Sales and Marketing Information System for Mui Kwang Vauum Coating Co., Ltd.

by

Mr. Narin Chotverasatanaon

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

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

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Project Title	Sales and Marketing Information System for Mui Kwang Vacuum Coating Co., Ltd.
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Academic Year	November 18, 2001

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

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ABSTRACT

This study analyses the marketing problems for Sales & Marketing Information System of Mui Kwang Vacuum Coating Company. A marketing plan is offered to overcome the problems. The study begins with a literature review on sales and marketing philosophies.

The study revealed problems for immediate attention: The current existing Sales & Marketing Information System is based on the manual and some computerized system. Most of the data is stored on paper, while some parts are kept in the Microsoft Excel, and stored in the Hard disk on a personal computer. It requires many operating staff to maintain the system, and has to face the general problems of manual system, which are error-prone, with a high maintenance cost.

The study emphasizes on the new system, which can provide a better and easy operation without mistakes and redundant work. Furthermore, the new system should encourage the users in better controlling, planning, evaluating, and decision making. It is not only try to utilize the existing resources, but also set to up a computer system to support the users for more efficiency and effectiveness in operations. All data is kept in the database server, Microsoft Access 7.0 Server Extension. It will reduce the number of administrative staff, solve the problem of manual system and decrease the high maintenance cost.

ACKNOWLEDGEMENTS

The writer would like to express his gratitude to the project advisor: Dr. Aran Numphol, for his valuable time and guidance through out the project. He is also grateful to all project committee members

He is most indebted to Mui Kwang Vacuum Coating Company who gives me the necessary information in order that the project can be implemented.

He extend sincere thanks to Mr. Apichart Siridamrongchaisak, Production Manager, Ms. Somporn Ratanaamonsak, Senior System Analyst, Mr. Tarin Changwangsa, Junior System Analyst and Miss Pajaree Nitimonkolwan for their timely assistance and information provided to me while carrying out the data collection required for this project.

Special appreciation goes to family for their fervent and continuous encouragement. Above all, forever grateful to my parents, whose willingness to invest in his future has enabled me to achieve my educational goal.

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Management information system (MIS) is the heart of an organization. To complete effectively in a world market, executive now realize that they must take full advantage of their information resources

Mui Kwang Vacuum Coating Co., Ltd. was established in 1995. Now, the company has 50 staff, which consists of a factory staff of 35 persons and office staff of 15 persons. The company business is coating materials such as alloy wheels. They divided their products in to two categories, the first product is only coating the material. It means the customers would bring the material and they would only coat that material. Second they produce the material and coat. It means the customers would bring the original one to be a sample and they would copy it. Approximately 80% of the job is to produce and coat while 20% is coating only.

These are some example of company products:

(1) Teacup, Chinese cup

(2) Gold or Silver cup for offered as a prize

etc.

The management of company believes in the concept of MIS and would like to set up the mangement information system in their organization since it is not only managing the meaningful information for analyzing, evaluating, planning, and controling but also enhancement them for decision making, better service to customers, development of new products, competing with the competitors and etc. Additionally, this system support the management at all levels in long term and short terms strategic planning and operations, which finally reach the company objectives and policies.

Approval has been given to the general principles of the plans for restructuring the marketing system. The writer was directly involved to cooperate with the department regarding stuffing, budgeting, and computerization.

To support this restructuring, the management capability and operational efficiency, the project has been prepared which includes the reform of internal administrative structures, regulation revision, additional manpower recruitment and training, acquisition of new office space and facilities, and the development of data processing system. The organization chart of the company is shown on Figure 2.1.

1.2 Objectives of the Project

To Analyze, design and develop a computerized system for Mui Kwang Vacuum Coating Co., Ltd. in order that the system will be able to:

(1) To analyze and design the computer system for marketing department and management of the company.

(2) To provide accurate and meaningful information for top management so that they can make better decides both in short term and long term strategic planning.

(3) To arrange the report to all levels of management in order that they can plan and control to reach company targets and goals.

(4) To develop the management information system for the organization.

(5) To support management with the timely information and report which enhance them to analyze and understand the market situation.

1.3 Scope of the Project

This project is concerned mainly with the marketing management system which will enhance all levels of management to evaluate, analyze, control, and plan so as accomplish the company's objectives. We would like to classify the information that we need to collect as hereunder:

(a) Customers:

Customer's data that we require are

(1) Customer orders.

(2) Customer credit term.

(3) Customers consumption for each item.

(b) Products:

In formation of each product are

(1) Cost of goods sold.

(2) Margin of each product.

(3) Quantity order per month for each customer.

(4) Comparing the quantity sales per month with the last month sales

(c) Management:

(1) Management can compare the sales turnover between the last year and this year sales

(2) Management can get the timely and meaningful information of each product and each customer.

1.4 Deliverables

This report will have the following details.

(1) Project Introduction

- (a) Background
- (b) Objectives
- (c) Scope

(2) Description of the Existing System.

- (a) Background of the Organization
- (b) Existing Business Functions
- (c) Current Problems
- (d) Areas for improvement

(3) Description of Proposed New System.

- (a) User Requirements
- (b) Overview of Propose System
- (c) System Design
- (d) Hardware and Software Requirements
- (e) Cost/Benefit Analysis

(4) System Implementation Plan.

- (a) Developing the System
- (b) Testing
- (c) Training
- (d) Documentation

(5) Conclusions and Recommendations.

No.	Task Name	April				May				June				July			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
	I. System Analysis																
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	Define the New System requirement																
7	Cost & Benefit Analysis																
	II. System Design																
8	Web Interface Design																
9	Report Design																
10	Database Design																
11	Network Design																
12	Program Design																
	III. System Implementation																
13	Coding																
14	Testing																
15	Hardware Installation																
16	Software Installation																
17	Conversion																

Figure 1.1. Project Plan for Sales & Marketing Information System of Mui Kwang Vacuum Coating Co., Ltd.

II. THE EXISTING SYSTEM

2.1 Background of the Organization

Management information system (MIS) is the heart of an organization. To compete effectively in a world market, executives now realize that they must take full advantage of their information resources

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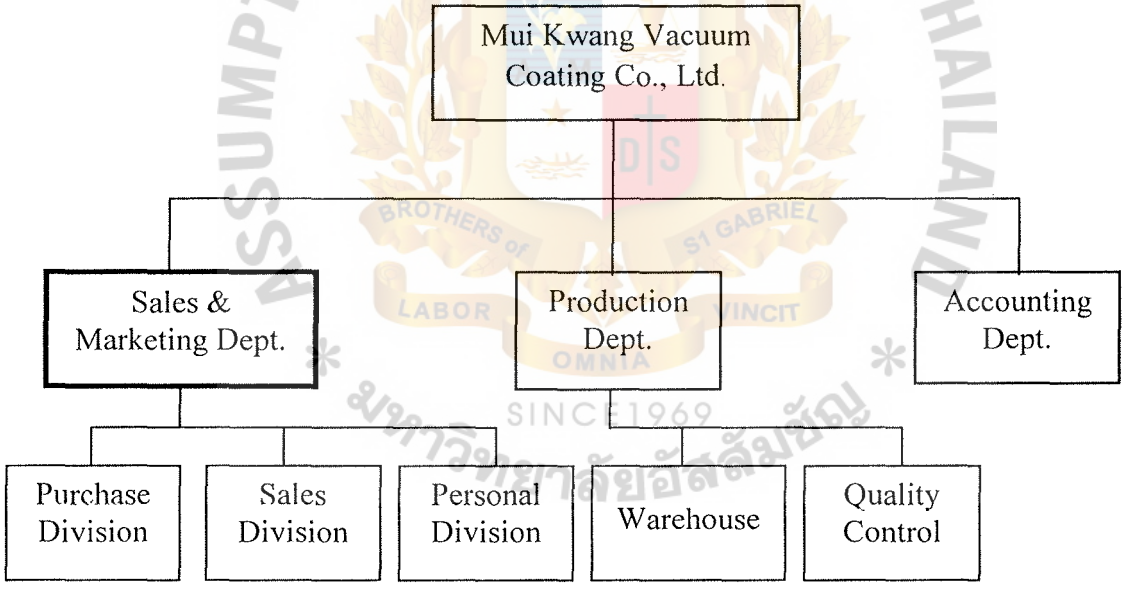

Figure 2.1 Organization Chart of Mui Kwang Vacuum Coating Co., Ltd.

2.2 Current Problems and Areas for Improvement

Due to the weaknesses of the current system, the following problems occur:

(1) There are duplicates of filing the documents.

(2) There is no systematic standard and enough documents to support efficient procedures.

(3) Same data is kept in many places and creates redundancy problem.

(4) Time is wasted in handling and referencing for information at every steps.

(5) No database of customer information, product information, sales history and warranty period, in order to verify and judgement.

(6) No summary report for management level to decision making and time action

(a) Poor follow-up procedure.

(b) Poor planing in replenishing stock

(7) No quality information history.

The advantages that we will get from implementing the computerized warranty information system in order to enhance warranty claim performance in the following area:

(1) To reduce the error from the manual system.

(2) To speed up the information transaction process.

(3) To decrease the documents draw up process.

(4) To create reliability and accuracy database.

(5) To provide meaningful information to support the decision making of management level.

(6) To create user friendly programs with graphic user interface.

2.3 Existing Computer System

In the existing system, the company has a manual and some computerized system, most data is stored on paper, while some parts are kept in the Microsoft Excel, and stored in the hard disk of personal computer. Even though, company has an advance in hardware area it is not efficiently utilized. Figure2.2 presents the existing hardware and software in our company.

For software on each workstation is Window98 with Microsoft office97 Professional Edition, with the following program:

(1) MS Word

(2) MS Excel

(3) MS Internet Explorer

(4) MS Access

III. THE PROPOSED SYSTEM

3.1 System Specification

User Requirements

After analyzing the existing system, we can identify the user requirement as follows:

(1) Reducing time and increasing accuracy in issuing order form, quotations, contracts, and invoices.

(2) User friendly interface screen for the whole system.

(3) Provide the summary report to management level and other parties.

(4) Increase volume of work.

(5) Support the quality information and countermeasure result.

(6) Generating reports on time and upon request.

3.1.1 Input Design

The Input design is an important design of all database designs. The analyst has to design source documents, input screen, and methods and procedures for getting the data into the computer. System analyst must be extremely accurate because the data input is so critical to successful processing, file maintenance, and output. The data input design must be easy to create data, not confuse the users, easy to learn and user friendly.

The input design refers to the design of screen design, document form, and document flow. The basic functions are to accept data entry, verification, validation, editing, adding, changing and deleting information. The input design is the most important, and also one of the most difficult parts which takes more time in programming and designing because of the validation, checking, retrieving, saving, looping, calculation, screen positioning, and viewing functions must be done by the input functions.

Input Requirements

(1) Customer Details: Customer details contain the details of customers, such as customer id, customer name, address, contact name, phone number, fax number, payment terms, etc.

(2) Product Details: Product Details contain the details of products, such as: product code, product name, specification, product description, price, etc.

(3) Customer Order Details: Customer Order Details contain the details of customer orders, such as: customer id, customer name, customer address, customer order number, product id, product name, quantity, unit price, total amount, payment terms, etc.

(4) Purchasing Details: Purchasing Details contain the details of purchasing, such as: supplier id, supplier name, P/O number, product id, product name, specification, quantity, unit price, total amount, payment terms, shipment date, etc.

(5) Sales Order Details: Sales Order Details contain the detail of sales order, such as: sales order id, customer name, address, contact name, product code, quantity, delivery date, etc.

3.2 System Design

The proposed system would focus on the design of a sales and Marketing information system from the beginning stage: receive order from the customer, generate and print invoice, deliver products to the customers and receive customers' payments A sales and marketing information system has been designed to achieve the following:

(1) Computerize the Sales and Marketing Information System from the existing manual system to improve productivity.

(2) To manage and control the payment from customers.

(3) To monitor and control Sales and Marketing Activities.

(4) To generate various reports to cope with forecasting planning activities.

3.2.1 Feasibility Analysis

Candidate System Matrix

From the existing system, Company uses a manual operation for Sales & Marketing information system. System Design deals with the physical or implementation-dependent aspects of a system or the system's technical specifications. After we establish the business requirements in the definition phase of system analysis, the configuration phase is conducted to identify, analyze candidate solutions and recommend a target system.

So, we should identify three possible candidate areas for discussion. We have to compare the difference of each candidate solution in term of Portion of System Computerized, Benefits, Servers and Workstations, Software Tools Needed, Application Software Method of Data Processing, Output Devices, Input Devices, and Storage Devices.

There are three candidate solutions to be considered:

(1) Candidate Solution 1

In this solution, we would like to replace the existing system with customized package software to satisfy Sales & Marketing information system required functionally by using MS C++ and MS Access 2000 for customize, local area network to distribute the information via clients and server. This candidate solution can be set implemented in a short period.

(2) Candidate Solution 2

This candidate solution uses the Microsoft Visual Basic 6.0 and Microsoft Access 2000. Local Area Network (LAN) is used to connect the clients and server computing.

(3) Candidate Solution 3

This candidate solution uses the Microsoft Visual Basic 6.0 and Microsoft SQL server. Local Area Network (LAN) is used to connect the clients and server computing.

The matrix is a useful tool for effectively capturing, organizing, and communicating the characteristics for candidate solutions. The characteristics of candidate system matrix consists of portion of system computerization benefits server and workstations, software tools need, application software, method of data processing, output devices and implications, input devices and implications and storage devices and implications.

Table 3.1. Candidate System Matrix.

Characteristics	Candidate 1	Candidate 2	Candidate 3
Portion of System Computerized	Software package would be purchased and customized to satisfy Sales and Marketing Information System required functionally.	Software solution that are designed and build for Sales and Marketing Information System.	Same as Candidate 2
Benefits	This solution can be set and implemented in short time period.	This solution, the application can be design for requirement properly.	Same as Candidate 2
Servers and Workstations	1. Pentium III 1.0 GHz (Server) 2. Pentium III 733 MHz (Client)	Same as Candidate 1	Same as Candidate 1
Software Tools Needs	MS C++ and MS Access 2000 for customization of package to provide report writing and integration.	MS Visual Basic 6.0 and MS Access 2000	MS Visual Basic 6.0 and MS SQL Server
Application Software	Package Solution	Custom Solution	Same as Candidate 2
Method of Data Processing	LAN and Window Millenium	Same as Candidate 1	Same as Candidate 1
Output Devices and Implication	Dot Matrix and Laser	Same as Candidate 1	Same as Candidate 1
Input Devices and Implication	Keyboard and Mouse	Same as Candidate 1	Same as Candidate 1
Storage Devices and Implication	MS Access	Same as Candidate 1	Same as Candidate 1

3.2.2 Feasibility Analysis

After the candidate solutions have been identified, the next step is to analyze the feasibility of the information system development in an organization. There are four categories of feasibility analysis.

Feasibility analysis is the process or the way to measure the benefits or practicality of the information system development in an organization. There are four categories of feasibility analysis.

(1) Operational feasibility (people oriented) : used measure how well the solution performs in the organization

(2) Technical feasibility (computer oriented): a measure of the practically of a specific technical solution and also the availability of the technical resources and expertise.

(3) Schedule feasibility: the measure of how long this project should be developed.

(4) Economic feasibility: dealing with the cost and benefits of the information system.

The feasibility analysis matrix is an analysis and ranking of the candidate solutions matrix. But we cannot know which one is the best. Sometimes the solution is good for technical but the cost is very high. Then the best way to get the final decision is to discuss with the end-users and owner.

Table 3.2. Feasibility Analysis Matrix.

Feasibility Criteria	Weight	Candidate 1	Candidate 2	Candidate 3
Operational Feasibility	30%	Some requirement would have to be modified to take advantage of software functionally. Score : 65	Fully supports user required functionally. Score : 100	Same as Candidate 2 Score : 100
Technical Feasibility Technology Expertise	30%	MS-Access 2000, easy to develop solution, low cost of programmer. Required to hire or train C++ expertise to perform modifications for integration requirement Score : 50	Using VB 6 create application to support all required function of our system. Score : 95	Same as Candidate 2 Score : 95
Economic Feasibility Cost to develop: Payback Period (discounted): Net Present Value: Detailed Calculation:	35%	Approximately 899,700 Baht Approximately 2.2 years Approximately 1,070,325 Baht Table A.1 Score : 95	Approximately 901,700 Baht Approximately 2.3 years Approximately 1,079,341 Baht Table A.2 Score : 90	Approximately 1,049,200 Baht Approximately 2.4 years Approximately 991,938 Baht Table A.3 Score : 80
Schedule Feasibility	10%	4 months Score : 95	3 – 5 months Score : 90	6 – 7 months Score : 80
Ranking	100%	72	*94	91

Table 3.3. Cost of Candidate 1, Baht.

Cost Items	Description	Amount	Unit Price	Price
1. Development Cost:	1.1 Personnel Cost:			
	System Analysis	1	25,000.00	25,000.00
	Programmer	1	15,000.00	15,000.00
	Subtotal 1:			40,000.00
	1.2 New Hardware Cost:			
	Development Server			
	(Pentium III 1 GHz.)	1	68,000.00	80,000.00
	Development Workstation			
	(Pentium III 633 MHz.)	8	39,000.00	312,000.00
	UPS (1000 VA)	9	3,000.00	27,000.00
	Ethernet Hub Server			
	(10/100 Mbps, 8 ports)	1	20,000.00	20,000.00
	Dot Matrix Printer	2	3,350.00	6,700.00
	Laser Printer	1	32,000.00	32,000.00
	Other Equipments			10,000.00
	Subtotal 2:			487,700.00
	1.3 New Software Cost:			
	Microsoft C++	1	35,000.00	35,000.00
	(Microsoft Window 98)	1	10,000.00	10,000.00
	License Microsoft Office 97	1	25,000.00	25,000.00
	Subtotal 3:			70,000.00
	1.4 Expense:			
	Training Course	1	25,000.00	25,000.00
	Set up Cost	1	15,000.00	15,000.00
	Subtotal 4:			40,000.00
	Total Development Cost:			250,000.00
2. Operating Cost:	2.1 Maintenance Cost			22,000.00
	Total Operating Cost			22,000.00
	Total Candidate1 system Cost			909,700.00

Table 3.4. Cost of Candidate 2, Baht.

Cost Items	Description	Amount	Unit Price	Price
1. Development Cost:	1.1 Personnel Cost:			
	System Analysis	1	25,000.00	25,000.00
	Programmer	1	15,000.00	15,000.00
	Subtotal 1:			40,000.00
	1.2 New Hardware Cost:			
	Development Server			
	(Pentium III 1 GHz.)	1	68,000.00	80,000.00
	Development Workstation			
	(Pentium III 866 MHz.)	8	40,000.00	320,000.00
	UPS (1000 VA)	9	2,500.00	22,500.00
	Ethernet Hub Server			
	(10/100 Mbps, 8 ports)	1	20,000.00	20,000.00
	Dot Matrix Printer	2	3,350.00	6,700.00
	Laser Printer	1	32,000.00	32,000.00
	Other Equipments			10,000.00
	Subtotal 2:			491,200.00
	1.3 New Software Cost:			
	Visual Basic6.0	1	20,000.00	20,000.00
	(Microsoft Window 98)	1	10,000.00	10,000.00
	License Microsoft Office 97	1	25,000.00	25,000.00
	Subtotal 3:			55,000.00
	1.4 Expense:			
	Training course	1	25,000.00	25,000.00
	Set up Cost	1	15,000.00	15,000.00
	Subtotal 4:			40,000.00
	Development Cost			350,000.00
2. Operating Cost:	2.1 Maintenance Cost			25,000.00
	Total Operating Cost			25,000.00
	Total Candidate2 system Cost			961,200.00

Table 3.5. Cost of Candidate 3, Baht.

Cost Items	Description	Amount	Unit Price	Price
1. Development Cost:	1.1 Personnel Cost:			
	System Analysis	1	25,000.00	25,000.00
	Programmer	1	15,000.00	15,000.00
	Subtotal 1:			40,000.00
	1.2 New Hardware Cost:			
	Development Server			
	(Pentium III 1 GHz.)	1	68,000.00	68,000.00
	Development Workstation			
	(Pentium III 733 MHz.)	8	40,000.00	320,000.00
	UPS (1000 VA)	9	2,500.00	22,500.00
	Ethernet Hub Server			
	(10/100 Mbps, 8 ports)	1	20,000.00	20,000.00
	Dot Matrix Printer	2	3,350.00	6,700.00
	Laser Printer	1	32,000.00	32,000.00
	Other Equipments			10,000.00
	Subtotal 2:			479,200.00
	1.3 New Software Cost:			
	Visual Basic6.0	1	20,000.00	20,000.00
	MS SQL	1	30,000.00	30,000.00
	(Microsoft Window 98)	1	10,000.00	10,000.00
	License Microsoft Office 97	1	25,000.00	25,000.00
	Subtotal 3:			55,000.00
	1.4 Expense:			
	Training Course	1	25,000.00	25,000.00
	Set up Cost	1	15,000.00	15,000.00
	Subtotal 4:			40,000.00
	Total Development Cost:			400,000.00
2. Operating Cost:	2.1 Maintenance Cost			35,000.00
	Total Operating Cost			35,000.00
	Total Candidate3 system Cost			1,049,200.00

Database Design:

Database Design seeks to develop a detailed description of a database that will meet the needs of all users and have application processes that can be used now or in the future. The objectives of the database design are:

(1) The data has to be available when the user wants to use it.

(2) The data must be accurate and consistent.

(3) The efficient storage of data as well as efficient updating and retrieval.

(4) The information obtained from the stored data must be in form useful for managing, planning, controlling, or decision making.

The proposed database system will be created and maintained to provide several benefits, and all details are shown as below:

(1) Reduce data duplication and redundancy.

(2) Improve data quality, data shareability, so that anyone in the system can access the same information at the same time.

(3) Improve data accessibility for users to extract needed information from the data resources.

(4) Improve the performance of data resource; utilize the physical computer resources with efficiency.

(5) Improve data security and prevent unauthorized access to data.

Software Design

In order to select the best software design for company, the following qualities of software need to be considered:

(1) Software should be user friendly, so that the users can interact easily, and also it should not take a long time for the user to master the system.

(2) Software should be easy to understand, with no intricacies to understand the program, and it also should require a minimum number of key presses to call up the desired screen.

(3) Software can be evolved according to the future requirements of the user.

(4) Software should reliable, so users can depend on it.

Modularity

A system composed of modules is called modular. Modularity is the single attribute of software that allows a program to be intellectually manageable. The modular technique is intended to simplify the task of developing large programs or systems. Before coding starts, programs are divided up into a number of self-contained logical sections or modules. Each of these is developed and tested separately (using a test harness which supplies test data and simulates the other modules with which it interacts), then the modules are progressively assembled together until the complete program has been built up.

The following properties are important for modules:

(1) Modules should be highly cohesive; That is, each module should accomplish one and only one function. Theoretically this makes the modules reusable in future programs.

(2) Modules should be loosely coupled; that is, modules should be minimally dependent on one another. This minimizes the effect that future changes in one module will have on other modules.

Modularity achieves three goals in practice: the capability of decomposing a complex system, of composing it from existing modules, and of understanding a system in pieces.

A system that has been developed based on modularity can assure that:

(1) Each function and each abstraction has a single, well-defined purpose.

(2) It is easy to identify all routines that share a major data structure.

This approach enhances design clarity, which in turn eases implementation, debugging, testing, documenting, and maintenance of the system.

Top-Down Approach

The new computerized system is typically based on a Top-Down Approach. This begins with the whole, progressively breaking this down into smaller units to eventually define in full detail. Computer-based systems are often designed in this manner. The reverse approach is known as bottom-up. As the system progresses, the system is decomposed into subsystems. It provides an orderly an orderly and systematic framework for the system

3.3 Output Design

The output design is required for reports and screens that generate information for reporting. Output design is usually considered the first step in system development whereby the programmers communicate with the users for the information required. These reports are based on user requirements for daily operation or for analysis.

The objectives of Output Design are:

(1) To convey information about the past activities, current status, or projections of the future.

(2) To show the signals of important events, opportunities, problems, or warnings.

(3) To trigger and confirm an action.

Methods of output design are Hard Copy of printer reports.

Output Requirements:

The output requirements is the information that must be the result from the input requirements that can generate the various reports, which support the management for better and proper decision making. The various reports are as follows:

(1) Purchase Order: Purchase Orders are documents that are provided by the company to the suppliers that contain product code, product name, specification, product description and quantity that the client wants to purchase.

(2) Sales Report: Sales Report provides the details of sales information, such as the total sales amount from period of time to period of time.

Screen Design.

It is at this step that the logical model of the new system is converted to the physical model of the new system, e.g. How information is to be arranged on a display screen used for a particular purpose, such as to enter a particular type of sales transaction. The format shows the fixed descriptive text or other information provided to guide the user, and identifies the areas on the screen into which data may be entered.

Where a mouse is used, the format may also include control fields such as buttons or pull-down menus.

The logical designs of the new system, such as data flow diagrams, are converted to the physical model of Screen Design. The use of the screen design is handled by the Menu Selection. The Main Menu for the Sales Information System is designed. The submenu for each selected menu is designed in order to view the reports on the screen, as well as print them on the printer. Users can add, edit, modify and delete the data according to his or her requirements.

3.4 Hardware and Software Requirements

Mui Kwang Vacuum Coating Co., Ltd's existing computer system is a manual system, with no network set up in the office. Moreover PCs work as a standalone. Therefore, the company needs to set up a network for the whole company.

The following are the hardware and software requirements for the proposed system for the company to expedite their work.

Hardware requirements

The Hardware Requirements can be summarized as follows:

(1) File Server 1 Unit

(a) Compaq Proliant CL380

(b) Two 2P clustered servers plus shared storage in a single cabinet

(c) Intel Pentium III 1.0GHz processor per server (dual processor capacity per server)

(d) Shared Storage System supports up to six 1" Wide Ultra2/Ultra3 Universal hot pluggable drives (up to 218.4GB)

(e) ServerWorks LE 3.0 Chipset with 133-MHz Front Side Bus 256KB level 2 ECC cache per processor 128MB PC 133-MHz Registered ECC SDRAM memory, expandable to 4GB (per server)

(f) Four expansion slots, three 64-bit PCI, one 32-bit PCI (per server)

(g) Compaq NC3163 Fast Ethernet NIC (embedded) PCI 10/100 WOL for heartbeat monitoring

(h) Compaq NC3123 Fast Ethernet NIC PCI10/100 Mbps WOL for public LAN (occupies one PIC slot per server)

(i) Integrated Smart Array Controller on each server node - utilized for server booth (per server)

(j) Compaq 64-bit Dual Channel Wide Ultra2 SCSI adapter - utilized for shared storage (occupies PCI slot) Two 1" Wide Ultra2/Ultra3 SCSI hot plug drive bays (per server)

(k) Rack ot Tower form factor - 10U

(l) Simplified system board removal for fast and easy servicing

(m) Removable servers, hot plug disks, power supplies and RAID controllers for easy serviceability and toolless access to major components Integrated Romote Console (IRC), Automatic Server Recovery-2 (ASR-2)

(2) PC Workstation 8 Units

(a) Compaq Presario 5000

(b) Intel Pentium III Processor 733MHz AMD Athlon 1.1GHz

(c) 128KB L2 Pipeline Burst Cache for Celeron Model and 256KB Integrated L2 Cache for Pentium & AMD Model

(d) 64MB - 128MB SDRAM , shared memory architecture, two total DIMM slots upgradeable to 512MB, 8MB dedicated for video memory (SDRAM DIMM required)

(e) 20-40 GB UltraDMA hard drive

(f) 48X CD-ROM, 10X DVD-ROM, 8X/4X/32X CD-RW Drive (selected models)

(g) 10/100 Ethernet NIC, Wake On LAN (selected models)

(h) 56K ITU V.90 modem

(i) Direct AGP 3D Graphics

(j) ESS Allegro PCI Audio

(k) Four USB Ports (2 front, 2 back)

(l) Internet Scroll Mouse

(m) 3.5" 1.44MB diskette drive

(n) Microsoft Windows ME Millennium Edition

(3) Network Peripherals

(a)	D-Link Ethernet Stackable Hub, 10 ports	1 Unit
(b)	HP Jet Direct Print Server ExPlus 3,2,Serial Ports	1 Unit

(4) UPS

(a)	POWERGUARD PE-1,250 (30mins)	1 Unit
(b)	POWERGUARD PE-600(15mins)	8 Units

(5) Printer

(a)	HP Laser Jet 4 P	1 Unit
(b)	HP Desk Jet 640C	1 Unit
(c)	Epson Stylus 740	1 Unit

(6) Tape Backup

(a)	HP Sure Store Tape 2000I k GB	1 Unit

(7) Wiring Job (Network Points) 10 Points

(a) Cat, 5 Utp Cable

(b) RJ-45 Connectors

(c) Rj-45 Wall Plate

The Figure 3.1 show the network configuration of the proposed system.

Software Requirements:

In order to fulfill the objectives, the following software requirements are recommended:

(1)	Operating Systems (OS)	Microsoft Windows 98
(2)	System Development Software	Office 97 Professional
(3)	Network Operating System (NOS)	Novell NetWare 4.11 (10users)
(4)	Database System Software	Visual Basic 6.0

3.5 Security and Controls

Generally, a successful new system in today's sophisticated rapidly changing business environment must built upon a solid business process of preparation and accounting controls. The management of a firm is responsible for establishing and maintaining adequate internal controls. In fact, the establishment and maintenance of such a system of internal controls is a significant management obligation.

One of the most important considerations in the development of the system operation is security and controls. Security in computing is a very vital issue. The company that has full and complete security and control, has an advantage over the other companies.

Only someone who has a password and is given authorization codes can operate the program. The user authentication and manipulation should be implemented so that the secrecy, integrity, and availability only to the authorized parties.

To cope with the security and controls for Mui Kwang Vacuum Coating Co., Ltd. the following proposed methods are recommended:

(1) Authorized persons only have physical access to the system. A password is provided into the program for the users to have access to certain sensitive areas in the data.

(2) Hardware and Printer should not be left unattended when it is printing any information. The computer hardware must be locked in the office at office closing time, and an authorized person should keep the key.

(3) All application programs should be copied to diskettes and kept in a safe and secured place. A backup process should be performed at the end of each day. Backup copies should be created every time the database is updated or modified.

(4) Ensure the authorized persons signs source documents such as Invoices, Purchasing Orders, etc.

(5) To prevent loss of data during a power failure, an UPS (Uninterrupted Power Supply) is recommended.

(6) The distribution of reports should be controlled to ensure that they are sent to the proper destination or right person.

(7) Using backup diskettes can ensure the recovery of data.

(8) Only an authorized person must make data Entry, Modification and Corrections.

3.6 Cost Comparison and Benefit Analysis

Usually, in any company, when a new computerized system has been developed and proposed, the following two costs will be examined: Direct Costs and Indirect Cost. Also, Mui Kwang Vacuum Co., Ltd. is ready to accept the following costs that may occur:

Direct Costs

(1) Computer hardware and software application equipment

(2) Communication hardware equipment.

(3) Common carrier line charges.

(4) Costs for backup equipment of system in case of failure.

(5) Costs of manually performing tests during a system outage.

(6) Facilities costs i.e. space requirement, electricity, offices, etc.

(7) Spare parts cost as necessary.

(8) Maintenance costs for hardware and software.

(9) Costs for the development person from hardware/software house.

(10) Development and performance of acceptance test procedure costs.

(11) Development of documentation costs.

Indirect Costs

(1) Personal training.

(2) Transformation of operation procedure.

(3) Development of support software.

(4) Disruption of normal activities.

(5) Increased system outage rate during initial operation period.

Cost Analysis

In the Cost Analysis issue, there are three major categories that are considered. These consist of Investment Cost, Implement Cost and (Annual) Operating Cost.

Investment Cost

To analyze the cost analysis, Investment Cost is the first direct cost that is concerned with the Hardware and Software Requirements Costs, which are required for the company according to the new proposed system. The following criteria is considered to select the types of hardware and software:

(a) Speed according to the nature of work.

(b) Amount of space required.

(c) Future expansion.

(d) Computer system life cycle.

(e) Computer Technology.

The above mentioned criteria is varied based on the Information Technology as well as the New Computer Technology, however, to use it with the Mui Kwang Vacuum Co., Ltd. to pay more attention to the users' knowledge, skills and experience in the computers and business, those are necessary for making decisions to choose the hardware and software for the company.

The following is the hardware and software's solution that had been chosen for the management and users according to the new proposed system requirements that will be invested in the hardware and software's solution to be implemented in this company.

Table 3.6. Manual System Cost Analysis, Baht.

Cost Items	Years				
	1	2	3	4	5
Fixed Cost:					
Typewriter 1unit@10,000	10,000.00	-	-	-	-
Calculator 7units@700	4,900.00	-	-	-	-
Total Fixed Cost	14900.00	0.00	0.00	0.00	0.00
Operating Cost:					
Salary Cost:					
Sales Manager 1person@27,000	27,000.00	29,700.00	32,670.00	35,937.00	39,530.70
Sales Admin 2person@12,000	24,000.00	26,400.00	29,040.00	31,944.00	35,138.40
Sales Staff 8persons@10,000	80,000.00	88,000.00	96,800.00	106,480.00	117,128.00
Total Monthly Salary Cost	131.000.00	144,100.00	158,510.00	174,361.00	191,797.10
Total Annual Salary Cost	1,572,000.00	1,729,200.00	1,902,120.00	2,092,332.00	2,301,565.20
Office Supplies & Miscellaneous Cost:					
Stationary 1,000baht per month	12,000.00	13,200.00	14,520.00	15,972.00	17,569.20
Paper 2,000baht per month	24,000.00	26,400.00	29,040.00	31,944.00	35,138.40
Miscellaneous2,000baht per month	60,000.00	26,400.00	29,040.00	31,944.00	35,138.40
Total Annual Office Supplies & Miscellaneous Cost	60,000.00	66,000.00	126,000.00	79,860.00	87,846.00
Utility Cost:					
Electricity 40,000baht per month	480,000.00	528,000.00	580,800.00	638,880.00	702,768.00
Water 4,500baht per month	54,000.00	59,400.00	65,340.00	71,874.00	79,061.40
Telephone 15,000baht per month	180,000.00	198,000.00	217,800.00	239,580.00	263,538.00
Total Utility Cost	714,000.00	785,400.00	863,940.00	950,334,00	1,045,367.40
Total Operating Cost	2,346,000.00	2,580,600.00	2,892,060.00	3,122,526.00	3,434,778.60
Total Manual System Cost	2,360,900.00	2,580,600.00	2892060.00	3,122,526.00	3,434,778.60

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

Year	Total Manual Cost	Accumulated Cost
1	2,360,900.00	2,360,900.00
2	2,580,600.00	4,941,500.00
3	2,838,660.00	7,780,160.00
4	3,122,526.00	10,902,686.00
5	3,434,778.60	14,337,464.60
Total	14,337,464.60	-

Table 3.8. Computerized System Cost Analysis, Baht.

Cost Items	Years				
	1	2	3	4	5
Fixed Cost:					
Hardware Cost					
Computer Server Cost	68,000.00	68,000.00	68,000.00	68,000.00	68,000.00
Personal Computer 8units@40,000	320,000.00	320,000.00	320,000.00	320,000.00	320,000.00
Maintenance Cost	0.00	0.00	0.00	0.00	0.00
Software Cost	75,000.00	75,000.00	75,000.00	75,000.00	75,000.00
Network Cost	20,000.00	0.00	0.00	0.00	0.00
Training Cost	30,000.00	0.00	0.00	0.00	0.00
Laser Printer 1unit@32,000	32,000.00	0.00	0.00	0.00	0.00
Jet Printer 2units@3,350	6,700.00	0.00	0.00	0.00	0.00
Developing Cost	350,000.00	0.00	0.00	0.00	0.00
Total Fixed Cost	901,700.00	463,000.00	463,000.00	488,000.00	490,000.00
Operating Cost:					
Salary Cost:					
Sales Manager 1person@27,000	27,000.00	29,700.00	32,670.00	35,937.00	39,530.70
Sales Admin 2person@12,000	12,000.00	13,200.00	14,520.00	15,972.00	17,569.20
Sales Staff 8persons@10,000	40,000.00	44,000.00	48,400.00	53,240.00	58,564.00
Total Monthly Salary Cost	131,000.00	86,900.00	95,590.00	105,149.00	115,663f.90
Total Annual Salary Cost	1,572,000.00	1,042,800.00	1,147,080.00	1,261,788.00	1,387,966.80
Office Supplies & Miscellaneous Cost:					
Stationary 700baht per month	8,400.00	9,240.00	10,164.00	11,180.40	12,298.44
Paper 1,400baht per month	16,800.00	18,480.00	20,328.00	22,360.00	24,596.88
Miscellaneous 1,400baht per month	16,800.00	18,480.00	20,328.00	22,360.00	24,596.88
Total Annual Office Supplies & Miscellaneous Cost	42,000.00	46,200.00	50,820.00	55,902.00	61,492.20
Utility Cost:					
Electricity 40,000baht per month	420,000.00	462,000.00	508,200.00	559,020.00	614,922.00
Water 4,500baht per month	48,000.00	52,800.00	58,080.00	63,888.00	70,276.80
Telephone 15,000baht per month	156,000.00	171,600.00	188,760.00	207,636.00	228,399.60
Total Utility Cost	624,000.00	686,400.00	755,040.00	830,544.00	913,598.40
Total Operating Cost	2,238,000.00	1,775,400.00	1,952,940.00	2,148,234.00	2,363,057.40

Table 3.9. Five Years Accumulated Computerized Cost, Baht.

Year	Total Computerized Cost	Accumulated Cost
1	3,139,700.00	3,139,700.00
2	2,228,400.00	5,368,100.00
3	2,415,940.00	7,784,040.00
4	2,636,234.00	10,420,274.00
5	2,853,057.40	13,273,331.40
Total	13,273,331.40	-

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

Year	Accumulated Manual Cost	Accumulated Computerized Cost
1	2,360,900.00	2,360,900.00
2	4,941,500.00	5,368,100.00
3	7,780,160.00	7,784,040.00
4	10,902,686.00	10,420,274.00
5	14,337,464.60	13,273,331.40

Implementation Cost

It is usually a one-time outlay to create and install the proposed system. It includes an application software program of technical service system development cost System Design and Programming Cost together with the Staff Training for increasing their skills for the new proposed system.

Operating Cost

It is a kind of supporting cost to use with both the existing and the proposed system, including software maintenance, stationary, toner cartridges and also software license fees which are needed at the present.

Benefit Analysis

The benefits of Sales and Marketing Information System is reflected in the proposed system after the implementation has been utilized. It may be seen that at the beginning stage, the existing manual system cost is less than the proposed system. But in the long term, the proposed system will provide some tangible and intangible benefits. Details are shown as follows:

Tangible Benefits

(a)	Reduction of time for staff workload	150,000	baht/year
(b)	Reduction materials due to doubling filing	95,000	baht/year
(c)	Reduction of paper works	75,000	baht/year
(d)	Reduce the stationery cost	55,000	baht/year
(e)	Reduction of assets loss	95,000	baht/year
(f)	Reduce cost caused by imported products	85,000	baht/year
		555,000	baht/year

Intangible Benefits

(a) Increase and improve operation efficiency and productivity.

(b) Provide accurate, timely and shared information, efficient management control

(c) Reduce some manual operations and decrease human errors.

(d) Prepare various kinds of short/long term reports.

(e) Ability to generate reports for the requested period.

(f) Prevent loss of information and Protect information from unauthorized person

(g) Improve quality and service performance among the customers and the staffs.

(h) Reduce data redundancy, collection time and operation cost in long term.

(i) Improved decision-making process by providing on time accessibility to information.

(j) Creating a good image of using new technology for the company.

Cost/Benefit Analysis

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

The Payback Period Analysis and Break-even Point Analysis are the two most popular tools to evaluate this issue.

Payback Period Analysis

Payback Period Analysis determines the exact amount of time required for the firm to recover its initial investment as calculated from cash inflows.

The payback period formula is shown as follows:

P = I/(1-T)R

Where P = Payback Period(year)

I = Initial Investment or Capital Expenditure

T = Corporate Tax Rate in Percentage(30%)

R = Annual Saving Realized by Investment

Payback Period = 901,700/(1-0.3)*555,000

= 2.32years

Break-even Point Analysis

Break-even point is a tool that is the most important way to measure and evaluate between the existing and the proposed system in terms of the representing the optimal cost of investment. The purpose is to determine returns in terms of cost investment.

The first year costs of the proposed system will be considerable because of the hardware and software installation. In the second year and in later years, the cost will decrease slightly and continuously. Maintenance cost is estimated to be 10% of the hardware cost and will increase approximately 10% per year

The promotion rate for staff rises approximately 12% per year and the inflation rate annual operation cost of the existing system will increase around 7% per year.

The result, as Table 3.11 and Table 3.12 shows, is that the cost of the proposed system will be higher than the existing system's cost in the first year, but when we study the following years, the cost is consecutive. The cost of the proposed system will be less and less than the existing system as the years go by.

Table 3.11. Total Cost of the Existing System, Baht.

Cash Flow Description	Year				
	1	2	3	4	5
1. Investment Cost	0	0	0	0	0
2.Implementation Cost 10%	0	0	0	0	0
3. Maintenance Cost 10%	0	0	0	0	0
4. Operation Cost 7%	650,000	695,500	744,185	796,278	852,017
5. Salary per Year 12%	480,000	537,600	602,112	674,365	755,289
Total Cost	1,130,000	1,233,100	1,346,297	1,470,643	1,607,307
Accumulative Cost	1,130,000	2,363,100	3,709,397	5,180,040	6,787,347

Table 3.12. Total Cost of the Proposed System, Baht.

Cash Flow Description	Year				
	1	2	3	4	5
1. Investment Cost	541,600	0	0	0	0
2.Implementation Cost 10%	150,000	165,000	181,500	199,650	219,615
3. Maintenance Cost 10%	90,000	99,000	108,900	119,790	131,769
4. Operation Cost 7%	190,000	203,300	217,531	232,758	249,051
5. Salary per Year 12%	400,000	448,000	501,760	561,971	629,408
Total Cost	1,371,600	915,300	1,009,691	1,114,169	1,229,843
Accumulative Cost	1,371,600	2,286,900	3,296,591	4,410,760	5,640,603

Table 3.13. Payback Analysis for Candidate Solution 1, Baht.

Cost Items	Years					
	0	1	2	3	4	5
Investment Cost	-899,700					
Operation Cost		22,000	24,000	25,000	25,500	26,350
Discount Factor for 1%	1.000	0.893	0.797	0.712	0.636	0.567
Time-adjusted cost	-899,700	19,646	19,128	17,800	16,218	14,940
Cumulative Time-adjusted cost over lifetime	-899,700	-880,054	-860,926	-843,126	-826,908	-811,968
Benefits derived from operating of new system	0	450,000	486,000	513,000	589,000	623,000
Discount Factor for 12%	1.000	0.893	0.797	0.712	0.636	0.567
Time-adjusted cost	0	401,850	387,342	365,256	374,604	353,241
Cumulative Time-adjusted cost over lifetime	0	401,850	789,192	1,154,448	1,529,052	1,882,293
Cumulative time-adjusted cost+benefits	-899,700	-478,204	-71,734	311,322	702,144	1,070,325

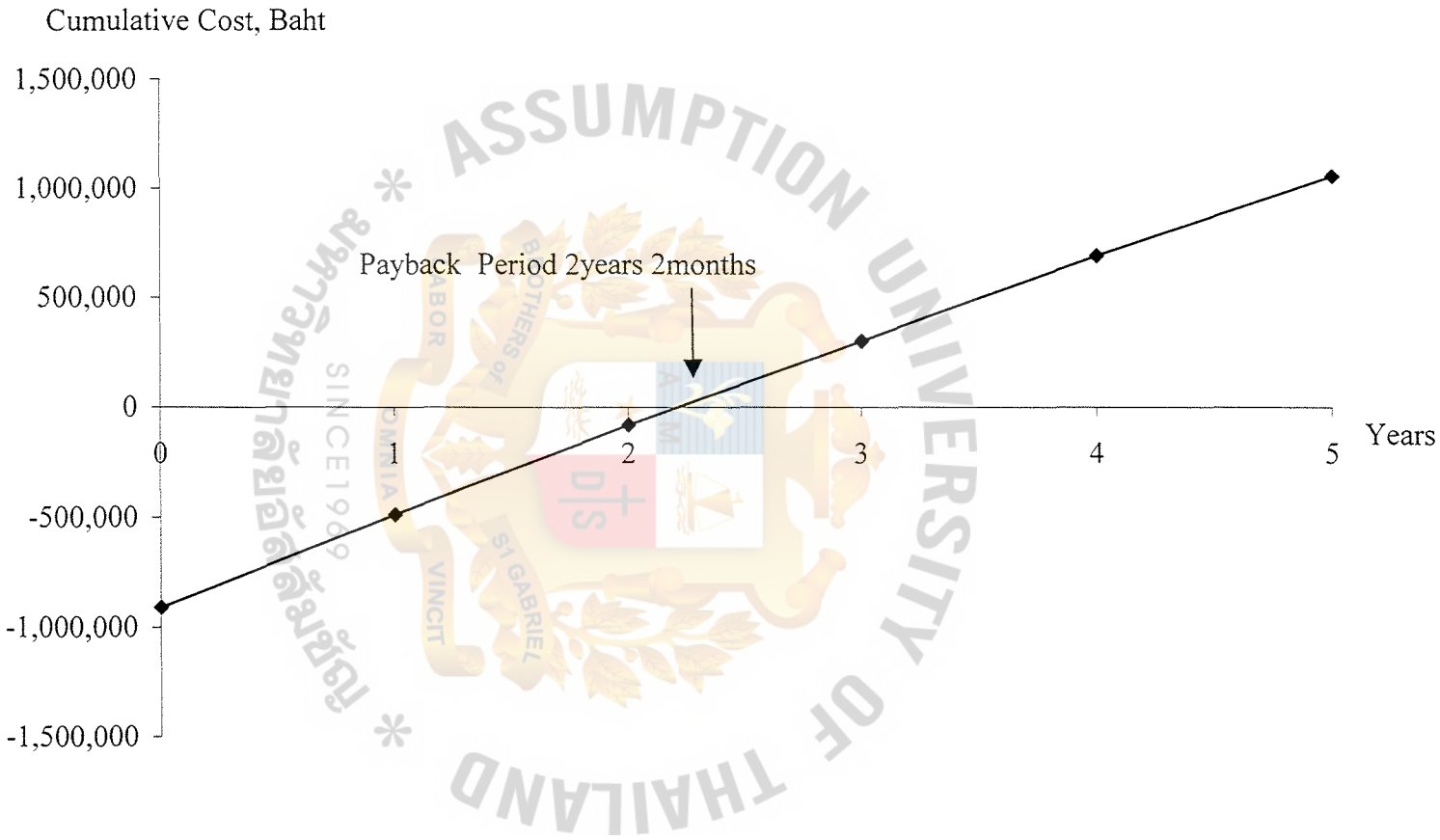

Figure 3.1. Payback Analysis Graph for Candidate Solution 1.

Table 3.14. Payback Analysis for Candidate Solution 2, Baht.

Cost Items	Years					
	0	1	2	3	4	5
Investment Cost	-901,700					
Operation Cost		25,000	26,800	27,800	28,800	29,900
Discount Factor for 1%	1.000	0.893	0.797	0.712	0.636	0.567
Time-adjusted cost	-901,700	22,325	21,360	19,794	18,317	16,953
Cumulative Time-adjusted cost over lifetime	-901,700	-879,375	-858,015	-838,222	-819,905	-802,952
Benefits derived from operating of new system	0	555,000	579,000	598,000	625,000	645,000
Discount Factor for 12%	1.000	0.893	0.797	0.712	0.636	0.567
Time-adjusted cost	0	401,850	387,342	365,256	374,604	353,241
Cumulative Time-adjusted cost over lifetime	0	401,850	789,192	1,154,448	1,529,052	1,882,293
Cumulative time-adjusted cost+benefits	-901,700	-477,525	-68,823	316,226	709,147	1,079,341

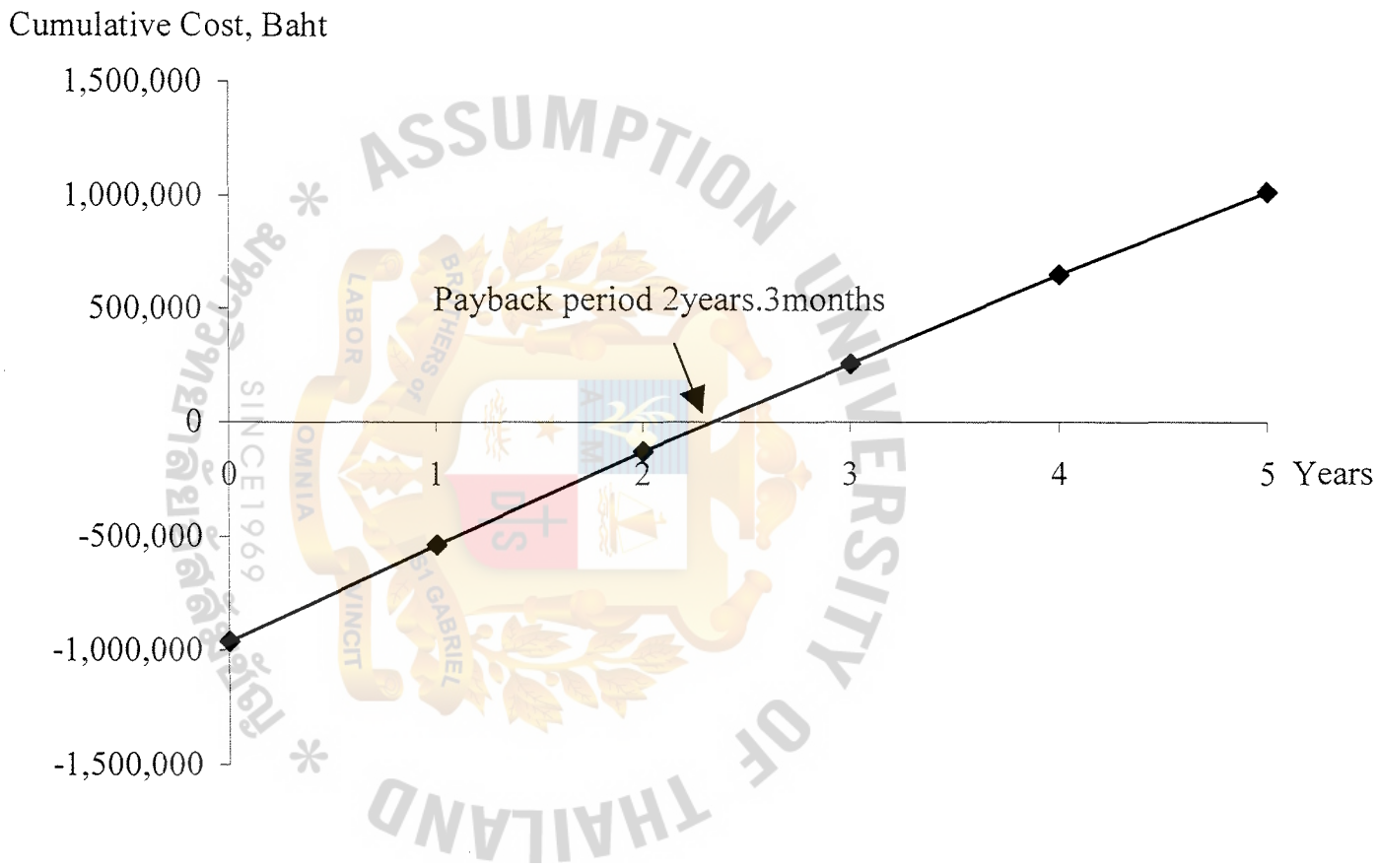

Figure 3.2. Payback Analysis Graph for Candidate Solution 2.

Table 3.15. Payback Analysis for Candidate Solution 3, Baht.

Cost Items	Years					
	0	1	2	3	4	5
Investment Cost	-1,049,200					
Operation Cost		25,000	27,000	29,000	31,000	33,000
Discount Factor for 1%	1.000	0.893	0.797	0.712	0.636	0.567
Time-adjusted cost	-1,049,200	22,325	21,519	20,648	19,716	18,711
Cumulative Time-adjusted cost over lifetime	-1,049,200	-1,026,875	-1,005,356	-984,708	-964,992	-946,281
Benefits derived from operating of new system	0	475,000	497,000	525,000	595,000	645,000
Discount Factor for 12%	1.000	0.893	0.797	0.712	0.636	0.567
Time-adjusted cost	0	424,175	396,109	373,800	378,420	365,715
Cumulative Time-adjusted cost over lifetime	0	424,175	820,284	1,194,084	1,572,504	1,938,219
Cumulative time-adjusted cost+benefits	-1,049,200	-602,700	-185,072	209,376	607,512	991,938

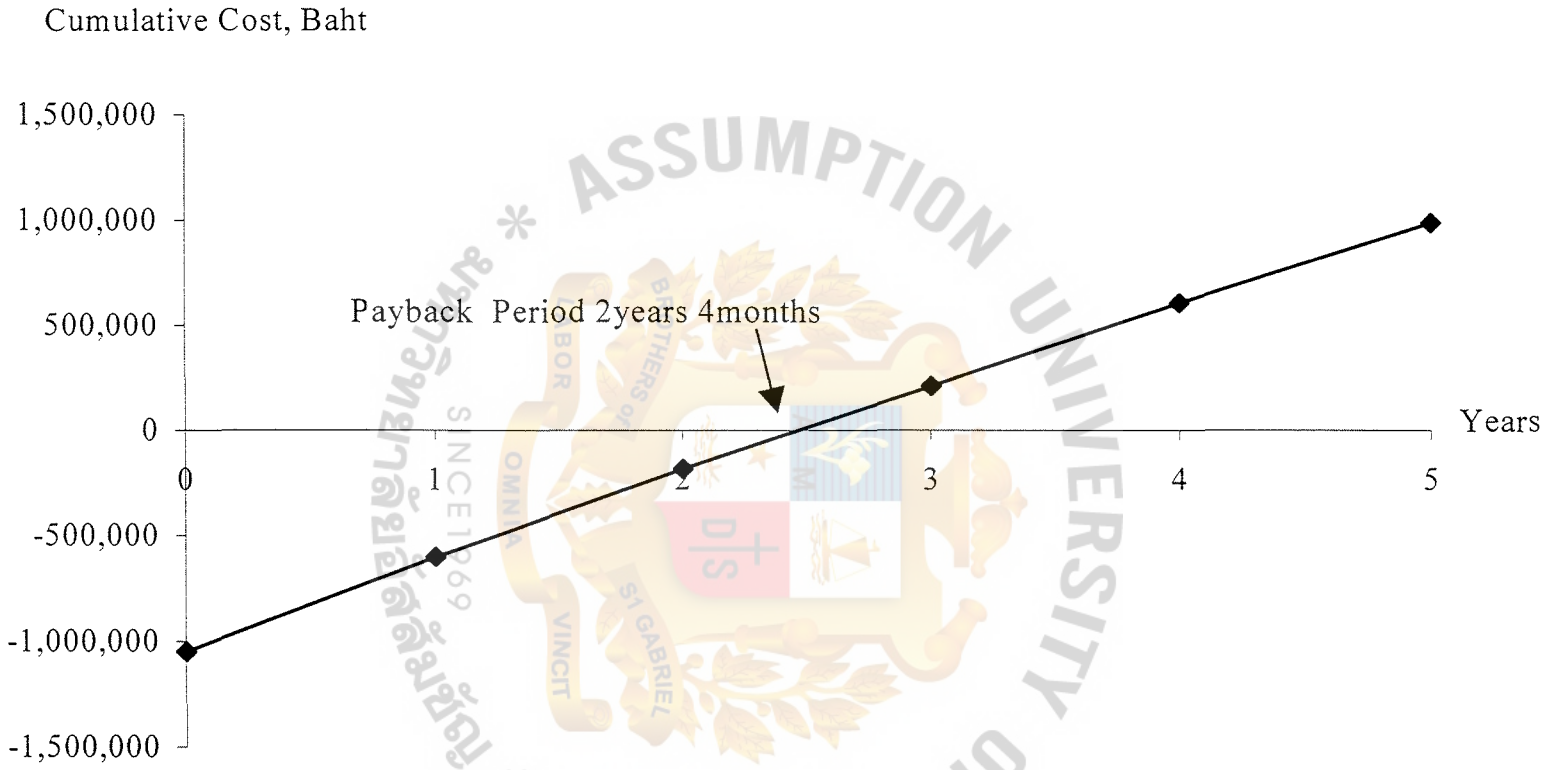

Figure 3.3. Payback Analysis Graph for Candidate Solution 3.

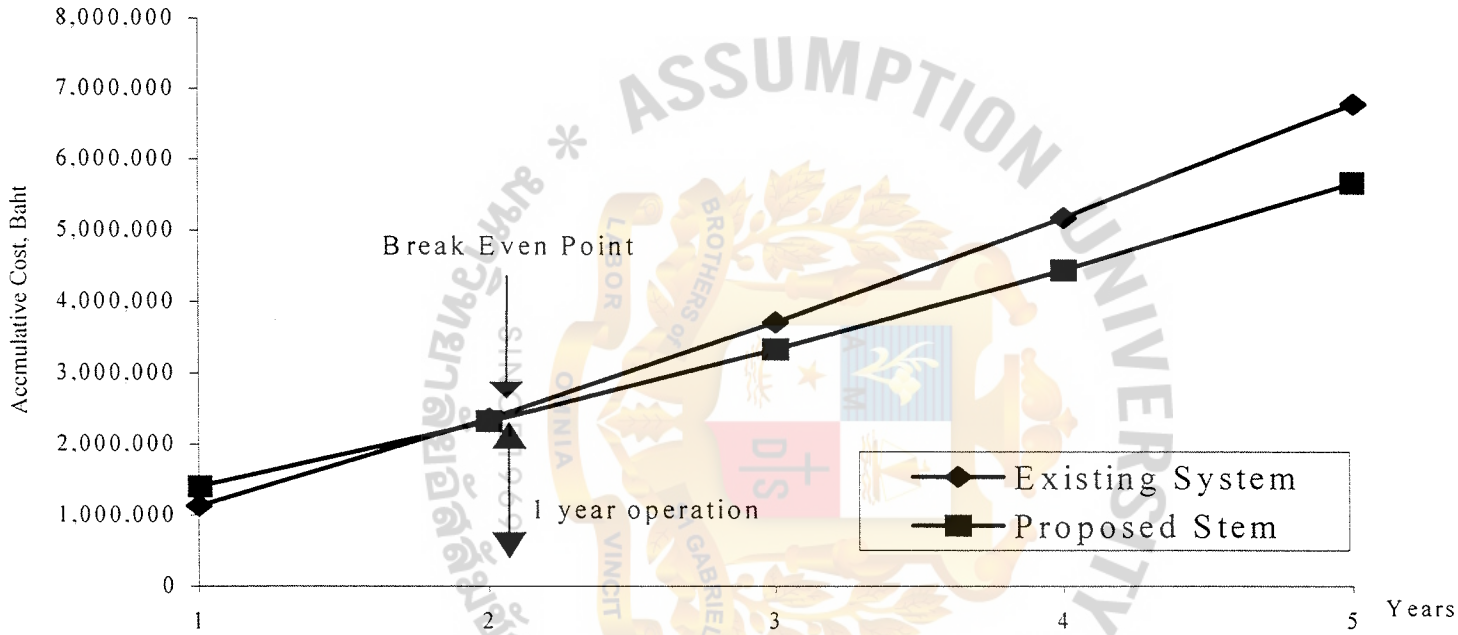

Figure 3.4. Cost Comparison between Existing System and Proposed System.

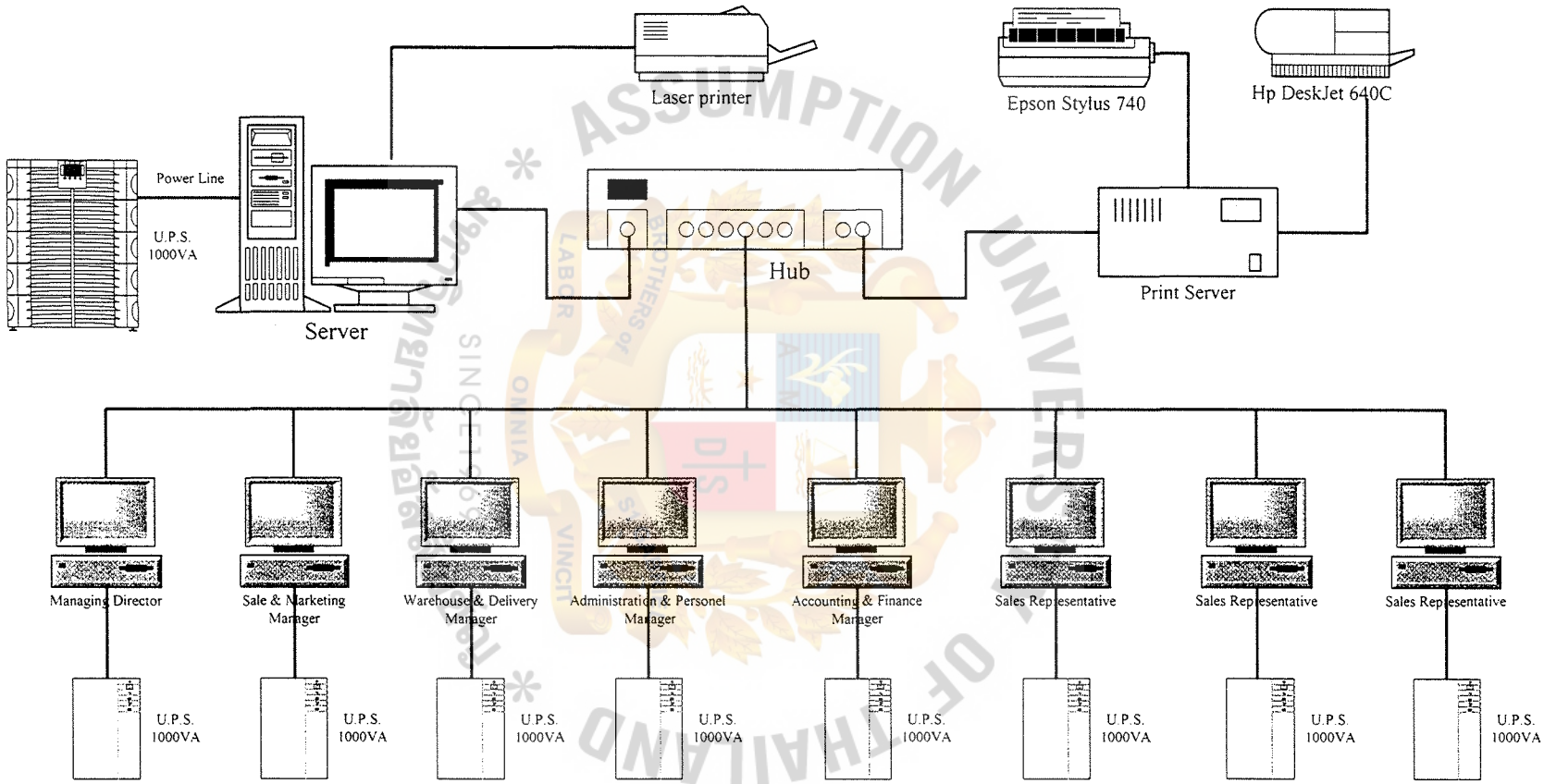

Figure 3.5. Network Configuration of the Proposed System.

IV. PROJECT IMPLEMENTATION

4.1 Overview of Project Implementation

The implementation of the project will start after the management's decision to accept the proposed system and also it will be set up using the parallel running concept. By this concept, the business process will keep working on both the existing manual system and the proposed computerized system for a number of cycles until the results of the new system have been proved. By the way, to use this concept, a lot of time will be spent in this period for the users who perform double job each day. But finally, they will be familiar with the new system.

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

(1) System Analysis

This part is to gather all information about the existing system, how data flow, how data relates to each other and how data is kept. Then identify the area under study and study the problem and after that, identify the Objectives and Scope of the project. At this stage the context diagram and the data flow diagrams of the existing system are created and cost/benefit between existing system and proposed system is analyzed.

(2) Detail Analysis and Design

This part is to develop the workflow of the existing system, the new work flow, such as the context diagram and the data flow diagram at many different levels are designed with an aim to solve the problems which exist in the existing system. The relationship of the data table is studied in order to redefine the best relation among them. Steps of work at each process is

defined in order to reduce the duplication of the network. All screens, such as input/output screens and various kinds of reports are designed.

(3) Implementation

This part is to implement all designs to the real thing. Programs that support the workflow are created. All input screens and report layouts are generated to support the designed workflow. After that, developers will test programs first, then users have to be trained to use the system and also test the system until they accept it.

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

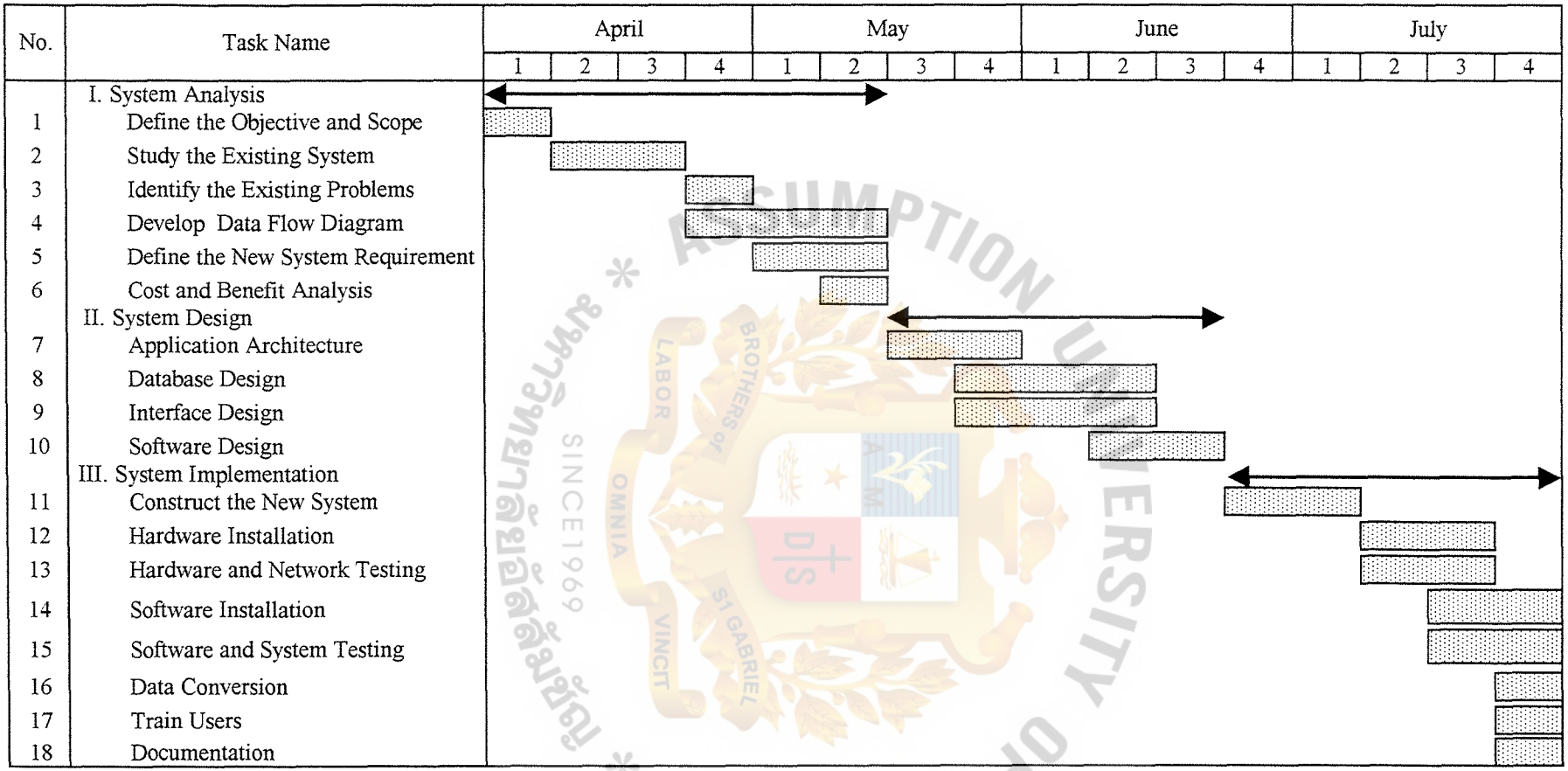

Figure 4.1. Project Implementation Schedule.

4.2 Test Plan

System testing is a critical process; testing of programs, subsystems and total systems is essential to quality assurance of software. It is done to turn up existing problems and their interfaces before the system is actually used. The common view of testing is that there are no errors in the program. Therefore, the most useful and practical approach is the understanding that testing is the process of executing a program with the explicit intention of finding errors and making the programs fail. The tester is actually truing to make the program fail. A successful test is one that finds an error.

The following tests are essential and recommended:

(1) Unit Testing (essential) ensures that the stand-alone program fixes the bug without side effects.

(2) System Testing (essential) ensures that the entire application, of which the modified program was a part, still works.

(3) Security and Recovery Testing (essential) ensure that the system is secure enough to protect unauthorized users to access into the system. Morover, if failures happen to database, the system should be able to recover those data.

An effective testing program does not guarantee systems reliability. Therefore, reliability must be designed into the system. A test case is a set of data that the system will process as normal input. However, the data is created with the express intent of determining whether the system will process them correctly.

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

V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

This purpose of this system development project is to analyze, design and implement a Sales and Marketing Information System for Mui Kwang Vacuum Coating Co., Ltd.

Nowadays, most companies are aware of the advantages of the computer hardware and have already invested in that hardware but how they can utilize the computer efficiently, is a matter of consideration. The software that we developed can help our company to utilize the hardware more efficiently. According to the cost and benefit analysis, the pay back period of the proposed system is only one year and seven months and the breakeven point is two million baht approximately.

Area of improvement is at the output process, which the top management's summary report will be issued as quickly as possible to the management level. The result of the software application that we implement for this system is MS Access 7.0 so that we have the database of all warranty claims from distributors. The beneficiary parties are our distributors and factory who can totally utilize this system together with our service division. Our warranty information system project achieves the business solution by reducing time and cost.

Table 5.1 shows the time used in each process of the proposed system compared with the existing system. The existing system requires more time in the manual process of data entry and calculation. The computer system reduces the time in the manual process from nineteen hours to three hours. In summary, we can conclude that the proposed system is more efficient and effective than the existing system.

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

Process	Existing System	Proposed System
Responding Sales Quotation	15mins.	3mins.
Customer Order Process	30mins	15mins.
Inventory Process	15mins	5mins.
Sales Order Process	30mins.	20mins.
Delivery Process	15mins	10mins.
Customer's Payment Report	1.5hrs.	10mins

(1) Data Entry Process:

The efficiency of entering data is the most critical part in screen and document form design in order to gather the information into the database files. The proposed system will eliminate manual entry of data and provide input screen for enter all necessary data into the system.

(2) Inquiry Process:

The proposed system has well integrated information for the users to inquire the information faster than the existing system.

(3) Calculate Process:

The proposed system has automatic calculation function to calculate the data for the final result.

(4) Modification Process:

The company uses On-Line Processing so the proposed system allows more quickly in error detection and error correction than batch processing because it allows greater human interaction in decision making.

(5) Printing Process:

The printing performance of the proposed system is quicker than the existing system as the result of the prepared form in computer system.

5.2 Recommendations

Although the Mui Kwang company is quite successfully developed, there are still some modifications needed to keep the system working effectively and to fit the organization's changing needs and nature. The management should act as the arrowhead to follow up with all user comments and lead them to be familiar with the new proposed system. Management must be able to forecast the orders which the customers are going to place in the near future, and the orders that the company will place to the main factors to ensure that the system will be done successfully as well.

Anyway, in order to make the proposed system more concrete and beneficial in the future, the following recommendations should be adapted to the company as well as the managements' visions and strategies:

(1) The company needs to set up their policy to use the new computerized system

(2) LAN (Local Area Network) is recommended to increase and control database sharing, information exchanging among users.

(3) The Sales and Marketing department is the first department that needs to be trained and well educated about how to utilize the proposed system. Also, they must have a plan for developing the other departments' system to be computerized, in order to improve and increase the company efficiency and effectiveness.

(4) To take new telecommunication technologies to adapt in the business world are good suggestions, in order to increase the advantages and productivity of

the company in the future. Internet Technology, Work Group Information System or Lotus Notes should be considered and recommended.

(5) They should develop every department in the company to have a database system of their own.

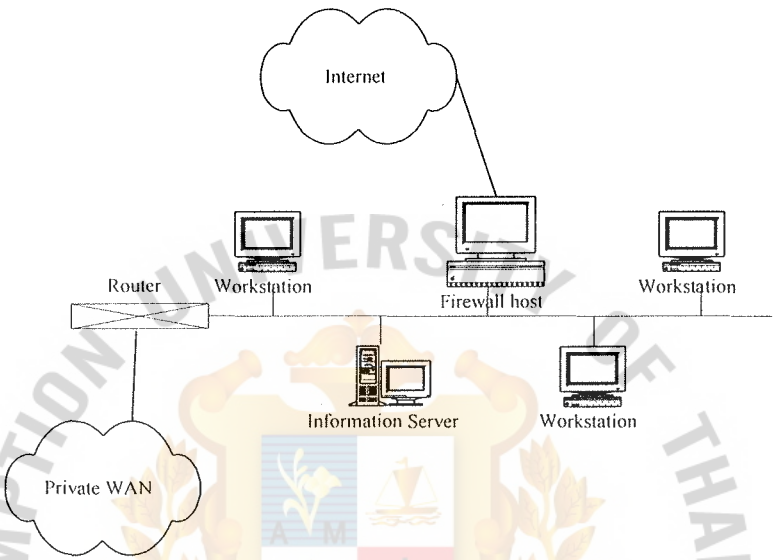

Figure 5.1. LAN Connection

(6) To facilitate communication in the organization, they must create an Intranet System.

(7) The LANs are under the control of the network manager and can be configured and tuned for cost-effective performance. Another approach to interconnection is a private WAN. A private WAN is constructed from leased lines from a public carrier or the use of wireless interconnections. The private WAN carries only traffic for a given organization, reducing security concerns. A Private WAN is an attractive option if there is a large volume of traffic between sites, justifying the investment.

(8) They should have added some more security when they develop the system to use the Internet such as a firewall system.

APPENDIX A

CONTEXT DIAGRAM

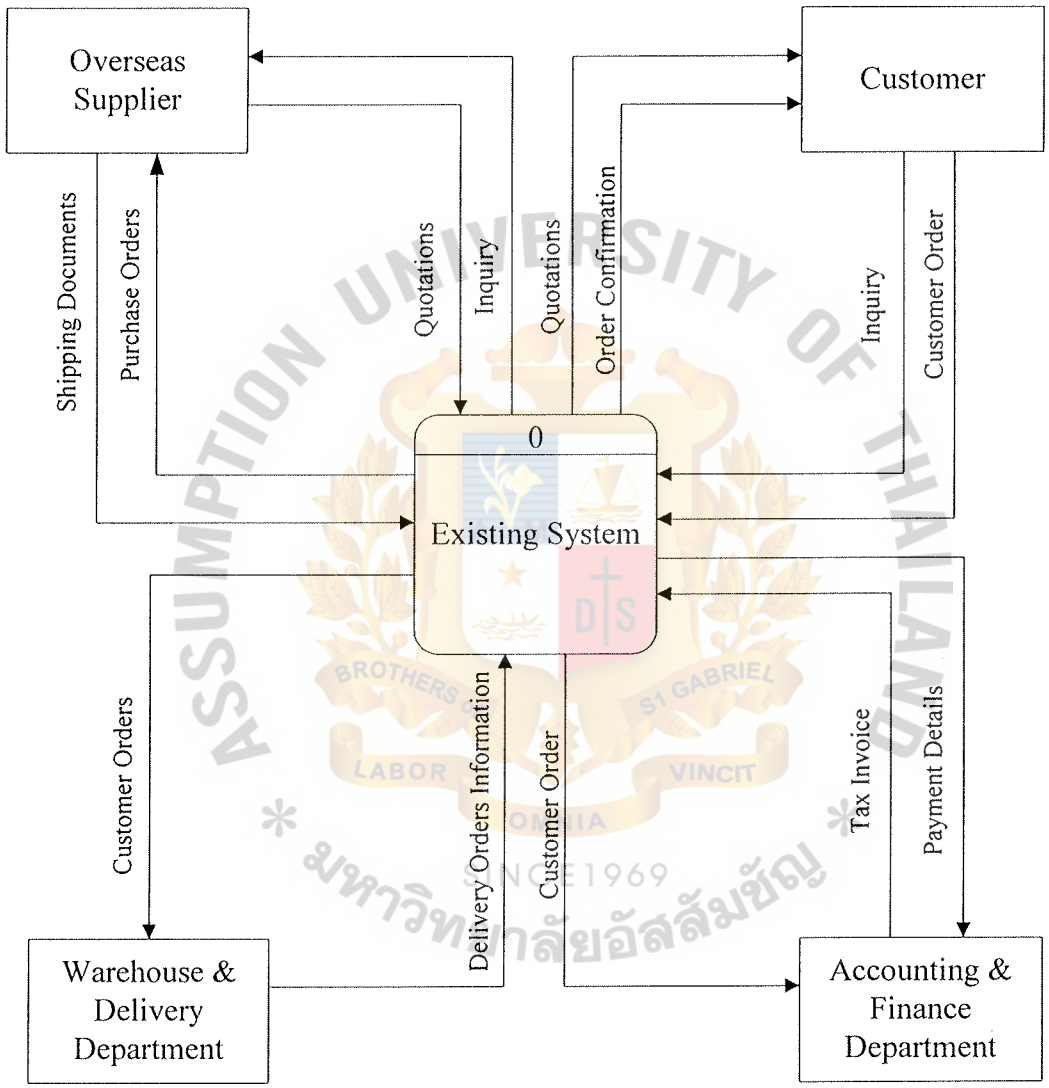

Figure A.1. Context Diagram of Existing System.

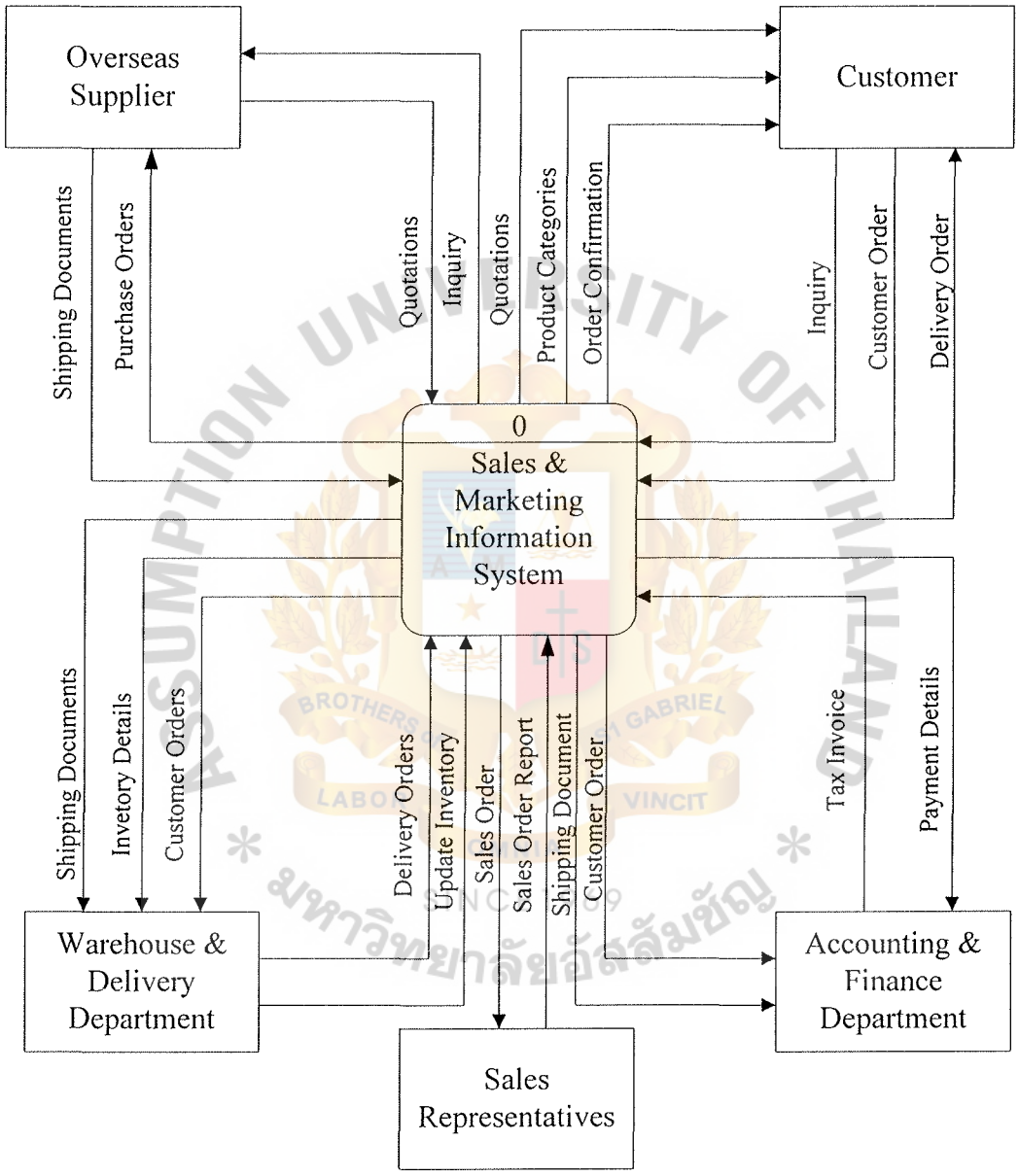

Figure A.3. Context Diagram Proposed System

APPENDIX B

DATA FLOW DIAGRAM

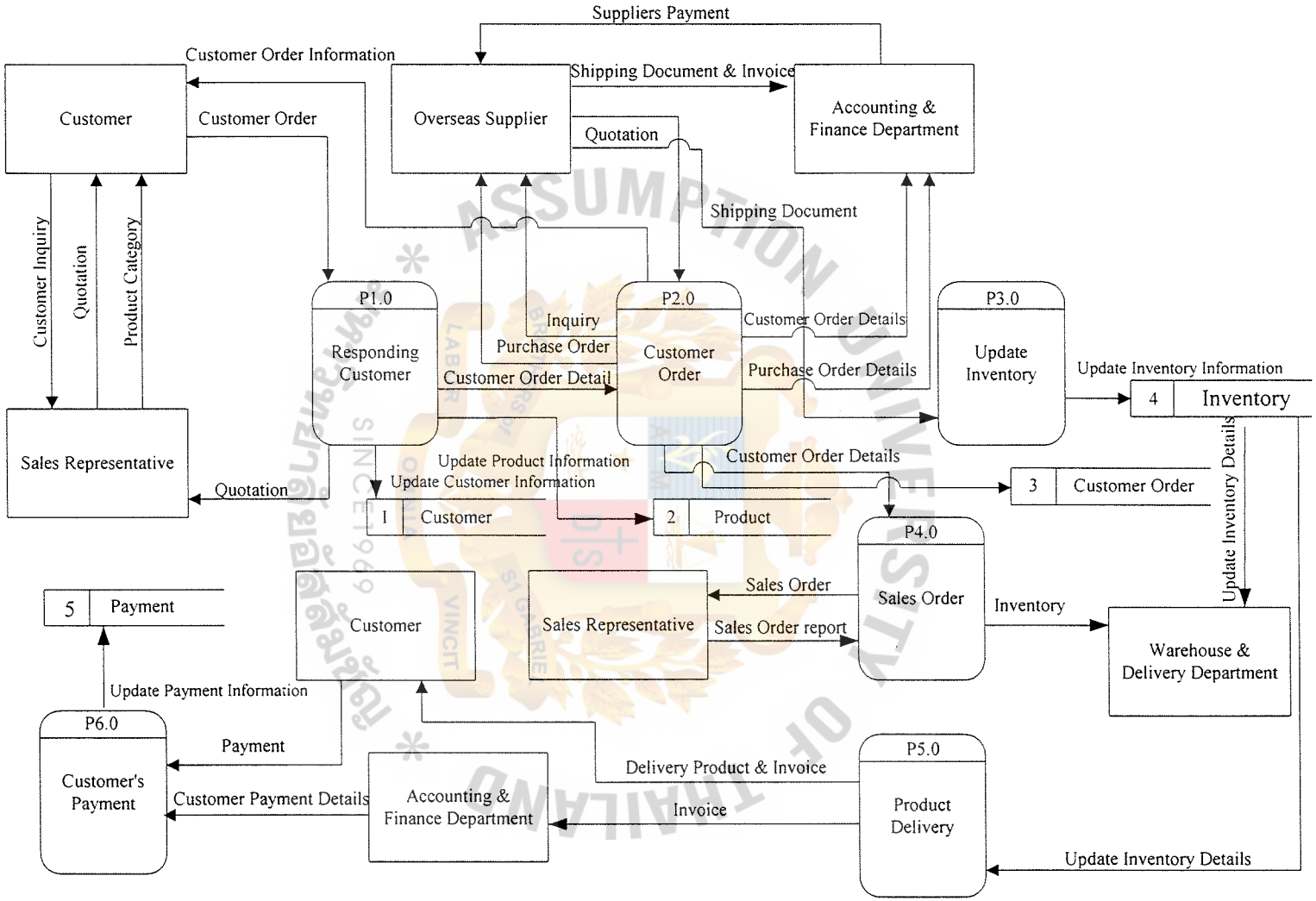

Figure B.1. Level 0 Data Flow Diagram.

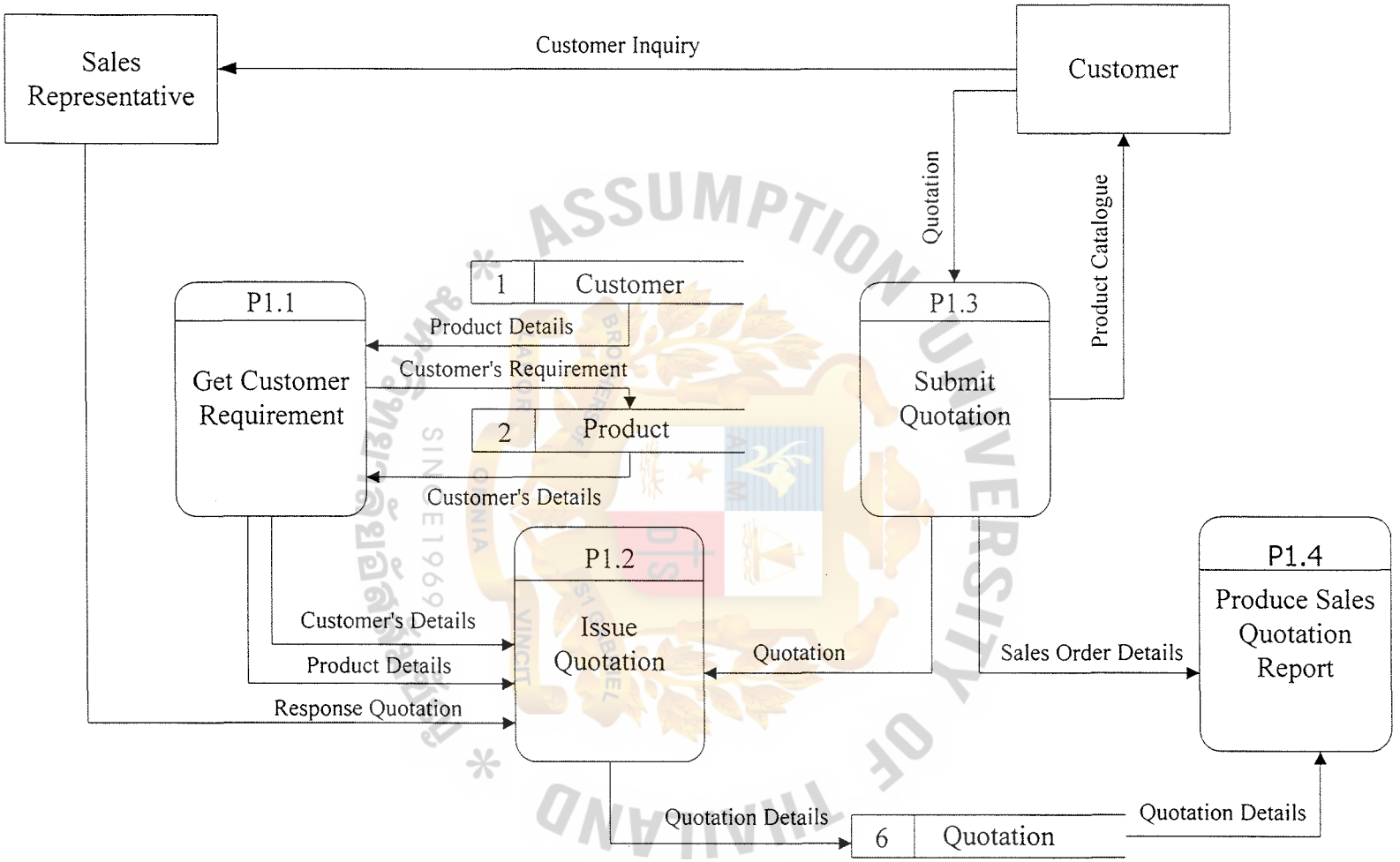

Figure B.2. Level 1 Data Flow Diagram of Process 1.0.

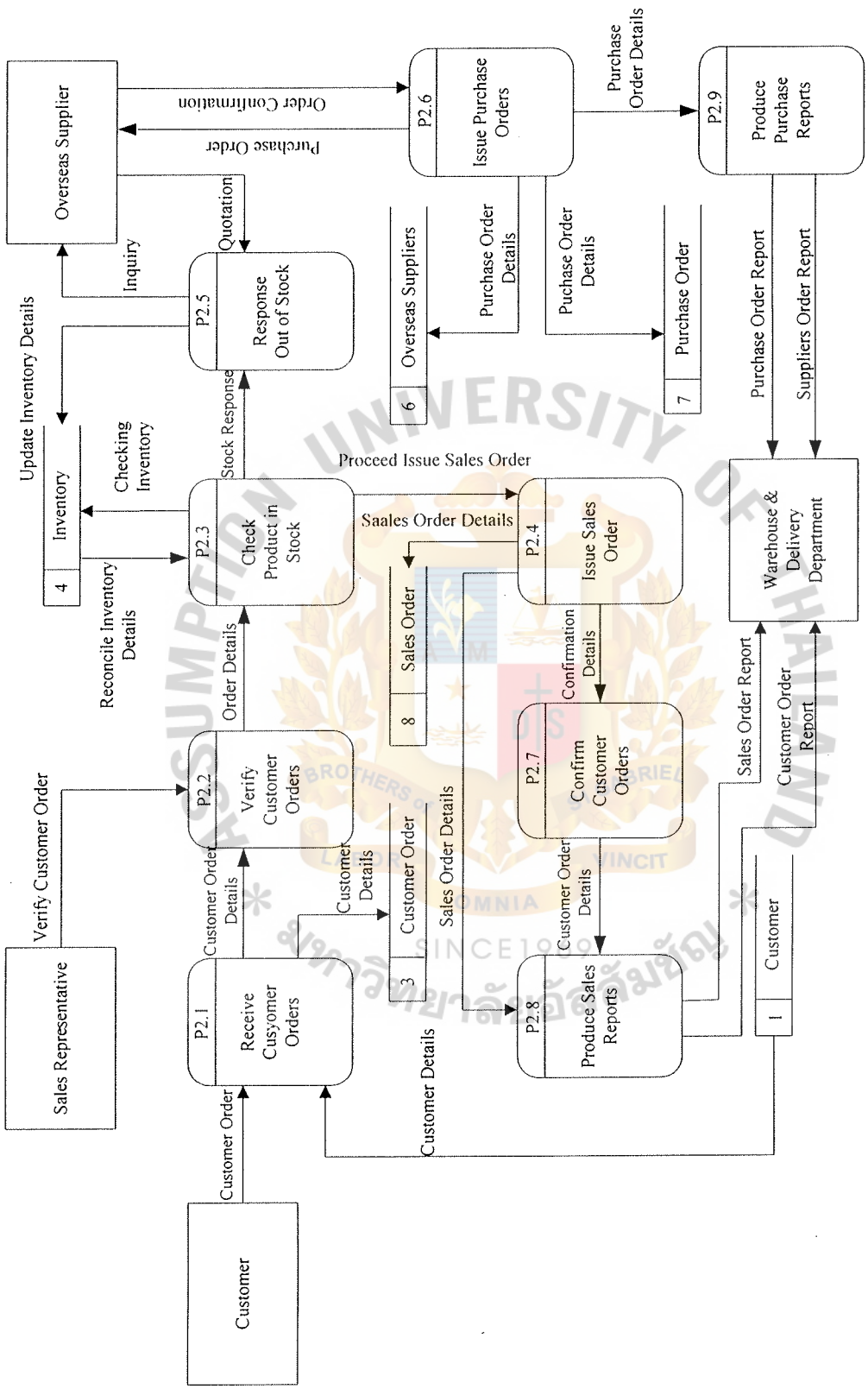

Figure B.3. Level 1 Data Flow Diagram of Process 2.0.

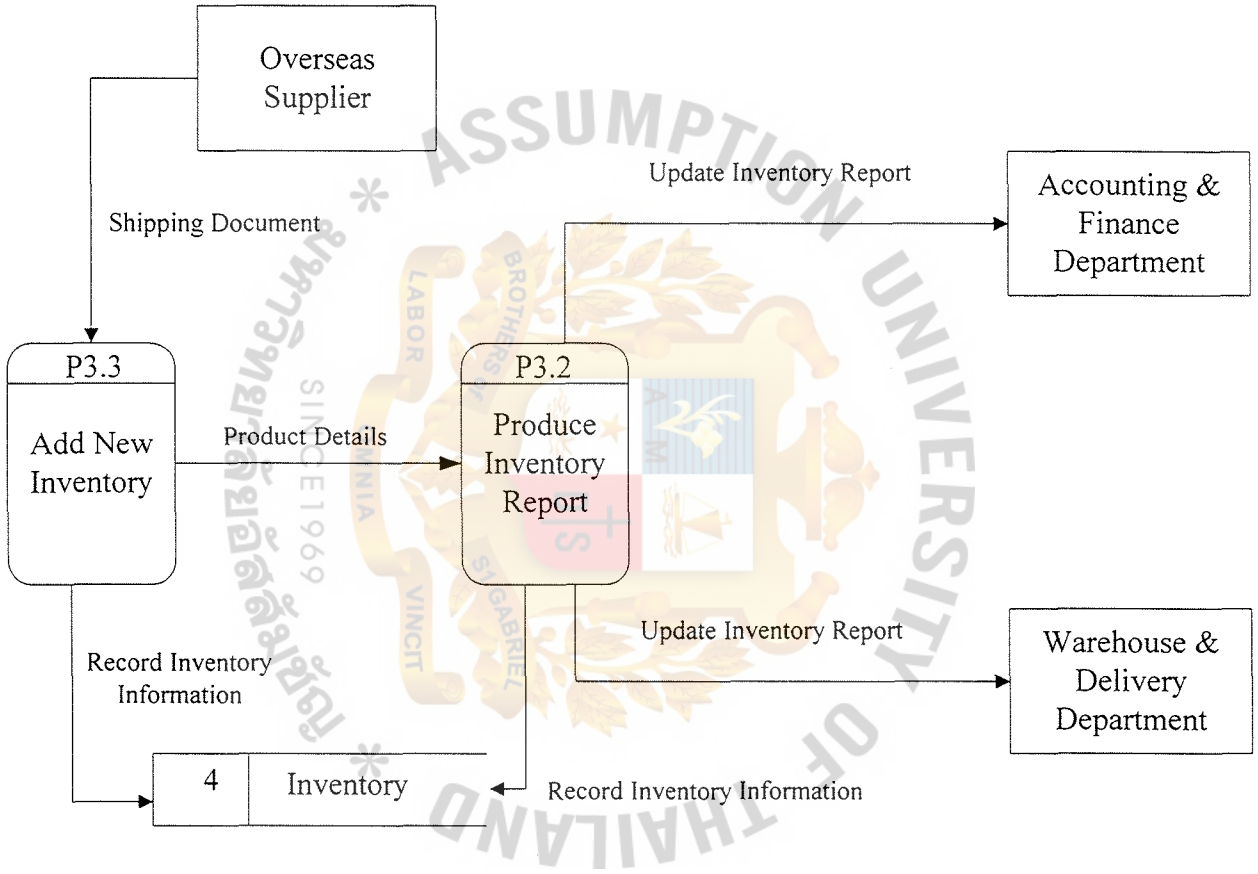

Figure B.4. Level 1 Data Flow Diagram of Process 3.0.

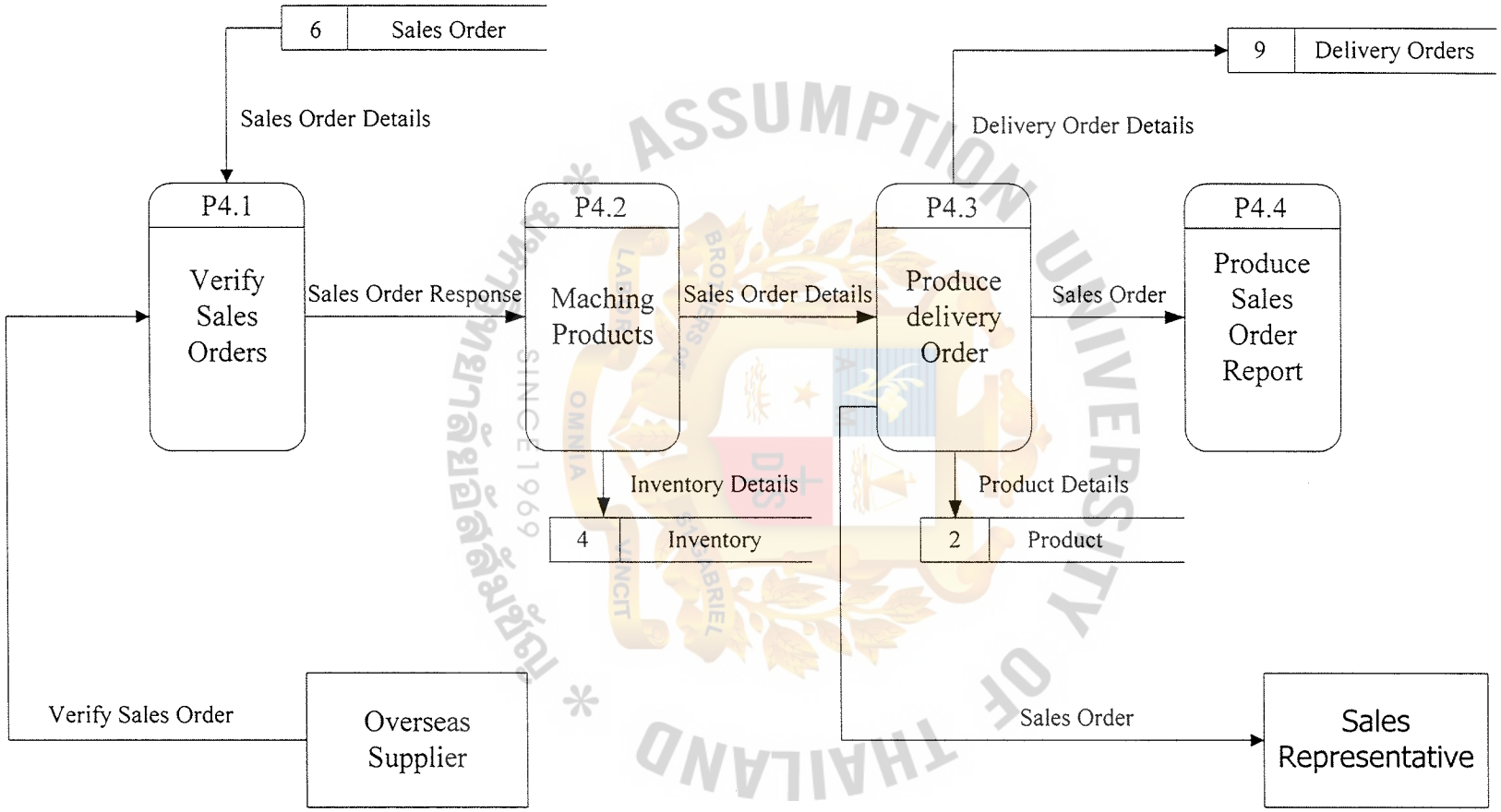

Figure B.5. Level1 Data Flow Diagram of Process 4.0.

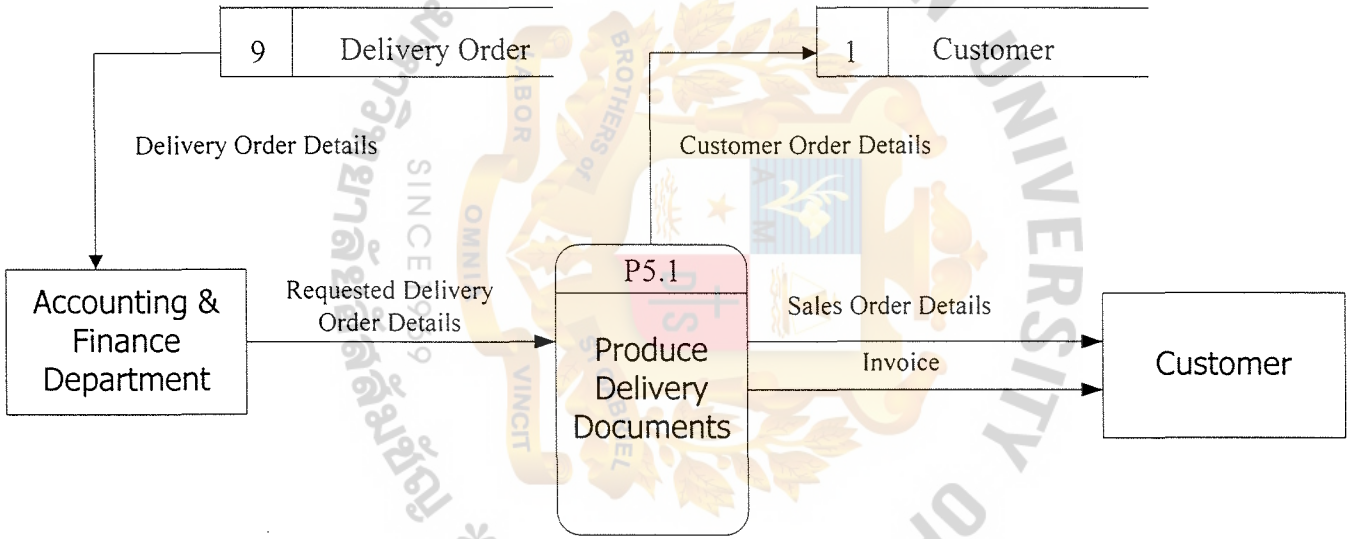

Figure B.6. Level 1 Data Flow Diagram of Process 5.0.

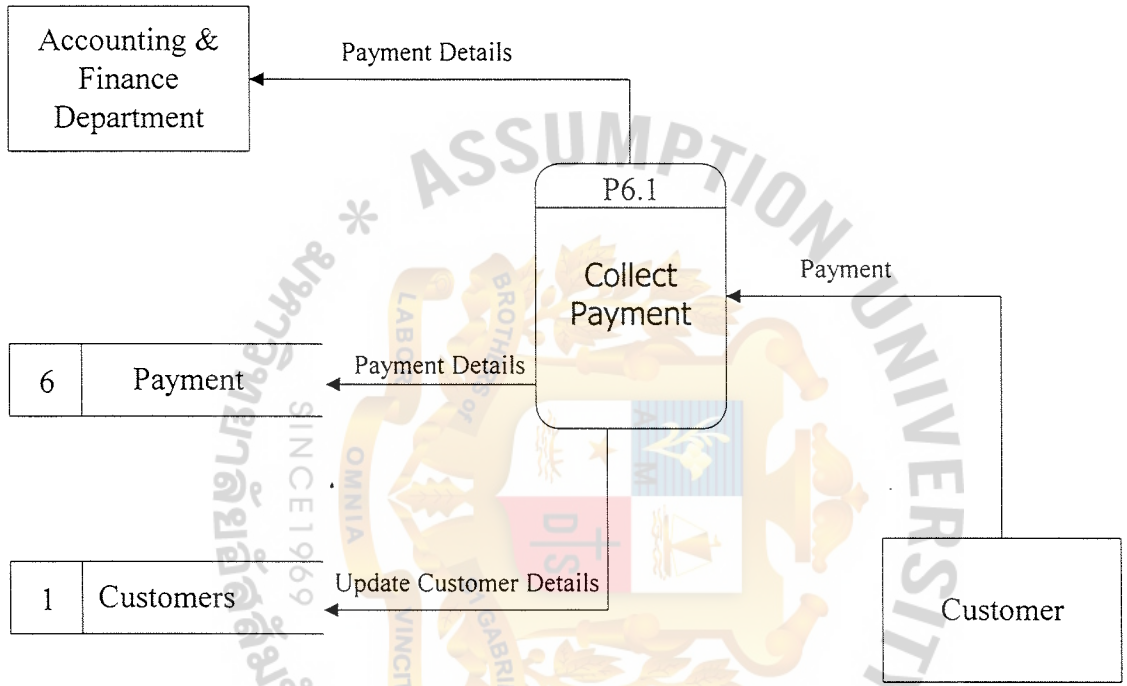

Figure B.7. Level 1 Data Flow Diagram of Process 6.0.

APPENDIX C

ENTITY RELATION SHIP DIAGRAM

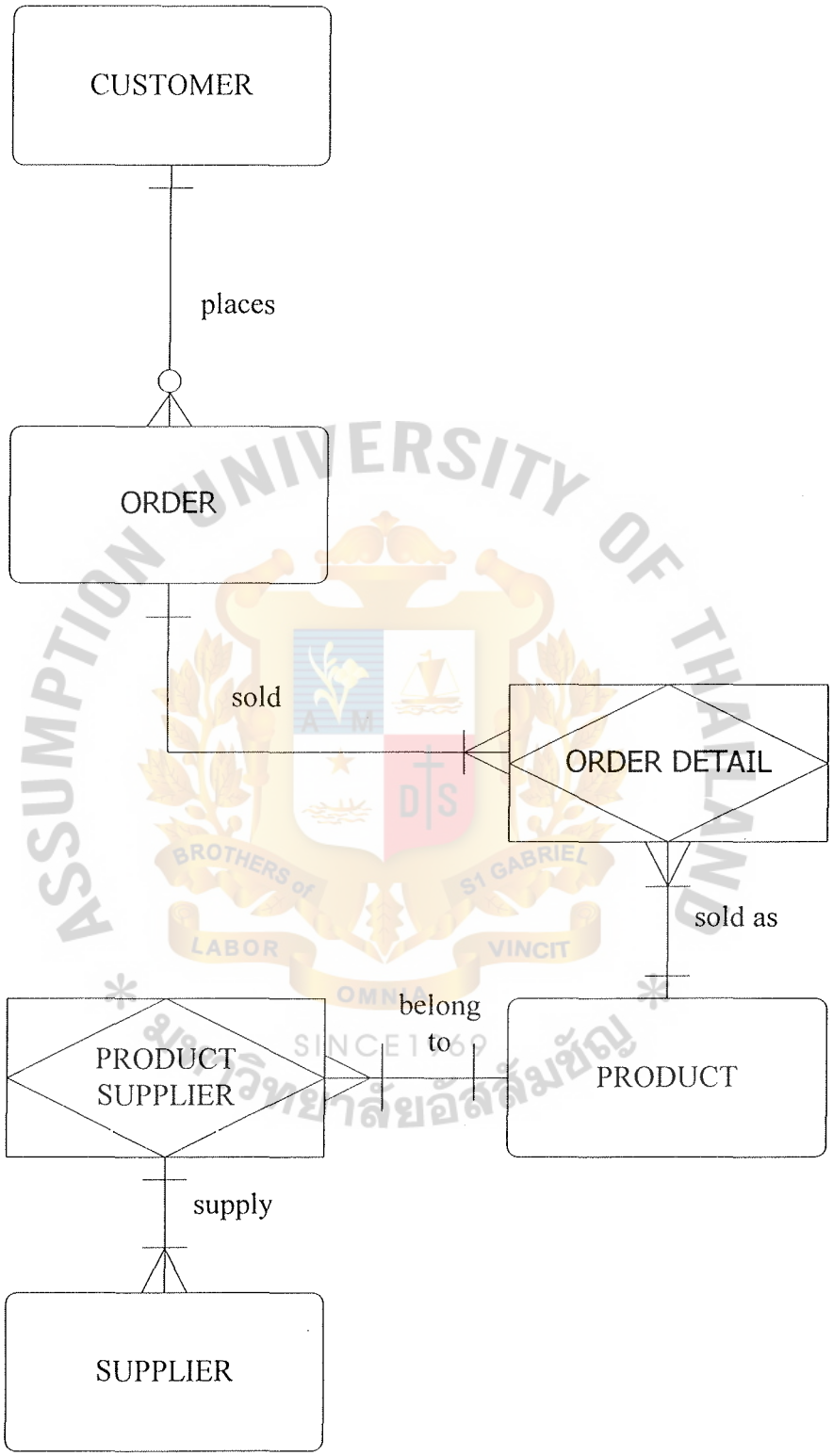

Figure C.1. Context Diagram of Entity Relationship Diagram.

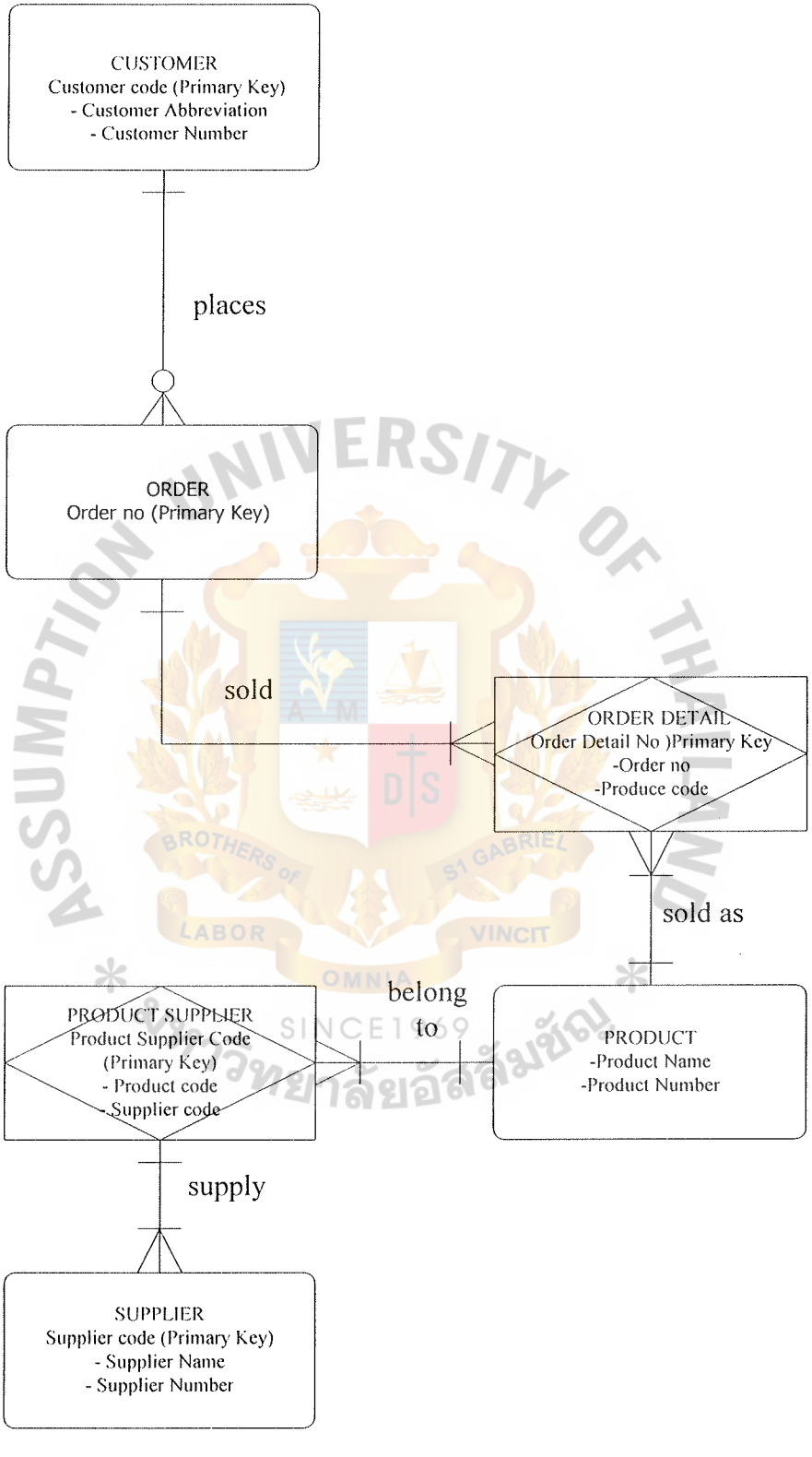

Figure C.2. Key-based Diagram of Entity Relationship Diagram.

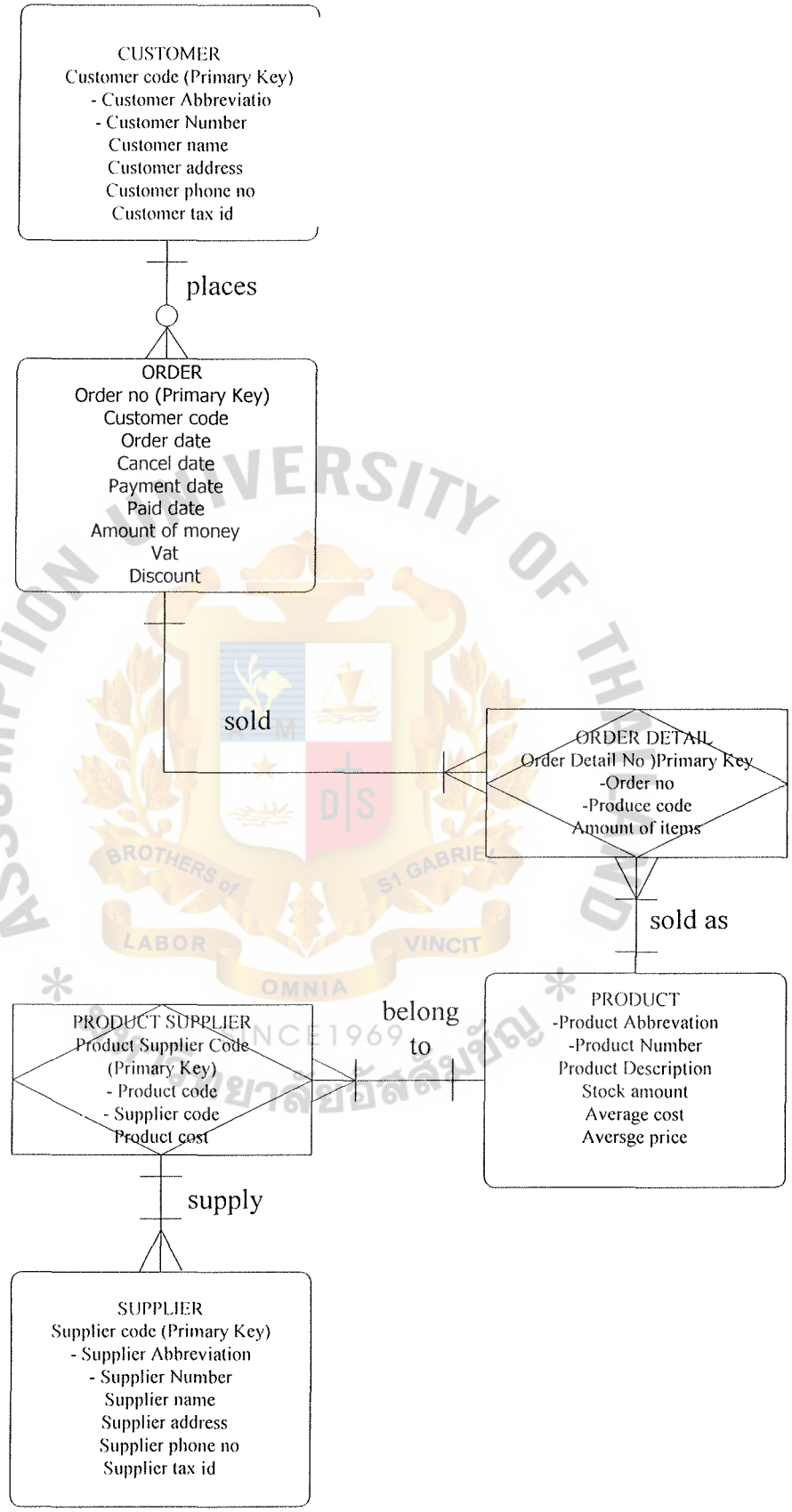

Figure C.3. Fully Attribute Diagram of Entity Relationship Diagram.

APPENDIX D

STRUCTURE CHART

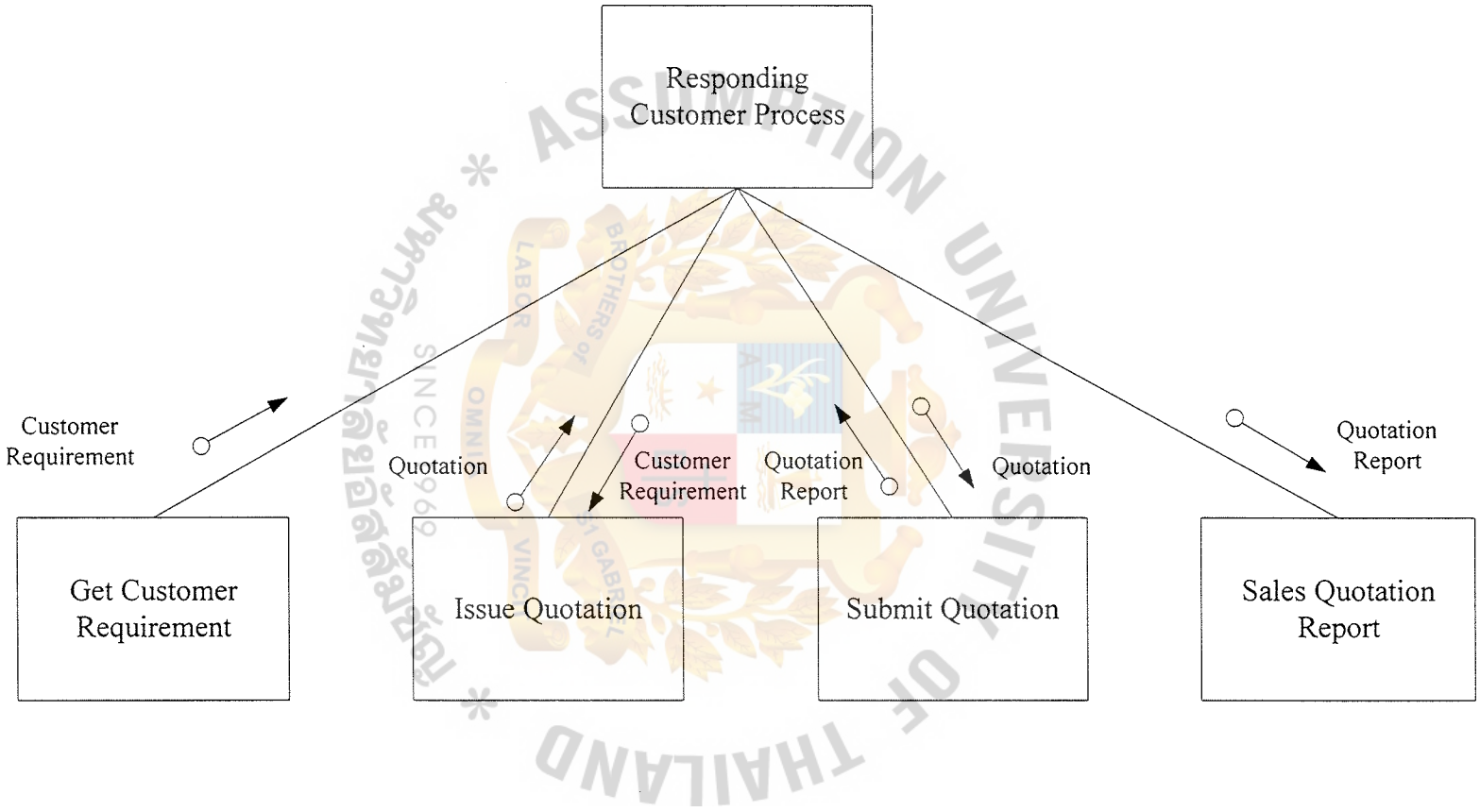

Figure D.1. Response Customer Process.

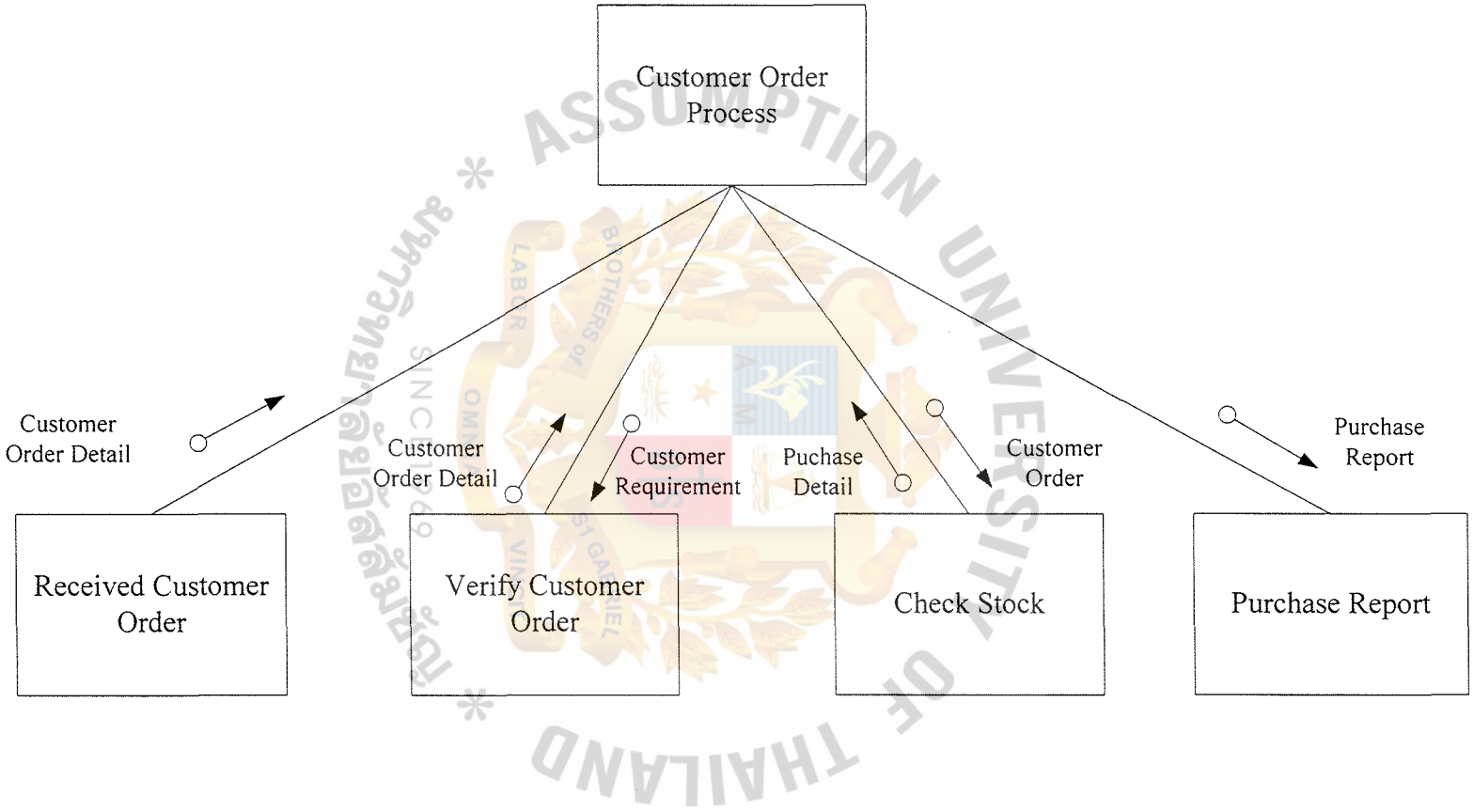

Figure D.2. Customer Order Process.

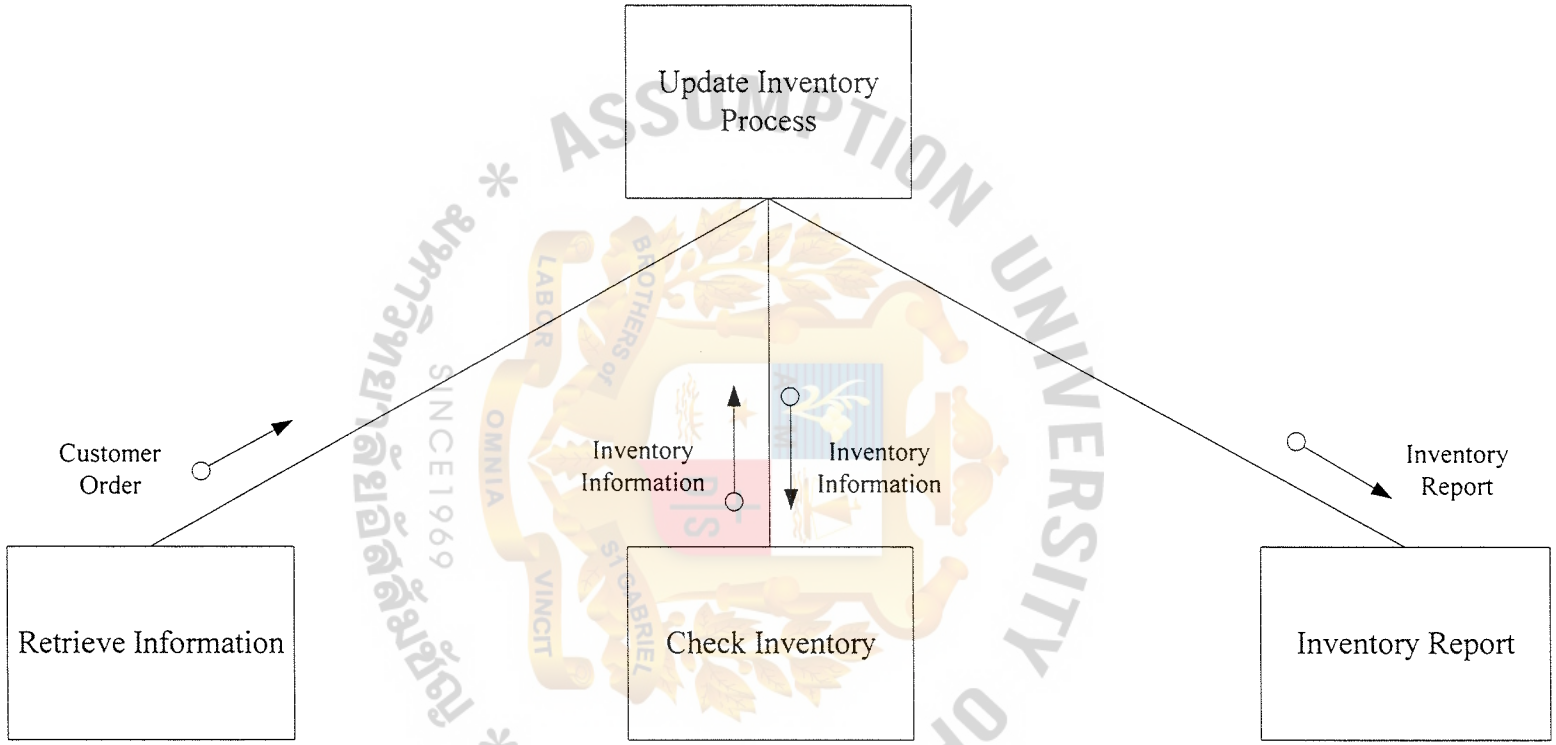

Figure D.3. Update Inventory Process.

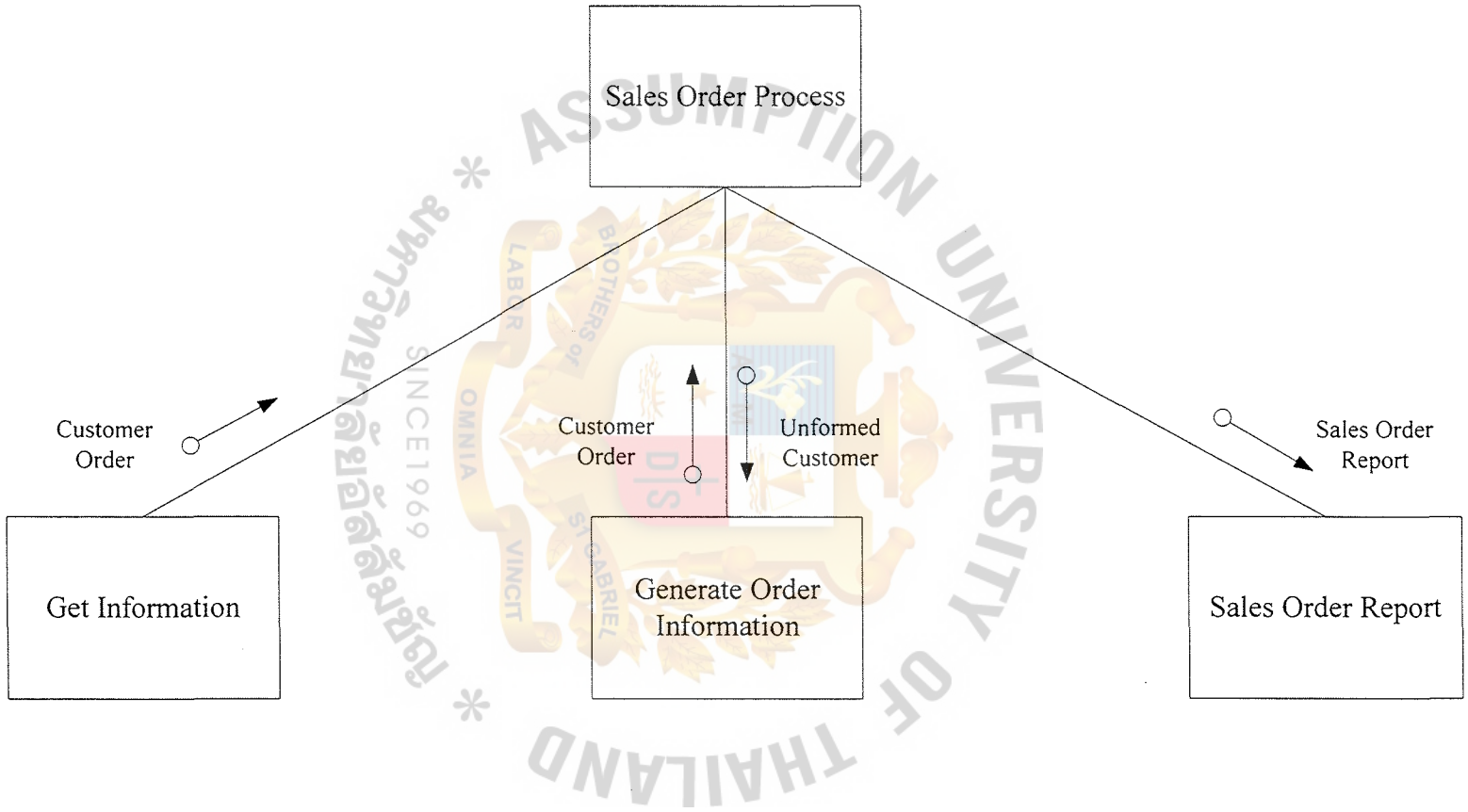

Figure D.4. Sales Order Process.

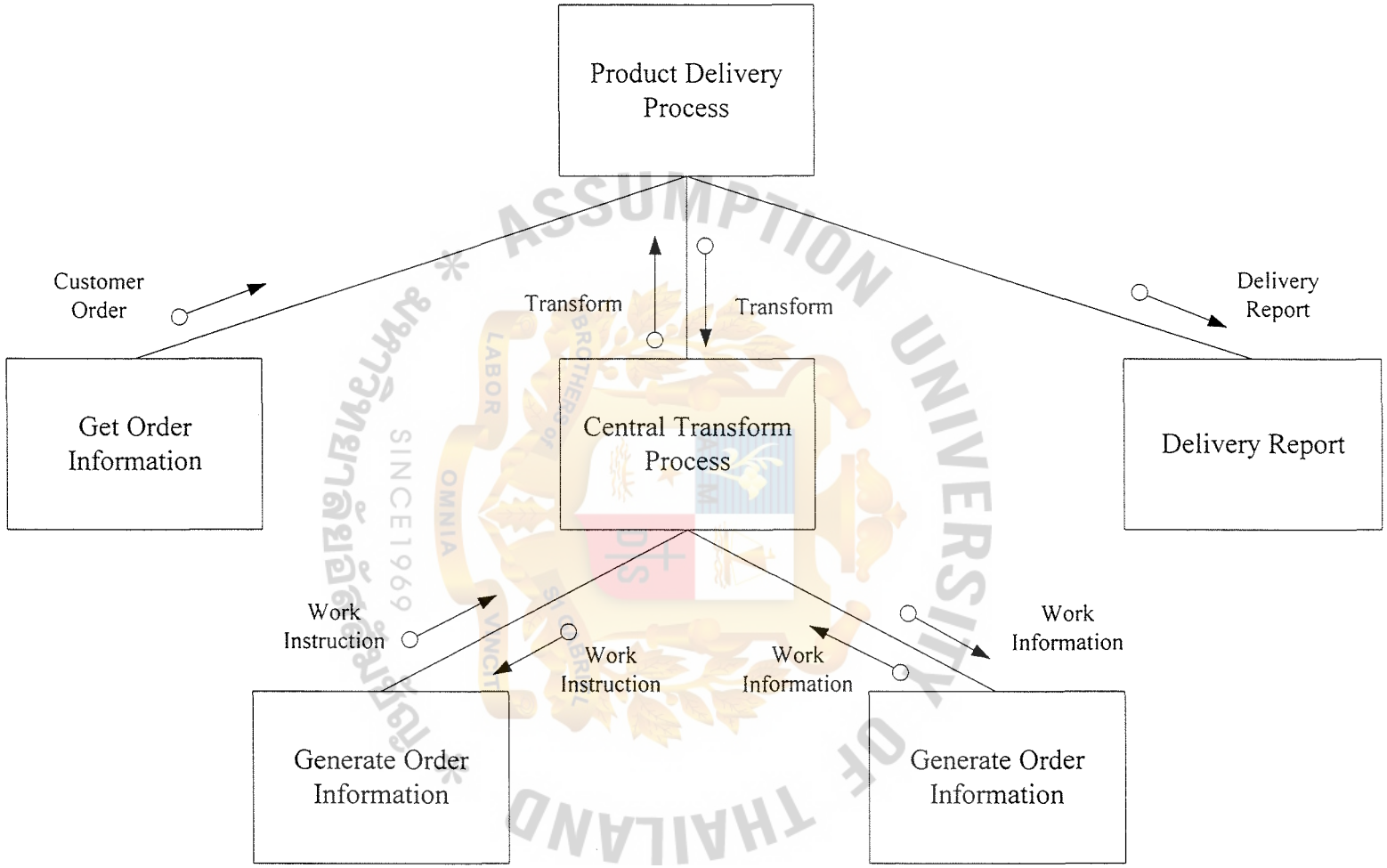

Figure D.5. Product Delivery Process.

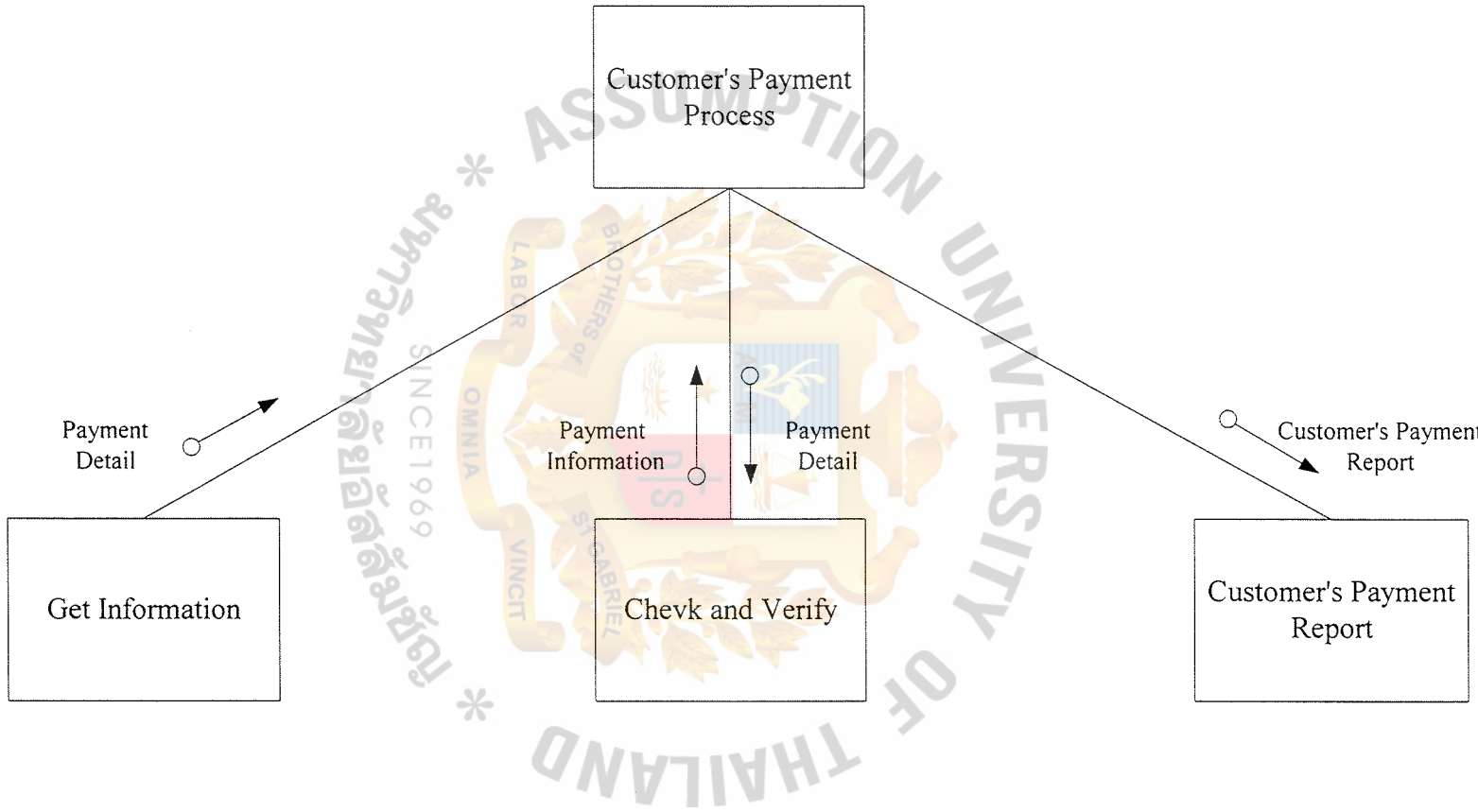

Figure D.6. Customer's Payment Process.

APPENDIX E

DATA DICTIONARY

Table E.1. Table Design of Customers Details (Customers).

Cust ID	Cust_Name	Cust_L_Name	Contact_Title	Company_Name	Address	Phone_No	Fax_No	Pymt_Term

Table E.2. Table Design of Products Details (Products).

Prod Code	Prod_Name	Category	Prod_Desc	Unit_Price	Supplier_Name	Lead_Time

Table E.3. Table Design of Inventory Details (Inventory).

Inv Record	Category	Warehouse_No	Prod_Name	Prod_Desc	Supplier_Name	Status

Table E.4. Table Design Of Payment Details (Payments).

Pymt ID	Cust_Name	Order_ID	Pymt_Amt	Pymt_Method	Check_No	Pymt_Terms

Table E.5. Table Design of Quotation Details (Quotation).

Quot_No	Quot_Date	Company_Details	Prod_Code	Unit_Price	Qty	Total_Price	Sales_Rep_Name

Table E.6. Table design of Customer Orders details (Customer Orders).

Order_ID	Order_Date	Ship_Date	Total_Sales_Ant	Total_Pymt	Due_Date	Cust_Details

Table E.7. Table Design of Purchase Orders Details (Purchase Orders).

PO_No	PO Date	Order_ID	Prd_Code	Sell_Prc	Ship_By	Ship_Sch	Super_Name	Qty	Unit_Prc	Dent_R	Sale_Rp_Nme

Table E.8. Table Design of Suppliers Information (Supplier).

Sup_ID	Sup_Name	Contact_Name	Contact_Title	Sup_Add	Country	Phone_No.	Pymt_Terms	Lead_Time

APPENDIX F

INPUT DESIGN

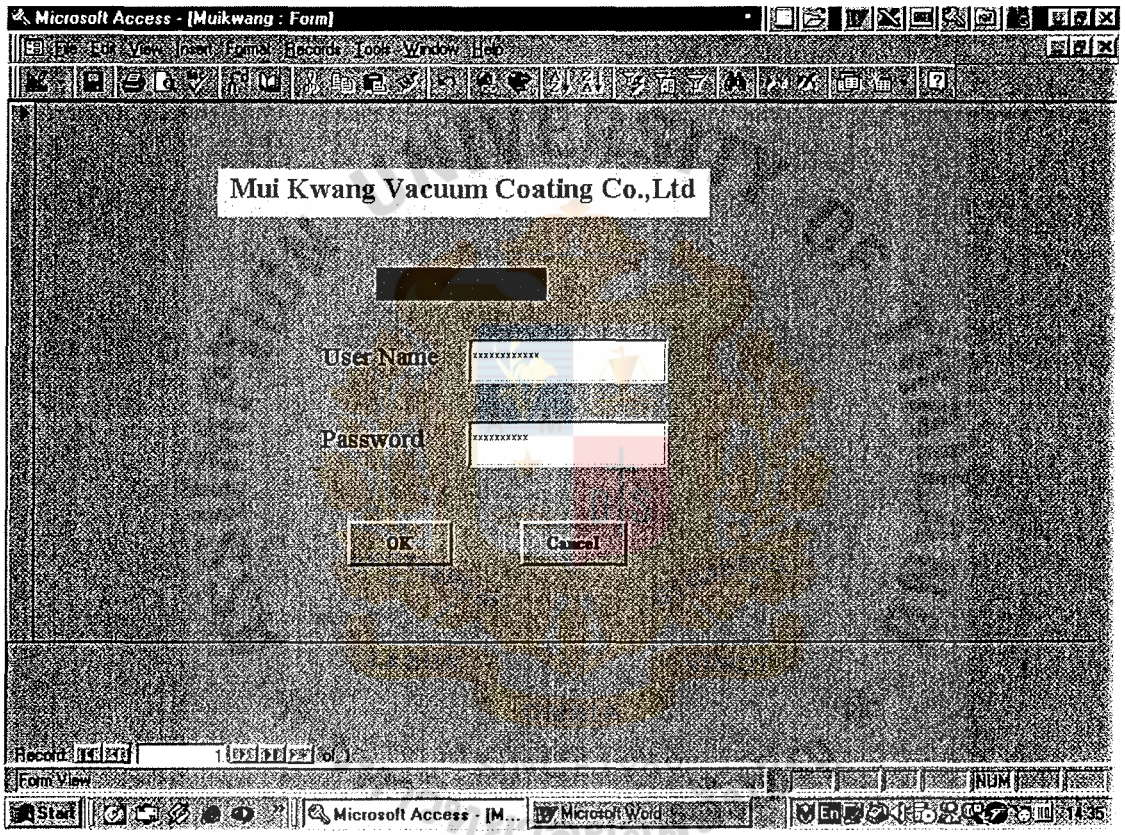

Figure F.1. Login Menu Screen.

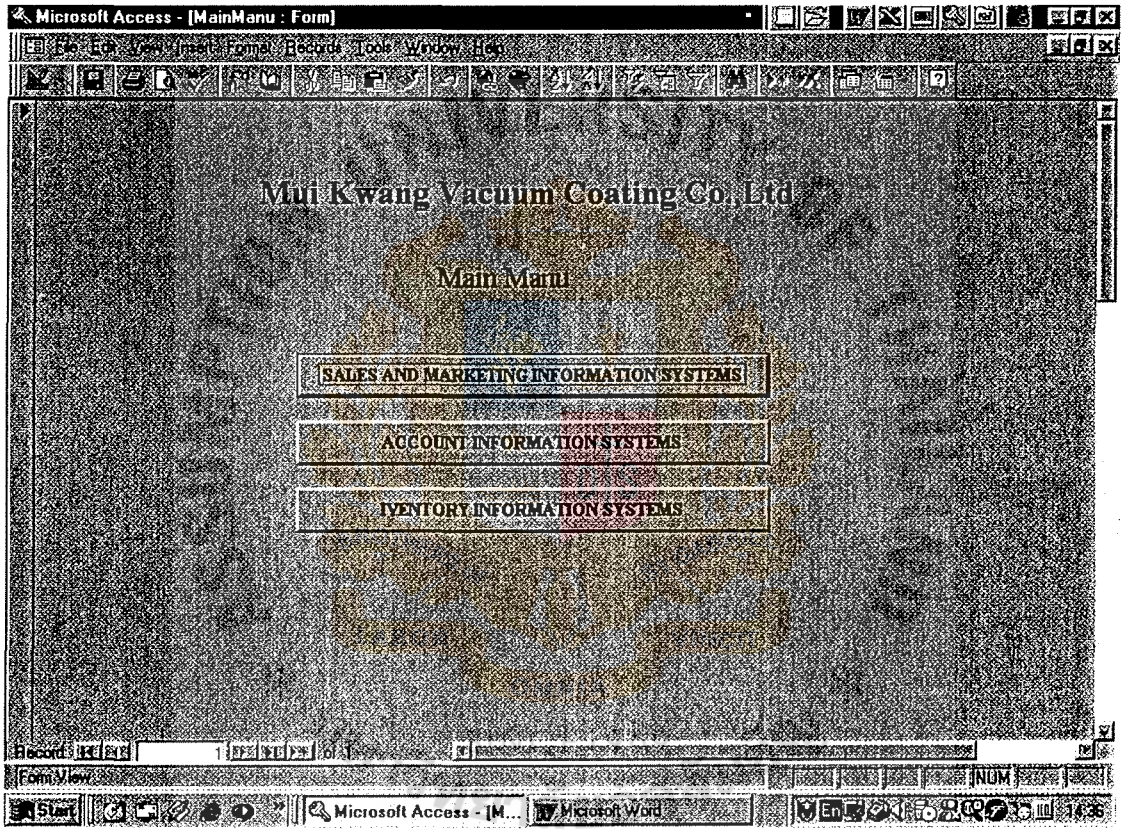

Figure F.2. Main Menu Screen.

Figure F.3. S&M Main Menu Screen.

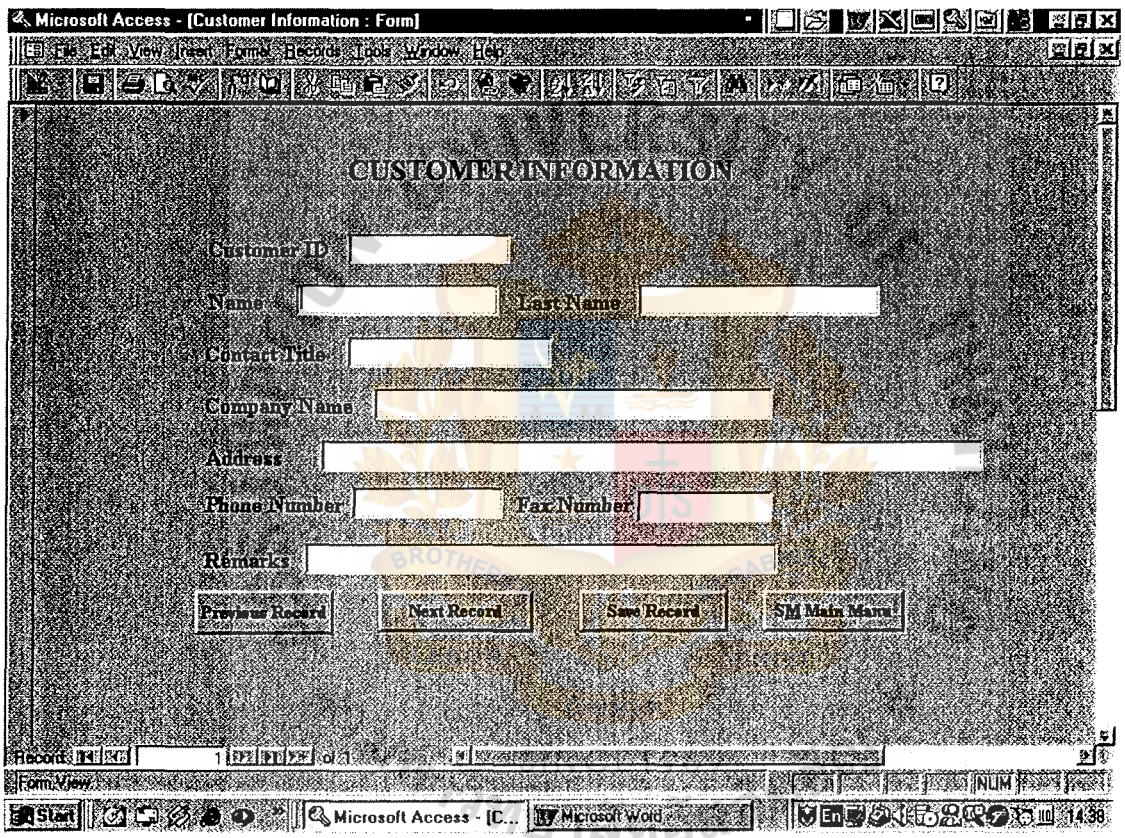

Figure F.4. Customer Information Input Screen.

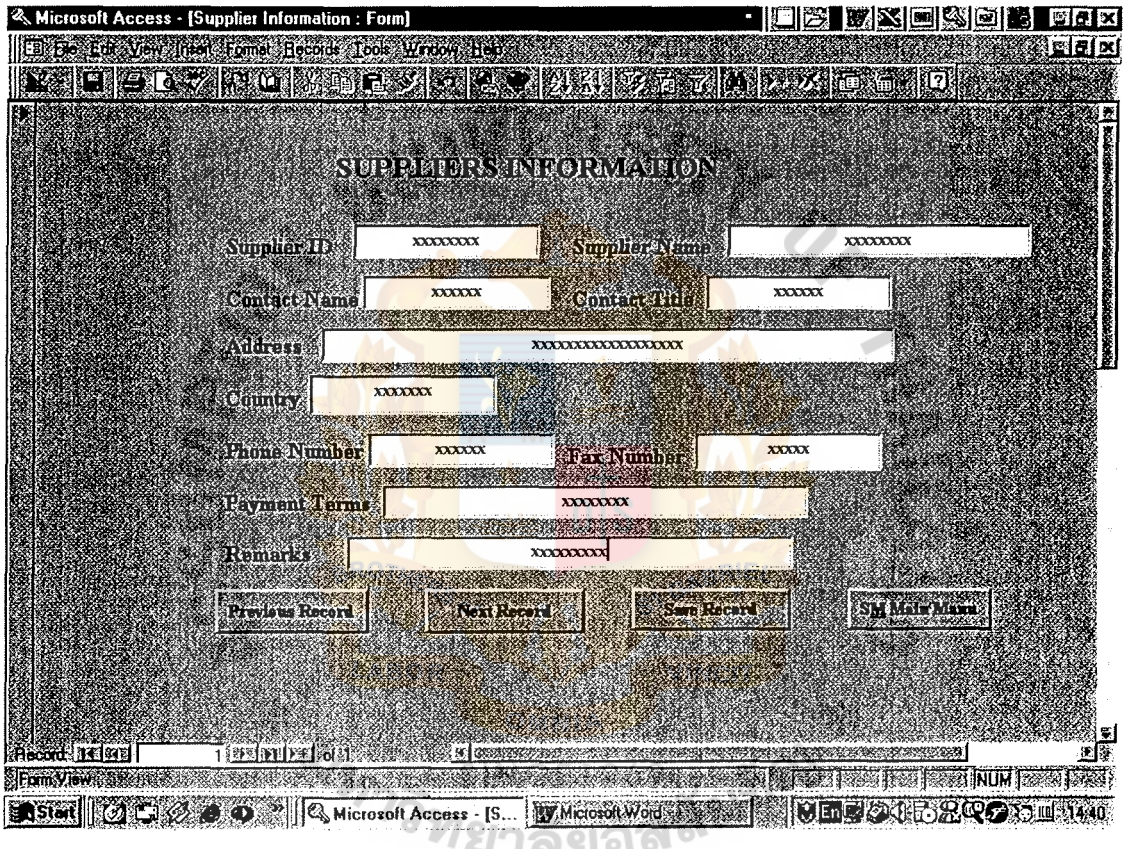

Figure F.5. Suppliers Information Input Screen.

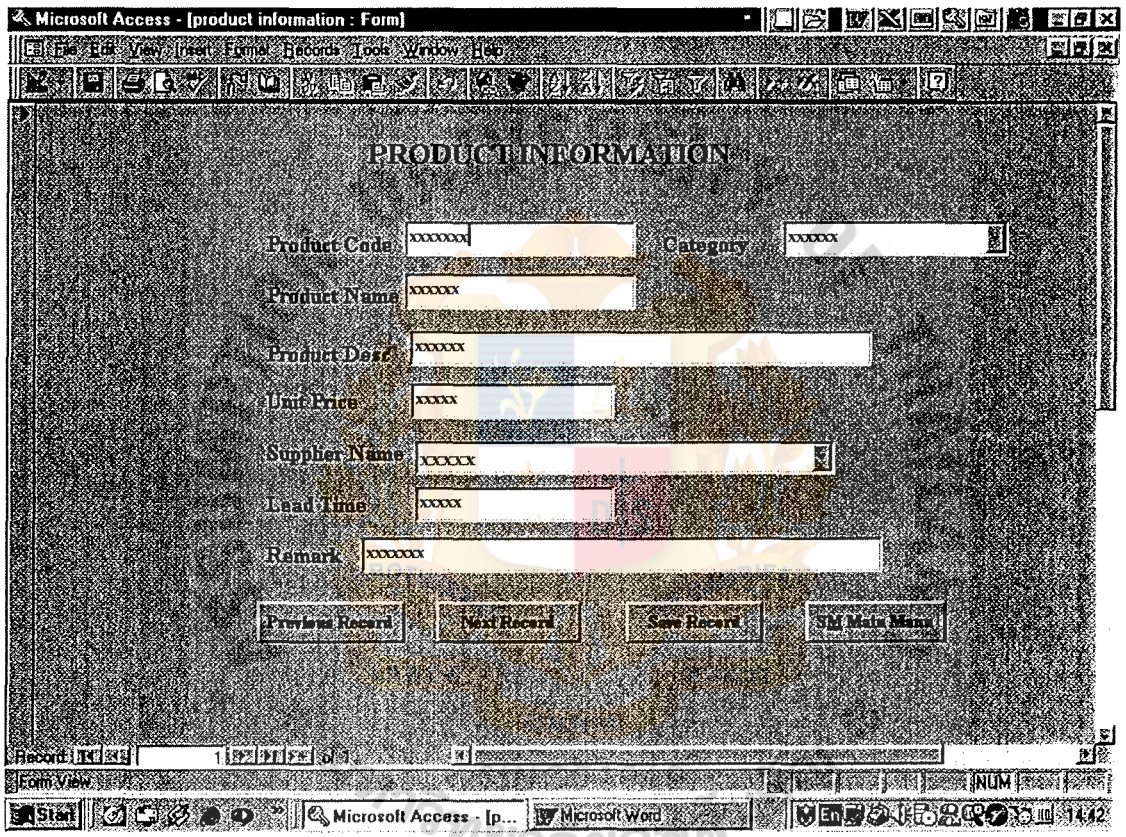

Figure F.6. Product Information Input Screen.

Figure F.7. Quotation Details Input Screen.

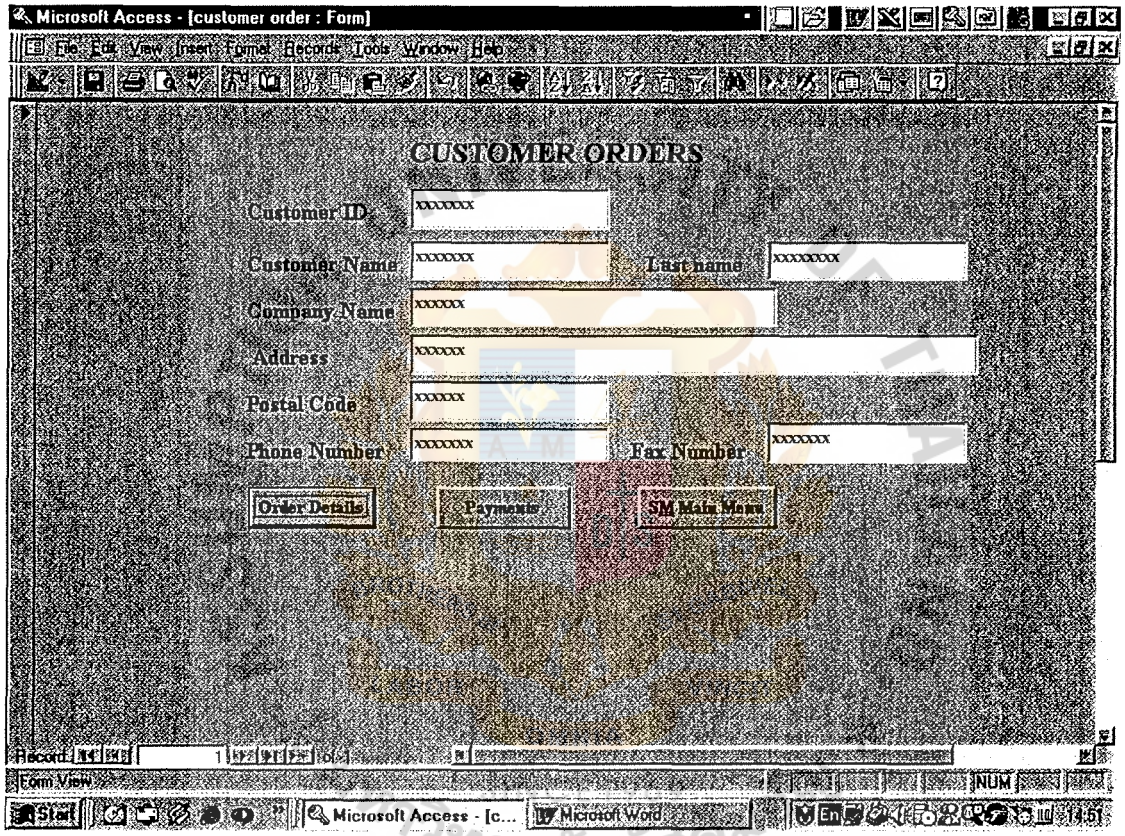

Figure F.8. Customer Orders Input Screen.

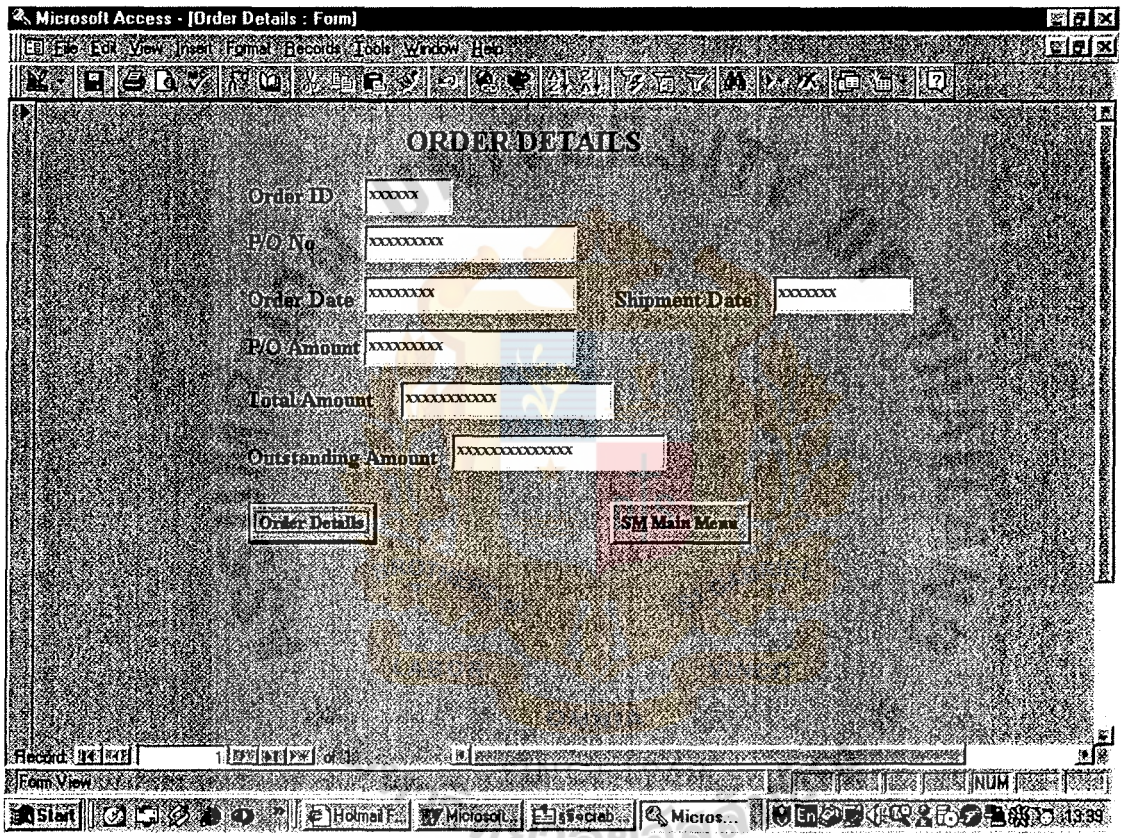

Figure F.9. Customer Orders Details Input Screen.

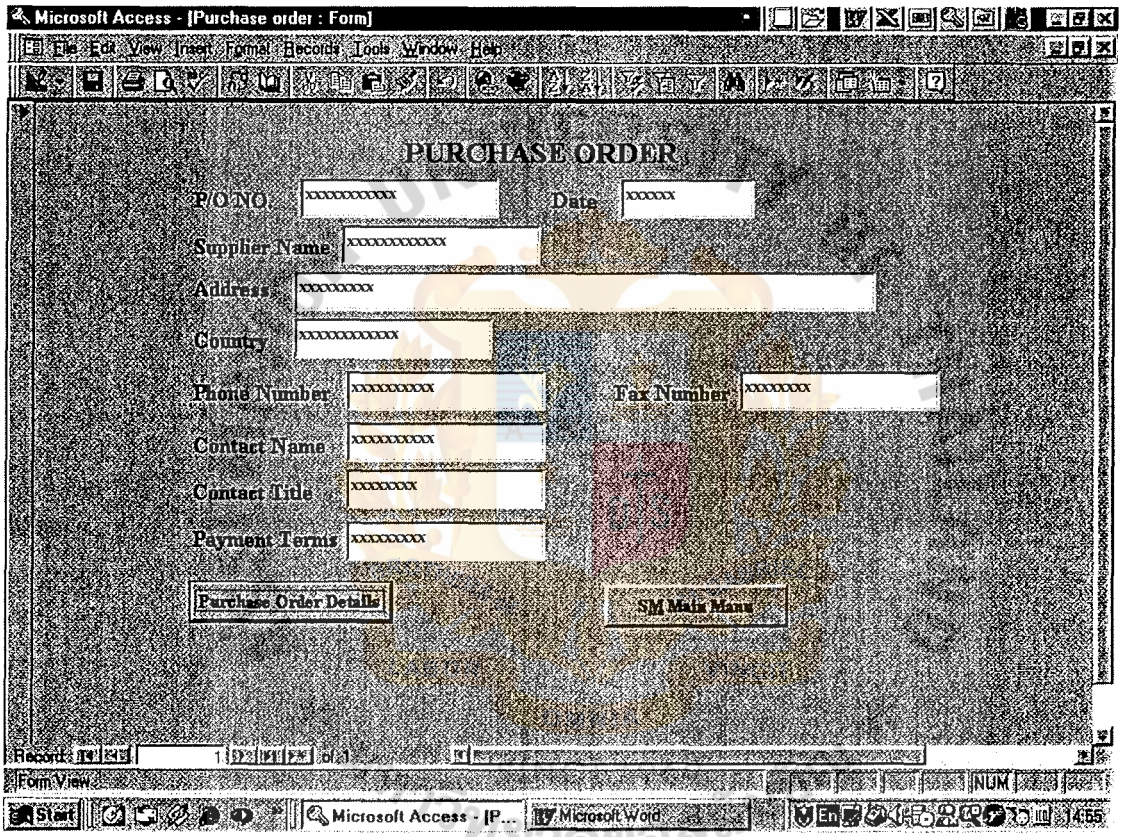

Figure F.10. Purchase Order Input Screen.

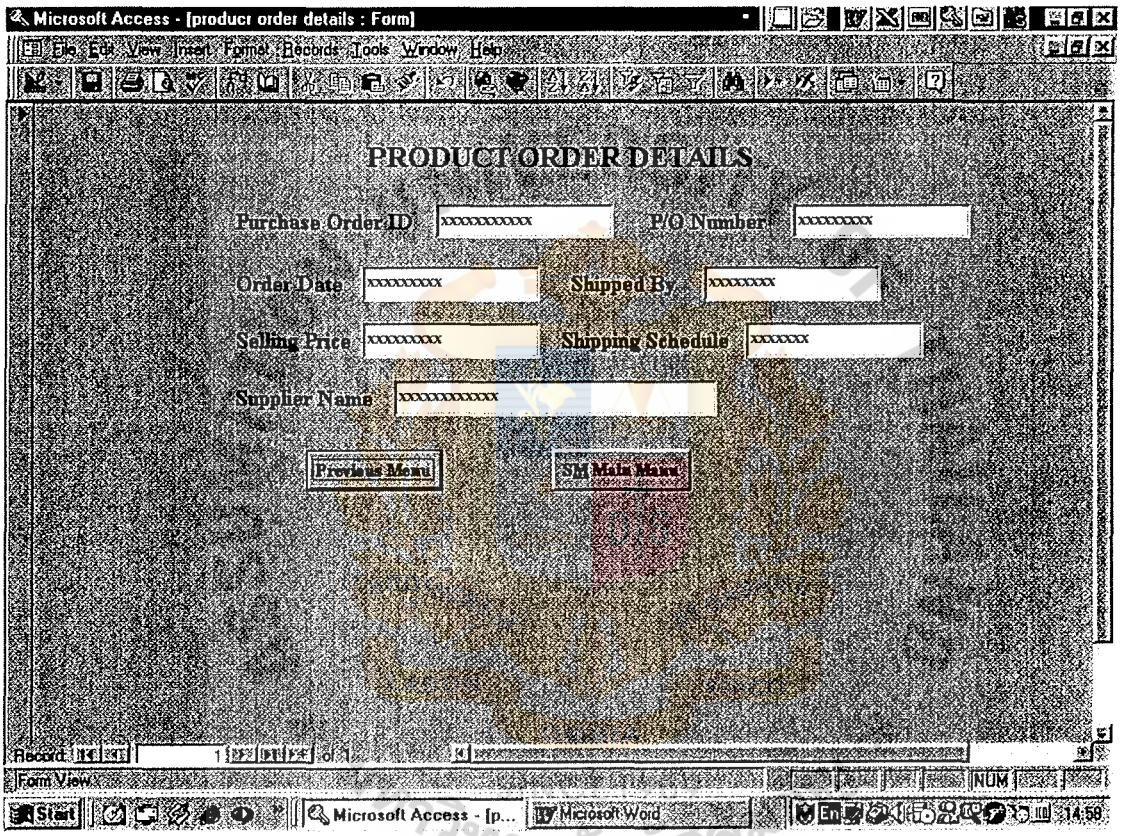

Figure F.11. Purchase Order Details Input Screen.

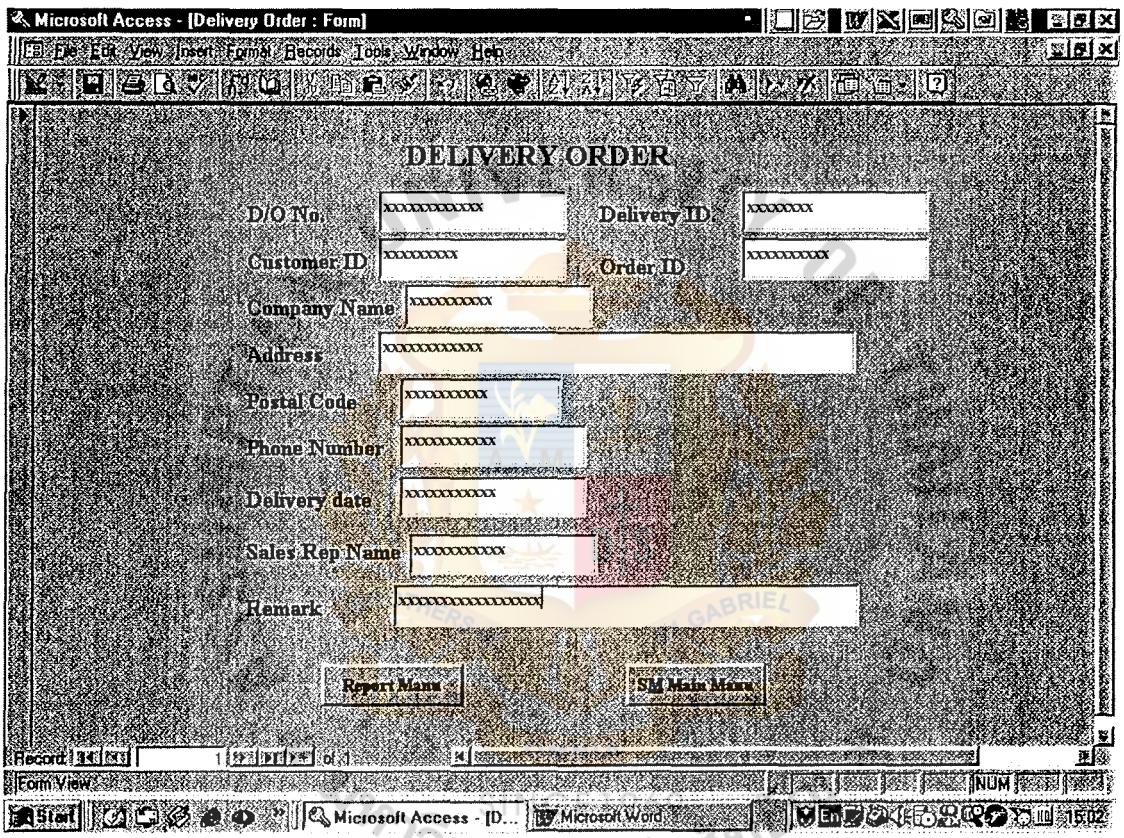

Figure F.12. Delivery Order Input Screen.

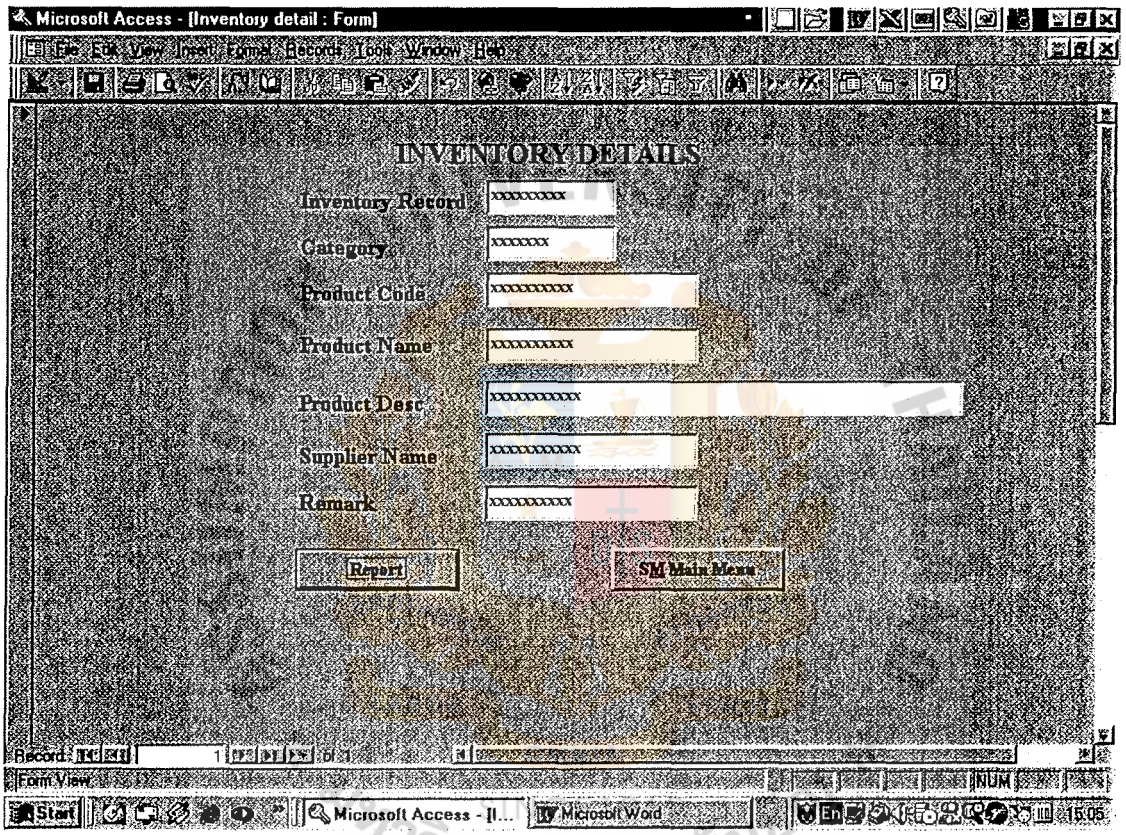

Figure F.13. Payment Details Input Screen.

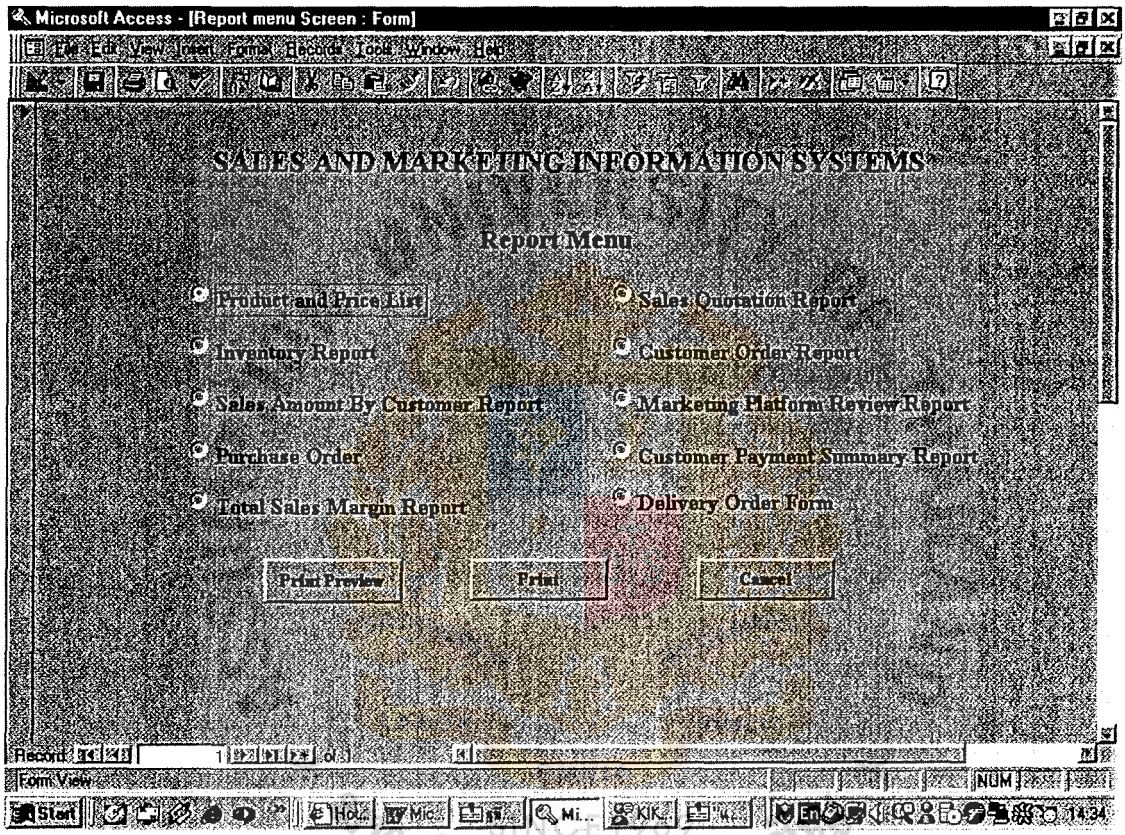

Figure F.14. Report Menu Screen.

APPENDIX G

OUT PUT DESIGN

Mui Kwang Vacuum Coating Co.,Ltd.

List of Customers

No.	Customer Name	Address	Phone Number	Fax Number	Name	Last Name
1.	xxxxxxxxxxxx	xxxxxxxxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	xxxxxx	xxxxxxxxxx
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						

Figure G.1. List of Customers.

Mui Kwang Vacuum Coating Co.,Ltd.

Product And Price List

No.	Product Code	Product Name	Product Description	Unit Price	Supplier Name	Lead Time
1.	xxxxxx	xxxxxxxxx	xxxxxxxxxxxxxxxx	xxxxxxx	xxxxxxxxx	xxxxxxxx
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						

Figure G.2. Product And Price List.

Mui Kwang Vacuum Coating Co.,Ltd.

Sales Quotation Report

For the Month of : xxxxxxxx **Currency :** xxxx

Quotation No.	Date	Customer Name	Total Amount	Sales Representative	Remarks
XXXX	XXXX	XXXXXXXXXXXX	XXXXXXXX	XXXXXXXXX	XXXX

Figure G.3. Sales Quotation Report.

Mui Kwang Vacuum Coating Co.,Ltd.

Customer Orders Report

For the Month of : xxxxx **Currency : xxxxx**

Order	Customer	Order Date	Customer Name	Customer's Requested Date	Sales Representive	Order Amount	ID.Order No.
XXX	XXXX	XXXXX	XXXXXXXX	XXXXXX	XXXXXXX	XXXXX	XXXX

Figure G.4. Customer Orders Report.

Mui Kwang Vacuum Coating Co.,Ltd.

Inventory Report

No.	Product Code	Product Name	Product description	Supplier Name	Location	Remarks
1.	xxxxxxxxx	xxxxxxxxx	xxxxxxxxxxxxxxx	xxxxxxxxx	xxxxxx	xxxxx
2.						
3.						
4.						
5.						
6.						
7.						
8						
9.						
10.						
11.						
12.						
13.						

Figure G.5. Inventory Report.

Mui Kwang Vacuum Coating Co.,Ltd.

Sales Amount By Customer Report

Customer : xxxxxxx

	S/N	Order ID	P/O No.	Order Date	Supplier Name	Amount (US$)	Sales Representative
1.	xxxx	xxx	xxxxxx	xxxxxxxxxxxx	xxxxxxxxxxx	xxxxxx	xxxxxxxxxxx
2.							
3.							
4.							

Figure G.6. Sales Amount By Customer Report.

Mui Kwang Vacuum Coating Co.,Ltd.

Total Monthly Sales Margin Summary Report

Month: xxxxxxxx

No.	Sold To	Cost(US$)	Selling Price (US$)	Amount (US$)
1.	xxxxxxxxxxxxxxxx	xxxxxxxx	xxxxxxxxxx	xxxxxxxxx
2.				
3.				
4.				

Figure G.7. Total Monthly Sales Margin Summary Report.

Mui Kwang Vacuum Coating Co.,Ltd.

Customer Payments Summary Report

Date	Order ID	Customer Name	Payment Amount (THB)	Check No.	Bank
xxx	xxxxxx	xxxxxxxxx	xxxxxxxxxxx	xxxxxx	xxxxxx

Figure G.8. Customer Payments Summary Report.

APPENDIX H

PROCESS SPECIFICATION

Table H.1. Process Specification of Process 1.1.

Items	Description
Process Name:	Get Customer Requirement
Data In :	1. Product Details
	2. Customer Details
Data Out :	1. Product Details
	2. Customer Details
Process :	1. Get details of product and customer
	2. Key in customer details
	3. Generate customer code
	4. Record customer and product details
Attachment :	1. Customer
	2. Product

Table H.2. Process Specification of Process 1.2.

Items	Description
Process Name:	Issue Quotation
Data In :	1. Customer details
	2. Product details
	3. Quotation details
Data Out :	1. Quotation details
Process :	1. Get details of product and customer
	2. Get Customer Quotation
	3. Key in quotation details
Attachment :	1. Customer

Table H.3. Process Specification of Process 1.3.

Items	Description
Process Name :	Submit Quotation
Data In :	1. Customer quotation details
Data Out :	1. Customer quotation details
Process :	1. Get quotation details
	2. Send to request confirmation
Attachment :	1. Customer quotation details

Table H.4. Process Specification of Process 1.4.

Items	Description
Process Name :	Produce Sales Quotation Reports
Data in :	1.Customer quotation details
Data Out :	1. Sales quotation report
Process :	1. Get quotation details
	2. Generate sales quotation reports
Attachment :	1. Customer
	2. Quotation

Table H.5. Process Specification of Process 2.1.

Items	Description
Process Name :	Receive Customer orders
Data In :	1. Customer ID
	2. Order request
	3. Customer details
Data Out :	1. Customer order details
Process :	1. Key in customer details
	2. Key in customer order
	3. Send customer order details to verify
Attachment :	1. Customer
	2. Order

Table H.6. Process Specification of Process 2.2.

Items	Description
Process Name :	Verify Customer Orders
Data In :	1. Customer order
	2. Customer order details
Data Out :	1. Order details
Process :	1. Get customer order
	2. Take the customer order data
	3. Verify the customer order
Attachment :	1. Customer order

Table H.7. Process Specification of Process 2.3.

Items	Description
Process Name :	Check Product in Stock
Data In :	1. Order details
	2. Inventory stock
Data Out :	1. Stock
	2. Sales order
Process :	1. Get stock details
	2. Check order details
	3. Check product in stock
Attachment :	1. Sales Order
	2. Inventory

Table H.8. Process Specification of Process 2.4.

Items	Description
Process Name :	Issue Sales Order
Data In :	1. Customer order details
Data Out :	1. Order confirmation details
	2. Sales order details
Process :	1. Get customer order details
	2. Confirm the information
Attachment :	1. Sales Order

Table H.9. Process Specification of Process 2.5.

Items	Description
Process Name :	Response Out of Stock
Data In :	1. Stock response
	2. Quotation
Data Out :	1. Inquiry
	2. Inventory details
Process :	1. Get quotation details
	2. Get stock response
	3. Update inventory details
Attachment :	1. Inventory

Table H.10. Process Specification of Process 2.6.

Items	Description
Process Name :	Issue Purchase Order
Data In :	1. Order Confirmation
Data Out :	1. Purchase order
	2. Purchase order details
Process :	1. Get order confirmation from overseas
	Supplier
	2. Key purchase order details
	3. Generate purchase order
Attachment :	1. Oversea Suppliers
	2. Purchase Order

Table H.11. Process Specification of Process 2.7.

Items	Description
Process Name :	Confirm Customer Orders
Data In :	1. Confirmation customer order details
Data Out :	1. Customer order details
Process :	1. Get confirmation details
	2. Send information to generate reports
Attachment :	1. Sales Order

Table H.12. Process Specification of Process 2.8.

Items	Description
Process Name :	Produce Sales Reports
Data In :	1. Customer order details
	2. Sales order details
Data Out :	1.Sales order report
	2. Customer order report
Process :	1. Get customer order information
	2. Get Sales order information
	3. Generate sales and customer order reports
Attachment :	1. Order
	2. Customer

Table H.13. Process Specification of Process 2.9.

Items	Description
Process Name :	Produce Purchase Reports
Data In :	1. Purchase order
Data Out :	1. Purchase order Report
	2. Suppliers Order Report
Process :	1. Get purchase order information
	2. Generate purchase order and supplier order
	report
Attachment :	1. Warehouse
	2. Purchase order
	3. Supplier

Table H.14. Process Specification of Process 3.1.

Items	Description
Process Name :	Add New Inventory
Data In :	1. Shipping document
Data Out :	1. Product details
	2. Inventory information
Process :	1. Get Shipping documents from overseas
	supplier
	2. Key in new inventory
	3. Update inventory record
Attachment :	1. Inventory
	2. Overseas Supplier

Table H.15. Process Specification of Process 3.2.

Items	Description
Process Name :	Produce Inventory Report
Data In :	1. Product details
Data Out :	1. Inventory report
Process :	1. Get product details
	2. Generate inventory report
	3. Update inventory stock
	4. Report to Account & Finance Dpt, Sales &
	Marketing Dpt, Warehouse & Delivery Dpt
Attachment :	1. Inventory
	2. Accounting & Finance department
	3. Sales & Marketing Department
	4. Warehouse & delivery Department

Table H.16. Process Specification of Process 4.1.

Items	Description
Process Name :	Verify Sales Orders
Data In :	1. Sales order details
Data Out :	1. Sales order information
Process :	1. Get Sales order details
	2. Verify it before sending
Attachment :	1. Sales Order
	2. Oversea Supplier

Table H.17. Process Specification of Process 4.2.

Items	Description
Process Name :	Matching Products
Data In :	1. Sales order details
Data Out :	1. Sales order details
Process :	1. Get sales order details
	2. Update inventory details
	3. Match the product with ordering
Attachment :	1. Inventory

Table H.18. Process Specification of Process 4.3.

Items	Description
Process Name :	Produce delivery Order
Data In :	1.Sales order details
Data Out :	1. Product details
	2. Sales order report
	3. Delivery order details
Process :	1. Get sales order details
	2. Generate sales order report
	3. Key in delivery order information
Attachment :	1. Delivery Orders
	2. Products
	3. Sales Representative

Table H.19. Process Specification of Process 4.4.

Items	Description
Process Name :	Produce sales Order Report
Data In :	1. Sales order
Data Out :	1. Sales order report
Process :	1. Get sales order information
	2. Generate sales order report
Attachment :	1. Order

Table H.21. Process Specification of Process 6.1.

Items	Description
Process Name :	Collect Payment
Data In :	1. Payment
Data Out :	1. Payment details
	2. Customer details
Process :	1. Get payment details from customer
	2. Send payment details to Accounting &
	Finance department
	3. Update customer details
	4. Update payment
Attachment :	1. Customer
	2. Account & Finance Department
	3. Payment

Table H.20. Process Specification of Process 5.1.

Items	Description
Process Name :	Produce Delivery Documents
Data In :	1. Delivery order details
Data Out :	1. Sales order details
	2. Invoice
	3. Customer order details
Process :	1. Get requested delivery order details
	2. Send invoices to customer
	3.Send sales order details to customer
	4. Update customer information
Attachment :	1. Customer Department
	2. Customers

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