Auto Insurance Information System
of South East Insurance Company (Raminthra Broker)

by

Ms. Wiparat Jewphocharoan

A Final Report of the Three-Credit Course
CS 6998 - CS 6999 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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Name   Ms. Wiparat Jewphocharoan

Project Advisor   Assoc.Prof.Dr. Suphamit Chittayasothorn

Academic Year   November 10, 2002

The Graduate School of Assumption University has approved this final report of the six-credit course, CS 6998 – CS 6999 System Development Project, submitted in partial fulfillment of the requirements for the degree of Master of Science in Computer Information Systems.

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ABSTRACT

The insurance business has become highly competitive as a result of recent economic downturn. Customer service is undoubtedly the most critical factor that may determine the success or failure of the business.

Today computer technology has been widely used in every part of business. In this system development project, the concept of a computerized system is applied to improve the existing order processing system operations. The major purpose of using the new system design is to reduce redundant process, to improve the working method, to increase the competitive advantages against rivals, to create better services, and to provide more accurate and up-to-date information for management. The system analysis phase covers several tasks such as studying the existing system function, identifying current problems and areas that have to be improved and preparing organization planning. The new system design phase includes the design of the new system presented by using data flow diagrams, database design, hardware and software requirements, and cost benefit analysis to improve the problem areas in the existing system. The scope of the project concerns with customer information management, insurance information management, policy information management, invoice documents and etc.

The proposed system is created by using cost/benefit analysis. Microsoft Access Program and File Insurance Software are chosen as the implementation tool on LAN Network. Furthermore, the relational database management concept is applied to design database and the software is built by using the concept of visual programming that can make user interface more friendly. Therefore, this project intends to provide a better solution to the existing problems and increase the efficiency of the operations by applying a computerized system.

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I. INTRODUCTION

1.1 Background of the Project

Nowadays, computers play an important role in every business, and computerized information systems are widely used among various insurance companies. Each insurance company tries to set its own computerized system to serve its specific needs, mainly to reduce cost of personnel assigned, time wastage, controlling and reporting.

The project is initialized in response to as a result of the rapid growth in the insurance business. The main concern of the project is Auto Insurance. Auto Insurance is a type of insurance which usually makes a good profit for many insurance companies. Most companies use the experience of underwriters to accept or reject the application. Insurance companies try to charge customers a correct premium, which is based on their assessment of the condition of car involved. The statistics used for calculating premium rates for various cars are based on the assumption that everybody in the Insurer's "family" or policy holder are playing fair. At present, underwriters will see the external body of the car to assess its condition. If there is any scratch on the body, they will reject the car to be insured or ask for a higher premium. There is a huge amount of outstanding work, especially in the production of policies and other documents, which cause delay in providing the management with necessary information on time. The system cannot assist the underwriter to answer customer promptly. Underwriters have to spend a lot of time in calculating the premium and preparing statutory reports or picture for the insurance commissioner's office. The reports are manually typed and the information sent are not always reliable.

This system development project aims to reduce labour-intensive work in producing documents and to improve the performance of underwriting departments.

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1.2 Objective of the Project

The main objective of the project is to design an information system to support insurance business of the Southeast Insurance Co., Ltd. The officers will be able to work more efficiently and effectively. Moreover, there are some changes in the insurance procedures that the old system does not support. The new system will be designed based on the changed environment. It will replace the existing system, which cannot support the new environment. Another objective of this project is to build a pioneer system for the company. If this works properly and suitably, the company will expand it to cover other applications of the company.

The objectives of the project can be categorized as follows:

(1) To study the existing system and identify the current problems of the system

(2) To define user requirements on the proposed system for Auto Insurance Department

(3) To design and standardize a new computer-based system for the company

(4) To implement and test the proposed system by using MS Access program section which provides the following applications:

    (i) To design a database that is flexible for future growth, reduce redundancy and inaccuracy of information

    (ii) To develop the application that contributes work flow of the business logic

    (iii) To provide management with timely, meaningful and reliable information which effects management's decision making in planning and controlling in order to achieve the organization plan and goal

1.3 Scope of the Project

The project covers major parts of the Auto Insurance Information which can be categorized to in:

(1) Scope of the Data

This project includes all data or information that play as input or output in insurance system. The names are listed below.

    (i)   Policy Information

    (ii)   Tax Invoice Information

    (iii) Customer and Customer Agent Information

    (iv) Claim Information

    (v)   Garage Data

(2) Scope of The Processes

In this project, all ongoing processes that occur in Auto Insurance Section will be studied and analyzed. The names of processes are listed below.

    (i)   Preparation of policy entry

    (ii)   Acceptable new policy transaction

    (iii) Preparation of risk accumulation

    (iv) Accumulation of Isolated Risks

    (v)   Accumulation of Block Risks

    (vi) Accumulation of Connected Isolated Risks

(3) Scope of Interfaces

External entities that will be covered in this project are as follows:

    (i)   Customer

    (ii)   Customer Agent

<div style="text-align: right">(iii) Garage</div>

<div style="text-align: right">(iv) Gathering Data</div>

<div style="text-align: right">(v) Claims</div>

<div style="text-align: right">(vi) Policy Document</div>

<div style="text-align: right">(vii) Accounting Department</div>

1.4 Deliverables

The deliverables of the Auto Insurance System are as follows:

(1)   A software package written in MS Access which can demonstrate both user interface screens and database management

(2)   Screen layout and menu layout for user interaction

(3)   Hard copy layout and on screen report consist of:

    (i)   Debit Note

    (ii)   Credit Note

    (iii) Rate of premium report

    (iv) Information of the first class insurance

    (v)   Information of the third class insurance

    (vi) Information of Automobile Insurance Act

    (vii) List of expiring policy each month

    (viii) Renewal Notice

    (ix) Non-renewed policy report

    (x)   Claim policy information report

    (xi) Garage information report

    (xii) Customer information report

1.5 Project Plan

The project plan is divided into four parts as follows:

(1) Feasibility Study

This is to study the current system, current hardware capacity and the overall situation. The organizational structure involving the scope of the system and problems related to each area will be studied.

(2) System analysis and design

The system analysis and design involves the detailed study of the current system and its problem. When the analysis of the existing system is completed, the problem and draft proposed by the new system will be presented to the system owner and system user for acceptance.

(3) System implementation

Plant preparation and providing space for new computer and output devices are major considerations in space planning and implementation in term part of network design, database designs and developing application programs. A trial procedure called test and acceptance which should be developed and conducted in conjunction with the design of the system in order to test the system and accept the items involved as being operational. As for training system operators and management, training programs will be conducted for each group according to their related work and authorization and users will be provided with operation manuals.

(4) System Conversion

System conversion consists of data conversion and system installation. The methods used in converting files will depend upon the alternative selected for the installation of the new system. The existing file is prepared for conversion but the cost and possibility of converting the existing file to match the new system must be considered.

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Both the existing system and new computerized system shall be operated concurrently for some period of time. Often, this parallel operation period coincides with business processing cycles such as week or month, during the interim period. All input transactions are used to update the database that supports both old and new systems. The project plan of Auto Insurance Information System of South East Insurance Company is shown in Figure 1.1

No.	Task Name	May 1	May 2	May 3	May 4	June 1	June 2	June 3	June 4	July 1	July 2	July 3	July 4	Aug 1	Aug 2	Aug 3	Aug 4
I.	**Analysis of the Existing System**																
1	Define the Objective and Scope	▓															
2	Study the Existing System		▓														
3	Identify the Existing Problems			▓													
4	Study the Existing Computer System			▓													
5	Develop Context Diagram				▓												
6	Develop Data Flow Diagram					▓											
7	Cost and Benefit Analysis						▓										
II.	**Analysis and Design of the Proposed System**																
8	Web Interface Design							▓									
9	Report Design							▓									
10	Database Design								▓								
11	Network Design							▓									
12	Program Design							▓									
III.	**Implementation of the Proposed System**																
13	Coding									▓			▓				
14	Testing									▓					▓		
15	Hardware Installation															▓	
16	Software Installation															▓	
17	Conversion																▓

Figure 1.1.   Project Plan of Auto Insurance Information System.

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II. THE EXISTING SYSTEM

2.1 Background of the Organization

SEIC was formally established on July 9, 1946, shortly after the World War II. Its founders were a distinguished group of investors namely H.R.H. Prince (Phra Chao Vorawongse Ther Phra Ong Chao) Bhanubandhu Yugala, H.S.H. Prince Kamalisan, Phya Prichanusut (Sern Punyarachune), Luang Damrongduritarekh (Damrong Seriniyom), Mr.Rong Sanit Jotikasathira, Mr.Thiara Leowrakvong, Mr.Bhakdi Nivatvongs, Mr.Chai Wanchai and Mr.Payap Srikarnchana. With an initial registered capital of 1million Baht, their objective was to create an insurance company that was not only a solid business venture but that would also be of service to society and the nation as a whole. Named Arkanae Prakanpai in Thai and South East Insurance Company Limited (SEIC) in English, the company chose the Temple of Dawn, a recognized symbol of prosperity, as its logo.

In the year that followed, joined by two additional directors, Mr. Pitak Boonyaraksh and Mr. Vai Vathanakul in February 1947, the company began laying plans for future growth.

In 1950, SEIC decided to add Life Insurance to its initial Fire and Marine insurance business. Reflecting the stature of the company, on February 1,1950, SEIC's first Life Insurance policy was officially presented to Queen Ramphai Bhannee (the royal consort of King Rama VII), making her the first policy holder of the new insurance.

In it's first year of operations, SEIC recorded what turned out to be its only ever loss. The company earned a premium of 187,636.78 against claims of 20,000.00 Baht, resulting in a deficit of 42,240.58 Baht. This was because the company had to keep

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money reserve for outstanding claims of Baht 123,179.12. It was the first and only loss ever occurred since the beginning of the business until today.

Organization Chart of the South East Insurance Co., Ltd. (Raminthra Broker)

```
                        ┌─────────────────┐
                        │    President    │
                        └────────┬────────┘
                                 │
                        ┌────────┴────────┐
                        │ General Manager │
                        └────────┬────────┘
                                 │
        ┌────────────────┬───────┴────────┬────────────────┐
┌───────────────┐ ┌──────────────┐ ┌──────────────┐ ┌──────────────┐
│  Personal and │ │   Insurance  │ │ Accounting & │ │  Marketing & │
│ Administration│ │  Department  │ │   Financial  │ │     Sale     │
│               │ │              │ │  Department  │ │  Department   │
└───────────────┘ └──────┬───────┘ └──────────────┘ └──────────────┘
                         │
            ┌────────────┴────────────┐
    ┌───────────────┐         ┌──────────────┐
    │ Life Insurance│         │   Disaster   │
    │               │         │   Insurance  │
    └───────────────┘         └──────┬───────┘
                                     │
                    ┌────────────────┼────────────────┐
            ┌──────────────┐ ┌──────────────┐ ┌──────────────┐
            │    Marine    │ │     Fire     │ │     Auto     │
            │   Insurance  │ │   Insurance  │ │   Insurance  │
            └──────────────┘ └──────────────┘ └──────────────┘
```
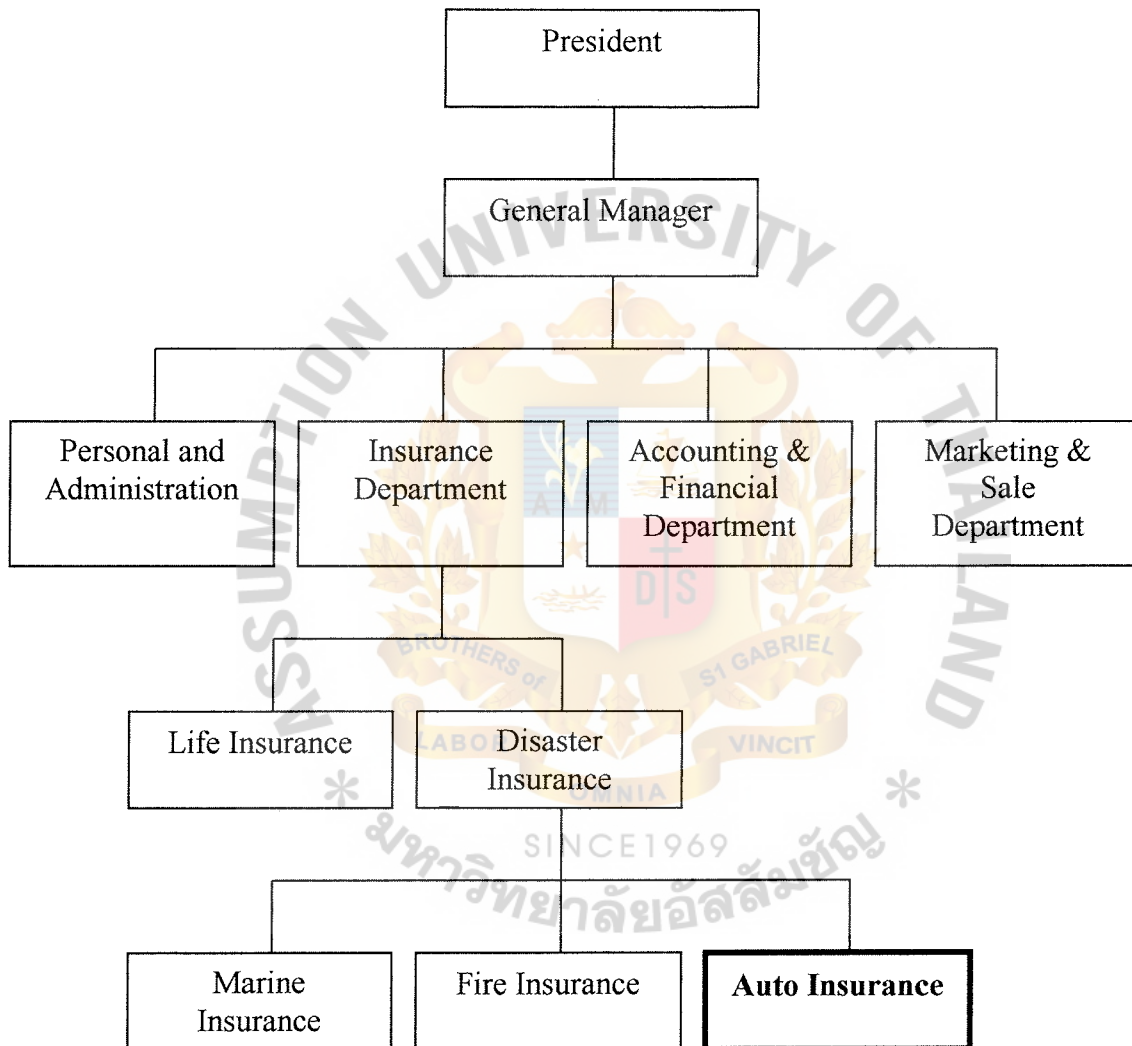
Figure 2.1.   Organization Chart of Raminthra Broker.

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2.2 Current Problems and Areas for Improvement

(1) Current Problems

Stand-alone PC is used in the existing system. Problems that occur are classified as follows:

(a) Data Redundancy

Separated operation with own files in each department often generates the same interpreted data. That causes data redundancy. Thus, generated information is not more accurate.

(b) Data is not being updated

It is very difficult to update the information of all customers and customer agents in the company.

(c) Low Performance

More steps are needed to verify information of customers and customer agents. In addition, operators must verify by themselves and use paper documents to store information.

(d) Lack of Data Sharing

The current system has no network and computer to link the data together; therefore unorganized data from different places are useless.

(e) Inefficiency in Serving Customers

The underwriters have to wait for a long time to find out and provide information to customers. They have to look at different files to get updated details of the policy schedule and then get back to the customer.

(f)   Cost Unknown

Cost of paper that is used by operators to keep and verify the information is unknown. The old system does not support verifying of information by computer.

(g)   More Mistakes

A few employees own their computers, so accurate information is very necessary. Input information should be proved by the system verifying process.

(2)   Area for Improvement

The study area is the flow of information that is spread among the computers in different departments. However, we focus on the following improvements:

(a)   To improve data integrity

(b)   To improve data security

(c)   To improve service quality

(d)   To reduce time consumption for all services

(e)   To reduce work redundancy

(f)   To reduce cost of paper

(g)   To provide the report system

2.3   Existing Computer System

Each division has its own responsibilities but they are interrelated. The analysis is shown in the context diagram (Figure 2.2) and data flow diagram level 0 (Figure 2.3)
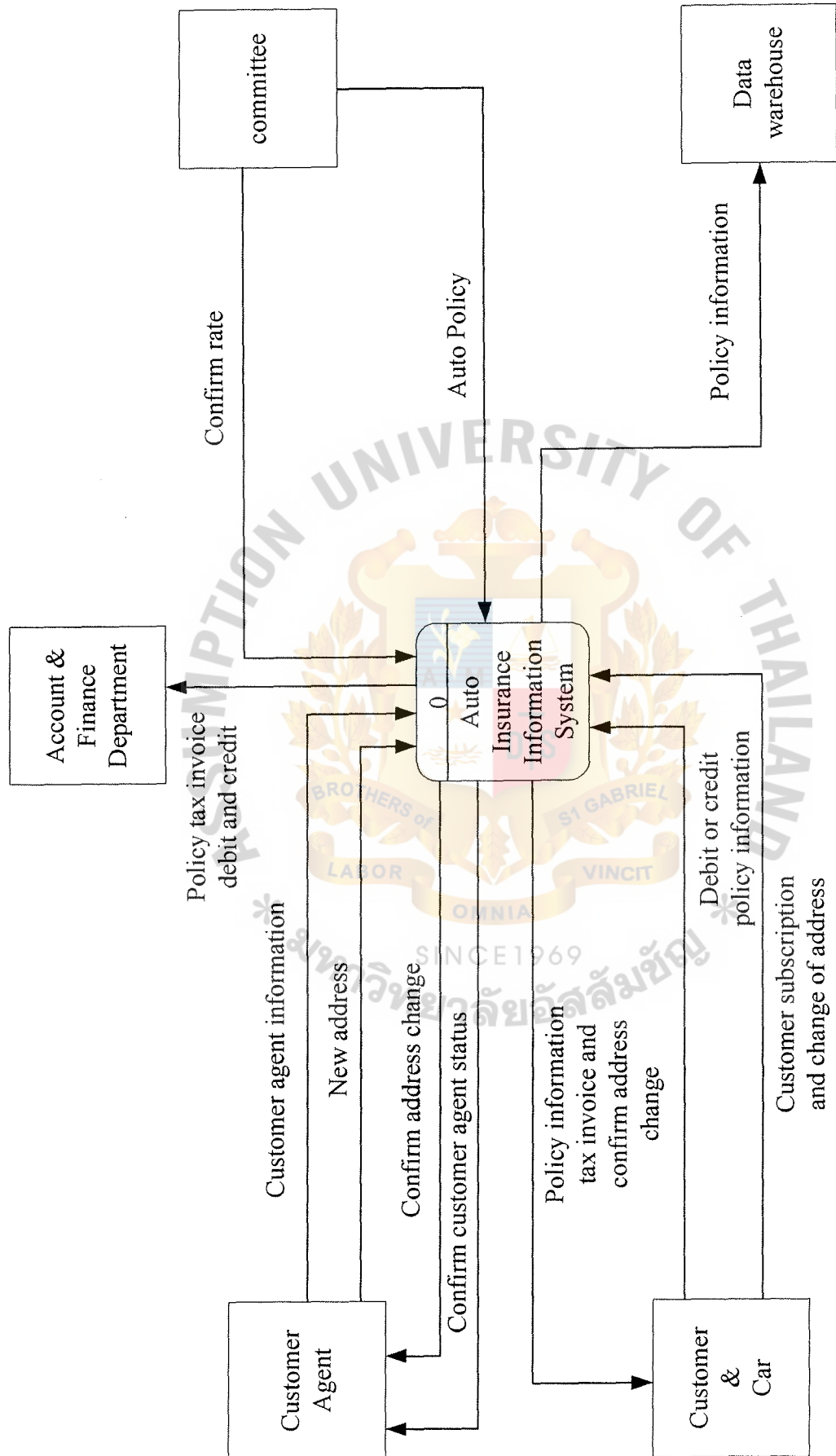
Figure 2.2. Context Level Data Flow Diagram of The Existing System.

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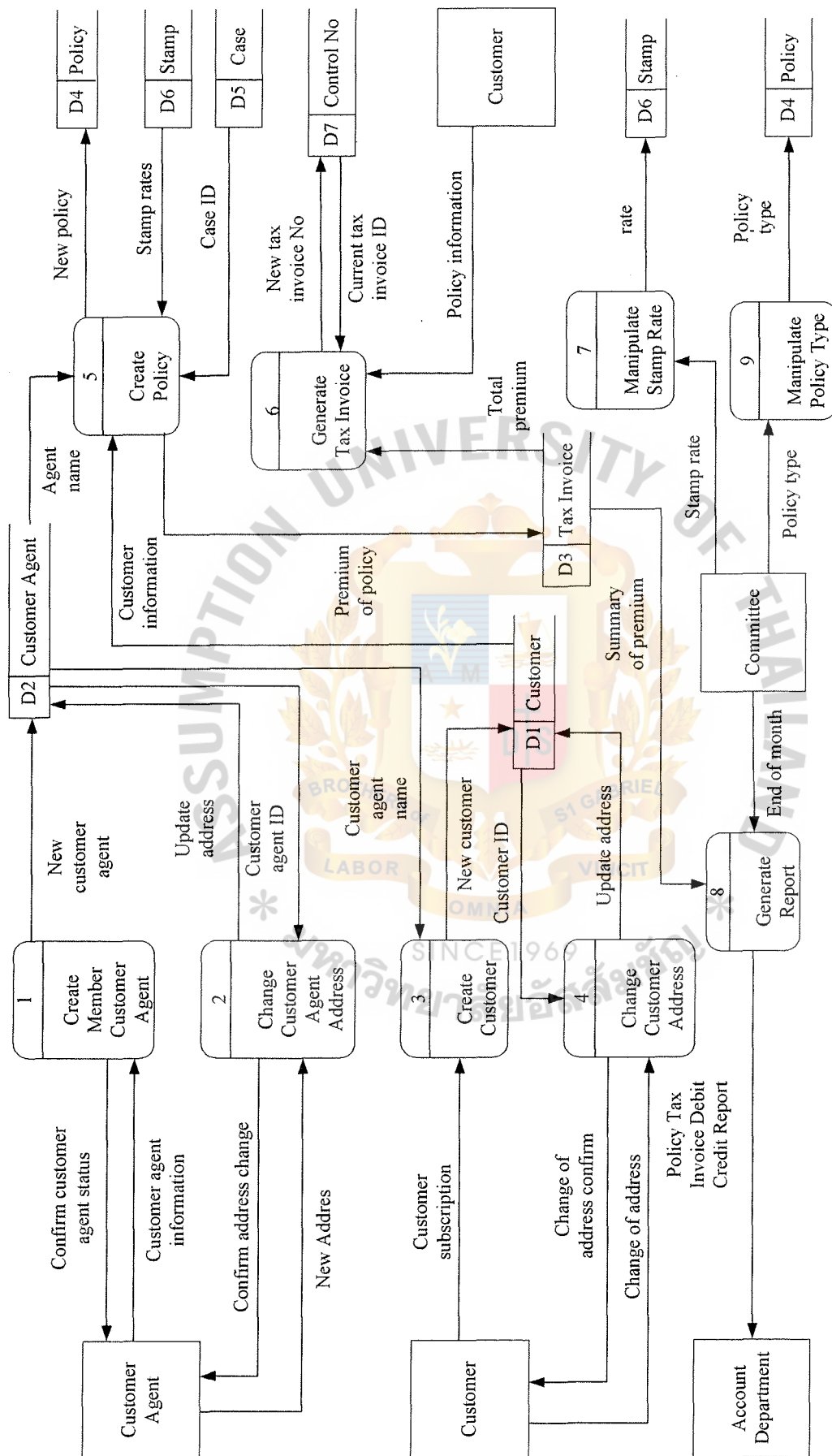
Figure 2.3.   Level 0 Data Flow Diagram of The Existing System.

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III.   THE PROPOSED SYSTEM

The next step is to design the proposed system, including input, output and resources required by the new system. The objective of the new system is to meet the present and future requirements of Auto Insurance Section.

3.1   System Specification

Main system requirements of the proposed system according to the needs of human resource department, are as follows:

(1)   The new system must be oriented towards the concept of user friendly interface.

(2)   The new system must support all necessary functions to update, delete, insert, backup and recover the data.

(3)   Sharing database is very necessary and it must be a Relational Database System and not be redundant.

(4)   Network system must be completely implemented. All computers must be successfully linked together.

(5)   The system should provide data security.

(6)   The system should print out all bills for service charge.

(7)   The system should provide the data that will be used for calculating and printing periodic invoices, including late charges.

(8)   The system should print out cash receipts for individual customers. Receipts can be entered daily, weekly, or on any other schedule convenient to the operator.

(9)   Standardized form and analysis must be easily understood by every department in the company.

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3.2 System Design

3.2.1 Input Design

The input forms of Auto Insurance Section are listed below.

(1) Customer Information

(2) Customer Agent Information

(3) Policy Information

(4) Garage Information

(5) Claims Information

(6) Debit or Credit Information

(7) Stamp Information

(8) Vat Information

(9) Tax Invoice Information

3.2.2 Output Design

Most output in the form of reports can support the decision making in management level. The forms are shown in Appendix B which include the following:

(1) Policy information list

(2) Debit and Credit information list

(3) Rate of premium report

(4) Information of the first class insurance

(5) Information of the third class insurance

(6) Information of Automobile Insurance Act

(7) List of expiring policy each month

(8) Renewal Notice

(9) Non-renewed policy report

(10) Claim policy information report

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(11) Garage information report

(12) Customer information report

3.2.3 Screen Design

The design of the screen focuses on the objective-oriented concept of every department in the company. The interface design is shown in Appendix A.

3.2.4 Process Design

The new system is purposed in order to correct the defects in the existing system. The new process is restructured to increase the workload of outperforming employee. The new process can be seen in Figures 3.1 – 3.15. The process specification is illustrated in Appendix D.

3.2.5 Database Design

Stored data in tabular form is distributed in relational database concept to duplicate table to multiple database servers in order to reduce data stream in the network and to ensure that data is always updated on each server. The new database design is shown in Appendix C.
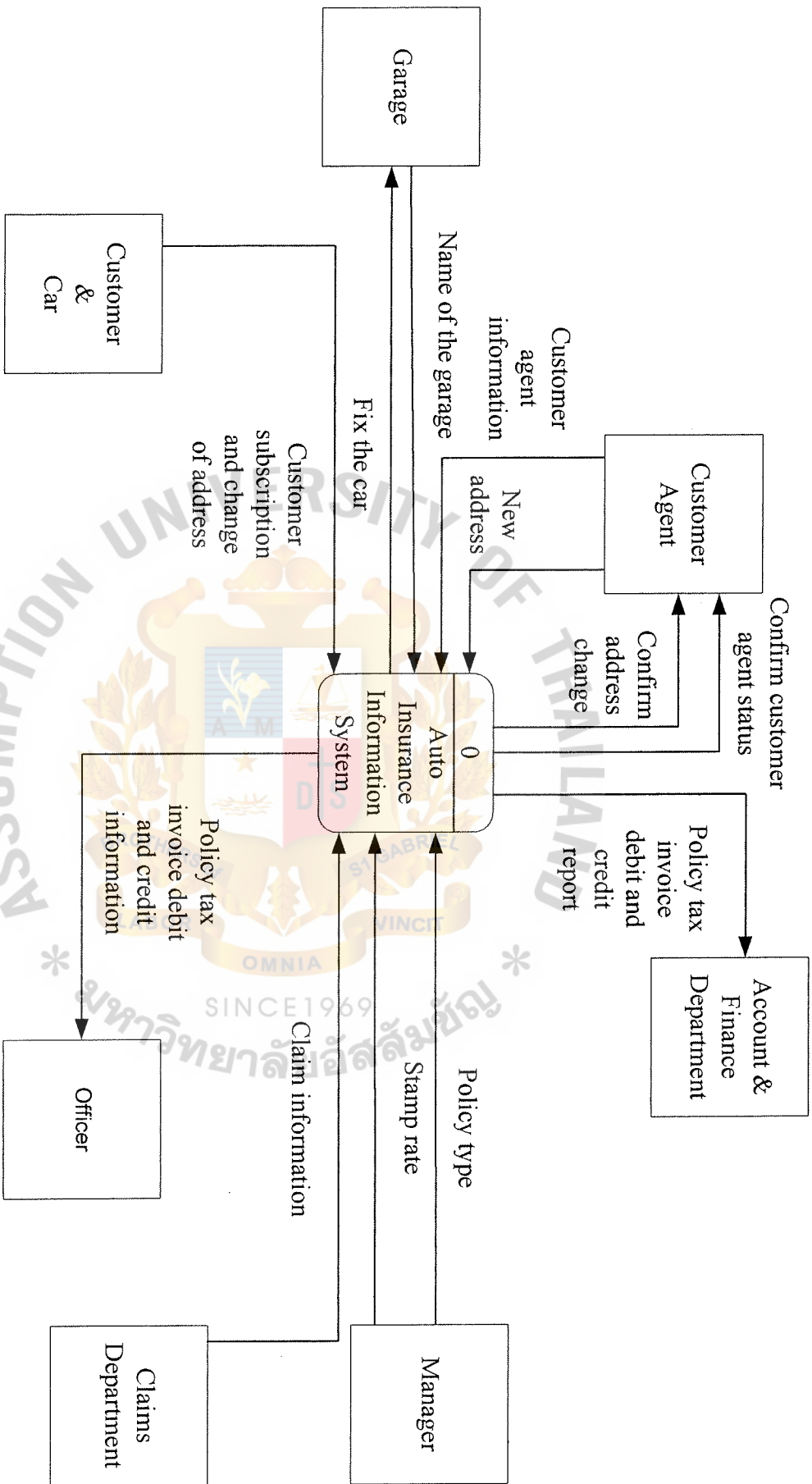
Figure 3.1. Context Level Data Flow Diagram of The Proposed System.
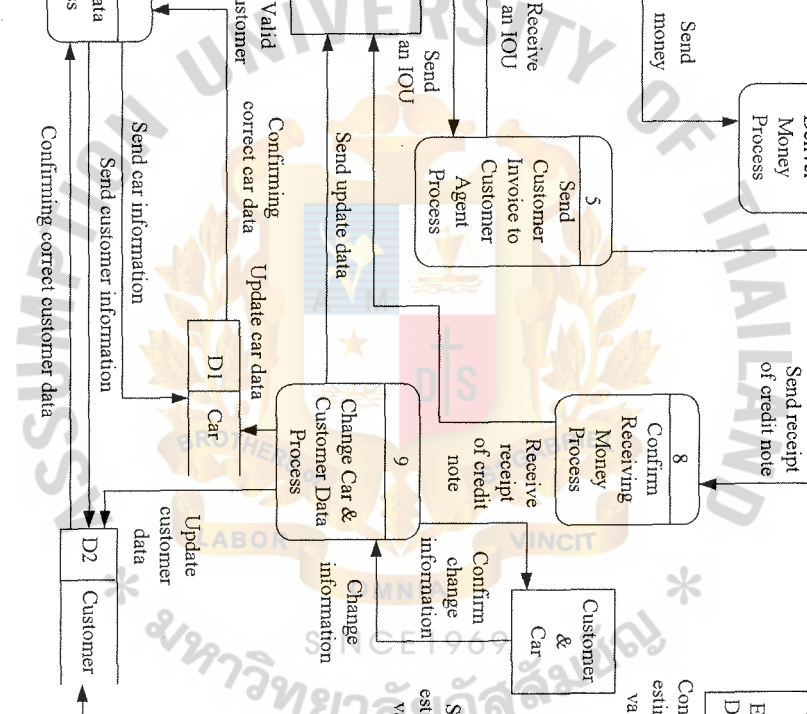
Figure 3.2.   Level 0 Data Flow Diagram of The Auto Insurance System.
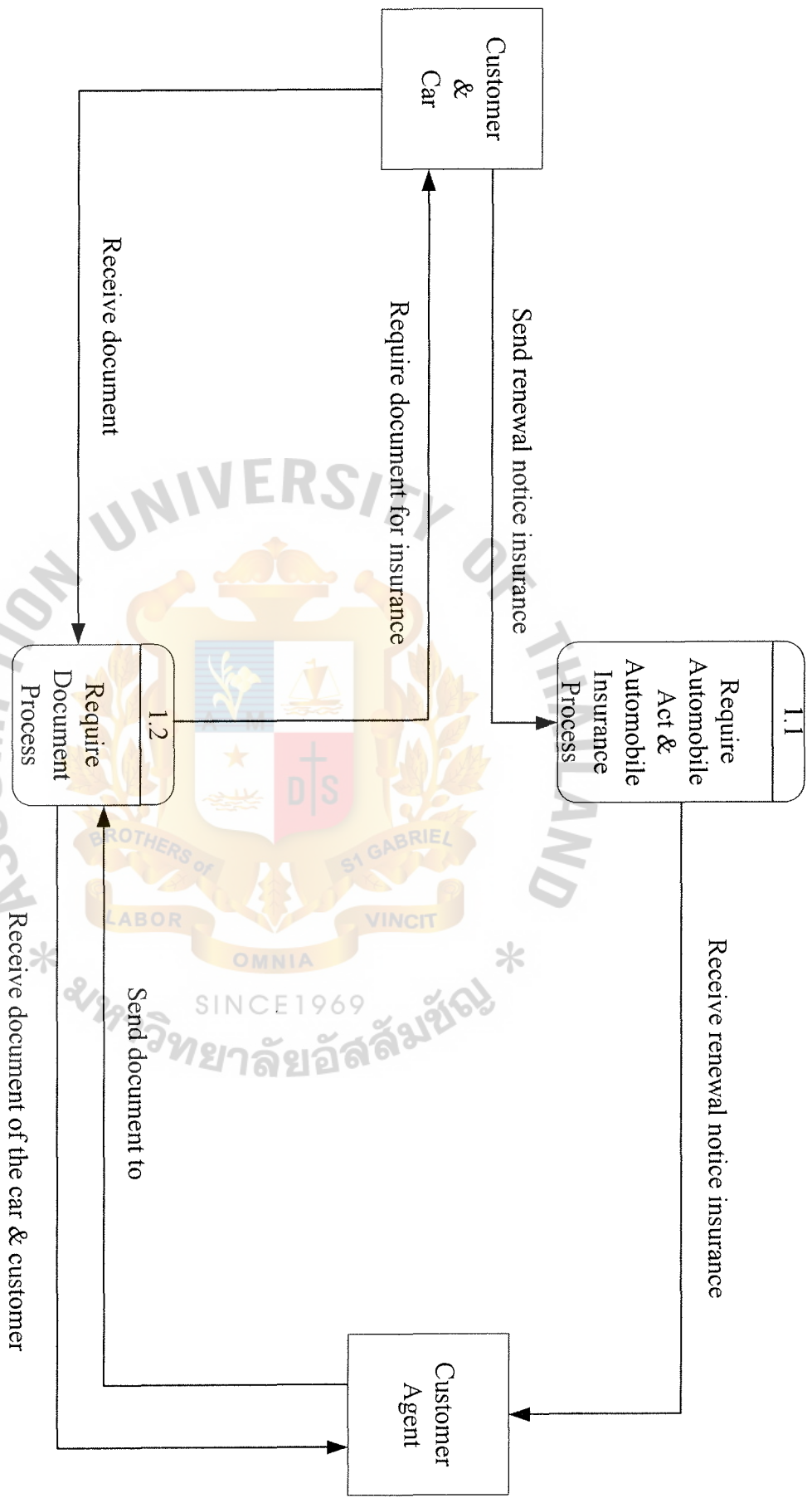
Figure 3.3.   Level 1 Data Flow Diagram of Require Automobile Act & Automobile Insurance Process of the Auto Insurance System.
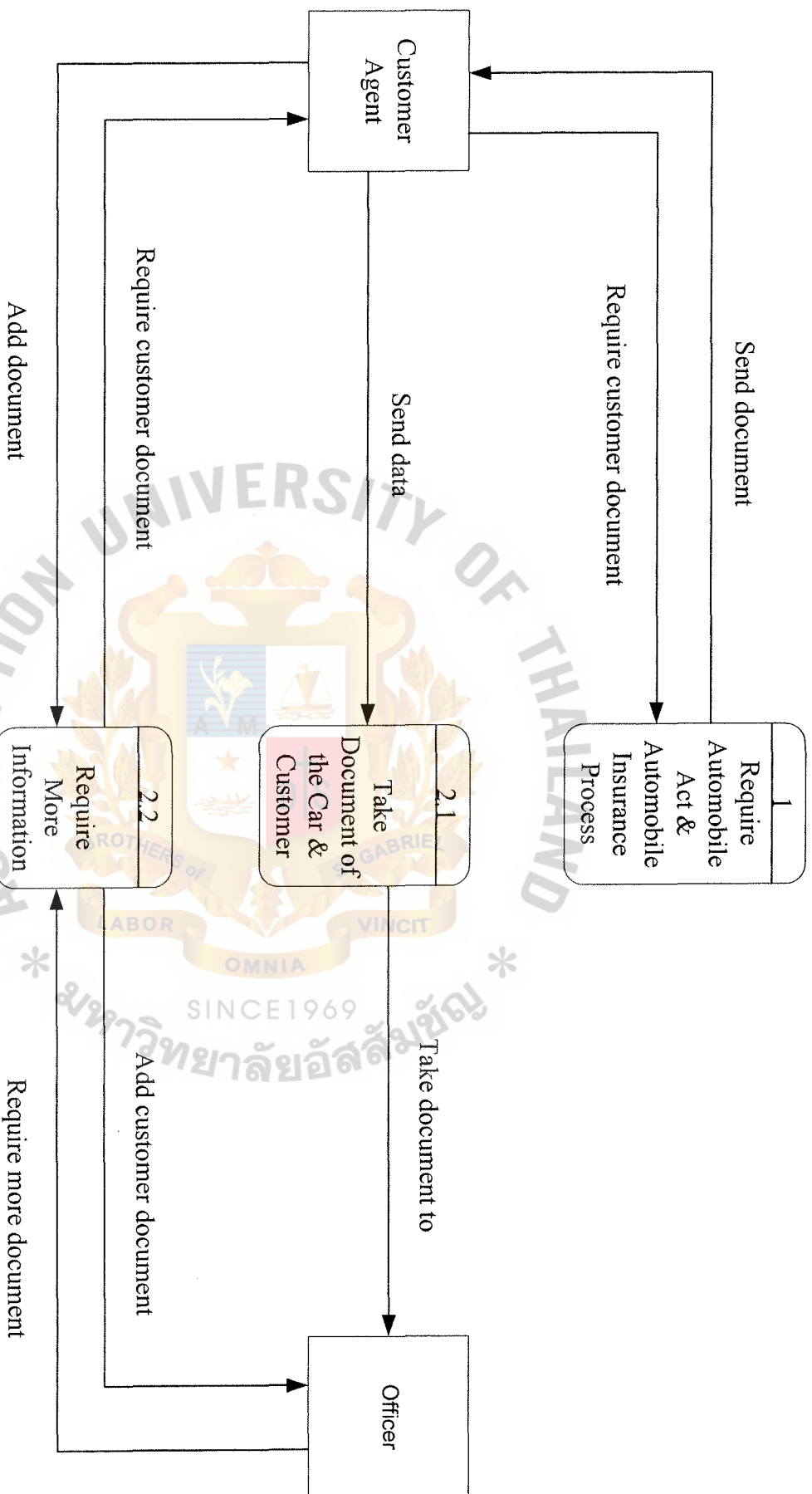
Figure 3.4.   Level 1 Data Flow Diagram of Take Car & Customer Document Process of The Auto Insurance System.
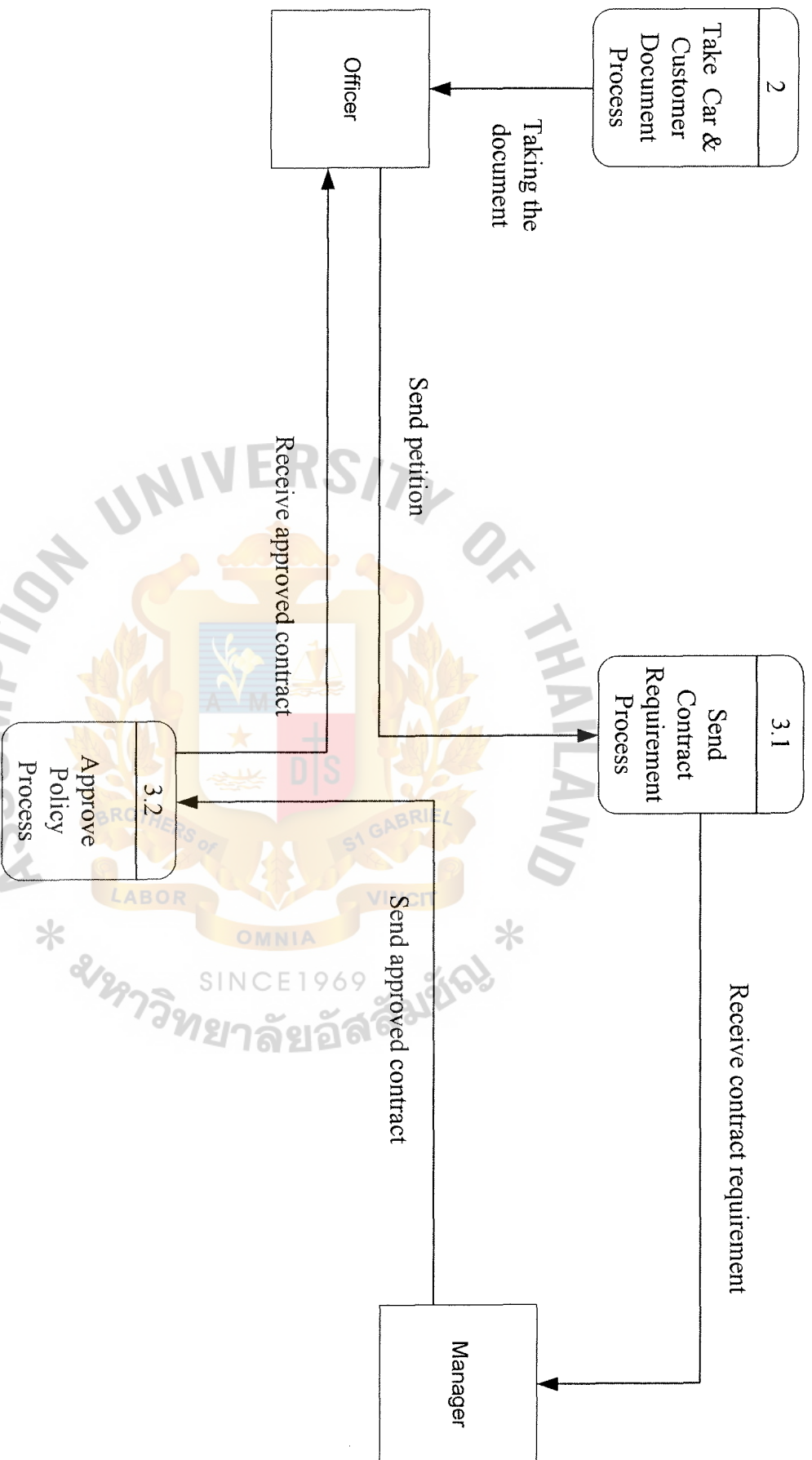
Figure 3.5. Level 1 Data Flow Diagram of Approval Automobile Act and Insurance Process of the Auto Insurance System.

Ask for approval

Send approval policy

| 3 | Approval Automobile Act and Insurance Process |

Officer

Input customer data

Input car data

Valid car

Valid customer

| 4.2 | Customer Data Process |

| 4.1 | Car Data Process |

Keep information of the customer

Keep information of the car
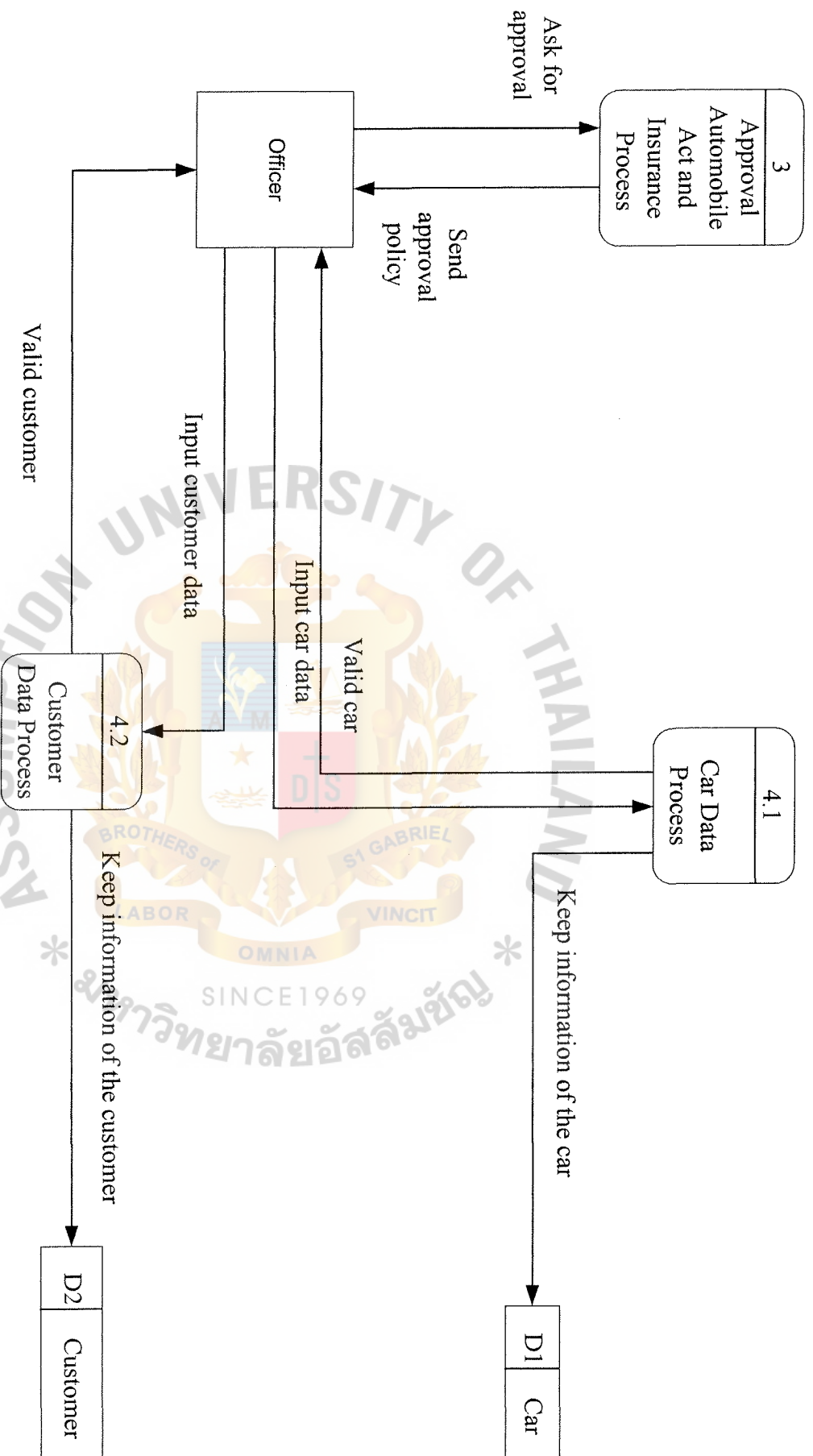
| D2 | Customer |

| D1 | Car |

Figure 3.6.   Figure 1 Data Flow Diagram of Input Data Process of The Auto Insurance System.
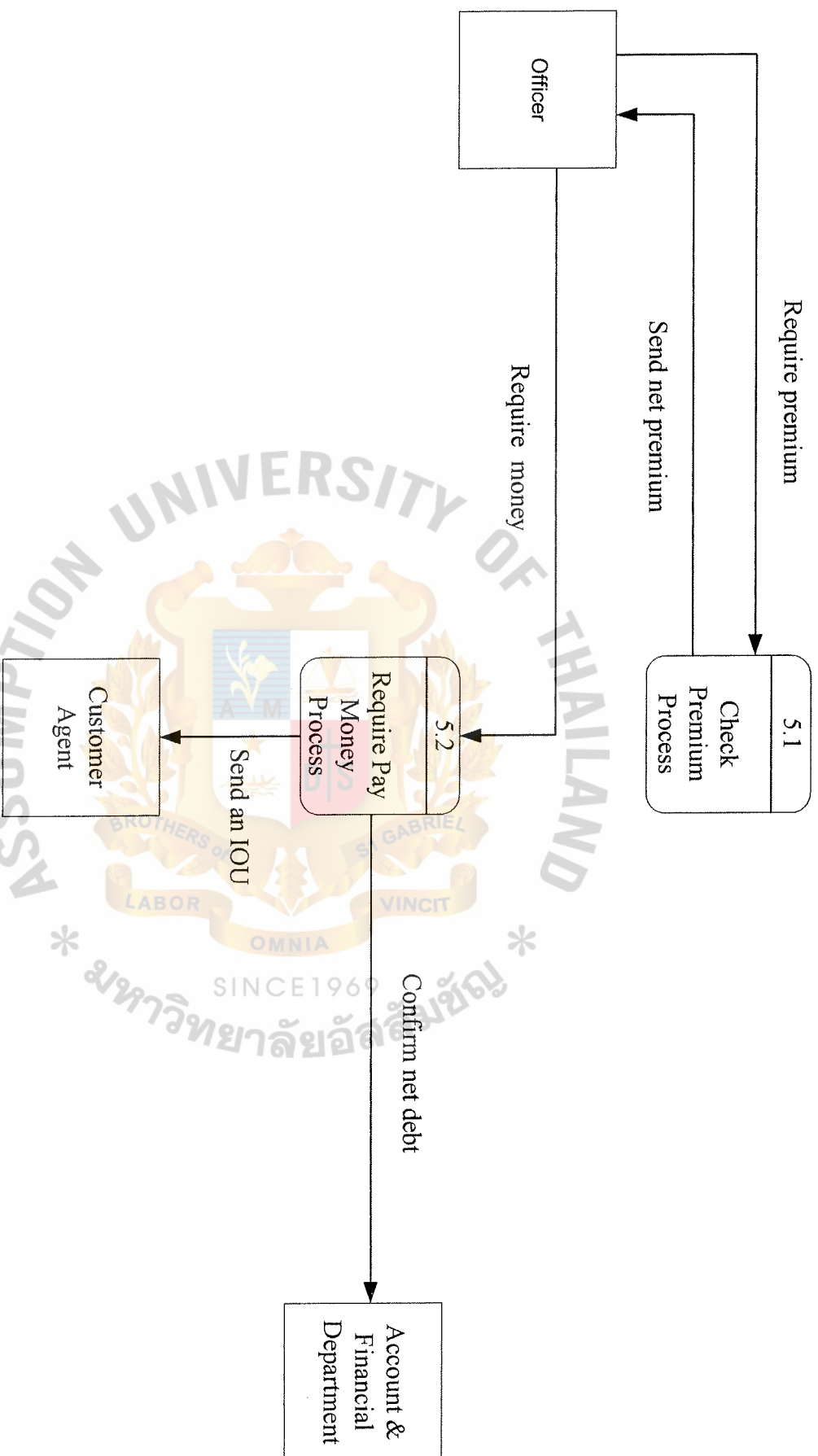
Figure 3.7. Level 1 Data Flow Diagram of Send Customer Invoice to Customer Agent Process of The Auto Insurance System.

6.1	
Collect Process	

Require payment

Confirm payment

6.2	
Receive Money Process	

Send money to

Customer Agent

Customer & Car

Send money

Receive receipt
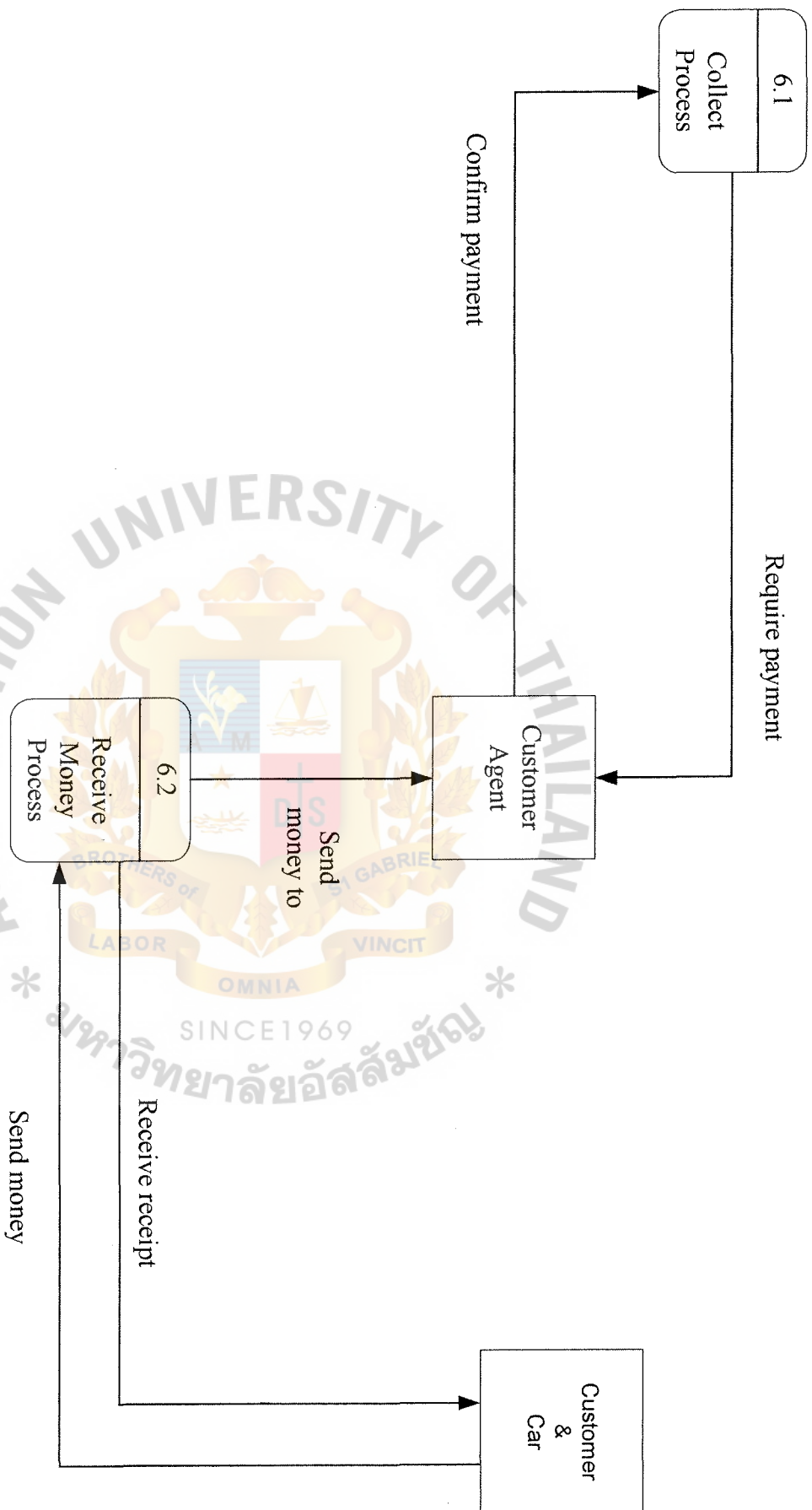
Figure 3.8.   Level 1 Data Flow Diagram of Require Customer Payment Process of The Auto Insurance System.
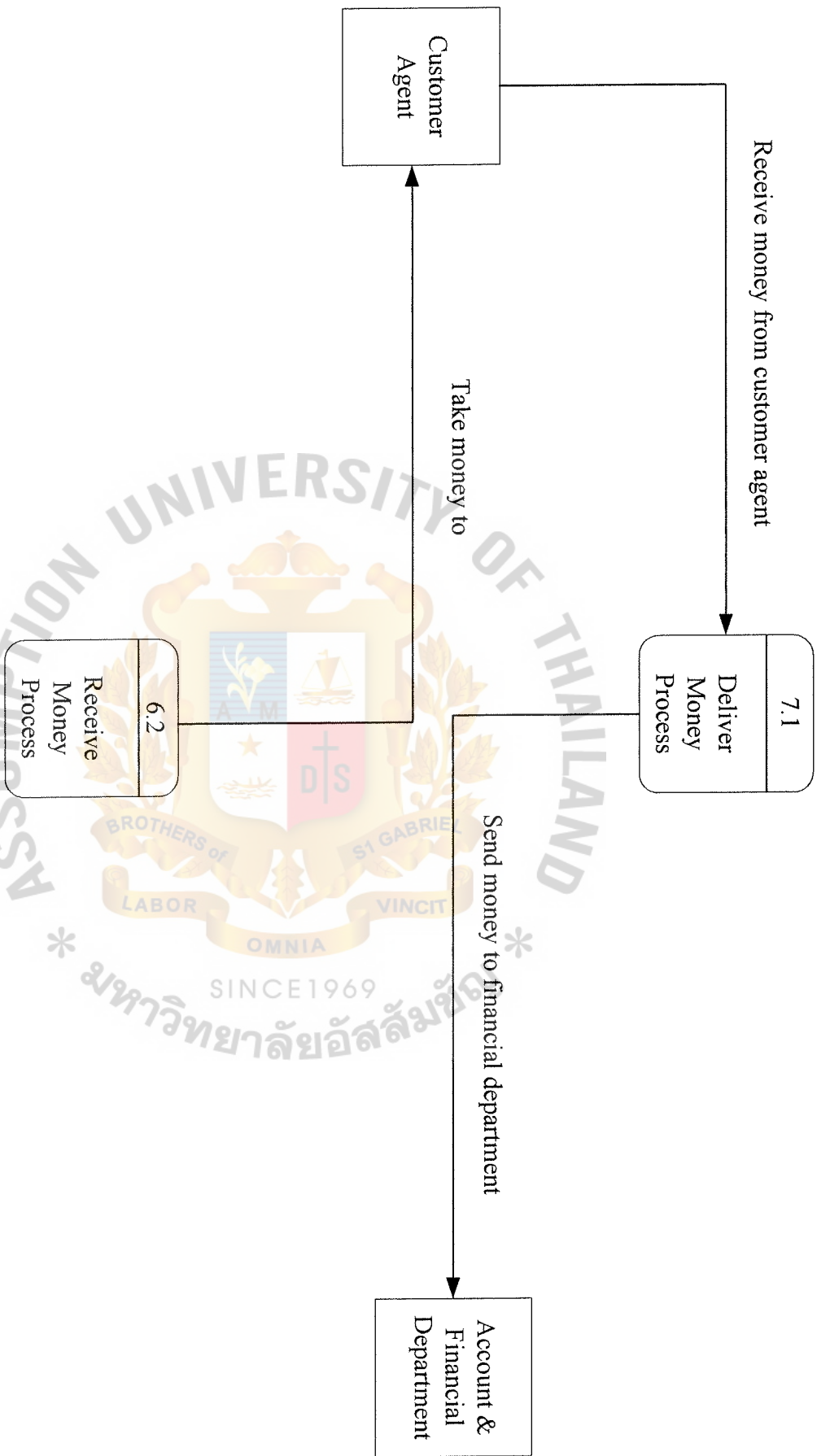
Figure 3.9.   Level 1 Data Flow Diagram of Deliver Money Process of The Auto Insurance System.
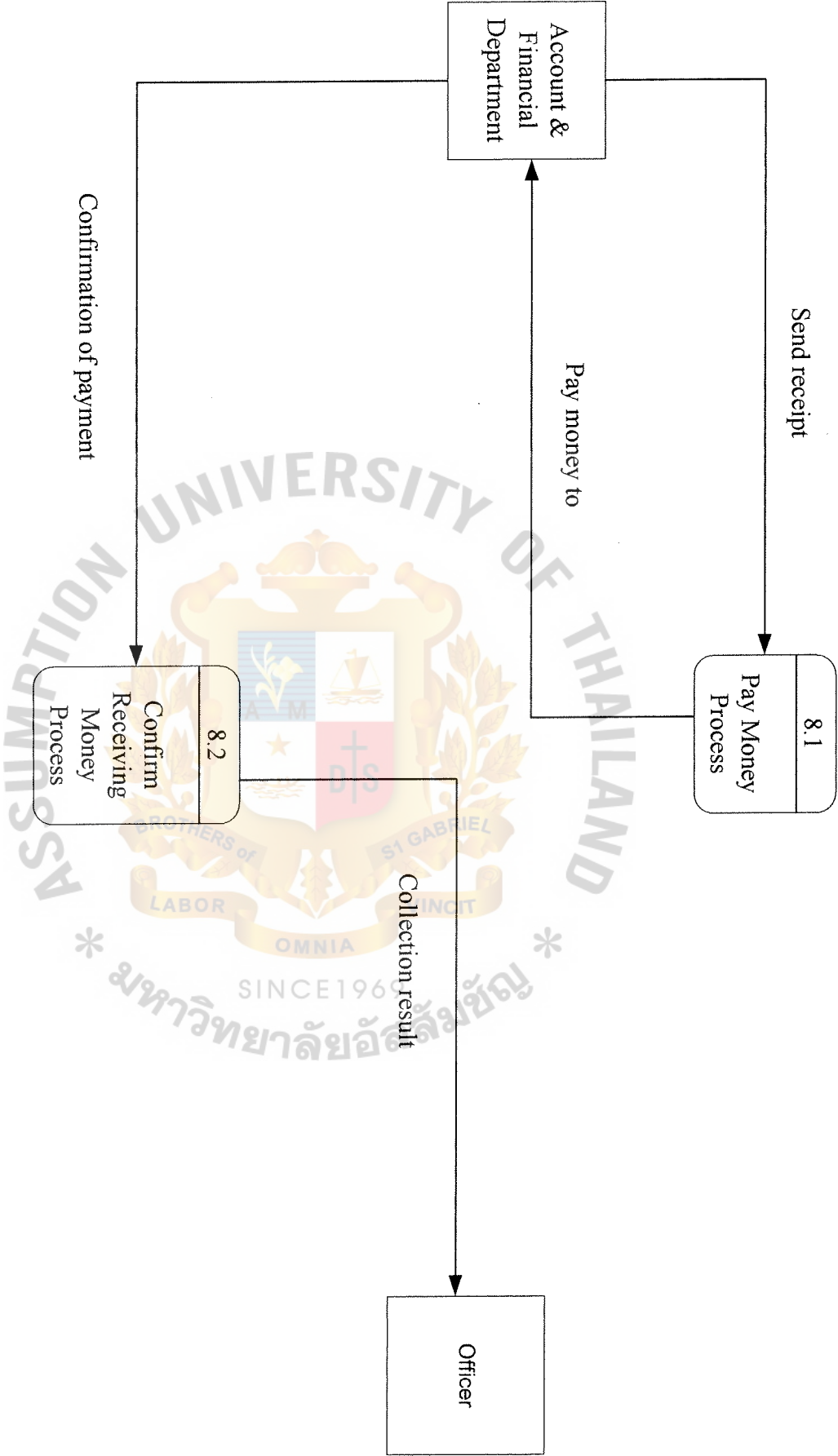
Figure 3.10.   Level 1 Data Flow Diagram of Confirm Receiving Money Process of The Auto Insurance System.
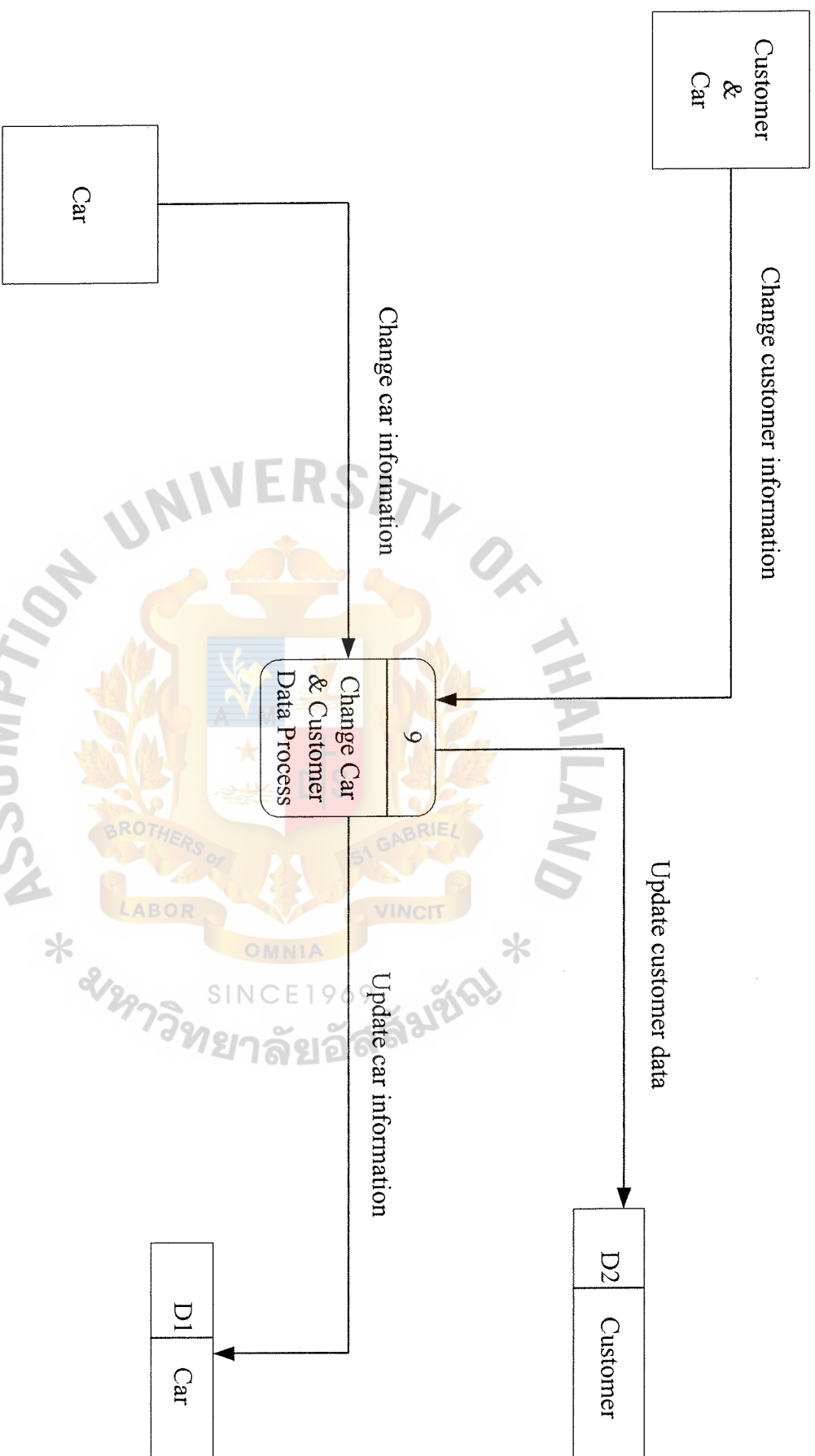
Figure 3.11.   Level 1 Data Flow Diagram of Change Car & Customer Data Process of The Auto Insurance System.
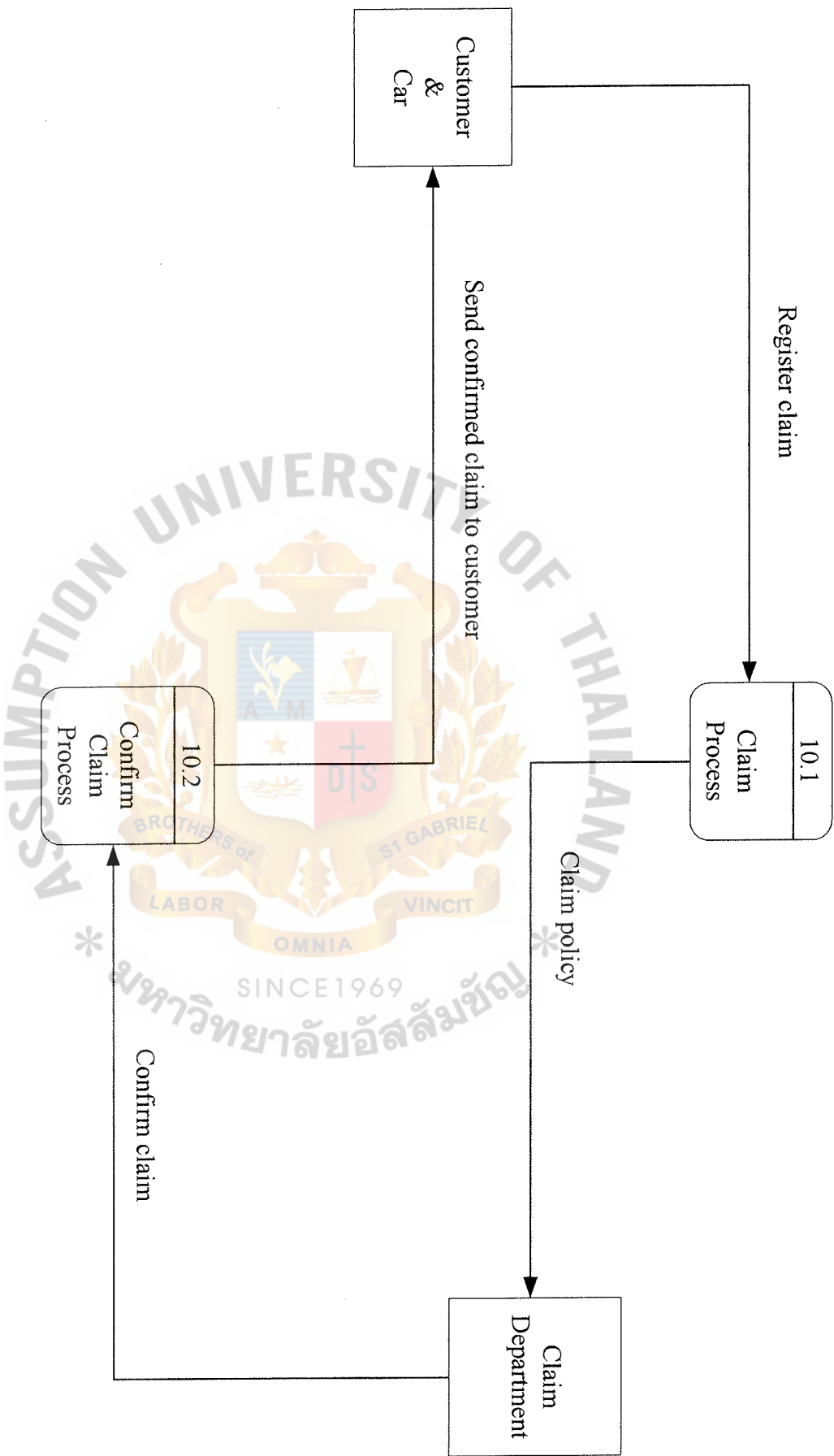
Figure 3.12. Level 1 Data Flow Diagram of Claim Insurance Process of The Auto Insurance System.
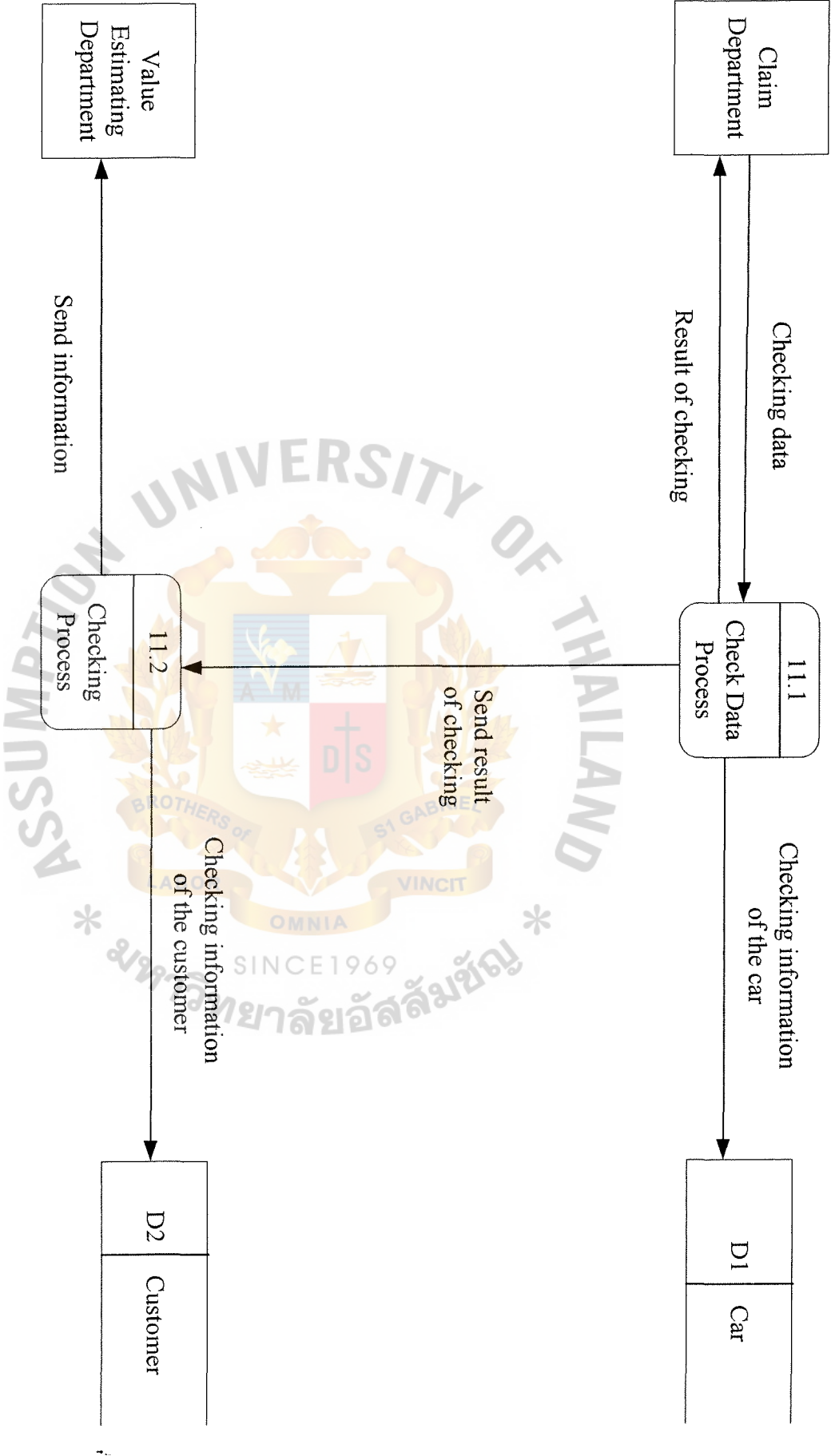
Figure 3.13. Level 1 Data Flow Diagram of Check Data Process of The Auto Insurance System.
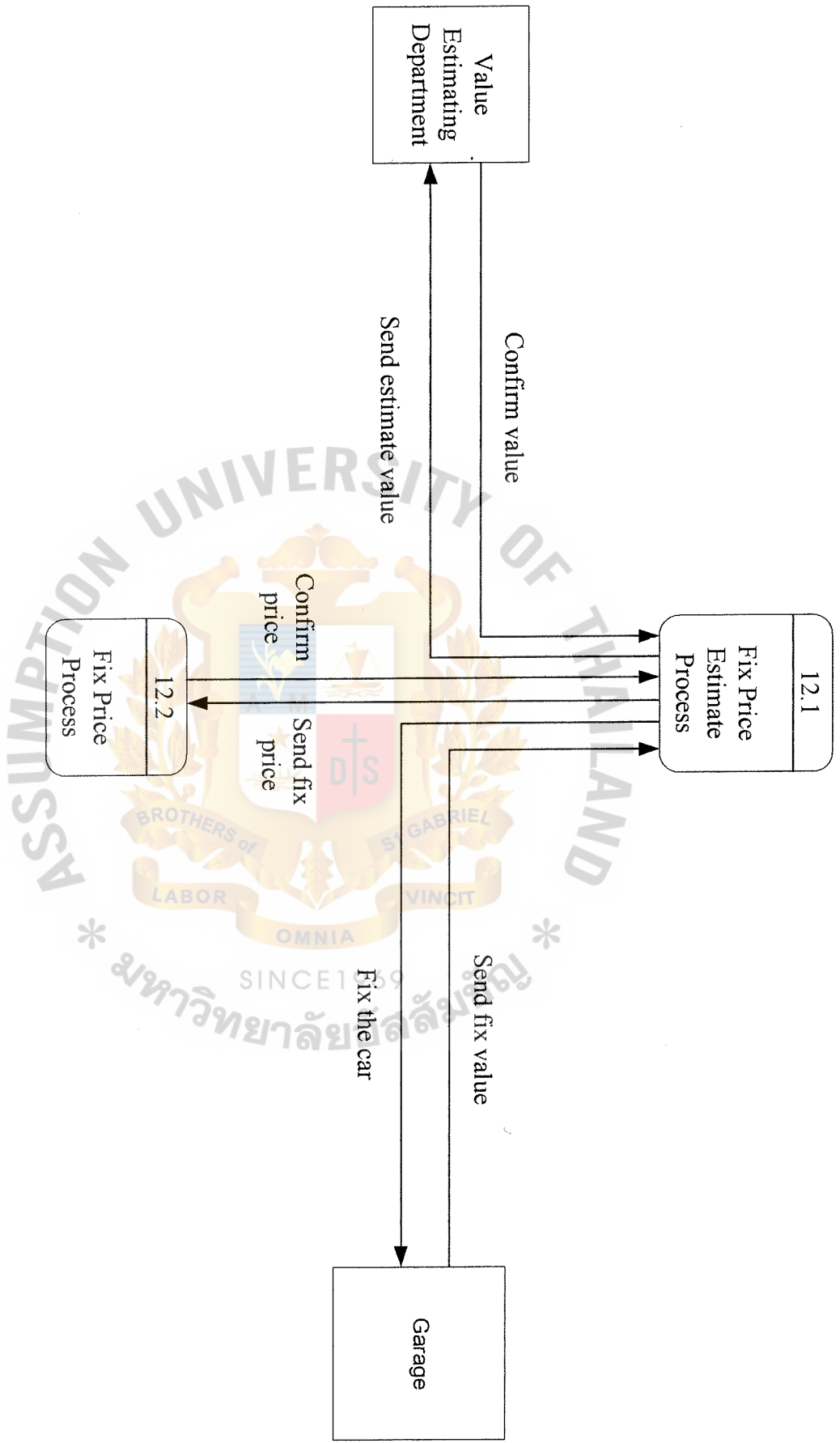
Figure 3.14. Level 1 Data Flow Diagram of Price Estimate Process of The Auto Insurance System.
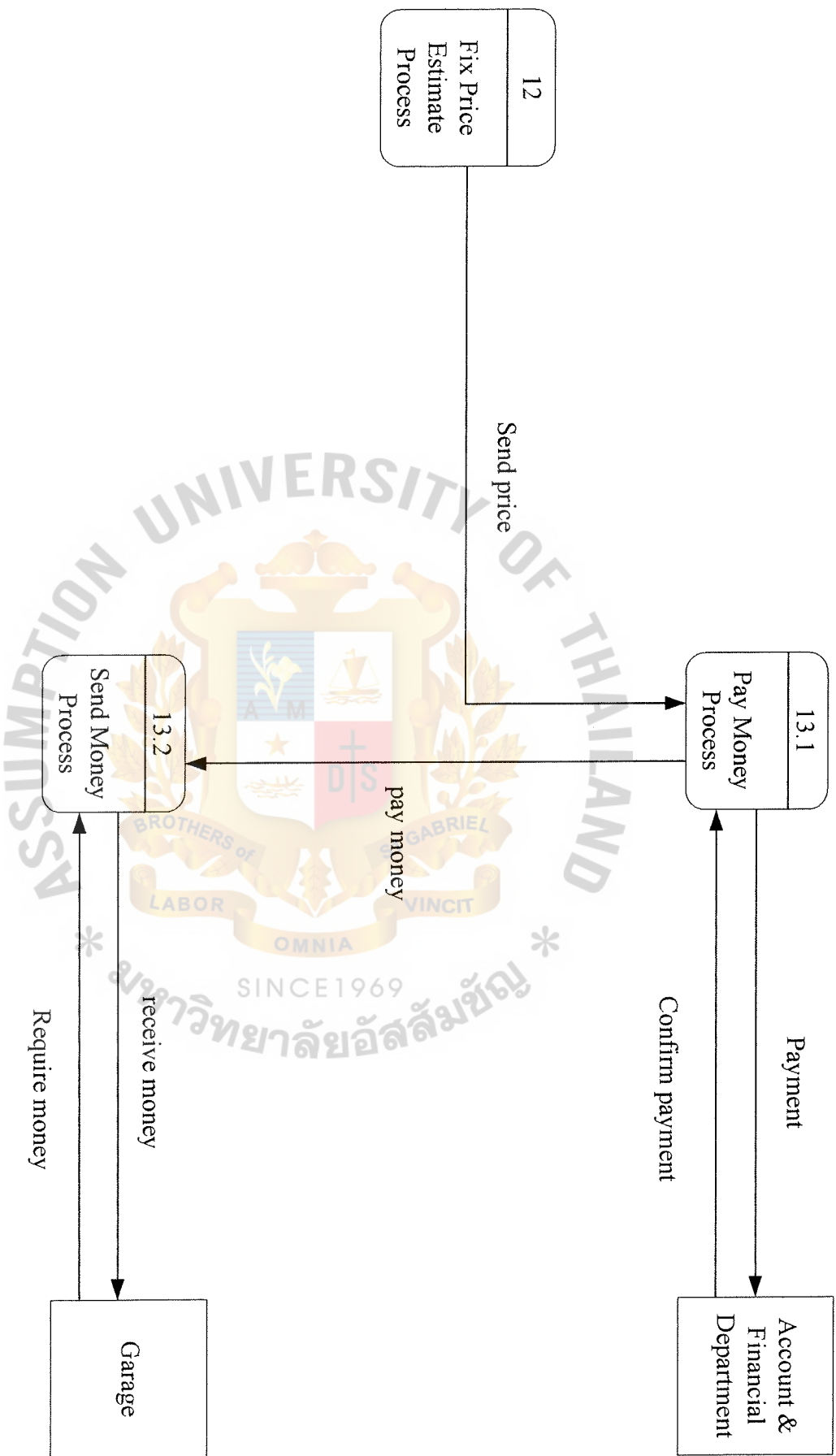
Figure 3.15.   Level 1 Data Flow Diagram of Pay Money Process of The Auto Insurance System.
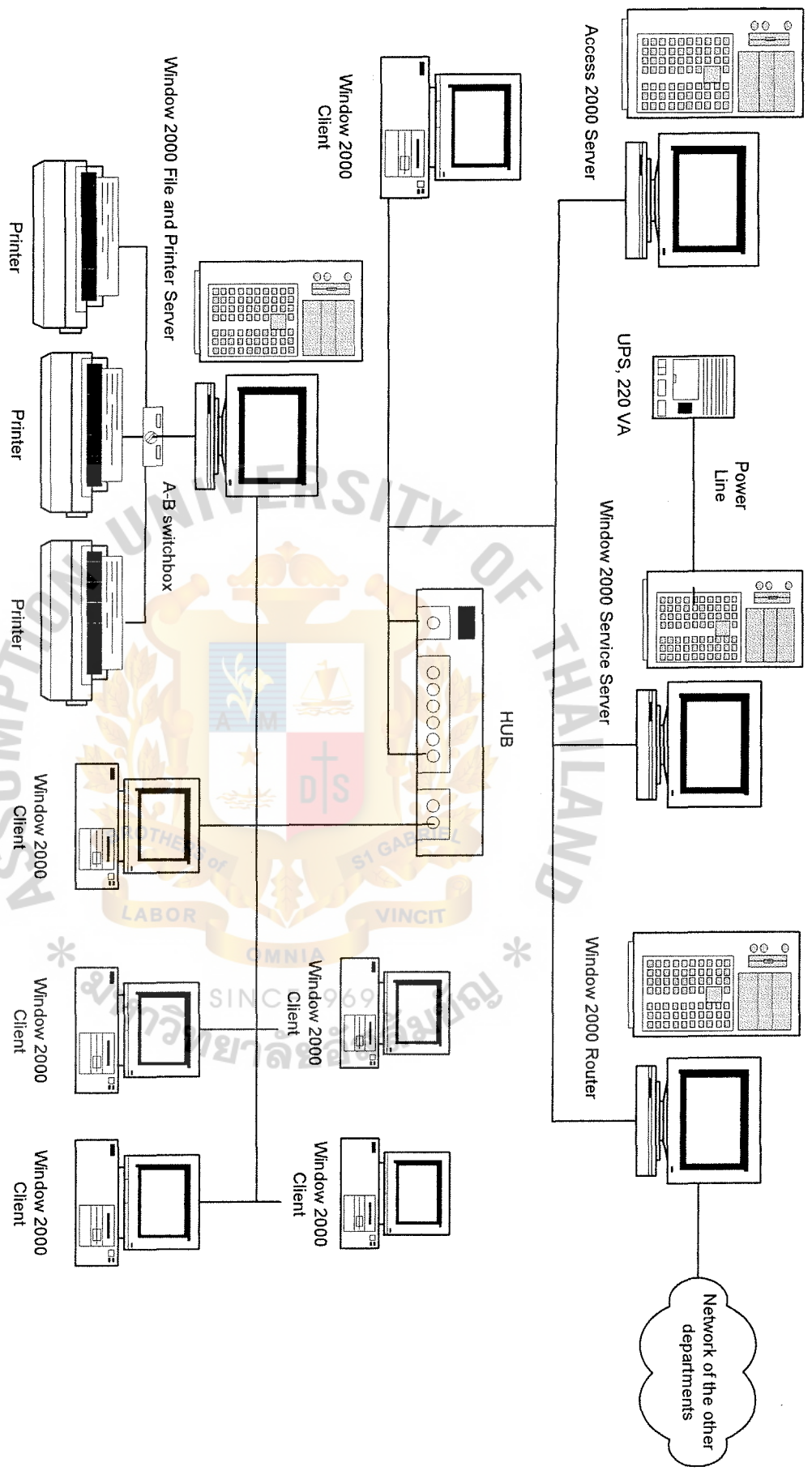
Figure 3.16. Hardware Configuration of Auto Insurance Development of the Proposed System.

3.3 Hardware and Software Requirements

Appropriate hardware and software specification enable the company to save cost of new project implementation. Both hardware and software requirements must be carefully considered because they are very important in changing to the new system. Comparing the cost between the existing and new systems can help us in decision making.

We prefer using network system. With the new network system, there will be a program supporting the company in using computer more efficiently, and sharing stored data in database.

Local Area Network (LAN) in the proposed system can support the system in several ways.

(1) Because of the computer connection in one office building, LAN is the appropriate solution.

(2) The information can be shared between workstations, including hardware, software and data. The result is cost reduction.

(3) LAN offers high-speed data communication between computers. The speed of data now can reach 100 Mbps with gigabyte.

(4) The error rate is less in network system.

The star topology with four workstations and one server is the best choice for the network system. The transmission of data and messages between clients can be managed by the server. With installed Ethernet and HUP for connection in the star topology, including connect server, workstations, printers and scanner, cost can also be reduced. The software and software specification are listed Tables 3.1-3.6.

Table 3.1. Hardware Specification for Database Server.

Hardware	Specification
CPU	Pentium III 933 GHz.
Memory	256 MB SD-RAM (Max 3 GB)
Hard Disk	Disk 20 GB, JBL Speaker
Floppy Disk	1.44 MB
CD-Rom Drive	56 X
Modem	56 K Modem
Network Adapter	3 Com 100 Mbps
Display Adapter	SVGA Card
Display Monitor	15" Monitor

Table 3.2. Hardware Specification for Terminal Service Server.

Hardware	Specification
CPU	Pentium III 933 GHz.
Memory	256 MB SD-RAM
Hard Disk	Disk 20 GB
Floppy Disk	1.44 MB
CD-Rom Drive	56 X
Modem	56 K Modem
Network Adapter	3 Com 100 Mbps
Display Adapter	SVGA Card
Display Monitor	15" Monitor

Table 3.3.   Hardware Specification for File and Print Server.

Hardware	Specification
CPU	Pentium III 933 GHz.
Memory	256 MB SD-RAM
Hard Disk	3 Disk 20 GB for Span Disk
Floppy Disk	1.44 MB
CD-Rom Drive	56 X
Modem	56 K Modem
Network Adapter	3 Com 100 Mbps
Display Adapter	SVGA Card
Display Monitor	15" Monitor

Table 3.4.   Hardware Specification for Workstation.

Hardware	Specification
CPU	Pentium III 850 GHz.
Memory	512 MB SD-RAM
Hard Disk	3 Disk 20 GB for Span Disk
Floppy Disk	1.44 MB
CD-Rom Drive	56 X
Modem	56 K Modem
Network Adapter	3 Com 100 Mbps
Display Adapter	SVGA Card
Display Monitor	15" Monitor

Table 3.5. Other Hardware Specifications.

Hardware	Specification
Printer	2 Printer HP LASERJET 1100
UPS	LEONICS OA4
HUB	16 PORT Speed
Cable	UTP

Table 3.6. Software Specification.

Hardware	Specification
Operation System	Microsoft Windows 2000 Advance Server
Database System	Microsoft Access 2000 Server
Application Software	Visual Basic 6.0

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Table 3.7.   Estimated Cost of Hardware and Software Requirement, Baht.

Hardware and Software	Units/Cost
Terminal Service Server	1 server : 48,000
Database Server	1 server : 43,000
Server File and Print Server	1 server : 45,000
Printer	3 printer : 25,000
UPS	1 UPS : 9,000
HUP	1 HUP : 9,000
Cable	250 M : 1,000
Microsoft Windows 2000 Advance Server	10,000
Microsoft Access 2000 Server	10,000
Visual Basic 6.0	10,000
Total	210,000

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3.4 Network Configuration

The cost of processor hardware has dropped far more rapidly than the cost of mass storage devices, printers, and other peripheral devices. The result is a need to share these expensive devices among a number of users to justify the cost of the equipment. This sharing requires some sort of client-server architecture operating over a network that interconnects users and resources.

In network configuration of this system, since the company is not large and has vary few staff, the star topology is selected. The term "topology" refers to the way a network is laid out, either physically or logically. In a star topology, each device or computer has a dedicated point-to-point linked only to a central controller, usually called a hub. The computers are not linked to each other.

The reason to select the star topology for this computerized system is it is less expensive. In a star topology, each computer needs only one link and I/O port to connect it to any number of other computers. This factor also makes it easy to install and reconfigure. Another advantage is robustness. If one fails, only that link is affected. All other links remain active. This factor also lends itself to easy fault identification and fault isolation. As long as the hub is working, it can be used to monitor link problems and bypass defective links.

3.5 Security and Control

Security is very important for every company, especially that of information. Thus, keeping information secret should be of primary concern. The system must be designed to support the security control in the proposed system.

3.5.1 Security of Data

The system needs physical database integrity so that the database is protected from physical problem, such as power failures, and it is possible to recover the database if it

is damaged or destroyed due to unexpected situations. The system needs logical database integrity so that the structure of the database is preserved. With logical integrity of the database, any modification to the value of one field will not affect other fields. The system will have access control so that a user is allowed to access only authorized data.

Accessing and sharing data, including reading, writing, executing, and manipulation must be concerned with the following:

(1) Accessing security level by applying policy for accessing the company database in each department.

(2) Using Active Directory of Windows 2000 to protect unauthorized access to Database Server and Terminal Server.

(3) Using RAID 5 volume and Back up information at the end of each day in order to recover data in a critical time.

3.5.2 Physical Security of Equipment

Uninterrupted Power Supply (UPS)

An UPS system server is a control buffer between the external source and the computer system. The system should be equipped with the UPS server to help continue the operations when electricity runs down. It also allows the operator to either "power down" normally or switch to a backup power source.

Virus Protection

Computer viruses are software programs that attach themselves to another program in computer memory or on a disk and spread from one program to another. Viruses damage data, cause computers to crash, display offending or annoying messages, or lie dormant until the time they are set to be "awakened".

In today's industry, scanning is no longer considered to be an extravagance but a necessity. Computer viruses attack not only the computing environment but also all other computing environments that are contacted. They can attach and later propagate themselves through disks and file. If no proper precautions are taken, they can plague the computing environment, resulting in information and hardware losses.

Thus, anti-virus software should be installed at all times. There are several antivirus programs including Norton Antivirus which is an efficient program to scan and protect virus. Norton Scan program detects, identifies, and disinfects known Dos and windows computer viruses. The program checks memory of the system and data area of disks for virus infections. If it finds a known virus, in most cases, it will eliminate the virus and fully repair the infected programs to their original conditions.

The physical equipment is able to support the flow of day to day data. As data is the asset of the organization, it must be protected and managed using the following ways;

 (1) Using the password for accessing all computers

 (2) Virus Intrusion

 (3) Each print report must have the printer record.

 (4) Unstable electricity must be of great concern. UPS is used to keep computer working all the time and to protect loss of data.

 (5) Training administrators to solve the problem in critical time.

3.5.3 Protection of the Integrity of System and Data

 Security of the System

Accessing of the system includes protection so the data must be correct.

 (1) Only authorized person is allowed to the handle the maintenance of the system.

(2)   Using Performance Monitor to set a threshold to warn the administrator for

critical service.

System Control

(1)   Input control: Use software with built-in function to check validity of the

input and keep the original document in the storage place for future

reference.

(2)   Output control: Software setting automatically controls the output control,

which is standardized.

3.6   Cost and Benefit Analysis

After the system has been developed and proposed, the analyst can weigh the cost and benefits of each alternative. This is called a cost-benefit analysis. Cost can be divided into two categories. The first category is concerned with developing the system, and the second is associated with operating the system. The development cost can be estimated from the outset of the project and should be refined at the end of each phase of the project. The operating cost can be estimated only when specific computer-based solutions have been defined (during the selection phase or later). Systems development costs are usually one-time costs that will not recur after the project has been completed.

(1)   Cost Analysis

There are two major cost categories, development costs and operational

costs. Development costs are associated with system development, and

operational costs are related to the day-to-day operation of information

systems.

(2)   Development Costs: Costs incurred for with the following reasons:

(a)   Personnel hours for analysis, design, programming, and testing

(b)   Preparation of computer site

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(c)   Documentation for new system

(d)   Changeover from old to new system

(e)   Conversion from old to new system format

(f)   Hardware purchase

(g)   Software purchase

(3)   Operating Cost: The recurring costs can be determined as the following:

    (a)   Computer supplies

    (b)   Ongoing training

    (c)   Day-to-day personnel cost, including systems administrator, computer operations, and end-user costs.

(4)   Benefits

    (a)   Tangible Benefits:

    Tangible benefits are usually measured in terms of monthly or annual savings or profit to the firm. Some examples of tangible benefits are as follows:

    (1)   Better credit

    (2)   Increased throughput

    (3)   Elimination of job steps

    (4)   Fewer processing errors

    (5)   Reduced credit losses

    (6)   Reduced expenses

    (7)   Decreased response time

    (b)   Intangible Benefits:

    Intangible benefits are those benefits believed to be difficult or impossible to quantify. Unless these benefits are at

least identified, it is entirely possible that many projects would not be feasible some examples are.

    (1)   Better service to customer

    (2)   Better decision making

    (3)   Improved customer goodwill

3.6.1 Cost/Benefit Analysis

To develop the proposed system is a long-term investment which represents sizable outlays of fund that commit a company to some course of action. Therefore, procedures are needed to be analyzed and selected properly. Attention must be given to measuring relevant cash flow and applying appropriate decision making techniques. Capital budgeting is the process of evaluating and selecting long-term investments consistent with the firm's goal of owner wealth maximization.

The Payback Period Analysis and the Breakeven Analysis are two most popular tools to evaluate this issue.

3.6.2 Payback Period Analysis:

The payback analysis technique is a simple and popular method for determining when an investment will pay for itself. Because systems development costs incur long before benefits begin to accrue, it will take some time for the benefits to overtake the costs.

After implementation, additional operating expenses that will incur must be recovered. Payback analysis determines how much time will lapse before accrued benefits overtake accrued and continuing costs. This period of time is called the "payback period". However, in an actual situation, "Discounted payback period" is used to analyze and compare the systems. Discounted payback period is based on the fact that the value of money earned today is more valuable than the value of money earned a

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year from now. Having the money today, it can be invested in a saving account. At the end of a year, the money will gain interest. This concept is called the present value of money.

The costs and benefits need to be adjusted for the time value of money. The present value of baht in a year depends on a "discount rate". The discount rate is a percentage similar to an interest rate that we is earned on a saving account.

3.6.3 Breakeven Analysis

Break-even point is the simplest form of cost comparison. This method is used when the costs of the proposed new system intersect the costs of the old system. At this point of intersection, the proposed new system begins to generate a positive monetary return in comparison with the old system. From now on, the amount invested in the new system will be offset by the saving the new system allows.

The first year costs of the proposed system will be considerably large because of the hardware and software installation. In the second year and in later years, the cost will decrease slightly and continuously.

The promotion rate for staff rises approximately 10% per year and the inflation rate and annual operation cost of the existing system will increase around 10% per year. The results in Tables 3.8 and 3.10 show that the cost of the proposed system will be higher than the existing system's cost in the first year. However in the following years, The cost of the proposed system becomes less than the existing system as can be seen form, the result in Tables 3.9 and 3.11.

Table   3.8 Manual System Cost Analysis, Baht.

Cost Items	Years				
	1	2	3	4	5
Fixed cost					
Typewriter 2 units @ 5,000	10,000.00	-	-	-	-
Calculator 6 units @ 400	2,400.00	-	-	-	-
Total Fixed Cost	12,400.00	-	-	-	-
Salary Cost					
(increase 10 % per year)					
Staff					
Project Manager 1 person @ 28,000	28,000.00	30,800.00	33,880.00	37,268.00	40,994.80
Receiving clerk 4 persons @11,000	44,000.00	48,400.00	53,240.00	58,564.00	64,420.40
Operator officer 4 persons @ 9,500	38,000.00	41,800.00	45,980.00	50,578.00	55,635.80
Total Salary Cost	110,000.00	121,000.00	133,100.00	146,410.00	161,051.00
Total Annual Salary Cost	1,320,000.00	1,452,000.00	1,597,200.00	1,756,920.00	1,932,612.00
Office Supplies & Miscellaneous Cost					
Stationery Per Annum	5,500.00	6,050.00	6,655.00	7,320.50	8,052.55
Paper Per Annum	9,930.00	10,923.00	12,015.30	13,216.83	14,538.51
Utility Per Annum	5,200.00	5,720.00	6,292.00	6,921.20	7,613.32
Miscellaneous Per Annum	5,200.00	5,720.00	6,292.00	6,921.20	7,613.32
Total Annual Office Supplies & Miscellaneous Cost	25,830.00	28,413.00	31,254.30	34,379.73	37,817.70
Total Annual Operating Cost	309,960.00	340,956.00	375,051.60	412,556.76	453,812.44
Total Manual System Cost	1,642,360.00	1,792,956.00	1,972,251.60	2,169,476.76	2,386,424.44

Table 3.9.   Five Year Accumulated Cost of Manual System, Baht.

Year	Total Manual Cost	Accumulated Cost
1	1,642,360.00	1,642,360.00
2	1,792,956.00	3,435,316.00
3	1,972,251.60	5,407,567.60
4	2,169,476.76	7,577,044.36
5	2,386,424.44	9,963,468.80
Total	9,963,468.80	-

Table 3.10. Computerized system Cost Analysis, Baht.

Cost Items	Years				
	1	2	3	4	5
Fixed cost					
Hardware Cost:					
Workstation Cost	60,000.00	60,000.00	60,000.00	60,000.00	60,000.00
Computer Server Cost	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00
Total Hardware Cost	80,000.00	80,000.00	80,000.00	80,000.00	80,000.00
Maintenance Cost	-	-	-	20,000.00	20,000.00
Software Cost:					
Compiler Cost	160,000.00	20,000.00	20,000.00	20,000.00	20,000.00
Application Cost	140,000.00	20,000.00	20,000.00	20,000.00	20,000.00
DBMS Cost	140,000.00	20,000.00	20,000.00	20,000.00	20,000.00
Total Software Cost	440,000.00	60,000.00	60,000.00	60,000.00	60,000.00
Implementation Cost:					
Advance Training Cost	130,000.00	-	-		-
Basic Training Cost	150,000.00	-	-		-
Set up Cost	150,000.00	-	-		-
Total Implementation Cost	430,000.00	-	-		-
Office Equipment Cost:					
Printer 3 Units @ 20,000	60,000.00	-	-		-
Total Fixed Cost	1,010,000.00	140,000.00	140,000.00	160,000.00	160,000.00
Operating Cost					
Operator 5 persons @ 9,500	47,500.00	52,250.00	57,475.00	63,222.50	69,544.75
Manager 1 persons @ 25,000	25,000.00	27,500.00	30,250.00	33,275.00	36,602.50
System Administrator 1 person 15,000	15,000.00	16,500.00	18,150.00	19,965.00	21,961.50
Total Monthly Cost	87,500.00	96,250.00	105,875.00	116,462.50	128,108.75
Total Annual Salary Cost	1,050,000.00	1,155,000.00	1,270,500.00	1,397,550.00	1,537,305.00
Office Supplies Cost: increase 5 %					
Stationery 1,600 per month	1,500.00	1,575.00	1,653.75	1,736.44	1,823.26
Paper 2,000 per month	2,150.00	2,257.50	2,370.38	2,488.89	2,613.34
Utility 5,500 per month	5,500.00	5,775.00	6,063.75	6,366.94	6,685.28
Miscellaneous 5,500 per month	5,500.00	5,775.00	6,063.75	6,366.94	6,685.28
Total Annual Office Supplies					
& Miscellaneous Cost	14,650.00	15,382.50	16,151.63	16,959.21	17,807.17
Total Annual Office Operating Cost	175,800.00	184,590.00	193,819.50	203,510.48	213,686.00
Total Operating Cost	1,225,800.00	1,339,590.00	1,464,319.50	1,601,060.48	1,750,991.00
Total Computerized System Cost	2,235,800.00	1,479,590.00	1,604,319.50	1,761,060.48	1,910,991.00

Table 3.11.   Five Year Accumulated Cost of Computerized System, Baht.

Year	Total Computerized Cost	Accumulated Cost
1	2,235,800.00	2,235,800.00
2	1,479,590.00	3,715,390.00
3	1,604,319.50	5,319,709.50
4	1,761,060.48	7,080,769.98
5	1,910,991.00	8,991,760.97
Total	8,991,760.97	-

Table 3.12.   Comparison of the System Costs, Baht.

Year	Accumulated Manual Cost	Accumulated Computerized Cost
1	1,642,360.00	2,235,800.00
2	3,435,316.00	3,715,390.00
3	5,407,567.60	5,319,709.50
4	7,577,044.36	7,080,769.98
5	9,963,468.80	8,991,760.97

The breakeven point is defined as the point where sales or revenue will be equal to expenses. There is no profit made or loss incurred at the breakeven point. This figure is important for anyone who manages a business since the break-even point is the lower limit of profit when setting prices and determining margins.

Figure 3.17 shows that after 1 year and 9 months of operation, the proposed system will reach the breakeven point, where sales or revenue equals to cost of building the system and it can seen from table 3.13 and Figure 3.18 that the project's payback period is 3 years and 6 months. Moreover, The Candidate Matrix which proposes 3 candidate methods is show in Appendix G.

Accumulated Cost, Baht

Breakeven Point

1 Year 9 Months' Operation
Note: Year 1 is the starting

Years

Accumulated
Manual Cost

Accumulated
Computerized Cost
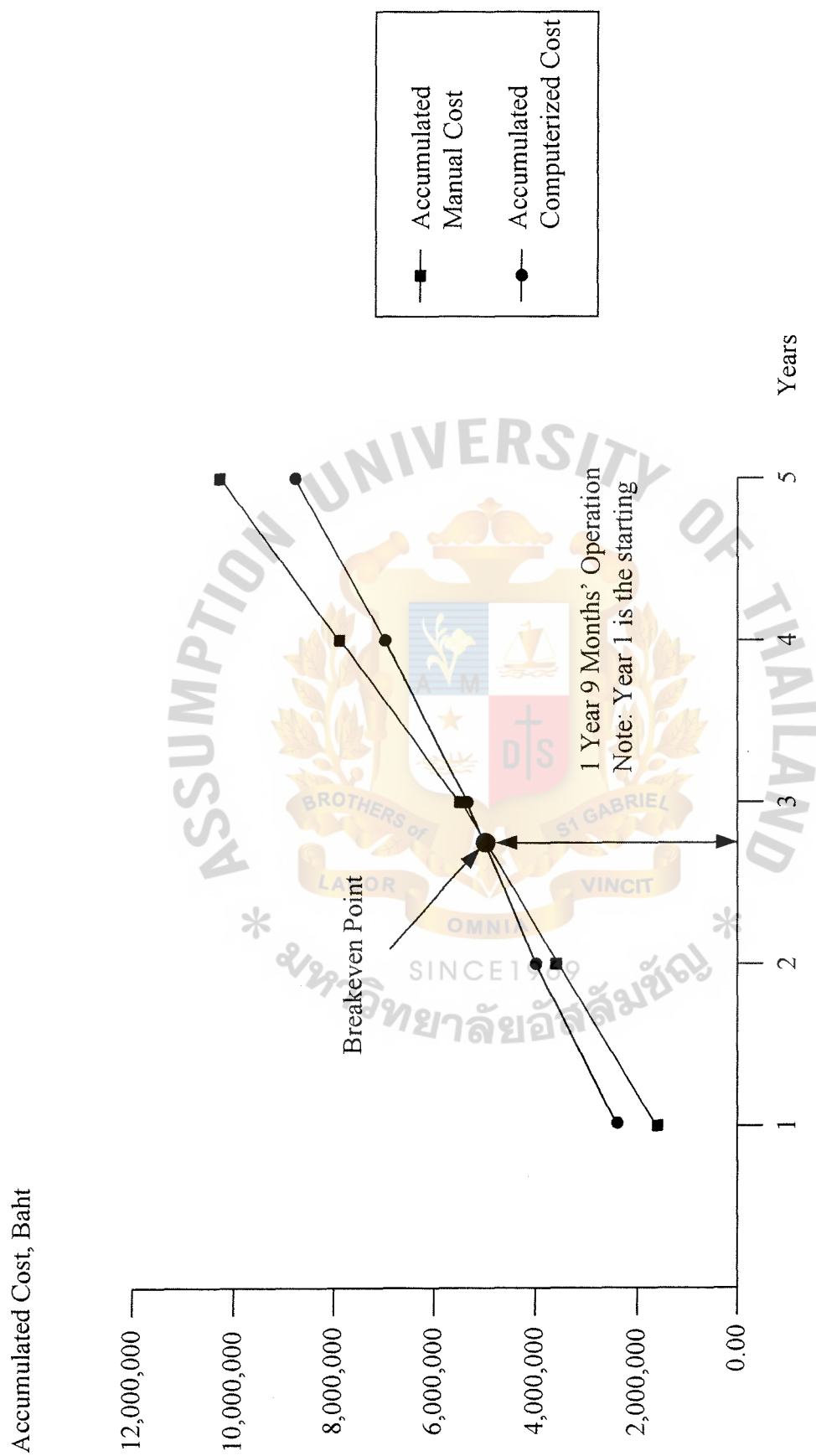
Figure 3.17. Cost Comparison between the Manual and Computerized Systems.

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Table 3.13. Payback Analysis for the Proposed System, Baht.

Cost Items	Years					
	0	1	2	3	4	5
Development Cost	-1,010,000.00					
Operation & maintenance Cost	0.00	-140,000.00	-140,000.00	-160,000.00	-160,000.00	-160,000.00
Discount factor for 9 %	1.000	0.917	0.842	0.772	0.708	0.650
Time-adjusted costs (adjusted to present value)	-1,010,000.00	-128,380.00	-117,880.00	-123,520.00	-113,280.00	-104,000.00
Cumulative time-adjusted costs over lifetime	-1,010,000.00	-1,138,380.00	-1,256,260.00	-1,379,780.00	-1,493,060.00	-1,597,060.00
Benefits derived from operation of new system	0.00	400,000.00	480,000.00	560,000.00	640,000.00	720,000.00
Discount factor for 9 %	1.000	0.917	0.842	0.772	0.708	0.650
Time-adjusted costs (adjusted to present value)	0.00	366,800.00	404,160.00	432,320.00	453,120.00	468,000.00
Cumulative time-adjusted benefits over lifetime	0.00	366,800.00	770,960.00	1,203,280.00	1,656,400.00	2,124,400.00
Cumulative lifetime time-adjusted cost + benefit	-1,010,000.00	-771,580.00	-485,300.00	-176,500.00	163,340.00	527,340.00

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Figure 3.18. Payback Analysis.

IV.   PROJECT IMPLEMENTATION

4.1   Overview of Project Implementation

The project was started in May 2002. It can be classified into 4 periods.

(1)   Feasibility Study Period

(2)   System Analysis and Design Period

(3)   System Implementation Period

(4)   System Conversion Period

The project has been done according to the project time schedule that is presented

in the Gantt Chart as shown on the following page.

4.2   Test Plan and Results

Testing includes verification of the basic logic of each program and the

effectiveness of the entire system. It is to make sure that the system works correctly

before it is used. The project team continually tests and modifies the system.

Participated users are satisfied with the results of the test. There are two most common

strategies known as bottom-up testing and top-down testing. In this case, the bottom-up

testing is used. This approach begins by testing small, individual modules in a stand-

alone fashion. This project also includes the following.

4.3   Unit Testing

Individual programmers who create the programs test basic program modules. The

programmers usually make up their test data with program specification objectives.

4.4   Module and Subsystem Testing

The stress is on the independent test of the data generation. Users should be

included in this test to make the data less contrived and more realistic. This is to create

input data that would cause another department's processing logic to fail.

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4.5 System Testing

The purpose is to validate all programs, input-output procedures, and the database. All programs are tested altogether once more. Testing with test data and live data is necessary. Live data are actual data that have already been processed through the existing service system. During the system testing with live data, the users get involved. Testing and modification will continue until the project team and the participating users are satisfied with the results of the test.

4.6 Acceptance Test

The users are allowed to submit their own test cases to verify the effectiveness of the system. All the bugs should be eliminated. The staff should be able to manage all system components smoothly. This test is to get the user's stamp of approval. They can examine and test the operation of the system until they are satisfied.

4.7 Conversion

Once acceptance testing is complete, the project team can begin to integrate people, software, hardware, procedures and data into the operational information system. This normally involves conversion from the existing service system to the new one. Conversion is the task of translating the user's current files, forms and databases to the format required by the new system.

Electronic conversion cannot be applied to this project, since the existing service system is a manual one. Thus, there are 3 tasks to be performed for conversion.

(1) Users have to identify and prepare all necessary data and personnel for the system conversion.

(2) Users have to prepare cut-off procedures for data transition from the existing service system to the new one.

(3) Users enter all data files to the new system. For this, the method of parallel

conversion is used.

In parallel conversion, the existing service system and the new one operate simultaneously, until the project team is confident that the new system is working properly. Then, the result of the new system can be compared to that of the other. The existing service system will serve as a backup if the new one fails to operate as expected. The time for parallel conversion is usually a month, which is one complete invoicing and collecting cycle.

4.8 Installation

The installation of the new system may be an instantaneous affair, but it is often a major task. For this project, there is only one installation at a single site with a personal computer in phase I. Therefore, users site preparation may not be required.

(1) Hardware Installation

The new system in phase I requires only a personal computer and a

printer. Thus, the vender usually carries out hardware installation. The

installation may be as simple as taking the computer out of a box, plugging it

in and linking it to the printer.

(2) Software Installation

Software installation involves loading all the compute programs that

are written for the new system onto the computer and making them ready for

the operation.

4.9 Training

Training is the final task of the systems development team. The training is for all users in charge of administrative affairs. Definitely, the users need training before they can begin using the new system.

In this project, it is assumed that all users have basic knowledge of computer. Therefore, the agenda for the training program are as follows.

(1)   Guide to the computer system and its components.

(2)   Guide to administrator for Windows 2000 and Microsoft Access and its components.

(3)   Guide to Windows 2000 Terminal Service operating system and procedures.

(4)   Purposes and objectives of the system.

(5)   Differences between the existing service system and the new one.

(6)   Overviews of the system operations and procedures.

(7)   Duties and responsibilities of end users and technical support personnel.

(8)   Orientation with the new system.

(9)   Demonstration of the new system.

(10) An introductory hands-on walk through the system.

(11) Familiarization with the new system practice together with database test.

V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The project covers major parts of the Auto Insurance Information System. This project originated from the requirements to improve its existing service system which is a manual one. The project team develops the computerized system to satisfy the owner's need and to reduce the existing problems.

The scopes of this project are as follows:

(1) To design work flow of the Auto Insurance Information System of the South East Insurance in order to automate invoicing and collecting.

(2) To design an appropriate file and database system with Relational Database.

(3) To design management report for the owner to improve decision-making process, because a decision-maker is reluctant to assume that the information is accurate unless it is verifiable.

The existing service system can be divided into following main components:

(1) New Customer

(2) New Customer Agent Member

(3) Customer Address Change

(4) Customer Agent Address Change

(5) New policy

(6) New Adjusted Policy

(7) Generate Tax Invoice

(8) Generate Report

(9) Manipulate Stamp Rate

(10) Transfer Data to Ware House

(11) Garage Information

(12) Claim Information

Table 5.1 Degree of Achievement between the Existing System and the Proposed System.

Process	Existing System (Time Spent)	Propose System (Time Spent)
Approve Customer Order	1 hr. 30 mins	30 mins
Process Produce Report	4 hr.	30 mins
Process Purchase Order	1 hr.	20 mins
Process Payment	50 mins	15 mins
Process Invoice	50 mins	15 mins
Total	8 hrs. 10 mins	1 hrs. 50 mins

However, the main functions of the new system are to perform the task of administrative staff. The advantages of the new system are as follows.

(1) It reduces working time for invoicing and collecting.

(2) It is easy to use.

(3) It is easy to manage incase of expansion of the company.

(4) It is easy to produce all management report.

(5) It satisfies the user's real information requirement.

(6) It is easy to find the information for the customers.

The proposed system also spends less time than the existing system for each process. It means that the proposed system is more efficient and effective than the existing system. Table 3.4 shows the comparison of degree of achievement between the proposed system and the existing system.

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5.2 Degree of Achievement

The proposed system as can be seen from Table 5.1 is much faster than the existing system and saves a lot of time spent in Order Processing System. Since, existing system is manual, problems in paperwork and human error often occur. In the approved customer order process, a sales person must approve the order by finding the customer details in the old paper file, checking the specification of policy, and keeping this order in the paper file. But, in the proposed system, he can search customer details by typing the customer's name and easily checking the policy specification. In the manual system, it takes a lot of time to generate sales summary report, customer lists, product lists, and etc. because the staff must collect a lot of data to generate reports for analysis. The other processes in the existing system also takes much time.

Therefore the proposed system can save the operation time, make the result more accurate, and also help the staff work efficiently.

5.3 Recommendations

The new computerized system has been designed to meet the requirements of the owner and administrative staff of the South East Insurance.

Future plans for the system are as follows:

(1) Update the customer information in the Database Server from Terminal Service Server by installing Windows 2000 Service Pack Version 1. This feature is used for the branch offices.

(2) Improve performance when client computers are added for branch offices and headquarter office by adding the computer to Terminal Service Server.

(3) Protect available data by providing back-up computers so that when the primary computer being used in operation fails it can be immediately

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replaced by back-up one. This method uses external disk to link between two computers to build Cluster Computer.

Finally, this system can be modified to a standard package for any branches in Thailand if more information on their operations is provided. Yet some features such as online connection, should be added in the future version.

APPENDIX   A

APPLICATION INTERFACE DESIGN

Figure A.1. Login Form.

Figure A.2. Main Menu Form.

AUTO INSURANCE INFORMATION

The First Class Insurance Information System

The First Class Insurance

Customer

Customer ID	C1148/45	Name	Mr. Monchai
Policy No.	012256-02NBK	Surname	Chantaman
An Act No.	895-45/00756	Address	14/5 M.7 Raminthra, Bangkei
Customer Agent ID	ID ...	Telephone	02-5781849

Cars

Car License	กร-4738 กท.	Chassis No.	MMTR2357HKWN
Brand Name	MITSUBISHI	Start Date	22/11/2002
Type	Saloon Car	End Date	22/11/2003
Weight/CC/Seat	1050/1600/7		

| Add | Delete | Update | Save | Next | Cancel |

Figure A.3.   The First Class Insurance Form.

AUTO INSURANCE INFORMATION

The Third Class Insurance

Customer

Customer ID	C445/45	Name	Ms.Wiparat
Policy No.	0045-023RBK	Surname	Jewphochararoan
An Act No.	895-45/11236	Address	82 M.12 Wangsomboon, Srake
Customer Agent ID	ID	Telephone	037-568934

Cars

Car License	อท-3576 สก.	Chassis No.	TFR54HPY4579
Brand Name	ISUZU	Start Date	20/10/2002
Type	Pickup	End Date	20/10/2003
Weight/CC/Seat	2500/2499/3		

Add   Delete   Update   Save   Next   Cancel

Figure A.4.   The Third Class Insurance Form.

AUTO INSURANCE INFORMATION

Automobile Act

Customer

Customer ID	C009/45	Name	Ms. Prayut
An Act No.	895-45/00567	Surname	Thongkong
Customer Agent ID	ID ...	Address	12/4 Kannayaow, Bangkok
Telephone	01-9093173		

Cars

Car License	ฆ-3056 กท.	Chassis No.	NRT0093YTR11
Brand Name	NISSAN	Start Date	19/10/2002
Type	Saloon Car		
Weight/CC/Seat	1900/1800/7	End Date	19/10/2003

Add	Delete	Update	Save	Next	Cancel

Figure A.5.   Automobile Act Form.

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Figure A.6.   Customer Agent Form.

Figure A.7.   Rate of Premium Form.

AUTO INSURANCE INFORMATION

Referance Credit Note

Customer ID 45204   Credit No. CR00126   Date 24/10/2002

Referance

T/I, DN, CR T456734   Policy No. 895-45/0012RBK

Endt 00   Inst 00   Premium 30,000

Credit

Policy No. 895-45/0012RBK Endt 00 Inst 01 Decrease 3,000

Vat 7 % VAT Amount 2,310

Total 32,310

Descriptions

[Save]   [Print]   [Exit]

Figure A.8.   Credit Note Form.

AUTO INSURANCE INFORMATION

Referance Debit Note

Customer ID	45204	Credit No.	CR00126	Date	24/10/2002

Referance

T/I, DN, CR	T456734	Policy No.	895-45/0012RBK

Endt	00	Inst	01	Premium	32,310

Debit Note

Policy No.	895-45/0012RBK	Endt	00	Inst	02	Decrease	3,000
				Vat	7 %	VAT Amount	2,471.70
						Total	34,781.70

Descriptions

Save	Print	Exit

Figure A.9.   Debit Note Form.

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Figure A.10. Tax Invoice Form.

Figure A.11.   List of Expiring Policies by Month Form.

AUTO INSURANCE INFORMATION

Renewal notice and non-renewed policy

Policy No.	895-45/011234	Customer Name	Wiparat Jewphocharoan
Stamp Rate		Renewal	Renewal Notice
Start Date	20/10/2002	End Date	20/10/2003

OK   Cancel

Figure A.12.   Renewal Notice and Non-Renewed Policy Form.

Figure A.13.   Claim and Garage Information Form.

APPENDIX   B

REPORT DESIGN

SOUTH EAST INSURANCE CO., LTD.

South East Insurance Co., Ltd. 315, G, 4, 7, 8, 9 floor, Silom Road, Silom, Bangrak, Bangkok 10500 Telephone 631-1331-45 Fax (622) 236-7614.

RECEIPT

No: REC0001

Date: 22/11/2002

Insured Name & Address	Policy Premium	3,740.00	Baht
Ms. Wiparat Jewphocharoan 1 M.4 Ramintra Road, Soi 19, Anusaowaree, Bangken, Bangkok 10220.	Revised Premium	2,618.00	Baht
	Stamp Duty	15.00	Baht
	Total Amount	2,633.00	Baht
	VAT	184.31	Baht
	Net Total	2,817.31	Baht

Policy No. 895-45/012987   Code No. 45/3247-101

Code	Make/Model	License No.	Chassis No.	No. of Seats/Displacement/GVW
1.20D	TOYOTA	ภร-4738 กท.	TFR54HPY256	7 /1600/1050

Endorsement No. BRD/AO4/02-00245-00

Period Insured From: 22/11/2002   To: 22/11/2003   at 16.30 hours

Use of Motor Vehicle:

As evidence the Company has caused this Policy be signed by duly authorized persons and the Company stamp to be affixed at this Office.

....

Director   Director   Authorized Signature

Figure B.1.   Receipt of Tax Invoice.

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SOUTH EAST INSURANCE CO., LTD.

South East Insurance Co., Ltd. 315, G, 4, 7, 8, 9 floor, Silom Road, Silom, Bangrak, Bangkok 10500 Telephone 631-1331-45 Fax (622) 236-7614.

CREDIT NOTE

No: REC0001

Date: 22/11/2002

Insured Name & Address	Policy Premium	3,740.00	Baht
Ms. Wiparat Jewphocharoan 1 M.4 Ramintra Road, Soi 19, Anusaowaree, Bangken, Bangkok 10220.	Revised Premium	2,618.00	Baht
	Decrease	1,122.00	Baht
	Stamp Duty	15.00	Baht
	Total Amount	2,633.00	Baht
	VAT	184.31	Baht
	Net Total	2,817.31	Baht

Policy No. 895-45/012987			Code No. 45/3247-101	
Code	Make/Model	License No.	Chassis No.	No. of Seats/Displacement/GVW
1.20D	TOYOTA	กร-4738 กท.	TFR54HPY256	7/1600/1050

Endorsement No. BRD/AO4/02-00245-00	Previous Tax Invoice No. CNSVRE0101
Period Insured From: 22/11/2002	To: 22/11/2003 at 16.30 hours
Use of Motor Vehicle:	

Please pay by crossed cheque in favour of South East Insurance Co., Ltd. If payment is made by cheque, this receipt will be valid only when the cheque has been honoured.

....

Authorized Signature   Collector   Date

Figure B.2.   Receipt of Credit Note.

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SOUTH EAST INSURANCE CO., LTD.

South East Insurance Co., Ltd. 315, G, 4, 7, 8, 9 floor, Silom Road, Silom, Bangrak, Bangkok 10500 Telephone 631-1331-45 Fax (622) 236-7614.

DEBIT NOTE

No: REC0001

Date: 22/11/2002

Insured Name & Address	Policy Premium	5,000.00	Baht
Ms. Wiparat Jewphocharoan 1 M.4 Ramintra Road, Soi 19, Anusaowaree, Bangken, Bangkok 10220.	Revised Premium	2,780.00	Baht
	Increase	2,000.00	Baht
	Stamp Duty	80.00	Baht
	Total Amount	2,080.00	Baht
	VAT	140.00	Baht
	Net Total	2,220.00	Baht

Policy No. 895-45/012987   Code No. 45/3247-101

Code	Make/Model	License No.	Chassis No.	No. of Seats/Displacement/GVW
1.20D	TOYOTA	กร-4738 กท.	TFR54HPY256	7 /1600/1050

Endorsement No. BRD/AO4/02-00245-00   Previous Tax Invoice No. CNSVRE0101

Period Insured From: 22/11/2002   To: 22/11/2003   at 16.30 hours

Use of Motor Vehicle:

Please pay by crossed cheque in favour of South East Insurance Co., Ltd. If payment is made by cheque, this receipt will be valid only when the cheque has been honoured.

…………………………   …………………   …………………….

Authorized Signature   Collector   Date

Figure B.3.   Receipt of Debit Note.

SUOTH EAST INSURANCE CO., LTD.

South East Insurance Co., Ltd, 315, G, 4, 7, 8, 9 Floor, Silom Road, Silom, Bangrak, Bangkok 10500 Telephone 631-1331-45 Fax (622) 236-7614.

Tax Payer No. 3101046595

Co.Code: SEI	THE SCHEDULE MOTOR INSURANCE	
Policy No.: A.1-00002/0545		Territory: Thailand

Insured Name: Ms.Wiparat Jewphocharoan
        Address: 6/199 Soi Amonphan nakorn 6, Channayaow, Bangkok 10230.

Name driver 1	Date of birth	Occupation
Name driver 2	Date of birth	Occupation

Beneficiary:

Period of Insurance: From 22/11/2002	To: 22/11/2003	at 16.30 hr.

Particulars of Vehicle: Group 4, 1 year of the car, 2000 CC.

Item	Code	Make/Model	Licence No.	Chassis No.	Year	Body	Seat/CC/Weight
1	1.10	MITSUBISHI	กง-4738 กท.	MMTSRF001	2001	Saloon	7/1600/1050

Limit of Liability: This Policy affords coverages only with respect of those agreements of which a limit of liability shown:-

Third Party Liability	Own Damage	Additional Cover as per Disability

1) Third party Bodily Injury in excess of Motor compulsory Insurance
    500,000.00
Baht/person
    10,000,000.00
Baht/accident
2) Third Party Property Damage
    2,500,000.00
Baht/accident
3) Deductible
    0.00
Baht/accident
	1) Own Damage (other than by Theft/Fire)
	    400,000.00 Baht/accident
	2) Loss by Theft/Fire
	    400,000.00 Baht/accident
		1) Personal Accident
		  1.1 Death, Dismemberment & Permanent Disability
		    a) One driver 200,000.00 Baht
		    b) Passenger 6 persons
		        200,000.00 Baht/Person
		  1.2 Temporary Disability
		    a) One driver Baht/week
		    b) Passenger persons
		    Baht/person/week
		2) Medical Expenses 50,000.00 Baht/person
		3) Bail Bond 200,000.00Baht/Accident

Basic Premium:	16,546.00 Baht	Additional Premium 3,484.00 Baht
In case of named driver, a discount of baht	0.00 is deducted	

Disc ounts	Deductible 0.00 Baht	Fleet 0.00 Baht	Experience 4,006.00 Baht	Others 0.00 Baht	Total 4,006.00 Baht
Surc harge	Others 0.00 Baht		Experience 0.00 Baht		

Premium	Stamps	VAT	Total
16,024.00	66.00	1,126.23	17,215.23

Use of Motor Vehicle:

☐ Agent ☑ Broker	UPD Broker Co., Ltd.	Lincence No. 102541
Agreement made on 22/11/2002	Policy Issued 22/11/2002	

As evidence the Company has caused this Policy to be signed by duly authorized persons and the Company stamp to be affixed at this Office.

....

    Director   Director   Authorized Signature

Figure B.4.   Auto Insurance Schedule.

SOUTH EAST INSURANCE CO., LTD.

South East Insurance Co., Ltd. 315, G, 4, 7, 8, 9 floor, Silom Road, Silom, Bangrak, Bangkok 10500.
Telephone 631-1331-45, Fax (622) 236-7614.

Premium Attachment Schedule

Item No.	Type of Policy	Limit of Liability	Premium	Stamp	Vat	Total	Remark
1.10	The first Class Insurance						Rate of premium can change up to make/model of the car
	- Saloon Car	400,000-10,000,000	22,000.00	66.00	1,540.00	23,606.00	
	- Pickup	300,000-8,000,000	21,000.00	56.00	1,470.00	22,526.00	
	- Van	500,000-12,000,000	25,000.00	73.00	1,750.00	26,823.00	
1.20	The third Class Insurance						
	- Saloon Car	200,000-2,000,000	7,500.00	35.00	525.00	8,060.00	
	- Pickup	200,000-2,000,000	8,000.00	30.00	560.00	8,590.00	
	- Van	300,000-2,500,000	9,000.00	33.00	630.00	9,663.00	
1.30	Package						Fix rate of premium
	- Saloon Car	500,000-2,500,000	3,000.00	13.00	210.00	3,223.00	
	- Pickup	500,000-2,500,000	3,800.00	15.00	266.00	4,081.00	
	- Van	500,000-2,500,000	4,500.00	10.00	315.00	4,825.00	
1.40	Automobile Act						Fix rate same as another companies
	- Saloon Car	500,000-10,000,000	900.00	9.00	63.00	972.00	
	- Pickup	500,000-10,000,000	1,200.00	11.00	84.00	1,295.00	
	- Van	500,000-10,000,000	1,800.00	14.00	126.00	1,940.00	

Figure B.5.   Premium Attachment Schedule Report.

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SOUTH EAST INSURANCE CO., LTD.

South East Insurance Co., Ltd. 315, G, 4, 7, 8, 9 floor, Silom Road, Silom, Bangrak, Bangkok 10500.
Telephone 631-1331-45, Fax (622) 236-7614.

Run Date: 22/10/2002 Time: 14:41:22

Customer Information of the first Class Insurance

Broker: 147 Raminthra.

Policy No.	Customer Name	Agent ID	License No.	Make/Model	Type	Chassis No.	Year	Seat/C.C/Weight	Start Date	End Date
A.1-0002/04	Wiparat Jewphocharo	10/2541	กร-4738 กท.	MITSUBISHI	Saloon	MMTSRCF001086	2001	7/1600/1050	22/11/2002	22/11/2003
B.2-0013/05	Bechawan Siriroj	15/2543	ลฑ-4536 กท.	ISUZU	Pickup	TFR54HPY145689	2000	3/2995/2450	24/11/2002	24/11/2003
B.2-0014/05	Monthira Watachai	22/2543	ลบ-4532 กท.	NISSAN	Pickup	NNRT0987236721	2002	3/2999/2500	27/11/2002	27/11/2003
C.3-2451/07	Prayut Thongkong	12/2445	จ-2546 กท.	TOYOTA	Van	12367803412457 89	2000	15/3000/3505	1/1/2002	1/1/2003
A.1-0002/04	Rungtiva Planglinth	18/2544	มฆ-0256 กท.	FORD	Saloon	FFRTYP450698RT4	2002	7/1800/2000	10/1/2002	10/1/2003

Figure B.6. Customer Information Report of the first Class Insurance.

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SOUTH EAST INSURANCE CO., LTD.

South East Insurance Co., Ltd. 315, G, 4, 7, 8, 9 floor, Silom Road, Silom, Bangrak, Bangkok 10500.
Telephone 631-1331-45, Fax (622) 236-7614.

Customer Information of the third Class Insurance

Broker: 147 Raminthra.

Run Date: 15/09/2002 Time: 11:30:45

Policy No.	Customer Name	Agent ID	License No.	Make/Model	Type	Chassis No.	Year	Seat/C.C/Weight	Start Date	End Date
C.3-2451/07	Prayut Thongkong	12/2445	จ-2546 กท.	BENZE	Van	123678034124S789	2000	15/3000/3505	1/1/2002	1/1/2003
A.1-0002/04	Wiparat Jewphocharo	10/2541	กร-4738 กท.	MITSUBISHI	Saloon	MMTSRCF001086	2001	7/1600/1050	22/11/2002	22/11/2003
A.1-0002/04	Rungtiva Planglinth	18/2544	บฉ-0256 กท.	HONDA	Saloon	FFRTYP450698RT4	2002	7/1800/2000	10/1/2002	10/1/2003
B.2-0013/05	Bechawan Siriroj	15/2543	กผ-4536 กท.	ISUZU	Pickup	TFR54HPY145689	2000	3/2995/2450	24/11/2002	24/11/2003
B.2-0014/05	Monthira Watachai	22/2543	กว-4532 กท.	NISSAN	Pickup	NNRT0987236721	2002	3/2999/2500	27/11/2002	27/11/2003

Figure B.7. Customer Information Report of the Third Class Insurance.

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SOUTH EAST INSURANCE CO., LTD.

South East Insurance Co., Ltd. 315, G, 4, 7, 8, 9 floor, Silom Road, Silom, Bangrak, Bangkok 10500.
Telephone 631-1331-45, Fax (622) 236-7614.

Customer Information of Automobile Act

Broker: 147 Raminthra.

An Act No.	Customer Name	License No.	Make/Model	Type	Chassis No.	Year	Seat/C.C/Weight	Start Date	End Date
895-45/0023	Prayut Thongkong	ฎ-2546 กท.	TOYOTA	Van	1236780341245789	2000	15/3000/3505	1/1/2002	1/1/2003
895-45/0027	Wiparat Jewphocharo	กร-4738 กท.	HONDA	Saloon	MMTSRCF001086	2001	7/1600/1050	22/11/2002	22/11/2003
895-45/1245	Bechawan Siriroj	ภท-4536 กท.	ISUZU	Pickup	TFR54HPY145689	2000	3/2995/2450	24/11/2002	24/11/2003
895-45/3459	Rungtiva Planglinth	บฉ-0256 กท.	BMW	Saloon	FFRTYP450698RT4	2002	7/1800/2000	10/1/2002	10/1/2003
895-45/6780	Monthira Watachai	ภบ-4532 กท.	NISSAN	Pickup	NNRT0987236721	2002	3/2999/2500	27/11/2002	27/11/2003

Figure B.8 Customer Information Report of Automobile Act.

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SOUTH EAST INSURANCE CO., LTD.

South East Insurance Co., Ltd. 315, G, 4, 7, 8, 9 floor, Silom Road, Silom, Bangrak, Bangkok 10500.
Telephone 631-1331-45, Fax (622) 236-7614.

Details of Expiring Policies by Month

Month	Policy No.	An Act No.	Customer Name	Agent ID	License No.	Make/Model	Type	Year	Start Date	End Date
January	A.1-00023/45	895-45/00124	Amonrat Maun	S441-926	กง-3456 กท.	HONDA	Saloon	2001	03/01/2002	03/01/2003
	B.2-00045/45	895-45/00234	Narumol Srino	S451-345	พง-234 กง.	TOYOTA	Pickup	2002	05/01/2002	05/01/2003
	A.1-20059/45	895-45/00567	Sangda Kanthiy	S445-456	กก-6782กน.	NISSAN	Saloon	2000	07/01/2002	07/01/2003
February	C.3-23460/45	895-45/23490	Aphichrad Wisit	S445-456	พน-4678 นน.	HYUNDAI	Saloon	2001	10/02/2002	10/02/2003
	B.2-45610/45	895-45/67891	Rathakran Srisur	S424-098	ว-2345 พน.	FORD	Pickup	2000	25/02/2002	25/02/2003
March	B.2-34009/45	895-45/09841	Lawal Pholsukc	S435-034	วก-3459 กน.	BENZE	Saloon	2002	15/03/2002	15/03/2003
	A.1-0934/45	895-45/34092	Wanicha Thong	S455-267	บว-3345 ชม.	VOLVO	Saloon	2002	28/03/2002	28/03/2003
April	A.2-00948/45	895-45/67982	Warapol Yuorjit	S441-926	พจ-5556 กก.	PASSAZE	Saloon	2000	21/04/2002	21/04/2003
	A.2-00945/45	895-45/32187	Yoadpha Prachu	S451-345	กด-2224 นฐ.	KAI	Saloon	2001	23/04/2002	23/04/2003
	B.1-00912/45	895-45/90872	Surat Nilphat	S445-455	กก-1245 บร.	MITTUBIS	Pickup	2001	25/04/2002	25/04/2003
June	C.1-00345/45	895-45/77893	Wimoltip Chinw	S435-034	ยน-6877 พจ.	TOYOTA	Van	2001	12/06/2002	12/06/2003
	C.2-00984/45	895-45/00954	Onarng Thaton	S455-267	ออ-0098 ลพ.	HONDA	Saloon	2002	19/06/2002	19/06/2003
	A.2-00346/45	895-45/00983	Thanyanan Noiti	S424-098	ผพ-7755 ชม.	BENZE	Saloon	2002	21/06/2002	21/06/2003
July	A.2-00981/45	895-45/12495	Sangchai Audo	S445-456	ขจ-2211 นน.	BMW	Saloon	2002	08/07/2002	08/07/2003
	A.1-0124/45	895-45/23094	Montha Chunha	S424-098	บว-7786 กท.	VOLVO	Saloon	2000	09/07/2002	09/07/2003
August	B.3-0321/45	895-45/23451	Kanoknapa Dun	S424-098	กก-4447 นท.	NISSAN	Pickup	2000	11/08/2002	11/08/2003
September	B.2-00456/45	895-45/02345	Pramoul Sriwi	S445-456	วก-3459 กน.	MITTSUBI	Van	2001	01/09/2002	01/09/2003
	A.2-00897/45	895-45/04569	Chuncheep Fh	S424-098	บว-3345 ชม.	KAI	Saloon	2001	04/09/2002	04/09/2003

Figure B. 9.   Details of Expiring Policies by Month.

SOUTH EAST INSURANCE CO., LTD.

South East Insurance Co., Ltd. 315, G, 4, 7, 8, 9 floor, Silom Road, Silom, Bangrak, Bangkok 10500.
Telephone 631-1331-45, Fax (622) 236-7614.

Renewal Notice

Broker: 147 Raminthra.

Run Date: 15/09/2002 Time: 11:30:45

Policy No.	Customer Name	Agent ID	License No	Make/Model	Type	Chassis No.	Start Date	End Date	Claim ID	Renewal Date
C.3-2451/07	Prayut Thongkong	12/2445	ฐ-2546 กท.	BENZE	Van	123678034124578 9	1/1/2002	1/1/2003	CL33/45	1/1/2003
A.1-0002/04	Wiparat Jewphoch	10/2541	กร-4738 กท.	MITSUBISHI	Saloon	MMTSRCF001086	22/11/2002	22/11/2003	-	22/11/2003
A.1-0002/04	Rungtiva Planglint	18/2544	บฎ-0256 กท.	HONDA	Saloon	FFRTYP450698RT4	10/1/2002	10/1/2003	-	10/1/2003
B.2-0013/05	Bechawan Siriroj	15/2543	ดท-4536 กท.	ISUZU	Pickup	TFR54HPY145689	24/11/2002	24/11/2003	CL21/45	24/11/2003
B.2-0014/05	Monthira Watacha	22/2543	ลบ-4532 กท.	NISSAN	Pickup	NNRT0987236721	27/11/2002	27/11/2003	-	27/11/2003

Figure B.10. Renewal Notice Report.

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SOUTH EAST INSURANCE CO., LTD.

South East Insurance Co., Ltd. 315, G, 4, 7, 8, 9 floor, Silom Road, Silom, Bangrak, Bangkok 10500.
Telephone 631-1331-45, Fax (622) 236-7614.

Non-Renewed Policy

Broker: 147 Raminthra.

Run Date: 15/09/2002 Time: 11:30:45

Policy No.	Customer Name	Agent ID	License No.	Make/Model	Type	Chassis No.	Start Date	End Date	Claim ID
C.3-2451/07	Prayut Thongkong	12/2445	ฆ-2546 กท.	BENZE	Van	12367803412457897	1/1/2002	1/1/2003	CL33/45
A.1-0002/04	Wiparat Jevphocharo	10/2541	กร-4738 กท.	MITSUBISHI	Saloon	MMTSRCF001086	22/11/2002	22/11/2003	-
A.1-0002/04	Rungtiva Planglinth	18/2544	กม-0256 กท.	HONDA	Saloon	FFRTYP450698RT4	10/1/2002	10/1/2003	-
B.2-0013/05	Bechawan Siriroj	15/2543	กค-4536 กท.	ISUZU	Pickup	TFR54HPY145689	24/11/2002	24/11/2003	CL21/45
B.2-0014/05	Monthira Watachai	22/2543	กบ-4532 กท.	NISSAN	Pickup	NNRT0987236721	27/11/2002	27/11/2003	-

Figure B.11. Non-Renewed Policy Report.

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SOUTH EAST INSURANCE CO., LTD.

South East Insurance Co., Ltd. 315, G, 4, 7, 8, 9 floor, Silom Road, Silom, Bangrak, Bangkok 10500.
Telephone 631-1331-45, Fax (622) 236-7614.

Claim Policy Information

Broker: 147 Raminthra Broker

Run Date: 15/09/2002 Time: 11:30:45

Claim ID	Policy No.	Customer Name	License No.	Make/Model	Type	Start Date	End Date	Amount of Claim	Wright/Wrong	Garage No.
CL33/45	C.3-2451/07	Prayut Thongkong	จ-2546 กท.	BENZE	Van	1/1/2002	1/1/2003	1	Wright	Ga0015
-	A.1-0002/04	Wiparat Jewphocharo	กร-4738 กท.	MITSUBISHI	Saloon	22/11/2002	22/11/2003	-	-	-
-	A.1-0002/04	Rungtiva Planglinth	บฉ-0256 กท.	HONDA	Saloon	10/1/2002	10/1/2003	1	Wrong	Ga0023
CL21/45	B.2-0013/05	Bechawan Siriroj	ฆท-4536 กท.	ISUZU	Pickup	24/11/2002	24/11/2003	-	-	-
-	B.2-0014/05	Monthira Watachai	ฆบ-4532 กท.	NISSAN	Pickup	27/11/2002	27/11/2003	1	Wright	Ga0091

Figure B.12.   Claim Policy Report.

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SOUTH EAST INSURANCE CO., LTD.

South East Insurance Co., Ltd. 315, G, 4, 7, 8, 9 floor, Silom Road, Silom, Bangrak, Bangkok 10500.
Telephone 631-1331-45, Fax (622) 236-7614.

Information of Garage

Broker: 147 Raminthra Broker

Run Date: 15/09/2002 Time: 11:30:45

Garage No.	Garage Name	Claim ID	Policy No.	License No.	Make/Model	Type	Start Date	End Date	Amount of Fix	Estimate Value
Ga0015	Thanacrit	CL33/45	C.3-2451/07	จ-2546 กท.	BENZE	Van	1/1/2002	1/1/2003	1	40,000.00
-	-	-	A.1-0002/04	กร-4738 กท.	MITSUBISHI	Saloon	22/11/2002	22/11/2003	-	-
Ga0023	V.T.Body Service	-	A.1-0002/04	บย-0256 กท.	HONDA	Saloon	10/1/2002	10/1/2003	1	25,000.00
-	-	CL21/45	B.2-0013/05	ภท-4536 กท.	ISUZU	Pickup	24/11/2002	24/11/2003	-	-
Ga0091	Chaiyut Service	-	B.2-0014/05	ถว-4532 กท.	NISSAN	Pickup	27/11/2002	27/11/2003	1	30,000.00

Figure B.13.   Garage Information Report.

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SOUTH EAST INSURANCE CO., LTD.

South East Insurance Co., Ltd. 315, G, 4, 7, 8, 9 floor, Silom Road, Silom, Bangrak, Bangkok 10500.
Telephone 631-1331-45, Fax (622) 236-7614.

Summary of Customer Information

Broker: 147 Raminthra.

Policy No.	Customer Name	Address	Telephone	Start Date	End Date
C.3-2451/07	Prayut Thongkong	19/1 M.4 Raminthra Road, Bangken, Bangkok 10220	02-9707944	1/1/2002	1/1/2003
A.1-0002/04	Wiparat Jewphocharo	24/1 Klongkum, Bungkum, Bangkok 10230	02-9707800	22/11/2002	22/11/2003
A.1-0002/04	Rungtiva Planglinth	12 M.3 Haomark, Bangkapi, Bangkok 10240	02-5495687	10/1/2002	10/1/2003
B.2-0013/05	Bechawan Siriroj	19/4 Sukumvit 15 Samrong, Muang, Samutprakran 12700	02-9008732	24/11/2002	24/11/2003
B.2-0014/05	Monthira Watachai	11/2 Lumlukka, Muang, Phathumthanee 19000	02-560987	27/11/2002	27/11/2003

Figure B.14.   Customer Information Report.

APPENDIX C

DATABASE DESIGN
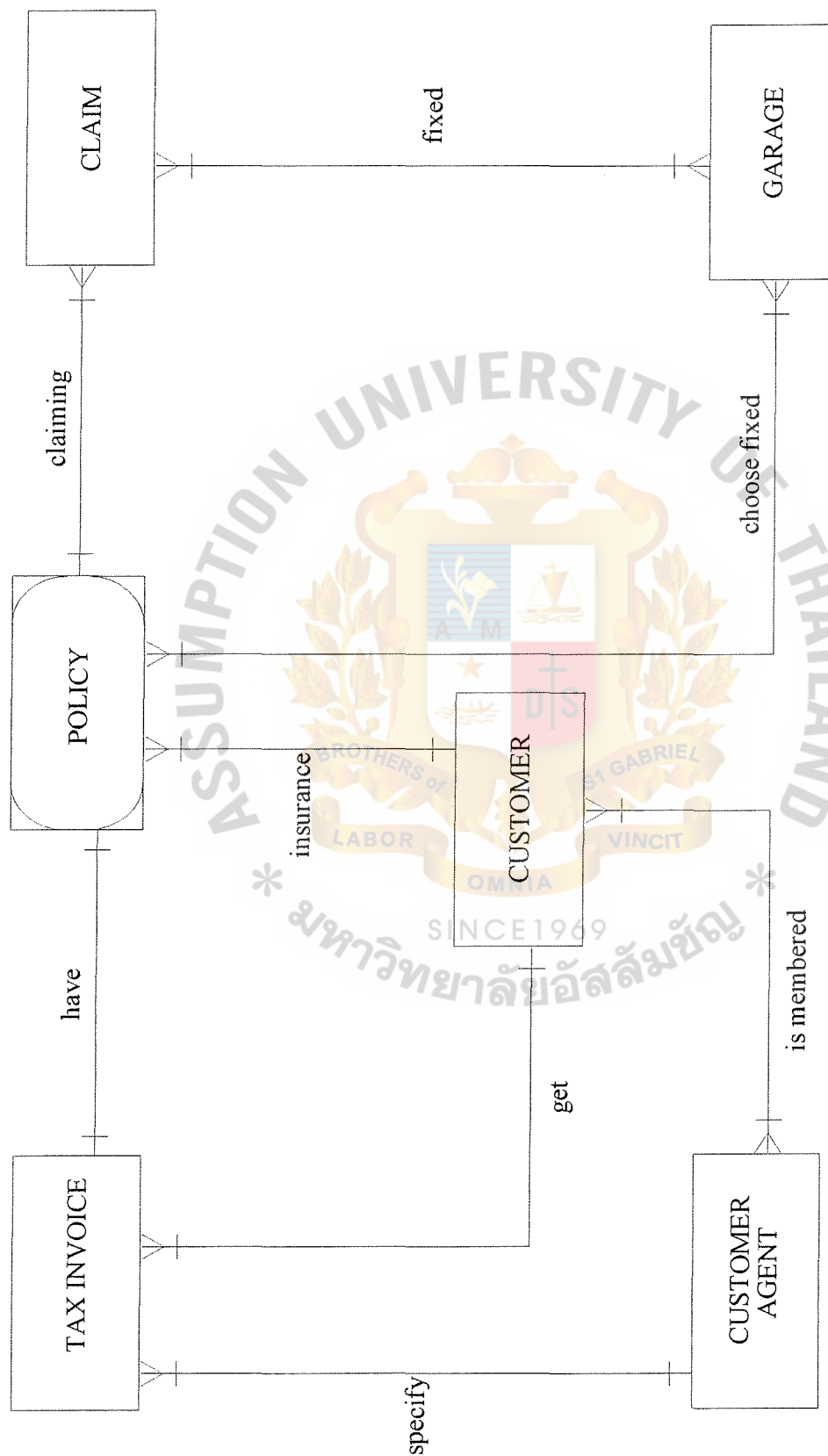
Figure C.1. Context Diagram of Auto Insurance Database.
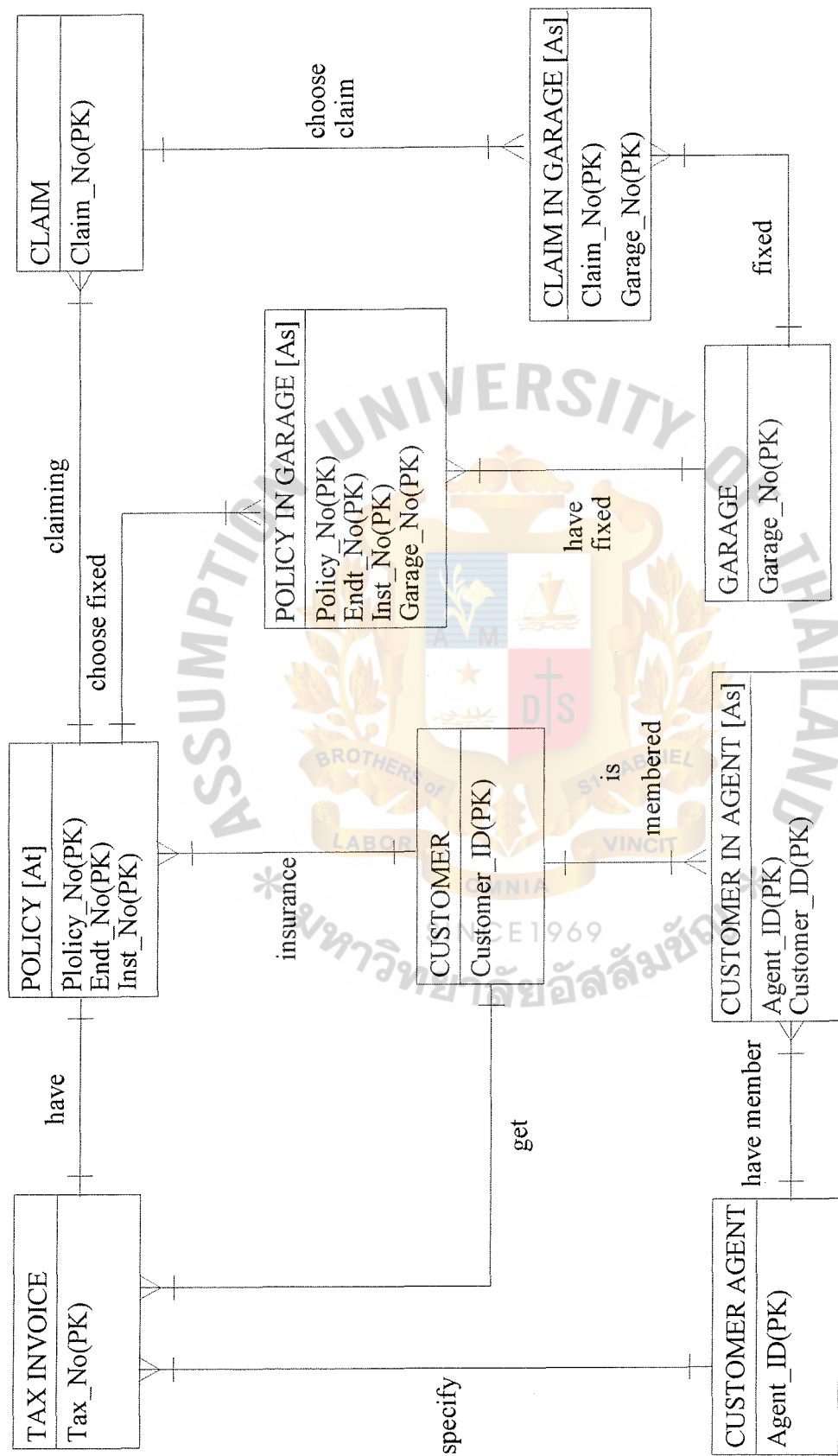
Figure C.2. Keybase Diagram of Auto Insurance Database.

87
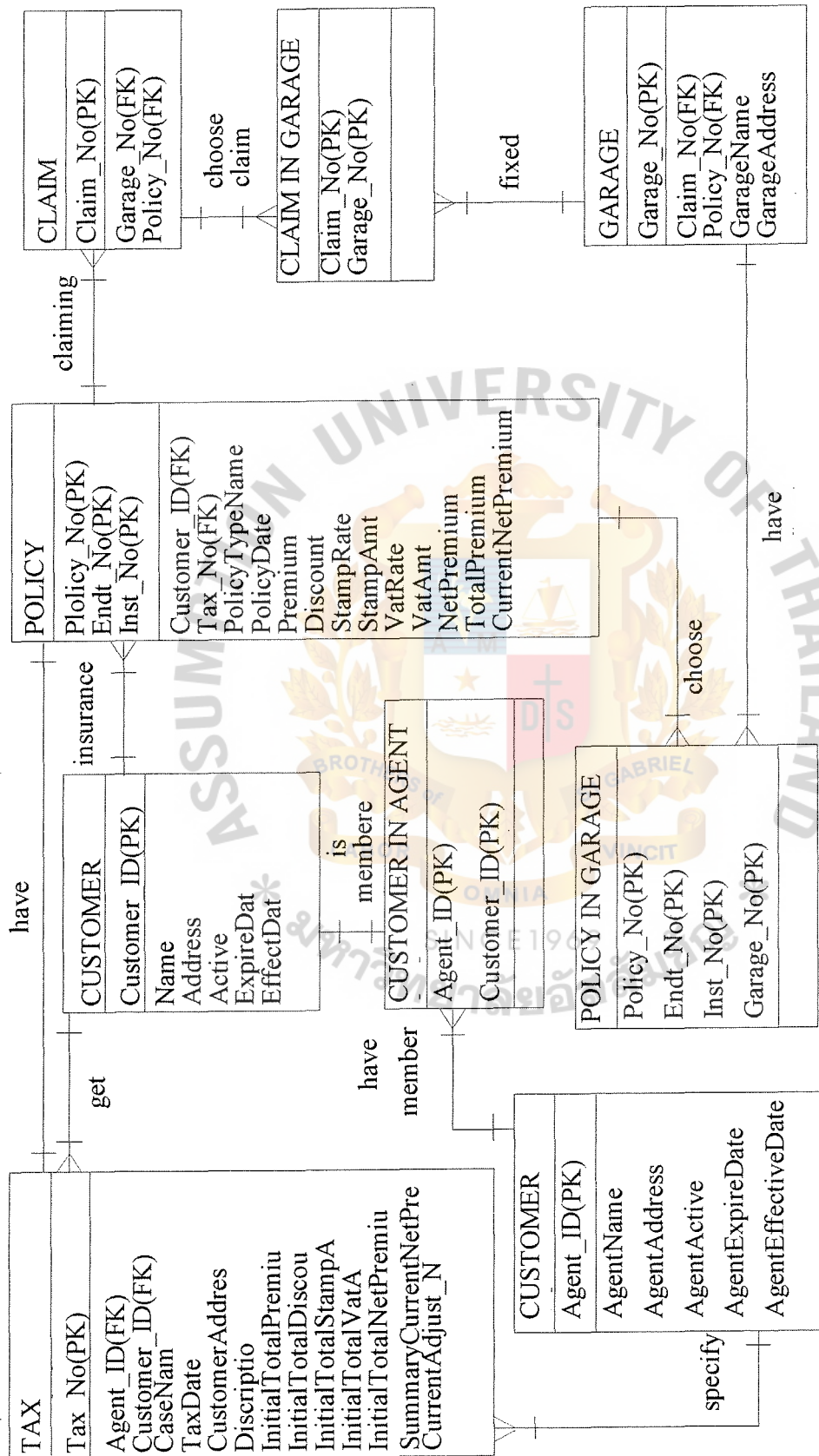
Figure C.3.   Full Attribute Diagram of Auto Insurance Database.

88
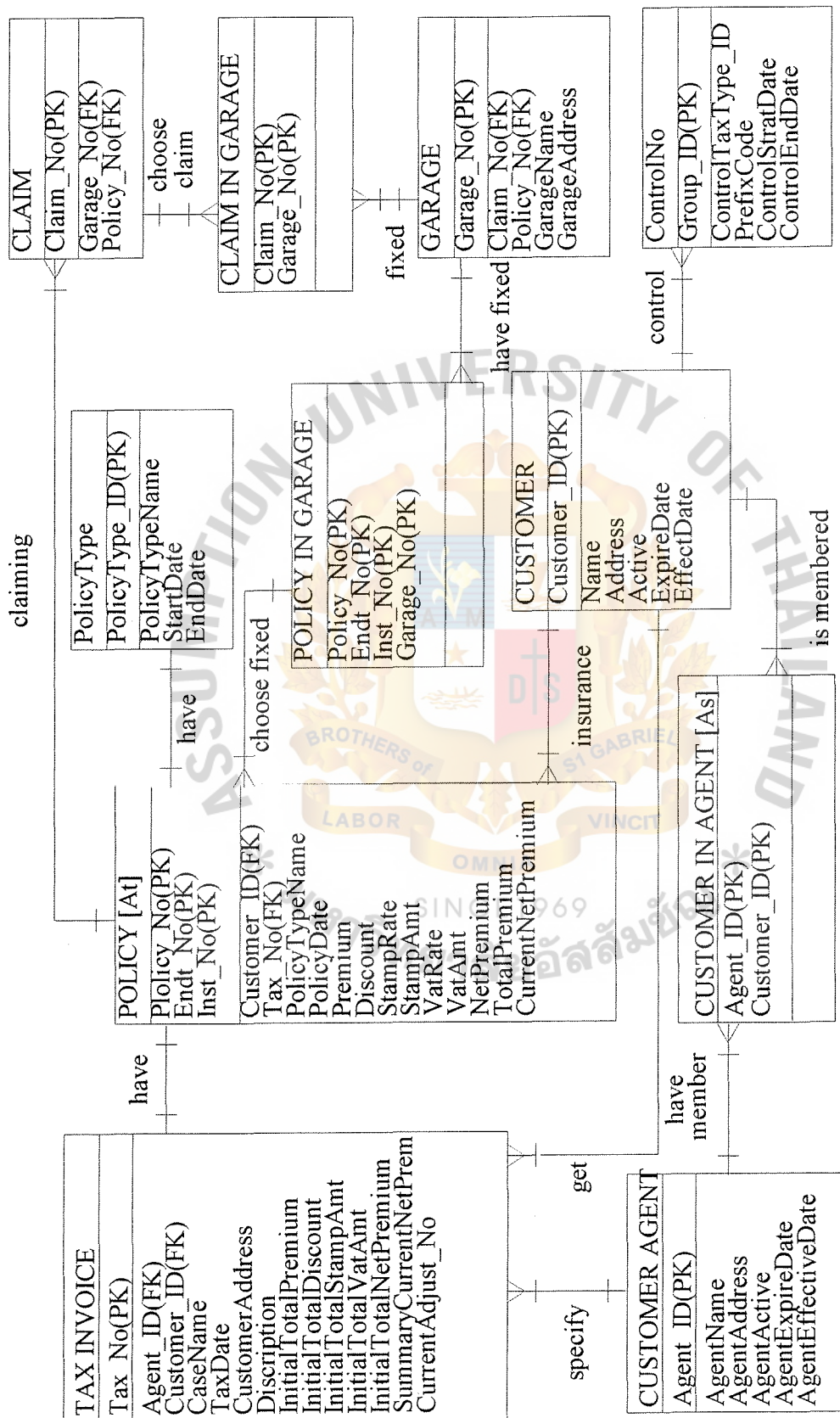
Figure C.4. Normalized Diagram of Auto Insurance Database.

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APPENDIX   D

PROCESS SPECIFICATION

PROCESS SPECIFICATION

Table D.1.   Process Specification of Process 1.

Items	Description
Process Name:	Require Automobile Act & Insurance
Data In:	Information of Customer and Auto
Data Out:	New Customer Confirm Customer Status
Process:	(1) Receive the requirement from the customer (2) Verify information from the customer (3) Record the customer information into customer database (4) Send the information or go and make a presentation to a customer (5) Repeat step 1 until the actual requirement has already been established
Attachment:	Customer Customer Agent

Table D.2. Process Specification of Process 2.

Items	Description
Process Name:	Take Car & Customer Document
Data In:	Customer & Car Data
Data Out:	Update Customer & Car Information
Process:	(1) Receive the requirement from the customer agent (2) Verify information from the customer agent (3) Send the introduction and make a presentation to the officer (4) Repeat step 1 until the actual requirement has already been established
Attachment:	Customer Agent Officer

Table D.3. Process Specification of Process 3.

Items	Description
Process Name:	Approval Automobile Act and Insurance
Data In:	Customer Agent Name Customer Subscription
Data Out:	New Customer New Customer in Agent
Process:	(1) Receive the requirement from the customer (2) Read customer agent name from customer agent data (3) Receive the customer information from the officer (4) Send information or make a presentation to a customer
Attachment:	(1) Officer (2) Manager

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Table D.4.   Process Specification of Process 4.

Items	Description
Process Name:	Input Data
Data In:	Customer Data Car Data
Data Out:	New Customer Information New Car Information
Process:	(1) Receive the information from the officer (2) Record the customer information in customer database (3) Record the car information in car database
Attachment:	(1) Officer (2) Data Store D1 (3) Data Store D2

Table D.5. Process Specification of Process 5.

Items	Description
Process Name:	Send Customer Invoice to Customer Agent
Data In:	Current Tax Invoice ID and Group ID Tax Invoice
Data Out:	New Tax Invoice ID Tax Invoice
Process:	(1) Receive the requirement from the officer (2) Read group ID and current Tax Invoice ID from control on database (3) Read total premium from Tax Invoice Database (4) Print Tax Invoice return to a customer (5) Repeat step 1 until the actual requirement has already been established
Attachment:	(1) Officer (2) Customer Agent (3) Financial Department

Table D.6. Process Specification of Process 6.

Items	Description
Process Name:	Require Customer Payment
Data In:	Available Policy Type
Data Out:	Net Premium
Process:	(1) Receive Available Policy Type from the prior process (2) Send Net Premium to the next process
Attachment:	(1) Customer (2) Customer Agent

Table D.7. Process Specification of Process 7.

Items	Description
Process Name:	Deliver Money
Data In:	Net Premium Vat Amount
Data Out:	Net Premium
Process:	(1) Receive Net Premium from the prior process (2) Receive Vat Amount from the prior process (3) Send Premium of Policy or Premium of Tax Invoice to the next process
Attachment:	(1) Customer Agent (2) Financial Department

Table D.8. Process Specification of Process 8.

Items	Description
Process Name:	Confirm Receiving Money
Data In:	Net Premium & Vat Amount
Data Out:	Premium of Policy or Premium of Tax Invoice
Process:	(1) Confirm result to collect money from the Financial Department (2) Receive result to collect money (3) Confirm collect money to Officer
Attachment:	(1) Financial Department (2) Officer

Table D.9.   Process Specification of Process 9.

Items	Description
Process Name:	Change Car & Customer Data
Data In:	Available Car Information Available Customer Information
Data Out:	Confirm Change of Data Confirm Update Address
Process:	(1) Confirm customer status from valid member customer process (2) Update the car information and customer address into car database and customer database (3) Send the information or go and make a presentation to the customer
Attachment:	(1) Customer (2) Officer (3) Data Store D1 (4) Data Store D2

Table D.10. Process Specification of Process 10.

Items	Description
Process Name:	Require Claim Insurance
Data In:	Case ID Available Customer ID
Data Out:	Available Case ID
Process:	(1) Receive information from the customer (2) Receive status of available customer ID from the prior process (3) Read case ID from case database (4) Send status of available case ID to next process
Attachment:	(1) Customer (2) Claim Department

Table D.11. Process Specification of Process 11.

Items	Description
Process Name:	Check Data Process
Data In:	Policy type Available Case ID Policy type ID
Data Out:	Available Policy type
Process:	(1) Receive information from the customer (2) Receive status of available case ID require claim from the prior process (3) Read policy type name from policy type database (4) Send status of available policy type to next process
Attachment:	(1) Claim Department (2) Estimate Value Department (3) Data Store D1 (4) Data Store D2

Table D.12.   Process Specification of Process 12.

Items	Description
Process Name:	Estimate Fix Price
Data In:	Calculate Estimated Value to fix the car Stamp Rate Vat Rate
Data Out:	Value to Fix the Car
Process:	(1) Receive the estimate valued from the value estimating department (2) Send the estimated value to the garage (3) Send estimate price to the pay money process
Attachment:	(1) Garage (2) Value Estimating Department (3) Pay Money Process

Table D.13. Process Specification of Process 13.

Items	Description
Process Name:	Pay Money Process
Data In:	Estimate Price Value Available Case ID Policy Type ID
Data Out:	Price Value Available Case ID
Process:	(1) Receive price value to fix the car from the estimate price (2) Send require pay money to financial department (3) Receive confirm pay money from the financial department
Attachment:	(1) Estimate Fix Price (2) Garage (3) Financial Department

Table D.14. Process Specification of Process 1.1.

Items	Description
Process Name:	Require Automobile Act & Automobile Insurance
Data In:	Customer Information Car Information Customer Agent Name
Data Out:	New Customer New Customer Agent New Policy
Process:	(1) Receive the requirement from the customer (2) Send the requirement to the customer agent (3) Send document to officer (4) Read the customer information into customer agent database and customer database (5) Send the information or go and make a presentation to the customer
Attachment:	(1) Customer (2) Customer Agent (3) Officer

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Table D.15.   Process Specification of Process 1.2.

Items	Description
Process Name:	Require Document
Data In:	Document of the customer and car
Data Out:	New Customer and New Policy
Process:	(1) Receive the require document from the customer (2) Send the document to the customer agent (3) Send information to officer
Attachment:	(1) Customer (2) Customer Agent (3) Officer

Table D.16.   Process Specification of Process 2.1.

Items	Description
Process Name:	Take Document of The Car and Customer
Data In:	Customer Information Car Information
Data Out:	New Customer New Customer Agent
Process:	(1) Receive the data from the customer agent (2) Send data to officer
Attachment:	(1) Customer (2) Officer

Table D.17. Process Specification of Process 2.2.

Items	Description
Process Name:	Require More Information
Data In:	Customer Subscription Add More Information of the Customer
Data Out:	Available Customer Information
Process:	(1) Receive more information of the customer from the customer agent (2) Read the customer agent name from customer agent database (3) Verify requirement of customer information
Attachment:	(1) Officer (2) Customer (3) Customer Agent

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Table D.18.   Process Specification of Process 3.1.

Items	Description
Process Name:	Send Contract Requirement
Data In:	Stamp Rate
Data Out:	New Stamp Rate
Process:	(1) Send petition through the officer (2) Manager receive petition (3) Repeat step 1
Attachment:	(1) Officer (2) Manager

Table D.19.   Process Specification of Process 3.2.

Items	Description
Process Name:	Approve Policy
Data In:	New Policy Stamp Rate
Data Out:	New Policy New Stamp Rate
Process:	(1) Receive Stamp Rate requirement from the manager (2) Record the new stamp rate into stamp database
Attachment:	(1) Manager (2) Officer

Table D.20.   Process Specification of Process 4.1.

Items	Description
Process Name:	Car Data
Data In:	Information of the Car
Data Out:	New Car Data
Process:	(1) Receive car data from the officer (2) Record new car data into car database
Attachment:	(1) Officer (2) Data Store D1

Table D.21.   Process Specification of Process 4.2.

Items	Description
Process Name:	Customer Data
Data In:	Information of the Customer
Data Out:	New Customer
Process:	(1) Receive customer data from the officer (2) Record the new customer data into car database
Attachment:	(1) Officer (2) Data Store D2

Table D.22.   Process Specification of Process 5.1.

Items	Description
Process Name:	Check Premium
Data In:	Net Premium Vat Premium
Data Out:	Premium of Policy or Premium of Tax Invoice
Process:	(1) Receive Net Premium from the prior process (2) Receive Vat Amount from the prior process (3) Send Premium of Policy or Premium of Tax Invoice to the next process
Attachment:	(1) Officer

Table D.23.   Process Specification of Process 5.2.

Items	Description
Process Name:	Require Pay Money
Data In:	Available Policy Type Current Premium
Data Out:	Net Premium
Process:	(1) Read current premium from policy database (2) Receive available policy type from the prior process (3) Send an IOU to customer agent
Attachment:	(1) Officer (2) Financial Department

Table D.24.   Process Specification of Process 6.1.

Items	Description
Process Name:	Collect
Data In:	Net Premium Vat Amount
Data Out:	Premium of Policy & Vat Amount
Process:	(1) Receive net premium from the collect process (2) Send IOU to the customer (3) Send premium of the policy or tax invoice to the next process
Attachment:	(1) Customer (2) Customer Agent

Table D.25.   Process Specification of Process 6.2.

Items	Description
Process Name:	Receive Money
Data In:	Available Policy Type
Data Out:	Net Premium
Process:	(1) Receive money from the customer (2) Send money to the customer agent (3) Send net premium & money to the next process
Attachment:	(1) Customer (2) Customer Agent

Table D.26. Process Specification of Process 7.1.

Items	Description
Process Name:	Deliver Money
Data In:	Policy ID
Data Out:	Net Premium
Process:	(1) Receive net premium from the prior process (2) Receive money from the customer agent (3) Send money to the financial department
Attachment:	(1) Customer Agent (2) Financial Department

Table D.27. Process Specification of Process 8.1.

Items	Description
Process Name:	Pay Money
Data In:	Policy Type Net Premium
Data Out:	Net Premium
Process:	(1) Read premium from policy database (2) Receive money from the customer (3) Send money to financial department
Attachment:	(1) Customer (2) Financial Department

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Table D.28.   Process Specification of Process 8.2.

Items	Description
Process Name:	Confirm Receiving Money
Data In:	Receipt of Tax Invoice Debit Note Credit Note
Data Out:	Receipt of Tax Invoice Debit Note
Process:	(1) Receive receipt of tax invoice from the financial department (2) Send result to collect money to the officer (3) Confirm debit note
Attachment:	(1) Financial Department (2) Officer

Table D.29. Process Specification of Process 10.1.

Items	Description
Process Name:	Claim
Data In:	Policy No. Check Customer & Car Data
Data Out:	Case Claim ID Policy No.
Process:	(1) Receive require claim from the customer (2) Check data from customer database and car database (3) Send case claim ID to claim department
Attachment:	(1) Customer (2) Claim Department

Table D.30. Process Specification of Process 10.2.

Items	Description
Process Name:	Confirm Claim
Data In:	Case Claim ID Policy No.
Data Out:	Case Claim ID
Process:	(1) Receive confirm claiming from claim department (2) Confirm claiming to the customer
Attachment:	(1) Claim Department (2) Customer

Table D.31.   Process Specification of Process 11.1.

Items	Description
Process Name:	Check Data
Data In:	Case ID Available Customer ID
Data Out:	Available Case ID
Process:	(1) Receive information from the customer (2) Receive status of available customer ID from the prior process (3) Read case ID from case database (4) Send status of available case ID to next process
Attachment:	(1) Claim Department (2) Customer (3) Data Store D1 (4) Data Store D2

Table D.32.   Process Specification of Process 11.2.

Items	Description
Process Name:	Checking
Data In:	Case ID Policy No.
Data Out:	Case ID Policy No.
Process:	(1) Receive status of available customer ID from the prior process (2) Send status of available case ID to Estimate Value case ID
Attachment:	(1) Estimate Value Department

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Table D.33.   Process Specification of Process 12.1.

Items	Description
Process Name:	Fix Price Estimate
Data In:	Estimate Price Value Policy No. Case ID
Data Out:	Price Value Policy No. Case ID
Process:	(1) Receive the estimate value and Policy No. from the Value Estimating department (2) Send Case ID to the Garage
Attachment:	(1) Value Estimating Department (2) Garage

Table D.34. Process Specification of Process 12.2.

Items	Description
Process Name:	Fix Price
Data In:	Case ID Estimate Price Value
Data Out:	Case ID Price Value
Process:	(1) Receive price fix value from the prior process (2) Send price value to the Garage and Financial Department
Attachment:	(1) Garage (2) Financial Department

Table D.35.   Process Specification of Process 13.1.

Items	Description
Process Name:	Pay Money
Data In:	Price Value Case ID
Data Out:	Price Value
Process:	(1) Receive price value from the estimate fix price (2) Send require pay money to the financial department (3) Send money to the garage
Attachment:	(1) Estimate Fix Price (2) Financial Department (3) Garage

APPENDIX E

DATADICTIONARY

Table E.1   Data Dictionary of Auto Insurance Database.

Field Name	Meaning
Active	The Status of Customer that is marked for deleting all records
Address	The Customer's Address
Agent Active	The Status of Agent Customer that is marked for delete all record
Agent Address	The Agent Customer Address
Agent Effect Date	The Start date of Agent Customer record
Agent Expire Date	The End date that Agent Customer record is deleted
Agent ID	The Agent Customer Identification Number
Agent Name	The Agent Customer Name
An IOU	A promise to pay the debt
Approval	The Manager signs to approve the Policy
Case ID	Case Identification Number
Case Name	The name of Tax Invoice Case to explain the relationship of Tax Invoice and Policy
Collect	To bring or come together in a group
Control End Date	The Start date of Policy Type record
Control Strat Date	The End date that Policy Type record is deleted
Coltrol Tax Type_ID	Type of Identification Number that needs to generate such as Debit, Credit or Tax Invoice
Current Adjust_No	The Last Number of Debit or Credit that perfroms this policy record
Current Net Premium	The current money that remains after Credit or Debit
Current Policy Net Premium	The current money that remains after Credit or Debit
Customer Address	The Customer Address
Customer_ID	TheCustomer Identification Number
Description	The Description of Tax Invoice
Discount	The Discount for privileged person
Effect Date	The Start Date of Customer record

Table E.1. Data Dictionary of Auto Insurance Database (Continued)

Field Name	Meaning
End Date	The End date that Policy Type record is deleted
Endt_No	The Number of Debit and Credit modification
Estimate Value	Estimate price to fix the car
Expire Date	The End date that Customer record is deleted
Garage	The name of Garage to fix the car
Group_ID	The Computer Identification Number
Initial Total Discount	The Initial Total of all Policies Discount
Initial Total Net Premium	The Initial Total of all Policies Net Premium: Net Premium = Premium-Discount
Initial Total Premium	The Initial Total of all Policies Premium
Initial Total Stapm Amt	The Initial Total of all Policies Stamp Amount Stamp Amount = Net Premium*Stamp Rate
Initial Total Vat Amt	The Initial Total of all Policies Vat Amount: Vat Amount = Stamp Amount*Vat Rate
Inst_No	The Number of separated payment time
Number	The Number that generates sequence numbers
Name	The Customer Name
Net Premium	Net Premium=Premium-Discount
Officer	The person working at the personnel department
Policy Date	The Date of creating Policy Record
Policy_No	The Number of Policy
Policy Type Name	The Name of Policy Type
Prefix Code	The Code that is used for dividing Computer, Tax Invoice Debit and Credit
Premium	The money that is paid for insurance for each policy
Stamp Amt	The Value that is used for calculating Vat Amount
Stamp End Date	The End Date that Stamp record is deleted

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Table E.1.   Data Dictionary of Auto Insurance Database (Continued)

Field Name	Meaning
Stamp Rate	The Rate that is used for calculating Stamp Amount
Stamp Strat Date	The Start date of Stamp record
Strat Date	The Start date of Policy record
Summary Current Net Premium	Current Net Premium of Policy that remians after Debit or Credit
Tax Date	The Date of generating Tax Invoice to Customer
Tax_No	The Tax Invoice Identification Number
Tax Type_ID	The Tax Invoice Type Identification Number
Total Premium	Total Premium=Net Premium-Vat Amount
Vat Amt	The Value that is used for calculating Total Premium
Vat End Date	The End date that Vat record is deleted
Vat Rate	The Rate that is used for calculating Vat Amount

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APPENDIX F

STRUCTURE CHART
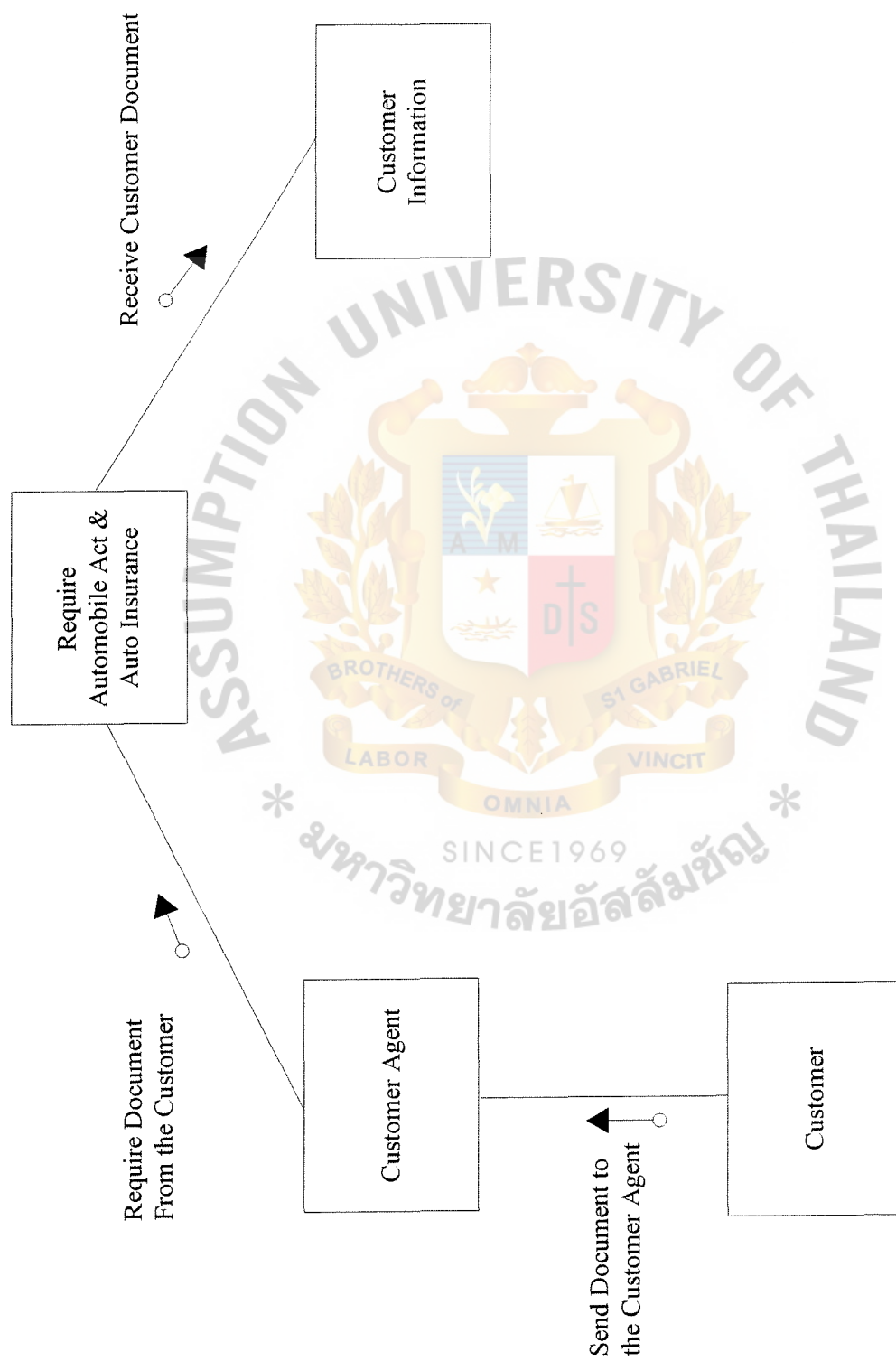
Figure F.1.   Structure Chart of Requiring Automobile Act & Auto Insurance.
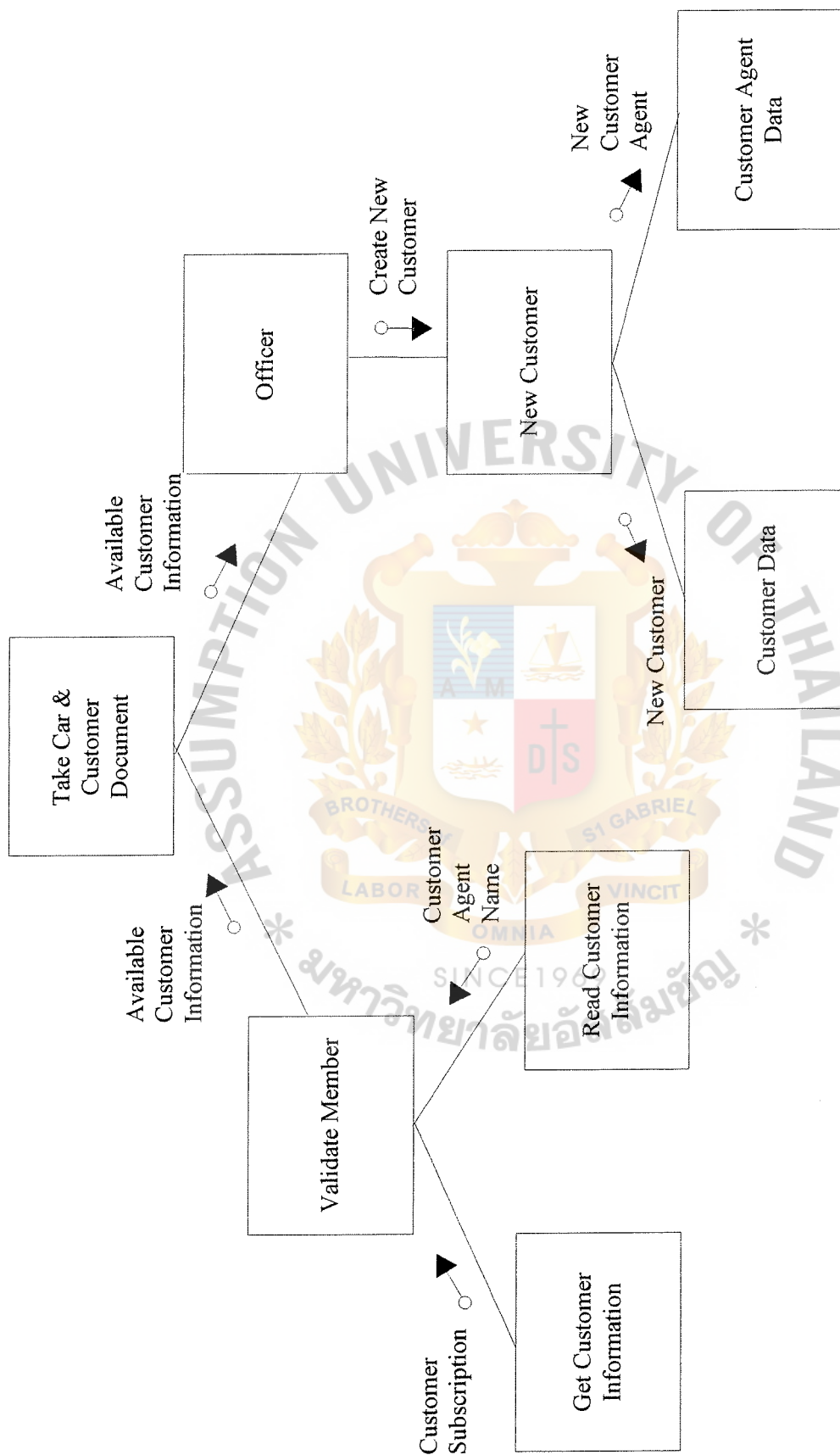
Figure F.2.   Structure Chart of Taking Car & Customer Document.
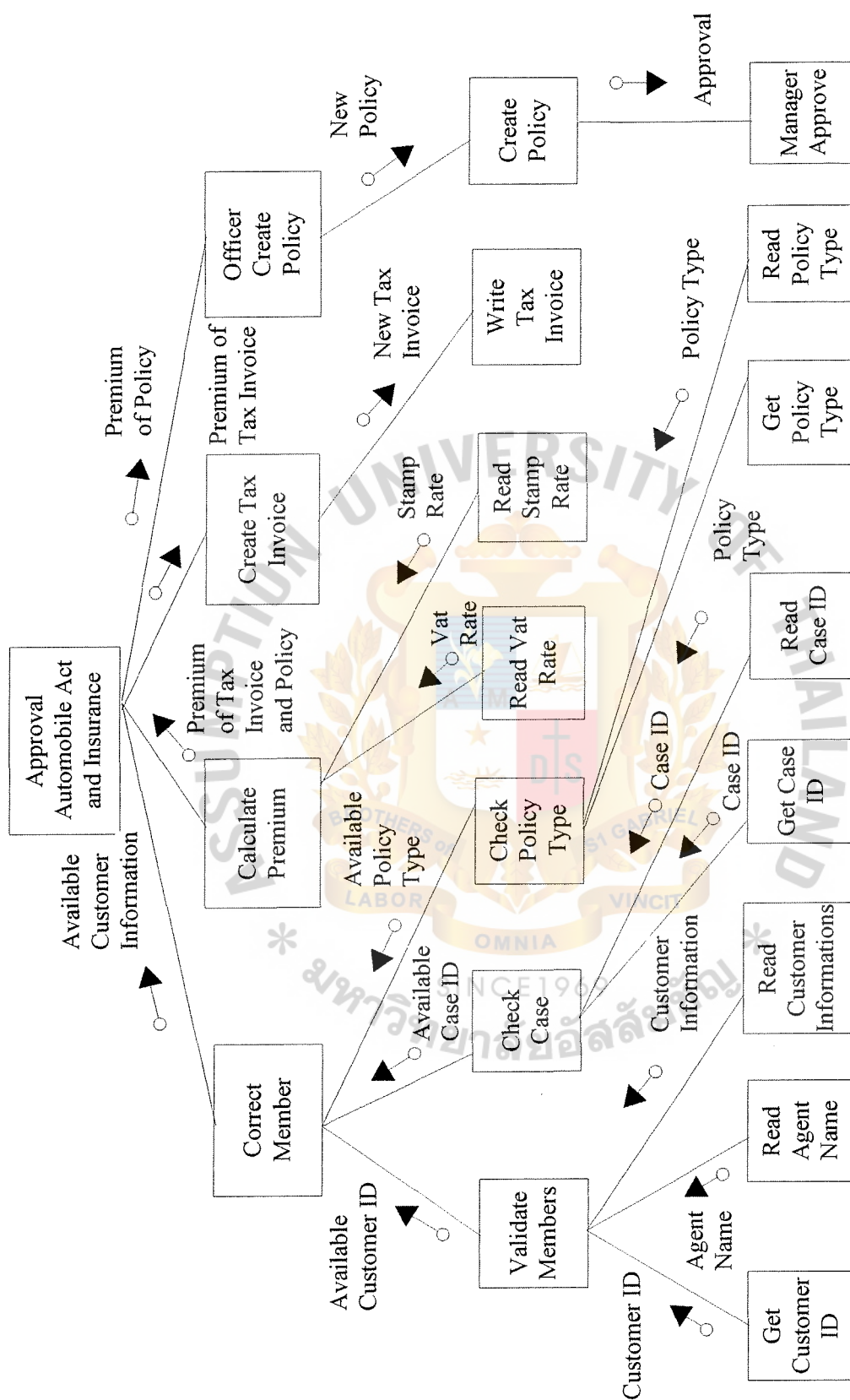
Figure F.3. Structure Chart of Approving Automobile Act and Insurance.
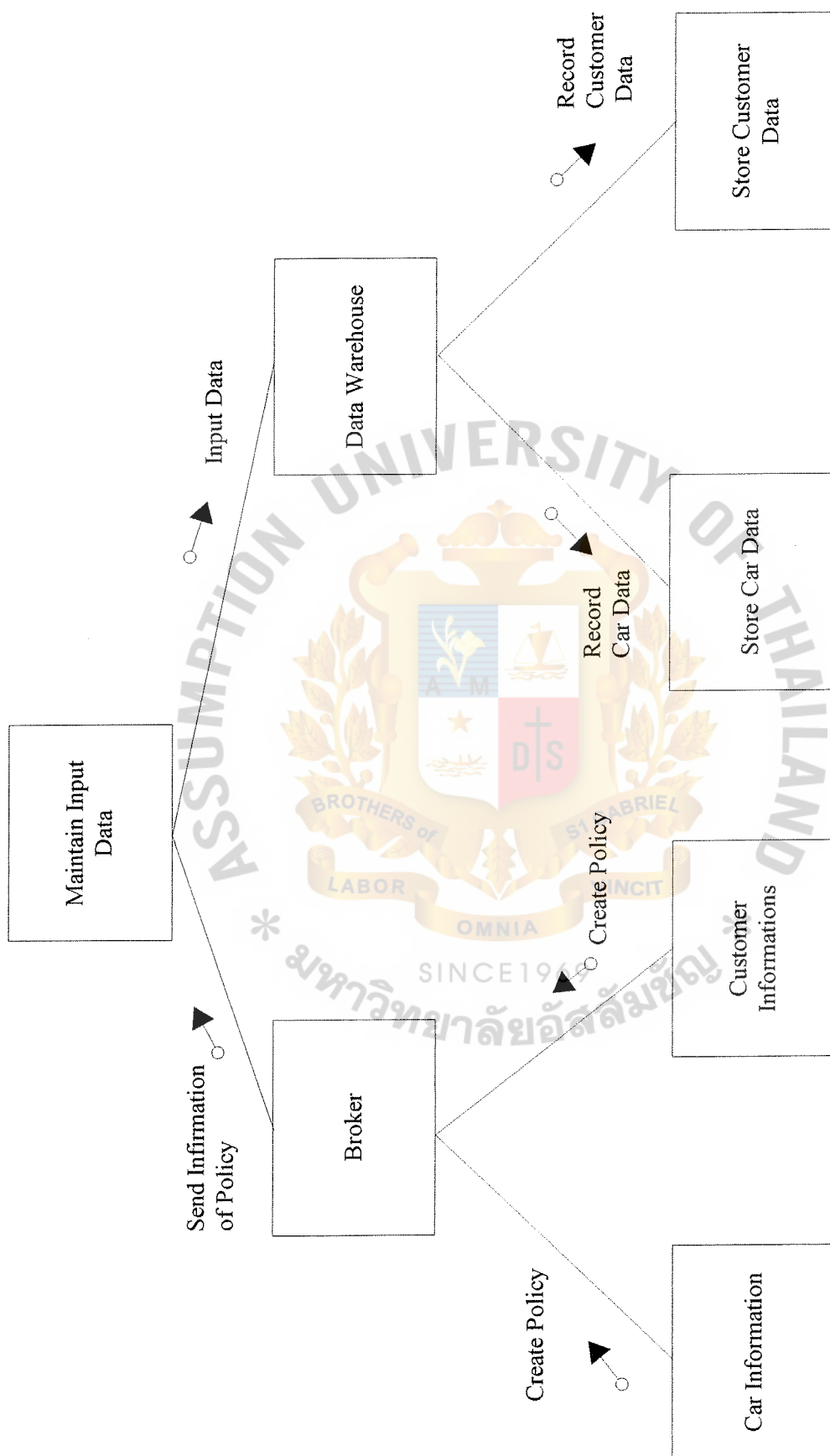
Figure F.4. Structure Chart of Input Data.
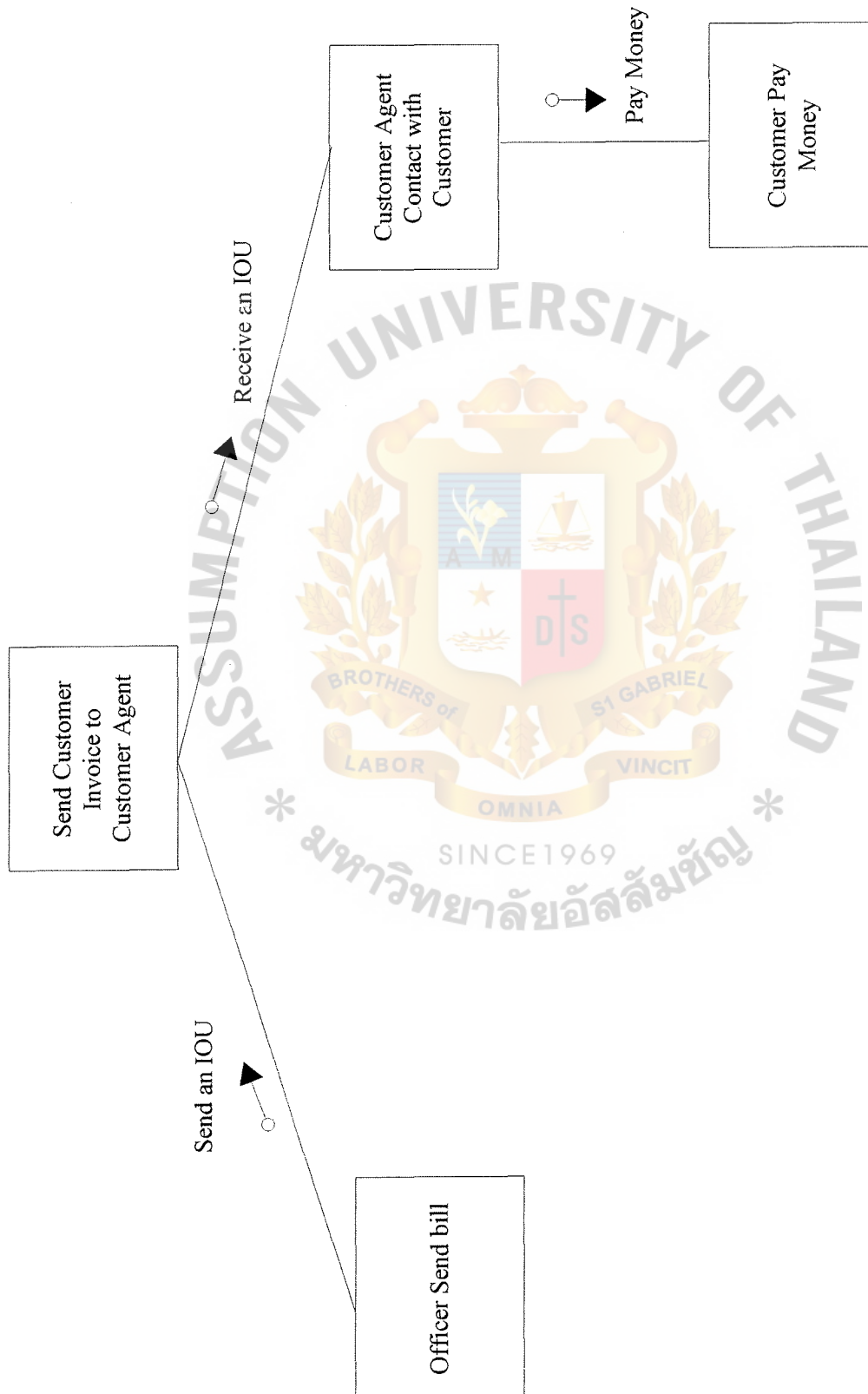
Figure F.5.   Structure Chart of sending Customer Invoice to Customer Agent.
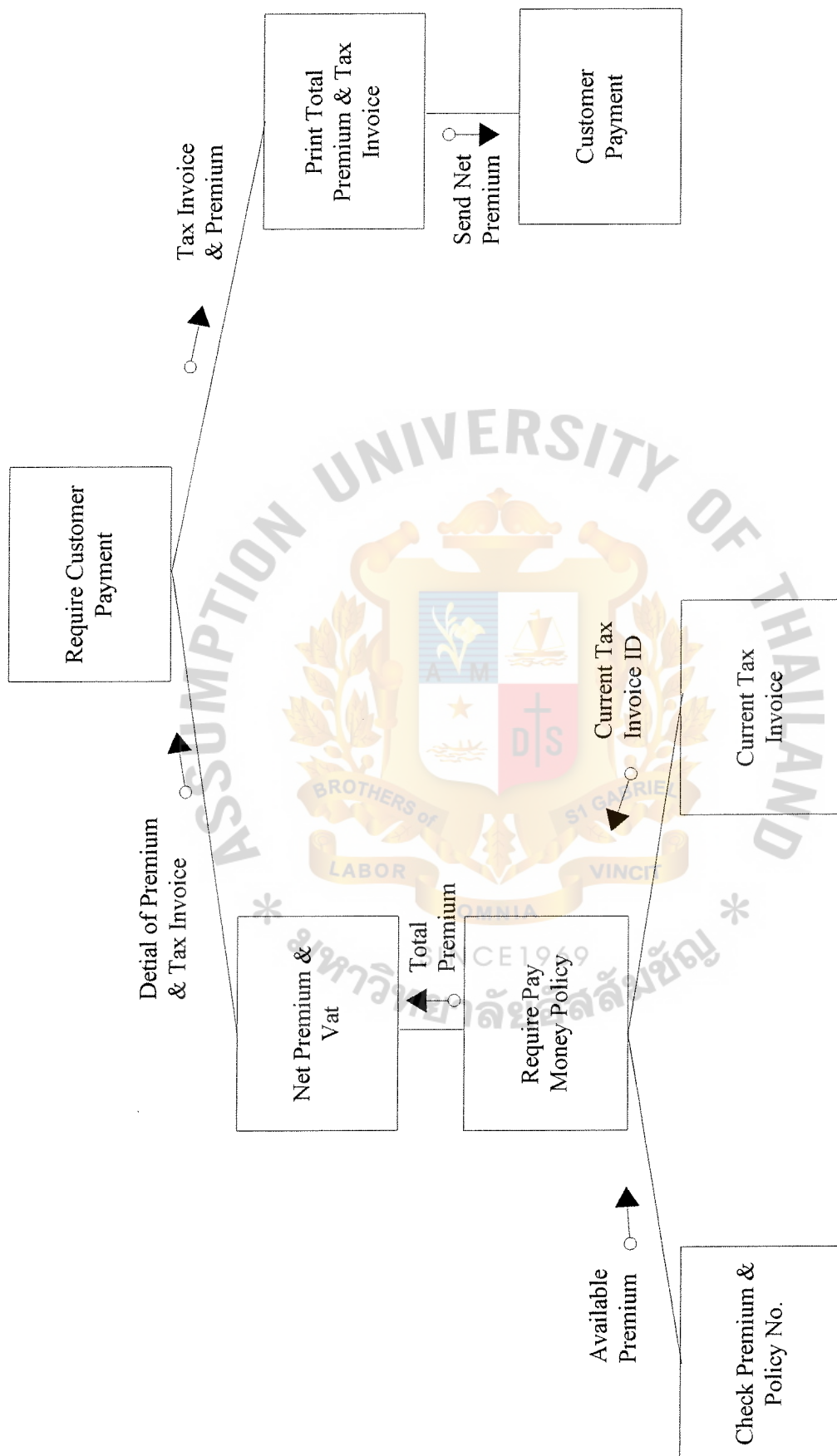
Figure F.6.   Structure Chart of Requiring Customer Payment.
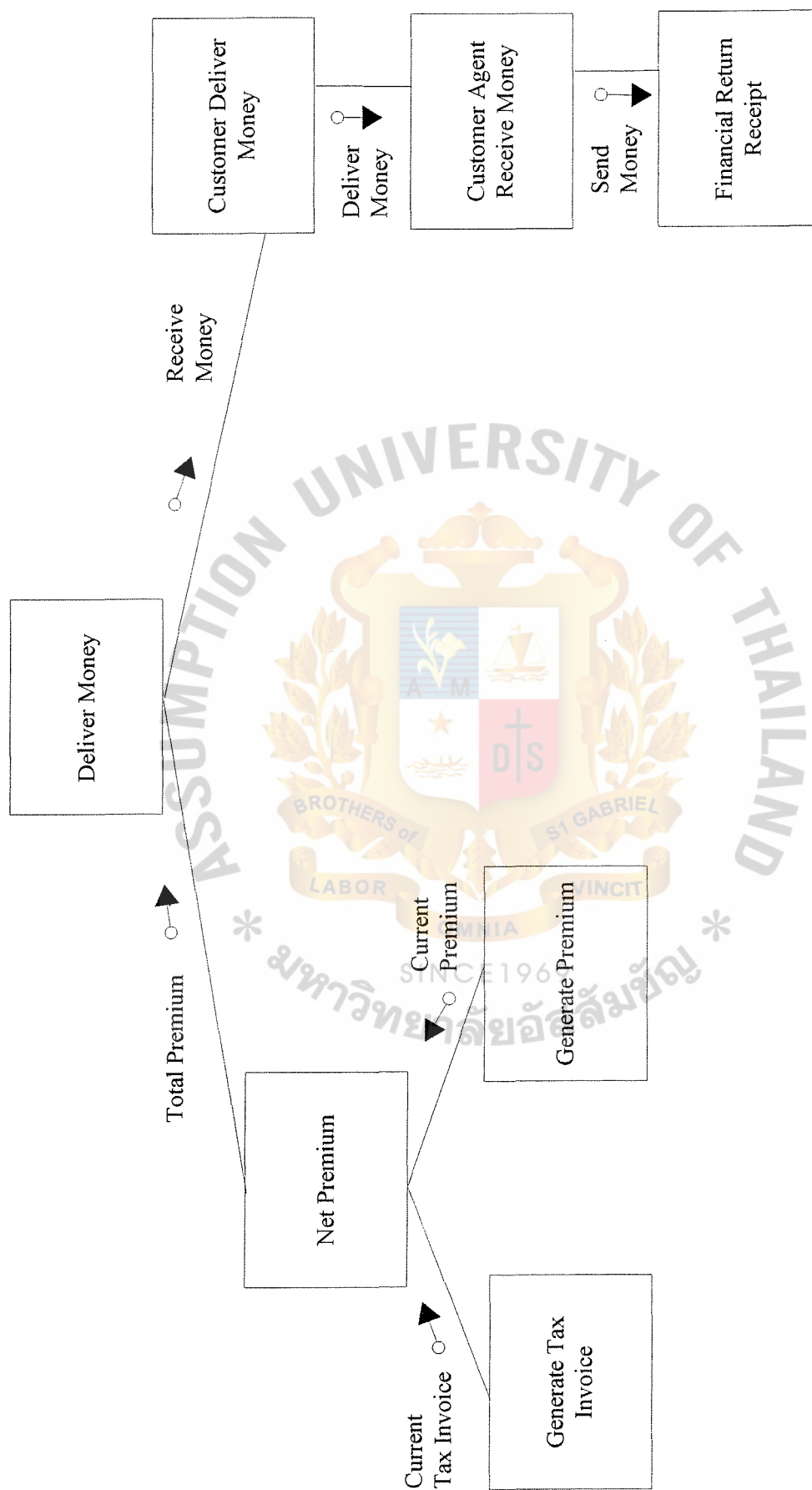
Figure F.7. Structure Chart of Delivering Money.

126
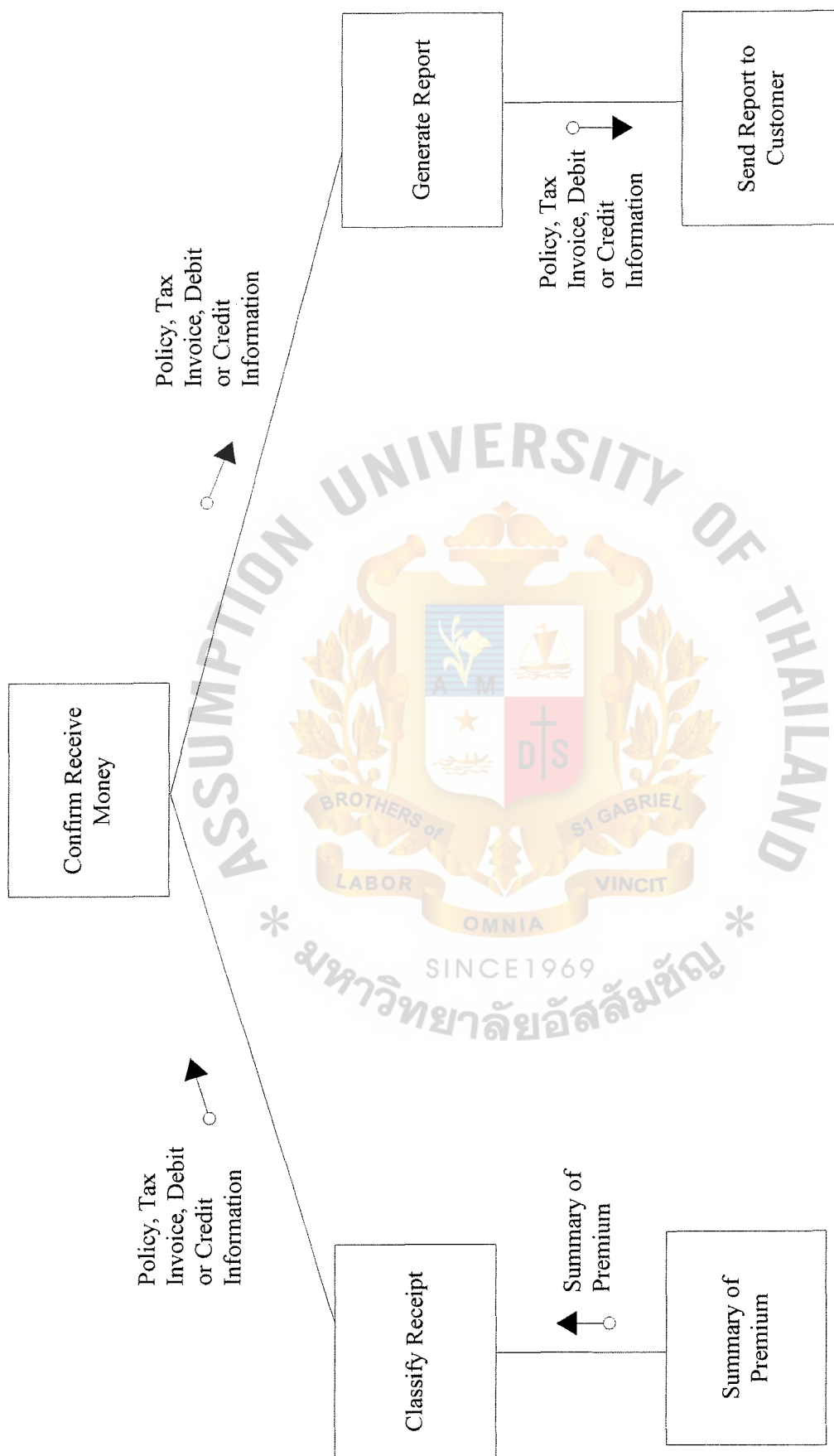
Figure F.8. Structure Chart of Confirming Receiving Money.

127
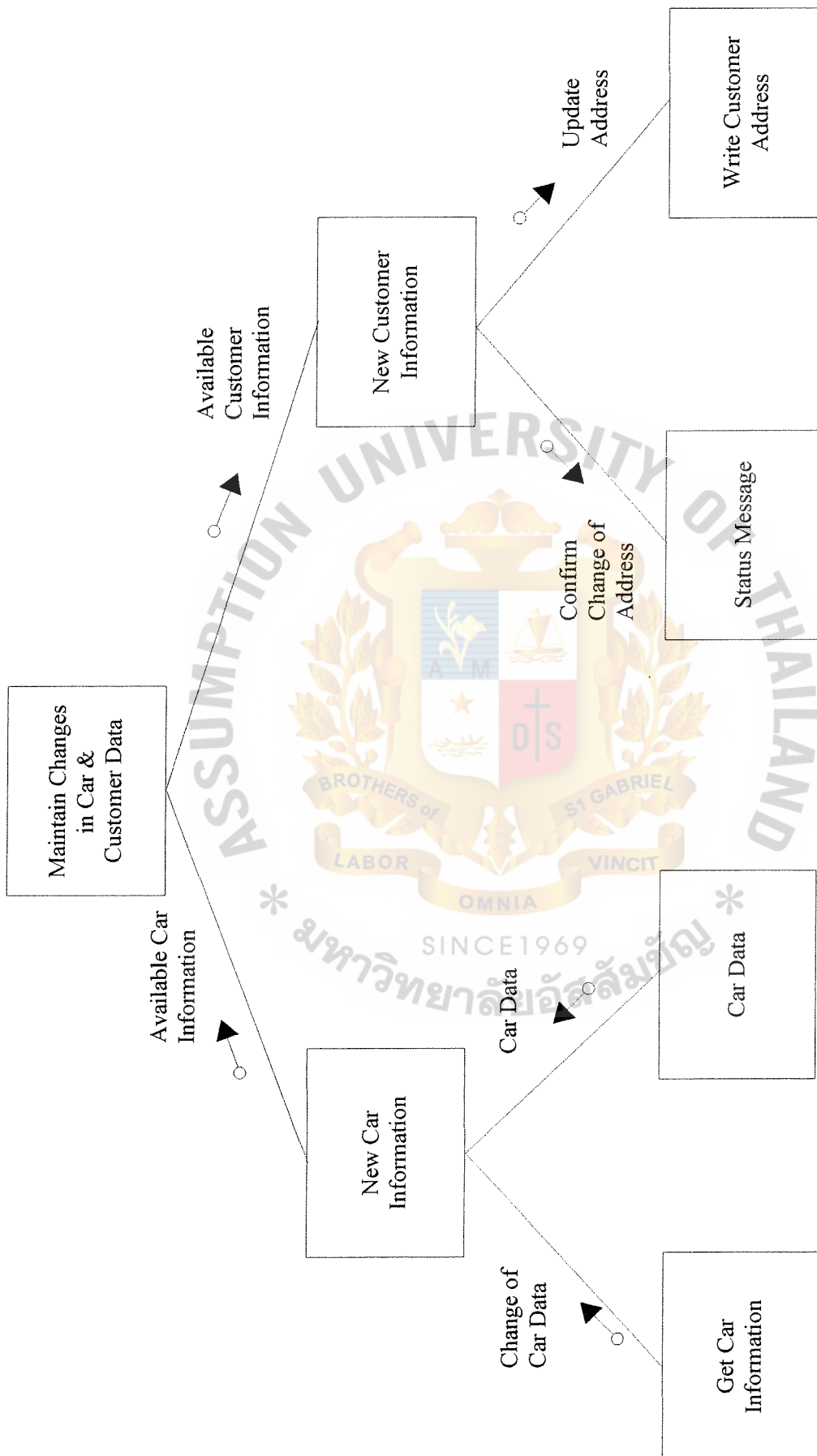
Figure F.9. Structure Chart of Changes in Car & Customer Data.
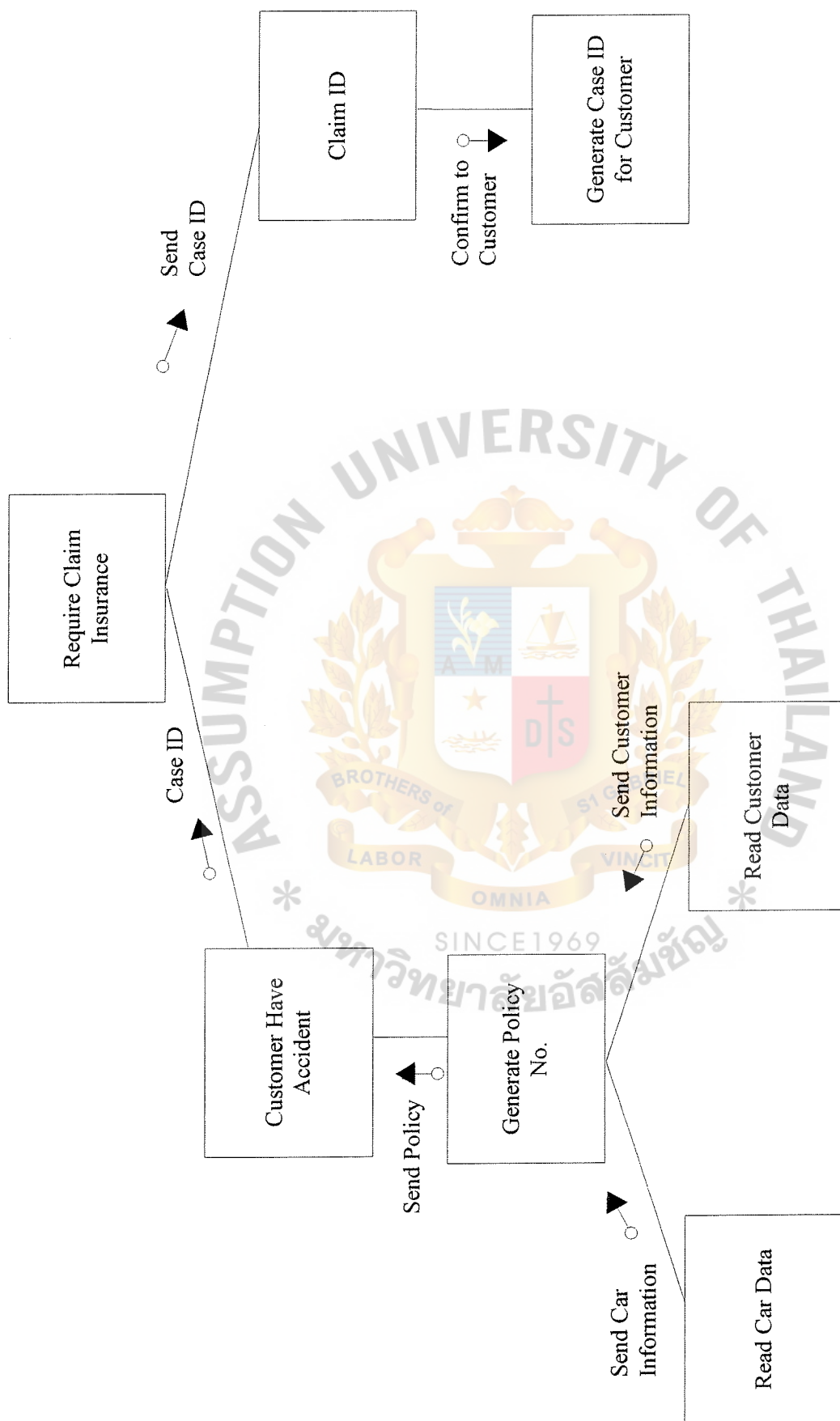
Figure F.10.   Structure Chart of Claiming Insurance.
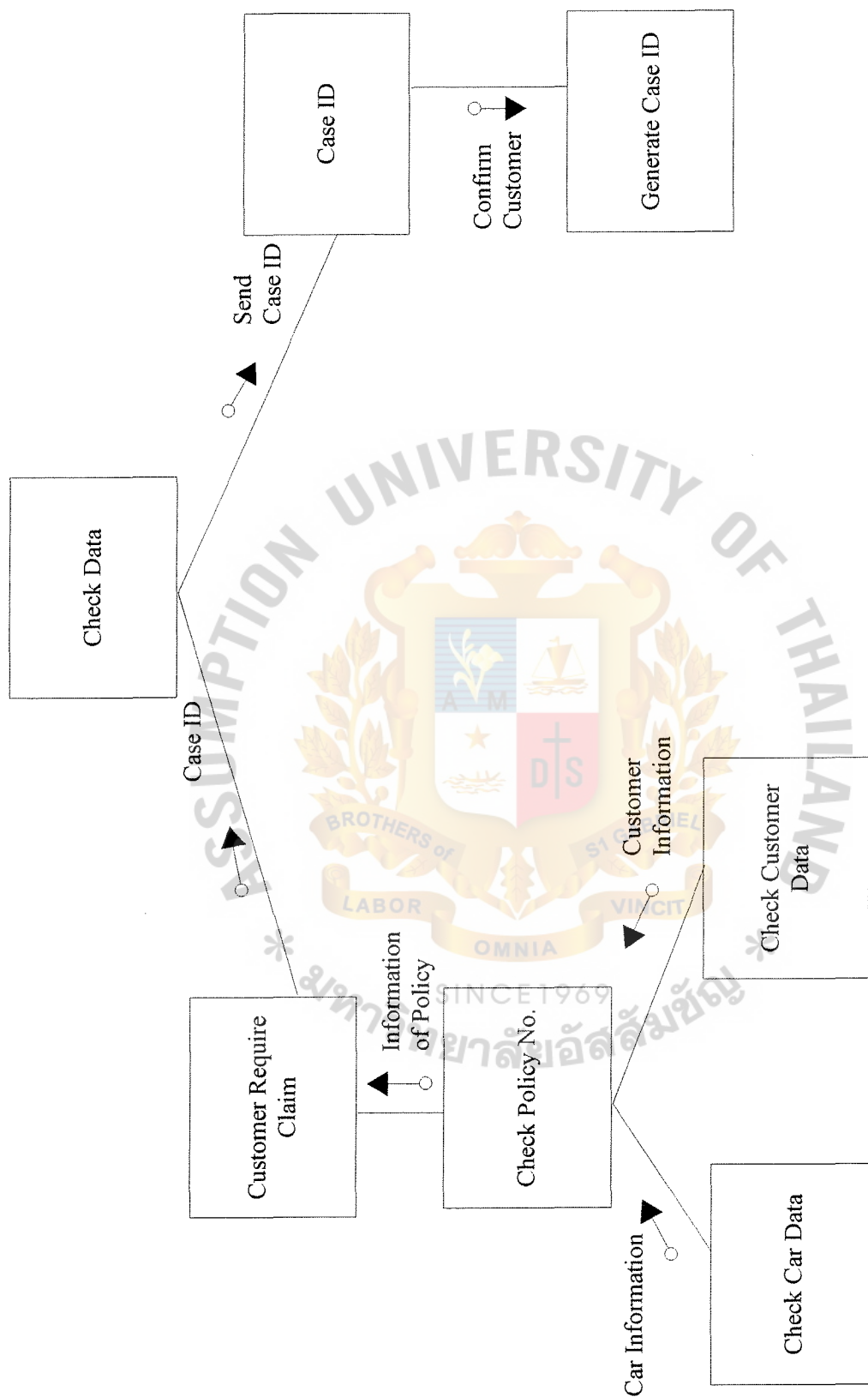
Figure F.11. Structure Chart of Checking Data.

130
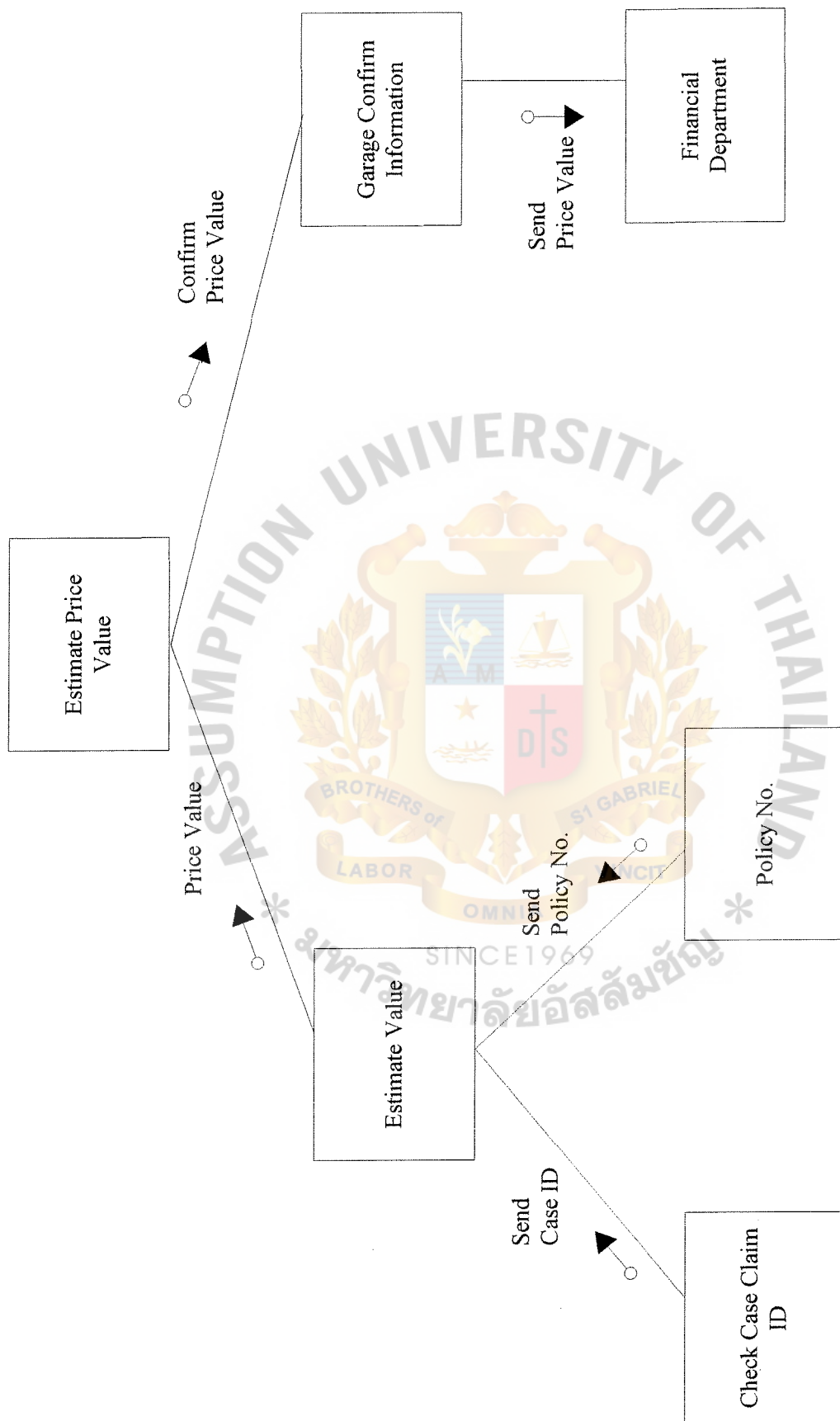
Figure F.12. Structure Chart of Estimating Price Value.
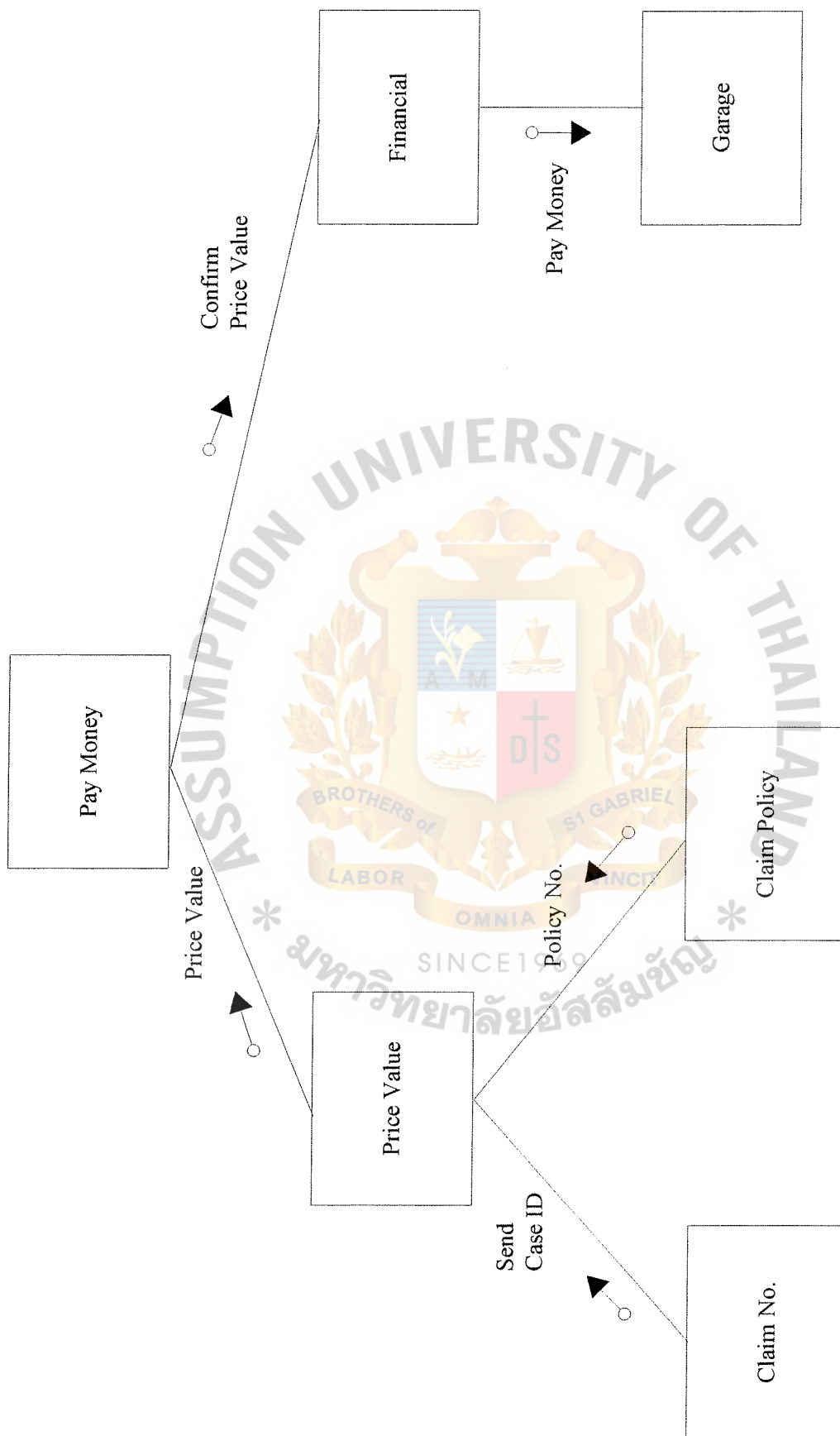
Figure F.13.   Structure Chart of Paying Money.

APPENDIX G

CANDIDATE MATRIX

Table G.1.   Partial Completed Candidate Matrix.

Characteristics	Candidate 1	Candidate 2	Candidate 3
Portion of Computerized System Brief description of the business benefits that would be computerized for this candidate.	Fully supports user required business Process for Raminthra Broker of South East Insurance System	Same as candidate 1	Same as candidate 1
Benefits Brief description of the business benefits that would be realized for this candidate.	Fully supports user required business Process for Raminthra Broker of South East Insurance System	Same as candidate 1	Same as candidate 1
Server and Workstations A description of the servers and workstations needed to support this candidate.	Technically architecture dictate Pentium III MS Windows 2000 class Server, MS Windows 2000 workstation (Client)	Technically architecture dictate Pentium III MS Windows 2000 class Server, MS Windows 2000 workstation (Client)	dictate Pentium III MS Windows NT class Server, MS Windows NT workstation (Client)
Software Tools Needed Software Tools needed to design and build the candidate (e.g., database management system, emulators, operating systems, languages,etc.). Non general packages are to be purchased.	Ms Visual Basic 6.0 Visio 2000	Ms Visual Basic 6.0 Visio 2000	MS Visual C++ 6.0 Visio 4.1

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Table G.1. Partial Completed Candidate Matrix (Continued).

Characteristics	Candidate 1	Candidate 2	Candidate 3
Application Tools Needed A description of the software to be purchased, built, accessed, or some combination of these techniques	Customer Solution	Same as candidate 1	Same as candidate 1
Method of Data Processing Generally some combination of online, batch, deferred batch, remote batch, and real time.	3 Tier Client/Server	3 Tier Client/Server	2 Tier Client/Server
Out Devices and Implications A description of output devices that would be used,special out put requirement (e.g.,network, preprinted forms, etc), and output considerations (e.g.,constraints)	4 HP Laser Jet 6P	Same as candidate 1	Same as candidate 1
Input Devices and Implications A description of input devices for work that use input devices (e.g.key board, mouse, etc). special input requirements.	Keyboard & Mouse	Keyboard & Mouse	Keyboard & Mouse

Table G.2.   Partially Completed Candidate Matrix.

Feasibility Criteria	weight	Candidate 1	Candidate 2	Candidate 3
Operational Feasibility Functionality. A description of to what degree the candidate would benefit the organization and how well the system would work Political. A description of how wellreceived this solution would be from both user management, user and organization perspective	30%	Fully supports user required functionality Score: 100	Same as candidate 1 Score: 100	Same as candidate 1 Score: 100
Technical Feasibility Technology. An assessment of the maturity, availability (or ability to acquire), and desirability of the computer technology needed to support this candidate. Expertise. An assessment of the technical expertise needed to develop, operate, and maintain the candidate system.	30%	Borland Delphi demonstration and presentation have agreed the transition will be simple and finding programmers will be easier than C++ and application programs execution are faster than MS Visual Basic 6.0 Score: 100	Required to hire or train C++ expertise to perfrom modification for integration requirements Score: 80	MS Visual Basic Demonstration and presentation have agreed the transition will be simple and finding programmers will be easier than C++ Score: 90
Economic Feasibility Cost to develop:	30%	Approximately 1,010,000 baht	Approximately 1,090,000 baht	Approximately 1,030,000 baht

Table G.2.   Partially Completed Candidate Matrix (Continued).

Feasibility Criteria	weight	Candidate 1	Candidate 2	Candidate 3
Payback period (discounted): Net present values:		Approximately 3.6 year Approximately 1,051,385 baht Score: 90	Approximately 3.9 year Approximately 633,716 baht Score: 70	Approximately 3.7 year Approximately 903,716 baht Score: 85
Schedule Feasibility An assessment of how long the solution will take to design and implement.	10%	10 months Score: 80	less than 8 month Score: 100	8-12 months Score: 60
Ranking	100%	95	81	92.5

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Table G.3. Computerized system Cost Analysis of Candidate 1, Baht.

Cost Items	Years				
	1	2	3	4	5
Fixed cost					
Hardware Cost:					
Workstation Cost	60,000.00	60,000.00	60,000.00	60,000.00	60,000.00
Computer Server Cost	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00
Total Hardware Cost	80,000.00	80,000.00	80,000.00	80,000.00	80,000.00
Maintenance Cost	-	-	-	20,000.00	20,000.00
Software Cost:					
Compiler Cost	160,000.00	20,000.00	20,000.00	20,000.00	20,000.00
Application Cost	140,000.00	20,000.00	20,000.00	20,000.00	20,000.00
DBMS Cost	140,000.00	20,000.00	20,000.00	20,000.00	20,000.00
Total Software Cost	440,000.00	60,000.00	60,000.00	60,000.00	60,000.00
Implementation Cost:					
Advance Training Cost	130,000.00	-	-	-	-
Basic Training Cost	150,000.00	-	-	-	-
Set up Cost	150,000.00	-	-	-	-
Total Implementation Cost	430,000.00	-	-	-	-
Office Equipment Cost:					
Printer 3 Units @ 20,000	60,000.00	-	-	-	-
Total Fixed Cost	1,010,000.00	140,000.00	140,000.00	160,000.00	160,000.00
Operating Cost					
Operator 5 persons @ 9,500	47,500.00	52,250.00	57,475.00	63,222.50	69,544.75
Manager 1 persons @ 25,000	25,000.00	27,500.00	30,250.00	33,275.00	36,602.50
System Administrator 1 person 15,000	15,000.00	16,500.00	18,150.00	19,965.00	21,961.50
Total Monthly Cost	87,500.00	96,250.00	105,875.00	116,462.50	128,108.75
Total Annual Salary Cost	1,050,000.00	1,155,000.00	1,270,500.00	1,397,550.00	1,537,305.00
Office Supplies Cost: increase 5 %					
Stationery 1,600 per month	1,500.00	1,575.00	1,653.75	1,736.44	1,823.26
Paper 2,000 per month	2,150.00	2,257.50	2,370.38	2,488.89	2,613.34
Utility 5,500 per month	5,500.00	5,775.00	6,063.75	6,366.94	6,685.28
Miscellaneous 5,500 per month	5,500.00	5,775.00	6,063.75	6,366.94	6,685.28
Total Annual Office Supplies					
& Miscellaneous Cost	14,650.00	15,382.50	16,151.63	16,959.21	17,807.17
Total Annual Office Operating Cost	175,800.00	184,590.00	193,819.50	203,510.48	213,686.00
Total Operating Cost	1,225,800.00	1,339,590.00	1,464,319.50	1,601,060.48	1,750,991.00
Total Computerized System Cost	2,235,800.00	1,479,590.00	1,604,319.50	1,761,060.48	1,910,991.00

Table G.4.   Five Year Accumulated Cost of Computerized Candidate 1, Baht.

Year	Total Cost of Computerized System	Accumulated Cost
1	2,235,800.00	2,235,800.00
2	1,479,590.00	3,715,390.00
3	1,604,319.50	5,319,709.50
4	1,761,060.48	7,080,769.98
5	1,910,991.00	8,991,760.97
Total	8,991,760.97	0.00

Table G.5.   Comparison of the System Cost of Candidate 1, Baht.

Year	Accumulated Manual Cost	Accumulated Computerized Cost
1	1,642,360.00	2,235,800.00
2	3,435,316.00	3,715,390.00
3	5,407,567.60	5,319,709.50
4	7,577,044.36	7,080,769.98
5	9,963,468.80	8,991,760.97

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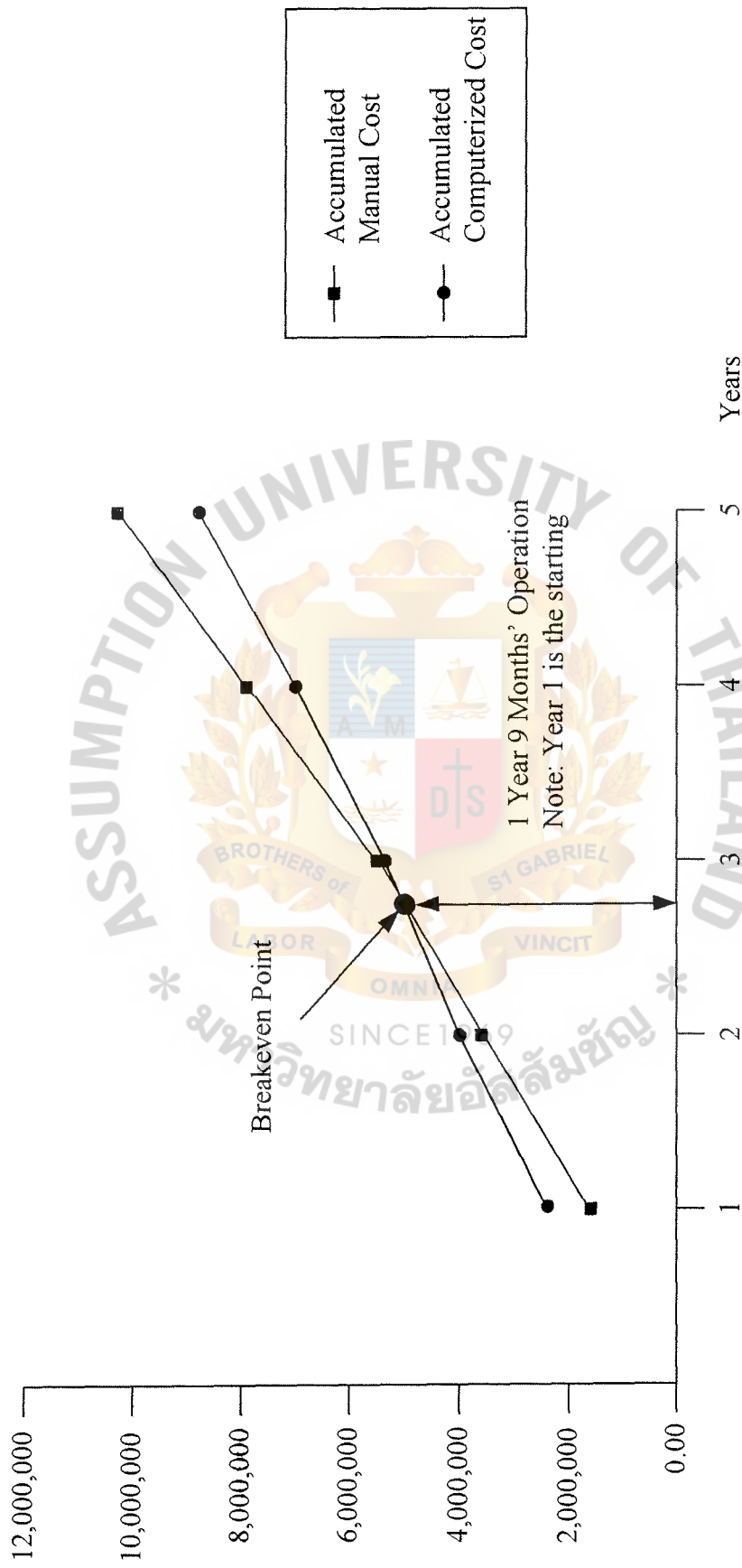
Figure G.1. Cost Comparison between the Manual and Computerized Systems for Candidate Solution 1.

Table G.6. Payback Analysis for the Proposed System of Candidate 1, Baht.

Cost Items	Years					
	0	1	2	3	4	5
Development Cost	-1,010,000.00					
Operation & maintenance Cost	0.00	-140,000.00	-140,000.00	-160,000.00	-160,000.00	-160,000.00
Discount factor for 9 %	1.000	0.917	0.842	0.772	0.708	0.650
Time-adjusted costs (adjusted to present value)	-1,010,000.00	-128,380.00	-117,880.00	-123,520.00	-113,280.00	-104,000.00
Cumulative time-adjusted costs over lifetime	-1,010,000.00	-1,138,380.00	-1,256,260.00	-1,379,780.00	-1,493,060.00	-1,597,060.00
Benefits derived from operation of new system	0.00	400,000.00	480,000.00	560,000.00	640,000.00	720,000.00
Discount factor for 9 %	1.000	0.917	0.842	0.772	0.708	0.650
Time-adjusted costs (adjusted to present value)	0.00	366,800.00	404,160.00	432,320.00	453,120.00	468,000.00
Cumulative time-adjusted benefits over lifetime	0.00	366,800.00	770,960.00	1,203,280.00	1,656,400.00	2,124,400.00
Cumulative lifetime time-adjusted cost + benefit	-1,010,000.00	-771,580.00	-485,300.00	-176,500.00	163,340.00	527,340.00

Figure G.2.   Payback Analysis for Candidate Solution 1.

Table G.7. Computerized System Cost Analysis of Candidate 2, Baht.

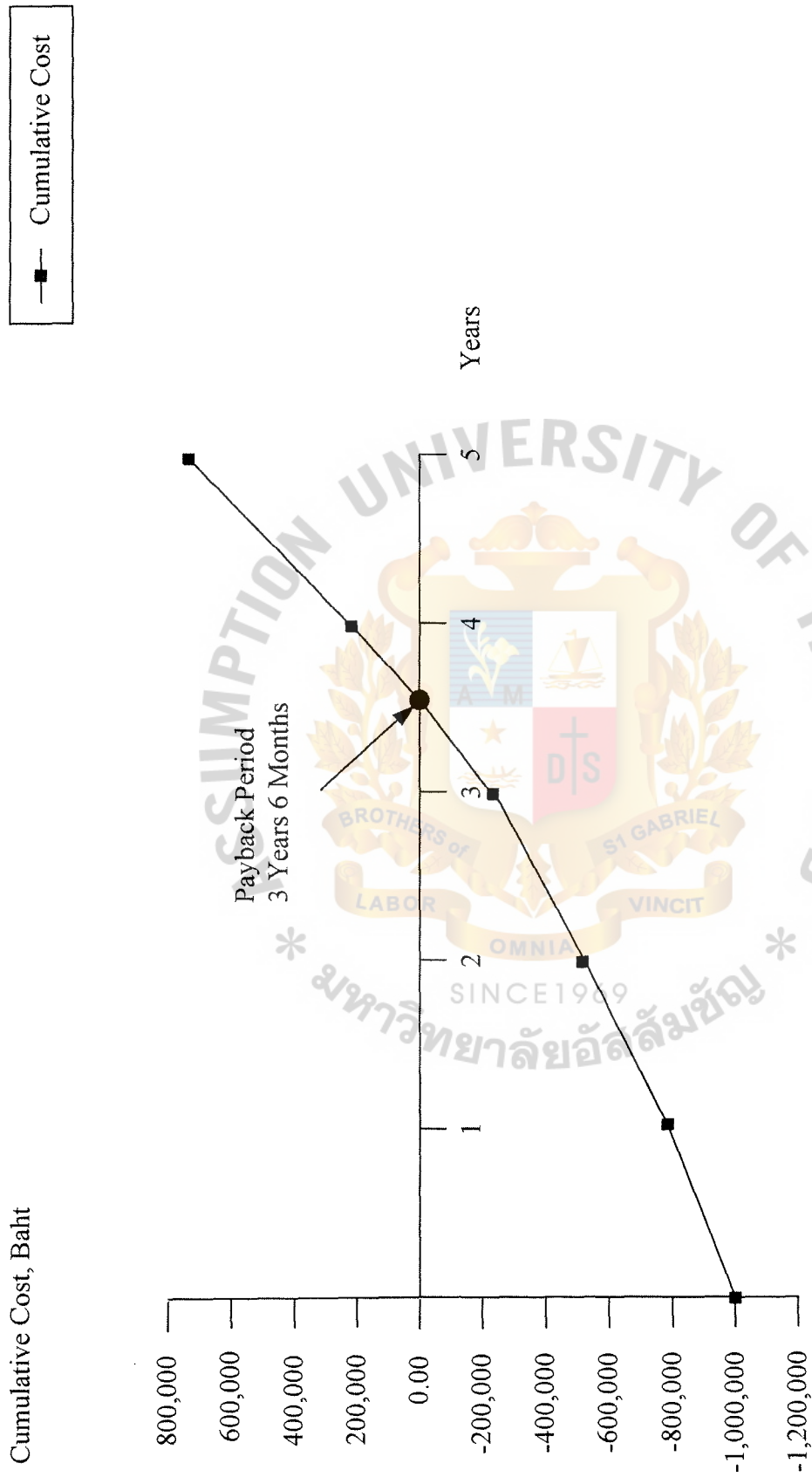| Cost Items	Years				
	1	2	3	4	5
Fixed cost					
Hardware Cost :					
Workstation Cost	60,000.00	60,000.00	60,000.00	60,000.00	60,000.00
Computer Server Cost	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00
Total Hardware Cost	80,000.00	80,000.00	80,000.00	80,000.00	80,000.00
Maintenance Cost	-	-	-	20,000.00	20,000.00
Software Cost :					
Compiler Cost	160,000.00	20,000.00	20,000.00	20,000.00	20,000.00
Application Cost	140,000.00	20,000.00	20,000.00	20,000.00	20,000.00
DBMS Cost	220,000.00	20,000.00	20,000.00	20,000.00	20,000.00
Total Software Cost	520,000.00	60,000.00	60,000.00	60,000.00	60,000.00
Implementation Cost :					
Advance Training Cost	130,000.00	-	-	-	-
Basic Training Cost	150,000.00	-	-	-	-
Set up Cost	150,000.00	-	-	-	-
Total Implementation Cost	430,000.00	-	-	-	-
Office Equipment Cost :					
Printer 3 Units @ 20,000	60,000.00	-	-	-	-
Total Fixed Cost	1,090,000.00	140,000.00	140,000.00	160,000.00	160,000.00
Operating Cost					
Operator 5 persons @ 9,500	47,500.00	52,250.00	57,475.00	63,222.50	69,544.75
Manager 1 persons @ 25,000	25,000.00	27,500.00	30,250.00	33,275.00	36,602.50
System Administrator 1 person 15,000	15,000.00	16,500.00	18,150.00	19,965.00	21,961.50
Total Monthly Cost	87,500.00	96,250.00	105,875.00	116,462.50	128,108.75
Total Annual Salary Cost	1,050,000.00	1,155,000.00	1,270,500.00	1,397,550.00	1,537,305.00
Office Supplies Cost: increase 5 %					
Stationery 1,600 per month	1,500.00	1,575.00	1,653.75	1,736.44	1,823.26
Paper 2,000 per month	2,150.00	2,257.50	2,370.38	2,488.89	2,613.34
Utility 5,500 per month	5,500.00	5,775.00	6,063.75	6,366.94	6,685.28
Miscellaneous 5,500 per month	5,500.00	5,775.00	6,063.75	6,366.94	6,685.28
Total Annual Office Supplies & Miscellaneous Cost	14,650.00	15,382.50	16,151.63	16,959.21	17,807.17
Total Annual Office Operating Cost	175,800.00	184,590.00	193,819.50	203,510.48	213,686.00
Total Operating Cost	1,225,800.00	1,339,590.00	1,464,319.50	1,601,060.48	1,750,991.00
Total Computerized System Cost	2,315,800.00	1,479,590.00	1,604,319.50	1,761,060.48	1,910,991.00

Table G.8.   Five Accumulated Computerized Cost of Candidate 2, Baht.

Year	Total Computerized Cost	Accumulated Cost
1	2,315,800.00	2,315,800.00
2	1,479,590.00	3,795,390.00
3	1,604,319.50	5,399,709.50
4	1,761,060.48	7,160,769.98
5	1,910,991.00	9,071,760.97
Total	9,071,760.97	

Table G.9.   Comparison of the System Cost of Candidate 2, Baht.

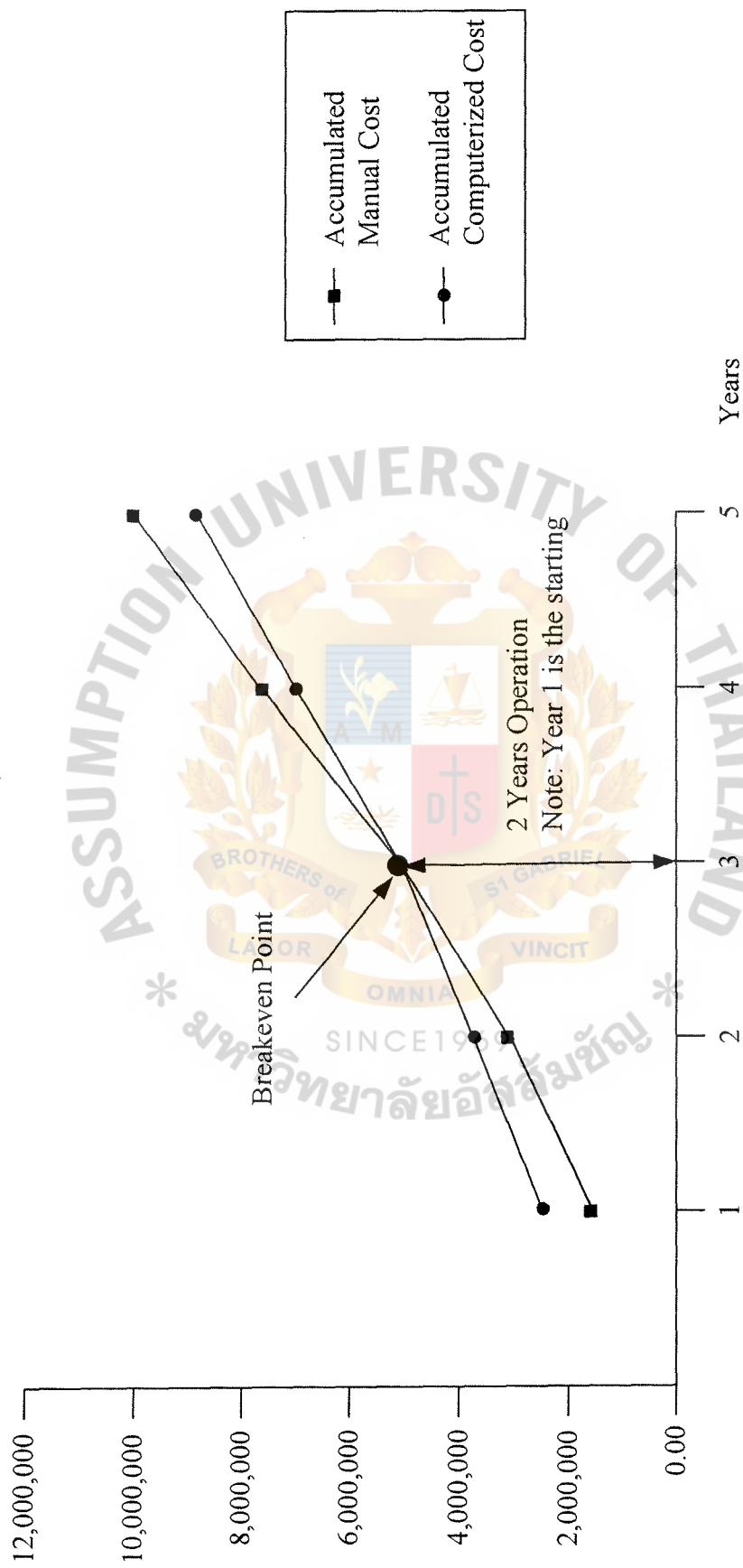| Year	Accumulated Manual Cost	Accumulated Computerized Cost
1	1,642,360.00	2,315,800.00
2	3,435,316.00	3,795,390.00
3	5,407,567.60	5,399,709.50
4	7,577,044.36	7,160,769.98
5	9,963,468.80	9,071,760.97

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Figure G.3.   Cost Comparison between the Manual and Computerized Systems for Candidate Solution 2.

Table G.10.   Payback Analysis for the Proposed System of Candidate 2, Baht.

Cost Items	Years					
	0	1	2	3	4	5
Development Cost	-1,090,000.00					
Operation & maintenance Cost	0.00	-140,000.00	-140,000.00	-160,000.00	-160,000.00	-160,000.00
Discount factor for 9 %	1.000	0.917	0.842	0.772	0.708	0.650
Time-adjusted costs (adjust to present value)	-1,090,000.00	-128,380.00	-117,880.00	-123,520.00	-113,280.00	-104,000.00
Cumulative time-adjusted costs over lifetime	-1,090,000.00	-1,218,380.00	-1,336,260.00	-1,459,780.00	-1,573,060.00	-1,677,060.00
Benefits derived from operation of new system	0.00	400,000.00	480,000.00	560,000.00	640,000.00	720,000.00
Discount factor for 9 %	1.000	0.917	0.842	0.772	0.708	0.650
Time-adjusted costs (adjust to present value)	0.00	366,800.00	404,160.00	432,320.00	453,120.00	468,000.00
Cumulative time-adjusted benefits over lifetime	0.00	366,800.00	770,960.00	1,203,280.00	1,656,400.00	2,124,400.00
Cumulative lifetime time-adjusted cost + benefit	-1,090,000.00	-851,580.00	-565,300.00	-256,500.00	83,340.00	447,340.00

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Cumulative Cost, Baht

Cumulative Cost

Years
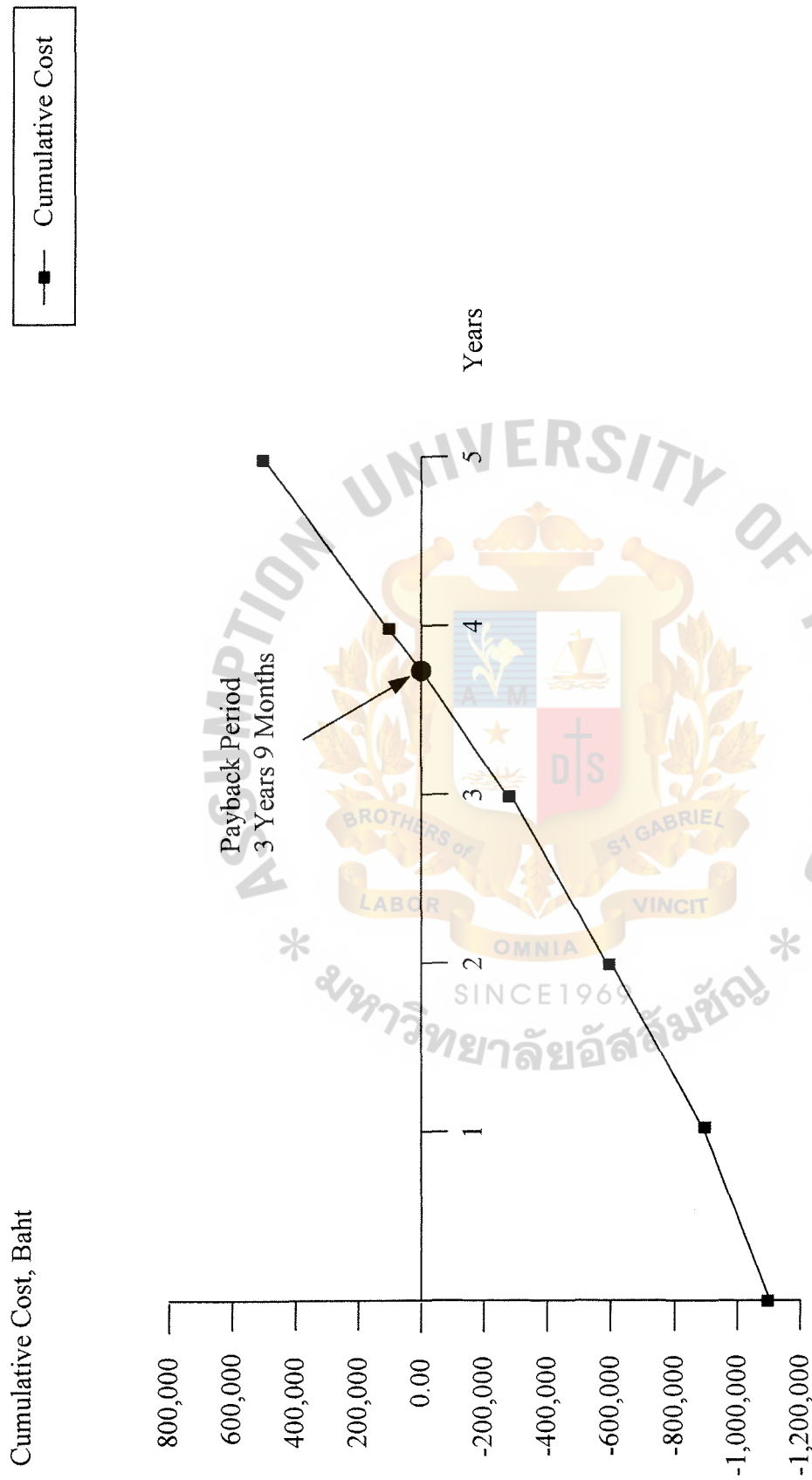
Payback Period
3 Years 9 Months

Figure G.4.   Payback Analysis for Candidate Solution 2.

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Table G.11.   Computerized System Cost Analysis of Candidate 3, Baht.

Cost Items	Years				
	1	2	3	4	5
Fixed cost					
Hardware Cost :					
Workstation Cost	60,000.00	60,000.00	60,000.00	60,000.00	60,000.00
Computer Server Cost	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00
Total Hardware Cost	80,000.00	80,000.00	80,000.00	80,000.00	80,000.00
Maintenance Cost	-	-	-	20,000.00	20,000.00
Software Cost :					
Compiler Cost	180,000.00	20,000.00	20,000.00	20,000.00	20,000.00
Application Cost	140,000.00	20,000.00	20,000.00	20,000.00	20,000.00
DBMS Cost	140,000.00	20,000.00	20,000.00	20,000.00	20,000.00
Total Software Cost	460,000.00	60,000.00	60,000.00	60,000.00	60,000.00
Implementation Cost :					
Advance Training Cost	130,000.00	-	-	-	-
Basic Training Cost	150,000.00	-	-	-	-
Set up Cost	150,000.00	-	-	-	-
Total Implementation Cost	430,000.00	-	-	-	-
Office Equipment Cost :					
Printer 3 Units @ 20,000	60,000.00	-	-	-	-
Total Fixed Cost	1,030,000.00	140,000.00	140,000.00	160,000.00	160,000.00
Operating Cost					
Operator 5 persons @ 9,500	47,500.00	52,250.00	57,475.00	63,222.50	69,544.75
Manager 1 persons @ 25,000	25,000.00	27,500.00	30,250.00	33,275.00	36,602.50
System Administrator 1 person 15,000	15,000.00	16,500.00	18,150.00	19,965.00	21,961.50
Total Monthly Cost	87,500.00	96,250.00	105,875.00	116,462.50	128,108.75
Total Annual Salary Cost	1,050,000.00	1,155,000.00	1,270,500.00	1,397,550.00	1,537,305.00
Office Supplies Cost: increase 5 %					
Stationery 1,600 per month	1,500.00	1,575.00	1,653.75	1,736.44	1,823.26
Paper 2,000 per month	2,200.00	2,310.00	2,425.50	2,546.78	2,674.11
Utility 5,500 per month	5,500.00	5,775.00	6,063.75	6,366.94	6,685.28
Miscellaneous 5,500 per month	5,500.00	5,775.00	6,063.75	6,366.94	6,685.28
Total Annual Office Supplies					
& Miscellaneous Cost	14,700.00	15,435.00	16,206.75	17,017.09	17,867.94
Total Annual Office Operating Cost	176,400.00	185,220.00	194,481.00	204,205.05	214,415.30
Total Operating Cost	1,226,400.00	1,340,220.00	1,464,981.00	1,601,755.05	1,751,720.30
Total Computerized System Cost	2,256,400.00	1,480,220.00	1,604,981.00	1,761,755.05	1,911,720.30

Table G.12. Five Accumulated Computerized Cost of Candidate 3, Baht.

Year	Total Computerized Cost	Accumulated Cost
1	2,256,400.00	2,256,400.00
2	1,480,220.00	3,736,620.00
3	1,604,981.00	5,341,601.00
4	1,761,755.05	7,103,356.05
5	1,911,720.30	9,015,076.35
Total	9,015,076.35	

Table G.13. Comparison of the System Costs of Candidate 3, Baht.

Year	Accumulated Manual Cost	Accumulated Computerized Cost
1	1,642,360.00	2,256,400.00
2	3,435,316.00	3,736,620.00
3	5,407,567.60	5,341,601.00
4	7,577,044.36	7,103,356.05
5	9,963,468.80	9,015,076.35

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Accumulated Cost, Baht

12,000,000

10,000,000

8,000,000

6,000,000

4,000,000

2,000,000

0.00

Breakeven Point

1 Year 10 Months' Operation
Note: Year 1 is the starting

1   2   3   4   5

Years

Accumulated
Manual Cost

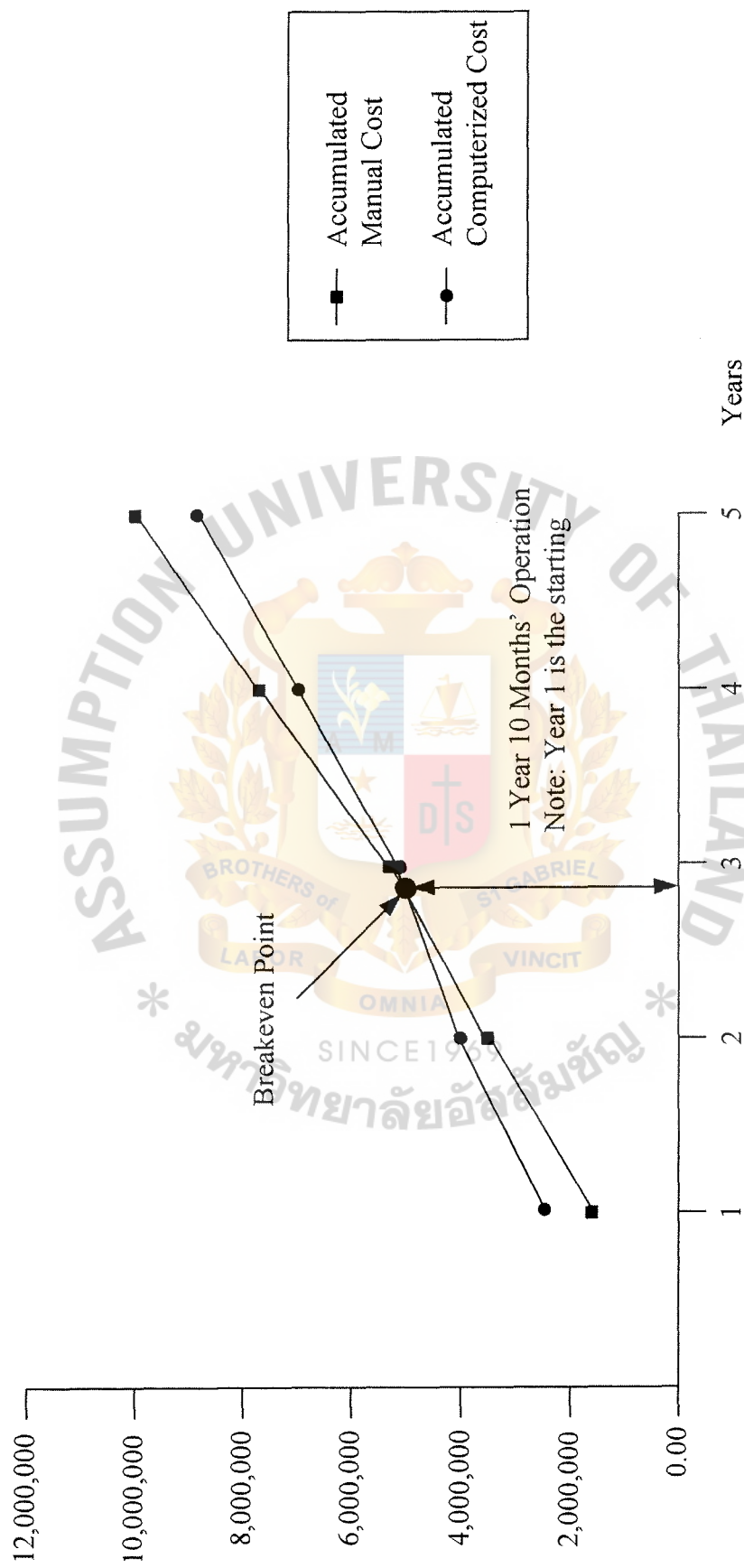Accumulated
Computerized Cost

Figure G.3.   Cost Comparison between the Manual and Computerized Systems for Candidate Solution 3.

Table G.14. Payback Analysis for the Proposed System of Candidate 3, Baht.

Cost Items	Years					
	0	1	2	3	4	5
Development Cost	-1,030,000.00					
Operation & maintenance Cost	0.00	-140,000.00	-140,000.00	-160,000.00	-160,000.00	-160,000.00
Discount factor for 9 %	1.000	0.917	0.842	0.772	0.708	0.650
Time-adjusted costs (adjust to present value)	-1,030,000.00	-128,380.00	-117,880.00	-123,520.00	-113,280.00	-104,000.00
Cumulative time-adjusted costs over lifetime	-1,030,000.00	-1,158,380.00	-1,276,260.00	-1,399,780.00	-1,513,060.00	-1,617,060.00
Benefits derived from operation of new system	0.00	400,000.00	480,000.00	560,000.00	640,000.00	720,000.00
Discount factor for 9 %	1.000	0.917	0.842	0.772	0.708	0.650
Time-adjusted costs (adjust to present value)	0.00	366,800.00	404,160.00	432,320.00	453,120.00	468,000.00
Cumulative time-adjusted benefits over lifetime	0.00	366,800.00	770,960.00	1,203,280.00	1,656,400.00	2,124,400.00
Cumulative lifetime time-adjusted cost + benefit	-1,030,000.00	-791,580.00	-505,300.00	-196,500.00	143,340.00	507,340.00

Cumulative Cost, Baht

Cumulative Cost

Years

Payback Period
3 Years 7 Months

800,000
600,000
400,000
200,000
0.00
-200,000
-400,000
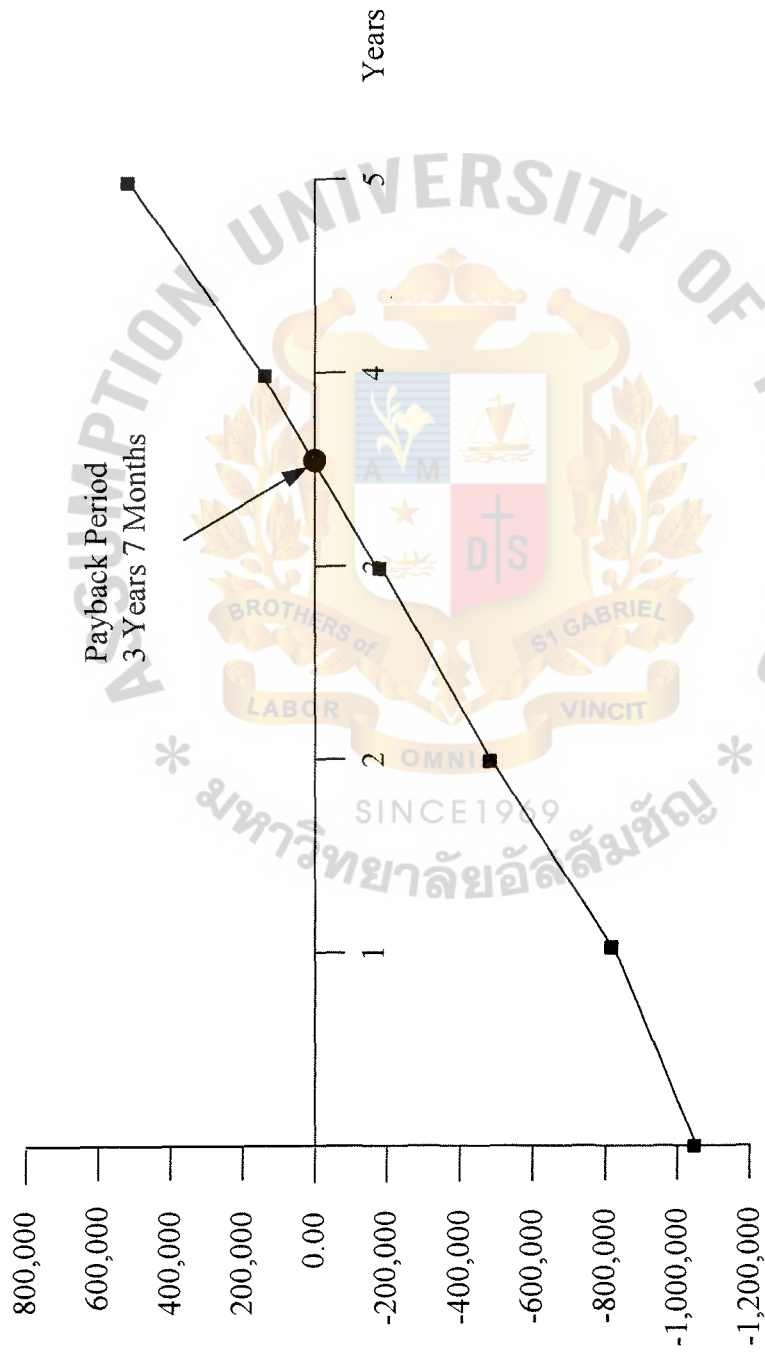-600,000
-800,000
-1,000,000
-1,200,000

1
2
3
4
5

Figure G.6.   Payback Analysis for Candidate Solution 3.

BIBLIOGRAPHY

1. Annual Report of South East Insurance Co., Ltd, 2000.

2. Date, C. J. An Introduction to Database System, 6 Edition. Philippins: Addison Wesley Publishing Company, 1995.

3. Eliason, Alan A. System Development Analysis, Design and Implementation. Harper Collins Publisher 2nd Edition, 1990.

4. FitzGerald, J. and Ardre F. FitzGerald. Fundamentals of System Analysis. NY: John Wiley & Sons, 1987.

5. Greer, Tyson. Understanding Intranets. Redmond, WA: Microsoft Press, 1998.

6. Kendall, Kenneth E. and Kendall Julie E. Systems Analysis and Design. Prentice-Hall International Inc., 1992.

7. Korth, F. Henry and Abraham Slberschatz. Database System Concepts. NY: McGraw-Hill International, 1991.

8. Kosiur, David. Understanding Electronic Commerce. WA: Microsoft Press, 1997.

9. Long Larry. Management Information Systems. Prentice-Hall International, Inc.,1989.

10. Loomis, Mary. The Database Book Maxwell Macmillan Publishing Company, 1990.

11. Page-Jones, Meilir. The Practical Guide to Structured System Design. NJ: Prentice-Hall International Company, 1988.

12. Senn, James A. Analysis & Design of Information Systems, 2nd Edition. NY: McGraw-Hill Publishing Company, 1989.

13. Trepper, Charles. Ecommerce Strategices. USA:Microsoft Press, 2000.

14. Whitten, Jeffery L., D. Bentley and Kevin C. Dittman. Systems Analysis and System Design Methods, Fifth Edition. MacGrawgill, 2001.

15. Yourdon, Edward. Modern Structured Analysis. Prentice-Hall International Inc., 1989.