



# SALES ORDER PROCESSING SYSTEM FOR CHOCKCHAI COMPANY LIMITED

by

Ms. Apiradee Tianukrit

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

July, 2000

**MS (CIS)**

**St. Gabriel's Library, Assumption University**

124869

**Sales Order Processing System  
for Chockchai Company Limited**

by  
Ms. Apiradee Tianukrit



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

July 2000

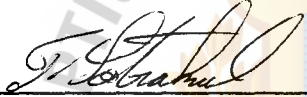



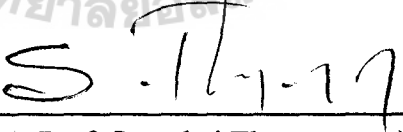


|                 |                               |
|-----------------|-------------------------------|
| Project Title   | Sales Order Processing System |
| Name            | Ms. Apiradee Tianukrit        |
| Project Advisor | Dr. Thotsapon Sortrakul       |
| Academic Year   | July 2000                     |

---

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.

Approval Committee:

|  |  |
|--|--|
| <br>(Dr. Thotsapon Sortrakul)<br>Advisor                       | <br>(Prof. Dr. Srisakdi Charmonman)<br>Chairman       |
| <br>(Air Marshal Dr. Chulit Meesajjee)<br>Dean and Co-Advisor | <br>(Asst. Prof. Dr. Vichit Avatchanakorn)<br>Member |
| <br>(Assoc. Prof. Somchai Thayarnyong)<br>MUA Representative |  |

July 2000

## ABSTRACT

The system development project is about analyzing current system, structuring & organizing data in aspect of designing and implementing computer software and hardware for Sales Order Processing System of Chockchai Company Limited, a shoe manufacturing company. This system is developed in order to serve the customer's requirements quickly and to improve work flow and data flow within the company.

The study of this project begins with an analysis of the current system. From gathering the requirement information, it is found that the company operates its business activity manually so it causes many problems such as delay response for customer's need, inaccurate information of goods in stock and disorderly function. As a result of the investigation of existing system, the proposed system is designed to solve the problem from the existing system. The study of the proposed system concerns the data flow diagram for improving work flow of the company. The system is implemented on Microsoft Access as the software tool. The cost analysis and cost comparison of the proposed system is determined by using the payback methods. Also, we are concerned with the break-even analysis in which we use the accumulating cost to determine the break-even point between the existing system and the propose system. With regard to implementing the proposed system, the employees will work in parallel between the existing system and the proposed system until they are familiar with the new one. At the same time, they will be trained to use the computer system on how to enter the main menu and exit the screen.

After this system is fully developed, this system will be installed and tested for correctness. It will be satisfactory to the company's performance even if there are some problems in using the computer system at first. We can say that the new system will render many advantages such as rapid time in response to the customer's requirements as well as orderly employee function within each section.



## ACKNOWLEDGEMENTS

The writer wishes to take this opportunity to thank specially her advisor, Dr. Thotsapon Sortrakul who has given her the time to consult on her project and advise her in all aspects of this project.

The writer would like to thank all other committee members Prof.Dr. Srisakdi Charmonman, Air Marshal Dr. Chulit Meesajjee, Asst.Prof.Dr. Vichit Avatchanakorn, Assoc. Prof. Somchai Thayarnyong, for providing her an opportunity to pursue this project and have taken time to read this project and attend in the oral examination which she has really appreciated their kind constructive criticisms. Also, the writer is grateful to all the lecturers in MS(CIS) program for providing their valuable knowledge during her study in ABAC.

The writer would also like to thank the staff and management team of Chockchai Company Limited for providing information and cooperation in this project.

The writer extends her sincere thanks to her friends Mr. Amornthep Sampeenong, Ms. Lawan Putthaprasatporn, and Ms. Aranee Niansomboon for help and information provides to her.

Finally, the writer wishes to thank her family for their encouragement throughout this course of work.

## TABLE OF CONTENTS

| <u>Chapter</u>                                  | <u>Page</u> |
|---|-------------|
| ABSTRACT  | i           |
| ACKNOWLEDGEMENTS                                | iii         |
| LIST OF FIGURES                                 | vi          |
| LIST OF TABLES                                  | viii        |
| I. INTRODUCTION                                 | 1           |
| 1.1 Background of the Project                   | 1           |
| 1.2 Objectives of the Project                   | 3           |
| 1.3 Benefit of the Project                      | 4           |
| 1.4 Scope of the Project                        | 5           |
| 1.5 Project Plan                                | 6           |
| II. THE EXISTING SYSTEM                         | 8           |
| 2.1 Background of the Company                   | 8           |
| 2.2 Existing Business Functions                 | 12          |
| 2.3 Current Problems and Areas for Improvements | 17          |
| III. THE PROPOSED SYSTEM                        | 21          |
| 3.1 User Requirements                           | 21          |
| 3.2 System Design                               | 22          |
| 3.3 Hardware and Software Requirements          | 33          |
| 3.4 Security and Controls                       | 36          |
| 3.5 Cost Benefit Analysis                       | 38          |

| <u>Chapter</u>                         | <u>Page</u> |
|--|-------------|
| IV. PROJECT IMPLEMENTATION             | 46          |
| 4.1 Overview of Programming the System | 46          |
| 4.2 Stage of Implementation            | 46          |
| 4.3 Data Conversion                    | 48          |
| V. CONCLUSIONS AND RECOMMENDATIONS     | 49          |
| 5.1 Conclusions                        | 49          |
| 5.2 Recommendations                    | 51          |
| APPENDIX A INPUT SCREEN/USER INTERFACE | 52          |
| APPENCIX B OUTPUT/REPORT DESIGN        | 65          |
| APPENDIX C PROCESS SPECIFICATION       | 75          |
| APPENDIX D DATA DICTIONARY             | 83          |
| BIBLIOGRAPHY                           | 87          |



## LIST OF FIGURES

| <u>Figure</u>  | <u>Page</u> |
|--|-------------|
| 1.1 Project Plan of Sales Order Processing System              | 7           |
| 2.1 Organization Chart of Chockchai Company Limited            | 11          |
| 2.2 Context Level Data Flow Diagram of Existing System         | 15          |
| 2.3 Level 0 Data Flow Diagram of Existing System               | 16          |
| 3.1 Context Level Data Flow Diagram of the Proposed System     | 23          |
| 3.2 Level 0 Data Flow Diagram of Sales Processing System       | 24          |
| 3.3 Level 1 Data Flow Diagram of Receive Order Process         | 25          |
| 3.4 Level 1 Data Flow Diagram of Check Available Stock Process | 26          |
| 3.5 Level 1 Data Flow Diagram of Generate Invoice Process      | 27          |
| 3.6 Level 1 Data Flow Diagram of Delivery Process              | 28          |
| 3.7 Level 1 Data Flow Diagram of Update Stock Process          | 29          |
| 3.8 Level 1 Data Flow Diagram of Produce Report Process        | 30          |
| 3.9 Hardware Configuration of Proposed System                  | 34          |
| 3.10 Cost Comparison between Manual & Proposed System          | 45          |
| A.1 Product Master File  | 52          |
| A.2 Customer Master File                                       | 53          |
| A.3 Invoice Transaction File                                   | 54          |
| A.4 Orders Transaction File                                    | 55          |
| A.5 Login Menu   | 56          |
| A.6 Main Menu Form   | 57          |
| A.7 Record Menu Form   | 58          |

| <u>Figure</u>                     | <u>Page</u> |
|-----------------------------------|-------------|
| A.8 Customer Record Form          | 59          |
| A.9 Product Record Form           | 60          |
| A.10 Transaction Menu Form        | 61          |
| A.11 Customer Order Record Form   | 62          |
| A.12 Customer Invoice Record Form | 63          |
| A.13 Report Menu Form             | 64          |
| B.1 Report of Customer            | 65          |
| B.2 Report of Product Detail      | 66          |
| B.3 Report of Invoice             | 67          |
| B.4 Report of Order List          | 68          |
| B.5 Report of Top Ten Best Sold   | 69          |
| B.6 Report of Sales Summary       | 70          |
| B.7 Report of Delivery Order      | 71          |
| B.8 Report of Quantity on Hand    | 72          |
| B.9 Report of List Price          | 73          |
| B.10 Report of History of Product | 74          |

## LIST OF TABLES

| <u>Table</u>                                       | <u>Page</u> |
|--|-------------|
| 3.1 Hardware Specification for Intranet Server     | 33          |
| 3.2 Hardware Specification for Client Machine      | 34          |
| 3.3 Software Specification                         | 35          |
| 3.4 Manual System Cost Analysis                    | 38          |
| 3.5 Five Years Accumulate Manual System Cost       | 39          |
| 3.6 Computerized System Cost Analysis              | 40          |
| 3.7 Five Years Accumulate Computerized System Cost | 41          |
| 3.8 The Comparison of System Costs                 | 44          |
| 5.1 Degree of Achievement                          | 50          |
| C.1 Process Specification of Process 1.1           | 75          |
| C.2 Process Specification of Process 1.2           | 75          |
| C.3 Process Specification of Process 1.3           | 76          |
| C.4 Process Specification of Process 2.1           | 76          |
| C.5 Process Specification of Process 2.2           | 77          |
| C.6 Process Specification of Process 3.1           | 77          |
| C.7 Process Specification of Process 3.2           | 78          |
| C.8 Process Specification of Process 3.3           | 78          |
| C.9 Process Specification of Process 4.1           | 79          |
| C.10 Process Specification of Process 4.2          | 79          |
| C.11 Process Specification of Process 4.3          | 80          |
| C.12 Process Specification of Process 5.1          | 80          |

| <u>Table</u>  | <u>Page</u> |
|---|-------------|
| C.13 Process Specification of Process 5.2                         | 81          |
| C.14 Process Specification of Process 5.3                         | 81          |
| C.15 Process Specification of Process 6.1                         | 82          |
| C.16 Process Specification of Process 6.2                         | 82          |
| C.17 Process Specification of Process 6.3                         | 82          |
| D.1 Data Dictionary of Sales Processing System of Existing System | 83          |
| D.2 Data Dictionary of Sales Processing System of Proposed System | 84          |





# **I. INTRODUCTION**

## **1.1 Background of the Project**

Nowadays, there is a rapid change that has occurred in the business world. Computer, has taken place to perform an important role in term of data processing and business to business communication network linking. Therefore, today, speed is one of the important factors of the business operation. This system development design is for Chockchai Company Limited in order to facilitate the day-to-day operation in the area of Marketing and Sales Department.

The major responsibility of Marketing and sales Department are revenue generation and increase profitability for the company. The process cycle normally includes sales order entry, billing, shipping, account receivable, and credit & collection. Sales Order Processing is concerned with receiving sales order checking customer's name & address, checking inventory, and processing order until printing Invoice. Marketing concerns the details of Invoice and pick up of the products for customers. After the products are received already, the documents will be sent back to the Accounting Department later.

For the Marketing & Sales Department, sales analysis is essential to evaluate sales performance, product, and forecasting including checking customer's record. In addition, the analysis is also useful for manager's decision making in the business. Consequently, a good information is a strategic tool to achieve competitive advantage against competitors in the marketing.

Now, Chockchai company operates its business activities based on the manual system. After investigation of the existing system and discussion with management, the following problems were encountered:

- (1) The information cannot be shared between department.
- (2) Different format of reports of each department
- (3) Getting the information takes a long time
- (4) Redundancy of data
- (5) The resources cannot be shared between each function.

Therefore, Chockchai company will bring the computer system to operate the Sales Order processing System which is designed to meet the user's requirement to keep up with the dynamic marking. It has to be developed in the timely accurate and controllable manner including easy use for the users to analyze sales performance and direct the information efficiently and effectively.

## 1.2 Objectives of the Project

The objective of the project on Ordering Information System are as follows:

- (1) The analyst the existing system:
  - (a) To study the internal and environment of the system
  - (b) To generate the understanding of the existing system
- (2) The analyst and design the new system requirements
  - (a) To design the new system that is suitable with the technology
- (3) To implement the new system
  - (a) To help the saving time and people in the order working
  - (b) To make the operation is quickly and efficiency
  - (c) To produce products according the working office requirement
  - (d) To make the information are accurate
  - (e) To reduce cost of system output

#### 1.4 Scope of the Project

The scope of this project covers the area of Sales Order Processing System which emphasis on the following requirement:

- (a) To create a system which can be integrated with other departments
- (b) To design database of product, customer, order, invoice, and reporting
- (c) To design relationship between each record
- (d) To design the communication network supporting the new proposed system
- (e) To estimate costs of the system
- (f) To provide report that help in decision making

A brief overview of the project is as follows. The discussion in the first chapter deals with the introduction to the objective and scope of the project. The second chapter describes the background of the organization, the analysis of the result of the existing system, the problems and area of improvement., After the system analysis and system design, the result are in third chapter. This chapter describes the conceptual requirement of the user, the new computerized system, the hardware and the software requirements, finally the cost comparison. The fourth chapter shows the project implementation which is divided into application development, test the system, implementation, data conversion and training. The conclusion and recommendation are discuss in Chapter 5.



## 1.5 Project Plan

After the approval of the management, the analyst planned the project phases as follows:

- (1) Study existing manual system: including studying the existing workflow, defining the objective and scope, and identifying existing problem.
- (2) New system analysis: analyze and develop context diagram, develop data flow diagram, and cost and benefit analysis
- (3) New system design and model: analyze the model of the new system, define the input and output, and design the interface for data entry and report.
- (4) Test and install the new system: including installing the new application program, data conversion and implementing with train and test user and program.

The details of the project plan schedule are defined in Figure 1.1.

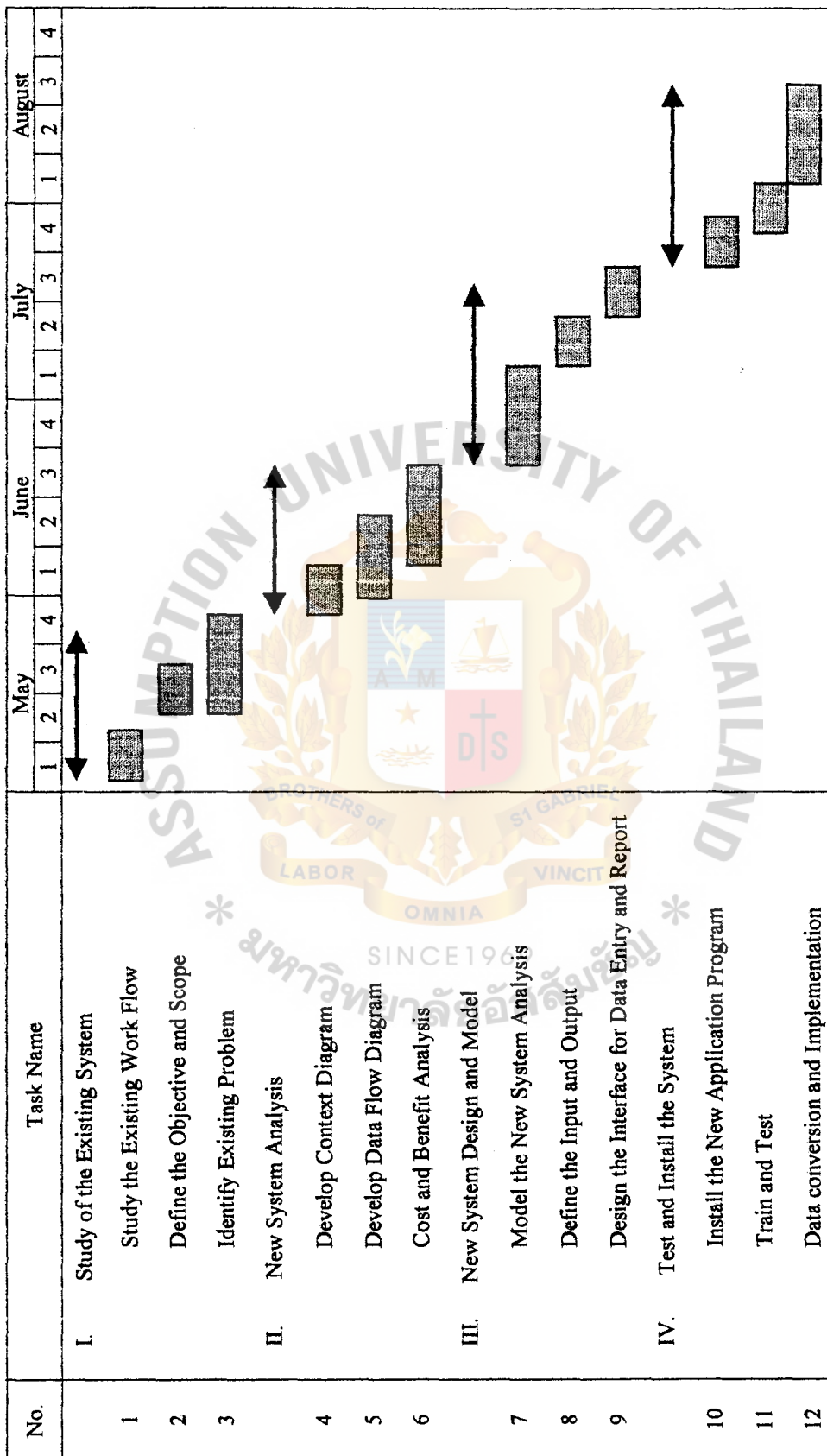


Figure 1.1. Project Plan of Sales Order Processing System.

## II. THE EXISTING SYSTEM

### 2.1 Background of The Company

Chockchai Company Limited was established in 1980, and it is located at 52/20 Petchkasem Road Tapra Bangkokyai Bangkok 10600 Thailand. The company's business activity is the Manufacturing of shoe under the brand name of "Chaiga".

Chockchai Company Limited can be illustrated into 3 main departments and each of their major functions are described as follows:

- (1) Marketing and Sales Department
  - (a) Forecasting sales
  - (b) Calculating the tendency of the market target of each product
  - (c) Forecasting the product life cycle
  - (d) Marketing a decision for market situation
  - (e) Creating the market plan and strategies
  - (f) Pushing sales volume up to the market
- (2) Accounting Department
  - (a) Collecting the payment
  - (b) Generating the financial documents
  - (c) Issuing the financial report
  - (d) Performing the financial control of the company cash flow
  - (e) Paying tax

### (3) Product Department

- (a) Produce product
- (b) Forecasting the volume of the product to be produced
- (c) Performing the quality control
- (d) Selecting the appropriate raw material in terms of cost and quality
- (e) Testing the product quality
- (f) Keeping and taking care of the finished product
- (g) Delivering the product to the customer within time
- (h) Checking and counting stock at the end of every month
- (i) Performing the stock control system

Chockchai company is a small company and has a simple organization chart which is shown in Figure 2.1. Mostly Chockchai company uses informal communication. Each department above has its own management style and information flow and report format within its department but all the departments will have the same outcome according to the corporate policy.

At present, the company has grown rapidly with larger customers. Sales processing is the major function of the company. The Sales section deal directly with the customer and try to sell as much good as possible. Due to the rapid expansion, the number of customers has increased so the problem of filing system gives the management trouble and it also slows data processing. Each department has its own filing system but they could not share the same data resources.



In order to review the performance of the company every period and improve efficiency and ease of use, the company has to send each department the updated information within specific calls.



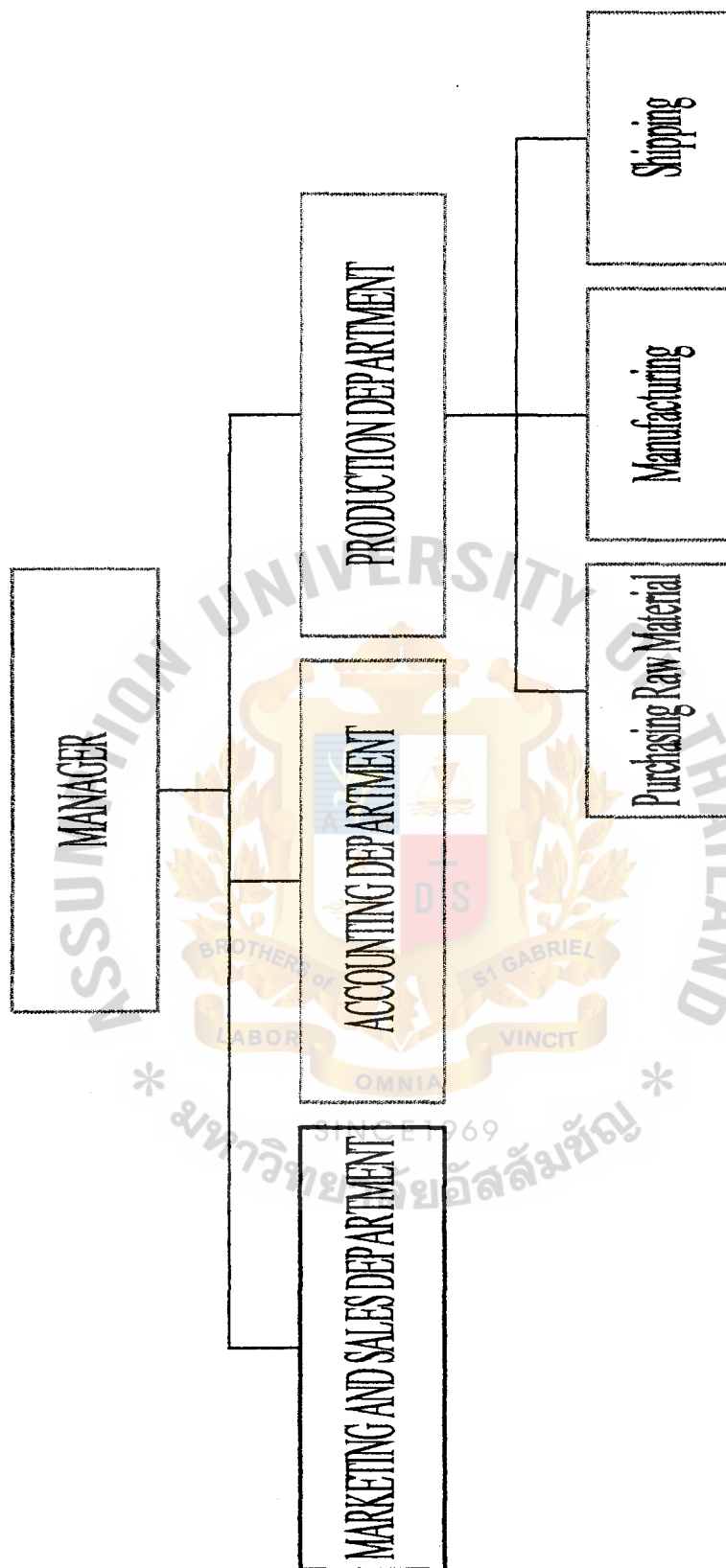


Figure 2.1. Organization Chart of Chockchai Company Limited.

## 2.2 Existing Business Function

The existing business functions of Chockchai company are manual and can be summarized as follows:

### 2.2.1 Context Diagram of Existing System

Context diagram provides the overall picture of the existing system which is shown in Figure 2.2. Customer makes an order then the company asks the customer in confirmation of the order. The delivery order is sent to production department in order to get the product for the customer. After that invoice is sent to the customer with the ordered product . Payment from customer will be sent to accounting department with another copy of invoice. At the end of each month the report is sent to the manager.

### 2.2.2 Data Flow Diagram of Existing System

The data flow diagram of the existing system is divided into the four processes which is shown in Figure 2.3. All process are performed manually. The four process are:

#### Process 1: Accept Order Request

Sales staff accepts a product order list from a customer and then verify the order. After that staff sends a confirmation order to the customer.

#### Process 2: Check Available Stock

After sales staff accepts the order request from the customer, then check this ordered product in the production department. If an ordered product is unavailable, the staff will order the production department to produce the unavailable ordered product.

### Process 3: Create Invoice

Staff creates invoice from product order list detail and print in hard copy to customer and accounting department.

### Process 4: Produce Report

The staff generates reports such as sales report, payment report and then send them to manager

#### 2.2.3 Existing Documents

- (1) Invoice: This is a formal document. It can be considered as a sales document given to the customer, and another copy is sent to the accounting department.
- (2) Product List: The product list includes the information of products to be sold, price, and availability of each product.
- (3) Purchase Order: The customer makes out the purchase order and issues this documents to the company in placing an order.
- (4) Delivery Order: This is an informal document which is used inside the company to the production department. The details of the delivery order include shipping location, and amount of ordered product.



#### 2.2.4.Product of the Existing System

The product of the existing system is to provide customer service, record sales and provide reports to the manager. The existing system does not provide enough information needed by the management. The inefficient system demands for a better system such as computerized system which could provide better services to management and customer.



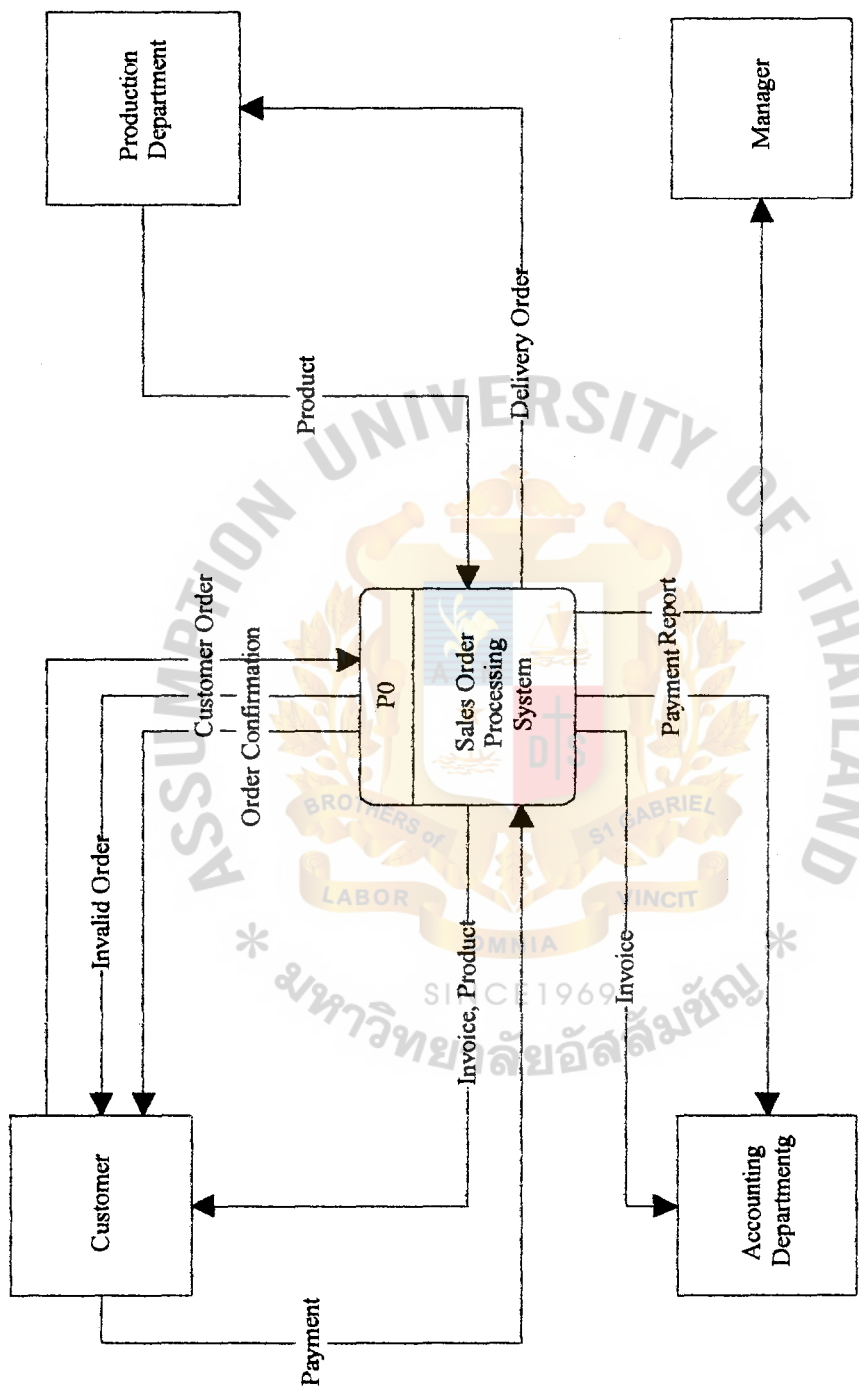


Figure 2.2. Context Level Data Flow Diagram of Sales Order Processing System of Existing System.

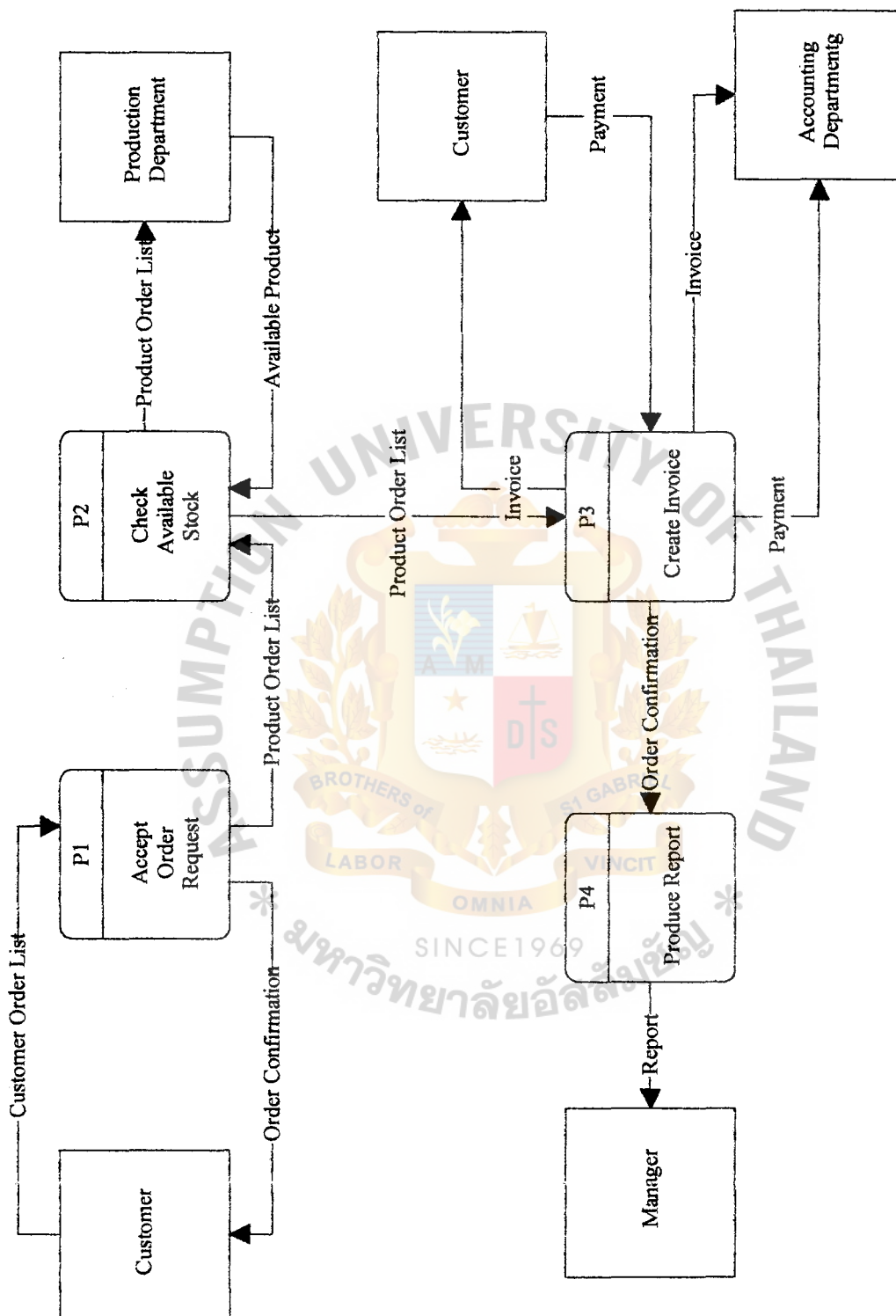


Figure 2.3. Level 0 Data Flow Diagram of Sales Order Processing System of Existing System.

## 2.3 Current Problems and Areas for Improvements

### 2.3.1 Current Problem

After surveying the existing system, the problems have been stated as the following:

(1) Lack of data integrity

As the process of the system, it deals and contacts many departments in the organization. Sometimes the data will be changed, and then the staff must inform the other departments which have been effected on this situation.

However, the information which must be transferred to other department usually is usually lost in the manual process. Therefore some changes in a document occurs many times in the marketing & sales department so it does not match with the invoice

(2) Time consumption

The daily transactions which are transferred to another department must be rewritten and recorded to the document files. Therefore, the process of each transaction will consume more time and it also creates the routine jobs. Sometimes many mistakes occur from both sales and accounting department. And it takes a lot of time to check and correct. The accounting staff has to spend quite a long time in gathering the additional information and rechecking a bulk of documents all the time.

(3) Information accuracy

The high workload can cause the mistakes and the marketing and sales departments may forget to submit and record the checks which have been correct from the customers. And it is sometimes forgotten to submit the copy of the invoice to the accounting department. That is the cause of the error in several reports.

(4) Document redundancy

The company will have a lot of document files in each department and must spend a lot of money for office supplies and space for the redundancy document. And the report documents which are created at each period will be destroyed unless it is the up-to-date report.

(5) Inventory control

The error in the inventory control method also causes a lot of problems to the sales department such as the shortage of the products and the over-stock of the unsold products.

### 2.3.2 Areas for improvements

(1) Increase the data integrity

The unnecessary jobs should be cut off, at least should be simplified.

We have to set up the new policy to reduce the job which has the same procedure. The new system should substitute the staff in doing some jobs. And design the new database after surveying their requirements.

(2) Reduce time consumption

Once the information is guaranteed for accuracy, the staffs need not to spend time in double process in every procedure. The information should be centralized to be kept in the same storage for easier retrieval.

(3) Improve the information accuracy

There should be the new method of storing and managing the information for more accuracy. The improved system should make sure that the information is always updated and leads the staffs to the right information they want.

(4) Reduce the redundancy document

After the computerized system has been implemented, the redundancy documents will be solved. The computerized system must implement the concept of paperless system and GUI. And the management can make the decision by using the report shown at their personnel terminal.



(5) Improve the inventory control

The new system must have to be interfaced to the inventory control system to keep track of the products for better management to lower the cost of the on-hand products.



### **III. THE PROPOSED SYSTEM**

The proposed computerized system will facilitate the day-to-day operation and set up information base for management instead of manual system. The proposed system will serve all user requirements, utilize existing resources and increase effectiveness in daily operation.

#### **3.1 User Requirements**

The user requirements are translated into system characteristics during design. An information system can meet user needs since it can accomplish the stated following:

- (1) Performs the right procedures properly
- (2) Presents information and instructions in an acceptable and effective fashion
- (3) Produces accurate result
- (4) Provides an acceptable interface and method of interaction
- (5) Is perceived by users as a reliable system

The requirement from the user can be stated that the new proposed system should be able to perform as follows:

- (1) Reduce time and increase an accuracy of searching the product which is matched to the order requested by the customer
- (2) Reduce work flow and no work duplication still exists in the work processes
- (3) All the data can be controlled and accessed upon right request
- (4) Application is easy to use and implement
- (5) Generate reports up to the request
- (6) Increase effectivity and efficiency of each work process

- (7) Maintain the consistency and integrity of the kept data
- (8) Provide necessary data, such as analysis report for management decision
- (9) Reduce redundancy of the kept data

## **3.2 System Design**

### **3.2.1 Overview of the Proposed System**

The proposed system is designed to support better performance of the inventory control system. The computer program that will be used to perform the system is Microsoft Access. The users who are inventory staffs will use Microsoft Access for daily transaction in which we have designed the interface screen for easy use and the user will be trained to use the mentioned program as well.

### **3.2.2 The New System Design**

In order to improve the performance of the sales section, we need to design its logical data flow. We are going to discuss about the context diagram and the logical data flow which are necessary for the new system design.

Figure show the context diagram that is the view of the sales processing system and its relation to other sections. The data flow diagram of process level 0, data flow diagram of process level 1 are shown in Figures 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, and 3.8 respectively. As for data dictionary and process Specification, they are shown in Appendices C and D respectively.

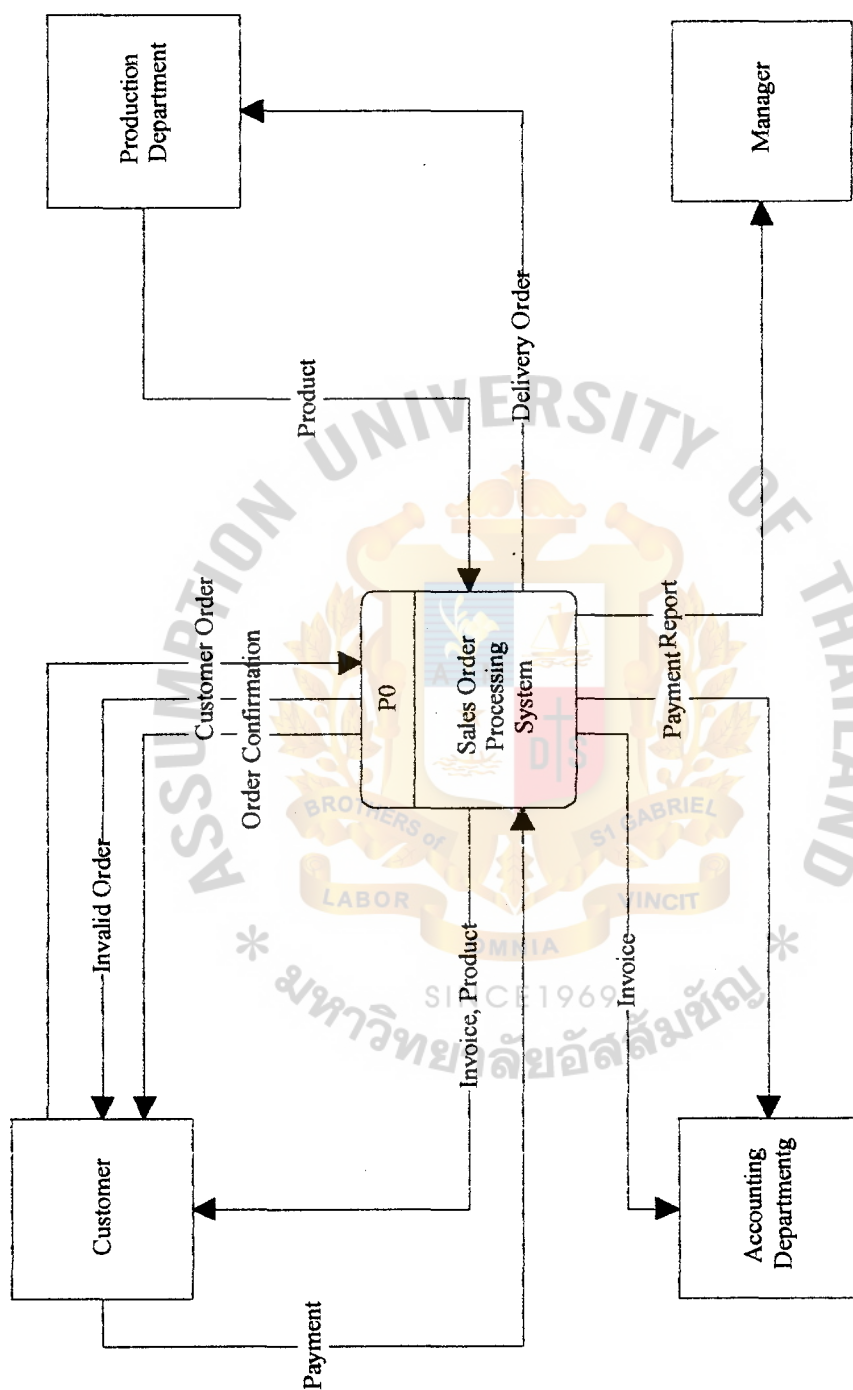


Figure 3.1. Context Level Data Flow Diagram of Sales Order Processing System.

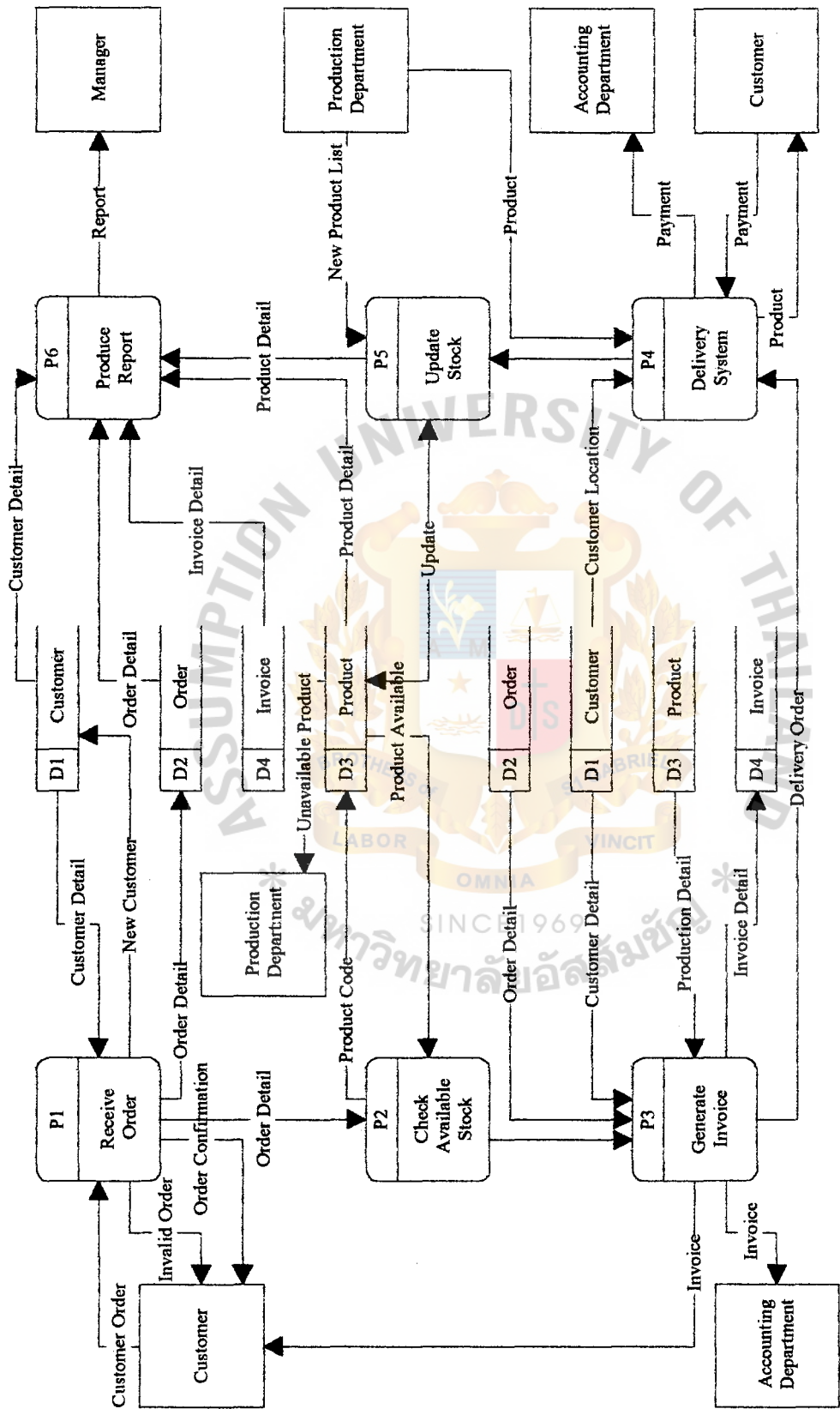


Figure 3.2. Level 0 Data Flow Diagram of Sales Processing Information System.

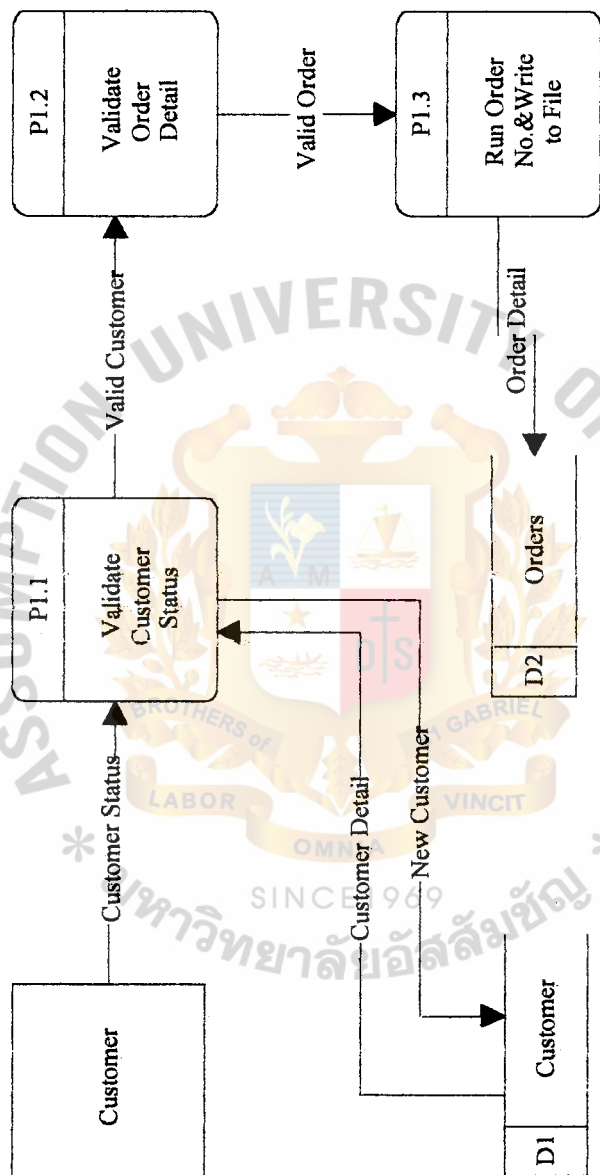


Figure 3.3. Level 1 Data Flow Diagram of Receive Order Process of Sales Processing Information System.



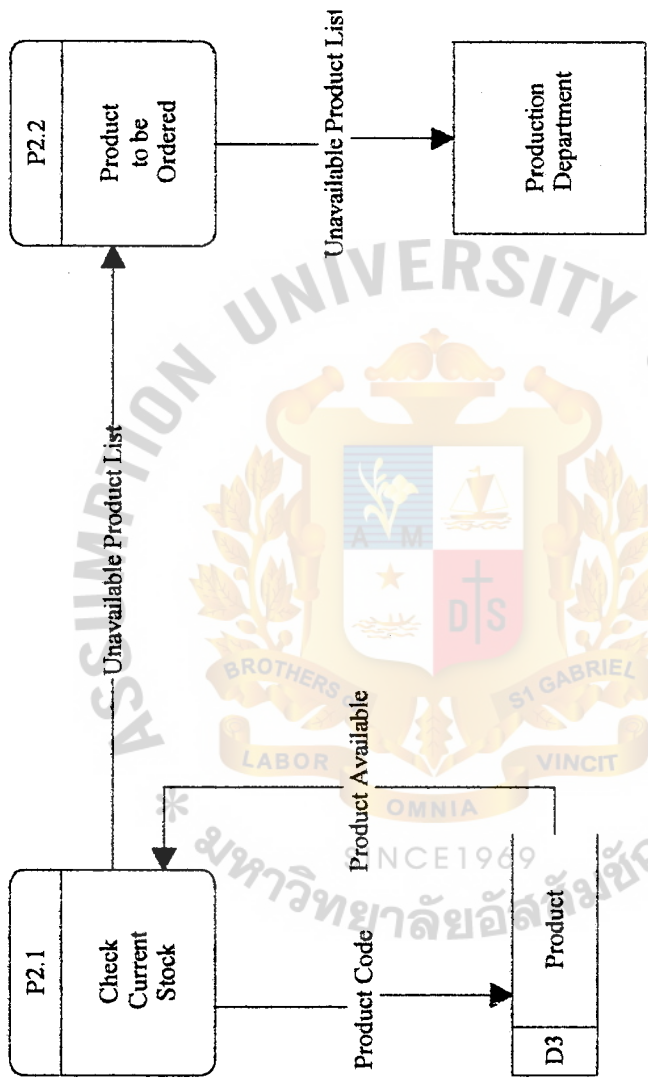


Figure 3.4. Level 1 Data Flow Diagram of Check Available Stock Process of Sales Processing Information System.

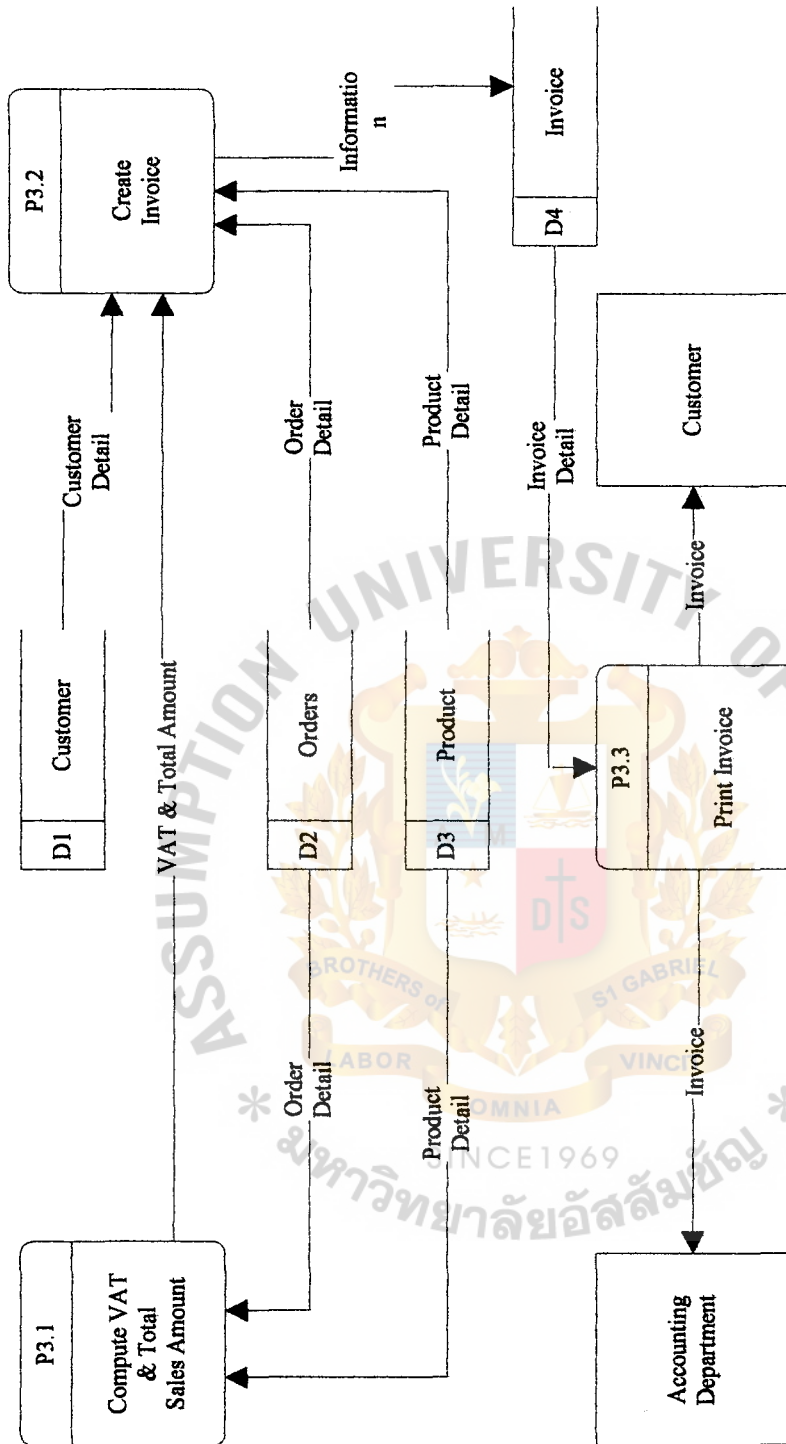


Figure 3.5. Level 1 Data Flow Diagram of Generate Invoice Process of Sales Processing Information System.

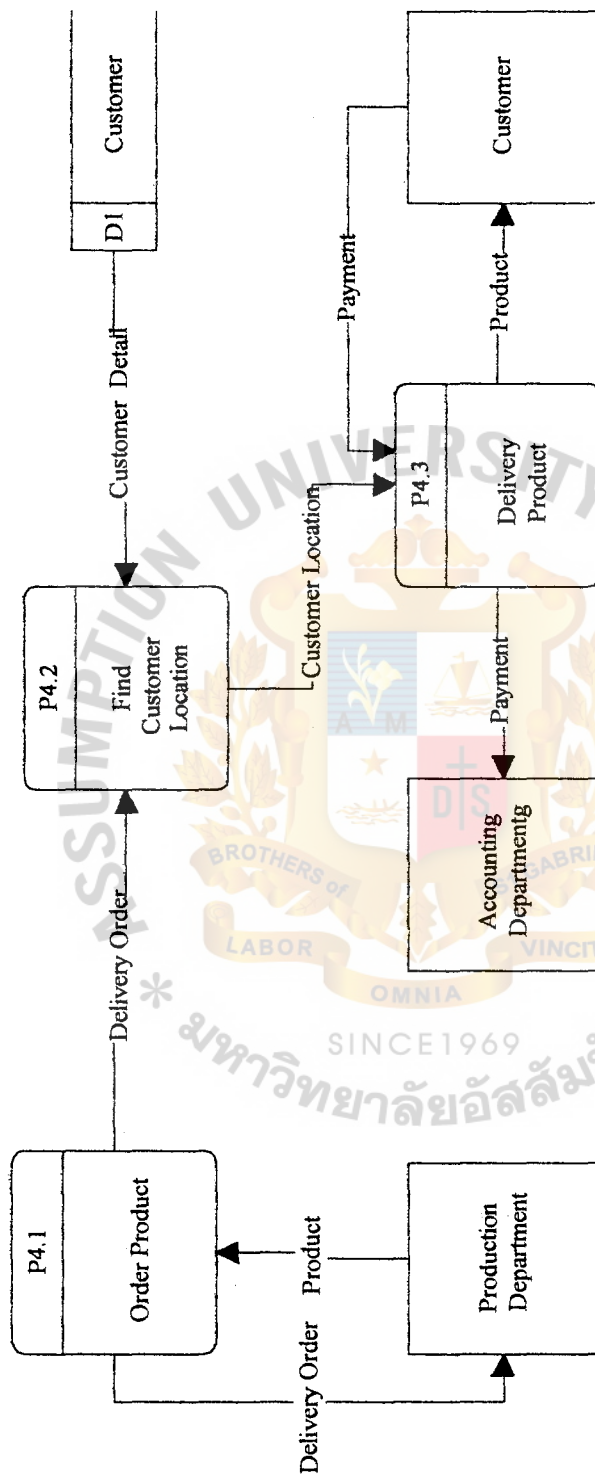


Figure 3.6. Level 1 Data Flow Diagram of Delivery System Process of Sales Processing Information System.

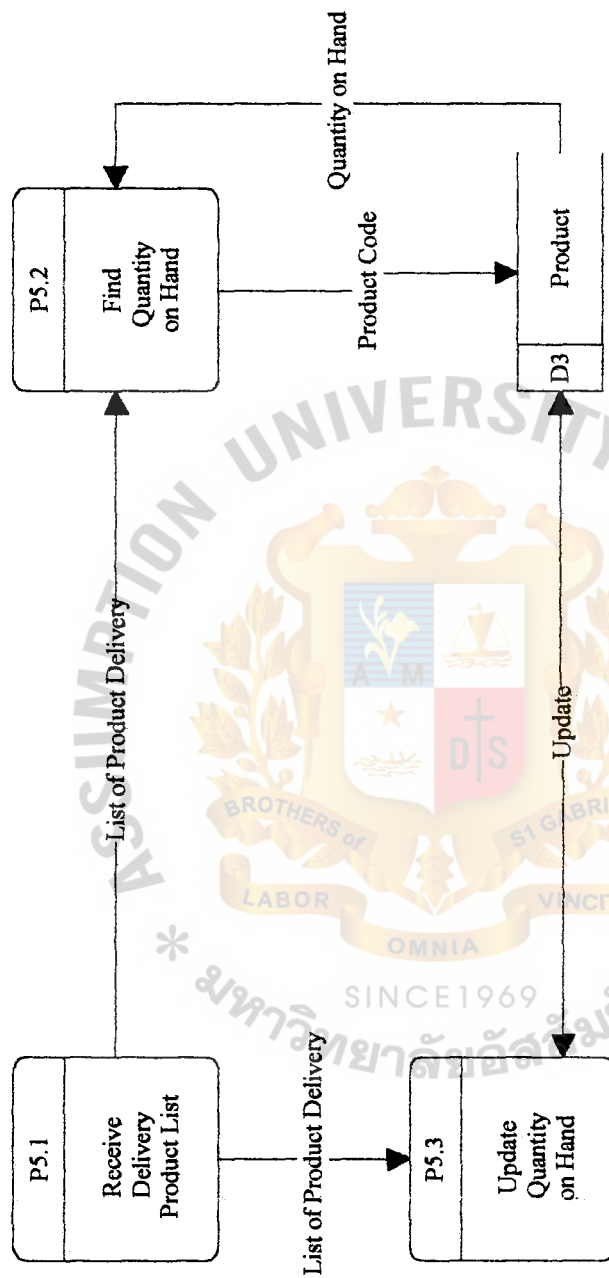


Figure 3.7. Level 1 Data Flow Diagram of Update Stock Process of Sales Processing Information System.

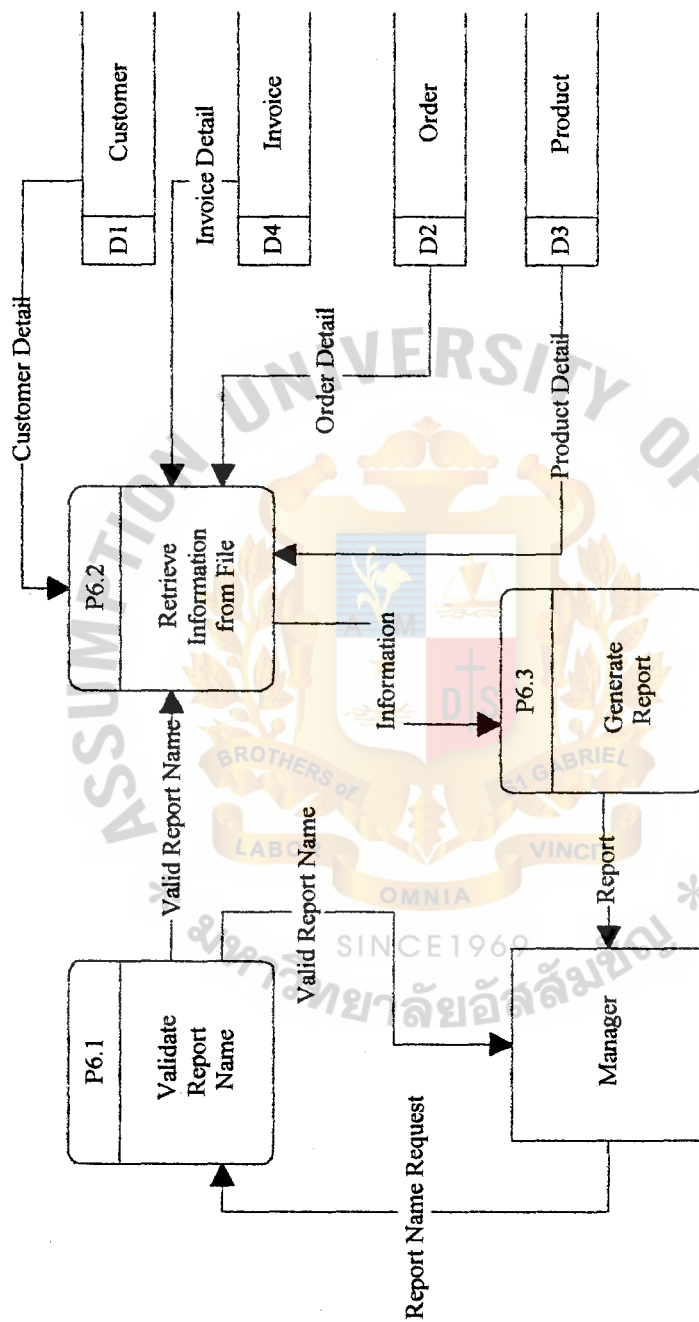


Figure 3.8. Level 1 Data Flow Diagram of Produce Report of Sales Processing Information System.

The whole of the proposed system is divided into 6 process as stated below:

Process 1: Receive Order

- (1) To check customer record
- (2) To verify customer order
- (3) To update customer record

Process 2: Check Available Stock

- (1) To check available stock
- (2) To order unavailable product to production department

Process 3: Generate Invoice

- (1) To create customer Invoice
- (2) To communicate with Accounting Department with regard to customer invoice
- (3) To send invoice to customer

Process 4: Delivery System

- (1) To find customer location from file
- (2) To send product to customer
- (3) To get payment from customer
- (4) To send payment to Accounting Department

Process 5: Update Stock

- (1) To inform delivery product
- (2) To adjust and update quantity on hand
- (3) To daily update product on hand after sales



## Process 6: Produce Report

- (1) To retrieve information from file
- (2) To generate report

The above mentioned 6 processes have been designed to control the sales processing system for better performance. This leads to many advantages compared to the system such as it provides more convenient and accurate information and helps in the prospective view for the management level in case of expansion to meet the company growth.



### 3.3 Hardware and Software Requirement

The proposed system has specific hardware and software specification as follows:

#### 3.3.1 Hardware Requirements

The system will use personal computer to run. All computers will be connected to one another on small LAN. One set of computers will be dedicated to be a file server, which will be used to store the data shareable to all workstation. The file server usage will help to reduce time and cost of separate storage.

The network will be Ethernet type connected to concentrator (HUB) using UTP cable. The network adapter cards are installed in all computer sets. The configurations of hardware are as follows:

Table 3.1. Hardware Specifications for Intranet Server.

| Hardware     | Specification                          |
|--------------|--|
| CPU          | PENTIUM III 650 E BOX                  |
| Memory       | SDRAM128/133 standard, Hyundai         |
| Hard Disk    | 20.5 GB Quantum 7200 RPM               |
| Floppy Drive | 1.44MB diskette drive                  |
| Audio        | Creative Live Value                    |
| Display      | 17" MAG FD786                          |
| Graphics     | Integrated Intel 3D Graphics           |
| Multimedia   | AGP VANTA TNT2 32MB TV out             |
| Accessory    | 104 Keys Keyboard, mouse and mouse pad |
| CD ROM       | CD ROM 52 X Creative                   |

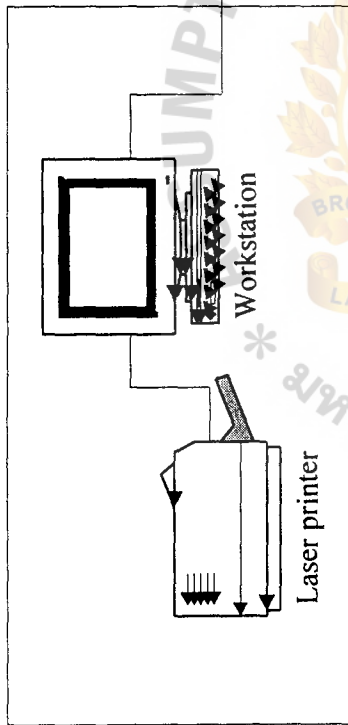
Table 3.2. Hardware Specifications for Each Client Machine.

| Hardware     | Specification                          |
|--------------|--|
| CPU          | PENTIUM III 500 E BOX                  |
| Memory       | SDRAM 64/133 standard, Hyundai         |
| Hard Disk    | 10.2 GB Seagate 5400 ROM               |
| Floppy Drive | 1.44MB diskette drive                  |
| Audio        | Creative Live Value                    |
| Display      | 15" MAG 570 FD                         |
| Graphics     | Integrated Intel 3D Graphics           |
| Multimedia   | AGP VANTA TNT2 32MB TV out             |
| Accessory    | 104 Keys Keyboard, mouse and mouse pad |
| CD ROM       | CD ROM 52 X Creative                   |
| Printer      | HP LASER JET 1100                      |

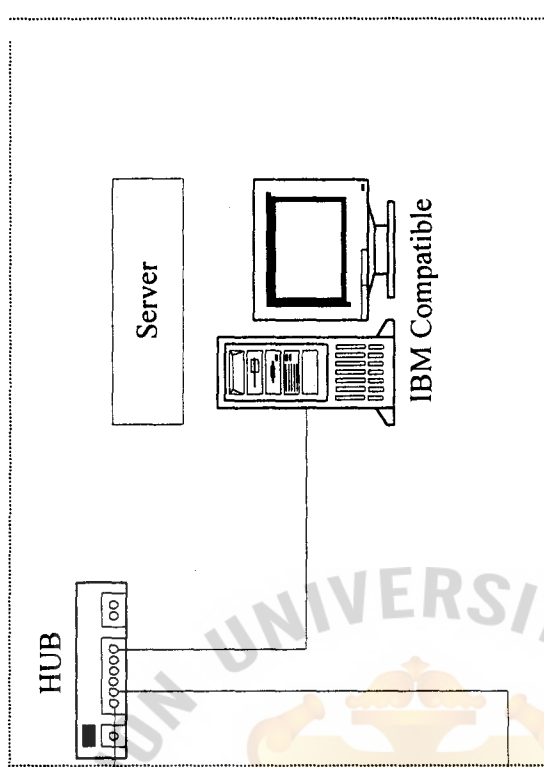
The components of network configuration are defined as follows:

- (1) UPS (Uninterruptible Power Supply) 500VA : 3 units
- (2) UTP 4 pairs CAT-5: 200meter
- (3) HUB(Lanbit Multi Switching) 3 Com 8 port 10/100: 1 unit
- (4) Eternet LAN card 10/100 Mbps Pci: 3 units

Marketing and Sales Department



Manager



Accounting and Production Department

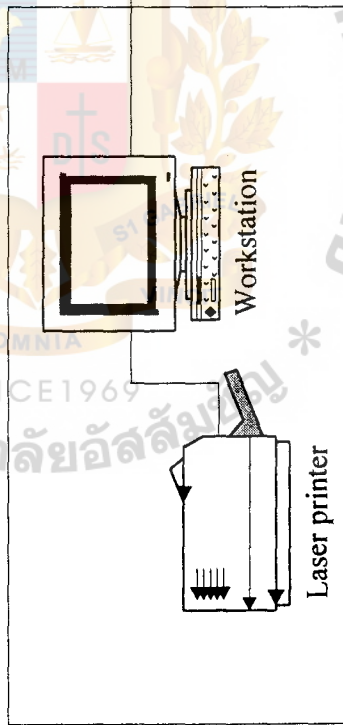


Figure 3.9. Hardware Configuration of Proposed System.

### 3.3.2 Software Requirements

Table 3.3. Software Specifications.

| Software               | Specification       |
|------------------------|---------------------|
| Operating System       | Window 98           |
| Application Software   | Microsoft Office 97 |
| Communication Software | Window 98           |
| Database Server        | Microsoft Access 97 |

### 3.3.3 Network Specification

The objective of network connection is sharing resources that are database or information, application programs and hardware. This network allows multiple users to access resources at the same period of time. This system is designed by Star topology that uses HUB to be the center of the connecting workstations (Figure 3.9.). The components of the network configuration are defined as follows:

- (1) Network Topology :Star Topology
- (2) Interconnection :HUB 12 ports
- (3) Wiring and cable :UTP 4 Pairs CAT-5
- (4) Server :PCs File Server
- (5) Workstation :PCs
- (6) Network operation :Microsoft Window 98
- (7) Network interface card :LAN card

### 3.4 Security and Control

The major assets of computing system are hardware, software and data. An attack to the hardware renders data being processed to be lost or unusable . There are risks of theft or malicious destruction of hardware. Software can also face the threat of copying of programs and can also be destroyed maliciously or it could be modified or deleted. Data attack is one of the other serious problems as an unauthorized system also needs to provide security for the Local Area Network.

The following security and control methods are proposed to avoid attacks the computer system may face:

- (1) Only authorized persons are permitted physical access to the system.
- (2) Password is installed into the program for the user to have access to certain area of the database.
- (3) An UPS (Uninterrupted Power Supply) is recommended to prevent loss of data during power failure.
- (4) All input forms should be verified and checked by an authorized person before entering the data in the database.
- (5) All the application programs' backup copies should be kept at a safe and secure place. The backup process should take place at the end of each day.
- (6) The authorized person should make data entry, modification and correction.

For checking this when the user selects to do any of the above three actions, he/she is asked to enter the user name and the password. After checking if he/she is authorized to make the data entry, modification and correction, he/she is allowed access to it.



- (7) Hardware and printer should not be left unattended during the printing process.
- (8) The computer hardware must be locked in the office at closing time, and the key should be entrusted to an authorized person.
- (9) Authorized persons should be instructed to sign source documents.
- (10) Staff should be provided with adequate training of how to use the system.
- (11) The distribution of reports should be controlled to ensure that they are sent to the correct places.



### 3.5 Cost/Benefit Analysis

#### 3.5.1 Cost Analysis

##### (1) Cost of the Existing System

The cost occurring in the existing system can be clarified mainly by 2 items, one is for the fixed cost for running the operation and the other is the variable operation cost that depends on the transactions occurring yearly which are shown in table below:

Table 3.4. Manual System Cost Analysis, Baht.

| Cost Items                                       | Year 1              | Year 2              | Year 3              | Year 4              | Year 5              |
|--|---------------------|---------------------|---------------------|---------------------|---------------------|
| <u>Operating Cost</u>                            |                     |                     |                     |                     |                     |
| <u>Personnel</u>                                 |                     |                     |                     |                     |                     |
| Manager 1 person @ 20,000 x 12 months            | 240,000.00          | 264,000.00          | 290,400.00          | 319,440.00          | 351,384.00          |
| Sales Officer 3persons @ 10,000 x 12 months      | 360,000.00          | 396,000.00          | 435,600.00          | 479,160.00          | 527,076.00          |
| Accounting Officer 2persons @ 12,000 x 12 months | 288,000.00          | 316,800.00          | 348,480.00          | 383,328.00          | 421,660.80          |
| Production Officer 3persons @ 9,000 x 12 months  | 324,000.00          | 356,400.00          | 392,040.00          | 431,244.00          | 474,368.40          |
| Total Personnel Cost                             | <u>1,212,000.00</u> | <u>1,333,200.00</u> | <u>1,466,520.00</u> | <u>1,613,172.00</u> | <u>1,774,489.20</u> |
| <u>Office Supplies &amp; Miscellaneous Cost</u>  |                     |                     |                     |                     |                     |
| Stationary per annual                            | 5000.00             | 5,500.00            | 6,050.00            | 6,655.00            | 7,320.50            |
| Paper per annual                                 | 10,000.00           | 11,000.00           | 12,100.00           | 13,310.00           | 14,641.00           |
| Miscellaneous per annual                         | 3,000.00            | 3,300.00            | 3,630.00            | 3,993.00            | 4,392.50            |
| Utility Cost per annual                          | 2,000.00            | 2,200.00            | 2,420.00            | 2,662.00            | 2,928.00            |
| Total annual supplies & miscellaneous Cost       | <u>20,000.00</u>    | <u>22,000.00</u>    | <u>24,200.00</u>    | <u>26,620.00</u>    | <u>29,282.00</u>    |
| Total annual Operating Cost                      | 1,232,000.00        | 1,355,200.00        | 1,490,720.00        | 1,639,792.00        | 1,803,772.20        |
| Total Manual cost per year                       | <u>1,232,000.00</u> | <u>1,355,200.00</u> | <u>1,490,720.00</u> | <u>1,639,792.00</u> | <u>1,803,772.20</u> |

Table 3.5. Five Years Accumulate Manual System Cost.

| Year  | Total Manual Cost (Baht) | Accumulate Cost (Baht) |
|-------|--------------------------|------------------------|
| 1     | 1,232,000.00             | 1,232,000.00           |
| 2     | 1,355,200.00             | 2,587,200.00           |
| 3     | 1,490,720.00             | 4,077,920.00           |
| 4     | 1,639,792.00             | 5,717,712.00           |
| 5     | 1,803,770.40             | 7,521,482.40           |
| Total | 7,521,482.40             |                        |

(2) Cost of Computerized System

The main cost of computerized system includes the investment cost, implementation cost, and annual operating cost. The investment costs are non-recurring capital outlays to develop or acquire new equipment's and technology such as new hardware and software and other items which are necessary cost of proposed system. Implementation costs are basically the costs incurred to install the proposed system and are one time cost outlays. It includes the cost of development of the system, the cost of time taken in developing are taken into consideration after the development of the implementation has taken place. Annual operation costs are the recurring costs for operating the system on a monthly or yearly basis depending on the nature of the business. It means the costs of software and hardware maintenance and consideration are taken into consideration. The cost of computerized system are mentioned in Table 3.6.

Table 3.6. Computerized System Cost Analysis, Baht.

| Cost Items  | Year 1              | Year 2              | Year 3              | Year 4              | Year 5              |
|---|---------------------|---------------------|---------------------|---------------------|---------------------|
| <b>Fixed Cost</b>                                 |                     |                     |                     |                     |                     |
| Hardware Cost:                                    |                     |                     |                     |                     |                     |
| Computer Server cost 1 unit @ 50,000              | 50,000.00           | *                   | *                   | *                   | *                   |
| Workstation cost 2 units @ 35,000                 | 70,000.00           | *                   | *                   | *                   | *                   |
| Printer cost 2 units @ 17,000                     | 34,000.00           | *                   | *                   | *                   | *                   |
| UPS (Uninterruptible Power Supply) 3units@3,000   | 9,000.00            | *                   | *                   | *                   | *                   |
| UTP   | 2,500.00            | *                   | *                   | *                   | *                   |
| HUB   | 12,000.00           | *                   | *                   | *                   | *                   |
| Ethernet LAN card 3units @2,000                   | 6,000.00            | *                   | *                   | *                   | *                   |
| Total Hardware Cost                               | <u>183,500.00</u>   | <u>0.00</u>         | <u>0.00</u>         | <u>0.00</u>         | <u>0.00</u>         |
| Maintenance Cost                                  | *                   | *                   | *                   | 15,000.00           | 17,000.00           |
| Total Maintenance Cost                            | <u>0.00</u>         | <u>0.00</u>         | <u>0.00</u>         | <u>15,000.00</u>    | <u>17,000.00</u>    |
| Software Cost :                                   |                     |                     |                     |                     |                     |
| Network Operating System (Window 98)              | 30,000.00           | 0.00                | 0.00                | 0.00                | 0.00                |
| Application Software (Office 97)                  | 20,000.00           | 0.00                | 0.00                | 0.00                | 0.00                |
| Total Software Cost                               | <u>50,000.00</u>    | <u>0.00</u>         | <u>0.00</u>         | <u>0.00</u>         | <u>0.00</u>         |
| Implementation Cost                               |                     |                     |                     |                     |                     |
| Software Development                              | 20,000.00           | 0.00                | 0.00                | 0.00                | 0.00                |
| User Training                                     | 20,000.00           | 0.00                | 0.00                | 0.00                | 0.00                |
| Site preparation                                  | 10,000.00           | 0.00                | 0.00                | 0.00                | 0.00                |
| Total Implementation Cost                         | <u>50,000.00</u>    | <u>0.00</u>         | <u>0.00</u>         | <u>0.00</u>         | <u>0.00</u>         |
| TOTAL FIXED COST                                  | <u>283,500.00</u>   | <u>0.00</u>         | <u>0.00</u>         | <u>15,000.00</u>    | <u>17,000.00</u>    |
| <b>Operating Cost</b>                             |                     |                     |                     |                     |                     |
| <b>Personnel</b>                                  |                     |                     |                     |                     |                     |
| Manager 1 person @ 20,000 x 12 months             | 240,000.00          | 264,000.00          | 290,400.00          | 319,440.00          | 351,384.00          |
| Sales Officer 2 persons @ 10,000 x 12 months      | 240,000.00          | 264,000.00          | 290,400.00          | 319,440.00          | 351,384.00          |
| Accounting Officer 1 persons @ 12,000 x 12 months | 288,000.00          | 316,000.00          | 348,480.00          | 383,328.00          | 421,660.40          |
| Production Officer 2 persons @ 9,000 x 12 months  | 216,000.00          | 237,600.00          | 261,360.00          | 287,496.00          | 316,245.60          |
| Total Personnel Cost                              | <u>948,000.00</u>   | <u>1,082,000.00</u> | <u>1,196,640.00</u> | <u>1,309,704.00</u> | <u>1,440,674.00</u> |
| <b>Office Supplies &amp; Miscellaneous Cost</b>   |                     |                     |                     |                     |                     |
| Stationary per annual                             | 2,000.00            | 2,200.00            | 2,420.00            | 2,662.00            | 2,928.20            |
| Paper per annual                                  | 5,000.00            | 5,500.00            | 6,050.00            | 6,655.00            | 7,320.40            |
| 3.5 Diskette per annual                           | 3,000.00            | 3,300.00            | 3,630.00            | 3,993.00            | 4,392.20            |
| Miscellaneous per annual                          | 3,000.00            | 3,300.00            | 3,630.00            | 3,993.00            | 4,392.20            |
| Utility Cost per annual                           | 3,000.00            | 3,300.00            | 3,630.00            | 3,993.00            | 4,392.20            |
| Total Office supplies & Miscellaneous Cost        | <u>16,000.00</u>    | <u>17,600.00</u>    | <u>19,360.00</u>    | <u>21,296.00</u>    | <u>23,425.60</u>    |
| TOTAL ANNUAL OPERATING COST                       | <u>1,000,000.00</u> | <u>1,099,600.00</u> | <u>1,216,000.00</u> | <u>1,331,000.00</u> | <u>1,464,099.60</u> |
| Total Computerized cost per year                  | <u>1,283,500.00</u> | <u>1,099,600.00</u> | <u>1,216,000.00</u> | <u>1,346,000.00</u> | <u>1,481,099.60</u> |

Table 3.7. Five Years Accumulate Computerized System Cost.

| Year  | Total Computerized Cost(Baht) | Accumulate Cost (Baht) |
|-------|-------------------------------|------------------------|
| 1     | 1,283,500.00                  | 1,283,500.00           |
| 2     | 1,099,600.00                  | 2,383,100.00           |
| 3     | 1,216,000.00                  | 3,599,100.00           |
| 4     | 1,346,000.00                  | 4,945,100.00           |
| 5     | 1,481,099.00                  | 6,426,199.60           |
| Total | 6,426,199.60                  |                        |

3.5.2 Benefit Analysis

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

(1) Tangible Benefits

The yield for the tangible benefits for the new proposed system are quite clear, such as the centralized computer database which can be a better source of information at least a faster retrieval source. Moreover, it can reduce redundancy of record keeping for each personnel’s information that affects the decreasing unnecessary documents. Management will get more accurate information so that they can get better control. Furthermore, it will reduce time in searching or producing the standard report required by each personnel.

Although the cost of developing the proposed system is higher than that of the manual system, in the near future the usage of the new system will become more economical and attractive than using the current system.

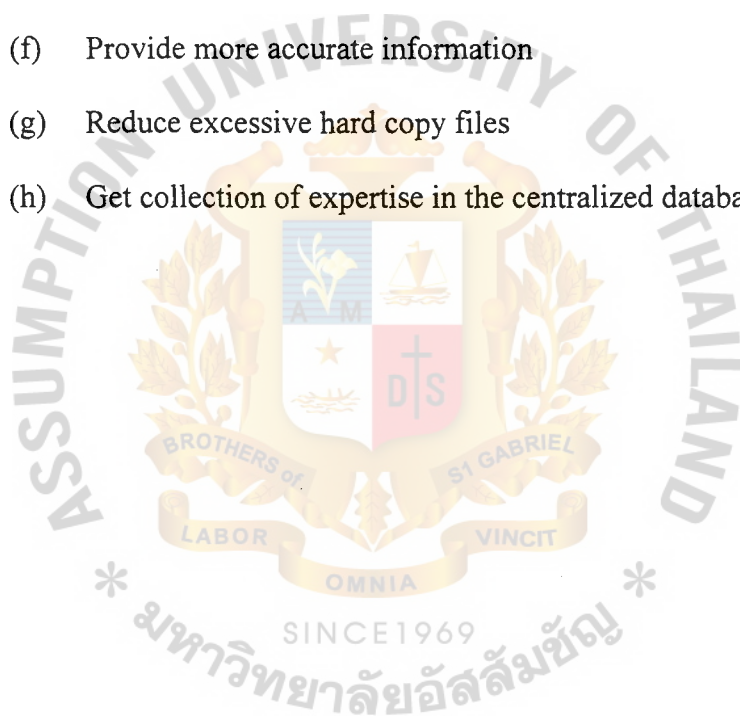
The benefits that are tangible can be summarized as follows:

|     |                           |         |           |
|-----|---------------------------|---------|-----------|
| (a) | Reduce sales staff        | 120,000 | baht/year |
| (b) | Reduce Production officer | 108,000 | baht/year |
| (c) | Reduce cost of paper use  | 5,000   | baht/year |
| (d) | Reduce cost of stationary | 3,000   | baht/year |
|     | Total Annual cost saving  | 236,000 | baht/year |

## (2) Intangible Benefit

The following items are the intangible benefits expected from the system:

- (a) Reduce searching time for required document
- (b) Provide more efficient procurement plan
- (c) Provide competitive advantage in finding new procurement policy
- (d) Reduce redundancy of data
- (e) Reduce workload of record keeping, data entry
- (f) Provide more accurate information
- (g) Reduce excessive hard copy files
- (h) Get collection of expertise in the centralized database





3.5.3 Cost Comparison

There are many well-known techniques for comparing the costs and benefits of the proposed system. They include break even analysis, payback etc. All the techniques provide straight forward information to decision makers about the worthiness of the proposed system.

Comparing the accumulate cost of existing system and accumulate cost of proposed system is given in table 3.8.. The differences of the systems are shown by using break-even analysis with the help of a graph, which is shown in figure 3.10. After one year and one month, the cost of new system would reach the break even point and thereafter, it will become more economical to operate than current system.

Table 3.8. The Comparison of System Costs.

| Year | Accumulate Manual Cost (Baht) | Accumulate Computerized Cost (Baht) |
|------|-------------------------------|-------------------------------------|
| 1    | 1,232,000.00                  | 1,283,500.00                        |
| 2    | 2,587,200.00                  | 2,383,100.00                        |
| 3    | 4,077,920.00                  | 3,599,100.00                        |
| 4    | 5,717,712.00                  | 4,945,100.00                        |
| 5    | 7,521,482.40                  | 6,426,199.60                        |

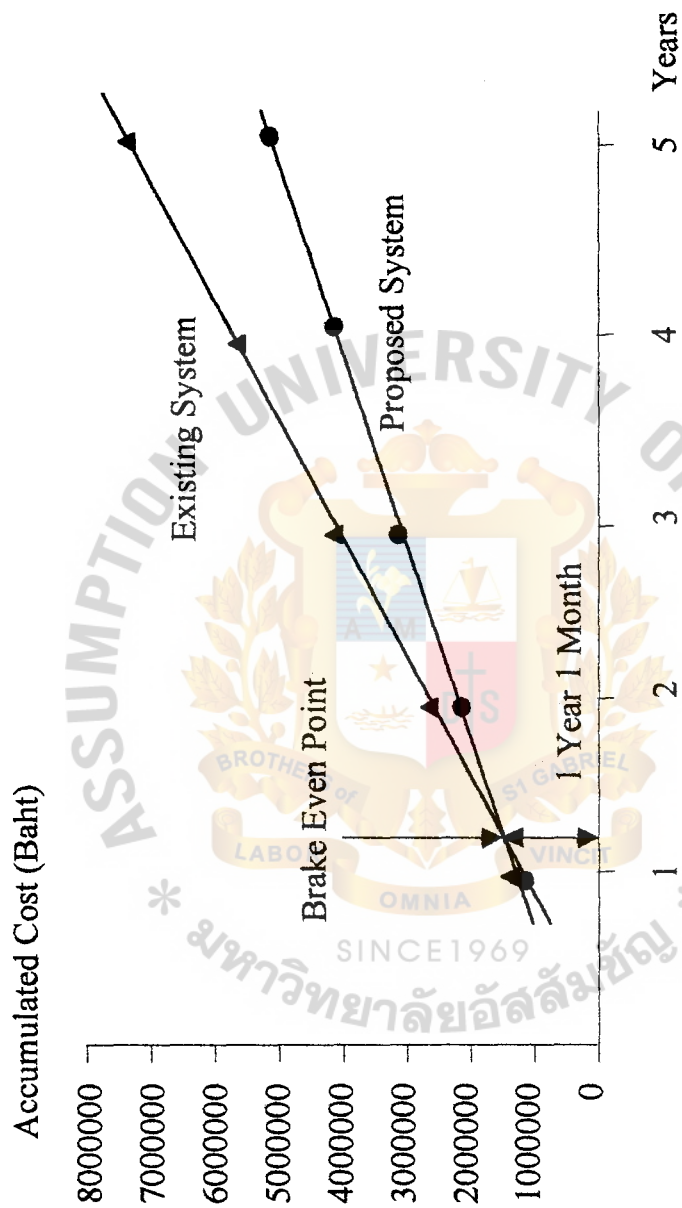


Figure 3.10. Cost Comparison Between Manual & Proposed System.

## IV. PROJECT IMPLEMENTATION

### 4.1 Overview of Project Implementation

The implementation process is set up by using the parallel run concept. By this concept, the process will work on both the old system and the new system for the number of cycles until the result of the new system proved the operating. Therefore a lot of time will be spent in this period for the user who will make double job in each day and must become familiar with the new process. However, the new process is designed and programmed based on the routine job of the user which spends a short time for some user to understand the process and do it correctly.

### 4.2 Stage of Implementation

The implementation consists of three stages those are the separated and distinct tasks that must be performed in sequential order:

(1) Programming

In this stage, the application programs are written in order to perform whatever business transactions that are being computerized.

(2) Testing

It involves the testing of the program, a full systems test, and the documentation of the programs. A complete schedule of testing involves the following:

- (a) Testing individual program.
- (b) Creating test data.
- (c) Ling/string/single-thread testing.
- (d) System/multiple-thread testing.

(e) Backup and restart testing.

(3) Installation

At this stage, the overall system runs the program, interface with the different files of data, utilization and telecommunication networks, and interface with the user.

(4) Training

Training the staff is and necessary job in this section because the user will use the system correctly when they understand it well. The training process is provided by duty and by department. We classify the group of users to be two groups. The first group is the user group which will be trained by each department and the other group is the manager which will be trained in all of the system in the program and it flows in one course. Therefore, the manager group must spend time for training to know the flow of the system.

(5) Documentation

Documentation of this system will be separated into 2 type document too. The first is the user-guide which describes the method to be used in this program in each screen. The other document is the programming guide which describes the flow of the system and data-dictionary. This document will help the programmer to develop system expandable and maintain the system in the future.

## 4.3 Conversion

Conversion to the new system from the old system is the significant operated for some time. This is done to ensure that all major problems in the new system have been solved before the old system is discarded. Parallel conversion minimizes the risk of major flaws in the new system causing irreparable harm to the business. Parallel conversion is suitable for the change from the manual system to the computerized system, although it increases the cost of running two systems over some period and consumes more time with double workload of employees. When the employees can run the new system smoothly and all major problem can be solved, the double workloads will be reduced.



## V. CONCLUSIONS AND RECOMMENDATIONS

### 5.1 Conclusions

The proposed system development project is a beginning point of the computerization system for the company. The system can be developed to eradicate the current problems and for the future requirements of the user. The system development project is as follows:

The user specified the wish to have a computerized database system that supports the information related to the historical purchase, historical sales, customer payment and also information share ability among all the relevant users. After considering the study of the entire system, it was gathered that there were several problems in information retrieval for making procurement action plan and management decision making because the existing system is a manual system and all the information were not kept properly. The user spent too much time for record keeping and searching for the records produced just to find only one or two needed records. Moreover, the company still wastes a lot of computer resources available in the system because of low level of utility.

After surveying and collecting user requirement, the researcher has proposed a new system of purchase, sales and billing control by data flow diagram, which shows the process in each area of work. The system design for the new system has been developed. Data dictionary, process specification, screen layout and report are prepared for use in application development.

The new computerized sales order processing control are designed to provide suitable solutions and to respond to the user requirements and for more utilization of the system resources. It helps the staffs to reduce the redundant work and routine workload tasks, leading to increased efficiency in process time.

Table 5.1 shows the time spends on each process of the proposed system compared with the existing system. It shows that each process of the proposed system spend less time than each process of existing which has to pass many manual work steps. This can be explained, as the proposed system is more efficient and effective than the existing system.

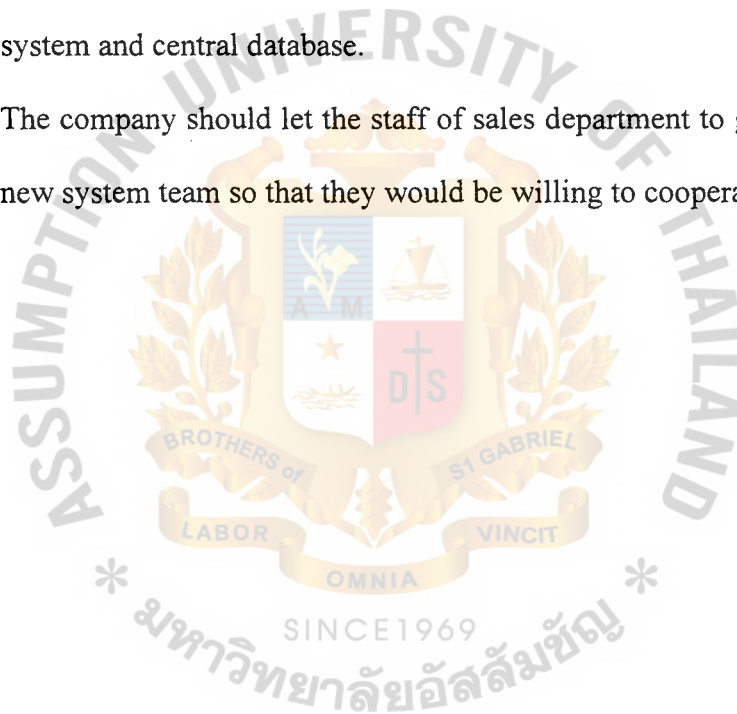
Table 5.1. Degree of Achievement.

| Process               | Existing System | Proposed System |
|-----------------------|-----------------|-----------------|
| Inquiry Process       | 15 mins.        | 3 mins.         |
| Modification Process  | 20 mins.        | 10 mins.        |
| Daily Report Process  | 1 hrs.          | 5 mins.         |
| Issue Invoice Process | 10 mins.        | 5 mins.         |
| Total                 | 1 hrs. 45 mins. | 23 mins.        |



## 5.2 Recommendations

- (1) There should be a study on structure of existing databases of all departments for the feasibility of doing data conversion, if so, the data conversion is needed as much as possible.
- (2) To connect existing computer system to the new computer system of Sales Department.
- (3) The company should assign some suitable group of staff to handle the new central database or they should recruit new computer staffs to handle new system and central database.
- (4) The company should let the staff of sales department to get involved in the new system team so that they would be willing to cooperate in this project.





## APPENDIX A

### INPUT SCREEN/USER INTERFACE

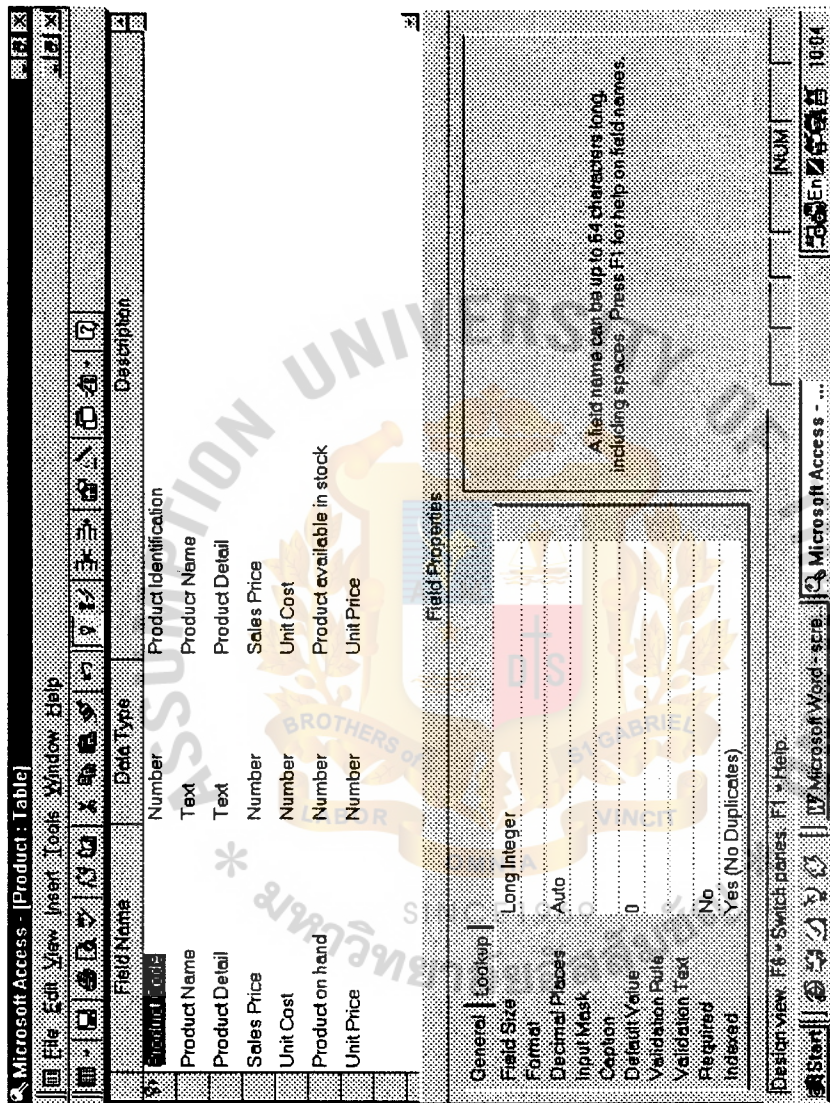


Figure A.1. Product Master File.

Microsoft Access - [Customer: Table]

File Edit View Insert Tools Window Help

| Field Name    | Data Type | Description                      |
|---------------|-----------|----------------------------------|
| Customer ID   | Number    | Customer Identification          |
| Customer Name | Text      | Customer Name                    |
| Contact Name  | Text      | Contact Name                     |
| Title         | Text      | Title of Contact Name            |
| Address       | Text      | Customer Address                 |
| Telephone     | Text      | Phone Number                     |
| Fax           | Text      | Fax Number                       |
| Credit Limit  | Text      | Maximum credit allow to customer |
| Outstanding   | Text      | Outstanding                      |

Field Properties

General | Lookup |

Field Size: Long Integer

Format: Auto

Input Mask: 0

Caption: No

Default Value: Yes (No Duplicates)

Validation Rule: No

Validation Text: Yes

Required: Yes

Indexed: Yes

Design View | Switch panels: Fields | Help

Microsoft Word - ...

Microsoft Access - ...

10:30

A field name can be up to 64 characters long, including spaces. Press F1 for help on field names.

Figure A.2. Customer Master File.



Microsoft Access - [Invoice : Table]

File Edit View Insert Tools Window Help

| Field Name     | Date Type | Description             |
|----------------|-----------|-------------------------|
| Invoice code   | Number    | Invoice Identification  |
| Product Code   | Number    | Product Identification  |
| Product Name   | Text      | Product Name            |
| Customer Code  | Number    | Customer Identification |
| Product Detail | Text      | Product Detail          |
| Sales Price    | Number    | Sales Price             |
| Unit Cost      | Number    | Unit Cost               |
| Unit Price     | Number    | Unit Price              |

Field Properties

| General         | Lookup       |
|-----------------|--------------|
| Field Size      | Long Integer |
| Format          |              |
| Decimal Places  | Auto         |
| Input Mask      |              |
| Caption         |              |
| Default Value   | 0            |
| Validation Rule |              |
| Validation Text |              |
| Required        | No           |
| Indexed         | No           |

The field description is optional. It helps you describe the field and is also displayed in the status bar when you select this field on a form. Press F1 for help on descriptions.

Design view F6 - Switch panes: F1 - Help

Microsoft Word - ...

Microsoft Access - ...

10:03

Figure A.3. Invoice Transaction File.

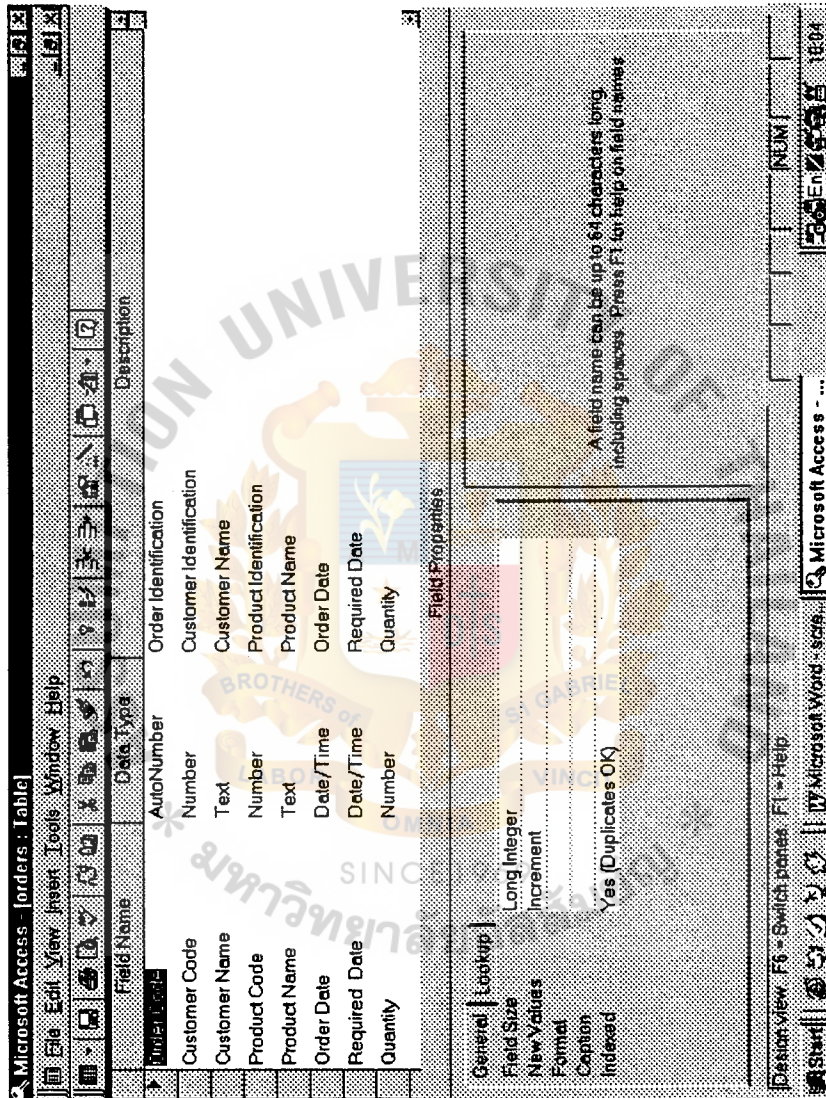


Figure A.4. Orders Transaction File.

Microsoft Access - [Login : Form]

File Edit View Insert Format Records Tools Window Help

**CHOCKCHAI COMPANY LIMITED**

**Login User**

Date: 14/7/00

Time: 5:00:59

Login Name: Apirdee

Password: .....

O.K.

CANCEL

Record: 1 of 1 Initial of 1

Form View

Microsoft Access - ...

NUM

Page 1 of 1

Figure A.5. Login Menu Form.



Microsoft Access - [Product - Table]

File Edit View Insert Tools Window Help

| Field Name      | Data Type | Product Identification     | Description |
|-----------------|-----------|----------------------------|-------------|
| Product Name    | Text      | Product Name               |             |
| Product Detail  | Text      | Product Detail             |             |
| Sales Price     | Number    | Sales Price                |             |
| Unit Cost       | Number    | Unit Cost                  |             |
| Product on hand | Number    | Product available in stock |             |
| Unit Price      | Number    | Unit Price                 |             |

Field Properties

General | Lookup |

Field Size: Long Integer

Format: Auto

Decimal Places: 0

Input Mask: No

Caption: Yes (No Duplicates)

Default Value: No

Validation Rule: Yes

Validation Text: No

Required: Yes

Indexed: No

Design view. F6 = Switch panes. F1 = Help.

Microsoft Word - .accdb

Microsoft Access - 1634

Figure A.6. Main Menu Form.

The image shows a screenshot of a Microsoft Access form. The title bar at the top reads "Microsoft Access - [RECORD : Form]". The menu bar includes "File", "Edit", "View", "Insert", "Format", "Records", "Tools", "Window", and "Help". The main area of the form has a header section with the text "CHOCKCHAI COMPANY LIMITED" and a large section titled "RECORD". Below "RECORD" are three buttons: "CUSTOMER", "PRODUCT", and "MAIN MENU". The status bar at the bottom indicates "Record #1 of 1" and "Form View". There are also some icons and a "Microsoft Access" logo in the bottom right corner.

Figure A.7. Record Menu Form.



Microsoft Access - [Customer: Form]

File Edit View Insert Format Records Tools Window Help

80% View Database

## CHOCKCHAI COMPANY LIMITED

Date/Time: 14/7/00 10:35:55

Customer Code:

Customer Name:

Contact Name:

Address:

Telephone:

Credit Limit:

Note:

Buttons: Add, Delete, Undo, Save, Exit

Page: 1 of 1

Ready

Microsoft Word: scr... Microsoft Access - ...

Figure A.8. Customer Record Form.





Microsoft Access - [Transaction - Form]

File Edit View Insert Format Records Tools Window Help

**CHOCKCHAI COMPANY LIMITED**

**Transaction**

Customer Order

Customer Invoice

Main Menu

Record: 1 of 1  
Form View

Microsoft Access - ... Microsoft Word - ...

22:46

Figure A.10. Transaction Menu Form.





Microsoft Access - [customer invoice : form]

File Edit View Insert Format Records Tools Window Help

## CHOCKCHAI COMPANY LIMITED

### Customer Invoice

Order No:

Customer Code:

Customer Name:

Address:

Invoice No:

Invoice Date:

Credit Term:

| Product Code  | Product Name | Quantity | Unit Price | Amount |
|---|--------------|----------|------------|--------|
| <div style="text-align: center;">Record: 1 of 1</div> |              |          |            |        |

Add

Print

Delete

Preview

Exit

Total

VAT

Net Total

Record: 1 of 1

Customer Identification

Microsoft Access - [D:\Microsoft Word : .scr] 22:53

Figure A.12. Customer Invoice Record Form.



Microsoft Access - [report - Form]

File Edit View Insert Format Records Tools Window Help

## CHOCKCHAI COMPANY LIMITED

### Report

- Customer Detail Report
- Product Detail Report
- Customer Invoice Report
- Product List Price Report
- History Product Report
- Order List Report
- Delivery Order Report
- Quantity on Hand Report
- Sales Summary by Product Report
- Sales Summary by Customer Report

Preview      Print      Exit

Record: 1 of 1  
Form View

Microsoft Access - ... Microsoft Word - ...

22:54

Figure A.13. Report Menu Form.



## APPENDIX B

### OUTPUT/REPORT DESIGN

CUSTOMER REPORT

| Page1         |               |              |           |         |             |
|---------------|---------------|--------------|-----------|---------|-------------|
| Date 99/99/99 |               |              | Amount    |         |             |
| Customer Code | Customer Name | Contact Name | Telephone | Address | Date Opened |
| 99            | X(10)         | X(10)        | X(20)     | X(50)   | 99/99/99    |
| 99            | X(10)         | X(10)        | X(20)     | X(50)   | 99/99/99    |
| 99            | X(10)         | X(10)        | X(20)     | X(50)   | 99/99/99    |
| 99            | X(10)         | X(10)        | X(20)     | X(50)   | 99/99/99    |
| 99            | X(10)         | X(10)        | X(20)     | X(50)   | 99/99/99    |
| 99            | X(10)         | X(10)        | X(20)     | X(50)   | 99/99/99    |

Figure B.1. Report of Customer.



# INVOICE REPORT

Page 1

Date 99/99/99

| Invoice Code | Customer Name | Order Code | Invoice Date | Quantity | Unit Price | Amount   |
|--------------|---------------|------------|--------------|----------|------------|----------|
| 99           | X(10)         | 99         | 99/99/99     | X(10)    | 9(12).99   | 9(12).99 |
| 99           | X(10)         | 99         | 99/99/99     | X(10)    | 9(12).99   | 9(12).99 |
| 99           | X(10)         | 99         | 99/99/99     | X(10)    | 9(12).99   | 9(12).99 |
| 99           | X(10)         | 99         | 99/99/99     | X(10)    | 9(12).99   | 9(12).99 |
| 99           | X(10)         | 99         | 99/99/99     | X(10)    | 9(12).99   | 9(12).99 |
| 99           | X(10)         | 99         | 99/99/99     | X(10)    | 9(12).99   | 9(12).99 |

Figure B.3. Report of Invoice.





# **TOP TEN BEST SOLD REPORT**

Date 99/99/99

| No. | Product Code | Product Detail | Unit Cost | Unit Price | Quantity | Amount   |
|-----|--------------|----------------|-----------|------------|----------|----------|
| 99  | 99           | X(20)          | 9(12).99  | 9(12).99   | X(10)    | 9(12).99 |
| 99  | 99           | X(20)          | 9(12).99  | 9(12).99   | X(10)    | 9(12).99 |
| 99  | 99           | X(20)          | 9(12).99  | 9(12).99   | X(10)    | 9(12).99 |
| 99  | 99           | X(20)          | 9(12).99  | 9(12).99   | X(10)    | 9(12).99 |
| 99  | 99           | X(20)          | 9(12).99  | 9(12).99   | X(10)    | 9(12).99 |
| 99  | 99           | X(20)          | 9(12).99  | 9(12).99   | X(10)    | 9(12).99 |

Figure B.5. Report of Top Ten Best Sold.



| SUMMARY OF SALES REPORT      |                |            |          |          |
|------------------------------|----------------|------------|----------|----------|
| Between 99/99/99 to 99/99/99 |                |            |          |          |
| Page 1                       |                |            |          |          |
| Date 99/99/99                |                |            |          |          |
| Product Code                 | Product Detail | Unit Price | Quantity | Amount   |
| 99                           | X(10)          | 9(12),99   | X(10)    | 9(12),99 |
| 99                           | X(10)          | 9(12),99   | X(10)    | 9(12),99 |
| 99                           | X(10)          | 9(12),99   | X(10)    | 9(12),99 |
| 99                           | X(10)          | 9(12),99   | X(10)    | 9(12),99 |
| 99                           | X(10)          | 9(12),99   | X(10)    | 9(12),99 |
| 99                           | X(10)          | 9(12),99   | X(10)    | 9(12),99 |

Figure B.6. Report of Sales Summary.

Page 1

Date 99/99/99

Invoice No.: 99

Customer Code : 99

Shipping Address: x(50)

Customer Name: x(10)

Telephone: x(10)

DELIVERY ORDER REPORT

| Product Code | Product Name | Quantity | Amount   |
|--------------|--------------|----------|----------|
| 99           | X(10)        | X(10)    | 9(12).99 |
| 99           | X(10)        | X(10)    | 9(12).99 |
| 99           | X(10)        | X(10)    | 9(12).99 |

Figure B.7. Report of Delivery Order.

71

**QUANTITY ON HAND REPORT**

Page 1  
Date 99/99/99

| Product Code | Product Name | Count | Net Quantity |
|--------------|--------------|-------|--------------|
| 99           | X(10)        | X(10) | X(10)        |
| 99           | X(10)        | X(10) | X(10)        |
| 99           | X(10)        | X(10) | X(10)        |
| 99           | X(10)        | X(10) | X(10)        |
| 99           | X(10)        | X(10) | X(10)        |
| 99           | X(10)        | X(10) | X(10)        |

Figure B.8. Report of Quantity on Hand.



**HISTORY OF PRODUCT REPORT**

Page 1

Date 99/99/99

Product Code: 99

Product Name: x (10)

| No. | Date     | Description | Product In | Product Out |
|-----|----------|-------------|------------|-------------|
| 99  | 99/99/99 | X(50)       | X(10)      | X(10)       |
| 99  | 99/99/99 | X(50)       | X(10)      | X(10)       |
| 99  | 99/99/99 | X(50)       | X(10)      | X(10)       |

Figure B.10. Report of History of Product.



## APPENDIX C

### PROCESS SPECIFICATION



Table C.1. Process Specification of Process 1.1.

|               |  |
|---------------|--|
| Process Name: | Validate Customer Status   |
| Data In:      | Customer Status<br>Customer Detail   |
| Data Out:     | New Customer<br>Valid Customer   |
| Process:      | (1) Get customer data, customer name, address, phone number, and assign customer code<br>(2) Check customer status<br>(3) Record new customer into customer file |
| Attachment:   | (1) Customer<br>(2) Customer Data Store  |

Table C.2. Process Specification of Process 1.2.

|               |  |
|---------------|--|
| Process Name: | Validate Order Detail  |
| Data In:      | Valid Customer<br>Customer Order Detail  |
| Data Out:     | Valid Order  |
| Process:      | (1) Receive customer order list from customer<br>(2) Check and verify detail of orders<br>(3) Confirmation order to customer<br>(4) Send order list to process Run order no. & write to file |
| Attachment:   | (1) Customer<br>(2) Process 1.3. Run order no. & write to file   |

Table C.3. Process Specification of Process 1.3.

|               |  |
|---------------|--|
| Process Name: | Run Order No. & Write to File                |
| Data In:      | Valid Customer Order List<br>Customer Detail |
| Data Out:     | Order Record                                 |
| Process:      | Write order detail to Orders file            |
| Attachment:   | Order Data Store                             |

Table C.4. Process Specification of Process 2.1.

|               |  |
|---------------|--|
| Process Name: | Check Current Stock  |
| Data In:      | Order List<br>Product Code   |
| Data Out:     | Available Product Amount<br>Unavailable Product Amount   |
| Process:      | (1) Send product on ordered to product file<br>(2) Check available product<br>(3) Find unavailable product and send to<br>Process 2.2. |
| Attachment:   | Product Data Store   |

Table C.5. Process Specification of Process 2.2.

|               |   |
|---------------|---|
| Process Name: | Product to be Ordered   |
| Data In:      | Unavailable Product List  |
| Data Out:     | Amount of product to be ordered   |
| Process:      | (1) Get amount of unavailable product<br>(2) Order the unavailable product to<br>Production Department to produce |
| Attachment:   | Production Department   |

Table C.6. Process Specification of Process 3.1.

|               |  |
|---------------|--|
| Process Name: | Compute VAT & Total Sales Amount   |
| Data In:      | Order Detail<br>Product Detail   |
| Data Out:     | VAT and Total Sales Amount   |
| Process:      | (1) Receive product and order detail<br>(2) Calculate VAT and Total sales amount |
| Attachment:   | (1) Order Data Store<br>(2) Product Data Store                                   |

Table C.7. Process Specification of Process 3.2.

|               |  |
|---------------|--|
| Process Name: | Create Invoice   |
| Data In:      | Product amount & Unit price  |
| Data Out:     | Invoice Record   |
| Process:      | (1) Receive product , order , and customer detail<br>(2) Generate and record to Invoice file |
| Attachment:   | (1) Product Data Store<br>(2) Orders Data Store<br>(3) Customer Data Store                   |

Table C.8. Process Specification of Process 3.3.

|               |   |
|---------------|---|
| Process Name: | Print Invoice   |
| Data In:      | Invoice Detail  |
| Data Out:     | Invoice   |
| Process:      | (1) Receive Invoice information<br>(2) Select Invoice number<br>(3) Print Invoice |
| Attachment:   | (1) Invoice Data Store<br>(2) Customer<br>(3) Accounting Department               |

Table C.9. Process Specification of Process 4.1.

|               |  |
|---------------|--|
| Process Name: | Order Product  |
| Data In:      | Delivery Order   |
| Data Out:     | Delivery Order   |
| Process:      | (1) Receive Delivery Order<br>(2) Order Product from Production Department |
| Attachment:   | Production Department  |

Table C.10. Process Specification of Process 4.2.

|               |  |
|---------------|--|
| Process Name: | Find Customer Location   |
| Data In:      | Delivery Order<br>Customer Detail  |
| Data Out:     | Customer Location  |
| Process:      | (1) Get customer detail and delivery order<br>(2) Find customer location |
| Attachment:   | Customer Data Store  |

Table C.11. Process Specification of Process 4.3.

|               |   |
|---------------|---|
| Process Name: | Delivery Product  |
| Data In:      | Customer Location   |
| Data Out:     | List of Product Delivery  |
| Process:      | (1) Get customer location<br>(2) Delivery product to customer<br>(3) Receive payment from customer<br>(4) Send payment to Accounting Department |
| Attachment:   | (1) Customer<br>(3) Accounting Department   |

Table C.12. Process Specification of Process 5.1.

|               |   |
|---------------|---|
| Process Name: | Receive Delivery Product List                       |
| Data In:      | List of Product Delivery                            |
| Data Out:     | List of Product Delivery                            |
| Process:      | Receive delivery product list from delivery process |
| Attachment:   | Process 4.0 Delivery System                         |



Table C.13. Process Specification of Process 5.2.

|               |   |
|---------------|---|
| Process Name: | Find Quantity on Hand   |
| Data In:      | List of Delivery Product<br>Product Detail  |
| Data Out:     | Product on Hand   |
| Process:      | (1) Receive list of product delivery to customer<br>(2) Check with product record |
| Attachment:   | Product Data Store  |

Table C.14. Process Specification of Process 5.3.

|               |  |
|---------------|--|
| Process Name: | Update Quantity on Hand  |
| Data In:      | List of Product Delivery<br>Product Record                             |
| Data Out:     | Update Product Record  |
| Process:      | (1) Receive of product delivery list<br>(2) Update with Product record |
| Attachment:   | Product Data Store   |

Table C.15. Process Specification of Process 6.1.

|               |   |
|---------------|---|
| Process Name: | Validate Report Name  |
| Data In:      | Report Request  |
| Data Out:     | Valid Report  |
| Process:      | (1) Receive report name request<br>(2) Validate report name<br>(3) Send valid report name to manager<br>(4) Send valid report name to Process<br>Retrieve Information from File |
| Attachment:   | Manager   |

Table C.16. Process Specification of Process 6.2.

|               |   |
|---------------|---|
| Process Name: | Process Retrieve Information from File  |
| Data In:      | Valid Report Name   |
| Data Out:     | Information from File   |
| Process:      | (1) Receive valid report name<br>(2) Get information from file<br>(3) Send information to process generate report |
| Attachment:   | (1) Customer Data Store<br>(2) Product Data Store<br>(3) Orders Data Store<br>(4) Invoice Data Store              |

Table C.17. Process Specification of Process 6.3.

|               |   |
|---------------|---|
| Process Name: | Generate Report   |
| Data In:      | Information Retrieve from File  |
| Data Out:     | Report  |
| Process:      | (1) Receive information from retrieve<br>information from file process<br>(2) Generate report |
| Attachment:   | Manager   |



## APPENDIX D

### DATA DICTIONARY

Table D.1. Data Dictionary of Sales Order Processing System of Existing System.

| Field Name                       | Meaning  |
|----------------------------------|--|
| Accept Order Request             | Process of accept order from the customer                      |
| Accounting Department            | Accounting Department of the company                           |
| Check Available Stock            | Process of check product on hand                               |
| Create Invoice                   | Process of generate invoice of customer order                  |
| Customer                         | Customer who order product                                     |
| Customer Order                   | Order from customer  |
| Customer Order List              | List of customer order   |
| Delivery Order                   | Delivery order in shipping product to<br>Production Department |
| Invoice                          | Copy of document from customer order                           |
| Manager                          | Manager of the company   |
| Order Confirm                    | Confirmation order to the customer                             |
| Payment                          | Customer payment   |
| Produce Report                   | Process produce report   |
| Product                          | Product that is sent to customer                               |
| Product Order List               | List customer orders   |
| Production Department            | Production Department of the company                           |
| Report                           | Requested report from manager                                  |
| Sales Order Processing<br>System | Process Sales Order Processing System                          |

Table D.2. Data Dictionary of Sales Order Processing System of Proposed System.

| Field Name                       | Meaning   |
|----------------------------------|---|
| Check Available Stock            | Process of check product on hand                            |
| Check Current Stock              | Process check product on hand in stock                      |
| Compute VAT & Total Sales amount | Process compute VAT and total amount of each invoice        |
| Customer                         | File record customer information                            |
| Customer Detail                  | Customer Information  |
| Customer Location                | Location of customer in shipping product                    |
| Customer Order                   | Order from customer   |
| Customer Order List              | List of customer order                                      |
| Customer Status                  | The status of the customer whether a new or an old customer |
| Delivery Order                   | Delivery order in shipping product to Production Department |
| Delivery System                  | Process of product delivery to customer                     |
| Find Customer Location           | Process find customer in order to ship product              |
| Generate Invoice                 | Process of invoice generation of customer orders            |
| Generate Report                  | Process of report generation                                |
| Invalid Order                    | The order which is not valid                                |
| Invoice                          | Copy of document from customer order                        |
| Invoice File                     | File collect invoice information                            |
| List of Product Delivery         | List of shipped product to customer                         |
| New Customer                     | New customer entry in ordering product                      |
| New Product List                 | List of new amount product produce                          |
| Order Confirm                    | Confirmation order to the customer                          |
| Order Detail                     | Order Information   |



Table D.2. Data Dictionary of Sales Order Processing System of Proposed System (Continued).

| Field Name                     | Meaning   |
|--------------------------------|---|
| Order Product                  | Process of order product  |
| Orders                         | File collect customer orders record   |
| Payment                        | Customer payment  |
| Print Invoice                  | Print invoice in hard copy  |
| Produce Report                 | Process produce report  |
| Product                        | File collect customer information   |
| Product Available              | Product on hand   |
| Product Code                   | Product identification  |
| Product Detail                 | Product information   |
| Product Order List             | List customer orders  |
| Product to be Order            | Process of order out of stock product requirement to production department to be produced |
| Production Department          | Production Department of the company  |
| Receive Delivery Product List  | Process get list of product that had been shipped to customer already                     |
| Receive Order                  | Process of receive order from customer  |
| Report                         | Requested report from manager   |
| Retrieve Information from File | Process gathering information in order to produce required report                         |
| Run Order and Write to File    | Process to run order and then writ to file  |
| Sales Order Processing System  | Process Sales Order Processing System   |
| Unavailable Product List       | List out of stock product   |
| Update                         | Update the amount of product  |
| Update Quantity On Hand        | Process of update amount of product on hand   |

Table D.2. Data Dictionary of Sales Order Processing System of Proposed System (Continued).

| Field Name               | Meaning   |
|--------------------------|---|
| Validate Customer Status | Process check customer detail                                 |
| Validate Order Detail    | Process check order detail                                    |
| Validate Report Name     | Report that can be created from sales order processing system |
| Valid Customer           | Customer that have valid detail                               |
| Valid Order              | Order that have valid detail                                  |



## BIBLIOGRAPHY

1. Alter, S. L. Decision Support System: Current Practice and Continuing Challenges. Philippines: Addison-Wesley, 1980.
2. Armour, G. C. and E. S. Buffa. "A Heuristic Algorithm and Simulation Approach to Relative Location of Facilities." Management Science 9, no. 6 (1986): 16-23.
3. Benjamin, C. O. and C. Jungthirapanich. "An Intelligent Decision Support System for Facility Location," Proceedings of the International Industrial Engineering Conference, Detroit, Michigan, May 19-22, 1991.
4. Berry, H. P. "Applications of Linear Programming and Electronic Computers to the Planning of Expansion of Plant Facilities," Proceedings of the Conference of Electronics in Action, American Management Association, 1957.
5. Boose, J. H. Expertise Transfer for Expert System Design. New York: Elsevier Science, 1986.
6. Buffa, E. S. Basic Production Management. New York: John Wiley & Sons, 1971.
7. Date, C. J. An Introduction to Database System, Volume I, 6<sup>th</sup> Edition. MA: Addison-Wesley, 1995.
8. FitzGerald, J. and Andre F. FitaGerald. Fundaments of System Analysis. NY: John Wiley & Sons, 1987.
9. Korth, F. Henry and Abraham Slberschatz. Database System Concepts. NY: McGraw-Hill International, 1991.
10. Page-Jones, Meilir. The Practical Guide to Structured System Design. NJ: Prentice-Hall International Company, 1988.
11. Senn, James A. Analysis & Design of Information Systems, 2<sup>nd</sup> Edition. NY: McGraw-Hill Publishing Company, 1989.