Warehouse Information System

by

Ms. Suwimol Attasart

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

Submitted in Partial Fulfillment
of the Requirements for the Degree of
Master of Science
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Project Title	Warehouse Information System
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Academic Year	March 2001

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

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ABSTRACT

The project is concerned with analysis and design of Warehouse Information System for SAS Logistics Company with the purpose of improving the operations of the company. The problems of the existing manual system are cargoes storage, error of data entry, mistake of charge calculation, cargo in-out not equal to the real life, resulting in loss of company revenue and inaccurate information for management. The new system is designed to replace the weakness resulting in the following problems. It is expected to provide more expediting operation with less errors.

The Warehouse Information System aims at capturing the competitive advantage of the new technology and improving the current operation. Using the proposed system, there are several benefits offered by this system which can be divided into tangible and intangible benefits. For intangible benefits, the proposed system will increase the efficiency of work operation and customer satisfaction. It also provides accurate, fast and reliable information which enhance our customer services. For tangible benefits, there are fewer errors of cargoes in-out records and processing errors.

ACKNOWLEDGEMENTS

Several people have made contributions to this project. The writer would like to acknowledge their efforts and thank them for their contribution. Without them, this project would not have been possible.

First and foremost she would like to express deep sense of gratitude to her advisor, Dr. Boonyarit Pokrud, for his valuable suggestions and advice given in the preparation of this project. It is only due to their invaluable guidance provided to her during the entire course of the project that she is able to come out with this project in its present state. She considers herself fortunate to have had the opportunity to study under them in Assumption University.

Secondly, it also gives a great sense of pleasure to thank the President of SAS Logistics Company, for his timely assistance and information provided to her while carrying out the data collection required in her project. And sincere gratitude also goes to all the members of the MS(CIS) committee members for their advice.

Finally, She wishes to thank her family for all their support and prayers in helping her with her project. They have been a great source of encouragement for her throughout her study in Assumption University.

TABLE OF CONTENTS

LIST OF FIGURES

Figure		Page
D.1	ER Diagram of Context Data Model	74
D.2	ER Diagram of Key-Based Data Model	75
D.3	ER Diagram of Fully-attributed Data Model	76
D.4	Structure Chart of Maintain Master File	77
D.5	Structure Chart of Receive Cargo	78
D.6	Structure Chart of Issue Master File	79
D.7	Structure Chart of Issue Cargo	80
D.8	Structure Chart of Delivery Cargo	81
D.9	Structure Chart of Monthly Process	82
D.10	Structure Chart of Produce Report	83
E.1	System Login	84
E.2	System Login Failure	84
E.3	Main Menu	85
E.4	Main Menu Form of Master Files	86
E.5	Warehouse Main Form	87
E.6	Warehouse Main Form (Continued)	88
E.7	Location Main Form	89
E.8	Customer Main Form	90
E.9	Product Main Form	91
E.10	Truck Main Form	92
E.11	Document Main Form	93
E.12	Agreement Main Form	94
E.13	Agreement Main Form (Continued)	95
E.14	Map Main Form	96

Figure		Page

Figure		Page
F.5	Report of Gate Pass	121
F.6	Report of Product Enquiry	122
F.7	Report of Customer Product Enquiry	123
F.8	Report of Stock	124
F.9	Report of Stock Transaction	125
F.10	Report of Operation Schedule	126
F.11	Report of Cargo Movement	127
F.12	Report of Truck Movement	128
F.13	Report Attachment of Storage Charge	129
F.14	Report Attachment of Transportation Charge	130
F.15	Report of Debit Note	131

LIST OF TABLES

Table		Page

Table		Page

Table		Page

I. INTRODUCTION

1.1 Background of the Project

The use of IT in the storage, handling and distribution market has increased dramatically in the past few years. During the last few decades the world has undergone an information and communication revolution. SAS Logistics Co., Ltd., one of the industry's largest logistics providers in Thailand, know this and are aware of it in everyday lives. What is interesting to businesses is the shift in wealth towards a completely intangible commodity - knowledge.

The company's current system is a manual one that manages the flow of information regarding incoming and outgoing cargo including control of the storage, handling and transportation charge. The company's related services including contract and public warehousing which consists of general and general bonded cargoes, lot number control, pick-and-pack, and sub-assembly.

The new Warehouse Information System can reduce manual processes by warehouse operators such as storing, lifting, booking and scheduling. To eliminate waste of unnecessary work, control materials and information, integrate with the business and apply appropriate solutions.

1.2 Objectives of the Project

The project objectives for the Warehouse Information System are:

(1) To study the existing system.

Find out the occurred problem and identify possible practical solutions to those problems.

(2) To study the requirements of users and design computerize system according to those users' requirements.

(3) To reduce the mistake that may happen because of the data entry of the operation.

(4) To provide timely and reliable information in decision making.

(5) To implement the new system using Delphi 5.

1.3 Scope of the Project

(1) Maintenance of the warehouse information system.

The system allows the authorized user to maintain the warehouse management data such as entering, updating, and deleting.

(2) Handle the flow of operation:

(a) Incoming Cargo

(1) Contract Creation

(2) Received cargo with packing list

(3) Register cargo into each location

(b) Outgoing Cargo

(1) Outgoing cargo without packing

(2) Outgoing cargo with packing

(3) Confirm Delivery

(c) Charge Calculation

(1) Storage and handling charge

(2) Transportation charge

(d) Monthly Processing

(1) Generate debit note

(2) Transfer debit not to A/R

(e) Inquiry

(1) Location inquiry

(2) Product inquiry

(3) Customer product inquiry

(3) Design screen layout on client computer to operate activities.

(4) Produce the reports such as receive slip, delivery slip, stock reports, and debit note.

1.4 Deliverables

The deliverables for the warehouse information system project are as follows:

(1) The result of the study and analysis of the existing system

(2) The new design and application development that is written in Delphi5

(3) Screen layout and menu system for user interface

(4) Management information system used for decision making

(5) Various hard copy layouts such as:

(a) Receiving Slip, Receiving List, Warehouse Label

(b) Delivery Slip, Delivery List, Gate Pass

(c) Delivery Operation Schedule

(d) Cargo Movement

(e) Expiry warning report

(f) Storage and Handling Charge Report

(g) Transportation Charge Report

(h) Debit Note

1.5 Project Plan

The project plan is represented in terms of Gantt Chart as shown in Figure 1.1.

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

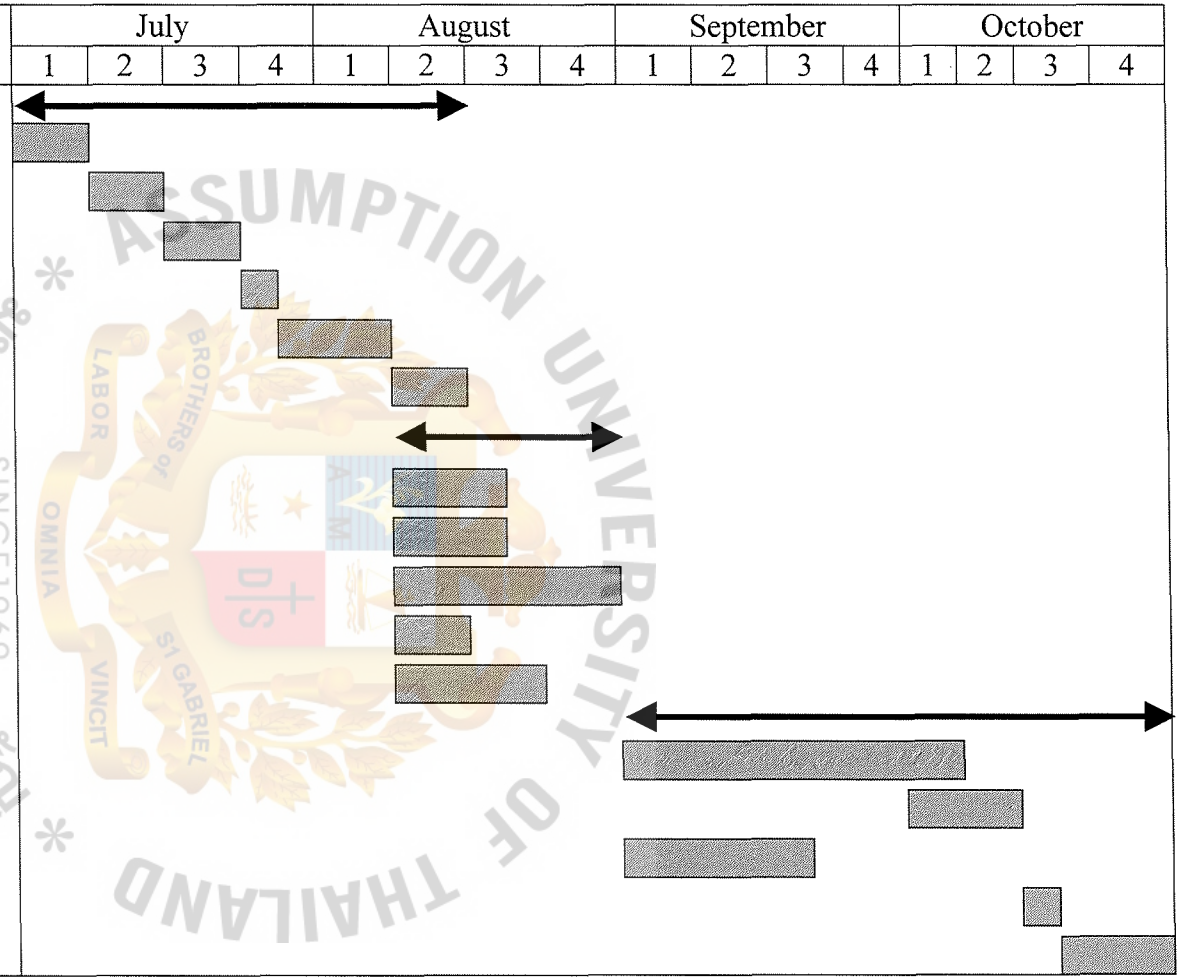


Figure 1.1. Project Plan of Warehouse Information System.

II. THE EXISTING SYSTEM

2.1 Background of the Organization

SAS Logistics Co., Ltd., was established in 1993, located on Samutprakarn Province. SAS Logistics business is to both receive and deliver cargoes for customers who deposit cargoes in location of warehouse.

Figure 2.1 illustrates the basic structural organization of the company. It is classically organized into 6 departments.

2.1.1 Marketing Department

Marketing Department responsible for marketing plan, advertising and promotion, sales and quotation.

2.1.2 Operation Department

Operation Department responsible for receipt and delivery process, (cargo storage or picking location decision including first-in-first-out control,) stock control and charge calculation.

2.1.3 Warehouse Department

This section is responsible for in-out cargo check from the list, cargo load / unload and picking / packing of cargo for delivery by authorized document from the operation department.

2.1.4 Financial Department

Financial and Accounting Department handled with all figures in the company such as making general accounting standard, payroll for all staffs, payment for debt and tax, generate debit note for collect money from customer.

2.1.5 Computer Department

Computer Department responsible for hardware, software and database management.

2.1.6 Security Department

Security Department responsible with in-out truck check and warehouse gate control.

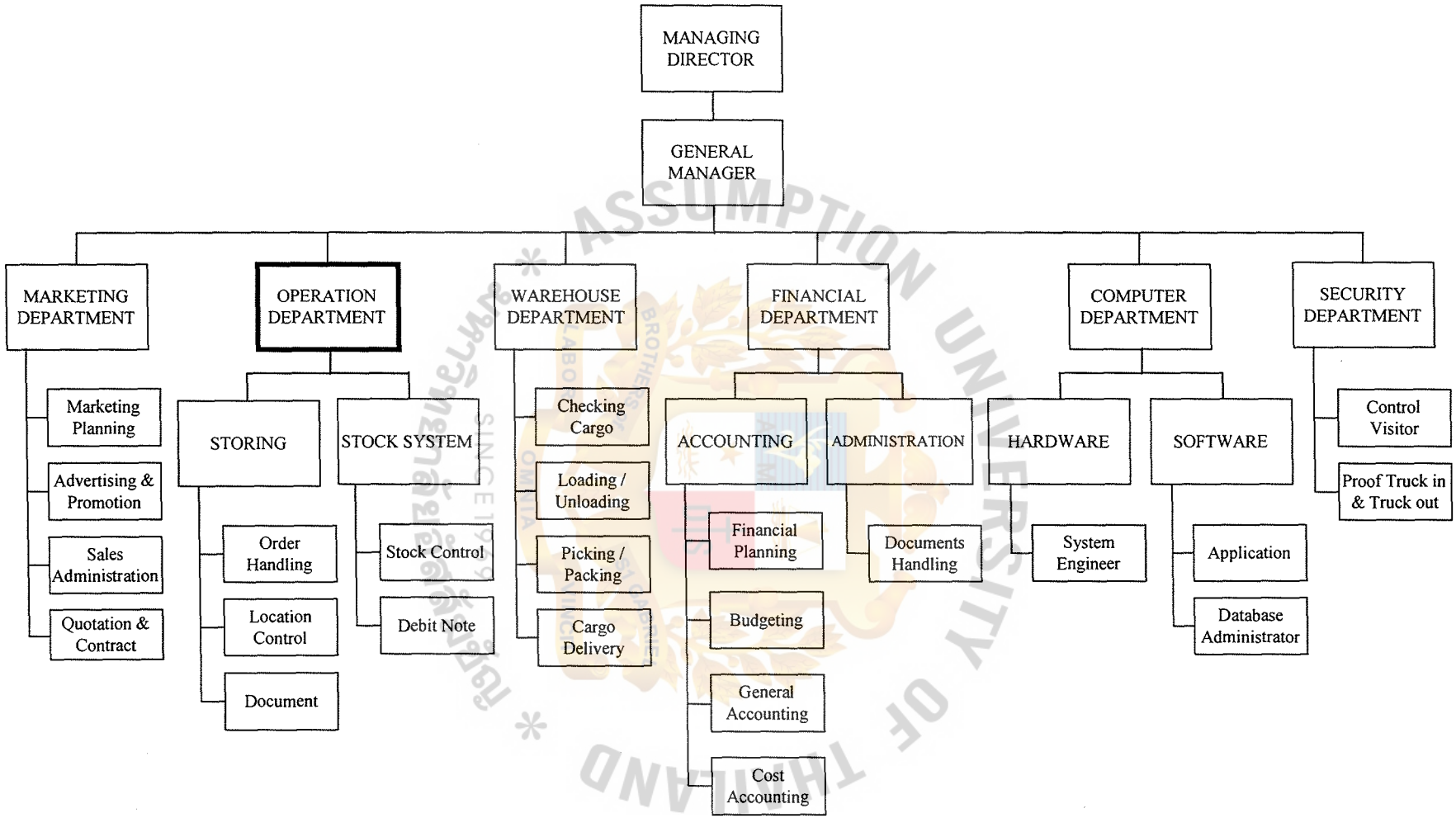


Figure 2.1. Organization Chart.

2.2 Existing Business Function

The existing business functions of SAS Logistics are manual and staff control the movement of cargoes. The functions of warehouse information system can be summarized as follows:

Incoming

When the customer passes a packing list to the Operation Department to request for a quotation; the Operation Department makes quotation and proposes to the customer. When receiving the customer's consent, the Operation Department will then create customer as well as product codes and information. After that the customer brings cargoes with packing list to the company, contact security guard and Operation Department respectively. Then, the Operation Department inputs the information received and decides the location of cargoes to be kept in the warehouse. And cargoes will be carried to warehouse by truck and unloaded to locations as specified in the receiving list. After the Warehouse manager signs in receiving list, it will return to Operation Department and then sent to Operation manager for approve. The Computer Department will print report cargo movement and send it to customer.

Outgoing

In contrast, when customer forwards order sheet with a cargo list to the company, the Operation Department will issue a document and pick cargo from the location set in the warehouse. While cargoes on the truck are pending for delivery; outgoing tally sheet is to be prepared for Operation Department and they input all the delivery information and print out the delivery slip and gate pass. After printing, the document will go to Operation manager for approve and Computer Department will print report cargo movement for customer. Trucks will carry cargoes through Security Department and send them to customers respectively.

Moreover, any document involved in the Operation Department will be passed to Financial Department for accounting purpose. Financial Department will be responsible for accounting (salary, bonus, welfare payment and administration). The Financial Department has to collect money from the customers who pay in installment form.

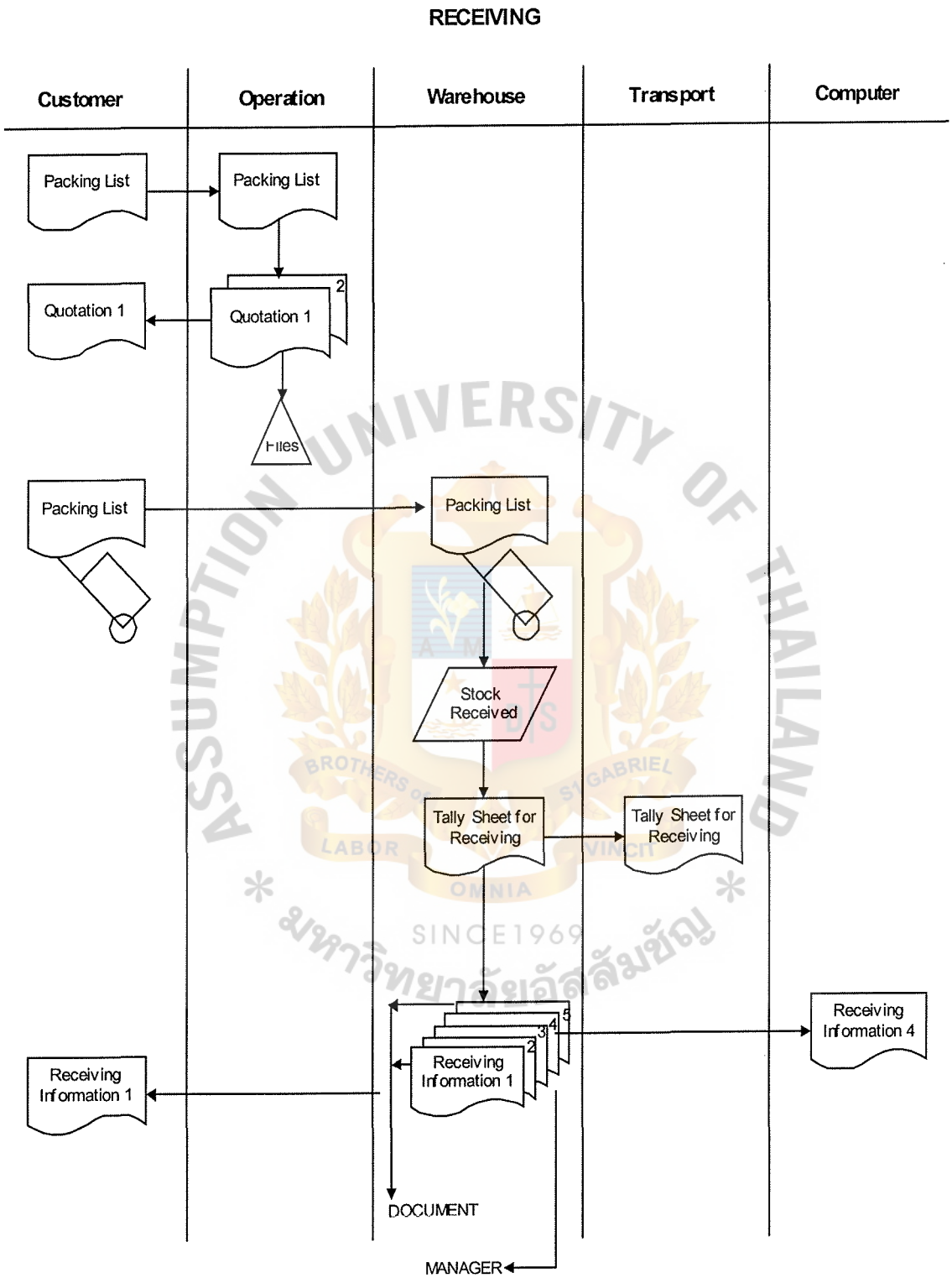


Figure 2.2. Function of Receiving.

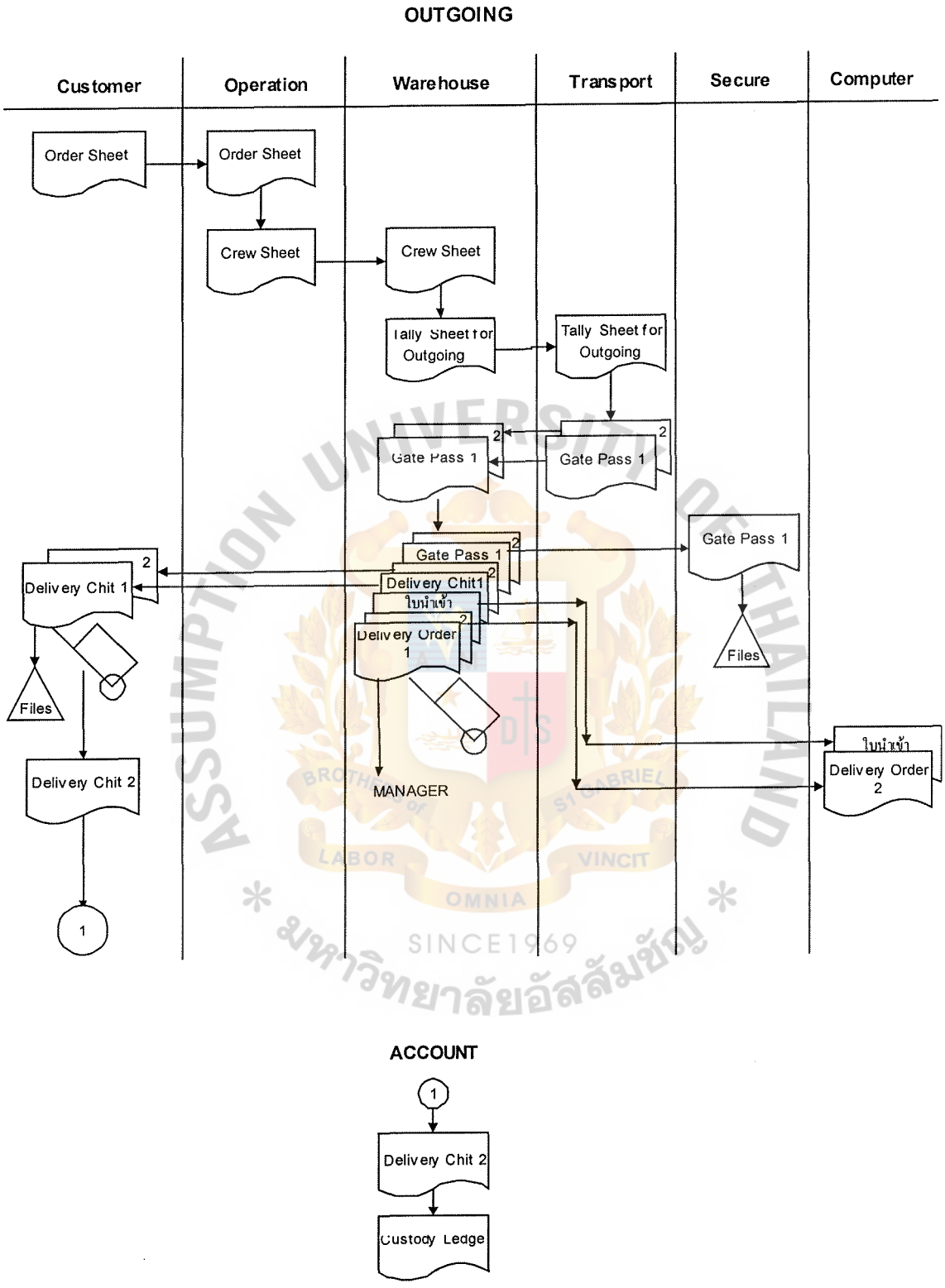


Figure 2.3. Function of Outgoing.

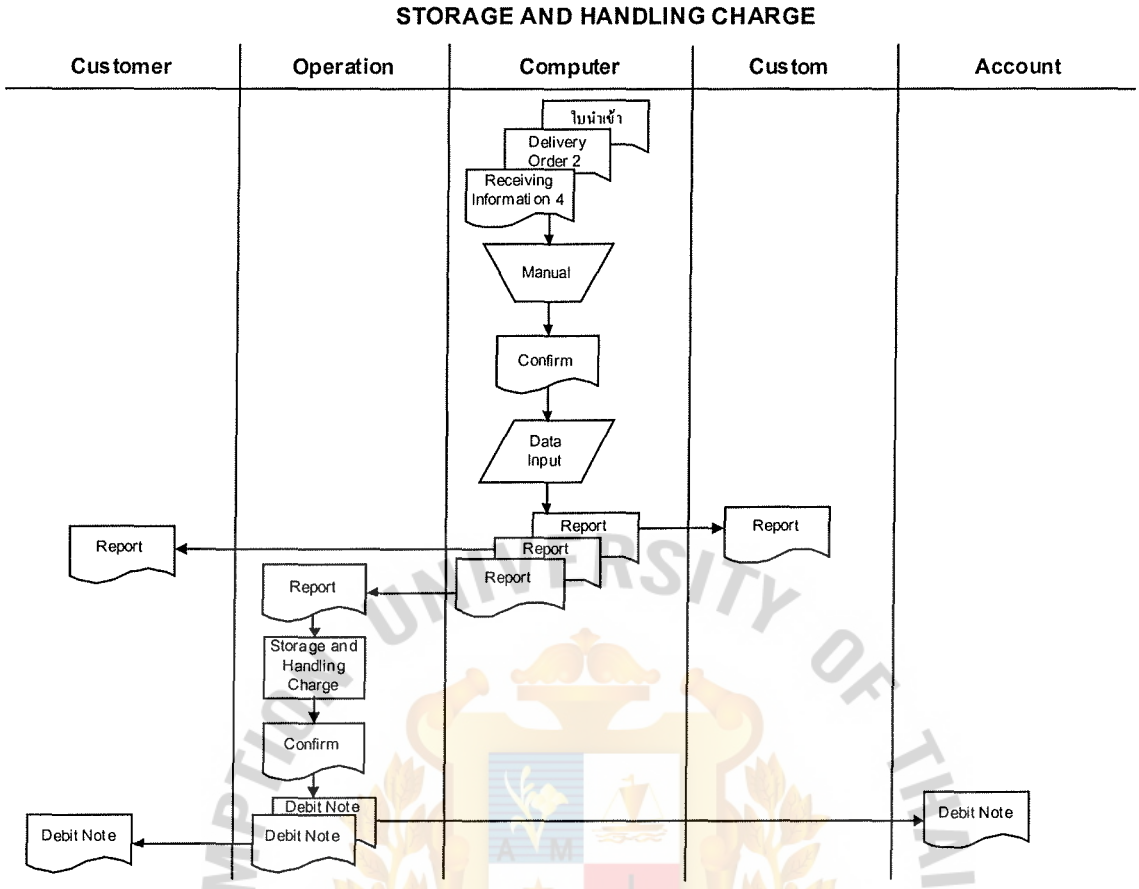


Figure 2.4. Function of Storage and Handling Charge.

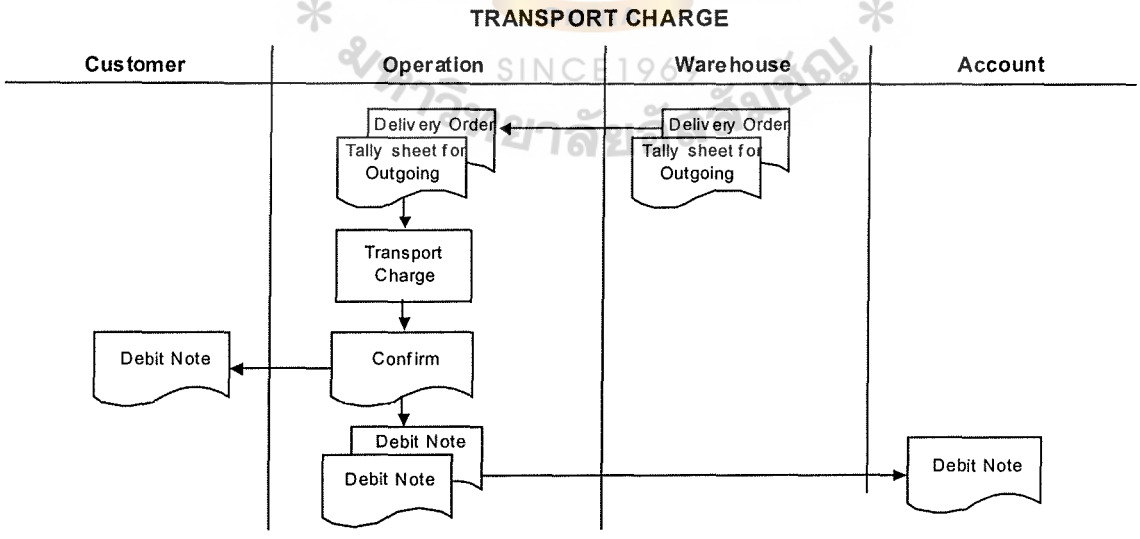


Figure 2.5. Function of Transport Charge.

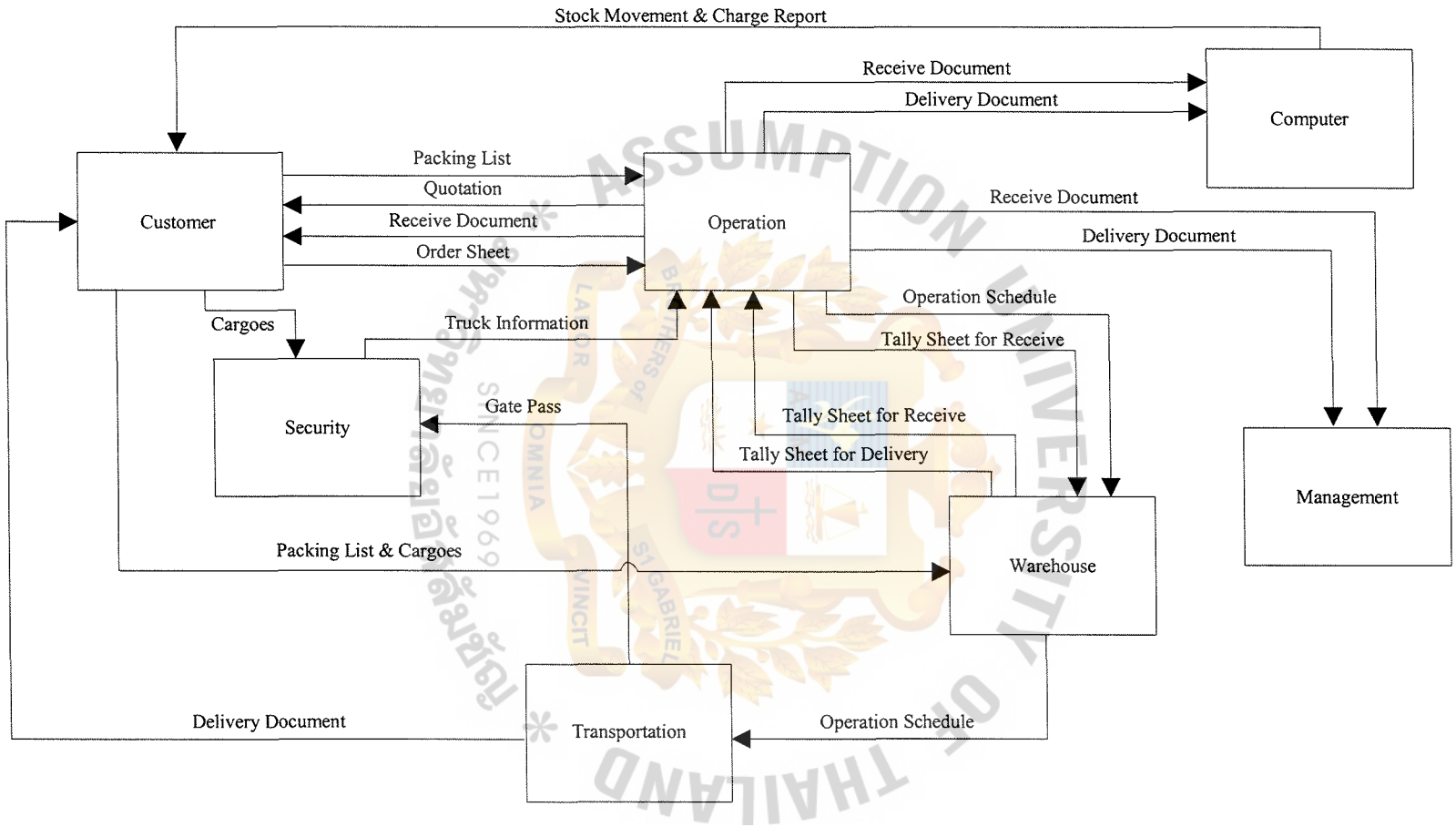


Figure 2.6. Existing Business Functions.

2.3 Current Problems and Areas for Improvement

2.3.1 Current Problems

Several current and specific problems within the existing system can be identified as follows:

(a) High chance of mistake

For manual system, the workers have to check the in-out stock and stock balance by themselves. They should count them one by one. Moreover, it is difficult to control the stock because the many transactions about cargoes received and issued within a day, so to update the quantities of cargoes has a high chance to be wrong. It is a waste of time.

(b) The Information is not Up-to-date

Some operations are redundant because the company uses a manual system for operating. This manual system causes an abundance of paperwork and some inconsistencies, and repetitions. This brings about incorrect information concerning the type and quantity of products available.

(c) Take much time for the following tasks:

(1) Checking availability of location to keep cargoes from customer

(2) Calculating the storage, handling and transportation charge

(3) Preparing reports of cargoes movement

(d) More worker requirement

There is many type of cargo in the warehouse that are kept in location, so you need additional workers to check the stock balance in warehouse.

(e) Inefficient Reporting System

Management does not receive reports on time, nor obtain enough reports. The output reports are not accurate so the company cannot rely on them and it is difficult to forecast and evaluate performance. No report scheme is used for decision making in time action. Therefore, the management requires a system which is able to generate more efficient reports or information such as Charge by Contract Number Report, Charge by Debit Note Report for decision making.

2.3.2 Areas for Improvement

(a) The daily work is more systematic. The new system provides more reliable and correct information for decision-making and forecasting from management team.

(b) The organization can reduce human labor and human errors by using the new system.

(c) The improvement of the warehouse information system will prepare calculation of storage, handling and transportation charge which is correctly done by using computer-based system. The staffs can check the availability of location to deposit new cargoes and rearrange location in warehouse. They also prepare all the reports quickly and easily. Furthermore, the proposed system can carry out many routine tasks in one millisecond.

III. THE PROPOSED SYSTEM

The proposed system will provide a computerized information system instead of a manual system.

3.1 User Requirements

After reviewing and evaluating the existing system, the user requirements are obtained from the user and the existing system. Actually, the existing system can serve the user requirement to some extent, but there are some requirements that the existing system still can not serve.

User still need further development for more system functions as well as improvement including query capability and report production, database storage, security and so on. The user requirements are concluded as follows:

(a) The staffs are able to view the current customer stock level of each cargo from the computer at any time.

(b) Ease of usage and familiarity with the new system.

(c) Multiple users to access the database at the same time.

(d) More reliable and consistent procedures to eliminate errors

There is an abundance of paperwork causing some inconsistencies, and repetitions from the manual system of boarding the repossessed assets. When those errors are eliminated, the system will be obtained with the up-to-date, accurate information.

(e) Security and operation control should be provided for protecting data.

No allowance for an unauthorized party to access the system. And ensuring the authorized user can access the data in an authorized way.

3.2 System Design

3.2.1 The Proposed Functions

The proposed system uses a context diagram to focus on data flowing in and out of the system and the processing of the data.

The data flow diagram is used to present the proposed system step by step. The data flow diagram is a modeling tool that allows the user to picture the proposed system. In order to present the proposed system concept to the user and the management, the system must be converted into a concrete format, which is understandable. In structured analysis and design, a context diagram and a data flow diagram will be presented for discussion.

The new system design divides the whole system into 5 subsystems as follows:

(1) Process 1: Manage Incoming Cargoes

This process inputs the information of customer, cargoes, charge, owner and agreement. When customer sends his cargo to front office, the operator will input the information for received cargo such as customer name, cargo code, quantity and allocated location in warehouse.

(2) Process 2: Manage Outgoing Cargoes

After receiving customer order information, the operator will input the information of customer order, and create issue information to prepare cargo such as customer name, cargo, quantity and picking cargo. During sending date or when customer arrives, the operator will input delivery information such as truck type, driver name, and choose cargo from issue record and deduct customer cargo stock in warehouse.

(3) Process 3: Inquiry

This process can inquiry data via screen such as customer cargoes inquiry, cargoes inquiry and location inquiry.

(4) Process 4: Monthly Process

This process provides a screen to calculate all charges and transfer data to Accounting department.

(5) Process 5: Produce Reports

This process provides the report for customer and management team to analyze that information which comes from Warehouse Information System as follows:

(a) Summary Charge Amount by Contract Report

(b) Summary Charge Amount by Debit Note Report

(c) Summary of Customer Cargo Movement

(d) Charge Report

(e) Debit Note

3.2.2 Data Flow Diagrams

Data Flow Diagrams show the flow of operation. Data Flow Diagrams are represented in Appendix A.

3.2.3 Data Dictionary

Data dictionary defines each data and procedure in the data flow diagram. Data dictionary is represented in Appendix B.

3.2.4 Process Specification

The process specification provides further description of element-level processes as shown in Appendix C.

3.2.5 E-R Diagrams / Structure Chart Diagram

E-R Diagrams and Structure Chart Diagram show the relationship between entity. The E-R Diagrams and Structure Chart Diagram are represented in Appendix D.

3.2.6 User Interface Design / User Manual

The user interface designs are the design of the entire interface screens for the proposed system. The user interface design is represented in Appendix E.

3.2.7 Output Reports

The output reports are the reports that are generated by the proposed system. The output reports are represented in Appendix F.

3.2.8 File Layout

The File Layout shows the table name, the element name in each table, which is called an attribute name, the column name, and shows which attributes name is the primary key or the foreign key. Elements that fall into each table or that regularly combine with several other elements in many structures should be placed together into a structure record. File Layouts are shown in Appendix G.

3.3 Hardware and Software Requirement

3.3.1 Hardware Requirements

For Warehouse Information System is given in Figure 3.1. The proposed system requires the following Hardware components.

(1) Server 1 set

(a) HP NetServer E800

(b) Intel Pentium III processor at 733 MHz.

(c) 4 MB Video RAM

(d) 36.4 GB Ultra-wide SCSI-2

(e) CD-ROM Drive 40X-max-speed EIDE

(f) 15" HP Super VGA Monitor

(g) HP Sure Store 24 GB DDS-3 tape drive

(2) Workstation 5 sets

(a) Intel Pentium III 667 MHz.

(b) 64 MB SDRAM Expandable to 256 KB

(c) 10 GB Ultra DMA 66 Hard Drive

(d) ASUS 40 x CD-ROM Drive

(e) 15" Color Monitor Digital Control

(f) Medium Tower 230 W. case (ATX)

(3) Network Peripheral 6 sets

(a) UTP

(b) Fast Ethernet PCI Adapter 10/100 Mbps. (LAN Card)

(c) 10/100 Switching Hub 16 Ports

(4) UPS for server and Workstation 650 VA 6 sets

(5) Printer

(a) HP LaserJet 2100 1 set

(b) Epson LQ-2170I 1 set

(6) Modem – Asvn 56 Kbps. Speed 1 set

3.3.2 Software Requirements

The Software will encompass the implementation of the following:

(1) Window NT for Server version 4.0 1 set

(2) Window 98 Thai for Work Station 5 sets

(3) Microsoft Office 2000 1 set

(4) SQL Server 7.0 & Delphi 5 (10 licenses) 1 set

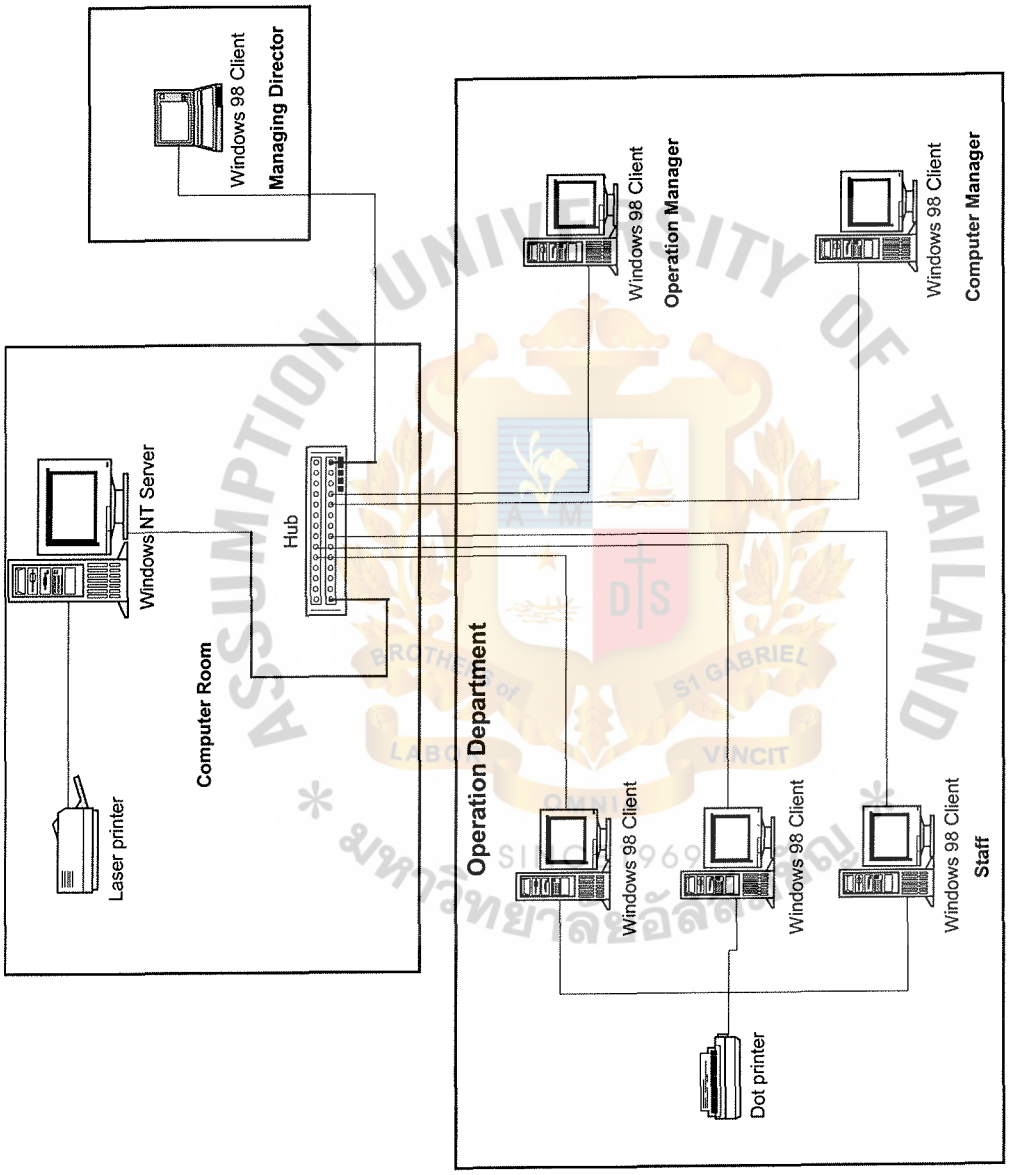


Figure 3.1. Network Architecture.

3.4 Security and Control

3.4.1 User-Oriented Access Control

(1) The user identifiers (ID) and passwords are assigned to authorized persons. When a user log in, the system asks for both a user ID and password.

(2) The system allows a user to log in only if that user's ID is known to system and if the user knows the password associated with the system with that ID.

(3) The user ID and password can determine the privileges accorded to the user. A few users (such as manager and assistant manager) have supervisory or superuser status that the system allows to read files and to perform functions modification and deletion.

(4) The number of document must be generated according to the running number.

3.4.2 Physical Security

(1) The failure of the main electricity supply causes interruption to the function of the computer facility or telecommunication network. UPS (Uninterruptible Power Supply) is used to supply power instead of the main electricity supply.

(2) Special detectors combined with removal or extractor fans and filters in the computer room and surrounding area are installed in order to protect against smoke and gas.

(3) To prevent an accident that may destroy the files during processing, backup is using to recover any destruction or error on files. So there must be backup tapes and backup copies should be created every time.

(4) Data correction must be made immediately after errors on the data listing reports are found.

3.5 Cost / Benefit Analysis

3.5.1 Cost Analysis

(1) Costs of Manual System

Table 3.1. Manual System Cost Analysis, Baht.

Cost items	Years				
	1	2	3	4	5
Operating Cost					
Salary Cost:					
Operation Manager 1 person @27,500	330,000.00	363,000.00	399,300.00	439,230.00	483,153.00
Staff 6 persons @ 10,000	720,000.00	792,000.00	871,200.00	958,320.00	1,054,152.00
Over Time Staff 6 persons	218,500.00	240,350.00	264,385.00	290,823.50	319,905.85
Bonus	87,500.00	96,250.00	105,875.00	116,462.50	128,108.75
Total Annual Salary Cost	1,356,000.00	1,491,600.00	1,640,760.00	1,804,836.00	1,985,319.60
Office Supplies & Miscellaneous Cost:					
Stationary Per Annual	8,000.00	8,800.00	9,680.00	10,648.00	11,712.80
Paper Per Annual	15,000.00	16,500.00	18,150.00	19,965.00	21,961.50
Ribbon Per Annual	5,000.00	5,500.00	6,050.00	6,655.00	7,320.50
Utilities Per Annual	30,000.00	33,000.00	36,300.00	39,930.00	43,923.00
Miscellaneous Per Annual	30,000.00	33,000.00	36,300.00	39,930.00	43,923.00
Total Annual Office Supplies & Miscellaneous	88,000.00	96,800.00	106,480.00	117,128.00	128,840.80
Total Manual System Cost	1,444,000.00	1,588,400.00	1,747,240.00	1,921,964.00	2,114,160.40

Table 3.2. Five Years Accumulated Manual System Cost, Baht.

Year	Total Manual Cost	Accumulated Cost
1	1,444,000.00	1,444,000.00
2	1,588,400.00	3,032,400.00
3	1,747,240.00	4,779,640.00
4	1,921,964.00	6,701,604.00
5	2,114,160.40	8,815,764.40
Total	8,815,764.40	–

(2) Costs of Computerized System

Table 3.3. Computerized System Cost Analysis, Baht.

Cost items	Years				
	1	2	3	4	5
Fixed Cost					
Hardware Cost:					
Computer Server Cost	30,980.00	30,980.00	30,980.00	30,980.00	30,980.00
Workstation Cost	37,500.00	37,500.00	37,500.00	37,500.00	37,500.00
Network Cost	10,200.00	10,200.00	10,200.00	10,200.00	10,200.00
Ups, Printer and Modem Cost	25,000.00	25,000.00	25,000.00	25,000.00	25,000.00
Total Hardware Cost	103,680.00	103,680.00	103,680.00	103,680.00	103,680.00
Maintenance Cost:					
Maintenance Cost	0.00	0.00	0.00	30,000.00	33,000.00
Total Maintenance Cost	0.00	0.00	0.00	30,000.00	33,000.00
Software Cost:					
Window NT for Server version 4.0	6,670.00	6,670.00	6,670.00	6,670.00	6,670.00
Window 98 Thai for Work Station 5 sets	2,550.00	2,550.00	2,550.00	2,550.00	2,550.00
Microsoft Office 2000 (Thai Edition)	6,550.00	6,550.00	6,550.00	6,550.00	6,550.00
SQL Server version 7.0 (10 Licenses)	17,200.00	17,200.00	17,200.00	17,200.00	17,200.00
Delphi 5	11,600.00	11,600.00	11,600.00	11,600.00	11,600.00
Total Software Cost	44,570.00	44,570.00	44,570.00	44,570.00	44,570.00
Implementation Cost:					
Advanced Training Cost	42,000.00	0.00	0.00	0.00	0.00
Basic Training Cost	27,000.00	0.00	0.00	0.00	0.00
Set up Cost	308,500.00	0.00	0.00	0.00	0.00
Total Implementation Cost	377,500.00	0.00	0.00	0.00	0.00
Total Fixed Cost	525,750.00	148,250.00	148,250.00	178,250.00	181,250.00
Operating Cost					
People-Ware Cost:					
Operation Manager 1 person @31,000	372,000.00	409,200.00	450,120.00	495,132.00	544,645.20
Computer Manager 1 person @16,000	192,000.00	211,200.00	232,320.00	255,552.00	281,107.20
Staff 3 persons @10,000	360,000.00	396,000.00	435,600.00	479,160.00	527,076.00
Over Time Staff 3 persons	49,000.00	53,900.00	59,290.00	65,219.00	71,740.90
Bonus	77,000.00	84,700.00	93,170.00	102,487.00	112,735.70
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 & Miscellaneous Cost:					
Stationary Per Annual	7,000.00	7,700.00	8,470.00	8,317.00	10,248.70
Paper Per Annual	8,000.00	8,800.00	9,680.00	10,648.00	11,712.80
Printer Toners Per Annual	6,000.00	6,600.00	7,260.00	7,986.00	8,784.60
Ribbon Per Annual	3,000.00	3,300.00	3,630.00	3,993.00	4,392.30
Utilities Per Annual	20,000.00	22,000.00	24,200.00	26,620.00	29,282.00
Miscellaneous Per Annual	10,000.00	11,000.00	12,100.00	13,310.00	14,641.00
Annual Office Supplies & Miscellaneous Cost	54,000.00	59,400.00	65,340.00	71,874.00	79,061.40
Total Operating Cost	1,104,000.00	1,214,400.00	1,335,840.00	1,469,424.00	1,616,366.40
Total Computerized System Cost	1,629,750.00	1,362,650.00	1,484,090.00	1,647,674.00	1,797,616.40

Table 3.4. Five Years Accumulated Computerized Cost, Baht.

Year	Total Computerized Cost	Accumulated Cost
1	1,629,750.00	1,629,750.00
2	1,362,650.00	2,992,400.00
3	1,484,090.00	4,476,490.00
4	1,647,674.00	6,124,164.00
5	1,797,616.40	7,921,780.40
Total	7,921,780.40	–

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

Table 3.5. The Comparison of the System Costs, Baht.

Year	Accumulated Manual Cost	Accumulated Computerized Cost
1	1,444,000.00	1,629,750.00
2	3,032,400.00	2,992,400.00
3	4,779,640.00	4,476,490.00
4	6,701,604.00	6,124,164.00
5	8,815,764.40	7,921,780.40

3.5.2 Benefit Analysis

Benefits are classified into two main categories: tangible and intangible. The proposed system provides the benefits, which are defined as follows:

(1) Tangible benefits

Tangible benefits are those that can be easily quantified. They are measured in term of annual saving when compares computerize system with manual system. The tangible benefit analysis is shown in Table 3.6.

Table 3.6. Tangible Benefit Analysis, Baht.

Cost items	Existing System	Proposed System	Difference
Salary Cost			
1. Salary Cost	1,050,000	924,000	126,000
2. OT Cost	218,500	49,000	169,500
3. Bonus Cost	87,500	77,000	10,500
Total annual salary cost saving			306,000
Annual Operating Cost			
Total annual cost saving	88,000	54,000	34,000
Total Cost Saving			340,000

(2) Intangible Benefits

Intangible costs in the company include all the problems occurring in the existing system. The major intangible costs will be summarized as follows:

(1) Lower operation due to customer dissatisfaction.

(2) The weak control of operation.

(3) Redundant process and data. Employees work low speed in doing daily operation.

3.5.3 Additional Benefits

The organization can efficiently manage, store, view, and process all information with this computerized system. So the computerized information system gives much intangible benefits such as:

(a) Enhance communications.

(b) Leveraging the organization's information: Imaging brings paper-based information into the organization's electronic information systems, where workers can more easily access and use it.

(c) Future cost avoidance.

(d) Integrate business application together to increase the efficiency of work and the accuracy of information for all management levels.

(e) Provision of information about customers.

(f) Improving security and control.

3.5.4 Breakeven Analysis

Breakeven Analysis is the regular form of cost comparison. Comparing the cost of the proposed system and the cost of the existing system to determine the point that the costs of the both systems become equal. Normally, cost of the proposed system will be highest at the first year because of installation of new hardware and software. The proposed system costs will be dropped rapidly after the system has already implemented. And another one system; cost of existing system, will increase every year. The major factor which is affected to the existing system is employee salary because it is fixed cost.

Cost comparison between the existing system and the proposed system is shown in Table 3.5. The Figure 3.2 show the break even-point, the proposed system will reach that point around 11 months. It indicates that the proposed system is more economy than the existing system.

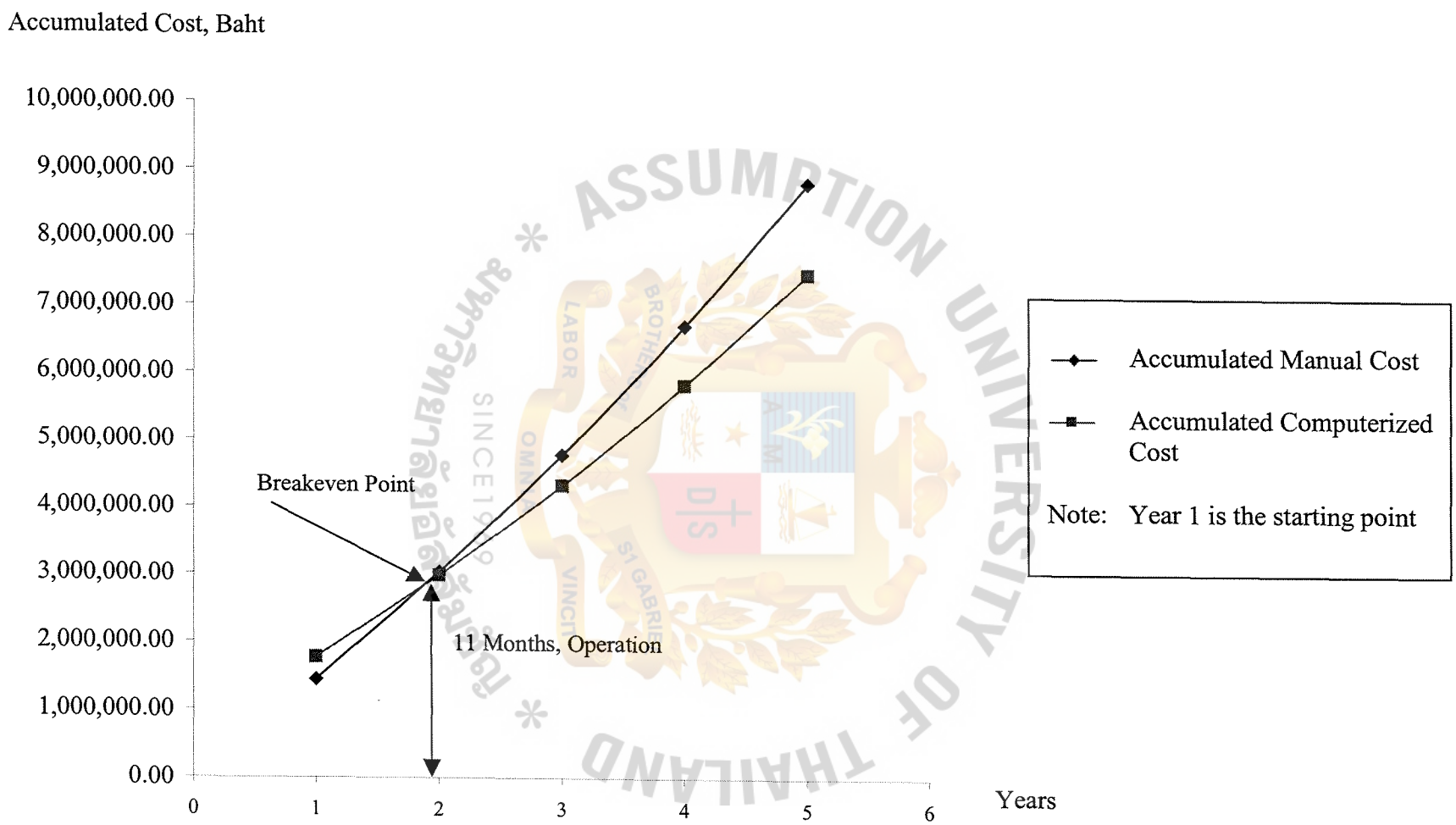


Figure 3.2. Break-Even Analysis.

3.5.5 Payback Analysis

The payback period is the simple and popular methodology to measure the performance of the benefit which accumulate earnings sufficient to cover the investment. Payback period is defined as the point in time when initial investment costs are recovered completely and proposed system savings begin.

The discounted payback must consist of the time value of money to adjust future money to be the current value actually called present value. The formula for present value is shown as follows:

$$PVn = \frac{1}{(1+I)^n}$$

Where PVn = Present value at year n

I = Discount rate (%)

N = Required year

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

$$P = \frac{I}{(1-T)R}$$

Where P = Payback period

I = Investment of capital expenditures

R = Annual savings

T = Tax rate in percent (30%)

$$P = \frac{525{,}750}{(1 - 0.3)\,340{,}000}$$

$$= 2.21$$

Table 3.7. Payback Analysis for the Proposed System, Baht.

Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Development cost:	525,750					
Operation & maintenance cost:		1,104,000	1,214,400	1,335,840	1,469,424	1,616,366
Discount factors for 10%	1.0000	0.909	0.826	0.751	0.683	0.5674
time-adjusted costs (adjusted to present value):	525,750	1,003,536	1,003,094	1,003,216	1,003,617	917,126
Cumulative time-adjusted costs Over lifetime:	525,750	1,529,286	2,532,380	3,535,596	4,539,213	5,456,339
Benefit derived from operation of new system:	0	1,360,000	1,496,000	1,645,600	1,810,160	1,991,176
Discount factor for 10%	1.0000	0.909	0.826	0.751	0.683	0.5674
Time-adjusted benefits (adjusted to present values):	0	1,236,240	1,235,696	1,235,846	1,236,339	1,129,793
Cumulative time adjusted benefits Over lifetime:	0	1,236,240	2,471,936	3,707,782	4,944,121	6,073,914
Cumulative lifetime time-adjusted cost + benefits:	-525,750	-293,046	-60,444	172,185	404,908	617,575

From Table 3.7., data can be transform to a graph of Payback Analysis as shown in Figure 3.3.

The payback period analysis can make profit in shortly, so it is suitable time for investment. If the payback period is greater than 4 years, it should not invest in the proposed system.

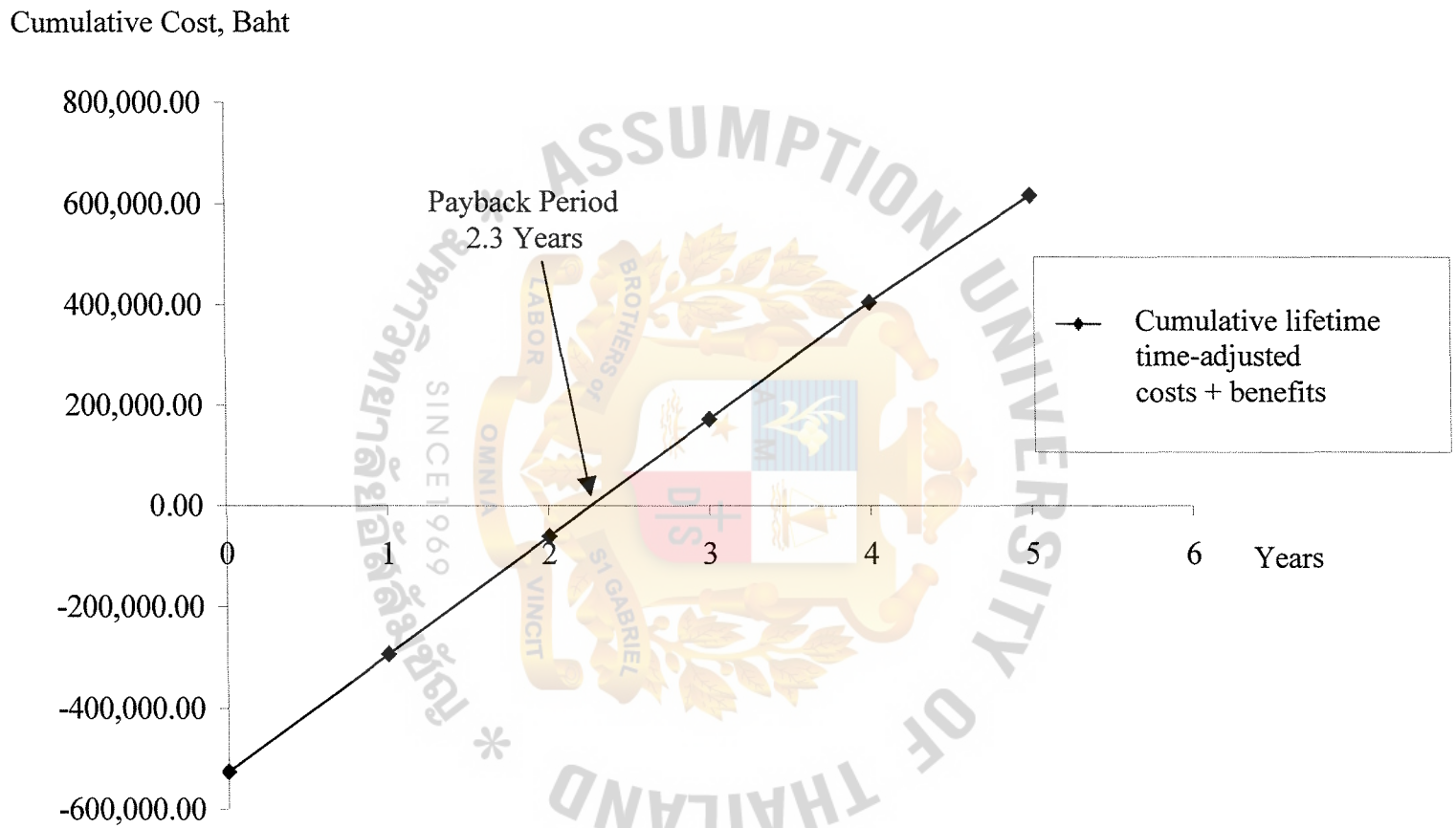


Figure 3.3. Payback Analysis.

IV. PROJECT IMPLEMENTATION

4.1 Coding

The system is divided into many modules according to the data flow diagram. The details of each module present the input, process, output and data flows.

The system will be applied in two-tiered Client/Server, using Microsoft SQL Server version 7.0 as database for storing data at the server with the Microsoft Windows NT and the client using Delphi version 5.0 for Graphic User Interface with the Windows 98. The Client/Server are communicated by ODBC.

4.1.1 Process Specification

The process specification will present process number, process name and details of each process.

There are 16 process specifications used in the new system as follows:

(1) Process 1.1.1 Create Customer Information

(2) Process 1.1.2 Create Agreement

(3) Process 1.1.3 Create Cargoes Information

(4) Process 1.1.4 Create Cargo Owner

(5) Process 1.2.1 Entry Receive Information

(6) Process 1.2.2 Generate Receive Detail

(7) Process 1.2.3 Allocate Location

(8) Process 1.2.4 Print Receive Information

(9) Process 1.2.5 Update Receive Information

(10) Process 2.1.1 Entry Customer Order

(11) Process 2.1.2 Entry Truck Master

(12) Process 2.1.3 Entry Issue Information

(13) Process 2.1.4 Picking Cargoes

(14) Process 2.1.5 Print Issue Information

(15) Process 2.2.1 Entry Delivery Information

(16) Process 2.2.2 Choose Cargoes from Issue Record

(17) Process 2.2.3 Update Receive Record

(18) Process 2.2.4 Print Delivery Information

(19) Process 2.2.5 Update Delivery Information

(20) Process 3.1 Location Inquiry

(21) Process 3.2 Cargoes Inquiry

(22) Process 3.3 Customer Cargoes Inquiry

(23) Process 4.1.1 Calculate Storage and Handling Charge

(24) Process 4.1.2 Calculate Transportation Charge

(25) Process 4.1.3 Generate Debit Note

(26) Process 4.2 Transfer data to Account

(27) Process 5.1 Print Stock Movement

(28) Process 5.2 Print Debit Note

(29) Process 5.3 Print Charge Report

(30) Process 5.4 Print Cargo Movement

4.2 Testing and Implementation

4.2.1 Testing

Testing is the process of executing all or some part of the system in order to discover any errors. Testing of specific programs, subsystems and the total system is essential for quality assurance of software. It is done in order to turn up any existing problems with programs and their interfaces before the system is actually used. Typically, testing is carried out by means of a bottom-up fashion which can be described as follows:

(1) Program Testing. The programmer follows each step in the program specification to check whether the routine works can be carried out they are written. The valid and invalid tested data are created and input to the system. Then the program is run in order to test all possible situations that might occur in the future.

(2) Link testing. This step is done to see if the programs which are interdependent can actually work together as planned.

(3) System testing. When link tests are satisfactorily concluded, the system as a complete entity must be tested. The objective of entire system testing is to ensure that the users are able to input the data properly and the overall system flow can work properly. In other words, the test is carried out to ensure that the entire system functions as a whole.

4.2.2 Implementation

Implementation is a process of assuring that the information system is operational and then involving well-trained users in its operation. The actual implementation will follow the project schedule as a guideline, however, additional factors that arise in the normal course of the project evolution should be considered. The term must establish plans that phase in deliverables in a reasonable manner. In a large system project, the primary role of the analyst is overseeing implementation by correctly estimating the time needed, and then supervising the installation of equipment for a traditional system, training of users and converting files and a database to the new system.

(1) User training. This is an important part of implementation, since the users must be able to run the whole system without the intervention of the analyst. The analyst has to consider who needs to be trained, who will train them,

objectives of training, methods of instruction to be used, sites, materials and time.

(2) Data conversion. The analyst has several strategies for converting the data from the previous system to the new system.

V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The purpose of this system development project is to analyze, design and implement the system to support the warehouse information system. Since the existing system is a manual system which causes many problems, the computerized system is then developed in order to meet user requirement.

From the existing system, the users operate the warehouse information system process manually. They have faced problems such as the large amount of cargo types, cargo quantities and transactions cause the process of daily transactions to be busy and difficult in the manual system. So the users need the computerized system to provide a timely, correct and reliable system. During the analysis phase, it is obvious that the information derived from the proposed system could support the top management in decision making in order to gain a competitive advantage.

The proposed system will provide the computerized information system instead of the manual system. It can also reduce the workload of manpower with the computerized system. The operation can meet user requirements such as the control of online customer order process, more reliable and consistent procedures to eliminate errors, security and operation control for protecting data, ease of usage, backup and recovery data, etc. Furthermore, there are the by-products such as fast, accurate, complete, up-to-date, cost reduced advertising, increased efficiency, and enhanced communications. And another reason for the implementation of this proposed system is the company's strategy to provide service and information to supporting the customer.

Table 5.1. Table of Achievement.

Process	The Existing System	The Proposed System
Input data	30 minutes / 1 transaction	3 minutes / 1 transaction
Update data	45 minutes / 1 transaction	3 minutes / 1 transaction
Search and Retrieve data	10 minutes / 1 transaction	20 seconds / 1 transaction
Output data (Report and Query)	30 minutes / 1 transaction	5 seconds / 1 transaction

The proposed system use less time in all process than the existing system.

(1) Input data: the proposed system retrieved the information from database to display on screen for user choose the information. The master file can be reused do not need to re-key in.

(2) Update data: the proposed system reach to the desired data by foreign key and update data by using the key of its record.

(3) Search and retrieve data: the proposed system search data in many form by using some information that user key in and searching in database to retrieve on screen or report. The proposed system keep the data in database and it can linked to each other.

(4) Output data: the proposed system create report and query by use the scope of the desired key to generate. All data are kept in database, it is easy to collect for generate many form of report.

5.2 Recommendations

This project will be developed to be one of the strategic methods of the company to gain competitive advantage over the competitors. This system not only assists the company to save operation cost but also increases the location capacity to keep cargoes from customers. The system is created purposely to increase customer's satisfaction. Such a system would help the company to reduce paper work, processing time, and human labor.

Because the new system potentially changes employees' operation, most of the employees often resist the new system when it is introduced. In order to make the conversion easier, the management team should make users have positive attitudes to the new system.

System Expansion

The system should be developed to cover other systems of the company such as Financial Department. The Financial department of the company should be further developed to the computer-based systems. Further system would help the company to reduce much of the operation costs in the long run. The system we developed here is considered to be part of the future system. The expansion of the development will be functional without double-checking some works in the system.

System Input

This project is the beginning of computerized system of the company. There are still various proposals that must go on. For the next phrase, they required to use a barcode reader. The program can be developed under PC and the barcode scanner, to scan the code of cargo for both incoming and outgoing cargoes. It can protect the mistaken cargo's code while the user key input the code.

E-Commerce

According to the change of technology and innovation, SAS Logistics have a plan to provide the E-Business solution in order to satisfy customer service.

The E-Business system, have the objectives as follows:

(1) To provide real-time data monitoring through internet for individual customer with security.

(2) To provide stock movement and stock transaction report printing through internet.

(3) To create Home page for advertising company

(4) Utilize existing resource

APPENDIX A

DATAFLOW DIAGRAMS

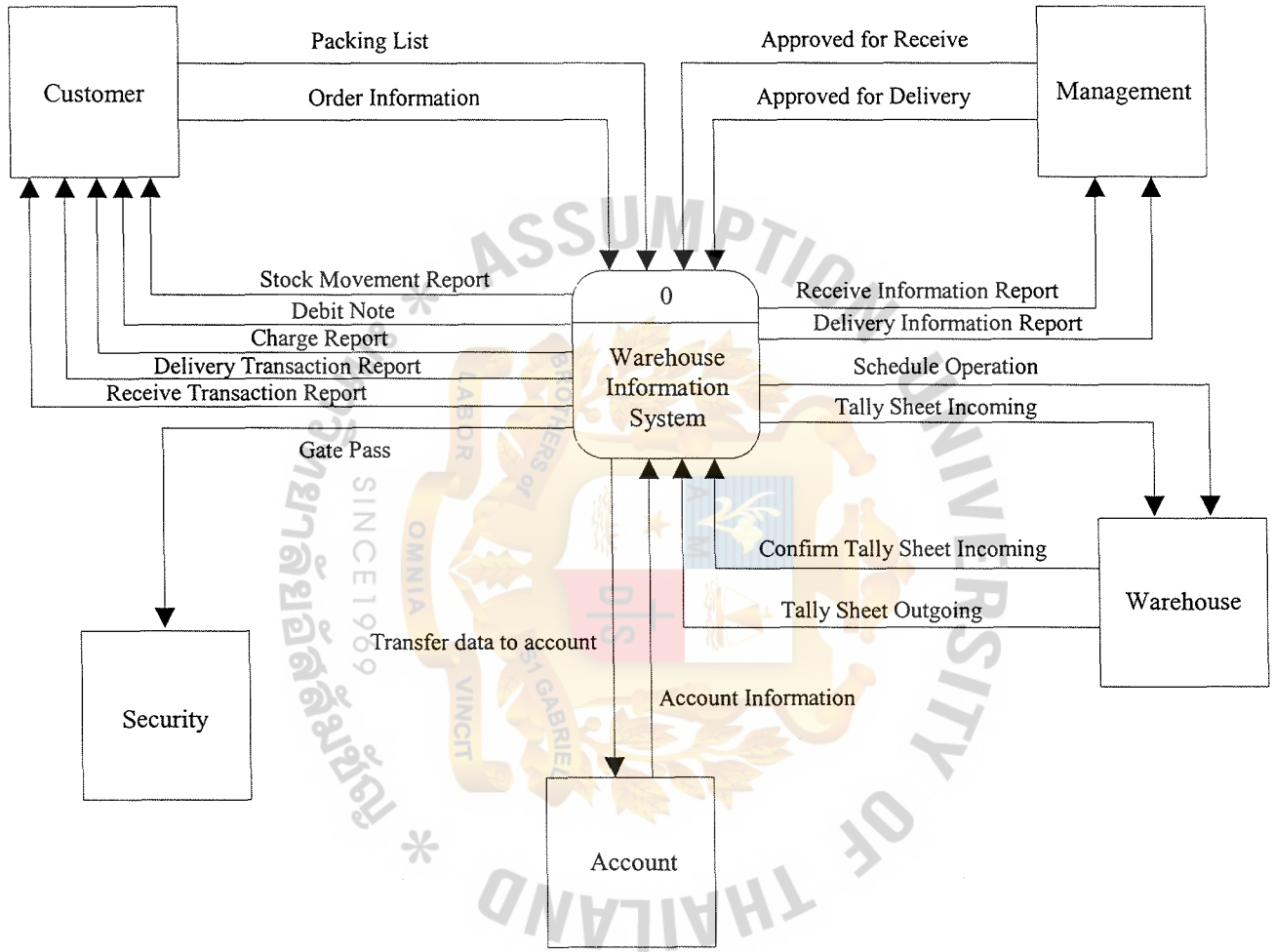


Figure A.1. Context Dataflow Diagram.

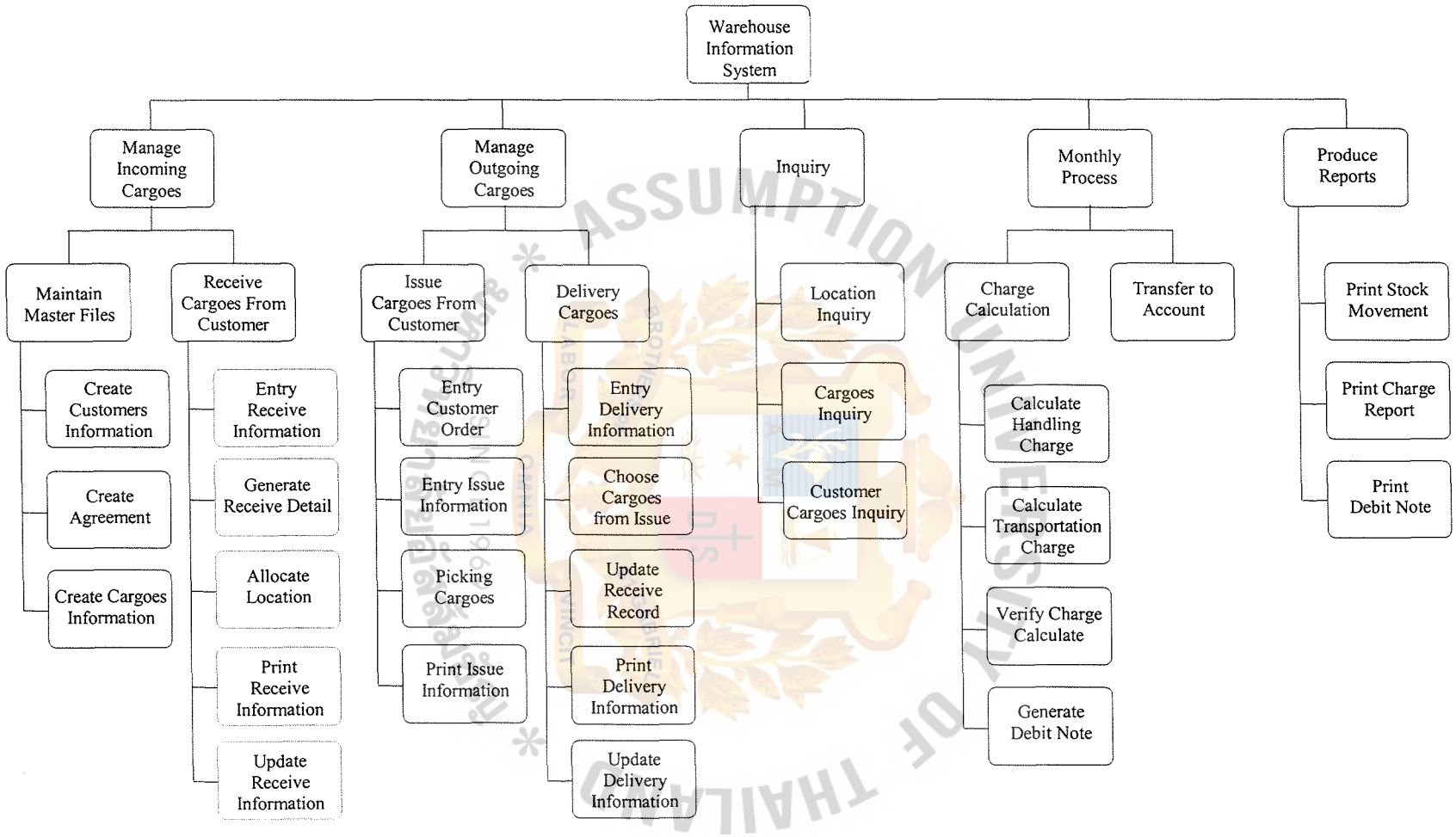


Figure A.2. Decomposition Diagram.

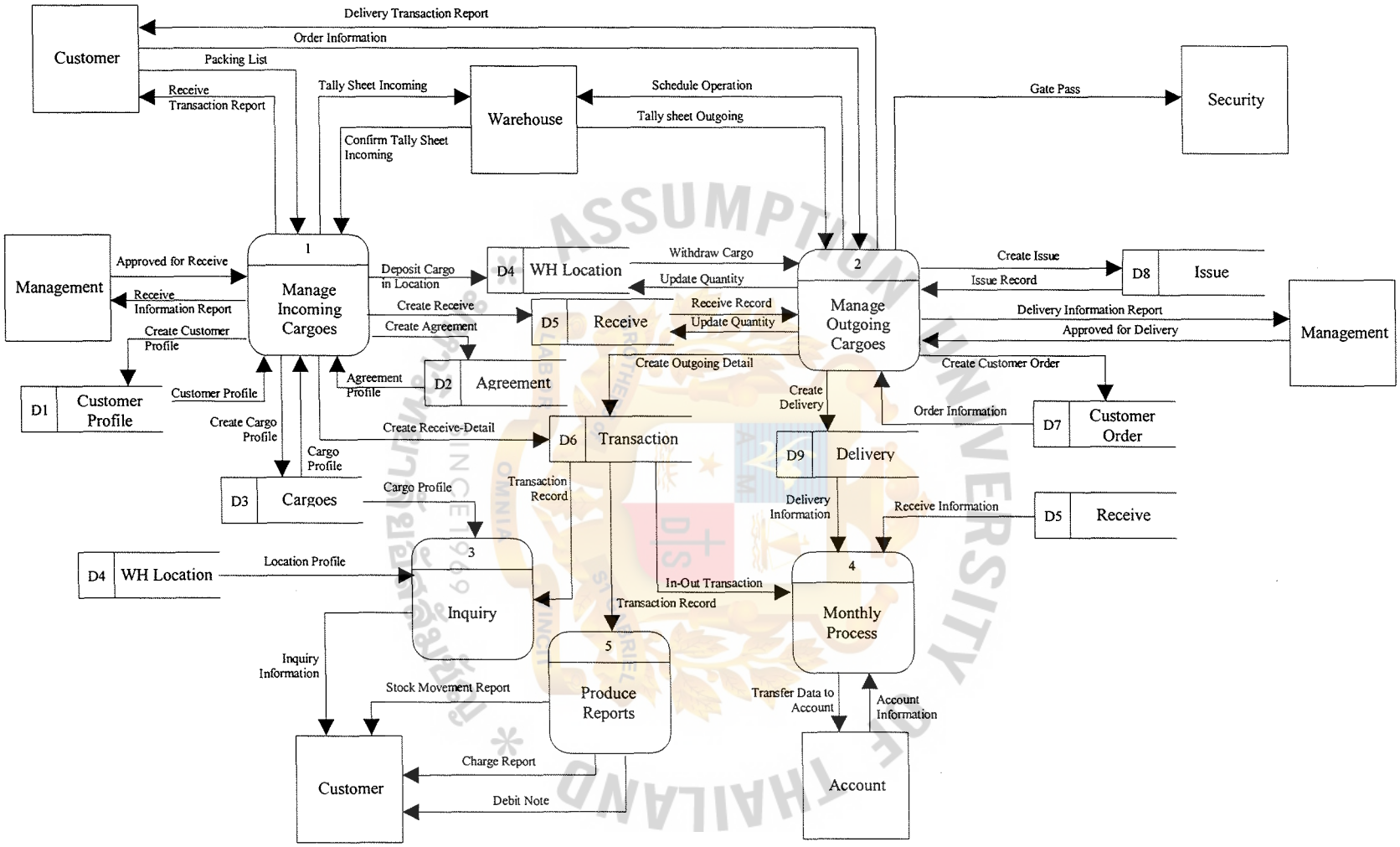


Figure A.3. Level 0 Dataflow Diagram of Warehouse Information System.

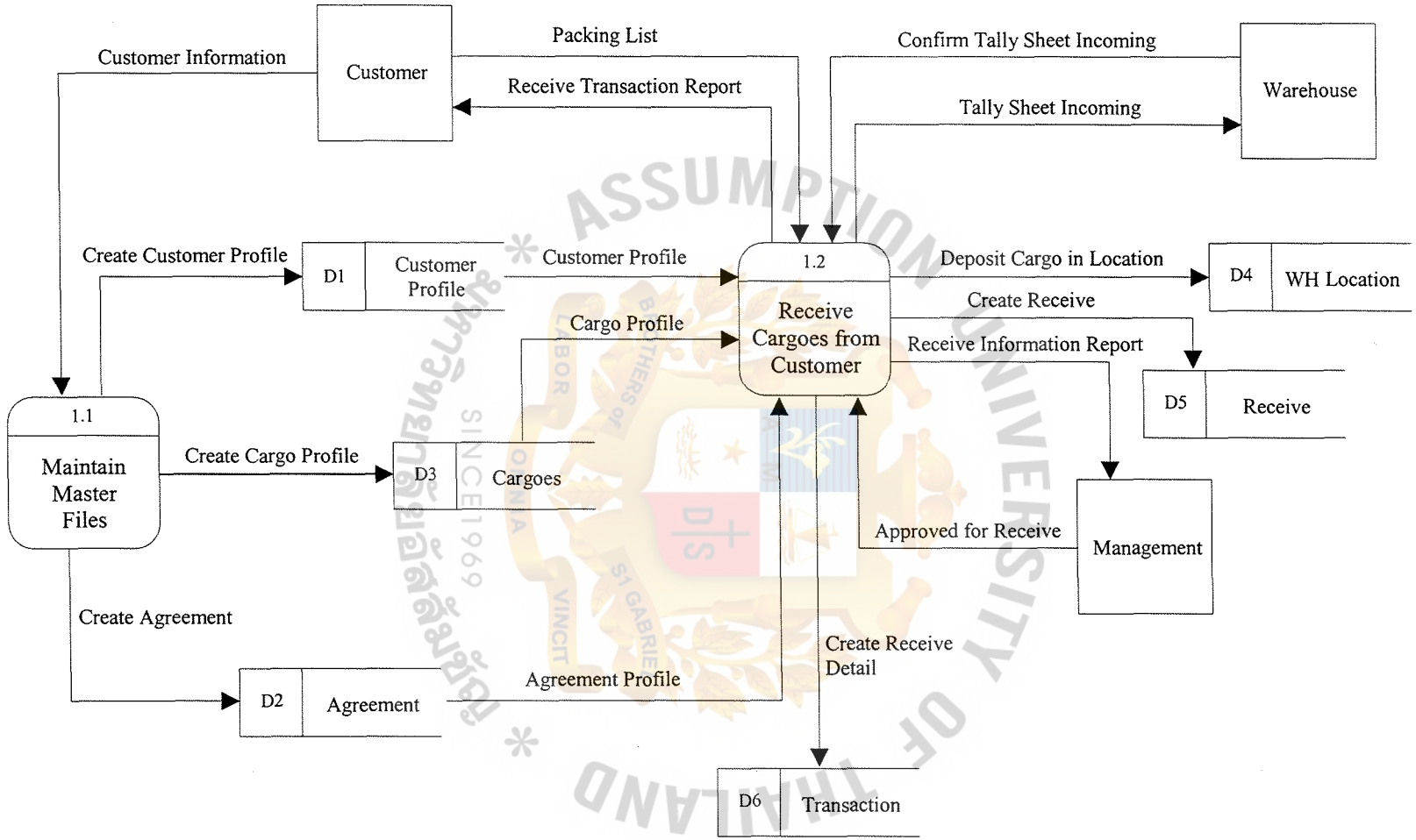


Figure A.4. Level 1 of Manage Incoming Cargo.

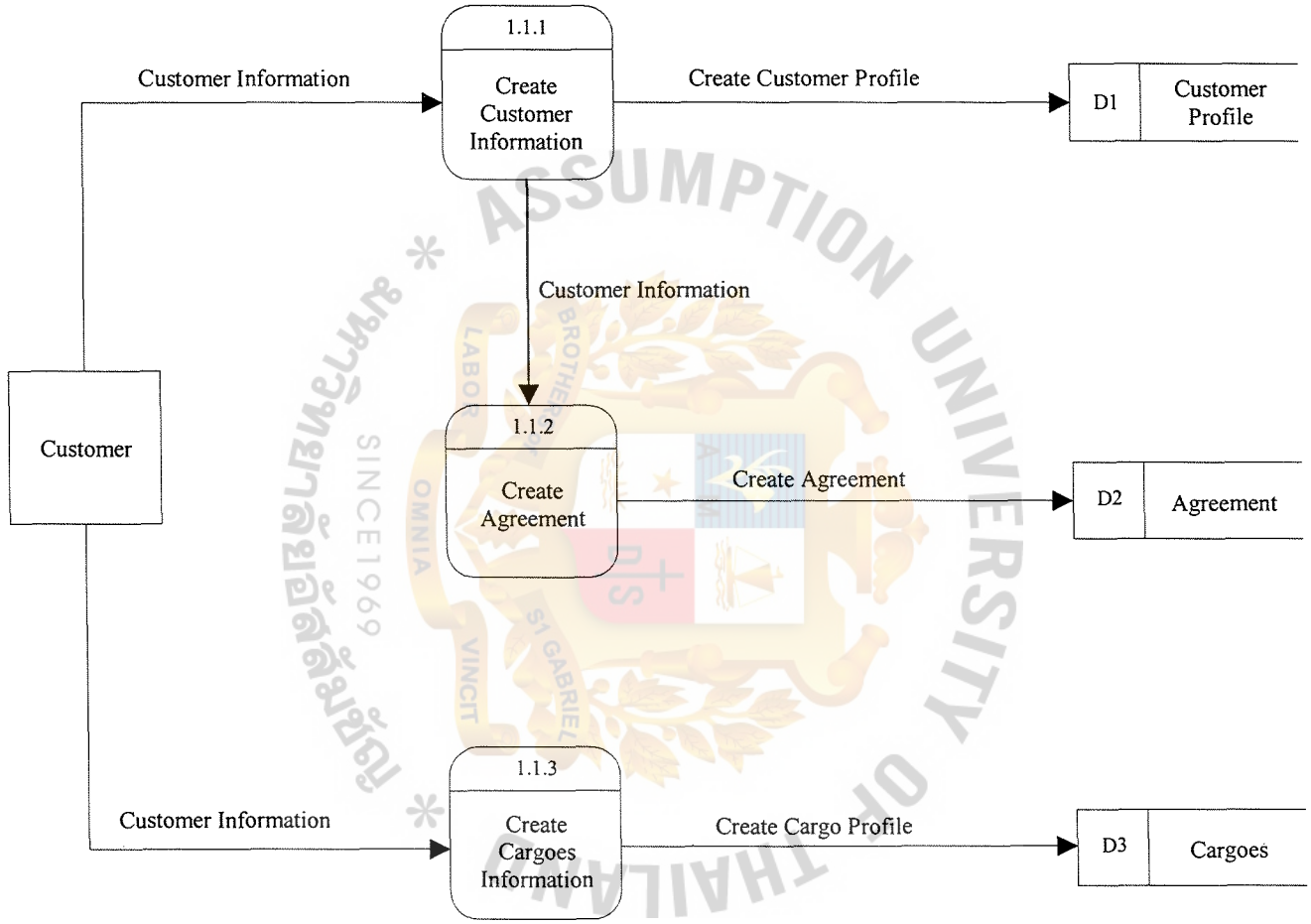


Figure A.5. Level 2 of Maintain Master Files.

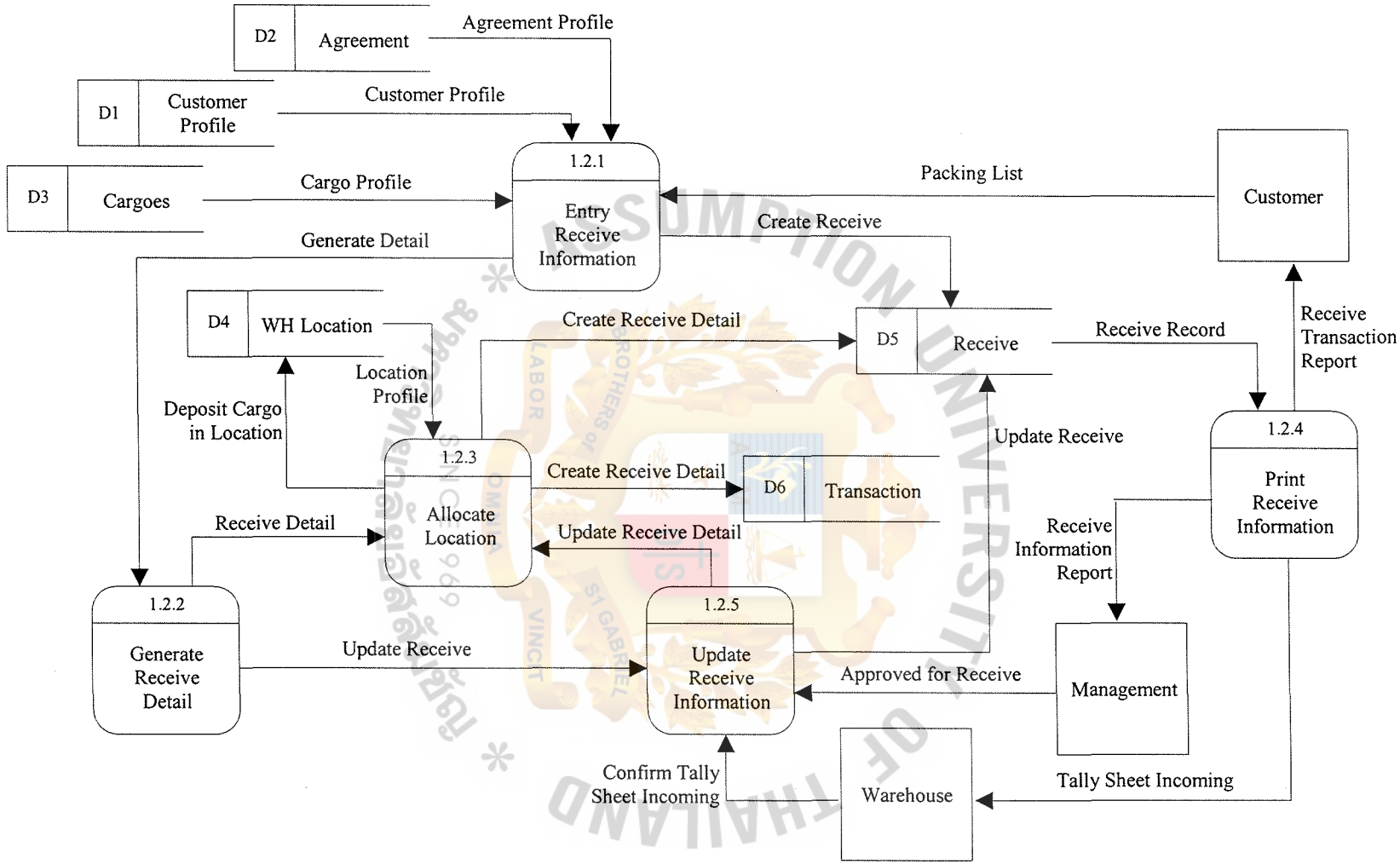


Figure A.6. Level 2 of Receive Cargoes from Customer.

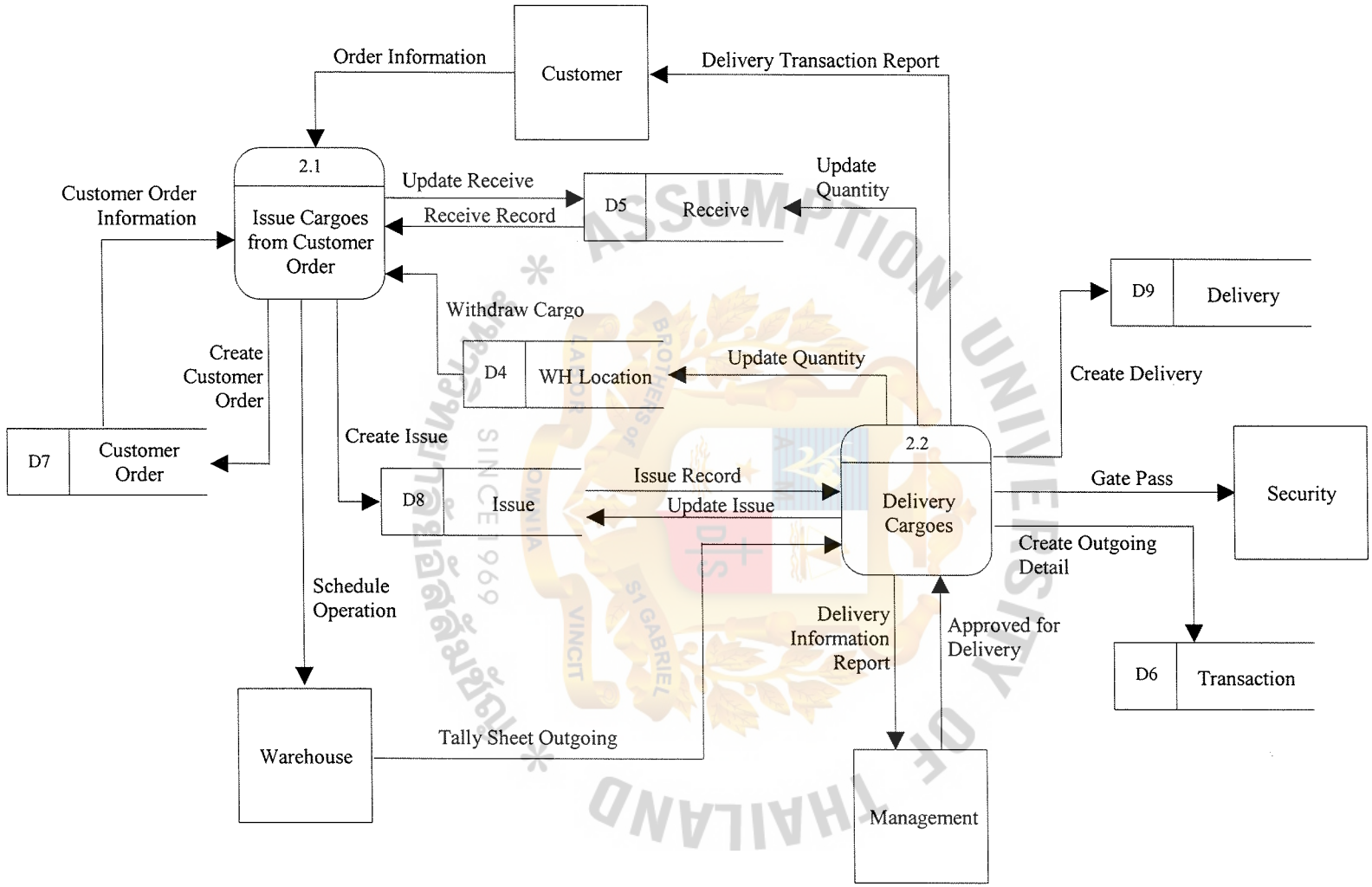


Figure A.7. Level 1 of Manage Outgoing Cargo.

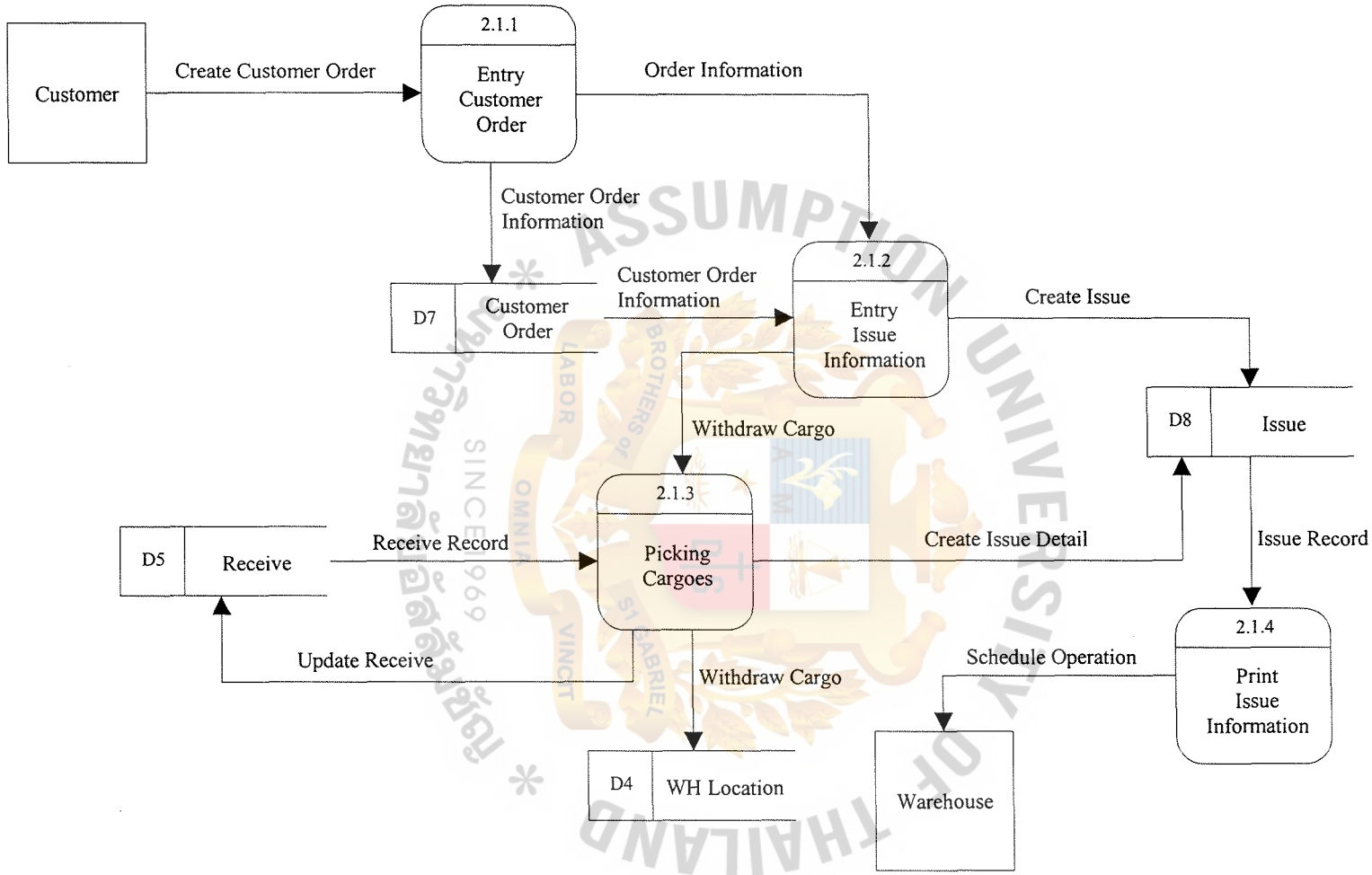


Figure A.8. Level 2 of Issue Cargoes from Customer Order.

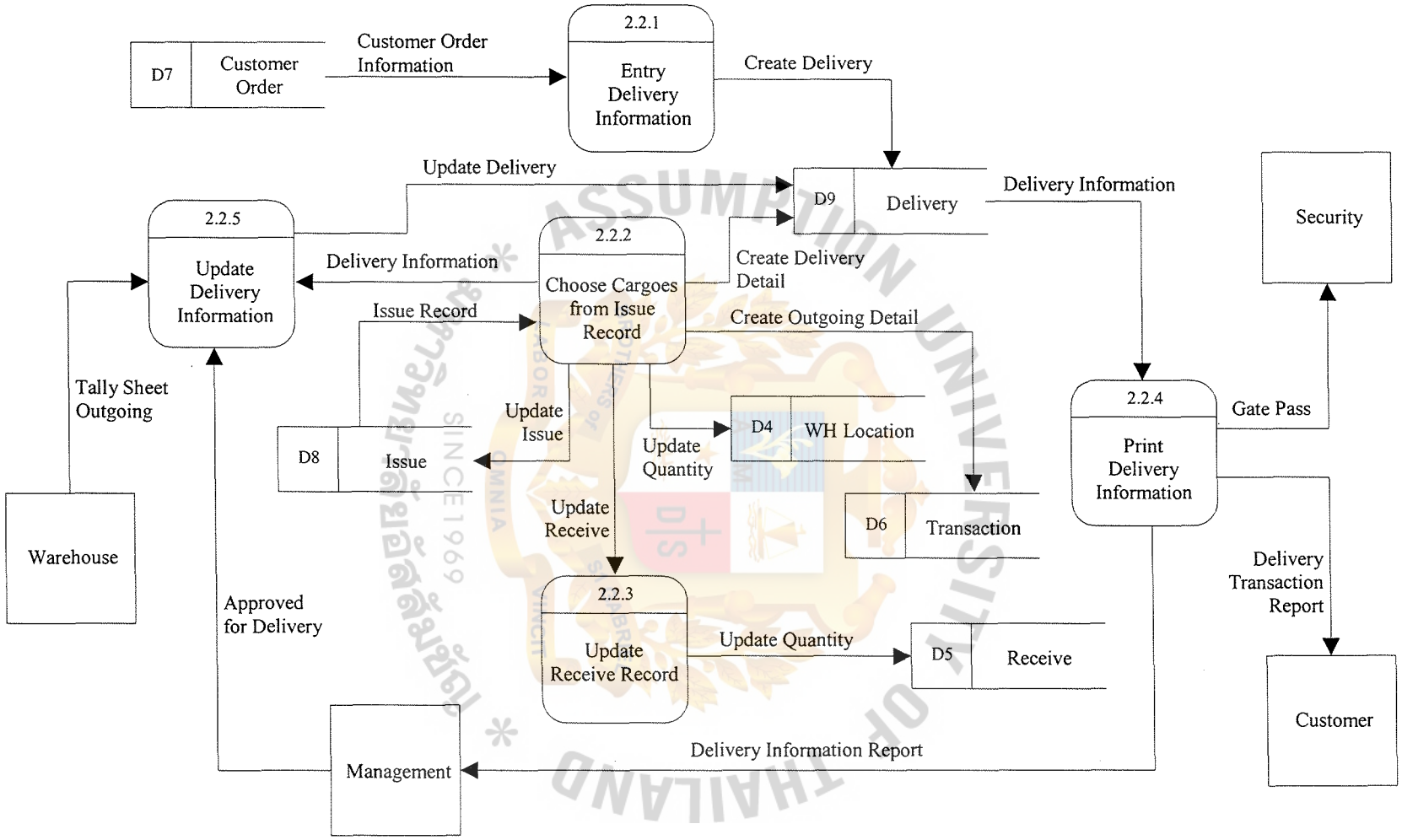


Figure A.9. Level 2 of Delivery Cargoes.

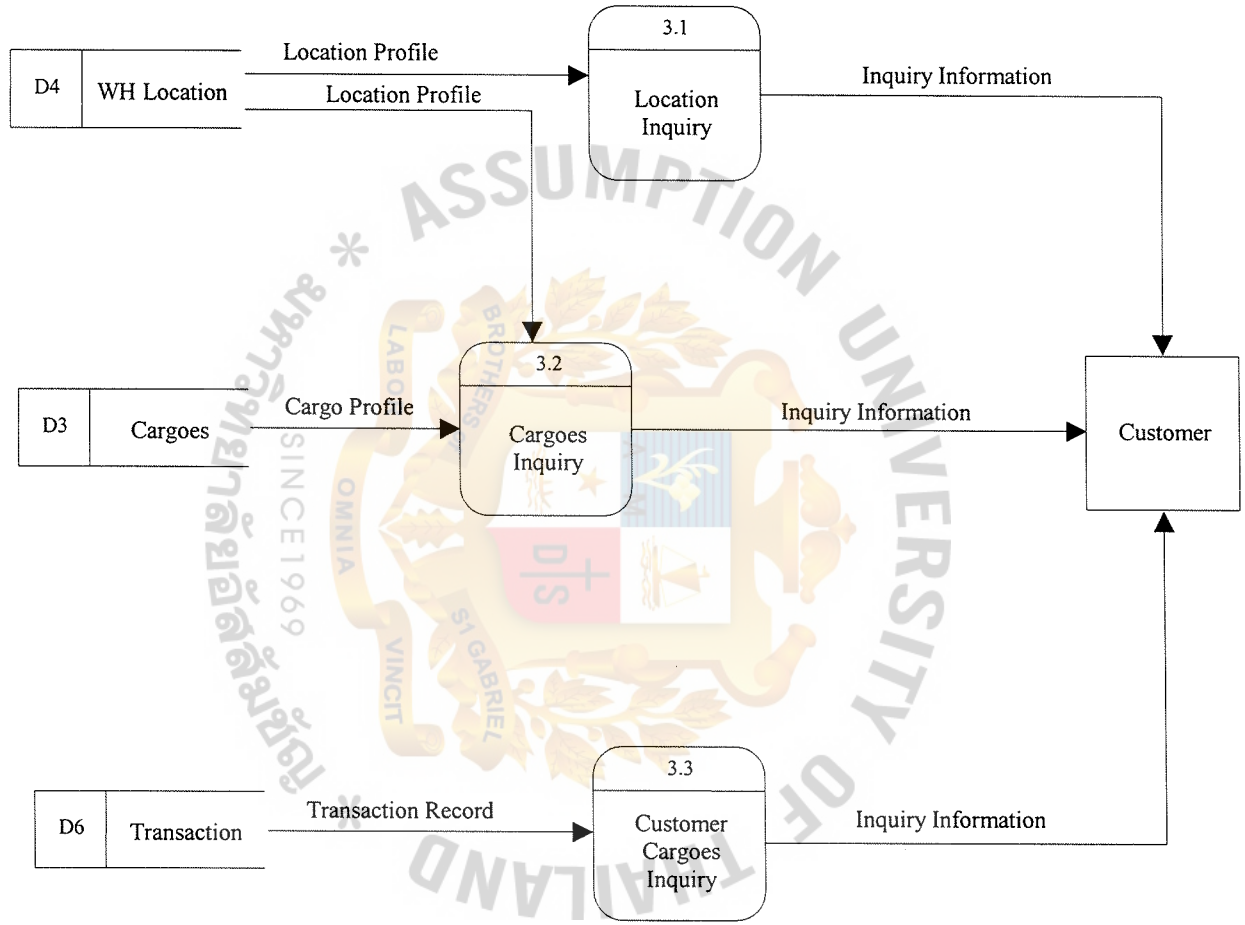


Figure A.10. Level 1 of Inquiry.

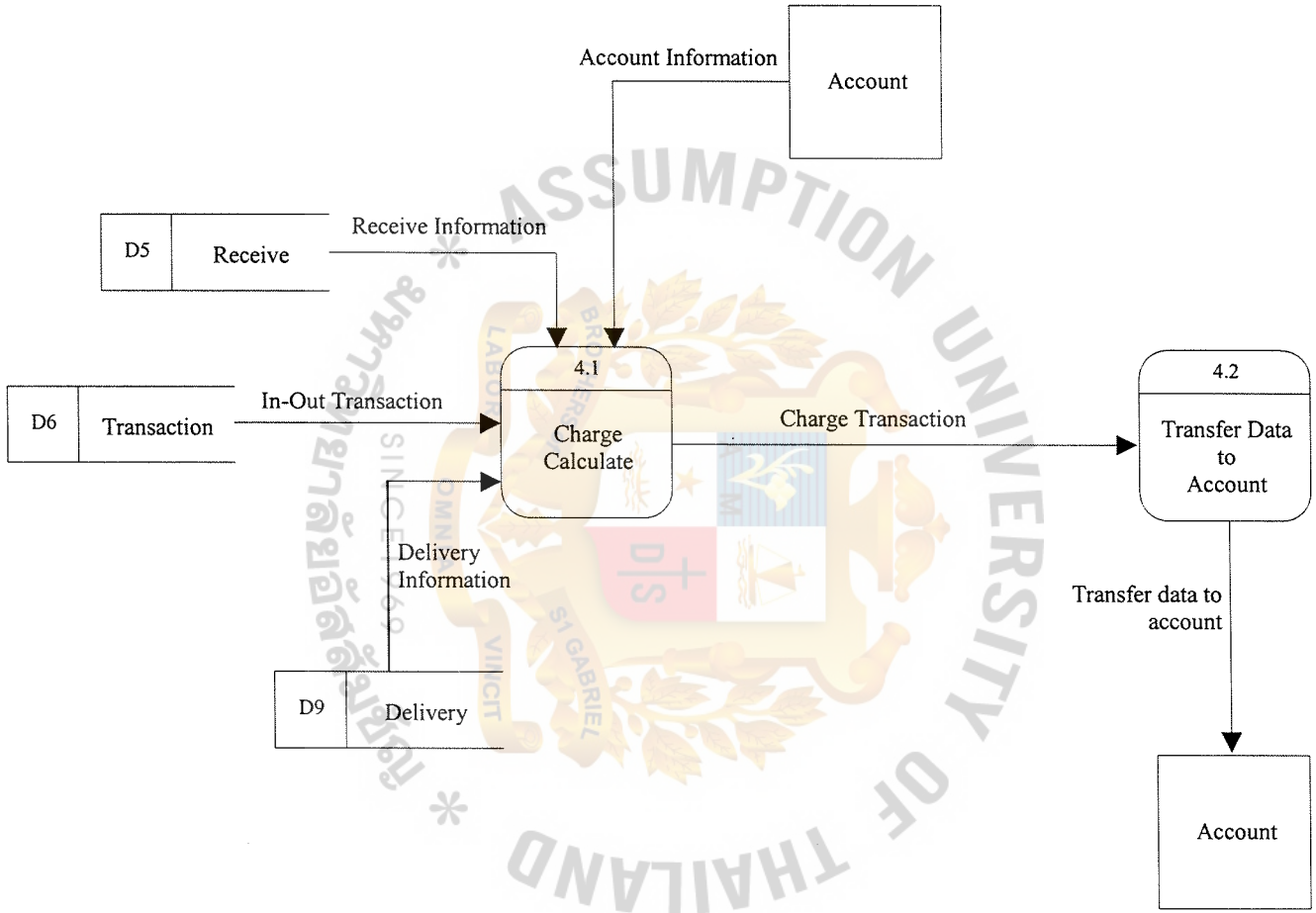


Figure A.11. Level 1 of Monthly Process.

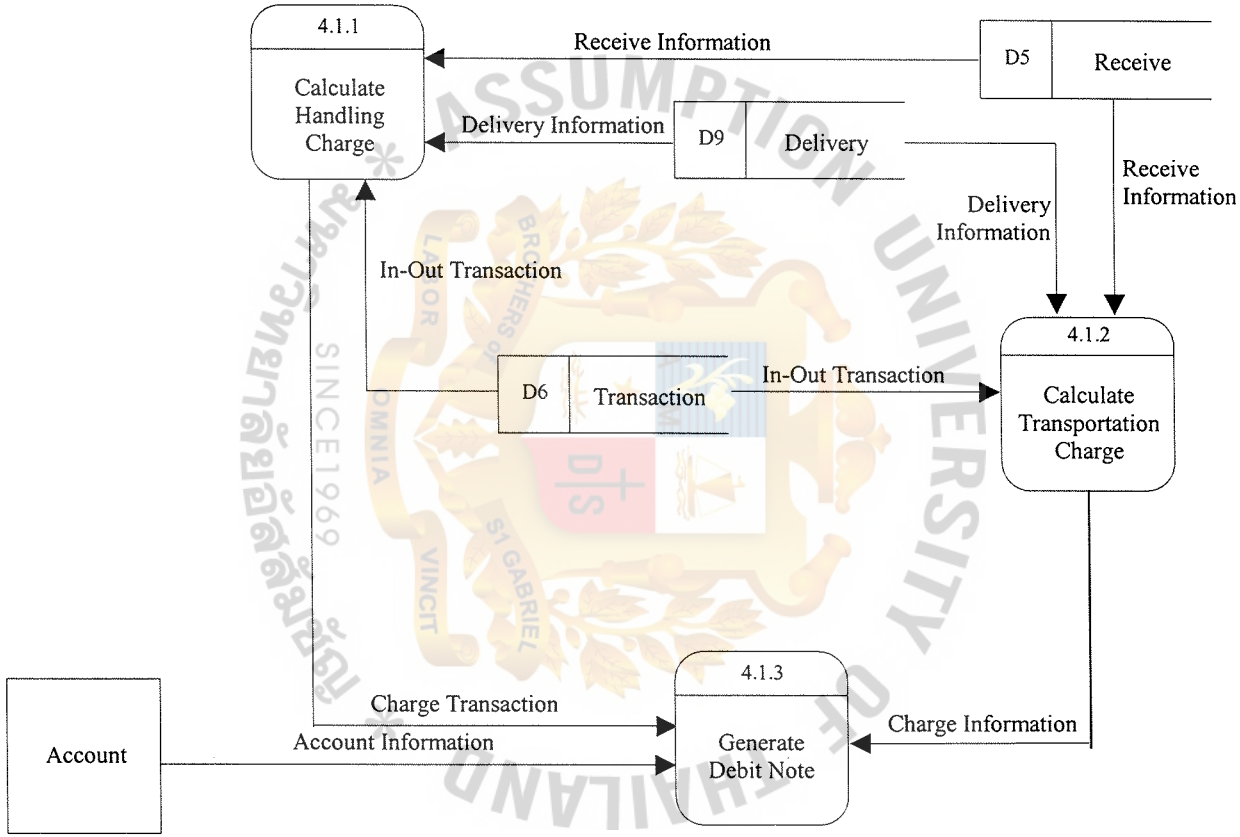


Figure A.12. Level 2 of Charge Calculate.

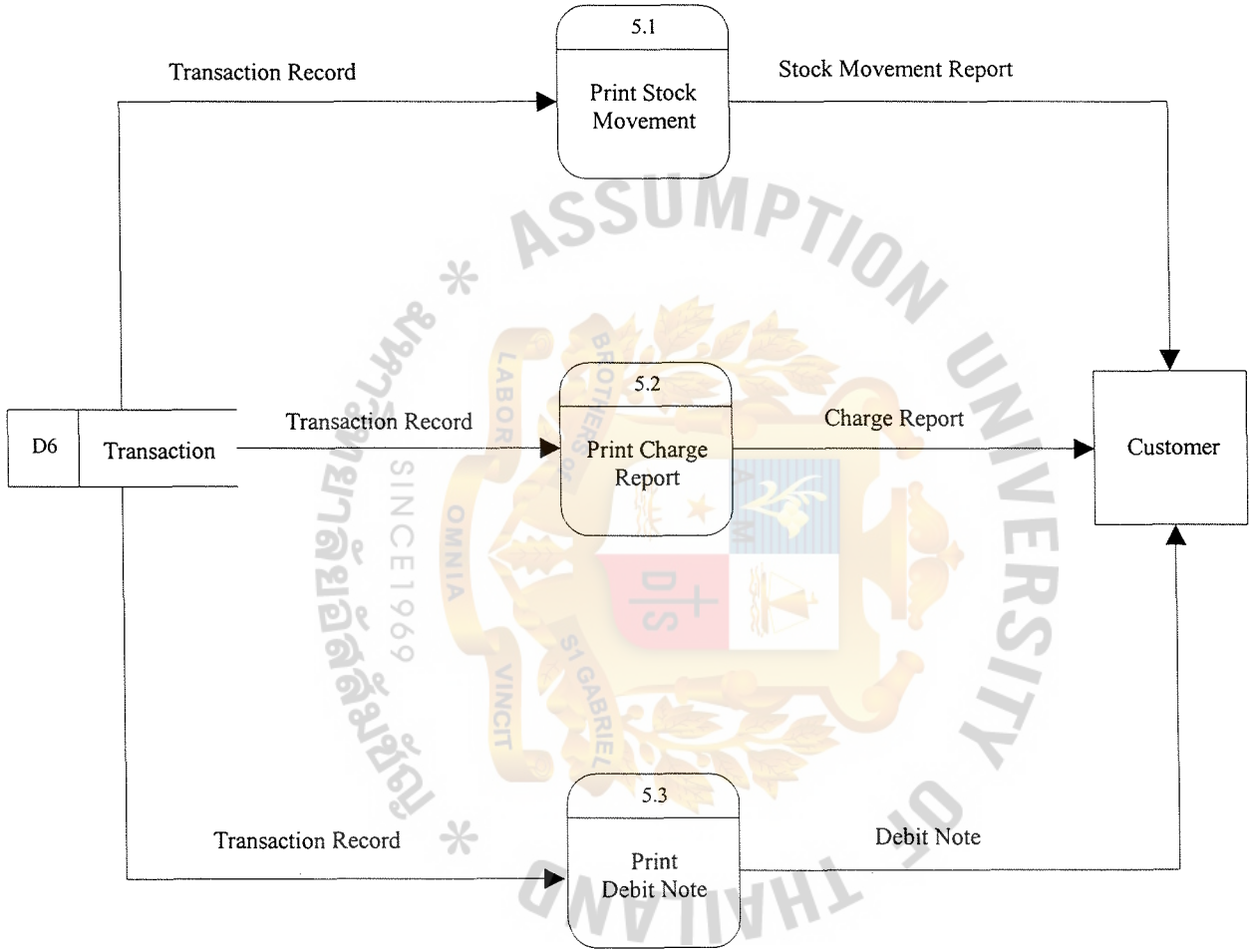


Figure A.13. Level 1 of Produce Reports.

APPENDIX B

DATA DICTIONARY

DATA DICTIONARY

Table B.1. Data Dictionary of Customer Table.

Field Name	Meaning
CustCode	Identify the Customer Id
CustName	Identify the Customer Name
Address1	Customer Address 1
Address2	Customer Address 2
Address3	Customer Address 3
Address4	Customer Address 4
PostageCode	Postage Code of Customer
Region	Region of Customer
Country	Country of Customer
Territory	Territory of Customer
PhoneNumber	Phone number
FaxNumber	Fax number
CurrCode	Currency exchange (i.e. BHT = Baht)
PayTerm	Payment term (i.e. 15, 30 days)
PayType	Payment by (i.e. Cash, Cheque)
VatRegNo	Vat register no.
ContractPerson	Contract person
ContractPosition	Contract Position
ARAcct	A/R Account No.

Table B.2. Data Dictionary of Agreement Table.

Field Name	Meaning
ContractNo	Identify the Contract No.
CustCode	Identify the Customer Id
ChgCode	Identify the Charge Code
TrnType	Transaction Type
ChgAmtperUnit	Charge rate per unit
ChgAmtperWgt	Charge rate per weight
ChgAmtperMment	Charge rate per measurement
RepeatDay	Repeat day for calculate
BFInclude	Calculate in which section

Table B.3. Data Dictionary of Cargoes Table.

Field Name	Meaning
ProductCode	Identify the Cargo code
Model	Model of cargo
Type	Type of cargo
Color	Color of cargo
ProductName	Identify the Cargo name
LifeSpan	Age of cargo
LocationSize	Capability of location
UOMCode	Unit of measurement
WgtPerUnit	Weight per unit
MeasurePerUnit	Measurement per unit
Categories	Categories group of cargo
ChargeGrp	Charge group of cargo
OtherGrp	Other group of cargo

Table B.4. Data Dictionary of Customer Order Table.

Field Name	Meaning
OrderNo	Identify the Order No.
CustCode	Customer Code
CustDocNo	Customer Reference No.
Destination	Destination to send cargo

Table B.5. Data Dictionary of Warehouse Location Table.

Field Name	Meaning
Location	Identify the Location
Name	Location Name
Warehouse	Warehouse to keep in
Occupy	Location occupy
MaxQuantity	Capacity of location
Quantity	Outstanding quantity
Weight	Outstanding weight
QtyPicking	Picking quantity
WhType	Warehouse type

Table B.6. Data Dictionary of Warehouse Location Detail Table.

Field Name	Meaning
Location	Identify the Location
DocNo	Receive no.
CustCode	Customer Code
ProductCode	Cargo Code
LotNoDesc	Lot no description
RcvDate	Receive date time
Quantity	Outstanding quantity
Weight	Outstanding weight
DamageFlag	Damage flag
QtyPicking	Picking quantity

Table B.7. Data Dictionary of Receive Table.

Field Name	Meaning
DocNo	Receive no.
RcvDateTime	Receive date time
CustCode	Customer code
CustDocNo	Customer reference no.
ProductCode	Cargo code
ShipArrDate	Ship arrive date
LifeSpan	Age of cargo
ExpireDate	Expire date
Quantity	Receive quantity
Weight	Receive weight
Measure	Receive measurement
QtyIssue	Issue quantity
WgtIssue	Issue weight
UOMCode	Unit of measurement
WgtPerUnit	Weight per unit
MeasurePerUnit	Measurement per unit
LocationSize	Capacity of location
TotalLocation	Total location use in record
DamageFlag	Damage flag
ShippingMark	Shipping mark
VehicleNo	Vehicle no, License no.
OwnerBy	Owner of cargo
Place	Place to keep cargo
Remark	Remark, comment
ContractNo	Contract no, agreement no.
QtyPicking	Picking quantity
WgtPicking	Picking weight
Status	Status of record

Table B.8. Data Dictionary of Receive Detail Table.

Field Name	Meaning
DocNo	Receive no.
SeqNo	Sequence no. of record
Location	Location in warehouse
LotNoDesc	Lot no. description
Quantity	Receive quantity
Weight	Receive weight
Measure	Receive measurement
QtyIssue	Issue quantity
WgtIssue	Issue weight
WhType	Warehouse type
QtyPicking	Picking quantity
WgtPicking	Picking weight
Status	Status of record

Table B.9. Data Dictionary of Transaction Table.

Field Name	Meaning
ProductCode	Cargo code
SysDateTime	System date time
RcvDocNo	Receive no.
DocNo	Receive no., delivery no
DocDateTime	Document date time
CustCode	Customer code
Location	Location in warehouse
WhType	Warehouse type
LotNoDesc	Lot no. description
TrnType	Transaction type
Quantity	Transaction quantity
Weight	Transaction weight
Measure	Transaction measurement
UOMCode	Unit of measurement
ContractNo	Contract no., Agreement no.
DamageFlag	Damage flag

Table B.10. Data Dictionary of Issue Table.

Field Name	Meaning
DocNo	Issue no.
OrderNo	Order no.
IssDateTime	Issue date time
CustCode	Customer code
ProductCode	Cargo code
DamageFlag	Damage flag
CustDocNo	Customer reference no.
Quantity	Issue quantity
Weight	Issue weight
UOMCode	Unit of measurement
WgtPerUnit	Weight per unit
MeasurePerUnit	Measurement per unit
DeliveryQty	Delivery quantity
DeliveryWgt	Delivery weight
Status	Status of record

Table B.11. Data Dictionary of Issue Detail Table.

Field Name	Meaning
DocNo	Issue no.
SeqNo	Sequence no.
RcvDocNo	Receive document no.
Location	Location in warehouse
LotNoDesc	Lot no. description
Quantity	Issue quantity
Weight	Issue weight
Measure	Issue measure
QtyDelivery	Delivery quantity
WgtDelivery	Delivery weight
ReceiveDate	Receive date time
WhType	Warehouse type
ContractNo	Contract no., Agreement no.
Status	Status of record

Table B.12. Data Dictionary of Delivery Table.

Field Name	Meaning
DeliveryNo	Delivery no.
OrderNo	Order no.
DeliDateTime	Delivery date time
CustCode	Customer code
Destination	Destination to send cargo
Quantity	Delivery quantity
Weight	Delivery weight
Measure	Delivery Measure
Driver	Driver name
VehicleNo	Vehicle no, License no.
DeliType	Delivery type
TruckOwner	Truck owner
TruckType	Type of truck
IsChg	Calculate transportation
TruckCost	Cost of truck for company
TruckChg	Charge of truck for charge customer
Remark	Remark
Address	Address

Table B.13. Data Dictionary of Delivery Detail Table.

Field Name	Meaning
DeliveryNo	Delivery no.
SeqNo	Sequence no.
IssDocNo	Issue document no.
RcvDocNo	Receive document no.
Location	Location in warehouse
ProductCode	Cargo code
Quantity	Delivery quantity
Weight	Delivery weight
Measure	Delivery Measure
WhType	Warehouse type
LotNoDesc	Lot no. description
UOMCode	Unit of measurement
ContractNo	Contract no., Agreement no.
DamageFlag	Damage flag
WgtPerUnit	Weight per unit
MeasurePerUnit	Measurement per unit
ReceiveDate	Receive date time

Table B.14. Data Dictionary of Truck Master Table.

Field Name	Meaning
TruckOwner	Truck owner
CustCode	Customer code
DestCode	Destination code
Destination	Destination
Address	Address
PostageCode	Postage Code
PhoneNumber	Phone number
FaxNumber	Fax number
PickupCost	Pick up cost
PickupChg	Pick up charge
SixWheelCost	Six wheel cost
SixWheelChg	Six wheel charge
TenWheelCost	Ten wheel cost
TenWheelChg	Ten wheel charge
TrailerCost	Trailer cost
TrailerChg	Trailer charge

Table B.15. Data Dictionary of Charge Master Table.

Field Name	Meaning
ChargeCode	Charge code
Name	Charge name
AcctCode	Account code
ChargeStat	Charge status

Table B.16. Data Dictionary of All Type Table.

Field Name	Meaning
Type	Type
TypeCode	Type Code
Description	Description

Table B.17. Data Dictionary of System Country Table.

Field Name	Meaning
CntyCode	Country code
Name	Country name

Table B.18. Data Dictionary of System Company Table.

Field Name	Meaning
Code	Company code
Name	Company name
Address1	Company address
PostageCode	Postage code
Country	Country
PhoneNumber	Phone number
FaxNumber	Fax number
CurrCode	Currency exchange i.e. BHT = Baht
Vat	Vat no.
VatRegNo	Vat register no.
TaxID	Tax id.

Table B.19. Data Dictionary of System Unit Table.

Field Name	Meaning
UOMCode	Unit of measurement code
Name	Unit name

Table B.20. Data Dictionary of System Warehouse Table.

Field Name	Meaning
Warehouse	Warehouse code
Name	Warehouse name

Table B.21. Data Dictionary of System Map Table.

Field Name	Meaning
MapNo	Map code.
Name	Map name

Table B.22. Data Dictionary of System Document Control Table.

Field Name	Meaning
DocType	Document type
Name	Document type name
DocGroup	Document group
SeqYear	Current year
SeqNo	Sequence no.

Table B.23. Data Dictionary of Warehouse Information Database.

Field Name	Meaning
Account-Information	Account No. + Account Name
Agreement-Profile	Contract No. + Customer No. + Charge Code
Approved-for-Delivery	Authorize from manager for delivery cargoes
Approved-for-Receive	Authorize from manager for receive cargoes
Cargo-Profile	Product Code + Product Name, Weight per unit + Measure per unit
Charge-Information	Charge Code + Charge amount
Charge-Transaction	Charge Code + Trans Type + Product Code + Quantity
Customer Information	Customer Code + Customer Name + Pay Term
Customer Order Info.	Customer Code + Order No. + Destination
Customer Profile	Customer Code + Customer Name + Address + Pay Term
Delivery Information	Delivery No. + Order No. + Customer Code + Destination
Deposit Cargo in Location	Reduce stock of cargo from location
In-Out Transaction	Movement of cargoes
Inquiry Information	Inquiry of cargoes
Issue Record	Issue No. + Order No. + Customer Code + Product Code
Location Profile	Location + Occupy + Warehouse Type
Map Profile	Map No. + Map Name + Warehouse
Order Information	Order No. + Customer Code + Destination
Receive Detail	Doc No. + Seq.No. + Location + Lot No. + Quantity + Weight
Receive Information	Doc No. + Customer Code + Product Code + Quantity
Receive Record	Doc No. + Customer Code + Product Code + Location + Lot No.
Truck Information	Truck Type + Customer Code + Destination + Truck Charge
Warehouse Information	Warehouse + Warehouse Type
Withdraw Cargo	Withdraw cargoes from location

APPENDIX C

PROCESS SPECIFICATION

Table C.1. Process Specification of Process 1.1.1.

Process Name	Create Customer Information
Data In:	Customer Information
Data Out:	Customer Record
Process:	1. Get necessary customer data, customer name, address, phone number, fax number and assign new Customer ID. 2. Record the customer data into database.
Attachment:	- Customer - Data Store Customer Profile

Table C.2. Process Specification of Process 1.1.2.

Process Name	Create Agreement
Data In:	Customer ID, Company charge rule
Data Out:	Agreement Record
Process:	1. Choose Customer ID from database. 2. Select cargo charge group. 3. Create contract rule for each charge code such as charge amount, calculate day, deduct the withdraw cargo in which period. 4. Repeat step 3 until the charge rule has already been established. 5. Record the customer agreement into database.
Attachment:	- Customer - Data Store Agreement

Table C.3. Process Specification of Process 1.1.3.

Process Name	Create Cargoes Information
Data In:	Customer cargo information
Data Out:	Cargoes Record
Process:	1. Get necessary customer cargo information, cargo characteristics, name, type, unit of measurement, weight per unit, measurement per unit and assign cargo ID. 2. Record the cargo data into database.
Attachment:	- Customer information - Data Store Cargoes

Table C.4. Process Specification of Process 1.2.1.

Process Name	Entry Receive Information
Data In:	Agreement, Customer Profile, Cargoes
Data Out:	Receive Record
Process:	1. Get Customer information. 2. Select document type (the beginning of document number). 3. Choose Customer ID from database. 4. Select Cargo Categories. 5. Choose Cargo ID from database. 6. Input detail of cargo receive, quantity, weight, lot number. 7. Generate Receive document number = max receive document number from database + 1. 8. Insert receive record into database. 9. Go to process 1.2.2.
Attachment:	- Data Store Receive

Table C.5. Process Specification of Process 1.2.2.

Process Name	Generate Receive Detail
Data In:	Receive Record
Data Out:	Receive Detail
Process:	1. The system will generate receive detail record depend on the result of quantity divide by the location size of cargo. 2. Insert receive detail record into database. 3. Go to process 1.2.3.
Attachment:	- Receive Detail

Table C.6. Process Specification of Process 1.2.3.

Process Name	Allocate Location
Data In:	Receive Detail, Warehouse location
Data Out:	Warehouse Location, Transaction, Receive Detail
Process:	1. Choose Map No. from database. 2. Assign the available location to keep customer's cargo. 3. Update location of receive detail record. 4. Insert receive record in transaction. 5. Update status of Warehouse location, and insert location detail. 6. Repeat step 2-5 until all of detail record has already been assigned. 7. Write data into database.
Attachment:	- Data Store Transaction - Data Store Receive

Table C.7. Process Specification of Process 1.2.4.

Process Name	Print Receive Information
Data In:	Receive record
Data Out:	Receive Information
Process:	1. Choose receive document number from database. 2. The report will display on screen or print out.
Attachment:	- Data Store Receive - Customer - Management - Warehouse

Table C.8. Process Specification of Process 1.2.5.

Process Name	Update Receive Information
Data In:	Management comment, Tally sheet confirmation from warehouse, Receive Record
Data Out:	Receive Detail
Process:	1. Receive the comment from management. 2. Receive the confirmation from warehouse. 3. Choose receive document number from database. 4. Modify receive record and update into database. 5. If the allocated record must be update then reverse the record and assign new record. 6. Go to process 1.2.3.
Attachment:	- Data Store Receive

Table C.9. Process Specification of Process 2.1.1.

Process Name	Entry Customer Order
Data In:	Customer order information
Data Out:	Customer Order Record
Process:	1. Select document type (the beginning of Order No.) 2. Choose Customer ID from database. 3. Input customer reference number and destination. 4. Generate Order number. 5. Record the customer order into customer order database.
Attachment:	- Data Store Customer Order

Table C.10. Process Specification of Process 2.1.2.

Process Name	Entry Truck Master
Data In:	Customer Information, cost and charge of truck
Data Out:	Truck Record
Process:	1. Choose Customer ID from database. 2. Select type of truck. 3. Input sending destination, address, truck cost, truck charge. 4. Record the truck information into truck database
Attachment:	- Data Store Truck Master

Table C.11. Process Specification of Process 2.1.3.

Process Name	Entry Issue Information
Data In:	Customer Order
Data Out:	Issue Record
Process:	1. Choose Customer Order from database. 2. Select document type (the beginning of document number). 3. Select Cargo Categories. 4. Choose Cargo ID from database. 5. Generate Issue document number = max issue document number in database + 1. 6. Insert issue record into database. 7. Go to process 2.1.4.
Attachment:	- Data Store Issue - Data Store Customer Order

Table C.12. Process Specification of Process 2.1.4.

Process Name	Picking Cargoes
Data In:	Receive Record, Warehouse Location
Data Out:	Issue Record
Process:	1. Input quantity to withdraw. 2. Withdraw cargo and quantity from warehouse location depend on receive record in database. 3. Update picking quantity in warehouse location. 4. Update picking quantity in receive record. 5. Record the issue record into issue database. 6. Repeat step 2-5 until the required quantity and cargo has been selected.
Attachment:	- Data Store Issue - Data Store Receive

Table C.13. Process Specification of Process 2.1.5.

Process Name	Print Issue Information
Data In:	Issue Record
Data Out:	Issue Information
Process:	1. Choose issue document number from database. 2. The report will display on screen or print out.
Attachment:	- Data Store Issue - Warehouse

Table C.14. Process Specification of Process 2.2.1.

Process Name	Entry Delivery Information
Data In:	Customer Order
Data Out:	Delivery Record
Process:	1. Choose Customer Order from database, the sending destination will display on screen. 2. Select document type (the beginning of document number). 3. Select the owner of truck, type of truck, the system will display the cost of truck and charge of truck on screen. 4. Input the necessary information of delivery. 5. Generate Delivery document number = max delivery document number +1. 6. Write delivery record into database. 7. Go to process 2.2.2.
Attachment:	- Data Store Delivery - Data Store Customer Order - Data Store Truck Master

Table C.15. Process Specification of Process 2.2.2.

Process Name	Choose Cargoes from Issue Record
Data In:	Issue Record, Warehouse Location
Data Out:	Delivery Record, Transaction Record, Warehouse Location
Process:	1. Input quantity to delivery. 2. Choose cargo from warehouse location depend on Issue record in database. 3. reduce cargo in warehouse location immediately. 4. Update picking quantity in warehouse location. 5. Update quantity and status in issue record. 6. Insert delivery record in transaction. 7. Go to process 2.2.3. 8. Repeat step 2-7 until the required quantity has already been selected. 9. Record the delivery detail into delivery database.
Attachment:	- Data Store Delivery - Data Store Warehouse Location - Data Store Issue

Table C.16. Process Specification of Process 2.2.3.

Process Name	Update Receive Record
Data In:	Delivery Record
Data Out:	Receive Record
Process:	1. Get receive document number from delivery record and search the receive record in database. 2. Update quantity issue, picking quantity and status in receive record.
Attachment:	- Data Store Receive

Table C.17. Process Specification of Process 2.2.4.

Process Name	Print Delivery Information
Data In:	Delivery Record
Data Out:	Delivery Information
Process:	1. Choose delivery document number from database. 2. The report will display on screen or print out.
Attachment:	- Data Store Delivery - Customer - Management - Security

Table C.18. Process Specification of Process 2.2.5.

Process Name	Update Delivery Information
Data In:	Management approval, Tally sheet from warehouse, Delivery Record
Data Out:	Delivery Detail
Process:	1. Receive the approval from management. 2. Receive the confirmation from warehouse. 3. Choose delivery document number from database. 4. Modify delivery record and update into database. 5. If the delivery detail record must be update then reverse the record and select the new record. 6. Go to process 2.2.2.
Attachment:	- Data Store Delivery

Table C.19. Process Specification of Process 3.1.

Process Name	Location Inquiry
Data In:	Map Number and Location request
Data Out:	Location on screen
Process:	1. Select Map Number from database. 2. The map with all location will appear on screen. 3. Click on the required Location. 4. If that location has detail, the system will display the detail in that location on screen such as the cargo, receive document number, customer ID, and quantity.
Attachment:	- Data Store Warehouse Location

Table C.20. Process Specification of Process 3.2.

Process Name	Cargoes Inquiry
Data In:	Cargo ID request
Data Out:	Location on screen
Process:	1. Select Customer ID, Cargo Categories, and Cargo ID from database. 2. If Found the required information, all of location detail which kept the request will display on screen.
Attachment:	- Data Store Warehouse Location - Data Store Cargo Profile

Table C.21. Process Specification of Process 3.3.

Process Name	Customer Cargoes Inquiry
Data In:	Customer ID and Cargo Categories request
Data Out:	Location on screen
Process:	1. Choose Customer ID and Cargo Categories from database. 2. If Found the required information, all of location detail which keep that request will display on screen.
Attachment:	- Data Store Warehouse Location - Data Store Cargo Profile

Table C.22. Process Specification of Process 4.1.1.

Process Name	Calculate Storage and Handling Charge
Data In:	Agreement Record, Receive Record, Delivery Record, Transaction Record
Data Out:	Charge Information
Process:	1. Choose Customer ID from database. 2. Select Month and Year to calculate. 3. Select contract number from agreement. 4. Get data from receive and transaction record separate by type of transaction. 5. Calculate storage of cargo and move up / down of cargo with charge amount rate in agreement contract. 6. Separate by Cargo Categories. 7. Record Charge Information into database. 8. Repeat step 3-7 until the charge has been calculated.
Attachment:	- Data Store Charge Attach Table

Table C.23. Process Specification of Process 4.1.2.

Process Name	Calculate Transportation Charge
Data In:	Agreement Record, Receive Record, Delivery Record, Transaction Record, Truck Record
Data Out:	Charge Information
Process:	1. Choose Customer ID from database. 2. Select Month and Year to calculate. 3. Select contract number from agreement. 4. Get data from delivery and delivery transaction record. 5. Calculate transportation of delivery with charge amount rate in truck master. 6. Record Charge Information into database. 7. Repeat step 3-6 until all truck trips have been calculated.
Attachment:	- Data Store Charge Attach Table

Table C.24. Process Specification of Process 4.1.3.

Process Name	Generate Debit Note
Data In:	Charge Attach Table Record
Data Out:	Debit Note Record
Process:	1. Select Month and Year to generate. 2. Select document type (the beginning of document number). 3. Generate data from Charge record into Debit Note for each customer and generate debit note number. 4. Record Debit Note Information into database. 5. Repeat step 3-4 until all customers have been generated.
Attachment:	- Account Information

Table C.25. Process Specification of Process 4.2.

Process Name	Transfer data to Account
Data In:	Charge Information
Data Out:	Send data to Account Department
Process:	1. Choose Debit Note to transfer. 2. Transfer data to Account Department. 3. Repeat step 1-2 until all selected have been transferred.
Attachment:	- Charge Transaction - Account

Table C.26. Process Specification of Process 5.1.

Process Name	Print Stock Movement
Data In:	Transaction Record
Data Out:	Stock Movement Information
Process:	1. Choose range of Date, Customer ID, Cargo ID, Cargo Categories from database. 2. The stock movement will be printed.
Attachment:	- Data Store Transaction - Customer

Table C.27. Process Specification of Process 5.2.

Process Name	Print Debit Note
Data In:	Transaction Record
Data Out:	Debit Note
Process:	1. Choose Month and Year, Customer ID, Cargo Categories from database. 2. The Debit Note will be printed.
Attachment:	- Data Store Transaction - Customer

Table C.28. Process Specification of Process 5.3.

Process Name	Print Charge Report
Data In:	Charge Attach Table
Data Out:	Charge Report, Charge Report by Contract No, Charge Report by Debit Note
Process:	1. Choose Month and Year, Customer ID, Cargo Categories from database. 2. The Charge Attach Report will be printed.
Attachment:	- Data Store Transaction - Data Store Charge Attach Table - Customer - Management

Table C.29. Process Specification of Process 5.4.

Process Name	Print Cargo Movement
Data In:	Transaction Record
Data Out:	Cargo Movement Report
Process:	1. Choose range of date. 2. Cargo Movement in the range will be printed.
Attachment:	- Management

APPENDIX D

E-R DIAGRAMS / STRUCTURE CHART DIAGRAM

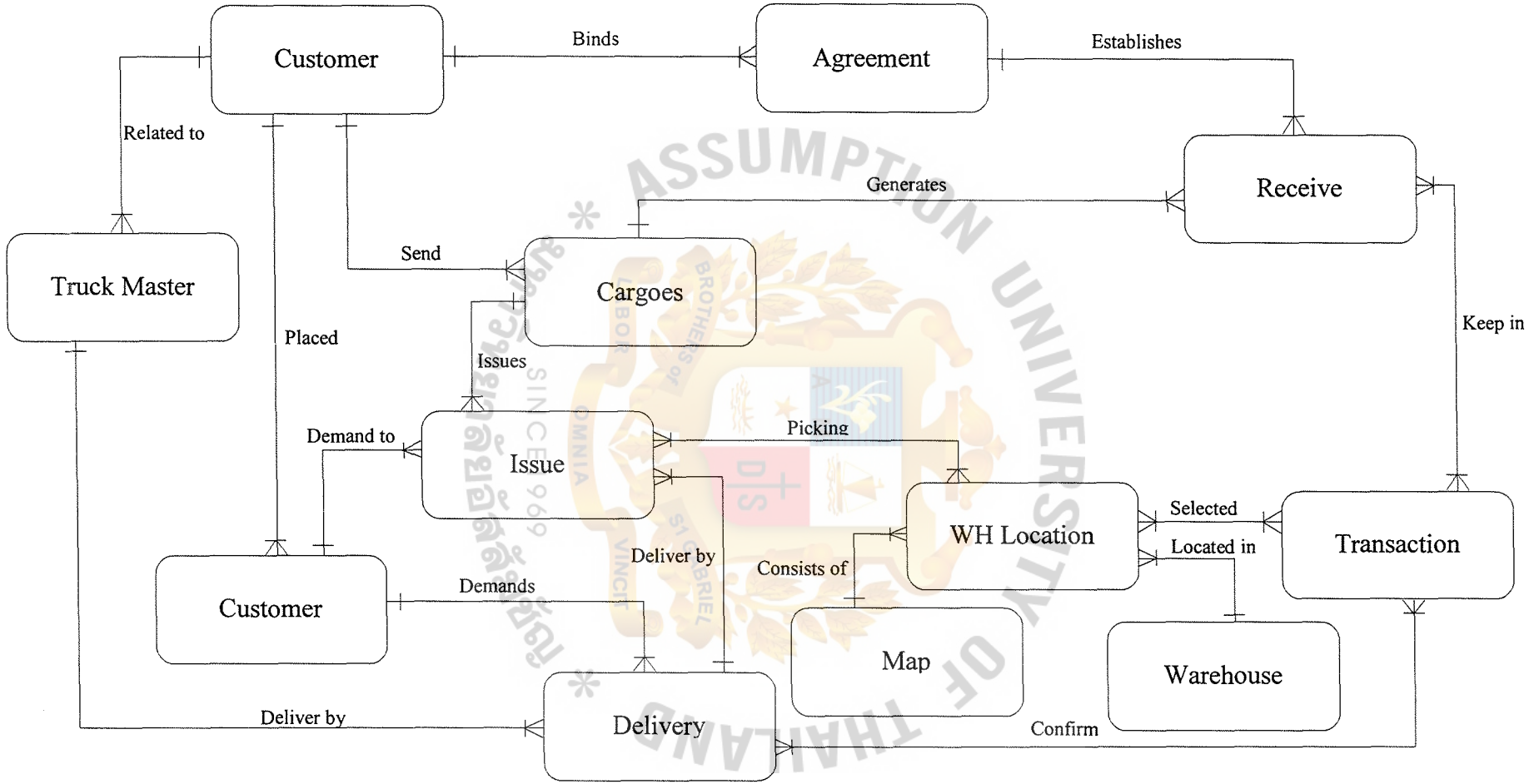


Figure D.1. ER Diagram of Context Data Model.

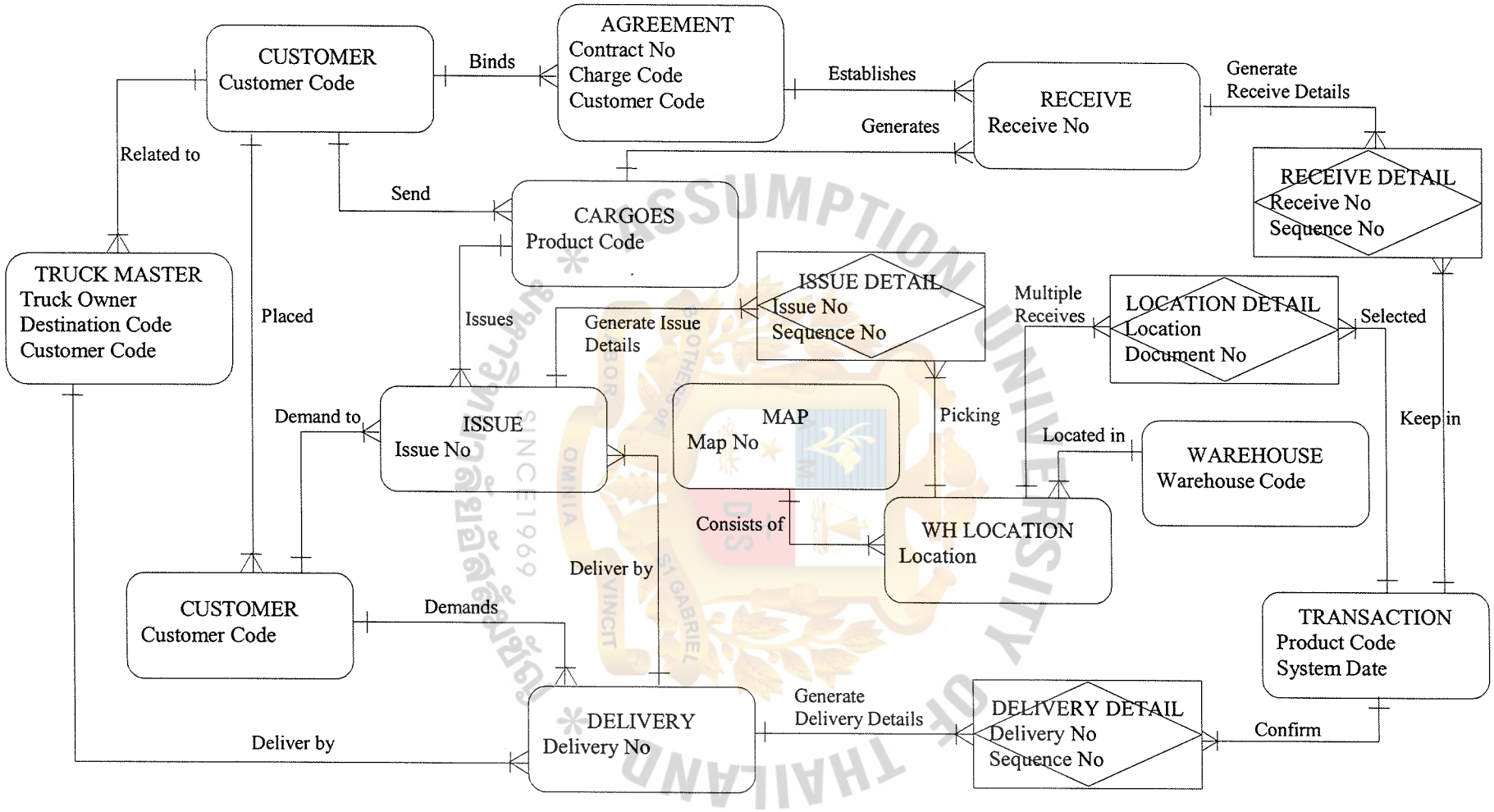


Figure D.2. ER Diagram of Key-Based Data Model.

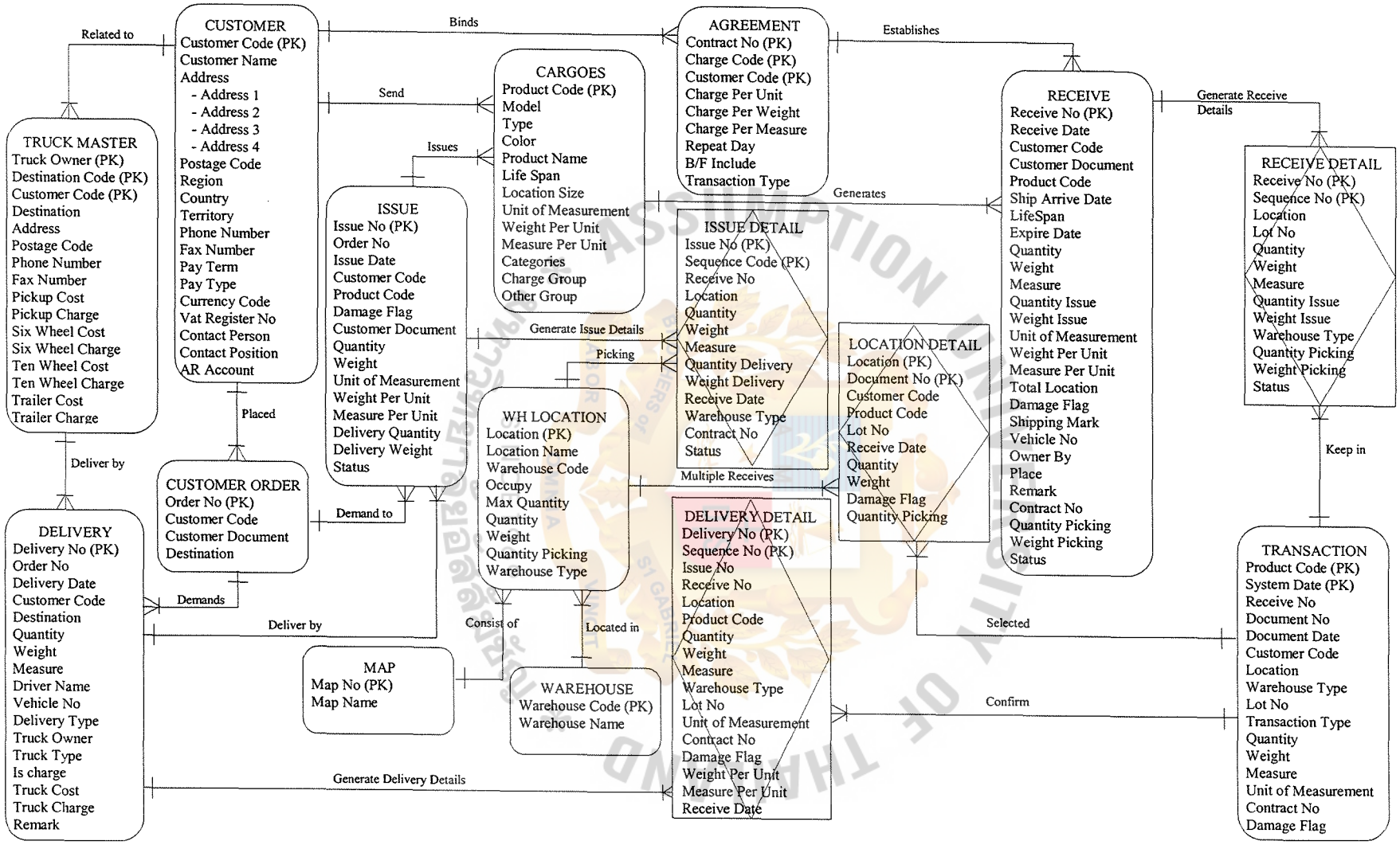


Figure D.3. ER Diagram of Fully-attributed Data Model.

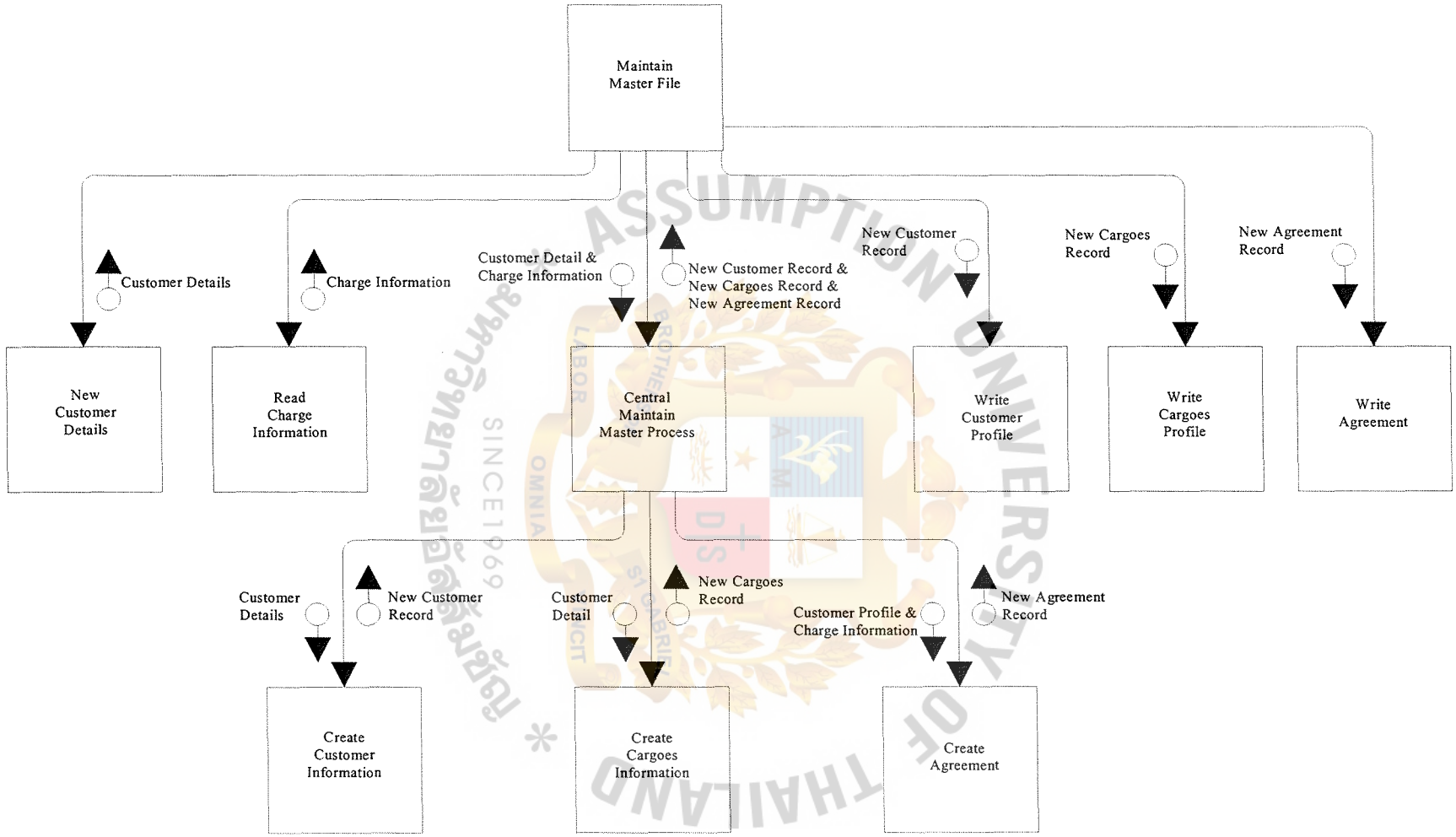


Figure D.4. Structure Chart of Maintain Master File Sub-System.

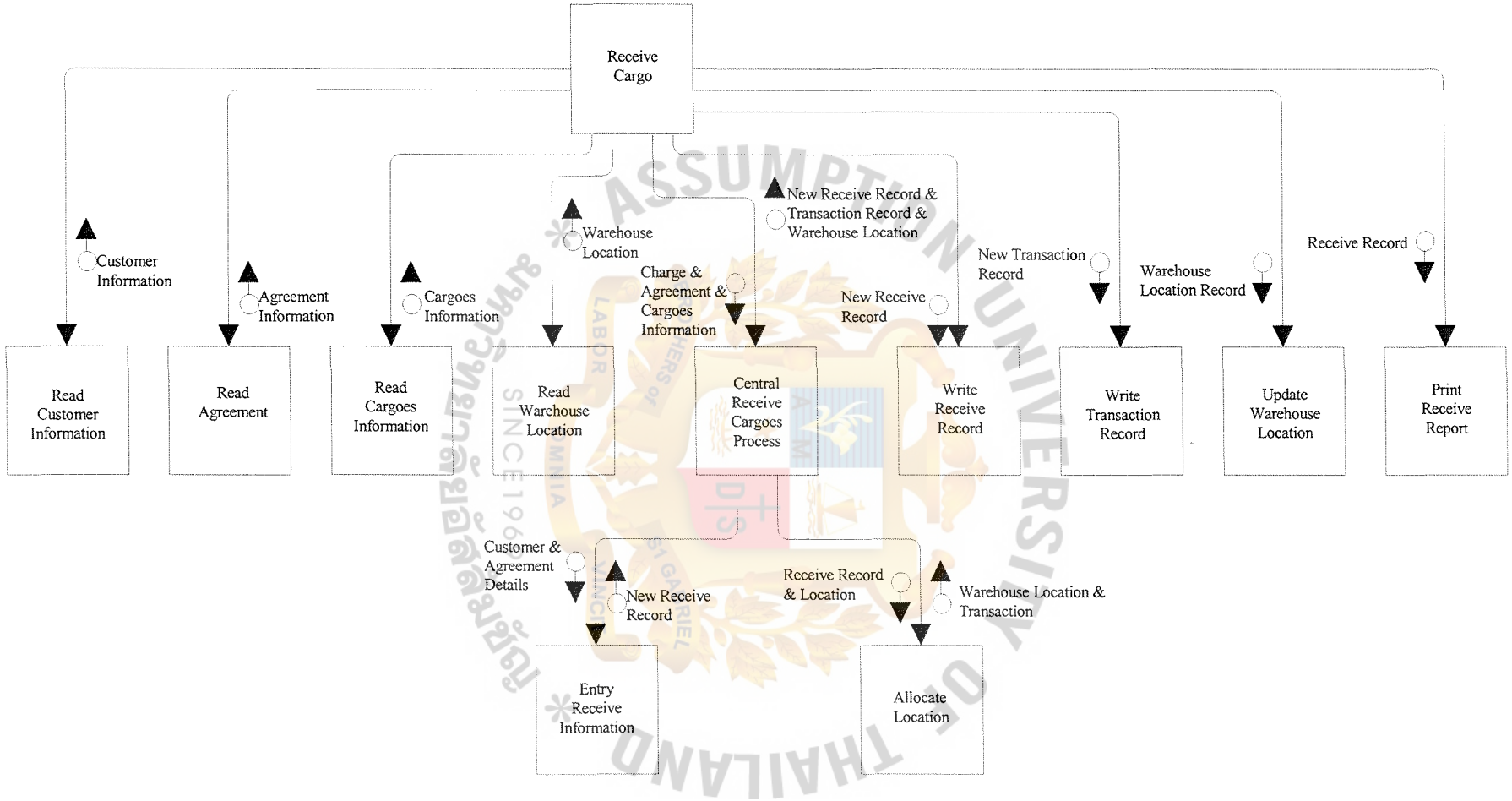


Figure D.5. Structure Chart of Receive Cargo Sub-System.

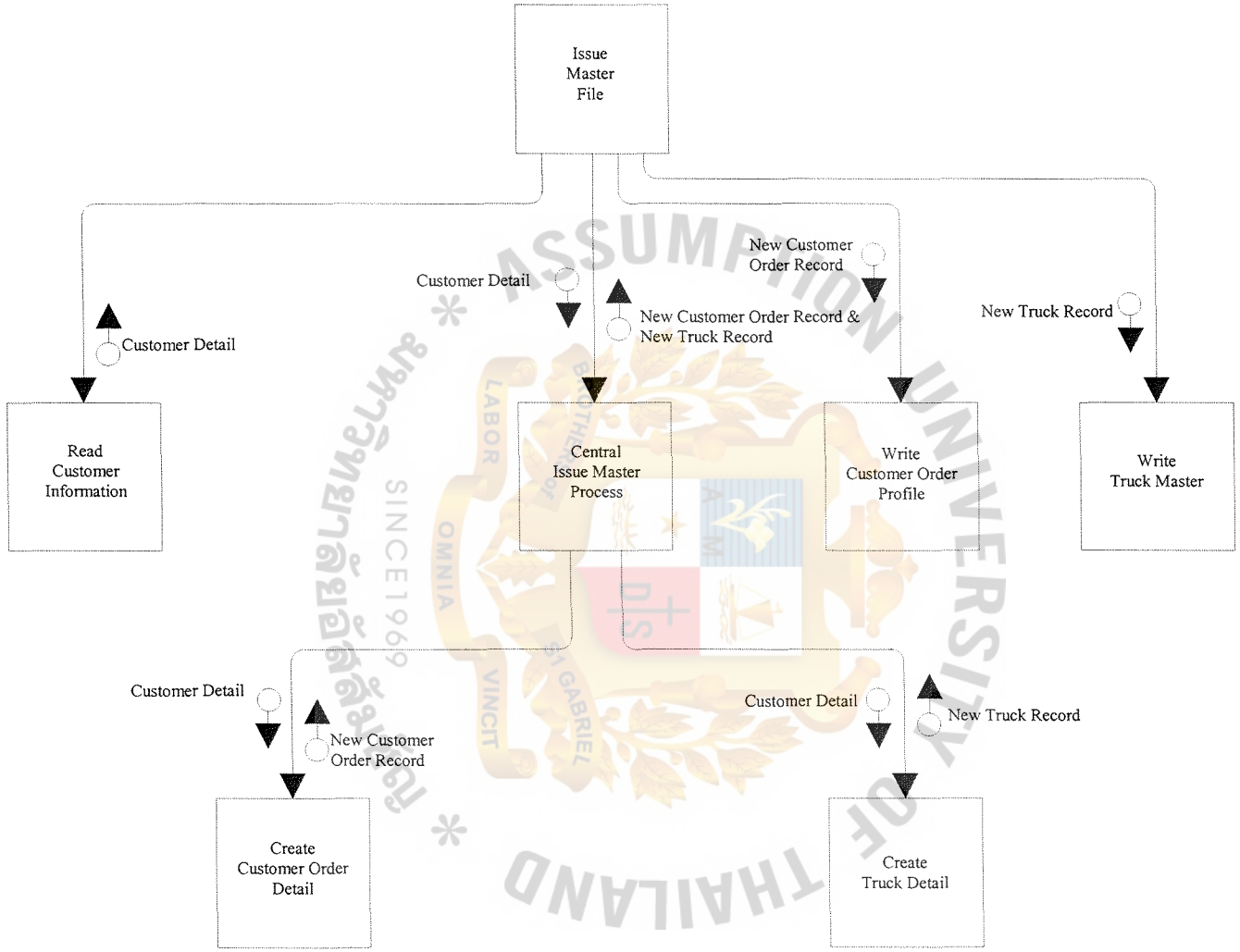


Figure D.6. Structure Chart of Issue Master File Sub-System.

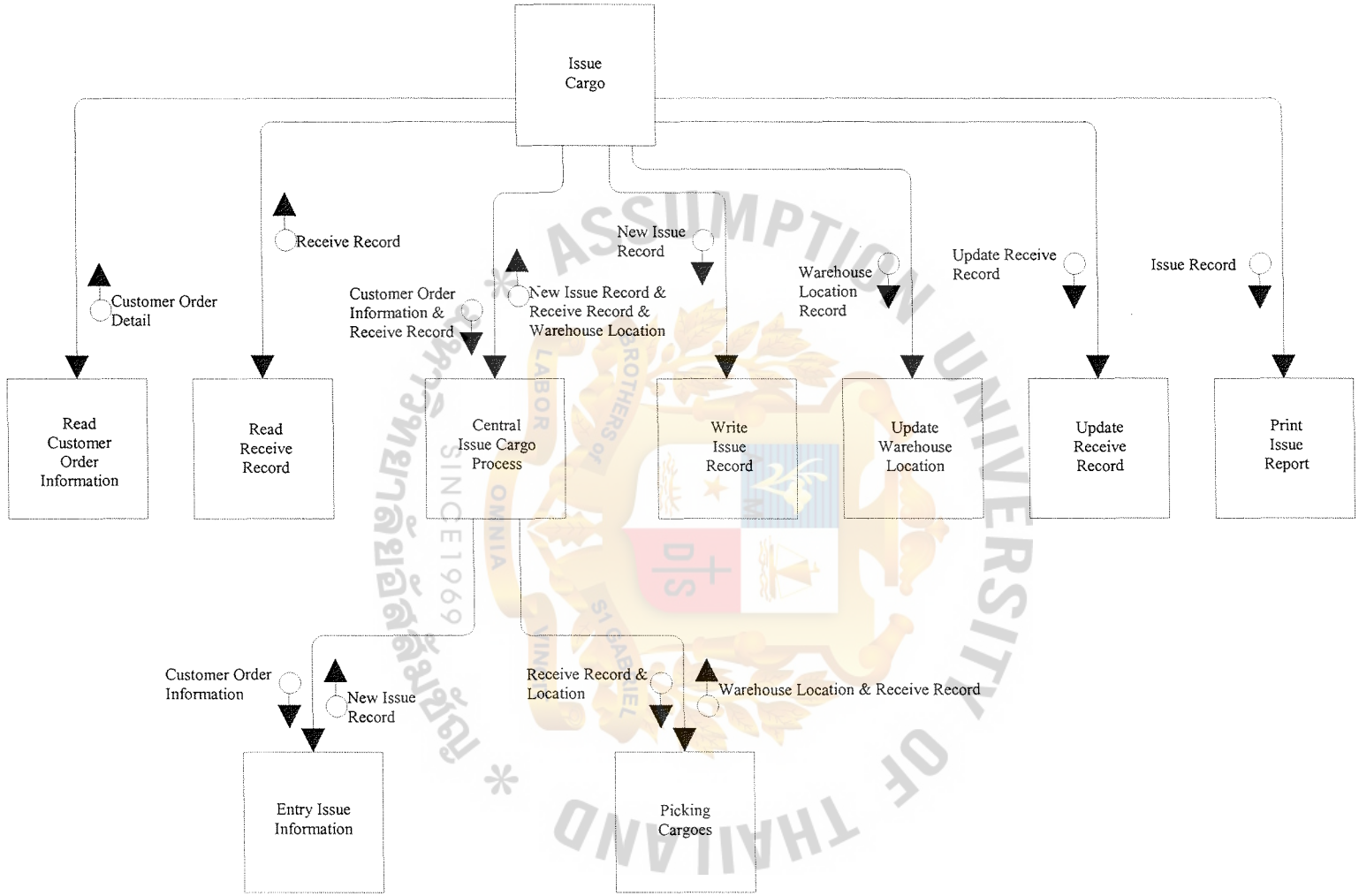


Figure D.7. Structure Chart of Issue Cargo Sub-System.

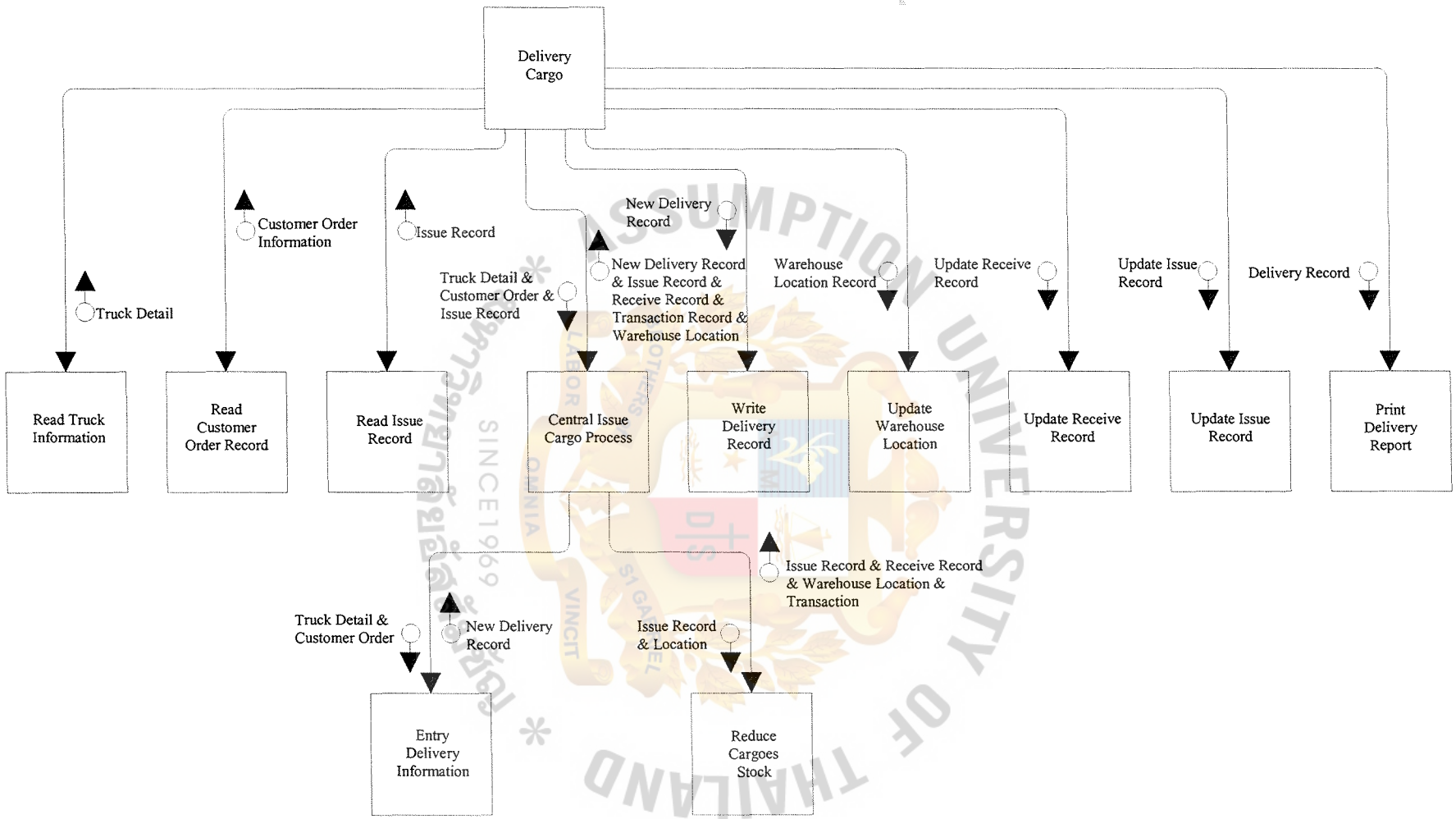


Figure D.8. Structure Chart of Delivery Cargo Sub-System.

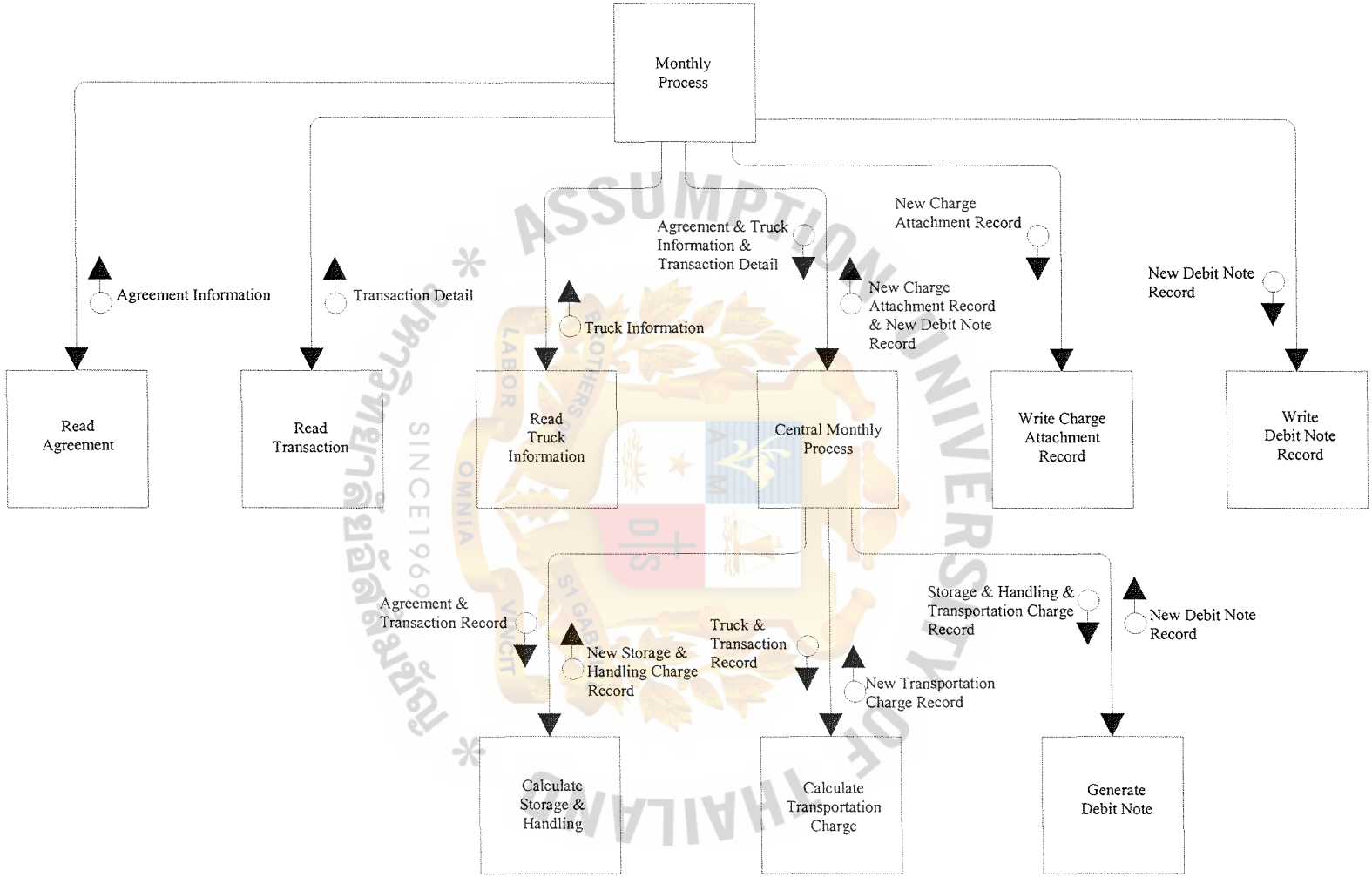


Figure D.9. Structure Chart of Monthly Process Sub-System.

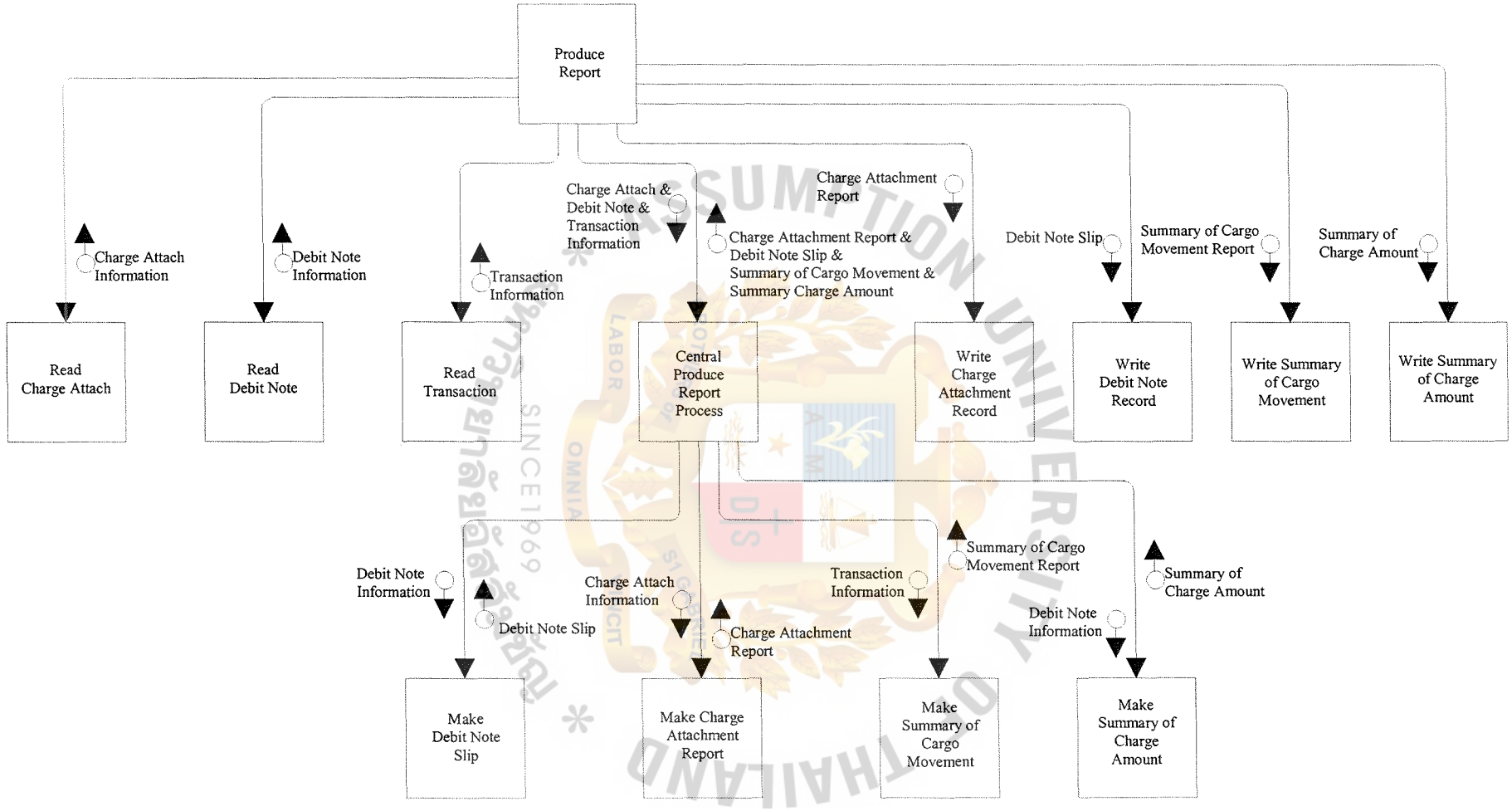


Figure D.10. Structure Chart of Produce Report Sub-System.

APPENDIX E

USER INTERFACE DESIGN / USER MANUAL

USER INTERFACE DESIGN

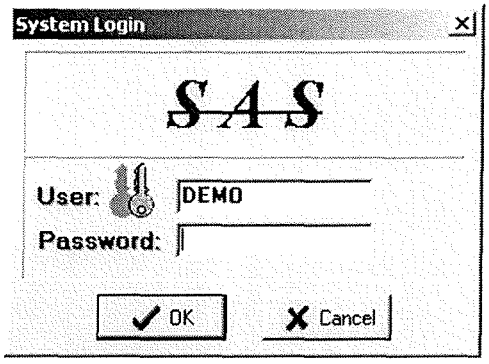


Figure E.1. System Login.

Figure E.2. System Login Failure.

System Login

OK button was defaulted on the screen when you key enter or click that will be passed on the next sceen (form menu).

If the password was wrong, it would show massage box which was "Invalid Password"

Cancel button for unload the program.

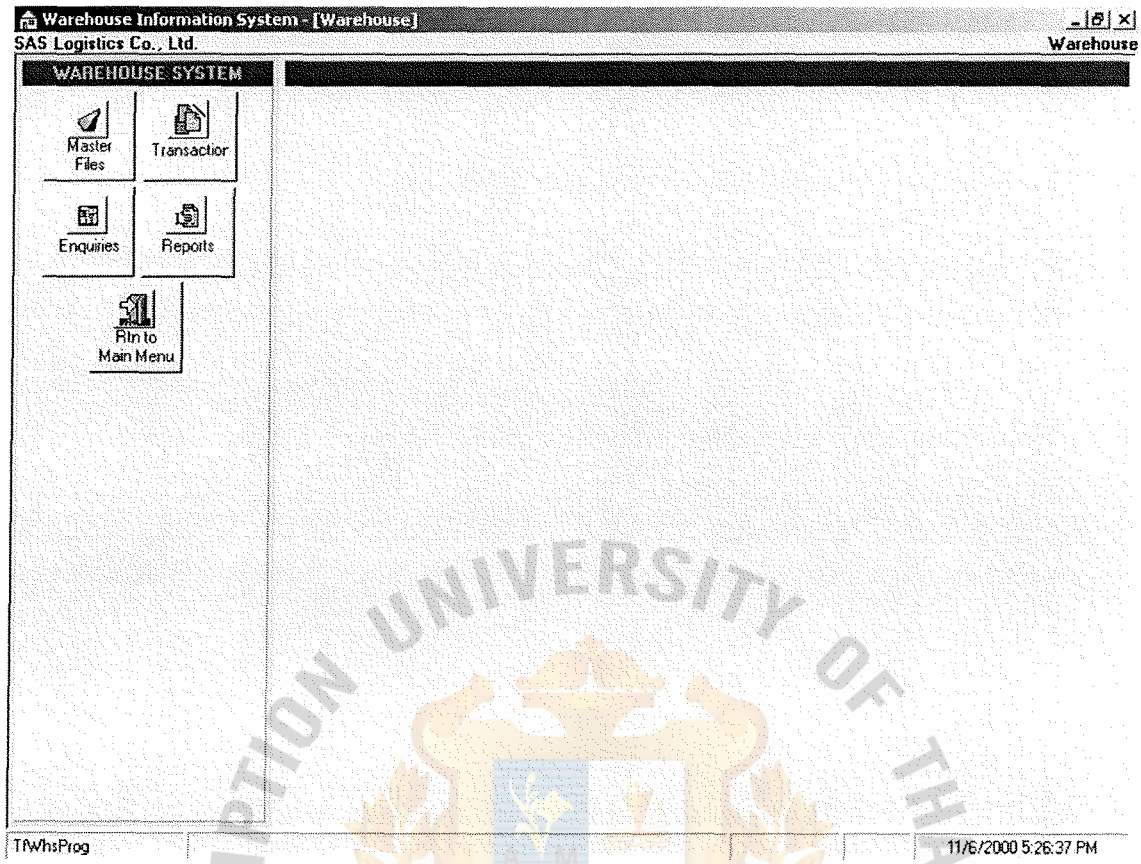


Figure E.3. Main Menu.

Main Menu

(1) Master Files button to access the file maintenance.

(2) Transaction button to access the transaction.

(3) Enquiries button to inquiry file.

(4) Reports button to show the information.

(5) Rtn to Main Menu button to exit the program.

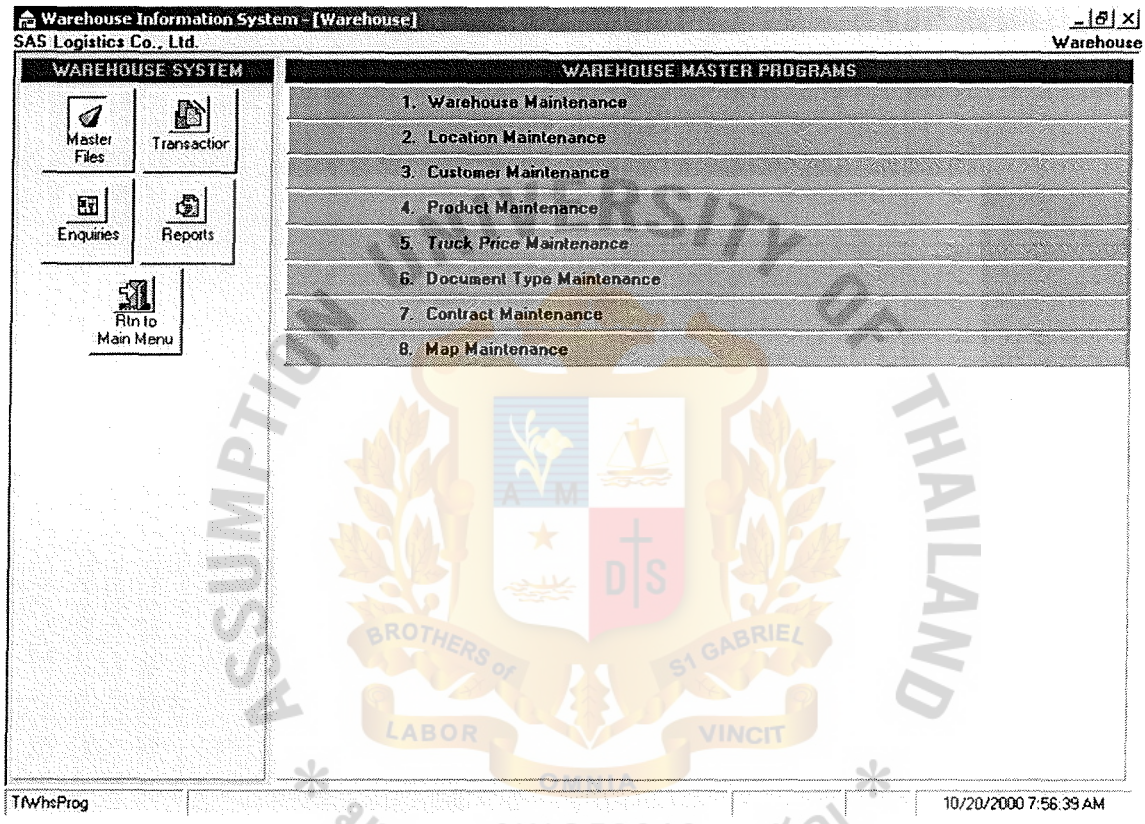


Figure E.4. Main Menu Form of Master Files.

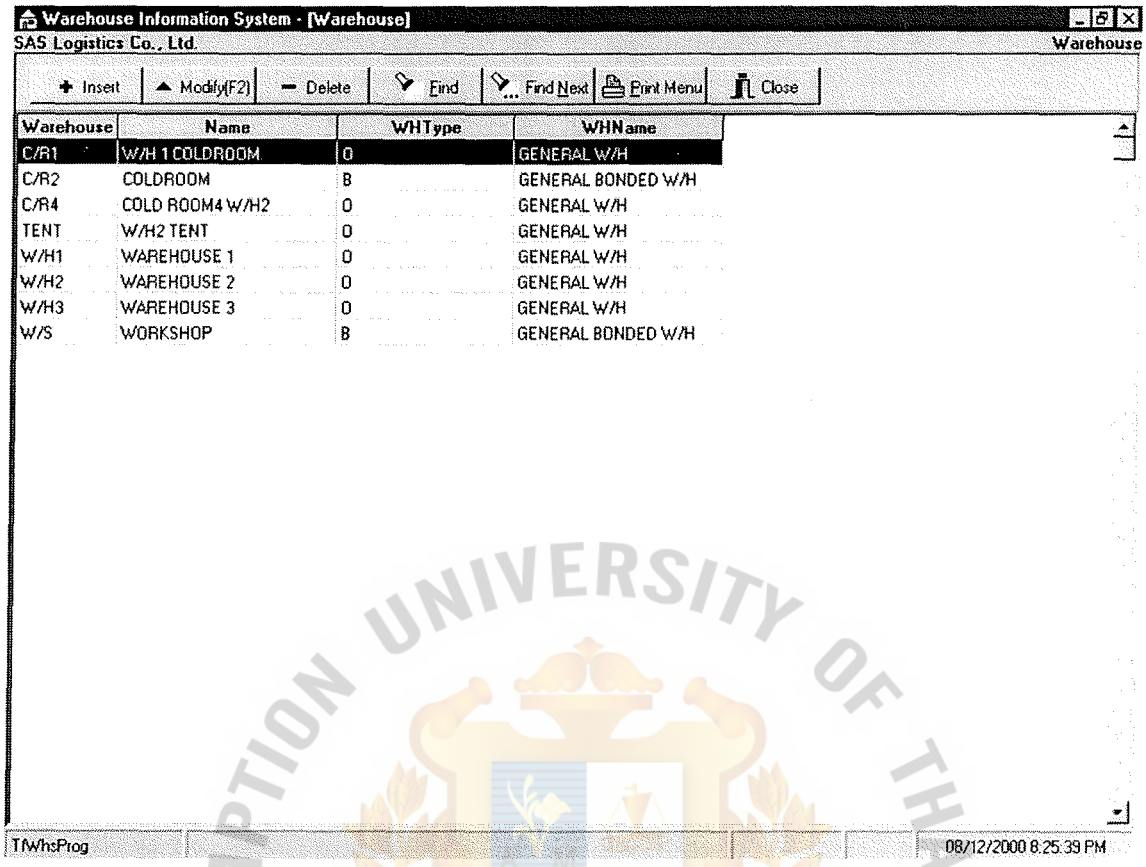


Figure E.5. Warehouse Main Form.

(1) Insert button to add new record.

(2) Modify button to update the existing record.

(3) Delete button to delete the existing record.

(4) Find button to find the desired key of record.

(5) Find Next button to find next record.

(6) Print Menu button to print the report.

(7) Close button to close the current program.

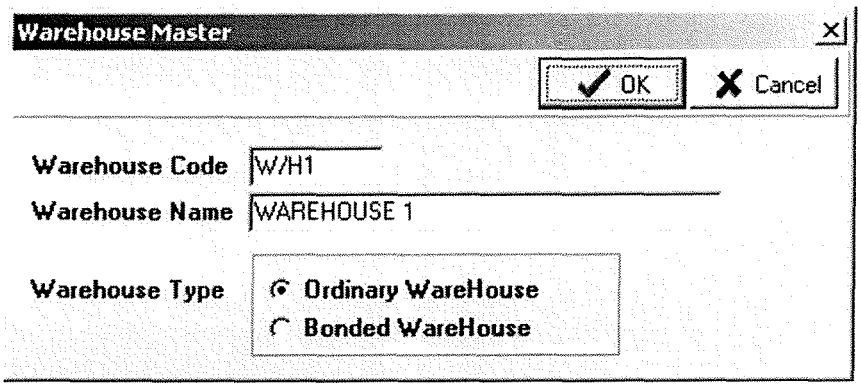


Figure E.6. Warehouse Main Form (Continued).

Warehouse Master

For defining types of warehouses.

Warehouse Code : Setting the code of warehouse.

Warehouse Name : Setting the name of warehouse.

Warehouse Type :

(1) Ordinary Warehouse : for general cargoes

(2) Bonded Warehouse : for specific cargoes

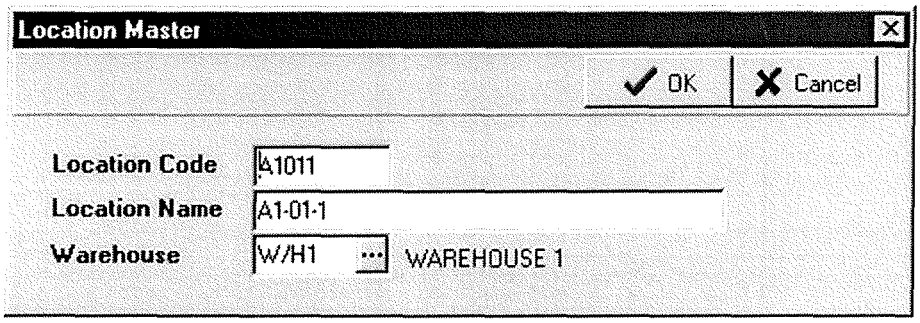


Figure E.7. Location Main Form.

Location Master

For defining codes of the warehouse locations where cargoes are stored with the following conditions: One warehouse contains multiple locations, One location stores one type of cargoes, No duplicated location codes allowed in the system.

Location Code : Setting the code of location.

Location Name : Setting the name of location.

Warehouse : Choose warehouse which contain this location.

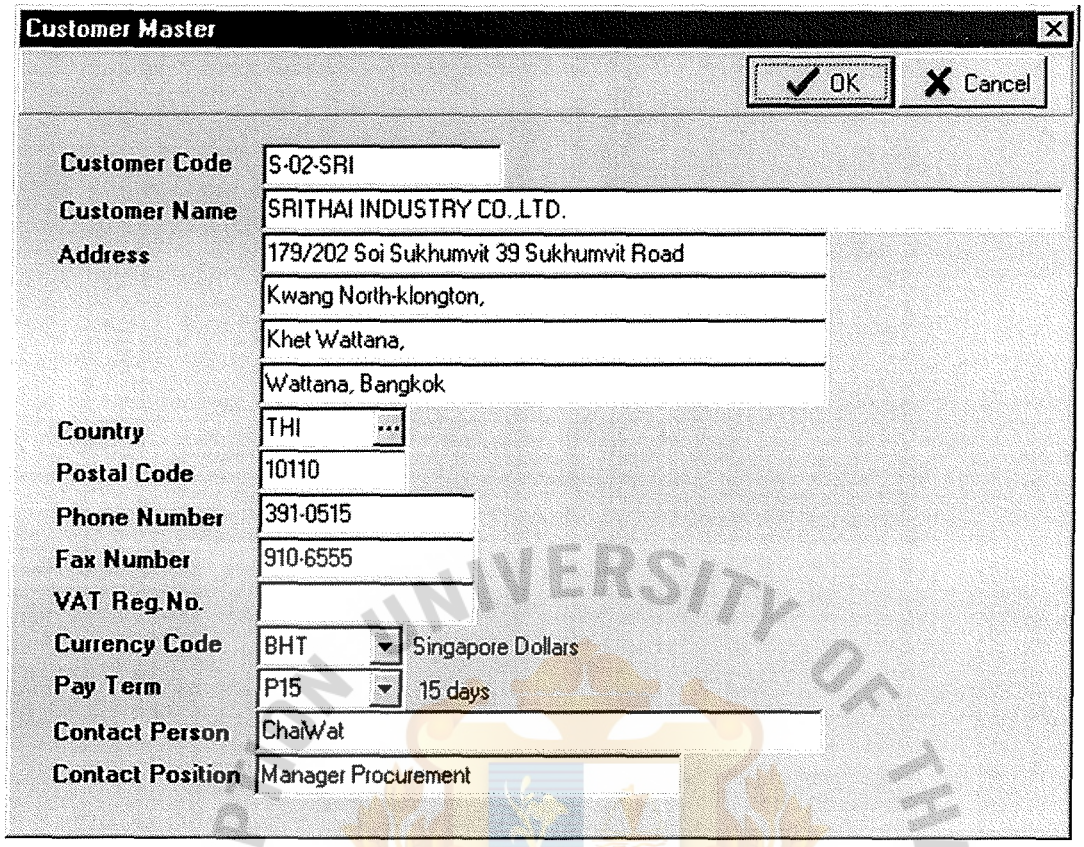


Figure E.8. Customer Main Form.

Customer Master

For recording the information and codes of the customers whose cargoes are stored in our warehouse.

Customer Code : Setting code of customer.

Customer Name : Input customer name.

Address : Input customer address.

Country : Choose from the database.

Currency Code : The currency use for customer in financial document.

Pay Term : Term of customer payment.

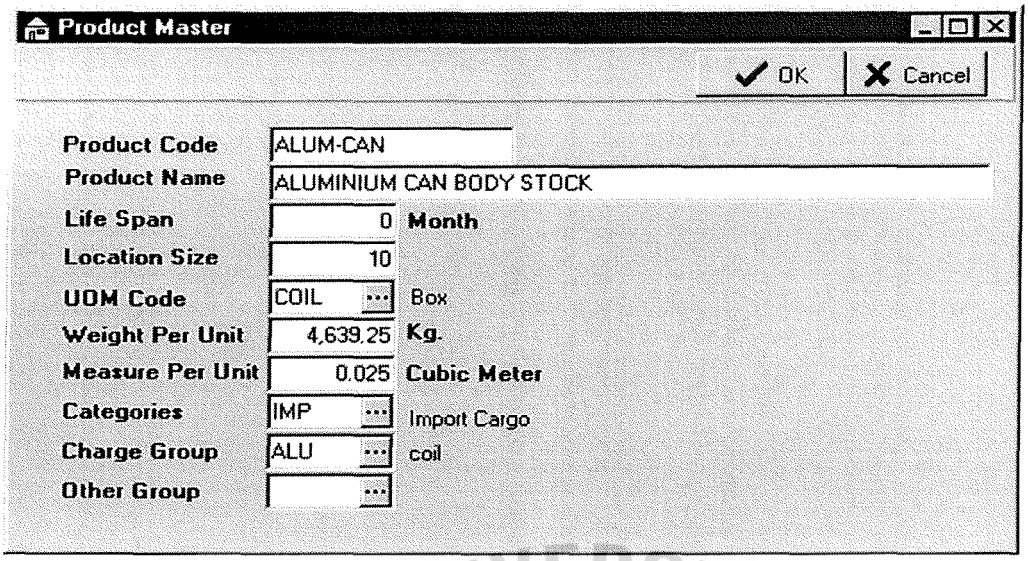


Figure E.9. Product Main Form.

Product Master

For defining those codes of cargoes that need to be stored in the computer system, with the following conditions:

(1) Unique codes in master file

(2) One code for one measurement unit

(3) One code for one weight unit

(4) One code for one piece unit

Because computer will refer to these units in calculation of various charges, such as storage charge, handling charge and transportation charge. These charges are calculated based on the agreement conditions, from types of units are to be referred.

Product Code : Setting code of cargoes.

Life Span : Defined for specific cargoes.

Location Size : Standard number of item per one location

UOM Code : Unit of measurement of cargo.

Categories / Charge Group / Other Group : Used for separated cargoes.

TruckPrice Master

OK | Cancel

Truck Owner	○ Company Truck ◉ Sub-Contractor		
CustCode	P-01-PANA ... PANASONIC LOGISTICS CO.,LTD.		
Destination Code	P-02-001		
Destination	PANASONIC (KO-RAJ)		
Address1	208 Lam-Luang Road,		
Address2	Kwang Wat Sommanas,		
Address3	Pomprab, Bangkok		
Address4			
Postal Code	10230		
Phone Number	284-9642		
Fax Number	294-9900		
Pick-Up Cost	470.00	Pick-Up Charge	1,000.00
Six Wheels Cost	1,280.00	Six Wheels Charge	1,700.00
Ten Wheels Cost	2,500.00	Ten Wheels Charge	3,000.00
Trailer Cost	4,000.00	Trailer Charge	5,000.00

Figure E.10. Truck Main Form.

TruckPrice Table

For defining values of the transportation charges and costs by customer / destination / truck type.

<u>Condition</u> : One customer can define multiple destinations.

Truck Owner :

(1) Company Truck - Company owner truck

(2) Sub_Contractor - Rental truck

Customer Code : Choose from customer master file.

Destination Code : Setting code of destination.

Destination : Destination name for sending cargoes.

Cost : The cost of truck.

Charge : The charge of truck for charge customer.

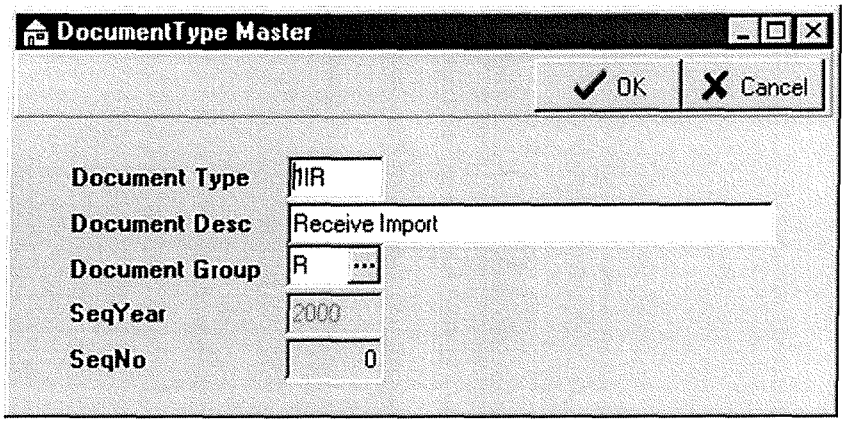


Figure E.11. Document Main Form.

Document Type

The objective of this file is to define the prefix code of each document, Users can define this 3-character code at their own wills by specifying its document type with the following alternatives :

Document Group can be

(1) R = Receiving

(2) O = Order Sheet

(3) I = Issuing

(4) D = Delivery

The code structure will be XXXYYYY999999

XXX = Document Type

YYYY = Transaction Year

999999 = Running number

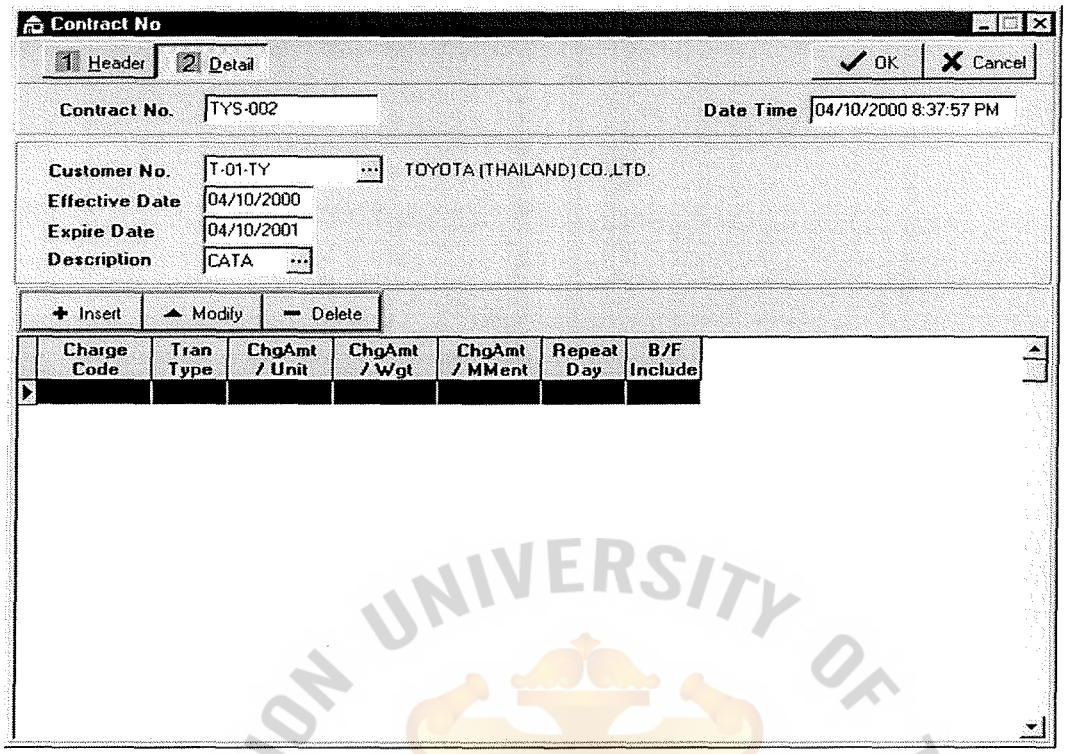


Figure E.12. Agreement Main Form.

Agreement Contract

Header Entry

For defining contract number and charge code for charge the customers whose have contract in our warehouse.

Contract No. : Setting for each customer.

Customer No. : Select one from Customer master file.

Description : Select group of cargo for group contract.

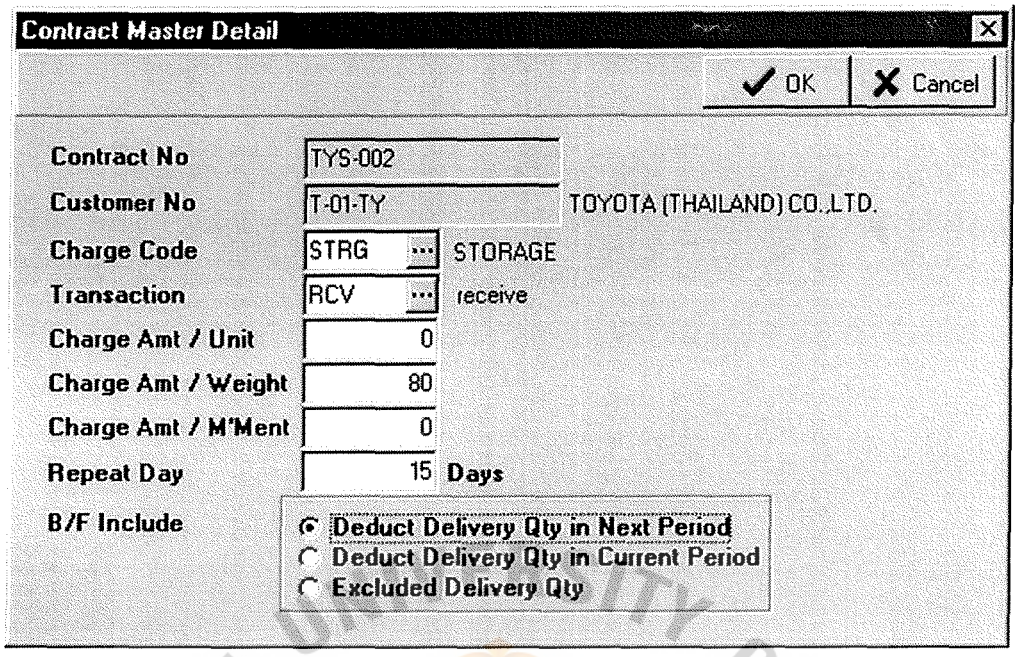


Figure E.13. Agreement Main Form (Continued).

<u>Detail Entry</u>

Charge Code : select one for which charge.

Transaction : Choose transaction code for this charge

RCV = Receive, DLI = Delivery

Charge Amt per Unit / Charge Amt per Weight / Charge Amt per M'Ment

: Charge amount per each measurement.

Repeat Day : Frequency day for calculate.

B/F Include : Deduct the delivery cargoes in which period.

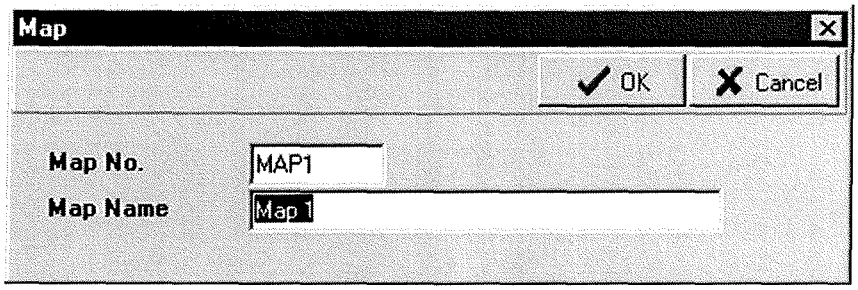


Figure E.14. Map Main Form.

Map Master

For defining map number and map name.

Map No. : Setting the code of map.

Map Name : The name of map.

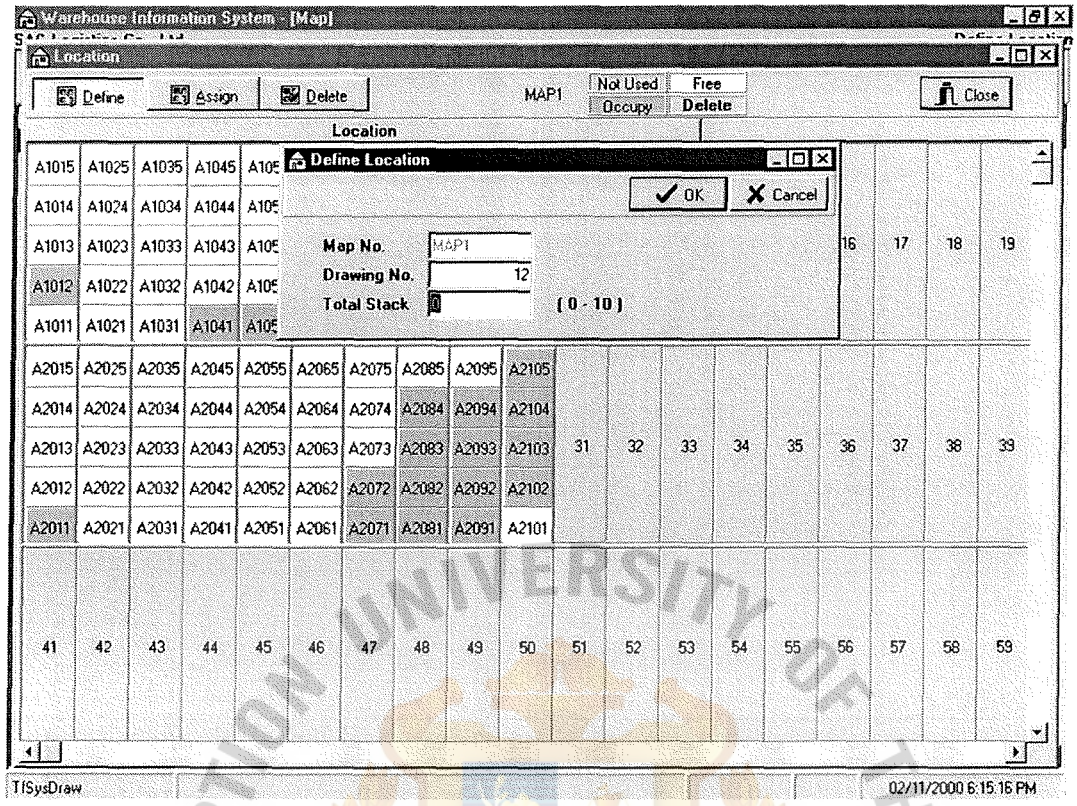


Figure E.15. Define Location.

Location Setting

<u>Define Button</u>

Click on Define Button and then double click on map. The Define Location screen will be display.

Map No. : Code of Map

Drawing No. : Drawing number of Map

Total Stack : Maximum of stack in one location

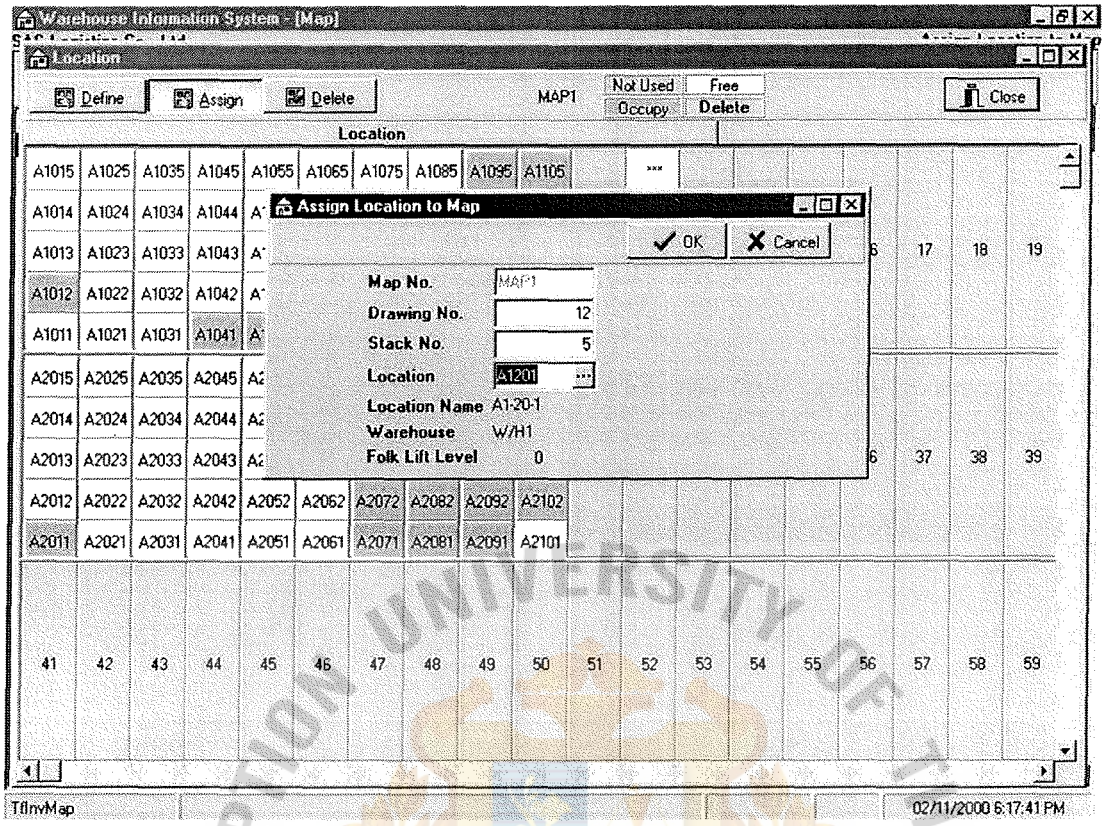


Figure E.16. Assign Location to Map.

<u>Assign Button</u>

Click on Assign Button and then double click on location. The Assign Location screen will be display.

Map No. : Code of Map

Drawing No. : Drawing number of Map

Total Stack : Maximum of stack in one location

Location : Choose location from database. (Location is unique, can not reusable.

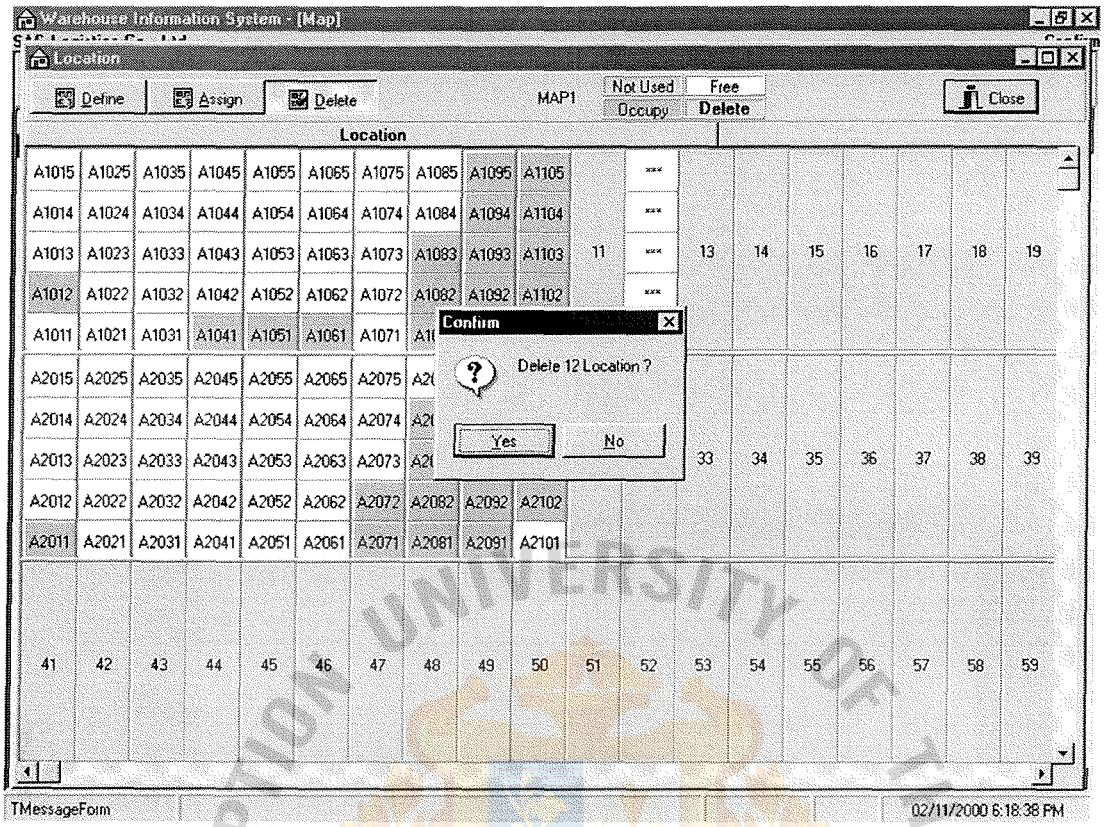


Figure E.17. Confirm Delete Location.

Delete Button

Click on Delete Button and then double click on map. The Delete Location screen will be display for confirmation.

Yes : Confirm for delete

No : Cancel of delete

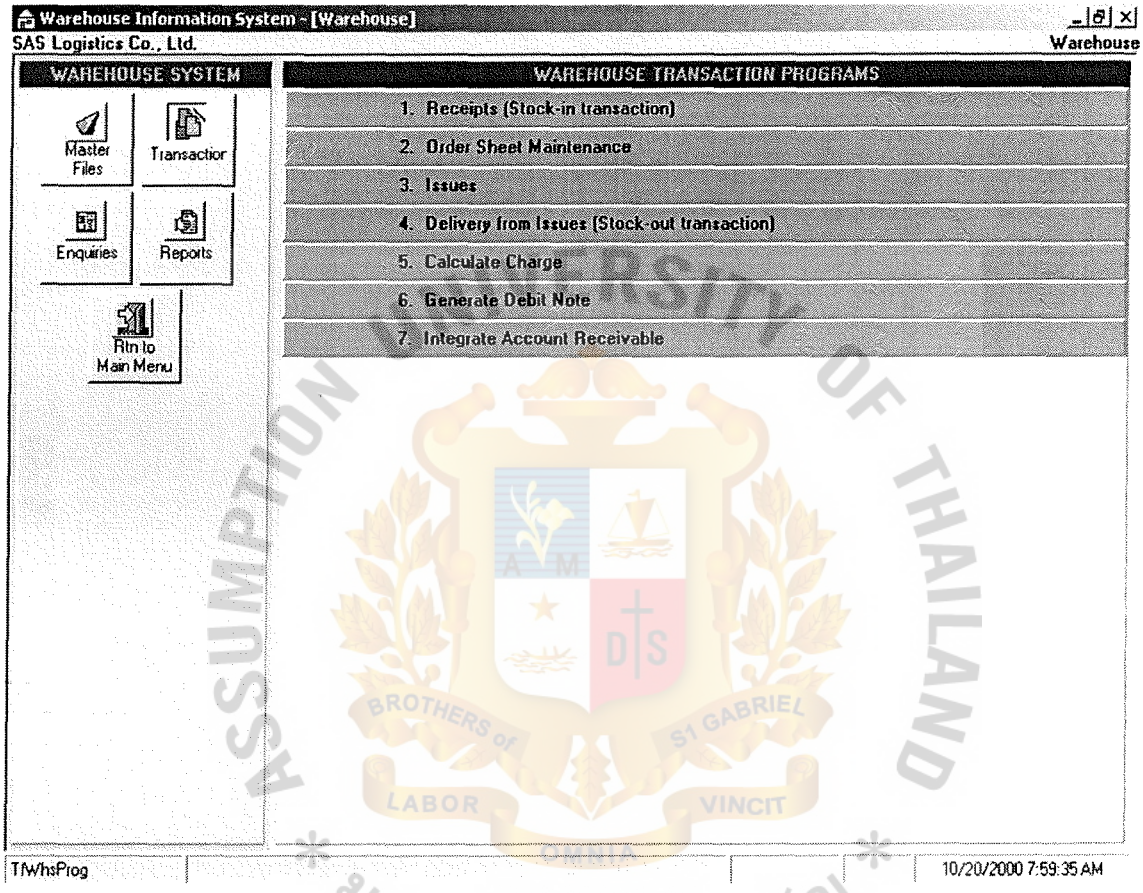


Figure E.18. Main Menu Form of Transaction.

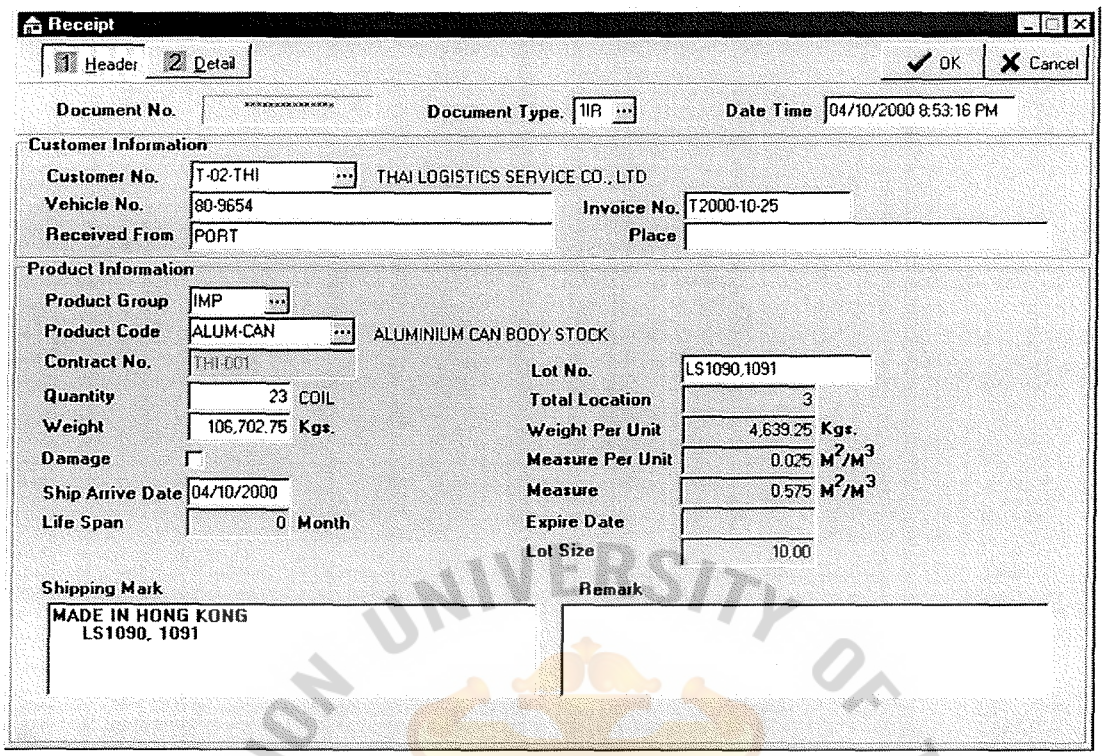


Figure E.19. Receive Main Form.

Cargoes Receive

<u>Header Entry</u>

Document Type	: Group 'R' can be selected from document type master.
Document No.	: Generated according to document type and date.
Customer No.	: Selected from customer master file.
Received From	: The cargo's owner.
Product Group	: Select categories group of cargoes.
Product Code	: Select cargoes which related to Product group.
Contract No.	: Retrieved from database.
Quantity	: Receive quantity.
Weight	: Calculated of Weight per unit multiply receive quantity. Weight can be modify by users.

Damage (Y/N) : In case damaged cargoes receive, they have to be put into different receive numbers.

Lot No. : Lot number of cargoes.

Ship Arrive Date : Must be input if product code is specific cargoes.

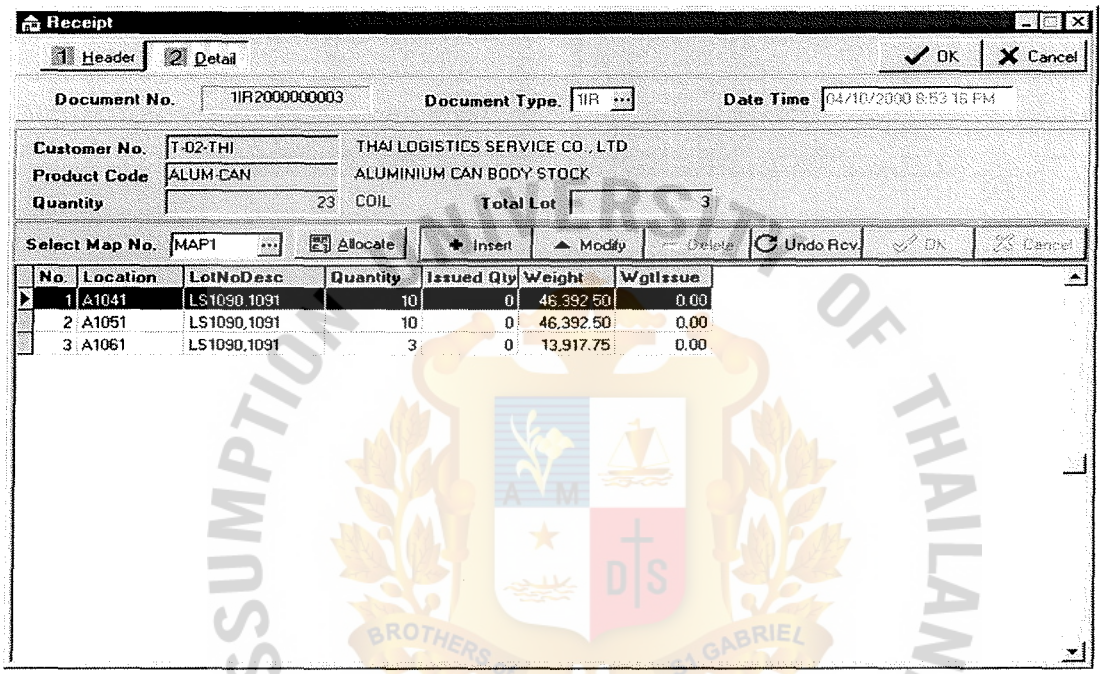


Figure E.20. Receive Main Form (Continued).

Detail Entry

Map No. : Choose map number from database.

1. Allocate button to assign location for receive record (location depend on Map No.
2. Insert button to add new receive detail record.
3. Modify button to update the existing detail record.
4. Delete button to delete the existing detail record.
5. Undo Rcv button to reverse receive transaction record.

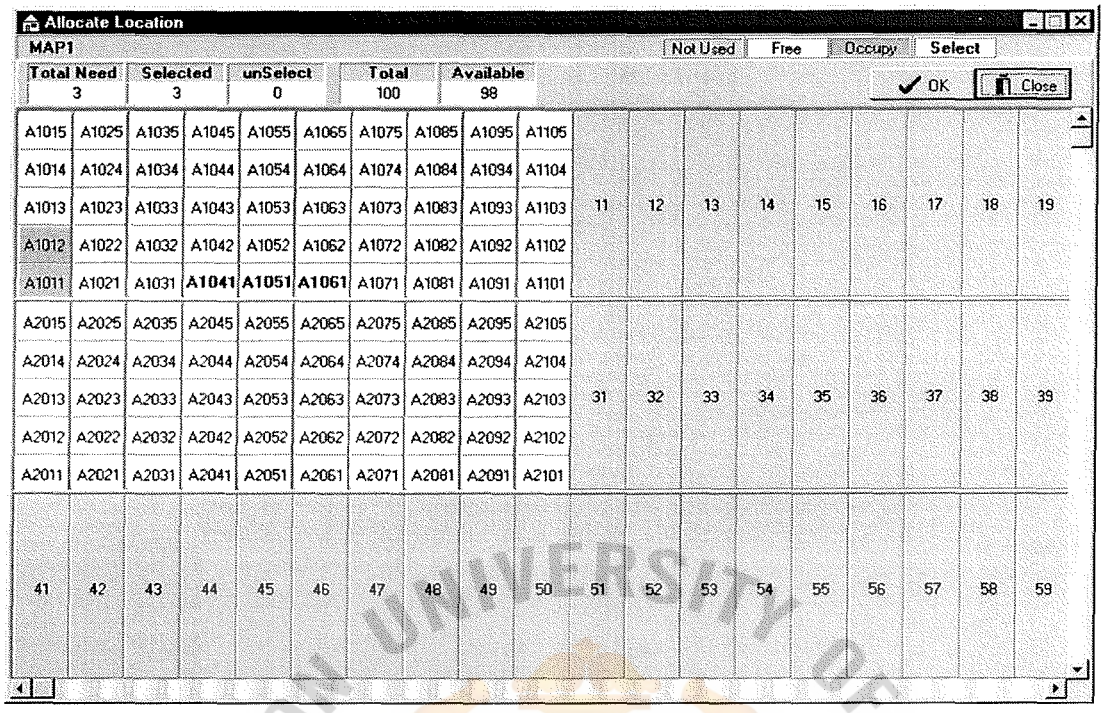


Figure E.21. Receive Main Form (Continued).

Define Location Number on map for each record by click on the location. Location used is blue color.

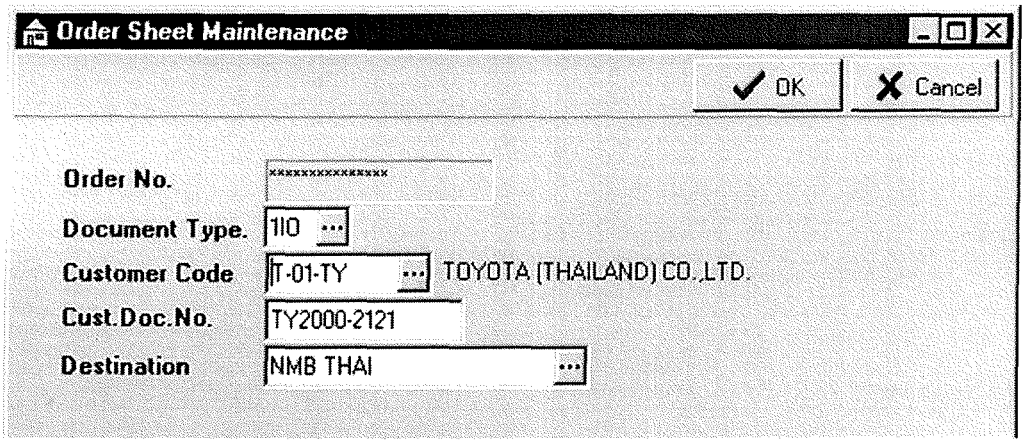


Figure E.22. Order Main Form.

Order Sheet Entry

After receiving order sheet from customer, users have to create company order sheet to define the customer no. and destination.

Document Type : Group 'O' can be selected from document type master.

Document No. : Generated according to document type and date.

Destination : Must pre-defined in TruckPrice Table.

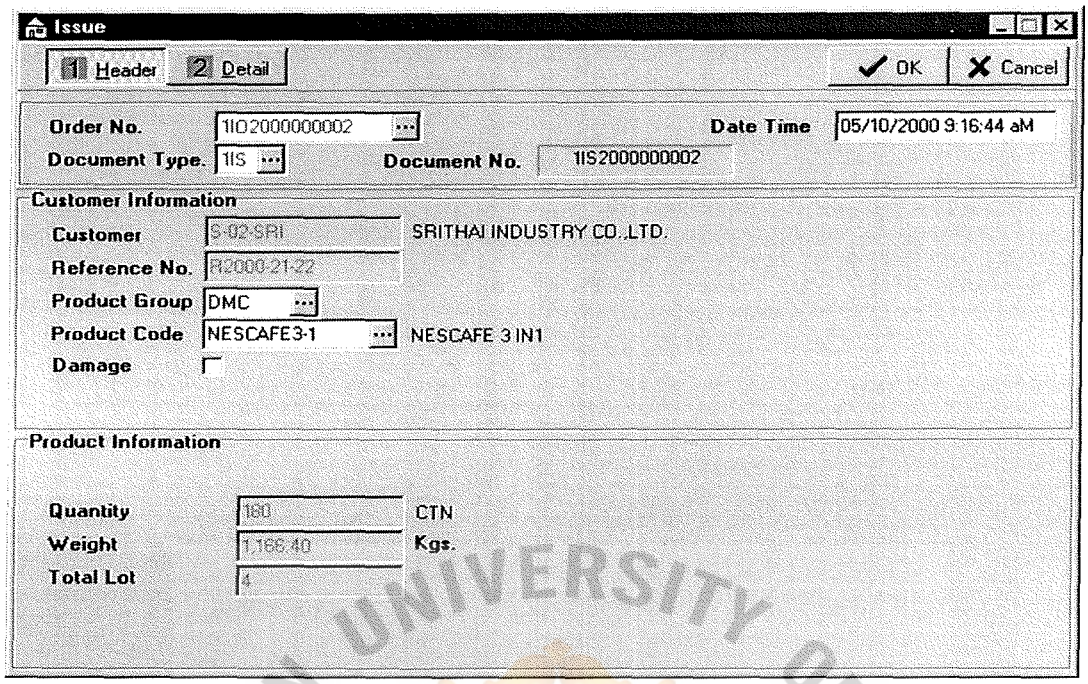


Figure E.23. Issue Main Form.

Cargoes Issue

Header Entry

Order No.	:	Must be exists in Order Sheet file.
Document Type	:	Group 'I' can be selected from document type master.
Document No.	:	Generated according to document type and date.
Customer No.	:	Retrieved from order sheet record.
Product Group	:	Select categories group of cargoes.
Product Code	:	Must exists in Receive File and related to Product group.
Damage (Y/N)	:	In case damaged cargoes are issued, they have to be put into different issue numbers.

Quantity / Weight / Total Lot : All are accumulated base on detail issued.

Condition : One order sheet number contains multiple issued numbers.

One issued number contains one product code and multiple locations.

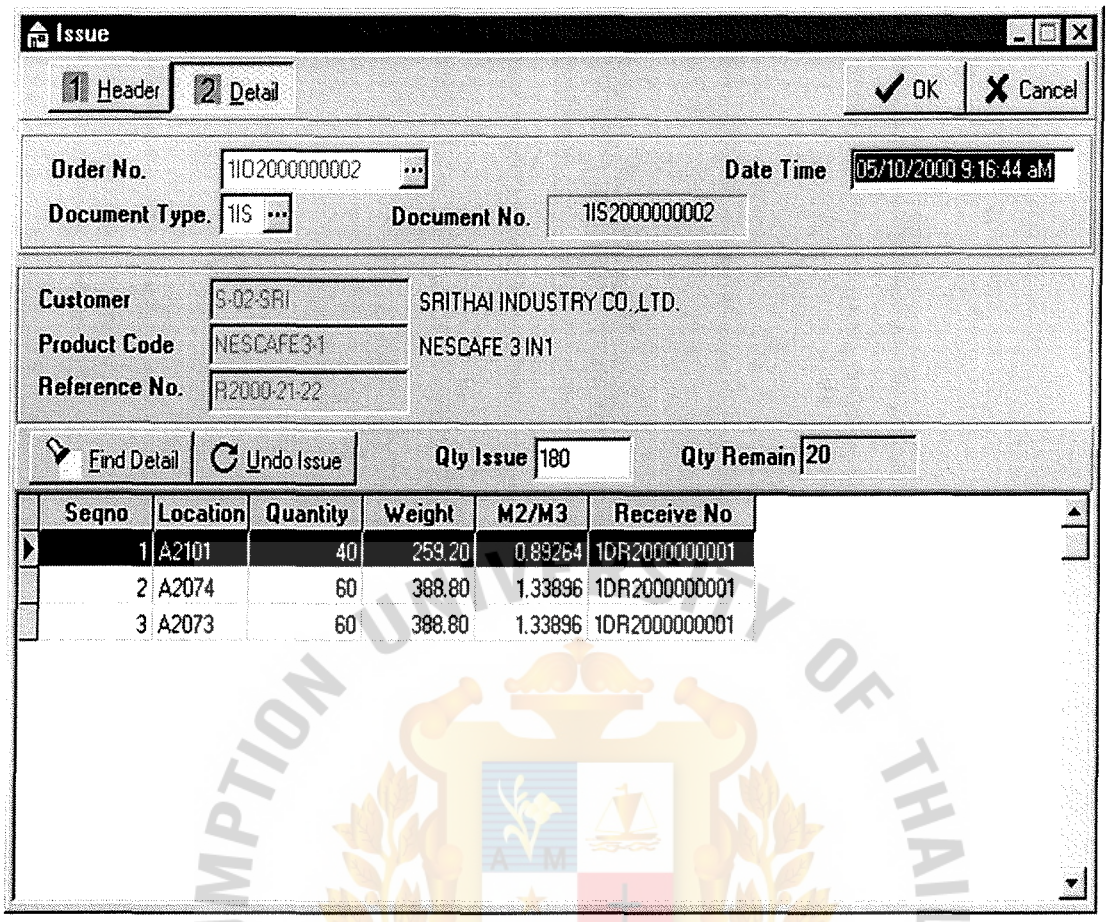


Figure E.24. Issue Main Form (Continued).

Detail Entry

Qty Issue : Quantity that desire to issued.

Qty Remain : The remaining of desired issue quantity.

User can click 'Find Detail' button to select the Receive Cargoes record.

Undo Issue button to reverse the issue transaction record.

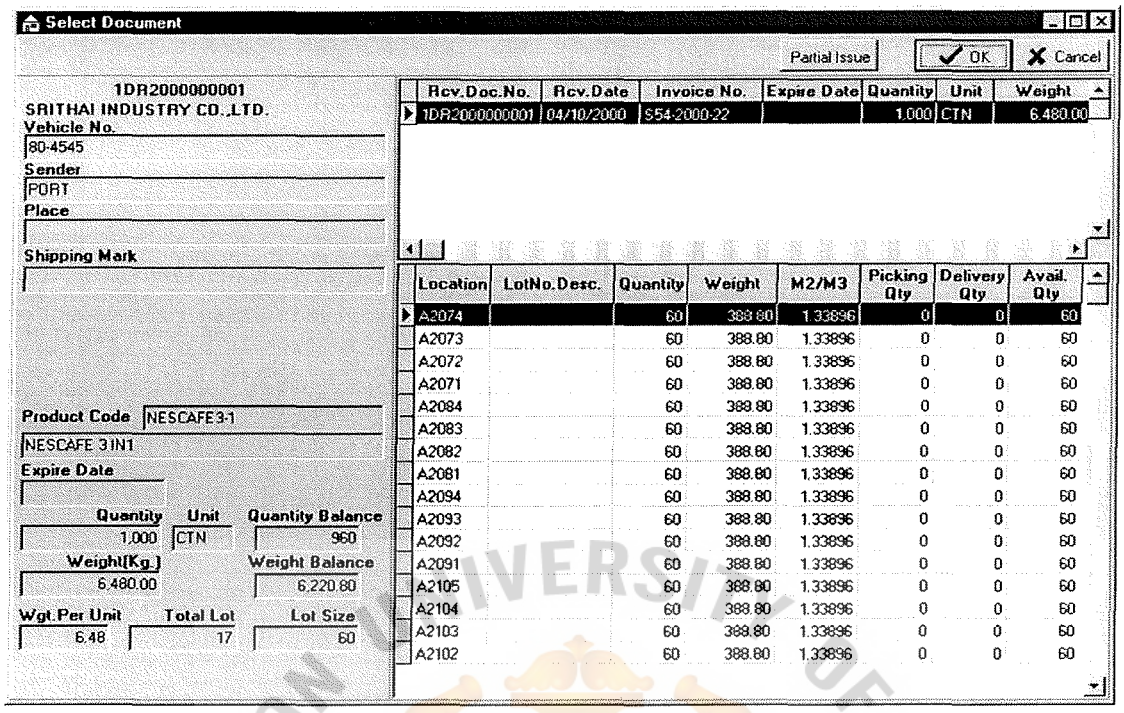


Figure E.25. Issue Main Form (Continued).

Detail Record issuing

The system will retrieve all the received cargoes record, which same cargoes and customer code in sequence of receiving date.

When the received cargoes record are selected, the system will retrieve all the location records according to the receive number in sequence of balance quantity.

Partial Issue button to issue some part of quantity in location.

Condition : Partial issue in each location is allowed.

Stock balance is not updated.

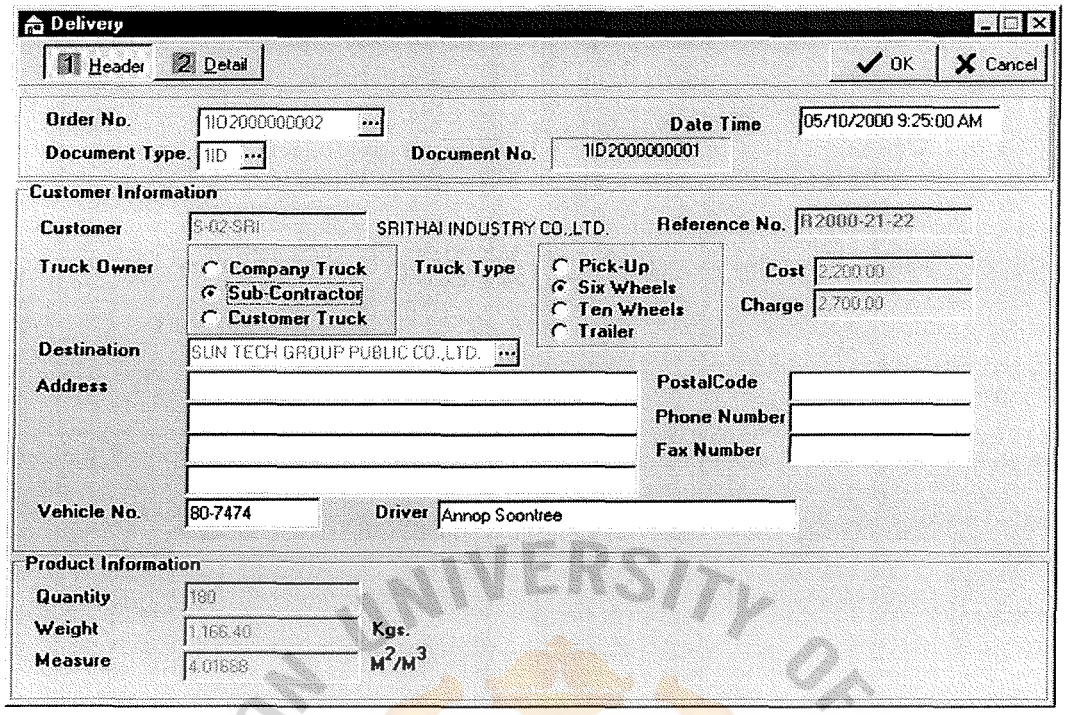


Figure E.26. Delivery Main Form.

Cargoes Delivery

<u>Header Entry</u>

Order No. : Must be exists in Order Sheet file.

Document Type : Group 'D' can be selected from document type master.

Document No. : Generated according to document type and date.

Customer No. : Retrieved from order sheet record.

Truck Owner/Truck Type : Must be selected.

Vehicle No / Driver : Must be input for reference.

Quantity/Weight/Total Lot : Accumulated base on detail of issue.

<u>Condition</u> : One order sheet number contains multiple delivery numbers.

One delivery number for one destination.

Destination can be changed for each delivery number.

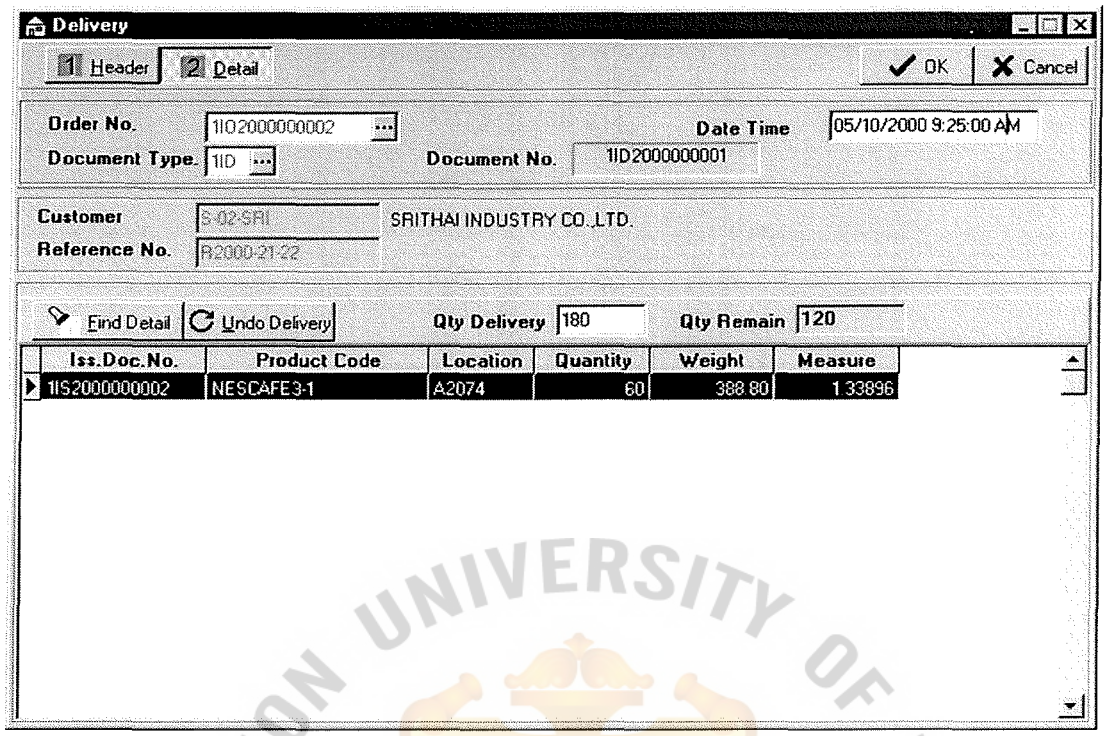


Figure E.27. Delivery Main Form (Continued).

Detail Entry

Qty Delivery : Quantity that desire to delivery.

Qty Remain : The remaining of desired delivery quantity.

User can click 'Find Detail' button to select the Issue Cargoes record for delivery purpose.

Undo Delivery button to reverse the delivery transaction record.

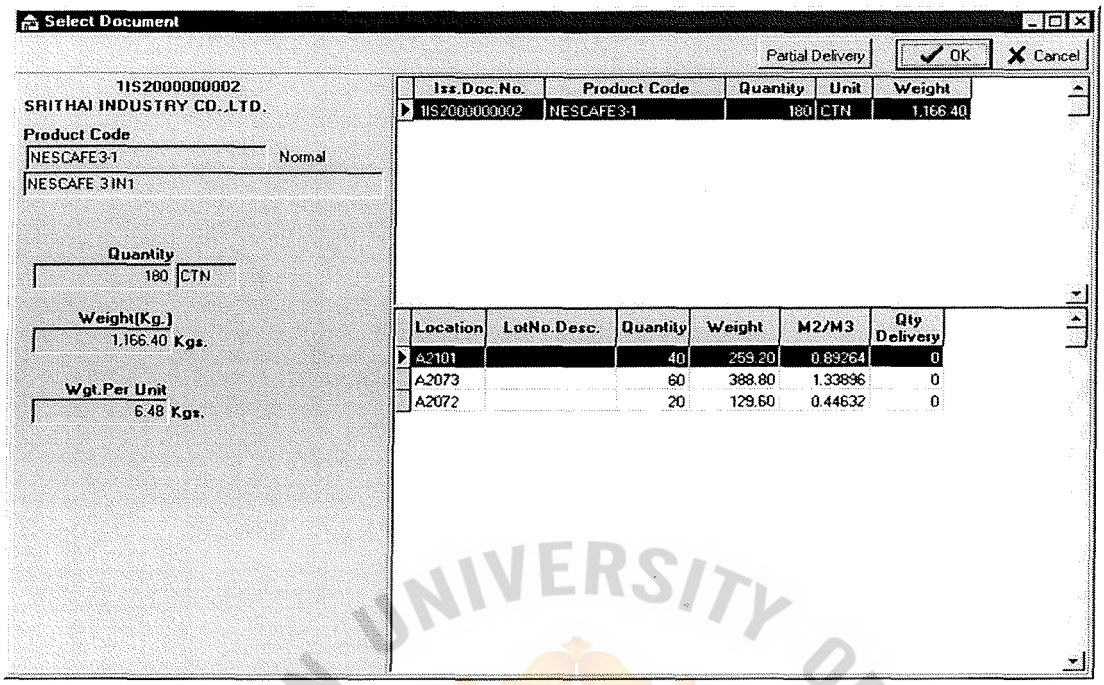


Figure E.28. Delivery Main Form (Continued).

Detail Record delivery

The system will retrieve all the issued cargoes record, which same order number.

When the issued cargoes record are selected, the system will retrieve all the location records according to the issue number.

Partial Issue button to issue some part of quantity in location.

Condition : One delivery number contains multiple issued number.

Partial delivery in each location is allowed.

Stock balance is updated immediately.

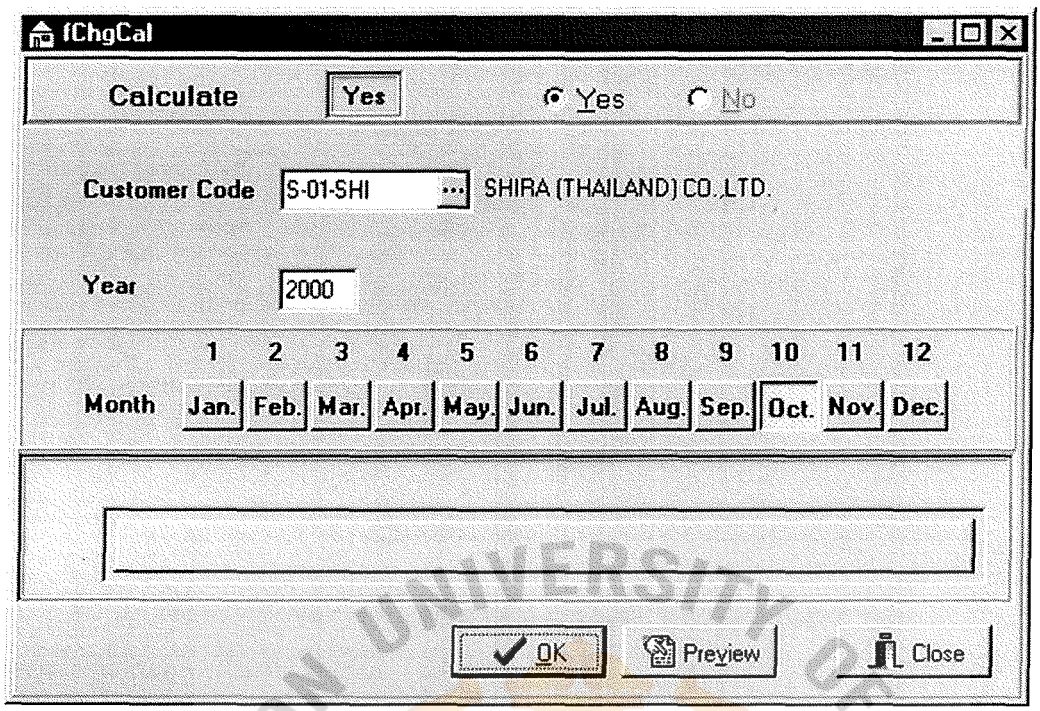


Figure E.29. Calculate Charge Main Form.

Calculate Charge

This screen is calculation of all charge.

Customer Code	:	Select customer code to calculate
Year	:	Input year
Month	:	Choose month to calculate
Calculate	:	Choose yes
OK	:	Start calculation
Preview	:	Preview summary of charge per customer

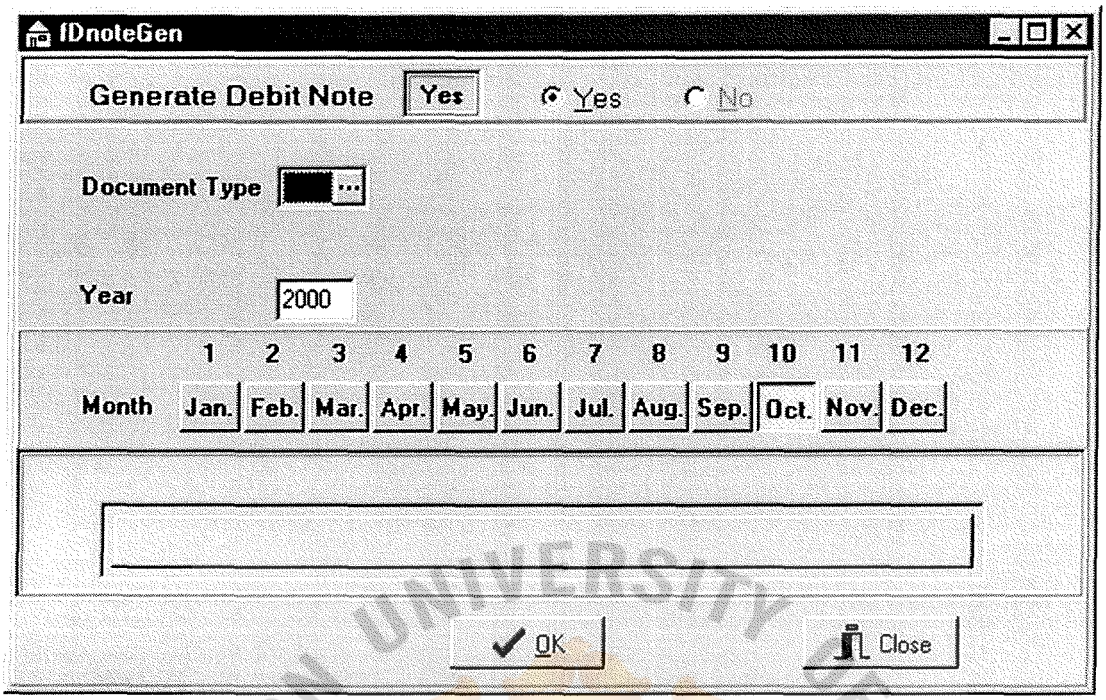


Figure E.30. Generate Debit Note Main Form.

<u>Generate Debit Note</u>

This screen is generate debit note

Document Type	:	Select type of document
Year	:	Input year
Month	:	Choose month to generate
Generate Debit Note	:	Choose yes
OK	:	Start generate

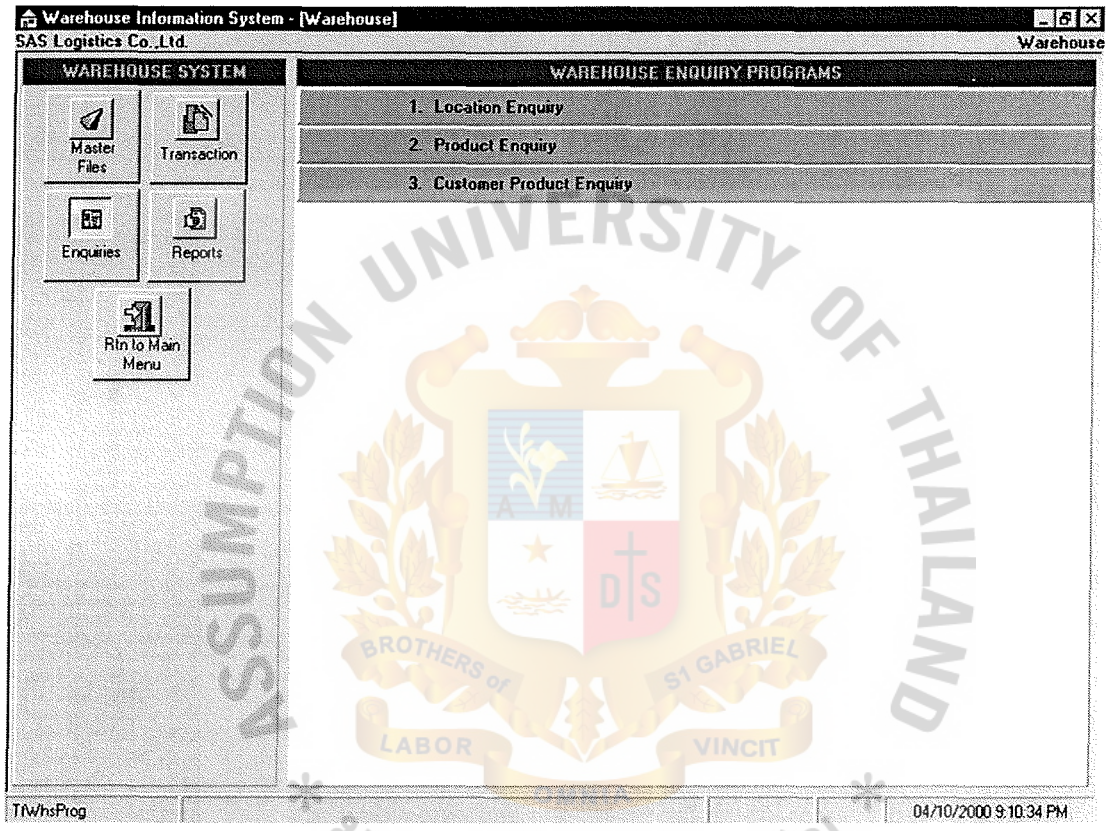


Figure E.31. Main Menu Form of Inquiry.

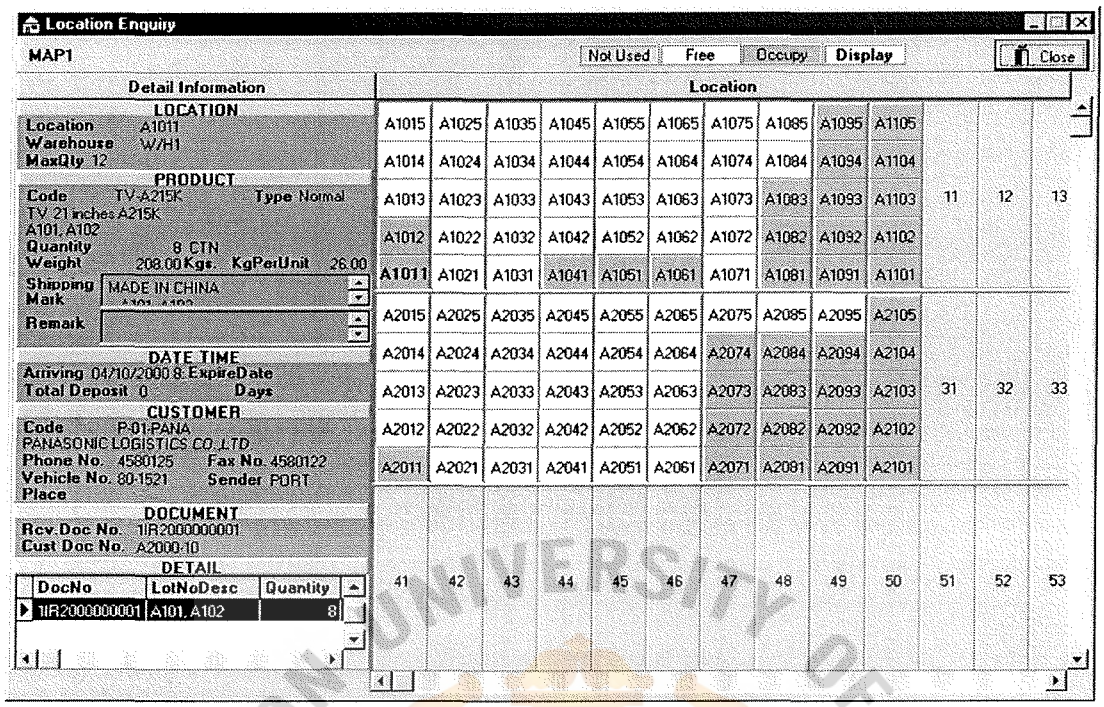


Figure E.32. Location Inquiry Main Form.

Location Inquiry

Inquiry of location in map.

User click on location and the information will be display on left screen.

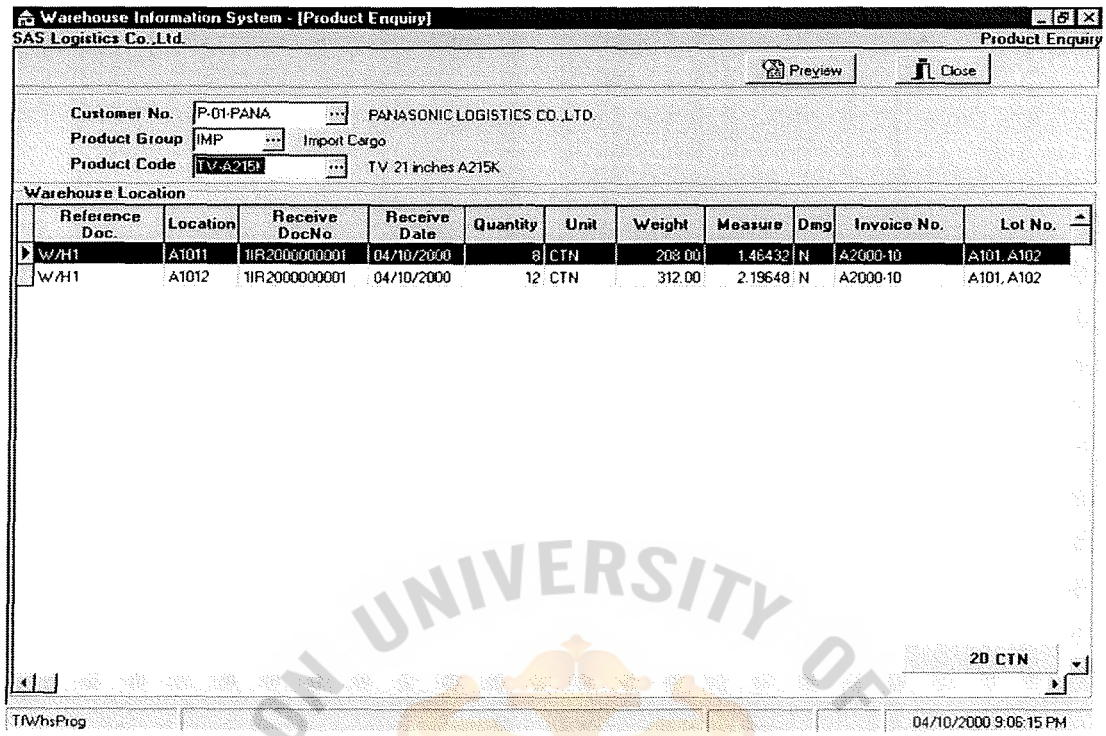


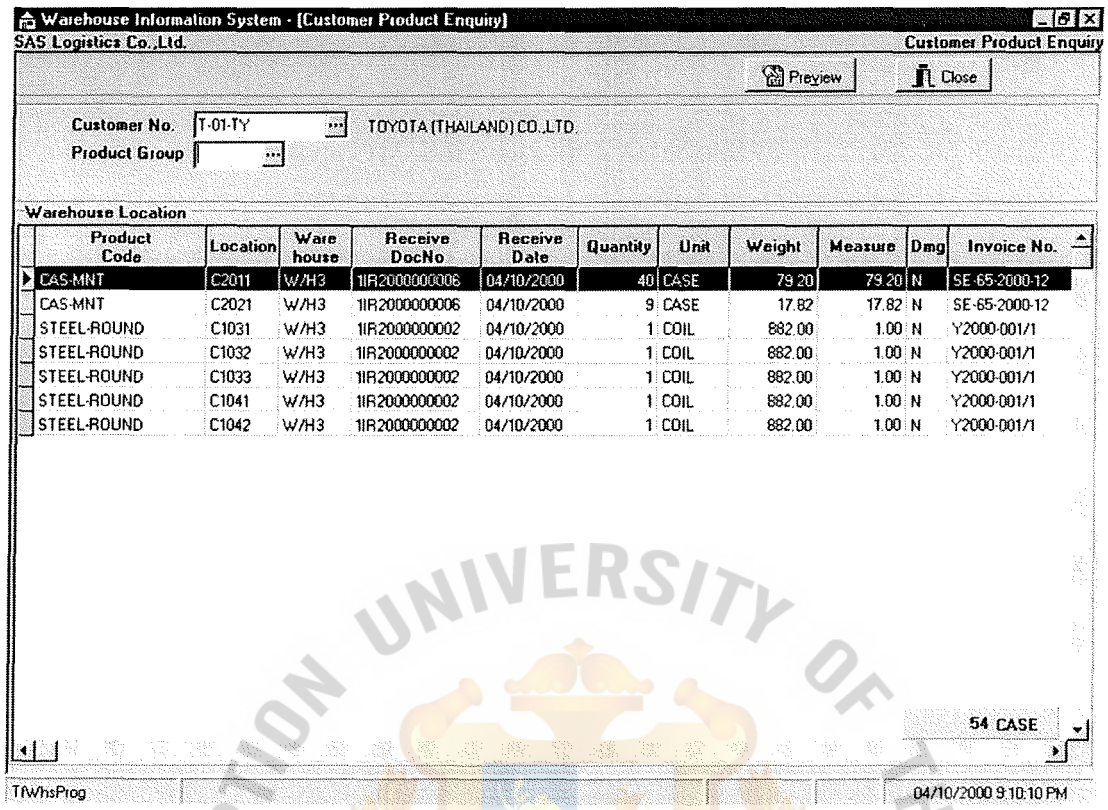
Figure E.33. Product Inquiry Main Form.

Product Inquiry

Inquiry of product in database.

Choose Customer No., Product Categories group and Product Code from database, all of location which contains the selected condition will be display on screen.

Preview button to print report on screen.



Product Code	Location	Ware house	Receive DocNo	Receive Date	Quantity	Unit	Weight	Measure	Dmg	Invoice No.
CAS-MNT	C2011	W/H3	1IR2000000006	04/10/2000	40	CASE	79.20	79.20	N	SE-65-2000-12
CAS-MNT	C2021	W/H3	1IR2000000006	04/10/2000	9	CASE	17.82	17.82	N	SE-65-2000-12
STEEL-ROUND	C1031	W/H3	1IR2000000002	04/10/2000	1	COIL	882.00	1.00	N	Y2000-001/1
STEEL-ROUND	C1032	W/H3	1IR2000000002	04/10/2000	1	COIL	882.00	1.00	N	Y2000-001/1
STEEL-ROUND	C1033	W/H3	1IR2000000002	04/10/2000	1	COIL	882.00	1.00	N	Y2000-001/1
STEEL-ROUND	C1041	W/H3	1IR2000000002	04/10/2000	1	COIL	882.00	1.00	N	Y2000-001/1
STEEL-ROUND	C1042	W/H3	1IR2000000002	04/10/2000	1	COIL	882.00	1.00	N	Y2000-001/1

Figure E.34. Customer Product Inquiry Main Form.

Customer Product Inquiry

Inquiry of customer product in database.

Choose Customer No., Product Categories group from database, all of location which contains the selected condition will be display on screen.

Preview button to print report on screen.

APPENDIX F

OUTPUT REPORTS

SAS LOGISTICS CO., LTD.

170 Pathana Rd., Tambon Phraeksa, Amphur Muang, Samutprakarn. 10280

Tel: 708-7474 Fax: (662)708-7470

ใบรับสินค้า
RECEIVING INFORMATION

No. 1IR2000003529

ลูกค้า **Customer** T-02-THI THAI LOGISTICS SERVICE CO., LTD.		วันที่ **Date** 04/10/2000 8:53:16 PM	
		เลขที่อ้างอิงของลูกค้า **Invoice No.** T2000-10-25	
Received From PORT		เลขที่สัญญา **Contract No.** THI-001	
รถบรรทุก / ตู้คอนเทนเนอร์ **Truck / Container** 80-9654	จำนวน **Nos. of P'Kgs.** 23 COIL	สถานที่ **Place**	
	น้ำหนัก / หน่วย Kg. / Unit 4,639.25	น้ำหนัก (กก.) **Weight (Kgs.)** 106,702.75	หน่วยวัด (ลบ.ม.) **M'ment (M^3)** 0.575
เครื่องหมายและนัมเบอร์ **Marks and Nos.** MADE IN HONG KONG	รายการสินค้า **Product Description** ALUM-CAN ALUMINIUM CAN BODY STOCK		
หมายเหตุ **Remark**			

Signature (Supervisor) **Signature (Customer)**

Figure F.1. Report of Receiving Information Slip.

SAS Logistics Co., Ltd. 05/10/2000

Inventory Receiving Listing

Doc No. **1IR2000000003** **Date** 04/10/2000 8:53:16 PM **Invoice No.** T2000-10-25

Customer No. T-02-THI THAI LOGISTICS SERVICE CO., LTD.

Shipping Mark

MADE IN HONG KONG

Product Description

ALUM-CAN
ALUMINIUM CAN BODY STOCK

Quantity	23	COIL	**Lot Size**	10		**Vehicle No.**	80-9654
Kg. Per Unit	4,639.25	**Kgs.**	**Total Location**	3		**Received From**	PORT
Total Weight	106,702.75	**Kgs.**	**Measurement**	0.575	M^3	**Place**	

Remark

No.	Location	Quantity	Weight	M'ment	Lot No.	Qty Delivery
1	A1-0-41	10	46,392.50	0.25	LS1090,1091	0
2	A1-0-51	10	46,392.50	0.25	LS1090,1091	0
3	A1-0-61	3	13,917.75	0.075	LS1090,1091	0

Figure F.2. Report of Inventory Receiving.

SAS Logistics Co., Ltd. 05/10/2000

Inventory Issuing Listing

Order No. **1IO2000000002** **Date** 05/10/2000 9:16:44 AM

Customer No. T-02-THI THAI LOGISTICS SERVICE CO., LTD. **Customer Doc. No.** R2000-21-22

Destination SUN TECH GROUP PUBLIC CO., LTD.

Issue No.	Rcv Doc No.	Product Name	Lot No.	Location	Quantity	Weight	Unit	M^2 / M^3	Damage
1IS2000000002	1DR200000001	NESCAFE 3 IN 1		A2-0-72	20	129.60	CTN	0.44632	N
1IS2000000002	1DR200000001	NESCAFE 3 IN 1		A2-0-73	60	388.80	CTN	1.33896	N
1IS2000000002	1DR200000001	NESCAFE 3 IN 1		A2-0-74	60	388.80	CTN	1.33896	N
1IS2000000002	1DR200000001	NESCAFE 3 IN 1		A2-1-01	40	259.20	CTN	0.89264	N

Figure F.3. Report of Inventory Issuing.

SAS LOGISTICS CO., LTD.

170 Pathana Rd., Tambon Phraeksa, Amphur Muang, Samutprakarn. 10280

Tel: 708-7474 Fax: (662)708-7470

ใบนำส่งสินค้า
DELIVERY CHIT

No. 1ID2000000003

ลูกค้า **Customer** T-02-THI THAI LOGISTICS SERVICE CO., LTD.	วันที่ **Date** 04/10/2000 9:30:11 PM
พนักงานขับรถ **Driver Name** Bumrung Jrungjit	เลขที่เอกสารการเบิก **Order No.** 1IO2000000001
ทะเบียนรถ **Truck No.** 81-5244	เลขที่อ้างอิงของลูกค้า **Cust.Doc.No.** S12/2000/12
สถานที่นำส่งสินค้า **Delivery To** BANGKOK CAN	จำนวน **Nos. of P'Kgs.** 6
	น้ำหนัก (กก.) **Weight (Kgs.)** 891.90 / หน่วยวัด (ลบ.ม.) **M'ment (M^3)** 10.90

รายการสินค้าออก **Description Cargo**

Product Code	Product Name	Quantity	Unit	WgtPerUnit	Weight	Measure
STEEL-ROUND 1IR2000000002	COLD DRAWN STEEL ROUND BAR	1	COIL	882.00	882.00	1.0
CAS-MNT 1IR2000000006	CASLEAK MONITOR	5	CASE	1.98	9.90	9.90

Signature (Supervisor) **Signature (Customer)**

Figure F.4. Report of Delivery Chit.

SAS LOGISTICS CO., LTD.

170 Pathana Rd., Tambon Phraeksa, Amphur Muang, Samutprakarn. 10280

Tel: 708-7474 Fax: (662)708-7470

ใบผ่านยาม
GATE PASS

No. 1ID2000000003

ลูกค้า **Customer** T-02-THI THAI LOGISTICS SERVICE CO., LTD.	วันที่ **Date** 04/10/2000 9:30:11 PM
พนักงานขับรถ **Driver Name** Bumrung Jrungjit	เลขที่เอกสารการเบิก **Order No.** 1IO2000000001
ทะเบียนรถ **Truck No.** 81-5244	เลขที่อ้างอิงของลูกค้า **Cust.Doc.No.** S12/2000/12
สถานที่นำส่งสินค้า **Delivery To** BANGKOK CAN	จำนวน **Nos. of P'Kgs.** 6
	น้ำหนัก (กก.) **Weight (Kgs.)** 891.90 / หน่วยวัด (ลบ.ม.) **M'ment (M^3)** 10.90

รายการสินค้าออก Description Cargo

Product Code	Product Name	Quantity	Unit	WgtPerUnit	Weight	Measure
STEEL-ROUND 1IR2000000002	COLD DRAWN STEEL ROUND BAR	1	COIL	882.00	882.00	1.0
CAS-MNT 1IR2000000006	CASLEAK MONITOR	5	CASE	1.98	9.90	9.90

Signature (Supervisor) **Signature (Customer)**

Figure F.5. Report of Gate Pass.

SAS Logistics Co., Ltd. 05/10/2000

Product Enquiry Listing

Reference Doc.	Location	Receive No.	Receive Date	Packing No.	Invoice No.	Lot No.	Quantity	Unit	Weight	Measure	Damage
Customer No.		T-01-TY	TOYOTA (THAILAND) CO., LTD.								
Product Code		STEEL-ROUND	COLD DRAWN STEEL ROUND BAR								
Warehouse Location											
W/H3	C1-0-31	1IR2000000002	04/10/2000		Y2000-001/1	CA-1011	1	COIL	882.00	1.00	N
W/H3	C1-0-32	1IR2000000002	04/10/2000		Y2000-001/1	CA-1011	1	COIL	882.00	1.00	N
W/H3	C1-0-41	1IR2000000002	04/10/2000		Y2000-001/1	CA-1011	1	COIL	882.00	1.00	N
W/H3	C1-0-42	1IR2000000002	04/10/2000		Y2000-001/1	CA-1011	1	COIL	882.00	1.00	N
							4				

Figure F.6. Report of Product Enquiry.

SAS Logistics Co., Ltd. 05/10/2000

Customer Product Enquiry Listing

Reference Doc.	Location	Receive No.	Receive Date	Packing No.	Invoice No.	Lot No.	Quantity	Unit	Weight	Measure	Damage
TOYOTA (THAILAND) CO., LTD.											
	CAS-MNT	**CASLEAK MONITOR**									
W/H3	C2-0-11	1IR2000000006	04/10/2000		SE-65-2000-12		40	CASE	79.20	79.20	N
W/H3	C2-0-21	1IR2000000006	04/10/2000		SE-65-2000-12		4	CASE	7.92	7.95	N
							44				
	STEEL-ROUND	**COLD DRAWN STEEL ROUND BAR**									
W/H3	C1-0-31	1IR2000000002	04/10/2000		Y2000-001/1	CA-1011	1	COIL	882.00	1.00	N
W/H3	C1-0-32	1IR2000000002	04/10/2000		Y2000-001/1	CA-1011	1	COIL	882.00	1.00	N
W/H3	C1-0-41	1IR2000000002	04/10/2000		Y2000-001/1	CA-1011	1	COIL	882.00	1.00	N
W/H3	C1-0-42	1IR2000000002	04/10/2000		Y2000-001/1	CA-1011	1	COIL	882.00	1.00	N
							4				

Figure F.7. Report of Customer Product Enquiry.

SAS Logistics Co., Ltd. 05/10/2000

Stock Report

Product Code	Product Name	Unit	Bal. 02/10/2000			Rcv.Q'ty			Del.Q'ty			Bal. 05/10/2000		
			Quantity	Weight	M^2/M^3	Quantity	Weight	M^2/M^3	Quantity	Weight	M^2/M^3	Quantity	Weight	M^2/M^3
TOYOTA (THAILAND) CO., LTD.														
PORT														
CAS-MNT	CASLEAK MONITOR	CASE	0	0.00	0.00	49	97.02	97.02	5	9.90	9.90	44	87.12	87.12
STEEL-ROUND	COLD DRAWN STEEL ROUND	COIL	0	0.00	0.00	5	4,410.00	5.00	1	882.00	1.00	4	3,528.00	4.00
	TOTAL		**0**	**0.00**	**0.00**	**54**	**4,507.02**	**102.02**	**6**	**891.90**	**10.90**	**48**	**3,615.12**	**91.12**
	GRAND TOTAL		**0**	**0.00**	**0.00**	**54**	**4,507.02**	**102.02**	**6**	**891.90**	**10.90**	**48**	**3,615.12**	**91.12**

Figure F.8. Report of Stock.

SAS Logistics Co., Ltd. 05/10/2000

Stock Transaction Report

Date	Doc No.	Location	Lot No.	Invoice No.	Unit	Bal. 02/10/2000			Rcv.Q'ty			Del.Q'ty			Bal. 05/10/2000		
						Quantity	Weight	M^2/M^3	Quantity	Weight	M^2/M^3	Quantity	Weight	M^2/M^3	Quantity	Weight	M^2/M^3
TOYOTA (THAILAND) CO., LTD.																	
CASLEAK MONITOR																	
04/10/2000	1IR2000000006	C2-0-11		SE-65-2000-12	CASE	0	0.00	0.00	40	79.20	79.20				40	79.20	79.20
04/10/2000	1IR2000000006	C2-0-21		SE-65-2000-12	CASE	40	79.20	79.20	9	17.82	17.82				49	97.02	97.02
04/10/2000	1IR2000000003	C2-0-21		SE-65-2000-12	CASE	49	97.02	97.02				5	9.90	9.90	44	87.12	87.12
		TOTAL				0	0.00	0.00	49	97.02	97.02	5	9.90	9.90	44	87.12	87.12
COLD DRAWN STEEL ROUND																	
04/10/2000	1IR2000000002	C1-0-31	Lot.CA-1011	Y2000-001/1	CASE	0	0.00	0.00	1	882.00	1.00				1	882.20	1.00
04/10/2000	1IR2000000002	C1-0-32	Lot.CA-1011	Y2000-001/1	CASE	1	882.00	1.00	1	882.00	1.00				2	1,764.00	2.00
04/10/2000	1IR2000000002	C1-0-33	Lot.CA-1011	Y2000-001/1	CASE	2	1,764.00	2.00	1	882.00	1.00				3	2,646.00	3.00
04/10/2000	1IR2000000002	C1-0-41	Lot.CA-1011	Y2000-001/1	CASE	3	2,646.00	3.00	1	882.00	1.00				4	3,528.00	4.00
04/10/2000	1IR2000000002	C1-0-42	Lot.CA-1011	Y2000-001/1	CASE	4	3,528.00	4.00	1	882.00	1.00				5	4,410.00	5.00
04/10/2000	1IR2000000002	C1-0-33	Lot.CA-1011	Y2000-001/1	CASE	5	4,410.00	5.00				1	882.00	1.00	4	3,528.00	4.00
		TOTAL				**0**	**0.00**	**0.00**	5	**4,410.00**	**5.00**	**1**	**882.00**	**1.00**	**4**	**3,528.00**	**4.00**
		GRAND TOTAL				**0**	**0.00**	**0.00**	**54**	**4,507.02**	**102.02**	**6**	**891.90**	**10.90**	**48**	**3,615.12**	**91.12**

Figure F.9. Report of Stock Transaction.

SAS Logistics Co., Ltd. 05/10/2000

Operation Schedule

Date	Shipper	Address	Job	Description	Q'TY	Weight	Transportation	Remarks
04/10/2000	PANASONIC LOGISTICS CO., LTD.	To: Chaisin Electric						
				TV 21 inches A215K				
				Lot. A101, A102	8 CTN	208.00 Kgs.		
04/10/2000	TOYOTA (THAILAND) CO., LTD.	To: BANGKOK CAN						
				COLD DRAWN STEEL ROUND BAR				
				Lot. CA-1011	2 COIL	1,764.00 Kgs.		
				CASLEAK MONITOR				
					9 CASE	17.82 Kgs.		

Figure F.10. Report of Operation Schedule.

SAS Logistics Co., Ltd. 05/10/2000

Cargo Movement Report
Period of 05/10/2000 – 05/10/2000

Customer	B/F		In (Kgs.)		Out (Kgs.)		Del.Q'ty		Balance	
	Weight	M^2M^3	Weight	M^2M^3	Weight	M^2M^3	Weight	M^2M^3	Weight	M^2M^3
PANASONIC LOGISTICS CO., LTD.	520.00	3.6608							520.00	3.6608
SHIRA (THAILAND) CO., LTD.	100,000.00	100,000.00							100,000.00	100,000.00
SRITHAI INDUSTRY CO., LTD.	6,480.00	22.316			1,166.40	4.01688	-1,166.40	-4.01688	5,313.60	18.29912
THAI LOGISTICS SERVICE CO., LTD.	106,702.75	0.575							106,702.75	0.575
TOYOTA (THAILAND) CO., LTD.	3,615.12	91.12							3,615.12	91.12
TOTAL	**317,317.87**	**100,117.6718**	**0.00**	**0.00**	**1,166.40**	**4.01688**	**-1,166.40**	**-4.01688**	**216,151.47**	**100,113.65492**

Figure F.11. Report of Cargo Movement.

SAS Logistics Co., Ltd. 05/10/2000

Truck Movement on 06/10/2000

Job	Company Truck				Rental Trip				Customer Truck	Remarks
	Pickup No. Trips	Six Wheel No. Trips	Ten Wheel No. Trips	Trailer No. Trips	Pickup No. Trips	Six Wheel No. Trips	Ten Wheel No. Trips	Trailer No. Trips		
Chaisin Electric	2			1			1			
PORT		1	3						2	
UENO					1	4				

Figure F.12. Report of Truck Movement.

SAS Logistics Co., Ltd. GENERAL W/H 05/10/2000

Storage Charge

SHIRA (THAILAND) CO., LTD.
DETAILS OF STORAGE FOR: SEPTEMBER 2000
Description: Chemical In Drums

Date	Rec.Qty	Rec.Wgt	Del.Qty	Del.Wgt	Bal.Qty	Bal.Wgt
Brought Forward					1) 130	1.9393
01/09/2000					130	1.9393
02/09/2000					130	1.9393
03/09/2000					130	1.9393
04/09/2000					130	1.9393
05/09/2000	1	0.016			131	1.9553
06/09/2000					131	1.9553
07/09/2000					131	1.9553
08/09/2000					131	1.9553
09/09/2000			2	0.0278	129	1.9275
10/09/2000					129	1.9275
11/09/2000					129	1.9275
12/09/2000					129	1.9275
13/09/2000					129	1.9275
14/09/2000					129	1.9275
15/09/2000			4	0.0556	2) 125	1.8719
S.TTL.	1) 1	0.016	6	0.0834		
16/09/2000			2	0.032	123	1.8399
17/09/2000					123	1.8399
18/09/2000					123	1.8399
19/09/2000					123	1.8399
20/09/2000					123	1.8399
21/09/2000					123	1.8399
22/09/2000			1	0.016	122	1.8239
23/09/2000					122	1.8239
24/09/2000					122	1.8239
25/09/2000					122	1.8239
26/09/2000			4	0.0598	118	1.7641
27/09/2000					118	1.7641
28/09/2000					118	1.7641
29/09/2000					118	1.7641
30/09/2000					3) 118	1.7641
S.TTL.	2) 0	0.000	7	0.1078		
G.TTL.	**1**	**0.016**	**13**	**0.1912**		

STORAGE CHARGE 1) = (130.00 + 1.00) x 80.00 = 10,480.00
2) = 125.00 x 80.00 = 10,000.00
HANDLING IN 1) = 1.00 x 45.00 = 45.00
HANDLING OUT 1) = 12.00 x 45.00 = 585.00

Figure F.13. Report Attachment of Storage Charge.

SHIRA (THAILAND) CO., LTD. 05/10/2000

Transportation Charge for: SEPTEMBER 2000

TRIP	DESTINATION	TRUCK NAME	@PRICE	TOTAL
2	KURASHIKI (Prachinburi)	SIX WHEELS	4,000.00	8,000.00
1	NAKASHIMA (Rojana)	SIX WHEELS	2,500.00	2,500.00
1	PONGPARA CODUNRUBBER (Bangkae)	TEN WHEELS	3,200.00	3,200.00
3	PONGPARA CODUNRUBBER (Krathumban)	PICKUP	3,500.00	10,500.00
1	SUNSTAR (Soi 7)	TRAILER	4,500.00	4,500.00
GRAND TOTAL				**28,700.00**

Figure F.14. Report Attachment of Transportation Charge.

SAS LOGISTICS CO., LTD.
170 Pathana Rd., Tambon Phraeksa, Amphur Muang, Samutprakarn. 10280
Tel: 708-7474 Fax: (662)708-7470

ใบแจ้งหนี้
DEBIT NOTE

บิลเลขที่
Bill No. 1DN0003951

บริษัท
Messrs : ITOCHU (THAILAND) LTD.

วันที่
Date August 31, 2000

5th Floor, Harindhorn Tower 54 North Sathorn Road, Bangrak, Bangkok 10500

บัญชี A/C Clearance and Delivery Charges		บาท / สต. Baht / Stgs.
	Storage Charge for August 2000 (GENERAL W/H) Asbestos	15,287.50
	Vat 7%	1,070.13
	DUE DATE : September 15, 2000 — รวม Total	16,357.63

For **SAS Logistics Co., Ltd.**

.....

General Manager

Figure F.15. Report of Debit Note.

APPENDIX G

FILE LAYOUT

DATABASE

Table G.1. Structure of Customer Table.

Field Name	Data Type	Length	Null	PK	Description
CustCode	Varchar	10		Y	Identify the Customer Id
CustName	Varchar	60	Y		Identify the Customer Name
Address1	Varchar	40	Y		Customer Address 1
Address2	Varchar	40	Y		Customer Address 2
Address3	Varchar	40	Y		Customer Address 3
Address4	Varchar	40	Y		Customer Address 4
PostageCode	Varchar	10	Y		Postage Code of Customer
Region	Varchar	3	Y		Region of Customer
Country	Varchar	3	Y		Country of Customer
Territory	Varchar	3	Y		Territory of Customer
PhoneNumber	Varchar	15	Y		Phone number
FaxNumber	Varchar	15	Y		Fax number
CurrCode	Varchar	3	Y		Currency exchange (i.e. BHT = Baht)
PayTerm	Varchar	5			Payment term (i.e. 15, 30 days)
PayType	Varchar	5			Payment by (i.e. Cash, Cheque)
VatRegNo	Varchar	14	Y		Vat register no.
ContractPerson	Varchar	40	Y		Contract person
ContractPosition	Varchar	30	Y		Contract Position
ARAcct	Varchar	10	Y		A/R Account No.

Table G.2. Structure of Agreement Table.

Field Name	Data Type	Length	Null	PK	Description
ContractNo	Varchar	15		Y	Identify the Contract No.
CustCode	Varchar	10		Y	Identify the Customer Id
ChgCode	Varchar	10		Y	Identify the Charge Code
TrnType	Varchar	3			Transaction Type
ChgAmtperUnit	Decimal	18,2			Charge rate per unit
ChgAmtperWgt	Decimal	18,2			Charge rate per weight
ChgAmtperMment	Decimal	18,2			Charge rate per measurement
RepeatDay	Integer				Repeat day for calculate
BFInclude	Char	1			Calculate in which section

Table G.3. Structure of Cargoes Table.

Field Name	Data Type	Length	Null	PK	Description
ProductCode	Varchar	20		Y	Identify the Cargo code
Model	Varchar	12			Model of cargo
Type	Varchar	4	Y		Type of cargo
Color	Varchar	4	Y		Color of cargo
ProductName	Varchar	60	Y		Identify the Cargo name
LifeSpan	Integer				Age of cargo
LocationSize	Decimal	18,0			Capability of location
UOMCode	Varchar	5			Unit of measurement
WgtPerUnit	Decimal	18,4			Weight per unit
MeasurePerUnit	Decimal	18,6			Measurement per unit
Categories	Varchar	5	Y		Categories group of cargo
ChargeGrp	Varchar	5	Y		Charge group of cargo
OtherGrp	Varchar	5	Y		Other group of cargo

Table G.4. Structure of Warehouse Location Table.

Field Name	Data Type	Length	Null	PK	Description
Location	Varchar	5		Y	Identify the Location
Name	Varchar	20			Location Name
Warehouse	Varchar	5			Warehouse to keep in
Occupy	Char	1			Location occupy
MaxQuantity	Decimal	18,0			Capacity of location
Quantity	Decimal	18,0			Outstanding quantity
Weight	Decimal	18,4			Outstanding weight
QtyPicking	Decimal	18,0			Picking quantity
WhType	Char	1			Warehouse type

Table G.5. Structure of Warehouse Location Detail Table.

Field Name	Data Type	Length	Null	PK	Description
Location	Varchar	5		Y	Identify the Location
DocNo	Varchar	15		Y	Receive no.
CustCode	Varchar	10			Customer Code
ProductCode	Varchar	20			Cargo Code
LotNoDesc	Varchar	15	Y		Lot no description
RcvDate	Datetime				Receive date time
Quantity	Decimal	18,0			Outstanding quantity
Weight	Decimal	18,4			Outstanding weight
DamageFlag	Char	1			Damage flag
QtyPicking	Decimal	18,0			Picking quantity

Table G.6. Structure of Receive Table.

Field Name	Data Type	Length	Null	PK	Description
DocNo	Varchar	15		Y	Receive no.
RcvDateTime	Datetime				Receive date time
CustCode	Varchar	10			Customer code
CustDocNo	Varchar	15	Y		Customer reference no.
ProductCode	Varchar	20			Cargo code
ShipArrDate	Datetime				Ship arrive date
LifeSpan	Integer				Age of cargo
ExpireDate	Datetime				Expire date
Quantity	Decimal	18,0			Receive quantity
Weight	Decimal	18,4			Receive weight
Measure	Decimal	18,6			Receive measurement
QtyIssue	Decimal	18,0			Issue quantity
WgtIssue	Decimal	18,4			Issue weight
UOMCode	Varchar	5			Unit of measurement
WgtPerUnit	Decimal	18,4			Weight per unit
MeasurePerUnit	Decimal	18,6			Measurement per unit
LocationSize	Decimal	18,0			Capacity of location
TotalLocation	Decimal	18,0			Total location use in record
DamageFlag	Char	1			Damage flag
ShippingMark	Varchar	255	Y		Shipping mark
VehicleNo	Varchar	10	Y		Vehicle no, License no.
OwnerBy	Varchar	40	Y		Owner of cargo
Place	varchar	40	Y		Place to keep cargo
Remark	Varchar	255	Y		Remark, comment
ContractNo	Varchar	15			Contract no, agreement no.
QtyPicking	Decimal	18,0			Picking quantity
WgtPicking	Decimal	18,4			Picking weight
Status	Char	1			Status of record

Table G.7. Structure of Receive Detail Table.

Field Name	Data Type	Length	Null	PK	Description
DocNo	Varchar	15		Y	Receive no.
SeqNo	Integer			Y	Sequence no. of record
Location	Varchar	5	Y		Location in warehouse
LotNoDesc	Varchar	15	Y		Lot no. description
Quantity	Decimal	18,0			Receive quantity
Weight	Decimal	18,4			Receive weight
Measure	Decimal	18,6			Receive measurement
QtyIssue	Decimal	18,0			Issue quantity
WgtIssue	Decimal	18,4			Issue weight
WhType	Char	1			Warehouse type
QtyPicking	Decimal	18,0			Picking quantity
WgtPicking	Decimal	18,4			Picking weight
Status	Char	1			Status of record

Table G.8. Structure of Customer Order Table.

Field Name	Data Type	Length	Null	PK	Description
OrderNo	Varchar	15		Y	Identify the Order No.
CustCode	Varchar	10			Customer Code
CustDocNo	Varchar	15	Y		Customer Reference No.
Destination	Varchar	60			Destination to send cargo

Table G.9. Structure of Transaction Table.

Field Name	Data Type	Length	Null	PK	Description
ProductCode	Varchar	20		Y	Cargo code
SysDateTime	Datetime			Y	System date time
RcvDocNo	Varchar	15			Receive no.
DocNo	Varchar	15			Receive no., delivery no
DocDateTime	Datetime				Document date time
CustCode	Varchar	10			Customer code
Location	Varchar	5			Location in warehouse
WhType	Char	1			Warehouse type
LotNoDesc	Varchar	15	Y		Lot no. description
TrnType	Varchar	3			Transaction type
Quantity	Decimal	18,0			Transaction quantity
Weight	Decimal	18,4			Transaction weight
Measure	Decimal	18,6			Transaction measurement
UOMCode	Varchar	5			Unit of measurement
ContractNo	Varchar	15			Contract no., Agreement no.
DamageFlag	Char	1			Damage flag

Table G.10. Structure of Issue Table.

Field Name	Data Type	Length	Null	PK	Description
DocNo	Varchar	15		Y	Issue no.
OrderNo	Varchar	15			Order no.
IssDateTime	Datetime				Issue date time
CustCode	Varchar	10			Customer code
ProductCode	Varchar	20			Cargo code
DamageFlag	Char	1			Damage flag
CustDocNo	Varchar	15	Y		Customer reference no.
Quantity	Decimal	18,0			Issue quantity
Weight	Decimal	18,4			Issue weight
UOMCode	Varchar	5			Unit of measurement
WgtPerUnit	Decimal	18,4			Weight per unit
MeasurePerUnit	Decimal	18,6			Measurement per unit
DeliveryQty	Decimal	18,0			Delivery quantity
DeliveryWgt	Decimal	18,4			Delivery weight
Status	Char	1			Status of record

Table G.11. Structure of Issue Detail Table.

Field Name	Data Type	Length	Null	PK	Description
DocNo	Varchar	15		Y	Issue no.
SeqNo	Integer			Y	Sequence no.
RcvDocNo	Varchar	15			Receive document no.
Location	Varchar	5			Location in warehouse
LotNoDesc	Varchar	15	Y		Lot no. description
Quantity	Decimal	18,0			Issue quantity
Weight	Decimal	18,4			Issue weight
Measure	Decimal	18,6			Issue measure
QtyDelivery	Decimal	18,0			Delivery quantity
WgtDelivery	Decimal	18,4			Delivery weight
ReceiveDate	Datetime				Receive date time
WhType	Char	1			Warehouse type
ContractNo	Varchar	15			Contract no., Agreement no.
Status	Char	1			Status of record

Table G.12. Structure of Delivery Table.

Field Name	Data Type	Length	Null	PK	Description
DeliveryNo	Varchar	15		Y	Delivery no.
OrderNo	Varchar	15			Order no.
DeliDateTime	Datetime				Delivery date time
CustCode	Varchar	10			Customer code
Destination	Varchar	60			Destination to send cargo
Quantity	Decimal	18,0			Delivery quantity
Weight	Decimal	18,4			Delivery weight
Measure	Decimal	18,6			Delivery Measure
Driver	Varchar	40	Y		Driver name
VehicleNo	Varchar	10	Y		Vehicle no, License no.
DeliType	Varchar	3			Delivery type
TruckOwner	Char	1			Truck owner
TruckType	Char	1			Type of truck
IsChg	Char	1			Calculate transportation
TruckCost	Decimal	18,2			Cost of truck for company
TruckChg	Decimal	18,2			Charge of truck for charge customer
Remark	Varchar	255	Y		Remark
Address	Varchar	200	Y		Address

Table G.13. Structure of Delivery Detail Table.

Field Name	Data Type	Length	Null	PK	Description
DeliveryNo	Varchar	15		Y	Delivery no.
SeqNo	Integer			Y	Sequence no.
IssDocNo	Varchar	15			Issue document no.
RcvDocNo	Varchar	15			Receive document no.
Location	Varchar	5			Location in warehouse
ProductCode	Varchar	20			Cargo code
Quantity	Decimal	18,0			Delivery quantity
Weight	Decimal	18,4			Delivery weight
Measure	Decimal	18,6			Delivery Measure
WhType	Char	1			Warehouse type
LotNoDesc	Varchar	15	Y		Lot no. description
UOMCode	Varchar	5			Unit of measurement
ContractNo	Varchar	15			Contract no., Agreement no.
DamageFlag	Char	1			Damage flag
WgtPerUnit	Decimal	18,4			Weight per unit
MeasurePerUnit	Decimal	18,6			Measurement per unit
ReceiveDate	datetime				Receive date time

Table G.14. Structure of Truck Master Table.

Field Name	Data Type	Length	Null	PK	Description
TruckOwner	Char	1		Y	Truck owner
CustCode	Varchar	10		Y	Customer code
DestCode	Varchar	10		Y	Destination code
Destination	Varchar	40	Y		Destination
Address	Varchar	255	Y		Address
PostageCode	Varchar	10	Y		Postage Code
PhoneNumber	Varchar	15	Y		Phone number
FaxNumber	Varchar	15	Y		Fax number
PickupCost	Decimal	18,0			Pick up cost
PickupChg	Decimal	18,0			Pick up charge
SixWheelCost	Decimal	18,0			Six wheel cost
SixWheelChg	Decimal	18,0			Six wheel charge
TenWheelCost	Decimal	18,0			Ten wheel cost
TenWheelChg	Decimal	18,0			Ten wheel charge
TrailerCost	Decimal	18,0			Trailer cost
TrailerChg	Decimal	18,0			Trailer charge

Table G.15. Structure of Charge Master Table.

Field Name	Data Type	Length	Null	PK	Description
ChargeCode	Varchar	10		Y	Charge code
Name	Varchar	30	Y		Charge name
AcctCode	Varchar	10	Y		Account code
ChargeStat	Char	1	Y		Charge status

Table G.16. Structure of All Type Table.

Field Name	Data Type	Length	Null	PK	Description
Type	Char	1		Y	Type
TypeCode	Varchar	10		Y	Type Code
Description	Varchar	40	Y		Description

Table G.17. Structure of System Company Table.

Field Name	Data Type	Length	Null	PK	Description
Code	Varchar	5		Y	Company code
Name	Varchar	60			Company name
Address1	Varchar	255			Company address
PostageCode	Varchar	10	Y		Postage code
Country	Varchar	3	Y		Country
PhoneNumber	Varchar	15	Y		Phone number
FaxNumber	Varchar	15	Y		Fax number
CurrCode	Varchar	3	Y		Currency exchange i.e. BHT = Baht
Vat	Decimal	6,4			Vat no.
VatRegNo	Varchar	14	Y		Vat register no.
TaxID	Varchar	10	Y		Tax id.

Table G.18. Structure of System Country Table.

Field Name	Data Type	Length	Null	PK	Description
CntyCode	Varchar	3		Y	Country code
Name	Varchar	20	Y		Country name

Table G.19. Structure of System Unit Table.

Field Name	Data Type	Length	Null	PK	Description
UOMCode	Varchar	5		Y	Unit of measurement code
Name	Varchar	20	Y		Unit name

Table G.20. Structure of System Warehouse Table.

Field Name	Data Type	Length	Null	PK	Description
Warehouse	Varchar	5		Y	Warehouse code
Name	Varchar	20	Y		Warehouse name

Table G.21. Structure of System Map Table.

Field Name	Data Type	Length	Null	PK	Description
MapNo	Varchar	5		Y	Map code
Name	Varchar	20	Y		Map name

Table G.22. Structure of System Document Control Table.

Field Name	Data Type	Length	Null	PK	Description
DocType	Varchar	3		Y	Document type
Name	Varchar	40	Y		Document type name
DocGroup	Char	1			Document group
SeqYear	Varchar	4			Current year
SeqNo	Integer				Sequence no.

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