



The Customer Service Information System for
Boon Bank Co., Ltd.

by

Ms. Haruethai Benjasilrak

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

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

November, 2001

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Project Title The Customer Service Information System for Boom Bank Co., Ltd.

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Academic Year November 18, 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

Boom Bank is a commercial bank in Thailand. Boom Bank provides service to the customer in the area of Deposit, Commercial Lending, Remittance, Foreign Exchange, and Other Payments Systems. In order to improve the Customer Service Information System, a lot of processes are required, and it has to deal with several departments. Therefore, this project is to develop the effective information system to facilitate the process of Customer Service Information System.

The current existing Customer Service Information System is based on the Banking System (COBOL Version). All data are stored in the file and paper. The existing system requires many staffs to operate and maintain the system, and this leads to high labor costs. In addition, it also faces many general problems of the Banking System that makes the system less effective and very slowly.

The new proposed Information System will be developed to replace the existing system with a Customer Service Information System. All data are kept in the Database Server, Microsoft Access. It will reduce the number of staffs required in the process, solve the problems of the existing system, and decrease the high maintenance cost. Moreover, it can support the management in making decisions by providing reliable, accurate and complete information and producing monthly reports.

ACKNOWLEDGEMENTS

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The writer desires to express her most sincere appreciation and thanks to Air Marshal Dr. Chulit Meesajjee, her project advisor, for his valuable suggestions and advice given in to preparation of this project

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I. INTRODUCTION

1.1 Background of the Project

The report is done according to the requirements of MS(CIS) program, CS6998 System Development Project, which includes studying and analyzing the problems of the existing system, defining user requirements, and designing the appropriate computerized system for a company. This report concerns replacing the existing system with the new effective system.

Boom Bank Company Limited is a commercial bank in Thailand. It was established a few years ago. Boom Bank Co., Ltd., stands on the land area of 35,000 square meters and Building is located on 25,000 square meter of land in 1501/34 Chan Road, Thungwatdon, Sathorn, Bangkok 10120. Boom Bank has many business areas that serve the customer such as Deposit, Transfer, Loan, Foreign Exchange, and Other Payments.

This report entails the Customer Service Information System of Boom Bank, because the existing system, Banking System is written by using COBOL Language can support only Deposit Transaction. So almost all of works in the existing system of the company are done manually and information that flows among departments can not be done effectively. This lead to many problems such as inconsistencies of data, incorrect calculating of interest, inefficient reporting system, slow processing, obsolete data, and inability to keep track of customers and transactions.

While the company has been growing, the Boom Bank Co., Ltd., will expand to the customer to serve in the area of Transfer, Commercial Lending and Other payments. So the company needs to change the system to more effective ways. Now Boom Bank Co., Ltd., has planned to expand the business to complete with other competitors.

Therefore, the company needs a new Customer Service Information System that can help achieve their job faster, easier, more effective, and also decrease the amount of paper used in the working process.

1.2 Objectives of the Project

The objectives of developing the Customer Service Information System project for Boom Bank Co. Ltd., are as the follows:

- (1) To enhance the efficiency of the existing system and control over computing resources including hardware installed.
- (2) To support the service deposit, withdrawal, transfer and other payments business area.
- (3) To generate accounting to the system correctly.
- (4) To increase speed of doing the transaction.
- (5) To reduce the number of errors that may occur.
- (6) To increase the validation and reliability of the data input.
- (7) To reduce the use of the wasted time.
- (8) To increase the security control to the Banking System.
- (9) To increase the quality and quantity of the transaction.

1.3 Scope of the Project

The Customer Service System (Personal Computer Version I), Boom Bank Company Limited, is the system that is created to process all the business areas such as the Deposit, Withdrawal, Transfer and Other Payment Services.

This project analyzes only the Customer Service Information System (Personal Computer Version I) that is related to Deposit, Withdrawal, Transfer and Other Payment Services. It is not analyzed for other business area.

This project refers to the following areas:

- (1) Creating the computerized system which is required in terms of accuracy, validation and speed.
- (2) To analyze the hardware and software for the projected Customer Service Information System.
- (3) To analyze and design the database for the projected Customer Service Information System.
- (4) To describe process specifications for the new system.
- (5) To design screen layouts and report layouts for users.
- (6) To update Accounting Balance correctly.
- (7) To be able to print the report correctly and completely.
- (8) Data inquiry can be made immediately.

1.4 Deliverables

The deliverables of the projected Customer Service Information System are as follows:

- (1) Project Introduction
 - (a) Background of the project
 - (b) Objectives
 - (c) Scope
- (2) The Existing System
 - (a) Background of the organization
 - (b) Existing business function
 - (c) Current problems and areas for improvements
 - (d) Existing computer system

(3) The Proposed System

(a) System specification

(1) Context diagram

(2) Data flow diagram

(b) System design

(c) Hardware and software requirement

(d) Security and controls

(e) Cost/benefit analysis

(4) Project Implementation

(5) Conclusions and Recommendations

1.5 Project Plan

This project plan of Boom Bank Co., Ltd. Customer Service Information System can be illustrated as follows:



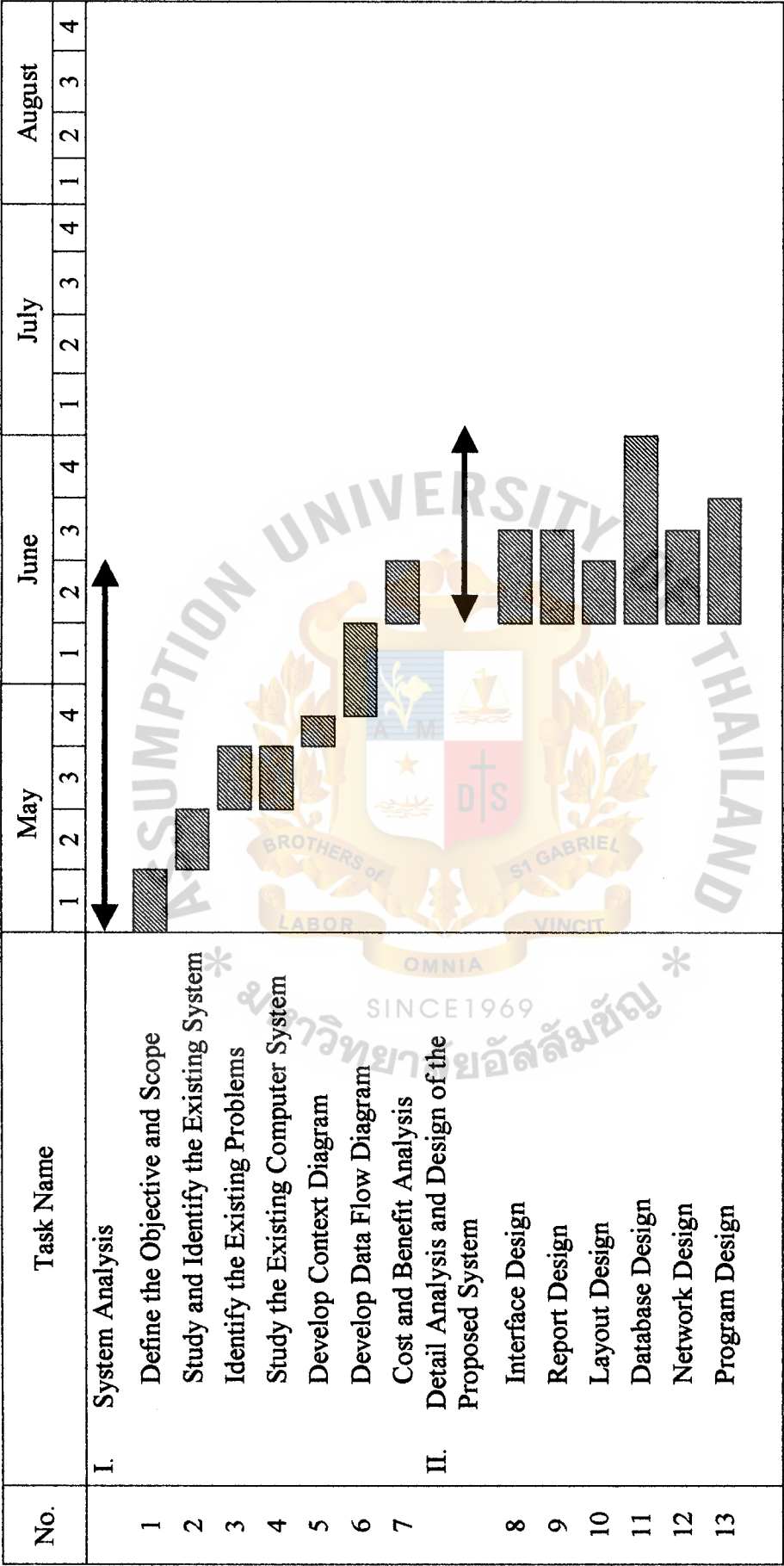


Figure 1.1. Project Plan of Customer Service Information System.

II. THE EXISTING SYSTEM

2.1 Background of the Organization

Boom Bank Company Limited is a commercial bank in Thailand. It was established a few years ago. Boom Bank Co., Ltd., stands on the land area of 35,000 square meter and Building is located on 25,000 square meters of land in 1501/34 Chan Road, Thungwatdon, Sathorn, Bangkok 10120. Boom Bank has many business areas that serve the customer such as Deposit, Transfer, Loan, etc. The company consists of eight departments. The job descriptions of each department are briefly described below:

(1) Trade Finance Department

The main responsibility of the department is serving the customer in the field of Trade Finance Service (Export and Import Business). For example, Issuing the Letter of Credit.

(2) Commercial Lending Department

The main responsibility of the department is serving the customer in the field of Commercial Loans. For giving the credit to the customer and control the repayment of the customer.

(3) Customer Service Department.

The main responsibility of the department is serving the customer in the field of Customer Service such as Deposit, Withdrawal, Transfer, Other Payments, and Update Passbook.

(4) Treasury Department

The main responsibility of the department is serving the customer in the field of Foreign Exchange and Money Market, and control the Nostro and Vostro Foreign Currency.

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(5) Marketing Department

The main responsibility of the department is to promote and increase the transaction volume.

(6) Personnel Department

The responsibility of the department is for human resources of the company, in charge of recruiting new employees, collecting, and updating employee records.

(7) Finance & Accounting Department

The main responsibility of the department is making general accounting standard, producing payroll for all employees, and handle the revenue and the expense transactions of the company.

(8) Audit Department

The main responsibility is auditing the program and the working of the user and control the security in the company.

The organization structure of Boom Bank Co., Ltd., consists of:

- (1) Mr. Wichai Benjasilrak as the President
- (2) Ms. Suneeporn Ngamjariyaporn as the Manager of Trade Finance Department
- (3) Ms. Araya Direkrungrung as the Manager of Commercial Lending Department
- (4) Ms. Sunedta Meepol as the Manager of Customer Service Department
- (5) Mr. Pongsak Jamjan as the Manager of Treasury Department
- (6) Mr. Sompomg Kongwiset as the Manager of Marketing Department

- (7) Ms. Sunanta Imboon as the Manager of Personnel
Department
- (8) Ms. Pradtana Songsang as the Manager of Finance &
Accounting Department
- (9) Mr. Sutat Meepon as the Manager of Audit Department



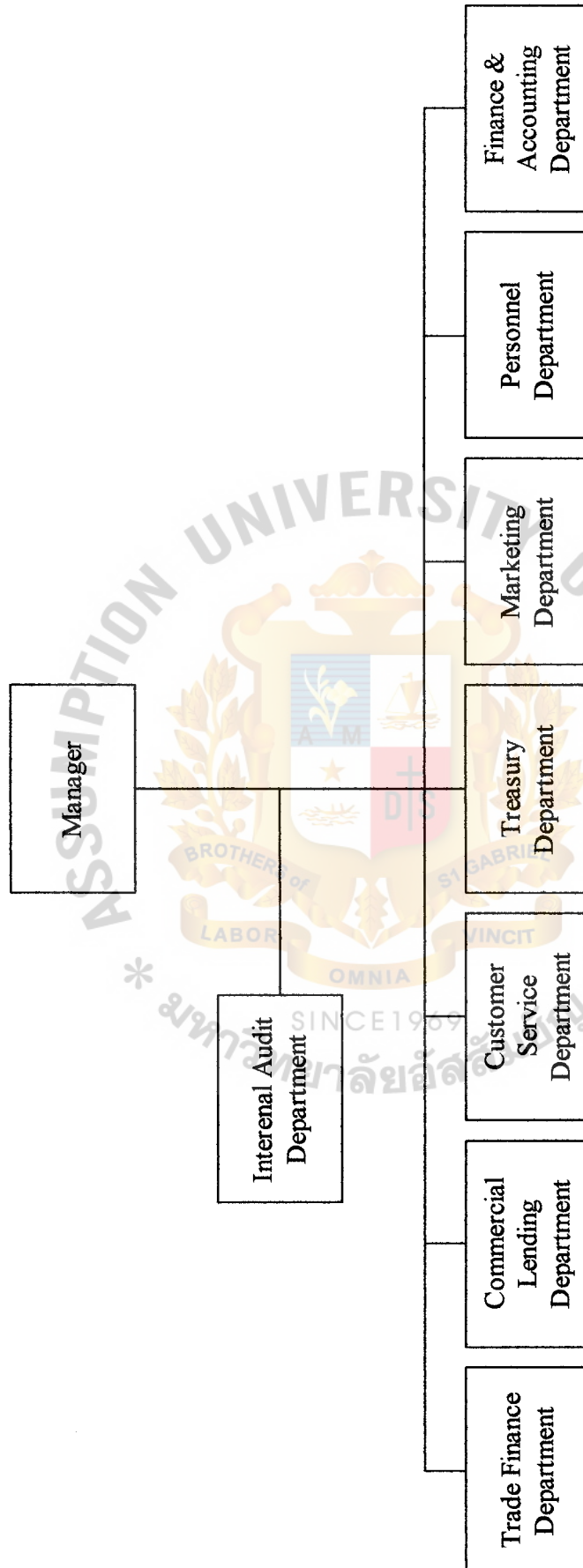


Figure 2.1. The Organization Chart of Boom Bank Co., Ltd.

2.1 Current Problems and Areas of Improvement

The current problems of the existing system of Boom Bank Co., Ltd., are as follows:

- (1) Workflow is quite slow due to manual operation in the existing system.
- (2) Many staffs are needed to process the transactions. This leads to high labor costs.
- (3) Many mistakes have occurred from the human error.
- (4) Data cannot be shared easily among different departments. This leads to the problems of data duplication, data redundancy, and data inconsistency.
- (5) A lot of duplicated information exists in each department, and the information is not up-to-date. This leads to information conflict among departments.
- (6) It takes too much time to generate the reports.
- (7) The working of the existing system, Banking System (COBOL Version) is not perfect. The purpose of Banking System is created for the Computerized System, but in fact the Banking System still needs manual system to support it.
- (8) The functionality of the existing system, Banking System is not a variety or does not support every kind of transaction, so users have many problems in using it.
- (9) Sometimes the running program at the end of day is not complete. It has an error message.

- (10) When the Banking System was down, the back up - diskette must be recovered. But the back up – diskette often is not working. So the Banking System can not continue to work. The solution for this present is bringing the back up – diskettes from the last two business days to recover. After recovery was finished, the user must key all the transactions that were related for today and the last business day transaction. All transactions must be completed and balanced. So it will use more time to key in all transactions and recover the back up. The user must manually check and trace the data in two days. And sometime the data keyed in is not complete as the old one.
- (11) Using diskette for storage data is slow, because we must use the 11-12 diskettes per day.
- (12) The poor security in the existing system, Banking System (COBOL Version).
- (13) The speed of computer and printer (Dot) are slow.
- (14) Lack of effective and efficient information flow between staff and customer.
- (15) The existing system, Banking System is inflexible. It is slow, so customers need to wait.

The problems mentioned above focus on the following areas of improvement:

- (1) Upgrade the existing system or develop the new system as soon as possible.
- (2) Update the technology or PC to be efficient for the branch.

- (3) Training the user for the new technology and try to give the knowledge to the user.
- (4) Improve the security both in the application and the Operating System.
- (5) Generating and printing the reports for the management people.

2.2 Existing Business Function

The business functions of the existing system, Banking System (COBOL Version) of the Boom Bank Co., Ltd., are as follows:

- (1) When the new customer open the account at the Boom Bank Co., Ltd., the customer service staff will register the customer information in to the existing system, Banking System (COBOL Version). After that the staff will print the passbook to the customer manually.
- (2) When the customer deposits the money to the Boom Bank Co., Ltd., the customer service staff will key the transaction in to the existing system, Banking System (COBOL Version) according to the deposit slip. And the staff still need to write the today transaction in to the book. The deposit slip will be sent to the Financial and Accounting Department for posting the accounting entries in to the accounting journal book.
- (3) For the withdrawal transaction, the customer service staff need to manually check and recalculate the interest and account balance to make the balance more accurate, because the existing system, Banking System (COBOL Version) does not automatically update or calculate the interest amount during the interest day. After that the staff will key the withdrawal transaction in to the existing system according to the withdrawal slip. The

withdrawal slip will be sent to the Financial and Accounting Department to post the accounting entries into the accounting journal book.

- (4) At the end of the day, the operator staff need to run the end of day process. If there is a problem during the end of day process, the EDP auditor need to check the error and find the solution to solve the problem as soon as possible.
- (5) The Financial and Accounting Department will check the account balance and generate the report to the management.



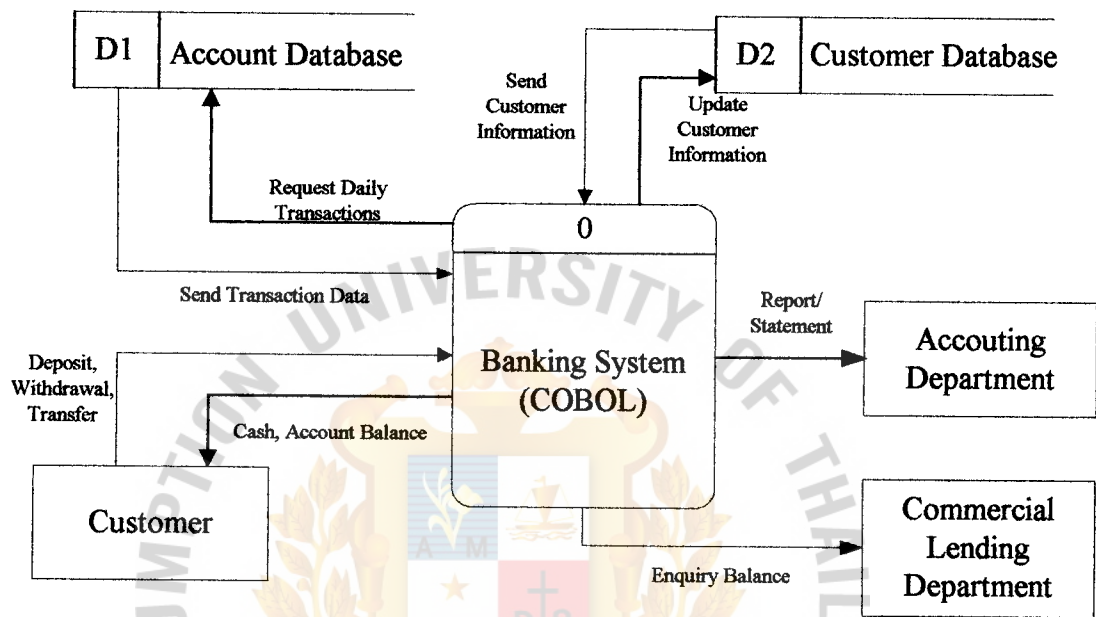


Figure 2.2. Context Level Data Flow Diagram of Existing Banking System (COBOL Version).

III. THE PROPOSED SYSTEM

3.1 System Specification

Application Architecture serves as the framework for general design. It defines the technologies used to build and use in the information system of the project in terms of Network Architecture, Data Architecture, Interface Architecture, and Process Architecture. The proposed system selected is the Candidate 3, which is described in Appendix D. Following are its application architecture.

3.1.1 Network Architecture

Server: Database Server 1,
Database Server2 (Back Up)

Client: Personal Computer

Topology: Star

The server and the client machines PC1 – PC2, are installed at Treasury Department. PC3 is installed at Marketing Department. PC4 – PC5 are installed at Financial and Accounting Department. PC6 is installed at Internal Audit Department. PC7 – PC8 are installed at Commercial Lending Department. PC9 – PC10 are installed at Trade Finance Department. PC11 is installed at Personnel Department. PC12 – PC15 are installed at Customer Service Department.

Network Architecture for the proposed system is Clients/Sever that is mainly consists of two Database Servers, and client machines. Bus topology is used to link multiple computers through a computer server. The significant protocols to be used is TCP/IP.

All data are stored in the database server. Some appropriate business logic is programmed to execute on the server. Some may be downloaded from the server to execute on the client.

System Interfaces will be controlled by the server. All database commands and instructions will be executed on the server.

Users can simply receive the data in the database via the network. When the system status processes, all client machines will be connected to the server. When client machines want to access the data in the database, the client machines only send database commands to be executed on the server. Then, the results will be sent from the server to the client machine. This can decrease the network traffic, as not all data in the database are sent through the network. Instead, only selected data are sent to the client machine as needed. Therefore, the amount of data passed through the network is not large.

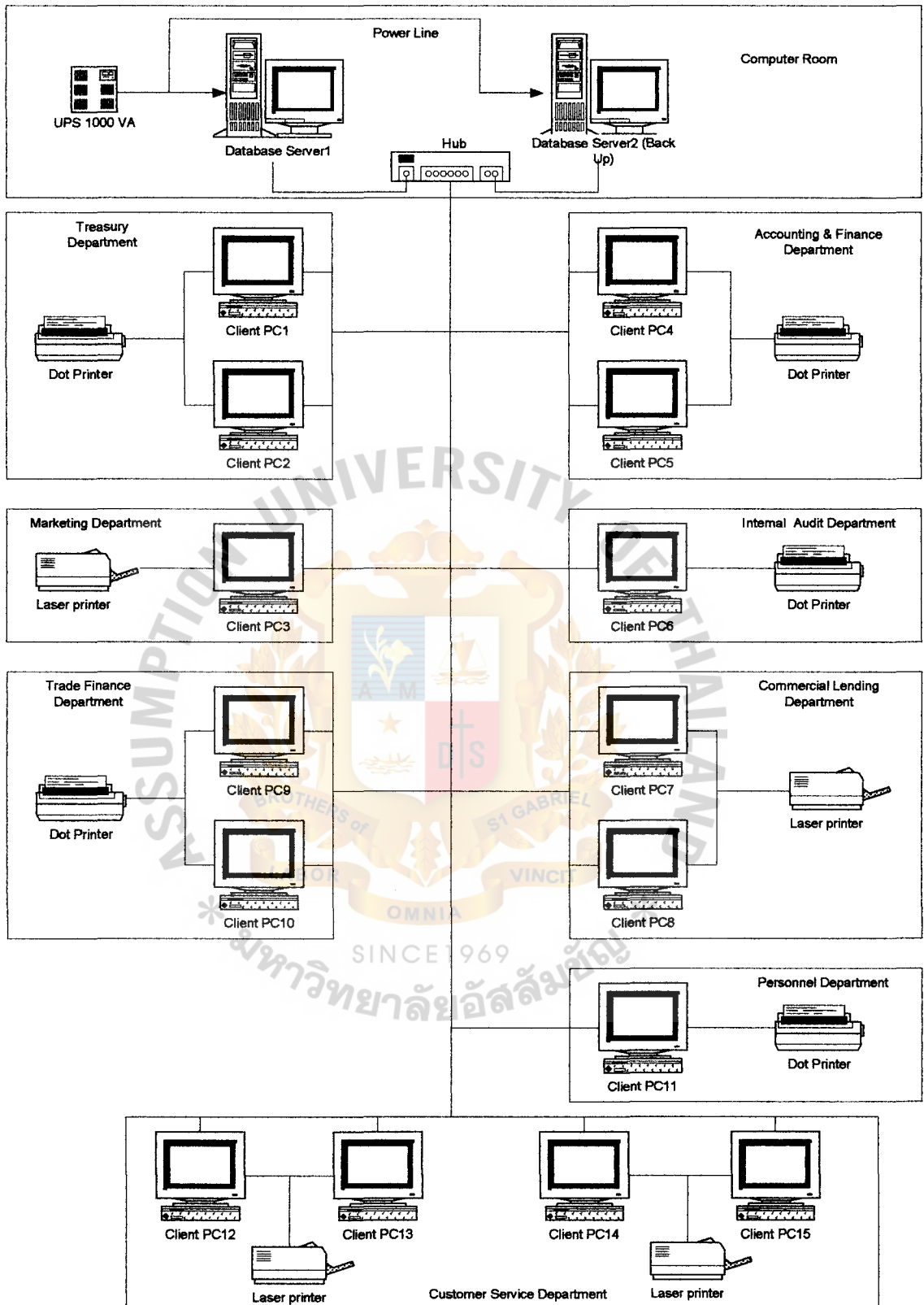


Figure 3.1. Network Architectures of Customer Service Information System.

3.1.2 Database Architecture

Relational Database Model is applied to the system. All data will be stored in the form of tables or relations that are integrated as the relation database. Microsoft Access is used to handle access and maintenance of the stored data also to facilitate backup, recovery and security of data.

The database language to be used is SQL(Structured Query Language). SQL facilitates data definition, query, and update. Hence, it is both the DDL (Data Definition Language) and DML (Data Maintenance Language).

3.1.3 Interface Architecture

The interface architecture is online processing. Not all personal computer can access to the Customer Service Information System. The system can keep track of customers, transactions, and processing. With online processing, when the user uses program on the client machine and if the work concerns update, insert, or delete data in the database, the program will send the database command to the database server to manipulate that data immediately. Online processing will always keep the data in the system up-to-date.

Online system enables business transactions and requires to be processed immediately when they occur. It permits greater human interaction in making decisions. The required today transactions, customer information and report can be generated immediately. In addition, updating the data online can increase the validation of data.

The client machines will be installed at Customer Service Department, to access and update records of customers, deposit transactions, withdrawal transactions, transfer transactions, and other payment transactions, and be installed at the Financial and Accounting Department for enquiry of the information and generate reporting and

update the interest rate, and be installed at the Commercial Lending Department for enquiry of the account balance for each customer, and be installed at the Trade Finance Department for enquiry of the account balance and customer information.

3.1.4 Process Architecture

Microsoft Visual Basic (VB 6) is the software language tools for developing the business application programs for the system, for the proposed Customer Service Information System consists of Windows Server NT 4.0, Microsoft Office 2000 Professional, Microsoft Visual Basic 6.0, and Microsoft Access.

Microsoft Visual Basic 6.0 is the programming language compiled for replication and execution on client PC.



3.2 System Design

The proposed system is designed with the aim to solve the problems of the existing system as stated previously and to meet all user requirements as well.

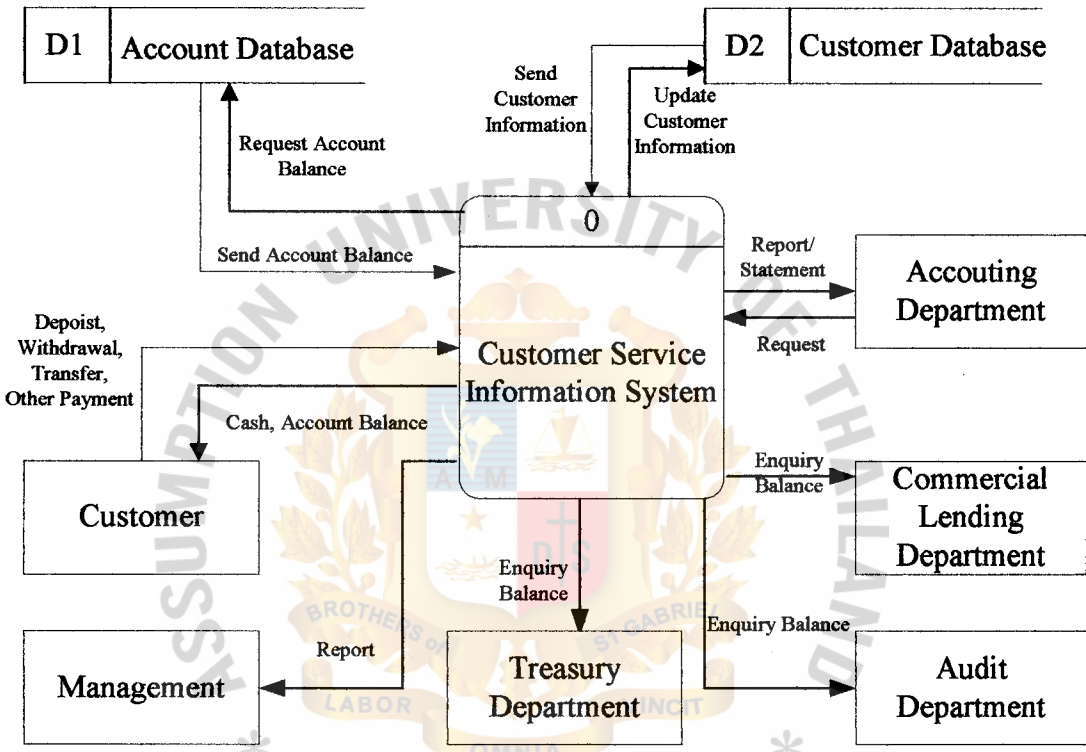


Figure 3.2. Context Level Data Flow Diagram of Customer Service Information System.

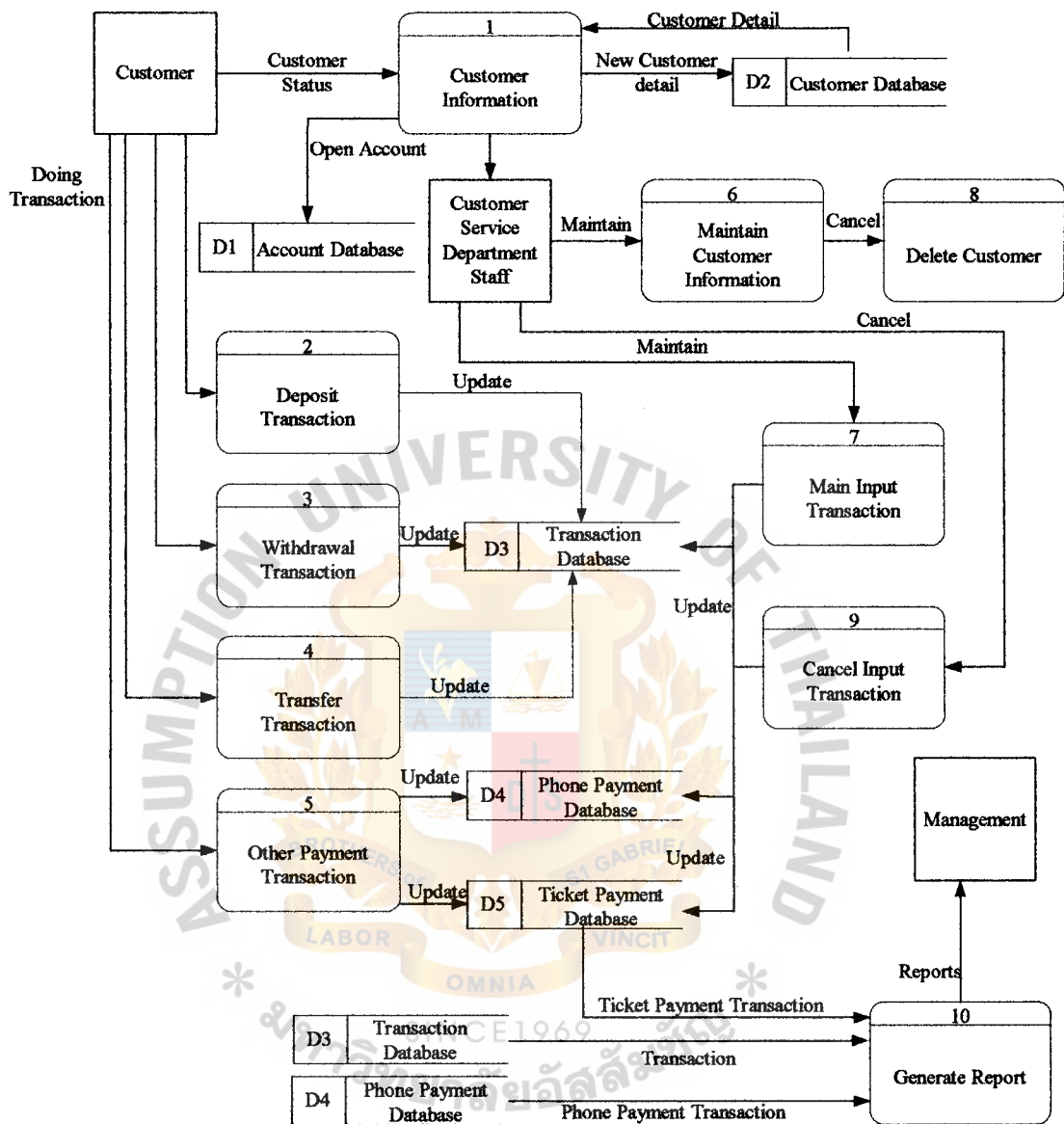


Figure 3.3. Level 0 Data Flow Diagram of Customer Service Information System.

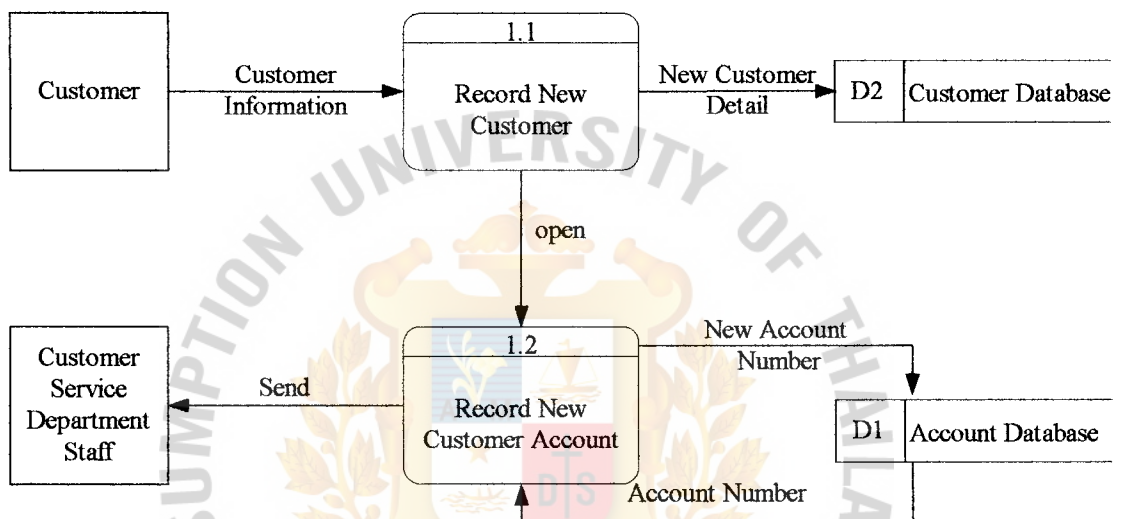


Figure 3.4. Level 1 Data Flow Diagram of New Customer of Customer Service Information System.

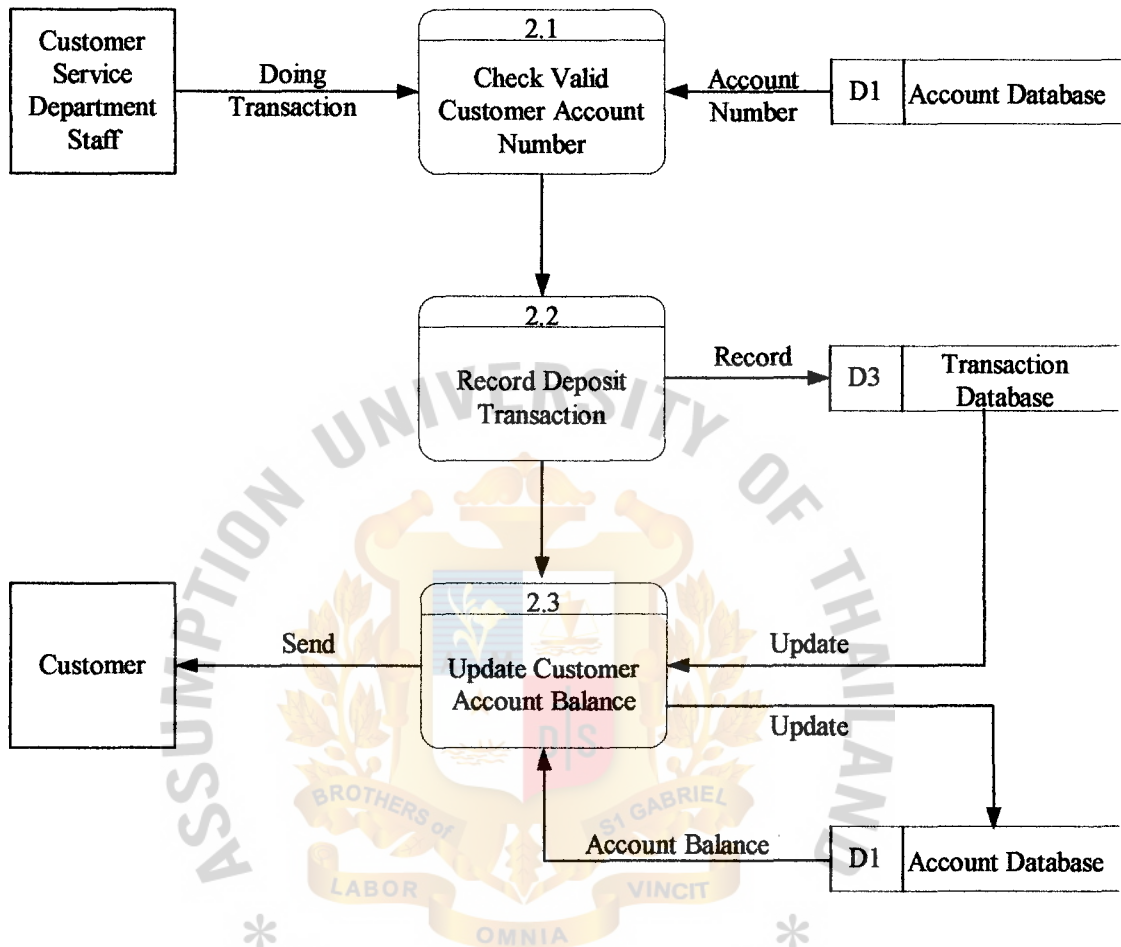


Figure 3.5. Level 1 Data Flow Diagram of Deposit Transaction of Customer Service Information System.

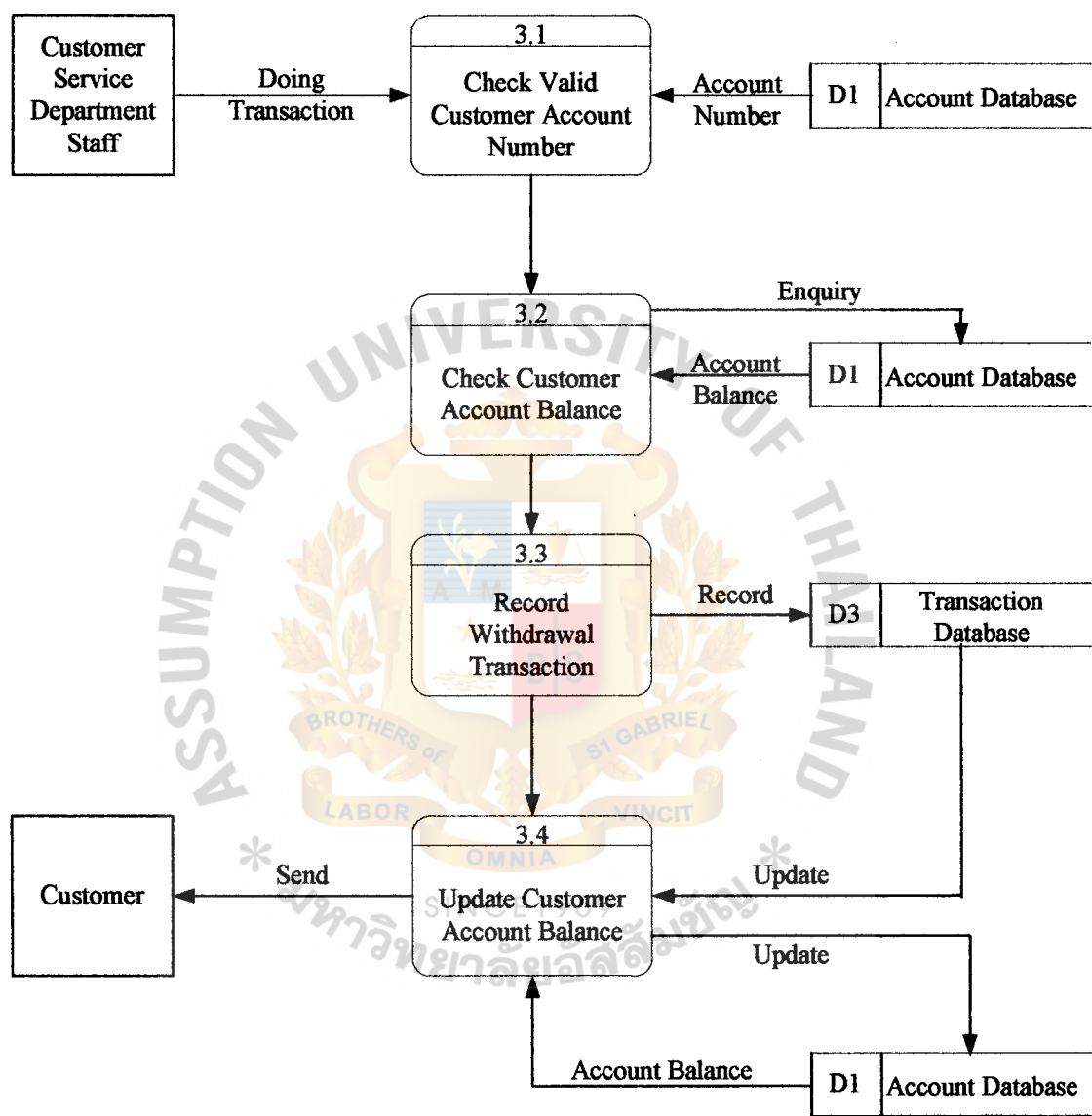


Figure 3.6. Level 1 Data Flow Diagram of Withdrawal Transaction of Customer Service Information System.

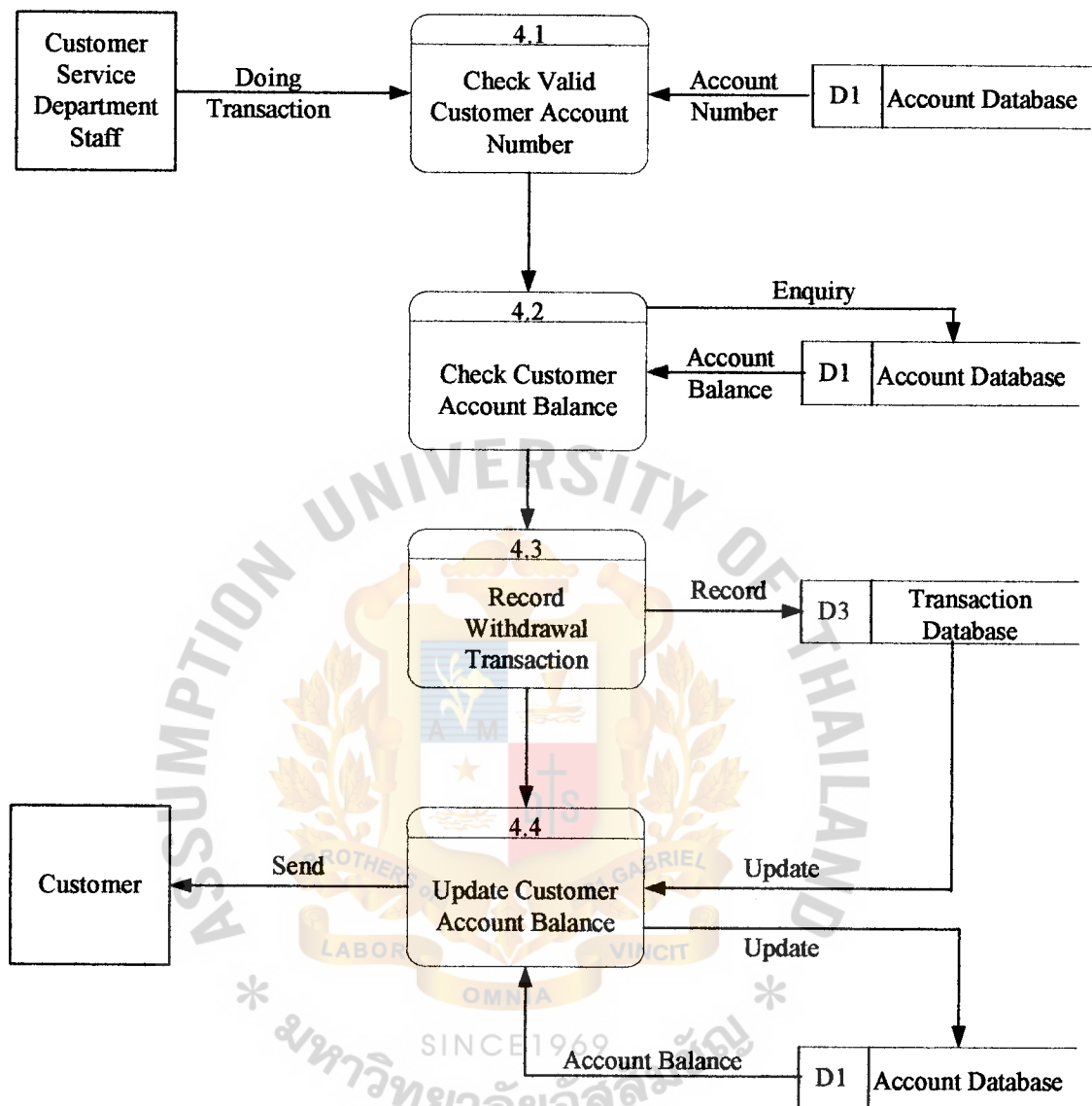


Figure 3.7. Level 1 Data Flow Diagram of Transfer Transaction of Customer Service Information System.

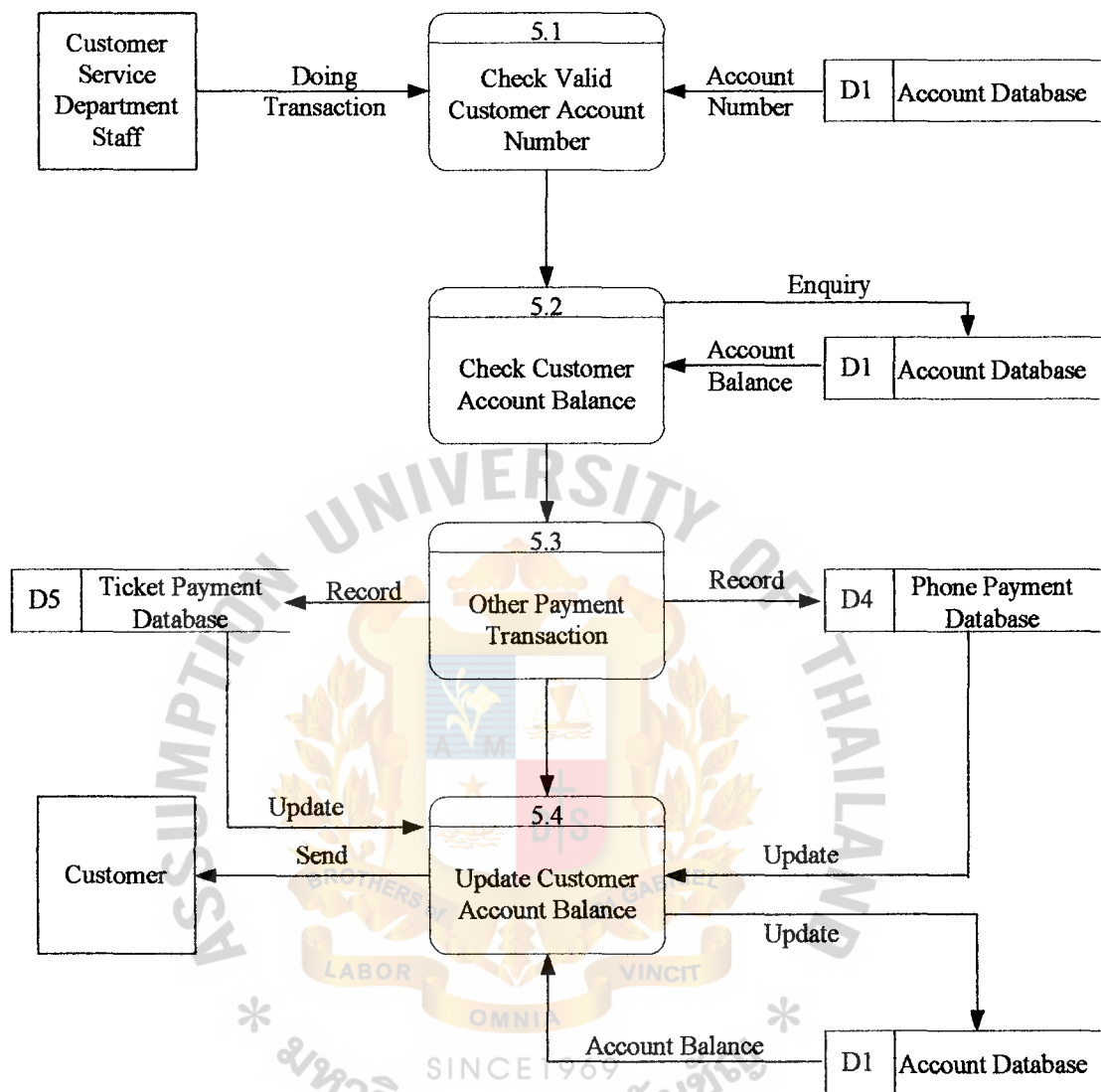


Figure 3.8. Level 1 Data Flow Diagram of Other Payments of Customer Service Information System.

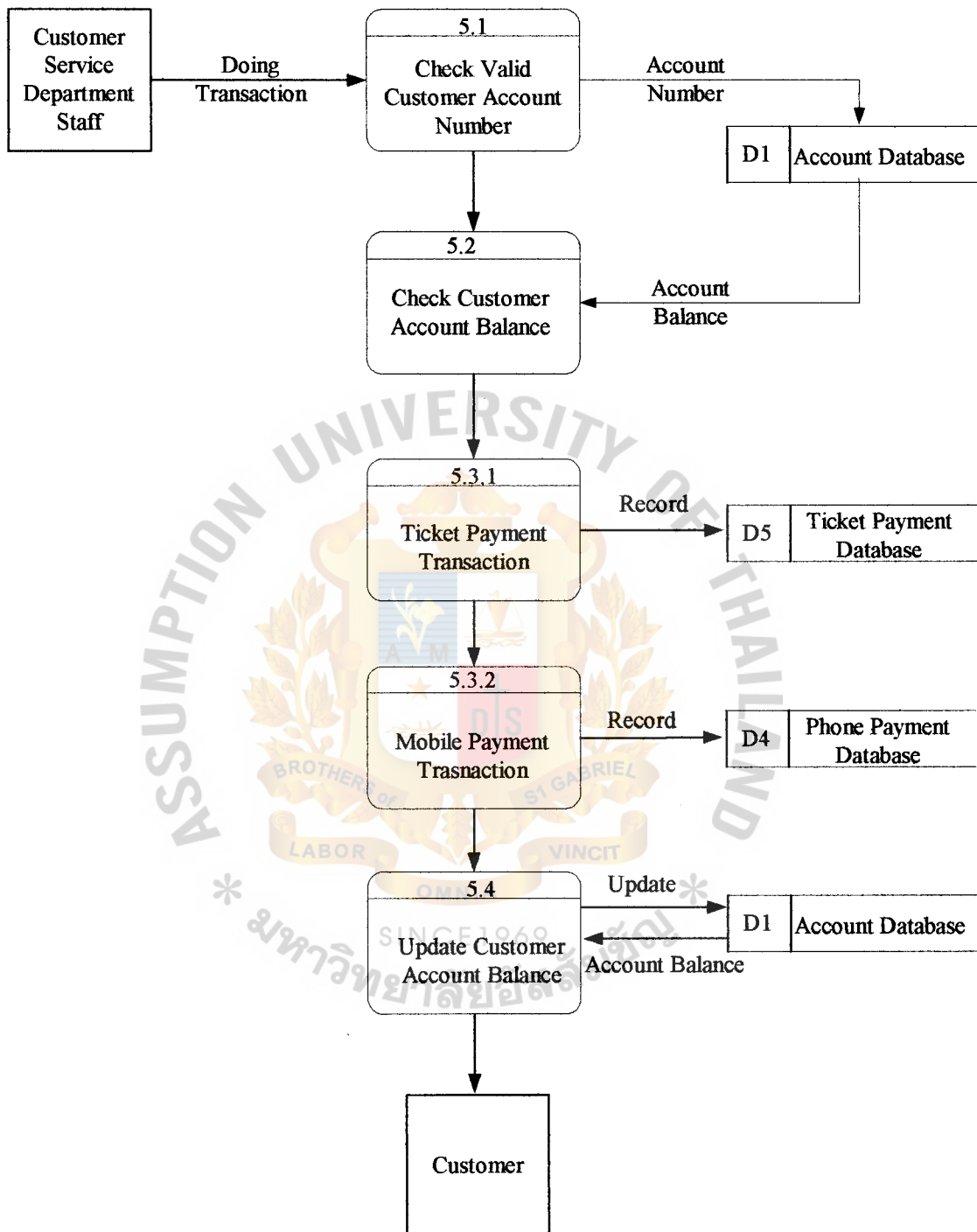


Figure 3.9. Level 2 Data Flow Diagram of Record Other Payment Transactions of Customer Service Information System.

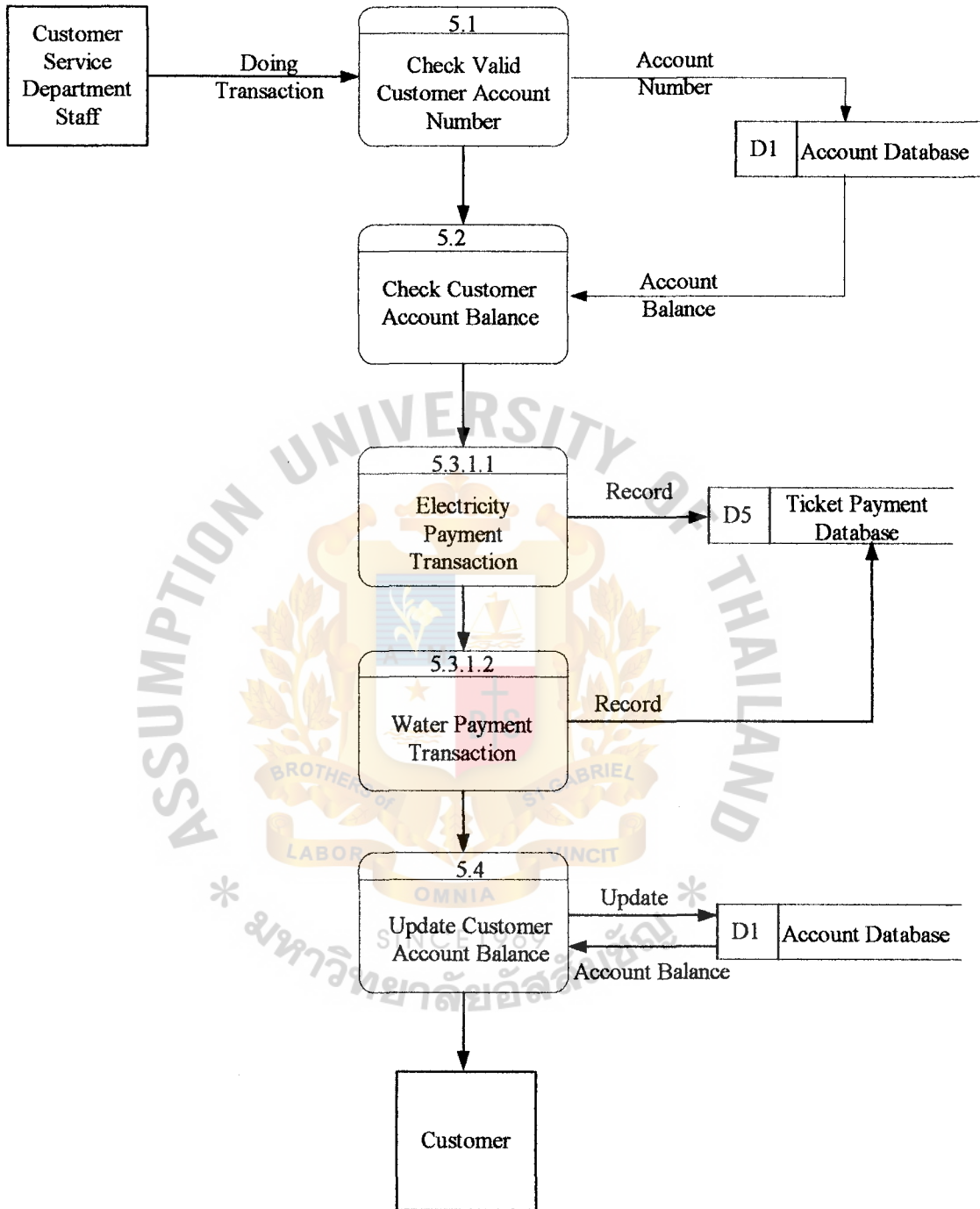


Figure 3.10. Level 3 Data Flow Diagram of Record Ticket Payment Transactions of Customer Service Information System.

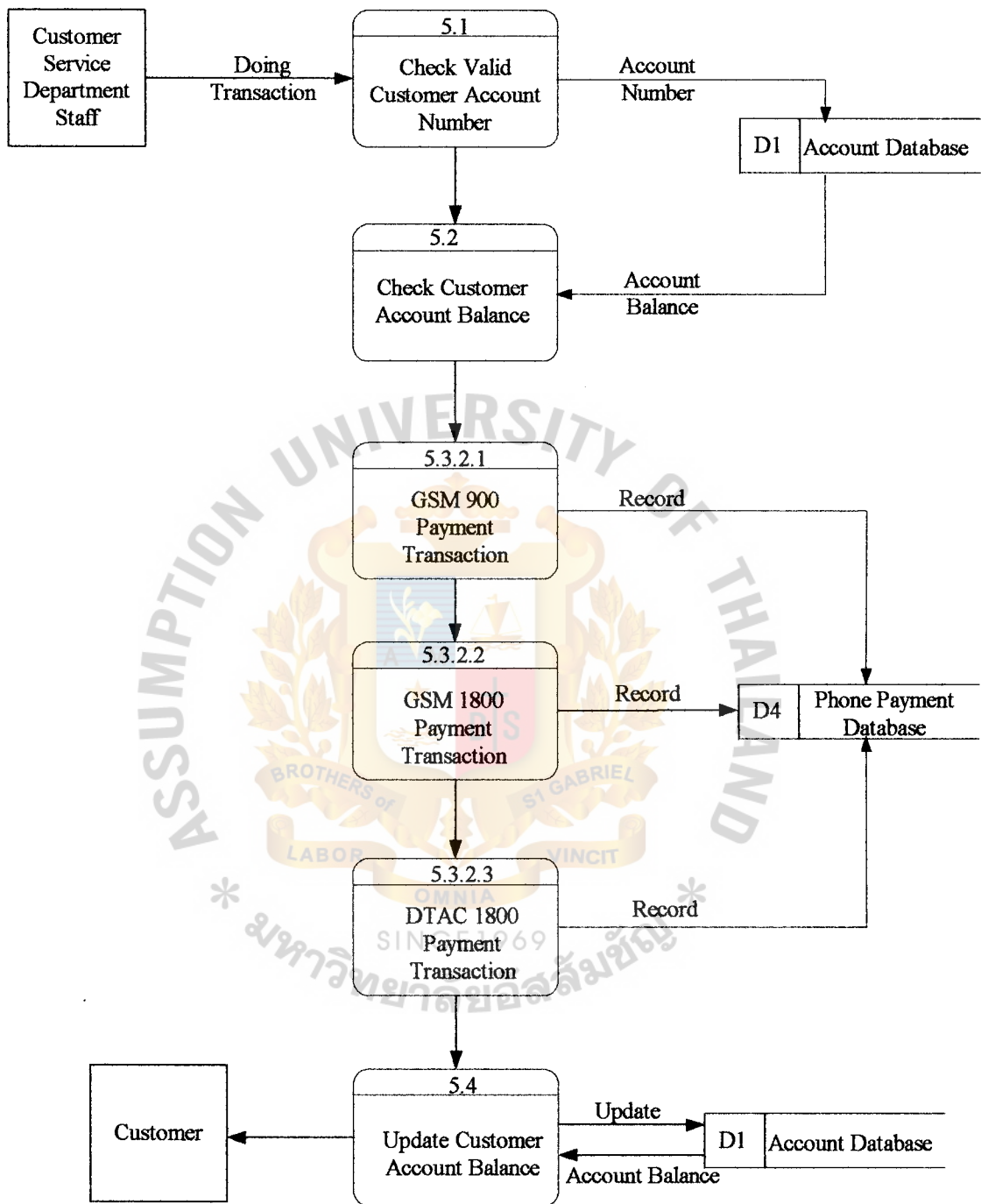


Figure 3.11. Level 3 Data Flow Diagram of Mobile Payment Transactions of Customer Service Information System.

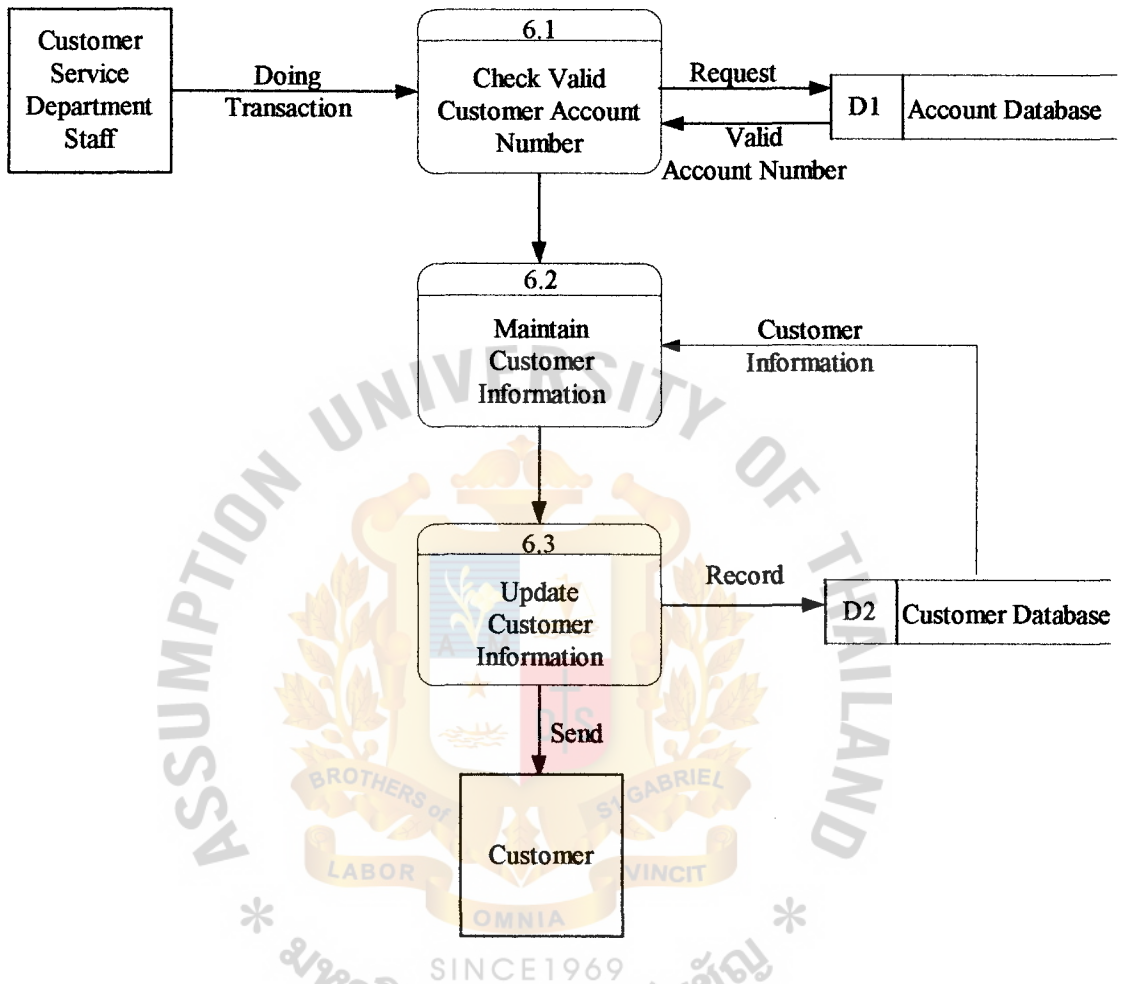


Figure 3.12. Level 1 Data Flow Diagram of Maintain Customer Information of Customer Service Information System.

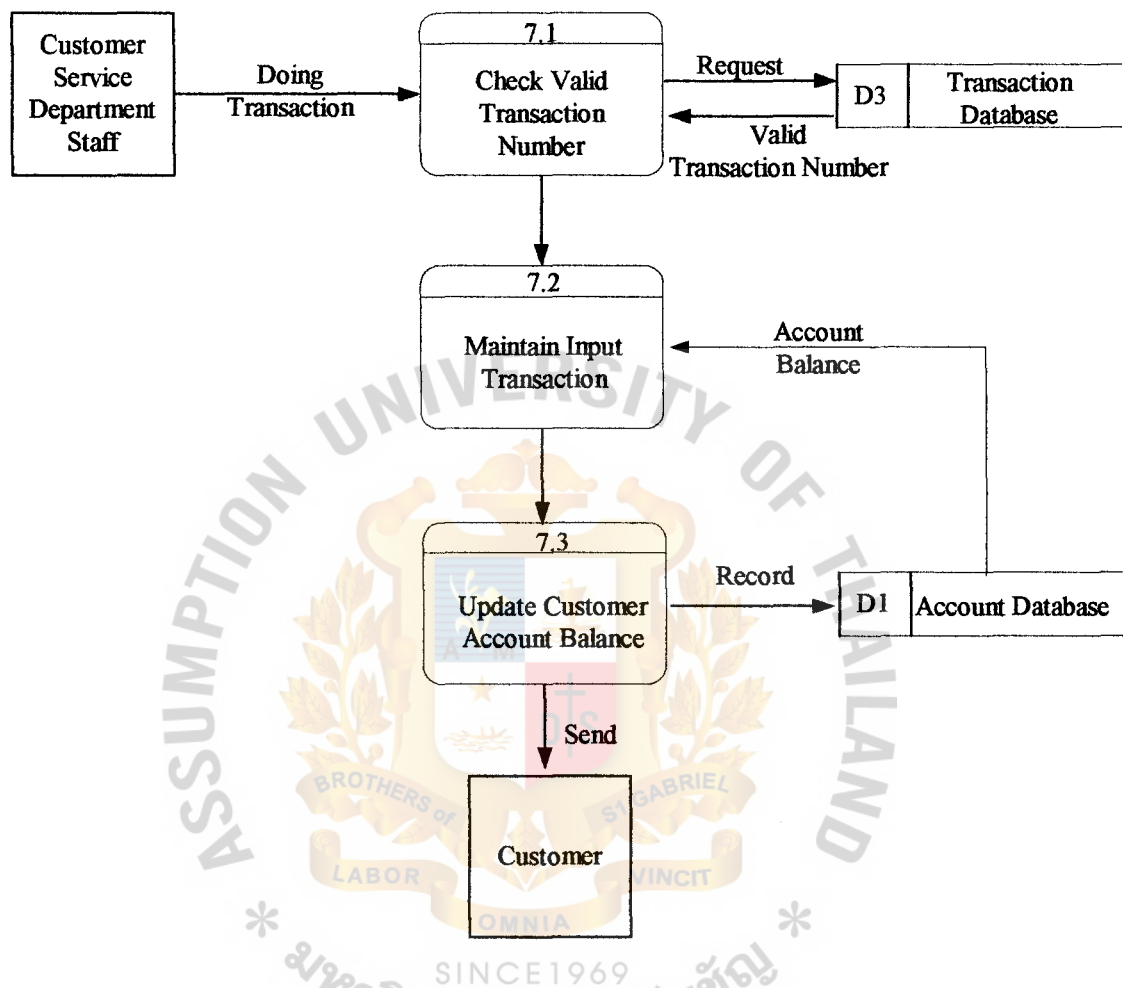


Figure 3.13. Level 1 Data Flow Diagram of Maintain Input Transaction and Payment of Customer Service Information System.

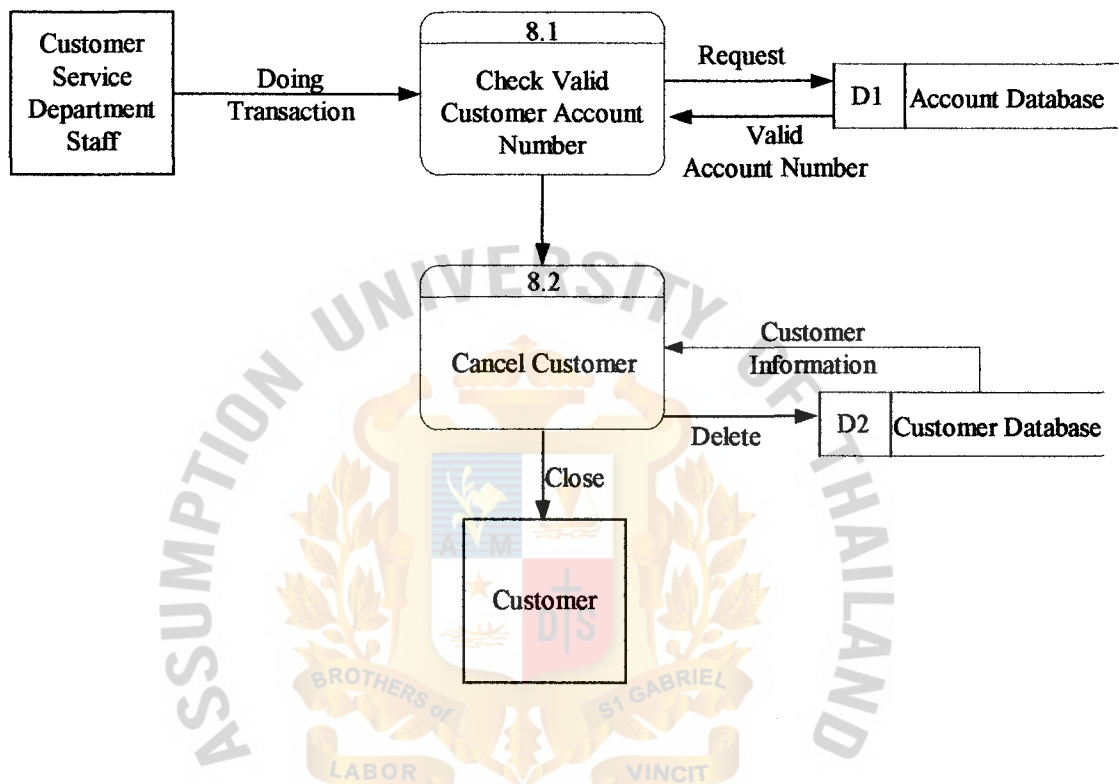


Figure 3.14. Level 1 Data Flow Diagram of Cancel Customer of Customer Service Information System.

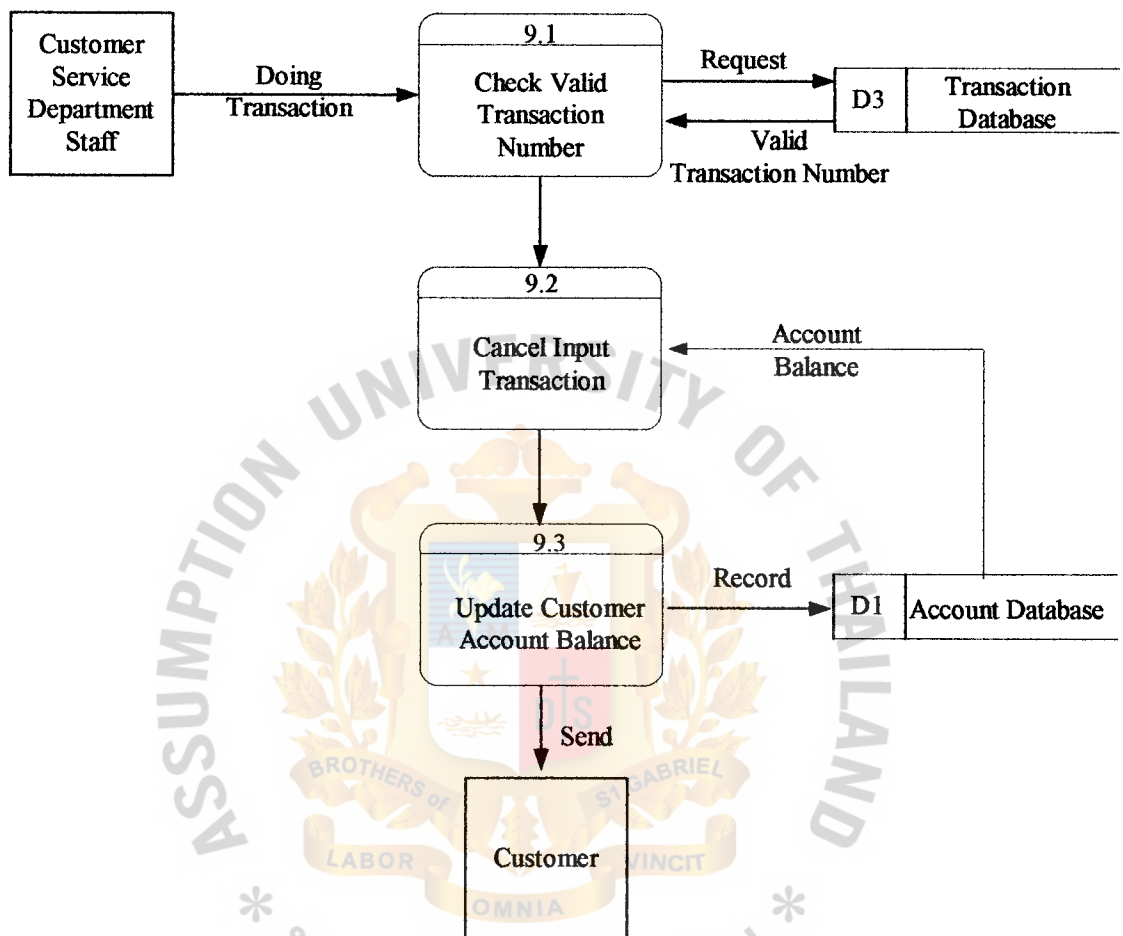


Figure 3.15. Level 1 Data Flow Diagram of Cancel Input Transaction of Customer Service Information System.

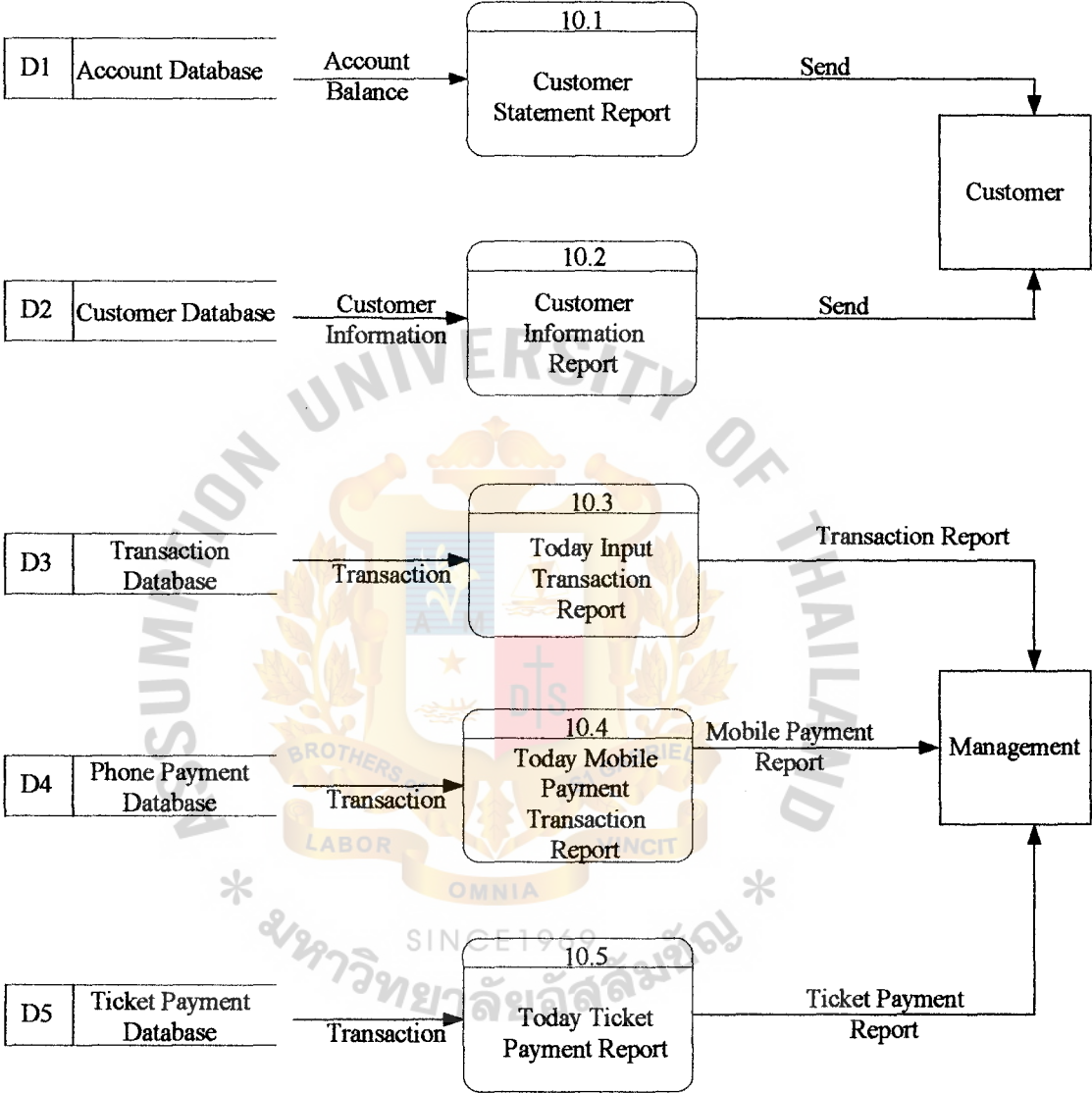


Figure 3.16. Level 1 Data Flow Diagram of Generate Report of Customer Service Information System.

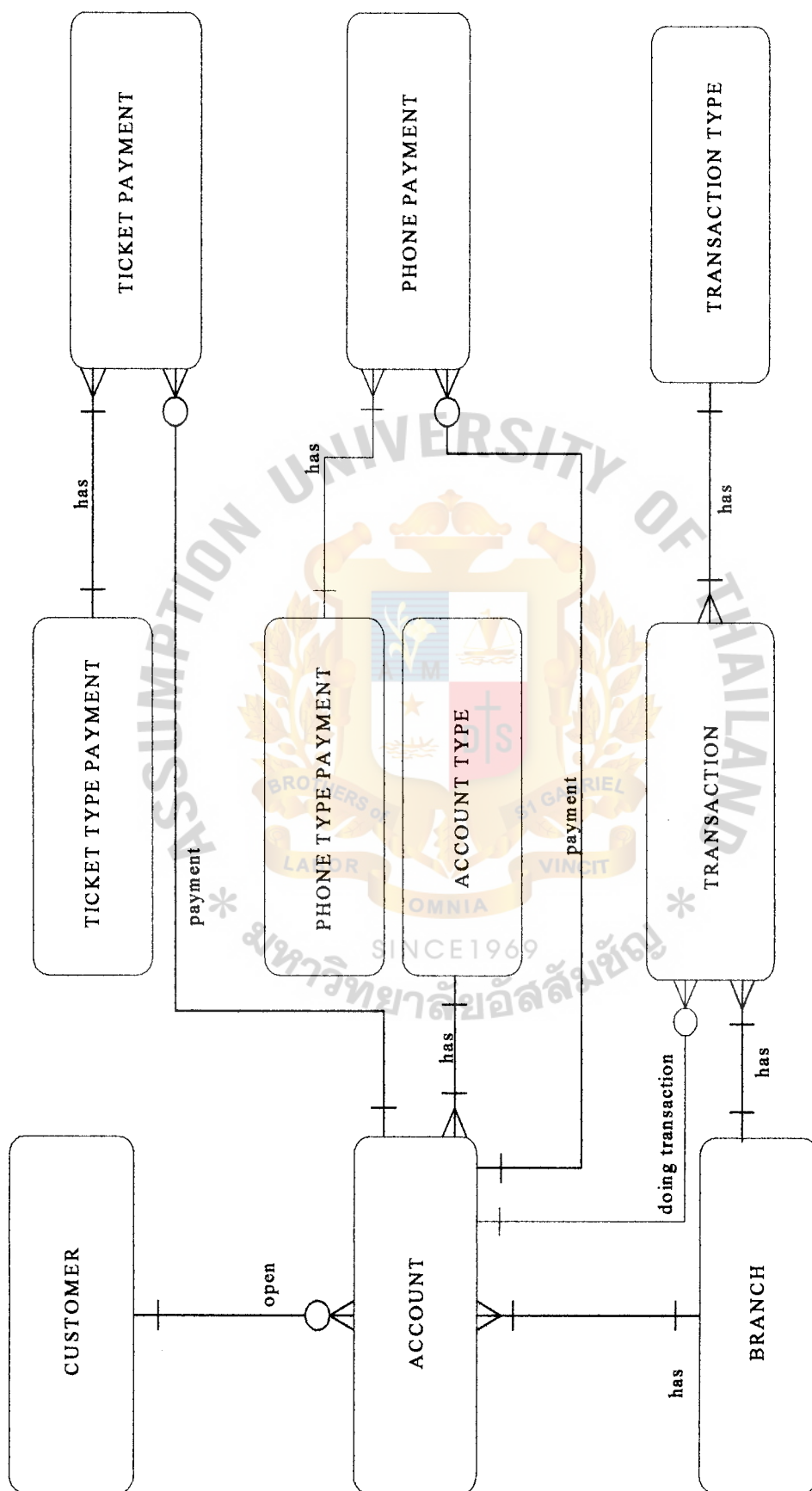


Figure 3.17. Context Diagram of Entity Relationship Diagram.

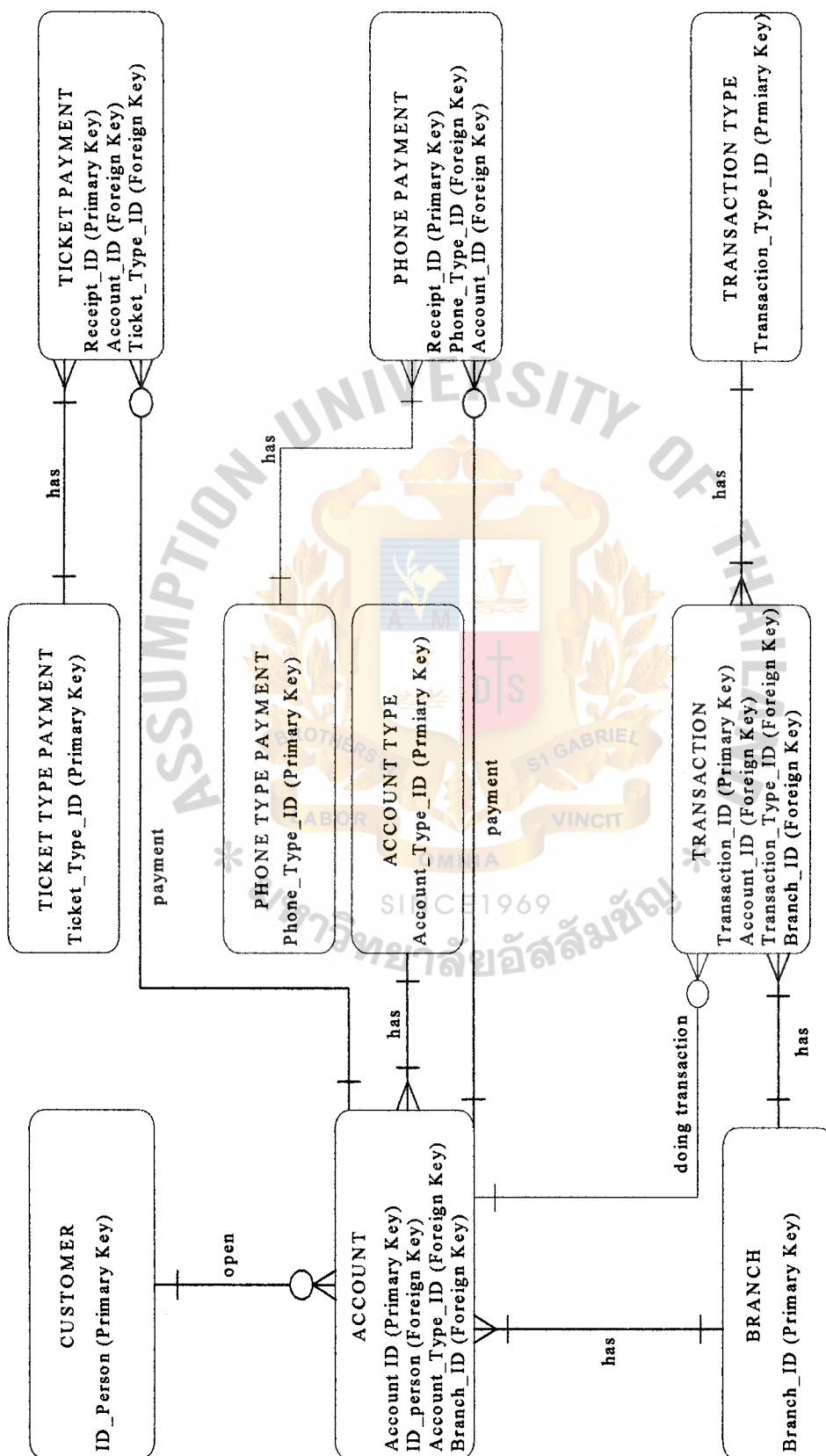


Figure 3.18. Key-based Diagram of Entity Relationship Diagram.

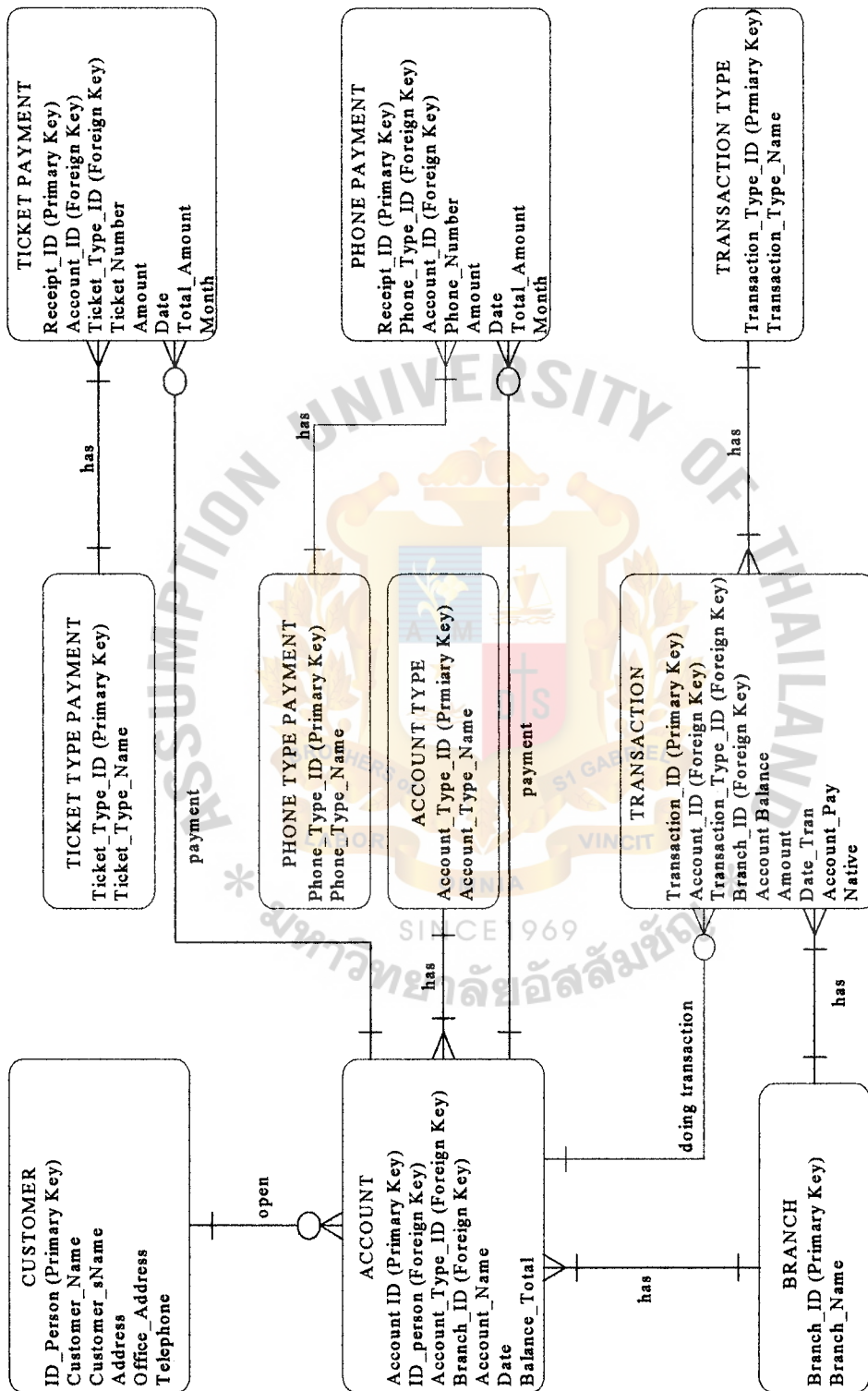


Figure 3.19. Fully Attribute Diagram of Entity Relationship Diagram.

3.3 Hardware and Software Requirement

3.3.1 Hardware and Software Requirement for Server

The proposed Customer Service Information System will be developed in the form of windows based. Microsoft Visual Studio 6.0 Enterprise Edition for Visual Basic 6.0 is major software tools used to develop the input and output design of the system. Microsoft Windows NT Server 4.0 (Service Pack 3) will be used as the server's operating system. Therefore, the hardware specification of server must support Microsoft Windows NT Server 4.0 and all other software in the suite. 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 Database Server.

Hardware	Specification
CPU	Pentium IV 800 MHz Support 2 CPU or higher
Cache	1 GB or higher
Memory	512 MB or higher
Hard Disk	SCSI RAID 5 40 GBx3
CD-Write Dot	4x4x32 or higher
CD-ROM Drive	52x
Floppy Drive	1.44 MB
Network Adapter	Ethernet 10/100 UTP – Connect
Display Adapter	SVGA Card
Display	17” Monitor
UPS	UPS 1000 VA

Table 3.2. The Software Specification for the Database Server.

Software	Specification
Operating System	Microsoft Windows NT Server 4.0 (Service Pack 3)
Application Server	Microsoft Visual Studio 6.0 Enterprise Edition
Database Server	Microsoft Access



3.3.2 Hardware and Software Requirement for Client.

For the proposed system, Customer Service Information System, the client machines have to possess capabilities to run the programs developed by Microsoft Visual Studio 6.0 Enterprise Edition for Visual Basic 6.0. The client machines specification should also be good enough to run other office automation software, such as spread sheet, word processing, etc. As the standard, the hardware specification and client machines must therefore be good enough to support Microsoft Windows 98 and Microsoft Office 2000 professional. The hardware are software specifications for each client machine are shown in Tables 3.3 and 3.4 respectively.

Table 3.3. The Hardware Specification for Each Client Machine.

Hardware	Specification
CPU	Pentium IV 800 MHz or higher
Cache	256 KB or higher
Memory	128 MB or higher
Hard Disk	10 GB or higher
CD-ROM Drive	52x
Floppy Drive	1.44 MB
Network Adapter	Ethernet 10/100 UTP – Connect
Display Adapter	SVGA Card
Display	15” Monitor
Printer	Laser and Dot Printer

Table 3.4. The Software Specification for Each Client Machine.

Software	Specification
Operating System	Microsoft Windows 2000
Developer Software	Microsoft Visual Studio 6.0 Enterprise Edition
Application Software	Microsoft Office 2000 Professional Edition

3.3.3 Other Hardware Requirement

Other important hardware needed for the proposed system is switch, network printer and cable. The specification of this hardware is illustrated in Table 3.5 as below:

Table 3.5. Other Hardware Requirements.

Hardware	Specification
Switch	Share switch 24 ports
Printer	Laser Printer
Cable	LAN Cable UTP

3.4 Security and Control

The information in Customer Service Information System is important to many departments. The data in database must always be available to use when needed. A satisfactory level of share ability must be achieved and the unauthorized access must be prevented. The following security and controls should be attained by the proposed system.

- (1) The authentication must exist in the Customer Service Information System to prevent unauthorized user from accessing the system.
- (2) The user profile needed to exist in the Customer Service Information System to classify the group to read, update, and execute the data in the database.
- (3) The password manage should exist in the Customer Service Information System.
- (4) There must be back up diskettes or CD-ROM for the data and program every month.
- (5) Data Correction must be done immediately after errors in the data listing report are found.
- (6) Input Validation must exist in the Customer Service Information System in each menu screen to protect the errors that come from the human being.
- (7) The report must be produced upon the predetermined schedule or the management request, as needed.
- (8) Data must be inputted, created, updated, and deleted during working hour only.

3.5 Cost and Benefit Analysis

The cost and benefit analysis is used to determine whether the project is worth or not. The average inflation rate is forecasted to be 10% through out the next 5 years. We are using straight line method in calculating the depreciation. Following are the details of the cost for the new proposed system, Customer Service Information System, compared to the existing system, Banking System (COBOL Version).



3.5.1 Cost of Existing System

Table 3.6. Existing System Cost Analysis, Baht.

Cost items	Years				
	1	2	3	4	5
<u>Fixed Cost</u>					
Personal Computer Cost 2 units	8,000.00	8,000.00	8,000.00	8,000.00	8,000.00
Type Writer 2 units @ 6,000	2,400.00	2,400.00	2,400.00	2,400.00	2,400.00
Dot Printer 1 unit @ 15,000	3,000.00	3,000.00	3,000.00	3,000.00	3,000.00
Calculator 10 units @ 500	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00
Software Cost	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00
Maintenance Cost	-	5,000.00	5,000.00	5,000.00	5,000.00
Total Fixed Cost	16,700.00	21,700.00	21,700.00	21,700.00	21,700.00
<u>Operating Cost</u>					
<u>Salary Cost:</u>					
Customer Service Manager 1 person @ 35,000	35,000.00	38,500.00	42,350.00	46,585.00	51,243.50
<u>Staff:</u>					
Supervisor 2 person @ 20,000	40,000.00	44,000.00	48,400.00	53,240.00	58,564.00
Teller 6 persons @ 12,000	72,000.00	79,200.00	87,120.00	95,832.00	105,415.20
Total Monthly Salary Cost	147,000.00	161,700.00	177,870.00	195,657.00	215,222.70
Total Annual Salary Cost	1,764,000.00	1,940,400.00	2,134,440.00	2,347,884.00	2,582,672.40
<u>Office Supplies & Miscellaneous Cost:</u>					
Stationery 2,000 per month	24,000.00	26,400.00	29,040.00	31,944.00	35,138.40
Paper 4,000 per month	48,000.00	52,800.00	58,080.00	63,888.00	70,276.80
Miscellaneous 4,000 per month	48,000.00	52,800.00	58,080.00	63,888.00	70,276.80
Total Annual Office Supplies & Miscellaneous Cost	120,000.00	132,000.00	145,200.00	159,720.00	175,692.00
<u>Utility Cost:</u>					
Electricity 40,000 per month	480,000.00	528,000.00	580,800.00	638,880.00	702,768.00
Water 6,000 per month	72,000.00	79,200.00	87,120.00	95,832.00	105,415.20
Telephone 20,000 per month	240,000.00	264,000.00	290,400.00	319,440.00	351,384.00
Total Utility Cost	792,000.00	871,200.00	958,320.00	1,054,152.00	1,159,567.20
Total Operating Cost	2,676,000.00	2,943,600.00	3,237,960.00	3,561,756.00	3,917,931.60
Total Existing System Cost	2,692,700.00	2,965,300.00	3,259,660.00	3,583,456.00	3,939,631.60

Table 3.7. Five Years Accumulated Existing System Cost, Baht.

Year	Total Manual Cost	Accumulated Cost
1	2,452,700.00	2,452,700.00
2	2,701,300.00	5,154,000.00
3	2,969,260.00	8,123,260.00
4	3,264,016.00	11,387,276.00
5	3,588,247.60	14,975,523.60
Total	14,975,523.60	-



3.5.2 Cost of Proposed System

Table 3.8. Proposed System Cost Analysis, Baht.

Cost items	Years				
	1	2	3	4	5
<u>Fixed Cost (Development Cost)</u>					
Hardware Cost:					
Computer Server Cost	32,000.00	32,000.00	32,000.00	32,000.00	32,000.00
Personal Computer Cost	30,000.00	30,000.00	30,000.00	30,000.00	30,000.00
Laser Printer 2 units @ 25,000	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
Dot Matrix Printer 2 units @ 15,000	6,000.00	6,000.00	6,000.00	6,000.00	6,000.00
UPS 1 unit @ 8,000	1,600.00	1,600.00	1,600.00	1,600.00	1,600.00
Total Hardware Cost	79,600.00	79,600.00	79,600.00	79,600.00	79,600.00
Software Cost	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00
Network Cost	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
System Architecture Cost	100,000.00	-	-	-	-
Training Cost	20,000.00	-	-	-	-
Maintenance Cost	-	40,000.00	44,000.00	48,400.00	53,240.00
Total Fixed Cost	259,600.00	179,600.00	183,600.00	188,000.00	192,840.00
<u>Operating Cost</u>					
<u>Salary Cost:</u>					
Customer Service Manager					
1 person @ 35,000	35,000.00	38,500.00	42,350.00	46,585.00	51,243.50
<u>Staff:</u>					
Supervisor 1 person @ 20,000	20,000.00	22,000.00	24,200.00	26,620.00	29,282.00
Teller 3 persons @ 12,000	36,000.00	39,600.00	43,560.00	47,916.00	52,707.60
System Engineer 1 person @ 25,000	25,000.00	27,500.00	30,250.00	33,275.00	36,602.50
Total Monthly Salary Cost	116,000.00	127,600.00	140,360.00	154,396.00	169,835.60
Total Annual Salary Cost	1,392,000.00	1,531,200.00	1,684,320.00	1,852,752.00	2,038,027.20
<u>Office Supplies & Miscellaneous Cost:</u>					
Stationery 1,200 per month	14,400.00	15,840.00	17,424.00	19,166.40	21,083.04
Paper 2,000 per month	24,000.00	26,400.00	29,040.00	31,944.00	35,138.40
Miscellaneous 4,000 per month	24,000.00	26,400.00	29,040.00	31,944.00	35,138.40
Total Annual Office Supplies & Miscellaneous Cost	62,400.00	68,640.00	75,504.00	83,054.40	91,359.84
<u>Utility Cost:</u>					
Electricity 40,000 per month	528,000.00	580,800.00	638,880.00	702,768.00	773,044.80

Table 3.8. Proposed System Cost Analysis, Baht (Continued).

Cost items	Years				
	1	2	3	4	5
Water 6,000 per month	48,000.00	52,800.00	58,080.00	63,888.00	70,276.80
Telephone 20,000 per month	210,000.00	231,000.00	254,100.00	279,510.00	307,461.00
Total Utility Cost	786,000.00	864,600.00	951,060.00	1,046,166.00	1,150,782.60
Total Operating Cost	2,240,400.00	2,464,440.00	2,710,884.00	2,981,972.40	3,280,169.64
Total Proposed System Cost	2,500,000.00	2,644,040.00	2,894,484.00	3,169,972.40	3,473,009.64

Table 3.9. Five Years Accumulated Proposed System Cost, Baht.

Year	Total Computerized Cost	Accumulated Cost
1	2,500,000.00	2,500,000.00
2	2,644,040.00	5,144,040.00
3	2,894,484.00	8,038,524.00
4	3,169,972.40	11,208,496.40
5	3,473,009.64	14,681,506.04
Total	14,681,506.04	-

3.5.3 Cost Comparison and Breakeven Analysis

Table 3.10. The Comparison of the System Costs, Baht.

Year	Accumulated Existing System Cost	Accumulated Proposed System Cost
1	2,452,700.00	2,500,000.00
2	5,154,000.00	5,144,040.00
3	8,123,260.00	8,038,524.00
4	11,387,276.00	11,208,496.40
5	14,975,523.60	14,681,506.04



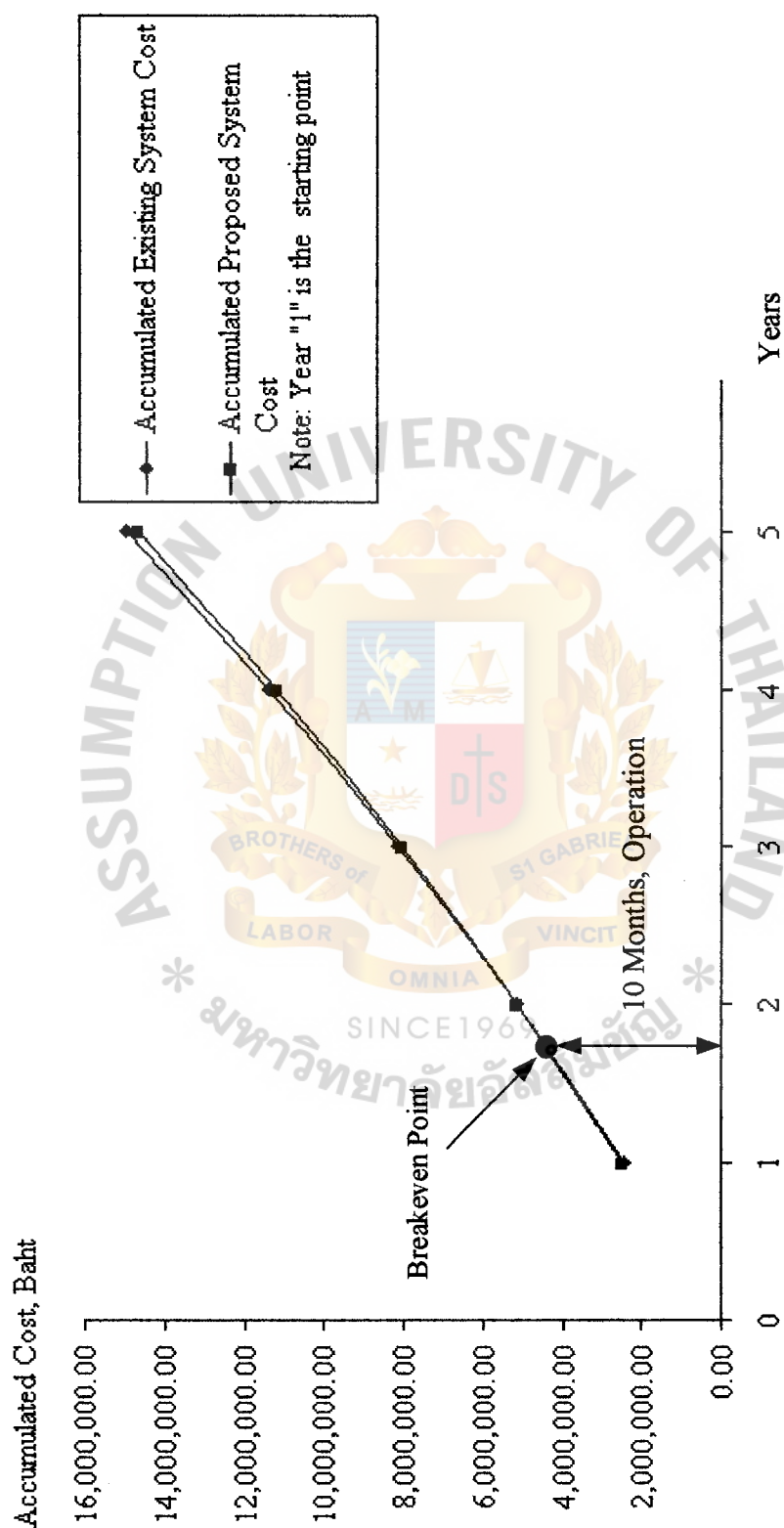


Figure 3.20. Cost Comparison between Existing and Proposed System.

3.5.4 Benefit Analysis

(1) Tangible Analysis

Cost reduction is the major benefit of the proposed system. In addition, the resource utilization will be more efficient. Salary cost, office supplies and miscellaneous cost, and utility cost are saved as shown below:

$$\begin{aligned}\text{Benefit for the 1}^{\text{st}} \text{ year} &= (1,764,000.00 - 1,392,000.00) + (120,000.00 - \\ &\quad 62,400.00) + (792,000.00 - 786,000.00) \\ &= 435,000.00 \quad \text{Baht/year}\end{aligned}$$

$$\begin{aligned}\text{Benefit for the 2}^{\text{nd}} \text{ year} &= (1,940,400.00 - 1,531,200.00) + (132,000.00 - \\ &\quad 68,640.00) + (871,200.00 - 864,600.00) \\ &= 479,160.00 \quad \text{Baht/year}\end{aligned}$$

$$\begin{aligned}\text{Benefit for the 3}^{\text{rd}} \text{ year} &= (2,134,440.00 - 1,684,320.00) + (145,200.00 - \\ &\quad 75,504.00) + (958,320.00 - 951,060.00) \\ &= 527,076.00 \quad \text{Baht/year}\end{aligned}$$

$$\begin{aligned}\text{Benefit for the 4}^{\text{th}} \text{ year} &= (2,347,884.00 - 1,852,752.00) + (159,720.00 - \\ &\quad 83,054.40) + (1,054,152.00 - 1,046,166.00) \\ &= 579,783.60 \quad \text{Baht/year}\end{aligned}$$

$$\begin{aligned}\text{Benefit for the 5}^{\text{th}} \text{ year} &= (2,582,672.40 - 2,038,027.20) + (175,692.00 - \\ &\quad 91,359.84) + (1,159,567.20 - 1,150,782.60) \\ &= 637,761.96 \quad \text{Baht/year}\end{aligned}$$

(2) Intangible Analysis

- (a) Providing more accurate information than that of the existing system.**
- (b) Reducing work process time and improving the efficiency of the operation.**
- (c) Reducing human error in doing documentation.**
- (d) Providing fast and efficient service to customers.**
- (e) Providing up-to-date information and reports to support the management's decision making.**
- (f) Making is easier and faster to search the required information.**
- (g) Making it easier and faster to produce the reports.**

3.5.5 Payback Analysis

The calculation for payback analysis is shown in Table 3.11.

Table 3.11. Payback Analysis for the Proposed System, Baht.

Cost items	Years					
	0	1	2	3	4	5
Depreciation cost	-818,000.00	-	-	-	-	-
Operation & Maintenance cost	-	-40,000.00	-44,000.00	-48,000.00	-53,240.00	-58,564.00
Discount factor for 10%	1.000	0.909	0.826	0.751	0.683	0.621
Time – adjusted costs (adjusted to present value)	-818,000.00	-36,360.00	-36,344.00	-36,348.00	-36,363.00	-36,368.00
Cumulative time-adjusted costs over lifetime	-818,000.00	-854,360.00	-890,704.00	-927,052.00	-963,415.00	-999,784.00
Benefit derived from operation of new system	-	435,000.00	479,160.00	527,076.00	579,783.60	637,761.96
Discount factor for 10%	1.000	0.909	0.826	0.751	0.683	0.621
Time – adjusted costs (adjusted to present value)	-	395,415.00	395,786.00	395,834.00	395,992	396,050
Cumulative time-adjusted benefits over lifetime	-	395,415.00	791,201.00	1,187,035	1,583,027	1,979,078
Cumulative lifetime time-adjusted cost + benefit	-818,000.00	-458,945.00	-99,503.00	259,983.00	619,612.00	979,294.00

The payback period can be calculated by the formula as follows:

$$P = \frac{\text{Last year of negative Cash flow difference} + \text{Cumulative Different last negative year}}{\text{Absolute value of cumulate difference (last negative plus first year positive year)}}$$

Where P = Payback Period

$$\begin{aligned} P &= 2 + \frac{99,503}{(99,503+259,983)} \\ &= 2.28 \text{ years or 2 years 3 months} \end{aligned}$$

Therefore, the payback period is about 2 years 3 months.



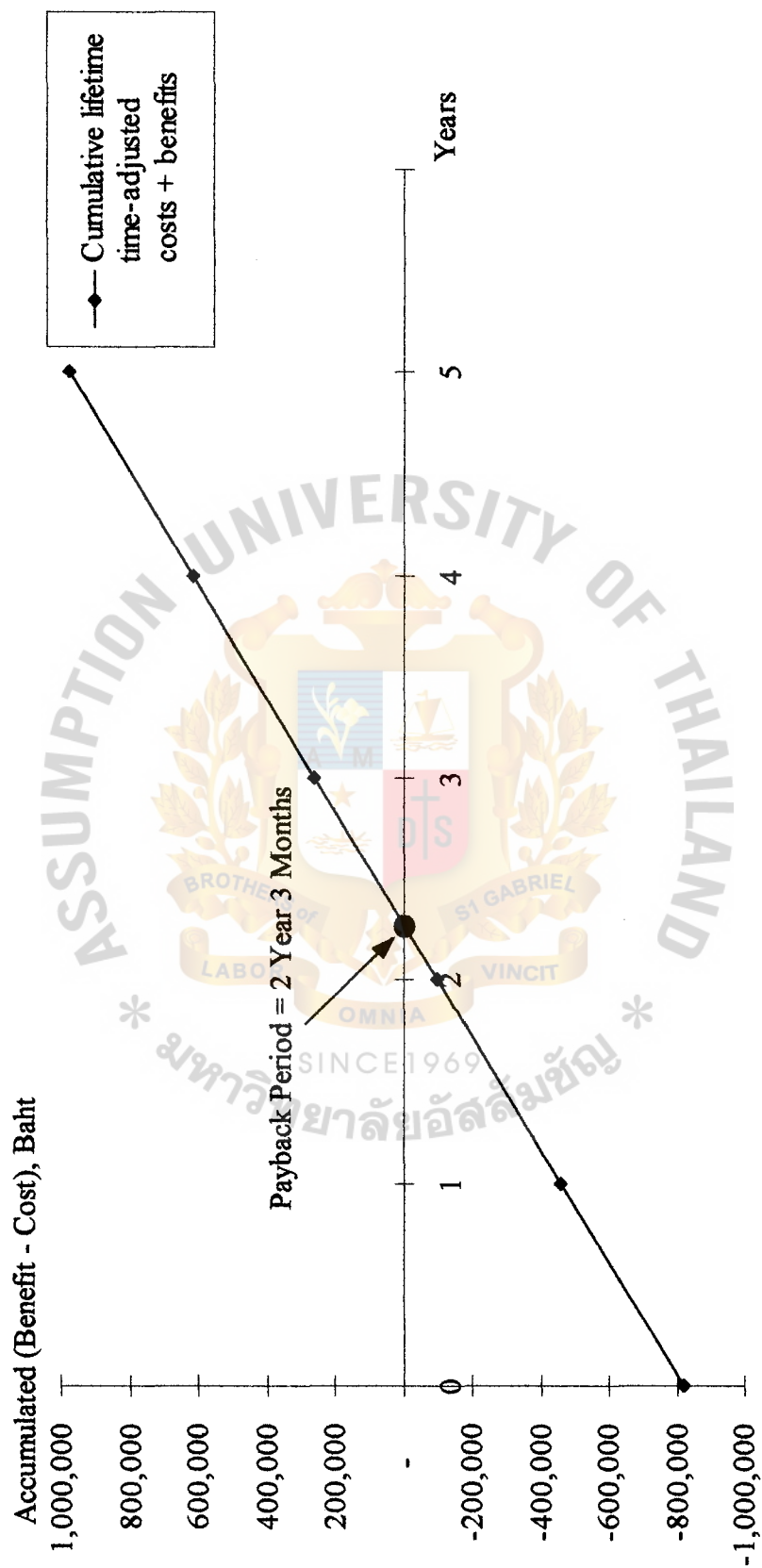


Figure 3.21. Payback Chart for the Proposed System.

IV. PROJECT IMPLEMENTATION

4.1 Overview of Project Implementation

System Implementation is the planned and orderly conversion from a current existing system, Banking System (Cobol Version) to the new proposed system, Customer Service Information System. The implementation process is set up basing on the parallel run concept. By applying this concept, the process will work on both existing system and the proposed system for a period of time until the operation and the calculation of the proposed system has been proved to be effective and efficient. During that period, the users have to do double jobs on the existing and on the proposed system everyday. The new proposed system process is designed based on the routine jobs of the existing system, so that it does not take a long time for the users to get used to the new system.

The project implementation can be divided into 3 main parts, System Analysis, Detail Analysis and Design, and Implementation.

(1) System Analysis

This major function is to gather all information about the existing system, including data flows, how data relate to each other, and how data are kept. Then the studying area must be identified, and the problems must be studied. The next function is to identify the Objectives and Scope of the project. At this stage the context diagram and the data flow diagrams of the existing system are created. The entity relationship diagram of the existing system also identify and apply to the new proposed system. The cost and benefit analysis between the existing system and the proposed system is also done.

(2) Detail Analysis and Design

The major function is to develop the workflow of the existing system and the new workflow of the proposed system. The context diagram and the data flow diagram at many different levels will be designed with an aim to solve the problems of the existing system. The relationship of data in each table is studied in order to define the best relation for the system. Steps of work at each process are carefully defined in order to reduce the traffic of network. All screens, such as input/output screens and various kinds of reports, are also designed.

(3) Implementation

The main function is to physically implement all the designed to become the real thing. Programs that support the workflow have to be created. All input/output screens and report layouts are also generated to support the designed workflow. The programs and the data conversion have been tested by the developers. The data conversion must be correct and complete. After the program and the data conversion is complete and correct, the user training has to be conducted in order to train the users how to use the system so that the users can test the system by themselves. After testing, if the users are not satisfied with the system, they can ask the system developers to correct the system until they accept it.

The project implementation schedule is shown as in the following Gantt Chart.

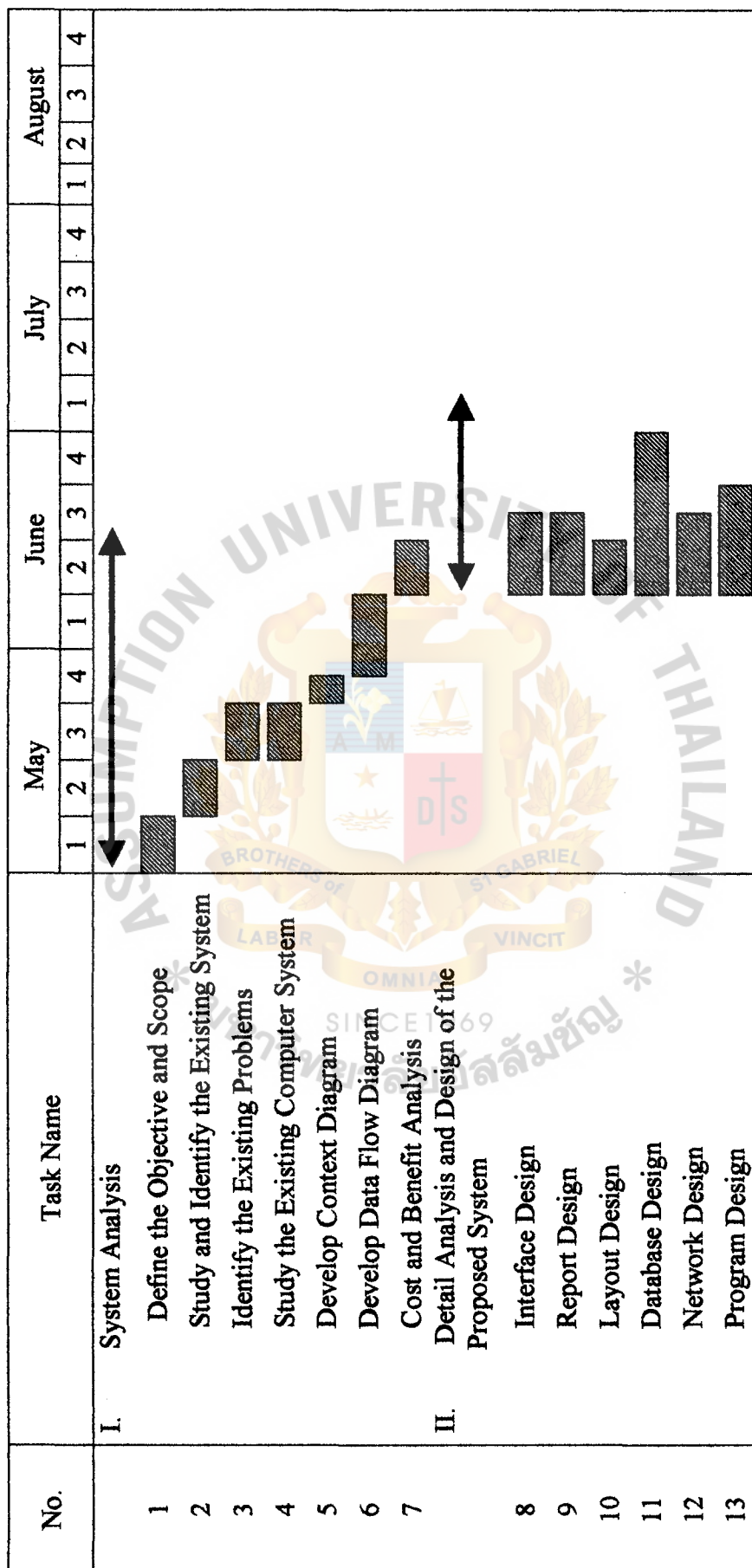


Figure 4.1. Schedule of Project Implementation of Customer Service Information System.

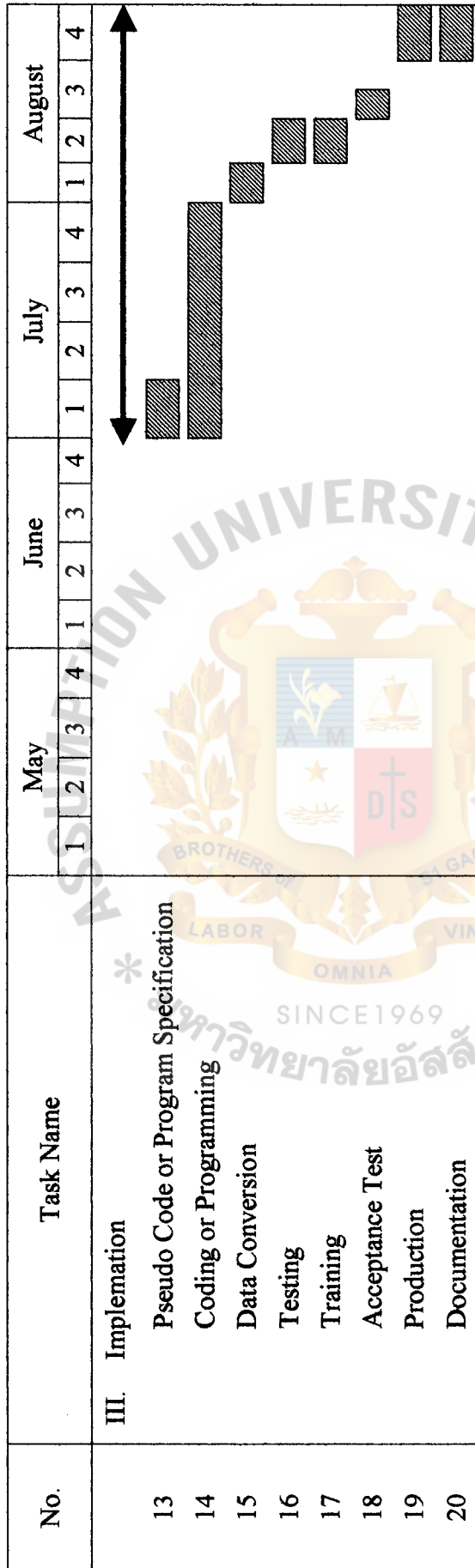


Figure 4.2. Schedule of Project Implementation of Customer Service Information System (Continued).

4.2 Source Code

The new proposed system is written by using Microsoft Visual Basic 6. The source code of the new system is shown in the following:

(1) Source Code of About Program

```
Private Sub About_Click()
```

```
Unload Me
```

```
End Sub
```

(2) Source Code of Account Find Form Program

```
Private Sub Command1_Click()
```

```
Dim db As Database
```

```
Dim rcs As Recordset
```

```
Dim address As String
```

```
If Len(Text1.Text) <> 9 Then
```

```
MsgBox "กรุณาใส่เลขที่บัตรประชาชนให้ถูกต้อง"
```

```
Text1.SetFocus
```

```
Exit Sub
```

```
End If
```

```
Set db =
```

```
DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")
```

```
Set rcs = db.OpenRecordset("SELECT * from account_table where  
account_id=" & Text1.Text & "", dbOpenDynaset)
```

```
If rcs.RecordCount = 0 Then
```

```
MsgBox "ไม่พบหมายเลขบัญชี"
```



```

Text1.Text = ""

Text1.SetFocus

Exit Sub

Else

Label2.Caption = rcs![Account_Name]

Label3.Caption = rcs![Account_type_ID]

Label4.Caption = rcs![Date]

Label5.Caption = rcs![ID_Person]

Edit_customer.Show

Me.Visible = False

End If

rcs.Close

db.Close

End Sub

Private Sub Command2_Click()

Unload Me

End Sub

Private Sub Text1_KeyPress(KeyAscii As Integer)

If KeyAscii = 13 Then

Command1_Click

End If

End Sub

```

(3) Source Code of Account Form Program

```

Private Sub Command1_Click()

```

Dim db As Database

Dim rcs As Recordset

Dim address As String

If Len(Text1.Text) <> 9 Then

MsgBox "กรุณาใส่หมายเลขบัญชีให้ถูกต้อง"

Text1.SetFocus

Exit Sub

End If

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT * from account_table where
account_id='" & Text1.Text & "'", dbOpenDynaset)

If rcs.RecordCount = 0 Then

MsgBox "ไม่พบหมายเลขบัญชี"

Text1.Text = ""

Text1.SetFocus

Exit Sub

Else

Label2.Caption = rcs![Account_Name]

Label3.Caption = rcs![Balance_Total]

Menu_customer.Show

Me.Visible = False

End If

```

rcs.Close

db.Close

End Sub

Private Sub Command2_Click()

Unload Me

End Sub

Private Sub Text1_Change()

If Len(Text1.Text) = 9 Then

    Text1.ForeColor = &H80FF80

Else

    Text1.ForeColor = &H80000008

End If

End Sub

Private Sub Text1_KeyPress(KeyAscii As Integer)

If KeyAscii = 13 Then

    Command1_Click

End If

End Sub

```

(4) Source Code of Add New Customer Program

```

Private Sub Command1_Click()

Dim db As Database

Dim rcs As Recordset

Dim address As String

```

```
If Text1.Text = "" Or Text2.Text = "" Or Text3.Text = "" Or Text4.Text =  
"" Or Text6.Text = "" Or Text7.Text = "" Then
```

```
    MsgBox "กรุณากรอกข้อมูลให้ครบถ้วน"
```

```
    Exit Sub
```

```
End If
```

```
If Len(Text3.Text) <> 13 Then
```

```
    MsgBox "กรุณาใส่เลขที่บัตรประชาชนให้ถูกต้อง"
```

```
    Text3.SetFocus
```

```
    Exit Sub
```

```
End If
```

```
address = Text4.Text & " " & Text5.Text
```

```
Set db =
```

```
DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")
```

```
Set rcs = db.OpenRecordset("Customer_table", dbOpenDynaset)
```

```
rcs.AddNew
```

```
rcs![ID_Person] = Trim(Text3.Text)
```

```
rcs![customer_name] = Trim(Text1.Text)
```

```
rcs![customer_sname] = Trim(Text2.Text)
```

```
rcs![address] = Trim(address)
```

```
rcs![Office_Address] = Trim(Text6.Text)
```

```
rcs![Telephone] = Trim(Text7.Text)
```

```
rcs.Update
```

```
MsgBox "ข้อมูลลูกค้าถูกบันทึกเรียบร้อยแล้ว"
```

Open_Customer.Show

Unload Add_New

End Sub

Private Sub Command2_Click()

Unload Add_New

End Sub

Private Sub Text3_KeyPress(KeyAscii As Integer)

If Len(Text3.Text) = 13 Then

Text3.ForeColor = &HC000&

Else

Text3.ForeColor = &H0&

End If

End Sub

(5) Source Code of Add New User Program

Private Sub Command1_Click()

Dim db As Database

Dim rcs As Recordset

If Text1.Text = "" Then

MsgBox "กรุณาใส่ชื่อผู้ใช้งานโปรแกรม"

Exit Sub

End If

If Text2.Text = "" Or Text3.Text = "" Then

MsgBox "กรุณาใส่รหัสผู้ใช้งานด้วย"

Exit Sub

End If

If Text2.Text <> Text3.Text Then

MsgBox "รหัสผู้ใช้งานไม่ตรงกัน"

Exit Sub

End If

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT * FROM user", dbOpenDynaset)

rcs.AddNew

rcs![UserName] = Text1.Text

rcs![Password] = Text2.Text

rcs.Update

rcs.Close

db.Close

MsgBox "เพิ่มผู้ใช้งานแล้ว"

Unload Me

End Sub

Private Sub Command2_Click()

Unload Me

End Sub

Private Sub Text3_KeyPress(KeyAscii As Integer)

If KeyAscii = 13 Then

Command1_Click

End If

End Sub

(6) Source Code of Delete Account Program

Private Sub Command1_Click()

Dim db As Database

Dim rcs As Recordset

If Text1.Text = "" Or Len(Text1.Text) < 9 Then

MsgBox "กรุณาใส่หมายเลขบัญชีที่ต้องการลบ"

Text1.SetFocus

Exit Sub

Else

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT * FROM Account_table where

Account_id=" & Text1.Text & "'", dbOpenDynaset)

If rcs.RecordCount > 0 Then

a = MsgBox("ยืนยันการลบบัญชี[" & rcs![Account_Name] & "]"?,

vbOKCancel)

If a = vbOK Then

rcs.Delete

MsgBox "บัญชีหมายเลข " & Text1.Text & "ถูกลบเรียบร้อยแล้ว"

rcs.Close

db.Close

Unload Me

End If

Else

MsgBox "ไม่พบข้อมูลดังกล่าว"

End If

rcs.Close

db.Close

End If

End Sub

Private Sub Command2_Click()

Unload Me

End Sub

Private Sub Text1_KeyPress(KeyAscii As Integer)

If KeyAscii = 13 Then

Command1_Click

End If

End Sub

(7) Source Code of Delete Receipt ID Program

Private Sub Command1_Click()

Dim db As Database

Dim rcs As Recordset

If Text1.Text = "" Or Len(Text1.Text) < 5 Then

MsgBox "กรุณาใส่หมายเลขนำจ่ายให้ถูกต้อง"

```
Text1.SetFocus

Exit Sub

Else

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

If Val(Text1.Text) >= 50000 Then

Set rcs = db.OpenRecordset("SELECT * FROM Phone_Payment

where Receipt_ID=" & Text1.Text & "", dbOpenDynaset)

Else

Set rcs = db.OpenRecordset("SELECT * FROM Ticket_pay where

Receipt_ID =" & Text1.Text & "", dbOpenDynaset)

End If

If rcs.RecordCount > 0 Then

a = MsgBox("ยืนยันการลบหมายเลขนำจ่าย[" & rcs![Receipt_ID] & "]",

vbOKCancel)

If a = vbOK Then

rcs.Delete

MsgBox "ข้อมูลรายการหมายเลขนำจ่าย " & Text1.Text & "ถูกลบเรียบร้อยแล้ว"

rcs.Close

db.Close

Unload Me

End If
```

Else

MsgBox "ไม่พบข้อมูลดังกล่าว"

End If

rcs.Close

db.Close

End If

End Sub

Private Sub Command2_Click()

Unload Me

End Sub

Private Sub Text1_KeyPress(KeyAscii As Integer)

If KeyAscii = 13 Then

Command1_Click

End If

End Sub

(8) Source Code of Delete Transaction Program

Private Sub Command1_Click()

Dim db As Database

Dim rcs As Recordset

If Text1.Text = "" Or Len(Text1.Text) < 5 Then

MsgBox "กรุณาใส่หมายเลข Transaction ที่ถูกต้อง"

Text1.SetFocus

Exit Sub

Else

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT * FROM transaction_table
where transaction_id=" & Text1.Text, dbOpenDynaset)

If rcs.RecordCount > 0 Then

a = MsgBox("ยืนยันการลบรายการ [" & rcs![transaction_id] & "]",

vbOKCancel)

If a = vbOK Then

rcs.Delete

MsgBox "รายการ Transaction " & Text1.Text & "ถูกลบเรียบร้อยแล้ว"

rcs.Close

db.Close

Unload Me

End If*

Else

MsgBox "ไม่พบข้อมูลดังกล่าว"

End If

rcs.Close

db.Close

End If

End Sub

Private Sub Command2_Click()

Unload Me

End Sub

Private Sub Text1_KeyPress(KeyAscii As Integer)

If KeyAscii = 13 Then

 Command1_Click

End If

End Sub

(9) Source Code of Menu Transaction Program

Private Sub Command1_Click()

Dim db As Database

Dim rcs As Recordset

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT * FROM transaction_table where
transaction_id=" & transaction_form.Text1.Text, dbOpenDynaset)

rcs.Edit

rcs![Account_Balance] = Val(Text6.Text) + Val(Text5.Text)

rcs![Amount] = Trim(Text6.Text)

rcs.Close

db.Close

update_amount Text1.Text, Val(Text6.Text) + Val(Text5.Text)

MsgBox "รายการแก้ไขการฝากเงินถูกปรับปรุงเรียบร้อยแล้ว"

Unload transaction_form

Unload Me

End Sub

Private Sub update_amount(ID As String, Balance As Currency)

Dim db As Database

Dim rcs As Recordset

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT * FROM Account_table WHERE

Account_id=" & ID & "', dbOpenDynaset)

rcs.Edit

rcs![Balance_Total] = Balance

rcs.Update

End Sub

Private Sub Command2_Click()

Unload Me

End Sub

Private Sub Form_Load()

Dim db As Database

Dim rcs As Recordset

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT * FROM transaction_table where

transaction_id=" & transaction_form.Text1.Text, dbOpenDynaset)

Text4.Text = rcs![transaction_id]

Text3.Text = rcs![Date_Tran]

```

Text1.Text = rcs![Account_id]

Text5.Text = Abs(Val(rcs![Account_Balance]) - Val(rcs![Amount]))

Text6.Text = rcs![Amount]

rcs.Close

Set rcs = db.OpenRecordset("SELECT * FROM Account_table Where

Account_id='" & Text1.Text & "'", dbOpenDynaset)

Text2.Text = rcs![Account_Name]

rcs.Close

db.Close

End Sub

```

(10) Source Code of Deposit Transaction Program

```

Private Sub Command1_Click()
Dim db As Database
Dim rcs As Recordset
Set db =
DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")
Set rcs = db.OpenRecordset("SELECT * FROM transaction_table",
dbOpenDynaset)

rcs.AddNew

rcs![transaction_id] = Text4.Text

rcs![Account_id] = Text1.Text

rcs![transac_type_id] = 1

rcs![Account_Balance] = Val(Text6.Text) + Val(Text5.Text)

rcs![Date_Tran] = Date

```



```

rcs![Amount] = Trim(Text6.Text)

rcs![Branch_id] = 0

rcs![Natrive] = "DPT" ' Deposit Transaction

rcs.Update

rcs.Close

db.Close

update_amount Text1.Text, Val(Text6.Text) + Val(Text5.Text)

MsgBox "รายการฝากเงินดำเนินการเรียบร้อยแล้ว"

Unload Me

End Sub

Private Sub update_amount(ID As String, Balance As Currency)

Dim db As Database

Dim rcs As Recordset

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT * FROM Account_table WHERE

Account_id='" & ID & "'", dbOpenDynaset)

rcs.Edit

rcs![Balance_Total] = Balance

rcs.Update

End Sub

Private Sub Command2_Click()

Unload deposit_tran

End Sub

```

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```
Private Sub Form_Load()

Dim db As Database

Dim rcs As Recordset

Text3.Text = Date

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT transaction_id FROM

transaction_table", dbOpenDynaset)

If rcs.RecordCount = 0 Then

    Text4.Text = "10000"

Else

    rcs.MoveLast

    Text4.Text = Val(rcs![transaction_id]) + 1

End If

rcs.Close

db.Close

Text1.Text = account_form.Text1.Text

Text2.Text = account_form.Label2.Caption

Text5.Text = account_form.Label3.Caption

End Sub
```

(11) Source Code of Detail Account Program

```
Private Sub Command1_Click()

Unload Me

End Sub
```

```

Private Sub Form_Load()

Dim db As Database

Dim rcs As Recordset

Dim a As String

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT Account_table.*,

Account_Type_table.Account_Type_Name FROM Account_Type_table

INNER JOIN Account_table ON Account_Type_table.Account_Type_ID =

Account_table.Account_Type_ID Where Account_table.Account_id = " &

account_form.Text1.Text & "'", dbOpenDynaset)

Text1.Text = rcs![Account_id]

Text2.Text = rcs![Account_Name]

Text3.Text = rcs![Date]

Text5.Text = rcs![Balance_Total]

Text6.Text = rcs![Account_Type_name]

a = rcs![ID_Person]

rcs.Close

Set rcs = db.OpenRecordset("SELECT * FROM customer_table Where

ID_Person = " & a & "'", dbOpenDynaset)

Text4.Text = rcs![customer_name] & " " & rcs![customer_sname]

rcs.Close

db.Close

End Sub

```

(12) Source Code of Edit Customer Program

```
Private Sub Command1_Click()

Dim db As Database

Dim rcs As Recordset

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT * FROM Customer_table Where

id_person="" & acc_find_form.Label5.Caption & """, dbOpenDynaset)

rcs.Edit

rcs![customer_name] = Text1.Text

rcs![customer_sname] = Text2.Text

rcs![address] = Text4.Text

rcs![Office_Address] = Text6.Text

rcs![Telephone] = Text7.Text

rcs.Update

rcs.Close

Set rcs = db.OpenRecordset("SELECT * FROM Account_table WHERE

account_ID="" & Text10.Text & """, dbOpenDynaset)

rcs.Edit

rcs![Account_type_ID] = Combo1.ListIndex + 1

rcs![Account_Name] = Trim(Text9.Text)

rcs.Update

rcs.Close

db.Close
```

MsgBox "ข้อมูลถูกคำนวณเรียบร้อยแล้ว"

Unload acc_find_form

Unload Me

End Sub

Private Sub Command2_Click()

Unload acc_find_form

Unload Me

End Sub

Private Sub Form_Load()

Dim db As Database

Dim rcs As Recordset

Text8.Text = acc_find_form.Label4.Caption

Text9.Text = acc_find_form.Label2.Caption

Text10.Text = acc_find_form.Text1.Text

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT Account_Type_name FROM
Account_type_table", dbOpenDynaset)

Do

Combo1.AddItem rcs![Account_Type_name]

rcs.MoveNext

Loop Until rcs.EOF

Combo1.ListIndex = Val(acc_find_form.Label3.Caption) - 1

rcs.Close

```

Set rcs = db.OpenRecordset("SELECT * FROM Customer_table Where
id_person='" & acc_find_form.Label5.Caption & "'", dbOpenDynaset)

Text1.Text = rcs![customer_name]

Text2.Text = rcs![customer_sname]

Text3.Text = rcs![ID_Person]

Text4.Text = rcs![address]

Text6.Text = rcs![Office_Address]

Text7.Text = rcs![Telephone]

rcs.Close

db.Close

End Sub

```

(13) Source Code of Edit Transfer Program

```

Private Sub Command1_Click()

Dim db As Database

Dim rcs As Recordset

If Val(Text5.Text) - Val(Text6.Text) < 100 Then

    MsgBox "จำนวนเงินที่ถอนเกินบัญชี"

    Text6.Text = ""

    Text6.SetFocus

Exit Sub

End If

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

```

```

Set rcs = db.OpenRecordset("SELECT * FROM transaction_table where
transaction_id=" & Text4.Text, dbOpenDynaset)

rcs.Edit

rcs![Account_Balance] = Val(Text5.Text) - Val(Text6.Text)

rcs![Account_Pay] = Text7.Text

rcs![Amount] = Trim(Text6.Text)

rcs![Branch_id] = 0

rcs.Update

rcs.Close

db.Close

update_amount Text1.Text, Val(Text5.Text) - Val(Text6.Text)

update_amount Text7.Text, Val(Label14.Caption) + Val(Text6.Text)

MsgBox "ข้อมูลการ โอนเงิน ได้ทำเรียบร้อยแล้ว"

Unload Me

End Sub

Private Sub update_amount(ID As String, Balance As Currency)

Dim db As Database

Dim rcs As Recordset

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT * FROM Account_table WHERE

Account_id=" & ID & "", dbOpenDynaset)

rcs.Edit

rcs![Balance_Total] = Balance

```


rcs.Update

End Sub

Private Sub Command2_Click()

Unload Me

End Sub

Private Sub Form_Load()

Dim rcs As Recordset

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT * FROM transaction_table where
transaction_id=" & transaction_form.Text1.Text, dbOpenDynaset)

Text4.Text = rcs![transaction_id]

Text3.Text = rcs![Date_Tran]

Text1.Text = rcs![Account_id]

Text5.Text = Val(rcs![Account_Balance]) + Val(rcs![Amount])

Text6.Text = rcs![Amount]

Text7.Text = rcs![Account_Pay]

rcs.Close

Set rcs = db.OpenRecordset("SELECT * FROM Account_table Where
Account_id=" & Text1.Text & "", dbOpenDynaset)

Text2.Text = rcs![Account_Name]

rcs.Close

Set rcs = db.OpenRecordset("SELECT * FROM Account_table Where
Account_id=" & Text7.Text & "", dbOpenDynaset)

Text8.Text = rcs![Account_Name]

rcs.Close

db.Close

End Sub

(14) Source Code of Edit User Program

Private Sub Command1_Click()

Dim db As Database

Dim rcs As Recordset

If Text1.Text = "" Then

MsgBox "กรุณาใส่ชื่อผู้ใช้งานโปรแกรม"

Exit Sub

End If

If Text2.Text Or Text3.Text Then

MsgBox "กรุณาใส่รหัสผู้ใช้งานด้วย"

Exit Sub

End If

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT * FROM user", dbOpenDynaset)

Do

If Trim(Text1.Text) = rcs![UserName] And Trim(Text2.Text) =

rcs![Password] Then

Exit Do

End If

rcs.MoveNext

Loop Until rcs.EOF

If rcs.EOF = False Then

rcs.Edit

rcs![Password] = Text3.Text

rcs.Update

MsgBox "รหัสถูกเปลี่ยนเรียบร้อยแล้ว"

rcs.Close

db.Close

Unload Me

Else

MsgBox "ชื่อผู้ใช้งานหรือรหัสผิดพลาดกรุณาใส่อีกครั้ง"

Text1.Text = ""

Text2.Text = ""

Text3.Text = ""

Text1.SetFocus

rcs.Close

db.Close

End If

End Sub

Private Sub Command2_Click()

Unload Me

End Sub

Private Sub Text3_KeyPress(KeyAscii As Integer)

If KeyAscii = 13 Then

 Command1_Click

End If

End Sub

(15) Source Code of Edit Withdrawal Transaction Program

Private Sub Command1_Click()

Dim db As Database

Dim rcs As Recordset

If Val(Text5.Text) - Val(Text6.Text) < 100 Then

 MsgBox "จำนวนเงินที่ถอนเกินบัญชี"

 Text6.Text = ""

 Text6.SetFocus

 Exit Sub

End If

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT * FROM transaction_table where
transaction_id=" & transaction_form.Text1.Text, dbOpenDynaset)

rcs.Edit

rcs![Account_Balance] = Val(Text5.Text) - Val(Text6.Text)

rcs![Amount] = Val(Text6.Text)

rcs.Update

rcs.Close

db.Close

update_amount Text1.Text, Val(Text5.Text) - Val(Text6.Text)

MsgBox "รายการแก้ไขการถอนเงินถูกปรับปรุงเรียบร้อยแล้ว"

Unload transaction_form

Unload Me

End Sub

Private Sub update_amount(ID As String, Balance As Currency)

Dim db As Database

Dim rcs As Recordset

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT * FROM Account_table WHERE
Account_id='" & ID & "'", dbOpenDynaset)

rcs.Edit

rcs![Balance_Total] = Balance

rcs.Update

End Sub

Private Sub Command2_Click()

Unload Me

End Sub

Private Sub Form_Load()

Dim db As Database

Dim rcs As Recordset

```

Set db =
DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")
Set rcs = db.OpenRecordset("SELECT * FROM transaction_table where
transaction_id=" & transaction_form.Text1.Text, dbOpenDynaset)
Text4.Text = rcs![transaction_id]
Text3.Text = rcs![Date_Tran]
Text1.Text = rcs![Account_id]
Text5.Text = Val(rcs![Account_Balance]) + Val(rcs![Amount])
Text6.Text = rcs![Amount]
rcs.Close
Set rcs = db.OpenRecordset("SELECT * FROM Account_table Where
Account_id=" & Text1.Text & "", dbOpenDynaset)
Text2.Text = rcs![Account_Name]
rcs.Close
db.Close
End Sub

```

(16) Source Code of Login Program

```

Private Sub cmdCancel_Click()

End

End Sub

Private Sub cmdOK_Click()

Dim db As Database

Dim rcs As Recordset

```

```

Set db =
DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")
Set rcs = db.OpenRecordset("user", dbOpenDynaset)
If txtUserName.Text = "" Or txtPassword.Text = "" Then
    MsgBox "กรุณาใส่ชื่อและรหัสผู้ใช้งาน"

    Exit Sub
Else
    Do
        If Trim(txtUserName.Text) = rcs![UserName] And
            Trim(txtPassword.Text) = rcs![Password] Then
            Exit Do
        End If
        rcs.MoveNext
    Loop Until rcs.EOF
    If rcs.EOF = False Then
        MDIForm1.Show
        Unload Me
    Else
        MsgBox "ชื่อหรือรหัสผู้ใช้งานไม่ตรงกัน"

        End
    End If
End If
End Sub

```


(17) Source Code of Account Information Program

```
Private Sub Command1_Click()
```

```
Dim str As String
```

```
If Text1.Text = "" Then
```

```
    str = " SELECT Account_table.Account_ID,
```

```
    Account_table.Account_Name, Customer_table.Customer_Name,
```

```
    Account_table.Balance_Total FROM Customer_table INNER JOIN
```

```
    (Account_Type_table INNER JOIN Account_table ON
```

```
    Account_Type_table.Account_Type_ID =
```

```
    Account_table.Account_Type_ID) ON Customer_table.ID_Person =
```

```
    Account_table.ID_Person"
```

```
Else
```

```
    str = " SELECT Account_table.Account_ID,
```

```
    Account_table.Account_Name, Customer_table.Customer_Name,
```

```
    Account_table.Balance_Total FROM Customer_table INNER JOIN
```

```
    (Account_Type_table INNER JOIN Account_table ON
```

```
    Account_Type_table.Account_Type_ID =
```

```
    Account_table.Account_Type_ID) ON Customer_table.ID_Person =
```

```
    Account_table.ID_Person WHERE Account_ID= "" &
```

```
    Trim(Text1.Text) & """
```

```
End If
```

```
Data1.RecordSource = str
```

```
Data1.Refresh
```

```
Label7.Caption = Data1.Recordset.RecordCount
```

If Data1.Recordset.RecordCount = 0 Then

MsgBox "ไม่พบข้อมูลดังกล่าว"

Text1.Text = ""

Text1.SetFocus

End If

End Sub

Private Sub Command2_Click()

Unload Me

End Sub

Private Sub Form_Load()

Data1.Refresh

Label7.Caption = Data1.Recordset.RecordCount

End Sub

(18) Source Code of Transaction Information Program

Private Sub Command1_Click()

Dim str As String

str = "SELECT Transaction_table.Date_Tran,

Transaction_table.Transaction_ID,

Transac_type_table.Transac_Type_Name, Transaction_table.Amount,

Transaction_table.Account_Pay , Transaction_table.Natrive FROM

Transac_type_table INNER JOIN Transaction_table ON

Transac_type_table.Transac_Type_ID =

Transaction_table.Transac_Type_ID"

If Text1.Text <> "" Then

```

        str = str & " Where (Transaction_table.Account_ID = " & Text1.Text
        & ") "

    End If

    str = str & " ORDER BY Transaction_table.Date_Tran"

    Data1.RecordSource = str

    Data1.Refresh

    Label3.Caption = Data1.Recordset.RecordCount

End Sub

Private Sub Command2_Click()

    Unload Me

End Sub

Private Sub Command3_Click()

    About.Show

End Sub

Private Sub Form_Load()

    Data1.Refresh

    Label3.Caption = Data1.Recordset.RecordCount

End Sub

Private Sub Text1_KeyPress(KeyAscii As Integer)

    If KeyAscii = 13 Then

        Command1_Click

    End If

End Sub

```

(19) Source Code of Source Code of Main Menu Program

```
Private Sub add_cus_Click()
```

```
Add_New.Show
```

```
End Sub
```

```
Private Sub Deposit_Menu_Click()
```

```
End Sub
```

```
Private Sub withdrawal1_Click()
```

```
End Sub
```

```
Private Sub all_today_report_Click()
```

```
End Sub
```

```
Private Sub AddUser_Click()
```

```
add_user.Show
```

```
End Sub
```

```
Private Sub Customer_info_Report_Click()
```

```
DataReport1.Show
```

```
End Sub
```

```
Private Sub del_customer_Click()
```

```
Del_account.Show
```

```
End Sub
```

```
Private Sub Del_transaction_Click()
```

```
End Sub
```

```
Private Sub del_receipted_Click()
```

```
Del_recip.Show
```

```
End Sub
```

```

Private Sub Del_transaction1_Click()

Del_transaction.Show

End Sub

Private Sub deposit_report_Click()

Dim str As String

str = "SELECT Transaction_table.Transaction_ID,
Transaction_table.Account_ID, Account_table.Account_Name,
Transaction_table.Amount, Transaction_table.Account_Balance,
Transaction_table.Date_Tran FROM Transaction_table, Account_table
WHERE Transaction_table.Account_ID = Account_table.Account_ID AND
(Transaction_table.Transac_Type_ID = '1') "
str = str & "AND Transaction_table.Date_Tran=#" & Date & "#"
DataEnvironment1.rsCommand2.Open str
DataReport2.Show

End Sub

Private Sub del_username_Click()

Dim db As Database

Dim rcs As Recordset

User = InputBox("กรุณาใส่ชื่อผู้ใช้งานที่ต้องการลบ")

Pass = InputBox("กรุณาใส่รหัสผ่าน")

If User = "" Or Pass = "" Then

MsgBox "กรุณาใส่ชื่อผู้ใช้งานและรหัสผ่าน"

Exit Sub


```

```

End If

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("user", dbOpenDynaset)

Do

    If Trim(User) = rcs![UserName] And Trim(Pass) = rcs![Password]

        Then

Exit Do

End If

rcs.MoveNext

Loop Until rcs.EOF

If rcs.EOF = False Then

    rcs.Delete

    MsgBox "ผู้ใช้งานถูกลบเรียบร้อยแล้ว"

    rcs.Close

    db.Close

Else

    MsgBox "ไม่พบผู้ใช้งานดังกล่าวกรุณาตรวจสอบชื่อรหัสผ่านให้ถูกต้อง"

    rcs.Close

    db.Close

End If

End Sub

Private Sub edit_cucustomer_Click()

```

acc_find_form.Show

End Sub

Private Sub Edit_submenu_Click()

transaction_form.Show

End Sub

Private Sub electric_report_Click()

Dim str As String

str = "SELECT Receipt_ID, `Month`, `Date`, Amount, Account_ID,

Ticket_Number FROM Ticket_Pay WHERE (Ticket_Type_id = 1)"

str = str & "AND Ticket_Pay.Date=#" & Date & "#"

DataEnvironment1.rsCommand5.Open str

DataReport5.Show

End Sub

Private Sub edit_username_Click()

edit_user.Show

End Sub

Private Sub exit_SubMenu_Click()

a = MsgBox("ต้องการออกจากโปรแกรม?", vbOKCancel)

If a = vbOK Then

End

End If

End Sub

Private Sub GSM1800_report_Click()

Dim str As String


```
str = "SELECT Account_ID, Amount, 'Date', 'Month', Phone_Number,  
Receipt_ID FROM Phone_Payment WHERE (Phone_Type_ID = 3) "
```

```
str = str & "AND Phone_Payment.Date=#" & Date & "#"
```

```
DataEnvironment1.rsCommand9.Open str
```

```
DataReport9.Show
```

```
End Sub
```

```
Private Sub GSM900_Report_Click()
```

```
Dim str As String
```

```
str = "SELECT Account_ID, Amount, 'Date', 'Month', Phone_Number,  
Receipt_ID FROM Phone_Payment WHERE (Phone_Type_ID = 1) "
```

```
str = str & "AND Phone_Payment.Date=#" & Date & "#"
```

```
DataEnvironment1.rsCommand7.Open str
```

```
DataReport7.Show
```

```
End Sub
```

```
Private Sub info_customer_Click()
```

```
info_account.Show
```

```
End Sub
```

```
Private Sub List_Of_trans_Click()
```

```
Dim str As String
```

```
a = InputBox("กรุณาใส่หมายเลขบัญชี")
```

```
If Trim(a) <> "" Then
```

```
str = "SELECT Transaction_ID, Date_Trans, Amount, Account_ID,
```

```
Natrive FROM Transaction_table WHERE Account_ID=" & a & ""
```

```
DataEnvironment1.rsCommand10.Open str
```

```

        DataReport10.Show

    End If

    End Sub

    Private Sub other_report_Click()

        Payment_report.Show

    End Sub

    Private Sub Payment_Find_Click()

        Receipted_Form.Show

    End Sub

    Private Sub Report_1800_Click()

        Dim str As String

        str = "SELECT Account_ID, Amount, `Date`, `Month`, Phone_Number,
        Receipt_ID FROM Phone_Payment WHERE (Phone_Type_ID = 2) "

        str = str & "AND Phone_Payment.Date=#" & Date & "#"

        DataEnvironment1.rsCommand8.Open str

        DataReport8.Show

    End Sub

    Private Sub Timer1_Timer()

        StatusBar1.Panels(4).Style = sbrTime

    End Sub

    Private Sub today_transaction_Click()

        Trans_Report.Show

    End Sub

    Private Sub Tran_customer_Click()

```

info_Transaction.Show

End Sub

Private Sub Transaction1_Click()

account_form.Show

End Sub

Private Sub water_report_Click()

Dim str As String

str = "SELECT Receipt_ID, `Month`, `Date`, Amount, Account_ID,
Ticket_Number FROM Ticket_Pay WHERE (Ticket_Type_id = 2)"

str = str & "AND Ticket_Pay.Date=#" & Date & "#"

DataEnvironment1.rsCommand6.Open str

DataReport6.Show

End Sub

Private Sub withDraw_Click()

Dim str As String

str = "SELECT Transaction_table.Transaction_ID,

Transaction_table.Account_ID, Account_table.Account_Name,

Transaction_table.Amount, Transaction_table.Account_Balance,

Transaction_table.Date_Tran FROM Transaction_table, Account_table

WHERE Transaction_table.Account_ID = Account_table.Account_ID AND

(Transaction_table.Transac_Type_ID = '2') "

str = str & "AND Transaction_table.Date_Tran=#" & Date & "#"

DataEnvironment1.rsCommand3.Open str

DataReport3.Show

End Sub

Private Sub withdrawal_report_Click()

Dim str As String

str = "SELECT Transaction_table.Transaction_ID,

Transaction_table.Date_Tran, Transaction_table.Amount,

Transaction_table.Account_Pay, Transaction_table.Account_ID,

Account_table.Account_Name FROM Transaction_table, Account_table

WHERE Transaction_table.Account_ID = Account_table.Account_ID AND

(Transaction_table.Transac_Type_ID = '3') "

str = str & "AND Transaction_table.Date_Tran=#" & Date & "#"

DataEnvironment1.rsCommand4.Open str

DataReport4.Show

End Sub

(20) Source Code of Menu of Customer Program

Private Sub Command1_Click()

Dim db As Database

Dim rcs As Recordset

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT * from account_table where

account_id="" & account_form.Text1.Text & "", dbOpenDynaset)

account_form.Label3.Caption = rcs![Balance_Total]

rcs.Close

db.Close

deposit_tran.Show

End Sub

Private Sub Command2_Click()

Dim db As Database

Dim rcs As Recordset

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT * from account_table where
account_id=" & account_form.Text1.Text & "", dbOpenDynaset)

account_form.Label2.Caption = rcs![Account_Name]

account_form.Label3.Caption = rcs![Balance_Total]

rcs.Close

db.Close

withdrawal.Show

End Sub

Private Sub Command3_Click()

Dim db As Database

Dim rcs As Recordset

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT * from account_table where
account_id=" & account_form.Text1.Text & "", dbOpenDynaset)

account_form.Label2.Caption = rcs![Account_Name]

account_form.Label3.Caption = rcs![Balance_Total]

```

rcs.Close

db.Close

Transfer.Show

End Sub

Private Sub Command4_Click()

Dim db As Database

Dim rcs As Recordset

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT * from account_table where

account_id=" & account_form.Text1.Text & "", dbOpenDynaset)

account_form.Label3.Caption = rcs![Balance_Total]

rcs.Close

```

(21) Source Code of Open Customer Account Program

```

Dim ID_Person As String

Private Sub Command1_Click()

Dim db As Database

Dim rcs As Recordset

If Text2.Text = "" Then

MsgBox "กรุณาใส่ชื่อบัญชี"

Exit Sub

End If

If Val(Text5.Text) < 100 Then

```

```

    MsgBox "เงินฝากขั้นต่ำ 100 บาท"

```

```

Exit Sub

End If

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("Account_table", dbOpenDynaset)

rcs.AddNew

rcs![Account_id] = Text1.Text

rcs![ID_Person] = ID_Person

rcs![Account_type_ID] = Combo1.ListIndex + 1

rcs![Account_Name] = Text2.Text

rcs![Date] = Date

rcs![Balance_Total] = Text5.Text

rcs![Branch_id] = 0

rcs.Update

rcs.Close

db.Close

MsgBox "บัญชีใหม่ถูกเปิดเรียบร้อยแล้ว"

Unload Me

End Sub

Private Sub Command2_Click()

Unload Open_Customer

End Sub

Private Sub Form_Load()

Dim db As Database

```



```

Dim rcs As Recordset

Dim name_person As String

ID_Person = Trim(Add_New.Text3.Text)

name_person = Trim(Add_New.Text1.Text) & " " &
Trim(Add_New.Text2.Text)

Text4.Text = name_person

Set db =
DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT account_id FROM Account_table",
dbOpenDynaset)

If rcs.RecordCount = 0 Then
    Text1.Text = "100000000"
Else
    rcs.MoveLast
    Text1.Text = Val(rcs![Account_id]) + 1
End If
rcs.Close

Set rcs = db.OpenRecordset("SELECT Account_Type_name FROM
Account_type_table", dbOpenDynaset)

Do

    Combo1.AddItem rcs![Account_Type_name]

    rcs.MoveNext

Loop Until rcs.EOF

Text3.Text = Date

```

Combo1.ListIndex = 1

Text5.Text = "100"

rcs.Close

db.Close

End Sub

(22) Source Code of Payment Program

Private Sub Command1_Click()

Dim str As String

If Option1.Value = True Then

str = "SELECT Receipt_ID, `Month`, `Date`, Amount, Account_ID,
Ticket_Number FROM Ticket_Pay WHERE (Ticket_Type_id = 1) "

ElseIf Option2.Value = True Then

str = "SELECT Receipt_ID, `Month`, `Date`, Amount, Account_ID,
Ticket_Number FROM Ticket_Pay WHERE (Ticket_Type_id = 2) "

ElseIf Option3.Value = True Then

str = "SELECT Account_ID, Amount, `Date`, `Month`,
Phone_Number, Receipt_ID FROM Phone_Payment WHERE
(Phone_Type_ID = 1) "

ElseIf Option7.Value = True Then

str = "SELECT Account_ID, Amount, `Date`, `Month`,
Phone_Number, Receipt_ID FROM Phone_Payment WHERE
(Phone_Type_ID = 3) "

ElseIf Option8.Value = True Then

```

str = "SELECT Account_ID, Amount, `Date`, `Month`,
Phone_Number, Receipt_ID FROM Phone_Payment WHERE
(Phone_Type_ID = 2) "

End If

If Option5.Value = True Then

    str = str & "AND Date=#" & Date & "#"

ElseIf Option6.Value = True Then

    Str = str & "AND ((Date>=#" & Text1.Text & "# And Date<=#" &
    Text2.Text & "#))"

End If

If Option1.Value = True Then

    DataEnvironment1.rsCommand5.Open str

    DataReport5.Show

ElseIf Option2.Value = True Then

    DataEnvironment1.rsCommand6.Open str

    DataReport6.Show

ElseIf Option3.Value = True Then

    DataEnvironment1.rsCommand7.Open str

    DataReport7.Show

ElseIf Option7.Value = True Then

    DataEnvironment1.rsCommand9.Open str

    DataReport9.Show

ElseIf Option8.Value = True Then

    DataEnvironment1.rsCommand8.Open str

```

DataReport8.Show

End If

End Sub

Private Sub Command2_Click()

Unload Me

End Sub

Private Sub Form_Load()

Option1.Value = True

Option4.Value = True

End Sub

Private Sub Option5_Click()

End Sub

Private Sub Option6_Click()

Text1.Text = ""

Text2.Text = ""

Text1.SetFocus

End Sub

(23) Source Code of Phone Program

Private Sub Command1_Click()

Dim db As Database

Dim rcs As Recordset

Dim tmp_transaction As String

If Combo1.Text = "" Or Combo2.Text = "" Or Text7.Text = "" Or

Text6.Text = "" Then

MsgBox "กรุณากรอกข้อมูลให้ครบถ้วน"

Exit Sub

End If

If Val(Text5.Text) - Val(Text6.Text) - 10 < 100 Then

MsgBox "ยอดเงินในบัญชีไม่เพียงพอกับค่าไฟฟ้า"

Exit Sub

End If

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("Phone_payment", dbOpenDynaset)

rcs.AddNew

rcs![Receipt_ID] = Text4.Text

rcs![Account_id] = Text1.Text

rcs![Phone_number] = Text7.Text

rcs![Month] = Combo1.List(Combo1.ListIndex)

rcs![Phone_Type_ID] = Combo2.ListIndex + 1

rcs![total_amount] = (Val(Text5.Text) - Val(Text6.Text) - 10)

rcs![Date] = Date

rcs![Amount] = Trim(Text6.Text)

rcs.Update

rcs.Close

Set rcs = db.OpenRecordset("SELECT transaction_id FROM
transaction_table", dbOpenDynaset)

```

If rcs.RecordCount = 0 Then

    tmp_transaction = "10000"

Else

    rcs.MoveLast

    tmp_transaction = Val(rcs![transaction_id]) + 1

End If

rcs.Close

Set rcs = db.OpenRecordset("SELECT * FROM transaction_table",
dbOpenDynaset)

rcs.AddNew

rcs![transaction_id] = tmp_transaction
rcs![Account_id] = Text1.Text
rcs![transac_type_id] = 2
rcs![Account_Balance] = (Val(Text5.Text) - Val(Text6.Text) - 10)
rcs![Date_Trans] = Date
rcs![Amount] = Trim(Text6.Text)
rcs![Branch_id] = 0
rcs![Natrive] = "MPP"    ' Mobile Phone Payment

rcs.Update

rcs.Close

db.Close

update_amount Text1.Text, (Val(Text5.Text) - Val(Text6.Text) - 10)

MsgBox "ข้อมูลรายการจ่ายค่าโทรศัพท์เรียบร้อยแล้ว"

Unload Me

```

End Sub

Private Sub update_amount(ID As String, Balance As Currency)

Dim db As Database

Dim rcs As Recordset

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT * FROM Account_table WHERE

Account_id=" & ID & "', dbOpenDynaset)

rcs.Edit

rcs![Balance_Total] = Balance

rcs.Update

rcs.Close

db.Close

End- Sub

Private Sub Command2_Click()

Unload Me

End Sub

Private Sub Form_Load()

Dim db As Database

Dim rcs As Recordset

Text3.Text = Date

Set db = DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("Phone_Payment", dbOpenDynaset)

If rcs.RecordCount = 0 Then


```
Text4.Text = "70000"
```

```
Else
```

```
rcs.MoveLast
```

```
Text4.Text = Val(rcs![Receipt_ID]) + 1
```

```
End If
```

```
rcs.Close
```

```
Set rcs = db.OpenRecordset("SELECT * FROM Phone_type_table",  
dbOpenDynaset)
```

```
Do
```

```
Combo2.AddItem rcs![Phone_type_name]
```

```
rcs.MoveNext
```

```
Loop Until rcs.EOF
```

```
rcs.Close
```

```
db.Close
```

```
Text1.Text = account_form.Text1.Text
```

```
Text2.Text = account_form.Label2.Caption
```

```
Text5.Text = account_form.Label3.Caption
```

```
End Sub
```

(24) Source Code of Receipt Payment Program

```
Private Sub Command1_Click()
```

```
Dim str As String
```

```
If Text1.Text = "" Then
```

```
MsgBox "กรุณาใส่หมายเลขการนำจ่าย"
```

```
Text1.SetFocus
```

Exit Sub

ElseIf Val(Text1.Text) >= 50000 Then

```
str = "SELECT Phone_Payment.Date, Phone_Payment.Account_ID,  
Phone_type_table.Phone_type_name, Phone_Payment.Month,  
Phone_Payment.Amount FROM Phone_type_table INNER JOIN  
Phone_Payment ON Phone_type_table.Phone_type_id =  
Phone_Payment.Phone_Type_ID WHERE Receipt_ID=" &  
Text1.Text & ""
```

Else

```
str = " SELECT Ticket_Pay.Date, Ticket_Pay.Account_ID,  
Ticket_Type_table.Ticket_type_name, Ticket_Pay.Month,  
Ticket_Pay.Amount FROM Ticket_Type_table INNER JOIN  
Ticket_Pay ON Ticket_Type_table.Ticket_type_id =  
Ticket_Pay.Ticket_Type_id WHERE Receipt_ID=" & Text1.Text &  
""
```

End If*

Data1.RecordSource = str

Data1.Refresh

Label3.Caption = Data1.Recordset.RecordCount

Label9.Visible = False

Label5.Visible = True

End Sub

Private Sub Command2_Click()

Unload Me

End Sub

Private Sub Form_Load()

Data1.Refresh

Label3.Caption = Data1.Recordset.RecordCount

Label9.Visible = True

Label5.Visible = False

End Sub

Private Sub Text1_KeyPress(KeyAscii As Integer)

If KeyAscii = 13 Then

Command1_Click

End If

End Sub

(25) Source Code of Ticket Payment Program

Private Sub Command1_Click()

Dim db As Database

Dim rcs As Recordset

Dim tmp_transaction As String

If Val(Text5.Text) - Val(Text6.Text) - 10 < 100 Then

MsgBox "ขอเงินในบัญชีไม่เพียงพอกับค่าไฟฟ้า"

Exit Sub

End If

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("Ticket_pay", dbOpenDynaset)

```

rcs.AddNew

rcs![Receipt_ID] = Text4.Text

rcs![Account_id] = Text1.Text

rcs![Ticket_number] = Text7.Text

rcs![Month] = Combo1.List(Combo1.ListIndex)

rcs![Ticket_Type_ID] = 1

rcs![total_amount] = (Val(Text5.Text) - Val(Text6.Text) - 10)

rcs![Date] = Date

rcs![Amount] = Trim(Text6.Text)

rcs.Update

rcs.Close

Set rcs = db.OpenRecordset("SELECT transaction_id FROM
transaction_table", dbOpenDynaset)

If rcs.RecordCount = 0 Then
    tmp_transaction = "10000"
Else
    *
    rcs.MoveLast
    tmp_transaction = Val(rcs![transaction_id]) + 1
End If

rcs.Close

Set rcs = db.OpenRecordset("SELECT * FROM transaction_table",
dbOpenDynaset)

rcs.AddNew

rcs![transaction_id] = tmp_transaction

```

```

rcs![Account_id] = Text1.Text

rcs![transac_type_id] = 2

rcs![Account_Balance] = (Val(Text5.Text) - Val(Text6.Text) - 10)

rcs![Date_Tran] = Date

rcs![Amount] = Trim(Text6.Text)

rcs![Branch_id] = 0

rcs![Natrive] = "ECP" ' Electric Payment

rcs.Update

rcs.Close

db.Close

update_amount Text1.Text, (Val(Text5.Text) - Val(Text6.Text) - 10)

MsgBox "ดำเนินการรายการจ่ายค่าไฟฟ้าเรียบร้อยแล้ว"

Unload Me

End Sub

Private Sub update_amount(ID As String, Balance As Currency)

Dim db As Database

Dim rcs As Recordset

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT * FROM Account_table WHERE

Account_id='" & ID & "'", dbOpenDynaset)

rcs.Edit

rcs![Balance_Total] = Balance

rcs.Update

```

```

rcs.Close

db.Close

End Sub

Private Sub Command2_Click()

Unload Me

End Sub

Private Sub Form_Load()

Dim db As Database

Dim rcs As Recordset

Text3.Text = Date

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT Receipt_id FROM Ticket_pay",

dbOpenDynaset)

If rcs.RecordCount = 0 Then

    Text4.Text = "10000"

Else

    rcs.MoveLast

    Text4.Text = Val(rcs![Receipt_ID]) + 1

End If

rcs.Close

db.Close

Text1.Text = account_form.Text1.Text

Text2.Text = account_form.Label2.Caption

```

Text5.Text = account_form.Label3.Caption

End Sub

(26) Source Code of Transaction Report Program

Private Sub Command1_Click()

Dim str As String

If Option1.Value = True Then

```
str = "SELECT Transaction_table.Transaction_ID,  
Transaction_table.Account_ID, Account_table.Account_Name,  
Transaction_table.Amount, Transaction_table.Account_Balance,  
Transaction_table.Date_Tran FROM Transaction_table,  
Account_table WHERE Transaction_table.Account_ID =  
Account_table.Account_ID AND  
(Transaction_table.Transac_Type_ID = '1') "
```

ElseIf Option2.Value = True Then

```
str = "SELECT Transaction_table.Transaction_ID,  
Transaction_table.Account_ID, Account_table.Account_Name,  
Transaction_table.Amount, Transaction_table.Account_Balance,  
Transaction_table.Date_Tran FROM Transaction_table,  
Account_table WHERE Transaction_table.Account_ID =  
Account_table.Account_ID AND  
(Transaction_table.Transac_Type_ID = '2') "
```

ElseIf Option3.Value = True Then

```
str = "SELECT Transaction_table.Transaction_ID,  
Transaction_table.Date_Tran, Transaction_table.Amount,
```



```

Transaction_table.Account_Pay, Transaction_table.Account_ID,
Account_table.Account_Name FROM Transaction_table,
Account_table WHERE Transaction_table.Account_ID =
Account_table.Account_ID AND
(Transaction_table.Transac_Type_ID = '3') "

End If

If Option5.Value = True Then

    str = str & "AND Transaction_table.Date_Tran=#" & Date & "#"

ElseIf Option6.Value = True Then

    str = str & "AND (((Transaction_table.Date_Tran)>=#" & Text1.Text
    & "&#" & And (Transaction_table.Date_Tran)<=#" & Text2.Text & "#))"
    ' str = str & "AND Transaction_table.Date_Tran=#" & Date & "#"

End If

If Option1.Value = True Then

    DataEnvironment1.rsCommand2.Open str

    DataReport2.Show

ElseIf Option2.Value = True Then

    DataEnvironment1.rsCommand3.Open str

    DataReport3.Show

ElseIf Option3.Value = True Then

    DataEnvironment1.rsCommand4.Open str

    DataReport4.Show

End If

End Sub

```

```
Private Sub Command2_Click()
```

```
Unload Me
```

```
End Sub
```

```
Private Sub Form_Load()
```

```
Option1.Value = True
```

```
Option4.Value = True
```

```
End Sub
```

```
Private Sub Option6_Click()
```

```
Text1.Text = ""
```

```
Text2.Text = ""
```

```
Text1.SetFocus
```

```
End Sub
```

(27) Source Code of Transaction Form Program

```
Private Sub Command1_Click()
```

```
Dim db As Database
```

```
Dim rcs As Recordset
```

```
Dim address As String
```

```
If Len(Text1.Text) <> 5 Then
```

```
MsgBox "กรุณาใส่เลขที่บัตรประชาชนให้ถูกต้อง"
```

```
Text1.SetFocus
```

```
Exit Sub
```

```
End If
```

```
Set db =
```

```
DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")
```

```
Set rcs = db.OpenRecordset("SELECT * from transaction_table where  
transaction_id=" & Text1.Text, dbOpenDynaset)
```

```
If rcs.RecordCount = 0 Then
```

```
    MsgBox "ไม่พบหมายเลขบัญชี"
```

```
    Text1.Text = ""
```

```
    Text1.SetFocus
```

```
    Exit Sub
```

```
Else
```

```
Label2.Caption = rcs![transac_type_id]
```

```
Me.Visible = False
```

```
End If
```

```
rcs.Close
```

```
db.Close
```

```
If Label2.Caption = "1" Then
```

```
    deposit_edit.Show
```

```
ElseIf Label2.Caption = "2" Then
```

```
    edit_withdrawal.Show
```

```
ElseIf Label2.Caption = "3" Then
```

```
    edit_transfer.Show
```

```
End If
```

```
End Sub
```

```
Private Sub Command2_Click()
```

```
Unload Me
```

```
End Sub
```

```
Private Sub Text1_KeyPress(KeyAscii As Integer)
```

```
If KeyAscii = 13 Then
```

```
    Command1_Click
```

```
End If
```

```
End Sub
```

(28) Source Code of Transfer Account Program

```
Private Sub Command1_Click()
```

```
Dim db As Database
```

```
Dim rcs As Recordset
```

```
If Val(Text5.Text) - Val(Text6.Text) < 100 Then
```

```
    MsgBox "จำนวนเงินที่ถอนเกินบัญชี"
```

```
    Text6.Text = ""
```

```
    Text6.SetFocus
```

```
    Exit Sub
```

```
End If
```

```
Set db =
```

```
DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")
```

```
Set rcs = db.OpenRecordset("SELECT * FROM transaction_table",
```

```
dbOpenDynaset)
```

```
rcs.AddNew
```

```
rcs![transaction_id] = Text4.Text
```

```
rcs![Account_id] = Text1.Text
```

```
rcs![transac_type_id] = 3
```

```
rcs![Account_Balance] = Val(Text5.Text) - Val(Text6.Text)
```

```

rcs![Account_Pay] = Text7.Text

rcs![Date_Tran] = Date

rcs![Amount] = Trim(Text6.Text)

rcs![Branch_id] = 0

rcs![Natrive] = "TFT"      ' Transfer Transaction

rcs.Update

rcs.Close

db.Close

update_amount Text1.Text, Val(Text5.Text) - Val(Text6.Text)

update_amount Text7.Text, Val(Label14.Caption) + Val(Text6.Text)

MsgBox "ข้อมูลการโอนเงินได้ทำเรียบร้อยแล้ว"

Unload Me

End Sub

Private Sub update_amount(ID As String, Balance As Currency)

Dim db As Database

Dim rcs As Recordset

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT * FROM Account_table WHERE

Account_id='" & ID & "'", dbOpenDynaset)

rcs.Edit

rcs![Balance_Total] = Balance

rcs.Update

End Sub

```

```

Private Sub Command2_Click()

Unload Me

End Sub

Private Sub Command4_Click()

Dim db As Database

Dim rcs As Recordset

If Len(Text7.Text) <> 9 Then

    MsgBox "กรุณาใส่เลขที่บัญชีให้ครบ9ตัว"

    Exit Sub

End If

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT * FROM Account_table Where

Account_ID=" & "" & Text7.Text & "", dbOpenDynaset)

If rcs.RecordCount = 0 Then

    MsgBox "ไม่พบหมายเลขบัญชีดังกล่าว"

    Text7.Text = ""

    Text7.SetFocus

Else

    Text8.Text = rcs![Account_Name]

    Label14.Caption = rcs![Balance_Total]

    Text6.SetFocus

End If

```

```

rcs.Close

db.Close

End Sub

Private Sub Form_Load()

Dim db As Database

Dim rcs As Recordset

Text3.Text = Date

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT transaction_id FROM

transaction_table", dbOpenDynaset)

If rcs.RecordCount = 0 Then

    Text4.Text = "10000"

Else

    rcs.MoveLast

    Text4.Text = Val(rcs![transaction_id]) + 1*

End If

rcs.Close

db.Close

Text1.Text = account_form.Text1.Text

Text2.Text = account_form.Label2.Caption

Text5.Text = account_form.Label3.Caption

End Sub

```


(29) Source Code of Water Payment Program

```
Private Sub Command1_Click()

Dim db As Database

Dim rcs As Recordset

Dim tmp_transaction As String

If Val(Text5.Text) - Val(Text6.Text) - 10 < 100 Then

    MsgBox "ยอดเงินในบัญชีไม่เพียงพอกับค่าไฟฟ้า"

Exit Sub

End If

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("Ticket_pay", dbOpenDynaset)

rcs.AddNew

rcs![Receipt_ID] = Text4.Text

rcs![Account_id] = Text1.Text

rcs![Ticket_number] = Text7.Text

rcs![Month] = Combo1.List(Combo1.ListIndex)

rcs![Ticket_Type_ID] = 2

rcs![total_amount] = (Val(Text5.Text) - Val(Text6.Text) - 10)

rcs![Date] = Date

rcs![Amount] = Trim(Text6.Text)

rcs.Update

rcs.Close
```

```

Set rcs = db.OpenRecordset("SELECT transaction_id FROM
transaction_table", dbOpenDynaset)

If rcs.RecordCount = 0 Then

    tmp_transaction = "10000"

Else

    rcs.MoveLast

    tmp_transaction = Val(rcs![transaction_id]) + 1

End If

rcs.Close

Set rcs = db.OpenRecordset("SELECT * FROM transaction_table",
dbOpenDynaset)

rcs.AddNew
rcs![transaction_id] = tmp_transaction
rcs![Account_id] = Text1.Text
rcs![transac_type_id] = 2

rcs![Account_Balance] = (Val(Text5.Text) - Val(Text6.Text) - 10)
rcs![Date_Tran] = Date
rcs![Amount] = Trim(Text6.Text)

rcs![Branch_id] = 0

rcs![Natrive] = "WTP"      ' Water Payment

rcs.Update

rcs.Close

db.Close

update_amount Text1.Text, (Val(Text5.Text) - Val(Text6.Text) - 10)

```

MsgBox "รายการฝากเงินดำเนินการเรียบร้อยแล้ว"

Unload Me

End Sub

Private Sub update_amount(ID As String, Balance As Currency)

Dim db As Database

Dim rcs As Recordset

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT * FROM Account_table WHERE
Account_id='" & ID & "'", dbOpenDynaset)

rcs.Edit

rcs![Balance_Total] = Balance

rcs.Update

rcs.Close

db.Close

End Sub

Private Sub Command2_Click()

Unload Me

End Sub

Private Sub Form_Load()

Dim db As Database

Dim rcs As Recordset

Text3.Text = Date

```

Set db =
DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")
Set rcs = db.OpenRecordset("SELECT Receipt_id FROM Ticket_pay",
dbOpenDynaset)
If rcs.RecordCount = 0 Then
    Text4.Text = "10000"
Else
    rcs.MoveLast
    Text4.Text = Val(rcs![Receipt_ID]) + 1
End If
rcs.Close
db.Close
Text1.Text = account_form.Text1.Text
Text2.Text = account_form.Label2.Caption
Text5.Text = account_form.Label3.Caption
End Sub

```

(30) Source Code of Withdrwal Transaction Program

```

Private Sub Command1_Click()
    Dim db As Database
    Dim rcs As Recordset
    If Text6.Text < 100 Then
        MsgBox "ไม่สามารถถอนเงินต่ำกว่า 100 บาทได้"
        Text6.SetFocus
    Exit Sub

```

End If

If Val(Text5.Text) - Val(Text6.Text) < 100 Then

MsgBox "จำนวนเงินที่ถอนเกินบัญชี"

Text6.Text = ""

Text6.SetFocus

Exit Sub

End If

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT * FROM transaction_table",
dbOpenDynaset)

rcs.AddNew

rcs![transaction_id] = Text4.Text

rcs![Account_id] = Text1.Text

rcs![transac_type_id] = 2

rcs![Account_Balance] = Val(Text5.Text) - Val(Text6.Text)

rcs![Date_Tran] = Date

rcs![Amount] = Trim(Text6.Text)

rcs![Branch_id] = 0

rcs![Natrive] = "WDT" ' Withdrawal Transaction

rcs.Update

rcs.Close

db.Close

update_amount Text1.Text, Val(Text5.Text) - Val(Text6.Text)

MsgBox "ข้อมูลการถอนเงินได้ทำเรียบร้อยแล้ว"

Unload Me

End Sub

Private Sub Command2_Click()

Unload Me

End Sub

Private Sub update_amount(ID As String, Balance As Currency)

Dim db As Database

Dim rcs As Recordset

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

Set rcs = db.OpenRecordset("SELECT * FROM Account_table WHERE

Account_id='" & ID & "'", dbOpenDynaset)

rcs.Edit

rcs![Balance_Total] = Balance

rcs.Update

End Sub

Private Sub Form_Load()

Dim db As Database

Dim rcs As Recordset

Text3.Text = Date

Set db =

DBEngine.Workspaces(0).OpenDatabase("C:\bank\Bank_db.mdb")

```
Set rcs = db.OpenRecordset("SELECT transaction_id FROM  
transaction_table", dbOpenDynaset)  
  
If rcs.RecordCount = 0 Then  
    Text4.Text = "10000"  
  
Else  
    rcs.MoveLast  
  
    Text4.Text = Val(rcs![transaction_id]) + 1  
  
End If  
  
rcs.Close  
db.Close  
  
Text1.Text = account_form.Text1.Text  
Text2.Text = account_form.Label2.Caption  
Text5.Text = account_form.Label3.Caption  
End Sub
```


4.3 Test Plan

System testing is a critical process. Testing of programs, sub systems, and the total system is essential to the quality assurance of software. It is done to turn up the problems before the system is actually used. The common bad view of testing is that there is no error in the programs. Actually, the most important thing is the understanding that testing is the process of executing a program with the explicit intention of finding errors that make the program fail. The successful test is one that can find an error in program.

The following tests are essential and recommended.

- (1) Unit testing (essential) ensures that the stand-alone program fixes the bug without side effects.
- (2) System Testing (essential) ensures that entire application, of which the modified program was a part, still works.
- (3) Security and Recovery Testing (essential) ensure that system is secured enough to protect unauthorized users to access into the system, Moreover, if failures happen to the database, the system should be able to recover those data.

The effective testing of program does not guarantee systems reliability. Therefore, reliability must be designed into the system. A test case is the condition that must be tested into the new system. The test case should include the following:

- (1) Input Validation.
- (2) Functionality
 - (a) Input
 - (b) Process

(c) Output

(3) Access Control

After the tester had created the test case, they need to create the test script. Test script is the data test to be keyed in to the new system according to the test case condition. However, the data that is written in the test script are created with the express intention of determining whether the system will process them correctly.

Each finished module will be tested separately with the test case. After having finished testing all the modules, a new test case will be prepared for the testing of the whole program. If any errors are found at this stage, all of them have to be fixed until no error is found after performing the final test by using another test case.

4.4 Conversion

Data conversion is essential before implementing the new system. The system developer should be assured that the data conversion from the exiting to the new system are not different and must be complete and correct. The system developer can check the correctness and completeness of the system by using parallel run concept. By applying this concept, the process will work on both the existing and the new proposed system for a period of time until the total data and the output from the calculation of both system are the same. The system developer will do the data conversion only on the first time of implementing the new system. So the testing of the data conversion occurs only on the first time of implementing a new system. After the system developer assures the completeness and the correctness of the data conversion, they give the new system to the users to test the new system.

V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

From the Cost/Benefit Analysis in Chapter 3, the result is that the breakeven point between accumulated existing system cost and accumulated proposed system cost is 10 months. The payback analysis results in the payback period of 2 years 3 months. For both the breakeven point, please note that year 1 is the starting point. The company's guideline is that all investment must have a payback period less than or equal to three year. The investment in proposed system is a good investment, as it has the payback period of 2 years 3 months.

The proposed system will be constructed based on the Database Client/Server Configuration. The application programs will be installed by every client as they execute program. The users can not change the source code of the program by themselves. When the user key input data, all data are kept in both the database server and backup database server. It is for database server to lose or destroy.

Table 5.1 shows the time performance on each process of the proposed system compared with the existing system.

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

Process	Existing System	Proposed System
New Customer	10 minutes	5 minutes
Deposit Transaction	5 minutes	2 minutes
Withdrawal Transaction	20 minutes	2 minutes
Transfer Transaction	20 minutes	2 minutes
Other Payment Transaction	20 minutes	2 minutes
Maintain Transaction	10 minutes	5 minutes
Cancel Transaction	10 minutes	5 minutes
Produce Report	2 hours 30 minutes	30 minutes
Total	4 hours 5 minutes	53 minutes

The above table shows that each process of the proposed system consumes much less time than each process of the existing system.

For the Add New Customer Process, the existing system needs the user to look up the customer's profile in the book before adding new customer and print the customer's passbook manually so it used time greater than the proposed system.

For the Deposit Transaction Process, the existing system needs the supervisor to authorize transaction manually and need to write the transaction in the slip so it used time greater than the proposed system.

For the Withdrawal and Transfer Transaction Process, the existing system needs the user to look up and calculate the customer's balance manually before allowing the customer to withdraw or transfer and needs the supervisor to authorize transaction

manually and needs to write the transaction in the slip so it used time greater than the proposed system.

For the Other Payment Transaction Process, the existing system needs the user to look up and calculate the customer's balance manually before allowing the customer to withdraw and needs the supervisor to authorize transaction manually and needs to write the transaction in the slip and books for other payment transaction so it used time greater than the proposed system.

For the Maintain or Cancel Transaction Process, the existing system needs the user to look up and calculate the customer's balance manually and needs to look up the original slip before maintaining or canceling the transaction so it used time greater than the proposed system.

For the Produce Report Process, the existing system needs the user to look up, copy and prepare the report manually. The user will use Microsoft Excel to produce the report. They can produce only deposit transaction report, withdrawal transaction report and other payment transaction report, because it spends a lot of time. So it used time greater than the proposed system.

In the proposed system, all the processes will be automated by the computerized system. So, it can be concluded that the proposed system is more efficient and effective than the existing system.

In conclusion, the proposed system helps reduce the number of staffs and time for processing, increase security and control, solve the problem of manual system, decrease the high maintenance cost, and support the management's decision making with the accuracy and completeness of the information and reports.

5.2 Recommendations

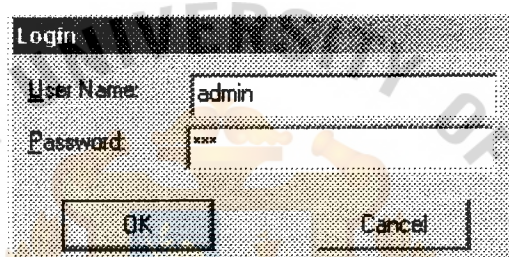
After the proposed system is implemented, the company should continuously monitor the working and the processing of the new proposed system and look at the feedback of the new system until the end of period of time. After that the company should change or develop the new system to be effective and efficient. The company should train the user and make the manual of the procedure process for the new user in using the Customer Service Information System.

Besides concentrating in the business procedure process, the company should consider the security and control, too. The security and control is essential for the company to prevent unauthorized users to access to the Customer Service Information System. The new system should have the user profile for granting the level of authority to access the functions and the database.

In the future, the company may want to develop the computerized system for other departments, or extend the system to other departments. The studying, experience and results from implementing this proposed system will greatly benefit and can be applied by the company.



APPENDIX A
SCREEN DESIGN



A screenshot of a 'Login' dialog box. The dialog has a title bar labeled 'Login'. It contains two input fields: 'User Name' with the text 'admin' and 'Password' with masked characters 'xxxx'. Below the fields are two buttons: 'OK' and 'Cancel'.

Login	
User Name:	admin
Password:	xxxx
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

Figure A.1. Login Form.

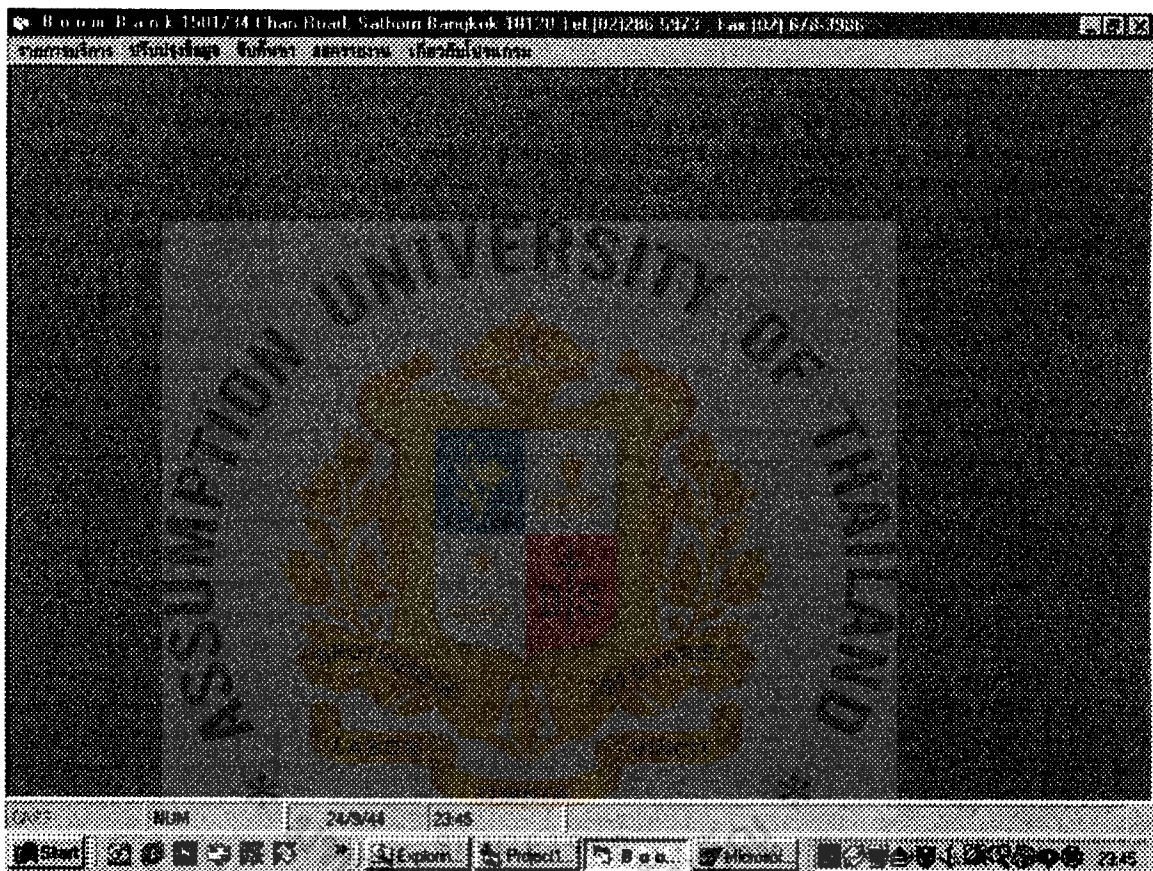


Figure A.2. Main Menu Form.



Figure A.3. Main Menu for Input the Transaction.

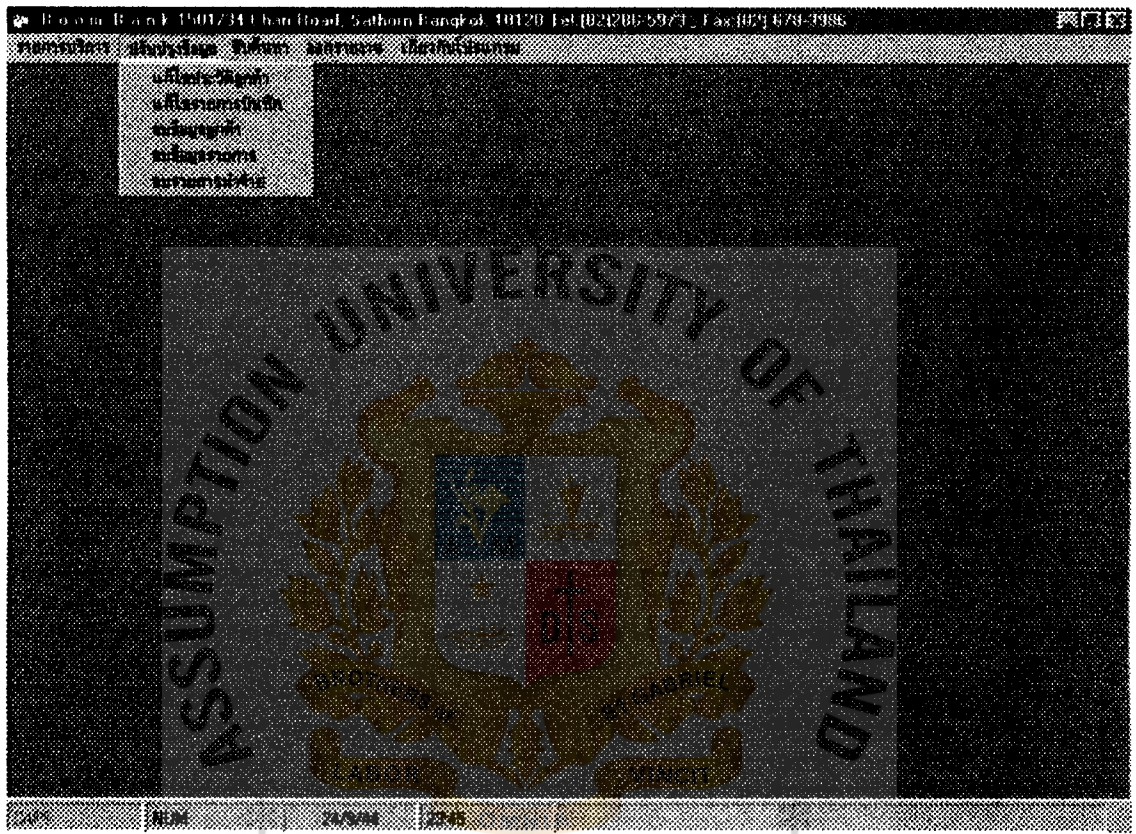


Figure A.4. Main Menu for Maintenance Transaction.

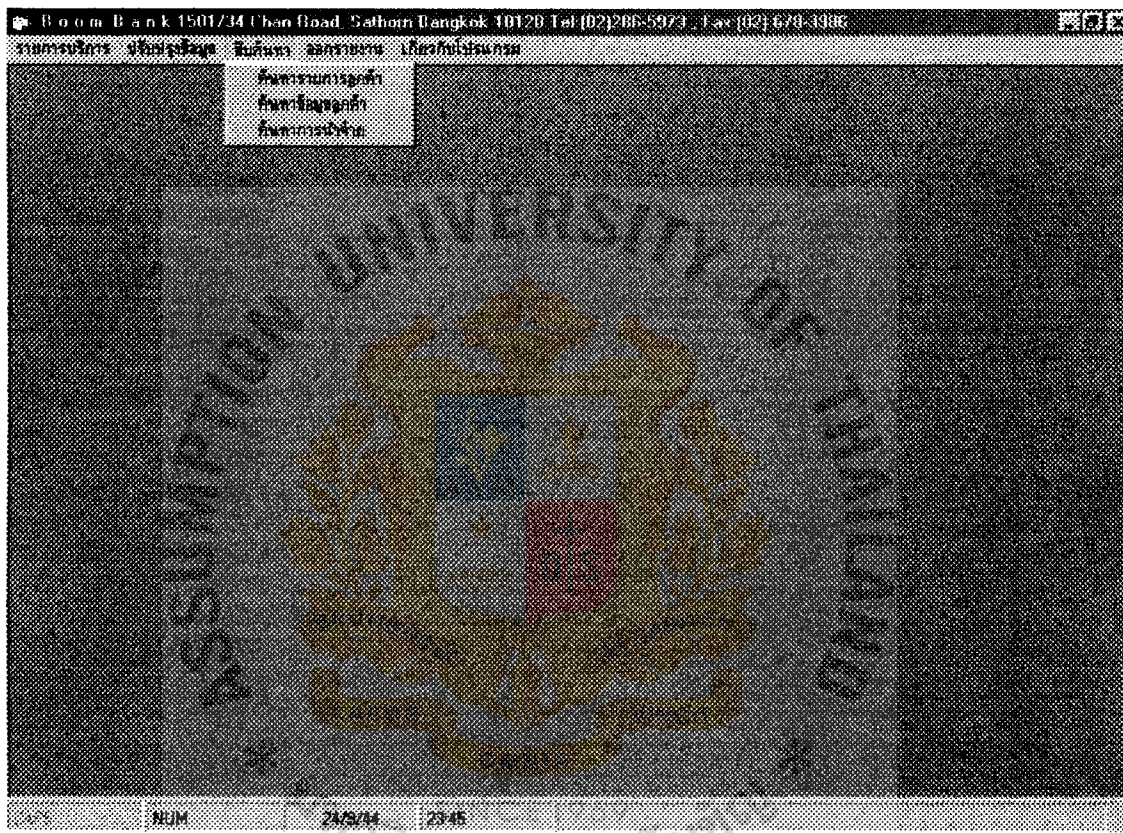


Figure A.5. Main Menu for Inquiry Information.

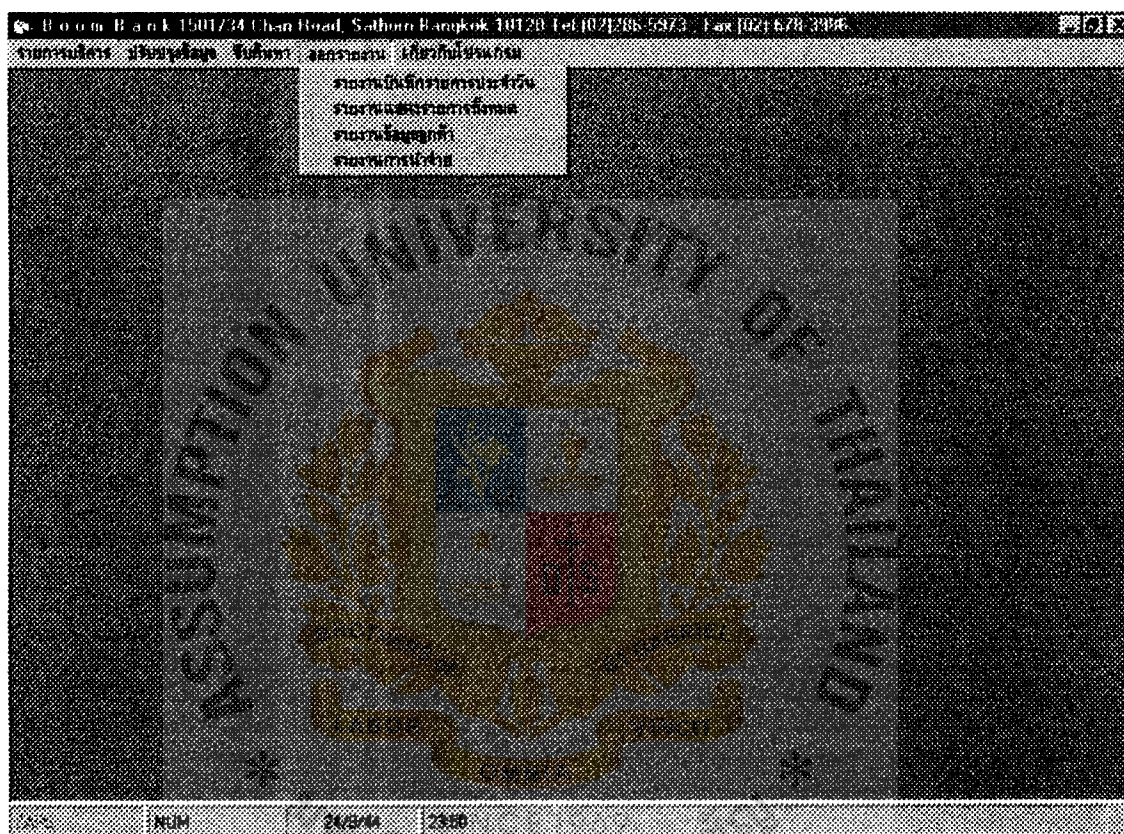


Figure A.6. Main Menu for Management Report.



Figure A.7. Main Menu for about the Programming.

Boom Bank 1501/34 Chan Road, Sathorn Bangkok 10120 Tel (02) 206-5973 Fax (02) 678-3966

บริการสินเชื่อ บริการเงินกู้ บริการออมทรัพย์ บริการบัตรเครดิต

หน้าใหม่: 16.000

Boom Bank Company Limited

1501/34 Chan Road, Sathorn Bangkok 10120 Tel (02) 206-5973 Fax (02) 678-3966

แบบฟอร์มข้อมูลลูกค้า

ชื่อจริง: นามสกุล:

เลขบัตรประชาชน:

ชื่อ:

นามสกุล:

เลขโทรศัพท์มือถือ:

27/5 NEM 24/5/44 7281

Figure A.8. New Customer Information Form for Customer Service Department.

Boom Bank 1501/34 Chan Road, Sathorn Bangkok 10120 Tel (02)206-5973 , Fax (02) 679-3986
ธนาคารบูม จำกัด 1501/34 ถนนชาน ถนนสาทร กรุงเทพมหานคร 10120 โทรศัพท์ (02) 206-5973 โทรสาร (02) 679-3986

เปิดบัญชีใหม่

Boom Bank Company Limited.
1501/34 Chan Road, Sathorn Bangkok 10120 Tel (02)206-5973 , Fax (02) 679-3986

เปิดบัญชีใหม่

เลขบัญชี 100000001 วันที่เปิดบัญชี 10/4/01

เจ้าของบัญชี WINAI APINANTAKULCHAI

ประเภทบัญชี *

บัญชี

ยอดเงินเปิดบัญชี 100 บาท

CAPS NIM 4/10/44 2216

Figure A.9. New Account Number Form for Customer Service Department.

Boon Bank 1501/34 Chan Road, Sathorn Bangkok 10120 Tel: (02) 206-5372 Fax: (02) 676-2006

รายงานการปฏิบัติงาน ประจำเดือน ธันวาคม ๒๕๕๓

เปิดบัญชีใหม่

Account Number

สาขา

สาขา

ASSUMPTION UNIVERSITY OF THAILAND

CAPS NUM 4/10/44 23:17

Figure A.10. Screen of Input Transaction Form for Customer Service Department.

Room Bank 1401/14 Chan Road, Sathorn Bangkok 10120 Tel (02)206-5977, Fax (02) 678-1986

ธนาคารกรุงเทพ จำกัด (มหาชน) สาขาสาทร

Transaction Form [10/4/01]

Account No. 100000001 Name WINAI APINATAKULCHAI

Transaction Type	Transaction Date
Transaction Amount	Transaction Time
Transaction Branch	Transaction Location
Transaction Remarks	Transaction Remarks

CAPS BLN 4/10/01 2217

Figure A.11. Screen of Input Transaction Form for Customer Service Department (Continued).

Boom Bank 1501/34 Chan Road, Sathorn Bangkok 10120 Tel (02)206-5973 Fax (02) 578-3966

Boom Bank Company Limited.
1501/34 Chan Road, Sathorn Bangkok 10120 Tel (02)206-5973 Fax (02) 578-3966

บริการฝากเงิน

ประเภท Transaction	10001	วันที่ฝากเงิน	10/4/01
เลขบัญชี	100000001		
ชื่อผู้ฝาก	WINAI APINATAKULCHAI		
จำนวนเงินฝาก	100	บาท	
จำนวนเงินฝาก		บาท	

ฝากเงิน

ถอนเงิน

SAFS NUM 4/10/01 2332

Figure A.12. Deposit Transaction Form for Customer Service Department.

Boom Bank 1501/14 Chan Road, Sathorn Bangkok 10120 Tel (02) 266-5973, Fax (02) 670-1936
 ธนาคารบม จำกัด (มหาชน) สำนักงาน สาทร กรุงเทพมหานคร

Boom Bank Company Limited
 1501/14 Chan Road, Sathorn Bangkok 10120 Tel (02) 266-5973, Fax (02) 670-1936

ใบการถอนเงิน

Transaction: 10002 วันที่ถอนเงิน 10/4/01

เลขที่บัญชี 100000001

บัญชี WINAI APINATAKULCHAI

จำนวนเงินที่ถอน 600 บาท

จำนวนเงินคงเหลือ 50 บาท

ถอน

ยกเลิก

CAPS REIM 4/10/01 23:18

Figure A.13. Withdrawal Transaction Form for Customer Service Department.

Boom Bank 1501/34 Chan Road, Sathorn Bangkok 10120 Tel (02) 206-5973, Fax (02) 678-3986

ธนาคารบม จำกัด (มหาชน) สำนักงานใหญ่ ถนนสาทรใต้ กรุงเทพมหานคร 10120

เลขบัญชี 100000001 ชื่อบัญชี WINAI APINATAKULCHAI

การโอนเงิน

Boom Bank Company Limited.

1501/34 Chan Road, Sathorn Bangkok 10120 Tel (02) 206-5973, Fax (02) 678-3986

บันทึกรายการโอนเงิน

รหัสโอน Transaction: 10003 วันที่โอนเงิน 10/4/01

เลขที่บัญชี 100000001

ชื่อผู้โอน WINAI APINATAKULCHAI

ยอดเงินโอน 500 บาท

เลขที่บัญชีโอน Search

ชื่อผู้รับโอน

จำนวนเงินโอน บาท

CAPS NUJ 4/10/44 23:18

Figure A.14. Transfer Transaction Form for Customer Service Department.

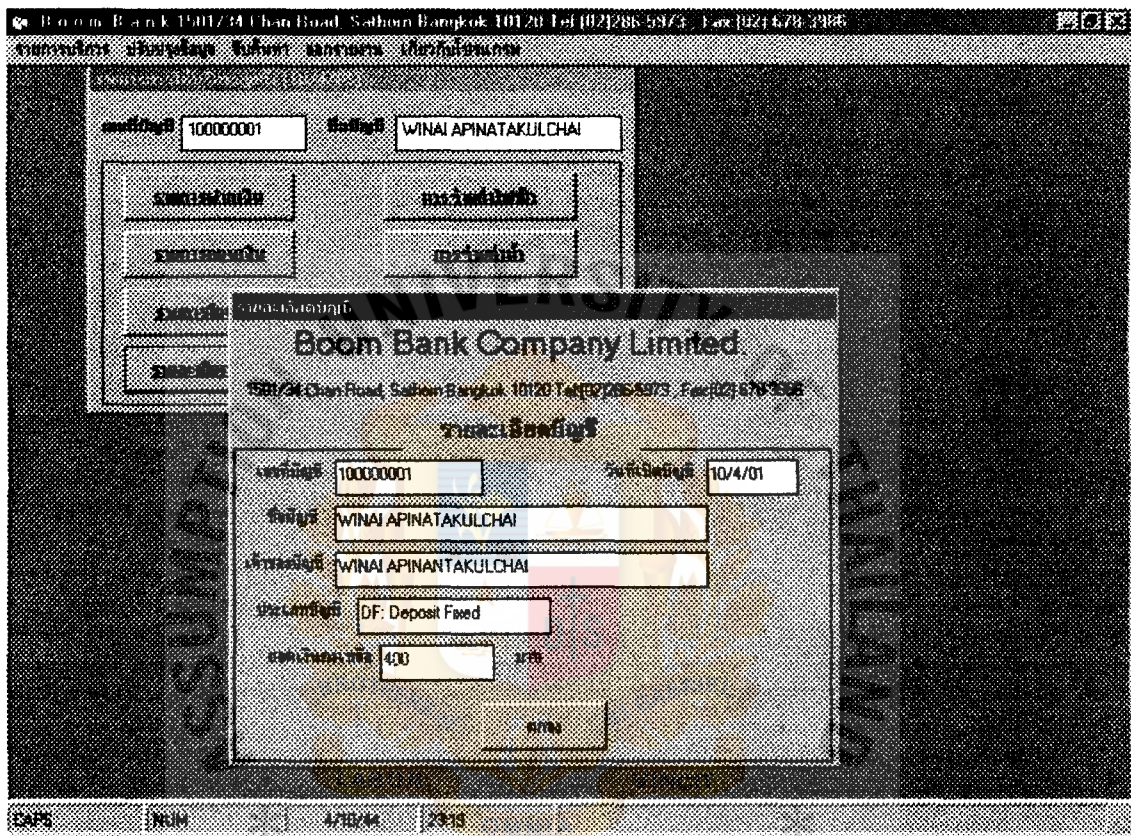


Figure A.15. Screen of Customer Account Balance for Customer Service Department.

Boom Bank 1501/34 Chan Road, Sathorn Bangkok 10120 Tel: (02) 286-5973 Fax: (02) 678-3986

การโอนเงิน: บัญชีออมทรัพย์ บัญชีเงินฝากออมทรัพย์ บัญชีเงินฝากออมทรัพย์

การโอนเงิน

Boom Bank Company Limited.
1501/34 Chan Road, Sathorn Bangkok 10120 Tel: (02) 286-5973 Fax: (02) 678-3986

บริการการจ่ายค่าไฟฟ้า

จำนวนเงิน	10000	วันที่จ่ายเงิน	10/4/01
เลขที่บัญชี	100000001		
ชื่อบัญชี	WINAI APINATAKULCHAI		
ยอดเงินโอนบัญชี	400	บาท	

จำนวนเงิน		วันที่จ่ายเงิน	
ยอดเงินโอนบัญชี		บาท	

ตกลง

ยกเลิก

CAPS NUM 4/10/01 23:19

Figure A.16. Electricity Payment Transaction for Customer Service Department.

17/10/44 22:21
SINCE 1969
มหาวิทยาลัยอัสสัมชัญ

17/10/44 22:21
SINCE 1969
มหาวิทยาลัยอัสสัมชัญ

Boom Bank 1501/34 Charon Road, Sathon Bangkok 10120 Tel: (02) 206-5973 , Fax: (02) 676-2906
 ธนาคารบม จำกัด (มหาชน) บริษัทมหาชน จำกัด (มหาชน)

เลขที่บัญชี: 1000000001 เลขที่บัตร: WINAI APINATAKULCHAI

Boom Bank Company Limited.
 1501/34 Charon Road, Sathon Bangkok 10120 Tel: (02) 206-5973 , Fax: (02) 676-2906

บริการชำระเงินค่าโทรศัพท์

หมายเลขโทรศัพท์	70000	วันที่ชำระเงิน	10/4/01
เลขที่บัญชี	100000001		
ชื่อลูกค้า	WINAI APINATAKULCHAI		
ยอดเงินโอน	260 บาท		

หมายเลขโทรศัพท์ 01		รหัสผ่าน	
ยอดเงินโอน		รหัสผ่าน	

DTAC 1800
GSM 1800

ชำระเงิน

Figure A.18. Mobile Payment transaction for Customer Service Department.

Room Bank 1501/34 Chan Road, Sathorn Bangkok 10120 Tel (02)256-5973 Fax (02) 678-3986

ธนาคารบูม จำกัด

Boom Bank Company Limited.

1501/34 Chan Road, Sathorn Bangkok 10120 Tel (02)256-5973 Fax (02) 678-3986

เลขบัญชี: 1000000000 วันที่เปิดบัญชี: 9/30/01

ประเภทบัญชี: DS: Deposit Saving

มีเงินฝาก: พ.ศ. ๒๕๔๖ เดือน กรกฎาคม

สาขา: Haruethai สาขา: Berisak

เลขที่บัตรประชาชน: 3100400306551

ที่อยู่: 1501/34 Chan Road, Thungwatdon, Sathorn, bankok 10120

บริษัท: KPMG Company

เลขที่โทรศัพท์มือถือ: 01-8702196

รับทราบ: _____

อนุมัติ: _____

Figure A.19. Maintain Customer Information Form for Customer Service Department.

Boom Bank 1501/34 Chan Road, Sathorn Bangkok 10120 Tel(02)286-5973 Fax(02)579-3986

ธนาคารบมบง บมบงบมบง บมบงบมบง บมบงบมบง

บริการธนาคารบมบง

Boom Bank Company Limited

1501/34 Chan Road, Sathorn Bangkok 10120 Tel(02)286-5973 Fax(02)579-3986

แก้ไขรายการฝากเงิน

หมายเลข Transaction:	10001	วันที่ฝากเงิน:	10/4/01
เลขที่บัญชี:	100000001		
ชื่อผู้ฝาก:	WINAJ APINATAKULCHAI		
ยอดเงินในบัญชี:	100	บาท	
จำนวนเงินที่ฝาก:	500	บาท	
<input type="button" value="ตกลง"/>		<input type="button" value="ยกเลิก"/>	

CAPS NUM 4/10/44 2223

Figure A.20. Maintain Input Transaction Form for Customer Service Department.

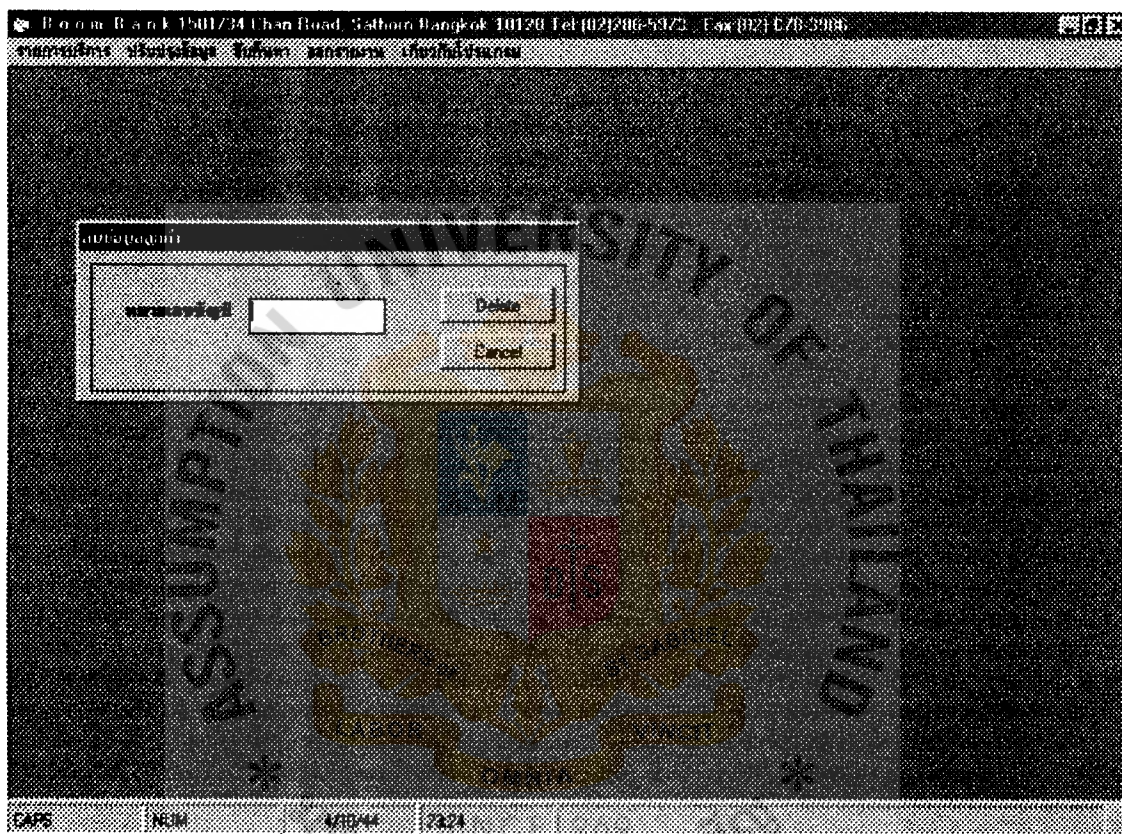


Figure A.21. Delete Customer Information Form for Customer Service Department.

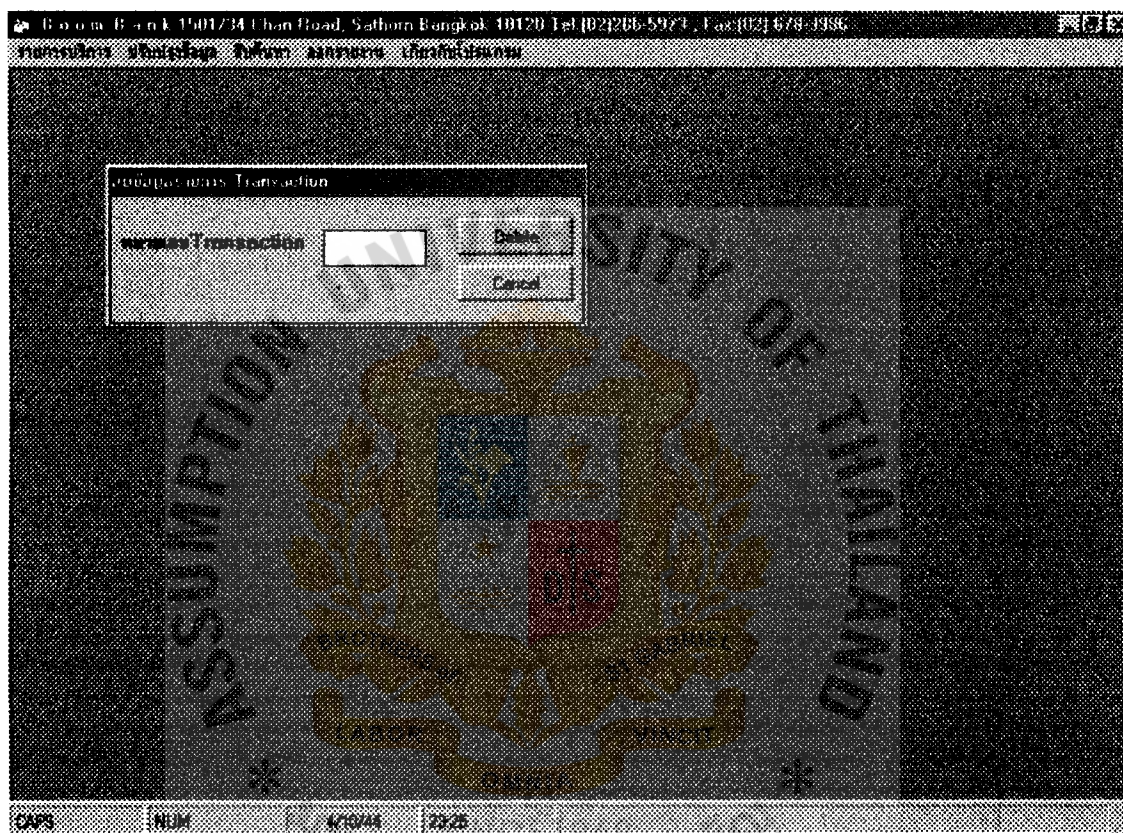


Figure A.22. Delete Input Transaction Form of Deposit, Withdrawal and Transfer for Customer Information Department.



Figure A.23. Delete Payment Transaction Form of Other Payment for Customer Service Department.

Boom Bank 1011/34 Chan Road, Sathorn Bangkok 10120 Tel (02) 206-5973 Fax (02) 670-3906
 ธนาคารบม จำกัด (มหาชน) สำนักงาน สาขาสาทร กรุงเทพมหานคร

Boom Bank Company Limited
 1011/34 Chan Road, Sathorn Bangkok 10120 Tel (02) 206-5973 Fax (02) 670-3906

ค้นหารายการลูกค้า

Find Remark Code
 Cancel

Date Transaction	Transaction ID	Type Transaction	Amount	Account Pay	Remark Code
9/30/01	10000	ฝากเงิน	10000		DPT
10/4/01	10006	ถอนเงิน	100		MPP
10/4/01	10005	ถอนเงิน	20		WTP
10/4/01	10004	ถอนเงิน	100		ECP
10/4/01	10003	ถอนเงิน	100	1000000000	TFT
10/4/01	10002	ถอนเงิน	100		WDT

Record 7

CAPE NUM 4/10/44 2325

Figure A.24. Screen of Inquiry Customer Transaction by Customer Account Number for Customer Service Department.

Boom Bank 1501/34 Chan Road, Sathorn Bangkok 10120 Tel (02) 286 5973 , Fax (02) 678 3986
 รายงานผลการปฏิบัติงาน ประจำวัน สืบค้นข้อมูล การดำเนินงาน เกี่ยวกับโปรแกรม

Boom Bank Company Limited
 1501/34 Chan Road, Sathorn Bangkok 10120 Tel (02) 286 5973 , Fax (02) 678 3986

ค้นหาข้อมูลลูกค้า

เลขที่บัญชี

Find
 Cancel

หมายเลขบัญชี	ชื่อลูกค้า	ชื่อสาขา	ยอดคงเหลือในบัญชี
▶ 100000000	น.ส.สุวิทย์ เบลอศิริรักษ์	Haruehai	100
100000001	WINAI APINATAKULCH	WINAI	600

Record 1

CAPS NUM 4/10/44 23.25

Figure A.25. Screen of Inquiry Customer Information by Customer Account Number for Customer Service Department.

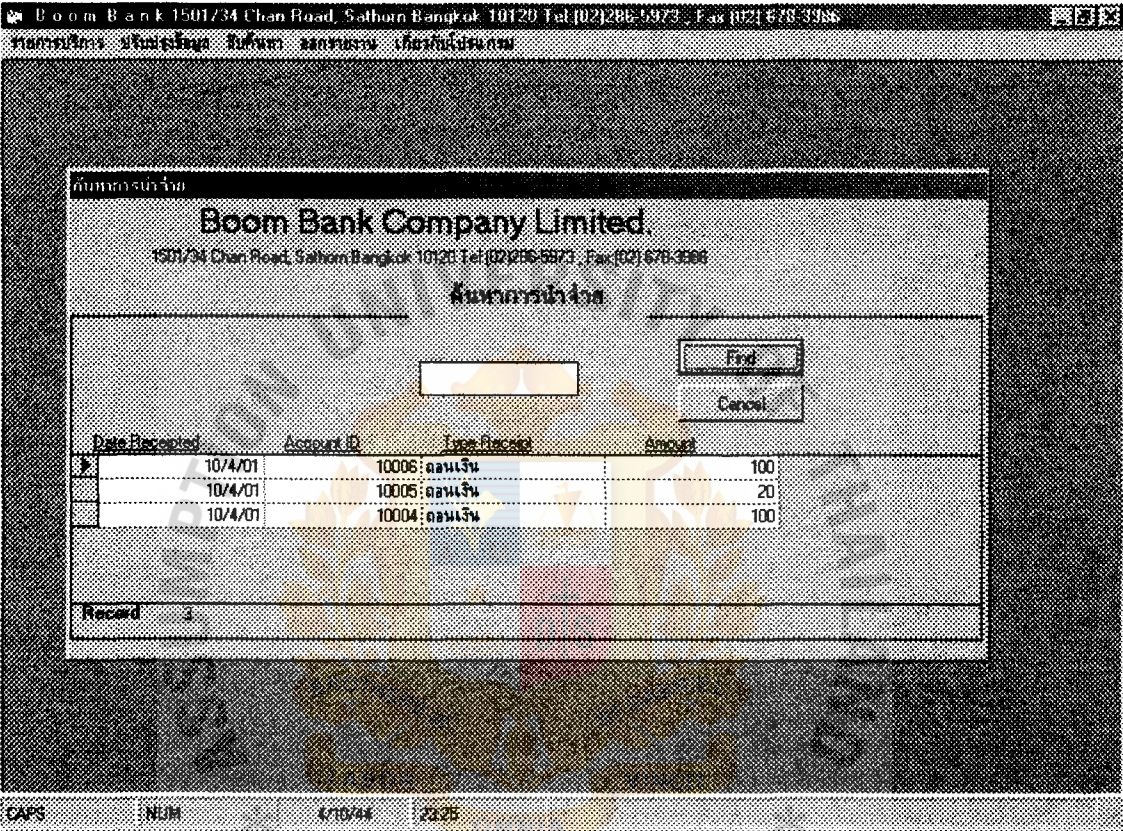


Figure A.26. Screen of Inquiry Payment Transaction by Receipt ID for Customer Service Department.

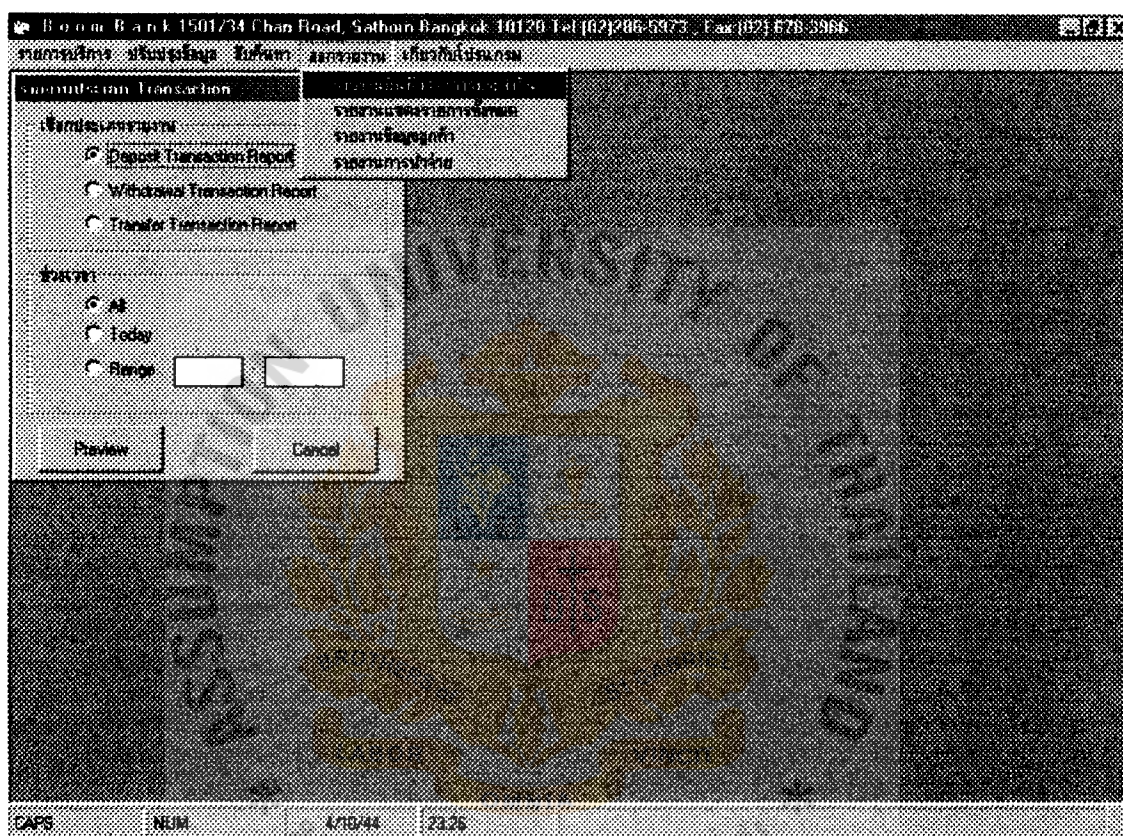


Figure A.27. Screen of Input Transaction Report for Customer Service Department.

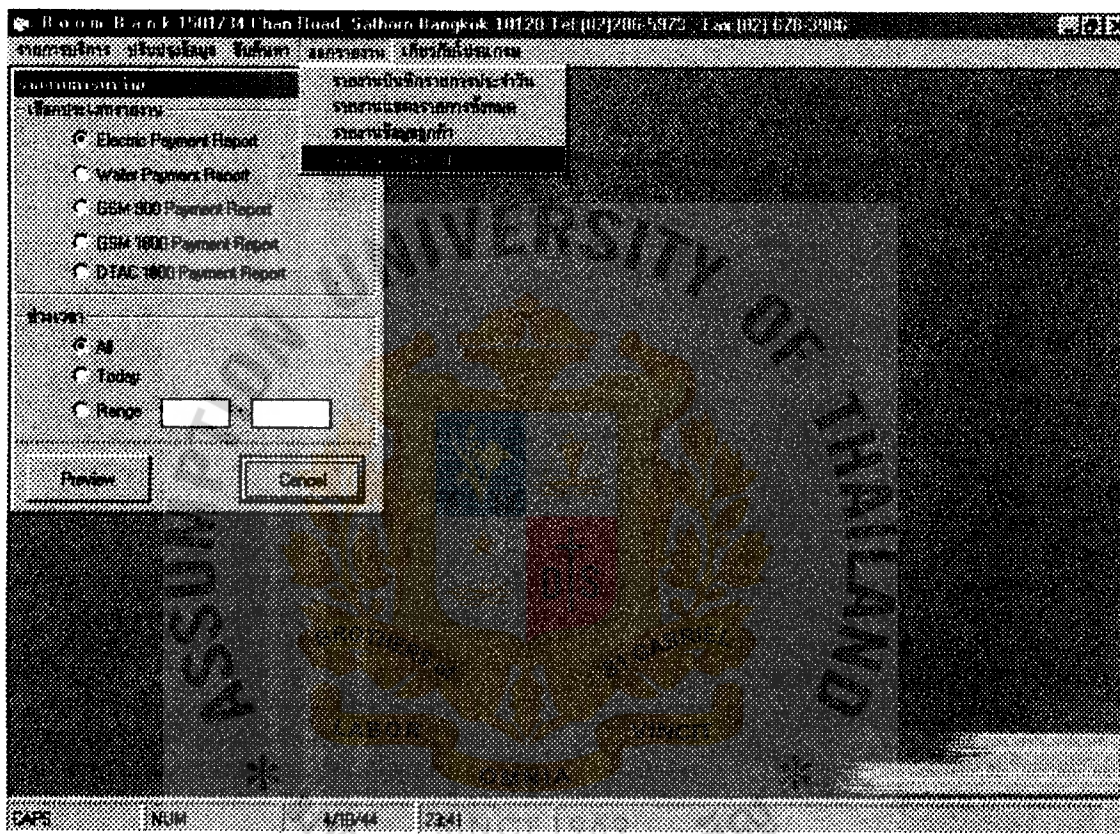


Figure A.28. Screen of Payment transaction Report for Customer Service Department.

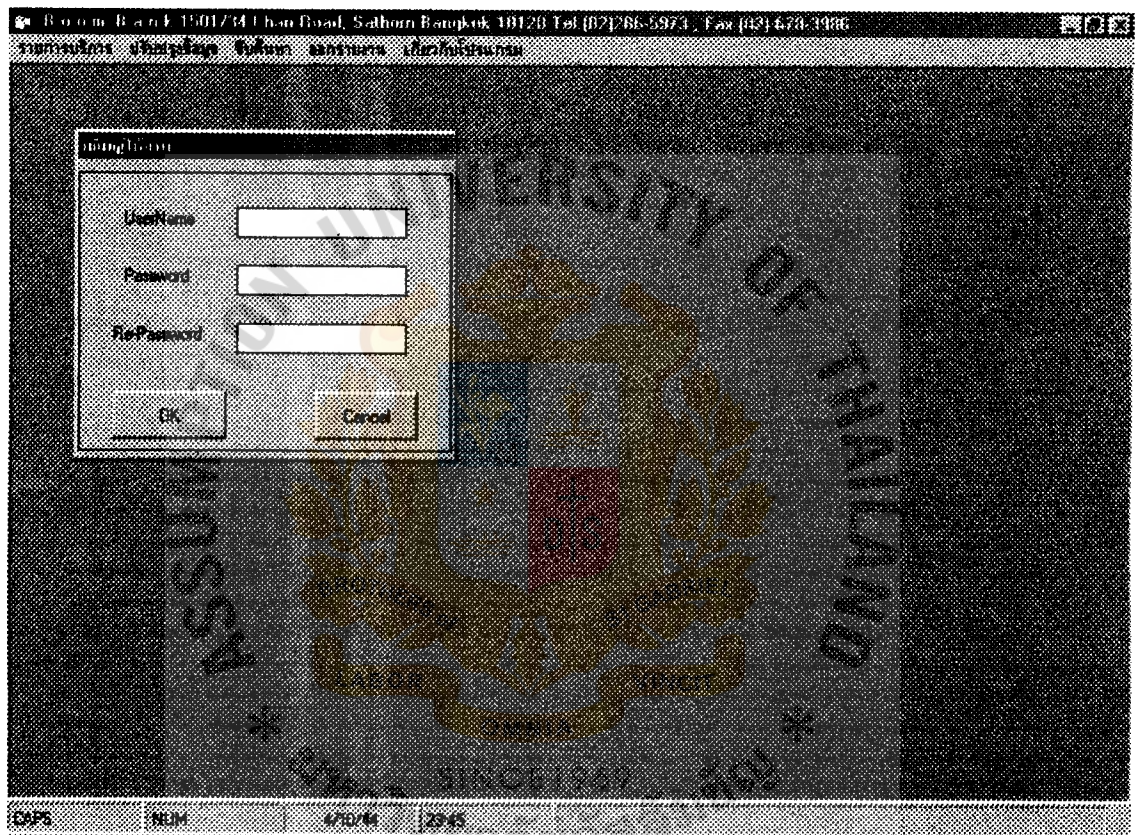


Figure A.29. Change Password.



Deposit Today Transaction Report					
Zoom 100%					
Boom Bank 1601/34 Chan Road, Sathorn Bangkok 10120 Tel:(02)286-6973 , Fax:(02) 678-3986 Deposit Today Transaction Report					
Transaction ID	Account ID	Account Name	Amount	Account Balance	Date
10000	100000000	บ.ส.พาณิชย์	10000	10100	9/30/01
10001	100000001	WJNAI	500	600	10/4/01

Figure B.1. Deposit Transaction Report.

Withdrawal Today Transaction Report					
Zoom: 100%					
<p align="center">Boom Bank</p> <p align="center">1501/34 Chan Road, Sathorn Bangkok 10120 Tel:(02)286-5973 , Fax:(02) 678-3986</p> <p align="center">Withdrawal Today Transaction Report</p>					
Transaction ID	Account ID	Account Name	Amount	Account Balance	Date
10002	100000001	WINAI	100	500	10/4/01
10004	100000001	WINAI	100	290	10/4/01
10005	100000001	WINAI	20	260	10/4/01
10006	100000001	WINAI	100	150	10/4/01

Figure B.2. Withdrawal Transaction Report.

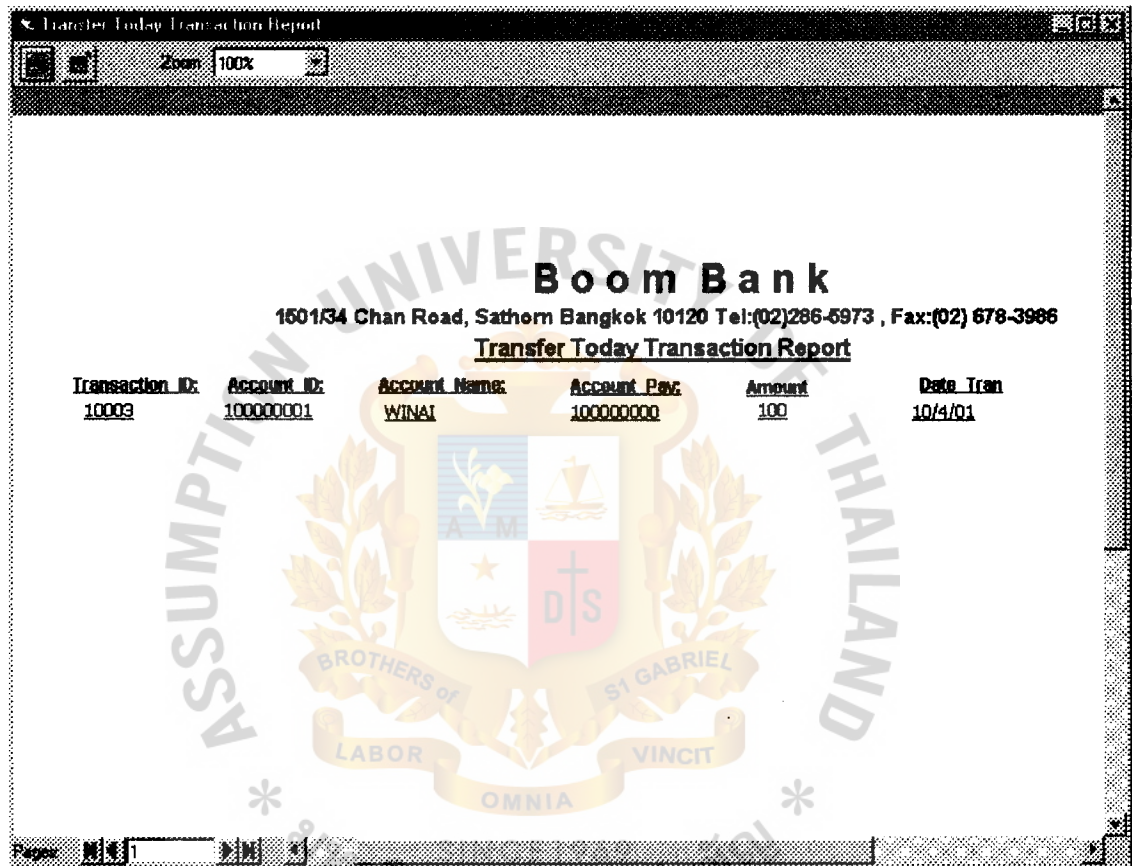


Figure B.3. Transfer Transaction Report.

▼ List Of Transactions Report

Zoom: 100%

Boom Bank
 1501/34 Chan Road, Sathorn Bangkok 10120 Tel:(02)286-5973 , Fax:(02) 678-3996

List Of Transactions Report

Account ID	Date Tran	Transaction ID	Notrive	Amount
100000001	10/4/01	10001	DPT	500
100000001	10/4/01	10002	WDT	100
100000001	10/4/01	10003	TFT	100
100000001	10/4/01	10004	ECP	100
100000001	10/4/01	10005	WTP	20
100000001	10/4/01	10006	MPP	100

DPT = Deposit Transaction WDT = Withdrawal Transaction TFT = Transfer Transaction ECP = Electric Payment WTP = Water Payment MPP = Mobile Phone Payment

Page: 1/1

Figure B.4. Customer Transaction Statement Report.

Customer Information Report

Zoom: 100%

Boom Bank

1501/34 Chan Road, Sathorn Bangkok 10120 Tel:(02)286-5973 , Fax:(02) 678-3886

Customer Information Report

Account ID	Account Name	Identiv ID	Customer Name	Address	Telephone	Date
100000000	น.ส.วิมล/น	310040030655	Haruethai Benjasirak	1501/34 Chan Road,	01-8702196	9/30/01
100000001	WINAI	310040030155	WINAI APINANTAKUL	2194 CHAROENKUNG ROAD,	01-6196798	10/4/01

Page: 1/1

Figure B.5. Customer Information Report.

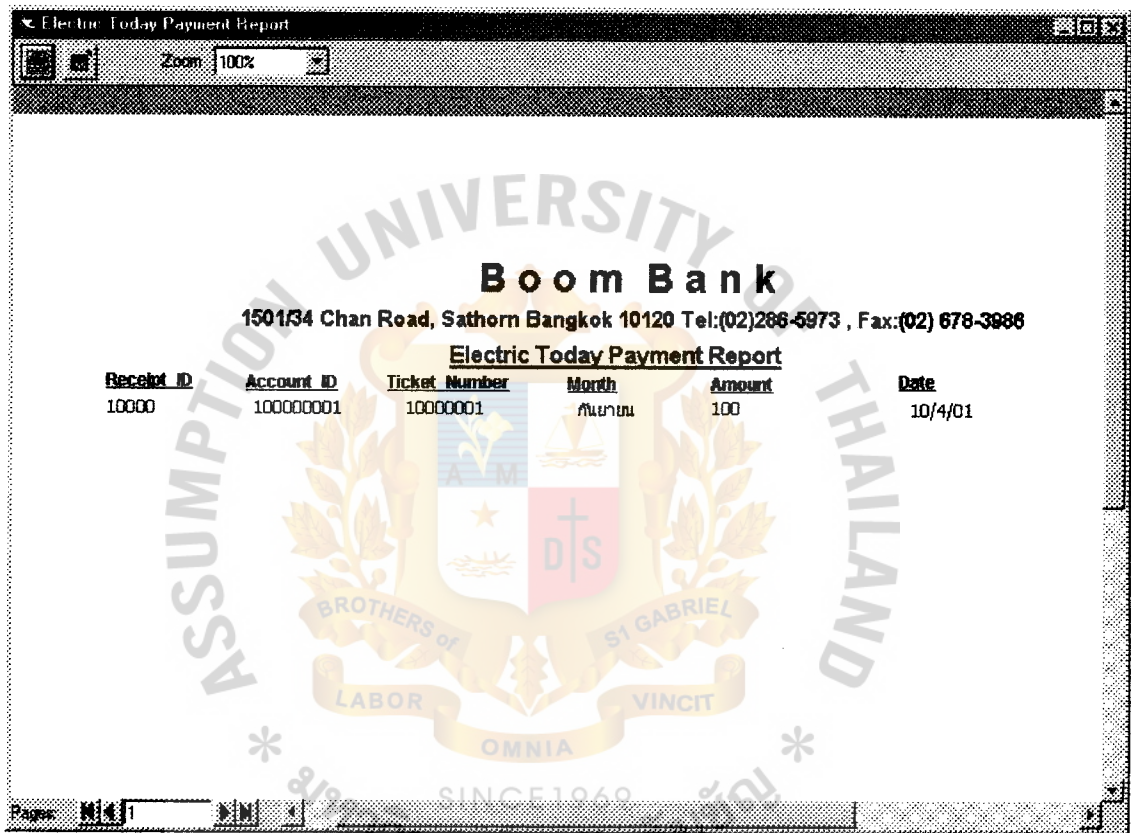


Figure B.6. Electricity Payment Report.

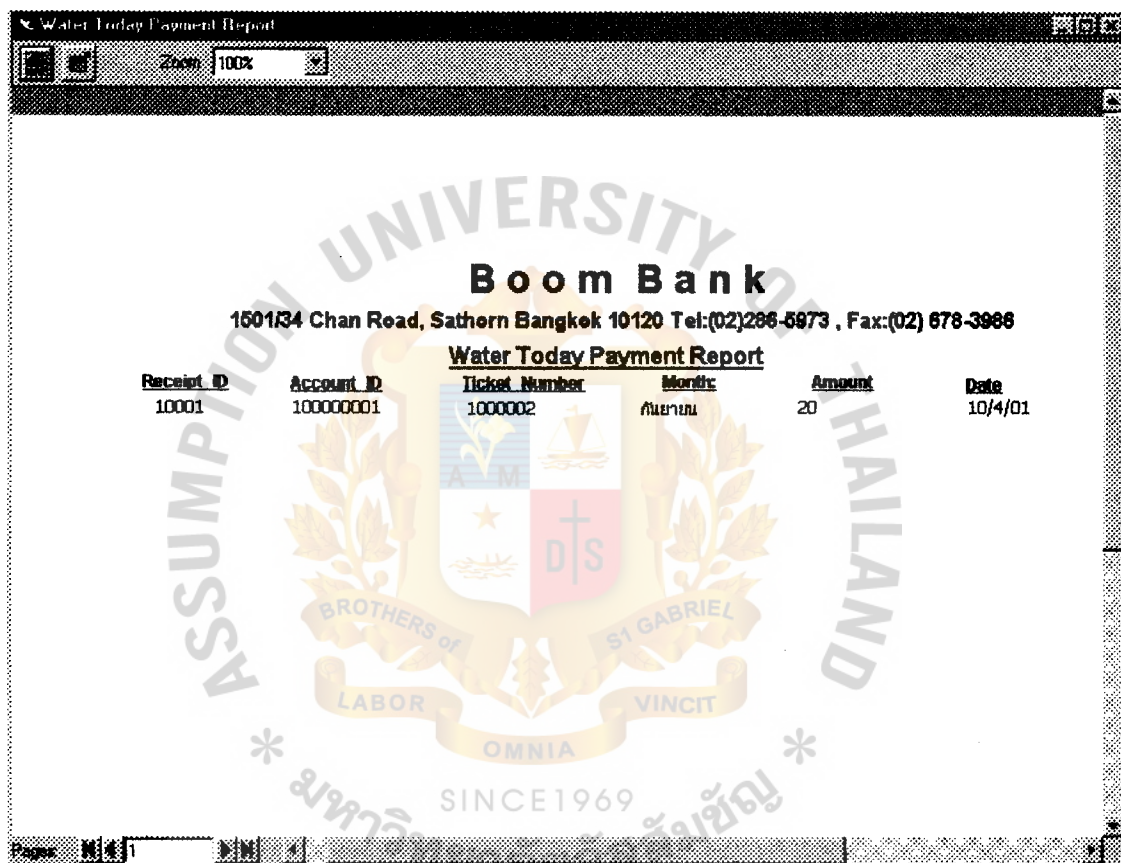


Figure B.7. Water Payment Report.

Boom Bank
1501/34 Chan Road, Sathorn Bangkok 10120 Tel:(02)286-5973 , Fax:(02) 676-3986

GSM 900 Mobile Phone Today Payment Report

<u>Receipt ID</u>	<u>Account ID</u>	<u>Phone Number</u>	<u>Month</u>	<u>Amount</u>	<u>Date</u>
70000	1000000001	6196798	มีนาคม	100	10/4/0

Figure B.8. GSM 900 Payment Report.

GSM 1800 Mobile Phone Today Payment Report					
Zoom 100%					
Boom Bank 1501/34 Chan Road, Sathorn Bangkok 10120 Tel:(02)286-5973 , Fax:(02) 678-3986					
GSM 1800 Mobile Phone Today Payment Report					
Receipt ID	Account ID	Phone Number	Month	Amount	Date
70002	100000001	6196798	สิงหาคม	100	10/4/01

Figure B.9. GSM 1800 Payment Report.

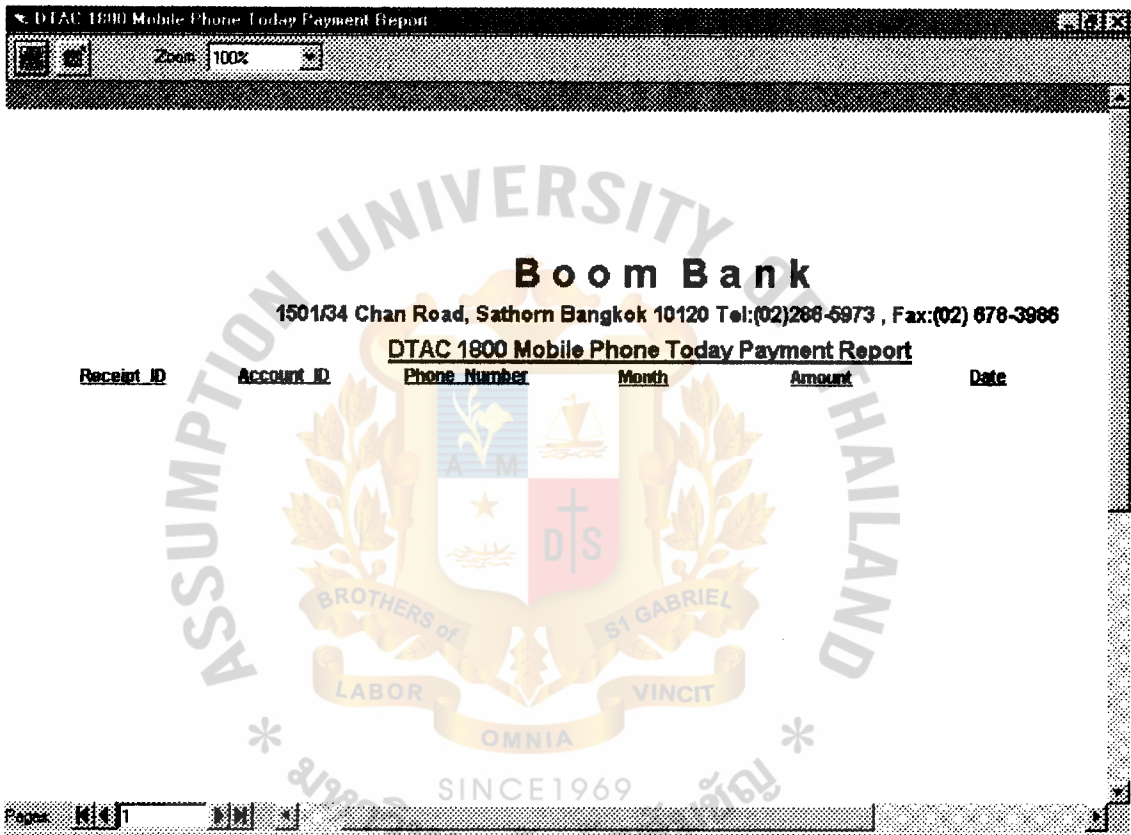


Figure B.10. DTAC 1800 Payment Report.



APPENDIX C
DATABASE DESIGN

Account Database

Table C.1. Structure of Account Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	Account_ID	Text (10)	Y	Y	N			Primary Key
2	ID_Person	Text (13)	Y	N	N	Customer		Attribute
3	Account_Type_ID	Text (2)	Y	N	N	Account Type		Attribute
4	Account_Name	Text (255)	N		N			Attribute
5	Date	Date/Time	N					Attribute
6	Balance_Total	Currency	N					Attribute
7	Branch_ID	Text (2)	Y	N	N	Branch		Attribute

Account Type Database

Table C.2. Structure of Account Type Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	Account_Type_ID	Text (2)	Y	Y	N			Primary Key
2	Account_Type_Name	Text (50)	N		N			Attribute

Branch Database

Table C.3. Structure of Branch Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	Branch_ID	Text (3)	Y	Y	N			Primary Key
2	Branch_Name	Text (50)	N		N			Attribute

Customer Database

Table C.4. Structure of Customer Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	ID_Person	Text (13)	Y	Y	N			Primary Key
2	Customer_Name	Text (30)	N		N			Attribute
3	Customer_sName	Text (50)	N		N			Attribute
4	Address	Text (255)	N		N			Attribute
5	Office_Address	Text (255)	N		N			Attribute
6	Telephone	Text (10)	N		N			Attribute

Phone Payment Database

Table C.5. Structure of Phone Payment Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	Receipt_ID	Text (50)	Y	Y	N			Primary Key
2	Phone_Number	Text (50)	N		N			Attribute
3	Phone_Type_ID	Integer	Y	N		Phone Type		Attribute
4	Account_ID	Text (50)	Y		N	Account		Attribute
5	Amount	Currency	N		N			Attribute
6	Date	Date/Time	N		N			Attribute
7	Total_Amount	Currency	N		N	Account		Attribute
8	Month	Text (50)	N		N			Attribute

Phone Type Payment Database

Table C.6. Structure of Phone Type Payment Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	Phone_Type_ID	Integer	Y	Y				Primary Key
2	Phone_Type_Name	Text (50)	N		N			Attribute

Ticket Payment Database

Table C.7. Structure of Ticket Payment Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	Receipt_ID	Text (50)	Y	Y	N			Primary Key
2	Ticket_Number	Text (50)	N		N			Attribute
3	Account_ID	Text (50)	N		N	Account		Attribute
4	Amount	Integer	N		N			Attribute
5	Total_Amount	Currency	N		N	Account		Attribute
6	Ticket_Type_ID	Currency	N			Ticket Type Payment		Attribute
7	Date	Date/Time	N					Attribute
8	Month	Text (50)	N		N			Attribute

Ticket Type Payment Database

Table C.8. Structure of Ticket Type Payment Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	Ticket_Type_ID	Integer	Y	Y	N			Primary Key
2	Ticket_Type_Name	Text (50)	N		N			Attribute

Transaction Type Database

Table C.9. Structure of Transaction Type Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	Transac_Type_ID	Text (3)	Y	Y	N			Primary Key
2	Transac_Type_Name	Text (50)	N		N			Attribute

Transaction Database

Table C.10. Structure of Transaction Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	Transaction_ID	Integer	Y	Y				Primary Key
2	Account_ID	Text (13)	Y	N	N	Account		Attribute
3	Transaction_Type_ID	Text (3)	Y	N	N	Transaction Type		Attribute
4	Account_Balance	Currency	N		N	Account		Attribute
5	Amount	Currency	N		N			Attribute
6	Date_Trans	Date/Time	N					Attribute
7	Branch_ID	Text (2)	Y	N	N	Branch		Attribute
8	Account_Pay	Text (13)	N		N			Attribute
9	Native	Text (15)	N		N			Attribute

User Database

Table C.11. Structure of User Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	Username	Text (50)	Y	Y	N			Primary Key
2	Password	Text (50)	N		N			Attribute



APPENDIX D
PROCESS SPECIFICATION

PROCESS SPECIFICATION

Table D.1. Process Specification of Process 1.1 Record New Customer.

Item	Description
Process Name:	Record New Customer
Data In:	(1) Customer Information (2) Requirement
Data Out:	(1) Customer ID (2) Data Store D2 (Customer)
Process:	(1) Get necessary customer data, customer name, address, phone number, etc. and assign new Customer ID from the Customer Request Form (2) Record the customer data into Customer Database
Attachment:	(1) Customer (2) Data Store D2 (Customer)

Table D.2. Process Specification of Process 1.2 Record New Customer Account Number.

Item	Description
Process Name:	Record New Customer Account Number
Data In:	(1) Customer ID (2) Data Store D2 (Customer)
Data Out:	(1) Customer Account Number (2) Data Store D1 (Account)
Process:	(1) Get necessary customer detail including name, address, telephone number and office. (2) Select the account type according to the customer's requirement. (3) The system will auto generate the new Account Number (4) Record the account name and account balance in to Account Database
Attachment:	(1) Customer (2) Data Store D2 (Customer)

Table D.3. Process Specification of Process 2.1 Check Valid Customer Account Number.

Item	Description
Process Name:	Check Valid Customer Account Number
Data In:	Customer Account Number
Data Out:	(1) Valid Customer Account Number (2) Data Store D1 (Account)
Process:	(1) Get necessary customer number, customer name and account type (2) Specify the customer account number (3) Check whether the customer account number exists in the database or not
Attachment:	Data Store D1 (Account)

Table D.4. Process Specification of Process 2.2 Record Deposit Transaction.

Item	Description
Process Name:	Record Deposit Transaction
Data In:	(1) Valid Customer Account Number (2) Data Store D1 (Account)
Data Out:	(1) Valid Customer Account Number (2) Data Store D3 (Transaction)
Process:	(1) Get necessary customer account number and account balance (2) The system will auto generate the transaction number (3) Record the deposit transaction including date, amount into the system according to the detail of customer slip
Attachment:	(1) Customer Slip (2) Data Store D1 (Account)

St. Gabriel Library, Au

Table D.5. Process Specification of Process 2.3 Update Customer Account Balance.

Item	Description
Process Name:	Update Customer Account Balance
Data In:	(1) Valid Customer Account Number (2) Data Store D3 (Transaction)
Data Out:	Data Store D1 (Account)
Process:	(1) Get Deposit Transaction (2) Update the account balance according to deposit transaction
Attachment:	Customer's Passbook

Table D.6. Process Specification of Process 3.1 Check Valid Customer Account.

Item	Description
Process Name:	Check Valid Customer Account Number
Data In:	Customer Account Number
Data Out:	(1) Valid Customer Account Number (2) Data Store D1 (Account)
Process:	(1) Get necessary customer number, customer name and account type (2) Specify the customer account number (3) Check whether the customer account number exists in the database or not
Attachment:	Data Store D1 (Account)

Table D.7. Process Specification of Process 3.2 Check Customer Account Balance.

Item	Description
Process Name:	Check Customer Account Balance
Data In:	(1) Valid Customer Account Number (2) Data Store D1 (Account)
Data Out:	(1) Customer Account Balance (2) Data Store D1 (Account)
Process:	(1) Get customer account number (2) Check customer account balance by compare with the withdrawal amount in the withdrawal slip
Attachment:	Data Store D1 (Account)

Table D.8. Process Specification of Process 3.3 Record Withdrawal Transaction.

Item	Description
Process Name:	Record Withdrawal Transaction
Data In:	(1) Customer Account Balance (2) Data Store D1 (Account)
Data Out:	(1) Valid Customer Account Number (2) Data Store D3 (Transaction)
Process:	(1) Get necessary customer account number and account balance (2) The system will auto generate transaction number (3) Record the withdrawal transaction including date, amount into the system according to the detail in the withdrawal slip
Attachment:	(1) Customer Slip (2) Data Store D1 (Account)

Table D.9. Process Specification of Process 3.4 Update Customer Account Balance.

Item	Description
Process Name:	Update Customer Account Balance
Data In:	(1) Valid Customer Account Number (2) Data Store D3 (Transaction)
Data Out:	Data Store D1 (Account)
Process:	(1) Get Withdrawal Transaction (2) Update the account balance according to the withdrawal amount
Attachment:	Customer's Passbook

Table D.10. Process Specification of Process 4.1 Check Valid Customer Account Number.

Item	Description
Process Name:	Check Valid Customer Account Number
Data In:	Customer Account Number
Data Out:	(1) Valid Customer Account Number (2) Data Store D1 (Account)
Process:	(1) Get necessary customer number, customer name and account type (2) Specify the customer account number (3) Check whether the customer account number exists in the database or not
Attachment:	Data Store D1 (Account)

Table D.11. Process Specification of Process 4.2 Check Customer Account Balance.

Item	Description
Process Name:	Check Customer Account Balance
Data In:	(1) Valid Customer Account Number (2) Data Store D1 (Account)
Data Out:	(1) Customer Account Balance (2) Data Store D1 (Account)
Process:	(1) Get customer account number (2) Check customer account balance according to the transfer amount in the transfer slip
Attachment:	Data Store D1 (Account)

Table D.12. Process Specification of Process 4.3 Record Transfer Transaction.

Item	Description
Process Name:	Record Transfer Transaction
Data In:	(1) Customer Account Balance (2) Data Store D1 (Account)
Data Out:	(1) Valid Customer Account Number (2) Data Store D3 (Transaction)
Process:	(1) Get necessary customer account number and account balance (2) The system will automatic generate transaction number (3) Record the transfer transaction including date, amount into the system according to the detail in the transfer slip
Attachment:	(1) Customer Slip (2) Data Store D1 (Account)

Table D.13. Process Specification of Process 4.4 Update Customer Account Balance.

Item	Description
Process Name:	Update Customer Account Balance
Data In:	(1) Valid Customer Account Number (2) Data Store D3 (Transaction)
Data Out:	Data Store D1 (Account)
Process:	(1) Get Transfer Transaction (2) Update the account balance according to the transfer amount
Attachment:	Customer's Passbook

Table D.14. Process Specification of Process 5.1 Check Valid Customer Account Number.

Item	Description
Process Name:	Check Valid Customer Account Number
Data In:	Customer Account Number
Data Out:	(1) Valid Customer Account Number (2) Data Store D1 (Account)
Process:	(1) Get necessary customer number, customer name and account type (2) Specify the customer account number (3) Check whether the customer account number exists in the database or not
Attachment:	Data Store D1 (Account)

Table D.15. Process Specification of Process 5.2 Check Customer Account Balance.

Item	Description
Process Name:	Check Customer Account Balance
Data In:	(1) Valid Customer Account Number (2) Data Store D1 (Account)
Data Out:	(1) Customer Account Balance (2) Data Store D1 (Account)
Process:	(1) Get customer account number (2) Check customer account balance with the other payments amount in the other payment slip
Attachment:	Data Store D1 (Account)

Table D.16. Process Specification of Process 5.3.1.1 Record Electricity Payment Transaction.

Item	Description
Process Name:	Record Electricity Payment Transaction
Data In:	(1) Customer Account Balance (2) Data Store D1 (Account)
Data Out:	(1) Valid Customer Account Number (2) Data Store D5 (Ticket Payment)
Process:	(1) Get necessary customer account number and account balance (2) The system will automatic generate receipt id for each transaction (3) Record the electricity transaction including date, amount into the system according to the detail in the other payment slip
Attachment:	(1)Customer Slip (2)Data Store D1 (Account)

Table D.17. Process Specification of Process 5.3.1.2 Record Water Payment Transaction.

Item	Description
Process Name:	Record Water Payment Transaction
Data In:	(1) Customer Account Balance (2) Data Store D1 (Account)
Data Out:	(1) Valid Customer Account Number (2) Data Store D5 (Ticket Payment)
Process:	(1) Get necessary customer account number and account balance (2) The system will automatic generate receipt id for each transaction (3) Record the water transaction including date, amount into the system according to the detail in the other payment slip
Attachment:	(1) Customer Slip (2) Data Store D1 (Account)

Table D.18. Process Specification of Process 5.3.2.1 Record GSM 900 Payment Transaction.

Item	Description
Process Name:	Record GSM 900 Payment Transaction
Data In:	(1) Customer Account Balance (2) Data Store D1 (Account)
Data Out:	(1) Valid Customer Account Number (2) Data Store D4 (Phone Payment)
Process:	(1) Get necessary customer account number and account balance (2) The system automatic generate the receipt id for each transaction (3) Record the GSM 900 transaction including date, amount into the system according to the detail in other payment slip
Attachment:	(1) Customer Slip (2) Data Store D1 (Account)

Table D.19. Process Specification of Process 5.3.2.2 Record GSM 1800 Payment Transaction.

Item	Description
Process Name:	Record GSM 1800 Payment Transaction
Data In:	(1) Customer Account Balance (2) Data Store D1 (Account)
Data Out:	(1) Valid Customer Account Number (2) Data Store D4 (Phone Payment)
Process:	(1) Get necessary customer account number and account balance (2) The system will automatic generate the receipt id for each transaction (3) Record the GSM 1800 transaction including date, amount into the system according to the detail in the other payment slip
Attachment:	(1) Customer Slip (2) Data Store D1 (Account)

Table D.20. Process Specification of Process 5.3.2.3 Record DTAC 1800 Payment Transaction.

Item	Description
Process Name:	Record DTAC 1800 Payment Transaction
Data In:	(1) Customer Account Balance (2) Data Store D1 (Account)
Data Out:	(1) Valid Customer Account Number (2) Data Store D4 (Phone Payment)
Process:	(1) Get necessary customer account number and account balance (2) The system will automatic generate receipt id for each transaction (3) Record the DTAC 1800 transaction including date, amount into the system according to the detail in the other payment slip
Attachment:	(1) Customer Slip (2) Data Store D1 (Account)

Table D.21. Process Specification of Process 5.4 Update Customer Account Balance.

Item	Description
Process Name:	Update Customer Account Balance
Data In:	(1) Valid Customer Account Number (2) Data Store D4 (Mobile Payment) (3) Data Store D5 (Ticket Payment)
Data Out:	Data Store D1 (Account)
Process:	(1) Get electricity payment, water payment, GSM 900 payment, GSM 1800 payment and DTAC 1800 payment (2) Update the account balance according to amount in the other payment slip
Attachment:	Customer's Passbook

Table D.22. Process Specification of Process 6.1 Check Valid Customer Account Number.

Item	Description
Process Name:	Check Valid Customer Account Number
Data In:	Customer Account Number
Data Out0:	(1) Valid Customer Account Number (2) Data Store D1 (Account)
Process:	(1) Get necessary customer number, customer name and account type (2) Specify the customer account number (3) Check whether the customer account number exists in the database or not
Attachment:	Data Store D1 (Account)

Table D.23. Process Specification of Process 6.2 Maintain Customer Information.

Item	Description
Process Name:	Maintain Customer Information
Data In:	(1) Valid Customer Account Balance (2) Data Store D1 (Account)
Data Out:	(1) Valid Customer Account Number (2) Data Store D2 (Customer)
Process:	(1) Get necessary customer account number and customer information (2) Maintain customer information such as Customer's address, telephone and office into the system according to the detail in customer information maintenance form
Attachment:	Customer

Table D.24. Process Specification of Process 6.3 Update Customer Information.

Item	Description
Process Name:	Update Customer Information
Data In:	(1) Valid Customer Account Number (2) Data Store D2 (Customer)
Data Out:	Data Store D2 (Customer)
Process:	(1) Get customer information such as customer's address, customer's telephone and customer's office (2) Update the customer information according to the detail in the customer information maintenance form
Attachment:	Customer

Table D.25. Process Specification of Process 7.1 Check Valid Transaction Number.

Item	Description
Process Name:	Check Valid Transaction Number
Data In:	Transaction Number
Data Out:	(1) Valid Transaction Number (2) Data Store D3 (Transaction)
Process:	(1) Get necessary transaction number (2) Specify the transaction number (3) Check whether the transaction number exists in the database or not
Attachment:	Data Store D3 (Transaction)

Table D.26. Process Specification of Process 7.2 Maintain Input Transaction.

Item	Description
Process Name:	Maintain Input Transaction
Data In:	(1) Valid Transaction Number (2) Data Store D1 (Account) (3) Data Store D3 (Transaction) (4) Data Store D4 (Mobile Payment) (5) Data Store D5 (Ticket Payment)
Data Out:	(1) Valid Transaction Number (2) Data Store D1 (Account) (3) Data Store D3 (Transaction) (4) Data Store D4 (Mobile Payment) (5) Data Store D5 (Ticket Payment)
Process:	(1) Get necessary transaction number, customer account number, amount, date and transaction type (2) Maintain input transaction such as deposit transaction, withdrawal transaction, transfer transaction, electricity payment transaction, water payment transaction, GSM 900 payment system, GSM 1800 payment system and DTAC 1800 payment system into the system according to the detail in the maintenance slip
Attachment:	Customer Slip

Table D.27. Process Specification of Process 7.3 Update Customer Account Balance.

Item	Description
Process Name:	Update Customer Account Balance
Data In:	(1) Valid Customer Account Number (2) Data Store D1 (Account) (3) Data Store D3 (Transaction) (4) Data Store D4 (Mobile Payment) (5) Data Store D5 (Ticket Payment)
Data Out:	Data Store D1 (Account)
Process:	(1) Get deposit transaction, withdrawal transaction, transfer transaction, electricity payment, water payment, GSM 900 payment, GSM 1800 payment and DTAC 1800 payment (2) Update the account balance according to the detail in maintenance slip
Attachment:	Customer's Passbook

Table D.28. Process Specification of Process 8.1 Check Valid Customer Account Number.

Item	Description
Process Name:	Check Valid Customer Account Number
Data In:	Customer Account Number
Data Out:	(1) Valid Customer Account Number (2) Data Store D1 (Account)
Process:	(1) Get necessary customer number, customer name and account type (2) Specify the customer account number (3) Check whether the customer account number exists in the database or not
Attachment:	Data Store D1 (Account)

Table D.29. Process Specification of Process 8.2 Delete Customer.

Item	Description
Process Name:	Delete Customer
Data In:	(1) Valid Customer Account Balance (2) Data Store D1 (Account)
Data Out:	(1) Valid Customer Account Number (2) Data Store D2 (Customer)
Process:	(1) Get necessary customer account number and customer information (2) Delete customer information from the system according to the delete customer profile form
Attachment:	Customer

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Table D.30. Process Specification of Process 9.1 Check Valid Transaction Number.

Item	Description
Process Name:	Check Valid Transaction Number
Data In:	Transaction Number
Data Out:	(1) Valid Transaction Number (2) Data Store D3 (Transaction)
Process:	(1) Get necessary transaction number (2) Specify the transaction number (3) Check whether the transaction number exists in the database or not
Attachment:	Data Store D3 (Transaction)

Table D.31. Process Specification of Process 9.2 Cancel Input Transaction.

Item	Description
Process Name:	Cancel Input Transaction
Data In:	(1) Valid Transaction Number (2) Data Store D1 (Account) (3) Data Store D3 (Transaction) (4) Data Store D4 (Mobile Payment) (5) Data Store D5 (Ticket Payment)
Data Out:	(1) Valid Transaction Number (2) Data Store D1 (Account) (3) Data Store D3 (Transaction) (4) Data Store D4 (Mobile Payment) (5) Data Store D5 (Ticket Payment)
Process:	(1) Get necessary transaction number, customer account number, amount, date and transaction type (2) Delete input transaction such as deposit transaction, withdrawal transaction, transfer transaction, electricity payment transaction, water payment transaction, GSM 900 payment system, GSM 1800 payment system and DTAC 1800 payment system into the system according to the transaction number in the delete transaction form
Attachment:	Customer Slip

Table D.32. Process Specification of Process 9.3 Update Customer Account Balance.

Item	Description
Process Name:	Update Customer Account Balance
Data In:	(1) Valid Customer Account Number (2) Data Store D1 (Account) (3) Data Store D3 (Transaction) (4) Data Store D4 (Mobile Payment) (5) Data Store D5 (Ticket Payment)
Data Out:	Data Store D1 (Account)
Process:	(1) Get cancel deposit transaction, withdrawal transaction, transfer transaction, electricity payment, water payment, GSM 900 payment, GSM 1800 payment and DTAC 1800 payment (2) Update the account balance according to the amount in the delete transaction form
Attachment:	Customer's Passbook

Table D.33. Process Specification of Process 10.1 Generate Customer Statement Report.

Item	Description
Process Name:	Generate Customer Statement Report
Data In:	(1) Valid Customer Account Number (2) Data Store D1 (Account)
Data Out:	(1) Valid Customer Account Number (2) Data Store D1 (Account)
Process:	(1) Read customer account number and account balance, transaction date, transaction type and transaction amount from Account table. (2) Process the data to generate Customer Statement Report (3) Print Report
Attachment:	(1) Data Store D3 (Transaction) (2) Customer

Table D.34. Process Specification of Process 10.2 Generate Customer Information Report.

Item	Description
Process Name:	Generate Customer Information Report
Data In:	(1) Valid Customer Account Number (2) Data Store D2 (Customer)
Data Out:	(1) Valid Customer Account Number (2) Data Store D2 (Customer)
Process:	(1) Read customer account number from Account table and customer information detail from Customer table (2) Process the data to generate Customer Information Report (3) Print Report
Attachment:	(1) Data Store D2 (Customer) (2) Customer

Table D.35. Process Specification of Process 10.3 Generate Today Transaction Report.

Item	Description
Process Name:	Generate Today Transaction Report
Data In:	Data Store D3 (Transaction)
Data Out:	Data Store D3 (Transaction)
Process:	(1) Read transaction number, transaction type, date and amount from Transaction table and Transaction Type table (2) Process the data to generate Today Transaction Report (3) Print Report
Attachment:	(1) Data Store D3 (Transaction) (2) Management

Table D.36. Process Specification of Process 10.4 Generate Today Mobile Payment Transactions Report.

Item	Description
Process Name:	Generate Today Mobile Payment Transactions Report
Data In:	Data Store D4 (Mobile Payment
Data Out:	Data Store D4 (Mobile Payment)
Process:	<ol style="list-style-type: none"> (1) Read transaction number, phone payment type phone payment amount and date from the Phone Payment table and Phone Payment Type table (2) Process the data to generate Today Mobile Payment Report (3) Print Report
Attachment:	<ol style="list-style-type: none"> (1) Data Store D4 (Mobile Payment) (2) Management

Table D.37. Process Specification of Process 10.5 Generate Today Ticket Payment Transactions Report (Electricity and Water Payment).

Item	Description
Process Name:	Generate Today Ticket Payment Transactions Report (Electricity and Water Payment)
Data In:	Data Store D5 (Ticket Payment)
Data Out:	Data Store D5 (Ticket Payment)
Process:	<ol style="list-style-type: none"> (1) Read ticket number, receipt id, ticket payment type, ticket payment amount and date from Ticket Payment table and Ticket Payment Type table (2) Process the data to generate Today Ticket Payment Report (Electricity and Water Payment Report) (3) Print Report
Attachment:	<ol style="list-style-type: none"> (1) Data Store D5 (Ticket Payment) (2) Management



DATA DICTIONARY

Table E.1. Data Dictionary of Account Database.

Field Name	Meaning
Account_ID	The Account Number of the Customer that is unique. A customer can open more than one account number, but one account number can not open more than one customer. This Account Number is auto generate by the computer.
ID_Person	The Customer ID or Personal Identification Number that is unique. Each Customer has only one customer ID.
Account_Type_ID	The Account Type of the Account Number. The customer will open account number according to thier objective, so account type must be select correctly. There are three account type that are existing in the system. <ul style="list-style-type: none"> - 'DF' for Deposit Fixed Account - 'SA' for Deposit Saving Account - 'CA' for Current Account
Account_Name	The Customer Name of the Account Number.
Date	The date of input the transaction.
Balance_Total	The total balance amount of Account Number.
Branch_ID	The branch number of the Boom Bank. There are 2 Branch Numbers in the system. <ul style="list-style-type: none"> - '1' for Chan Road Branch - '2' for Silom Branch

Table E.2. Data Dictionary of Account Type Database.

Field Name	Meaning
Account_Type_ID	<p>The Account Type of the Account Number. The customer will open account number according to thier objective, so account type must be select correctly. There are three account type that are existing in the system.</p> <ul style="list-style-type: none"> - 'DF' for Deposit Fixed Account - 'SA' for Deposit Saving Account - 'CA' for Current Account
Account_Type_Name	<p>The name of the Account Type such as Account Type ID is DF, it means Deposit Fixed Account.</p>

Table E.3. Data Dictionary of Branch Database.

Field Name	Meaning
Branch_ID	<p>The branch number of the Boom Bank. There are 2 Branch Numbers in the system.</p> <ul style="list-style-type: none"> - '1' for Chan Road Branch - '2' for Silom Branch
Branch_Name	<p>The name of the branch ID of Boom Bank.</p>

Table E.4. Data Dictionary of Customer Database.

Field Name	Meaning
ID_Person	The Customer ID or Personal Identification Number that is unique. Each Customer has only one customer ID.
Customer_Name	The name of the Customer. (First Name)
Customer_sName	The surname of the Customer. (Last Name)
Address	The address of the Customer.
Office_Address	The office's address of the Customer.
Telephone	The telephone number of the Customer.



Table E.5. Data Dictionary of Phone Payment Database.

Field Name	Meaning
Receipt_ID	The Receipt Number of the Input Transaction. This number is unique. The Receipt ID is auto generate by the computer.
Phone_Number	The Telephone Number of the Customer for doing payment.
Phone_Type_ID	The Phone Type of the Phone System. There are 3 Phone Types that are existing in the system. - '1' for GSM 900 System - '2' for DTAC 1800 System and - '3' for GSM 1800
Account_ID	The Account Number of the Customer that is unique. A customer can open more than one account number, but one account number can not open more than one customer. This Account Number is auto generate by the computer.
Amount	The amount for doing payment
Date	The transaction date.
Total_Amount	The Account Balance for the Account Number. This Number is auto calculate by the system.
Month	The month of the telephone number that doing payment

Table E.6. Data Dictionary of Phone Type Payment Database.

Field Name	Meaning
Phone_Type_ID	The Phone Type of the Phone System. There are 3 Phone Types that are existing in the system. <ul style="list-style-type: none">- '1' for GSM 900 System- '2' for DTAC 1800 System and- '3' for GSM 1800
Phone_Type_Name	The name of each Telephone Type.



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Table E.7. Data Dictionary of Ticket Payment Database.

Field Name	Meaning
Receipt_ID	The Receipt Number of the Input Transaction. This number is unique. The Receipt ID is auto generate by the computer.
Ticket_Number	The number of the electricity ticket or water ticket. This number is issue by the electricity or water system for payment.
Account_ID	The Account Number of the Customer that is unique. A customer can open more than one account number, but one account number can not open more than one customer. This Account Number is auto generate by the computer.
Amount	The amount for doing payment
Total_Amount	The Account Balance for the Account Number. This Number is auto calculate by the system.
Ticket_Type_ID	The Ticket Type of the Payment System. There are 2 Ticket Types that are existing in the system. - '1' for Electricity - '2' for Water
Date	The transaction date.
Month	The month of the telephone number that doing payment.

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Table E.8. Data Dictionary of Ticket Type Payment Database.

Field Name	Meaning
Ticket_Type_ID	The Ticket Type of the Payment System. There are 2 Ticket Types that are existing in the system. <ul style="list-style-type: none"> - '1' for Electricity - '2' for Water
Ticket_Type_Name	The name of the Ticket Type.

Table E.9. Data Dictionary of Transaction Type Database.

Field Name	Meaning
Transaction_Type_ID	The Transaction Type of the Input Transaction. There are 3 Transaction Types that are existing in the system. <ul style="list-style-type: none"> - '1' for Deposit Transaction - '2' for Withdrawal Transaction - '3' for Transfer Transaction
Transaction_Type_Name	The name of the Transaction Type.

Table E.10. Data Dictionary of Transaction Database.

Field Name	Meaning
Transaction_ID	The number of the input transaction. This number is unique. This Transaction ID is auto generate by the system.
Account_ID	The Account Number of the Customer that is unique. A customer can open more than one account number, but one account number can not open more than one customer. This Account Number is auto generate by the computer.
Transaction_Type_ID	The Transaction Type of the Input Transaction. There are 3 Transaction Types that are existing in the system. - '1' for Deposit Transaction - '2' for Withdrawal Transaction - '3' for Transfer Transaction
Account_Balance	The Account Balance for the Account Number. This Number is auto calculate by the system.
Amount	The amount for doing payment
Date_Trans	The transaction date.
Branch_ID	The branch number of the Boom Bank. There are 2 Branch Numbers in the system. - '1' for Chan Road Branch - '2' for Silom Branch
Account_Pay	The Beneficiary Account for doing Transfer System.
Native	The narrative for comment.

Table E.11. Data Dictionary of User Database.

Field Name	Meaning
Username	The User Name that has authorized to access to the system.
Password	The password for the user name that must be encryption.



APPENDIX F

ALTERNATIVE CANDIDATE SOLUTIONS

F.1 Alternative Candidates

There are three alternatives candidates for the new system as presented below:

Table F.1. Candidate Matrix.

Characteristics	Candidate 1	Candidate 2	Candidate 3
(1) <u>Portion of System Computerized</u> Brief description of that portion of the system that would be computerized in this candidate.	Purchase the standard package from the vendor that can support the user requirement functionality	Programmer of the Boom Bank is still continuing develop the existing system, Banking System (Cobol Version) by increase the functionality, but the data still keeping in file format. Programming is in the Dos Platform.	Programmer of the Boom Bank is decide to developing the new system Customer Service Information System. The data will keep in the Database format. Programming is in the Windows Platform.
(2) <u>Benefits</u> Brief description of the business benefits that would be realized for this candidate.	This solution can be implemented quickly because of it's a purchase solution and it is the standard package. This solution can support all user requirement currently.	This solution is very cheap, and can support all user requirement currently.	This solution fully support all user requirements, provides efficient interaction between users and support large database and this solution is not too expensive.
(3) <u>Servers and Workstations</u> A description of the servers and workstations needed to support this candidate.	<u>Servers:</u> Pentium IV 800 MHz., 40 GB. HDD, Cache 1GB., RAM 512 MB., 1.44 Floppy Drive, 4x4x32 CD-Write Drive, with MS Windows NT Server 4.0 (Service Pack 3), and UPS 650VA	Same as candidate 1.	Same as candidate 1.

Table F.1. Candidate Matrix (Continued).

Characteristics	Candidate 1	Candidate 2	Candidate 3
	<u>Clients:</u> Pentium IV 800 MHz ., 10 GB. HDD, Cache 256 KB., RAM 128 MB., 1.44 Floppy Drive, 52x CD-ROM Drive, with MS Windows 2000	Same as candidate 1.	Same as candidate 1.
(4) <u>Software Tools Needed</u> Software tools needed to design and build the candidate (e.g., database management system, emulators, operating system, languages, etc.). Not generally applicable if applications software packages are to be purchased.	Oracle Developer Release 6.0	COBOL and MS DOS	Microsoft Visual Studio 6.0 Enterprise Edition.
(5) <u>Application Software</u> A description of the software to be purchased, built, accessed or some combination of these techniques.	Package Solution	Add on some custom solution.	Custom Solution.
(6) <u>Method of Data Processing</u> Generally some combination of online, batch, deferred batch, remote batch, and real-time.	Client/Server	Same as candidate 1.	Same as candidate 1.

Table F.1. Candidate Matrix (Continued).

Characteristics	Candidate 1	Candidate 2	Candidate 3
<p>(7) <u>Output Devices and Implications</u> A description of output devices that would be used, special output requirements (e.g., network, preprinted forms, etc.), and output considerations (e.g., timing constraints).</p>	<p>4 Laser Printers</p> <p>5 Dot Matrix Printers</p> <p>15 inches SVGA monitor</p>	<p>Same as candidate 1.</p>	<p>Same as candidate 1.</p>
<p>(8) <u>Input Devices and Implications</u> A description of input methods to be that would be used, input devices (e.g., keyboard, mouse, etc.), special input requirements (e.g., new or revised forms from which data would be input), and input considerations (e.g., timing of actual inputs).</p>	<p>Keyboard & mouse</p>	<p>Same as candidate 1.</p>	<p>Same as candidate 1.</p>
<p>(9) <u>Storage Devices and Implications</u> Brief description of what data would be stored, what data would be accessed from existing stores, what storage media would be used, how much storage capacity would be needed, and how data would be organized.</p>	<p>Oracle Enterprise Edition Release 8.1.5</p>	<p>File and Diskette</p>	<p>MS Access</p>

Table F.2. Hardware and Software Requirement for Each Candidate.

Characteristics	Candidate 1	Candidate 2	Candidate 3
Server: - Pentium IV 800 MHz. - Cache 1 GB - RAM 512 MB - Hard Disk SCSI RAID5 40 GB - CD-Writer 4x4x32 - CD-ROM Drive 52X - Floppy Drive 1.44 MB - Network Adapter Ethernet 10/100 UTP-connect - Display Adapter SVGA Card - 17" Monitor - UPS 650 VA	X	X	X
Clients - Pentium IV 800 MHz - 256 KB - RAM 128 MB - Hard Disk 10 GB - CD-ROM Drive 52X - Floppy Drive 1.44 MB - Network Adapter SVGA Card - 15" Monitor	X	X	X
Laser Printer Server	X	X	X
Laser Printer	X	X	X
Dot Matrix Printer	X	X	X
Microsoft Windows NT Server 4.0 (Service Pack 3)	X	X	X
Oracle 8i Enterprise Edition Release 8.1.5	X		
Oracle Developer Release 6.0	X		
Microsoft Windows 2000	X	X	X
Microsoft Office 2000 Professional	X	X	X
Microsoft Access			X
File		X	
Microsoft Visual Studio 6.0 Enter			X

F.2 Feasibility Analysis

From the Feasibility Analysis Matrix below, the Candidate 3 is the best overall solution, as it gets the highest score of 94 in ranking.

Table F.3. Feasibility Analysis Matrix.

Feasibility Criteria	Weight	Candidate 1	Candidate 2	Candidate 3
<p>(1) <u>Operational Feasibility</u></p> <p><u>Functionality</u>: A description of to what degree the candidate would benefit the organization and how well the system would work.</p> <p><u>Political</u>: A description of how well received this solution would be from both user management, user, and organization perspective.</p>	30%	<p>Support the required functionality</p> <p>Many users and management accept this solution as support all their requirements. But they need the programmer to develop some program to make the working is more effective to their environment and make it easy to use. And for support other function in the future need to pay more.</p> <p>Score: 85</p>	<p>Fully supports the required functionality.</p> <p>Most users and management accept this candidate, as it fully supports their requirements. But it can not support for Management Report or Management Information and it is not easy to expanded to support other functions in the future.</p> <p>Score: 85</p>	<p>Fully supports the required functionality.</p> <p>Most users and management highly accept this solution. They convinced that this solution will meet all their requirements by using not too long time of construction. It can also be expanded easily to support other function in the future.</p> <p>Score: 100</p>
<p>(2) <u>Technical Feasibility</u></p> <p><u>Technology</u>: An assessment of the maturity,</p>	30%	<p>Oracle can effectively by used to design and build the system. Oracle is very good at</p>	<p>COBOL Programming is not hard to learn but this program is not flexible to using and in the</p>	<p>MS Visual Studio 6.0 Enterprise Edition – Microsoft Visual Basic 6.0 can</p>

Table F.3. Feasibility Analysis Matrix (Continued).

Feasibility Criteria	Weight	Candidate 1	Candidate 2	Candidate 3
<p>availability (or ability to acquire), and desirability of the computer technology needed to support this candidate.</p> <p><u>Expertise:</u> An assessment of the technical expertise needed to develop, operate, and maintain the candidate system.</p>	30%	<p>large support database, but it may be complex and hard to learn.</p> <p>Required to hire a vendor to construct all the system, and recruit one system engineer to take care of the system.</p> <p>Score: 85</p>	<p>future this complier will disappear.</p> <p>Score: 80</p>	<p>effectively be used to design and build the system. Now this software is popular for using. Most programmer will familiar it.</p> <p>MS Access is good at support database. It is stable and provides quickly access to the database. It is not complex and not hard to learn.</p> <p>Score: 95</p>
<p>(3) <u>Economic Feasibility</u></p> <p>Cost to develop: Break-even point: Payback period: Detailed calculations:</p>	30%	<p>Approximately 1,138,640 baht 2 Years 10 months 2 months See page 213-219</p> <p>Score: 85</p>	<p>Approximately 1,003,640 baht 1 Year 1 month 4 months See page 220-226</p> <p>Score: 95</p>	<p>Approximately 1,003,640 baht 1 Year 10 months 7 months See page 227-233</p> <p>Score: 90</p>
<p>(4) <u>Schedule Feasibility</u></p> <p>An assessment of how long the solution will take to design and implement.</p>	10%	<p>About 1 month</p> <p>Score: 95</p>	<p>About 2 months</p> <p>Score: 90</p>	<p>About 2.5 months</p> <p>Score: 85</p>
Ranking	100%	86	87	94

F.3 Cost/Benefit Analysis for Candidate 1

F.3.1 Cost of Candidate 1 Computerized System

Table F.4. Computerized System Cost Analysis for Candidate 1, Baht.

Cost items	Years				
	1	2	3	4	5
<u>Fixed Cost (Development Cost)</u>					
Hardware Cost:					
Computer Server Cost	32,000.00	32,000.00	32,000.00	32,000.00	32,000.00
Personal Computer Cost	30,000.00	30,000.00	30,000.00	30,000.00	30,000.00
Laser Printer 2 units @ 25,000	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
Dot Matrix Printer 2 units @ 15,000	6,000.00	6,000.00	6,000.00	6,000.00	6,000.00
UPS 1 unit @ 8,000	1,600.00	1,600.00	1,600.00	1,600.00	1,600.00
Total Hardware Cost	79,600.00	79,600.00	79,600.00	79,600.00	79,600.00
Software Cost	80,000.00	80,000.00	80,000.00	80,000.00	80,000.00
Network Cost	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
System Architecture Cost	100,000.00	-	-	-	-
Training Cost	5,000.00	-	-	-	-
Maintenance Cost	-	40,000.00	44,000.00	48,400.00	53,240.00
Total Fixed Cost	274,600.00	209,600.00	213,600.00	218,000.00	222,840.00
<u>Operating Cost</u>					
<u>Salary Cost:</u>					
Customer Service Manager					
1 person @ 35,000	35,000.00	38,500.00	42,350.00	46,585.00	51,243.50
<u>Staff:</u>					
Supervisor 1 person @ 20,000	20,000.00	22,000.00	24,200.00	26,620.00	29,282.00
Teller 3 persons @ 12,000	36,000.00	39,600.00	43,560.00	47,916.00	52,707.60
System Engineer 1 person @ 25,000	25,000.00	27,500.00	30,250.00	33,275.00	36,602.50
Total Monthly Salary Cost	116,000.00	127,600.00	140,360.00	154,396.00	169,835.60
Total Annual Salary Cost	1,392,000.00	1,531,200.00	1,684,320.00	1,852,752.00	2,038,027.20
<u>Office Supplies & Miscellaneous Cost:</u>					
Stationery 1,200 per month	14,400.00	15,840.00	17,424.00	19,166.40	21,083.04
Paper 2,000 per month	24,000.00	26,400.00	29,040.00	31,944.00	35,138.40
Miscellaneous 4,000 per month	24,000.00	26,400.00	29,040.00	31,944.00	35,138.40
Total Annual Office Supplies & Miscellaneous Cost	62,400.00	68,640.00	75,504.00	83,054.40	91,359.84
<u>Utility Cost:</u>					
Electricity 40,000 per month	528,000.00	580,800.00	638,880.00	702,768.00	773,044.80

Table F.4. Computerized System Cost Analysis for Candidate 1, Baht (Continued).

Cost items	Years				
	1	2	3	4	5
Water 6,000 per month	48,000.00	52,800.00	58,080.00	63,888.00	70,276.80
Telephone 20,000 per month	210,000.00	231,000.00	254,100.00	279,510.00	307,461.00
Total Utility Cost	786,000.00	864,600.00	951,060.00	1,046,166.00	1,150,782.60
Total Operating Cost	2,240,400.00	2,464,440.00	2,710,884.00	2,981,972.40	3,280,169.64
Total Proposed System Cost	2,515,000.00	2,674,040.00	2,924,484.00	3,199,972.40	3,503,009.64

F.3.2 Cost of Comparison and Breakeven Analysis for Candidate 1

Table F.5. The Comparison of the System Cost for Candidate 1, Baht.

Year	Accumulated Existing System Cost	Accumulated System Cost of Candidate 1
1	2,452,700.00	2,515,000.00
2	5,154,000.00	5,189,040.00
3	8,123,260.00	8,113,524.00
4	11,387,276.00	11,313,496.40
5	14,975,523.60	14,816,506.04

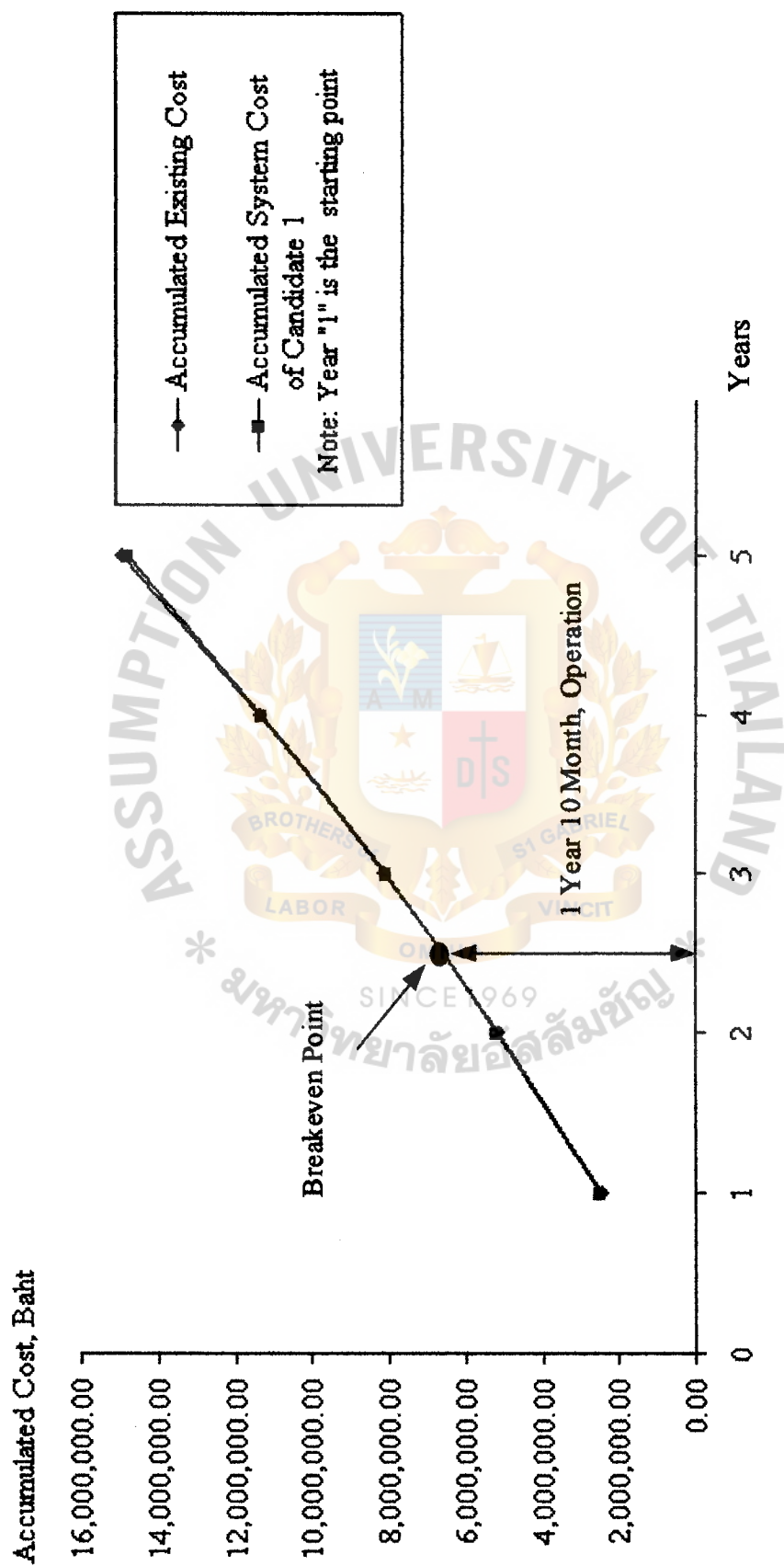


Figure F.1. Cost Comparison between Existing and Proposed System for Candidate 1.

F.3.3 Benefit Analysis for Candidate 1

From the Candidate 1 system, salary cost, office supplies and miscellaneous cost, and utility cost are saved as shown below:

$$\begin{aligned}\text{Benefit for the 1}^{\text{st}} \text{ year} &= (1,764,000.00 - 1,392,000.00) + (120,000.00 - \\ &\quad 62,400.00) + (792,000.00 - 786,000.00) \\ &= 435,000.00 \quad \text{Baht/year}\end{aligned}$$

$$\begin{aligned}\text{Benefit for the 2}^{\text{nd}} \text{ year} &= (1,940,400.00 - 1,531,200.00) + (132,000.00 - \\ &\quad 68,640.00) + (871,200.00 - 864,600.00) \\ &= 479,160.00 \quad \text{Baht/year}\end{aligned}$$

$$\begin{aligned}\text{Benefit for the 3}^{\text{rd}} \text{ year} &= (2,134,440.00 - 1,684,320.00) + (145,200.00 - \\ &\quad 75,504.00) + (958,320.00 - 951,060.00) \\ &= 527,076.00 \quad \text{Baht/year}\end{aligned}$$

$$\begin{aligned}\text{Benefit for the 4}^{\text{th}} \text{ year} &= (2,347,884.00 - 1,852,752.00) + (159,720.00 - \\ &\quad 83,054.40) + (1,054,152.00 - 1,046,166.00) \\ &= 579,783.60 \quad \text{Baht/year}\end{aligned}$$

$$\begin{aligned}\text{Benefit for the 5}^{\text{th}} \text{ year} &= (2,582,672.40 - 2,038,027.20) + (175,692.00 - \\ &\quad 91,359.84) + (1,159,567.20 - 1,150,782.60) \\ &= 637,761.96 \quad \text{Baht/year}\end{aligned}$$

F.3.4 Payback Analysis for Candidate 1

The calculation for payback analysis is shown in Table F.6.

Table F.6. Payback Analysis for Candidate 1, Baht.

Cost items	Years					
	0	1	2	3	4	5
Depreciation cost	-953,000.00	-	-	-	-	-
Operation & Maintenance cost	-	-40,000.00	-44,000.00	-48,000.00	-53,240.00	-58,564.00
Discount factor for 10%	1.000	0.909	0.826	0.751	0.683	0.621
Time – adjusted costs (adjusted to present value)	-953,000.00	-36,360.00	-36,344.00	-36,348.00	-36,363.00	-36,368.00
Cumulative time-adjusted costs over lifetime	-953,000.00	-989,360.00	-1,025,704.00	-1,062,052.00	-1,098,415.00	-1,134,784.00
Benefit derived from operation of new system	-	435,000.00	479,160.00	527,076.00	579,783.60	637,761.96
Discount factor for 10%	1.000	0.909	0.826	0.751	0.683	0.621
Time – adjusted costs (adjusted to present value)	-	395,415.00	395,786.00	395,834.00	395,992	396,050
Cumulative time-adjusted benefits over lifetime	-	395,415.00	791,201.00	1,187,035	1,583,027	1,979,078
Cumulative lifetime time-adjusted cost + benefit	-953,000.00	-593,945.00	-234,503.00	124,983.00	484,612.00	844,294.00

The payback period can be calculated by the formula as follows:

$$P = \frac{\text{Last year of negative Cash flow difference} + \text{Cumulative Different last negative year}}{\text{Absolute value of cumulate difference (last negative plus first year positive year)}}$$

Where P = Payback Period

$$\begin{aligned} P &= 2 + \frac{234,503}{(234,503+124,983)} \\ &= 2.65 \text{ years or 2 years 7 months} \end{aligned}$$

Therefore, the payback period is about 2 years 7 months.



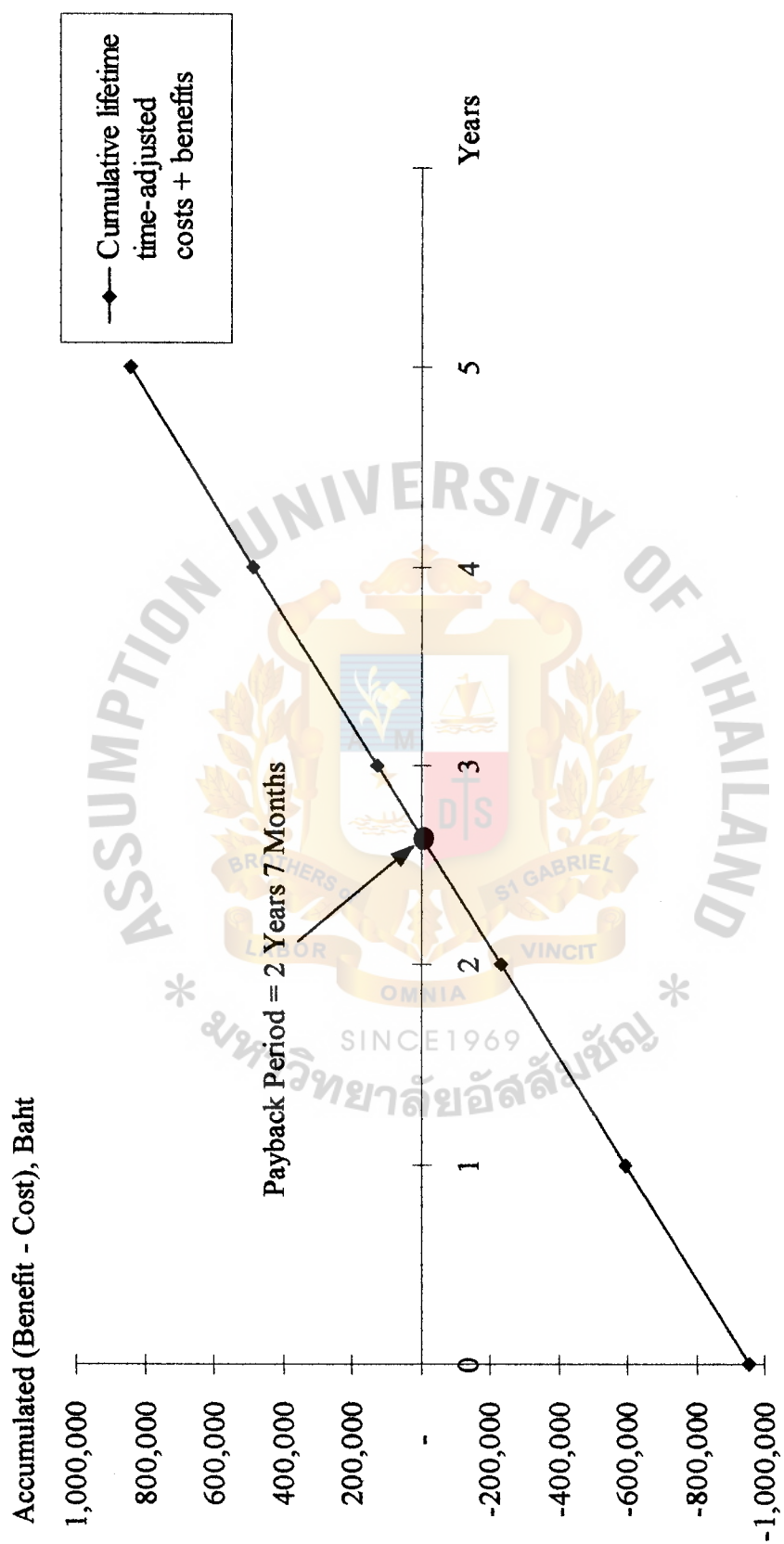


Figure F.2. Payback Chart for the Candidate 1.

F.4 Cost/Benefit Analysis for Candidate 2

F.4.1 Cost of Candidate 2 Computerized System

Table F.7. Computerized System Cost Analysis for Candidate 2, Baht.

Cost items	Years				
	1	2	3	4	5
Fixed Cost (Development Cost)					
Hardware Cost:					
Computer Server Cost	32,000.00	32,000.00	32,000.00	32,000.00	32,000.00
Personal Computer Cost	30,000.00	30,000.00	30,000.00	30,000.00	30,000.00
Laser Printer 2 units @ 25,000	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
Dot Matrix Printer 2 units @ 15,000	6,000.00	6,000.00	6,000.00	6,000.00	6,000.00
UPS 1 unit @ 8,000	1,600.00	1,600.00	1,600.00	1,600.00	1,600.00
Total Hardware Cost	79,600.00	79,600.00	79,600.00	79,600.00	79,600.00
Software Cost	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
Network Cost	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00
System Architecture Cost	100,000.00	-	-	-	-
Training Cost	5,000.00	-	-	-	-
Maintenance Cost	-	40,000.00	44,000.00	48,400.00	53,240.00
Total Fixed Cost	214,600.00	149,600.00	153,600.00	158,000.00	162,840.00
Operating Cost					
Salary Cost:					
Customer Service Manager					
1 person @ 35,000	35,000.00	38,500.00	42,350.00	46,585.00	51,243.50
Staff:					
Supervisor 1 person @ 20,000	20,000.00	22,000.00	24,200.00	26,620.00	29,282.00
Teller 3 persons @ 12,000	36,000.00	39,600.00	43,560.00	47,916.00	52,707.60
System Engineer 1 person @ 25,000	25,000.00	27,500.00	30,250.00	33,275.00	36,602.50
Total Monthly Salary Cost	116,000.00	127,600.00	140,360.00	154,396.00	169,835.60
Total Annual Salary Cost	1,392,000.00	1,531,200.00	1,684,320.00	1,852,752.00	2,038,027.20
Office Supplies & Miscellaneous Cost:					
Stationery 1,200 per month	14,400.00	15,840.00	17,424.00	19,166.40	21,083.04
Paper 2,000 per month	24,000.00	26,400.00	29,040.00	31,944.00	35,138.40
Miscellaneous 4,000 per month	24,000.00	26,400.00	29,040.00	31,944.00	35,138.40
Total Annual Office Supplies & Miscellaneous Cost	62,400.00	68,640.00	75,504.00	83,054.40	91,359.84
Utility Cost:					
Electricity 40,000 per month	528,000.00	580,800.00	638,880.00	702,768.00	773,044.80

Table F.7. Computerized System Cost Analysis for Candidate 2, Baht (Continued).

Cost items	Years				
	1	2	3	4	5
Water 6,000 per month	48,000.00	52,800.00	58,080.00	63,888.00	70,276.80
Telephone 20,000 per month	210,000.00	231,000.00	254,100.00	279,510.00	307,461.00
Total Utility Cost	786,000.00	864,600.00	951,060.00	1,046,166.00	1,150,782.60
Total Operating Cost	2,240,400.00	2,464,440.00	2,710,884.00	2,981,972.40	3,280,169.64
Total Proposed System Cost	2,455,000.00	2,614,040.00	2,864,484.00	3,139,972.40	3,443,009.64

F.4.2 Cost of Comparison and Breakeven Analysis for Candidate 2

Table F.8. The Comparison of the System Cost for Candidate 2, Baht.

Year	Accumulated Existing System Cost	Accumulated System Cost of Candidate 2
1	2,452,700.00	2,455,000.00
2	5,154,000.00	5,069,040.00
3	8,123,260.00	7,933,524.00
4	11,387,276.00	11,073,496.40
5	14,975,523.60	14,516,506.04

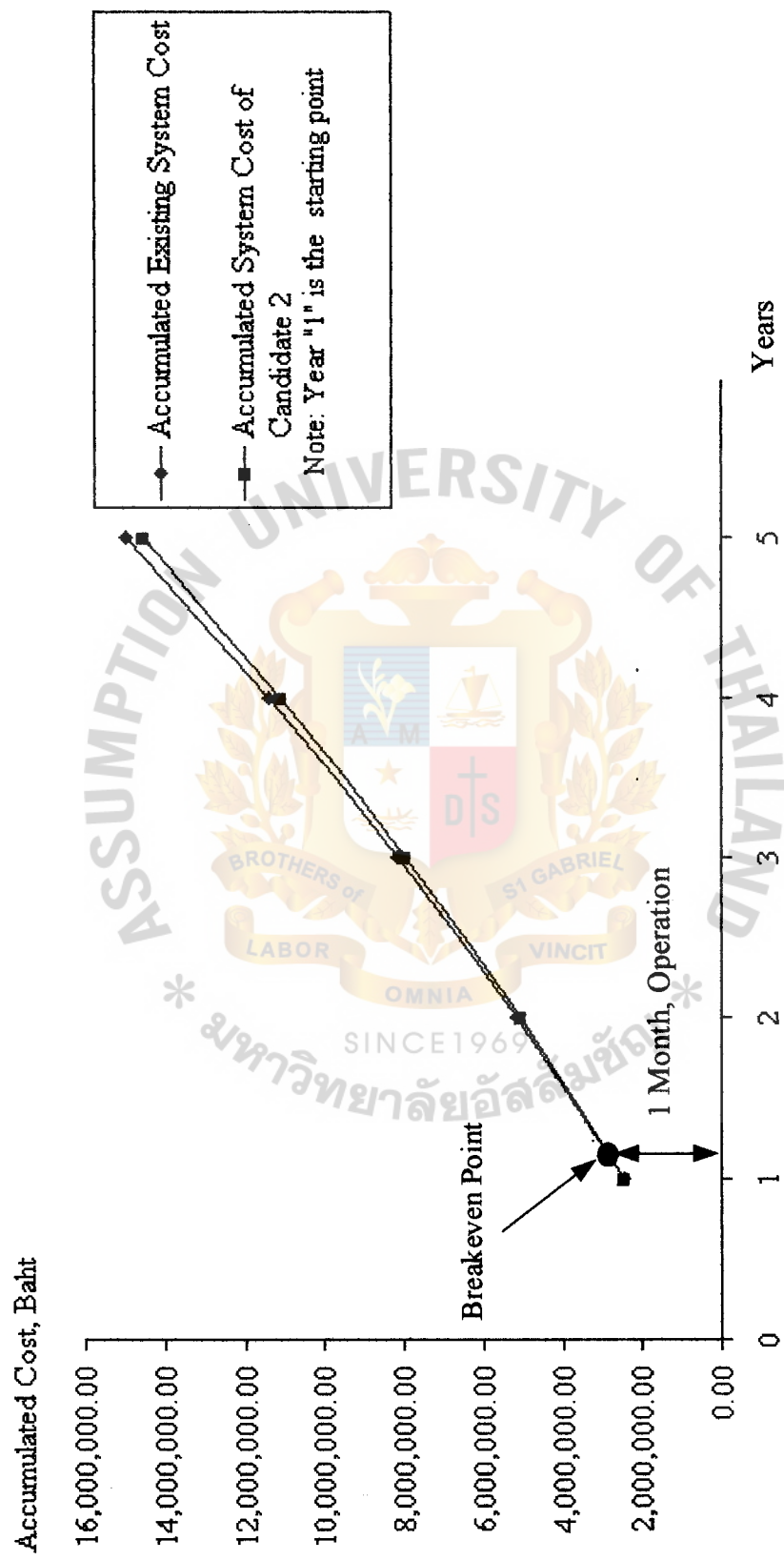


Figure F.3. Cost Comparison between Existing and Proposed System for Candidate 2.

F.4.3 Benefit Analysis for Candidate 2

From the Candidate 2 system, salary cost, office supplies and miscellaneous cost, and utility cost are saved as shown below:

$$\begin{aligned}\text{Benefit for the 1}^{\text{st}} \text{ year} &= (1,764,000.00 - 1,392,000.00) + (120,000.00 - \\ &\quad 62,400.00) + (792,000.00 - 786,000.00) \\ &= 435,000.00 \quad \text{Baht/year}\end{aligned}$$

$$\begin{aligned}\text{Benefit for the 2}^{\text{nd}} \text{ year} &= (1,940,400.00 - 1,531,200.00) + (132,000.00 - \\ &\quad 68,640.00) + (871,200.00 - 864,600.00) \\ &= 479,160.00 \quad \text{Baht/year}\end{aligned}$$

$$\begin{aligned}\text{Benefit for the 3}^{\text{rd}} \text{ year} &= (2,134,440.00 - 1,684,320.00) + (145,200.00 - \\ &\quad 75,504.00) + (958,320.00 - 951,060.00) \\ &= 527,076.00 \quad \text{Baht/year}\end{aligned}$$

$$\begin{aligned}\text{Benefit for the 4}^{\text{th}} \text{ year} &= (2,347,884.00 - 1,852,752.00) + (159,720.00 - \\ &\quad 83,054.40) + (1,054,152.00 - 1,046,166.00) \\ &= 579,783.60 \quad \text{Baht/year}\end{aligned}$$

$$\begin{aligned}\text{Benefit for the 5}^{\text{th}} \text{ year} &= (2,582,672.40 - 2,038,027.20) + (175,692.00 - \\ &\quad 91,359.84) + (1,159,567.20 - 1,150,782.60) \\ &= 637,761.96 \quad \text{Baht/year}\end{aligned}$$

F.4.4 Payback Analysis for Candidate 2

The calculation for payback analysis is shown in Table F.9.

Table F.9. Payback Analysis for Candidate 2, Baht.

Cost items	Years					
	0	1	2	3	4	5
Depreciation cost	-653,000.00	-	-	-	-	-
Operation & Maintenance cost	-	-40,000.00	-44,000.00	-48,000.00	-53,240.00	-58,564.00
Discount factor for 10%	1.000	0.909	0.826	0.751	0.683	0.621
Time – adjusted costs (adjusted to present value)	-653,000.00	-36,360.00	-36,344.00	-36,348.00	-36,363.00	-36,368.00
Cumulative time-adjusted costs over lifetime	-653,000.00	-989,360.00	-1,025,704.00	-1,062,052.00	-1,098,415.00	-1,134,784.00
Benefit derived from operation of new system	-	435,000.00	479,160.00	527,076.00	579,783.60	637,761.96
Discount factor for 10%	1.000	0.909	0.826	0.751	0.683	0.621
Time – adjusted costs (adjusted to present value)	-	395,415.00	395,786.00	395,834.00	395,992	396,050
Cumulative time-adjusted benefits over lifetime	-	395,415.00	791,201.00	1,187,035	1,583,027	1,979,078
Cumulative lifetime time-adjusted cost + benefit	-653,000.00	-293,945.00	-65,497.00	424,983.00	784,612.00	1,144,294.00

The payback period can be calculated by the formula as follows:

$$P = \frac{\text{Last year of negative Cash flow difference}}{\text{Cumulative Different last negative year}} + \frac{\text{Absolute value of cumulate difference (last negative plus first year positive year)}}{\text{Cumulative Different last negative year}}$$

Where P = Payback Period

$$P = 1 + \frac{234,503}{(234,503+124,983)} = 1.82 \text{ years or 1 year 9 months}$$

Therefore, the payback period is about 1 year 9 months.



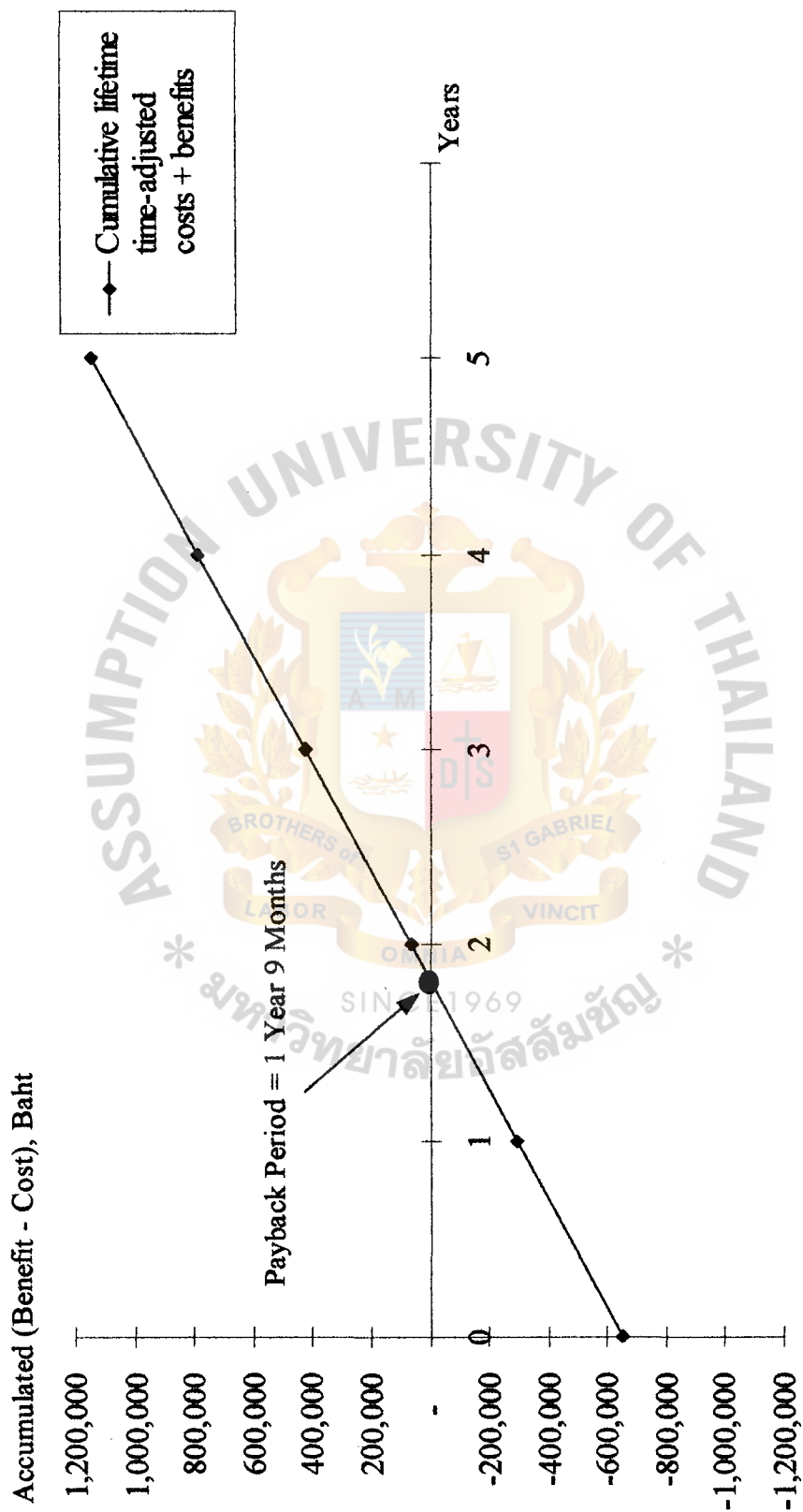


Figure F.4. Payback Chart for the Candidate 2.

F.5 Cost/Benefit Analysis for Candidate 3

F.5.1 Cost of Candidate 3 Computerized System

Table F.10. Computerized System Cost Analysis for Candidate 3, Baht.

Cost items	Years				
	1	2	3	4	5
Fixed Cost (Development Cost)					
Hardware Cost:					
Computer Server Cost	32,000.00	32,000.00	32,000.00	32,000.00	32,000.00
Personal Computer Cost	30,000.00	30,000.00	30,000.00	30,000.00	30,000.00
Laser Printer 2 units @ 25,000	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
Dot Matrix Printer 2 units @ 15,000	6,000.00	6,000.00	6,000.00	6,000.00	6,000.00
UPS 1 unit @ 8,000	1,600.00	1,600.00	1,600.00	1,600.00	1,600.00
Total Hardware Cost	79,600.00	79,600.00	79,600.00	79,600.00	79,600.00
Software Cost	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00
Network Cost	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
System Architecture Cost	100,000.00	-	-	-	-
Training Cost	20,000.00	-	-	-	-
Maintenance Cost	-	40,000.00	44,000.00	48,400.00	53,240.00
Total Fixed Cost	259,600.00	179,600.00	183,600.00	188,000.00	192,840.00
Operating Cost					
Salary Cost:					
Customer Service Manager					
1 person @ 35,000	35,000.00	38,500.00	42,350.00	46,585.00	51,243.50
Staff:					
Supervisor 1 person @ 20,000	20,000.00	22,000.00	24,200.00	26,620.00	29,282.00
Teller 3 persons @ 12,000	36,000.00	39,600.00	43,560.00	47,916.00	52,707.60
System Engineer 1 person @ 25,000	25,000.00	27,500.00	30,250.00	33,275.00	36,602.50
Total Monthly Salary Cost	116,000.00	127,600.00	140,360.00	154,396.00	169,835.60
Total Annual Salary Cost	1,392,000.00	1,531,200.00	1,684,320.00	1,852,752.00	2,038,027.20
Office Supplies & Miscellaneous Cost:					
Stationery 1,200 per month	14,400.00	15,840.00	17,424.00	19,166.40	21,083.04
Paper 2,000 per month	24,000.00	26,400.00	29,040.00	31,944.00	35,138.40
Miscellaneous 4,000 per month	24,000.00	26,400.00	29,040.00	31,944.00	35,138.40
Total Annual Office Supplies & Miscellaneous Cost	62,400.00	68,640.00	75,504.00	83,054.40	91,359.84
Utility Cost:					
Electricity 40,000 per month	528,000.00	580,800.00	638,880.00	702,768.00	773,044.80

Table F.10. Computerized System Cost Analysis for Candidate 3, Baht (Continued).

Cost items	Years				
	1	2	3	4	5
Water 6,000 per month	48,000.00	52,800.00	58,080.00	63,888.00	70,276.80
Telephone 20,000 per month	210,000.00	231,000.00	254,100.00	279,510.00	307,461.00
Total Utility Cost	786,000.00	864,600.00	951,060.00	1,046,166.00	1,150,782.60
Total Operating Cost	2,240,400.00	2,464,440.00	2,710,884.00	2,981,972.40	3,280,169.64
Total Proposed System Cost	2,500,000.00	2,644,040.00	2,894,484.00	3,169,972.40	3,473,009.64

F.5.2 Cost of Comparison and Breakeven Analysis for Candidate 3

Table F.11. The Comparison of the System Cost for Candidate 3, Baht.

Year	Accumulated Existing System Cost	Accumulated System Cost of Candidate 3
1	2,452,700.00	2,500,000.00
2	5,154,000.00	5,144,040.00
3	8,123,260.00	8,038,524.00
4	11,387,276.00	11,208,496.40
5	14,975,523.60	14,681,506.04

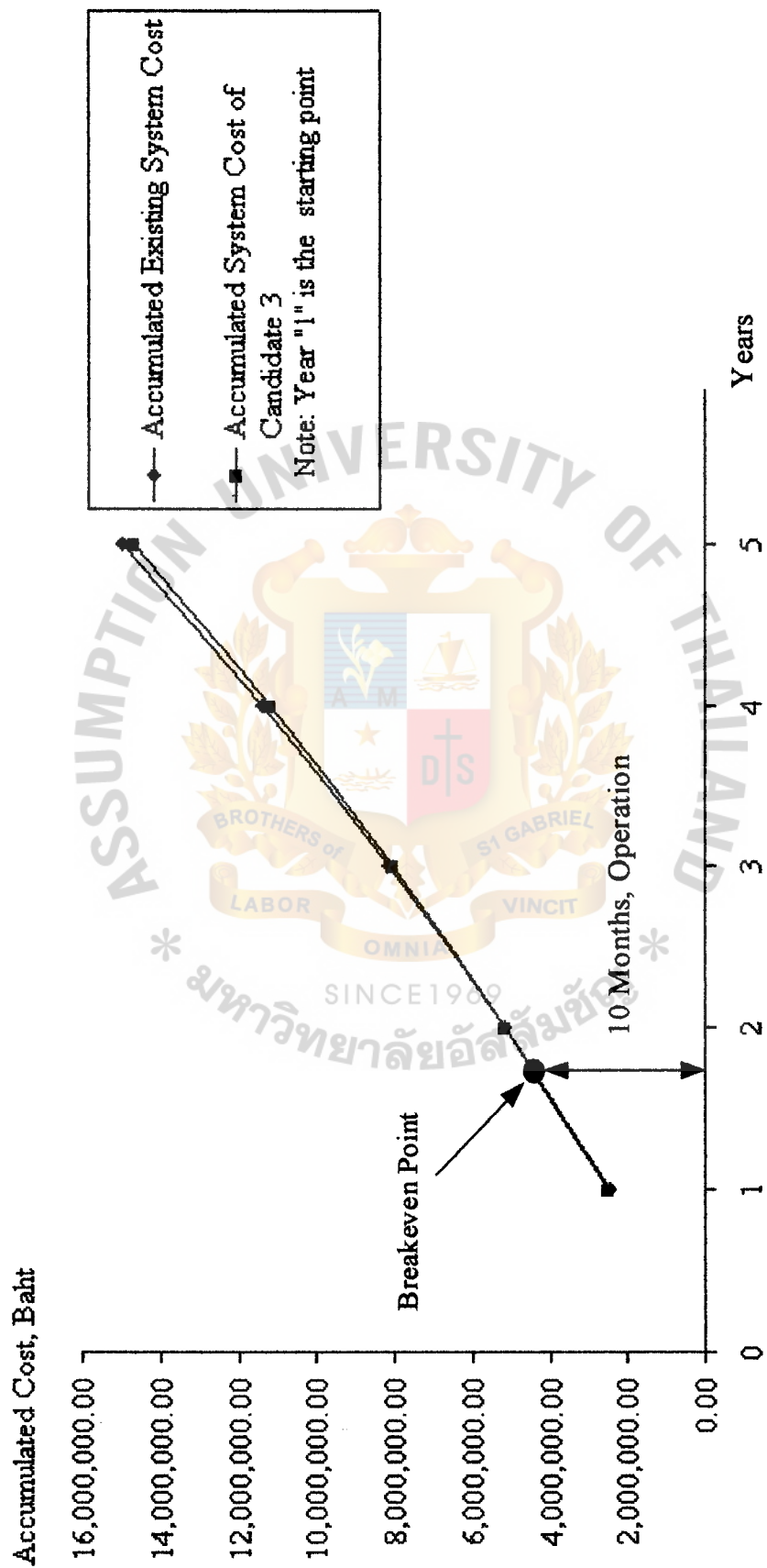


Figure F.5. Cost Comparison between Existing and Proposed System for Candidate 3.

F.5.3 Benefit Analysis for Candidate 3

From the Candidate 3 system, salary cost, office supplies and miscellaneous cost, and utility cost are saved as shown below:

$$\begin{aligned}\text{Benefit for the 1}^{\text{st}} \text{ year} &= (1,764,000.00 - 1,392,000.00) + (120,000.00 - \\ &\quad 62,400.00) + (792,000.00 - 786,000.00) \\ &= 435,000.00 \quad \text{Baht/year}\end{aligned}$$

$$\begin{aligned}\text{Benefit for the 2}^{\text{nd}} \text{ year} &= (1,940,400.00 - 1,531,200.00) + (132,000.00 - \\ &\quad 68,640.00) + (871,200.00 - 864,600.00) \\ &= 479,160.00 \quad \text{Baht/year}\end{aligned}$$

$$\begin{aligned}\text{Benefit for the 3}^{\text{rd}} \text{ year} &= (2,134,440.00 - 1,684,320.00) + (145,200.00 - \\ &\quad 75,504.00) + (958,320.00 - 951,060.00) \\ &= 527,076.00 \quad \text{Baht/year}\end{aligned}$$

$$\begin{aligned}\text{Benefit for the 4}^{\text{th}} \text{ year} &= (2,347,884.00 - 1,852,752.00) + (159,720.00 - \\ &\quad 83,054.40) + (1,054,152.00 - 1,046,166.00) \\ &= 579,783.60 \quad \text{Baht/year}\end{aligned}$$

$$\begin{aligned}\text{Benefit for the 5}^{\text{th}} \text{ year} &= (2,582,672.40 - 2,038,027.20) + (175,692.00 - \\ &\quad 91,359.84) + (1,159,567.20 - 1,150,782.60) \\ &= 637,761.96 \quad \text{Baht/year}\end{aligned}$$

F.5.4 Payback Analysis for Candidate 3

The calculation for payback analysis is shown in Table F.12.

Table F.12. Payback Analysis for Candidate 3, Baht.

Cost items	Years					
	0	1	2	3	4	5
Depreciation cost	-818,000.00	--	-	-	-	-
Operation & Maintenance cost	-	-40,000.00	-44,000.00	-48,000.00	-53,240.00	-58,564.00
Discount factor for 10%	1.000	0.909	0.826	0.751	0.683	0.621
Time – adjusted costs (adjusted to present value)	-818,000.00	-36,360.00	-36,344.00	-36,348.00	-36,363.00	-36,368.00
Cumulative time-adjusted costs over lifetime	-818,000.00	-854,360.00	-890,704.00	-927,052.00	-963,415.00	-999,784.00
Benefit derived from operation of new system	-	435,000.00	479,160.00	527,076.00	579,783.60	637,761.96
Discount factor for 10%	1.000	0.909	0.826	0.751	0.683	0.621
Time – adjusted costs (adjusted to present value)	-	395,415.00	395,786.00	395,834.00	395,992	396,050
Cumulative time-adjusted benefits over lifetime	-	395,415.00	791,201.00	1,187,035	1,583,027	1,979,078
Cumulative lifetime time-adjusted cost + benefit	-818,000.00	-458,945.00	-99,503.00	259,983.00	619,612.00	979,294.00

The payback period can be calculated by the formula as follows:

$$P = \frac{\text{Last year of negative Cash flow difference}}{\text{Cumulative Different last negative year}} + \frac{\text{Absolute value of cumulate difference (last negative plus first year positive year)}}{\text{Cumulative Different last negative year}}$$

Where P = Payback Period

$$P = 2 + \frac{99,503}{(99,503+259,983)} = 2.28 \text{ years or 2 years 3 months}$$

Therefore, the payback period is about 2 years 3 months.



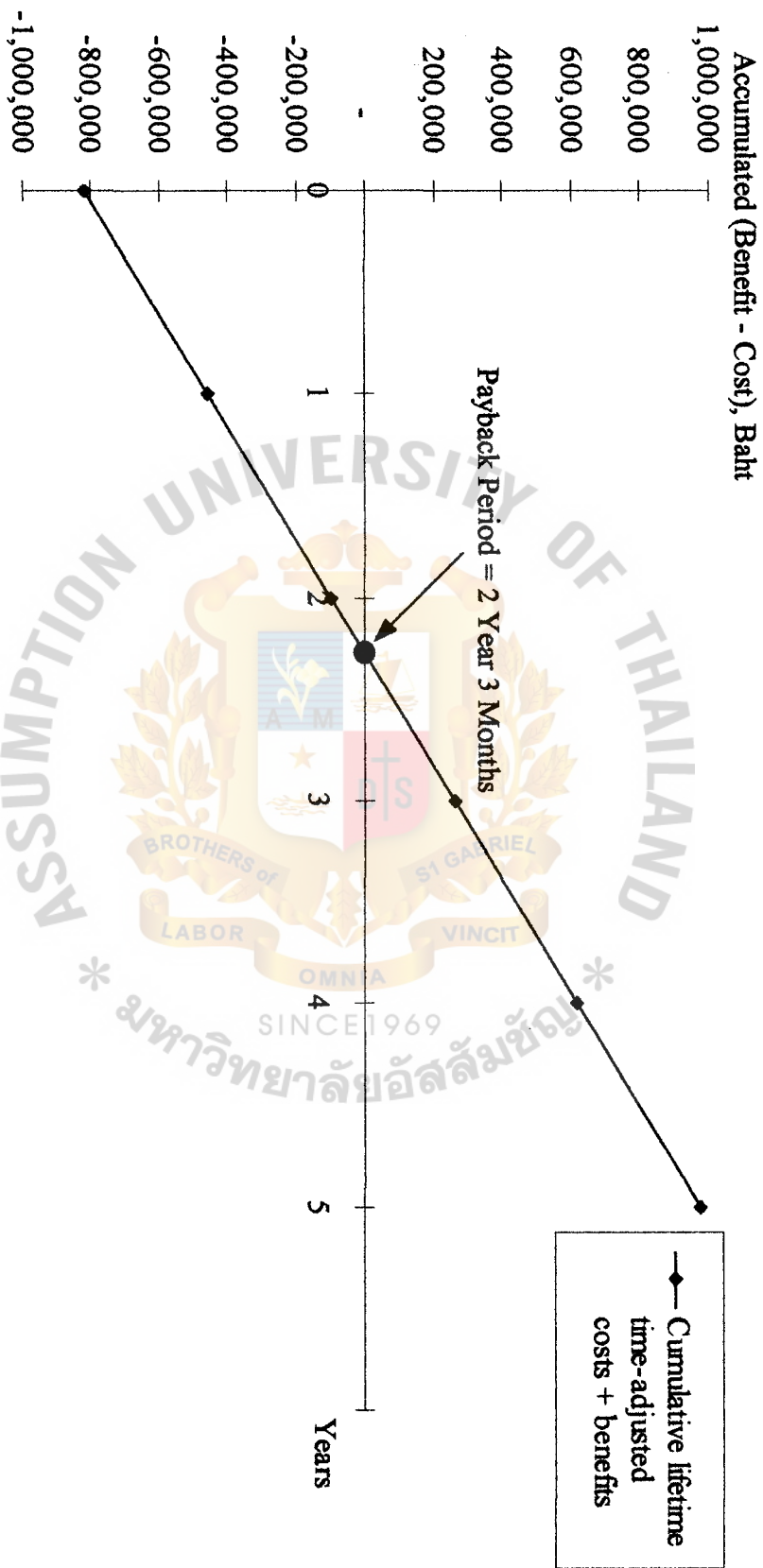


Figure F.6. Payback Chart for the Candidate 3.

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