ORDERING INFORMATION SYSTEM
FOR GIFT AND PREMIUM COMPANY

by

Ms. Anakkaon Watanalappoolpol

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

**Ordering Information System
for Gift and Premium Company**

by
Ms. Anakkaon Watanalappoolpol

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
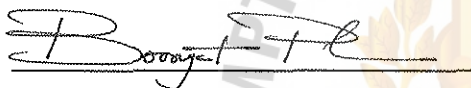Assumption University

November 2000

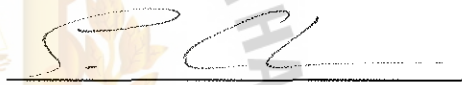| Project Title	Ordering Information System for Gift and Premium Company
Name	Ms. Anakkaon Watanalappoolpol
Project Advisor	Dr. Boonyarit Pokrud
Academic Year	November 2000

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

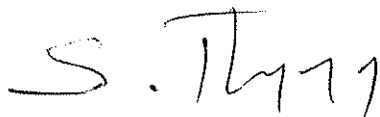Approval Committee:

_____
(Dr. Boonyarit Pokrud)
Advisor

_____
(Prof.Dr. Srisakdi Charmonman)
Chairman

_____
(Air Marshal Dr. Chulit Meesajjee)
Dean and Co-advisor

_____
(Asst.Prof.Dr. Vichit Avatchanakorn)
Member

_____
(Assoc.Prof. Somchai Thayarnyong)
MUA Representative

November 2000

ABSTRACT

Due to the dynamic change in Thai economy, the use of the computer becomes one of the important factors for every kind of businesses. Since the competition among businesses is relatively fierce, the demand for fast and easy access to data also grows. As the demand has risen, the need for the computerized system also increases dramatically.

After an analysis, design and implementation phase have been done for the existing system, the objectives are identified, the scope of the project is planned, the problems are found. Moreover, the user as well as management requirements have been taken into account for the development of the computerized system. Data Flow Diagram, Structure Chart are used in designing the program. Cost and Benefit Analysis with three popular methods are used to identify the Break Even Point, Payback Period, Net Present Value and Return on Investment. Security also plays an important role in developing the proposed system.

With the revolution of a computerized system, the company processing performance will improve, gaining the access or retrieving information can be done easily. The Ordering Information System For Zestteem Company Limited operates more efficiently and effectively with the use of the computerized system.

ACKNOWLEDGEMENTS

The writer would like to take this opportunity to express her gratitude to her advisor, Dr. Boonyarit Pokrud, for his valuable guidance and his kind suggestions during the period of this project.

The writer also would like to thank and express her appreciation to all instructors of MS (CIS) program for the knowledge, enthusiasm, expertise and eagerness to provide the knowledge, which she found useful in developing this project.

She also would like to thank Ms. Pinpraparn Watanalappoolpol, the Managing Director of Zestteem Company Limited for the information and valuable time in explaining the system of the company. She also would like to thank the officers of Zestteem Company Limited, who gave her collaboration in studying the company system.

She is also grateful to her friends for their encouragement, suggestion, opinion and assistance throughout the project.

Finally, the writer would like to express her gratitude to her family for giving her support and encouragement throughout the course of this project.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

x

I. INTRODUCTION

1.1 Background of the Project

Based on today's economic situation where competition is relatively fierce, the way or method that each company uses to compete with other has become one of the big issues to be considered. As The Zestteem Company has faced this situation, Zestteem Company want to try to design the product to be more attractive and unique. Zestteem Company tries to find out and capture the customer's need, then provides the customer with the right product at the right time.

Since the company's total volume of sales is now increasing dramatically, they are now faced with a load of paper work as all the works are done manually. This kind of paper works includes customer profile, supplier profile and various kinds of documents such as customer purchasing order (P/O), invoice, production specification etc. Without a good management in data keeping, searching or finding a particular information Zestteem will have a hard time.

The Ordering Information System is one of the important parts for all companies and is so to Zestteem Company. Within this project, the existing ordering system is studied and analyzed and all the business requirements as well as user requirements in ordering system is identified which later on will be used to design a new system.

With a new ordering system, Zestteem Company will be able to provide a better service including processing time in searching and keeping data, improving response time with customer, providing competitive edges over other companies, delivering as well as billing process. Moreover, the new system will provide data, which is used to support in decision making for the Top Management in the dynamic changes of the economy.

1.2 Objectives of the Project

The objectives of developing the Ordering Information System for Zestteem Company Limited are as follows:

(1) To study and analyze the existing system and design a new system for receiving orders from customer.

(2) To identify the problem in the existing system.

(3) To identify both business requirements as well as user requirements.

(4) To design computer-based information system for the ordering process in order to be able to compete with other companies.

(5) To minimize amount of paper work and increase the productivity.

(6) To increase the companies efficiency and effectiveness.

(7) To provide an easy access and search for the required data.

1.3 Scope of the Project

The scope of the Zestteem Ordering Information System can be generalized as follows:

(1) To keep customer profile

(2) To create new customer record

(3) To modify customer record

(4) To record customer purchase order .

(5) To issue company purchase order -

(6) To issue company invoice ·

(7) To issue company delivery order ·

(8) To keep supplier profile ·

(9) To create supplier record ·

(10) To modify supplier record ·

2

(11) To generate report for Top Management

1.3 Deliverables

The deliverables of the project of the Gift Trader Ordering Information System are as follows:

(1)　Screen Layout of User-Interface for end users

(2)　Various hard copy layouts and reports including:

(a)　Customer Profile

(b)　Supplier Profile

(c)　Monthly Sales Report

(d)　Company Purchase Order Report

(e)　Customer Purchase Order Report

(f)　Company Invoice Report

(g)　Product Specification Report

(h)　Inquiry Report

(i)　Delivery Order Report

1.5 Project Plan

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

Figure 1.1.   Project Plan Of Zestteem Company Limited.

II. EXISTING SYSTEM

2.1 Background of the Organization

Zestteem Company Limited was established in June 1999. The initiator of this company is Ms. Pinpraparn Watanalappoolpol, whose position is now the Managing Director, and her colleagues. The office is located on Sukhumwit 77 at Onnuch 36. The major task of the company is to provide all kinds of gifts and premiums such as T-shirt with or without printed logos, handbags, umbrellas, pillows, bed sheets, dolls, caps etc. The company operates as an agent and a trader. It also deals with product design, packaging, and product display in outlets or showrooms.

Although the company has opened for only a year, the amount of works or numbers of services are higher than expected. The workflow in taking order of Zestteem Company can be visualized as follows:

(1) The company salesman will contact the customer and then make an appointment to propose a product. On that day, the salesman will present the customer with the quotation of the product. If the customer is interested in the quoted price, they may issue their purchase order on the following day. On the other hand, the customer may send the purchase order to the company, and then the company will respond back to the customer whether the quoted price is possible for the production.

(2) After receiving the orders or purchase order (P/O) from the customer, the document is then recorded to the customer P/O book. Sales and Marketing Department have to verify whether the P/O is worth the production. The conditions that will be used to consider were customer quoted price, terms of payment, requested delivery date, lead-time, quantity and quality. If the

following purchase order passes all five conditions, then the Sales and Marketing Department will issue production specification request form to the Design and Production Department.

(3) Design and Production Department will use the requirement provided in the production specification form to create the sample prototype or model. This model will be sent back to the customer for approval. If confirmation of the production is received, then the production can begin otherwise, some minor changes are required to be done. For doing the sample, the customer has to agree for the half payment whether they are satisfied or not with the product.

(4) Next, the company issues the purchase order to the suitable supplier who can handle the entire raw materials requirement.

(5) Now, it is the process of receiving supplier invoice. The company has two points to check out. The first is whether the product delivered by the supplier is correct in both quantity and quality specified in the company purchase order. The second is to check whether the purchase order number specified in the supplier invoice matches with the company purchase order.

(6) After passing those two checkpoints, the company issues a company invoice to the customer as well as a delivery order. This is to ensure the acceptance of the product of the company by the customer. The invoice number must be concurrent with the delivery order number. For the payment policy, if the customer is a new customer, they are required to pay within 15 days or within 30 days.

(7) Each Department will collect the information produced in their department and generate a report for the Top Management. For more information on the

flow of the ordering process, it can be viewed on Appendix A and Appendix

B.

| Managing Director |
| Sales & Marketing | Design & Production | Finance & Accounting |
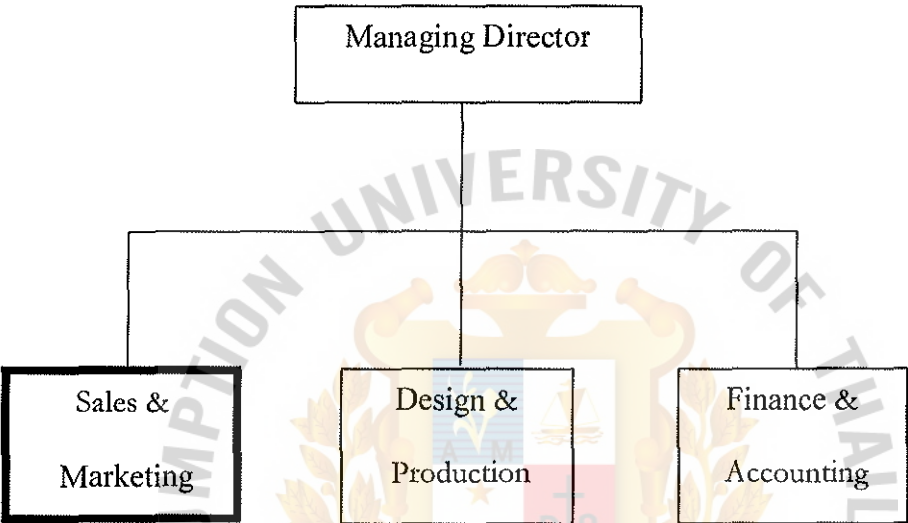
Figure 2.1.   Organization Chart of Zestteem Company Limited.

2.2   Existing Business Function

Figure 2.1 illustrates the organization structure of Zestteem Company Limited. There are three departments in a Top-Down hierarchy, which is described as follows:

(1)   Sales and Marketing Department

This department's mainly responsible for the daily operation of receiving an order, contacting, sometimes receiving the sample from the customer. The Sales and Marketing Department have to handle various kinds of paper work such as customer profile, customer purchase order, and company purchase order and supplier profile. The Sales and Marketing Department have to deal with the customer, negotiate when the quoted price is not reasonable or receive the confirmation for the production from the customer. This department has to deal with the supplier and find the right supplier who can support the production requirement.

(2)   Design and Production Department

This department's main responsibility is to verify the outline of production requirements specified in the production request form. Sometimes, they have to design the prototype or model for the product upon customer request. After all the criteria have been specified, the next step is to wait for approval from customer, in which, Sales and Marketing Department will have to follow up for the result for the production to begin.

(3)   Finance and Accounting Department

This department has to deal with the cash flow, capital, receivables and payables of the company. At the end of every month they have to prepare the financial reports, any movement in the Finance and Accounting Department must be informed to the Managing Director. They have to send

8

the financial report to the external accountant for preparing the annual profit and loss account for the company. The Finance and Accounting Department is the one that issues company invoice as well as delivery order to the customer.

(4) Top Management

In this section, the Managing Director supervises the management functions, control all major operations such as both short-term and long-term planning, budget controlling, decision-making. All of these actions require adequate data to support. This may be the reason why the data requested by the Managing Director must be supported upon request.

2.3 Current Problems and Areas for Improvements

2.3.1 Current Problems

During the analysis process, some problems were found and listed as follows:

(1) Customer complaint for slow response

The reason behind this problem may come from the slow and long process of taking an order from the customer. After the customer's purchase order has been received, the Sales and Marketing Department has to find out whether the quoted price by the customer is possible for the production, then send this purchase order to the Design and Production Department to verify all the production requirements. If all conditions produce a reasonable result, then the Sales and Marketing Department will respond to the customer. In the case like this, it will take at least three days to find a consensus answer for one customer purchase order.

(2) Lack of keeping data in a good method

Data entered is not complete and correct. There is a workload on paper work. Sometimes the loss of data occurs because of lack of good security protection.

(3) Lack of data integrity

The process of ordering system has to deal with several departments in the organization. Sometimes, some change is made when data is being transferred between departments and that change has not been informed to the involved department. This will cause misunderstanding and confusion among departments. For example, when the customer calls up and wants to make some change in quantity ordered from 50 pieces to 80 pieces. If this change has not been informed to the Finance and Accounting Department, the invoice issued by the Finance and Accounting Department contains wrong information. The amount to be collected from the customer also is incorrect.

(4) A lot of duplicated documents

This problem resulted from the redundant jobs, as the document has to be used by each department and kept separately. The company has to pay for the office supplies and space for these duplicated documents.

(5) Spend huge amounts of time to produce a report

Since there are various kinds of reports needed to generate and due to being non-systematic in keeping data, it may take several days to generate reports. Moreover, the data used may not be up to date. This can prevent the company from expanding the market as well as making an immediate decision.

(6)   Error due to data entering

This is caused by human error when they have to write down the record with the manual system.

Areas of Improvement

In this section, we will consider the existing problems and solving them based on the understanding of the operations and business requirements. The improvement must be made to achieve a better response in every way. All departments need to improve in order to attain the goal of efficiency as well as effectiveness. By Implementing the computerized system to replace existing manual system, the order processing system will be more efficient and provide better operations. The new computerized system will provide the staff with an easy operation, faster response.

(1)   The number of paper is reduced apparently because all data are now stored in the computer. The staff can access data by using the computer. The scope of accessing data depends on the authority of each person.

(2)   Avoid re-entry of data by using the relation of data.

(3)   Reduce the staff workload by using computer-based system for processing data instead of keeping data only. This will enhance time management.

(4)   Create security to protect the database

(5)   The customer number, supplier number, invoice number can be used to retrieve data related to what the user need. By using the computerized system, order processing can become more productive, efficient and effective.

(6)   Inquiry can be achieved easily. This leads to an advantage in immediate decision making and forecasting for the Top Management level.

11

(7)   To protect human error in entering data by providing error checking. This method will help in providing accuracy information as well as protection toward the damage that might occur to the database.

III.   PROPOSED SYSTEM

The objective of the proposed computerized system is to solve the current problems in the existing system. The existing system is studied and analyzed and the critical problems are found in the ordering system. The proposed system is intended to provide more benefits over the manual system for both operational level and management level.

The new proposed computerized system will:

(1)   Provide accuracy and up to date information.

(2)   Provide fast response to an inquiry

(3)   Reduce redundant data

(4)   Reduce error in entering data

(5)   Increase the effectiveness and better services.

(6)   Provide data for decision making and forecasting

3.1   Users' Requirements

The most important part is to find out what the user requirements are. As the users' requirements are very useful in developing the computerized system, this can ensure the satisfaction in a new proposed system. After an interview with the users, the conclusion can be categorized as follows:

3.1.1 Staff Requirements

The requirements from the staff or user of the program are:

(1)   To design a program, that can support the routine and standard procedure of the ordering system.

(2)   Searching and modifying for a particular customer data can be done via the customer number.

13

(3) The program input screen as well as output screen must be user-friendly and easy for an operation.

(4) New System must provide the ability to trace back the history of the data.

(5) The language used must be natural and easy to understand; only minimal training is required.

(6) Simple reports like customer or supplier profile must be able to generate.

(7) Error checking is necessary.

(8) Print any kind of documents easily.

(9) The data can be shared among departments.

3.1.2 Management's Requirements

(1) To generate various kinds of reports to support in decision-making and forecasting.

(2) To provide security to the database, assign the authority for the user.

(3) Reduce the overall operation cost.

(4) Back up and recovery should be designed.

3.1.3 General User's Requirements

(1) The inquiry of order processing will be fast.

(2) Simple report will be generated.

(3) The user-friendly interface is needed.

3.2 System Design

In this section, we are studying about the term Information Application Architecture. This will include the techniques that involve the distribution of Data, Process, Interface and Network. During this stage, the basic technical decisions have been identified. Those simple questions require a careful thought, as all the answers will comprise to be a computerized system for the company.

14

(1)   Network Architecture: Two Tiered Client/Server Architecture

As the company is categorized as a small size business, LAN (Local Area Network) is applied to connect several clients to the server. With this architecture, the information is stored on the server and the business logic and user interfaces are stored on the client.

(2)   Data Architecture:

Since technology is getting more advanced. The Data Architecture for an Ordering System of Zestteem Company comes out in a form of Distributed Relational Database Management System. The company decides to choose SQL Server for the database management system. The benefits behind this database management system are:

(a)   It allows the creation of the relation among programs in the database.

(b)   It provides the control of access to and maintenance of the stored data.

(c)   It provides the services of searching, sorting, extracting and summarizing.

(d)   It provides the services for backup, recovery and security.

(e)   It reduces the data traffic on the network.

(3)   Interface Architecture:

This fundamental architectural decision must be made regarding inputs, outputs and the intersystem connections. It is obvious that the proposed system is required to be an On-line Processing System with Graphical User Interface. It provides interactive transaction, conversation dialogues between user and computer. Errors are identified and corrected more quickly. Online processing systems transactions tend to be processed earlier since on-line system can be processed very fast without waiting for

15

batch data file preparation. Human interaction in decision making is permitted in this kind of processing. The edition and format of inputs and outputs can be done in an on-line mode. The data retrieved by the user is updated and ready for decision making.

(4)   Process Architecture:

This section will focus on the Software Development Environment and System Management (SDEs) for Two Tiered Client/Server. This will consist of the language and tools that is used in the development of business logic and application program.

As the product of Magic Software, this is a Post 4GL programming tool. It is a code-free application development tool. It provides a complete environment for the developer and end-user in a visual-programming environment. It also provides a powerful engine that performs 90 percents of the low-level function. Hundreds of instructions are condensed into Thirteen Operations. Magic offers speed and productivity; application portability and gateway capability as magic application can run on different platform using different databases. The whole application fits in one MCF file. It produces a user-friendly interface. Now, user can interact and become more familiar with the interface of the program.

(5)   Design of input and output screens

The concept concentrates more on the design of input screen as well as an output screen. The input screen must be user-friendly; this may help in reducing the error rate of wrong entering of data. The output screen is for showing the reference or printing forms for reports. Generally, both input and output screens are used to convey the information between user and the

16

computerized system. The input screen will be designed based on the rule of an easy operation. On the other hand, the output screen will be designed based on the information required to display. The input and output screens are shown in Appendix H and Appendix G respectively.

(6) Design of the Database Interaction

The database design is the most important part in creating a program. Without a good and well thought of database requirements, problem will occur when the time of implementation as well as time of maintenance comes. The database schema can be seen on Appendix E, Figure E.1 and Figure E.2. In addition, Appendix F shows the file structure of the database components.

(7) The form of output

There are two kinds of output: External output and Internal output. For external outputs, it comes out in the form of company purchase order, company invoice or delivery order. On the contrary, the Internal Output can be categorized into three sections.

(a) Detailed Report: this kind of report will include all the data, which depend on the purpose of the user. Some detailed reports are historical. It also can be used for a future references, management planning and control by generating schedules and analysis. As can be seen on Appendix G, the user is able to search and print out the detail of particular customer immediately.

(b) Summary Report: this provides the conclusion or summarized data to indicates trends and potential problems apart from the detailed report.

In Appendix G, Figure G.5 to Figure G.8 shows the summary report on the credit status of both customer and supplier.

(c) Exception Report: this report is especially best for some urgent request or an exceptional condition. Sometimes, some question needs an answer right away. This kind of report can support upon request.

(8) Software Design

This part is dedicated to the concern of how the program specifications are presented to the computer programming. The software design can be achieved through the structure chart. As the structure chart is graphically depicts a modular design of a program, it shows how the program has been partitioned into smaller more modules that are manageable, which later results in a computer program that is easier to implement and maintain. The structure chart can be visualized on Appendix C from Figure C.1 to Figure C.7.

3.3 Hardware and Software Requirements

The proposed system of Zestteem Ordering Information System requires the following hardware components.

(1) Server   1 set

Pentium III 700 EB

Motherboard Support SCSII Hard Disk

SD RAM 64 MB

Hard Disk SCSII 15 GB Quantum

Floppy Disk drive 1.44 MB

Monitor 15 inches Non Radiation

CD-ROM (brand name)

18

Key Board and Mouse

(2)   Client PC   4 sets

Pentium II 600 MHz

Motherboard 100 MHz

SD RAM 32 MB

Hard Disk 10 GB Quantum

Floppy Disk drive 1.44 MB

Monitor 15 inches Non Radiation

Key Board and Mouse

(3)   Laser Printer   1 set

HP Laser Jet 6 P

(4)   Dot matrix Printer   1 set

Epson LQ 2170

(5)   UPS 600 VA   1 set

(6)   Ethernet LAN Card   5 sets

Brand name Intel

PCI Interface (32bits)

10/100 MBs

Full Duplex

(7)   Ether Hub (8 ports)

(8)   UTP

The software requirements can be summarized as follows:

(a)   Microsoft Window NT

(b)   Microsoft Window 98

(c)   Microsoft Office 97

19

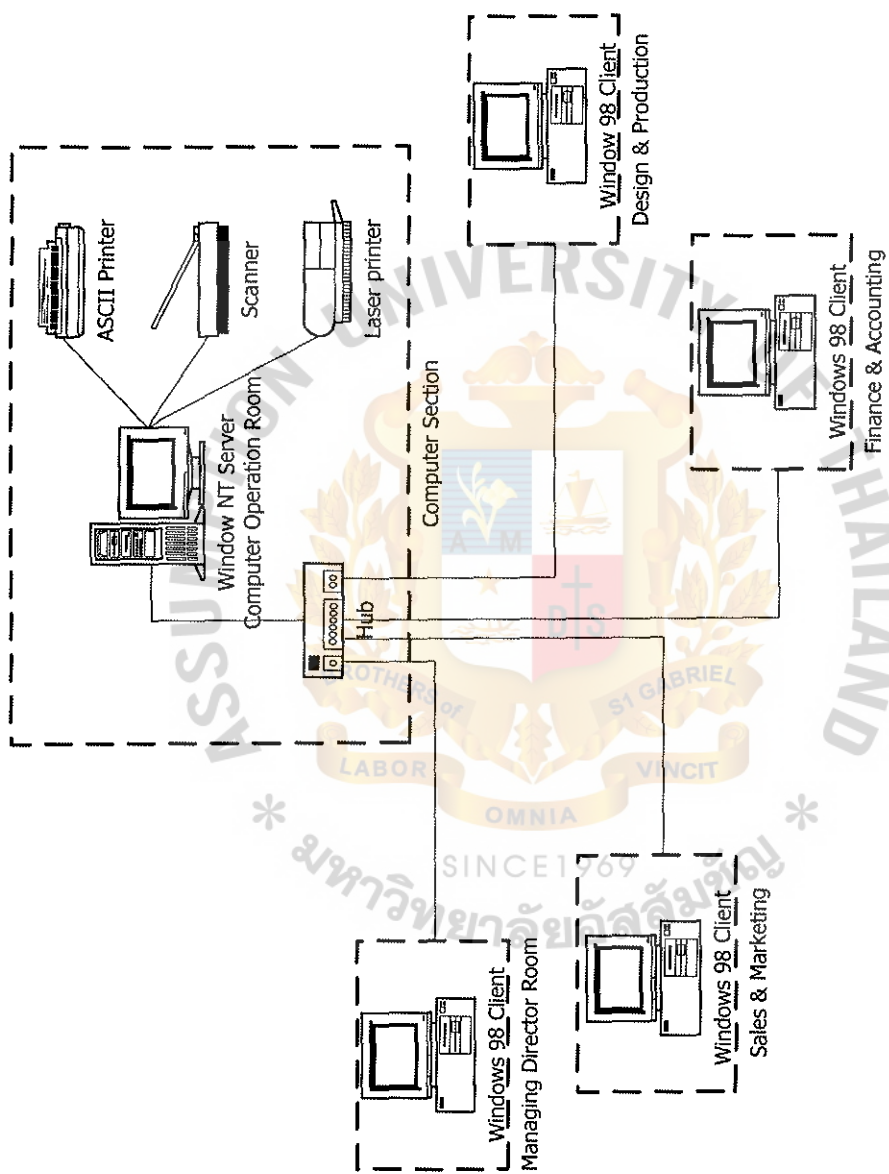(d) Magic Software Version 8

(e) Microsoft SQL Database Server Version 7

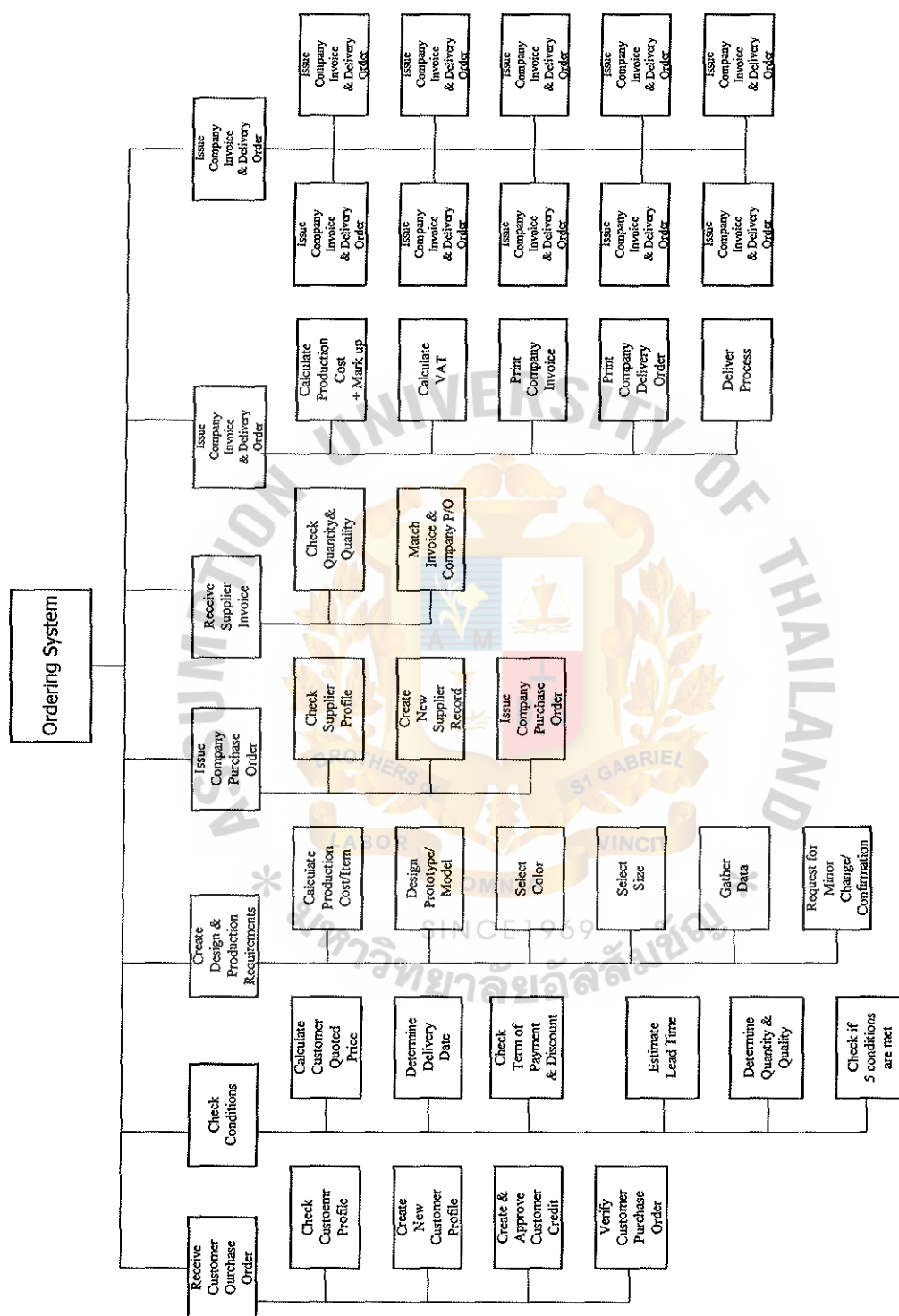Figure 3.1. The Proposed System Configuration.

21

Figure 3.2.   Functional Decomposition Diagram.

22

3.4 System Security and Controls

As nowadays, information becomes an invaluable asset, the various methods are created to protect from all possible harms. Since the computerized system of Zestteem Ordering System is designed in a form of distributed data, the concern is toward the authority for accessing the data. The user authentication is established and implemented. This is just the first phase of protecting the value of data to remain secret, possess integrity and availability for all users.

The security of computerized system possess the properties as follows:

3.4.1 User Identification

At the beginning, each user receives the password to access the data at the level that their job is related to. They are not able to access the data out of the range of their authority. The system will detect the unauthorized user if that user is not allowed to access that particular information area. The first step is to set the input interface that the user has to enter their password for getting into the system. This is a method to prevent and ensure only authorized users can enter the system. The password of each user is encrypted and kept in the Right database. This encrypted method will encrypt the password into a meaningless form so other users are unable to read and understand. (See Appendix H, Figure H.40 for password creation)

3.4.2 Program Security

This problem cannot happen when Magic Software is used. The main reason is Magic Software can be developed and modified only if that person has the development tool, which is referred to as the tiny mechanic that contains a code inside. Only with this HASP, the modification to the program can be done.

23

3.4.3 Physical Security

As the computer is considered a vulnerable object, the water, heat or even some scratch can cause some harm to the computer. The rule for using the computer should be set as follows:

    (a)   Do not smoke or drink near the computer

    (b)   Do not have meals near the computer

    (c)   Do not leave the computer open

In order to protect from natural disaster such as fire or flood, the computer should be placed on the table connected to the Uninterruptable Power Supply (U.P.S) and the fire alarm should be in the computer as well. Some further physical protection is the use of door locks, security guard at the entry points.

3.4.4 Data Entry and Validation

With the help from software application, the GUI control and technique can reduce the rate of errors made by user. The program can be set to check every line data is entered. This can ensure the quality of the data produced.

3.4.5 Database Control

With the authority of each user to be able to read, write, delete or any modification to the database, this specific range can protect from out of range access through the data or from any damage to the database system.

3.4.6 All media such as floppy disks, CD ROM must be kept in a safe place and handled with care.

3.4.7 The most important part is to backup data everyday in order to protect the damage in the hard disk.

3.5   Cost and Benefit Analysis

3.5.1 Cost Analysis

Cost Analysis is the technique for testing the economic feasibility. The economic feasibility refers to the cost-effectiveness of a project. Cost and Benefit Analysis determines whether the project is cost-effective.

Investment Cost: this is a onetime cost that will not recur after the project has been completed. This will include the cost of hardware, software, personnel and other expenses.

The Investment Cost, is classified into two parts, which are:

(a)   Development Costs are onetime costs associate with the analysis, design and implementation of the system.

(b)   Implementation Cost: the costs are related to the implementation of the system. This will include the costs such as training cost.

Apart from the Investment Cost, Annual Operating Cost may be a fixed costs over time or variable with respect to the system usage.

The Existing and Computerized System Operational Cost is listed on Table 3.1 and Table 3.2.

The comparison between the Existing System and Computerized System Cost is also displayed on Table 3.3

25

(1) Cost of the Existing System

Table 3.1   Estimated Costs of the Existing System, Baht.

Cost	Description	Amount	Unit Price	Price
1. Annual Operating Cost	1.1 Personnel Cost: Staffs	5	10,000	600,000
	Subtotal 1:			600,000
	1.2 Office Supplies: Stationary	12 Months	3,000	36,000
	Subtotal 2:			36,000
	1.3 Office Equipment and Miscellaneous: Office Equipment Cost Miscellaneous Cost	12 Months 12 Months	2,500 2,000	30,000 24,000
	Subtotal 3:			54,000
	1.4 Utility Cost	12 Months	1,000	12,000
	Subtotal 4:			12,000
	Total Operating Costs:			690,036
	Total Costs of an Existing System:			690,036

(2) Cost of the Proposed System

Table 3.2 Estimated Costs of the Proposed System, Baht.

Cost Items	Description	Amount	Unit Price	Price
1. Development Cost				
	1.1 New Hardware:			
	File Server	1	45,000	45,000
	Clients	4	25,000	100,000
	Laser Printer HP Laser Jet	1	19,000	19,000
	Dot Matrix Printer	1	23,000	23,000
	UPS 600V	1	3,800	3,800
	Removable Hard Disk	1	6,000	6,000
	Repeater (Hub)	1	3,000	3,000
	Total Cost of New Hardware:			199,800
	1.2 New Software:			
	Magic Software Version 8.3	1	30,000	30,000
	Microsoft SQL Server	1	65,000	65,000
	Microsoft Window 98	1	12,000	12,000
	Microsoft Window NT	1	30,000	30,000
	Microsoft Office 97	1	12,000	12,000
	Total Cost of New Software:			149,000
	1.4 Implementation Cost:			
	Software Development Cost			40,000
	Training Cost			10,000
	Setup & Installation Cost			10,000
	Total Implementation Cost:			60,000
	Total Development Costs:			408,800
2. Operating Cost				
	2.1 Personnel Cost:			
	Staffs (10,000 /Person/Month)	3	10,000	360,000
	Subtotal 1:			360,000
	2.2 Office Supplies Cost			
	Stationary			18,000
	Office Equipment Cost			18,000
	Miscellaneous Cost			21,600
	Maintenance and Utility Cost			15,000
	Subtotal 2:			72,600
	2.3 Depreciation Cost			39,960
	Subtotal 3:			39,960
	Total Projected Annual Costs:			881,360

(3) The Comparison of the System Costs between an Existing System and the Proposed System

Table 3.3 Cost Comparison between the Existing System and the Proposed System, Baht.

Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Cost of Manual System						
Operating Cost:						
Personnel:						
Staffs		600,000	660,000	726,000	798,600	878,460
Office Supplies						
Stationary		36,000	36,000	36,000	36,000	36,000
Office Equipment & Miscellameous Expense						
Office Equipment		30,000	33,000	36,300	39,930	43,923
Miscellaneous Cost		24,000	26,400	29,040	31,944	35,138
Utility Cost		12,000	12,000	12,000	12,000	12,000
Total		702,000	767,400	839,340	918,474	1,005,521
Accumulated Cost		702,000	1,469,400	2,308,740	3,227,214	4,232,735
Cost of Computerized System						
Development Cost:						
Hareware Cost	199,800	39,960	39,960	39,960	39,960	39,960
Software Cost	149,000	29,800	29,800	29,800	29,800	29,800
Implementation Cost	60,000					
Operating Cost:						
Personnel:						
Staffs		360,000	396,000	435,600	479,160	527,076
Office Supplies Cost:						
Stationary		18,000	18,000	18,000	18,000	18,000
Office Equipment		18,000	18,900	19,845	20,837	21,879
Miscellaneous		21,600	22,680	23,814	25,005	26,255
Maintenance Cost		15,000	15,000	15,000	15,000	15,000
Total	408,800	502,360	540,340	582,019	627,762	677,970
Accumulated Cost		911,160	1,451,500	2,033,519	2,661,281	3,339,251
Cost Difference		209,160	-17,900	-275,221	-565,933	-893,484

28

3.5.2 Benefit Analysis

The benefits from the computerized system can be generalized into two categories.

(1) Tangible Benefit:

This involves the decrease in the amount of money the company has to pay. It is measured in terms of money value (Baht). After implementation of the new system for Zestteem Ordering Information System, the tangible benefits are as follows:

(a) Reduce the paper usage   28,000 Baht

With the computerized system, everything is recorded in the computer, the paper usage is decreased dramatically so as to the cost of office supplies.

(b) Reduce the number of workers from 5 staff to 3 staff   240,000 Baht

Since the computerized system provides an easy operation for the employee, with a few staffs, the workflow of the company is under control and manageable.

(c) Reduce overtime expenses   150,000 Baht

Before the use of the computerized system, everything is done manually. During the high season, there is a lot of paper work. The employees have to work overtime to get all the works done.

(d) Increase the capability in searching for the data   200,000 Baht

With the new computerized system, the user is able to find the required data faster than the manual system. This can endorse the service to the customer as well as the performance of the company.

29

(e)   Increase Sales Volume   400,000 Baht

Since the computerized system helps in searching, data process becomes faster. Now the company can find the strategy to sell as many products as possible. There is no doubt that the sales volume will keep on increasing.

Total Tangible Benefit   1,018,000 Baht

(2)   Intangible Benefit:

This is the benefit, which can not be measured in terms of money value. It exists in a form of some improvement with the use of a new computerized system. The tangible benefits are found and listed as below:

(a)   Increase the efficiency in searching for the required data.

(b)   Reduce the time in preparing the report for the management and operation level.

(c)   Reduce the duplicate procedure.

(d)   Provide a fast access to the data.

(e)   Ad hoc query is possible.

(f)   Reduce the rate of human error.

(g)   Reduce the space to keep the document.

(h)   Increase the overall company performance.

(i)   Increase the customer satisfaction.

(j)   Build the company reputation.

(k)   Data sharing can be done easily.

(l)   Reduce the duplicated document.

There are several methods or techniques for cost and benefits analysis. Within this project, break-even analysis, payback analysis, net present value and return on

investment have been used to test the manual system operation against the computerized system.

Break Even Analysis

With the Break Even Analysis, it shows accumulation of Manual Cost versus Computerized Cost.

In Table 3.4 shows the Five Years of Manual Cost and the Accumulation.

Table 3.4. Five Years Accumulated Manual System Cost, Baht.

Year	Total Manual Cost	Accumulated Cost
1	702,000	702,000
2	767,400	1,469,400
3	839,340	2,308,740
4	918,474	3,227,214
5	1,005,521	4,232,735
Total	4,232,735	-

In Table 3.5 shows the Five Years of Computerized Cost and the Accumulation.

Table 3.5. Five Years Accumulated Computerized System Cost, Baht.

Year	Total Computerized Cost	Accumulated Cost
1	911,160	911,160
2	540,340	1,451,500
3	582,019	2,033,519
4	627,762	2,661,281
5	677,970	3,339,251
Total	3,339,251	-

Table 3.6 shows the Comparison between Accumulation of Manual Cost and Accumulation of Computerized Cost.

Table 3.6. The Comparison of the System Costs, Baht.

Year	Accumulated Manual Cost	Accumulated Computerized Cost
1	702,000	911,160
2	1,469,400	1,451,500
3	2,308,740	2,033,519
4	3,227,214	2,661,281
5	4,232,735	3,339,251
Total	4,232,735	3,339,251

Figure 3.6 shows the Break Even Point between the Manual Cost and Computerized Cost

The Figure 3.2 depicts the Break Even Analysis between the Manual System and the Computerized System. There are two kinds of line, which are shown in Figure 3.3. One dash line stands for the Manual System and other straight line for Computerized System. With the Break Even Analysis, the range of five years has been used to compare the accumulated cost between the manual system and the proposed system.

Apparently, the cost of the investment in the first year of the computerized system is higher than the manual system. For the following years, the cost of the computerized system tends to decline while the cost of the manual system increases dramatically. At one point, where these two lines cut across each other is called the Break Even Point. As in the Figure 3.2, within 1 years and nearly 11 months the proposed system would have reached the Break Even Point, and thereafter, becomes more economical to operate than the existing system.
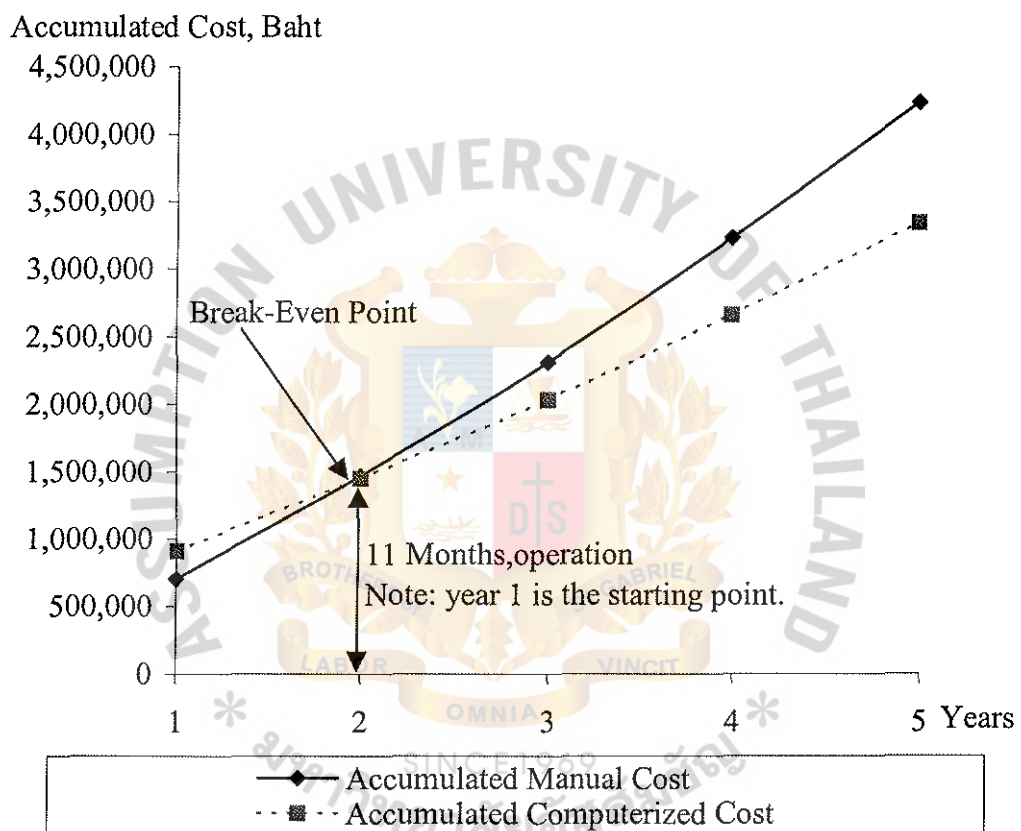
32

Figure 3.2. The Break Even Analysis.

<u>Payback Analysis</u>

This is one of the popular methods for determining if and when an investment will pay off. As the company has to invest a certain amount of budget for the development cost long before the benefits are received, this will take a period of time for the benefits to overtake the costs.

Payback Period for the Proposed System can be calculated by the following :

Formula:

Payback Period = $C / (A + B)$

Where

A = Last year of negative cash flow difference

B = Cumulative difference last negative year

C = Absolute value of cumulative difference

Table 3.7.   The Cumulative Difference of Existing System and Proposed System, Baht.

Cumulative Difference	Year 1	Year2	Year 3	Year 4	Year 5
Difference (Manual-Computerized)	-286,780	175,049	637,679	1,100,176	1,560,854

Payback Period = $1 + \dfrac{286,780}{286,780+175,049}$

Payback period = $1 + 0.58 = 1.58$ or 1 Year and 7 Months

The Payback Analysis, states the company has to take 1 year and 7 months for the system to pay for the cost incurred. Payback Analysis explains more about the calculation of Table 3.8 and Figure 3.4 shows the Payback Analysis Graph.

34

(1) Payback Analysis

Table 3.8. Payback Analysis of the Proposed System, Baht.

| Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Development Cost:	-408,800					
Annual Operating Cost:		-881,360	-540,340	-582,019	-627,762	-677,970
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567
Time-adjsted costs (adjusted to present value):	-408,800	-787,054	-430,651	-414,398	-399,257	-384,409
Cumulative time-adjusted costs over lifetime:	-408,800	-1,195,854	-1,626,505	-2,040,903	-2,440,160	-2,824,569
Benefits derived from operation of new system:	0	1,018,000	1,119,800	1,231,780	1,354,958	1,490,454
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567
Time-adjsted benefits (adjusted to present value):	0	909,074	892,481	877,027	861,753	845,087
Cumulative time-adjusted benefits over lifetime:	0	909,074	1,801,555	2,678,582	3,540,335	4,385,423
Cumulative Lifetime Time Adjusted Costs + Benefits:	-408,800	-286,780	175,049	637,679	1,100,176	1,560,854
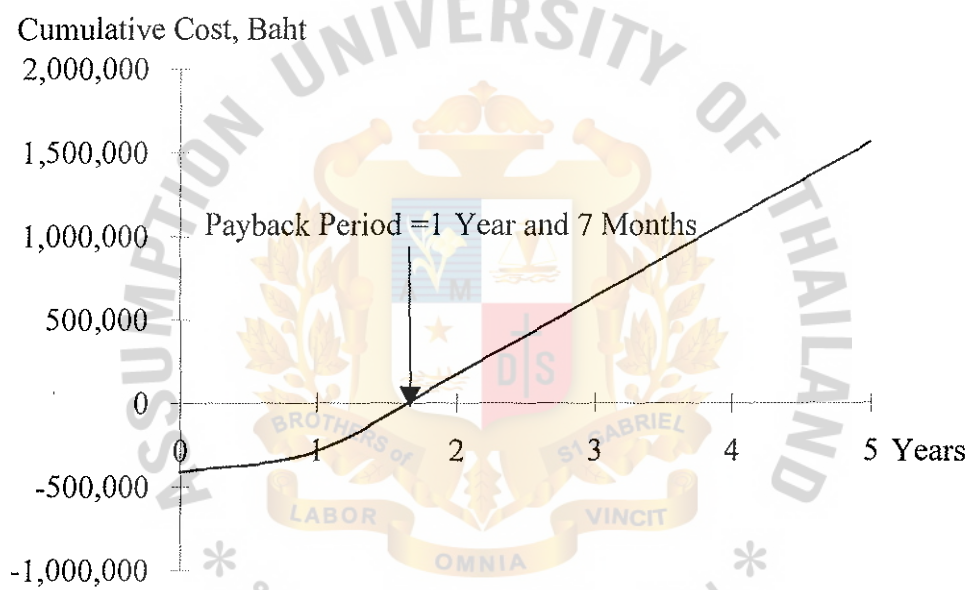
Figure 3.4   Payback Analysis for the Proposed System.

Net Present Value

The Net Present Value determines whether it is worth an investment for a computerized system, if the subtraction of the net present value of lifetime cost with the sum of the net present value of lifetime benefit returns the positive value. This can indicate a reasonable or good investment for the company. The Table 3.9 shows the Net Present Value Analysis of The Proposed System. As shown in the Table, the Net Present Value returns a positive value, this means if the company invests 1,560,854 (Baht) at 12 percents for five years, the company will make the same profit as by implementing the computerized system.

Return on Investment

This technique is used to compare the lifetime profitability. The return on investment for a project is a percentage rate that measures the relationship between the amount the business get back from an investment and the amount invested.

The return on investment is calculated as follows:

$$ROI= \frac{Estimated\ Lifetime\ Benefits - Estimated\ Lifetime\ Cost}{Estimated\ Lifetime\ Costs}$$

The Calculation of ROI can be seen on Table 3.10

37

(2) Net Present Value Analysis

Table 3.9. Net Present Value Analysis, Baht.

Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Development cost:	-408,800						
Annual Operating cost:		-881,360	-540,340	-582,019	-627,762	-677,970	
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567	
Present value of annual costs:	-408,800	-787,054	-430,651	-414,398	-399,257	-384,409	
Total present value of lifetime costs:							-2,824,569
Benefits derived from operation of new system:	0	1,018,000	1,119,800	1,231,780	1,354,958	1,490,454	
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567	
Present value of annual benefits:	0	909,074	892,481	877,027	861,753	845,087	
Total present value of lifetime benefits:							4,385,423
Net Present Value							1,560,854

38

(3)   Return on Investment Analysis

Table 3.10.   Return on Investment Analysis, Baht.

Return on Investment	Cost
Estimated Lifetime Benefits:	4,385,423
Estimated Lifetime Costs:	2,824,569
Return on Investment	1,560,854
Return on Investment (%)	55.26%
All are time-adjusted values	

Comparison and Discussion of Four Methods in Cost and Benefit Analysis

Table 3.11.   Comparison and Discussion of Four Methods in Cost and Benefits Analysis.

Method	Result
Break Even Analysis	1 year and 11 months
Payback Analysis	1 year and nearly 7 months
Net Present Value	Positive value of 1,560,854 Baht
Return on Investment	55.26%

From the result of Break Even Analysis, 1 year and 11 months depicts the time when the cost of the manual system and cost of the computerized system is exactly equal. It will not provide any further information rather than how many years it takes before the cost of manual and computerized is matched.

For Payback Analysis, this method determines how much time will lapse before accrued benefits overtake accrued and continuing costs. The basic rule for consideration is to accept the project when the result returns positive value, the result is acceptable. This may increase the efficiency and effectiveness of the company as well as the Tangible benefits. From this project, it takes 1 year and 7 months for the accrued benefits to overtake the accurued and continuing costs.

With the Net Present Value, if we invest 1,560,854 Baht at 12 percent for five years, we will make the same profits as we implement the information system for the company.

The last method is Return on Investment, we basically consider if the result returns a higher percentage than the discount rate, this project is acceptable as well.

Since this project returns 55.26% which is far more than 12.00%, we think this project is approved.

IV. SYSTEM IMPLEMENTATION

After the completion of the system analysis and design, the next step is the system implementation.

System implementation consists of four phases:

(1)   Programming

(2)   Testing

(3)   Conversion

(4)   Training

4.1   Programming

In this part, we concentrate on using Magic Software Version 8.3 as a tool in developing and designing the program for the Zestteem Ordering Information System. We try to implement the program to be user-friendly as well as easy to read and understand programming logic. We start the designing of the program from the point where the user can search for the desired customer profile. User can create, edit and delete the data of unwanted customers. This programming logic can be applied to the supplier profile as well. The program also can record customer purchase order and retrieve the data when it is necessary. The user also is able to issue company purchase order, company invoice as well as company delivery order. The report also can be created based on the user and management requirements.

4.2   Testing

After the program has been designed and implemented, it now comes the testing part. Testing process is conducted to detect and correct the errors. It also tests the unification of each module in the entire system. All possible ways to get off the route, apart from the program, are designed and problems must be found and prevented from

happening in the future. We have to test whether the program is easy to use and understand if we are the users. If it was hard to follow and understand, then we have to make it more simple. We have to test from the general level to a level that is more specific in order to ensure the correctness of the program. The next important thing in testing process is the peak load testing. It can determine whether the system is capable of handling the high volume of activities that occur when the system is at the peak of the processing

4.3 Conversion

System conversion consists of Data Conversion and System Installation. The major objective is to install the computerized system to replace the manual system. All the data previously kept on the paper is now recorded to the designed database. This process must be executed carefully since the conversion of data takes a certain time to process while the existing system is running in a parallel processing until the full computerized system is ready.

4.4 Training

After the program has been tested and installed, there comes the process of training for the user to be familiar and able to use the program correctly. As we know, some user may not know how to use the computer at all. This is the process to literate the user to understand the flow of the program and probably the logic. System analysts, programmers and vendors are assigned to train the users. The methods used are demonstration of the equipment, create the training manual, give the lecture about the procedure, discussion, question and answer and hands on experience with new equipment.

V.   CONCLUSIONS AND RECOMMENDATIONS

5.1   Conclusions

Most businesses are now using the computerized system to help in the processing and keeping data in the database. Zestteem Ordering Information System, now turns to use the computerized system to replace the manual system. As the business keeps on expanding, the computer plays a more important role in handling the increasing workloads. The main tasks of the system include recording customer purchase orders, create, edit and deletion of the customer's profile, issue company purchase orders to the supplier, issue invoices to the customer and etc. The computerized system provides accurate, consistent information and eliminates redundant operations. Moreover, with the computerized system, the sales volume has increased dramatically, better services has been provided to the customer.

The project started by identifying the problems, objectives, scopes and the deliverables. Then the next step is to gather all the information or requirements using an interviewing method. Context diagram, data flow diagrams and structure charts were used to plan the input processes and the output of business functions. It also can be used in designing the program as well. With entity relationship diagram, we are able to know the structure of the database component. Data dictionary and process specifications were developed to show the program flow of the computerized system. The cost and benefit analysis is developed to compare the costs of the existing system and the proposed system. With four methods: Break even analysis, Payback period, Net present value and Return on Investment, we can determine whether the new system is worth the investment. The result is, the investment is reasonable. Both tangible and intangible benefits were presented with the deployment of the computerized system.

44

The company decides to use Magic Software to develop the program for an ordering system. The program has been tested several times before it can be installed. This is the way to ensure the program to be error free. It is also less costly to discover problems before the system is actually assigned and used by the users. Data is stored in the database and every department can access through shared data. The users of the computerized system have been trained to understand and gain the knowledge about the new computerized system. Different strategies have been used in training due to the differences in background of computer literacy.

Table 5.1 shows the time spent on each process of the Manual System compared to the Proposed System. It shows that each process of the Proposed System uses less amount of time to finish the mission. This can explain that the Proposed System is far more efficient and effective than the Existing System.

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

Process	Existing System	Proposed System
Create Customer Record	20 mins	5 mins
Search for Customer Profile	30 mins	5 mins
Record Customer Purchase Order	25 mins	5 mins
Produce Company Invoice	20 mins	10 mins
Search Supplier Profile	30 mins.	5 mins
Record Company Purchase Order	15 mins	8 mins
Total	2 hrs. 20 mins	38 mins

The process of creating customer or supplier profile can be done by just clicking on the 'Create' button on Figure H.8 and H.18 respectively. The new window will pop up, then the user need to enter the required data to the provided text box. After finishing

with the details then click on the 'Save' button. This time the new profile has been created successfully while taking less amount of time.

For the process of searching customer profile, the user is required to press 'F5' button to zoom the whole data up then browse through until the user finds the right customer. Other method is provided as well, the user has to key in the customer number then the closest range of customer number and name will appear then the user needs only to select the desired customer. This concept is also applied in searching supplier profile as well.

Now, we are at the phase of recording customer or company purchase order. The user needs only to enter the data to the provided space then click the save button. The information is now recorded to the following files for future reference.

For the part of generating company invoice, the user does not have to enter the invoice number. This invoice number is already pre-specified within the program, the last number of the invoice will come up automatically. The user does not have to search for the last time previous number at all. This provides a helpful in arranging the invoice number with the correct sequence and easy for searching in the future. For more information on the process of the program, see Appendix H.

5.2 Recommendations

The success of the Ordering Information System of Zestteem Company Limited cannot succeed without the efficiency in analysis, design and implementation of the computerized system. In addition, the system developed in this project still needs an ongoing development, revisions and modifications to meet the future requirements. The proposed system environment is a Local Area Network that provides the facilities to expand the network connection and serve the new advance technology.

46

However, to become successful in implementing the Ordering Information System, the following factors should be considered:

(1) The new Ordering Information System needs to have LAN administrator to handle and support the technical requirements about the network of the company.

(2) It should have a supporter for the computer program in the company in case of program malfunction.

(3) Frequently reviews and keeping up to date of the user requirements to correct the mistakes and development in the future.

(4) The company may adapt the computerized system to other departments such as Accounting and Finance Department. This will enhance the processing performance, reduce work cycle and eliminate unnecessary paper work.

(5) In the future, e-commerce may play an important role in expanding the market for Zestteem Company to the worldwide market. This attempt requires further study.

APPENDIX A

CONTEXT DATA FLOW DIAGRAM
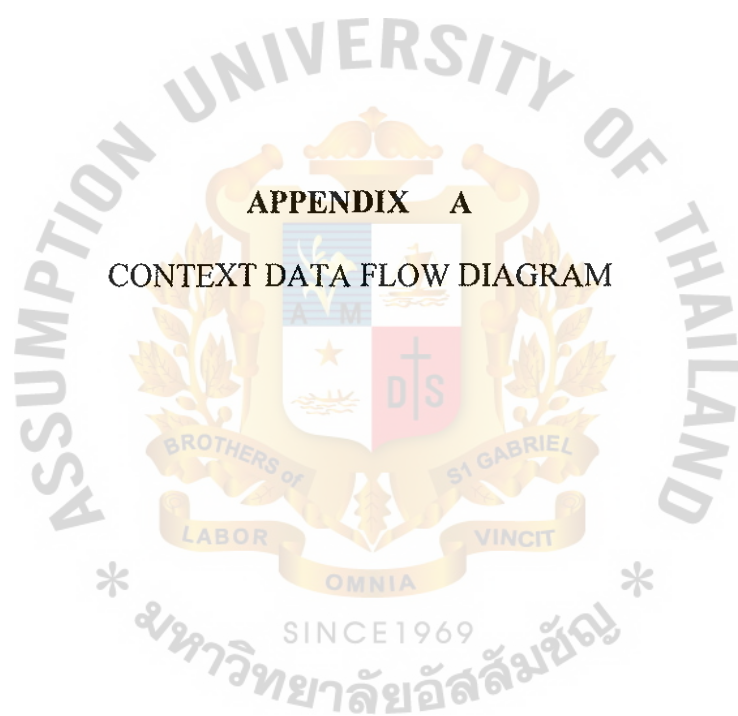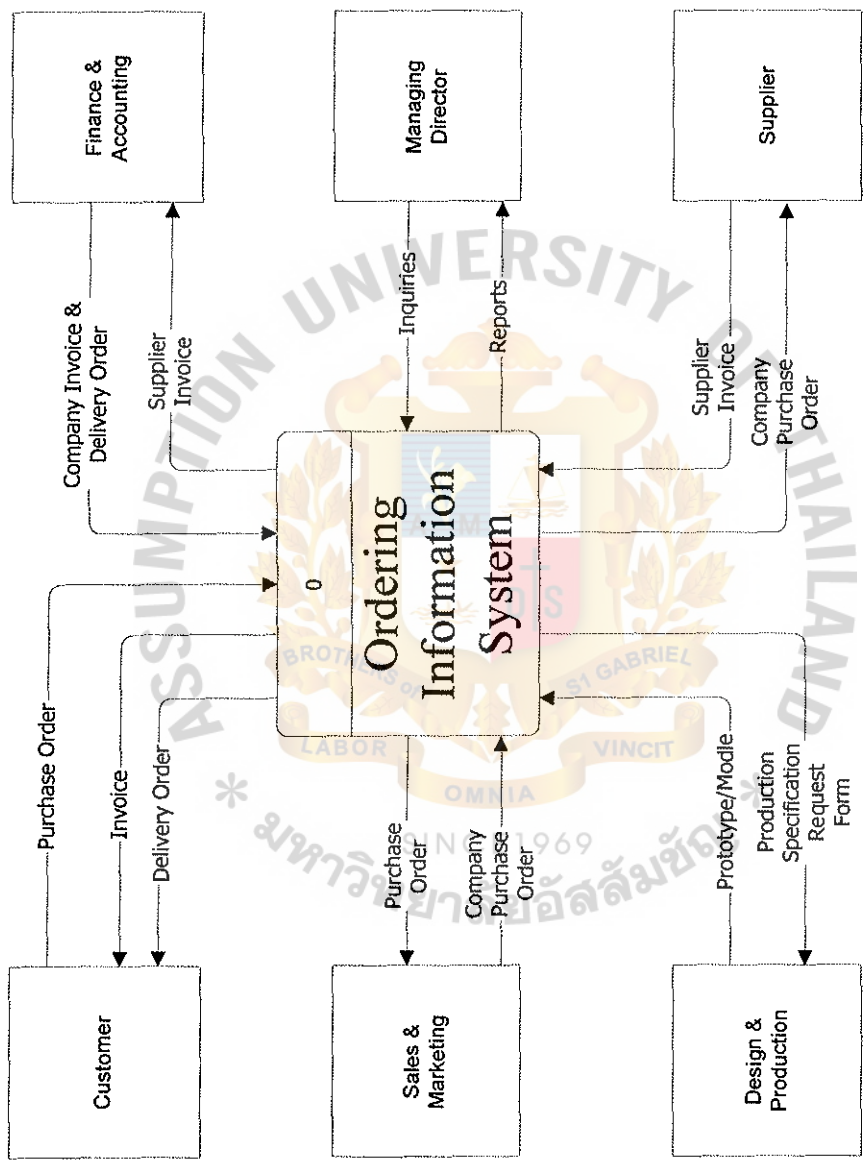
Figure A.1. Context DFD of Zestteem Ordering Information System.

48

APPENDIX   B
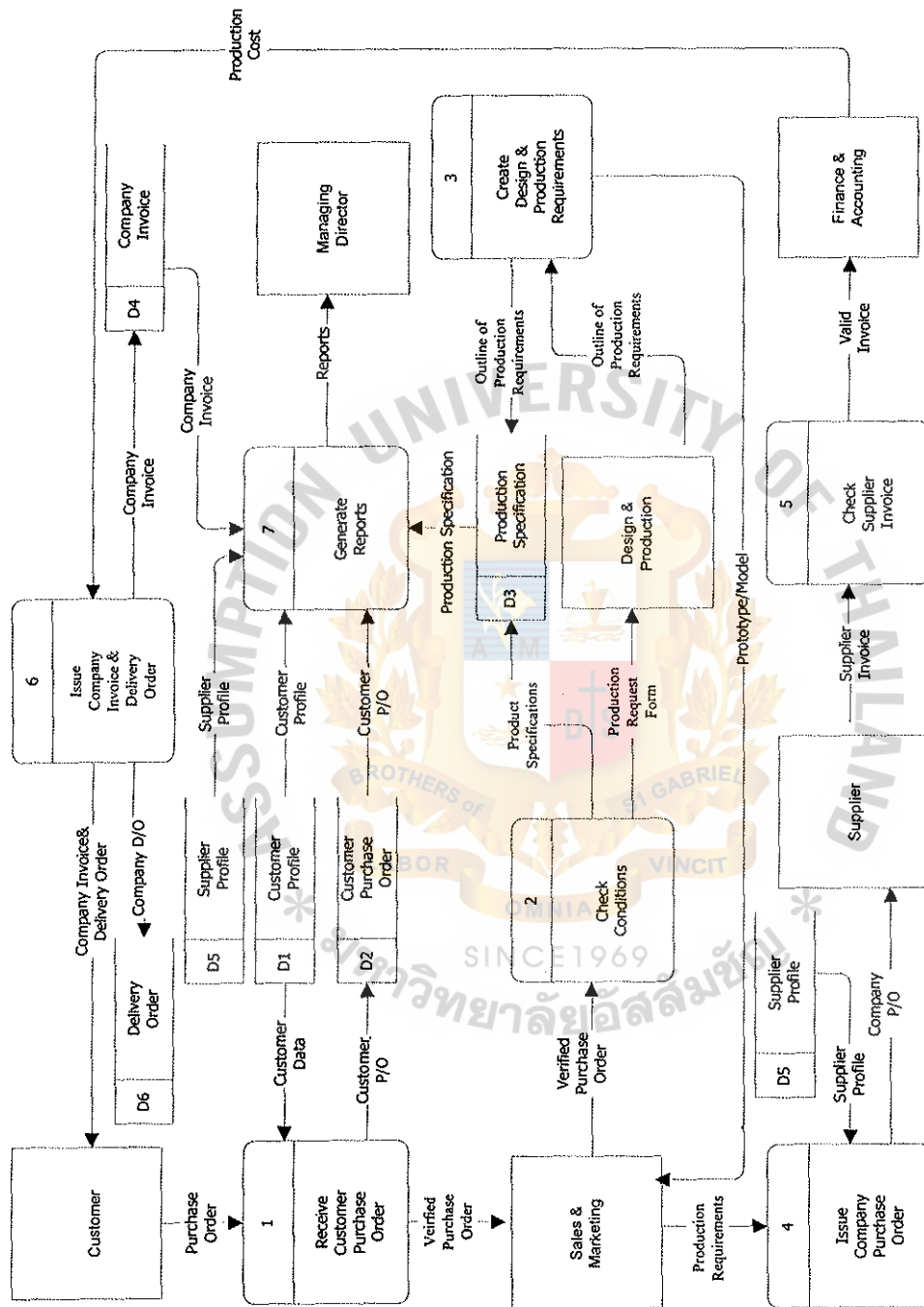
DATA FLOW DIAGRAM

Figure B.1.   Data Flow Diagram Level 0 of Proposed System.
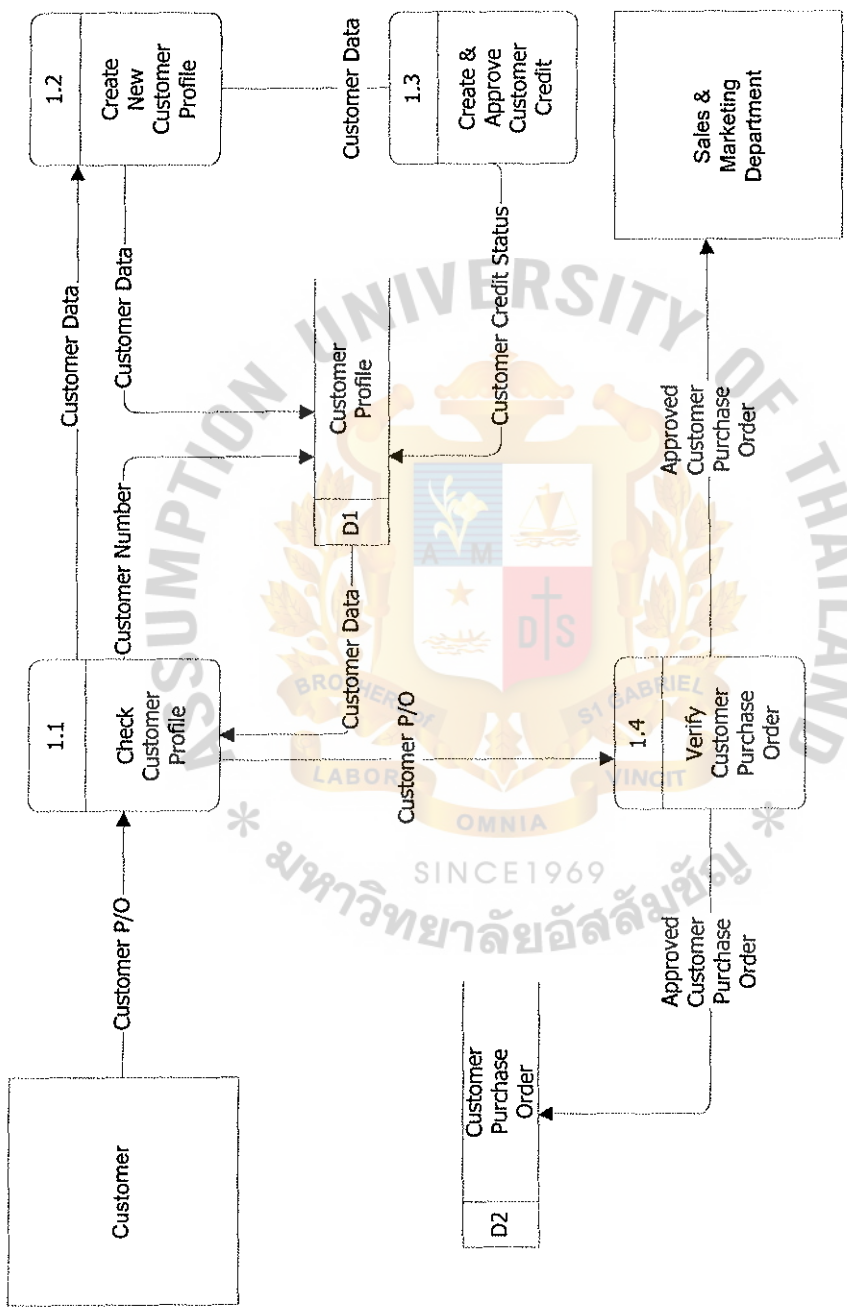
Figure B.2.   Data Flow Diagram Level 1:   Process 1.0 Receive Customer Purchase Order.
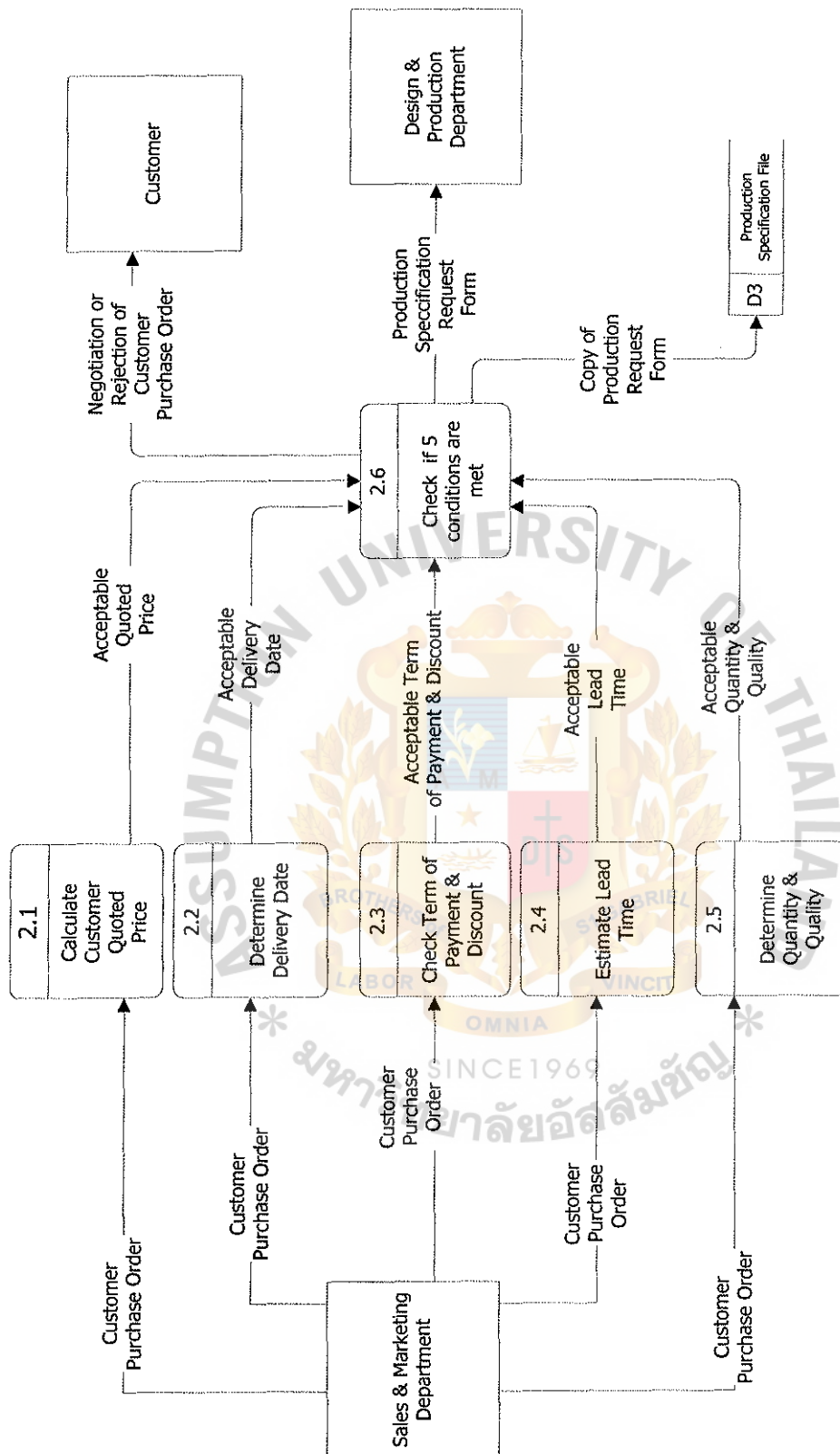
Figure B.3. Data Flow Diagram Level 1: Process 2.0 Check Conditions.
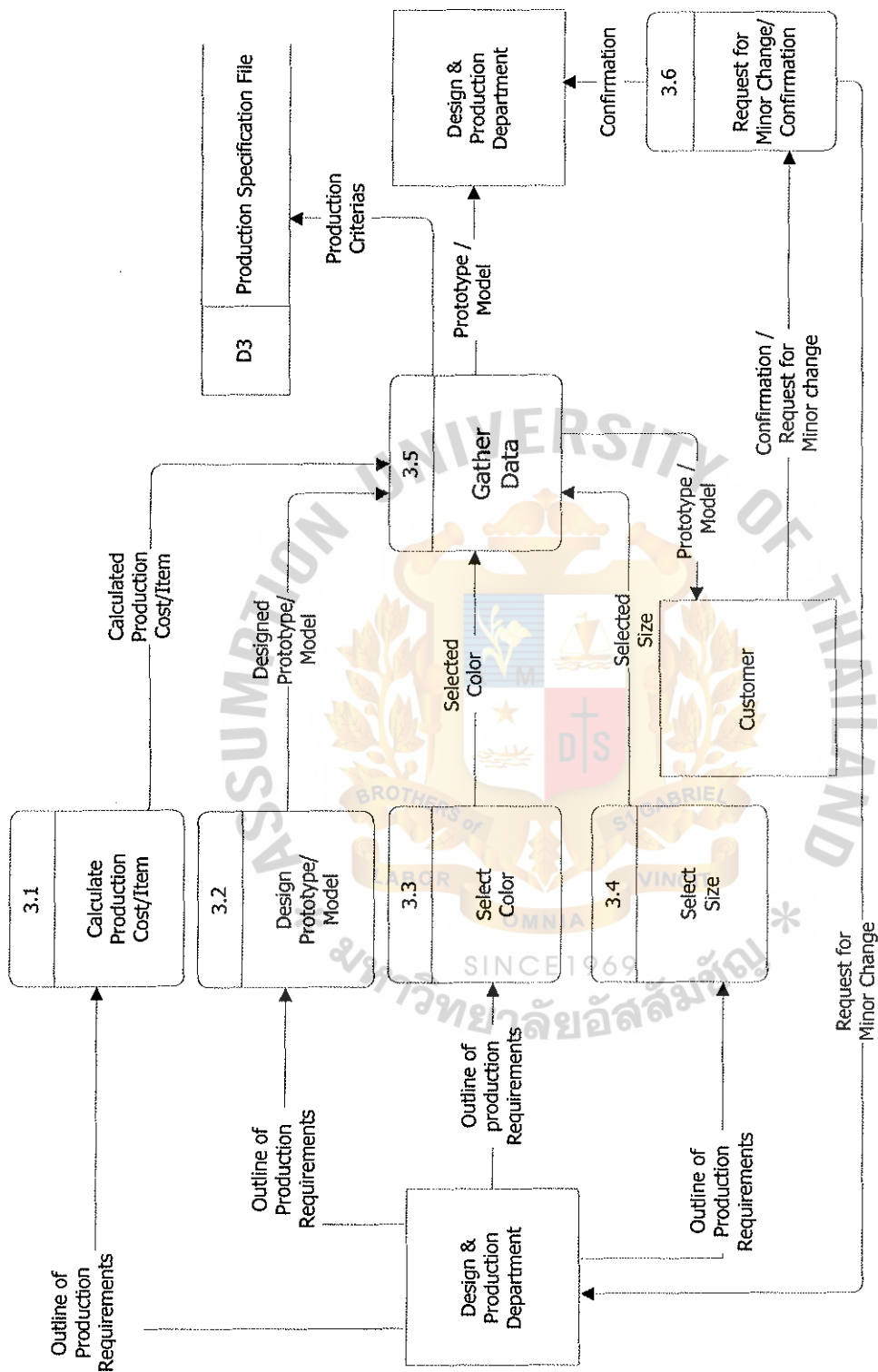
Figure B.4.   Data Flow Diagram Level 1: Process 3.0 Create Production Requirements.

52
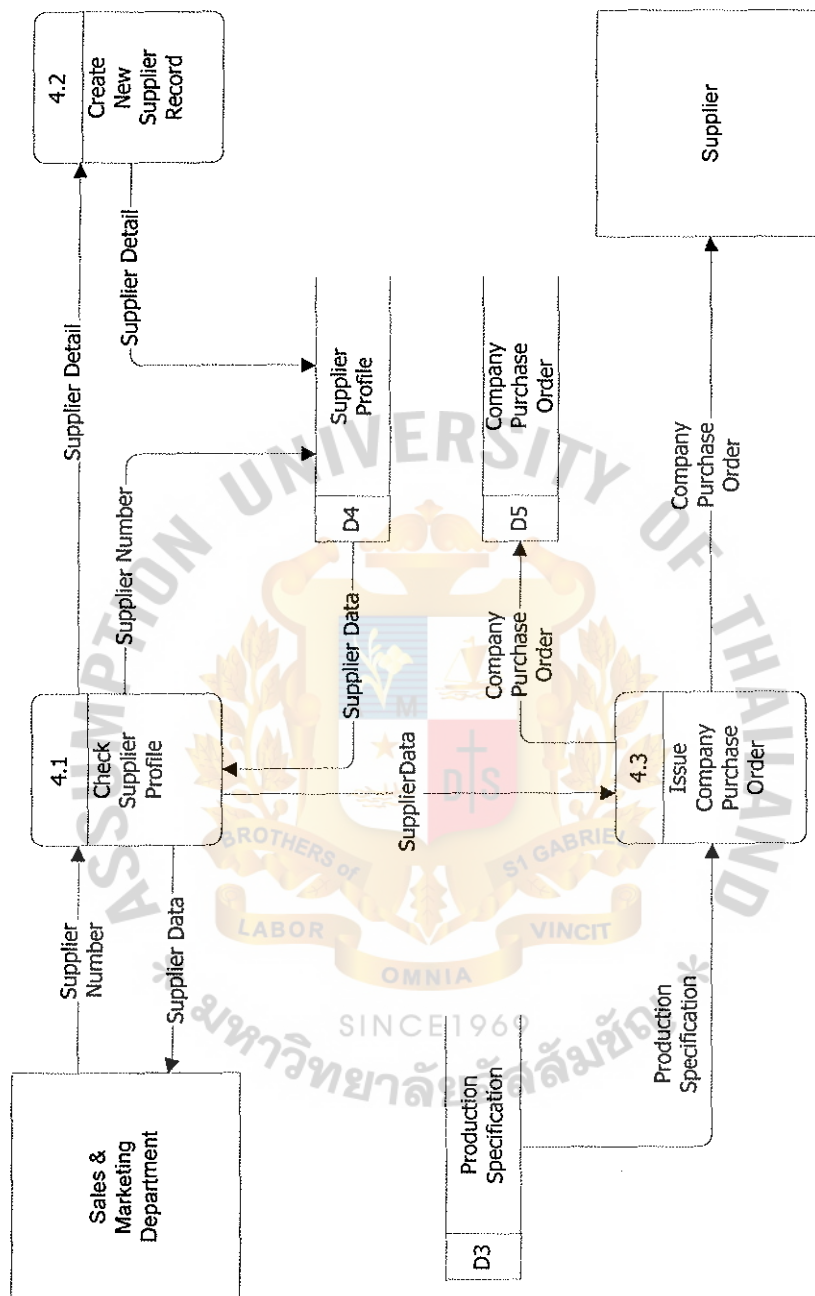
Process B.5.   Data Flow Diagram Level 1: Process 4.0 Issue Company Order.

53
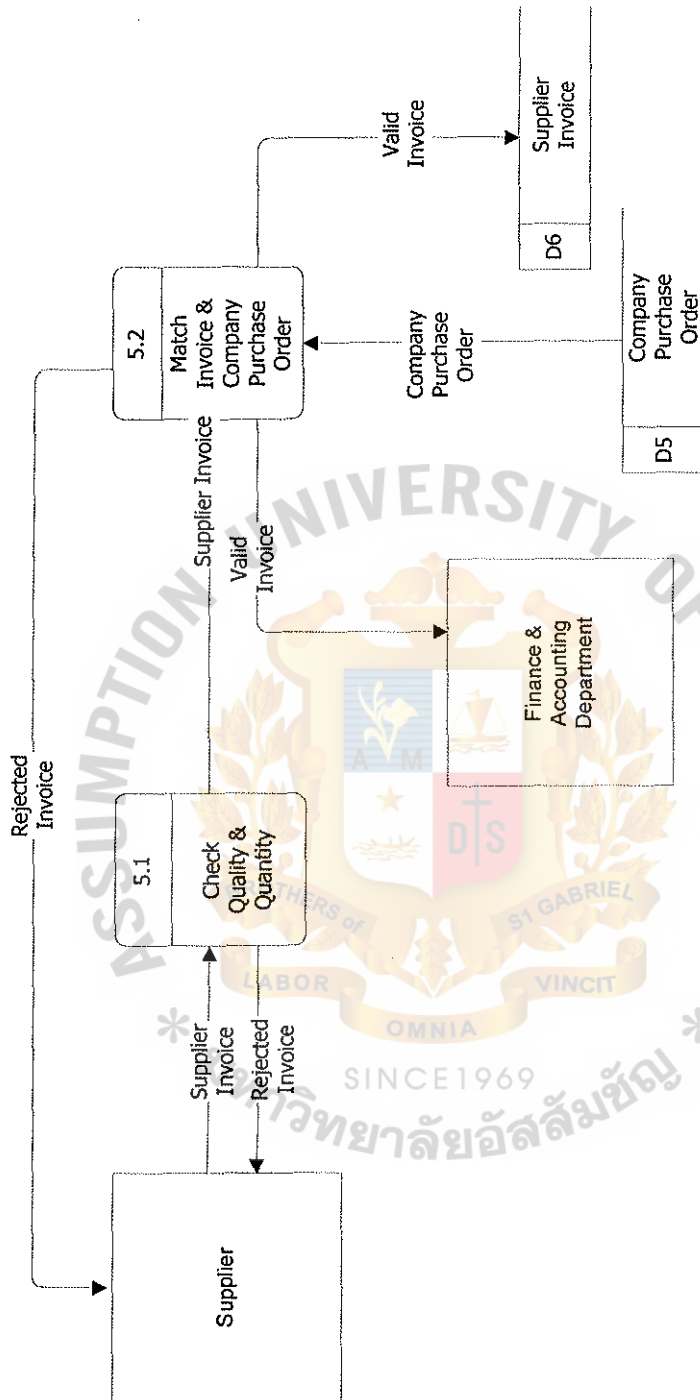
Figure B.6. Data Flow Diagram Level 1: Process 5.0 Receive Supplier Invoice.
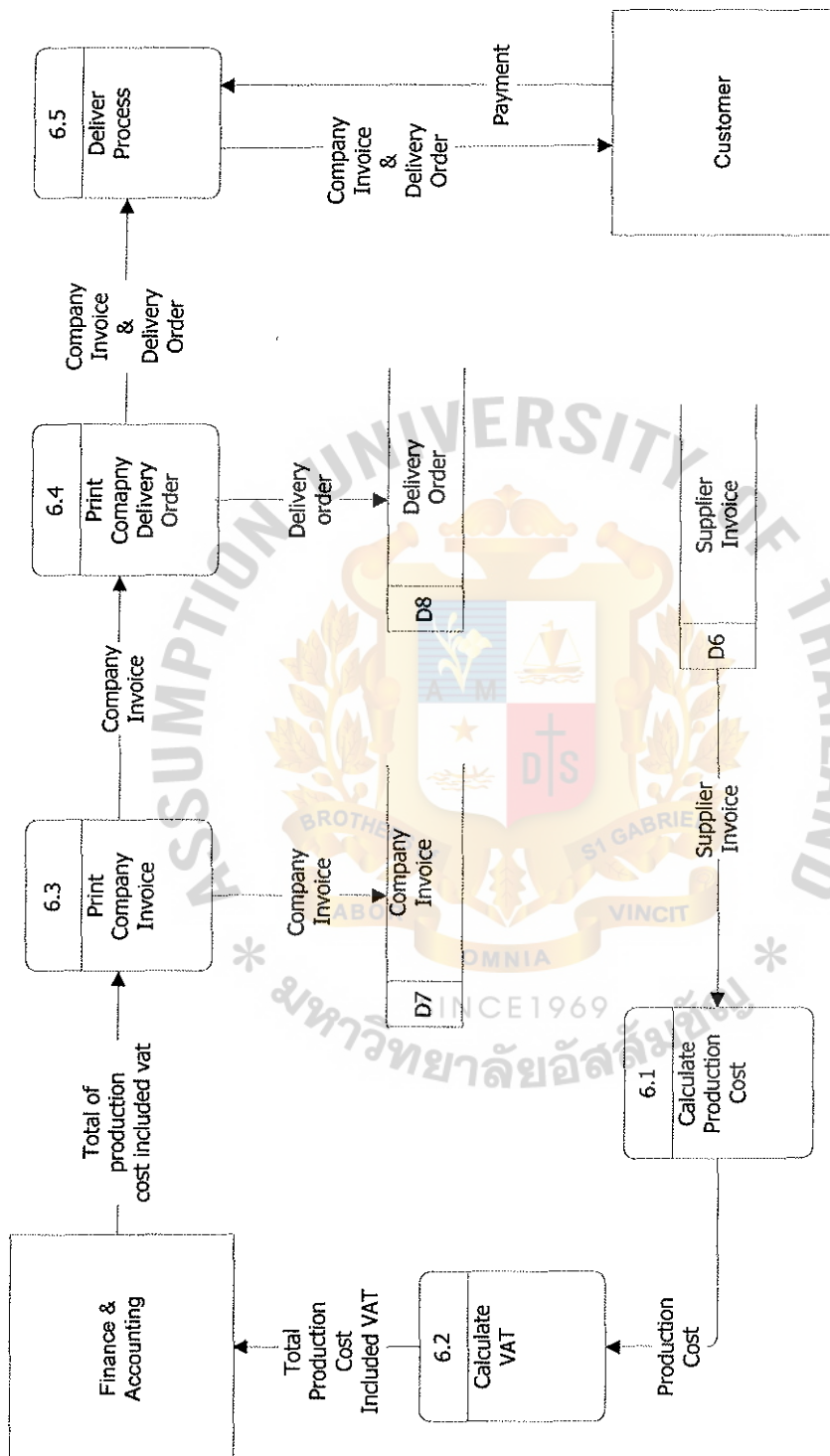
Figure B.7. Data Flow Diagram Level 1: Process 6.0 Issue Company Invoice.
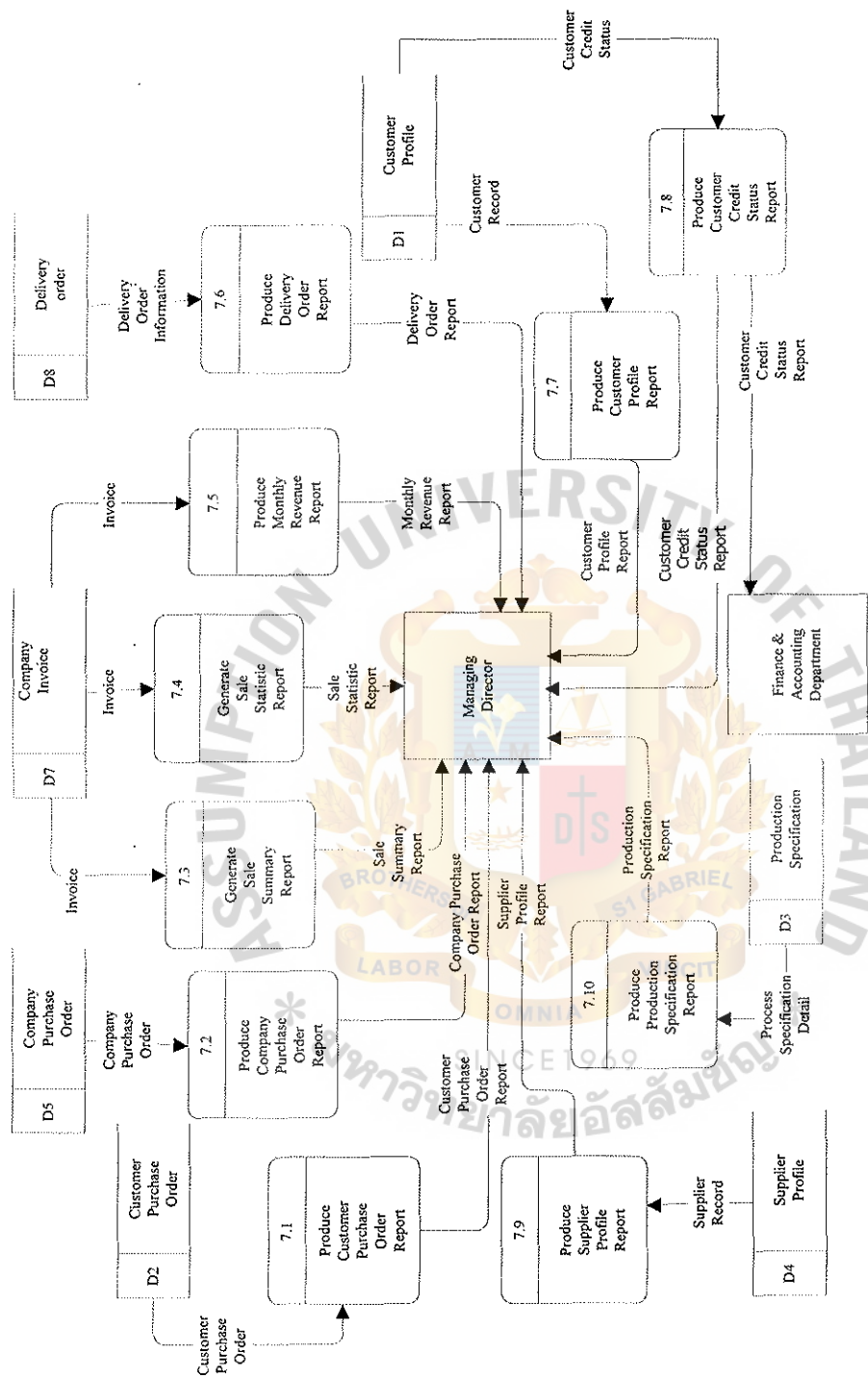
Figure B.8.   Data Flow Diagram Level 1: Process 7.0 Generate Reports.
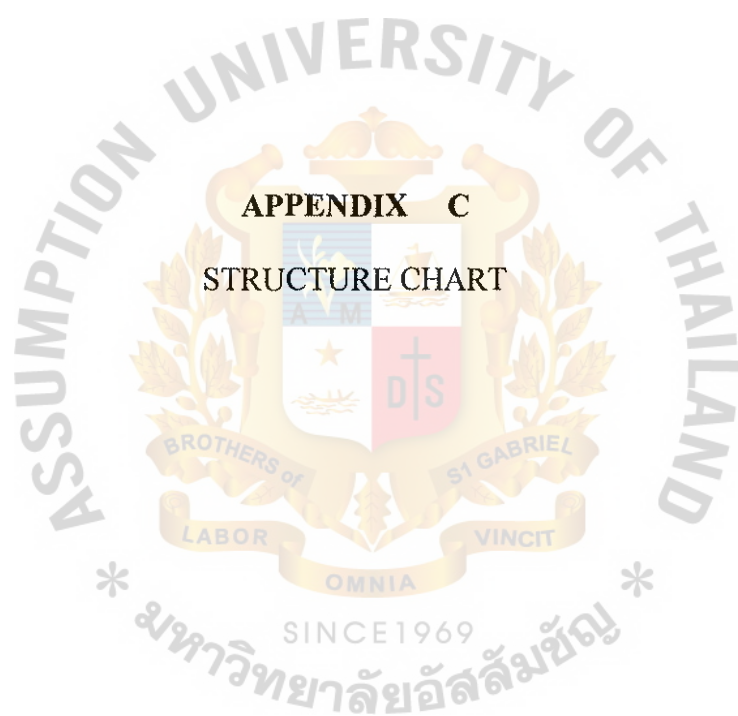
APPENDIX   C

STRUCTURE CHART
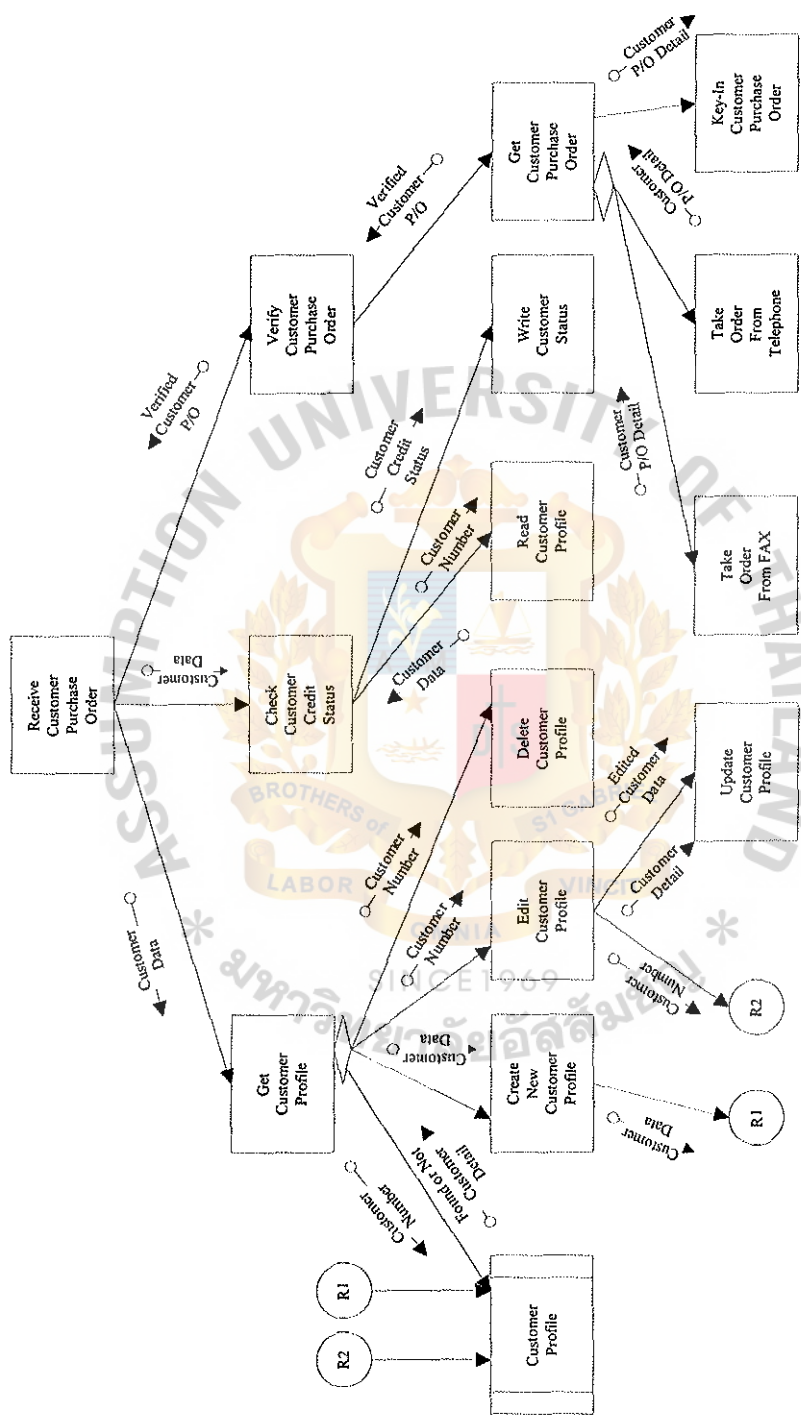
Figure C.1. Structure Chart of Receive Customer Purchase Order.
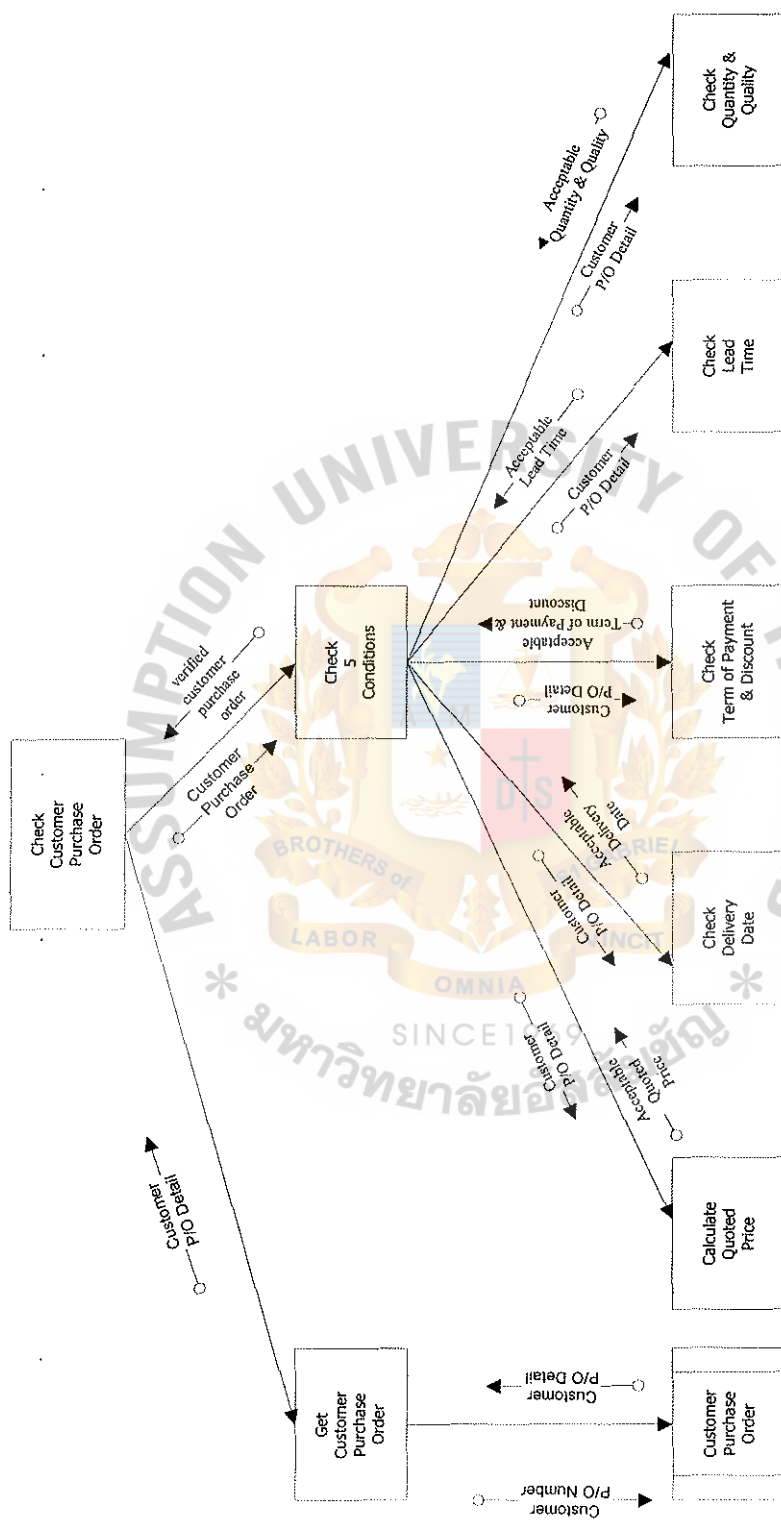
Figure C.2.   Structure Chart of Check Conditions.

58
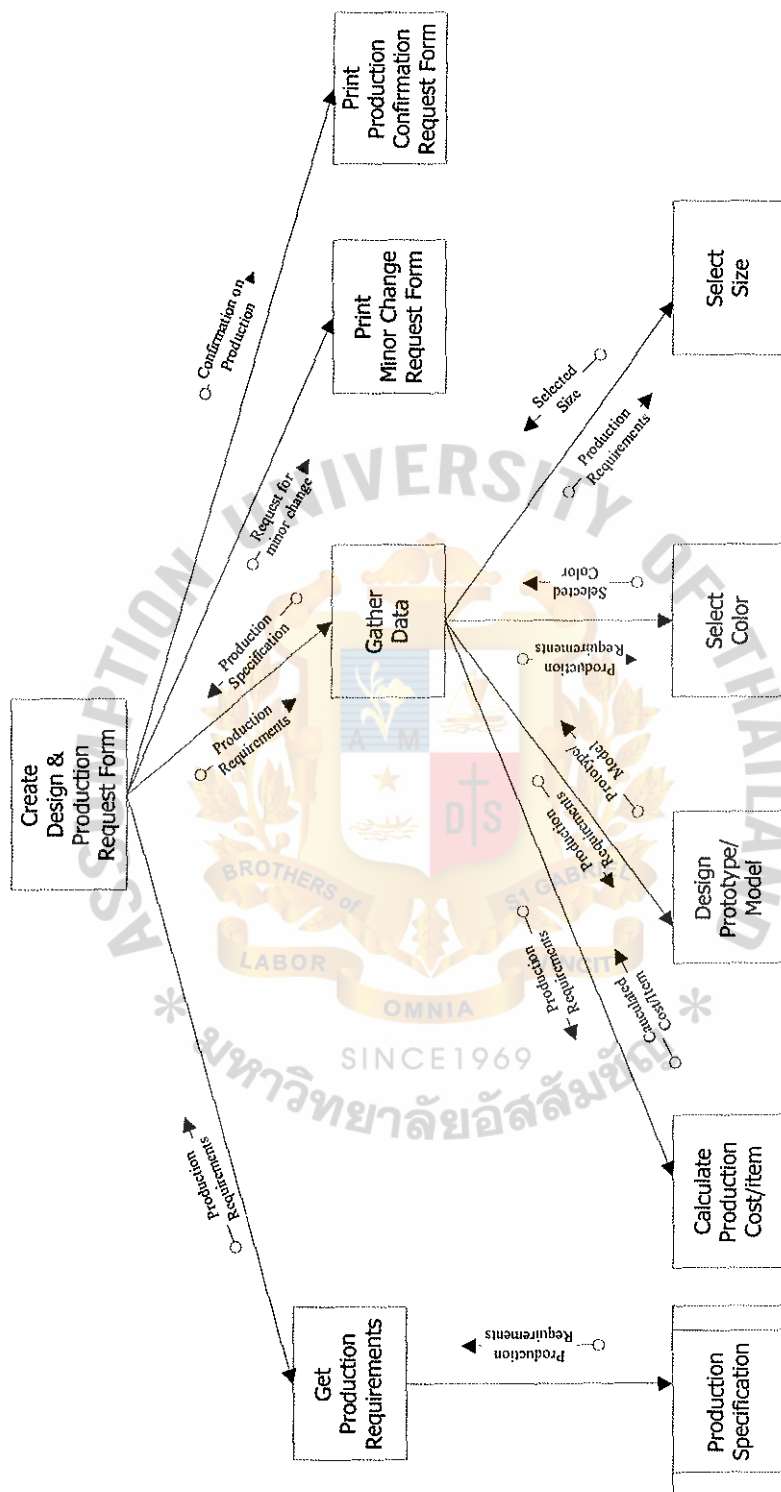
Figure C.3.   Structure Chart of Create Design and Production Request.

59
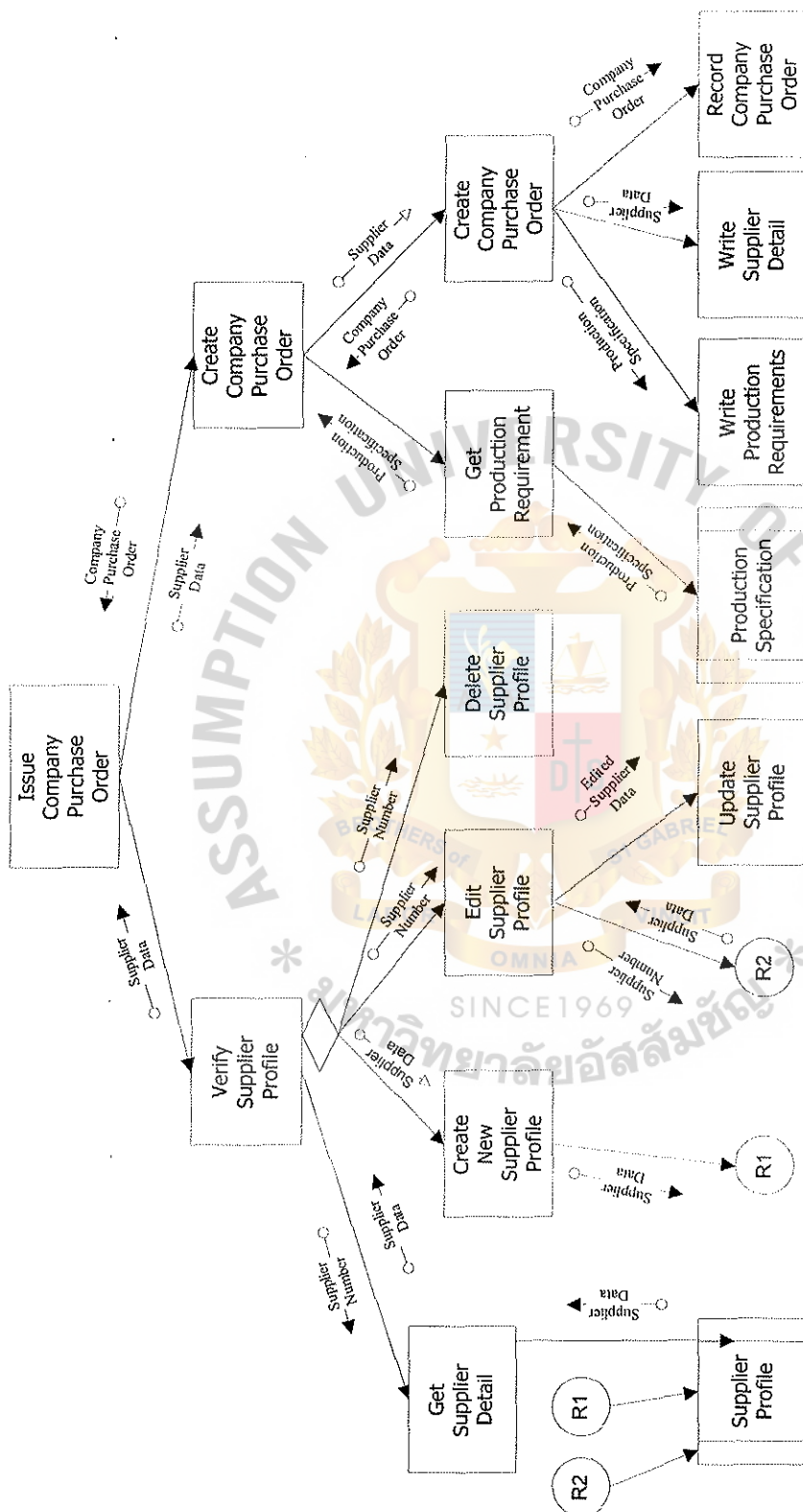
Figure C.4.   Structure Chart of Issue Company Purchase Order.
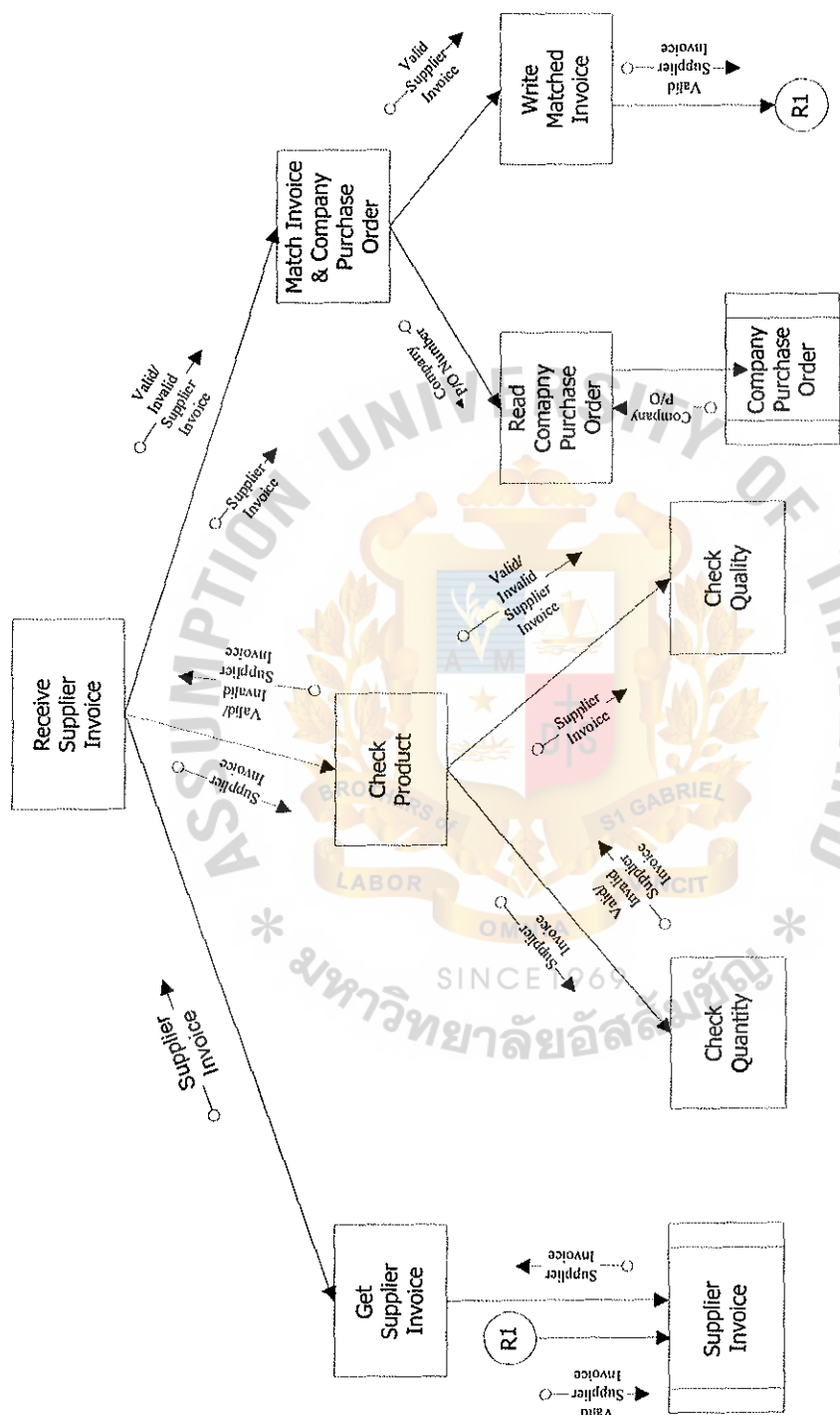
Figure C.5. Structure Chart of Receive Supplier Invoice.
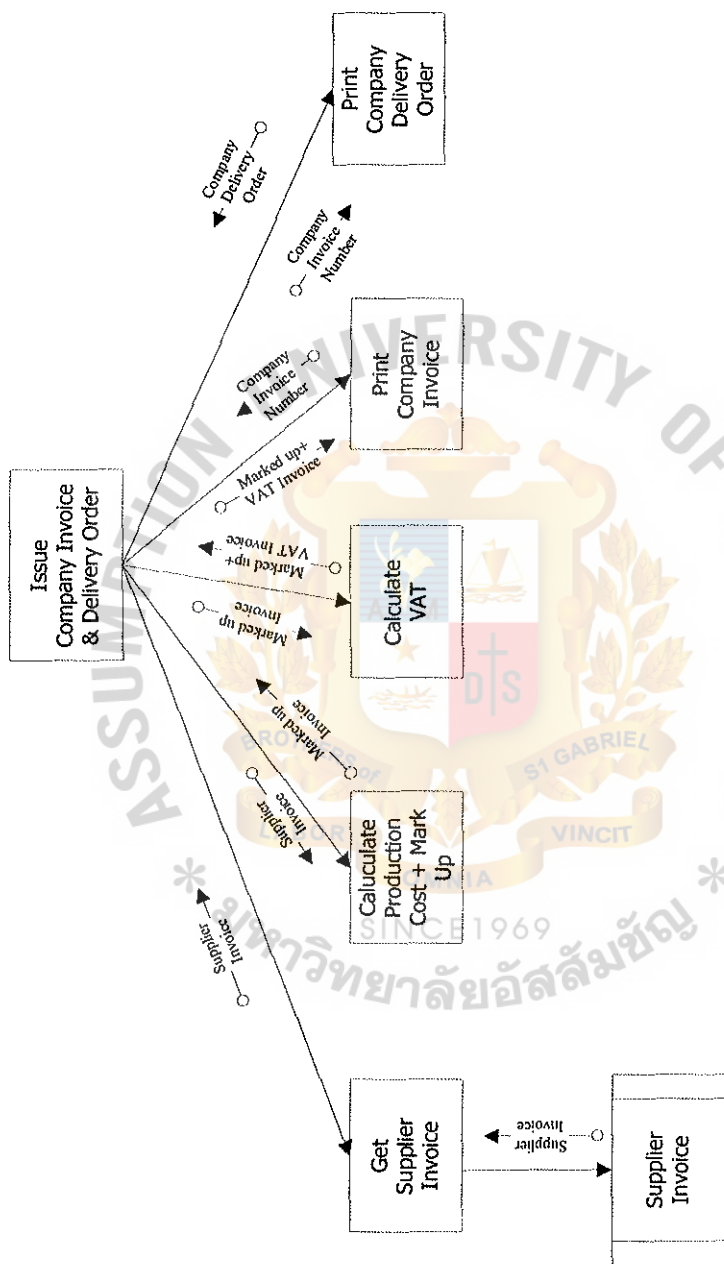
Figure C.6.   Structure Chart of Issue Company Invoice & Delivery Order.
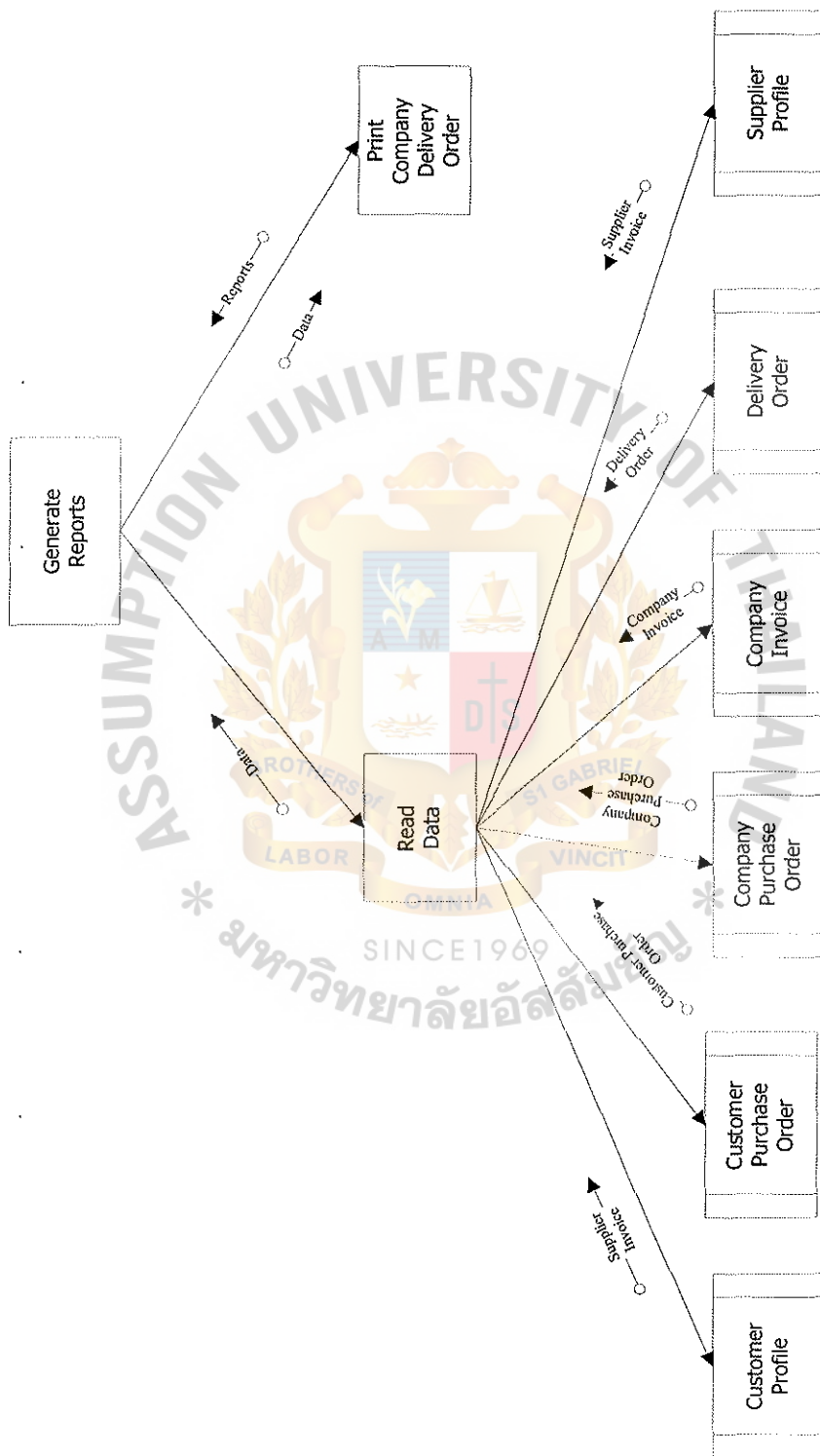
Figure C.7.   Structure Chart of Generate Reports.

APPENDIX   D

DATA DICTIONARY

DATA DICTIONARY

Table D.1.   Data Definition of the Entity Relationship Diagram.

Data Element	Definition
1. Color	Color of the product
2. Company Invoice_No	The invoice number issue by the company to the customer
3. Company P/O_No	Company purchase order number
4. Contact Person	The person whom the company should contact with.
5. Customer P/O_Date	Customer purchase order date
6. Customer P/O_No	Customer purchase order number
7. Customer_Billing Address	The address in which, the company send the invoice to the customer
8. Customer_Facsimile	The facsimile number of the customer
9. Customer_Name	Customer Name
10. Customer_No	Customer number
11. Customer_Shipping Address	The address in which the product has been delivered to.
12. Customer_Telephone	The telephone number of the customer
13. Delivery Address	The place that the product must be delivered
14. Delivery Date	The date in which the product have to be delivered
15. Delivery Order_Date	The date in which the delivery has been made
16. Delivery Order_No	The delivery order number
17. Detail of product	The description of the product
18. Invoice Date	The issue date of the invoice
19. Invoice_No	The number of invoice. It consists of 5 digits. The sequence starts from 00001 onward
20. Lead Time	The period of time allow for the production to be made
21. Model	The model of the product
22. Order Date	The date in which the company issue the purchase order to the supplier
23. Order Due	The date in which the supplier has to send the product to the company
24. Product Description	The description of the product
25. Product_Name	The so-called name of the product
26. Product_No	The product number is used for a reference to the product that has been sold to the customer

Table D.1.   Data Definition of the Entity Relationship Diagram (Continued).

Data Element	Definition
27. Production Spec_No	The production specification number. The detail or combination of each product.
28. Prototype	The prototype of the product
29. Quantity	The amount of the product that has been ordered by the customer
30. Quantity & Quality	The quantity ordered and the quality of the product
31. Quantity Order	The amount of the product the company request the supplier to produce
32. Quoted Price	The price of the product that has been offered by the customer for the production of the product
33. Requested Delivery Date	The date in which the product must be delivered to the customer
34. Supplier Address	The address of the supplier
35. Supplier Facsimile	The facsimile number of the supplier
36. Supplier Invoice_No	The number of invoice issued by the supplier
37. Supplier Name	The name of the supplier
38. Supplier Telephone	The telephone number of the supplier
39. Supplier_No	The number of the supplier
40. Term of Payment	The agreement for payment either between the customer and the company or between the company and the supplier
41. Total	The total cost of the production
42. Unit Price	The cost per item of each product

APPENDIX   E

PROCESS SPECIFICATION

Table E.1. Process Specification of Process 1.1.

Process Name	Check Customer Profile
Data In	Customer Data
Data Out	Customer Detail
Process	1. Get necessary customer data, customer name, billing address, shipping address, telephone number, facsimile number, contact person 2. Read customer data from the Customer Profile Database 3. Send customer data to the Process 1.2.
Attachment	• Customer • Data Store Customer Profile

Table E.2. Process Specification of Process 1.2.

Process Name	Create New Customer Profile
Data In	Customer Detail from process 1.1
Data Out	Customer Record
Process	1. Receive customer detail 2. Read customer detail 3. Record the customer detail into Customer Profile Database 4. Update customer detail to the Customer Profile Database 5. Delete customer detail from the Customer Profile Database.
Attachment	• Data Store Customer Profile

Table E.3. Process Specification of Process 1.3.

Process Name	Create & Approve Customer Credit
Data In	Customer Detail
Data Out	Approved Customer Credit Status
Process	1. Read customer detail 2. Evaluate the credit status based on the provided data 3. Determine whether the customer should have a credit of 15 days, 30 days or cash only 4. Record the credit status to the Customer Profile Database 5. Update customer credit to the Customer Profile Database 6. Send approved customer credit status to the Process 2.3.
Attachment	• Data Store Customer Profile

Table E.4. Process Specification of Process 1.4.

Process Name	Verify Customer Purchase Order
Data In	Customer Purchase Order
Data Out	Verified Customer Purchase Order
Process	1. Read Customer Purchase Order 2. Check whether all the data provided by the customer is complete and meaningful 3. Record the customer purchase order to the Customer Purchase Order Database 4. Send the approved purchase order to the Sales & Marketing Department 5. Update Customer Purchase Order Database 6. Send uncompleted purchase order back to the customer 7. Send verified customer purchase order to Process 2.1.
Attachment	• Data Store Customer Purchase Order • Sales & Marketing Department

Table E.5. Process Specification of Process 2.1.

Process Name	Evaluate & Calculate Customer Quoted Price
Data In	Customer Purchase Order
Data Out	Acceptable Quoted Price
Process	1. Read customer purchase order 2. Calculate whether the quoted price is acceptable for the production 3. Send the acceptable quoted price to Process 2.6.
Attachment	• Sales & Marketing Department

Table E.6. Process Specification of Process 2.2.

Process Name	Determine Delivery Date
Data In	Customer Purchase Order
Data Out	Acceptable Delivery Date
Process	1. Read customer purchase order 2. Determine whether the delivery date is acceptable for the delivery of the product 3. Send the acceptable delivery date to Process 2.6.
Attachment	• Sales & Marketing Department

Table E.7. Process Specification of Process 2.3.

Process Name	Check Term of Payment & Discount
Data In	Customer Purchase Order
Data Out	Acceptable Term of Payment & Discount
Process	1. Read customer purchaser order 2. Evaluate term of payment from the customer credit status 3. Determine the discount rate 4. Send the acceptable term of payment and discount to Process 2.6.
Attachment	• Sales & Marketing Department

68

Table E.8. Process Specification of Process 2.4.

Process Name	Estimate Lead Time
Data In	Customer Purchase Order
Data Out	Acceptable Lead Time
Process	1. Read customer purchaser order 2. Estimate Lead time 3. Send the acceptable lead time to Process 2.6.
Attachment	• Sales & Marketing Department

Table E.9. Process Specification of Process 2.5.

Process Name	Determine Quantity & Quality
Data In	Customer Purchase Order
Data Out	Acceptable Quantity & Quality
Process	1. Read customer purchaser order 2. Determine the amount of quantity order is worth of the production 3. Determine the requested quality of the product 4. Send the acceptable quantity and quality to Process 2.6.
Attachment	• Sales & Marketing Department

69

Table E.10.   Process Specification of Process 2.6.

Process Name	Check If 5 Conditions are met
Data In	1. Acceptable Quoted Price 2. Acceptable Delivery Date 3. Acceptable Term of Payment & Discount 4. Acceptable Lead Time 5. Acceptable Quantity & Quality
Data Out	Production Request Form
Process	1. Gather all the result from the previous five process 2. Read all five conditions 3. Check whether all five conditions meet the standard 4. Issue the production request form 5. Update the Production Specification Database 6. Negotiate with the customer if the result is not consensus
Attachment	• Design & Production Department • Customer • Data Store Production Specification File

70

Table E.11.   Process Specification of Process 3.1.

Process Name	Calculate Production Cost/Item
Data In	Production Request Form
Data Out	Calculated Cost/Item
Process	1. Read production request form 2. Calculate the actual production cost per item 3. Send the calculated cost per item to Process 3.5.
Attachment	• Design & Production Department

Table E.12.   Process Specification of Process 3.2.

Process Name	Design Prototype / Model
Data In	Production Request Form
Data Out	Designed Prototype / Model
Process	1. Read production request form 2. Figure how the product will come out as a prototype or model 3. Create a sample of production model / prototype 4. Send the designed prototype / model to Process 3.5.
Attachment	• Design & Production Department

Table E.13.   Process Specification of Process 3.3.

Process Name	Select The Color
Data In	Production Request Form
Data Out	Selected Color
Process	1. Read production request form 2. Decide whether what color should be used in a production. 3. Select the desired color 4. Send the selected color to Process 3.5.
Attachment	• Design & Production Department

71

Table E.14.   Process Specification of Process 3.4.

Process Name	Select Size of the Product
Data In	Production Request Form
Data Out	Selected Size
Process	1. Read production request form 2. Decide whether which size should be used in a production. 3. Select the desired size 4. Send the selected size to Process 3.5.
Attachment	• Design & Production Department

Table E.15.   Process Specification of Process 3.5.

Process Name	Gather Data
Data In	1. Calculated Production Cost/Item 2. Designed Prototype / Model 3. Selected Color 4. Selected Size
Data Out	Design Specifications
Process	1. Get calculated production cost/item production 2. Choose the desired prototype / model 3. Get the desired color 4. Get the desired size 5. Update the Production Specification Database 6. Send the Production Specification to the customer for an approval 7. Send the Production Specification to the Sales & Marketing Department.
Attachment	• Design & Production Department • Customer • Data Store Production Specification

72

Table E.16.   Process Specification of Process 3.6.

Process Name	Request For Minor Change / Confirmation
Data In	Customer's Approval
Data Out	Minor Change or Confirmation For The Production
Process	1. Receive the customer approval for the production 2. Check whether some minor change has been requested 3. Send the requested minor change to the Design & Production Department 4. Start the production if confirmation from the customer has been received 5. Send the design specification to the Sales & Marketing Department.
Attachment	• Design & Production Department • Customer • Sales & Marketing Department

Table E.17.   Process Specification of Process 4.1.

Process Name	Check Supplier
Data In	Supplier Data
Data Out	Supplier Detail
Process	4. Get Supplier Number 5. Search Supplier Database with the supplier number 6. Read supplier detail 7. Send supplier detail to the Sales & Marketing Department.
Attachment	• Sales & Marketing Department • Data Store Supplier File

73

Table E.18.   Process Specification of Process 4.2.

Process Name	Create New Supplier Detail
Data In	Supplier Detail
Data Out	Supplier Record
Process	1. Get supplier detail 2. Create supplier number 3. Record supplier detail to the Supplier Database 4. Update supplier detail to the Supplier Database 5. Delete supplier detail from the Supplier Database.
Attachment	• Data Store Supplier File

Table E.19.   Process Specification of Process 4.3.

Process Name	Issue Company Purchase Order
Data In	1. Supplier Number 2. Production Specification Number
Data Out	Company Purchase Order
Process	1. Get Supplier Number 2. Key in all detail of the production requirement to the purchase order 3. Record the detail of purchase order to the Company Purchase Order Database 4. Update the Company Purchase Order Database 5. Send Company Purchase Order to the supplier
Attachment	• Supplier • Data Store Company Purchase Order

74

Table E.20.   Process Specification of Process 5.1.

Process Name	Check Quality & Quantity
Data In	Supplier Invoice
Data Out	Valid Supplier Invoice
Process	1. Get Supplier Invoice 2. Check whether the product deliver by the supplier is according to the invoice 3. Reject supplier invoice if the quality and quantity is not up to the production standard 4. Send supplier invoice to the Process 5.2.
Attachment	• Supplier

Table E.21.   Process Specification of Process 5.2.

Process Name	Match Invoice With Company Purchase Order
Data In	1. Supplier Invoice 2. Company Purchase Order
Data Out	Valid Supplier Invoice
Process	1. Get supplier Invoice 2. Get company purchase order 3. Check whether the supplier invoice is matched with the previously issued company purchase order 4. Reject the supplier invoice if it is not matched with the company purchase order 5. Update the Invoice Database 6. Send valid invoice to the Finance & Accounting Department.
Attachment	• Data Store Company Purchase Order • Data Store Invoice File • Finance & Accounting Department

75

Table E.22.   Process Specification of Process 6.1.

Process Name	Calculate Production Cost
Data In	Supplier Invoice
Data Out	Production Cost
Process	1. Get Supplier Invoice 2. Calculate the production cost 3. Add Mark Up of the company to the production cost 4. Send the marked up production cost to Process 6.2.
Attachment	• Finance & Accounting Department • Invoice File

Table E.23.   Process Specification of Process 6.2.

Process Name	Calculate VAT Amount
Data In	Total Production Cost
Data Out	Total Production Cost Included VAT
Process	1. Get total production cost 2. Calculate VAT amount (production cost * 0.07%) 3. Add VAT to the production cost 4. Send production cost included VAT to the Finance & Accounting Department.
Attachment	• Finance & Accounting Department

Table E.24.   Process Specification of Process 6.3.

Process Name	Print Company Invoice
Data In	Total Production Cost Included VAT
Data Out	Company Invoice
Process	1. Get total production cost included VAT 2. Record company invoice 3. Print Company invoice 4. Update (Company/Supplier or just)Invoice File 5. Send company invoice to process 6.4.
Attachment	• Finance & Accounting Department • Data Store Invoice File

Table E.25.   Process Specification of Process 6.4.

Process Name	Print Company Delivery Order
Data In	Company Invoice
Data Out	Company Invoice & Delivery Order
Process	1. Get company invoice 2. Record company invoice number to the delivery note 3. Record delivery order 4. Print Company delivery order 5. Update delivery order to the Delivery Order Database 6. Send company invoice as well as delivery order to the Process 6.5.
Attachment	• Data Store Delivery Order File

Table E.26.   Process Specification of Process 6.5.

Process Name	Deliver Product
Data In	Company Invoice & Delivery Order
Data Out	Company Invoice & Delivery Order
Process	1. Get company invoice 2. Get company delivery order. 3. Send company invoice and delivery order to the customer in order to notify the future payment as well as the acceptance of the product by the customer
Attachment	• Customer

Table E:27.   Process Specification of Process 7.1.

Process Name	Produce Customer Purchase Order Report
Data In	Data Store Customer Purchase Order
Data Out	Customer Purchase Order Report
Process	1. Read customer purchase order from the Customer Purchase Order File 2. Generate the customer purchase order report 3. Send the customer purchase order report to the Managing Director.
Attachment	• Managing Director • Data Store Customer Purchase Order

78

Table E.28.   Process Specification of Process 7.2.

Process Name	Produce Company Purchase Order Report
Data In	Data Store Company Purchase Order
Data Out	Company Purchase Order Report
Process	1. Read company purchase order from the Company Purchase Order File 2. Generate the company purchase order report 3. Send the company purchase order report to the Managing Director.
Attachment	• Managing Director • Data Store Company Purchase Order

Table E.29.   Process Specification of Process 7.3.

Process Name	Produce Sales Summary Report
Data In	Data Store Invoice
Data Out	Sales Summary Report
Process	1. Read sales information from the Invoice Database 2. Generate sales summary report.
Attachment	• Managing Director • Data Store Invoice

79

Table E.30.   Process Specification of Process 7.4.

Process Name	Produce Sales Statistic Report
Data In	Data Store Invoice
Data Out	Sales Statistic Report
Process	1. Read sales information from the Invoice Database 2. Generate the sales statistic report 3. Send the sales statistic report to the Managing Director.
Attachment	• Managing Director • Data Store Invoice

Table E.31.   Process Specification of Process 7.5.

Process Name	Produce Monthly Revenue Report
Data In	Data Store Invoice
Data Out	Monthly Revenue Report
Process	1. Read sales information from the Data Store Invoice 2. Generate monthly revenue report 3. Send the monthly revenue report to the Managing Director.
Attachment	• Managing Director • Data Store Invoice

Table E.32.   Process Specification of Process 7.6.

Process Name	Produce Delivery Order Report
Data In	Data Store Delivery Order
Data Out	Delivery Order Report
Process	1. Read delivery order information from the Delivery Order Database 2. Generate the delivery order report 3. Send the delivery order report to the Managing Director.
Attachment	• Managing Director • Data Store Delivery Order

80

Table E.33.   Process Specification of Process 7.7.

Process Name	Produce Customer Profile Report
Data In	Data Store Customer Profile
Data Out	Customer Profile Report
Process	1. Read customer data from the Customer Profile Database 2. Generate customer profile report 3. Send the customer profile report to the Managing Director.
Attachment	• Managing Director • Data Store Customer Profile

Table E.34.   Process Specification of Process 7.8.

Process Name	Produce Customer Credit Status Report
Data In	Data Store Customer Profile
Data Out	Customer Credit Status Report
Process	1. Read customer credit status from the Customer Profile Database 2. Generate customer credit status report 3. Send the customer credit status report to the Managing Director.
Attachment	• Managing Director • Data Store Customer Profile • Finance & Accounting Department

81

Table E.35.   Process Specification of Process 7.9.

Process Name	Produce Supplier Profile Report
Data In	Data Store Supplier Profile
Data Out	Supplier Profile Report
Process	1. Read supplier data from the Supplier Profile Database 4. Generate supplier profile report 5. Send the supplier profile report to the Managing Director.
Attachment	• Managing Director • Data Store Supplier Profile

Table E.36.   Process Specification of Process 7.10.

Process Name	Produce Production Specification Report
Data In	Data Store Production Specification
Data Out	Production Specification Report
Process	1. Read production specification detail from the Production Specification Database 2. Generate production specification report 3. Send the production specification report to the Managing Director.
Attachment	• Managing Director • Data Store Production Specification

APPENDIX   F

DATABASE DESIGN

PHYSICAL SCHEMA

Customer

Customer No	Customer Name	Customer Billing Address	Customer Shipping Address	Customer Telephone

Customer Facsimile	Contact Person

Customer Purchase Order

Customer P/O No	Customer No	Customer P/O Date	Running Number	Record Date	Customer P/O Detail

Quoted Price	Estimate Lead Time	Size	Color	Recorder

Company Purchase Order

Company P/O No	Product Spec No	Supplier No	Company P/O Date	Term Of Payment	Requested Delivery Date

Delivery Address	Quantity	Unit Price	Product Description

Company Invoice

Company Invoice No	Company P/O No	Product No	Delivery Order No	Requested Delivery Date

Delivery Date	Delivery Address

Figure F.1. Physical Schema.

Delivery Order

Delivery Order No	Company Invoice No	Delivery Date	Product No	Customer No	Customer Name

Customer Billing Address	Customer Shipping Address	Product Name	Product Description

Product Sold

Production No	Supplier Invoice No	Product Name	Detail of Product

Supplier Profile

Supplier No	Supplier Name	Supplier Address	Supplier Telephone	Supplier Facsimile

Contact Person

Supplier Invoice

Supplier Invoice No	Supplier No	Invoice Date	Term Of Payment	Product No.	Product Description

Quantity	Unit Price	Total

Figure F.2. Physical Schema (Continued).
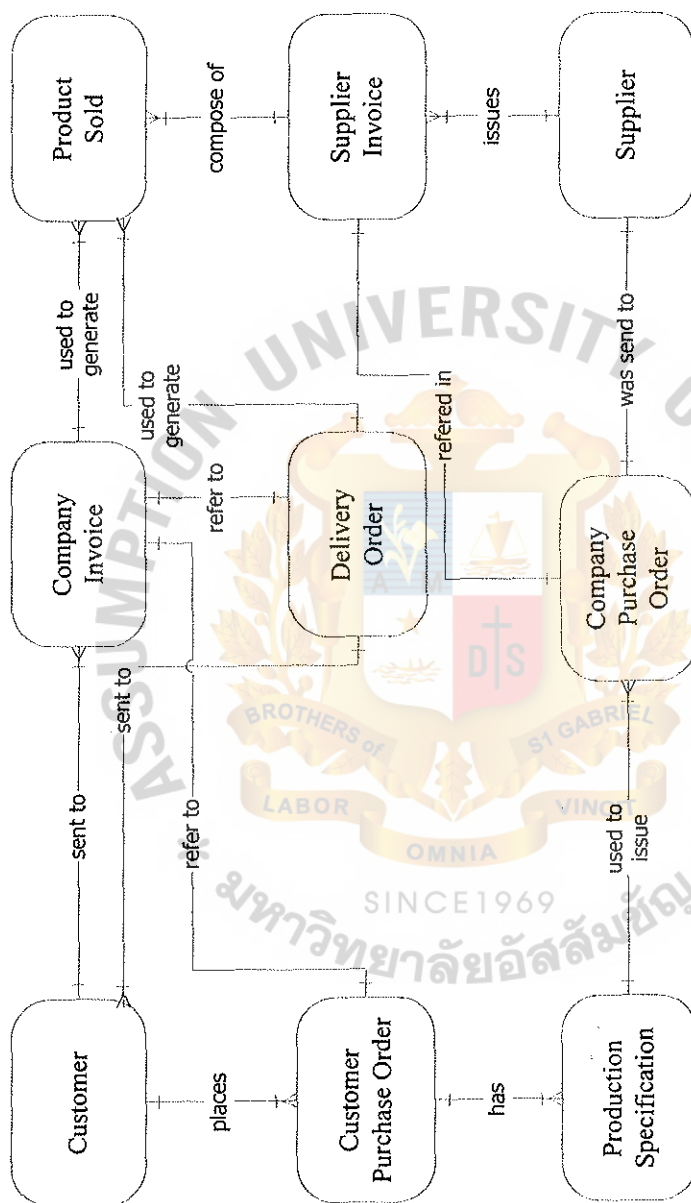
Figure F.3.   Entity Relationship Diagram: Entity Level.
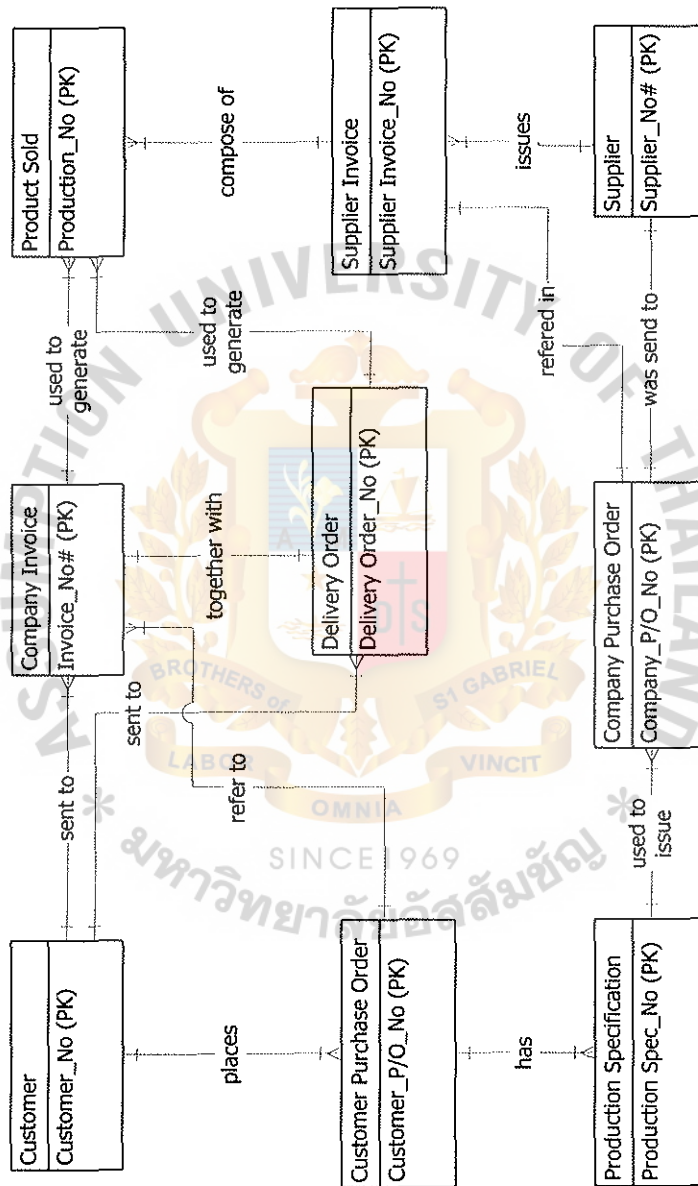
Figure F.4.   Entity Relationship Diagram: Key Based Level.
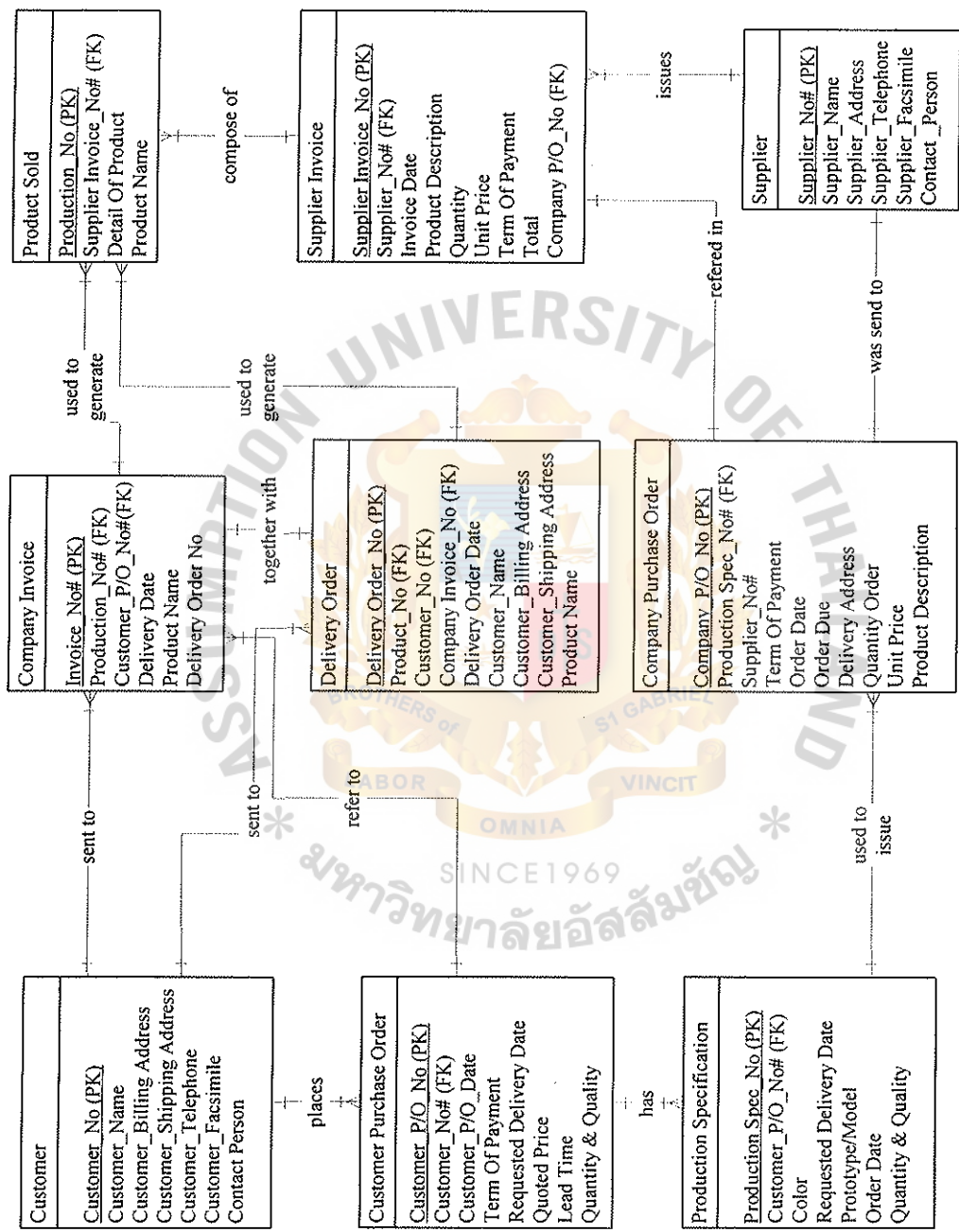
Figure F.5. Entity Relationship Diagram: Attribute Level .

Table F.1.   File Structure of Customer Profile.

File Structure		
File Name: Customer Profile		
Field Name	Type	Length
Customer No	Numeric	5
Customer Name	Alpha	30
Customer Billing Address	Alpha	50
Customer Shipping Address	Alpha	50
Customer Telephone	Numeric	10
Customer Facsimile	Numeric	10
Contact Person	Alpha	50

Table F.2.   File Structure of Customer Purchase Order.

File Structure		
File Name: Customer Purchase Order		
Field Name	Type	Length
Customer P/O Number	Numeric	5
Customer Number	Numeric	5
Customer P/O Date	Date	##/##/####
Running Number	Numeric	2
Record Date	Date	##/##/####
Customer P/O Detail	Alpha	50
Quoted Price	Numeric	10
Estimate Lead Time	Numeric	2
Size	Alpha	50
Color	Numeric	3
Recorder	Alpha	50

Figure F.3.   File Structure of Company Purchase Order.

File Structure		
File Name: Company Purchase Order		
Field Name	Type	Length
Company P/O Number	Numeric	5
Production Spec No	Numeric	5
Supplier Number	Numeric	5
Company P/O Date	Date	##/##/####
Term Of Payment	Alpha	50
Requested Delivery Date	Date	##/##/####
Delivery Address	Alpha	50
Quantity	Numeric	5
Unit Price	Numeric	7
Product Description	Alpha	50

Figure F.4.   File Structure of Company Invoice.

File Structure		
File Name: Company Invoice Number		
Field Name	Type	Length
Company Invoice Number	Numeric	5
Company P/O Number	Numeric	5
Product Number	Numeric	5
Customer Number	Numeric	5
Delivery Order Number	Numeric	5
Requested Delivery Date	Date	##/##/####
Delivery Date	Date	##/##/####
Delivery Address	Alpha	50

89

Figure F.5.   File Structure of Delivery Order.

File Structure		
File Name: Delivery Order		
Field Name	Type	Length
Delivery Order No	Numeric	5
Company Invoice No	Numeric	5
Delivery Date	Date	##/##/####
Product No	Numeric	5
Customer No	Numeric	5
Customer Name	Alpha	50
Customer Billing Address	Alpha	50
Customer Shipping Address	Alpha	50
Product Name	Alpha	50
Product Description	Alpha	50

Figure F.6.   File Structure of Product Sold.

File Structure		
File Name: Product Sold		
Field Name	Type	Length
Production Number	Numeric	5
Supplier Invoice Numher	Numeric	5
Product Name	Alpha	50
Detail Of Product	Alpha	100

90

Figure F.7.   File Structure of Supplier Profile.

File Structure		
File Name: Supplier Profile		
Field Name	Type	Length
Supplier No	Numeric	5
Supplier Name	Numeric	5
Supplier Address	Alpha	50
Supplier Telephone	Numeric	10
Supplier Facsimile	Numeric	10
Contact Person	Alpha	50

Figure F.8.   File Structure of Supplier Invoice.

File Structure		
File Name: Supplier Invoice		
Field Name	Type	Length
Supplier Invoice No	Numeric	5
Supplier Number	Numeric	5
Invoice Date	Date	##/##/####
Term Of Payment	Alpha	50
Product No	Numeric	5
Product Name	Alpha	50
Product Description	Alpha	50
Quantity	Numeric	5
Unit Price	Numeric	5
Total	Numeric	7

APPENDIX   G

REPORT DESIGN

Individual Customer Profile Report

รหัสลูกค้า	10007
ชื่อ	บริษัท เวิลด์ไวด์ แอคเซสซอรี โปรดัคท์ จำกัด
สถานที่ส่งสินค้า	10/65 ซอย วัดสีสุก ถ.พระราม 2 แขวง บางแค เขต จอมทอง กรุงเทพ 10150
สถานที่วางบิล	10/65 ซอย วัดสีสุก ถ.พระราม 2 แขวง บางแค เขต จอมทอง กรุงเทพ 10150
โทรศัพท์	467-7192
โทรสาร	467-7193
สถานะ	15
ผู้ติดต่อ	คุณ เมตตา อาจหาญ

Figure G.1.   Individual Customer Profile.

92

Customer Profile

จากรหัสลูกค้า 10001 ถึง 10003

รหัสลูกค้า	10001
ชื่อ	พรไพลิน การพิมพ์
สถานที่ส่งสินค้า	26/12-13 สุขุมวิท 63 กรุงเทพ 10250
สถานที่วางบิล	26/12-13 สุขุมวิท 63 กรุงเทพ 10250
โทรศัพท์	718-3645
โทรสาร	718-3646
สถานะ	15
ผู้ติดต่อ	คุณ พรเทพ เกษยุภาพร

รหัสลูกค้า	10002
ชื่อ	บริษัท ชวนันท์ ปริ้นติ้ง จำกัด
สถานที่ส่งสินค้า	3653 ซ. อุดมสุข กรุงเทพ 10250
สถานที่วางบิล	3653 ซ. อุดมสุข กรุงเทพ 10250
โทรศัพท์	369-4242
โทรสาร	369-4243
สถานะ	15
ผู้ติดต่อ	คุณ เมทินี ศรีศรัย

รหัสลูกค้า	10003
ชื่อ	บริษัท ยูไนเต็ด แฟชั่น จำกัด
สถานที่ส่งสินค้า	486/52 ซอยเหล่าลดา อรุณอัมรินทร์ กรุงเทพ 10023
สถานที่วางบิล	486/52 ซอยเหล่าลดา อรุณอัมรินทร์ กรุงเทพ 10023
โทรศัพท์	433-8548
โทรสาร	433-8549
สถานะ	30
ผู้ติดต่อ	คุณ ธนายง ปรีดา

Figure G.2.   Ranged Customer Profile.

93

Individual Supplier Profile

รหัสผู้ขาย	50004
ชื่อ	ร้าน เอส อาร์ กรุ๊ป
ที่อยู่	31/27 ซอย ประชาสันติ ถ. ดินแดง แขวง ดินแดง เขต ดินแดง กรุงเทพ 10320
โทรศัพท์	676-2356
โทรสาร	676-2357
สถานะ	15
ผู้ติดต่อ	คุณ ปรีดา นาคณรงค์

Figure G.3.   Individual Supplier Profile.

<u>Supplier Profile</u>

จากรหัสผู้ขาย 50001 ถึง 50003

รหัสผู้ขาย	50001
ชื่อ	พีระการพิมพ์
ที่อยู่	142/78 ลาดพร้าว 23 จตุจักร 10900
โทรศัพท์	939-4785-8
โทรสาร	939-4759
สถานะ	30
ผู้ติดต่อ	คุณ สมศรี แสงทอง

รหัสผู้ขาย	50002
ชื่อ	วราคณา แอนด์ เฟรนด์ อารต์ ดีไซด์
ที่อยู่	1572-4 ศูนย์การค้า วรรัตน์ ซอย 7 ถนน จันทน์ เขต สาธร กรุงเทพ 10120
โทรศัพท์	676-3070
โทรสาร	676-3071
สถานะ	30
ผู้ติดต่อ	คุณ การุณ อร่ามฟ้า

รหัสผู้ขาย	50003
ชื่อ	บริษัท วราธร การเมนท์ จำกัด
ที่อยู่	15/42 หมู่ 1 เลียบชายทะเล บางขุนเทียน แขวง แสมดำ เขต บางขุนเทียน กรุงเทพ 10150
โทรศัพท์	892-0647
โทรสาร	896-0699
สถานะ	15
ผู้ติดต่อ	คุณ เพียงเกตุ เหล่านธี

Figure G.4.   Ranged Supplier Profile.

95

Credit 15 Days – Customer

หน้า   1

จากรหัสลูกค้า 10001   ถึง   10014

เวลา   15.18

วันที่   25/09/00

รหัสลูกค้า	ชื่อลูกค้า
10001	พรไพลิน การพิมพ์
10002	บริษัท ชวนันท์ ปริ้นติ้ง จำกัด
10005	กริบ แอนด์ โก เพนท์
10007	บริษัท เวิลด์ไวด์ แอคเซสซอรี โปรดัคท์ จำกัด
10008	บริษัท เอส พี ซี โปรดักส์ จำกัด
10010	รัชนีภัณฑ์
10013	บริษัท ออเดอรส์ การเมนท์ จำกัด

Figure G.5.   Credit 15 Days – Customer.

96

Credit 30 Days – Customer

จากรหัสลูกค้า 10001   ถึง   10014

รหัสลูกค้า	ชื่อลูกค้า
10003	บริษัท ยูไนเต็ด แฟชั่น จำกัด
10004	ซีดาร์ การพิมพ์ จำกัด
10006	ซันอาร์ท ดีไซน์
10009	ศรีภัทรา อินเตอร์ ปริ้นติ้ง
10011	เกรียงไกรเพนท์ กรุ๊ป
10012	วี วี กรุ๊ป อิมปอรต์ เอ็กซ์ปอรต์ จำกัด
10014	บริษัท เอ็ม แอนด์ บี การเมนท์ จำกัด

Figure G.6.   Credit 30 Days-Customer.

Credit 15 days – Supplier

จากรหัสผู้ขาย 50001 ถึง 50010

เวลา   16.07

วันที่   25/09/00

รหัสผู้ขาย	ชื่อผู้ขาย
10003	บริษัท วราธร การเมนท์ จำกัด
10004	ร้าน เอส อาร์ กรุ๊ป
10006	หจก. ยูไนเต็ด แฟชั่น จำกัด
10009	หจก. คอทตอน เทคไทลย์ จำกัด
10010	แสงเพชร เทคไทลย์ จำกัด

Figure G.7.   Credit 15 Days – Supplier.

Credit 30 Days – Supplier

	หน้า	1
จากรหัสผู้ขาย 50001 ถึง 50010	เวลา	16.45
	วันที่	25/09/00

รหัสผู้ขาย	ชื่อผู้ขาย
10001	พีระการพิมพ์
10002	วราคณา แอนด์ เฟรนด์ อารต์ ดีไซด์
10005	บริษัท แกรนด์ อินเตอร์เนชั่นแนล การ์เมนท์ จำกัด
10007	สามพี่น้อง การเมนท์ จำกัด
10008	บริษัท โอ ที ยูนิฟอรม์ จำกัด

Figure G.8.   Credit 30 Days – Supplier.

99

Zestteem Company Limited **Original**

25/325-6 ซอย อ่อนนุช 36 ถนน สุขุมวิท 77 แขวง สวนหลวง เขต สวนหลวง กรุงเทพฯ 10250

โทร. 742-2667-8 โทรสาร.742-2669

E-mail: zestteem@hotmail.com

ใบแจ้งหนี้ / ใบกำกับภาษี

INVOICE

รหัสลูกค้า   10007

เลขที่ NO. 01258

วันที่   25/09/00

ชื่อลูกค้า / ที่อยู่ CUSTOMER NAME/ADDRESS	สถานที่ส่ง / SHIP TO
บริษัท เวิลด์ไวด์ แอคเซสซอรี โปรดัคท์ จำกัด	บริษัท เวิลด์ไวด์ แอคเซสซอรี โปรดัคท์ จำกัด
10/65 ซอย วัดสีสุก ถ.พระราม 2 แขวง บางแค เขต จอมทอง	10/65 ซอย วัดสีสุก ถ.พระราม 2 แขวง บางแค เขต
กรุงเทพ 10150	จอมทอง กรุงเทพ 10150

เลขที่ใบสั่งซื้อ	ผู้สั่งซื้อ	วันที่ส่งสินค้า	การชำระเงิน	พนักงานขาย
430923/1	คุณ เมตตา อางหาญ			

ลำดับ	รหัสสินค้า	รายการ DESCRIPTION	จำนวน	หน่วยละ	จำนวนเงิน
1	00001	เสื้อ ที-เชิ้ต พร้อมปักโลโก้ บริษัท WWAP	150	45	6,750.00

กรณีสินค้ามีปัญหา โปรดกรุณาส่งคืนภายใน 1 อาทิตย์	รวมมูลค่าสินค้า / TOTAL	6,750.00
มิฉะนั้นทางบริษัทจะไม่รับผิดชอบ	ภาษีมูลค่าเพิ่ม / VAT 7%	472.50
ผิด ตก ยกเว้น E & O.E.	รวมมูลค่าทั้งสิ้น / GRAND TOTAL	7,225.50

ได้รับสินค้าดังรายการข้างบนนี้ไว้ถูกต้องแล้ว	บริษัท เซสท์ทีม จำกัด
	Zestteem Company Limited
ผู้รับของ _____ วันที่ ___/___/___	
RECEIVER	
ผู้ส่งของ _____ วันที่ ___/___/___	ลายเซ็นต์
SENDER	AUTHORIZED SIGNATURE

Figure G.9.   Sample of Invoice (Original).

Zestteem Company Limited   **Copy**

25/325-6 ซอย อ่อนนุช 36 ถนน สุขุมวิท 77 แขวง สวนหลวง เขต สวนหลวง กรุงเทพฯ 10250

โทร. 742-2667-8 โทรสาร.742-2669

E-mail: zestteem@hotmail.com

<div align="center">

ใบแจ้งหนี้ / ใบกำกับภาษี

INVOICE

</div>

รหัสลูกค้า   10007   เลขที่ NO. 01258

                                                                                      วันที่   25/09/00

ชื่อลูกค้า / ที่อยู่ CUSTOMER NAME/ADDRESS	สถานที่ส่ง / SHIP TO
บริษัท เวิลด์ไวด์ แอคเซสซอรี โปรดัคท์ จำกัด	บริษัท เวิลด์ไวด์ แอคเซสซอรี โปรดัคท์ จำกัด
10/65 ซอย วัดสีสุก ถ.พระราม 2 แขวง บางแค เขต จอมทอง	10/65 ซอย วัดสีสุก ถ.พระราม 2 แขวง บางแค เขต
กรุงเทพ 10150	จอมทอง กรุงเทพ 10150

เลขที่ใบสั่งซื้อ	ผู้สั่งซื้อ	วันที่ส่งสินค้า	การชำระเงิน	พนักงานขาย
430923/1	คุณ เมตตา อาจหาญ			

ลำดับ	รหัสสินค้า	รายการ DESCRIPTION	จำนวน	หน่วยละ	จำนวนเงิน
1	00001	เสื้อ ที-เชิ้ต พร้อมปักโลโก้ บริษัท WWAP	150	45	6,750.00

กรณีสินค้ามีปัญหา โปรดกรุณาส่งคืนภายใน 1 อาทิตย์	รวมมูลค่าสินค้า / TOTAL	6,750.00
มิฉะนั้นทางบริษัทจะไม่รับผิดชอบ	ภาษีมูลค่าเพิ่ม / VAT 7%	472.50
ผิด ตก ยกเว้น E & O.E.	รวมมูลค่าทั้งสิ้น / GRAND TOTAL	7,225.50

ได้รับสินค้าดังรายการข้างบนนี้ไว้ถูกต้องแล้ว	บริษัท เซสท์ตีม จำกัด
	Zestteem Company Limited
ผู้รับของ _____ วันที่ __/__/__	
RECEIVER	
ผู้ส่งของ _____ วันที่ __/__/__	ลายเซ็นต์
SENDER	AUTHORIZED SIGNATURE

<div align="center">

Figure G.10.   Sample of Invoice (Copy).

101

</div>

Zestteem Company Limited

ใบส่งสินค้า

DELIVERY ORDER

รหัสลูกค้า [10007]   บริษัท เวิลด์ไวด์ แอคเซสซอรี โปรดัคท์ จำกัด   เลขที่ 25412

ที่อยู่   10/65 ซอย วัดสีสุก ถ.พระราม 2 แขวง บางแค   วันที่ 24/09/00

เขต จอมทอง กรุงเทพ 10150   เลขที่ใบแจ้งหนี้ 01258

ส่งที่   10/65 ซอย วัดสีสุก ถ.พระราม 2 แขวง บางแค

เขต จอมทอง กรุงเทพ 10150

ลำดับที่	รหัสสินค้า	ชื่อสินค้า	ราคาต่อหน่วย	จำนวน
1	00001	เสื้อ ที-เชิ้ต พร้อมปักโลโก้ บริษัท WWAP	45.00	150

ลงชื่อ .... ผู้ส่งของ   ลงชื่อ .... ผู้รับของ

Figure G.11.   Sample of Delivery Order.

<table>
<tr><td colspan="6" align="center">**Zestteem Company Limited**</td></tr>
<tr><td colspan="6" align="center">ใบสั่งซื้อ
PURCHASE ORDER</td></tr>
</table>

รหัสผู้ขาย [50002] วราคณา แอนด์ เฟรนด์ อารต์ ดีไซด์   เลขที่ 25412

ที่อยู่ 1572-4 ศูนย์การค้า วรรัตน์ ซอย 7 ถนน จันทน์   วันที่ 24/09/00

เขต สาธร กรุงเทพ 10120

ลำดับ	รายการสินค้า	จำนวน	ราคาต่อหน่วย	จำนวนเงิน
1	เสื้อยืดคอกลมผ้า COTTON 100 % เบอร์ 20 Size S	50	25.00	1,250.00
2	เสื้อยืดคอกลมผ้า COTTON 100 % เบอร์ 20 Size M	50	35.00	1,750.00
3	เสื้อยืดคอกลมผ้า COTTON 100 % เบอร์ 20 Size L	50	45.00	2,250.00
			รวมเป็นเงิน	5,250.00
			ภาษีมูลค่าเพิ่ม 10 %	525.00
			รวมทั้งสิ้น	5,775.00

ผู้มีอำนาจสั่งซื้อ .... วันที่ ____/____/____

Figure G.12.   Company Purchase Order.

APPENDIX H

USER INTERFACE AND USER MANUAL

Figure H.1.   The Zestteem Ordering System Icon.

The first time when the user turn on the computer, they will find this rectangular
shape icon named as 'Zestteem Ordering System' on their desktop. When they double
click on this icon, they are entering the Zestteem Ordering System.

104
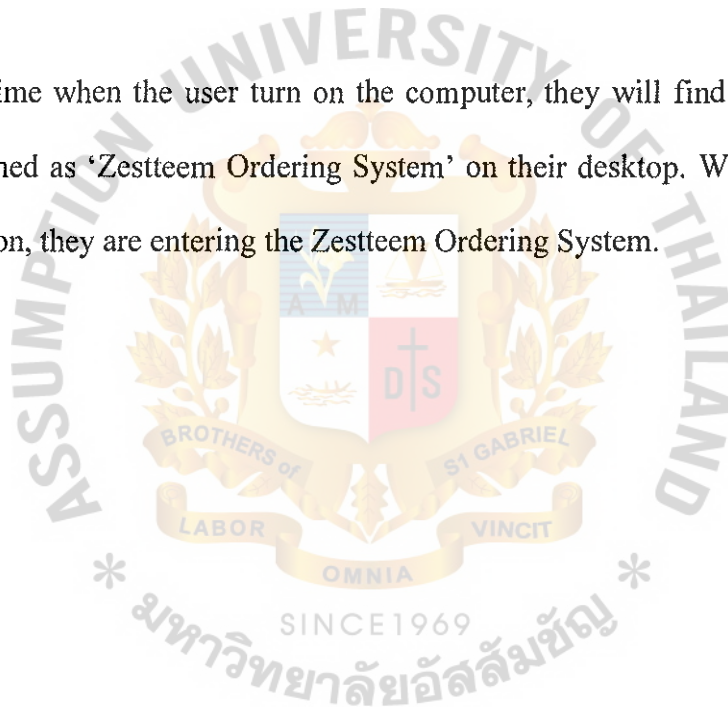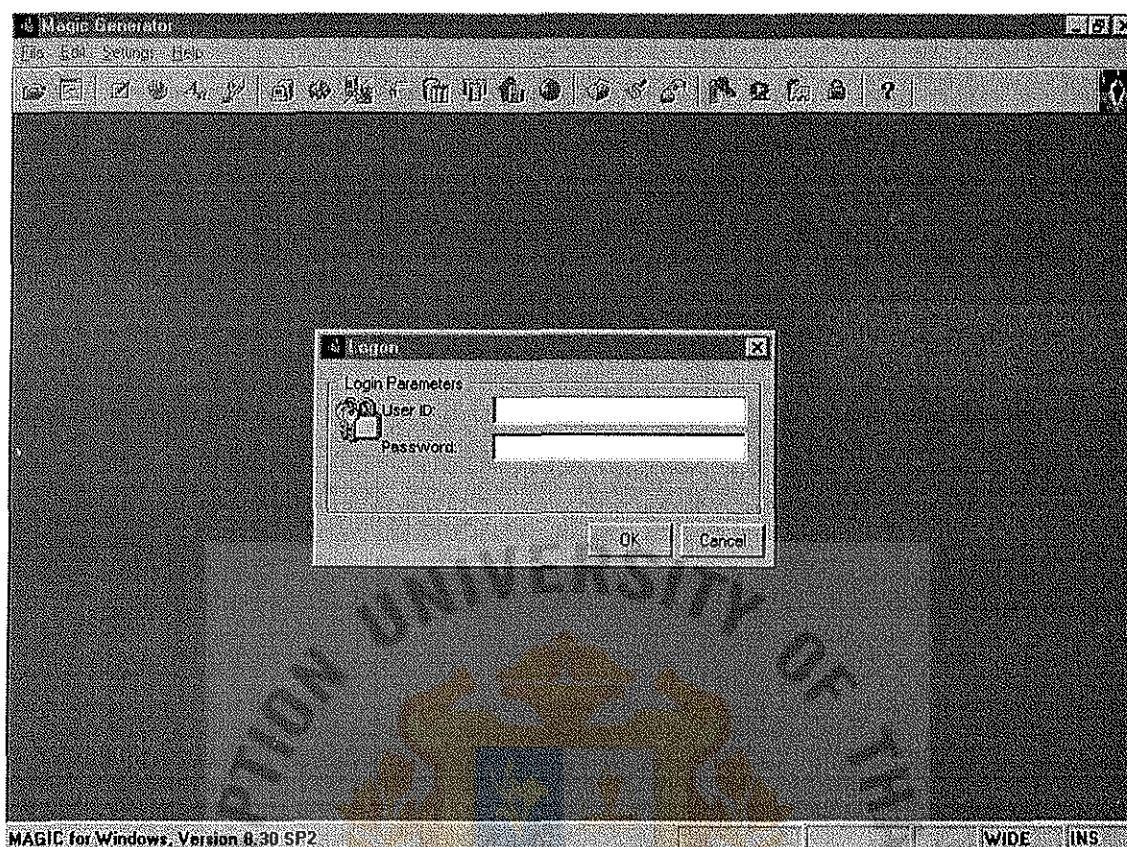
Figure H.2.   The Authorization Page.

After the user already doubled click on the icon of 'Zestteem Ordering System', the authorization page will pop up as shown in the above figure. It is a turn of the user to enter their User ID as well as the Password then Click 'OK' button.

105
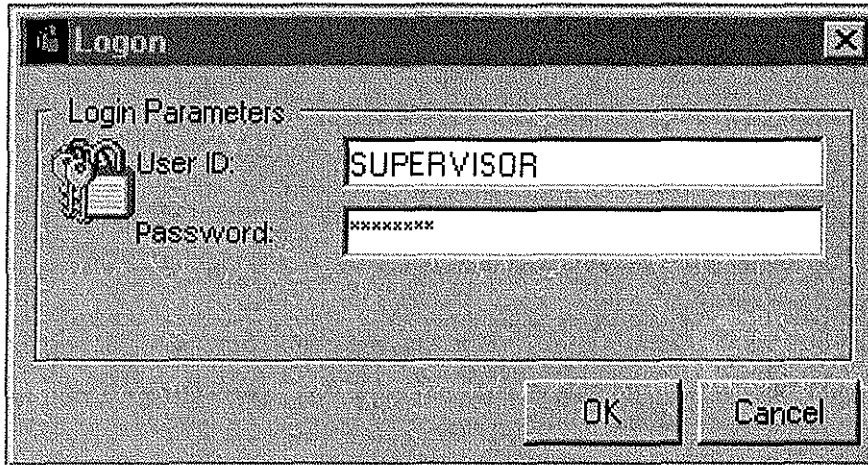
Figure H.3.   Enter User ID and Password.

User now keys their User ID and Password into the provided rectangular box.
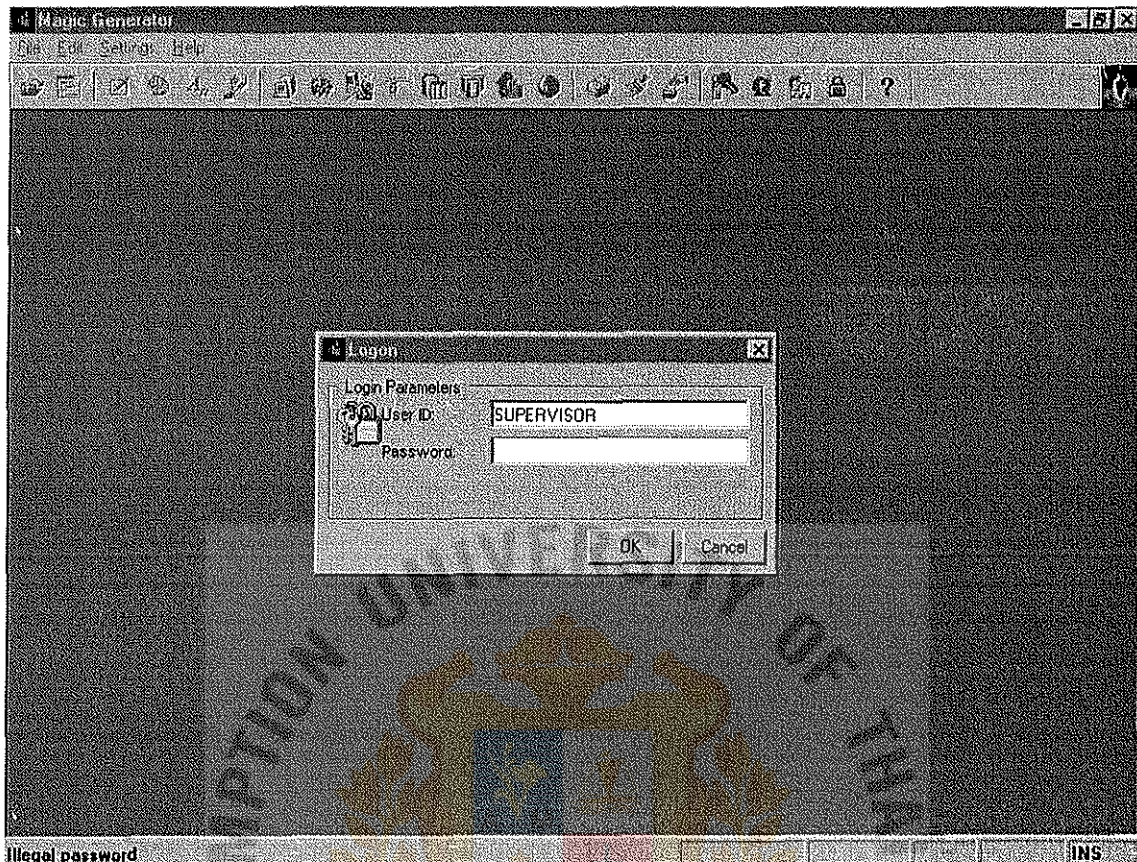
Figure H.4.   Illegal Password.

If the user type in the wrong password at the time they want to enter the system, the system will show the warning message ' Illegal Password'. The password box is now empty, this is a sign for the user to enter their password again.

If they give the correct password, they will get an access to the program immediately.
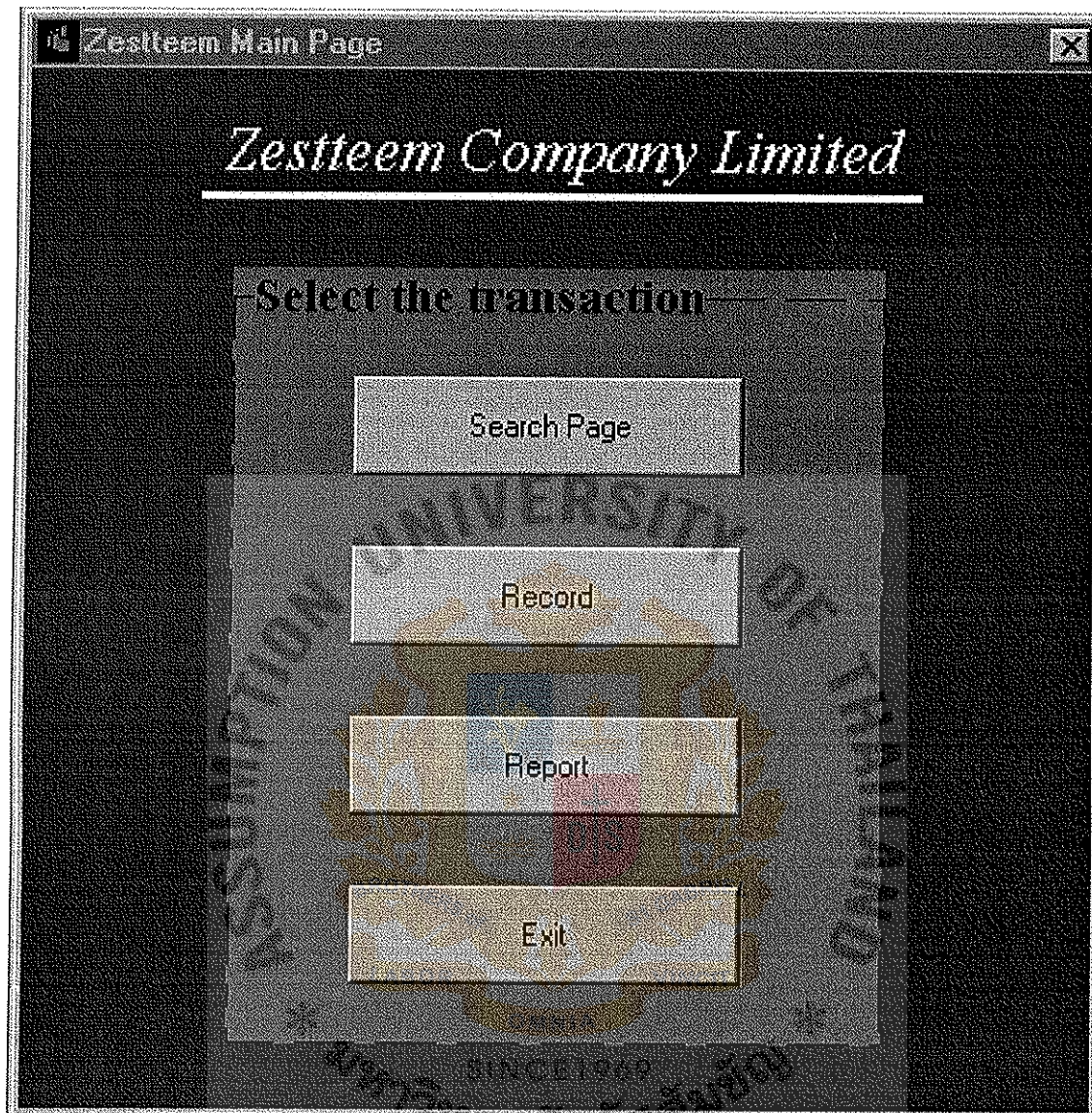
Figure H.5.   Zestteem Main Page.

After the User ID and Password have been verified, the main page of the Zestteem

Ordering Information System is automated immediately.
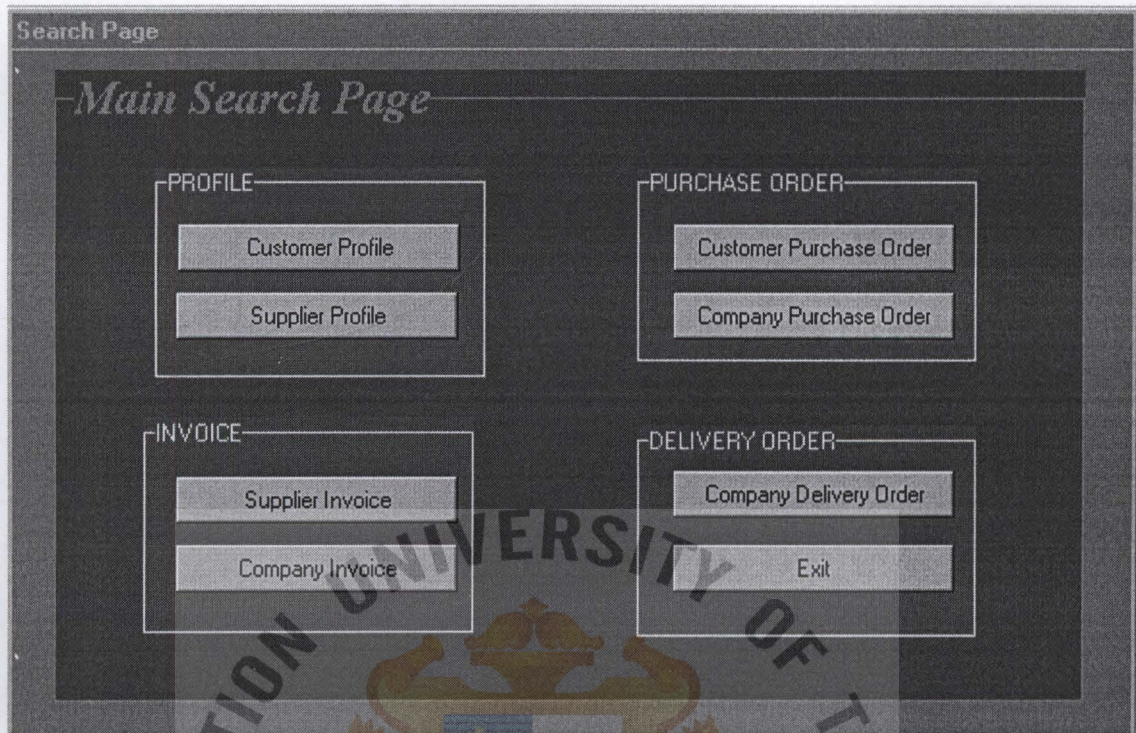
Figure H.6.   Main Search Page.

This is the page where the user can search for a particular information by clicking on the category that they are interested in. They are classified into four sections, which are:

(1)   Profile

    (a)   Customer Profile (Figure H.7)

    (b)   Supplier Profile (Figure H.17)

(2)   Purchase Order

    (a)   Customer Purchase Order (Figure H.29)

    (b)   Company Purchase Order (Figure H.30)

(3)   Invoice

     (a)   Supplier Invoice (Figure H.31)

     (b)   Company Invoice (Figure H.32)

(4)   Delivery Order

     (a)   Company Delivery Order (Figure H.33)

Figure H.7.   Search Customer Profile.

By clicking on the F5 button, the list of customer profile interface will come along side by side to this Search Customer Profile Interface. See Figure H.8.

Figure H.8.　Customer Profile Page.

This is the page where all the customer number and customer name is shown. The user can browse through the list of the customer profile. If the user knows the number of the customer but not certain whether it is correct or not, they can start by entering the first digit of the customer number at the customer number column. This will locate the customer with the range they want to come up.

Figure H.9.   Search Customer Profile with Zoom.

With the combination of Figure H.7 and Figure H.8, we derive the interface that contains both the Search Customer Profile Interface and the List of Customer Profile. First the user has to click 'F5' button. Then the customer profile interface will pop up. Next the user can scroll down the list of the customer profile until he or she finds the right customer then Press 'Enter' button. This time, the list of customer profile will be disappeared leaving only the Search Customer Profile Interface, which shows full detail of the customer.

Figure H.10.   Search Customer Profile with Zoomed Data.

After Press 'Enter' button, we derived the full detail of customer number 10007. The user can click 'Close' button to exit from this page and return to the Main Search Page Figure H.6.
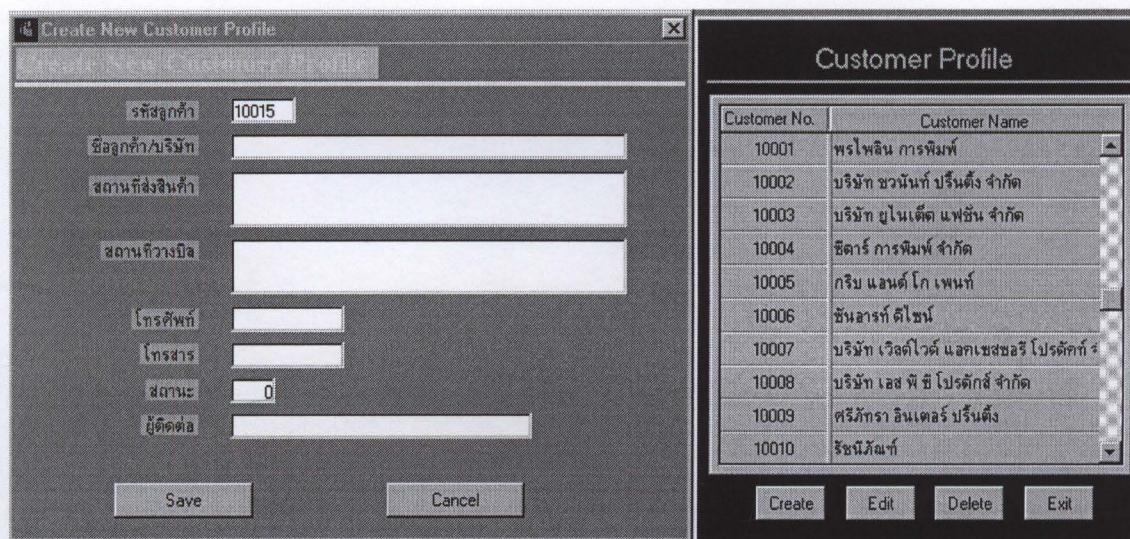
Figure H.11.   Create Customer Profile.

When there is a new customer, the creation of new customer profile becomes one of the important factors the program should be included. The user has to click on the 'Create' button. When this button has been pressed on, a call has been sent to the sub program, therefore, the new window of 'Create New Customer Profile' is showed upon.

Now, the user can enter all the required data belong to the customer. One more point to add is the user does not have to enter the customer number, the customer number shows up immediately. The program has been set in a way that there is not necessary for the user to remember what is the last number of the customer number they have already created. This is an automatic numbering without a duplicate number.

Sometimes, the user may want to quit this window pop up, they can do by just clicking on the 'Cancel' button. This command will close this interface itself and return to Customer Profile Page.

Figure H.12.   Edit Customer Profile.

When the user realize they have made something wrong to the customer profile, they are able to modify the customer profile by just clicking at the 'Edit' button.

When they click on 'Edit' button, the Edit Customer Interface comes up. The main point is which customer profile the user wants to make change, that record must be pointed first then hits the 'Edit' button.

In this case, the first customer number (10001) is highlighted, then click 'Edit' button. The detail related to this customer will come up. During this time, the user can modify the detail of this customer. After finished with modifying with this customer profile, the user has to click 'Save' button in order to save new edited detail to the database of the customer profile.

On the other hand, if the user has changed their mind so they can click at the 'Cancel' button to quit from this operation. This will lead them back to Search Customer Profile Interface.

Figure H.13.   Delete Customer Profile.

The same concept of editing the customer profile can also be applied to the deletion of the customer profile. The difference is when the user want to delete the customer profile, they have to applied the password for the deletion. This password is not the same as the one that everybody has. As we realize, some user might delete the customer profile by mistake, consequently, the way to prevent this kind of mistake is to ask the user to enter the password for deletion. If the password is not correct, the customer profile will not be deleted. This is one of the protection provided within the program.

Again, if the user changes their mind, just click on the 'Cancel' button to quit from this page and return to the Search Customer Profile Interface.

Figure H.14.   Password Confirmation for Deletion.

When the user decides to delete the customer profile. The protection from making

an error is to set the password for deletion. As we realize, the mistake occurred from the

deletion produces a great loss for the company. The information belongs to the deleted

customer has been deleted permanently. This is a reason why we have to ask for the

password before the deletion has been processed.

```
┌─────────────────────────────────────────────────────────────┐
│ Error Message                                                 │
├───────────────────────────────────────────────────────────── │
│                                                               │
│   Your auhorization for deletion has been declinded.          │
│                    Please try again.                          │
│                                                               │
│                                                               │
│        ┌──────────┐              ┌──────────┐                 │
│        │    OK    │              │  Cancel  │                 │
│        └──────────┘              └──────────┘                 │
│                                                               │
└─────────────────────────────────────────────────────────────┘
```
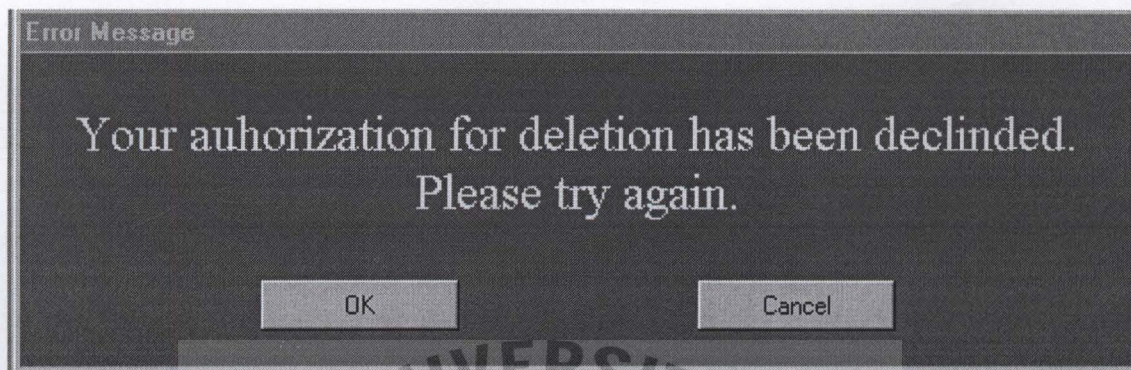
Figure H.15.   Error Message.

If the user enters the wrong password for deletion, this message box will come up.

This is to let the user know they have applied the wrong password.

118
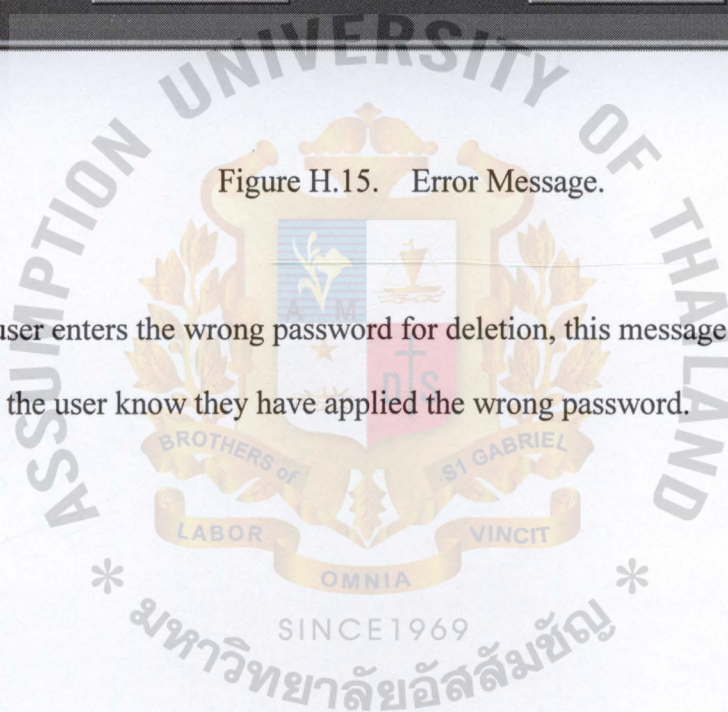
Figure H.16.   Confirmation on Deletion.

This is the last confirmation in the program before the customer profile is deleted permanently.
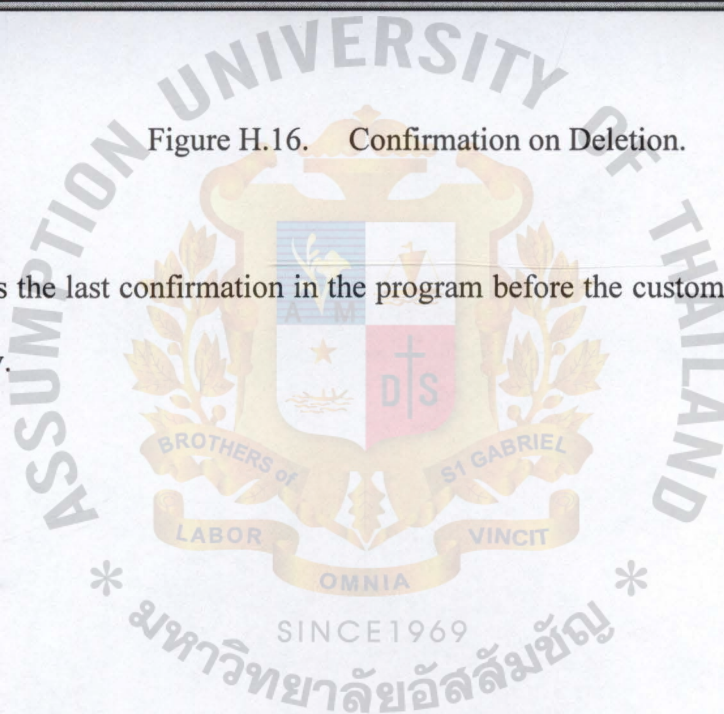
Figure H.17.   Search Supplier Profile.

This is an interface that the user can search for the supplier detail. The user has to Press F5 button to see the entire supplier data.

Figure H.18.   Supplier Profile.

This is the list of supplier profile. When user press F5, this list will pop up along with the Supplier Profile Search Page.

Figure H.19.   Search Supplier Profile Interface with Zoom.

When the user press (F5) button this will send zoom action to the supplier profile, consequently, the supplier profile is popped up. As usual, the user can scroll down the list of the supplier profile. If found the right supplier, then press 'Enter' button. Suddenly, the information belongs to the supplier is shown in the Search Supplier Profile Interface as in the Figure H.20.

Figure H.20.   Search Supplier Profile with Zoomed Data.

When the desire supplier has been selected, the full detail is shown as in the above

Figure.

123

Figure H.21.   Create New Supplier Profile.

Sometimes, new supplier is found, the necessity in creating the new record of the supplier arises. The user needs only click at the 'Create' button. With this single click, the Create New Supplier Profile Interface comes upon the request.

As we can notice, the number of the supplier is automatically defined, so the number (50010) has been set in advance for the new supplier to be recorded.

This time, the user only fulfills all the requirements data to the provided boxes then click at the 'Save' button. The record is saved to the Supplier Profile File.

Figure H.22.   Create New Supplier Profile with Data.

Since the Supplier Profiles' number is already pre-specified, it is a turn of the user to enter all the relevant data in the provided space. Then click 'Save' button for recording this new supplier to the Supplier Profile File. We can see the result of the new added supplier in the next Figure H.23.

Figure H.23.   Newly Created Supplier Profile.

With the click on the 'Save' button in the Figure H.22, the new supplier number

(50010) and detail has been recorded to the Supplier Profile.

Figure H.24.   Edit Supplier Profile.

When the user wants to modify the detail of the supplier, they can do that by click on the 'Edit' button. The Edit Supplier Page will come up with the detail of the supplier that has been highlighted before the 'Edit' button has been pressed on. Now, the user can modify the content of the browsed supplier profile.

The user has to click the 'Save' button when they are finished with the modification of the data. This will record the new edited data to the Supplier Profile.

User can click 'Cancel' when they changed their mind. This will make the Interface to close itself and return to the Search Supplier Profile Interface.

Figure H.25.   Delete Supplier Profile.

The deletion of the supplier profile also can be achieved easily. By clicking on the 'Delete' button, the new interface named Delete Supplier Profile is shown with the intended to delete supplier data in the above Figure. User needs only click at the 'Delete' button.

Again, the prevention from making a mistake by unintentional deletion has been set. Before the deletion process is begin, the user is required to enter the password for deletion. The same process of the customer profile also applied with the supplier profile.
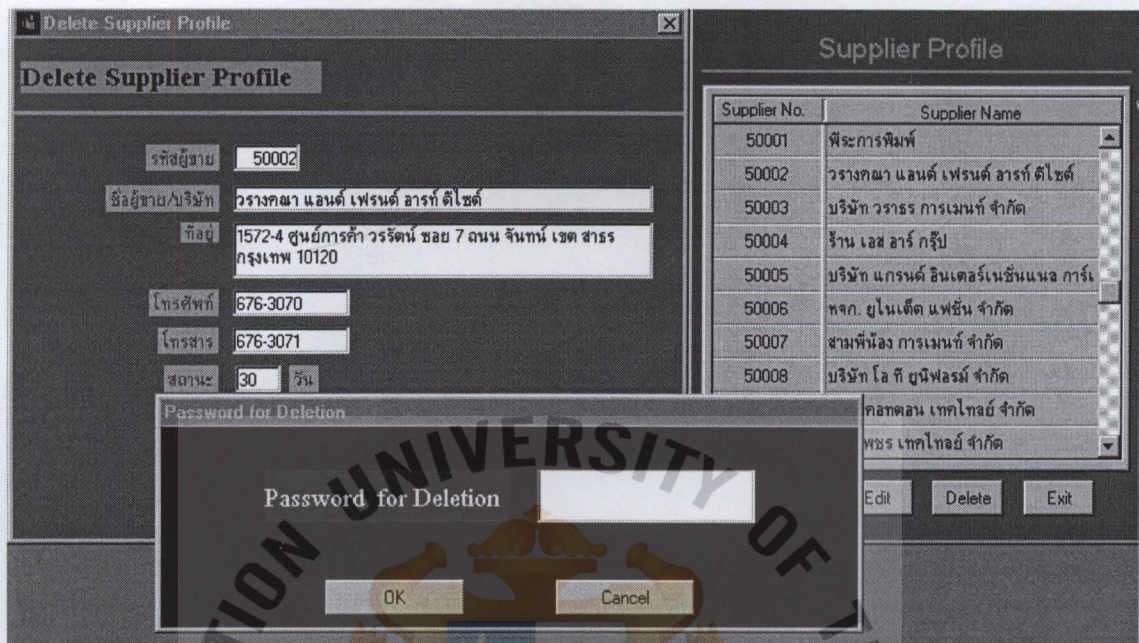
Figure H.26.   Ask for Password before the Deletion Operation.

The user has to enter the password before the deletion can be processed. This is to protect from the mistake in deletion. The Error Message of Wrong Password and The Confirmation of Deletion are presented the same way as the Customer Profile.

129

Figure H.27.   Customer Purchase Order Search Page.

This is the page where the user can enter the customer purchase order number and customer name in searching for the detail belongs to this purchase order.

Figure H.28. Customer Purchase Order with Sample Data.

By entering the customer purchase order number and customer number, the information about the requested purchase order will be shown.

Figure H.29. Query Data of Customer Purchase Order Number.

With the Customer Purchase Order Number and Customer Number, this provides the user with the opportunity to search for the detail of an individual Purchase Order Number. As the example, the user has to key in Customer Purchase Order Number (430923/1) and Customer Number (10007) then click 'Start Searching' button.

The pop up interface will come up with the full detail of the following purchase order. When the user finishes reading the detail, they have to click 'Close' button to quit from this page.

Figure H.30.   Search Company Purchase Order.

When the user wants to search for the detail of the purchase order, they can do it by clicking on the entering the Company Purchase Order number. The above figure will show the detail belonging to the requested purchase order.

Figure H.31.   Search Supplier Invoice.

Sometimes, the user may want to search for the data of the supplier invoice, they may want to do this in a case of the payment they have to make. They may query the data belong to the supplier invoice and check whether the data is correct or not.

Figure H.32.   Search Company Invoice.

Sometimes, the user may want to search for the data of the invoice. They may want to know what is the detail of the searched invoice. They only need to enter the company invoice number. With the company invoice number, the data belong to this number will be shown. After they finish reading, they can click 'Close' button to get out of this page.

Figure H.33.   Search Company Delivery Order.

The Delivery Order Number can be used in searching for the details of to whom the company deliver the product, at what price and how much we sold, what kind of product has been delivered. The invoice issued by the company is also known by using the delivery order number in searching as well.
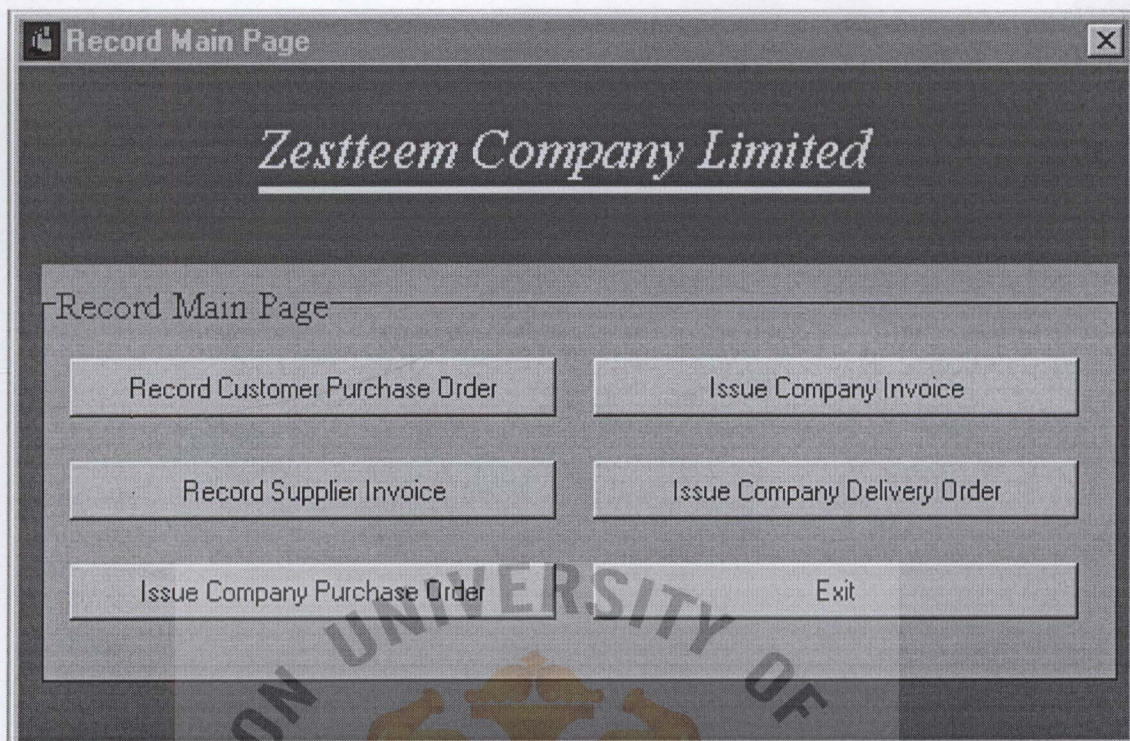
Figure H.34. Record Main Page.

This is the page where all the transaction involved in the Ordering System is processed. The user can start the transaction by just clicking on the item they prefer to do the transaction.

Figure H.35.   Customer Purchase Order Form.

When the customer sends company the purchase order, we have to record the customer purchase to the customer purchase order file. This record is kept for future reference. If the user wants to know the detail of this purchase order number, they can search the full detail in the Search Page at Figure H.6. then continue to click on the Search Customer Purchase Order.

Figure H.36.   Record Customer Purchase Order.

This is the way data is entered to the program before the user click at the save button. We can notice, at the right top of the interface, there is a date and name of the person who makes a record of this customer purchase order. This can be used to check whether the user has entered the correct data or not?

Figure H.37.   Record Supplier Invoice.

When the supplier deliver the product to the company, the document comes along with the product is the invoice. To protect from losing the invoice, the program has provided the user with the record page of the supplier invoice.

The user needs to enter the supplier number if they knew what is the number of the required supplier. Otherwise, they can zoom to see the data of supplier from the supplier profile as in the next Figure H.17.

Figure H.38.   Issue Company Purchase Order.

After we found the right supplier now we have to prepare the company purchase order. This purchase order is recorded when the user press 'Enter' button. If the user wants to print the form of purchase order, they can do it as well by press on the 'Print' button. This form of purchase order is then sent to the supplier for the production request.

Figure H.39.   Issue Company Invoice.

When the product has been received from the supplier, the company has to prepare the invoice for the collection of money from the customer. By issuing the invoice, the user has to provide all the data related to the purchase order from the customer then press 'Save' button. This will keep the current record to the Invoice File of the company. Press 'Print' button to print out the form of invoice and send this document to the customer along with the Delivery order which will be shown in the next Figure.

Figure H.40.   Issue Company Delivery Order.

When the company has to deliver the product to the customer, the Delivery Order document is generated for this purpose. This document is an approval for the acceptance of the product. The user does not have to enter the Delivery Order Number, this will be an automatically generated. The user needs to enter the invoice number so the data belong to the invoice will be retrieved and show on the screen.
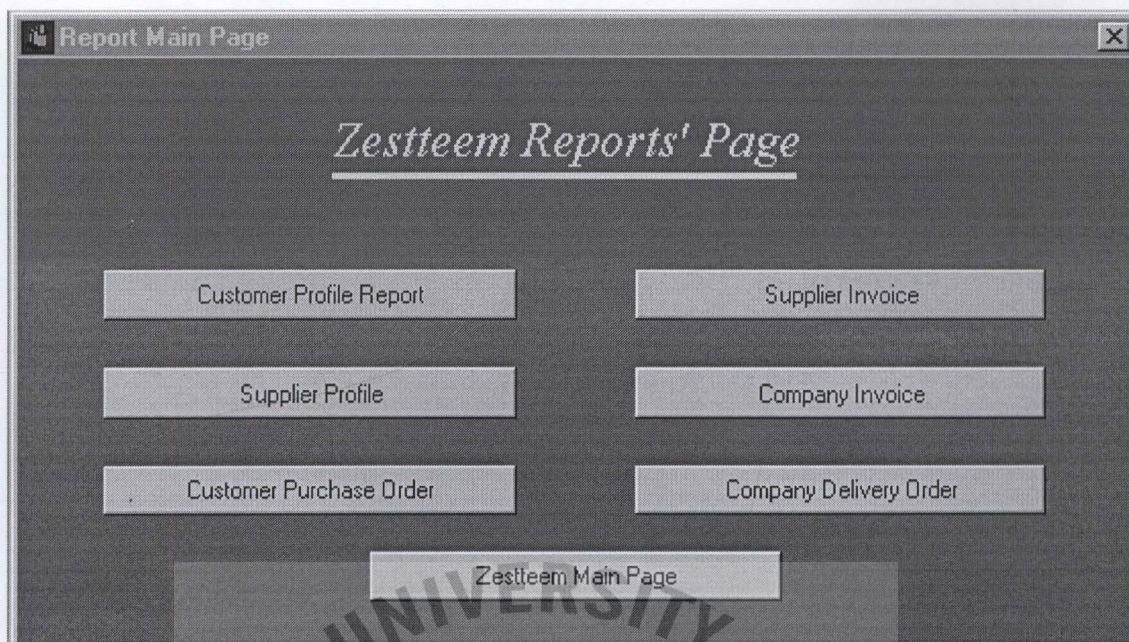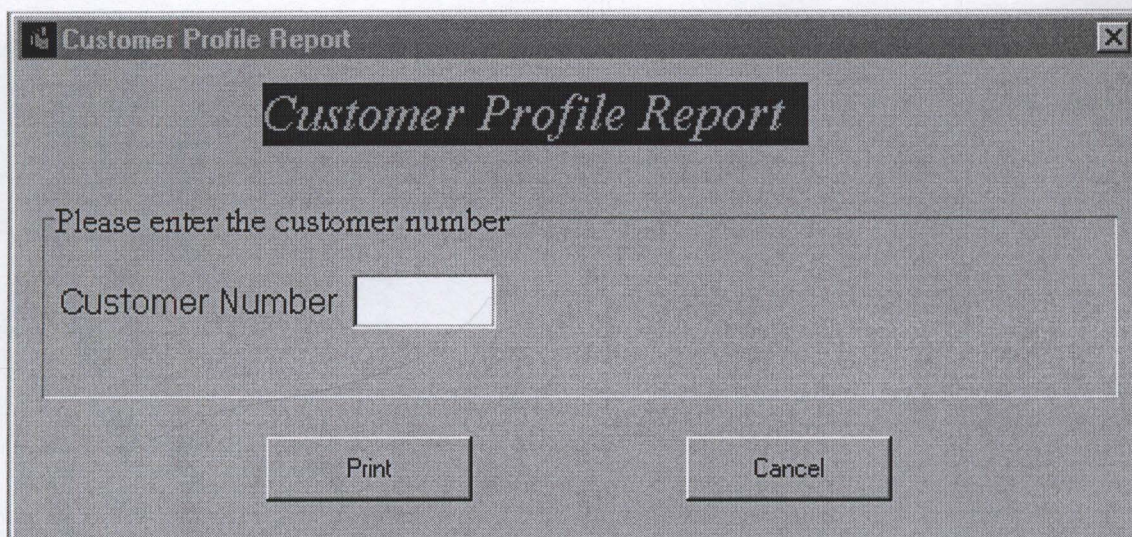
Figure H.41.   Zestteem Reports' Page.

This is the main interface of the report part. With six icons, six different kind of report is generated. This report is explained more in the following figure onward.

Figure H.42.   Print Customer Profile.

When there is a time the customer profile is needed, the user can print out an individual customer profile by just selecting the Report icon from the Figure H.5 then move forward to Figure H.41 for the choice to make. With this example, the user clicks on the 'Customer Profile' button. The Customer Profile Report will come up and the user has to browse through or key in the customer number. Then click on 'Print' button.
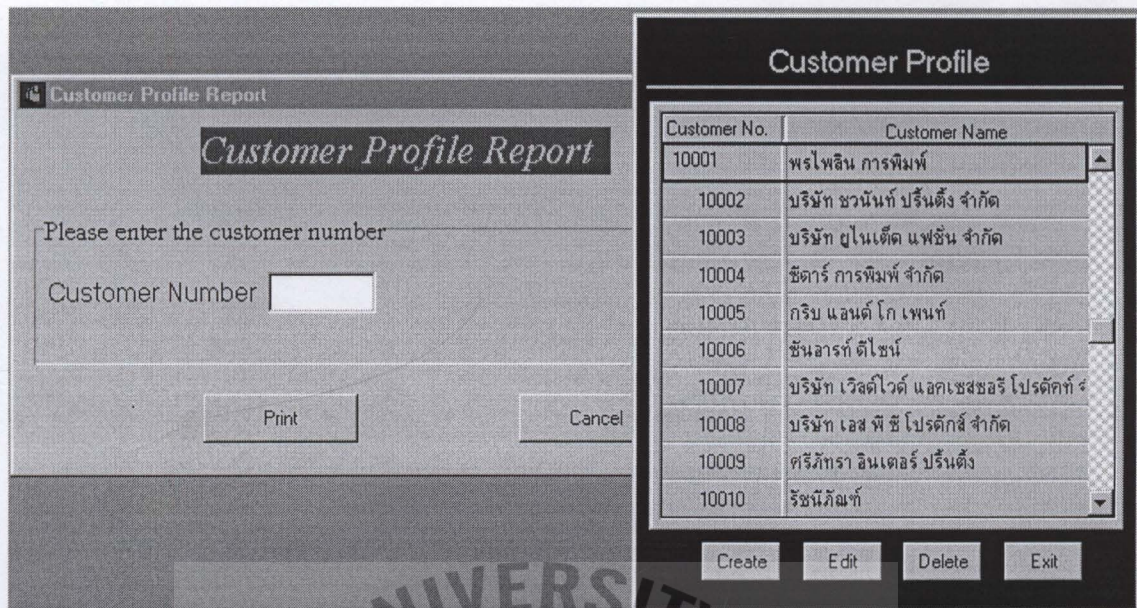
Figure H.43.   Browse Through Customer Profile.

The user can browse through the customer number and name before they click on the 'Print' button. The result is shown in the following Figure H.44.
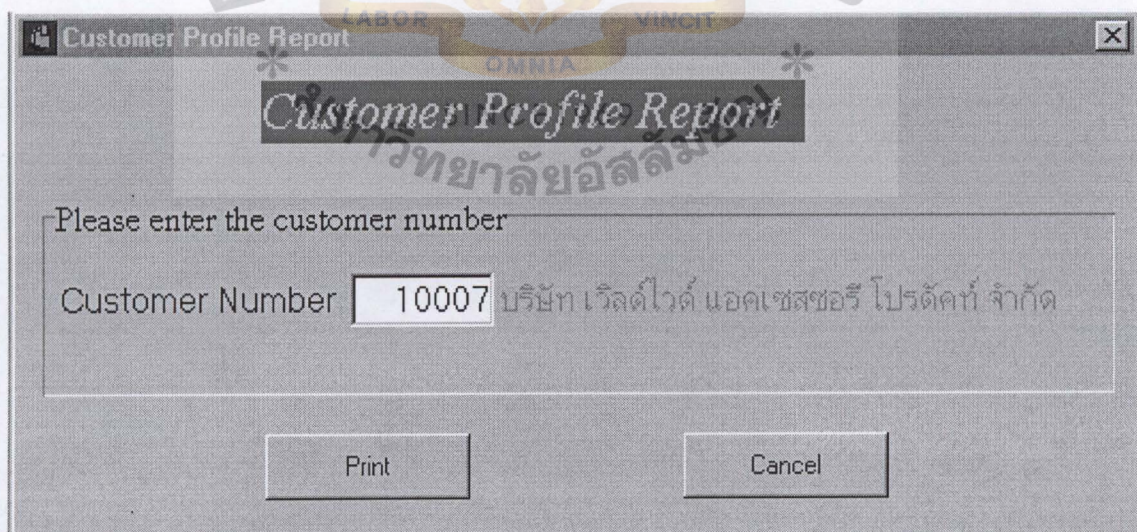

Figure H.44.   After selection of the Customer Number.
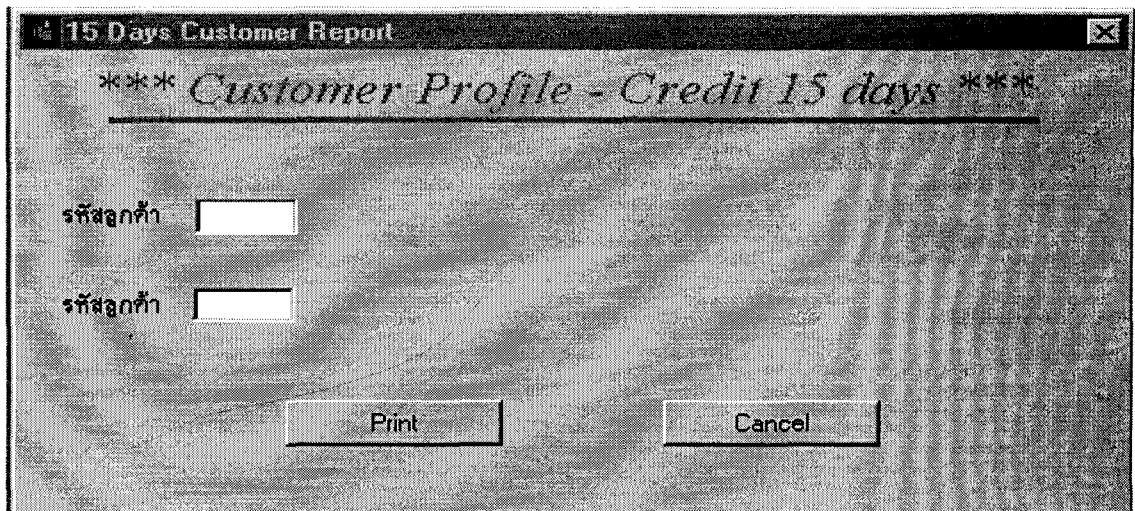
146

Figure H.45.   The Customer Profile Report of Selected Customer.

After the user push the 'Print' button, the report which is show online will come out like the above Figure. For the Report, which printed out on the paper, see the reference on the Report section.

Figure H.46. Report on Customer Profile with 15 Days Credit Status.

At first, the user has to enter the range of the customer number because they may not know who has 15 days credit status. They user can browse through the data of customer number by press 'F5'. Then press 'Print' button for the result.
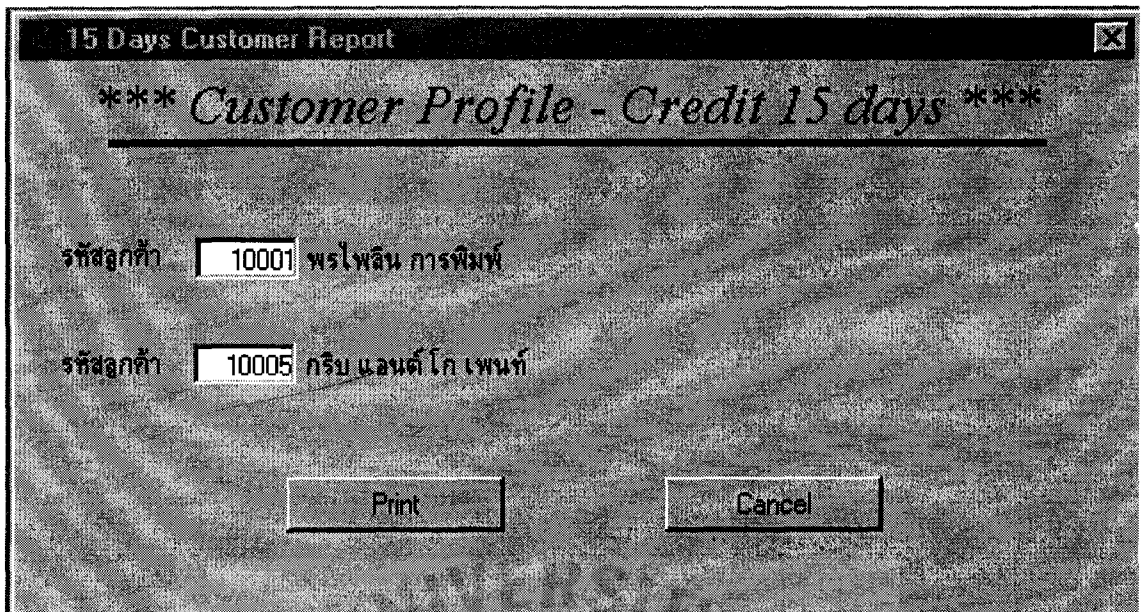
Figure H.47.   Customer Profile-Credit 15 Days with Selected Customer Number.

Since the range of the customer has been selected (10001-10005), then click Print
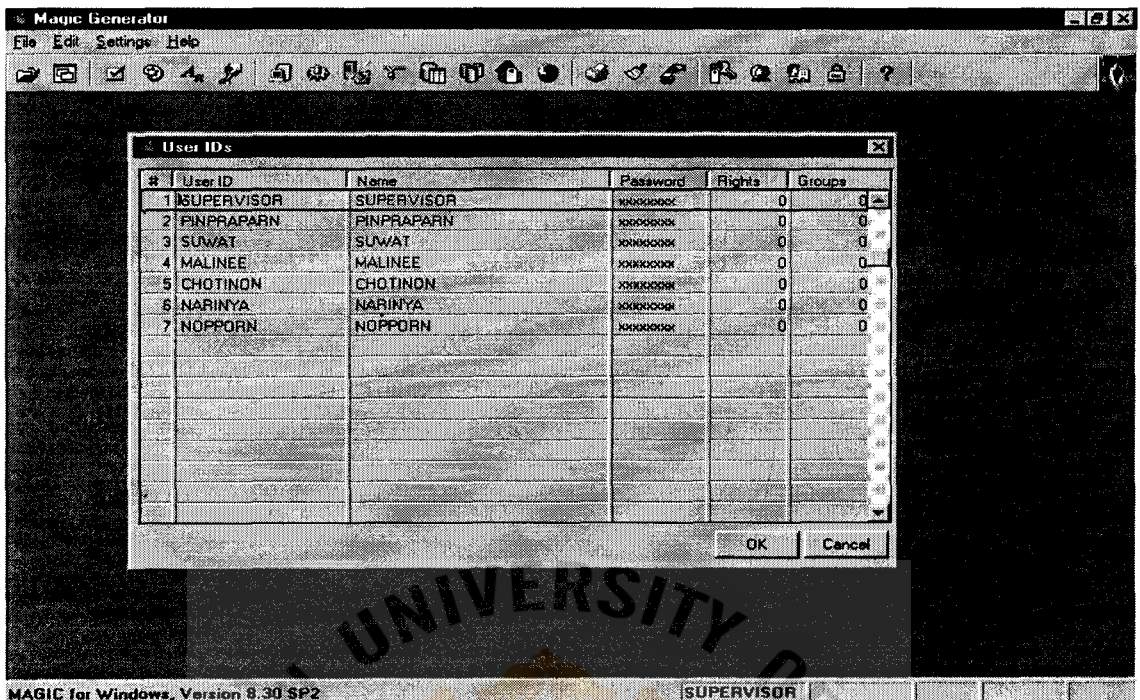
to see the result.

Figure H.48. Set Username and Password.

This is the page where the first time the user has to enter their name and password for later access to the system. As we can see, the password is encrypted into a meaningless from. This will protect an unauthorized person to access the data. Only 'Supervisor' can see this entire list. We can reserve the 'Supervisor' identification for only the Managing Director.

BIBLIOGRAPHY

1. Date, C. J. An Introduction to Database Systems, Fifth Edition. MA: Addison-Wesley Publishing Company, 1990.

2. Fitzgerald, J. and A. Fitzgerald. Fundamentals of System Analysis, Using Structured Analysis and Design Techniques, 3 rd Edition. New York: John Wiley & Son Inc., 1997.

3. Kendall, Kenneth E. and Julie E. Kendall. System Analysis and Design. Englewood Cliff, NJ: Prentice-Hall International Inc., 1995.

4. Loomis, Mary E. S. Data Management and File Structures. London: Prentice-Hall International Inc., 1989.

5. McLeod, Raymond, Jr. System Analysis and Design: An Organizational Approach. Forth Worth: Dryden Press., 1994.

6. Nyssen, G. M. and E. D. Falkenberg. SQL. U.S.A: Prentice-Hall International Inc., 1984.

7. Page-Jones, Meilir. The Practical Guide to Structured System Design, 2 nd Edition. London: Prentice-Hall International Inc., 1998.

8. The Magic Developer's Guide and Reference, Magic Software Enterprise Ltd., 1998.

9. Whitten, Jeffrey L. and Lonnie D. Bentley. System Analysis and Design Methods, 4 th Edition. Taipei: McGraw-Hill Inc., 1998.

10. Yourdon, Edward. Modern Structure Analysis. London: Prentice-Hall International Inc., 1989.