



Claim Payment System for Non-Life Insurance

By

Mr. Sutee Tantivanichanon

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

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

November 1999

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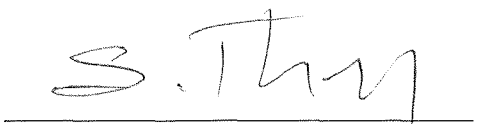
The Graduate School of Assumption University has approved this report of the three-credit course, CS 6998 System Development Project, submitted in partial fulfilment of the requirements for the degree of Master of Science in Computer Information System.

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ABSTRACT

This study covers the analysis, design and partial implementation of a computer information in a non-life insurance industry. This project emphasises on system analysis and design deliverables of Claim Payment System for Thai Zurich Insurance Company Limited. The analysis and design phases cover the problem definitions, study plan, information gathering and understanding of the existing system and the new system requirement. It also includes the design of a new system and economic cost comparison.

The scope of this study is limited only to Claim Payment for motor vehicles. The system is analysed by using structured analysis technique; for instance, the context and data flow diagram. The designing of the proposed system covers software, database, input and output. This is to solve and also minimise problems. The system has been implemented with Microsoft-Access, which is a user-friendly application. All users concerned can easily produce transaction, update, print report and generate output via screen and hard copy.

The writer believes that the improvement process in this study will not only make users work more easily but also be a step to set-up the standard for the information system in non-life insurance industry.

ACKNOWLEDGEMENTS

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I. INTRODUCTION

1.1 Background of the Project

Nowadays, Computerised Information System has been widely used among various Non-life insurance companies. Each company sets its own computerised system to serve its own specific needs mainly to reduce time and cost of personnel assigned to time consuming tasks, monitoring and reporting. The non-life insurance is concerned with various areas as follows:

1. Motor vehicle provides compensation for accidents or damage to an insurer's vehicle, including theft and legal liability to others as a result of bodily injury or damage to their property.
2. Fire material damage against actual physical loss or damage to fixed property.
3. Marine cargo against loss or damage to goods-in -transit whether by a client's own transport or whist entrusted to an independent carrier.
4. Loss of profits provides compensation for loss of gross profit in the event of interruption to business caused by damage to property insured.

This project is initiated as a result of the rapid growth in the insurance business. The project presents in-depth analysis, design and implement of non-life Insurance Information System, particularly, with specific focus on Claim Payment System of Thai Zurich Insurance Company Limited.

1.2 Objectives of the Project

The objectives of this System Development Project are as follows;

- To define and analyse the existing system.
- To improve the existing system to be a realisable information system
- To provide the solution towards the claim payment system

- To design a computer-based information system for claim and finance department.
- To design a new system for claim payment system (using Microsoft-Access) which is more effective and efficient.

The purposes of this project are for;

- the management to get information more easily and accurately.
- the bottleneck in producing the claim payment reports to be eliminated.
- all manual paper work to be reduced.
- duplication of works to be eliminated.

1.3 Scope of the Project

The project will cover major parts of the non-life Claim Payment System that can be categorised into:

- Policy number data entry
- Claim number data entry
- Claim requisition data entry
- Update garage data file
- Update Claim requisition file
- Prepare and print claim confirm report
- Claim payment data entry
- Update check payment control file
- Update claim registration file
- Prepare and print check payment report

1.4 Deliverable of this Project

The deliverance for the project on Claim Payment System” is as follows;

- A software package (using Microsoft Access) for Claim Payment System

- Screen/Report layout of all data input/output and program.
- The following document as a minimum hard copy and on-screen reports required.
 - ◇ Screen of Policy Holder
 - ◇ Screen of Garage
 - ◇ Screen of Accident Notes
 - ◇ Screen of Repairing Report
 - ◇ Screen of Claim Requisition
 - ◇ Screen of Claim Confirmation
 - ◇ Inquiry Screen of Accident Notes
 - ◇ Inquiry Screen of Repairing Report
 - ◇ Inquiry Screen of Claim Requisition
 - ◇ Inquiry Screen of Claim Confirmation
 - ◇ Screen of Payment Order
 - ◇ Screen of Print Cheque
 - ◇ Claim Register Report
 - ◇ Cheque Payment Report
 - ◇ On-line Payment via Citibank Report
 - ◇ Cash Payment Report

II. THE EXISTING SYSTEM

2.1 Background of the Organisation

The company is a non-life insurance business. The company has just changed its corporate name to “Thai Zurich Insurance Company Limited” since April 1997 because of joint venture agreement with the Zurich Group from Switzerland.

Generally, the company has four business lines as follows;

1. Motor-car insurance
2. Fire insurance
3. Marine insurance
4. Miscellaneous insurance

According to the starting point of the joint venture with the Zurich group, the Company is on the process to re-structure all business processing and functions. The main activities that the company is required to improve are Revenue, Collection, Purchase and Payment Activities.

These four activities are relevant to many departments in the organisation, especially, the Information Technology department (IT) and the Finance department.

This is quite a big project that the company wants to complete within a few years.

2.1.1 Company's Profile:

The company is founded under the name “Thai Metropole Insurance and warehouse company Limited” on January 21,1953, with registration number 3784 and initial registered capital of 10 million baht. The company was located on 126/2 Krungthonburi Road, Bang Lamphu Lang, Klongsan, Bangkok.

In 1998, the company registered a share of 60 million baht with the insurance premium (Revenue) of 1.7 billion baht which the company boasts a total of 66 branches and representative offices and 860 employees.

2.1.2 Company's Organization Chart

The company's organization chart is presented (as of 31 December 1998) see in figure 2.1.

2.2 Existing Business Functions

The nature of business function is to provide the non-life insurance services to the policyholders. There are four-business lines that are mentioned above in Thai Zurich Insurance Company.

There are also four business activities that relate to the existing functions;

- 1) Revenue and Uncollected premium activity: these start upon the clients purchase of the Insurance policy from the agents/ brokers or from the company. The credit-term is granted to those agents and brokers for 60-90 days.
- 2) Collection activity: It is incurred when the credit granting is due and then those agents/ brokers submit cash.
- 3) Claim Payable activity: It occurs when the garages send debit-notes or invoices charge to the company. Mostly credit granting by vendors are about 90 days.
- 4) Claim payment activity: this activity is concerned with what the project is now studying and improving. This is performed when the due-date of payment is reached.

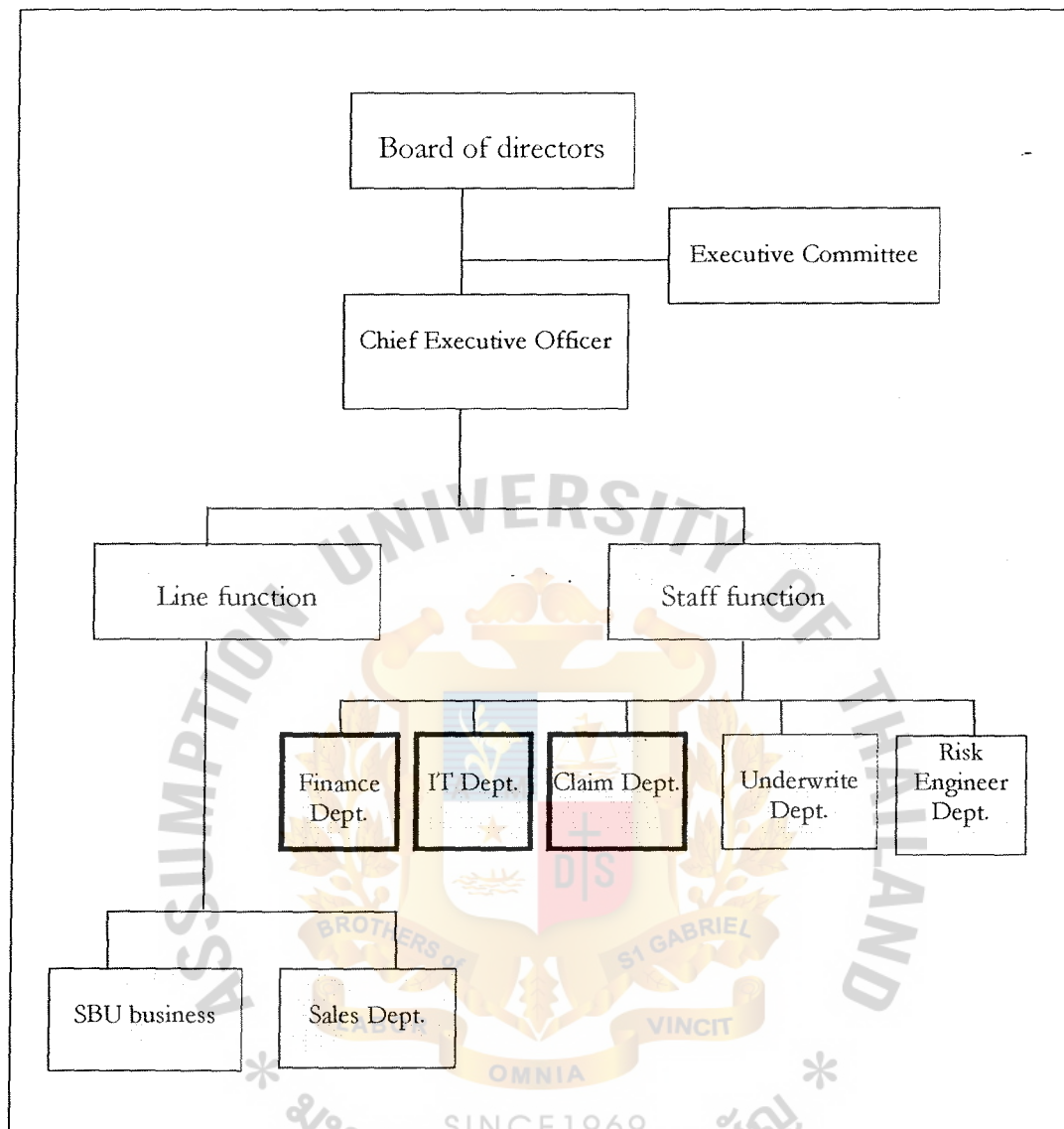


Figure 2.1. Organisation Chart.

However, in this report, we have to narrow the scope and emphasize on the Claim Payment activities. For the Claim Payment system, there are three departments that are involved in the business function, which have been described below:

1. Claim Department

Claim functions are responsible for providing the following activities:

A) Take accidental note activity

- Receive a call of car accident
- Issue claim number
- Contact to a surveyor

B) Prepare claim requisition activity

- Receive garages repairing report
- Receive invoices from garages
- Review invoices and claim number
- Issues claim confirmation
- Records in a claim file

2. Finance Department

Finance functions take responsibility for providing the activities as follows:

A) Claim payment activity

- Manually verify Claim confirmation and Claim invoice
- Prepare manual payment by sorting type of payment
- Issue manual cheques
- Prepare manual issuing cheque report
- Prepare manual payment report
- Prepare manual claim confirmation report

3. Information Technology Department

IT Department functions take responsibility for providing the following activities:

- A) Facilitate the General Insurance System (GIS.) to claim Department and others.

B) Try to improve the IT system to serve the users' requirement.

2.3 Current Problems and Areas for Improvement

From the main activity that is mentioned above, the priority system, which needs to be improved, is the claim payment system. The management wants to exactly know the entire flow and control over the cheque payment, especially, in motor claim expenses.

The existing over claim payment system is a semi manual-computerised system as follows: -

1. On-Accident Claim Process (see Figure 2.2)
2. Motor Claim Process (see Figure 2.5)
3. Motor Claim Settlement Process (see Figure 2.7)
4. Data Model - ER-Diagram (see figure 2.9)
5. Process Model (level 0) - Context Diagram (see Figure 2.10)

2.3.1 Analysis of the Existing Claim Payment System

There are three processes of the existing claim payment system;

Process1: Accidental note process (Manual work)

- Receive a call of car accident
- Issue claim number
- Contact a surveyor
- A surveyor issues an accident note

Process 2: Claim requisition process (Computerised work- in General Insurance System)

- Client has a car prepared
- A garage submits an invoice
- Review invoice and claim number

- Issues claim confirmation
- Records in a claim file

Process 3: Claim payment process (Manual work)

- Manually verify confirmation and invoice
- Prepare manual payment by sorting type of payment
- Issue manual cheques
- Prepare manual issuing cheque report
- Prepare manual payment report
- Prepare manual claim confirmation report

In this current situation, there are many problems over the claim payment system because there are too many transactions on claim payment expenses. There is also unrealisable information that is gathered from the system-output.

Problems incurred are listed as follows:

- 1) There are huge transactions of cheques issuing, but we could not ensure that there is no cheque missing.
- 2) More time consumed issuing those cheques. There are about 400-500 cheques issued per week; it is expected to be about 35-45 hours time spent on printing and signing those cheques.
- 3) There are often misspellings on cheques that are issued
- 4) There are many cheques that had been manually prepared (using Microsoft-Excel) and then recorded back to the General Ledger system.
- 5) There are always manual preparations of cheques resulting in wrong figures reported than actual cheque issuance.

- 6) More staff are employed to reconcile in 4. There are about eight people assigned to do this task.
- 7) There are many cases of double cheques issuance on the same date, amount and vendor.
- 8) The Claim confirmation report (Microsoft-Excel) is always a mistake and sometimes the cheques issuance does not match with this report.

2.4 The Existing Computer System

The computerized system that is concerned with the claim payment system can be categorized as follows: -

2.4.1 The Existing Computer Hardware

- a) One set of Server which the following specifications:
 - CPU Pentium 166 MHz
 - 64 MB memory
 - 1.44 MB Floppy disk-drive, 100 MB Zip-drive
 - 32 X CD-ROM drive
 - 3.0 GB Internal Hard disk
 - 14" Color monitor
 - 104 Key board and mouse
- b) Twenty sets of personal computers which comprise of the specifications below;
 - CPU Pentium 80486-66 MHz
 - 4 MB memories
 - 540 MB Hard disk IDE interface
 - 1.44 MB Floppy disk
 - 14" Color monitor, 1024*768 pixels

- 101 Key board and mouse
- c) Twenty sets of NEC P3200-Dot Printers (Auto Gross) and five HP color-inkjet printers

2.4.2 The Existing Computer Software

- Window NT server V4.0
- LAN workplace for DOS (30 license users)
- MS.DOS version 6.2 Thai Edition
- MS. Windows 95 Thai Edition
- Norton Anti-virus and utility foe windows 95
- General Insurance System Application (GIS.)
- MS - Word, Excel, Power point, Project and Access.
- Lotus Notes

2.5 The Existing Resources

Besides the existing computer system, there are also other resources that can be utilized in order to achieve the goal for setting up the claim payment system.

Based on the Survey phase, it is found that Human Resource (Certain groups) in the related departments; Claim, Finance and Information Technology Department have their sufficient capacity to perform the new claim payment system.

There are two or three key persons at manager level for each department. These personnel can understand and analyze their own work flows regarding the claim and claim payment system.

Then, it will benefit the company, if we try to utilize them in case of in-house modification. On the other hand, the company will have been provided with the IT technical assistant from the Zurich group in case of trouble.

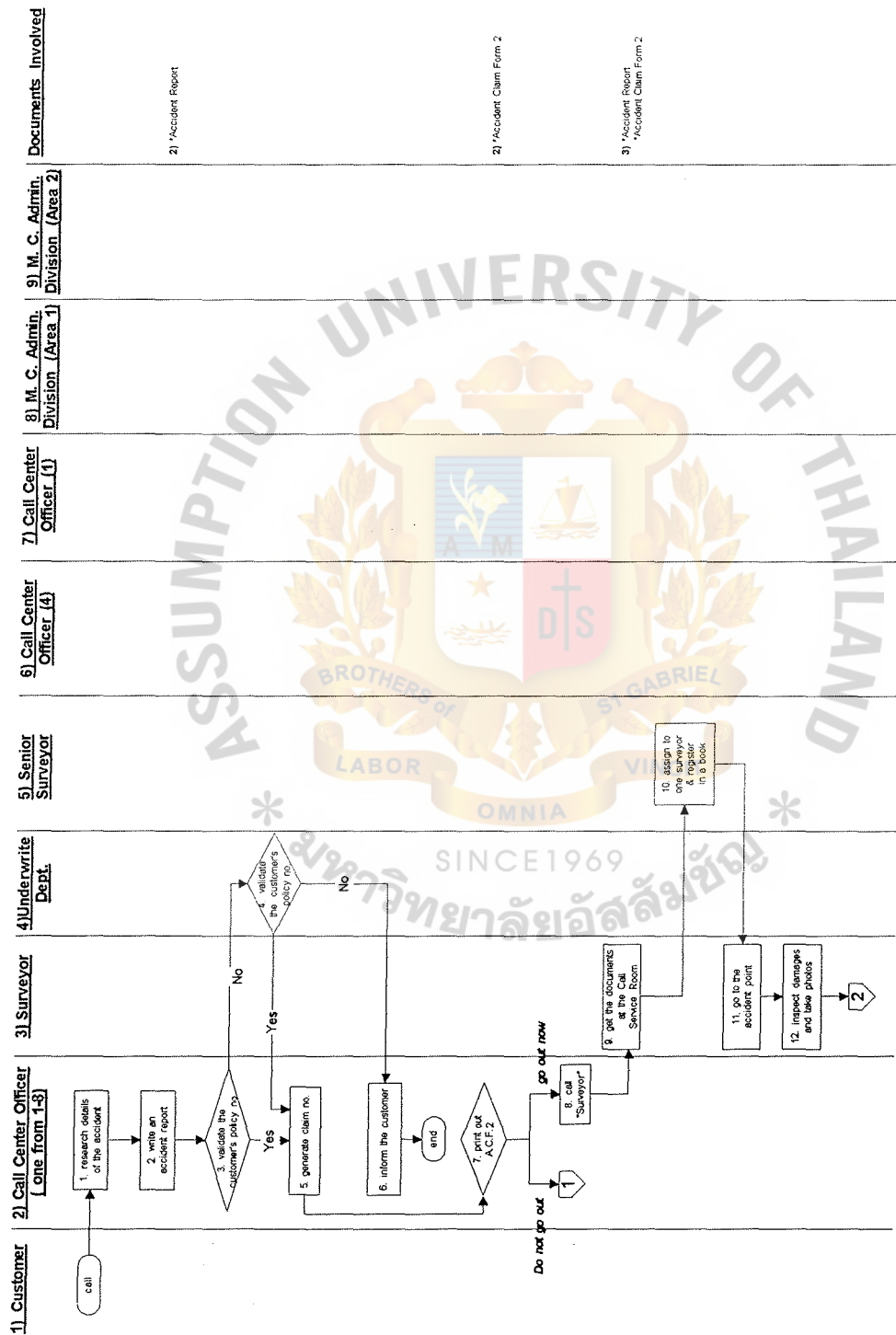


Figure 2.2. Existing Flow: On-Accident Claim Process.

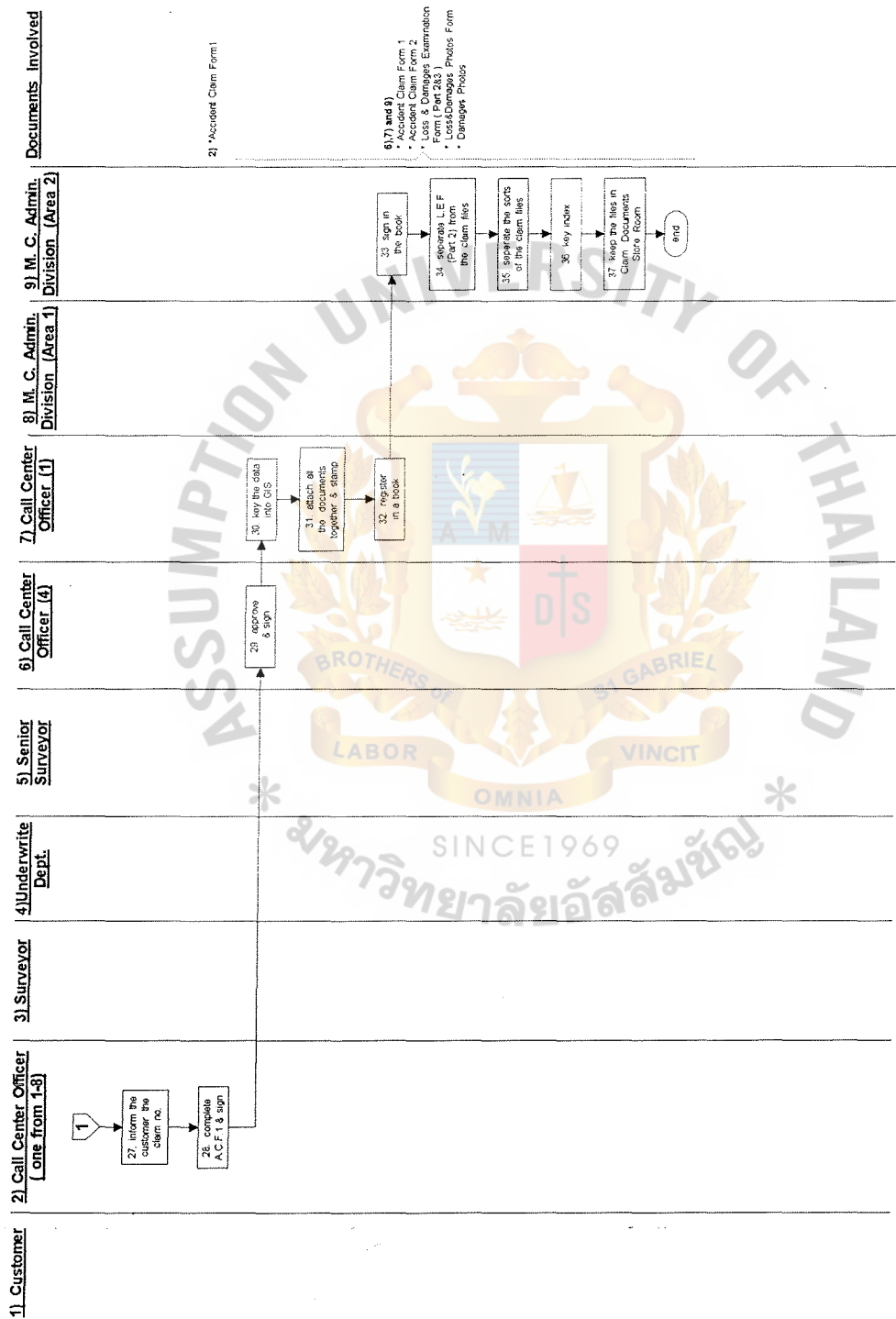


Figure 2.4. Existing Flow: On-Accident Claim Process (Continue).

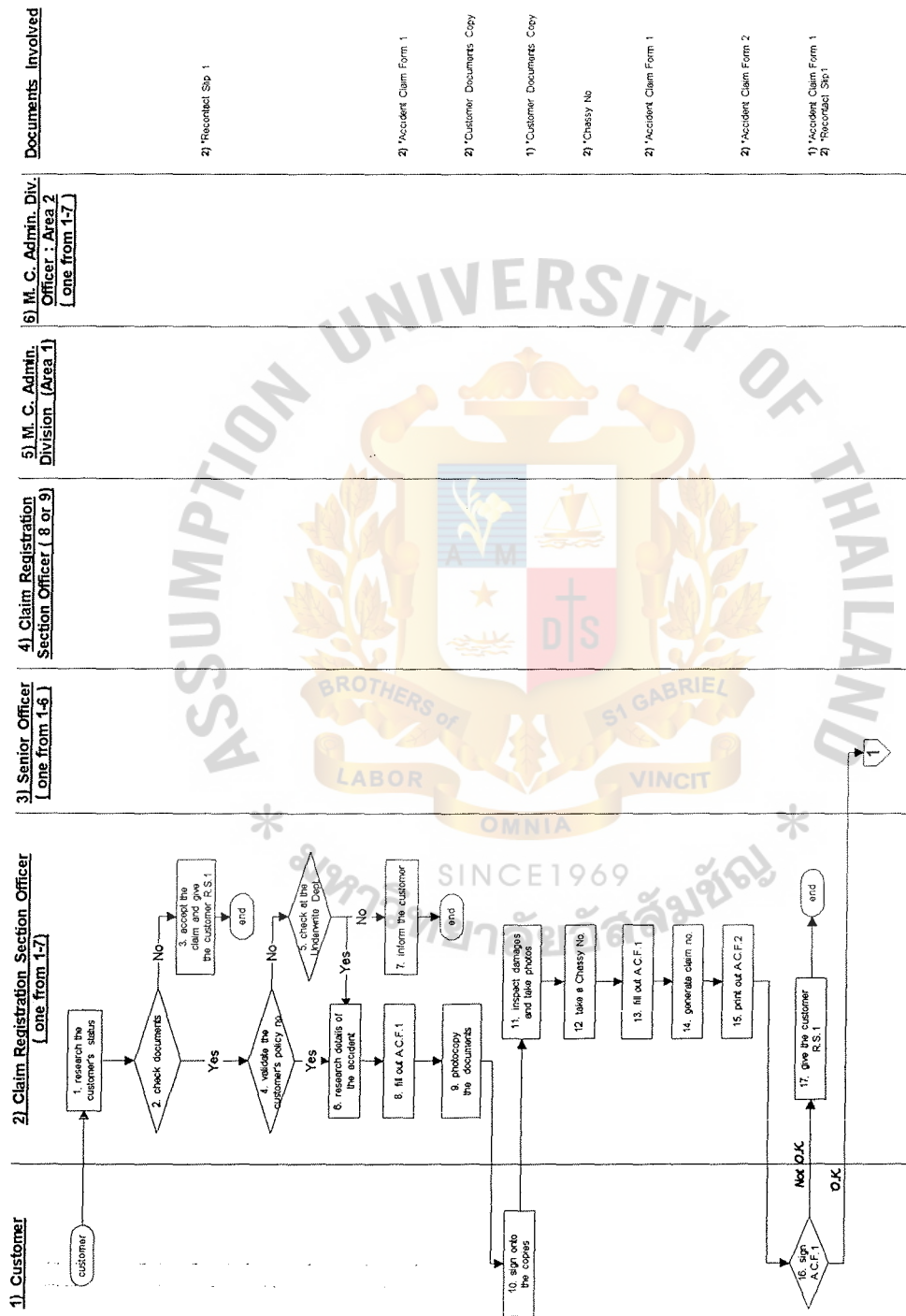


Figure 2.5. Existing Flow: Motor Claim Process.

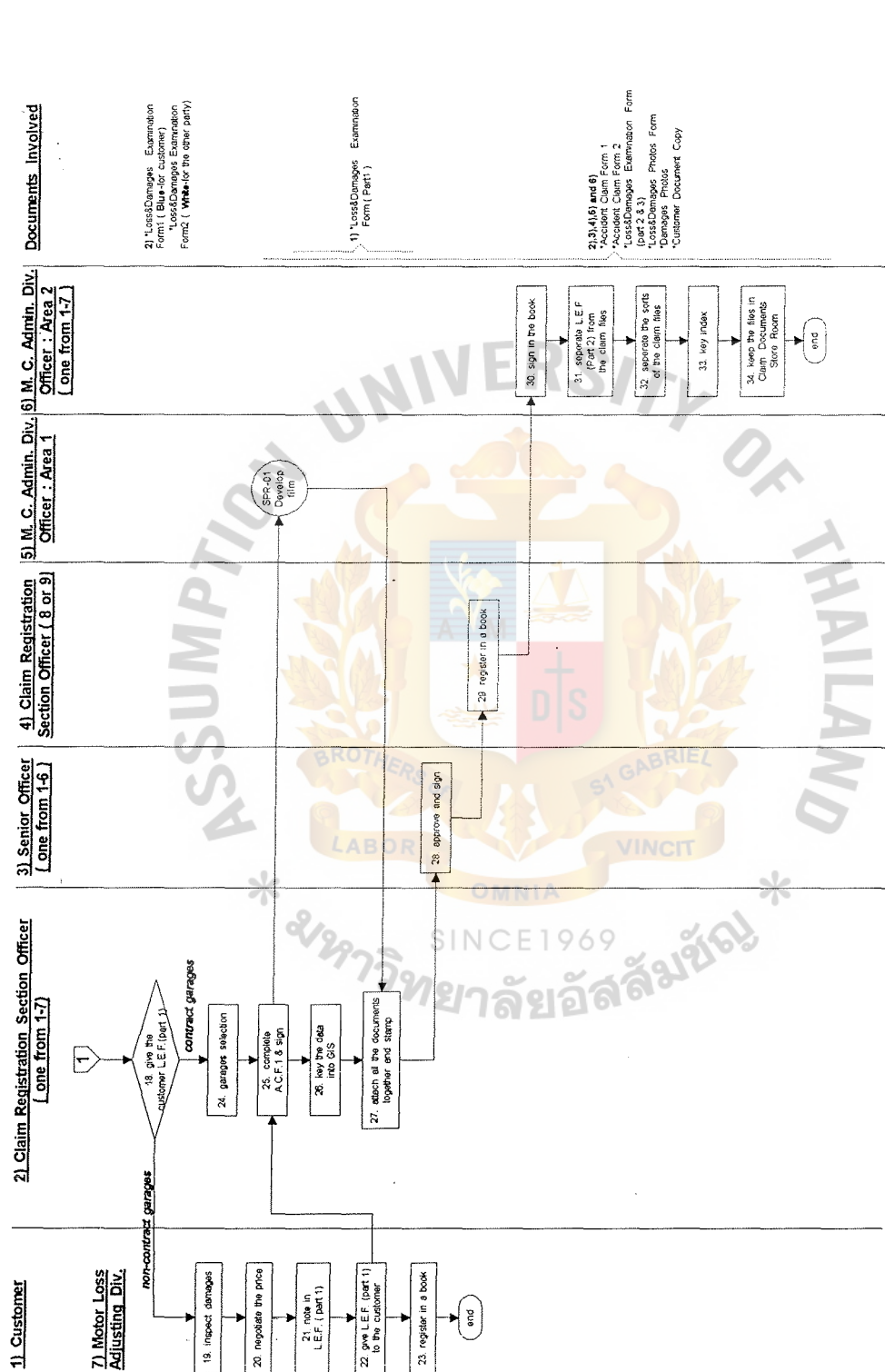


Figure 2.6. Existing Flow: Motor Claim Process (Continue).

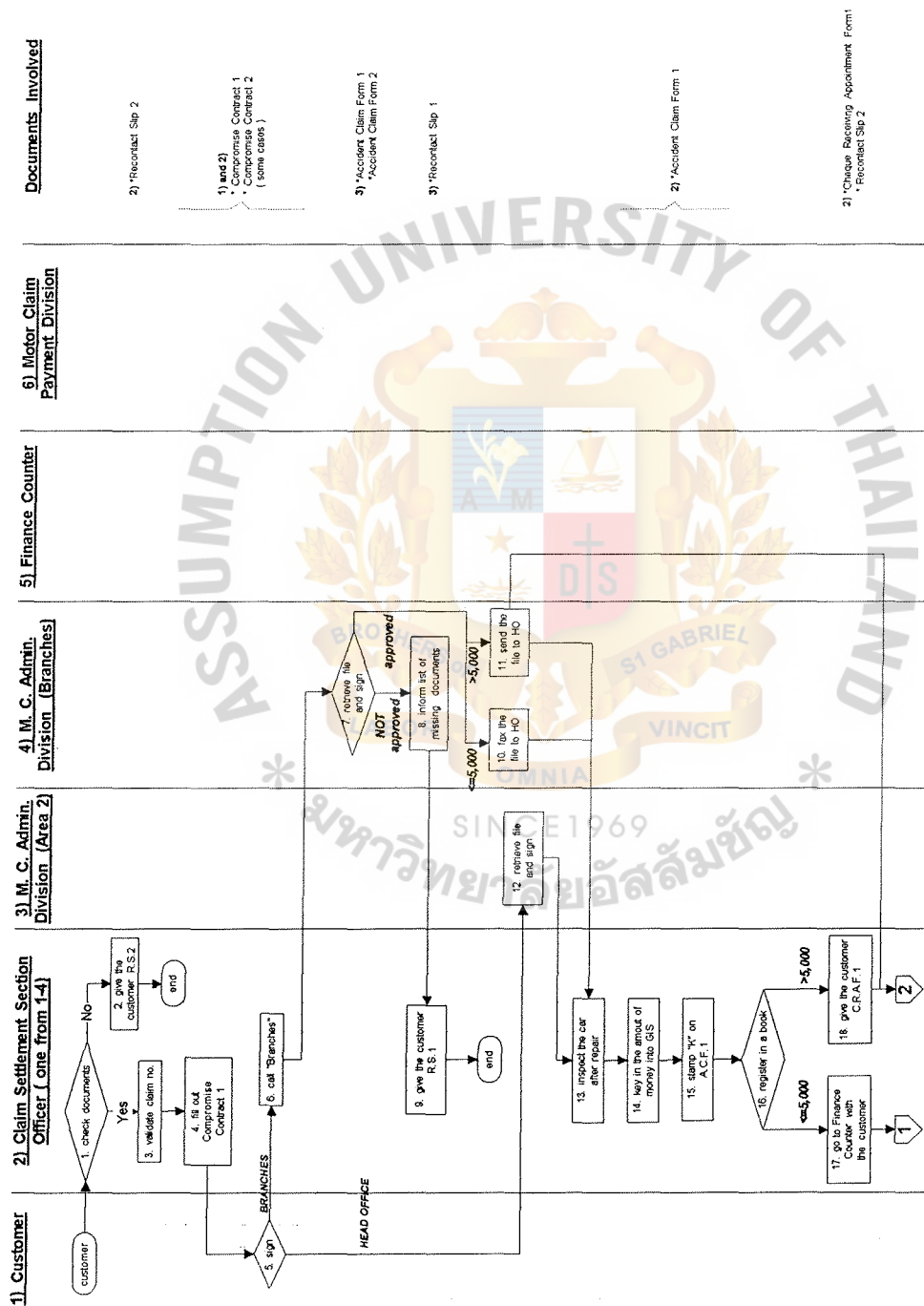


Figure 2.7. Existing Flow: Motor Claim Settlement Process.

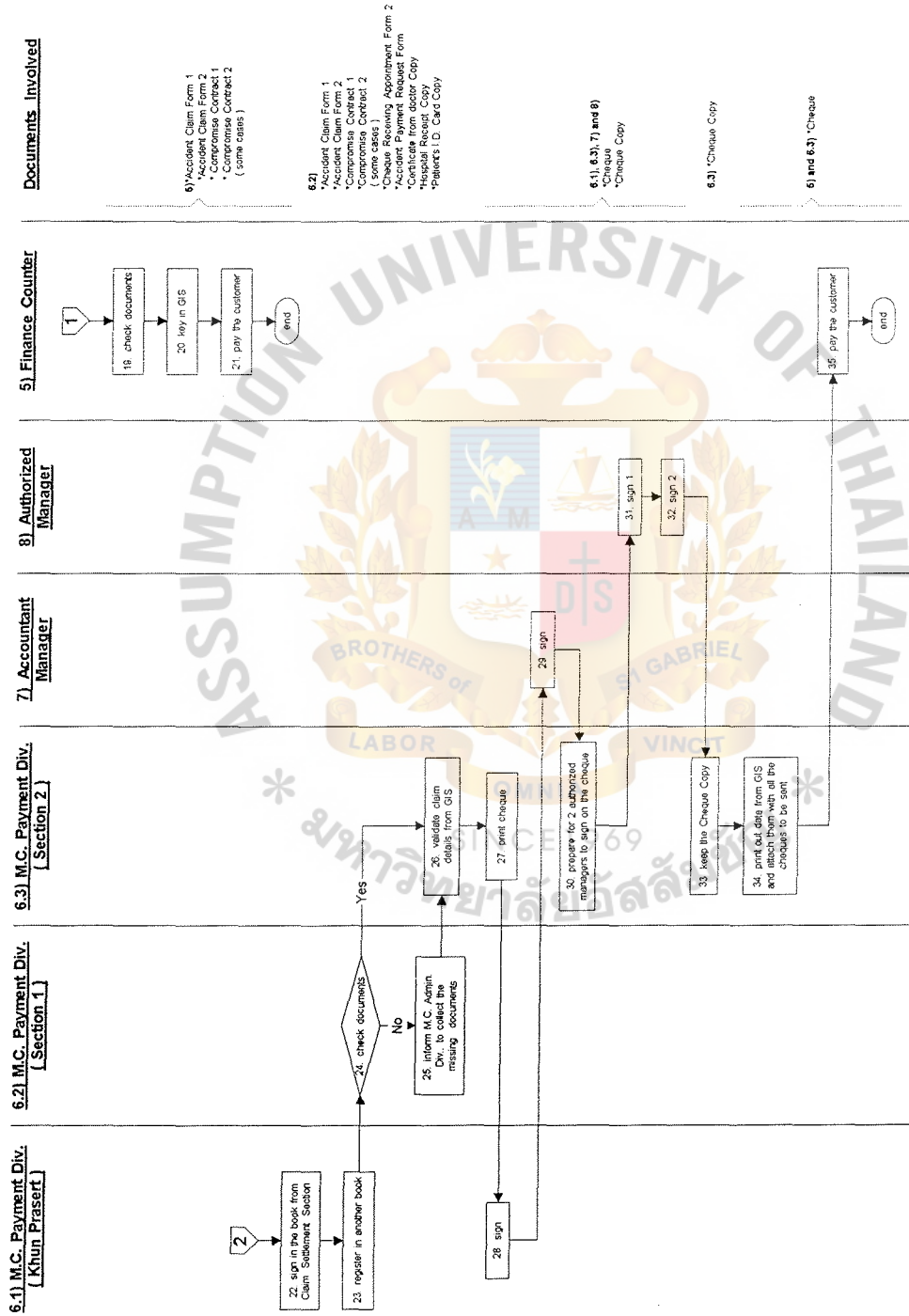


Figure 2.8. Existing Flow: Motor Claim Settlement Process (Continue).

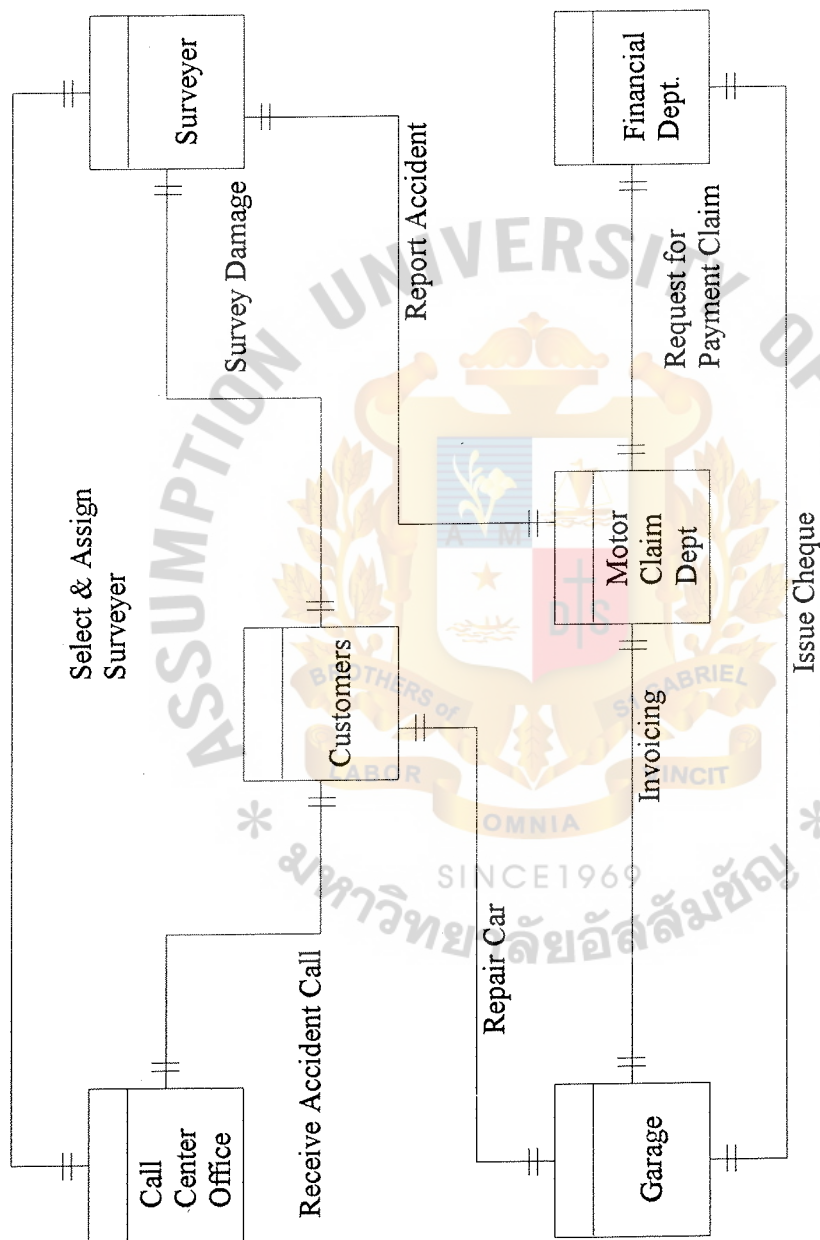


Figure 2.9. The Existing Context Data Model for the Claim Payment System.

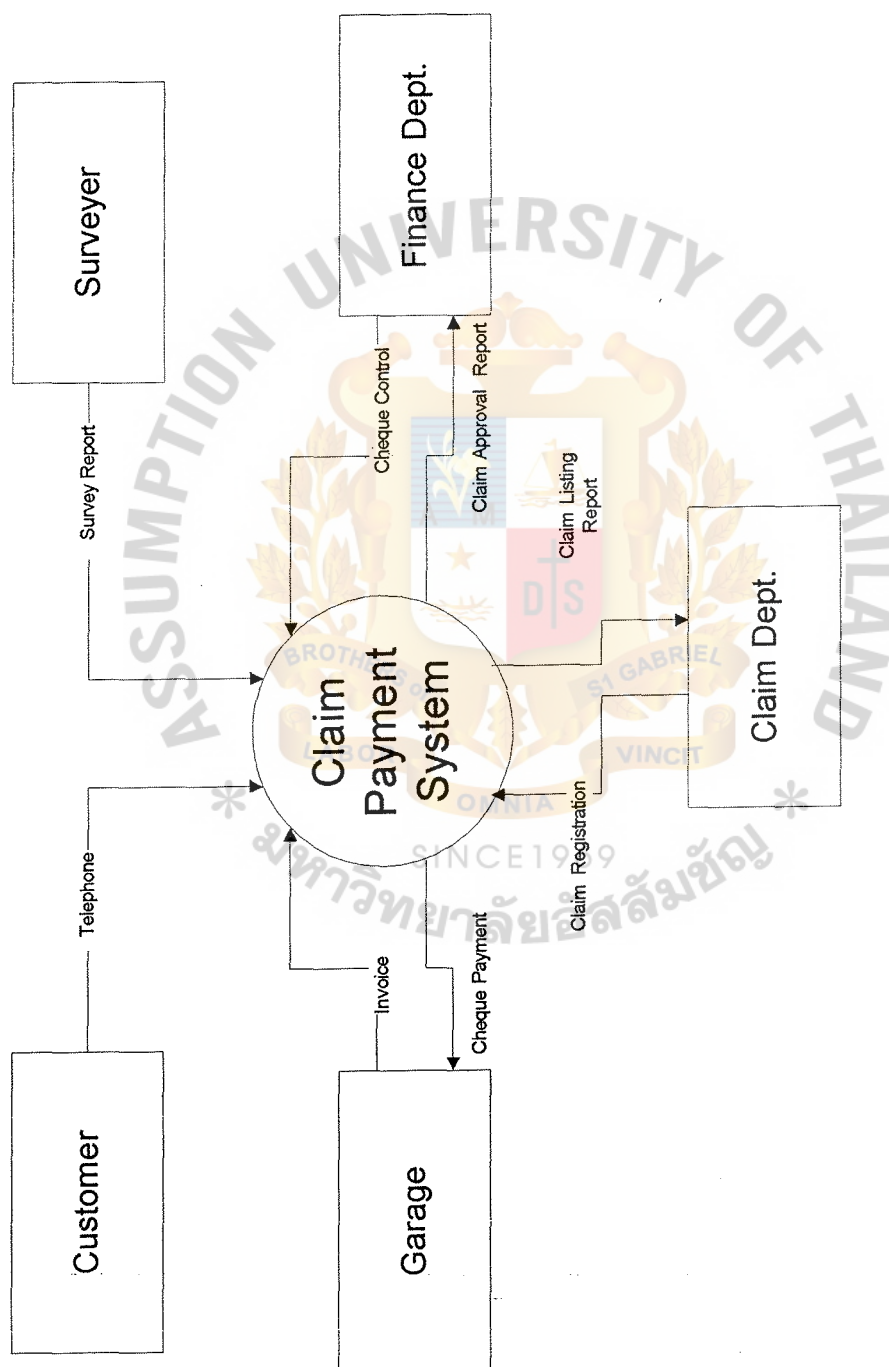


Figure 2.10. The Existing Process Model: Context Diagram of Claim Payment System.

III. THE PROPOSED SYSTEM

The proposed computerized system will provide the information and report to the management. It will provide the users an ease to use, solve the problems of the claim and claim payment systems. This proposed system can also avoid an increase in the company's budgeting and to utilize the existing resources with effectiveness.

For defining the new system, we identify the requirements into:

3.1 User Requirements

During the analysis of the existing system, we can conclude that the user's requirements can be defined as follows:

- Improve the existing system to be a reliable information system.
- Reduce manual paper works.
- Eliminate the bottle-neck in producing the claim payment system.
- Eliminate the duplication of workload.
- Enable high degree of data integrity.
- Enable automatic process claim payment system and produce its report.
- Provide inquiry screen for the information of each claim payment available to users to use various keys to retrieve the payment information.
- Quit issuing those manual cheques but use outsourcing facility e.g. Using cheque issuance application.
- Require training courses for IT background.
- Enable Finance department to retrieve data for faster and better service about claim payment to the garages.
- Have certain applications (such as Microsoft-Access) developed by IT Department in the future in order to get easy access to information. The

possible features or screens that have to be included in this application development are as follows:

- Obtain Information of claim from General Information System
- Perform policy data entry
- Perform claim data entry
- Update claim log-book file
- Perform claim requisition data entry
- Update garage-claim data file
- Print claim confirmation report
- Perform claim payment data entry
- Update cheque control file
- Update claim registration file
- Transmit online payment via electronic banking
- Print all claim payment reports

3.2 System Design

The Operational requirements of this proposed system are shown in the system design as follows:

3.2.1 Data Model: Entity Relation Diagram (ER-Diagram)

The Entity Relation Model of the proposed system emphasizing the related entity of the system and for database design are shown in Appendix A.

Figures A.1, A.2 and A.3 present ER-Diagram for overall Claim Payment System in the form of Data Diagram. Figure A.1 shows context diagram only entities related to each other. Figure A.2 shows full attributes in each entity that relate to each other and Figure A.3 presents full attributes at the normalization level 3.

The concepts for data diagram can be described as follows: -

A. Identify the entities and attributes of the claim payment system.

There are seven entities: -

- a) Customers (Policyholder). Its attributes comprise of Policy Number, Policy Status, Start date (Date of issue), Policyholder's name, address, telephone, Sum Insurance and Premium Amount.
- b) Call Center Office. There are five attributes; Call Center Code, Call Center Name, Staff code, Staff Name and Call Center Telephone number.
- c) Surveyor. Its attributes comprise of Surveyor code, Surveyor name and Surveyor telephone number.
- d) Motor Claim Department. There are two attributes; Department Number (code) and Department Name.
- e) Garage. Its attributes consist of Garage Code, Garage Name, Garage Type, Contact person and Credit term.
- f) Finance Department. There are two attributes; Department Number and Department Name.
- g) Citibank. Its attributes consist of Payment Number, Garage Name and Amount.

B) Identify the key (Identifier) and associated entities of claim payment system.

The keys (identifiers) have already been identified in figures A.1, A.2 and

A.3. However, we can identify associative entities for one-to-many

relationship, there are nine associated entities for the claim payment system:-

- a) Accident (note report)
- b) Assign Surveyor
- c) Surveyor Damage (report)

- d) Accidental Report (from surveyor)
- e) Repair (report)
- f) Repair-car (report)
- g) Claim Requisition
- h) Claim Payment
- i) Cheque Payment

C) Identify database design at the 3rd Normal Form. (see figure A.3)

3.2.2 Process Model: Context Diagram and Data Flow Diagram

The Process Model presents the flows of data in the claim payment system. The proposed process models are shown in Context Diagram and Data Flow Diagram (level 0) in Appendices B and C.

Figure B.1 presents Context Diagram of claim payment system. Figures C.1 shows Data Flow Diagram at level 0, Figure C.2-C.4 presents Data Flow Diagram at level 1 and Figure C.5-C.9 shows Data Flow Diagram at level 2.

The process of Data Flows Diagram are performed as follows:-

(This explanation relates to figure C.1: Data Flow Diagram at level 0)

A. Accident Note Process:

1. When a customer incurs an accident and, then, calls the Call Center Office to inform about the accident case, the customer will provide all the information such as policy number, driver name, accident type, place and time to call an officer.
2. A call officer in the Call Center records (input) accident information to the computer for the Claim (Accident) number and policy number after that he/she retrieves a surveyor from a surveyor's list and then selects and assigns a

surveyor to visit the accident place. In this stage, data storage will keep this information into an Accident Claim file.

3. A surveyor takes the accident report and records the surveyor code, surveyor's name, accident place, accident time, driver's name, car license number and damage points to the computer (General Insurance System). In this stage, data storage will keep the data into a Claim Logbook file.

B. Claim Requisition Process:

4. Garages send their invoice and repair reports to a claim officer (Motor Claim Department). A claim officer will retrieve all the information; Car Repair Number, Car Receipt Date, Repairing date, Repairing components, quantities and amount, Finishing Date, Car Recipient name and address and then, verify with the garages' invoice and repair reports. In this stage, Claim Logbook file will be retrieved/ read and Compromise Contract file is updated.
5. The Claim office (in 4) will record the information which has been investigated to the computer. In this stage, the data storage are kept in three files; Inspect file, Garage Claim file and Claim Requisition file.
6. The Claim office (in 4) will also record the due date on settlement to the garage in the Claim Confirmation file.

C. Claim Payment Process:

7. Every day, a finance officer will retrieve the information from two files; Claim Requisition file and Claim Confirmation file and then update into the Claim registration file. The information retrieved is Claim Requisition Number, Claim Requisition date, Claim Confirmation Number, Claim Confirmation date, Garage invoice date and number and Agreed Repair Amount. At this stage the

data storage in the Claim Requisition and the Claim confirmation files are read and the Claim registration is updated.

8. On due date, the finance officer (in 7) will retrieve the Claim Registration file and then select types of payment; Cash, Manual printed check or Citibank online payment (Electronic Banking). In this stage, data storage from Claim Registration is read and Cheque Control and Citibank Control files are updated.
9. Claim Payment via Citibank will automatically transfer money to the garages' accounts. Cash and Manual printed cheques will be distributed to the garages at the company's cashier counters. (It is estimated that 99% of claims are paid via Citibank)

3.2.3 Data Dictionary

The data dictionary entries are created after the data flow diagram has been completed and then modified to include the new structure records and elements gleaned from document analysis. The data dictionary is defined in Appendix D.

3.2.4 Input, Output, and Interface Design (Prototype)

The Input, Output and Interface design are shown in Appendix E, and are the prototypes of the proposed system. The prototype of Claim Payment system is shown as follows:-

A) Main Menu: Claim Payment System

B) Sub Menu:

1) Add/ Edit Policyholders

1.1 Policyholders Input Screen

2) Add/ Edit Garage Data File

2.1 Garages Input Screen

3) Accident and Claim Request

Sub Submenu:

3.1 Accident Note

- Accident Note Input Screen

3.2 Repairing Report

- Repairing Report Input Screen

3.3 Claim Requisition

- Claim Requisition Input Screen

4) Claim Check and Payment Request

Sub Submenu

4.1 Claim Confirmation

- Claim Confirmation Input Screen

4.2 Claim Payment Request

- Claim Payment Order Input Screen

5) Inquiry on Claim Requisition:

Sub submenu:

5.1 Inquiry on Accident Note

- Accident Note Screen

5.2 Inquiry on Repairing Report

- Repairing Report Screen

5.3 Inquiry on Claim requisition

- Claim Requisition Screen

5.4 Inquiry on Claim confirmation

- Claim Confirmation Screen

6) Payment Preparation:

Sub submenu:

6.1 Print Cheque

- Cheque Issurance Input Screen

6.2 Citibank Online Payment (Electronic Banking)

(Wait for Citibank specification and its application.)

7) Payment Report

7.1 Cash Payment Report (Printout)

7.2 Cheque Payment Report (Printout)

7.3 Citibank Online Payment Report (Printout)

7.4 Pending Payment Report (for other purpose)

7.5 Claim Register Report (Printout)

3.2.5 Structure Charts and Module Specification.

This is the logical overview of software design and its relationship among each module in the integrated system. See appendices F and G.

3.3 Hardware and Software Requirements

After surveying the hardware and software requirements, it is found that the existing computerized systems is appropriate and suitable for the proposed system. We only restructure and customize certain features of the existing system and employ Microsoft-Access in order to map with the proposed system. We try to manage and utilize the existing resources as much as we can. The specifications of the computer system are represented in the same way as 2.4 for the existing computer system.

In addition, it is unnecessary to provide the network system on the claim payment system since it is for the purpose of management centralized control in the head office.

3.4 Security and Control

Data are very expensive. Hence, we try to restricted control in order to ensure that claim information and the claim payment information can be controlled and secure enough.

For the proposed system we have to ensure the security of the hardware and the software, privacy of information and integrity of the system by protecting data and computer systems from unauthorized access, modification, destruction or misuse. In this proposed system, there are many security and controls that can be categorized as follows: -

3.4.1 Physical Security. These concern the protection from:

- a) Protection for hardware
 - Unauthorized access
 - Diastase
 - Breakdown and interruptions

b) Protection for data

c) Protection for program and application

3.4.2 Logical Security. These consider:

a) User identification

User authentication is verified upon the users start requests and password identification is assigned. If it is a wrong password, the screen alerts the user to reenter the password. If there are three times incorrect password keyed in, the system is then terminated. The password is automatically updated every three months.

b) Time restriction

The server is set for users to access within the specific period of time.

c) Authentication level

The users are given at necessary low access level to perform his tasks and activities.

3.4.3 Behavioral Security.

a) Having the system log the number of unsuccessful sign-on attempt user is in order to monitor whether unauthorized users are attempting to sign on the system.

b) Classification of user ID authorization, so each user can access his own functional areas.

c) Having the specific function key for specific User ID.

3.5 System Cost-Benefit Evaluation and Comparison

3.5.1 Cost-Benefit Evaluation:

3.5.1.1 Cost of the existing system

Cost evaluation for the existing system can be summarized as follows:-

a) Cost of hardware and software

The details of the existing hardware and software are presented in the topic 2.4 the existing computer system. However, the existing system cost can be estimated as below:-

- One set of server and software (LAN. included). 150,000 Baht

- Twenty sets of personal computers and applications included 800,000 Baht

- Twenty sets of printers 250,000 Baht

Total Cost of hardware and software 1,200,000 Baht

b) Cost of computer supply Cost per year

- Cost of ribbons, stationery and other supplies 240,000 Baht

c) Cost of maintenance Cost per year

- Cost of IT. Staff to maintenance the computers 600,000 Baht

d) Cost of manual work for the existing claim payment system Cost per year

- Cost of staff to perform the manual system,
total 30 persons, Bht. 150,000 per month 1,800,000 Baht
- Cost of space rental Bht. 30,000 per month 360,000 Baht
- Cost of improper cheque management (.2% of cheque issue)
total amount of cheque is Bht. 20 million per month;
Bht.40,000 per month 480,000 Baht
- Total of cost of manual work 2,640,000 Baht
- Total of operating cost per year 3,480,000 Baht

We can conclude that the existing system cost for the claim payment are comprised of :-

- 1) Hardware and software cost amounting to Bht. 1,200,000.
- 2) Operating cost amounting to Bht. 3,480,000 per year.

3.5.1.2 Cost of investment of the proposed system

Since the existing system is not suitable for the current situation and can not solve the problems that we have mentioned. We have to study other alternatives in terms of features and functions together with the feasibility of each candidate and its specification.

Finally we can conclude that there are three candidates to be discusses as follows:

1. Application Package from Oracle
2. Oracle System with In-house Development
3. General Insurance System (GIS: The General Insurance System is the existing system that the company used in front-office for the operation) with In-house Development.

Candidate 1 “Oracle Full Package”

This is the Account Application Package from Oracle System. It already has a built-in report in which we can use right the way and save time. It works on Client Server environment. The server can range from MS Windows NT. However, since this is the application package, there are some points which cannot meet the business requirement and need to adapt the company process. There is no additional staff needed for this candidate, since we can use existing IT team for maintenance. The approximate costs for employing this candidate are as follows:

<u>a) The initial year</u>	<u>Baht</u>
Initial investment Cost:	
- Oracle Accounting System (20 Concurrent users @ 60,000)	1,200,000
Implementation Cost:	
- Implementation 9 Months @ 100,000 each	<u>900,000</u>
Total	<u>2,100,000</u>
<u>b) The consequent years (Five year services)</u>	
Maintenance Cost: (Yearly Cost)	
- Oracle Accounting System (20 Concurrent users @ 15,000)	<u>300,000</u>

Candidate 2 “Oracle Plus Modified by in-house”

This is the Database Management Software, which we can run on any platform ranging from MS Windows NT. It also has Development Tools that enable users to generate a Specific Report to fit their requirements easily. However, if we employ this candidate, we need to have some more staff who has good knowledge of Relational Database Management System and Oracle Development tools as a manager of development team, and use existing IT staffs for this team. The approximate costs for employing this candidate are as follows:

a) The Initial year

Initial investment Cost:	<u>Baht</u>
- Oracle Base (20 Concurrent users @ 60,000)	1,200,000
- Development Tools	<u>400,000</u>
Total Initial Investment Cost	<u>1,600,000</u>

b) The Consequent year (Five year Services)

Development Team:	
- Development consultants @ 60,000 per month (for a year service)	<u>720,000</u>
Maintenance Cost: (Yearly Cost)	
- Oracle Base (20 Concurrent users @ 7,500)	150,000
- Development Tools	<u>50,000</u>
Total Maintenance Cost	<u>200,000</u>
Total Development and Maintenance cost	<u>920,000</u>

Candidate 3 “GIS plus In-house”

This is the existing software that the company already purchased. It is the special software from Zurich (Parent Company). GIS is the application package in which it is developed to support the insurance company. However, these still have some points which cannot fit the specific requirement. Moreover, this software has been bought directly from Malaysia, thus any modification cost, implementation cost and consultant cost should be done toward Malaysia which is high and difficult for maintaining in the long term. There should be an additional Implementation cost and Maintenance cost for this “GIS plus In-house” only which ranges as follows:

a) The initial year

Implementation Cost:	<u>Baht</u>
- Implementation 6 Months @ 200,000 each	<u>1,200,000</u>

(Using IT people and consultants from the Zurich group)

b) The consequent years (Five year services)

Maintenance Cost (Yearly Cost)

- GIS maintenance agreement cost, yearly 500,000 Baht

(Two Malaysia consultants Plus In-house IT service providing)

3.5.2 Benefits Evaluation:

It is the company's policy to utilize the existing resources. The existing system in the topic of 3.5.1.1 and twenty staffs are fully utilized.

However, it is estimated that it will benefit the company after this proposed system is finished. The benefits of this project can be classified as follows:-

	<u>Benefit per year</u>
a) Reduce duplicate work, totally 10 persons 50,000 per month	600,000 Baht
b) Reduce cost of space rental 5,000 per month	60,000 Baht
c) Reduce cost for improper check management of .2% of total cheque issue in each month (amount of cheque is about 20 million), around Bht. 40,000 per month	480,000 Baht
d) Reduce cost of ribbons, stationery and other supplies	<u>40,000</u> Baht
Total benefits to this proposed system	<u>1,180,000</u> Baht

3.5.3 Cost Comparison

The cost comparison in both the existing and the proposed system are presented as follows:-

Table 3.1. Cost Comparison – Summary, in Baht.

Cost components	Cost of the existing system	Cost of the proposed system		
		Candidate 1	Candidate 2	Candidate 3
Cost of hardware & software	1,200,000	1,200,000	1,200,000	1,200,000
Yearly cost of computer supply	240,000	240,000	240,000	240,000
Yearly cost of maintenance	600,000	600,000	600,000	600,000
Yearly Cost of manual work	2,640,000	2,640,000	2,640,000	2,640,000
Yearly Benefits of using new system	-	(1,180,000)	(1,180,000)	(1,180,000)
Cost of development of new system (at the first year)	-	2,100,000	1,600,000	1,200,000
Yearly Cost of maintenance of new system	-	300,000	920,000	500,000

Table 3.2. Cumulative Cost Comparison, in Baht.

Cumulative Cost	The existing system	The proposed system of candidate 1	The proposed system of candidate 2	The proposed system of candidate 3
Total cumulative cost at the end of the fifth year	18,600,000	16,000,000	17,980,000	15,900,000

3.5.4 Recommendation and Selection

The details of Alternative solutions and Feasibility analysis are shown in Table 3.1-3.7 and Figure 3.1 - 3.6 and we can summarize the main factors for decision making of both cost and benefit as shown on the next page.

After we have completed the Candidate Matrix which fills up all the characteristics required for each candidate and also perform Feasibility Study of each candidate in terms of various issues, we decide to select Candidate 3 named “GIS. Plus In-house” which

has the highest total ranking score comprising of Operational Feasibility, Technical Feasibility, Economic Feasibility and Schedule Feasibility.

Table 3.3. Summary of Cost and Benefits Results, in Baht.

Categories	Candidate 1	Candidate 2	Candidate 3
Benefits derived from operating of the new system (PV)	4,767,200	4,767,200	4,767,200
Cost derived from operating the new system (PV)	3,012,000	4,369,800	2,720,000
Net benefits derived from the new system (PV)	1,755,200	370,000	2,047,000
Cumulative Cost	16,000,000	17,980,000	15,900,000
Payback Period (Time-Adjusted)	1 year and 2 months	1 year and 11 months	<1 year
Breakeven Point	1 year	1 year	<1 year
Score from feasibility study	56%	60%	87%
Ranking	3	2	1
Decide to choose candidate #3.- GIS. Plus Inhouse Modification Alternative.			

Table 3.4. Feasibility Analysis Matrix of Cost Evaluation and Comparison.

Feasibility Criteria	Wt.	Candidate 1. Oracle full package	Candidate 2. Oracle + Modified by inhouse	Candidate 3. GIS + Inhouse
Operational Feasibility Functionality. A description of to what degree the candidate would benefit the organization and how well the system would work.	25%	The software application is a standardized package. Certain parts may not be suitable for the insurance business but some parts in this system are better than those in the existing system. Full package purchasing may have unnecessary functions and figures. The users may not be familiar with the new work processes.	The same as using "Oracle full package" but tailor made or modified program and application done by the Oracle staff. The unnecessary functions and figures are minimized. The users may still not be familiar with the new work processes.	The Information Technology team fully understand and support user requirement. The current business process problems are acknowledged by the team and wait for the next proceed from the management.
Political. A description of how well received this solution would be from both user management, user and organization perspective.		The users management, users and organization to accept change.	The users management, users and organization to accept change.	The users management, users and organization to accept change.
Technical Feasibility Technology. An assessment of the maturity, availability (or ability to acquire), and desirability of the computer technology needed to this support candidate.	25%	Required to hire the expert to train the users management, and users.	Required to hire and train expert to perform modifications for integration requirement Required to hire the expert to train the users management, and users.	The IT team is supported by the Zurich group. The Know-how from Zurich is more simplified and easier to use than the Thailand base. The IT team and the IT from Zurich have to perform modifications and train the users management and users.
Economic Feasibility Cost to develop : Maintenance cost: Net Benefits at the present value : Detailed calculations :	40%	Approximately Bht. 2,100,000 Approximately Bht. 300,000 (Total 1,500,000 for five years) Approximately 1,755,200 Bht See details of NPV and Payback Analysis on Figure 3.4 & 3.5	Approximately Bht. 1,600,000 Approximately Bht. 920,000 (Total 4,200,000 for five years) Approximately 370,400 Bht See details of NPV and Payback Analysis on Figure 3.6 & 3.7	Approximately Bht. 1,200,000 Approximately Bht. 500,000 (Total 2,500,000 for five years) Approximately 2,047,000 Bht See details of NPV and Payback Analysis on Figure 3.8 & 3.9
Schedule Feasibility An assessment of how long the solution will take to design and implement	10%	About 9 months	About 12 months	About 6 months
Ranking	100%	Score: 70 56.00%	Score: 50 60.00%	Score: 90 87.50%

Table 3.5. Candidate System Matrix of Cost Evaluation and Comparison.

Characteristics	Candidate 1.	Candidate 2.	Candidate 3.
	Oracle Full Application Package	Oracle + Modified by inhouse	GIS-Inhouse
<p>Portion of System Computerized</p> <p>Brief description of that portion of the system that would be computerized in this candidate.</p>	<p>This candidate uses the built-in report for the application which selects only the Accounting Module</p> <p>This is aimed to support the Claim Payment System</p>	<p>This Oracle + modified by inhouse has great advantage for flexibility, since this software allows user to create the specific Report which can best fit their requirement</p> <p>The system experts should be employed to develop and maintain</p>	<p>Actually, the GIS provides the full payment system. It is an application software for only non-life insurance. It is available for the claim and payment processes.</p> <p>GIS is written by a group of IT insurance expert, and sold by the vender namely "Bas Consultarnting - Malaysia"</p> <p>It is acceptable among the group of insurance industry. It can increase the policy issue productivity, control and produce the specific report to the management.</p>
<p>Benefits</p> <p>Brief description of the business benefits that would be realized</p>	<p>this is the easy and the fastest way to implement the system</p>	<p>Have Software tools to develop phase Application to fit specific Requirement</p>	<p>Server is Unix , MS windowsNT 4.0 workstation.</p>
<p>Servers and Workstations</p> <p>A description of the servers and workstation needed for support</p>	<p>Server is Unix , MS windowsNT 4.0 workstation.</p>	<p>Server is Unix , MS windowsNT 4.0 workstation.</p>	<p>Server is Unix , MS windowsNT 4.0 workstation.</p>
<p>Software Tools Needed</p> <p>Software tools needed to design and build (e.g. database management system, emulators, operating systems, languages, etc.). Not generally applicable if application software packages are not to be purchased.</p>		<p>Oracle Development tools</p>	<p>GIS is General Insurance System which is written by Informix version 7.0x (4-GL). Database management is Informix on "Sun" , Emulators is DL2000 and O/S is Unix.</p>
<p>Application Software</p> <p>A description of the software to be purchased, built, accessed, or some combination of these techniques.</p>	<p>Mixed with standardized package and custom solution.</p>	<p>Relational Database Management System</p>	<p>Mixed with standardized package and custom solution.</p>
<p>Method of Data Processing</p> <p>Generally some combination of: on line, batch, differe batch, remote batch, and real - time.</p>	<p>Client/Server</p>	<p>Client/Server</p>	<p>The centralized data processing in Head office. The main server in H/O is the host. Real-time it in the specification.</p>
<p>Output Devices and Implications</p> <p>A description of output devices that would be used, special output requirements (e.g. network, preprinted forms, etc.) and output considerations (e.g. timing constraints).</p>	<p>Printers are mostly output. For upcountry, net work uses frame realay, leased line and satellites links.</p>	<p>Printers are mostly output. For upcountry, net work is uses frame realay, leased line and satellites links.</p>	<p>Printers are mostly output. For upcountry, net work is uses frame realay, leased line and satellites links. (for the future plan)</p>
<p>Input Devices and Implications</p> <p>A description of input methods to be used, input devices (e.g. keyboard, mouse, etc.), special input requirements (e.g. new or revised forms from which data would be input), and input considerations (e.g. timing of actual inputs).</p>	<p>Key board and mouse.</p>	<p>Key board and mouse.</p>	<p>Key board and mouse.</p>
<p>Storage Devices and Implications</p> <p>Brief description of what data would be stored, what data would be accessed from existing stores, what storage media would be used, how much storage capacity would be organized.</p>	<p>Storage data is done by using a centralized storage method. The storage device called "E3000" with 32 GB arrayed capability. There is back-up for duplicating data, MIS and certain applications for 32 GB.</p>	<p>Storage data is done by using a centralized storage method. The storage device called "E3000" with 32 GB arrayed capability. There is back-up for duplicating data, MIS and certain applications for 32 GB.</p>	<p>Storage data is done by using a centralized storage method. The storage device called "E3000" with 32 GB arrayed capability. There is back-up for duplicating data, MIS and certain applications for 32 GB.</p>

Table 3.6. Net Present Value, Payback Analysis and Breakeven for Candidate 1 - Oracle Full Application Package Alternative. in Baht

Cost Items	Year	Year 1	Year 2	Year 3	Year 4	Year 5
Development cost		2,100,000	-	-	-	-
Operation and maintenance		-	300,000	300,000	300,000	300,000
Discount factors for 12%		1,000	0.893	0.797	0.712	0.638
Time-adjusted costs (adjusted to present value)		2,100,000	267,900	239,100	213,600	191,400
Cumulative time-adjusted costs over life-time (A)		2,100,000	2,367,900	2,607,000	2,820,600	3,012,000
Benefits derived from operation of new systems		1,180,000	1,180,000	1,180,000	1,180,000	1,180,000
Discount factors for 12%		1,000	0.893	0.797	0.712	0.638
Time-adjusted costs (adjusted to present value)		1,180,000	1,053,740	940,460	840,160	752,840
Cumulative time-adjusted costs over life-time (B)		1,180,000	2,233,740	3,174,200	4,014,360	4,767,200
Net Present Value of lifetime costs at the fifth year (B)-(A)						1,755,200
Payback period:						
Cumulative costs- time adjusted (A)		2,100,000	2,367,900	2,607,000	2,820,600	3,012,000
Cumulative benefits- time adjusted (B)		1,180,000	2,233,740	3,174,200	4,014,360	4,767,200
Net Cumulative benefits and Costs: (B)-(A)		-920,000	-134,160	567,200	1,193,760	1,755,200
Breakeven :						
Cumulative costs of the new system		5,600,000	8,200,000	10,800,000	13,400,000	16,000,000
Cumulative costs of the existing system		4,680,000	8,160,000	11,640,000	15,120,000	18,600,000

Table 3.7. Net Present Value, Payback Analysis and Breakeven for Candidate 2 - Oracle System + Inhouse Modification Alternative, in Baht.

Cost Items	Year	Year 1	Year 2	Year 3	Year 4	Year 5
Development cost		1,600,000	-	-	-	-
Operation and maintenance		-	920,000	920,000	920,000	920,000
Discount factors for 12%		1,000	0.893	0.797	0.712	0.638
Time-adjusted cost s (adjusted to present value)		1,600,000	821,560	733,240	655,040	586,960
Cumulative time-adjusted costs over life-time (A)		1,600,000	2,421,560	3,154,800	3,809,840	4,396,800
Benefits derived from operation of new systems		1,180,000	1,180,000	1,180,000	1,180,000	1,180,000
Discount factors for 12%		1,000	0.893	0.797	0.712	0.638
Time-adjusted cost s (adjusted to present value)		1,180,000	1,053,740	940,460	840,160	752,840
Cumulative time-adjusted costs over life-time (B)		1,180,000	2,233,740	3,174,200	4,014,360	4,767,200
Net Present Value of lifetime costs at the fifth year (B)-(A)						370,400
Payback period:						
Cumulative costs- time adjusted (A)		1,600,000	2,421,560	3,154,800	3,809,840	4,396,800
Cumulative benefits- time adjusted (B)		1,180,000	2,233,740	3,174,200	4,014,360	4,767,200
Net Cumulative benefitss and Costs: (B)-(A)		-420,000	-187,820	19,400	204,520	370,400
Breakeven :						
Cumulative costs of the new system		5,100,000	8,320,000	11,540,000	14,760,000	17,980,000
Cumulative costs of the existing system		4,680,000	8,160,000	11,640,000	15,120,000	18,600,000

Table 3.8. Net Present Value, Payback Analysis and Breakeven for Candidate 3 - General Insurance System (GIS.) + Inhouse Modification Alternative, in Baht.

Cost Items	Year	Year 1	Year 2	Year 3	Year 4	Year 5
Development cost		1,200,000	-	-	-	-
Operation and maintenance		-	500,000	500,000	500,000	500,000
Discount factors for 12%		1.000	0.893	0.797	0.712	0.638
Time-adjusted costs (adjusted to present value)		1,200,000	446,500	398,500	356,000	319,000
Cumulative time-adjusted costs over life-time (A)		1,200,000	1,646,500	2,045,000	2,401,000	2,720,000
Benefits derived from operation of new systems		1,180,000	1,180,000	1,180,000	1,180,000	1,180,000
Discount factors for 12%		1.000	0.893	0.797	0.712	0.638
Time-adjusted costs (adjusted to present value)		1,180,000	1,053,740	940,460	840,160	752,840
Cumulative time-adjusted costs over life-time (B)		1,180,000	2,233,740	3,174,200	4,014,360	4,767,200
Net Present Value of lifetime costs at the fifth year (B)-(A)						2,047,200
Payback period:						
Cumulative costs- time adjusted (A)		1,200,000	1,646,500	2,045,000	2,401,000	2,720,000
Cumulative benefits- time adjusted (B)		1,180,000	2,233,740	3,174,200	4,014,360	4,767,200
Net Cumulative benefitss and Costs: (B)-(A)		-20,000	587,240	1,129,200	1,613,360	2,047,200
Breakeven :						
Cumulative costs of the new system		4,700,000	7,500,000	10,300,000	13,100,000	15,900,000
Cumulative costs of the existing system		4,680,000	8,160,000	11,640,000	15,120,000	18,600,000

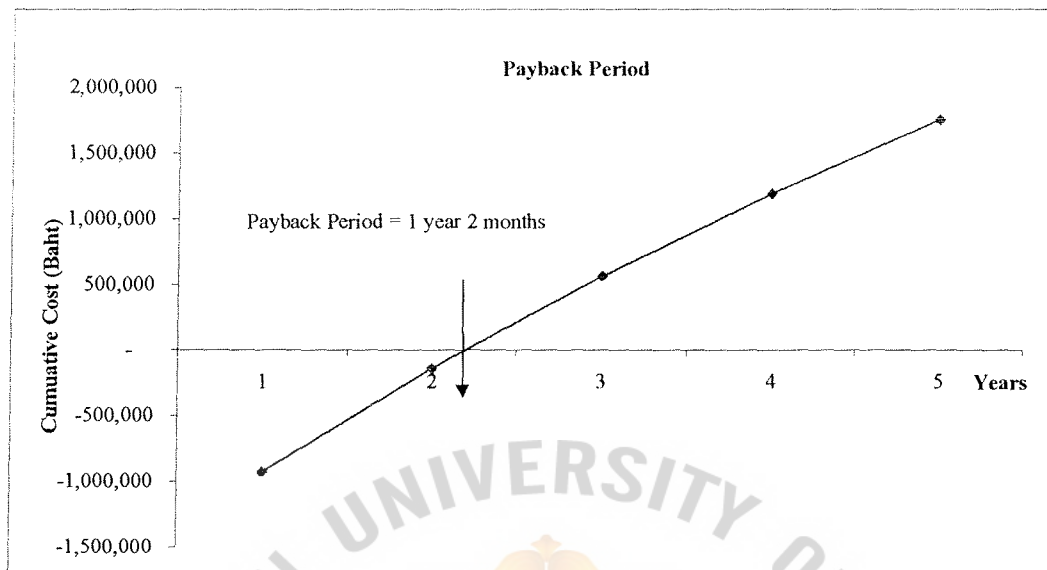


Figure 3.1. Payback Analysis for Candidate 1 - Oracle Full Application Package Alternative.

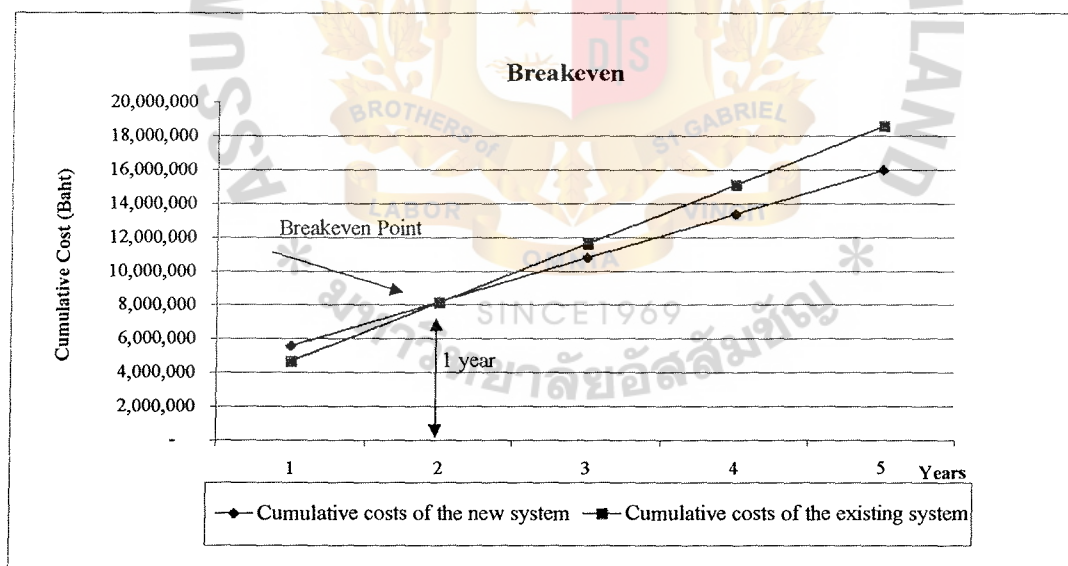


Figure 3.2. Breakeven for Candidate 1 - Oracle Full Application Package Alternative.

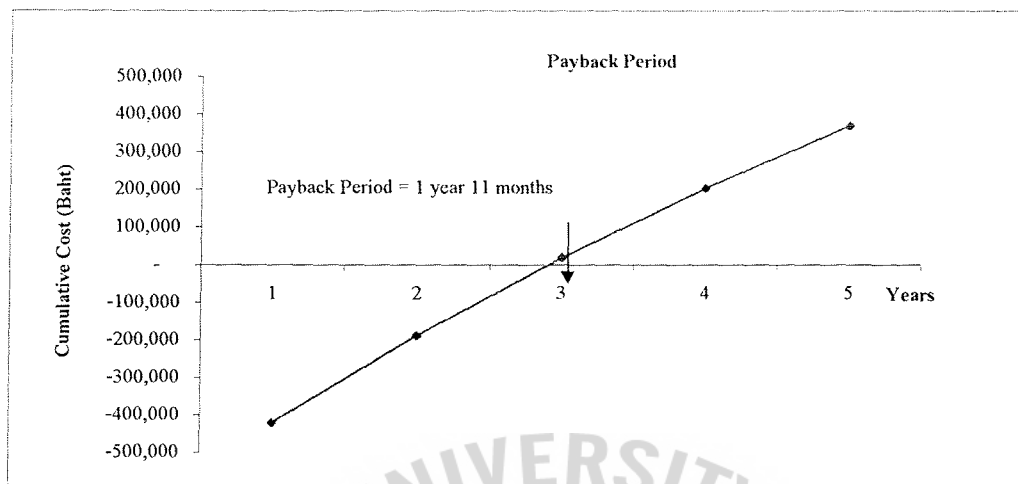


Figure 3.3. Payback Period for Candidate 2 - Oracle System + Inhouse Modification Alternative.

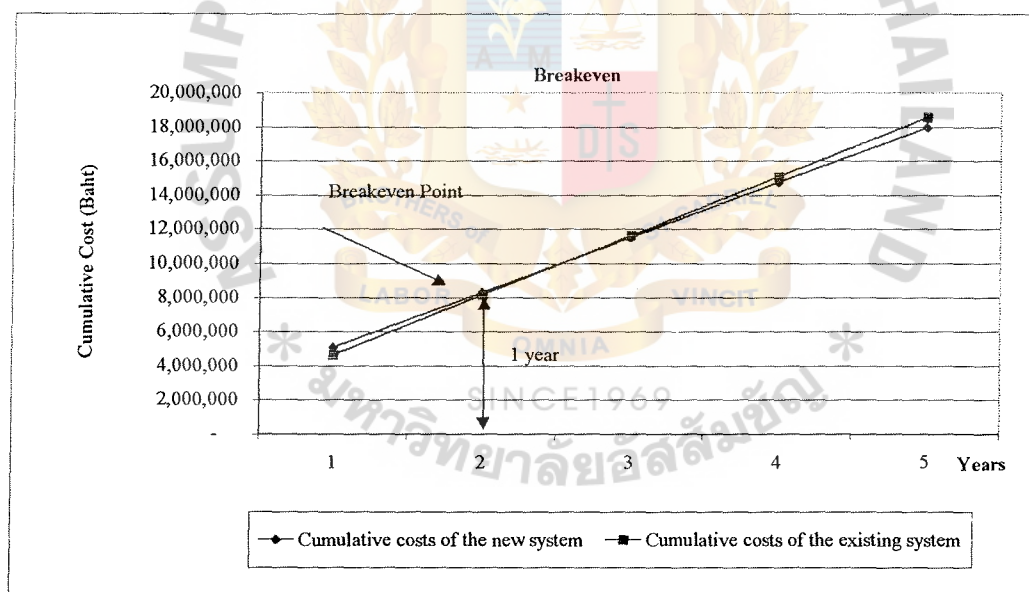


Figure 3.4. Breakeven for Candidate 2 - Oracle Full Application Package Alternative.

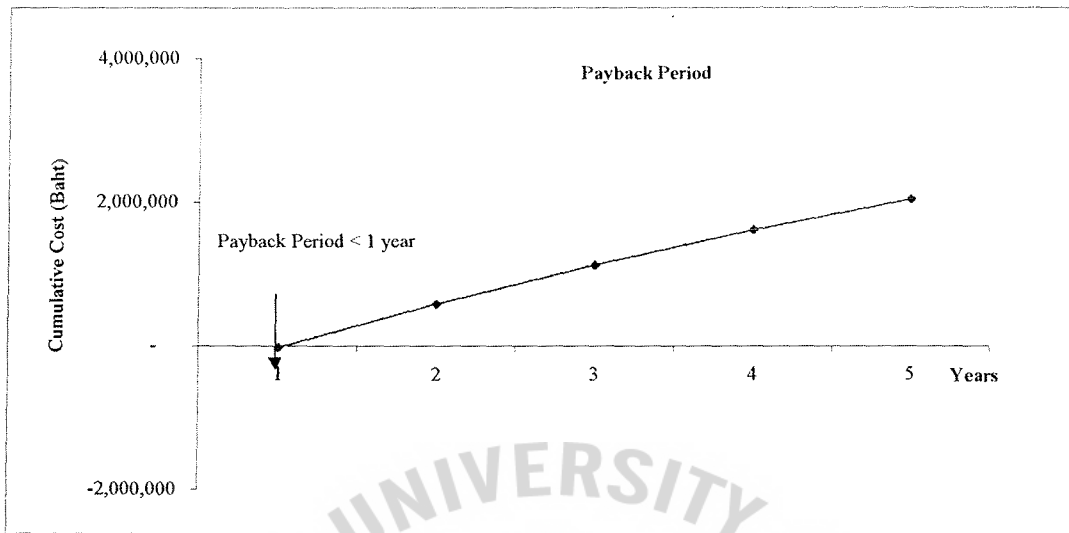


Figure 3.5. Payback Period for Candidate 3 - General Insurance System (GIS.) + Inhouse Modification Alternative.

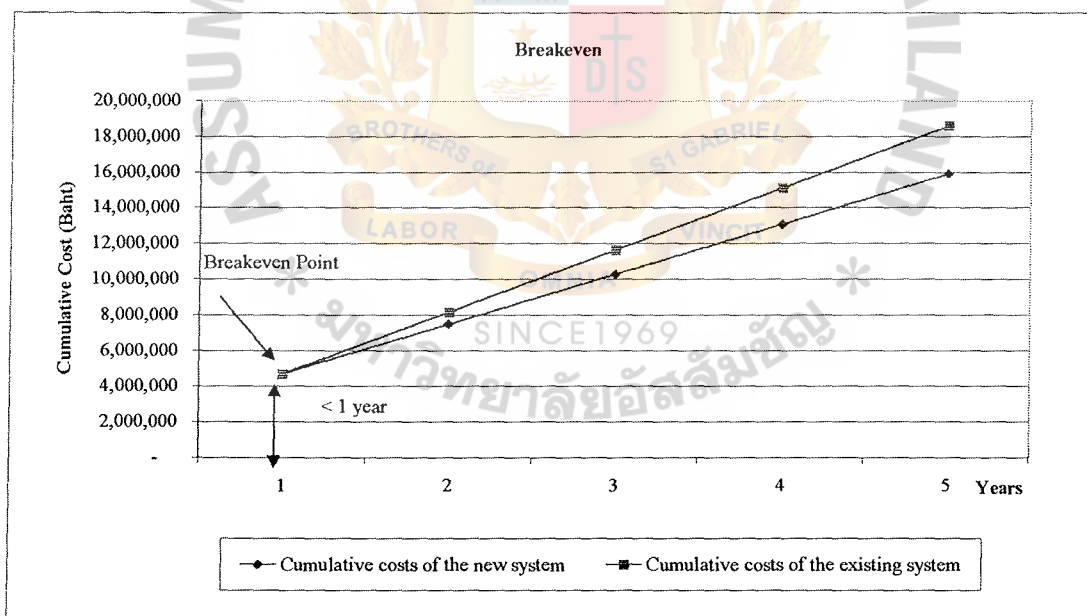


Figure 3.6. Breakeven for Candidate 3 - General Insurance System (GIS.) + Inhouse Modification Alternative.

IV. PROJECT IMPLEMENTATION

4.1 Overview of Project Implement Plan and Schedule

4.1.1 Project Implementation Plan

a) Feasibility Study

The feasibility study is to study about current system, current hardware capability and the overall operation of the related system and human resources. The investigation of the existing problem and user requirement should be done.

b) System analysis and design

The system analysis and design involve the study in details about the current system and problem definition which will take time for interview and work-through the related functions. After that we have to discuss with the management about the existing system, problems that occurred, and the draft proposed system. Finally we also present all these to the key users and the related operators.

c) System implementation

Software application is taken as the major part of the system implementation. Microsoft-Access is the selected application that the company chooses. The existing computerized system is to consider that their capacity is enough to handle the new proposed system.

It will perform testing and acceptance in order to ensure the effectiveness of the proposed system and the training program will be conducted to each group according to their related work and authorization of each group. The manual and guideline will be distributed to the users and related operators.

d) System conversion

System conversion consists of data conversion and system installation. The methods used in conversion files will depend on the alternative selected for installation of the new system. We also have to consider the cost and possibility of conversion of the existing file to match the new system.

The claim payment system has just been created, it means that the new proposed system has started. However, both the existing system and the new computerized system will operate concurrently for a period of time and this parallel operation coincides with business cycles e.g., a week during the interim period. All input transactions are used to update the database that supports both the old and the new system.

The activities that must occur to implement the new system and put it into operation, including the following:-

- 1) All parameters have to be prepared
- 2) All files have to be cleared
- 3) All computer vendors have to be listed
- 4) All new documents have to be documents
- 5) All responsibility have be assigned to each activity.

e) Users training

Training concerns only in-house training. The trainer is a System Analyst who knows the overall organization's in both personnel and Claim Payment System. People will associate with the new system and know the details of what their role will be, how they can use the system and where they will do or will not do in the Claim Payment.

4.1.2 Project Implement Schedule

The development of this project will take five months as shown in Figure 4.1

4.2 Test Plan and Results

Testing is performed throughout the system development and done on many different levels at various intervals. However; for the Claim Payment System, there are two testing plans as shown below:-

4.2.1 Testing System Software and System Development

This step is provided by a vendor that we have tested already when the Software is loaded to the hardware.

4.2.2 Testing Application Software (General Insurance System and Microsoft-Access)

a) Program testing with test data:

The GIS and Microsoft - Access are tested by the programmer and system analyst. The following steps are included in the testing process.

- Test valid and invalid data
- Test possible variations in format and codes
- Output must be corrected and satisfactory
- File output from tested data must be correct

b) Link testing test data

System Analyst tests the programs on GIS that are interdependent, actually work together or tests all combinations by creating special test data to ensure that the system can detect errors and can handle normal or bulk transactions.

c) Full Systems testing with test data:

The operators and users become actively involved in testing. There are factors to take into consideration when testing;

- Checking that documentation is clear enough and adequate for operators and users to afford correct and efficient operation

- Determining if output is correct and that users understand it. This testing will include measures of error, timelines, ease of use and so on.

d) Full System Testing with live data:

This step allows an accurate comparison of the new system's output with what we know to be correctly processed output as well as a good feel for how actual data will be handled.



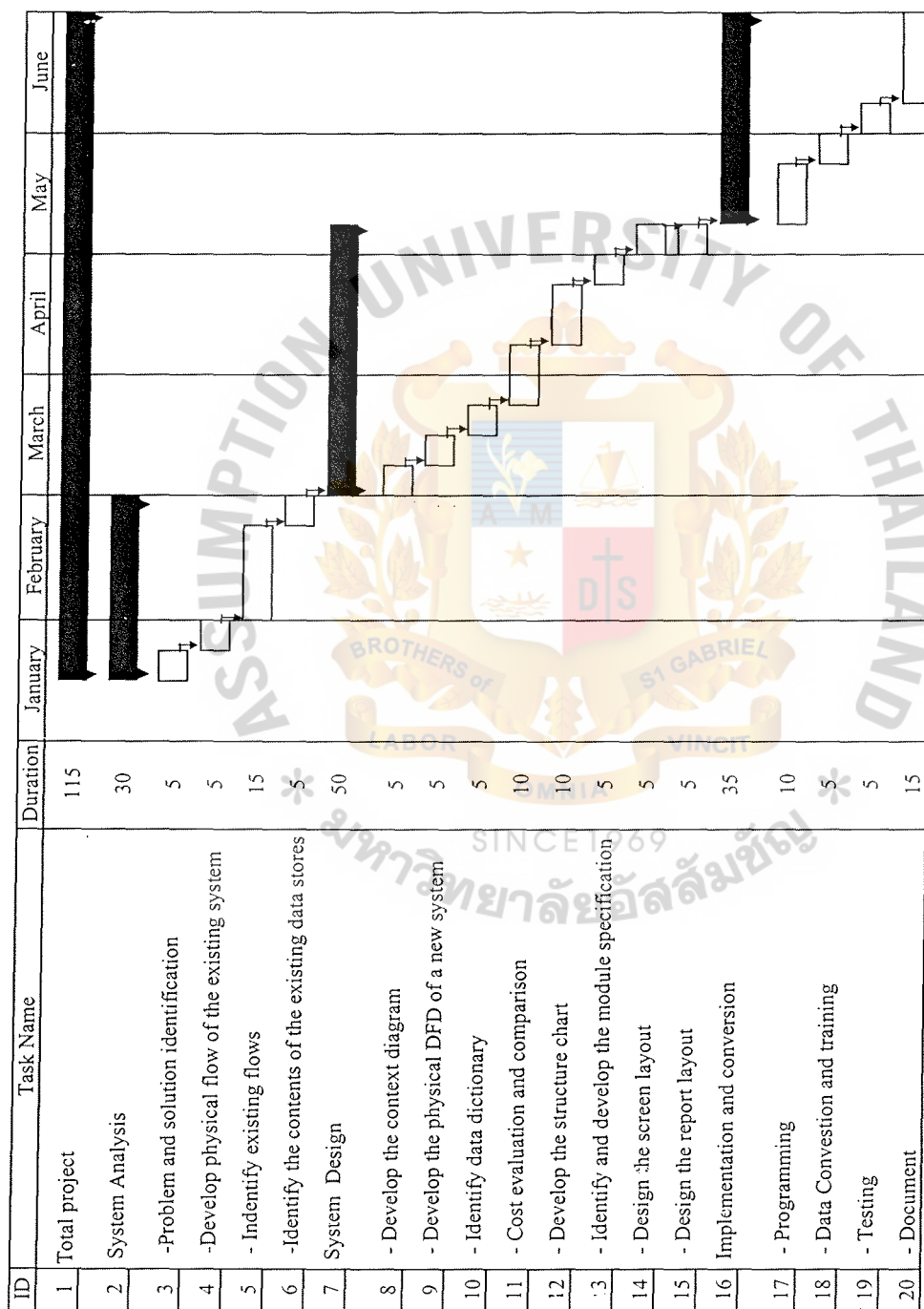


Figure 4.1. Project Implementation Schedule for Claim Payment System.

V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The objectives of the project are to analyze and design and then implementation the Claim Payment System (CPS) to meet the users' requirement, and to meet the organization's policy and operation plan for Thai Zurich Insurance Company Limited. The manual system was analyzed to see how the information flows and problems were found. This proposed system is designed to solve the problems of the manual system.

The Claim Payment System provides users with ability to create and maintain the Claim Payment database by entering the claim requisition, confirmation and repairing reports. The process will assist us to generate the payment type and lists to Citibank for automatic transfer to the customer's accounts. Besides, the users will have the ability to control the claim payment by matching all the claims to the garages and also have the ability to classify payment type, e.g. by cash, manual cheque or automatic transfer to the customer accounts.

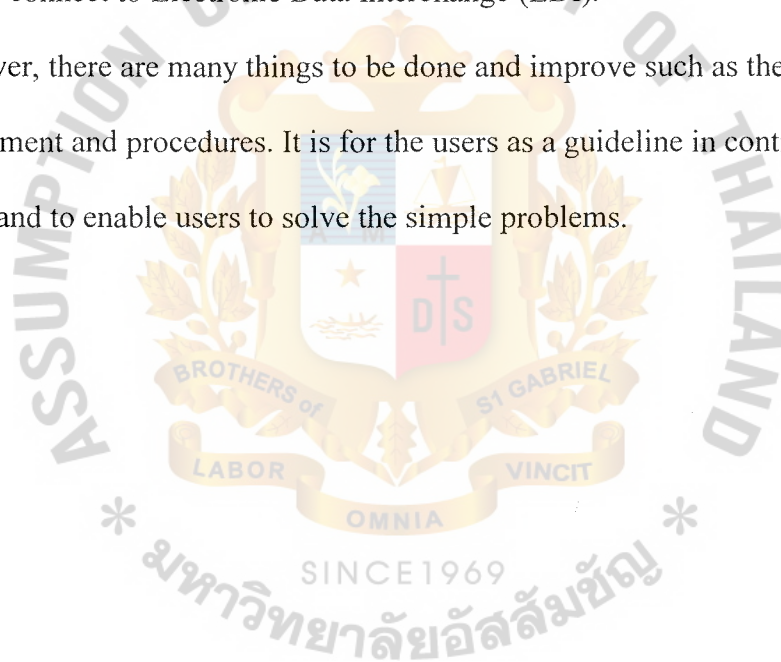
The users can get several available system functions, which are displayed as menu, and the users can choose among them. The management can get the claim and payment reports from this system for decision-making. The system provides more accurate and timely information. The inquiries and reports enable users to make more timely decision.

The system design and development of this project use the top-down approach to design this refers to looking at the overall organization objectives first and then decomposing them into management system requirement. Finally it is found that the appropriate solution for the Claim Payment System is the GIS, plus In-house modification, which uses Microsoft-Access as the application software.

5.2 Recommendations

The Claim Payment System has been definitely completed according to the objectives and users' requirements. This proposed system is only one part of the overall system that needs to be improved. In the future, the company has a plan to enlarge the market in upcountry area, then, at that time the design for the interconnection of data will be done by highly precision technology in order to integrate the overall insurance company and connect to Electronic Data Interchange (EDI).

Moreover, there are many things to be done and improve such as the job controls for claim payment and procedures. It is for the users as a guideline in controlling the assigned job and to enable users to solve the simple problems.



APPENDIX A
DATA MODEL (E-R DIAGRAM) AND FOR DATABASE DESIGN



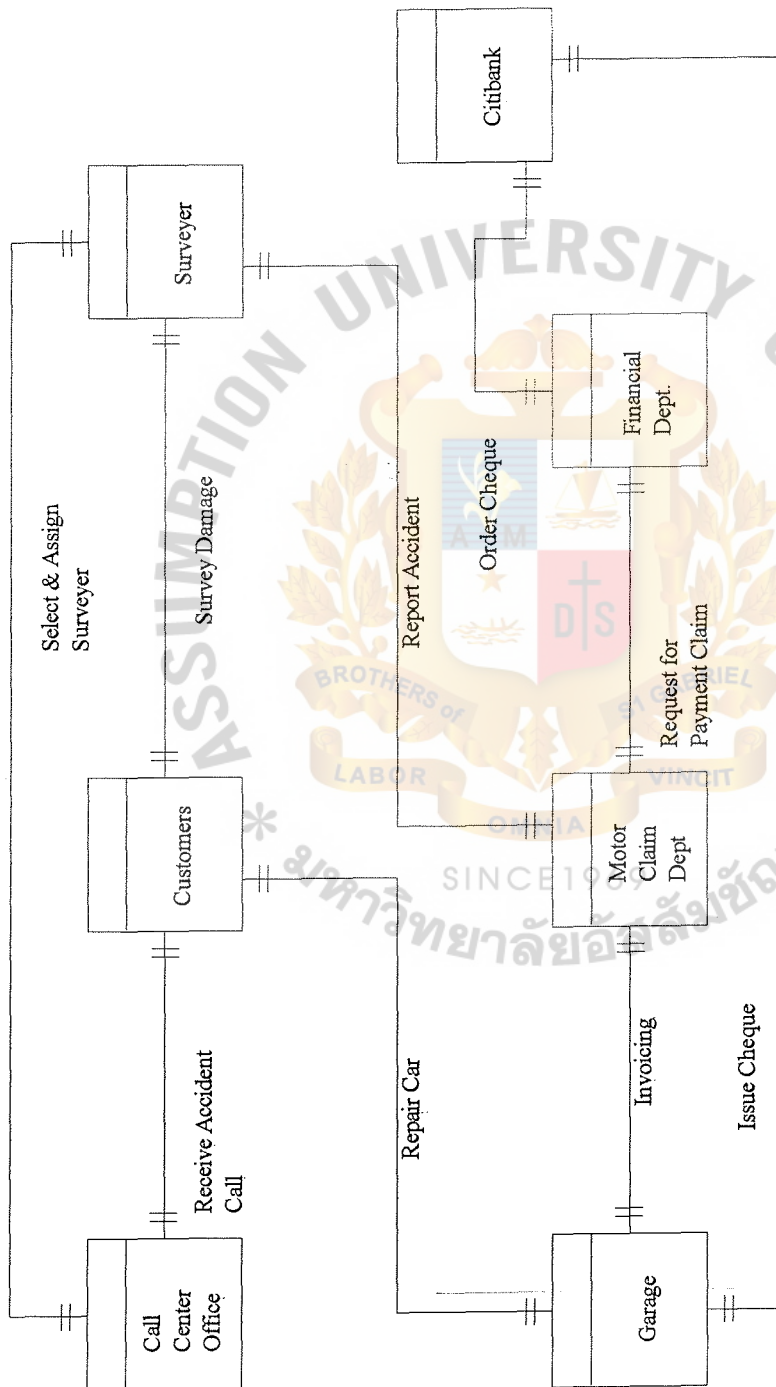


Figure A.1. Context Data Model (E-R Diagram) for Claim Payment System.

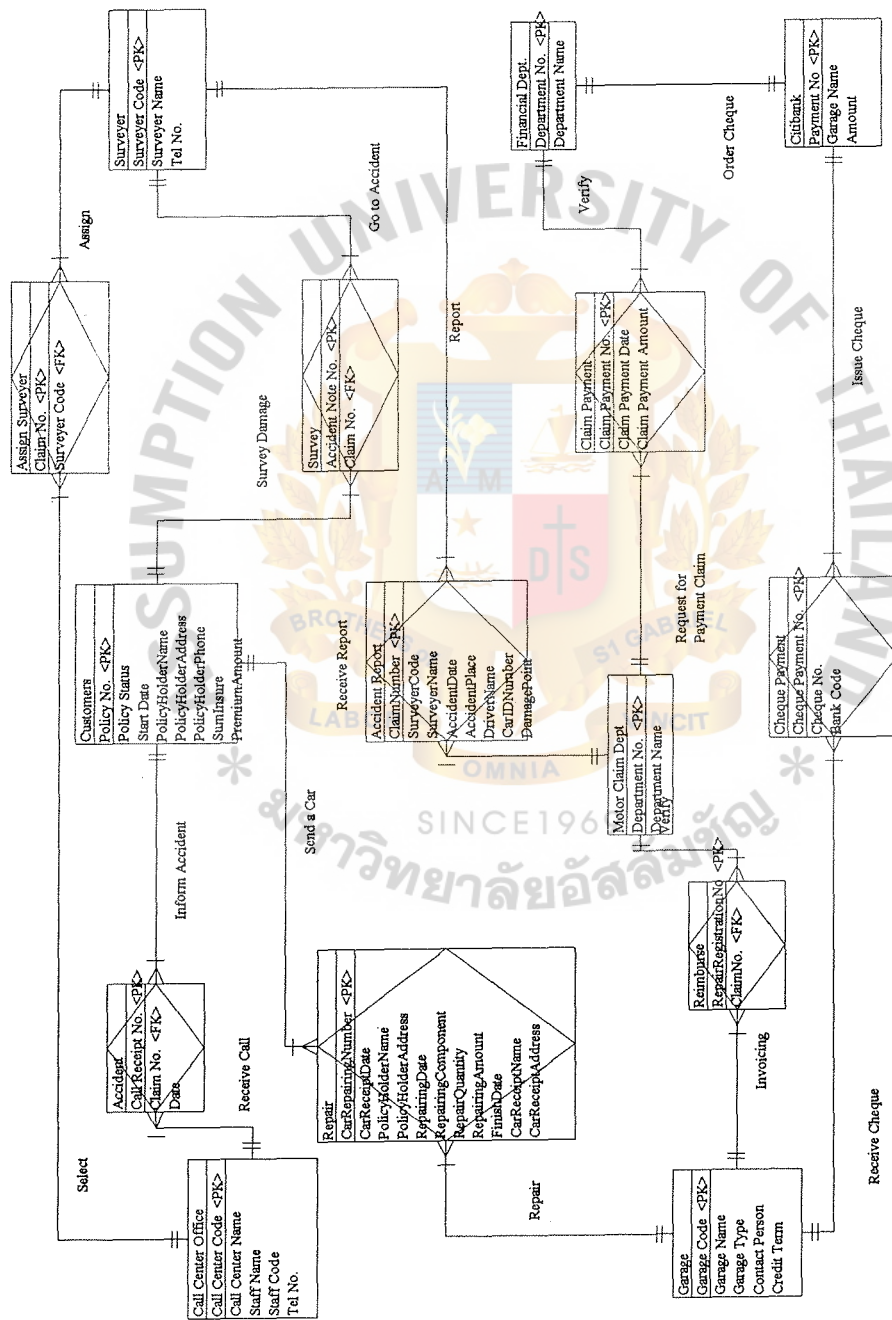


Figure A.2. Data Model (E-R Diagram) – Full Attribute for Claim Payment System.

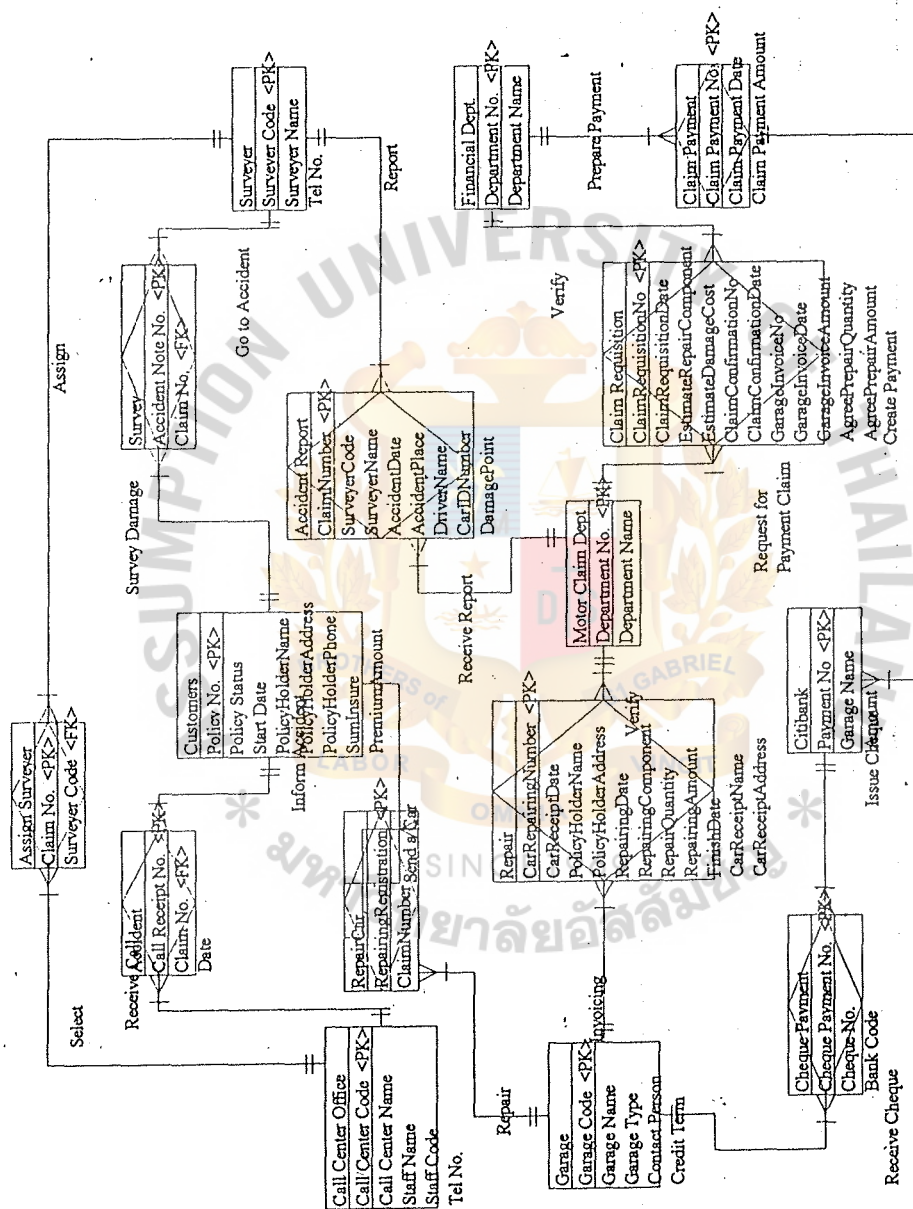


Figure A.3 Data Model (E-R Diagram) at the 3rd Normal Form of Claim Payment System.



APPENDIX B

PROCESS MODEL - CONTEXT DIAGRAM

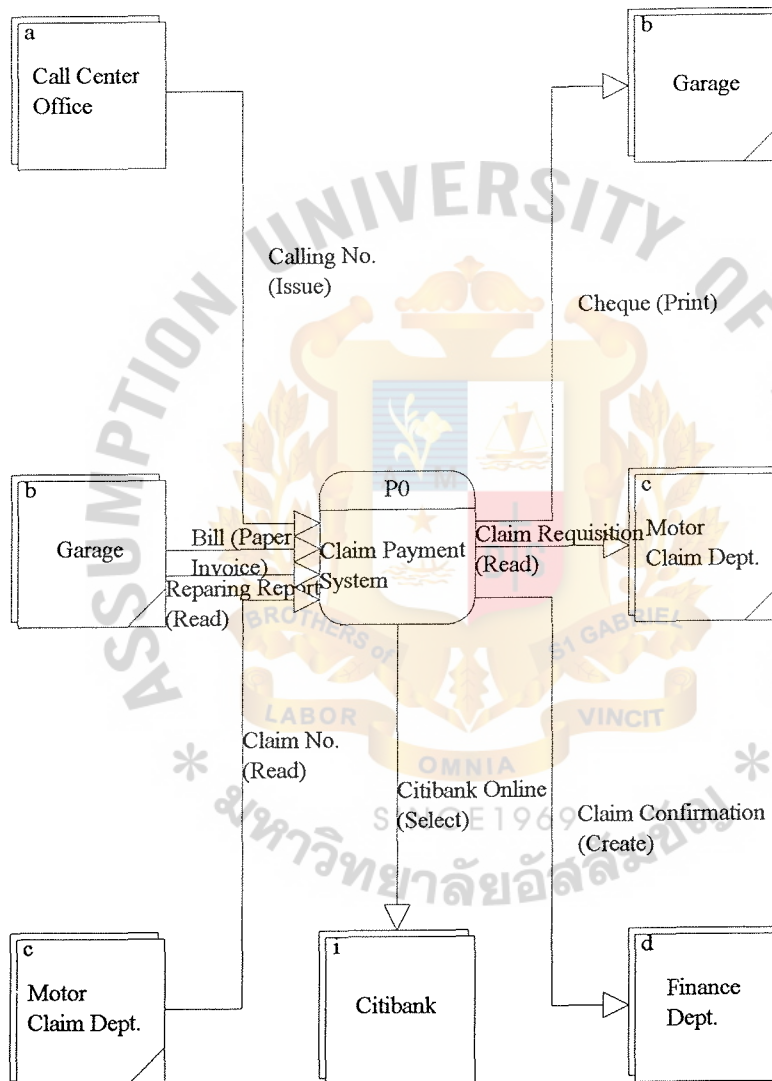
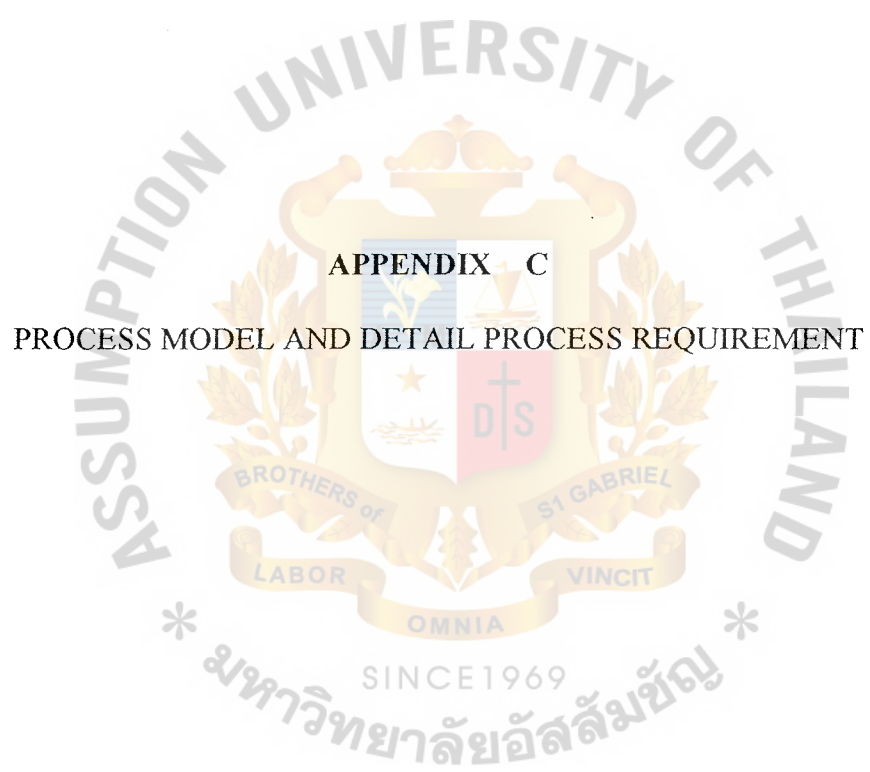


Figure B.1. Context Diagram of Claim Payment System.



APPENDIX C

PROCESS MODEL AND DETAIL PROCESS REQUIREMENT

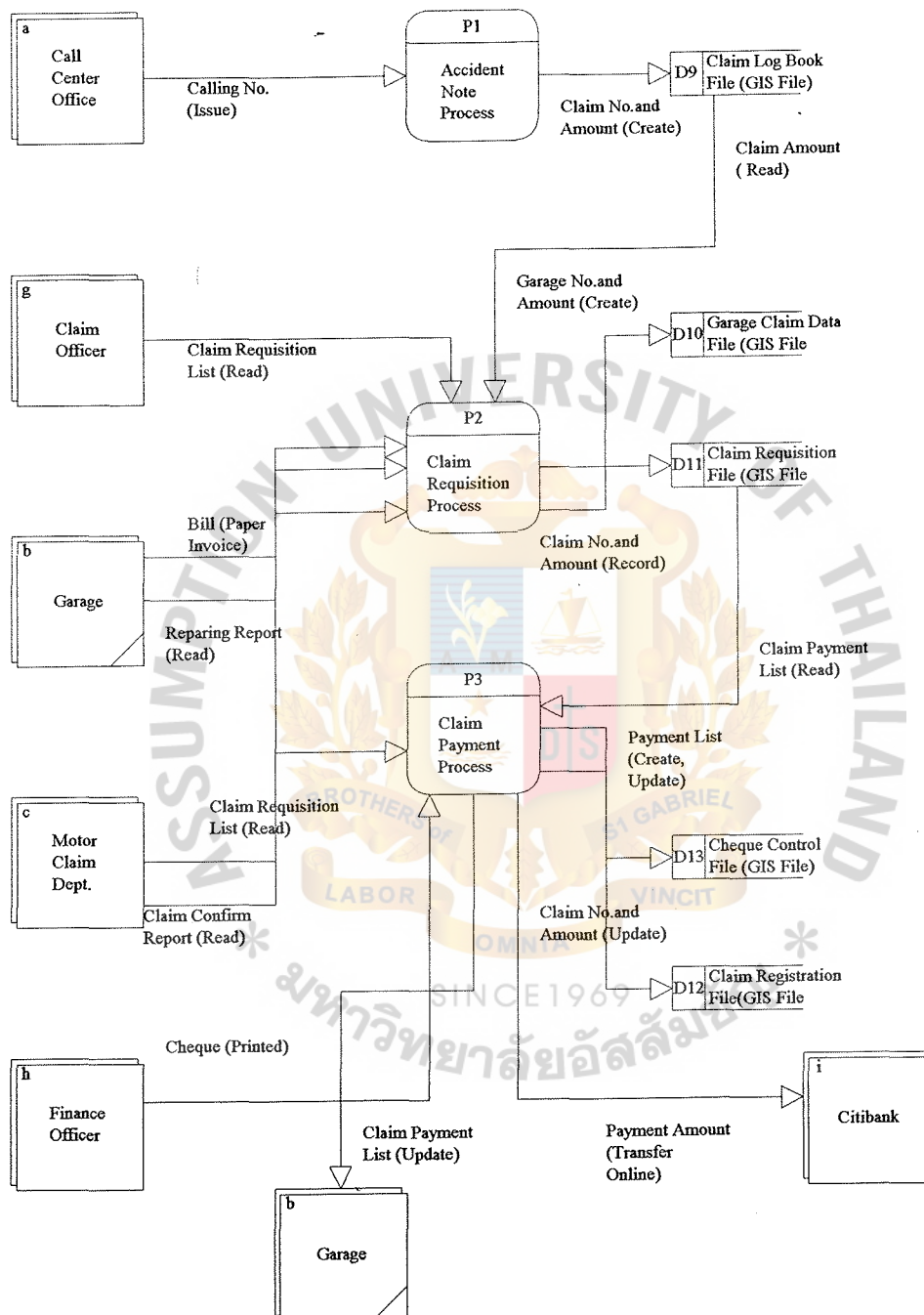


Figure C.1. Physical Data Flow Diagram Level 0 of Claim Payment System.

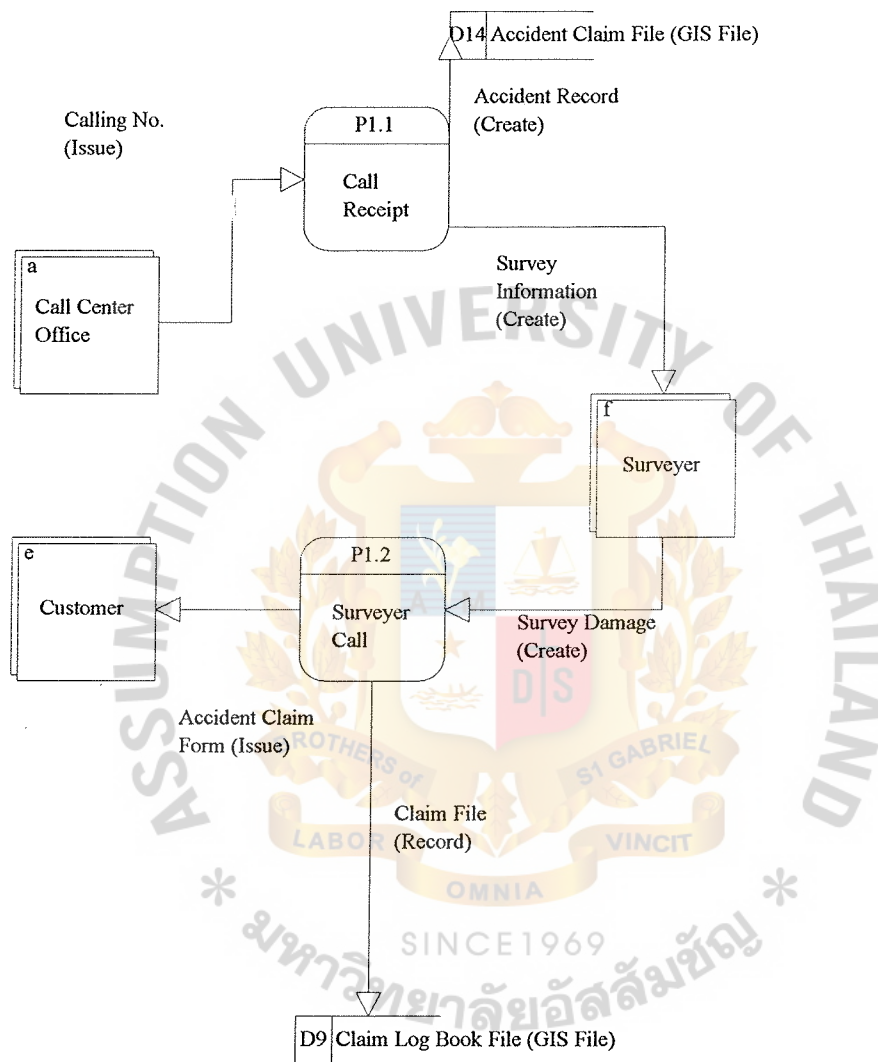


Figure C.2. Data Flow Diagram Level 1 of Accident Note Process.

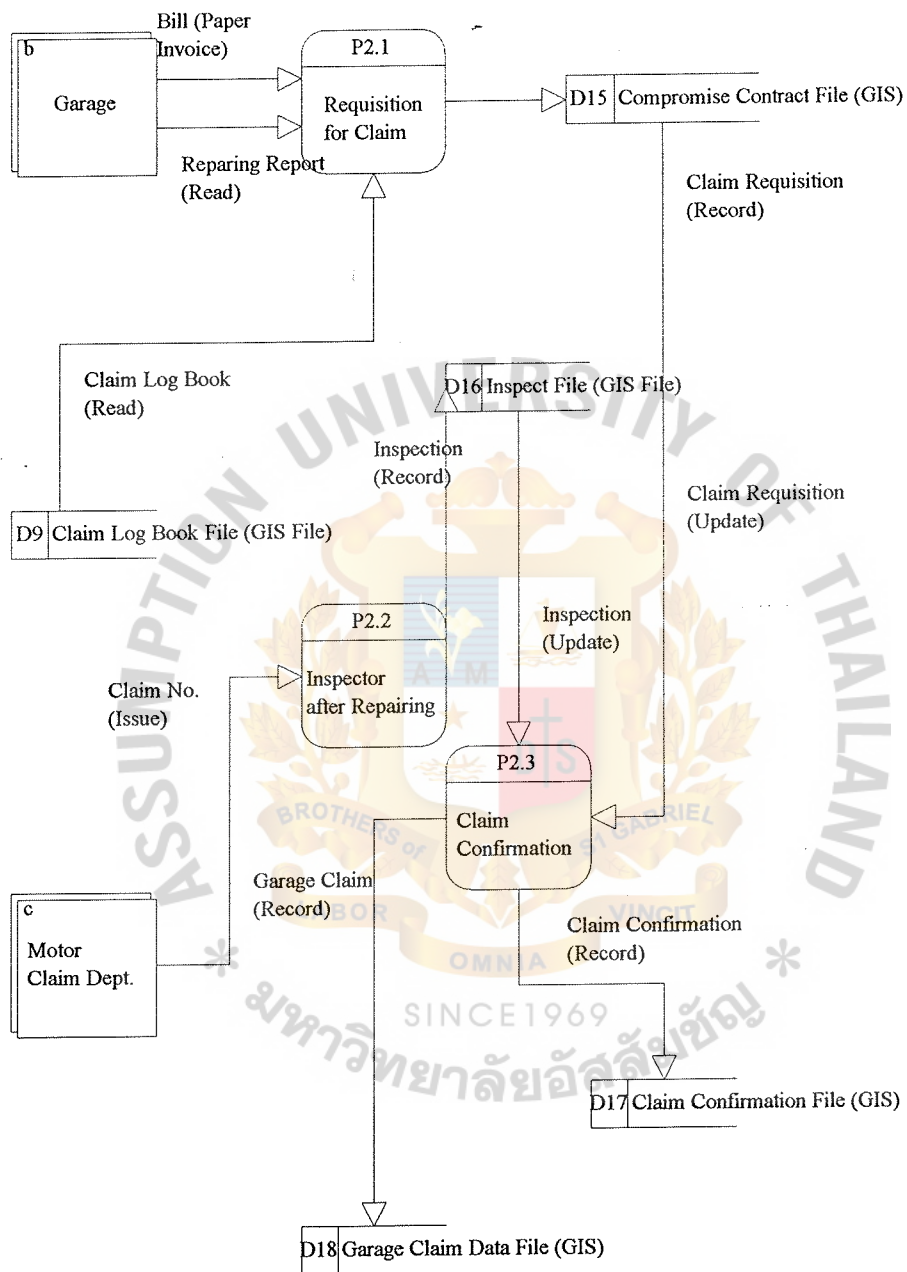


Figure C.3. Data Flow Diagram Level 1 of Claim Requisition Process.

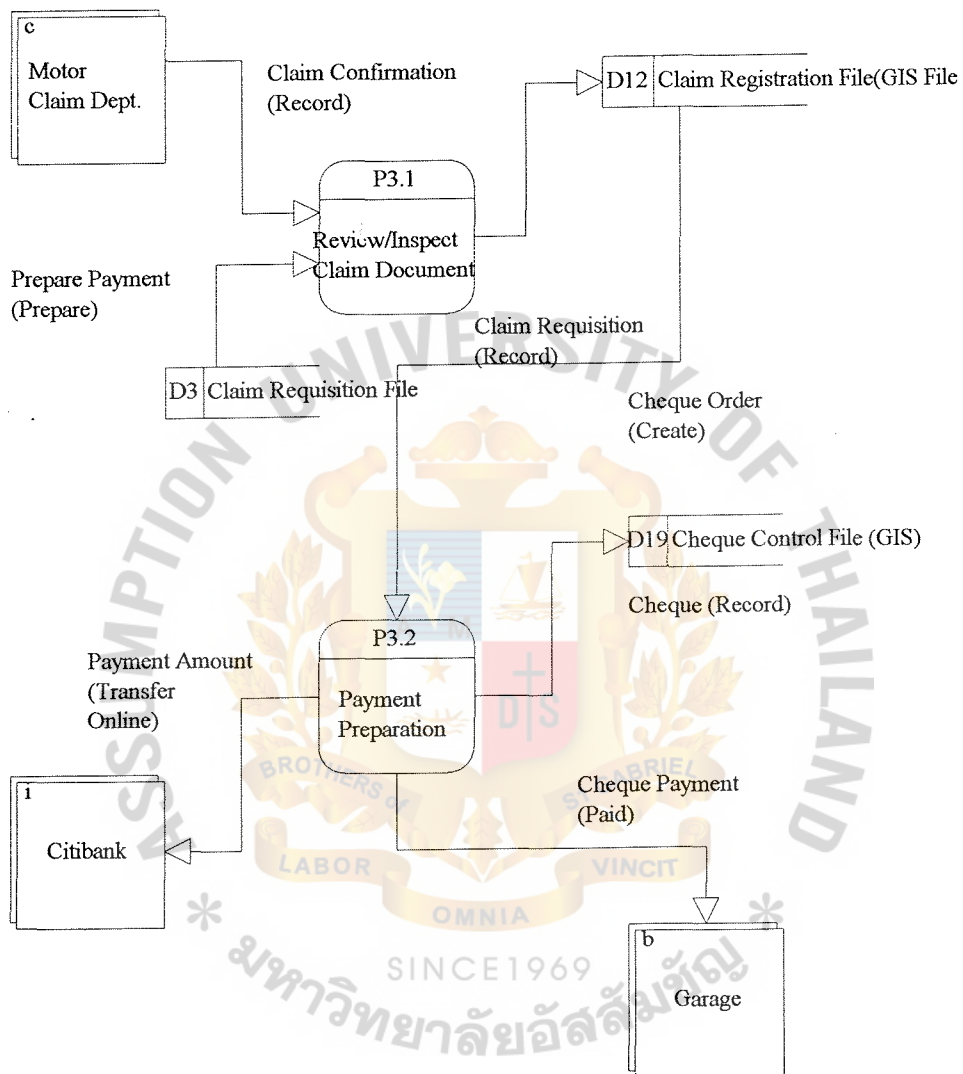


Figure C.4. Data Flow Diagram Level 1 of Claim Payment Process.

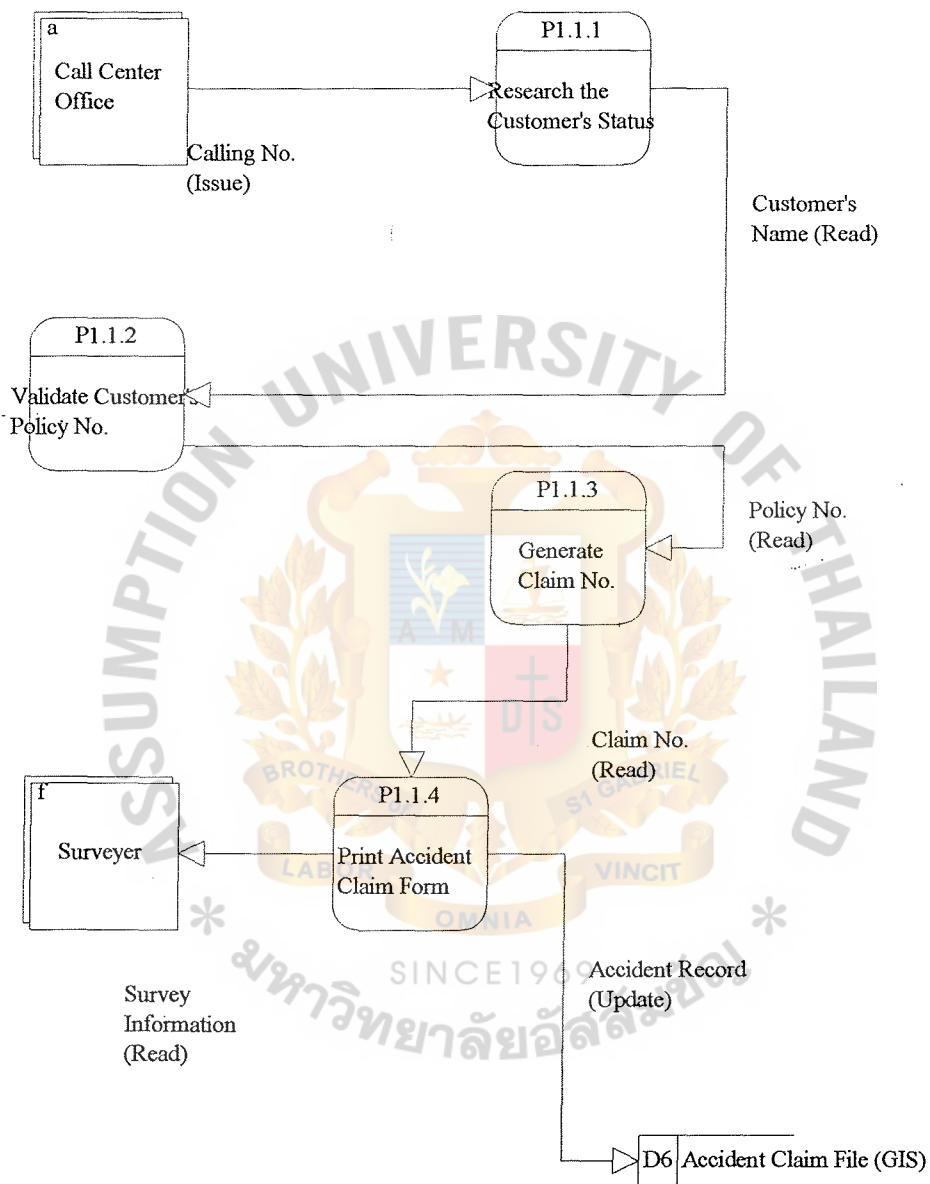


Figure C.5. Data Flow Diagram Level 2 of Call Receipt Activity.

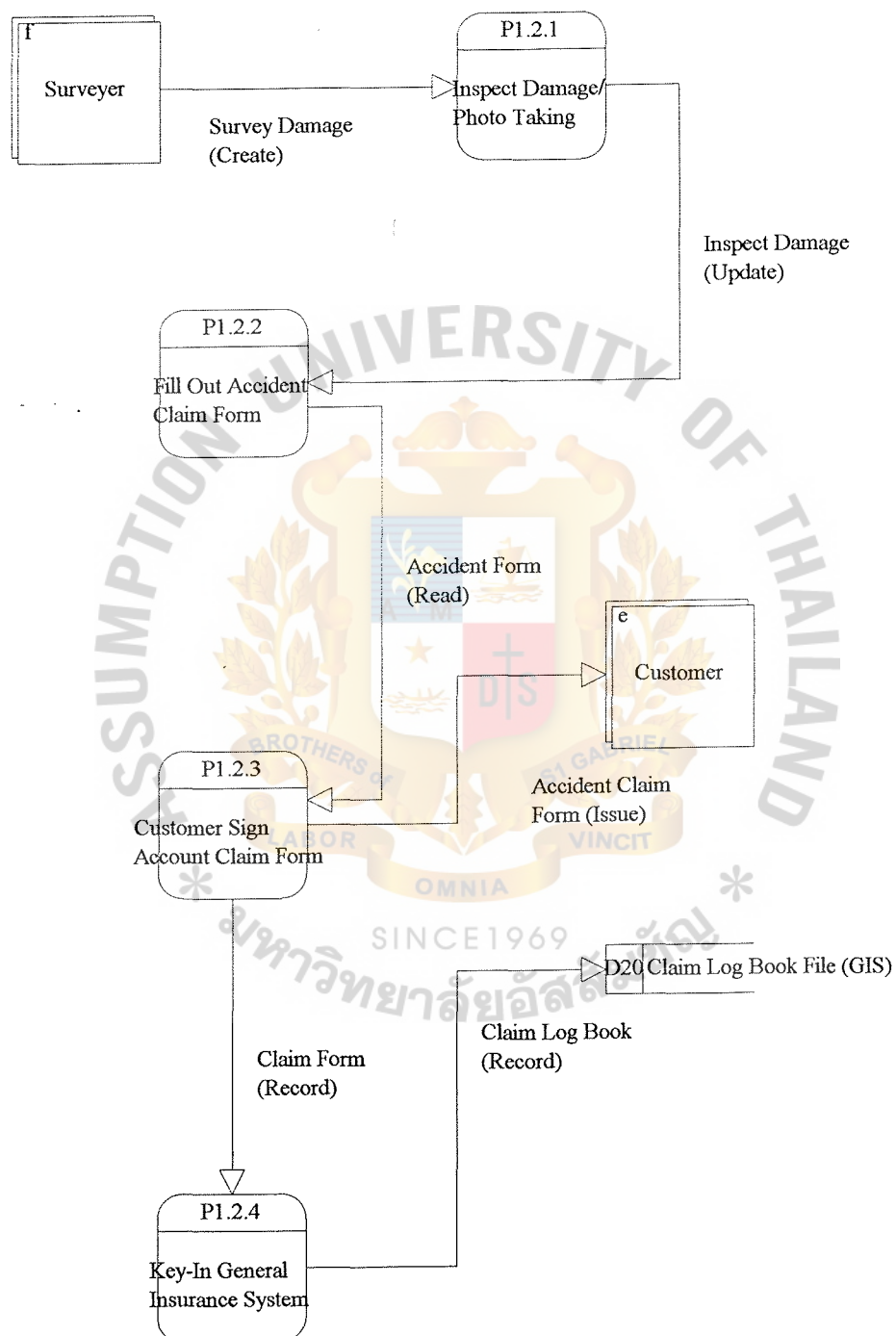


Figure C.6. Data Flow Diagram Level 2 of Surveyor Call Activity.

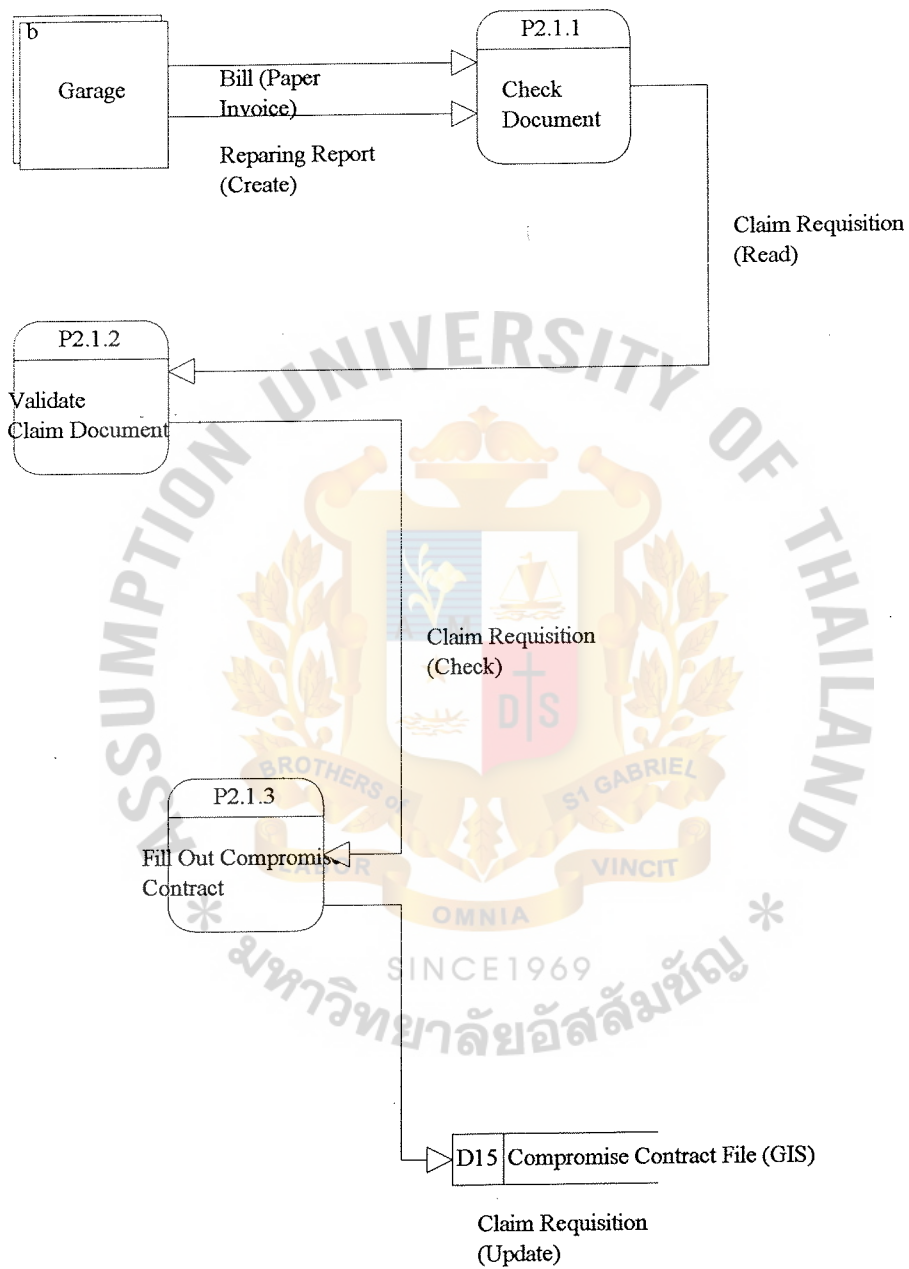


Figure C.7. Data Flow Diagram Level 2 of Requisition for Claim.

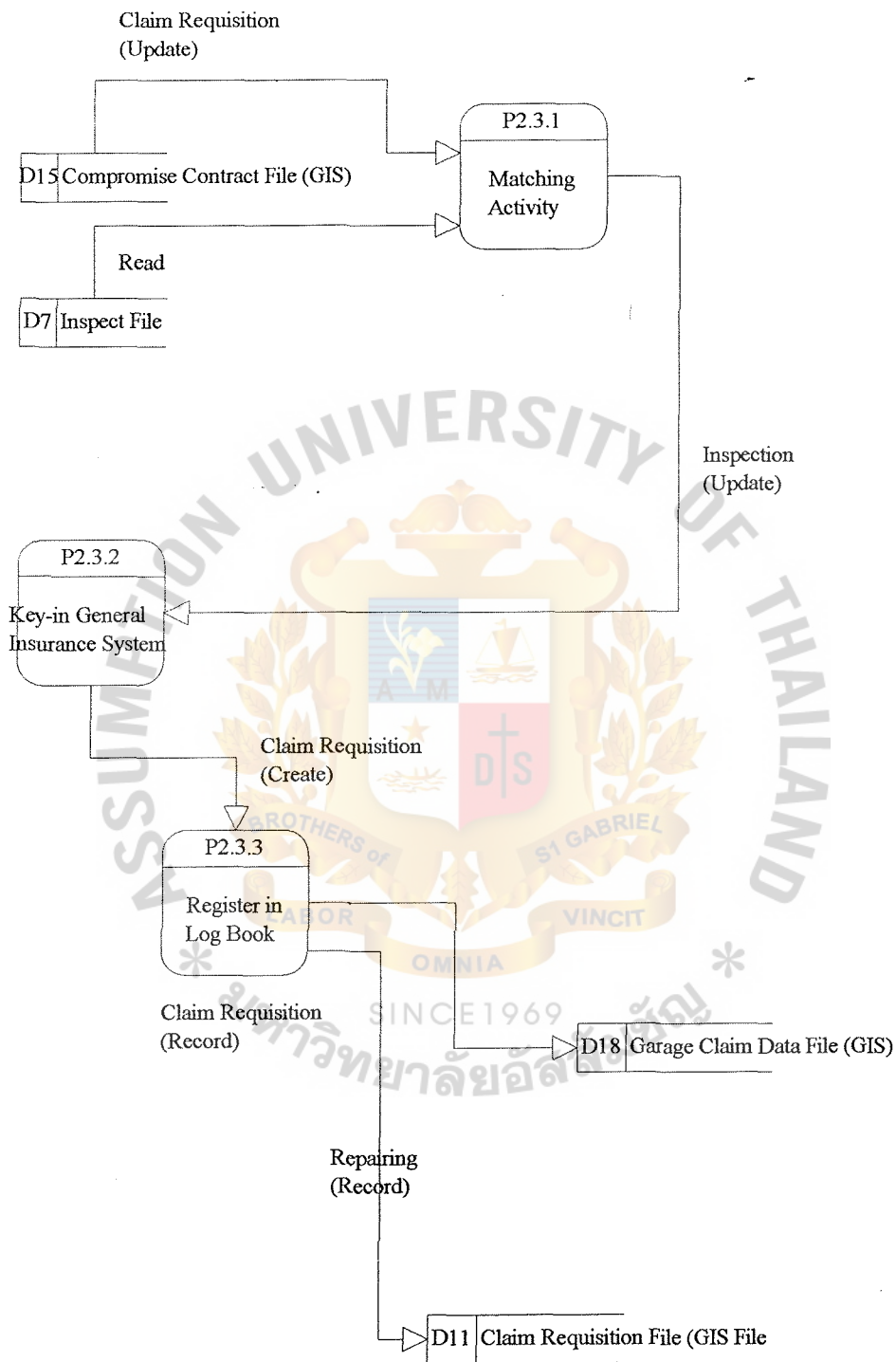


Figure C.8: Data Flow Diagram Level 2 of Claim Confirmation Activity.

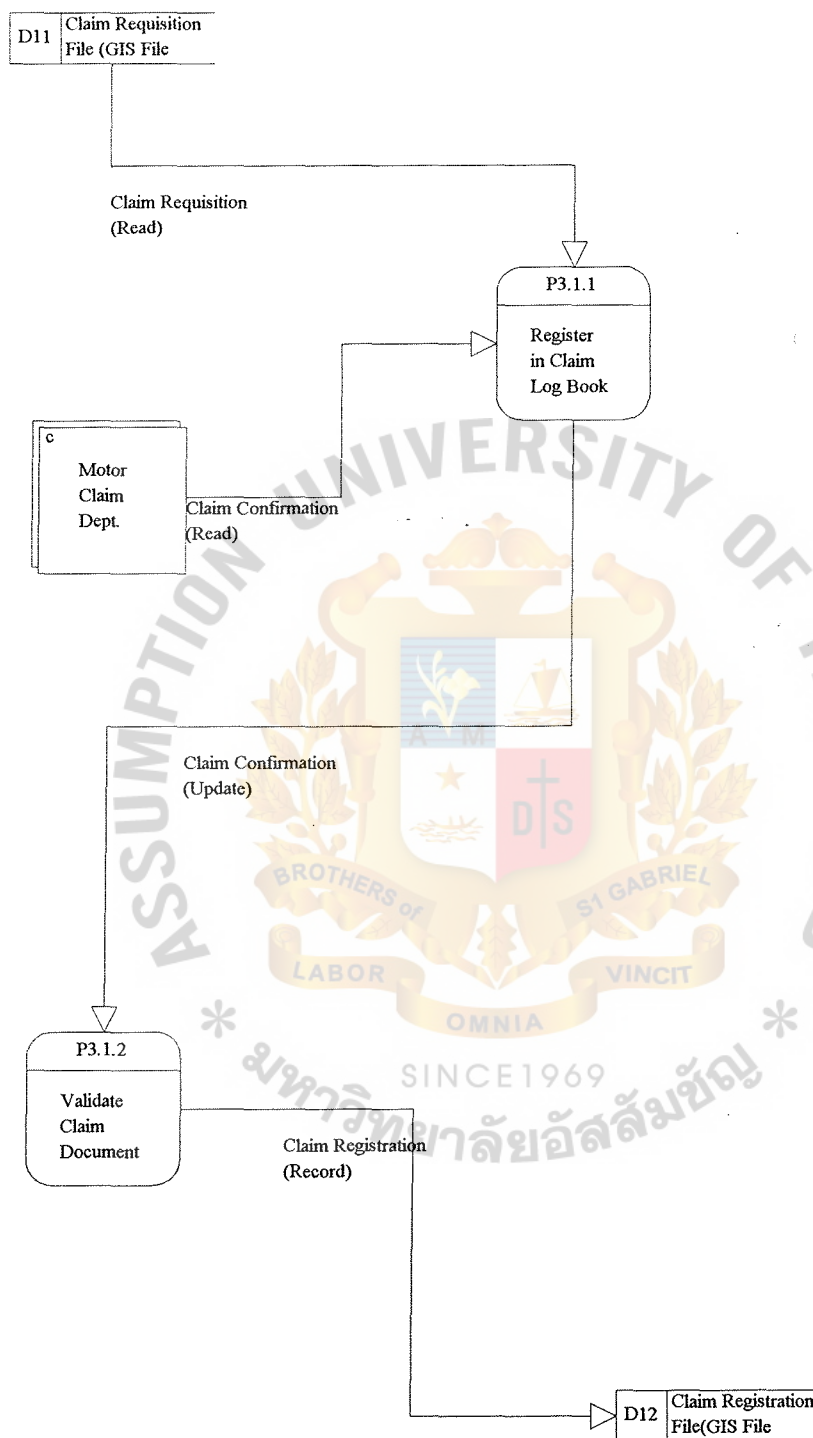


Figure C.9. Data Flow Diagram Level 2 of Review/ Inspect Claim Document.

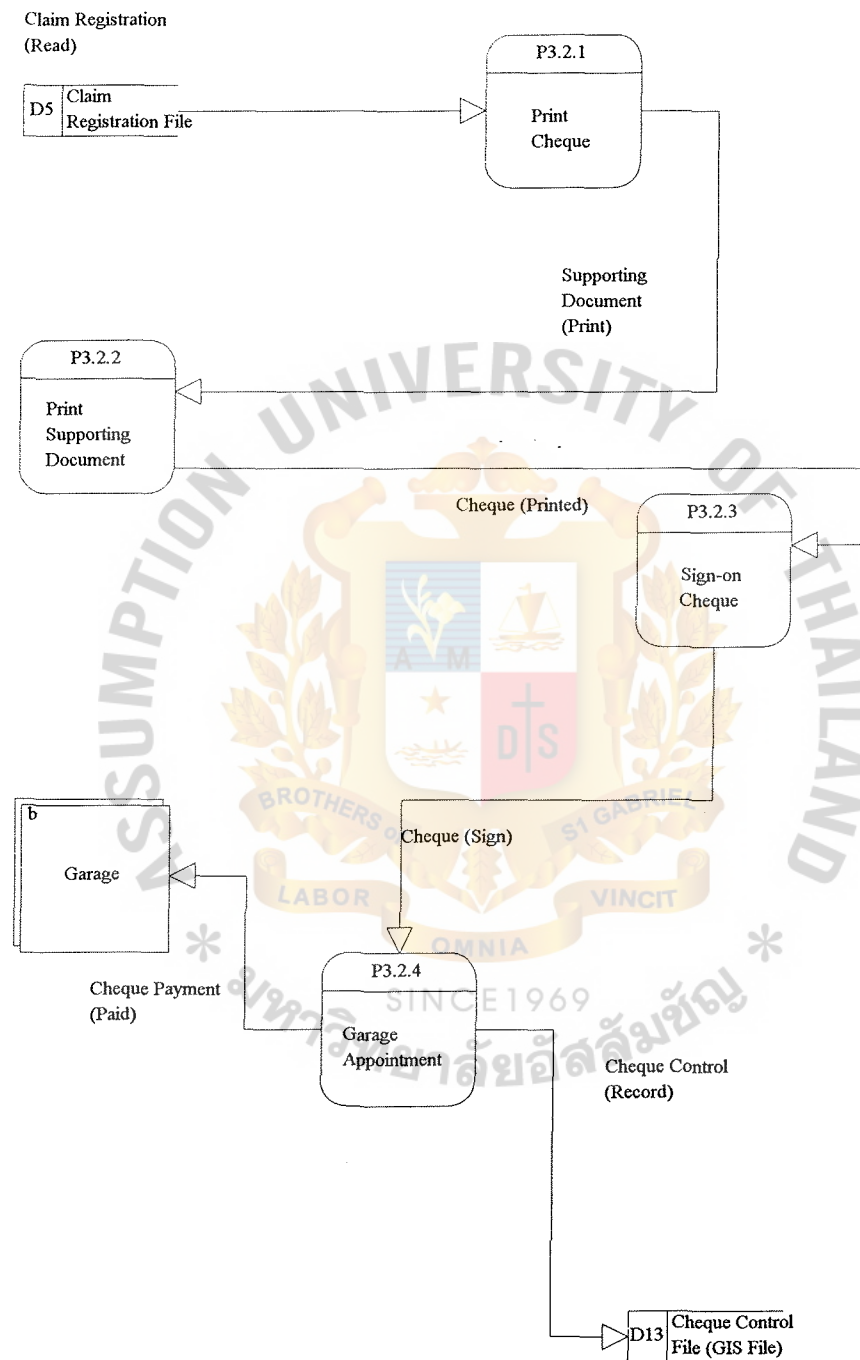


Figure C.10. Data Flow Diagram Level 2 of Cheque Payment Activity.



APPENDIX D

DATA DICTIONARY

Table D.1. Data Dictionary.

Object Name	Object Type	Definition	Short Description
Bill (Paper Invoice)	Data Flow	* document issued requiring cash payment * invoice no. + invoice date + car repaired component + car repaired quantity + invoice amount	The Garages send bills after they completely repaired the accident cars.
Calling No. (Issue)	Data Flow	* number of accident running on each type branch or in head office* 7(numeric digit)	After a call center gets an accident call, she/he will book the number of accident into the computer.
Cheque (Printed)	Data Flow	* print the cheque for claim payment to the garage directly* cheque payment no. + cheque no. +	Manual cheque printing issued by the finance department.

Table D.2. Data Dictionary (Continue).

Object Name	Object Type	Definition	Short Description
		cheque date + cheque amount	
Claim Amount (Read)	Data Flow	* read amount of expected claim* surveyor code + surveyor name + accident date + driver name + driver ID + car ID + expected damage cost	Claim amount is retrieved from the Claim Log- Book file to the Claim Requisition Process.
Claim Confirm Report (Read)	Data Flow	* read information about claim confirmation * claim confirmation no. + claim confirmation date + claim confirmation amount	The claim officer processes for invoice due.
Claim No. and amount (Create)	Data Flow	* create information about claim number and expected claim	After a surveyor gets an accident Information, all

Table D.3. Data Dictionary (Continue).

Object Name	Object Type	Definition	Short Description
		amount * claim no. + call receipt no. + claim date + expected claim amount	claim number and expected amount will be entered into the General Insurance system.
Claim No. and amount (Record)	Data Flow	* record information about claim number and expected claim amount * claim no. + call receipt no. + claim date + expected claim amount	After Claim Requisition Processes, this information is kept at the Claim Requisition file.
Claim No. and amount (Update)	Data Flow	* update information about claim number and expected claim amount *	After Claim Payment Process, this information is kept at the Claim

Table D.4. Data Dictionary (Continue).

Object Name	Object Type	Definition	Short Description
		claim requisition no. + claim requisition date + claim confirmation no. + claim confirmation date + invoice no. + invoice amount + agree repaired amount	Requisition file.
Claim Payment List (Read)	Data Flow	* read list of claim payment* claim payment no. + claim payment date + claim payment amount	After the Claim Payment Process, the claim payment file (in the General Insurance System) is retrieved
Claim Payment List (Update)	Data Flow	* update list of claim payment* claim payment no. + claim payment	After the Claim Payment Process, the information is updated by the

Table D.5. Data Dictionary (Continue),

Object Name	Object Type	Definition	Short Description
		date + claim payment amount	motor claim officer.
Claim Requisition List (Read)	Data Flow	*read list of claim requisition * car repair no. + car received date + policyholder code + policyholder name + repaired quantity + repaired amount + finished date + expected repaired amount	During the Claim Payment Process, a claim officer retrieve this information via the claim Requisition file in order to match information from repairing report (from the garages)
Garage No. and amount (Create)	Data Flow	*create information about garage* garage no. + invoice date + date of car repaired + quantity of car components + invoice amount	After the Claim Requisition Process, a claim officer creates this information and keeps in the Garage Claim data file.

Table D.6. Data Dictionary (Continue).

Object Name	Object Type	Definition	Short Description
Payment Amount (Transfer Online)	Data Flow	* transfer information about claim payment to Citibank * payment no. + transfer date + garage name + garage account no. + type of account + amount	It is an information of motor claim payment transfer via Modem to Citibank. This information is automatic transfer into the garages' accounts.
Payment List (Create, Update)	Data Flow	*create and update list of claim payment* claim requisition no. + invoice no. + claim requisition date + invoice amount + agreed repaired quantity + agreed repaired amount	After the Claim Payment Process, a finance officer will create or update this information from or to the Claim Requisition file in order to create/ update payment list in the

Table D.7. Data Dictionary (Continue).

Object Name	Object Type	Definition	Short Description
			Citibank Control Book file and Cheque Control file.
Repairing Report (Read)	Data Flow	*document issued for identifying car repaired* car receipt no. + car receipt date + policyholder name + car repairing components + car repairing quantity + car repairing cost + finished date + car returned date	During the Claim requisition process, a claim officer retrieve all information from the Claim Log Book file and key in certain data from repairing report (from garages)
Accident Note Process	Data Process	It is the first Process of Claim payment, It consists of two sub processes; 1) Call Receipt Process and	The Call Receipt Process is a process of gathering an accident call from the clients.

Table D.8. Data Dictionary (Continue).

Object Name	Object Type	Definition	Short Description
		2) Surveyor Call Process.	An operator keys in number of accident call and find the nearest surveyor. The Surveyor Call Process is calling a nearest surveyor to the accident place
Claim payment Process	Data Process	It is the third process of Claim Payment System, it comprises of two sub processes; 1) Review/ Inspect claim document process and 2) Payment Preparation Process	The Review/ Inspect claim document process is a process to prove the validation of data and information and the Payment Preparation is a process to prepare manual

Table D.9. Data Dictionary (Continue).

Object Name	Object Type	Definition	Short Description
			cheque or on-line transfer to Citibank.
Claim Requisition Process	Data Process	The second process of claim payment system, it consists of the Requisition for claim and the inspector after repairing process	The Requisition for the claim is process to record information from garage in both bulling and repairing report and the inspector after repairing is a process to check the validation in pricing of car components and quantity consumed.
Cheque Control File (GIS File)	Data Store	Data store in cheque control file after claim payment	After the Claim Payment Process, the Cheque

Table D.10. Data Dictionary (Continue).

Object Name	Object Type	Definition	Short Description
		process	Control file is a data file that is kept via General Insurance System.
Claim Log Book File (GIS File)	Data Store	Data store of claim number and expected claim payment process	After an Accident Note Process, this date will be kept at the Claim Log Book file via General Insurance System.
Claim Registration File (GIS File)	Data Store	Data store in claim registration file after the Claim Payment Process.	After the Claim Payment Process, this information is kept in the Claim Registration file. It is a data file that is kept via

Table D.11. Data Dictionary (Continue).

Object Name	Object Type	Definition	Short Description
			General Insurance System.
Claim Requisition File (GIS File)	Data Store	Data store after the claim requisition process	The Claim Requisition file is a data file that is kept via the General Insurance System.
Garage Claim Data File (GIS File)	Data Store	Data store after the claim the claim requisition process	The Garage Claim Data file is a data file that is kept via the General Insurance System.
Call Center Office	External Entity	A group of persons who work in both the Head Office and branches. They are called "Accident	They have a duty to receive accident calls from the customers and

Table D.12. Data Dictionary (Continue),

Object Name	Object Type	Definition	Short Description
		Operator”. They are all under the Claim department, which is supervised by a Claim Manager.	contact the nearest surveyor to go to the accident place. They work 24 hours (3 shifts a day) to serve the accident cases.
Citibank	External Entity	A bank that provides on-line cash transfer	The last of Claim payment process is the transfer of cash to the bank. Cash will be directly automatic posted to the garages’ accounts
Claim Officer	External Entity	A group of independent claim officer that perform a task to verify and validate the	During the Claim Requisition Process, this claim officer has to prove the

Table D.13. Data Dictionary (Continue).

Object Name	Object Type	Definition	Short Description
		repairing quantity, repairing car components and pricing.	validity of the evidence and document.
Finance officer	External Entity	A finance manager who is in the Head office	The finance manager has taken the responsibility to approve the claim payment transactions and also arranged appropriate types of payment for either the manual cheque or the on- line transfer via Citibank.
Garage	External Entity	Garages that repair the accident car	After the garages finish repairing the accident car, they send .

Table D.14. Data Dictionary (Continue).

Object Name	Object Type	Definition	Short Description
			invoices and repairing reports to the motor claim department.
Motor Claim Depart.	External Entity	A group of claim payment officers under the Claim department	They are not the same group as the independent claim officer. They have a responsibility to review and inspect claim document.



APPENDIX E

INPUT, INTERFACE AND OUTPUT DESIGN

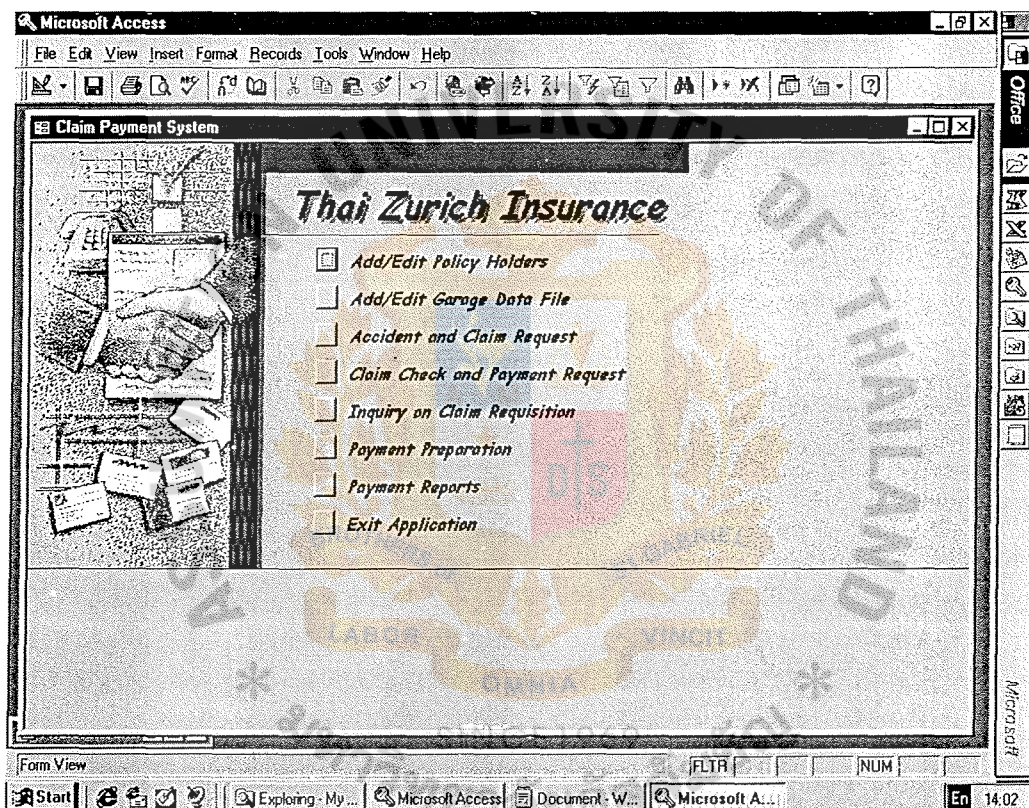


Figure E.1. Main Menu Screen of Claim Payment System.

PolicyNumber	
PolicyStatus	Type 1
PolicyCoveragePeriod	05-Dec-93
PolicyHolderName	Noppadol Keereepailhoon
PolicyAddress	32/8 Muangthong Thani, Bangkok
PolicyHolderPhone	951-0875
CardIDNumber	
SumInsurance	500000
PremiumAmount	130000

Figure E.2. Add/Edit Policyholder (Input Screen).

GarageCode	1001
GarageName	Kung Garage
GarageAddress	78 Tivanon Road, Nonthaburi 11000
GaragePhone	588-3117

Figure E.3. Add/Edit Garage Data File (Input Screen).

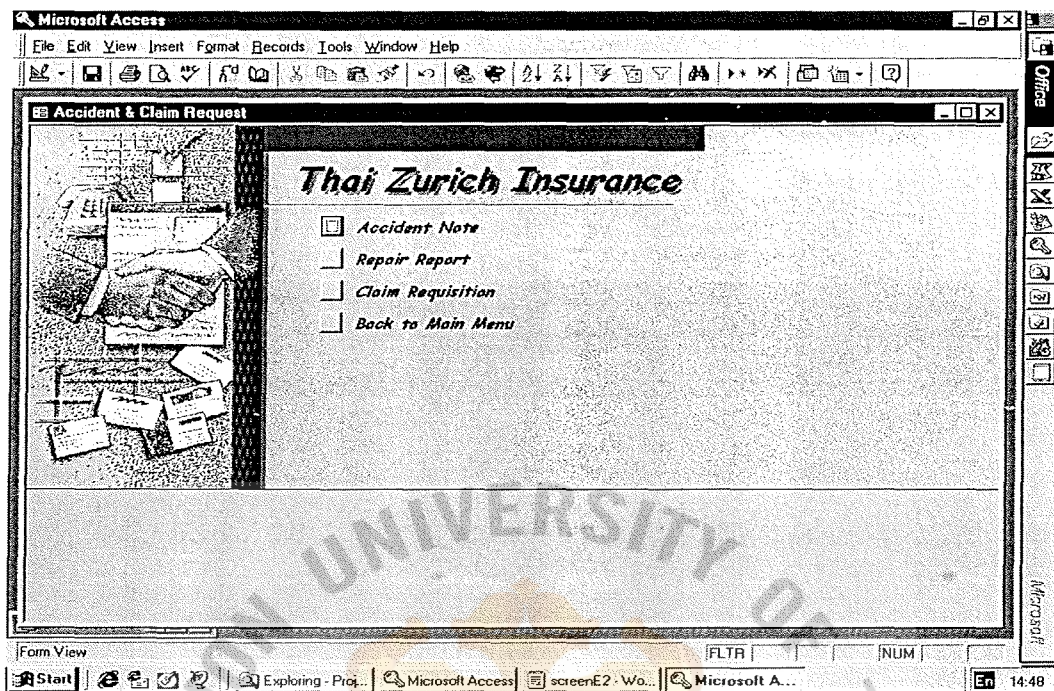


Figure E.4. Submenu Screen: Accident and Claim Request.

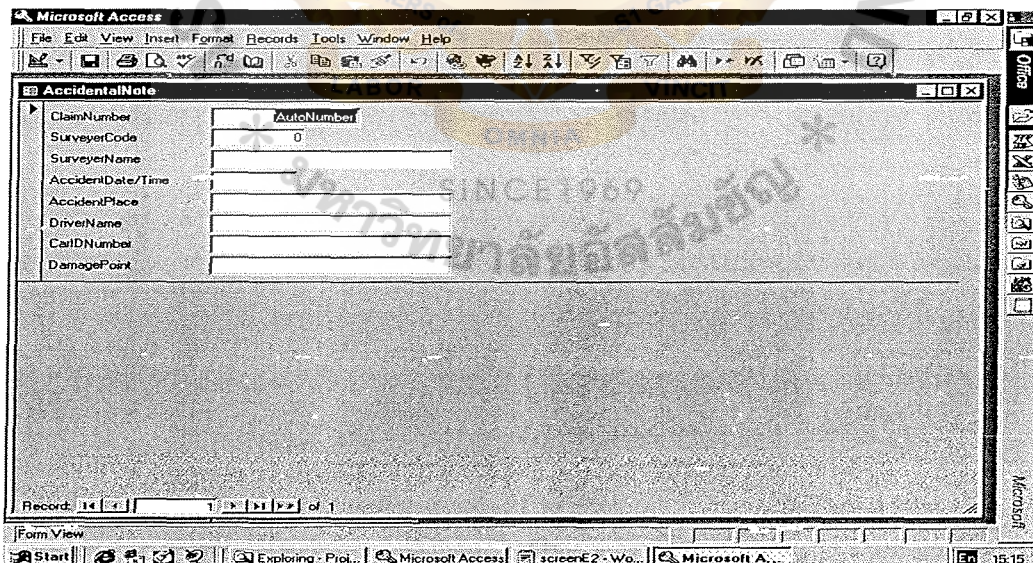


Figure E.5. Accident Note Screen (Input Screen).

Microsoft Access

File Edit View Insert Format Records Tools Window Help

RepairingReport

CarRepairingNumber: AutoNumber

CarReceiptDate:

PolicyHolderName:

PolicyHolderAddress:

RepairingDate:

RepairingComponents:

RepairingQuantities: 0

RepairingAmount: 0

FinishDate:

CarReceiptName:

CarReceiptAddress:

Record: 1 of 1

Form View

Start Exploring - Project Microsoft Access Document - WordPad Microsoft Access 16:05

Figure E.6. Repair Report Screen (Input Screen).

Microsoft Access

File Edit View Insert Format Records Tools Window Help

ClaimRequisition

ClaimRequisitionNumber: AutoNumber

ClaimRequisitionDate:

EstimateRepairComponent:

EstimateComponentPrice: 0

PriceControlAuthorizeName:

RepairingReportNumber: 0

Record: 1 of 1

Form View

Start Exploring - Project Microsoft Access Document - WordPad Microsoft Access 16:09

Figure E.7. Claim Requisition Screen (Input Screen).

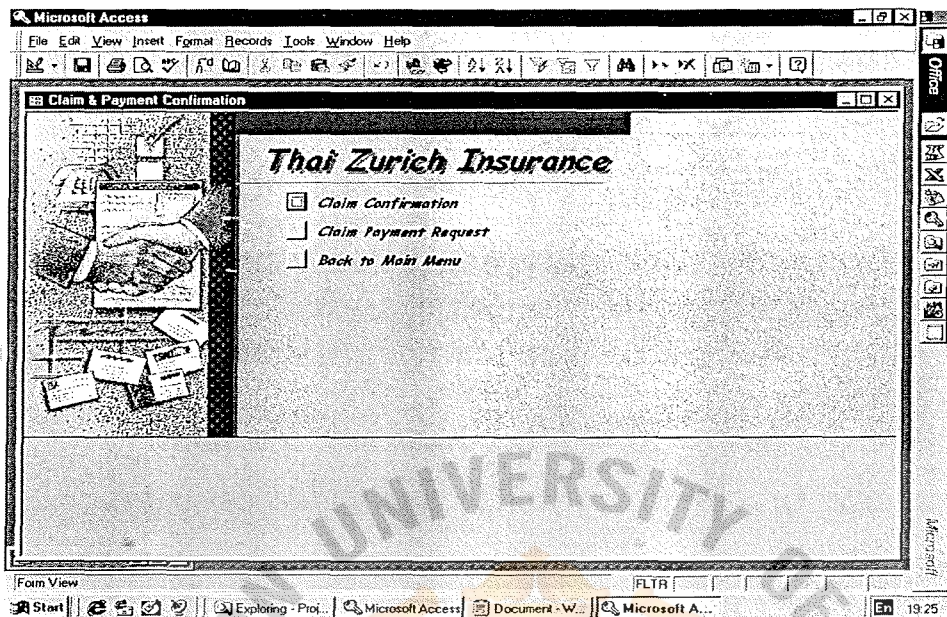


Figure E.8. Submenu Screen : Claim Check and Payment Request.

ClaimConfirmationNumber	AutoNumber
ClaimConfirmationDate	
GarageInvoiceNumber	0
GarageInvoiceDate	
GarageInvoiceAmount	0
AgreeRepairedQuantity	0
AgreeRepairedAmount	0
Authorized (Y/N)	
ClaimAuthorizedName	
ClaimRequestNumber	0

Figure E.9. Claim Confirmation Screen (Input Screen).

ClaimPaymentOrder

ClaimPaymentNumber: AutoNumber

ClaimPaymentDate:

ClaimPaymentAmount: 0

PaymentType:

ClaimAuthorizedName:

Authorize (Y/N):

ClaimConfirmationNo: 0

Record: 14 of 1

Form View

Figure E.10. Claim Payment Order (Input Screen).

Inquiry on Claim Requisition

Thai Zurich Insurance

☒ Inquiry on Accident Note

☐ Inquiry on Repair Report

☐ Inquiry on Claim Requisition

☐ Inquiry on Claim Confirmation

☐ Back to Main Menu

Form View

FLTR

Figure E.11. Submenu Screen: Inquiry on Claim Requisition.

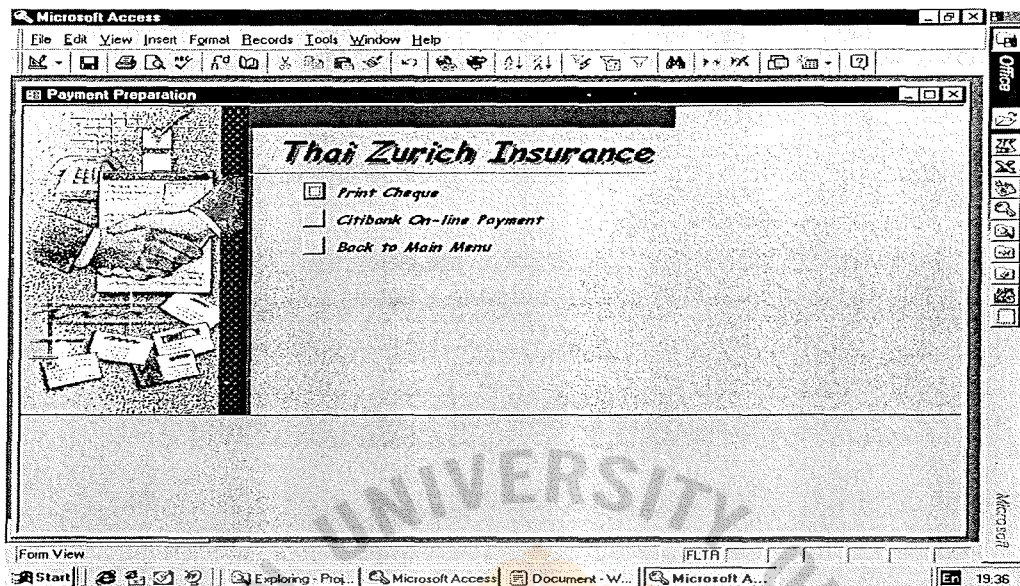


Figure E.12. Submenu Screen: Payment Preparation.

ChequeNo	(AutoNumber)
ChequeDate	
ChequeAmount	0
GarageName	
ClaimPaymentNo	0

Figure E.13. Cheque Issue Screen (Input Screen).

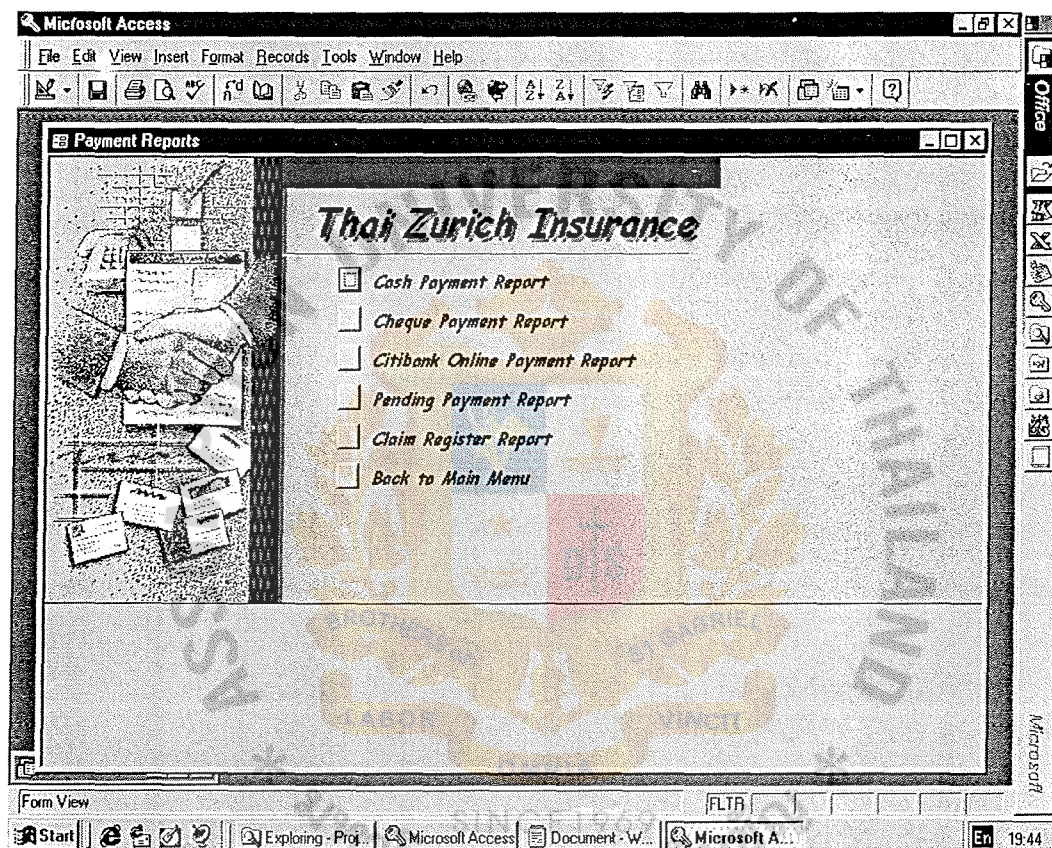


Figure E.14. Submenu Screen : Payment Reports.

[illegible]

Figure E.15. Cash Payment Report (output).

Thai Zurich Insurance

as of ____ / ____ / ____

Thai Zurich Insurance

[illegible]

Figure E.17. Citibank Online Payment Report (Output).

Thai Zurich Insurance

as of ____ / ____ / ____

[illegible]

Figure E.19. Claim Register Report (Output).



APPENDIX F
STRUCTURE CHARTS

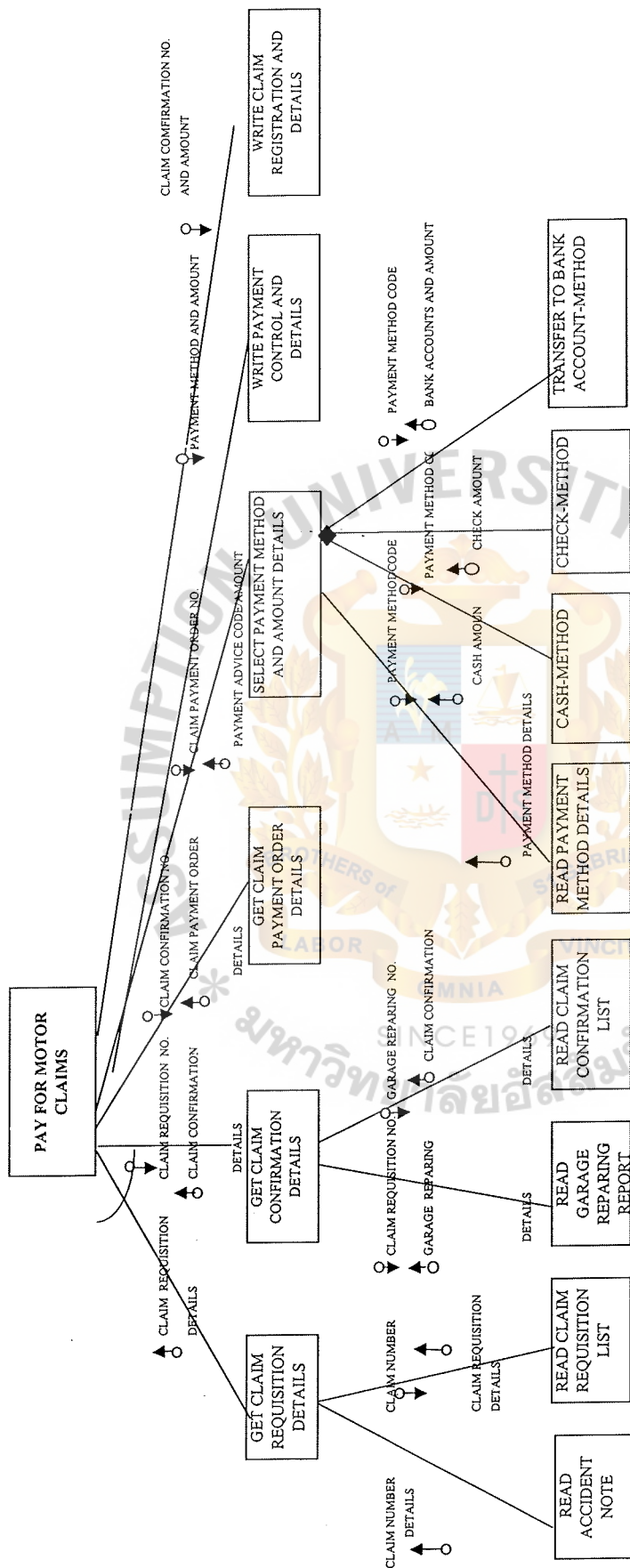


Figure F.1. Structure Chart of Claim Payment System.



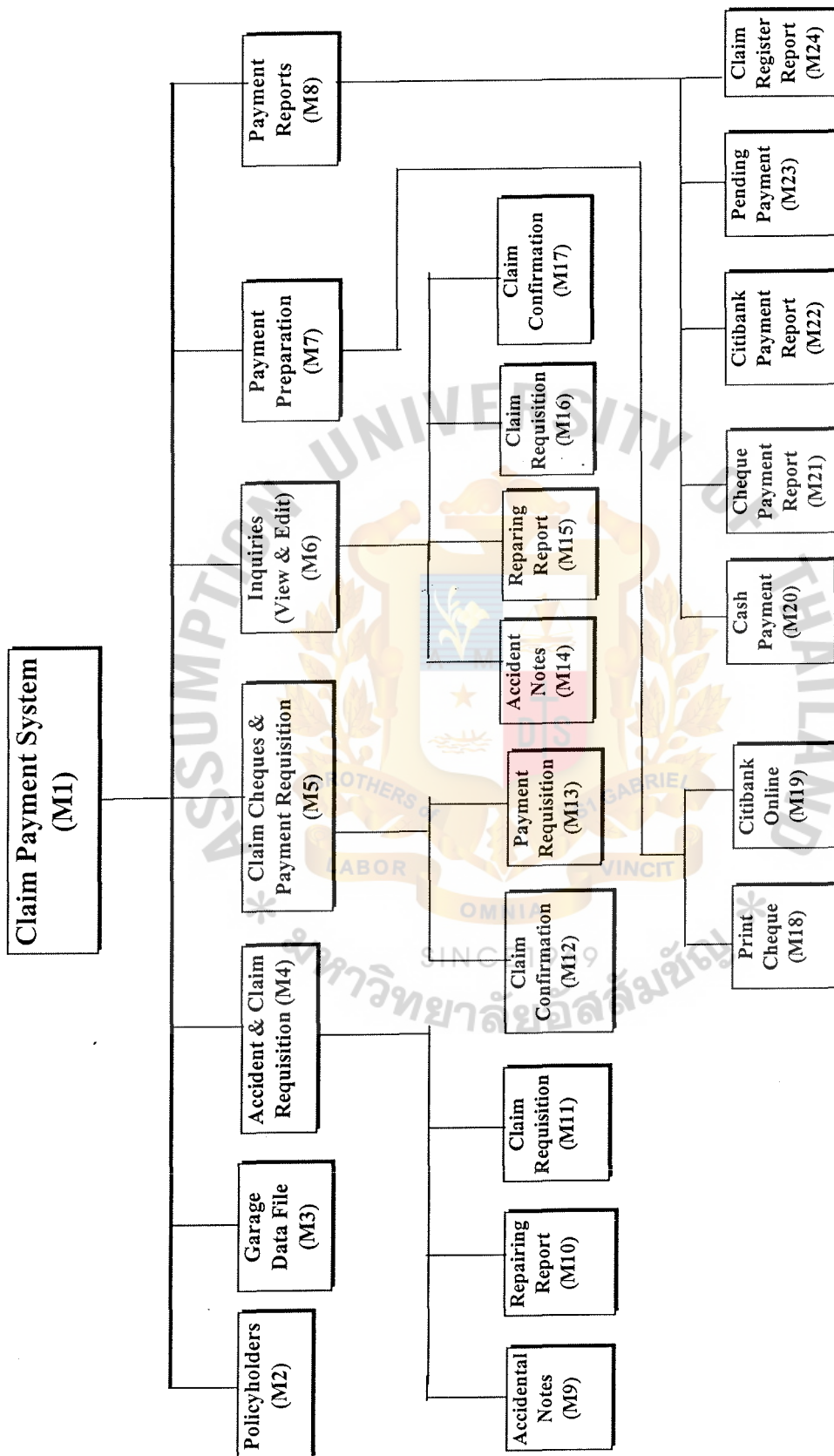


Figure G.1. Module Layout.

Module Specification

Module No.	M1
Module Name	Claim Payment System
Purpose/ Objective	This is the main Menu of the System
Input	Menu Selection
Output	Claim Payment to the Garage
Invoke	M2, M3, M4, M5, M6, M7, M8
Caller	N/A
Begin	Show submenu
End	Exit
Module No.	M2
Module Name	Policyholders
Purpose/ Objective	This is the screen input for the Policy Holder
Input	POLICY NUMBER POLICY STATUS POLICY COVERAGE PERIOD POLICYHOLDER NAME POLICYHOLDER ADDRESS POLICYHOLDER PHONE NUMBER SUM INSURANCE PREMIUM AMOUNT
Output	Policy Holder Record
Invoke	Policy Holder Screen
Caller	M1
Begin	Popup the Policy Holder Input Screen

End	Exit to M1 Main menu
Module No.	M3
Module Name	Garage Data File
Purpose/ Objective	This is the screen input for Garage Data File
Input	GARAGE CODE NUMBER GARAGE NAME GARAGE ADDRESS GARAGE PHONE NUMBER
Output	Garage Data File
Invoke	Garage Data File Screen
Caller	M1
Begin	Popup Garage Data Input Screen Input/ Edit
End	Exit to M1 Main menu
Module No.	M4
Module Name	Accidental & Claim Requisition
Purpose/ Objective	This is the sub menu screen for Accident Note, Repairing Report and Claim Requisition
Input	Menu Selection
Output	Support Information for the further Payment process
Invoke	M9, M10, M11
Caller	M1
Begin	Popup Sub Menu - Accidental Note - Repairing Report - Claim Requisition

End	Exit to M1 Main menu
Module No.	M5
Module Name	Claim Check & Payment Requisition
Purpose/ Objective	This is the sub menu screen for Claim Confirmation And Payment Requisition
Input	Menu Selection
Output	Supported Information for further payment process
Invoke	M12, M13
Caller	M1
Begin	Popup Sub Menu <ul style="list-style-type: none"> - Claim Confirmation - Payment Requisition
End	Exit to M1 Main menu
Module No.	M6
Module Name	Inquiries for Claim Requisition
Purpose/ Objective	This is the menu to call sub menu to view the input data Regarding Accident Notes, Claim Requisition and Claim Confirmation for further decision
Input	Menu Selection
Output	Supported Information for further payment approval
Invoke	M14, M15, M16
Caller	M1
Begin	Popup Sub Menu <ul style="list-style-type: none"> - View Accidental Notes - View Claim Requisition - View Claim Confirmation
End	Exit to M1 Main menu
Module No.	M7

Module Name	Payment Preparation
Purpose/ Objective	This is the menu to call sub menu to process on Payment Selection of type to paid to garage
Input	Menu Selection
Output	Payment to Creditor (Garage owner)
Invoke	M17, M18
Caller	M1
Begin	Popup Sub Menu - Print Cheque - Citibank Online Payment
End	Exit to M1 Main menu
Module No.	M8
Module Name	Payment Report
Purpose/ Objective	This is the menu to call sub menu to print all the reports concerning the claim payment system
Input	Menu Selection
Output	Report to user
Invoke	M19, M20, M21, M22, M23
Caller	M1
Begin	Popup Sub Menu - Cash Payment Report - Cheque Payment Report - Citibank Online Payment Report - Pending Payment - Claim Register Report
End	Exit to M1 Main menu
Module No.	M9
Module Name	Accidental Notes

Purpose/ Objective	This is the screen input for the Accident Events
Input	SUVEYER CODE SUVEYER NAME CLAIM NUMBER ACCIDENT DATE ANDTIME ACCIDENT PLACE DRIVER NAME CAR IDENTIFICATION NUMBER DAMAGED POINT (AREA)
Output	Accident Note record
Invoke	Accident Note input Screen
Caller	M4
Begin	Popup the Accident Note Input Screen Input
End	Exit to M4 Main menu
Module No.	M10
Module Name	Repairing Report
Purpose/ Objective	This is the screen input for the concerned Information from the garage regarding the car which is repair in the contract garage
Input	CAR REPAIRING NUMBER CAR RECEIPT(IN) DATE CAR OWNER NAME CAR OWNER ADDRESS REPAIR NUMBER

REPAIR COMPONENTS

REPAIR QUANTITIES

REPAIR AMOUNT

FINISH-REPAIR DATE

CAR RECEIPT(OUT) NAME

CAR RECEIPT(OUT) ADDRESS

Output Repair Detail from the Garage record
for matching with claim Requisition

Invoke Repairing Report input Screen

Caller M4

Begin Popup the Repair Report Input Screen

Input

End Exit to M4 Main menu

Module No. M11

Module Name Claim Requisition

Purpose/ Objective This is the screen to input the Claim Requisition

Input CLAIM REQUISITION NUMBER

CLAIM REQUISITION DATE

ESTIMATE REPAIRING COMPONENTS

ESTIMATE DAMAGED COMPONENT PRICING

PRICE-CONTROL AUTHORIZED NAME

Output Claim Requisition Detail for matching with
Repairing Report

Invoke Claim Requisition input Screen

Caller M4

Begin Popup the Claim Requisition Input Screen

	Input
End	Exit to M4 Main menu
Module No.	M12
Module Name	Claim Confirmation
Purpose/ Objective	This is the screen to input the Claim Confirmation
Input	CLAIM CONFIRMATION NUMBER CLAIM CONFIRMATION DATE GARAGE-INVOICE NUMBER GARAGE-INVOICE DATE GARAGE-INVOICE AMOUNT AGREE-REPAIRED QUANTITY AGREE-REPAIRED AMOUNT CLAIM AUTHORIZED NAME
Output	Claim Confirmation of the Claim Requisition and ready for Payment Requisition process
Invoke	Claim Confirmation input Screen
Caller	M5
Begin	Pop up the Claim Confirmation Input Screen
	Input
End	Exit to M5 Main menu
Module No.	M13
Module Name	Payment Requisition
Purpose/ Objective	This is the screen to input the payment request
Input	CLAIM PAYMENT NUMBER CLAIM PAYMENT DATE CLAIM PAYMENT AMOUNT

	PAYMENT TYPE
	CLAIM AUTHORIZED NAME
	AUTHORIZATION (Y/N)
Output	Payment ready for actual paid either by cash, Cheque or Citibank online payment
Invoke	ClaimPaymentOrder input Screen
Caller	M5
Begin	Popup the ClaimPaymentOrder Input Screen
	Input
	Store data categorized by payment type
End	Exit to M5 Main menu
Module No.	M14 - M17
Module Name	Inquiries about; - Accident Note - Repairing Report - Claim Requisition - Claim Confirmation
Purpose/ Objective	This is the sub menu screen for Inquiring the previous input screen, as the purpose to check the completeness
Input	Menu Selection
Output	N/A
Invoke	- Accident Note in Edit Mode - Repairing Report in Edit Mode - Claim Requisition in Edit Mode - Claim Confirmation in Edit Mode
Caller	M6

Begin	Popup Screen in Edit Mode for <ul style="list-style-type: none"> - Accident Note - Repairing Report - Claim Requisition - Claim Confirmation
End	Exit to M6 Main menu
Module No.	M18
Module Name	Print Cheque
Purpose/ Objective	This is the menu to Perform Cheque printing To the Garage
Input	CHEQUE NO CHEQUE DATE CHEQUE AMOUNT GARAGE NAME
Output	Print out Cheque
Invoke	Cheque Input and Printing Screen
Caller	M7
Begin	Popup the Cheque Input and Printing Screen Input Cheque Detail Print the Cheque
End	Exit to M7 Main menu
Module No.	M19
Module Name	Citibank Online Payment
Purpose/ Objective	This is the menu to Perform Payment via Citibank Online System
Input	PAYMENT NO

	PAYMENT DATE
	PAYMENT AMOUNT
	GARAGE NAME
Output	Transfer information for Citibank for further Payment via Citibank
Invoke	Citibank Transmission Screen
Caller	M7
Begin	Popup Citibank Transmission Screen Input Payment Detail Transmitt Data via Modem
End	Exit to M7 Main menu
Module No.	M20 - M24
Module Name	- Cash Payment Report - Cheque Payment Report - Citibank Online Payment Report - Pending Payment Report - Claim Register Report
Purpose/ Objective	This is the module to print all the report concerning the claim payment system
Input	Menu Selection
Output	Reports on - Cash Payment - Cheque Payment - Citibank Online Payment - Pending Payment - Claim Register

Invoke	<ul style="list-style-type: none"> - View/ Print Cash Payment Report Screen - View/ Print Cheque Payment Report Screen - View/ Print Citibank Online Payment Report Screen - View/ Print Pending Payment Report Screen - View/ Print Claim Register Report Screen
Caller	M8
Begin	<p>Popup the report on Screen</p> <p>Print the report via Screen or Printer</p>
End	Exit to M8 Main menu





APPENDIX H

FILE LAYOUT FOR DATABASE DESIGN

Table H.1. Claim Log Book File.

Screen: Policyholders (Figure E.2.)

File Name: Claim Log Book

Field	Field Description	Data Type	Length
PolicyNumber	Policy Number	Number	10
PolicyStatus	Policy Status	Text	50
PolicyCoveragePeriod	Policy Coverage Period	Date	10
PolicyHolderName	Policy Holder Name	Text	50
PolicyAddress	Policy Address	Text	50
PolicyHolderPhone	Policy Holder Phone Number	Number	10
CallID.Number	Call Identification Number	Number	15
SumInsurance	Sum Insurance Amount	Number	20
PremiumAmount	Premium Amount	Number	20

Table H.2. Garage Data File.

Screen: Garage (Figure E.3.)

File Name: Garage Data

Field	Field Description	Data Type	Length
GarageCode	Garage Code	Number	10
GarageName	Garage Name	Text	50
GarageAddress	Garage Address	Text	50
GaragePhone	Garage Phone	Number	10

Table H.3. Accident Note File.

Screen: Accident Note (Figure E.5.)

File Name: Accident Note

Field	Field Description	Data Type	Length
ClaimNumber	Claim Number	Number	10
SurveyorCode	Surveyor Code	Number	10
SurveyorName	Surveyor Name	Text	50
AccidentDate	Accident Date	Date	10
AccidentPlace	Accident Place	Text	50
DriverName	Driver Name	Text	50
CarID.Number	Car Indentification Number	Text	50
DamagePoint	Damage Point	Text	50

Table H.4. Repair Report File.

Screen: Repairing Report (Figure E.6)

File Name: Repair Report

Field	Field Description	Data Type	Length
CarRepairingNumber	Car Repairing Number	Number	10
CarReceiptDate	Car Receipt Date	Date	10
PolicyHolderName	Policy Holder Name	Text	50
PolicyHolderAddress	Policy Holder Address	Text	50
RepairingDate	Repairing Date	Date	10
RepairingComponents	Repairing Components	Text	50
RepairingQuantity	Repairing Quantity	Number	10
RepairingAmount	Repairing Amount	Number	15
FinishDate	Finish Date	Date	10
CarRecipientName	Car Recipient Name	Text	50
CarReceipientAddress	Car Recipient Address	Text	50

Table H.5. Claim Requisition File.

Screen: Claim Requisition (Figure E.7)

File Name: Claim Requisition

Field	Field Description	Data Type	Length
ClaimRequisitionNumber	Claim Requisition Number	Number	10
ClaimRequisitionDate	Claim Requisition Date	Date	10
EstimateRepairComponents	Estimate Repair Components	Text	50
EstimateComponentPrice	Estimate Component Price	Number	10
PriceControlAuthoriseName	Price Control Authorized Name	Text	50
RepairingReportNumber	Repairing Report Number	Number	10

Table H.6. Claim Confirmation File.

Screen: Claim Confirmation (Figure E.9)

File Name: Claim Confirmation

Field	Field Description	Data Type	Length
ClaimConfirmationNumber	Claim Confirmation Number	Number	10
ClaimConfirmationDate	Claim Confirmation Date	Date	10
GarageInvoiceName	Garage Invoice Name	Text	50
GarageInvoiceDate	Garage Invoice Date	Date	10
GarageInvoiceAmount	Garage Invoice Amount	Number	10
AgreeRepairedQuantity	Agree Repaired Quantity	Number	10
AgreeRepairedAmount	Agree Repaired Amount	Number	10
Authorised(Y/N)	Authorized (Y/N)	Yes/No	2
ClaimAuthorisedName	Claim Authorized Name	Text	50
ClaimRequisitionNumber	Claim Requisition Number	Number	10

Table H.7. Claim Payment Order File.

Screen: Claim Payment Order (Figure E.10)

File Name: Claim Payment Order

Field	Field Description	Data Type	Length
ClaimPaymentNumber	Claim Payment Number	Number	10
ClaimPaymentDate	Claim Payment Date	Date	10
ClaimPaymentAmount	Claim Payment Amount	Number	10
PaymentType	Payment Type	Text	50
ClaimAuthorisedName	Claim Authorized Name	Text	50
Authorised(Y/N)	Authorized (Y/N)	Yes/No	2
ClaimConfirmtionNo.	Claim Confirmation Number	Number	10

Table H.8. Cheque Issue File.

Screen: Cheque Issue (Figure E.13)

File Name: Cheque Issue

Field	Field Description	Data Type	Length
ChequeNo.	Cheque Number	Number	10
ChequeDate	Cheque Date	Date	10
ChequeAmount	Cheque Amount	Number	10
GarageName	Garage Name	Text	50
ClaimPaymentNo.	Claim Payment Number	Number	10



APPENDIX I

NETWORK CONFIGURATION

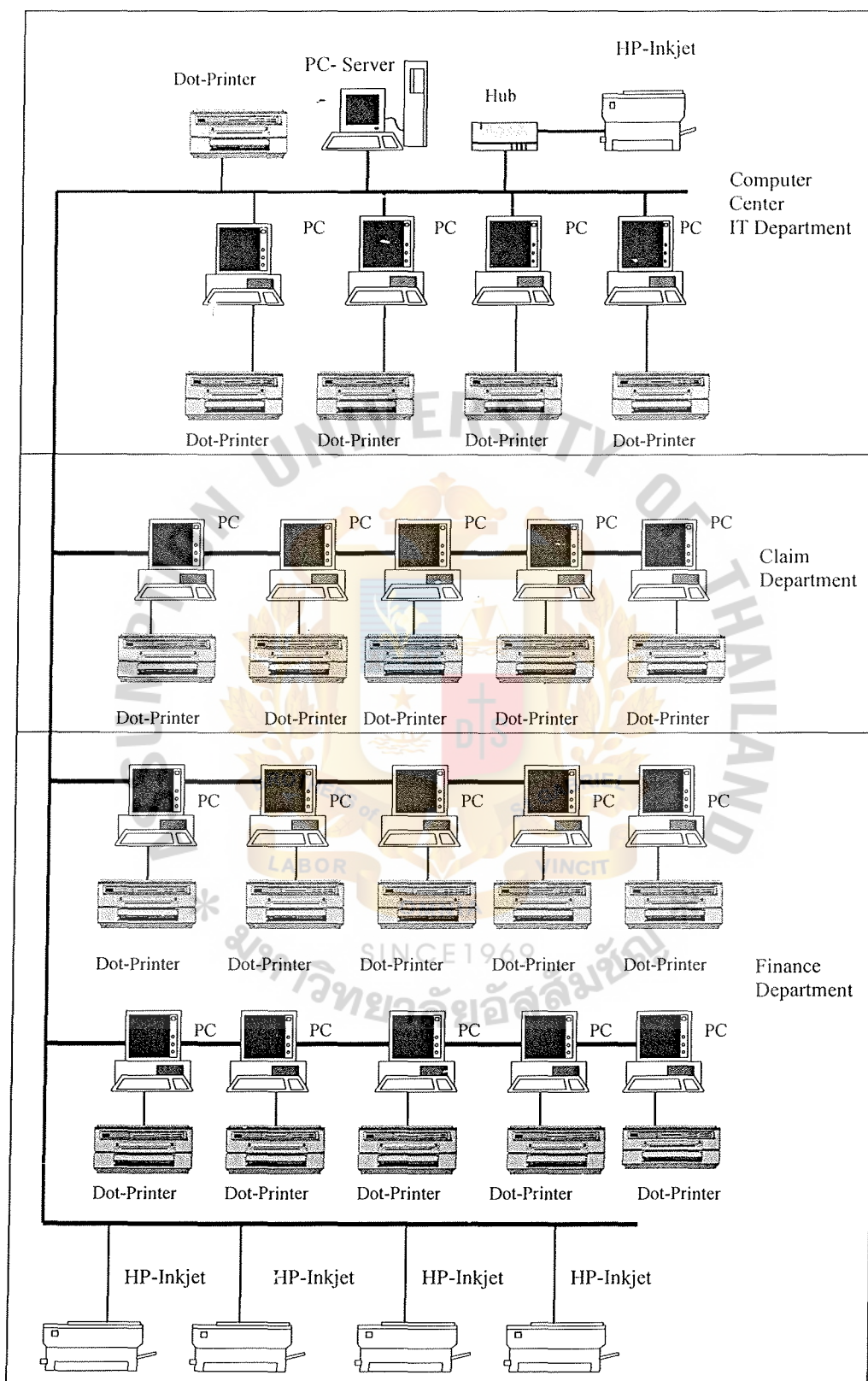


Figure I.1. Network Configuration of Claim Payment System.

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