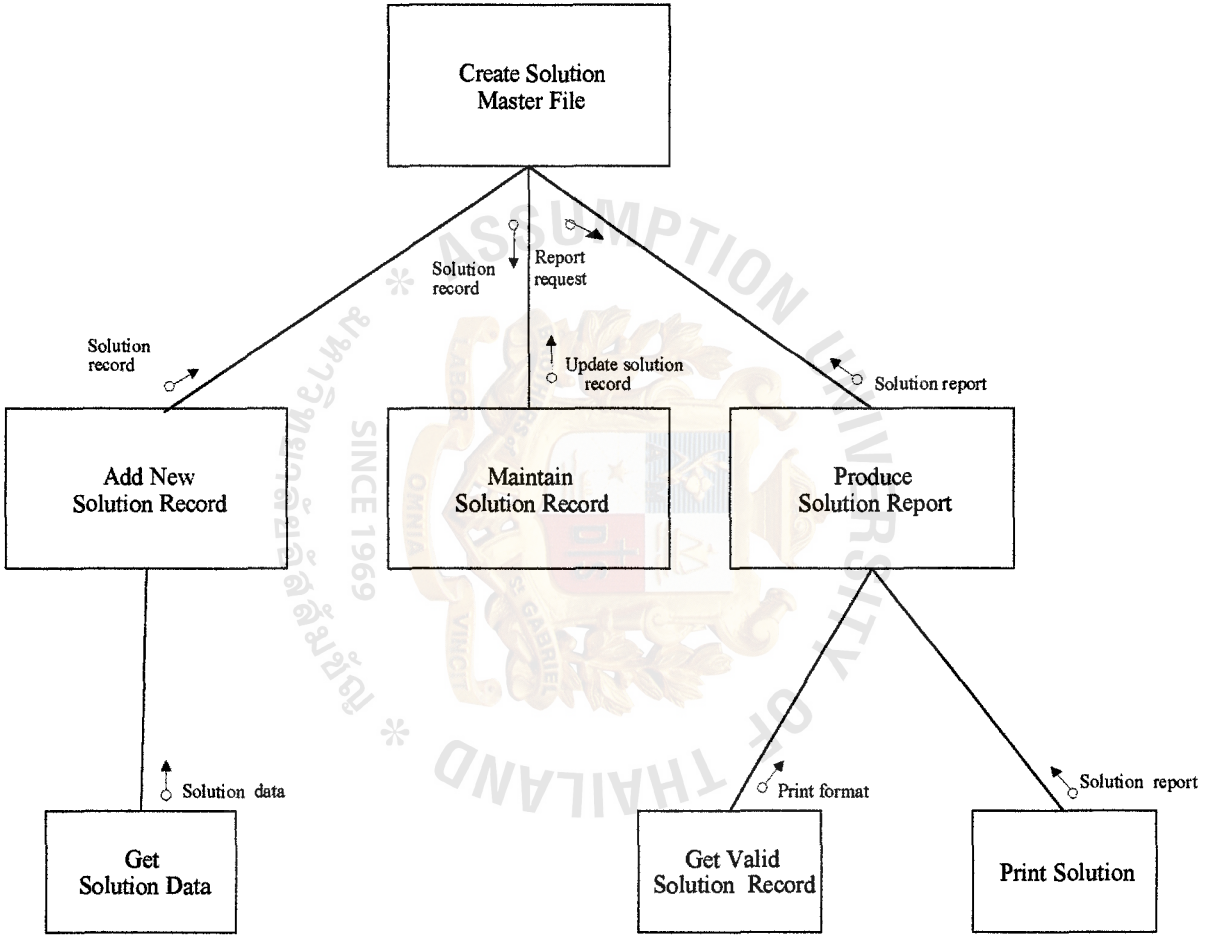

Figure E.10. Structure Chart of Creating Solution Master File.

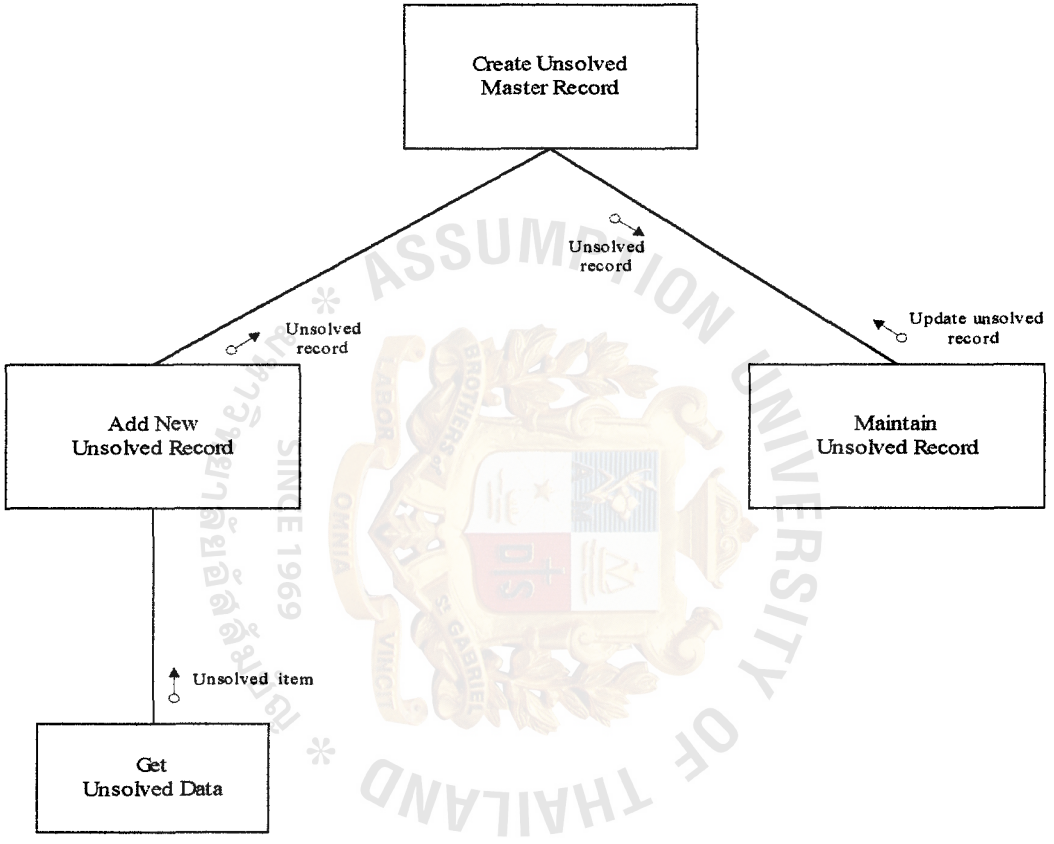

Figure E.11. Structure Chart of Creating Unsolved Master Record.

APPENDIX F

DATABASE DESIGN

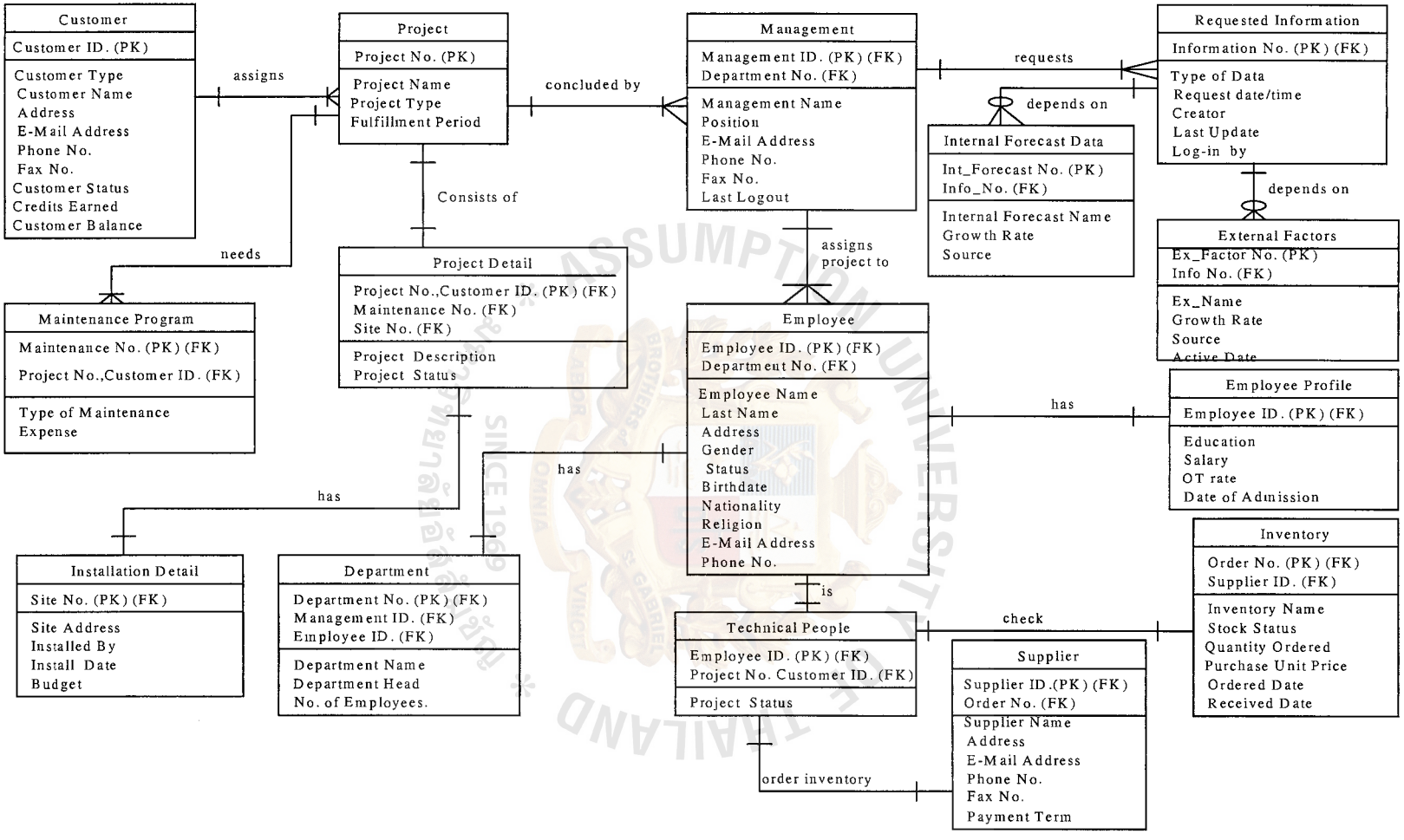

Figure F.1. Entity Relationship Model of Executive Information System.

Table F.1. Structure of Customer Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	Customer ID.	VarChar (6)	Y	Y				Primary key
2	Customer Type	Char (20)						Attribute
3	Customer Name	Char (50)						Attribute
4	Address	VarChar (40)						Attribute
5	E - Mail Address	VarChar (20)						Attribute
6	Phone No.	Integer						Attribute
7	Fax No.	Integer						Attribute
8	Customer Status	VarChar (10)						Attribute
9	Credits Earned	Integer						Attribute
10	Customer Balance	Integer						Attribute

Table F.2. Structure of Project Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	Project No.	VarChar (6)	Y	Y				Primary key
2	Project Name	Char (30)						Attribute
3	Project Type	Char (20)						Attribute
4	Fulfillment Period	Date						Attribute

Table F.3. Structure of Project Detail Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	Project No., Customer ID.	VarChar (12)	Y	Y		Maintenance		Primary key Foreign key
2	Maintenance No.	VarChar (6)	Y	Y				Foreign key
3	Site No.	VarChar (5)	Y	Y				Foreign key
4	Project Description	VarChar (50)						Attribute
5	Project Status	VarChar (13)						Attribute

Table F.4. Structure of Installation Detail Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	Site No.	VarChar (5)	Y	Y		Project Detail		Primary key Foreign key
2	Site Address	VarChar (30)						Attribute
3	Installed By	Char (50)						Attribute
4	Install Date	Date						Attribute
5	Budget	Money						Attribute

Table F.5. Structure of Management Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	Management ID.	VarChar (6)	Y	Y		Department		Primary key Foreign key
2	Department No.	VarChar (4)	Y	Y				Foreign key
3	Management Name	Char (20)						Attribute
4	Position	Char (15)						Attribute
5	E - Mail address	VarChar (20)						Attribute
6	Phone No.	Integer						Attribute
7	Fax No.	Integer						Attribute
8	Last Logout	Date/Time						Attribute

Table F.6. Structure of Requested Information Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	Information No.	VarChar (10)	Y	Y		External Factors		Primary Key Foreign Key
2	Type of Data	Char (13)						Attribute
3	Request Date/Time	Date/Time						Attribute
4	Creator	Char (20)						Attribute
5	Last Update	Date/Time						Attribute
6	Log-in by	Char (20)						Attribute

Table F.7. Structure of Employee Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	Employee ID.	VarChar (6)	Y	Y		Department		Primary key Foreign Key
2	Department No.	VarChar (4)	Y	Y				Foreign key
3	Employee Name	Char (20)						Attribute
4	Last Name	Char (20)						Attribute
5	Address	VarChar (30)						Attribute
6	Gender	Char (6)						Attribute
7	Status	Char (8)						Attribute
8	Birthdate	Date						Attribute
9	Nationality	Char (15)						Attribute
10	Religion	Char (15)						Attribute
11	E - Mail Address	VarChar (20)						Attribute
12	Phone No.	Integer						Attribute

Table F.8. Structure of Employee Profile Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	Employee ID.	VarChar (6)	Y	Y		Department		Primary key Foreign key
2	Education	Char (20)						Attribute
3	Salary	Money						Attribute
4	OT Rate	Money						Attribute
5	Date of Admission	Date						Attribute

Table F.9. Structure of Department Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	Department No.	VarChar (4)	Y	Y		Employee Management		Primary key Foreign key
2	Management ID.	VarChar (6)	Y	Y				Foreign key
3	Employee ID.	VarChar (6)	Y	Y				Foreign key
4	Department Name	Char (20)						Attribute
5	Department Head	Char (20)						Attribute
6	No. of Employees	Integer						Attribute

Table F.10. Structure of Technical People Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	Employee ID.	VarChar (6)	Y	Y		Department		Primary key Foreign key
2	Project No., Cus_ID.	VarChar (12)	Y	Y				Foreign key
3	Project Status	VarChar (13)						Attribute

Table F.11. Structure of Maintenance Program Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	Maintenance No.	VarChar (6)	Y	Y		Project Detail		Primary Key Foreign Key
2	Project No., Customer ID.	VarChar (12)	Y	Y				Foreign Key
3	Type of Maintenance	Char (8)						Attribute
4	Expense	Money						Attribute

Table F.12. Structure of Inventory Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	Order No.	VarChar (6)	Y	Y		Supplier		Primary key Foreign Key
2	Supplier ID.	VarChar (5)	Y	Y				Foreign key
3	Inventory Name	VarChar (15)						Attribute
4	Stock Status	VarChar (10)						Attribute
5	Quantity Ordered	VarChar (10)						Attribute
6	Purchase Unit Price	Integer						Attribute
7	Ordered Date	Date						Attribute
8	Received Date	Date						Attribute

Table F.13. Structure of Supplier Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	Supplier ID.	VarChar (5)	Y	Y		Inventory		Primary key Foreign key
2	Order No.	VarChar (6)	Y	Y				Foreign Key
3	Supplier Name	Char (20)						Attribute
4	Address	VarChar (30)						Attribute
5	E - Mail Address	VarChar (20)						Attribute
6	Phone No.	Integer						Attribute
7	Fax No.	Integer						Attribute
8	Payment Term	VarChar (15)						Attribute

Table F.14. Structure of External Factors Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	Ex_Factor No.	VarChar (5)	Y	Y		Request Information		Primary Key
2	Information No.	VarChar (10)	Y	Y				Foreign Key
3	Ex_Name	VarChar (50)						Attribute
4	Growth Rate	Percentage						Attribute
5	Source	Char (20)						Attribute
6	Active Date	Date						Attribute

Table F.15. Structure of Internal Forecast Data Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	Int_Forecast No.	VarChar (5)	Y	Y		Request Information		Primary Key
2	Information No.	VarChar (10)	Y	Y				Foreign Key
3	Internal Forecast Name	VarChar (50)						Attribute
4	Growth Rate	Percentage						Attribute
5	Source	Char (20)						Attribute

APPENDIX G

PROCESS SPECIFICATION

PROCESS SPECIFICATION

Table G.1. Process Specification of Accepting User Data.

Items	Description
Process Name:	Accept User Data
Data In:	User id. Password
Data Out:	User information Request screen
Process:	(1) Get user id and password that he fills in user screen. (2) Check it with User Master Database. (3) If user id and password match User Master Database. Then display User Information and Request Screen. Else deny access, display Access Reject Notice. (4) Show the result to user.
Attachment:	(1) User Master Database

Table G.2. Process Specification of Accepting User Request.

Items	Description
Process Name:	Accept User Request
Data In:	Requested information
Data Out:	Searching status screen
Process:	(1) Get requested information from user that he fills in Requested information screen. (2) Record it to Request Master Database. (3) Send user request to Problem Investigation Process.
Attachment:	(1) Request Master Database

Table G.3. Process Specification of Classifying User Request.

Items	Description
Process Name:	Classify User Request
Data In:	User request
Data Out:	Type of information Creator
Process:	(1) Receive user request. (2) Compare user request with Financial Master And Non-Financial Master Database. (3) If user request match with Financial Master Database. Then display type of information to be Financial, forward classified request. Else display type of information to be Non-Financial, forward classified request.
Attachment:	(1) Financial Master Database (2) Non-Financial Master Database

Table G.4. Process Specification of Recording to Log File.

Items	Description
Process Name:	Record to Log File
Data In:	Classified request
Data Out:	Modified user request
Process:	(1) Get classified request (2) Update Log File database (3) Forward classified request
Attachment:	(1) Log File Database

Table G.5. Process Specification of Retrieving Financial Data.

Items	Description
Process Name:	Retrieve Financial Data
Data In:	Financial Request
Data Out:	Requested Financial Detail
Process:	(1) Get Financial Request (2) Search it with Financial Master Database (3) If financial request exists in Financial Master Database Then send it to Record Financial Data process Else record to Unsolved Database, report To Technical Assistant Center (4) Display result to user
Attachment:	(1) Financial Master Database (2) Unsolved Database

Table G.6. Process Specification of Recording Request Financial Data.

Items	Description
Process Name:	Record Request Financial Data
Data In:	Requested Financial Data
Data Out:	Updated Solved Database
Process:	(1) Get requested financial data (2) Updated Solved Database
Attachment:	(1) Solved Database

Table G.7. Process Specification of Retrieving Non-Financial Data.

Items	Description
Process Name:	Retrieve Non-Financial Data
Data In:	Non-Financial Request
Data Out:	Requested Non-financial Detail
Process:	(1) Get Non-Financial Request. (2) Search it with Non-Financial Master Database. (3) If Non-Financial Request exists in Non-Financial Master Database. Then send it to Record Non-Financial Data Process. Else Record to Unsolved Database, report Technical Assistant Center. (4) Display result to user.
Attachment:	(1) Non-Financial Master (2) Unsolved

Table G.8. Process Specification of Recording Request Non-Financial Data.

Items	Description
Process Name:	Record Request Non-Financial Data
Data In:	Requested Non-Financial Data
Data Out:	Updated Solved Database
Process:	(1) Get Requested Non-Financial data. (2) Update Solved Database.
Attachment:	(1) Solved Database

APPENDIX H

COST ANALYSIS

Table H.1. Cost of Alternative Candidate 1, Baht.

Cost Items	Description	Amount	Unit Price	Price
1. Development Cost:	1.1 Personnel Cost:			
	System Analyst (180 hrs./ea)	1	200.00	36,000.00
	System Design (180 hrs./ea)	1	200.00	36,000.00
	Database Specialist (80 hrs./ea)	1	180.00	14,400.00
	Subtotal 1:			86,400.00
	1.2 Expenses:			
	Management Training Cost	8	7,000.00	56,000.00
	Installation Cost			10,000.00
	Subtotal 2:			66,000.00
	1.3 New Hardware & Software:			
	Server Computer (IBM Server, Intel Pentium III Processor)	1	250,000.00	250,000.00
	DBMS Server Software	1	50,000.00	50,000.00
	Application in the Client Side	1	30,000.00	30,000.00
	Subtotal 3:			330,000.00
	Total Development Cost			482,400.00
2. Operating Cost:	2.1 Personnel Cost:			
	System Administrator	2	200,000.00	400,000.00
	Subtotal 1:			400,000.00
	2.2 Maintenance:			
	Hardware Maintenance			10,000.00
	Agreement for DBMS Server Software			5,000.00
	Agreement on Application in the Client Side			5,000.00
	Subtotal 2:			20,000.00
	Total Operating Cost			420,000.00
	Total Project Annual Cost			902,400.00

Table H.2. Payback Analysis of Alternative Candidate 1, Baht.

Cost Items	Years					
	0	1	2	3	4	5
Development cost	-482,400.00	-	-	-	-	-
Operation & Maintenance Cost	0	-420,000.00	-436,800.00	-454,272.00	-472,422.88	-491,340.59
Discount Factors (10%)	1.00	0.91	0.83	0.75	0.68	0.62
Time-Adjusted Costs (Adjusted to Present Value)	-482,400.00	-382,200.00	-362,544.00	-340,704.00	-321,261.15	-304,631.16
Cumulative Time-Adjusted Costs Over Lifetime	-482,400.00	-864,600.00	-1,227,144.00	-1,567,848.00	-1,889,109.10	-2,193,740.20
Benefits Derived from Operation of New System	0	450,000.00	468,000.00	486,720.00	506,188.80	526,436.35
Discount Factors (10%)	1.00	0.91	0.83	0.75	0.68	0.62
Time-Adjusted Benefits (Adjusted to Present Value)	0	409,500.00	388,440.00	365,040.00	344,208.38	326,390.53
Cumulative Time-Adjusted Benefits Over Lifetime	0	409,500.00	797,940.00	1,162,980.00	1,507,188.30	1,833,578.80
Cumulative Lifetime Time-Adjusted Cost + Benefits	-482,400.00	-455,100.00	-429,204.00	-404,868.00	-381,920.80	-360,161.40

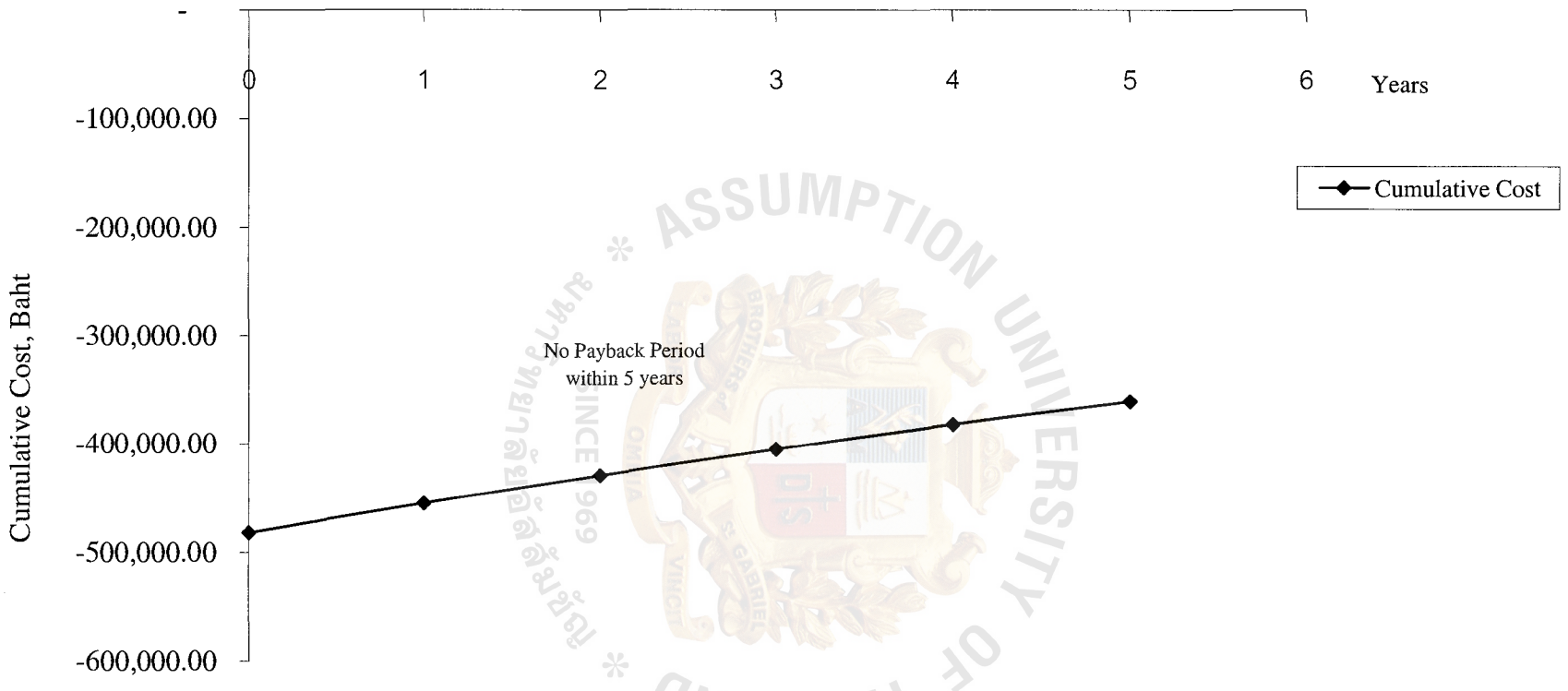

Figure H.1. Payback Analysis of Candidate 1.

Table H.3. Cost of Alternative Candidate 2, Baht.

Cost Items	Description	Amount	Unit Price	Price
1. Development Cost:	1.1 Personnel Cost:			
	System Analyst (250 hrs./ea)	1	500.00	125,000.00
	System Design (200 hrs./ea)	1	500.00	100,000.00
	Programmer (200 hrs./ea)	1	200.00	40,000.00
	Subtotal 1:			265,000.00
	1.2 Expenses:			
	Management Training Cost	8	7,000.00	56,000.00
	Installation Cost			9,000.00
	Subtotal 2:			65,000.00
	1.3 New Hardware & Software:			
	Server Computer (Compaq Used 500 MHz., Intel Pentium III Processor)	1	100,000.00	100,000.00
	DBMS Server Software	1	20,000.00	20,000.00
	Subtotal 3:			120,000.00
	Total Development Cost			450,000.00
2. Operating Cost:	2.1 Personnel Cost:			
	System Administrator	1	300,000.00	300,000.00
	Subtotal 1:			300,000.00
	2.2 Maintenance:			
	Hardware Maintenance			8,000.00
	Maintenance Agreement for DBMS Server Software			3,000.00
	Subtotal 2:			11,000.00
	Total Operating Cost			311,000.00
	Total Project Annual Cost			761,000.00

Table H.4. Payback Analysis of Alternative Candidate 2, Baht.

Cost Items	Years					
	0	1	2	3	4	5
Development cost	-450,000.00	-	-	-	-	-
Operation & Maintenance Cost	0	-311,000.00	-323,440.00	-336,377.60	-349,832.70	-363,826.00
Discount Factors (10%)	1.00	0.91	0.83	0.75	0.68	0.62
Time-Adjusted Costs (Adjusted to Present Value)	-450,000.00	-283,010.00	-268,455.20	-252,283.20	-237,886.23	-225,572.12
Cumulative Time-Adjusted Costs Over Lifetime	-450,000.00	-733,010.00	-1,001,465.20	-1,253,748.40	-1,491,634.60	-1,717,206.70
Benefits Derived from Operation of New System	0	450,000.00	468,000.00	486,720.00	506,188.80	526,436.35
Discount Factors (10%)	1.00	0.91	0.83	0.75	0.68	0.62
Time-Adjusted Benefits (Adjusted to Present Value)	0	409,500.00	388,440.00	365,040.00	344,208.38	326,390.53
Cumulative Time-Adjusted Benefits Over Lifetime	0	409,500.00	797,940.00	1,162,980.00	1,507,188.30	1,833,578.80
Cumulative Lifetime Time-Adjusted Cost + Benefits	-450,000.00	-323,510.00	-203,525.20	-90,768.40	15,553.70	116,372.10

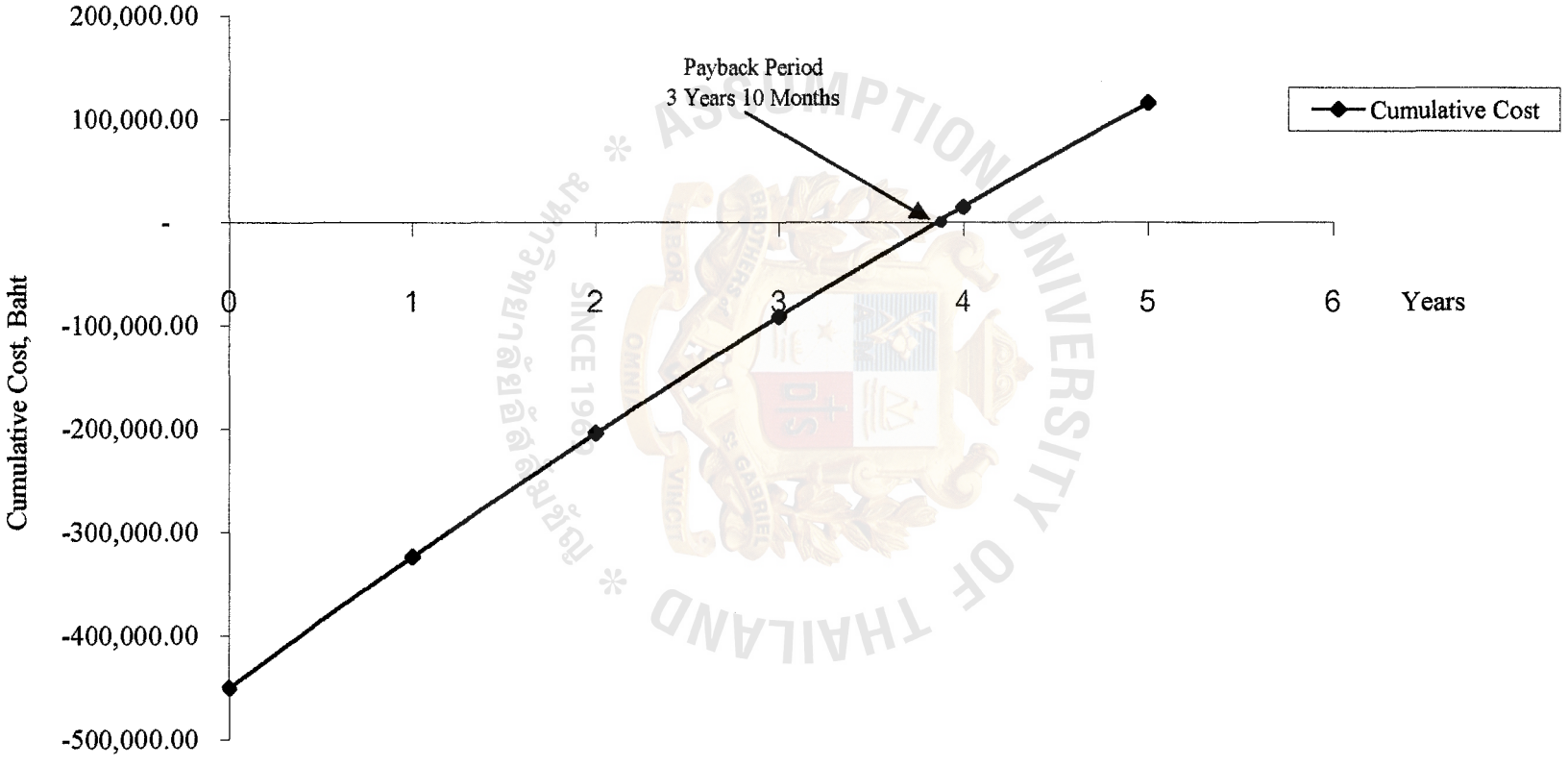

Figure H.2. Payback Analysis of Candidate 2.

Table H.5. Cost of Alternative Candidate 3, Baht.

Cost Items	Description	Amount	Unit Price	Price
1. Development Cost:	1.1 Personnel Cost:			
	System Analyst (150 hrs./ea)	1	250.00	37,500.00
	System Design (150 hrs./ea)	1	250.00	37,500.00
	Database Specialist (100 hrs./ea)	1	400.00	40,000.00
	Subtotal 1:			115,000.00
	1.2 Expenses:			
	Management Training Cost	8	-	40,000.00
	Installation Cost			10,000.00
	Subtotal 2:			50,000.00
	1.3 New Hardware & Software:			
	Server Computer (Upgrade PC 933 MHz., Intel Pentium III Processor)	1	50,000.00	50,000.00
	DBMS Server Software	1	50,000.00	50,000.00
	Application in the Client Side	1	30,000.00	30,000.00
	Subtotal 3:			130,000.00
	Total Development Cost			295,000.00
2. Operating Cost:	2.1 Personnel Cost:			
	System Administrator (In-House)	2	100,000.00	200,000.00
	Subtotal 1:			200,000.00
	2.2 Maintenance:			
	Hardware Maintenance			5,000.00
	Maintenance Agreement for DBMS Server Software			7,000.00
	Maintenance Agreement for Application in the Client Side			3,000.00
	Subtotal 2:			15,000.00
	Total Operating Cost			215,000.00
	Total Project Annual Cost			510,000.00

Table H.6. Payback Analysis of Alternative Candidate 3, Baht.

Cost Items	Years					
	0	1	2	3	4	5
Development cost	-295,000.00	-	-	-	-	-
Operation & Maintenance Cost	0	-215,000.00	-223,600.00	-232,544.00	-241,845.76	-251,519.59
Discount Factors (10%)	1.00	0.91	0.83	0.75	0.68	0.62
Time-Adjusted Costs (Adjusted to Present Value)	-295,000.00	-195,650.00	-185,588.00	-174,408.00	-164,455.11	-155,942.14
Cumulative Time-Adjusted Costs Over Lifetime	-295,000.00	-490,650.00	-676,238.00	-850,646.00	-1,015,101.10	-1,171,043.20
Benefits Derived from Operation of New System	0	450,000.00	468,000.00	486,720.00	506,188.80	526,436.35
Discount Factors (10%)	1.00	0.91	0.83	0.75	0.68	0.62
Time-Adjusted Benefits (Adjusted to Present Value)	0	409,500.00	388,440.00	365,040.00	344,208.38	326,390.53
Cumulative Time-Adjusted Benefits Over Lifetime	0	409,500.00	797,940.00	1,162,980.00	1,507,188.30	1,833,578.80
Cumulative Lifetime Time-Adjusted Cost + Benefits	-295,000.00	-81,150.00	121,702.00	312,334.00	492,087.20	662,535.60

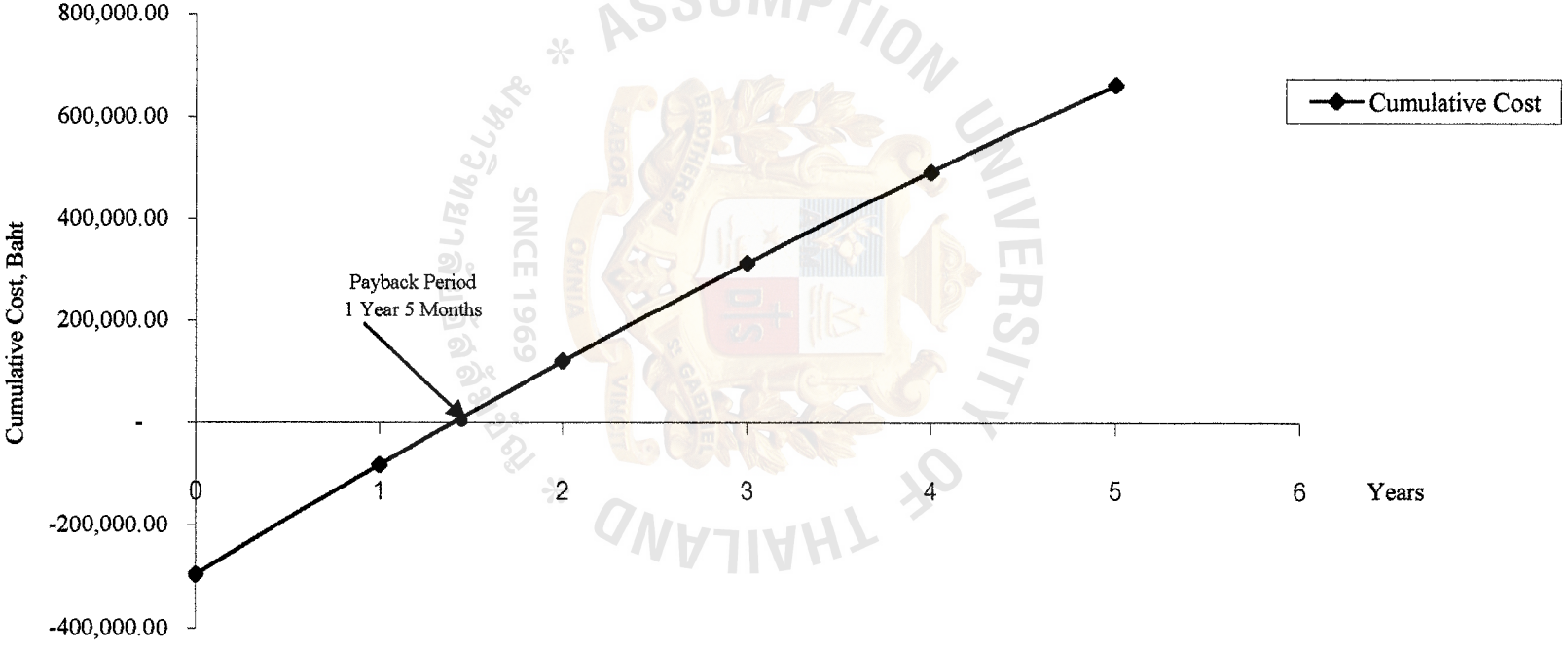

Figure H.3. Payback Analysis of Candidate 3.

Table H.7. Payback Analysis Comparison among Candidate I, II, and III, Baht.

Candidate	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Candidate I	-482,400.00	-455,100.00	-429,204.00	-404,868.00	-381,920.80	-360,161.40
Candidate II	-450,000.00	-323,510.00	-203,525.20	-90,768.40	15,553.70	116,372.10
Candidate III	-295,000.00	-81,150.00	121,702.00	312,334.00	492,087.20	662,535.60

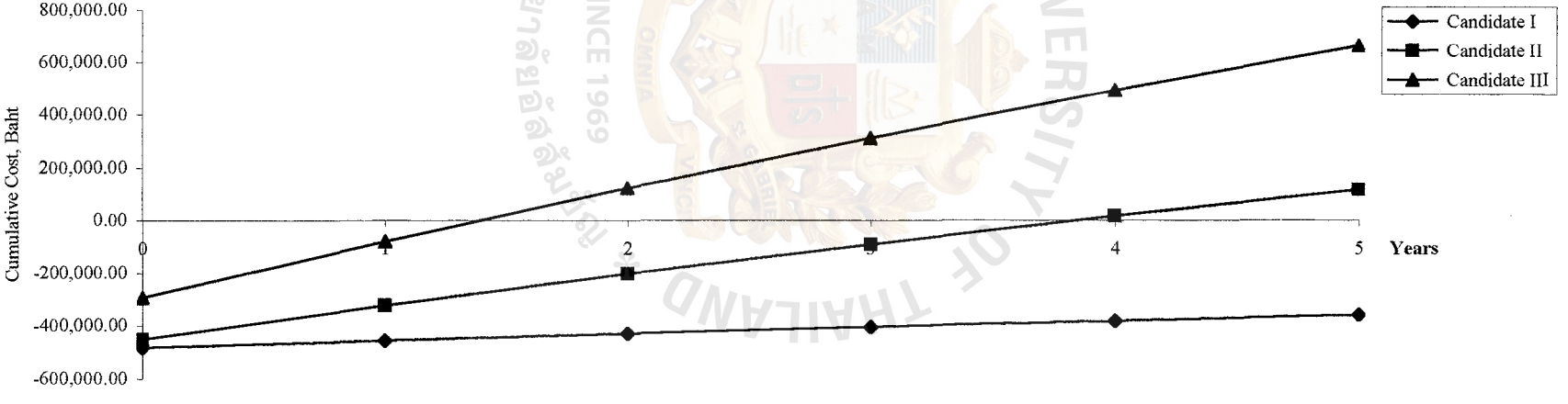

Figure H.4. Payback Analysis Comparison among Candidate I, II, and III.

APPENDIX I

DATA DICTIONARY

DATA DICTIONARY

Table I.1. Data Dictionary of the Executive Information System.

Data	Meaning
Enter user data	User enters user ID. and password to the system
Read user data	System reads user id. and password
Accept user data	System checks if user data match User Master File
Access Reject Notice	System reject accessing from user
Fill user request	User fills in his request
Record in Request Master	System records user request in Request Master file
Send user request	System sends user request to classify type of data
Check financial data type	System checks the forwarded request in Financial Master
Send financial record type	Financial record type is sent to the system if exists
Check non-financial data type	System checks the forwarded request in Non-Financial Master
Send non-financial record type	Non-financial record type is sent to the system if exists
Send classified request	System records classified request to Log File
Forward financial request	System sends financial request to search for a result
Retrieve financial data	System extracts data in Financial Master File
Send data	Extracted data is sent to the system
Record financial data	System records financial data that will be sent to user
Action to request	User receives response from the system
Record unsolved request	System records unsolved request to the Unsolved File
Forward non-financial request	System sends non-financial request to search for a result
Retrieve non-financial issue	System extracts data in Non-financial Master File
Record non-financial data	System records non-financial data that will be sent to user
Report unsolved request	System informs unsolved request to the TAC (Technical Assistant Center)

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