Electronic Order System by ASP

by

Mr. Napong Valaisathian

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

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Project Title   Electronic Order System by ASP

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

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ABSTRACT

Today, the Internet is the most well-known and the largest internetworking, which links hundreds of thousands of networks all over the world. Consequently, the Internet is the biggest source of exchanging information among people to communicate internally within the organization or externally with other organizations. The Internet can benefit organizations or companies in building new business models to link directly to their customers or suppliers, which is called "Electronic Commerce on the Internet".

The NV Company, which operates a family business, faces many problems with the existing order system. The business process of the existing order system is inefficient, causing time waste and increasing high operating expenses in the company. However, electronic commerce on the Internet offers the company new market opportunities and new sales channels.

This project proposed the use of electronic commerce methodology by using the company's web site to sell products and receive orders from customers of the company via the Internet. The investment cost is reasonable and the web site is available to consumers 24 hours a day. After the old system is replaced by the electronic order system, the new system offers the company an easier way to communicate with the existing customers as well as potential new customers at a very low cost. It decreases the maintenance cost of the system; furthermore, the redundant process in the existing order system is discarded, causing an efficiency of the order system.

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I. INTRODUCTION

1.1 Background of the Project

Today, the Internet is actually the biggest source of information, and it is an easy way to do e-commerce. Furthermore, the cost to invest in e-commerce via the Internet is normally the reasonable cost and e-commerce system is not difficult to maintain. Thus, the maintenance cost will be reasonable. E-commerce allows people to run their own business by themselves. Creating their own web sites, as virtual stores allowing everyone in the world, who connect to the Internet to visit their web sites and do business with them.

Consequently, e-commerce allows customers to order products from their web sites 24 hours everyday. The concept of e-commerce presents two major advantages, which are saving time and costs. Furthermore, the concept of e-commerce gives the researcher a new idea to develop a family business's order system into an "Electronic Order System by ASP".

The family business is producing and selling many kinds of stingray wallet and purse to close retailers, which are actually stores or gift shops. Most of the stores are located on Sukhumvit road; however, some of them are on Silom road and in Pattaya. Normally, the existing order system is a manual system. The orders are received from the customers by telephone and fax. The customers cannot indicate at that time the exact product to order, because there are new products every three months and they have no knowledge of them. As a result, many kinds of product are delivered to the customers as sample products for them making buying decision.

The customers may order some products, or they may not order any, which would waste the time and increase the expenses of the company. Because of this problem, the researcher decides to develop the "Electronic Order System" to present the products and also receive orders from member customers through a web site. The purpose of the project is to increase the efficiency of the order system.

1.2 Objectives of the Project

(1) To create the web site to act as a virtual store presenting products and receiving orders from customers via the Internet.

(2) To allow customers to view new products on the web site.

(3) To allow customers to order products directly from the web site.

(4) To reduce the cost of printing a catalog.

(5) To reduce the delivery cost of sending sample products to the customers.

(6) To deliver to the customers only products they really need at each time.

(7) To improve the efficiency of controlling stocks.

(8) To develop a database to record order information for marketing analysis.

1.3 Scope of the Project

Data: The database of the proposed system normally consists of five tables, which are Member table, Product table, Invoice table, Invoice_Detail table and Administrator table. The database is created using Microsoft Access. Member table stores customer information. The customers are allowed to search and order products directly from the web site, where product information is stored on Product table.

The administrator, who maintains the web site and the database, has rights to update, add, delete, check or print out a report of customer, product and invoice. Product table stores actually all product information, which includes an image of each product. Invoice table stores customer information, which orders products from the

company. Invoice_Detail table stores types of ordered product that the customers ordered from the company.

The scope of the database design is a relation database. A relational database stores data in a tabular form. Each file is implemented as a table. Similarly, each field is a column in the table and each record in the file is a row in the table. As a result, data in a relational database cannot be duplicated.

All tables are in the same database that is created by Microsoft Access 97, which is a personal computer database management system. Each table can relate with other tables in the same database by a foreign key. In contrast, a primary key of each table acts as an index of the table.

The database is created on a client machine. Then, it is forwarded and stored on the server of ISP Company in Bangkok where the company makes a contact . ISP Company also provides for backup, recovery and security of the database. However, the client machine of the NV Company can download the database file from the server for updating and checking order from customers.

Process: The process of the proposed system consists of four processes. These processes are:

(1) Customer Registration

(2) Customer Login

(3) Ordering a product

(4) Delivering the ordered product

Firstly, Customer Registration is the process for entering new customer information including username and password. Secondly, Customer Login is the process to check a customer's username and password and allowed only a member customer to enter the proposed system. Thirdly, Ordering product is the process to receiver order from the

customer and to store ordered information on the database. Finally, Delivering the ordered product is the process of preparing and delivering an order product to the customer.

The process of the proposed system is defined in term of the software language and tools that will be used to develop these four processes. The programming language, which is selected to implement these processes, are HTML, Java Script and ASP. Furthermore, tools that are used to implement these processes are Adobe PhotoShop, Adobe Golive and Personal web server.

Interface: Normally, the system is available for the member customers in Bangkok and in Pattaya. The customers are normally small businesses, which are gift shops or stores along Sukhumvit road and Silom road. However, the company needs to expand the market to other provinces in Thailand by the Internet.

Geography: Although the Electronic Order System can cover the whole, the company starts with covering only in Thailand at first. The administrator of the system is in Lardprow area while the server's site that house the web site and the database of the system, is rented from an ISP in Bangkok.

1.4 Deliverables of the Project

The following deliverables include:

(1) The web site for customers to order products and the administrator of the system to check customers' order

(2) The access database to store product, customer and customer's order data

(3) A final report containing at least:

    (a) Details of the proposed system

    (b) Data flow diagram of the proposed system

    (c) Process specification

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(d)   Data dictionary

(e)   Structure chart

(f)   Database design

(g)   Screen output of the Web site

(h)   Invoice, product and customer report

(i)   etc.

No.	Task Name		January				February				March				April			
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
I.	System Analysis																		
1	Define a scope of the project																		
2	Study the existing system																		
3	Analysis problem and opportunity																		
4	Define a business requirement																		
5	Develop process modeling																		
6	Develop data modeling																		
7	Cost and Benefit Analysis																		
II.	System Design																		
8	Network Design																		
9	Database Design																		
10	Program Design																		
11	Web Interface Design																		
III.	System Implementation																		
12	Coding																		
13	Build a database																		
14	Testing																		
15	Installation																		

Figure 1.1. Project Plan.

II. EXISTING BUSINESS SYSTEM

2.1 Background of the Existing Business

The company, which is the family business, is producing and selling many kinds of wallets and purses that is made from stingray's skin. The products are made by members in the family, but the company needs to employ outside employees to produce component parts of products. Moreover, all kinds of small wallets and purses will be purchased directly from the factory. There are seven employees who are persons in the family and there are about ten employees from outside. The responsibility of outside employees is to produce component parts of products while the three employees in the family are responsible for composing them into complete products.

The other three employees' responsibility are preparing and delivering the order product to the customers. The last person is the manager who is also the owner of the company. His responsibility is to manage all the business processes and delegates work to all employees including receiving orders from the customers, doing the accounting, purchasing raw material, selling products and controlling the stock.

The member customers of the company are stores and gift shops and have a close relationship to the company. Most of them are located on Sukhumvit road and Silom road in Bangkok. Moreover, some of them are at South Pattaya and Chiengmai. The existing order system is actually a manual system because the company is small and produces products only for close customers. Although the company does a small business and all business processes are a manual system, there are many problems in the existing order system area.
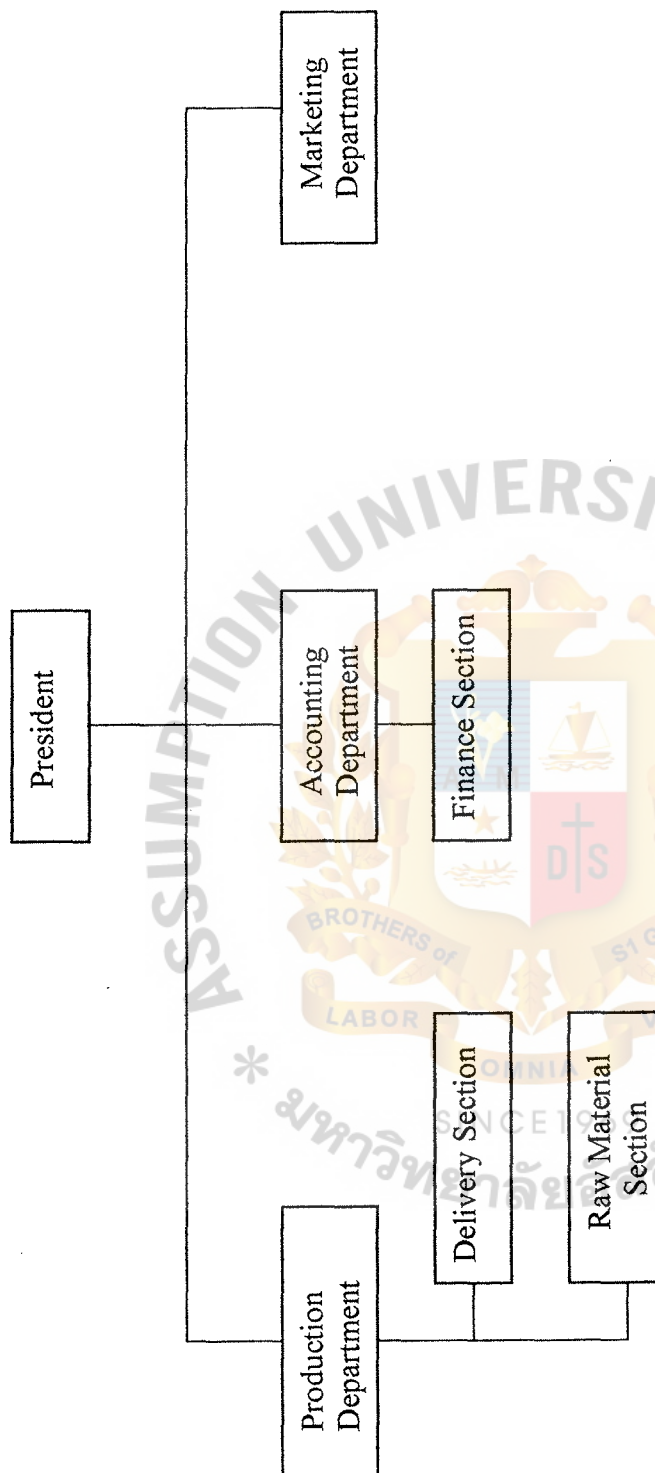
Figure 2.1. Organization Chart.

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2.2 Current Problems and Areas for Improvement

Normally, the company receives orders from the customers by telephone or fax. Thus, the customers will have no knowledge of the company's products unless they see them. As a result, the company needs to deliver sample products to the customers for them to make buying decision. Consequently, that function increases the delivery cost because the delivery process is redundant. The company delivers sample products, which are new products, to the customers the first time. Then, the company will deliver ordered products to them again if orders are received from the customers. Certainly, this problem has turned into being the main problem of the company because the operating expenses have increased.

Secondly, it is very difficult to expand the company's market because of company budget. Thus, the company cannot advertise and promote all company's products to potential customers.

Thirdly, the existing order system is not an efficient system to record customer, product and historical data of orders from the customers. As a result, it is difficult to estimate a number of products that should be reserved in a stock and to do analysis of the market.

Finally, customer, product and order records are paper documents that are difficult to maintain.

2.3 Existing Manual Order System

The existing system is certainly the manual system and the main area of the problem and area for improvement is the order system. The order system can be classified into three main areas, which are input, process and output.

Input: The first input is a request from a customer to deliver sample products to him/her.   The second input is an order from the customer after he/she makes buying decision.   The last input is a bill from the company and cash or check that is paid by the customer.

Process: The process of the existing order system can be classified into three processes.

Process 1 -- Ordering process

      Step 1:   Receiving a request from the customer to deliver sample products

               to him/her

      Step 2:   Sample products are prepared and delivered to the customer

      Step 3:   Receiving order from the customer and order details is recorded

               on paper

      Step 4:   Order details are sent to the owner of the company

Process 2--Preparing the ordered product

      Step 1:   The quantity of the order products in the stock is checked.

      Step 2:   Preparing the ordered products to be delivered

      Step 3:   The bill is prepared by the owner

      Step 4:   The ordered products are delivered to the customer

Process 3---Delivering the ordered product

      Step 1:   Delivering the ordered product to the customer

      Step 2:   The ordered products are checked by the customer

      Step 3:   The customer receives the receipt from the company

      Step 4:   The customer pays the company by cash or check

Output: The first output of the existing order system is the sample products to be delivered to the customer. The second output is the ordered products to be delivered to the customer. The third output is a receipt or invoice that is signed by the owner and sent to the customers. The last output is cash or check, which is paid by the customer, will be sent to the company.

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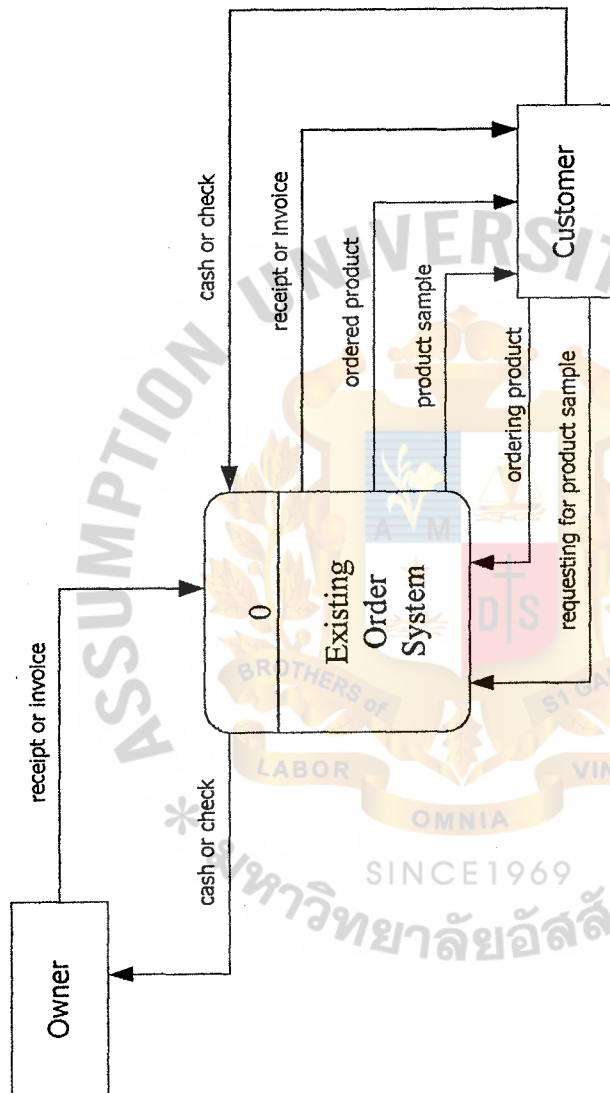
Figure 2.2. Context Data Flow Diagram of Existing System.

III. THE PROPOSED ELECTRONIC ORDER SYSTEM

3.1 System Specifications

Network Architecture: The network architecture of the proposed system bases on Internet technology, which is a type of client/server computing. The Internet is an information superhighway that permits computers of all types and sizes all over the world to exchange data and information. As a result, the proposed system is to create the web site to sell the company's products and receive orders from the member customers of the company through the Internet. The web site is created by a standard language and stored on the web server at Internet Service Provider(ISP) in Bangkok. The member customers and potential customers access the web site by web browser and a standard protocol.

In this case, the company takes advantages of the proposed system that based on Internet technology. Firstly, the company needs not to establish its own network that its investment cost is very high. Internet technology is wide area network through a telephone network, which has already existed. Consequently, the investment cost of developing the web site via the Internet is reasonable.

Secondly, the company needs not to maintain the web server that stores the web site and the database because it is ISP's responsibility. Thirdly, the administrator of the web site access the database of the web site by web browser and is allowed to retrieve the database from the web server for checking orders from the customers. Thus, the administrator of the proposed system does not need to have a high technical knowledge.

Finally, the administrator's responsibility is to create the web site and the database, to maintain the web site and the database, to add, delete or update data on the database, to check orders from the customers and to print out reports. A scope of the

administrator's responsibility is limited; thus, the administrator can be trained in a short period.

Data Architecture: The database of the proposed system must be a relational database, which is created by Microsoft Access.   It composes of five tables that are Member table, Product table, Invoice table, Invoice_detail table and Administrator table.   These tables are in the same database that is saved as *.mdb file.   Then, the database is uploaded to store on the web server.   The web site can connect to the database file by ODBC data source.   Consequently, the web page that connects to the database file must be inserted with a script language in order to communicate with the database of the web server.

Process Architecture: The proposed system based on Internet technology; thus, the software to access the web site is actually a web browser.   However, the researcher needs graphic software to develop the web site.   As a result, Adobe PhotoShop is a reasonable software to develop graphics for the web site and Adobe Golive is a reasonable HTML editor.   The researcher needs to write some script languages, which are Java Script and ASP that allow the web site to communicate with users and the database.

Interface Architecture: The Internet technology is an on-line processing; thus, the interface architecture of the proposed system must be a human interaction system.   The web site must be a sensitive system in error detection and error correction than a normal batch processing.   As a result, Graphic User Interface technology will enhance the user interface and increase interaction between users and computers.

3.2   System Analysis and Design

The process to analyse and design the proposed system bases on System Development life cycle concept (SDLC), which divides the processes into eight phases.

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However, to analyse and design the proposed system in this case consists of five phases. These are Study phase, Definition phase, Configuration phase, Design phase and Construction phase. Study phase, Definition phase and Configuration phase are actually in System analysis process. In contrast, Design phase and Construction phase are actually in System design process.

3.2.1 System Analysis

(1)   The Study Phase :   The study phase is to study the nature of the problem and try to understand completely the business problem domain of the existing system.   Moreover, the researcher needs to answer the question "Are these problems worth solving?". Modeling the context diagram of the existing system helps to understand clearly the structure of the system.

(2)   The Definition Phase :   The purpose of the definition phase is to find data, process, and interface and geography requirement of the proposed system. Modeling techniques and CASE tool help designing and understanding data, process, interface and geography requirement of the proposed system.

(3)   The Configuration Phase :   The configuration phase is to find the solution of the problems.   It composes of three main tasks.   These are to identify the solution, to analyze the solution and recommend a target system that will be designed and   implemented.   The technique needs to complete this activity is cost-benefit analysis.

3.2.2 System Design

(1)   The Design Phase :   The purpose of the design phase is to transform the business process requirement from the definition phase into physical process requirement.   This phase consists of technology the researcher use to

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implement the proposed system. Modeling technique and CASE tool help

designing and understanding the technology used for the proposed system.

(2) The Construction Phase : The purpose of the construction phase is to build

and test the proposed system that includes network, database, graphic

interface and program. Structure chart helps to design the program for the

proposed system.

3.2.3 Techniques

There are many techniques that analyze and design the proposed system. The

following techniques the researcher use to analyze and design the proposed system are :

Business Process Analysis: Business process analysis is to analyze each business

process in a set of related business process to determine what process is necessary and

what problem exists in each business process. This technique the researcher uses to

analyze the existing system and to find out its problems. It is used on study phase.

Context Diagram: Context diagram is a logical diagram, which shows what a system is

or does in logical view of business process. It is a part of process modeling. The

purpose of the context diagram is to define the scope and boundary for the existing and

the proposed system, which includes the input data, output data, flow of data and

external agents of the system. This technique is used on both study phase and definition

phase, that is shown in APPENDIX B.

Functional Decomposition Diagram: Functional decomposition diagram is the act of

breaking a system into its component subsystem., processes and subprocesses.

Functional decomposition Diagram is the first step before data flow diagram of the

proposed system will be designed. The process of the proposed system is broken into

logical subsets of processes from improved communication, analysis and design. It is

also called a hierarchy chart that shows the top-down functional decomposition and

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structure of the system. This technique is used on definition phase and is shown in APPENDIX A.

Logical Data Flow Diagram: Logical data flow diagram is also a part of process modeling. The purpose of logical data flow diagram is to organize the structure and flow of data through a system's processes, including the processing performed by the system. This data flow diagram is implemented independently from the technical implementation. This technique is used on definition phase and is shown in APPENDIX B.

Cost-Benefit Analysis: Cost-benefit analysis is to analyze the benefits that the proposed system will provide comparing with cost-effective of the proposed system. This technique is used on configuration phase to measure economics feasibility.

Database Design : Database Design is to design the database to store input and output data that flow through the system's processes. The database architecture of the proposed system is relational database that designs the database as a table. Each table shows table name, element name in each table, which is called an attribute. Furthermore, it shows which attribute is a primary key and foreign key of that table. It shows also size of each attribute. The database will be design on design phase. Database design is shown in APPENDIX F.

Data Dictionary: Data dictionary is a document that supports flow of data through the system's processes. It classifies data in each data flow that is necessary to design and implement the database. It is designed on design phase. It is shown in APPENDIX D.

Input, Output and User Interface Design: It is to design the screen format for users to input data and the output format presenting on the screen to the users. The most popular input format is Graphic user interface. Moreover, there are many types of output format that are graph output, report output etc. The input and output format must be user

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friendly; thus, the users are satisfied to work with the system. Similarly, the user interface of the system must be user friendly. The popular user interface is direct manipulation. This user interface style focuses on using icons, or small graphic image to suggest functions to the users. Input, output format and user interface of the proposed system is shown in APPENDIX G, which is designed on design phase.

Structure Chart: Structure chart is the process to design software of the proposed system. This technique consists of breaking up the program into a hierarchy of modules that result in a computer program that is easier to implement and maintain. This process is done on design phase that is very necessary for the construction phase. It is shown in APPENDIX E.

Fact-Finding Technique: Fact-finding technique is the formal process of using research, interviews, questionnaires, sampling and other techniques to collect information about the systems requirements. This is the technique that overlaps many or all phases of the system development life cycle. The technique of fact-finding we use to collect information are :

(1)   Research and Site Visits: Internet is a global network of networks. Thus, there are hundred of thousand of web sites to do e-commerce over the Internet. We visit these web sites to observe the format of the web site that sells products on the Internet. Consequently, the researcher learns the weakness and the strength of these web sites and to find out what the efficient format of the company's web site is and what format satisfied the customer's needs and wants. This technique is necessary for analyzing the business process of the proposed system on definition phase. Similarly, it is necessary on design phase when user interface of the proposed system will be designed.

(2)   Rapid Application Development(RAD):   Rapid application development is the popular fact-finding technique for finding the user requirement. In this case, the researcher uses this technique to design the web site because this technique allows the administrator to create quickly the web site and receive response from the users. The users can suggest to the researcher for improving the web site's layout and format. This process may take several iterations to correct the layout and format of the web site until the web site is completed. It is necessary on both design phase and construction phase.

(3)   Interviewing: Interviewing is a fact-finding technique four collecting information from individuals face to face. This technique overlaps on both definition phase and design phase. The researcher needs to interview with the owner of the business about the system's processes, input format, output format and user interface of the proposed system.

3.3   Hardware and Software Requirement

Hardware requirement of the proposed system is a computer that acts as a client connection to the Internet via ISP, a printer and a scanner. Today, a computer's technology is continuously developed; thus, a computer has actually high performance. The processor that is the heart of computers, is the main point determining a buying decision of a computer. Furthermore, AMD and Intel processors are the most powerful processors in the market.   The cost of AMD processor is lower than Intel processor while performance and efficiency of AMD and Intel processor are not much different. High competition between AMD and Intel processor in the market causes a reducing price of processors. Consequently, consumers will take the benefit and the minimum speed of the processor should not be less than 600 MHz.

RAM, VGA card and Harddisk are also factors determining a buying decision of a computer. A computer that works on graphic needs more resources than a computer performing a normal task. As a result, the minimum RAM on the computer should not be less than 128 MB. Similarly, RAM on VGA card should not be less than 16 MB. The chipset of VGA card must be a high performance and the most popular chipset of VGA card in the market today is Geforce 2MX from Nvidia.

The capacity of the Harddisk of the computer should not be less than 10 GB because there are many graphics and images of the product are needed to store on the computer. The researcher needs also a printer for printing out reports and a scanner for scanning the product's image.

Table 3.1. The Hardware Specification for the Client Machine.

Hardware	Specification
CPU	Duron 900 MHz
Mainboard	MSI K7T Pro 2-A
RAM	Kingston 128 MB
Harddisk	Maxtor 15.3 GB
VGA Card	Winfast Geforce 2 MX 32 MB
Sound Card	PCI on board
Modem	Rockwell 56 K
Floppy Disk Drive	Sony 1.44 MB
CD Rom Drive	Asus 40X
Monitor	ADI Provista 14"
Mouse	P&A PS2 Mouse
Keyboard	IBM 108 Keys Keyboard
Speaker	P&A Speaker 200 Watt
Printer	HP LaserJet 1100
Scanner	Microtek 600*1200
UPS	VA500

The most popular operating system is Window Me that is from Microsoft. Microsoft provides a lot of software that integrate with its operating system. Microsoft Office 97 includes Microsoft Access that is used to create the database and Internet

explorer from Microsoft is a powerful Web browser.

A graphic software and HTML editor is very importance for creating the web site A popular graphic software in the market is Adobe PhotoShop 5.5. Adobe Golive 4.0 is HTML editor that integrated with Adobe PhotoShop 5.5 and is selected to develop the web site. FTP software is necessary to send and access files on the web server of ISP from the client.

ASP is the script language inserting in each web page in order to connect to the database on the web server. In contrasts, Java script is also the script language inserting in each web page for interacting between a user and a computer.

Table 3.2. The Software Specification for the Client Machine.

Software	Specification
Operating System	Windows ME
Web Browser	Internet Explorer
Graphic Software	Adobe PhotoShop 5.5
HTML Editor	Adobe Golive 4.0
FTP Software	WS-FTP Pro
Script Language	Java Script and ASP
Database Software	Microsoft Access
Web Server	Personal Web Server 4.0

3.4 Security and Control

Security and control of the proposed system can be categorized into two main systems. These are computerized and manual security and control.

Computerized Security and Control

(1) The customers who visit the web site must register to be a member of the web site; thus, they are allowed to order products from us. They must enter all required data on prepared registration form. Java script code is inserted in this web page to ensure all required data will be entered and to display warning message to the customers. ASP code is also inserted to check that
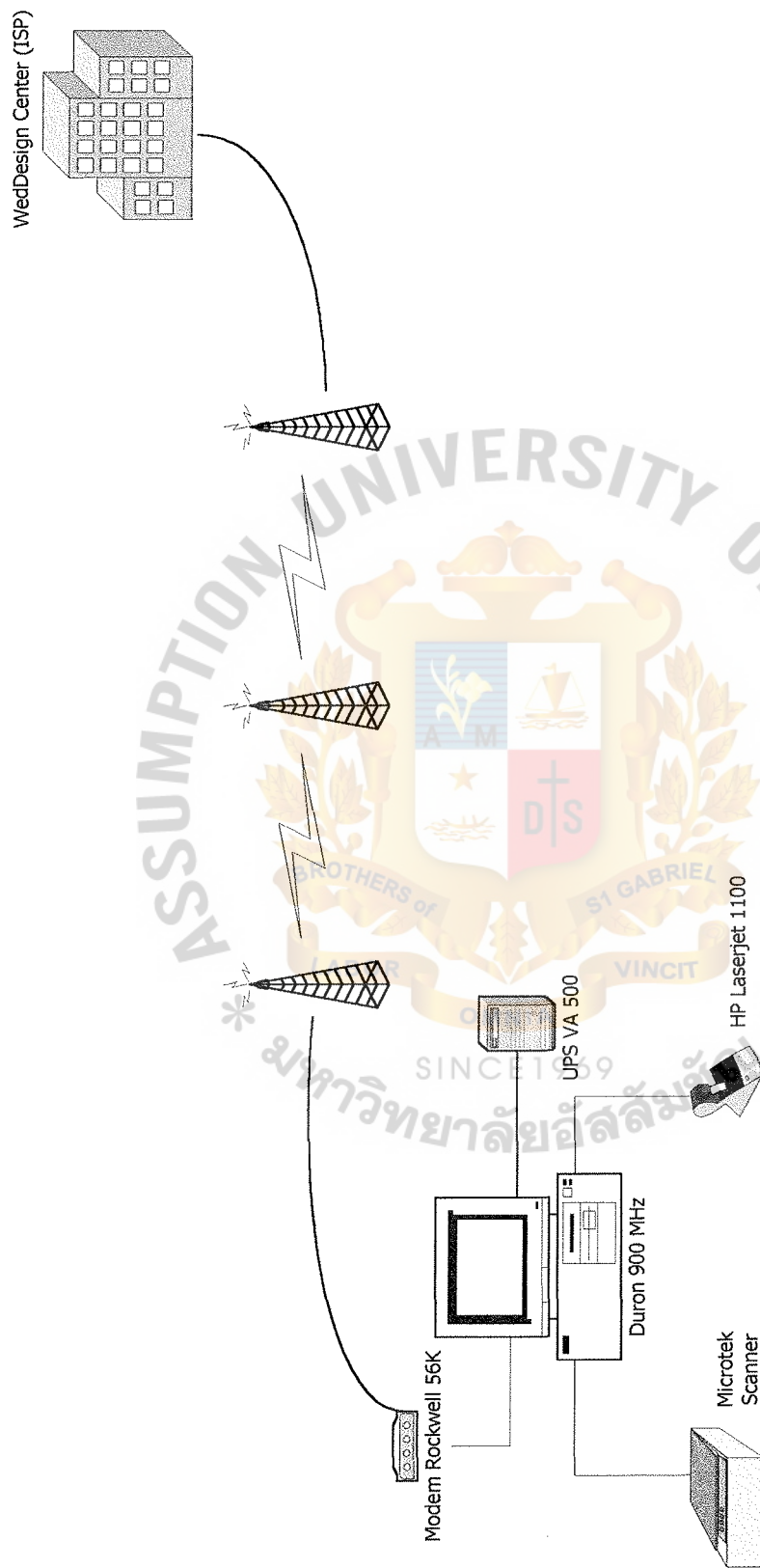
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Figure 3.1.   Hardware Configuration of the Proposed System.

WedDesign Center (ISP)

Modem Rockwell 56K

UPS VA 500

HP Laserjet 1100

Duron 900 MHz

Microtek Scanner

the selected username and password of the customers will not be repeated with the existing username and password of other customer stored on Member table.

(2)   When the customers login to the system, ASP code on the web page will check their username and password with the existing username and password on the Member table. If their username and password are not found, they are not allowed to order products from us.

(3)   After the customers login to the system, ASP code will create a special variable that is called "session variable". In the proposed system, name of this session variable is "login" and value of login variable is "pass". The special characteristic of this session variable is inheritance. As a result, login variable will be inherited to all web pages that are behind the login system. These web pages have an ASP code to check that login variable, which is inherited, is actually pass value or not. Consequently, an unauthorized customer cannot access directly to all web pages that are behind the login system.

(4)   The database of the web site is stored on web server at ISP. The database can be downloaded from the web server by the administrator who has the password of the database.

(5)   The administrator who has a correct username and password has an authorization to update, insert and delete data on the database as well as to check the customers' order and printing out reports.

Manual Security and Control

(1)   Invoice report that is printed out by the administrator must be actually signed by the owner. It is the owner's responsibility to check stocks and

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prepare products for delivery.

(2) The owner of the business has an authorization to access the database. Similarly, the owner can insert, update and delete data on the database as an administrator. Furthermore, the owner has an authorization to insert, update and delete the administrator's data on Administrator table.

3.5 Cost-Benefit Analysis

Costs to develop the proposed system fall into two categories. These are developing cost and operating cost. Development cost is usually onetime costs that will not recur after the proposed system has been completed. Development costs of the proposed system are:

Personnel costs – Personnel costs are salaries of the person who develop the proposed system, which usually are system analysis, system design, programmer etc.

Hardware and Software costs – This is a cost of hardware and software need for the proposed system.

Training costs – This is a cost to train the administrator how to develop and manage the proposed system.

The operating costs is different from development cost because it tends to incur throughout the lifetime of the system. The costs of operating a system can be classified as fixed and variable cost. Fixed costs occur at regular intervals but at relatively fixed rates. In contrast, variable costs occur in proportion to some usage factor.

Fixed costs – Fixed costs of the system are usually salaries of the worker or software license payments.

Variable costs – Variable cost of the system are normally printer paper used and floppy disks.

System Cost Analysis

(1)   Costs of Manual System

Table 3.3.   Manual System Cost Analysis, Baht.

Cost items		Years				
		1	2	3	4	5
Fixed Cost						
Typewriter	3units @9,500	28,500.00	-	-	-	-
Calculator	7units@1,500	10,500.00	-	-	-	-
Fax Machine	1units@25,000	25,000.00	-	-	-	-
Total Fixed Cost		61,000.00	-	-	-	-
Operating Cost						
Salary Cost:						
Manager	1 person @ 30,000	30,000.00	33,000.00	36,300.00	39,930.00	43,923.00
Staff:						
Production officer	3 persons @ 9,000	27,000.00	29,700.00	32,670.00	35,937.00	39,530.70
Delivery officer	3 persons @ 9,000	27,000.00	29,700.00	32,670.00	35,937.00	39,530.70
Outside employee	10 persons @ 3,000	30,000.00	33,000.00	36,300.00	39,930.00	43,923.00
Total monthly salary Cost		114,000.00	125,400.00	137,940.00	151,734.00	166,927.40
Total Annual Salary Cost		1,368,000.00	1,504,800.00	1,655,280.00	1,820,808.00	2,003,128.80
Office Supplies & Miscellaneous Cost:						
Stationary	Per Annual	3,000.00	3,300.00	3,630.00	3,993.00	4,392.30
Paper	Per Annual	5,000.00	5,500.00	6,050.00	6,655.00	7,320.50
Utility	Per Annual	7,000.00	7,700.00	8,470.00	9,317.00	10,248.70
Miscellaneous	Per Annual	2,000.00	2,200.00	2,420.00	2,662.00	2,928.20
Total Annual Office Supplies & Miscellaneous Cost		17,000.00	18,700.00	20,570.00	22,627.00	24,889.70
Total Annual Operating Cost		1,385,000.00	1,523,500.00	1,675,850.00	1,843,435.00	2,028,018.50
Total Manual System Cost		1,449,000.00	1,523,500.00	1,675,850.00	1,843,435.00	2,028,018.50

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

Year	Total Manual Cost	Accumulated Cost
1	1,449,000.00	1,449,000.00
2	1,523,500.00	2,972,500.00
3	1,675,850.00	4,648,350.00
4	1,843,435.00	6,491,785.00
5	2,028,018.50	8,519,803.50
Total	8,519,803.50	—

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(2) Costs of Computerized System

Table 3.5. Computerized System Cost Analysis, Baht.

Cost items	Years				
	1	2	3	4	5
Fixed Cost					
Hardware Cost:					
Personal Computer Cost	35,400.00	-	-	-	-
Printer Cost	15,000.00	-	-	-	-
Scanner Cost	5,600.00	-	-	-	-
Total Hardware Cost	56,000.00	-	-	-	-
Maintenance Cost:					
Maintenance Cost	-	-	-	12,500.00	12,500.00
Total Maintenance Cost	-	-	-	12,500.00	12,500.00
Software Cost:					
Personal Computer Cost	50,000.00	-	-	-	-
Total Software Cost	50,000.00	-	-	-	-
Implementation Cost:					
E-Commerce Training Cost	15,000.00	-	-	-	-
Web Programming Training Cost	1,2000.00	-	-	-	-
Web Developer Cost 12,000 @ 12 months	144,000.00	-	-	-	-
System Administrator Cost 10,000 @ 12 months	120,000.00	-	-	-	-
Total Implementation Cost	291,000.00	-	-	-	-
Office Equipment Cost:					
Calculator 3 Units @ 1,500	4,500.00	-	-	-	-
Total Office Equipment Cost	4,500.00	-	-	-	-
Total Fixed Cost	401,500.00	0.00	0.00	12,500.00	12,500.00
Operating Cost					
People-Ware Cost:					
Manager 1 person @ 30,000	30,000.00	33,000.00	36,300.00	39,930.00	43,923.00
Staff:					
Production Officer 3 persons @ 9,000	27,000.00	29,700.00	32,670.00	35,937.00	39,530.70
Delivery Officer 2 persons @ 9,000	18,000.00	19,800.00	21,780.00	23,958.00	26,353.80
Outside Employee 5 persons @ 3,000	15,000.00	16,500.00	18,150.00	19,965.00	21,961.50
Total Monthly Salary Cost	90,000.00	99,000.00	108,900.00	119,790.00	131,769.00
Total Annual Salary Cost	1,080,000.00	1,188,200.00	1,306,800.00	1,437,480.00	1,581,228.00
Office Supplies & Miscellaneous Cost:					
Stationary 1,500 per month	18,000.00	19,800.00	21,780.00	23,958.00	26,353.00
Paper 3,700 per month	44,400.00	48,840.00	53,724.00	59,096.40	65,006.04
Utility 5,000 per month	60,000.00	66,000.00	72,600.00	79,860.00	87,846.00
Miscellaneous 3,000 per month	36,000.00	39,600.00	43,560.00	47,916.00	52,707.60
Annual Office Supplies & Miscellaneous Cost	158,400.00	174,240.00	191,664.00	210,830.40	231,912.64
Total Operating Cost	1,238,400.00	1,362,240.00	1,498,464.00	1,648,310.40	1,813,140.64
Total Computerized System Cost	1,639,900.00	1,362,240.00	1,498,464.00	1,660,810.40	1,825,640.64

Table 3.6.   Five Years Accumulated Computerized Cost, Baht.

Year	Total Computerized Cost	Accumulated Cost
1	1,639,900.00	1,639,900.00
2	1,362,240.00	3,002,140.00
3	1,498,464.00	4,500,604.00
4	1,660,810.40	6,161,414.40
5	1,825,640.64	7,987,055.04
Total	7,987,055.04	–

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

Manual System

Table 3.7.   The Comparison of the System Costs, Baht.

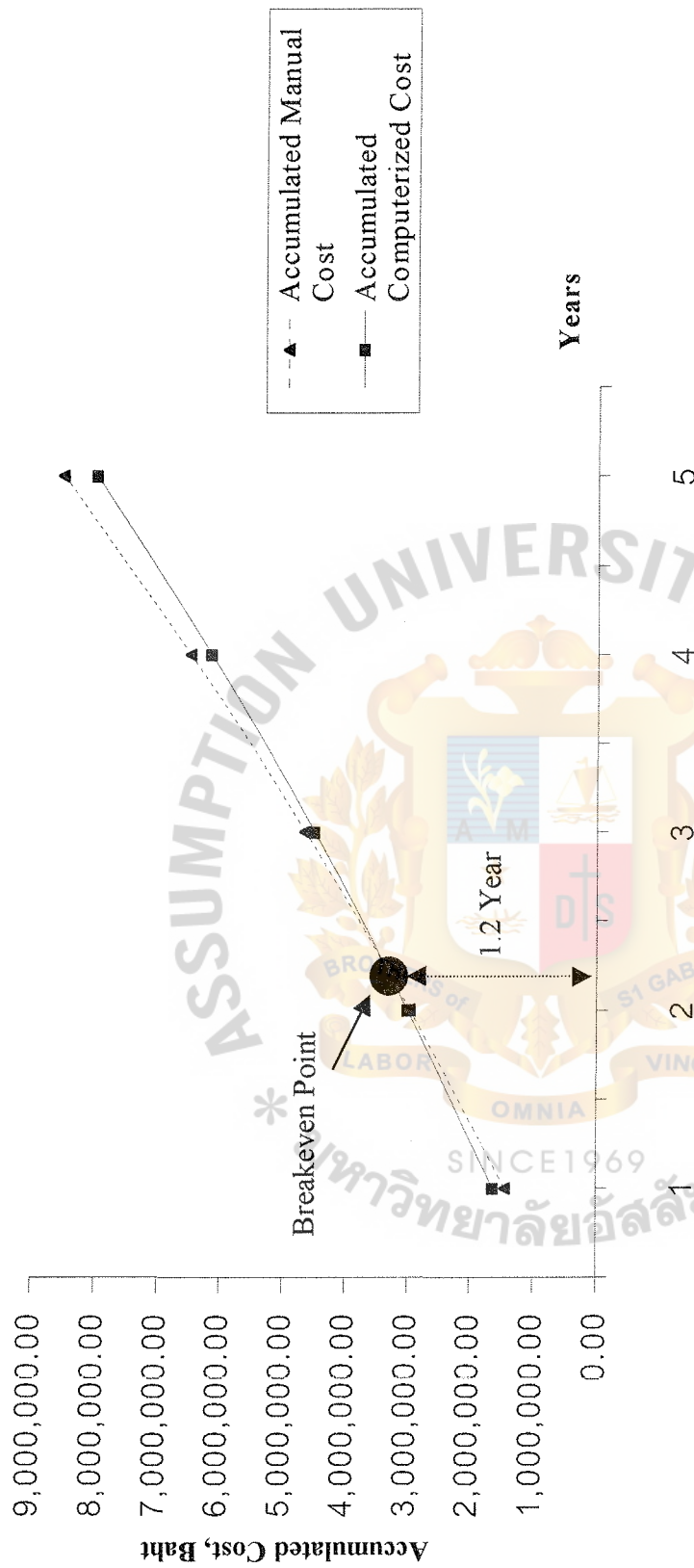| Year	Accumulated Manual Cost	Accumulated Computerized Cost
1	1,449,000.00	1,639,900.00
2	2,972,500.00	3,002,140.00
3	4,648,350.00	4,500,604.00
4	6,491,785.00	6,161,414.40
5	8,519,803.50	7,987,055.04

Figure 3.2. Cost Comparison between Existing System & Proposed

Payback Analysis

Table 3.8. Computerized System Payback Analysis, Baht.

| Cashflow Description	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Development Cost:	-402,500.00					
Operation & Maintenance Cost:		-1,238,400.00	-1,362,240.00	-1,498,764.00	-1,660,810.40	-1,825,640.64
Discount factors for 1.2%:	1.00	0.99	0.98	0.96	0.95	0.94
Time-adjusted Costs: (adjusted to present value)	-402,500.00	-1,223,715.42	-1,330,125.45	-1,463,430.92	-1,583,426.85	-1,719,937.76
Cumulative time-adjusted Costs over lifetime:	-402,500.00	-1,626,215.42	-2,956,340.87	-4,419,771.79	-6,003,198.64	-7,723,136.41
Benefit derived from operation of new system:	0.00	1,250,000.00	1,500,000.00	1,800,000.00	2,160,000.00	2,592,000.00
Discount factor for 1.2%:	1.00	0.99	0.98	0.96	0.95	0.94
Time-adjusted benefits: (adjusted to present value)	0.00	1,235,177.87	1,464,637.79	1,736,724.65	2,059,357.29	2,441,925.64
Cumulative time-adjusted benefits over lifetime:	0.00	1,235,177.87	2,699,815.65	4,436,540.30	6,495,897.59	8,937,823.22
Cumulative lifetime time-adjusted Costs+benefits:	-402,500.00	-391,037.55	-256,525.22	16,768.51	492,698.94	1,214,686.82
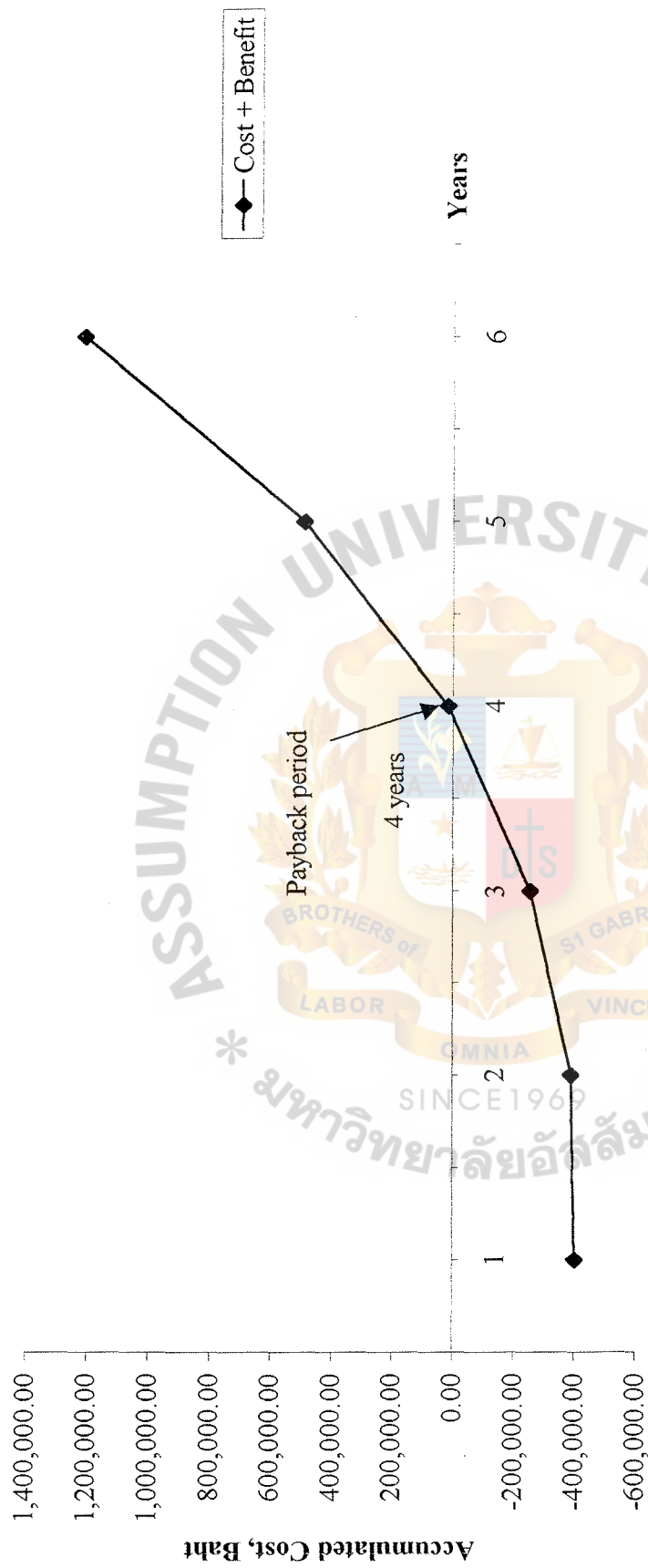
Figure 3.3. Payback Analysis of the Computerized System

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IV. PROJECT IMPLEMENTATION

4.1 Overview of Project Implementation

The project implementation of the proposed system bases on System Development Life Cycle (SDLC) as the researcher explained in previous part. The overview of the project implementation can be classified into three main tasks, which are System Analysis, System Design and System Support.

4.1.1 System Analysis

(1) The Study Phase: In the study phase, the existing system is studied to find the problem areas. The purpose of this phase is to find the problem is worth solving or not. Context diagram of the existing system will be created and Business process analysis is to analyze each business process in a set of related business process to determine what process is necessary and what problem exists in each business process. Consequently, the researcher learn about the existing system's data, processes, interfaces and geography. Finally, it is to analyze problems and opportunities. The purpose is to understand the underlying causes and effects of all problems and opportunities. It is important to study what problem should be solved and what problem should not and to find what opportunity can be best applied.

(2) The Definition Phase: The purpose of the definition phase is to find data, process, and interface and geography requirement of the proposed system. In this phase, "Interviewing" and "Search and site visit" are two main techniques to find the requirement of the proposed system. Interviewing to the members of the company to find what style of the web site they need.

Furthermore, to search and visit the existing web site on the Internet gives us an idea to design the web site. Then, context diagram shows the overall view of the proposed system. Furthermore, functional decomposition diagram is to classify the proposed system into a small module as a hierarchy tree. Subsequently, logical data flow diagram of each module will be designed. The purpose of these activities is to model business system requirement; thus, data, process, interface and geography can be verified. Logical data flow diagram will be transformed into a technical solution in system design process.

(3) The Configuration Phase: In this phase, cost and benefit analysis of the proposed system is estimated to define economic feasibility. There are two costs developing the proposed system that are development cost and operating cost. Development cost is one time cost. It is cost of implementing the proposed system on each phase. Operating cost is the cost when the proposed system is actually operated. It is a lifetime cost of the system.

4.1.2 System Design

(1) The Design Phase: The purpose of the design phase is to transform the business process requirement from the definition phase into physical process requirement. Firstly, logical data flow diagram of the proposed will be transformed into physical data flow diagram that show the process including technical implementation. It serves as a technical blueprint for the implementation. Secondly, logical database and data dictionary of the proposed will be designed. In the proposed system, the database is relational database that implements data in a series of tables that are related

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to one another via foreign keys. Thirdly, input, output and interface will be designed. In this phase, two main fact-finding techniques are important that are interviewing and rapid application development (RAD). We interview the member of the business and create rapid input, output and interface of the proposed system; thus, the researcher can receive rapidly a response of the designing. Finally, structure chart of the proposed system will be designed. Structure chart is the process to design software of the proposed system. This technique consists of breaking up the program into a hierarchy of modules that results in a computer program that is easier to implement and maintain. Structure chart will be coded as a program on the construction phase.

(2)   The Construction Phase: The purpose of the construction phase is to build and test the proposed system. Graphic of the web site will be created by using Adobe PhotoShop and Adobe Golive transform them into a programming code. Relational database of the system will be created by using MS Access. Java Script language that is a script language inserted into each web page for interactive system. Finally, ASP is also a script language that is inserted into each web page to communicate with the database on the server.

4.1.3   System Support

The last activity is system support, which is the ongoing maintenance of the system after it has been placed into operation. This activity includes program maintenance or system maintenance. Some bugs of the program can cause a problem to the system; thus, the action to correct this error is called program maintenance. The overall system must be tested to find an error after it is operated.

4.2 Test Plan

The test plan of the proposed system is composed of two testing that are Unit testing and System testing. Unit testing in this case ensures that each file can work correctly without any error. In contrast, System testing ensures that the entire web site can be worked very well without any error and ensures that each web page of the same web site can communicate with each other including the database on the server.

All files of the web site will be tested on personal computer before they are transferred to the web server. In this case, the researcher needs Personal Web Server that allows a personal computer to run a script language of the web server.

V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

After the existing order system is converted to be the proposed system, it increases an efficiency of the company's order system. The process of the order system can be reduced as well as the redundant process is discarded. Consequently, the company can reduce the number of employees; similarly, the operating expense can be decreased.

Although the investment cost of the proposed system is more than the investment cost of the existing system, the maintenance cost of the proposed system is less than the maintenance cost of the existing system.   In the future, the NV Company can estimate that the proposed system will gain more profit than the existing system within 4 years.

The company gets a chance to expand the market to potential customers through the Internet.   Furthermore, the company can improve an efficiency of controlling the stock. As a result, the company increases its potentiality to receive more orders from the member customers as well as the potential customers.

Finally, historical data of customer's orders are stored on the database that data is operated more efficiently. Thus, the company can make a marketing analysis and present a result in graph format, which is easy to understand and making an analysis for predicting the trend of the market in order to produce a product that satisfies the customers' need and want.

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

Process	Existing System	Proposed System
Order Process	3 hrs.	1 hr.
Product Prepare Process	2 hrs.	1.5 hrs.
Delivery Process	4 hrs.	2 hrs.
Invoice & Receipt Prepare Process	30 mins.	10 mins.
Total	9 hrs. 30 mins.	4 hrs. 40 mins.

Order Process: The company has to send sample products to the customer before the customer makes a decision to order products from the company.   In contrast, the proposed system allows the customer to see and order the company's products via the web site.

Product Prepare Process: The company cannot estimated a quantity of ordered product from customers until they decide to order products from the company.   In contrast, the proposed system allows the company to check a quantity of ordered product on the web site for a day or a month.   As a result, the company prepares a statistic report and improves a control stock process.

Delivery Process: The delivery process of sample products to the customer is discarded on the proposed system.

Invoice & Receipt Prepared Process: The invoice and receipt form is still on the database including an order detail of the company's customer.   As a result, the users can retrieve an order detail from the database and to print out as an invoice or a receipt.

5.2 Recommendations

There are some factors that are of importance to the implementation and the operation of the proposed system. These factors are :

(1) The person who is the administrator of the proposed system must be trained to understand the operation of the proposed system.

(2) The owner of the company must be trained how to operate the proposed system and the owner's right must be above the administrator's right.

(3) The proposed system will require to have an auto mail to send immediately a respondent mail to the customers who order product from the web site.

(4) In the future, the web site should allow the customers to pay by credit card v via the Internet and is secured by Secure Socket Layer (SSL).
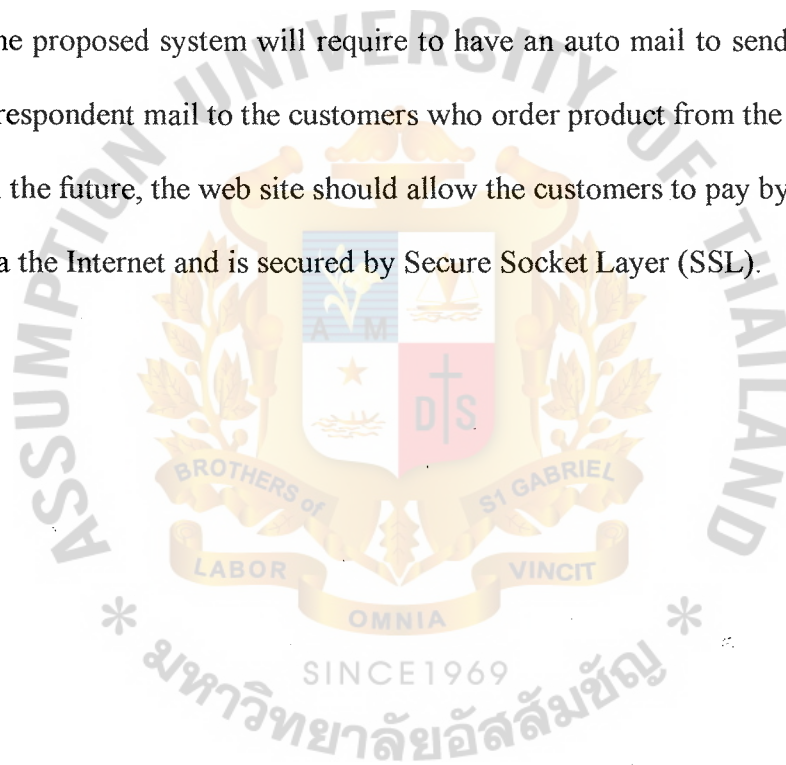
APPENDIX   A

FUNCTIONAL DECOMPOSITION DIAGRAM
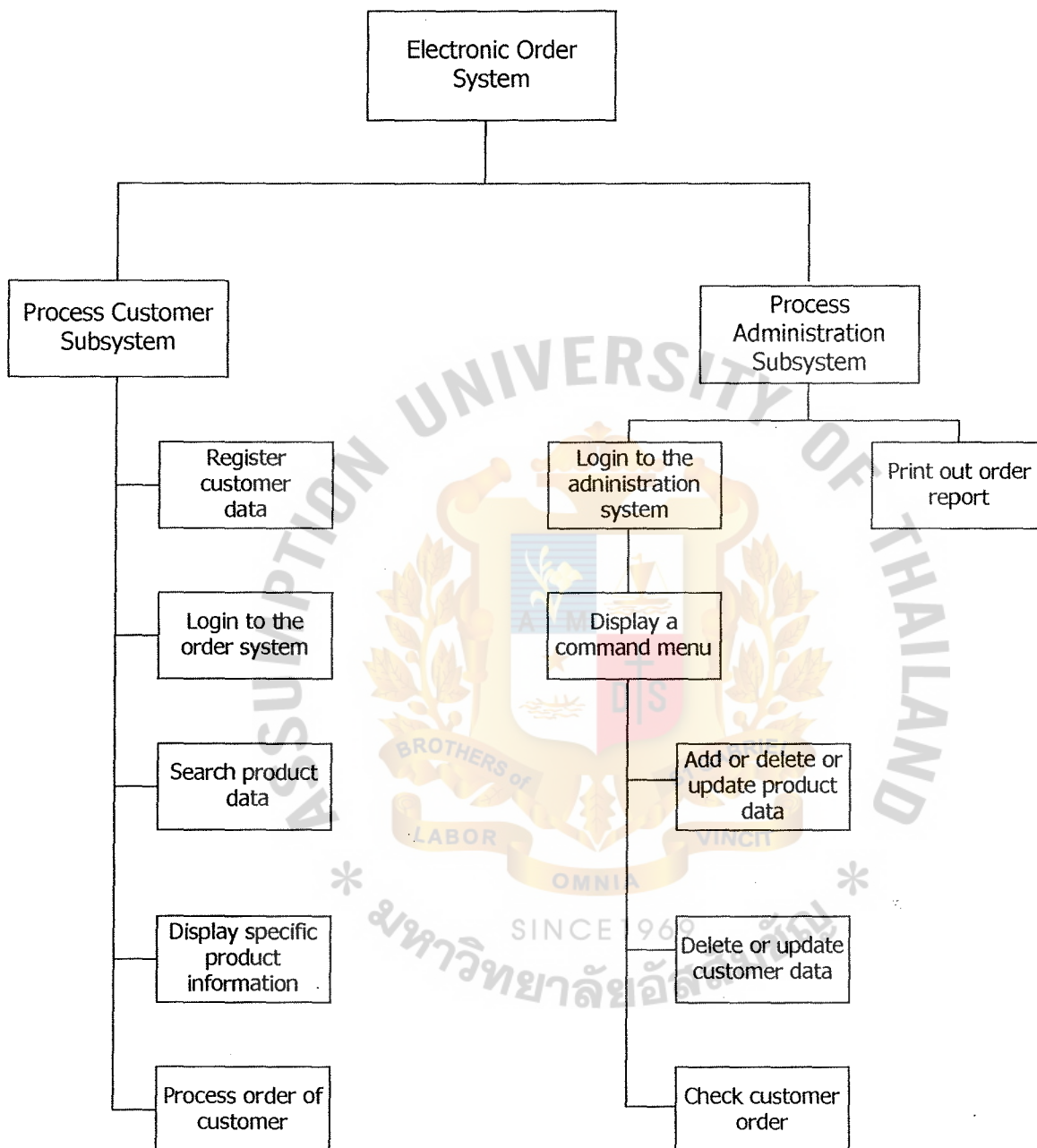
Figure A.1. Functional Decomposition Diagram of Proposed System.

APPENDIX   B
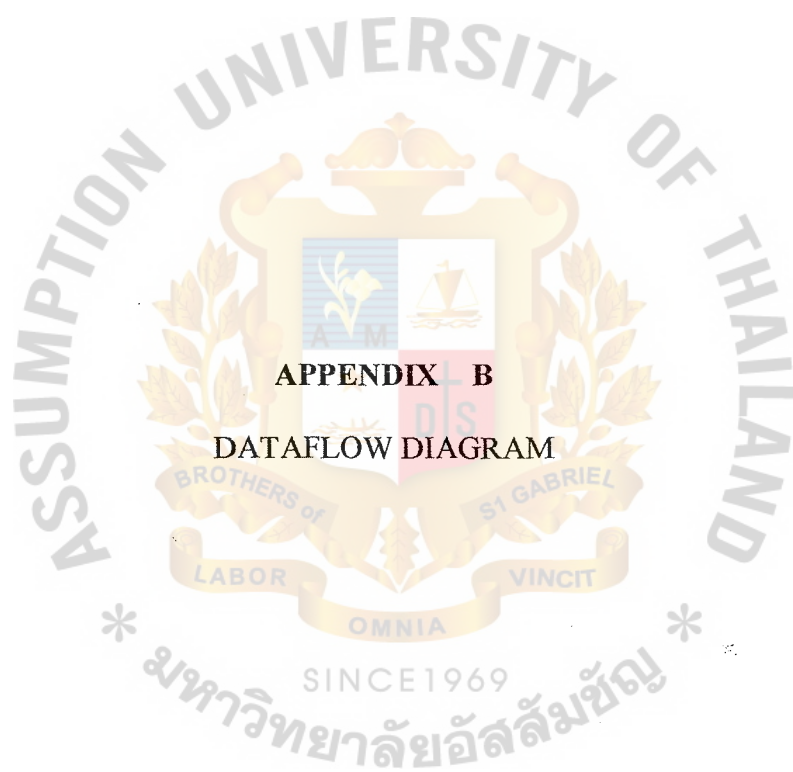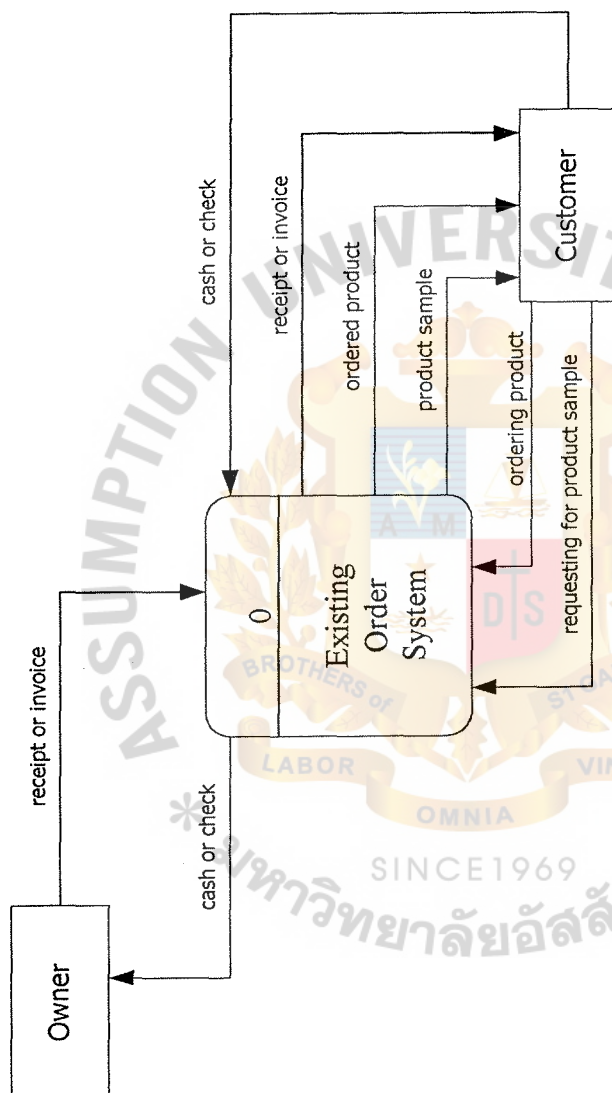
DATAFLOW DIAGRAM

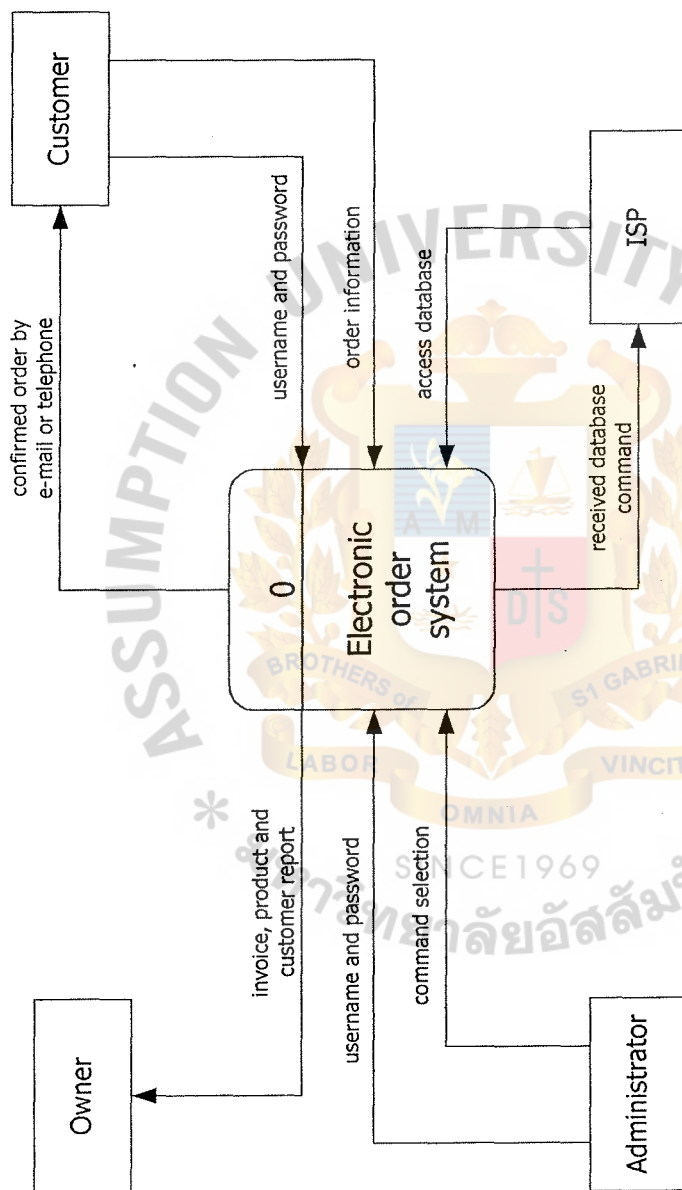Figure B.1. Context Data Flow Diagram of Existing System.

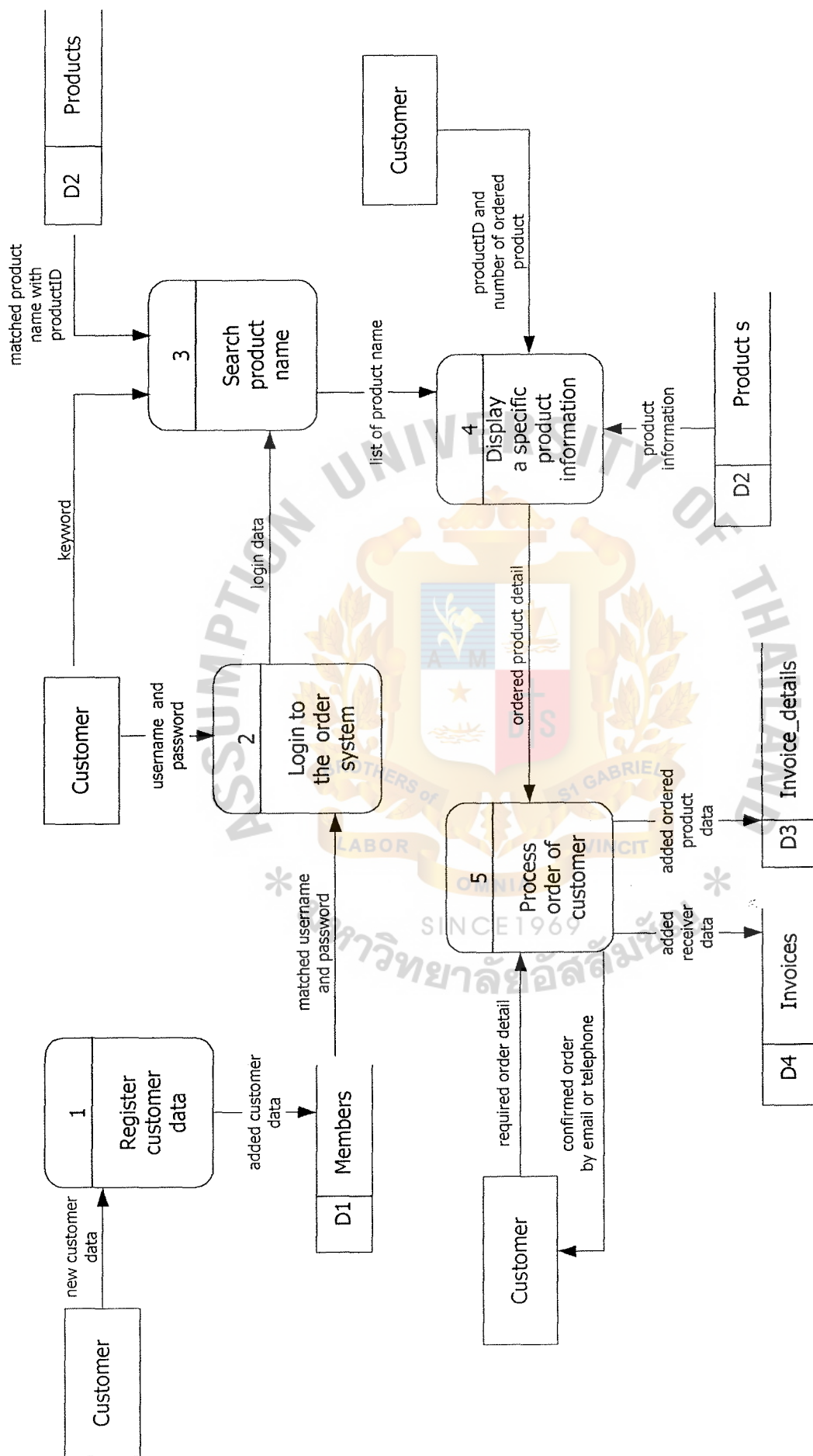Figure B.2. Context Data Flow Diagram of Proposed System: Process Order System.

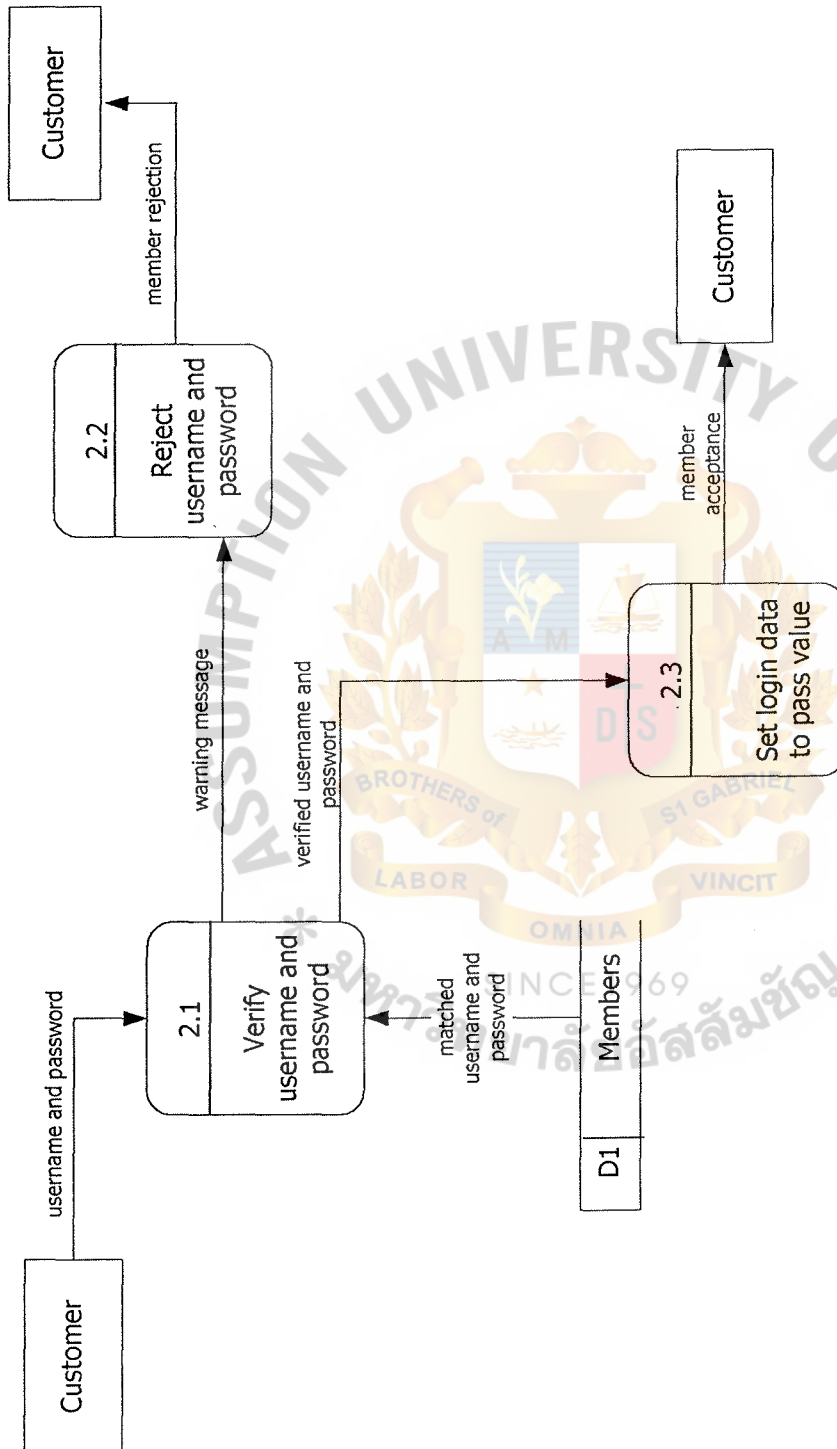Figure B.3. Data Flow Diagram Level 0: Process Customer System.

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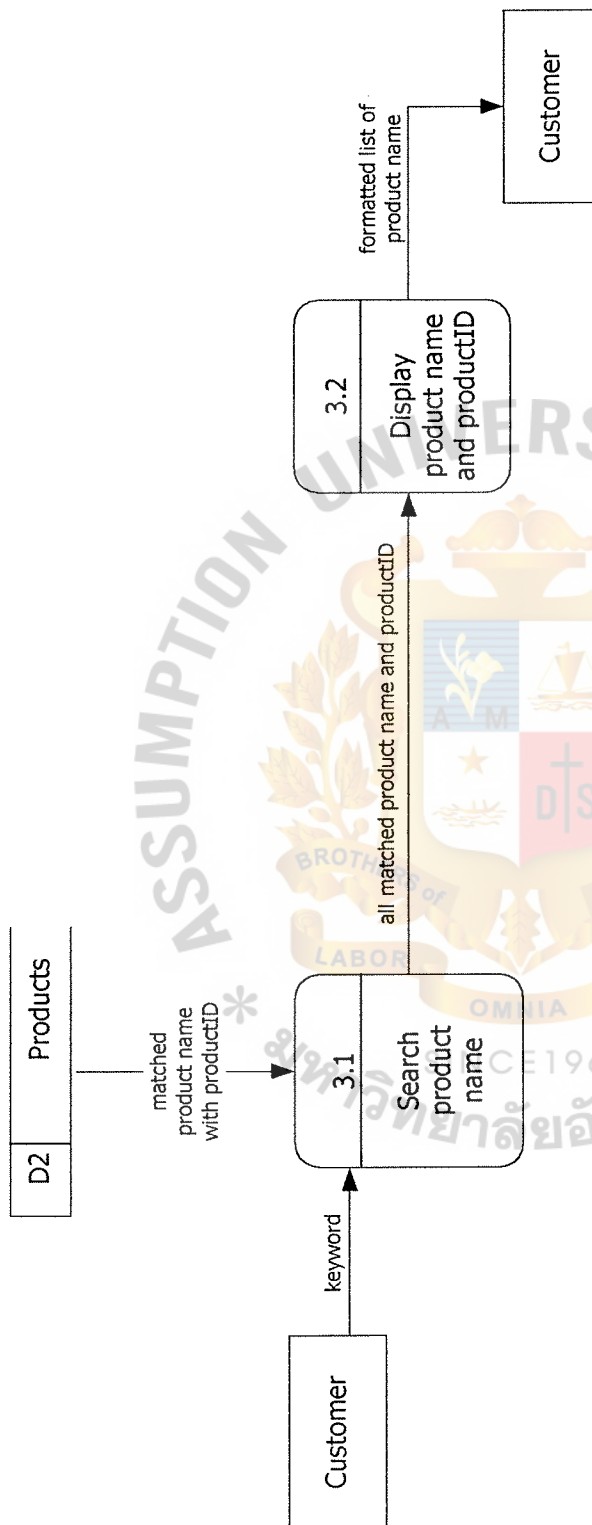Figure B.4.   Data Flow Diagram Level 1 (Process 2): Process Customer Login.

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Figure B.5. Data Flow Diagram Level 1 (Process 3): Process Searching Product.
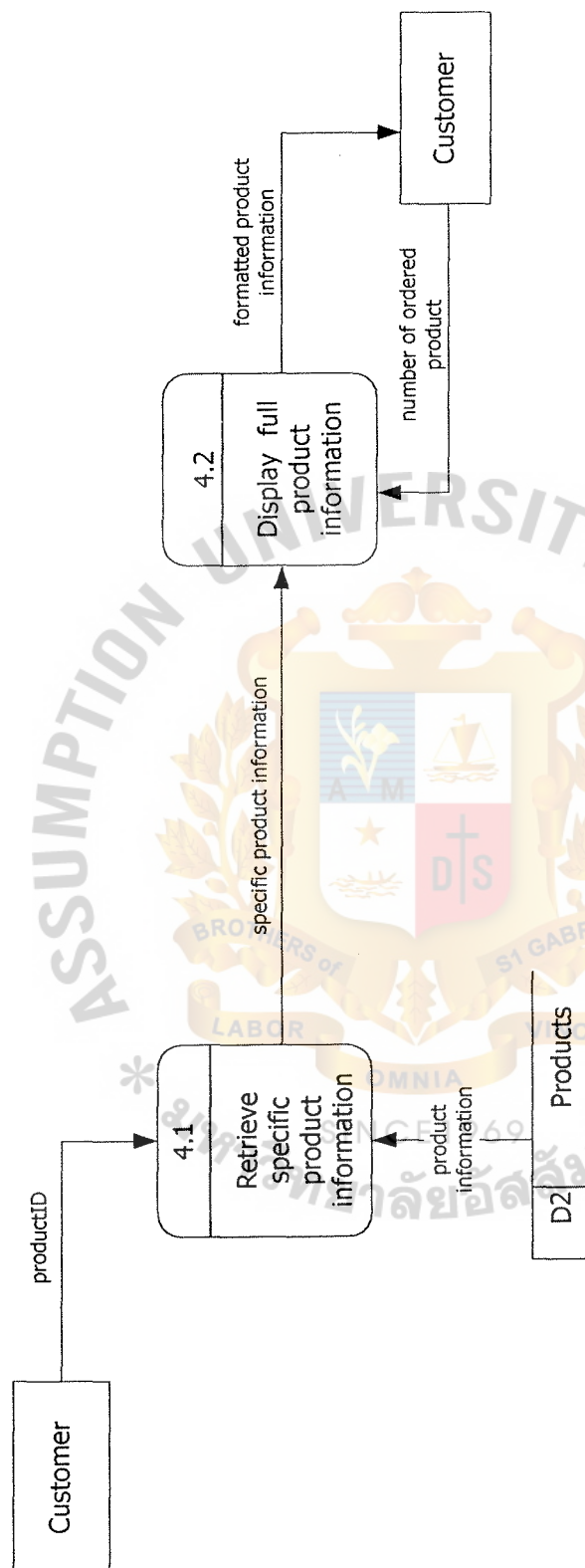
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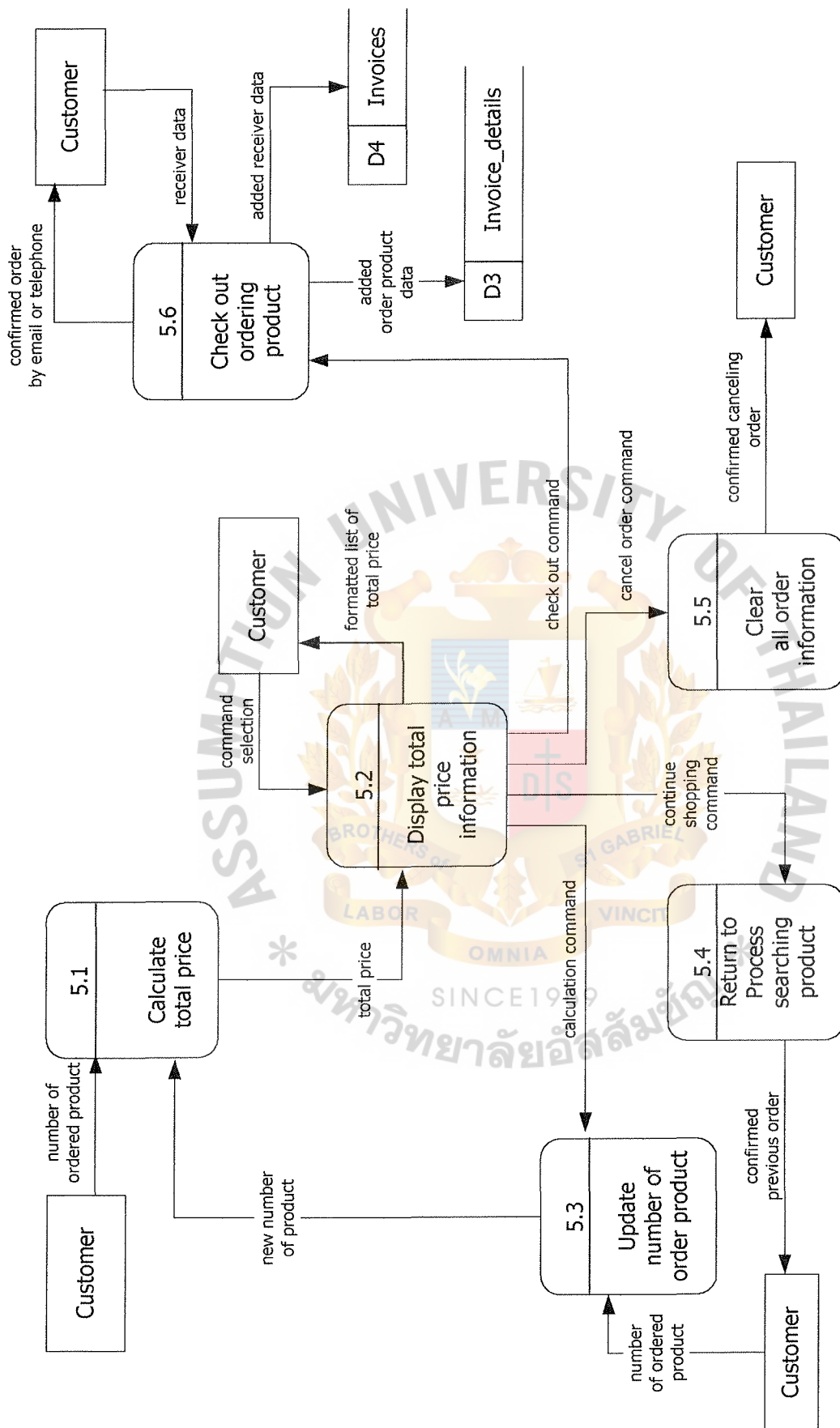Figure B.6.   Data Flow Diagram Level 1 (Process 4):   Process Retrieving Information.

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Figure B.7.   Data Flow Diagram Level 1 (Process 5): Process Customer Order.
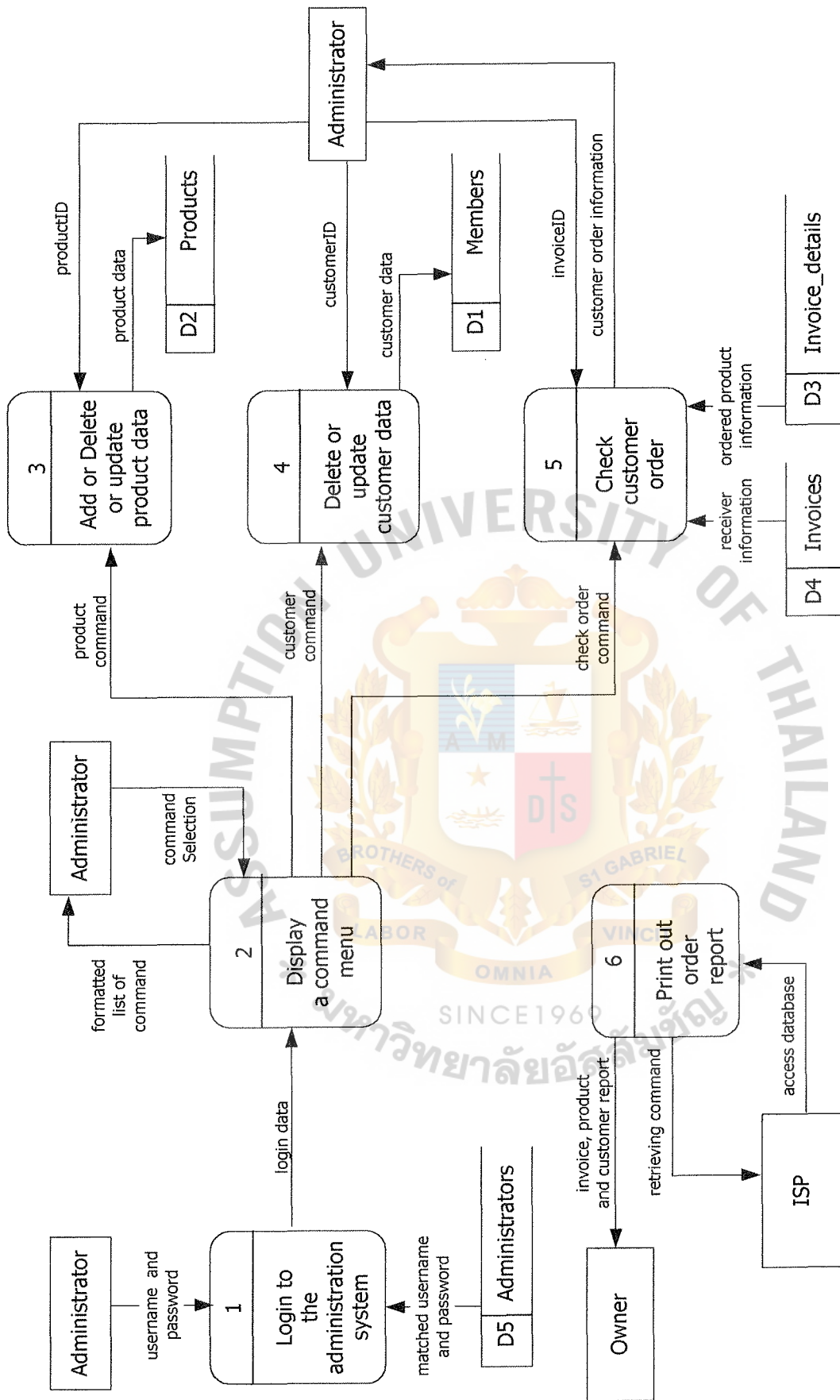
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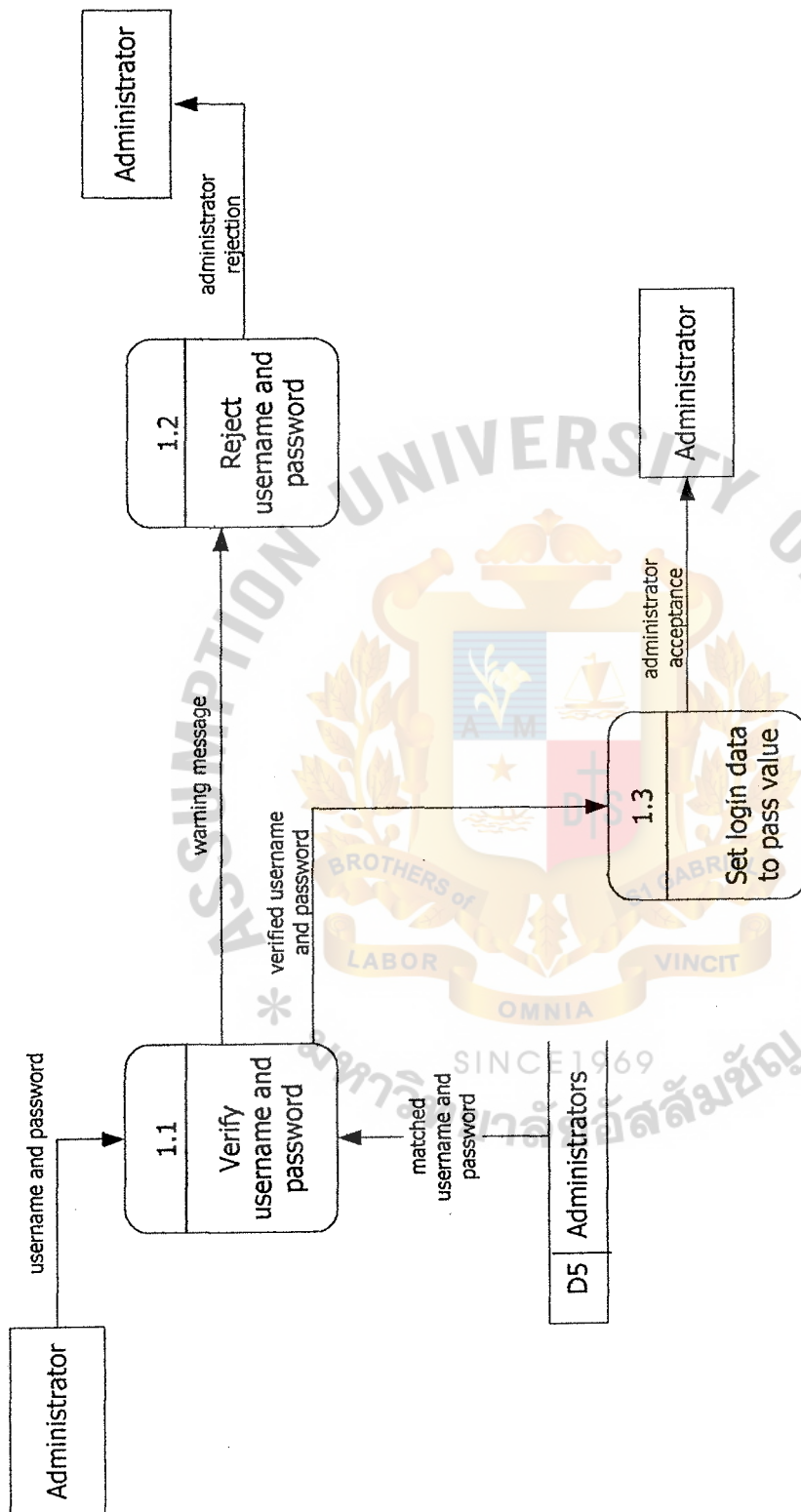Figure B.8. Data Flow Diagram Level 0: Process Administration System.

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Figure B.9. Data Flow Diagram Level 1 (Process 1): Process Administrator Login.
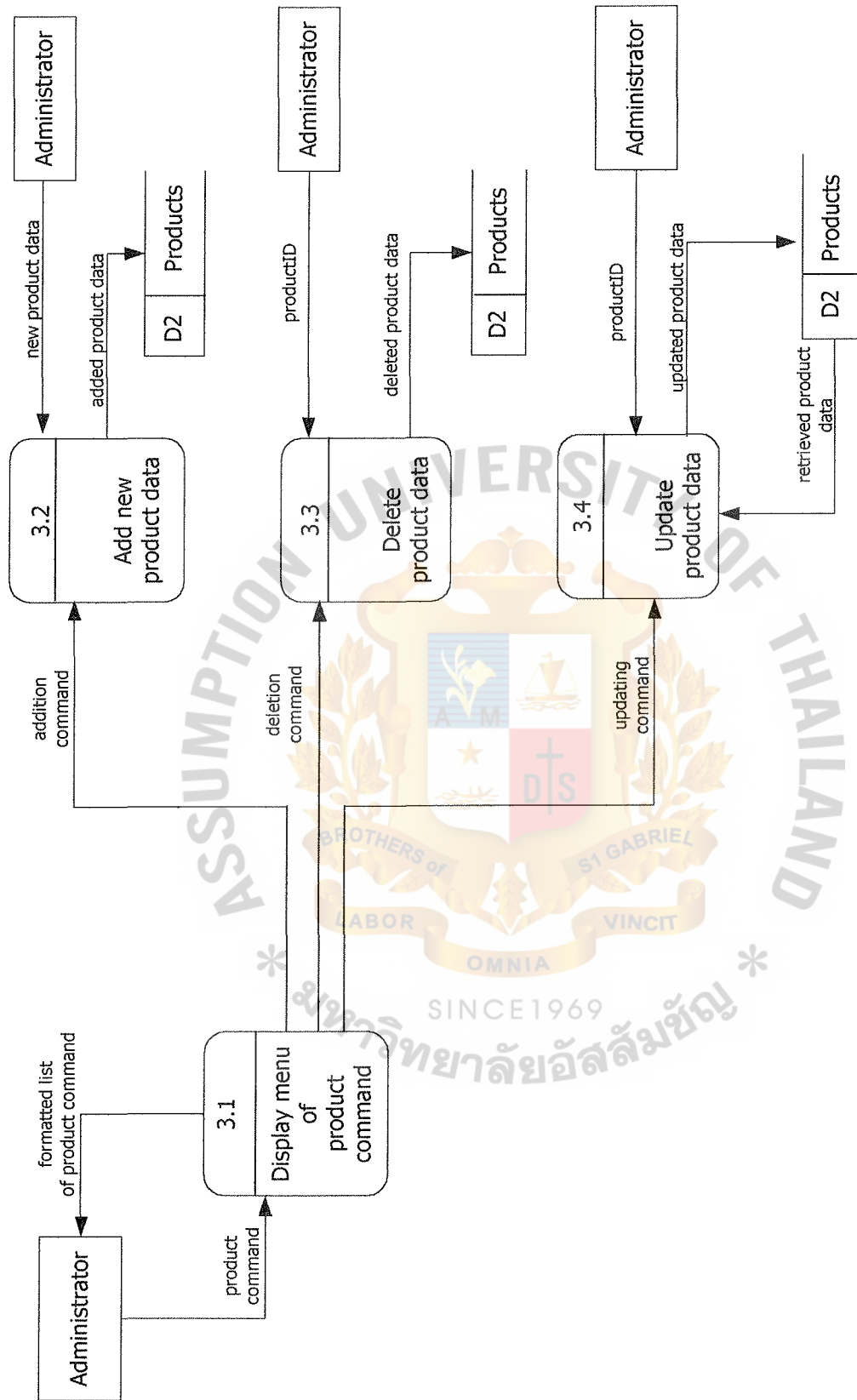
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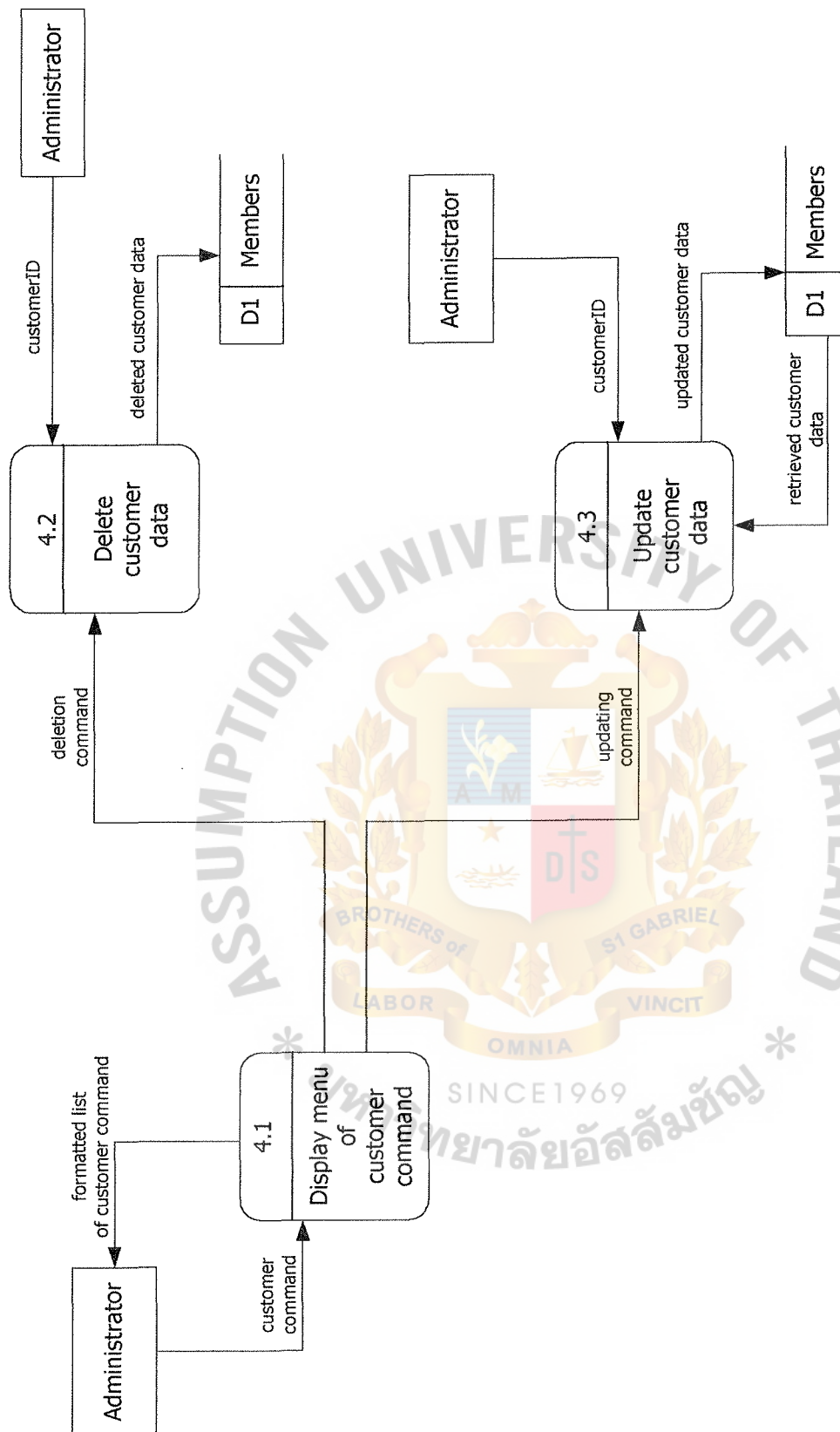Figure B.10.   Data Flow Diagram Level 1 (Process 3): Process Product Information.

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Figure B.11. Data Flow Diagram Level 1 (Process 4): Process Customer Information.
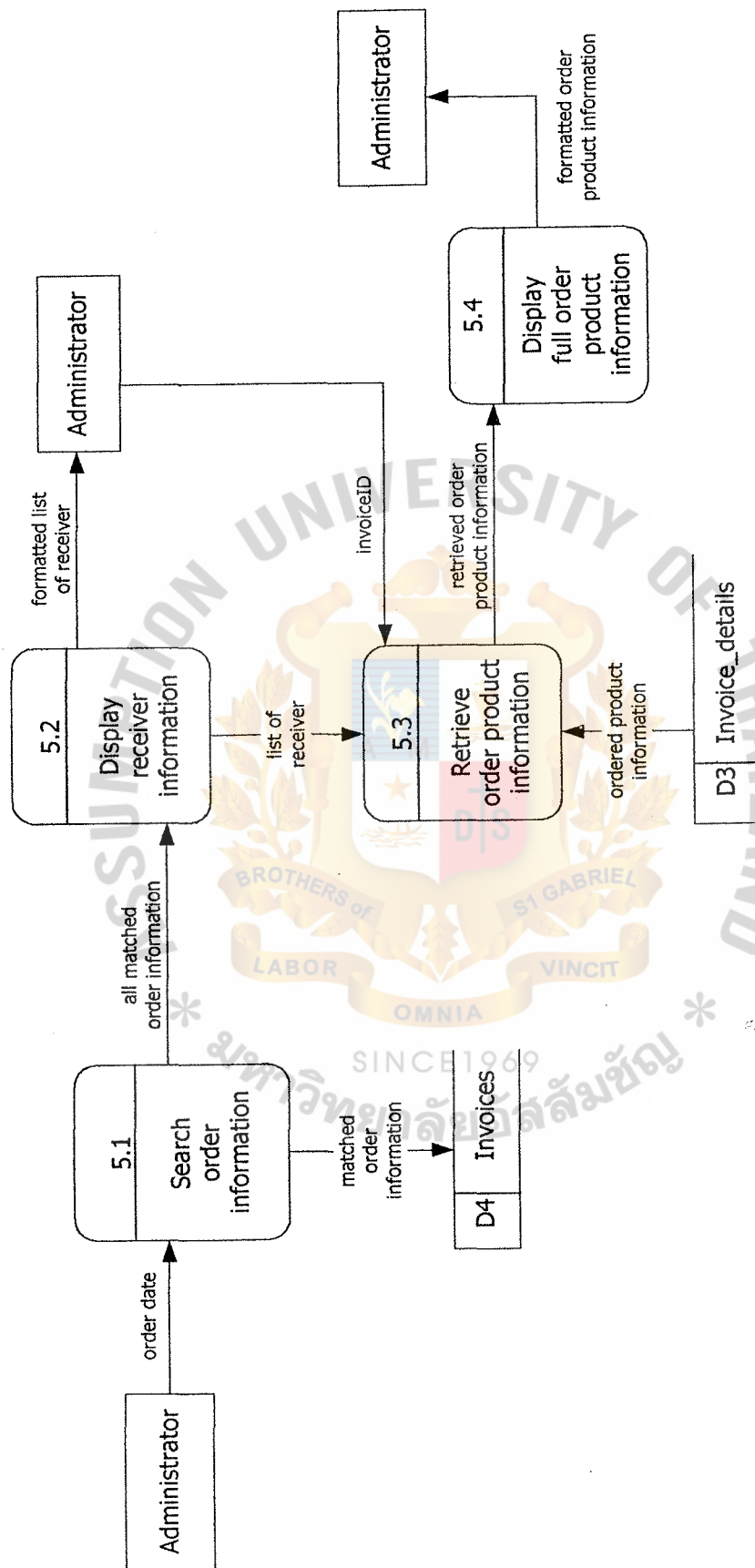
Figure B.12. Data Flow Diagram Level 1 (Process 5): Process Checking Order.

APPENDIX   C

PROCESS SPECIFICATION

PROCESS SPECIFICATION

Process Customer System

Table C.1.   Process Specification of Process 1.

Items	Description
Process Name:	Register customer data
Data In:	New customer data
Data Out:	Added customer data
Process:	(1) Get necessary customer data from the customer including username and password (2) Search username from Member table which is repeated (3) If username is repeated with existing username in the database, warning message will be Displayed to the customer (4) If required customer data are not fulfilled, warning message will be displayed to the customer (5) Verified customer data will be added
Attachment:	Customer Member Table

Table C.2.   Process Specification of Process 2.1.

Items	Description
Process Name:	Verify username and password
Data In:	Username and password Matched username and password
Data Out:	Verified username and password Warning message
Process:	(1) Get username and password from the customer (2) Search matched username and password on Member table (3) Send warning message to the customer if matched username and password are not found (4) Login variable will be set to pass value
Attachment:	Customer Member Table

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Table C.3. Process Specification of Process 2.2.

Items	Description
Process Name:	Reject username and password
Data In:	Warning message
Data Out:	Member rejection
Process:	(1) Member rejection (2) Return to Process 2.1 (Process customer login) to request new username and password from the customer
Attachment:	Customer

Table C.4. Process Specification of Process 2.3.

Items	Description
Process Name:	Set login data to pass value
Data In:	Verified username and password
Data Out:	Member acceptance
Process:	(1) Member acceptance (2) Set login variable to pass value (3) Go to Process 3.1 (Process searching product)
Attachment:	Customer

Table C.5. Process Specification of Process 3.1.

Items	Description
Process Name:	Search product data
Data In:	Keyword Matching product name with productID
Data Out:	All matched product name and productID
Process:	(1) Check login variable must be pass value (2) Return to Process 2.1 (Process customer login) if login variable is not pass value (3) Get keyword from the customer (4) Search matching product name and productID from Product table (5) All matching product detail will be displayed to the customer
Attachment:	Customer

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Table C.6.   Process Specification of Process 3.2.

Items	Description
Process Name:	Display product name and productID
Data In:	All matching product name and productID
Data Out:	Formatted list of product name
Process:	(1) Display a list of product name and productID to the customer
Attachment:	Customer

Table C.7.   Process Specification of Process 4.1.

Items	Description
Process Name:	Retrieve specific product information
Data In:	ProductID Product information
Data Out:	Specific product information
Process:	(1) Check login variable must be pass value (2) Return to Process 2.1 (Process customer login) if login variable is not pass value (3) Get productID from the customer (4) Search a specific product information from Product table (5) Product information will be displayed to the customer
Attachment:	Customer Product Table

Table C.8.   Process Specification of Process 4.2.

Items	Description
Process Name:	Display full product information
Data In:	Specific product information Number of ordered product
Data Out:	Formatted product information
Process:	(1) Display full product information (2) Get number of ordered product from the customer
Attachment:	Customer

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Table C.9.   Process Specification of Process 5.1.

Items	Description
Process Name:	Calculate total price
Data In:	Number of order product
Data Out:	Total price
Process:	(1) Check login variable must be pass value (2) Return to Process 2.1 (Process customer login) if login variable is not pass value. (3) Check number of ordered product (4) Calculate the total price of ordered product from a customer by multiply number of product with price/item
Attachment:	-

Table C.10.   Process Specification of Process 5.2.

Items	Description
Process Name:	Display total price information
Data In:	Total price Command selection
Data Out:	Formatted list of total price Type of command
Process:	(1) Display total price information to the customer (2) Get command selection from the customer (3) Classify type of command from the customer (4) Execute Calculation command or Continue Shopping command or Cancel order command or Check out command
Attachment:	Customer

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Table C.11. Process Specification of Process 5.3.

Items	Description
Process Name:	Update number of order product
Data In:	Calculation command Number of order product
Data Out:	New number of order product
Process:	(1) Get new number of order product from the customer (2) Return to Process 5.1 (Process customer order) to check number of order product
Attachment:	Customer

Table C.12. Process Specification of Process 5.4.

Items	Description
Process Name:	Return to Process Searching Product
Data In:	Continue shopping command
Data Out:	Confirmed previous order
Process:	(1) Return to Process 3 (Process searching product) to search new order product (2) Repeat the same process from Process 3 until all required products are ordered by the customer
Attachment:	–

Table C.13. Process Specification of Process 5.5.

Items	Description
Process Name:	Clear order information
Data In:	Cancel order command
Data Out:	Confirmed canceling order
Process:	(1) Clear all order variables in the program (2) Send confirmed message for canceling all order to the customer (3) Return to Process 3 (Process searching product)
Attachment:	Customer

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Table C.14. Process Specification of Process 5.6.

Items	Description
Process Name:	Check out ordering product
Data In:	Check out command Receiver data
Data Out:	Confirmed order by email or telephone Added receiver data Added ordered product data

Process:	(1) Get receiver data from the customer
	(2) Check the required receiver data
	(3) If required data is completely verified,
	    all order data will be added on the database
	(4) Send confirmed order message to the customer
	    by email or telephone

Attachment:	Customer

Process Administration System

Table C.15. Process Specification of Process 1.1.

Items	Description
Process Name:	Verify username and password
Data In:	Username and password Matched username and password
Data Out:	Verified username and password Warning message
Process:	(1) Get username and password from the administrator (2) Check username and password for null value (3) Search matched username and password on Administrator table (4) Send warning message to the administrator if matching username and password are not found (5) Login variable will be set to pass value
Attachment:	Administrator Administrator Table

Table C.16.   Process Specification of Process 1.2.

Items	Description
Process Name:	Reject username and password
Data In:	Warning message
Data Out:	Administrator rejection
Process:	(1) Administrator rejection (2) Return to Process 1.1 (Process administrator login) to request new username and password from the administrator
Attachment:	Administrator

Table C.17.   Process Specification of Process 1.3.

Items	Description
Process Name:	Set login data to pass value
Data In:	Verified username and password
Data Out:	Administrator acceptance
Process:	(1) Administrator acceptance (2) Set login variable to pass value (3) Go to Process 2 (Process command selection)
Attachment:	Administrator

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Table C.18.   Process Specification of Process 2.

Items	Description
Process Name:	Display command menu
Data In:	Login data Command Selection
Data Out:	Formatted list of command Product command Customer command Check order command
Process:	(1) Check login variable must be pass value (2) Return to Process 1.1 (Process administrator login) if login variable is not pass value (3) Get command selection from the administrator (4) Classify type of command from the Administrator (5) Execute Product or Customer information command or Check order command
Attachment:	Administrator

Table C.19.   Process Specification of Process 3.1.

Items	Description
Process Name:	Display a product command
Data In:	Product command
Data Out:	Formatted list of product command Addition command Deletion command Updating command
Process:	(1) Check login variable must be pass value (2) Return to Process 1.1 (Process Administrator login) if login variable is not pass value (3) Display a menu of product command (4) Get a product command from the administrator (5) Classify type of product command (6) Execute add or delete or update product Information
Attachment:	Administrator

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Table C.20.   Process Specification of Process 3.2.

Items	Description
Process Name:	Add new product data
Data In:	New product data Addition command
Data Out:	Added product data
Process:	(1) Get necessary product data from the Administrator including productID (2) Search productID from Product Table which ProductID is repeated (3) If productID is repeated with existing productID on Product table warning message will be displayed to the administrator (4) Verified product data will be added
Attachment:	Administrator Product Table

Table C.21.   Process Specification of Process 3.3.

Items	Description
Process Name:	Delete product data
Data In:	ProductID Deletion command
Data Out:	Deleted product data
Process:	(1) Get keyword from the administrator (2) Search matched product name and productID from Product table (3) All matching product name will be displayed to the administrator (4) Warning message will be sent to the administrator if product name is not found (5) Get productID of product data to be deleted from the administrator (6) Delete matched product data on Product Table
Attachment:	Administrator Product Table

Table C.22.   Process Specification of Process 3.4.

Items	Description
Process Name:	Update product data
Data In:	ProductID Updating command Retrieved product data
Data Out:	Updated product data
Process:	(1) Get keyword from the administrator (2) Search matching product name and productID from Product table (3) All matching product name will be displayed to the administrator (4) Warning message will be sent to the administrator if product name is not found (5) Get productID from the administrator (6) Retrieve full product data from Product table (7) Get updated product data from the Administrator (8) Replace existed product data with the updated product data on Product table
Attachment:	Administrator Product Table

Table C.23.   Process Specification of Process 4.1.

Items	Description
Process Name:	Display menu of customer command
Data In:	Customer command
Data Out:	Formatted list of customer command Deletion command Updating command
Process:	(1) Check login variable must be pass value (2) Return to Process 1.1 (Process Administrator Login) if login variable is not pass value (3) Display a menu of customer command (4) Get a customer command from the Administrator (5) Classify type of customer command (6) Execute delete or update customer data
Attachment:	Administrator

Table C.24.　Process Specification of Process 4.2

Items	Description
Process Name:	Delete customer data
Data In:	CustomerID Deletion command
Data Out:	Deleted customer data
Process:	(1) Get keyword from the administrator (2) Search matched customer name from Customer table (3) All matching customer name will be displayed to the administrator (4) Warning message will be sent to the administrator if customer name is not found (5) Get customerID to be deleted from the administrator (6) Delete matched customer data on Customer table
Attachment:	Administrator Customer Table

Table C.25.　Process Specification of Process 4.3.

Items	Description
Process Name:	Update customer data
Data In:	CustomerID Updating command Retrieved customer data
Data Out:	Updated customer data
Process:	(1) Get keyword from the administrator (2) Search matching customer name from Customer table (3) All matching customer name will be displayed to the administrator (4) Warning message will be sent to the administrator if customer name is not found (5) Get customerID from the administrator (6) Retrieve full customer data from Customer table (7) Get updated customer data from the Administrator (8) Replace existed customer data with the updated customer data on Customer table
Attachment:	Administrator Product Table

Table C.26. Process Specification of Process 5.1.

Items	Description
Process Name:	Search order information
Data In:	Ordered date Matched order information
Data Out:	All matching order information
Process:	(1) Check login variable must be pass value (2) Return to Process 1.1 (Process administrator login) if login variable is not pass value (3) Get date from the administrator (4) Search matching order information from Invoice table (5) All matching order information will be displayed to the administrator (6) Warning message will be sent to the administrator if date is not found
Attachment:	Administrator Invoice Table

Table C.27. Process Specification of Process 5.2.

Items	Description
Process Name:	Display receiver information
Data In:	All matched order information
Data Out:	Formatted list of receiver List of receiver
Process:	(1) Display a list of receiver information to the administrator
Attachment:	Administrator

Table C.28. Process Specification of Process 5.3.

Items	Description
Process Name:	Retrieve order product information
Data In:	List of receiver InvoiceID Ordered product information
Data Out:	Retrieved order product information
Process:	(1) Get InvoiceID from the administrator (2) Retrieve order product data from Invoice_detail Table (3) Order information will be displayed to the Administrator
Attachment:	Administrator Invoice_detail table

Table C.29. Process Specification of Process 5.4.

Items	Description
Process Name:	Display order product information
Data In:	Order product information
Data Out:	Formatted order information
Process:	(1) Get receiver information and order product Information from Invoice and Invoice_detail Table (2) Display formatted order information to the administrator
Attachment:	Administrator

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APPENDIX   D

DATA DICTIONARY

DATA DICTIONARY

Added customer data = *Customer data to be added on database*
Customer + Address number + Street + District
+ City + Postal + Telephone + (Email)
+ (Occupation) + (Company) + (Purpose)
+ Username + Password + Repassword

Added ordered product data = *Order product data to be added on database*
InvoiceID + ProductID + Product Name
+ Price + Item

Added product data = *Product data to be added on database*
ProductID + Product name + Size + Color
+ Price + Stock + Information + Image

Added receiver data = *Receiver data to be added on database*
Receiver + Rstreet + Raddress + Rdistrict
+ Rcity + Rpostal + Rtelephone + Remail

Addition command = *Administrator 's command for adding new
product data*

Administrator acceptance = *Administrator is allowed to login to the
system*

Administrator rejection = *Administrator is not allowed to login to the
system*

Calculation command = *Member's command to calculate total price
of order product*

Cancel order command = *Member's command to cancel all previous
order product*
InoiveID + ProductID + Price + Item

Check out command = *Member's command to confirm ordering
product*
InvoiceID + ProductID + Product name
+ Price + Item

Command selection = *List of command on screen output for member
or administrator to select*

Confirmed canceling order = *All order variable's value of the program are
cleared and canceling message is shown of
screen output*
InvoiceID + ProductID + Price + Item

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Confirmed order by email or telephone	=	*Sending email or calling to customer to confirm order and preparing to deliver product*
Confirmed previous order	=	*Keep all order variable's value* InvoiceID + ProduceID + Product name + Price + Item
Continue shopping command	=	*Member's command for continue ordering other product*
Customer command	=	*A command to operate customer data on the database*
Customer data	=	Customer + Address number + Street + District + City + Postal + Telephone + (Email) + (Occupation) + (Company) + (Purpose) + Username + Password + Repassword
CustomerID	=	*Select customerID on screen output for retrieving particular customer data from the database*
Deleted customer data	=	*Delete a particular customer data on the database* Customer + Address number + Street + District + City + Postal + Telephone + (Email) + (Occupation) + (Company) + (Purpose) + Username + Password + Repassword
Deleted product data	=	*Delete a particular product data on the database* ProductID + Productname + Size + Color + Price + Stock + Information + Image
Deletion command	=	*Administrator's command for deleting customer or product data on the database*
Formatted list of customer command	=	*List of customer command on screen output*
Formatted list of product command	=	*List of product command on screen output*
Formatted list of product name	=	*List of product name on screen output*
Formatted list of receiver	=	*List of receiver on screen output*

Formatted list of total price	=	*List of total price on screen output*
Formatted ordered product information	=	*Displaying order product information on screen output*
Formatted product Information	=	*Displaying full product information on screen output*
InvoiceID	=	*Select invoiceID on screen output for retrieving particular order product data from the database*
Keyword	=	*Enter keyword for searching product name or customer name*
List of product name	=	*A result of searching a product by keyword* ProductID + Product name
Login data	=	*To set login variable on the web pages to "pass" value*
Matched product name with productID	=	*Retrieving matched product name with productID from the database* ProductID + Product name
Matched order information	=	*Retrieving matched order information from the database* InvoiceID + ProductID + Product name + Price + Item
Matched username and password	=	*To compare username and password from the database and the customer* Username + Password
Member acceptance	=	*Member is allowed to login to the system*
Member rejection	=	*Member is not allowed to login to the system*
Number of ordered product	=	*Enter number of ordered product*
Ordered Date	=	*Enter order data on screen output for retrieving particular order information on the database* Day + Month + Year

Order information	=	*Ordered product information and receiver information from the customer* InvoiceID + ProductID + Product Name + Price + Item +Receiver + Rstreet + Raddress + Rdistrict+ Rcity + Rpostal + Rtelephone + Remail
Ordered product information	=	*Ordered product information of the customer* ProductID + Product Name+ Price + Item
Product command	=	* A command to operate product data on the database*
ProductID	=	*Select productID on screen output for retrieving particular product data from the database*
Product information	=	*Retrieving particular product information from the database* ProductID + Product name + Size + Color + Price + Stock + Information + Image
Receiver data	=	*Retrieving receiver data from the database* Receiver + Rstreet + Raddress + Rdistrict + Rcity + Rpostal + Rtelephone + Remail
Total price	=	*Total price of all order product*
Updating command	=	*Administrator's command for updating product or customer data on the database*
Updated customer data	=	*Update customer data on the database*
Updated product data	=	*Update product data on the database*
Username and Password	=	*To enter username and password from the the customer or the administrator*
Verified username and password	=	*Verified username and password* Username + Password
Warning message	=	*Communication between program and the the database when incorrect data is received*
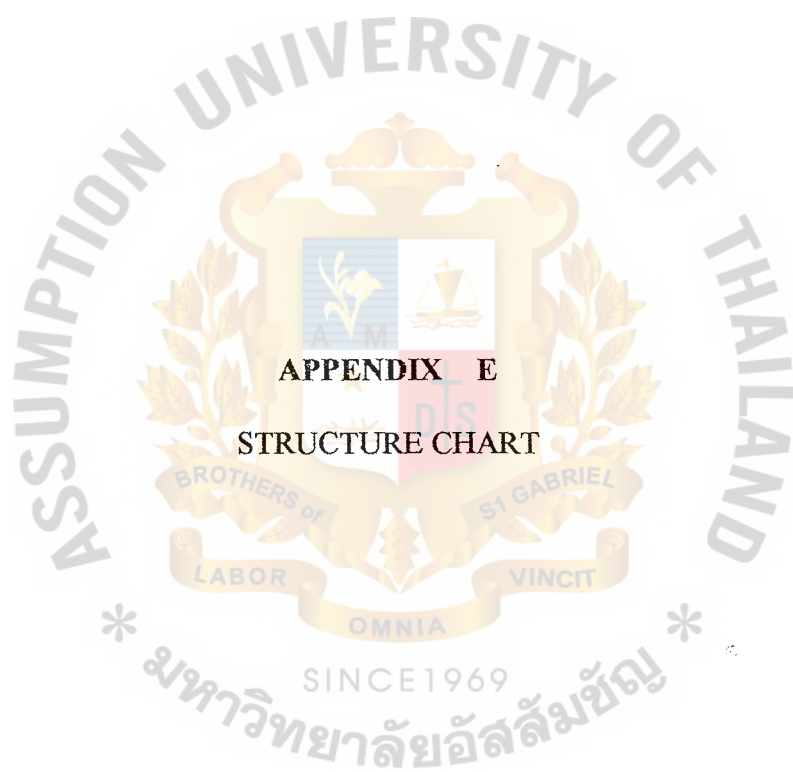
APPENDIX   E

STRUCTURE CHART
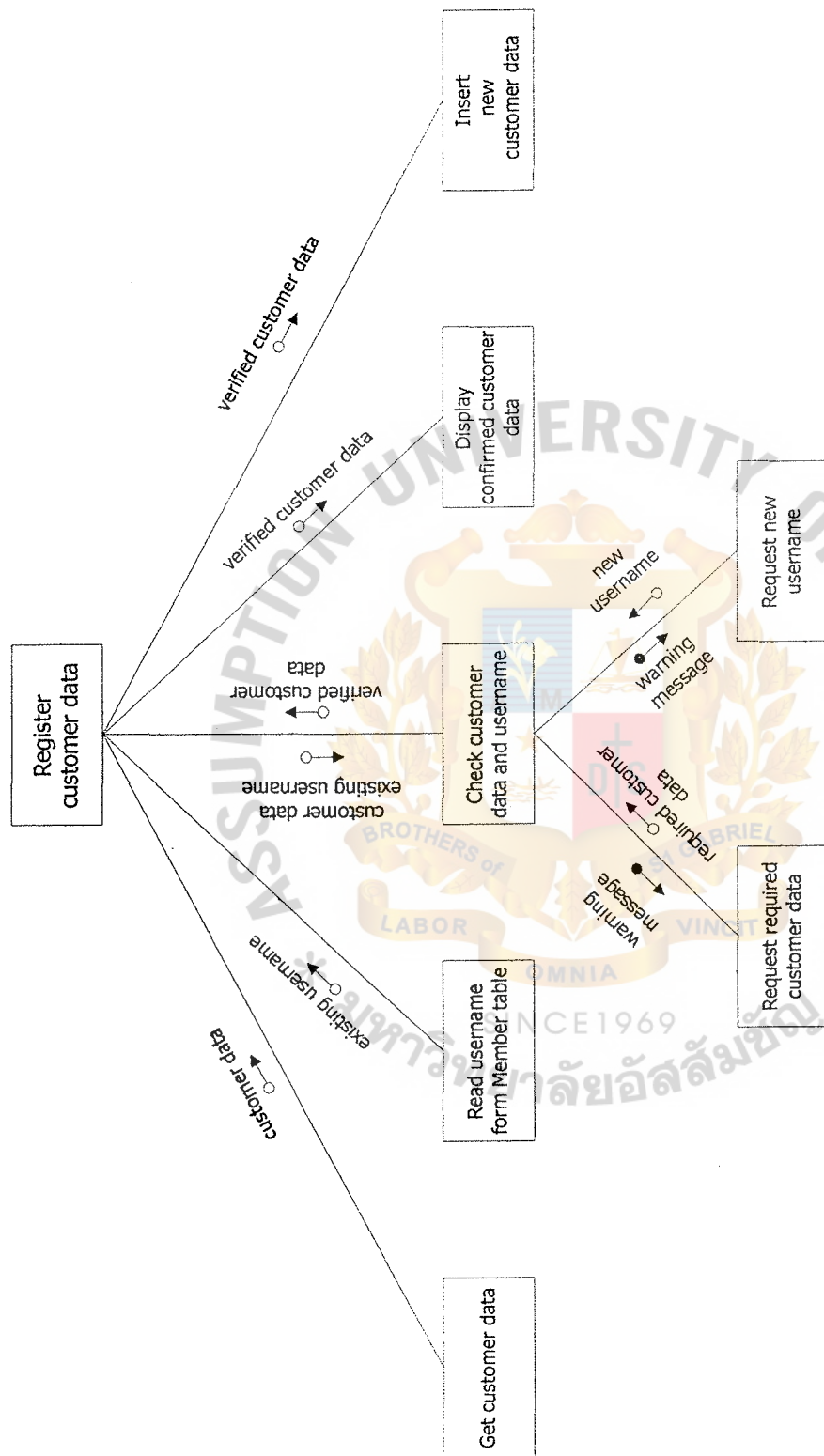
Figure E.1. Structure Chart of Customer System: Process Customer Registration.
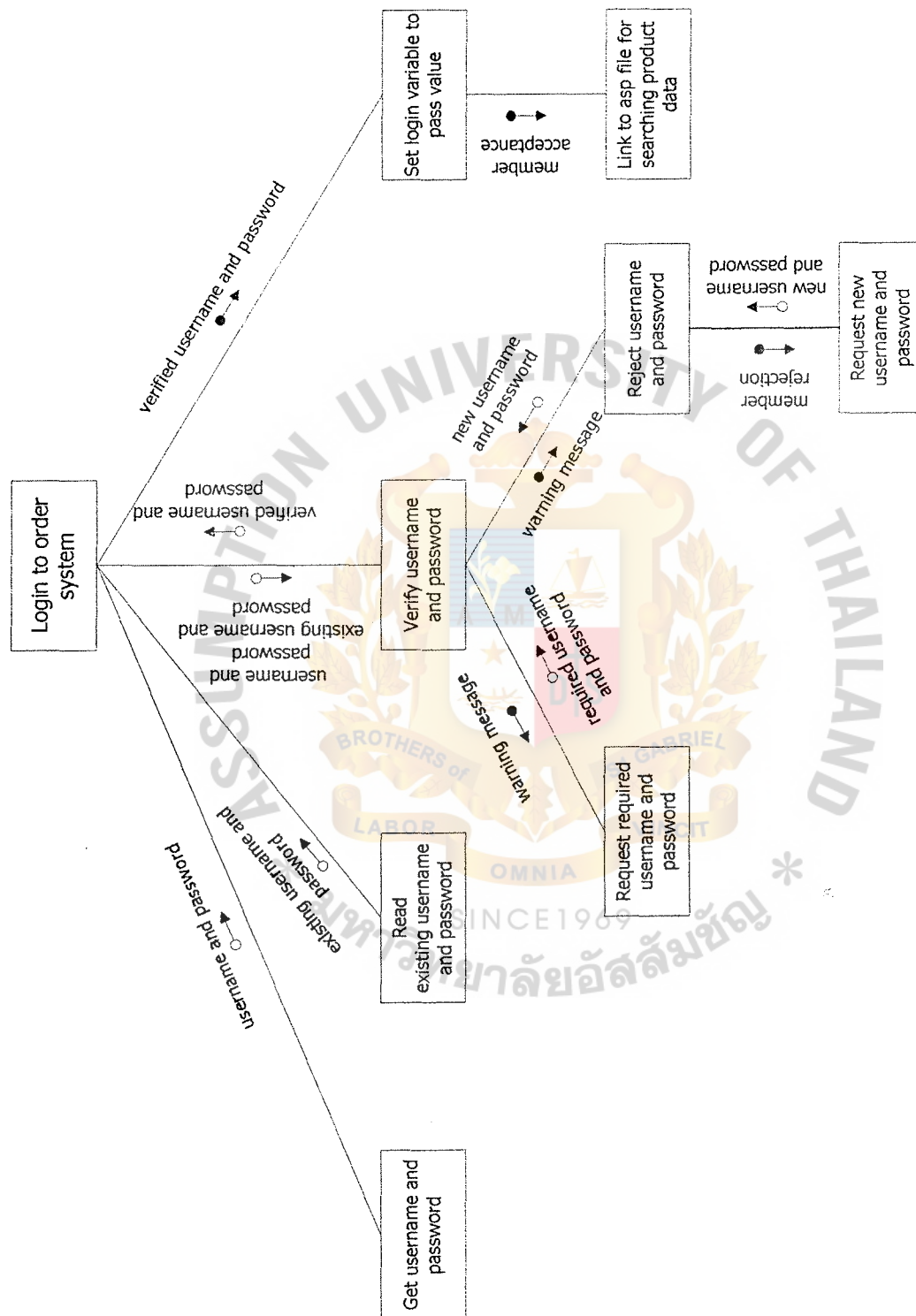
Figure E.2. Structure Chart of Customer System: Process Customer Login.
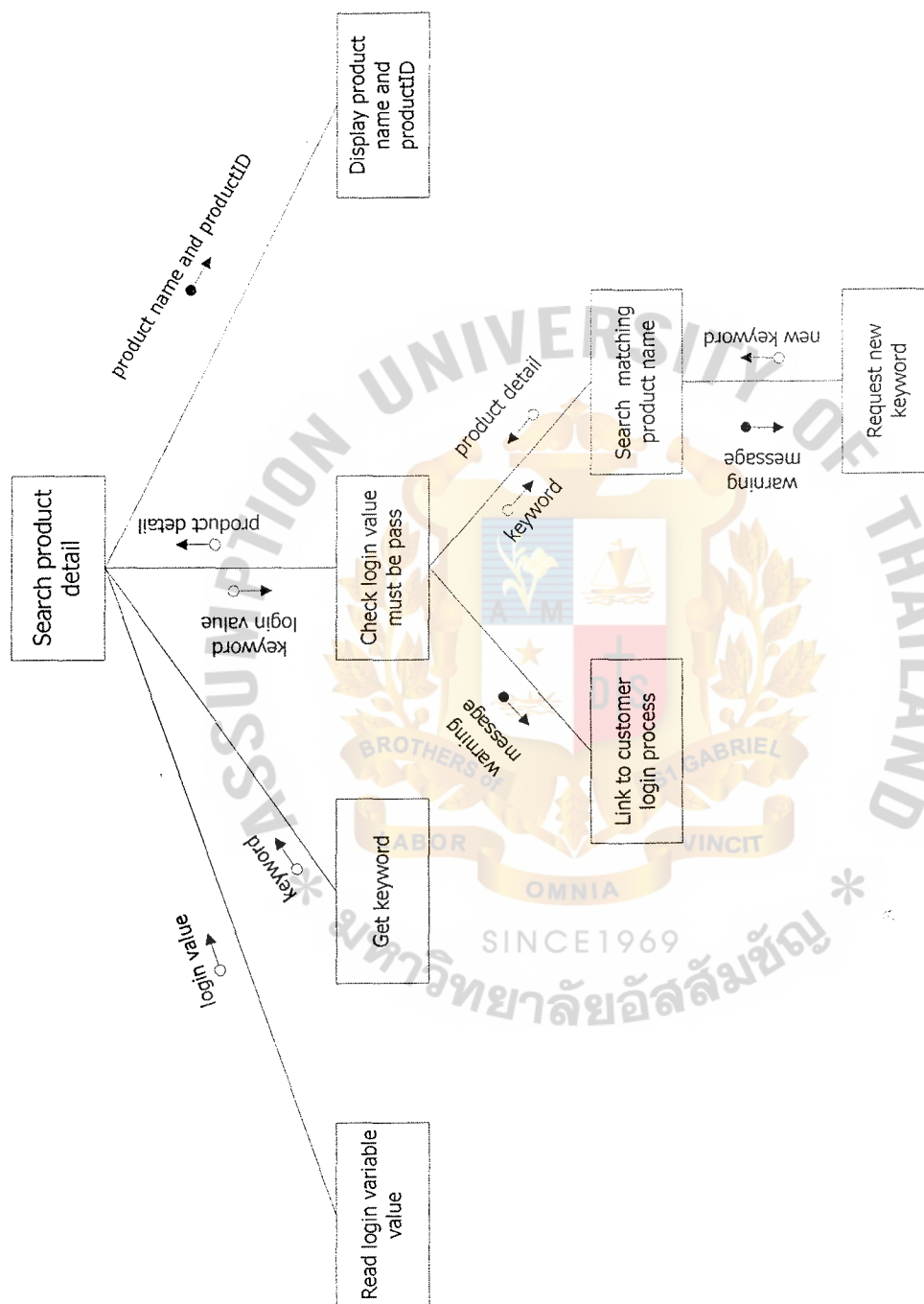
Figure E.3.   Structure Chart of Customer System: Process Searching Product.

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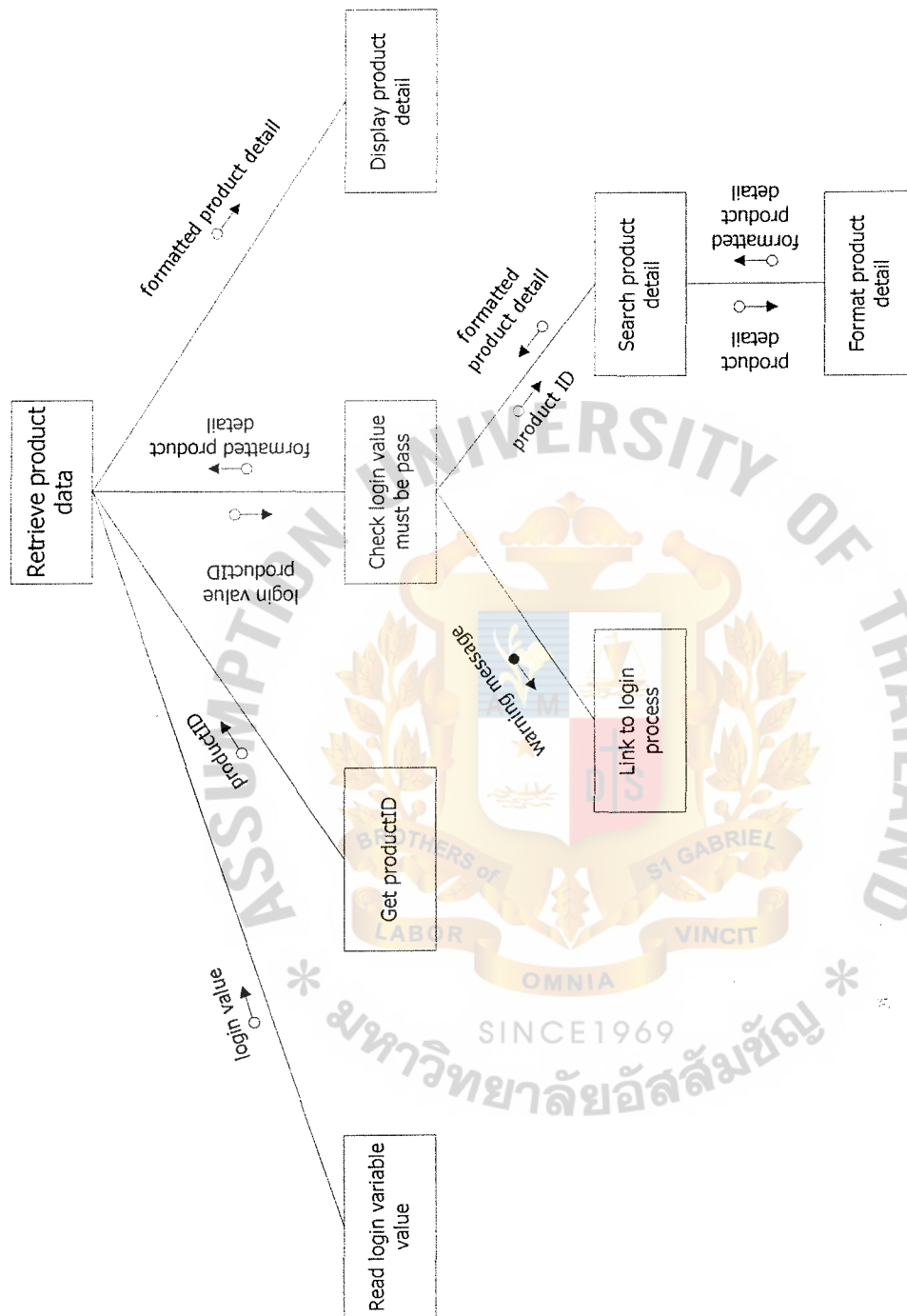
Figure E.4. Structure Chart of Customer System: Process Retrieving Information.
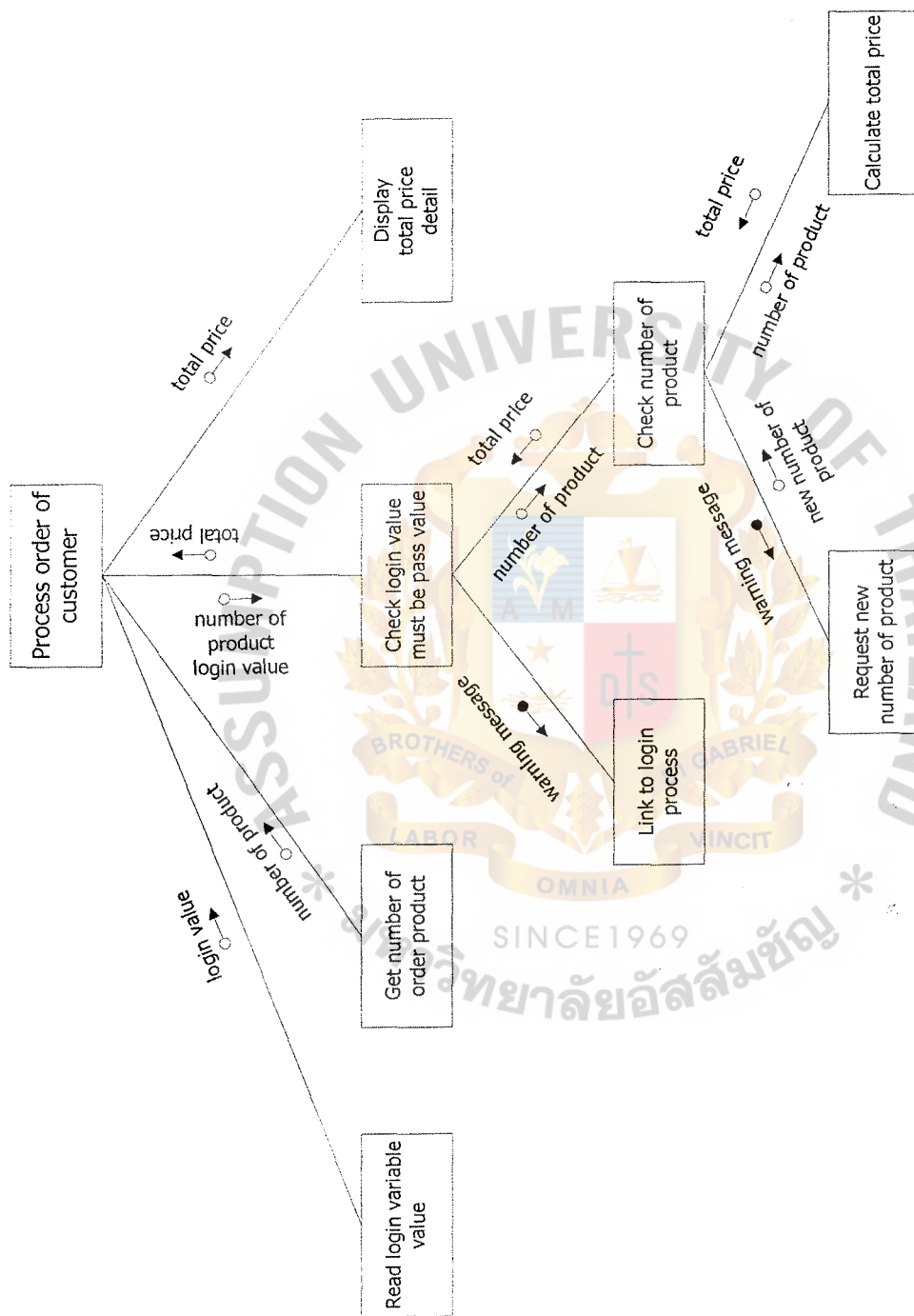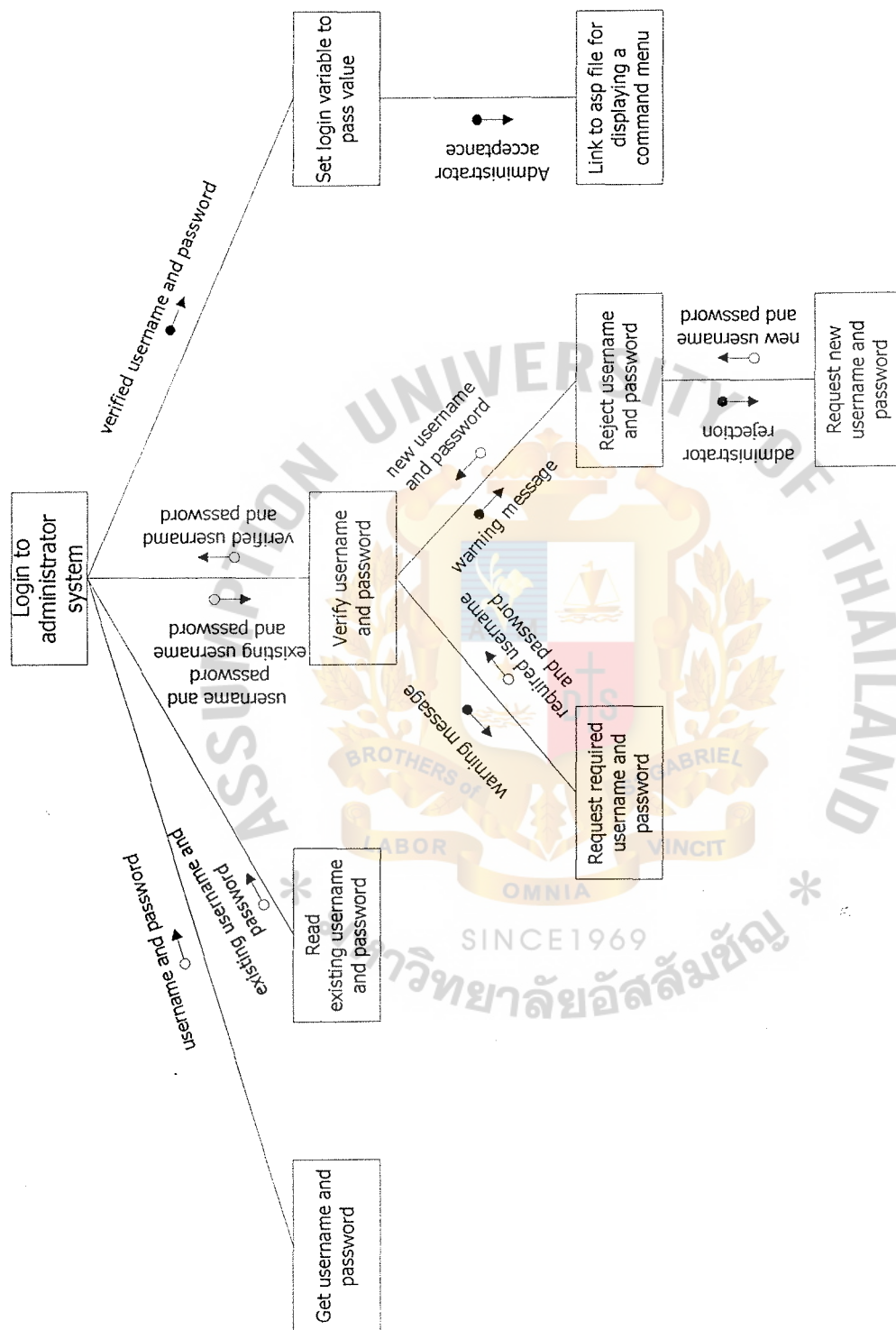
Figure E.5.   Structure Chart of Customer System: Process Ordering Product.
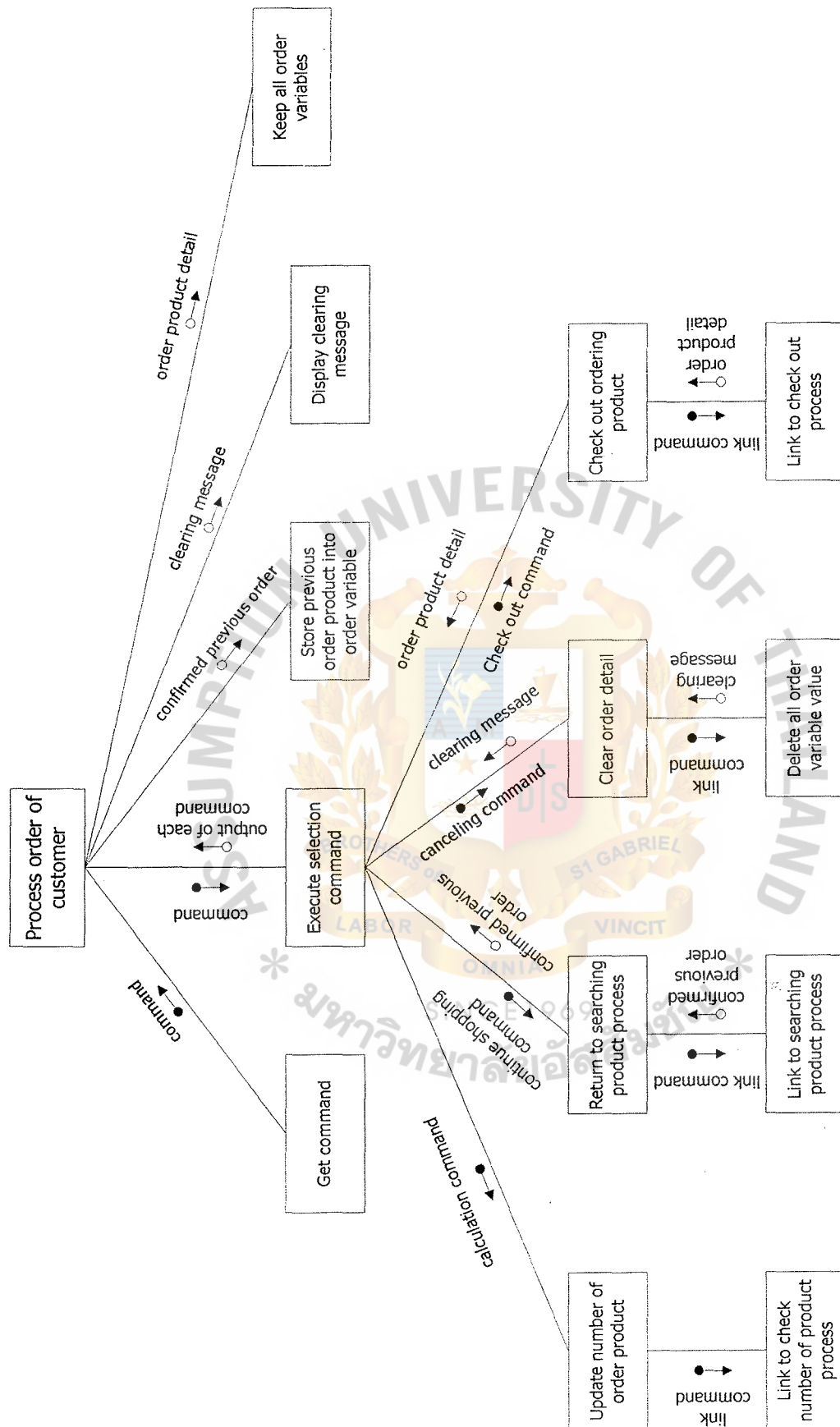
Figure E.6.   Structure Chart of Customer System: Process Ordering Product.

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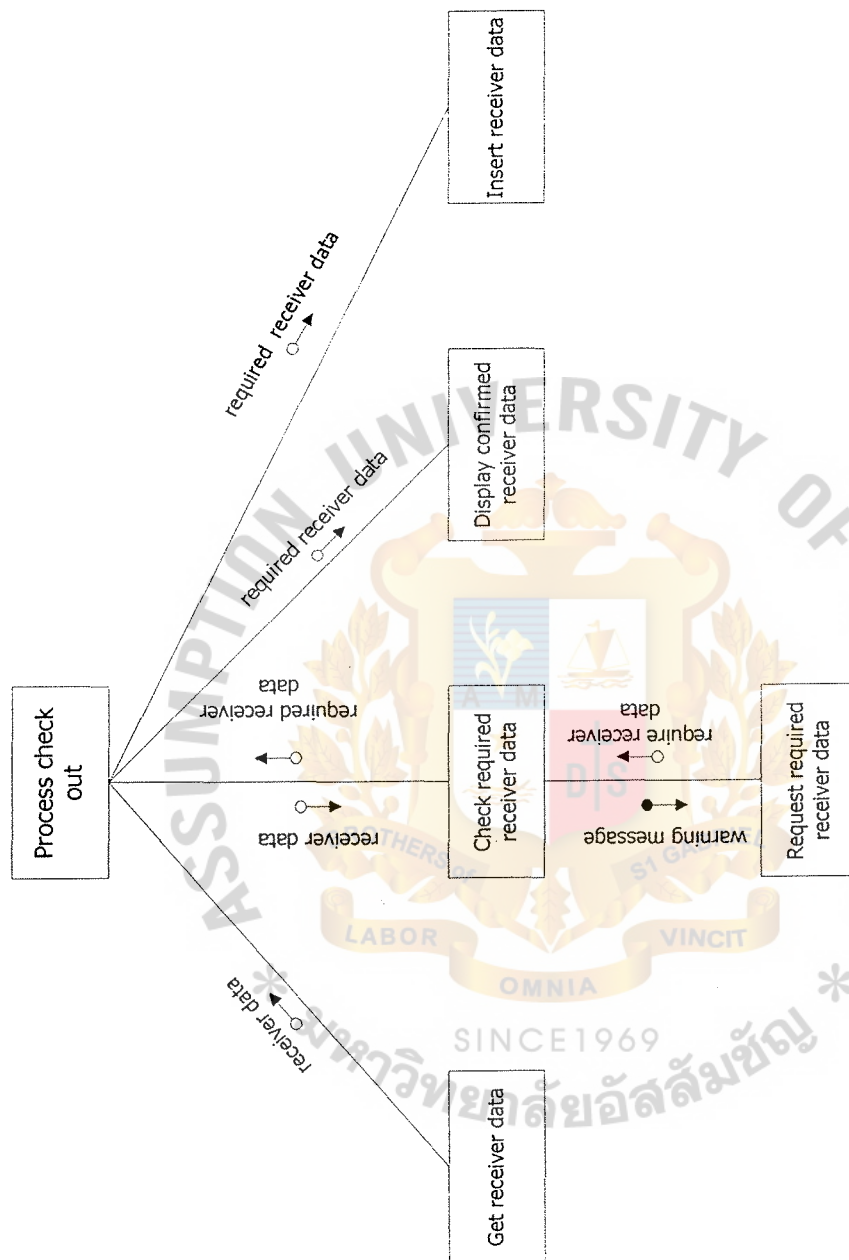
Figure E.7.   Structure Chart of Customer System: Process Customer Check Out.

Figure E.8. Structure Chart of Administrator System: Process Administrator Login.
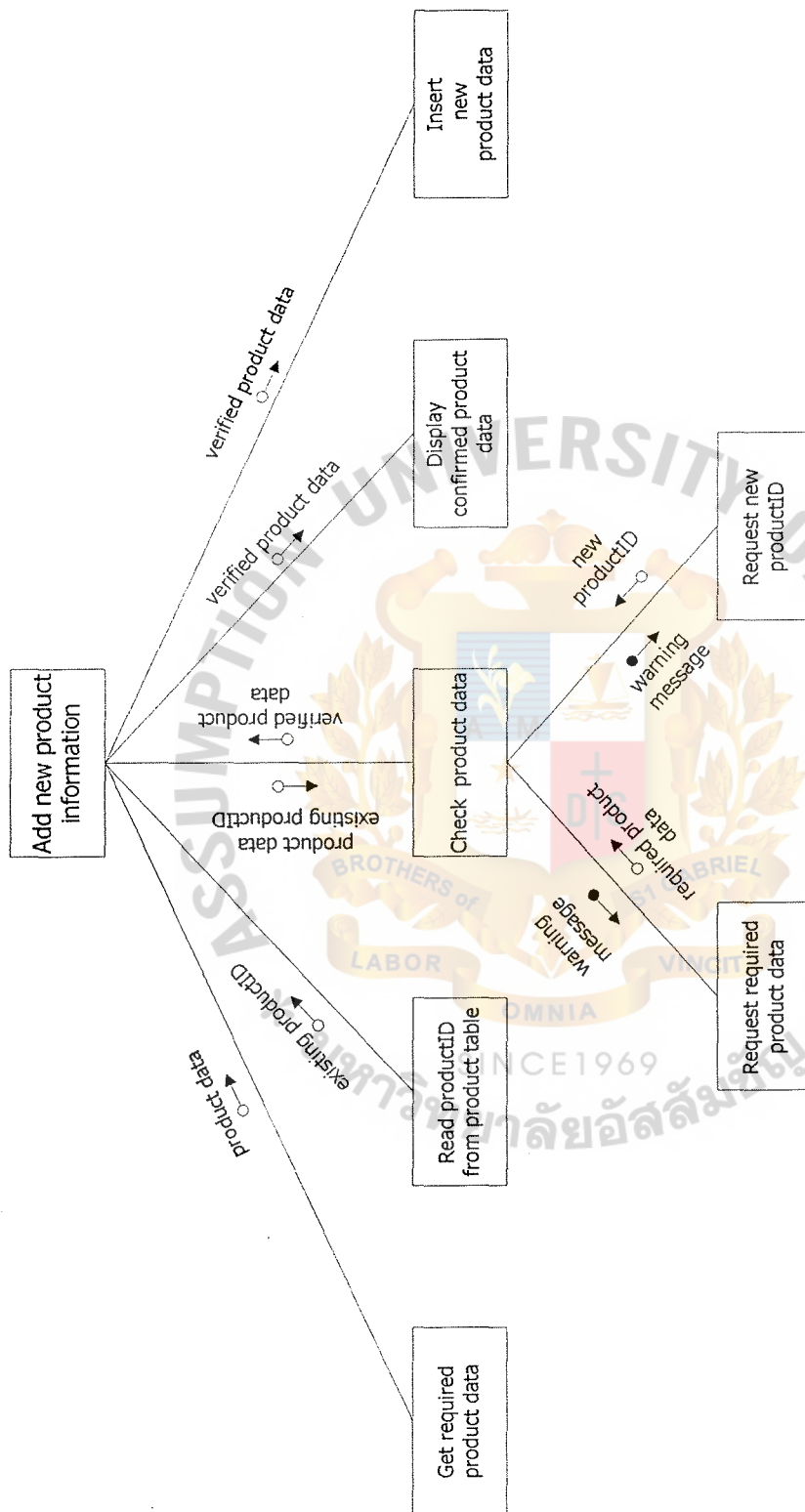
Figure E.9. Structure Chart of Administrator System: Adding Product Data.
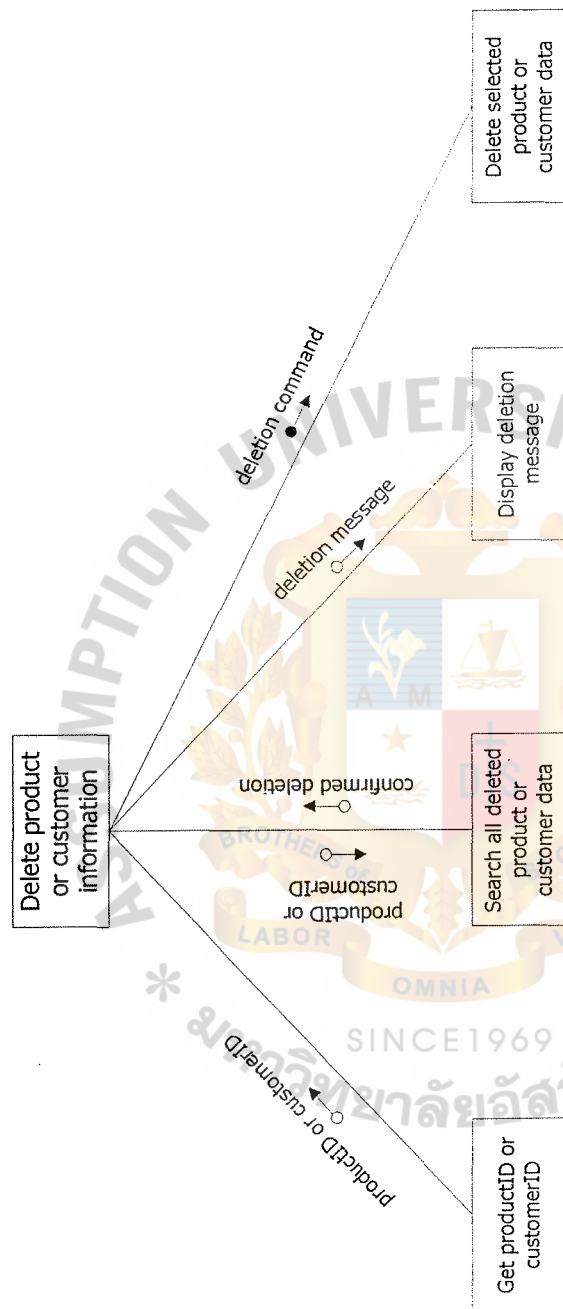
Figure E.10. Structure Chart of Administrator System: Deleting Product or Customer Data.
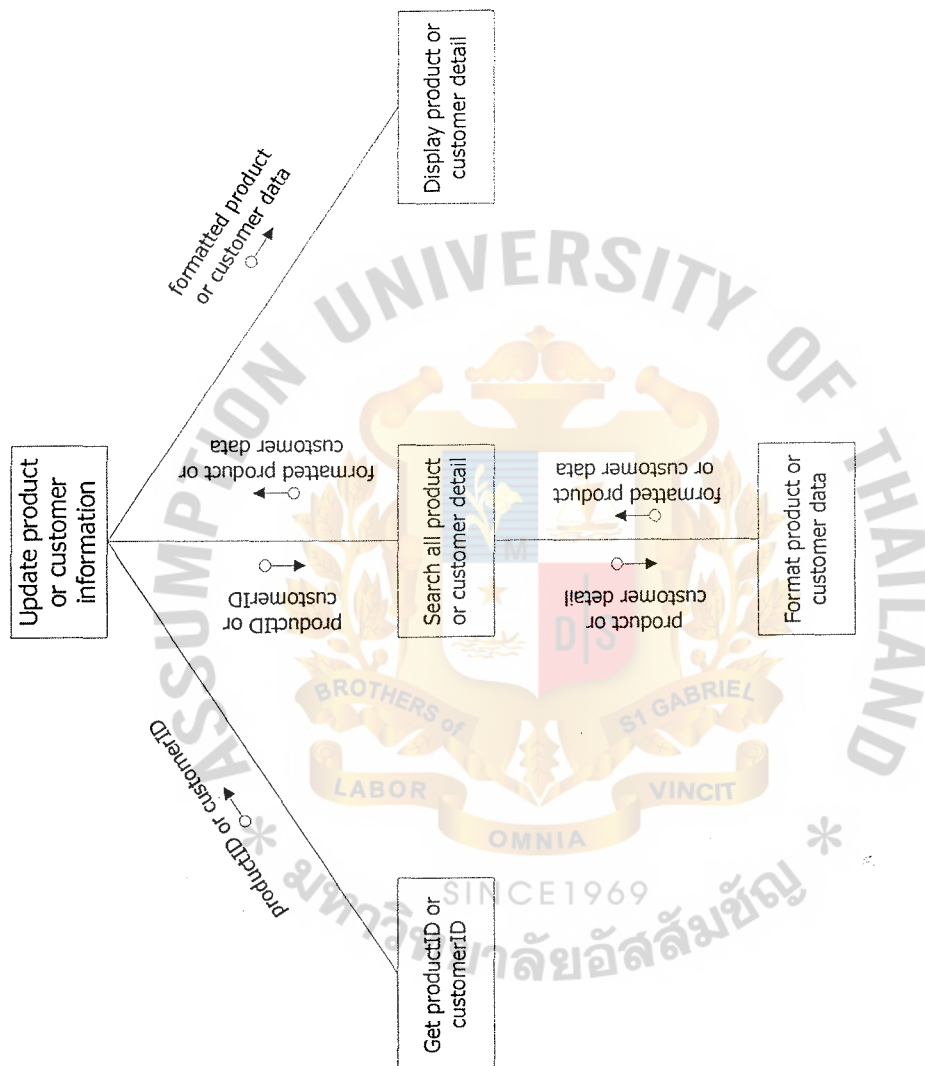
Figure E.11. Structure Chart of Administrator System: Updating Product or Customer Data.
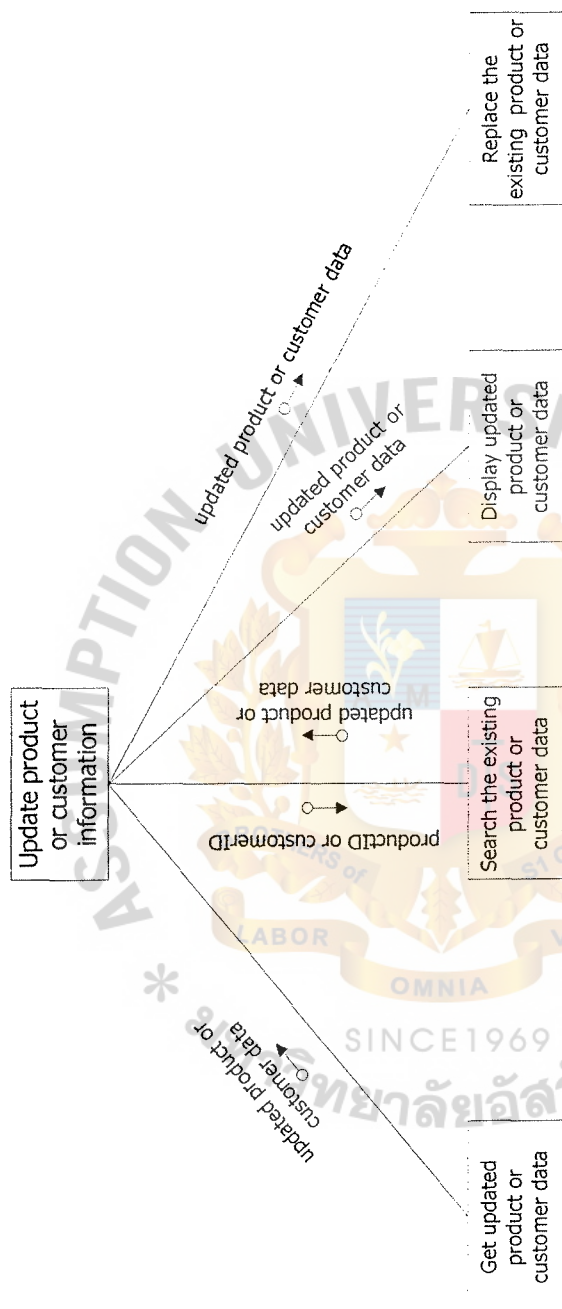
Figure E.12.   Structure Chart of Administrator System: Updating Product or Customer Data.
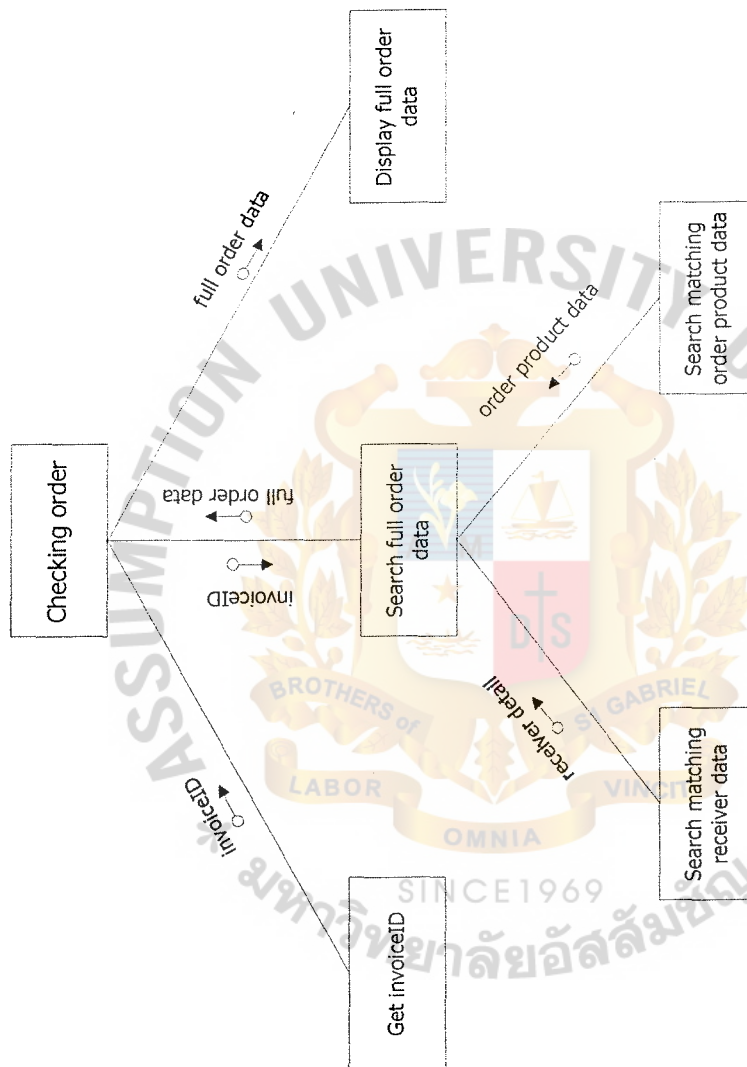
Figure E.13.   Structure Chart of Administrator System : Checking Order.

APPENDIX   F

DATABASE DESIGN

Invoice_detail

Invoice (PK)(FK)
Product (PK)(FK)
Product Name
Price
Item

···has···

Product

ProductID (PK)
Product Name
Size
Color
Price
Stock
Information
Image

···has···

Invoice

InvoiceID (PK)
Receiver (FK)
Raddress
Rstreet
Rdistrict
Rcity
Rpostal
Rtelephone
Remail
TotalPrice
TotalItem
InvoiceDate

Member

CustomerID (PK)
Customer Name
Address Number
STtreet
District
Cioty
Postal
Telephone
Email
Occupation
Company
Purpose
Username
Password
Repassword

····order····

Figure F.1.   Entity-Relationship Diagram.

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Table F.1. Structure of Member Table.

No.	Field Name	Field Type	Index	Unique	Null able	Foreign Key to Table	Check	Key Type
1	Customer Name	Text(15)	Y	Y		Invoice Table		Primary Key
2	CustomerID	AutoNumber	Y	Y				Attribute
3	Address Number	Text(6)						Attribute
4	Street	Text(20)	Y					Attribute
5	District	Text(20)						Attribute
6	City	Text(15)	Y					Attribute
7	Postal	Text(5)						Attribute
8	Telephone	Text(7)						Attribute
9	Email	Text(15)			Y			Attribute
10	Occupation	Text(15)			Y			Attribute
11	Company	Text(15)			Y			Attribute
12	Purpose	Memo			Y			Attribute
13	Username	Text(10)		Y				Attribute
14	Password	Text(16)					Between 8 to 16	Attribute
15	Repassword	Text(16)					Between 8 to 16	Attribute

Table F.2. Structure of Product Table.

No.	Field Name	Field Type	Index	Unique	Null able	Foreign Key to Table	Check	Key Type
1	ProductID	Text(5)	Y	Y		Invoice_detail Table		Primary Key
2	Product Name	Text(15)	Y	Y				Attribute
3	Size	Text(3)						Attribute
4	Color	Text((7))						Attribute
5	Price	Number						Attribute
6	Stock	Number	*					Attribute
7	Information	Memo						Attribute
8	Image	Text						Attribute

Table F.3. Structure of Administrator Table.

No.	Field Name	Field Type	Index	Unique	Null able	Foreign Key to Table	Check	Key Type
1	Administrator	Text(15)	Y	Y				Primary Key
2	Username	Text(8)		Y				Attribute
3	Password	Text(16)		Y				Attribute

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Table F.4. Structure of Invoice Table.

No.	Field Name	Field Type	Index	Unique	Null able	Foreign Key to Table	Check	Key Type
1	InvoiceID	Text(5)	Y	Y		Invoice_detail Table		Primary Key
2	Receiver	Text(15)	Y	Y				Foreign Key
3	Raddress	Text(6)						Attribute
4	Rstreet	Text(20)	Y					Attribute
5	Rdistrict	Text(20)						Attribute
6	Rcity	Text(15)	Y					Attribute
7	Rpostal	Text(5)						Attribute
8	Rtelephone	Text(7)						Attribute
9	Remail	Text(15)						Attribute
10	TotalPice	Number						Attribute
11	TotalItem	Number						Attribute
12	InvoiceDate	Date/Time						Attribute

Table F.5. Structure of Invoice_detail Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	InvoiceID	Text(5)	Y	Y				Primary Key Foreign Key
2	ProductID	Text(5)	Y	Y				Primary Key Foreign Key
3	Product Name	Text(15)						Attribute
4	Price	Number						Attribute
5	Item	Number						Attribute

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APPENDIX   G

WEB INTERFACE DESIGN

Customer System
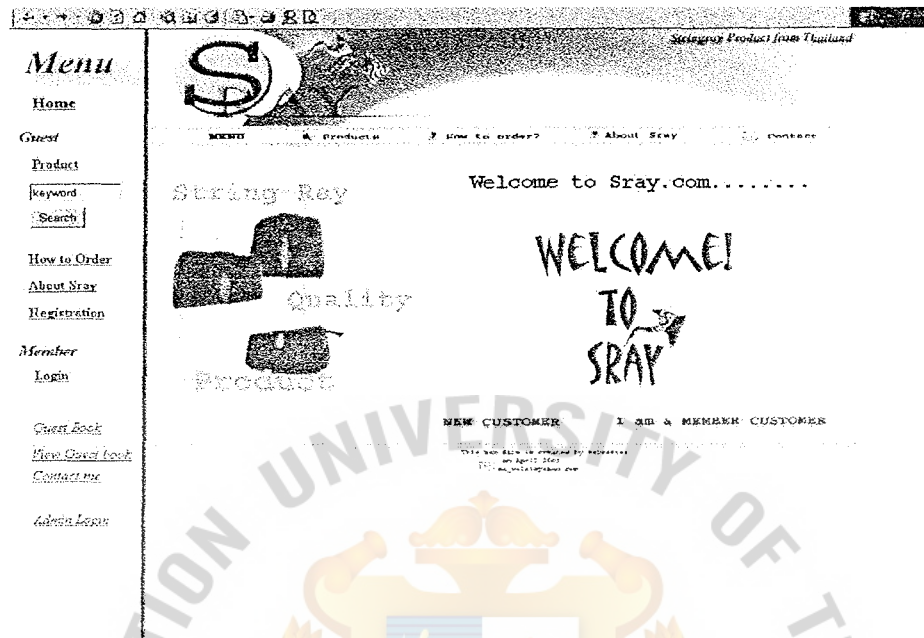
Figure G.1.   Home Page of the Web Site.

Screen Definition

Home page of the web site contains a main menu linking to other web pages.   A new customer can open a web page to make a registration.   A member customer can open a web page to enter his/her username and password. Then, he/she can login to the order system.   Furthermore, a customer can search company's products and read the company's background on the web site.

Figure G.2.   Customer Registration.

Screen Definition

This web page allows a new customer to make registration. Then, he/she becomes a member customer of the company.   A new customer must fill all required customer data.   Warning message will be displayed if required customer data is not fulfilled. After a customer clicked on **Send button,** the program calls to an asp file on the server to store received customer data on the database.
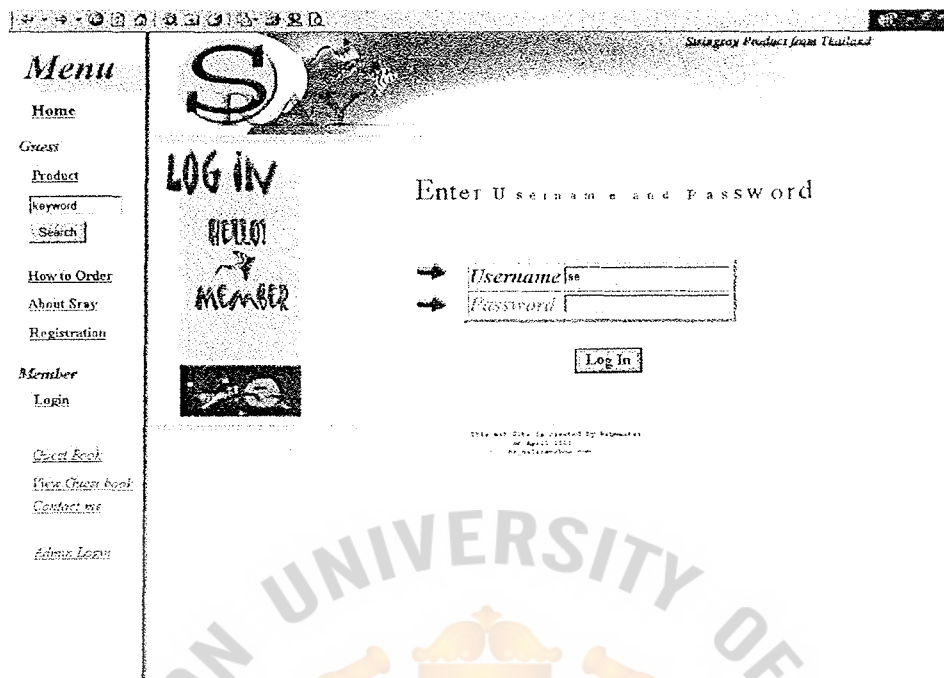
Figure G.3.   Member Login.

Screen Definition

A member must enter his/her username and password. Then, he/she can login to the order system.   The program calls to an asp file on the server to check matched username and password on the database.   If username or password is not filled, warning message will be displayed to the member.   If his/her username and password are not correct, the username and password in text field will be cleared and warning message will be displayed.
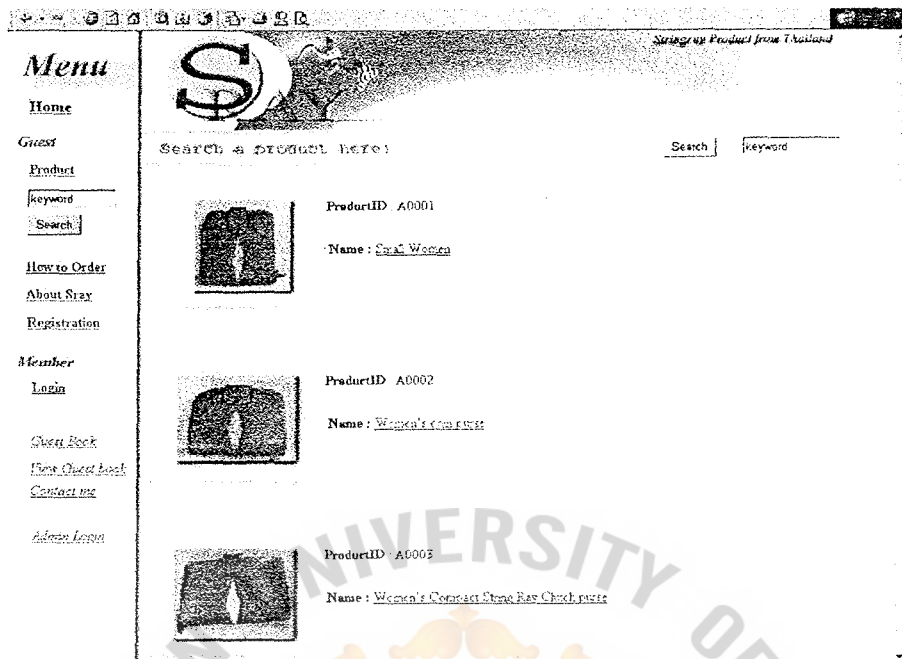
Figure G.4.   Searching Product.

Screen Definition

A list of product is displayed to a member after he/she login to order system. However, the member can search a needed product by enter a keyword. The program calls to an asp file on the server to compare a received keyword with the product's name on the database. Then, list of matched product will be displayed.
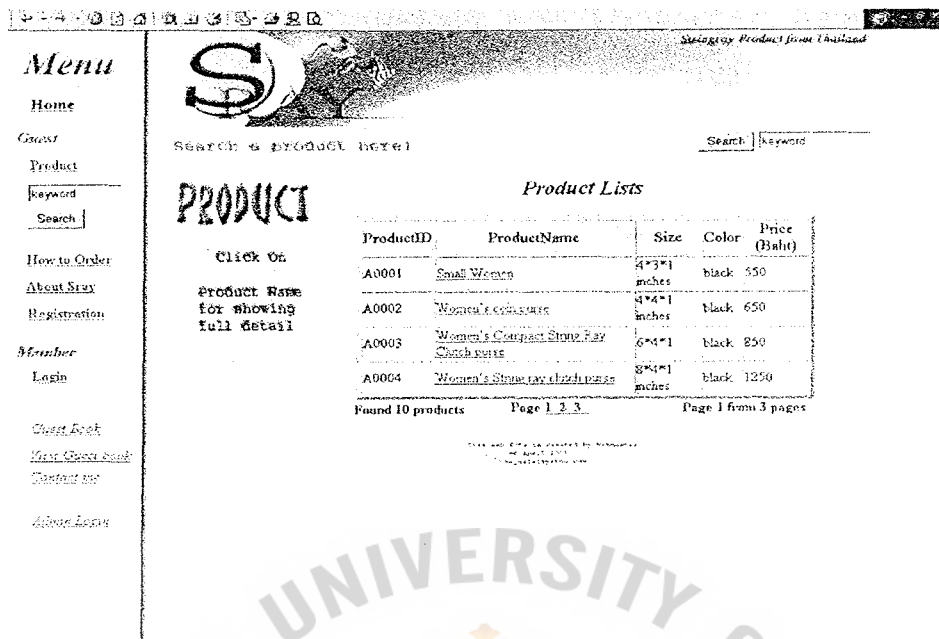
Figure G.5.   List of Product.

Screen Definition

A list of matched product is shown to a member. The member can click on product's name for displaying a full detail of the particular product.
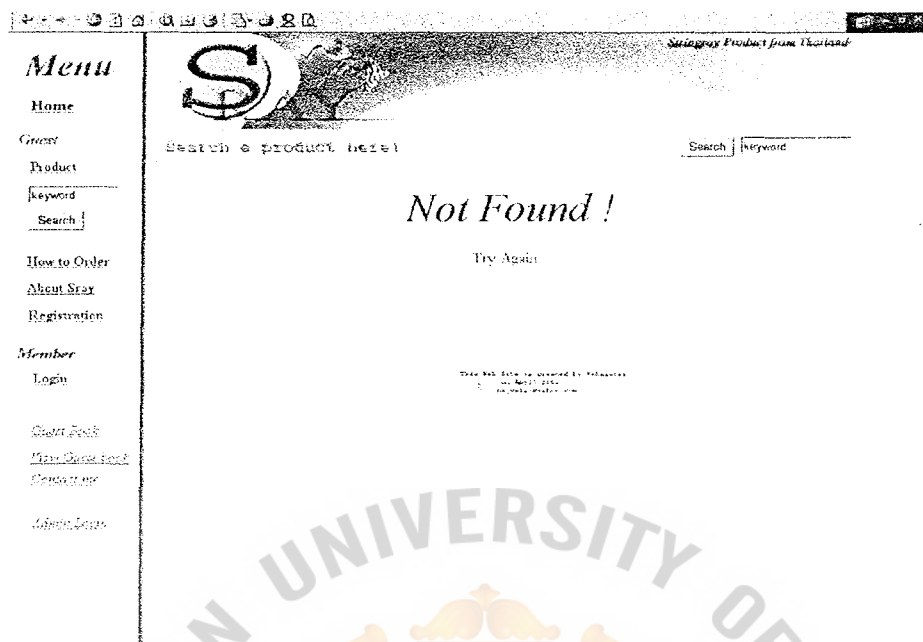
Figure G.6.   Warning Message.

Screen Definition

"Not Found" message will be displayed to a member if matching between a keyword and all products' names on the database is not found.
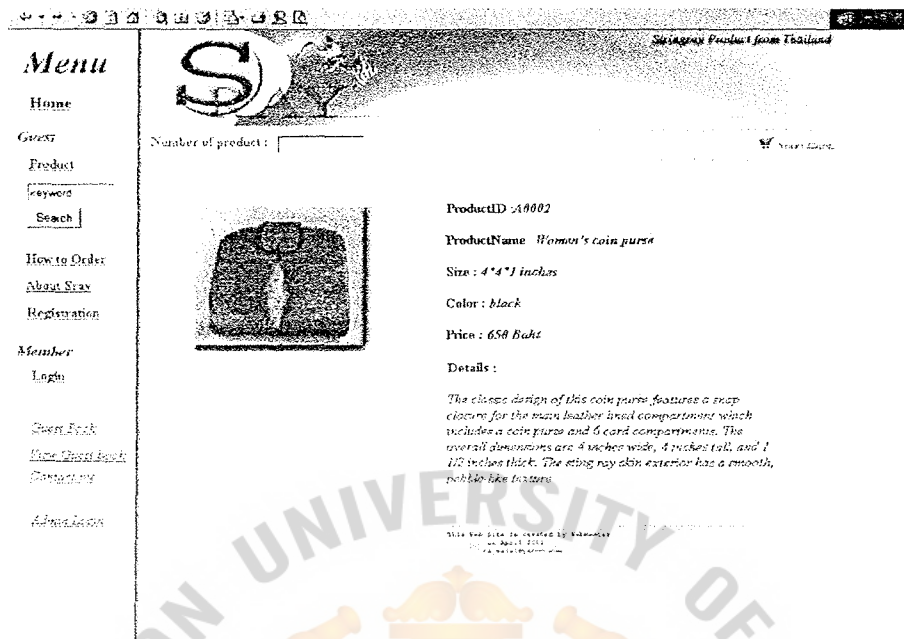
Figure G.7. Full Product Detail.

Screen Definition

A full product detail is shown to a member. On this web page, the member can order products by entering a number of products on text field and click on a shopping cart symbol. Ordered product data will be stored on variables and total price of ordered products will be calculated.

Figure G.8.   Shopping Cart.

Screen Definition

A total cost of ordered product is calculated. A member may change a number of ordered product and click on a **calculates button** to recalculate a new total price.

A **Continue shopping button** is returned to searching product process (Figure H.4.) for ordering other products. A Remove all button is to clear all variables' value that store ordered product data. Then, it will return to searching product process (Figure H.4.).

Finally, A **Check out button** is to confirm ordering of all ordered products.

Figure G.9.   Receiver Data.

Screen Definition

After a member clicked on **Check out button**, the member is allowed to enter receiver data where the ordered product will be sent.   The member must fill all required receiver data.   Warning message will be displayed if required receiver data is not full-filled.   After a **Submit button** is clicked on, the program calls to an asp file on the server to receive all receiver data and store on the database.
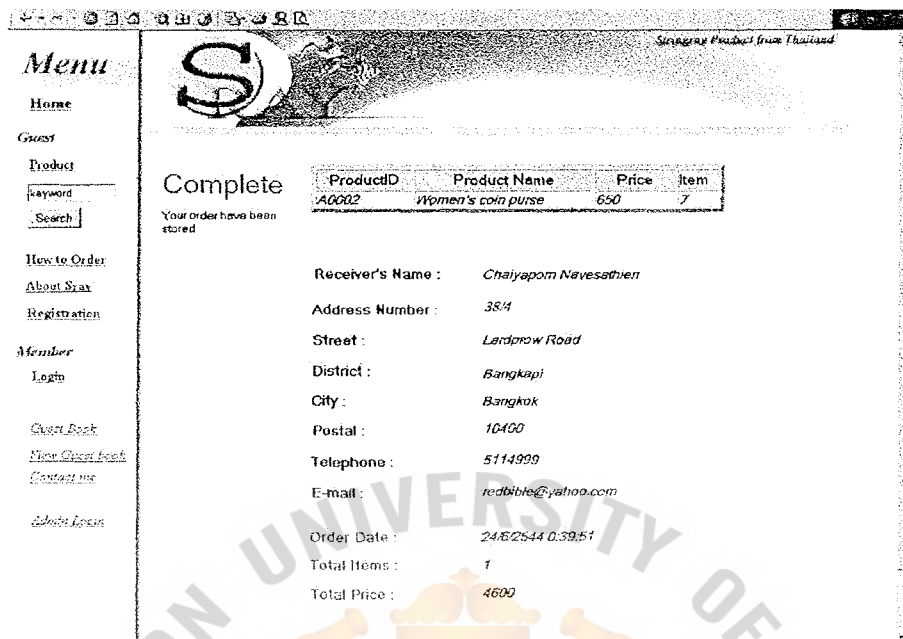
Figure G.10.   Store Ordered Product on the Database.

Screen Definition

This web page means an ordered product data is completely stored on the database.

Administration System

Figure G.11.   Administrator Login.

Screen Definition

An administrator enters username and password to login to the system.   The program calls to an asp file type on the server to check matched username and password on the database.   If username or password is not filled, warning message will be displayed to warn the administrator.   If the received username and password are not correct, the username and password in text field will be cleared and allow the administrator to enter new username and password.
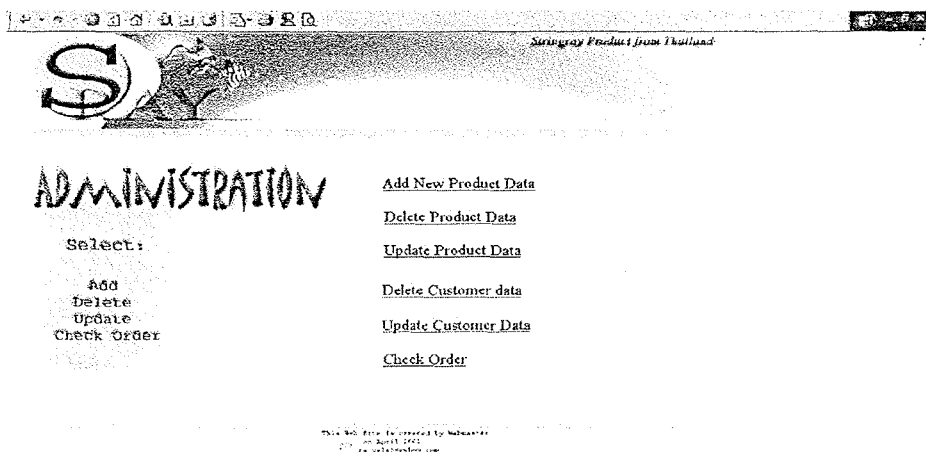
Figure G.12.   Administrator's Main Menu.

Screen Definition

Administrator's main menu includes adding deleting and updating product and customer data. Moreover, the administrator checks all orders from the member. The administrator can add, delete or update product data; however, the administrator can only delete or update customer data.

Figure G.13.   Adding Product Data.

Screen Definition

The administrator must enter all required product data. If required product data is not filled, warning message will be displayed to warn the administrator. After the administrator clicked on **Add button**, the program calls to an asp file on the server to receive all product data and store on the database.

Figure G.14.   Store Product Data on the Database.

Screen Definition

This web page means the new product data is completely added on the database.

Figure G.15.   Deleting Product Data.

Screen Definition

The administrator enters the keyword to find the needed product data.   The program calls to an asp file on the server to find the matched product's name on the database.   The result from searching will be displayed on the computer's screen as a list of product's name.   If the needed product data is not found, a "**Not found**" message (figure H.6.) will be shown to the administrator.
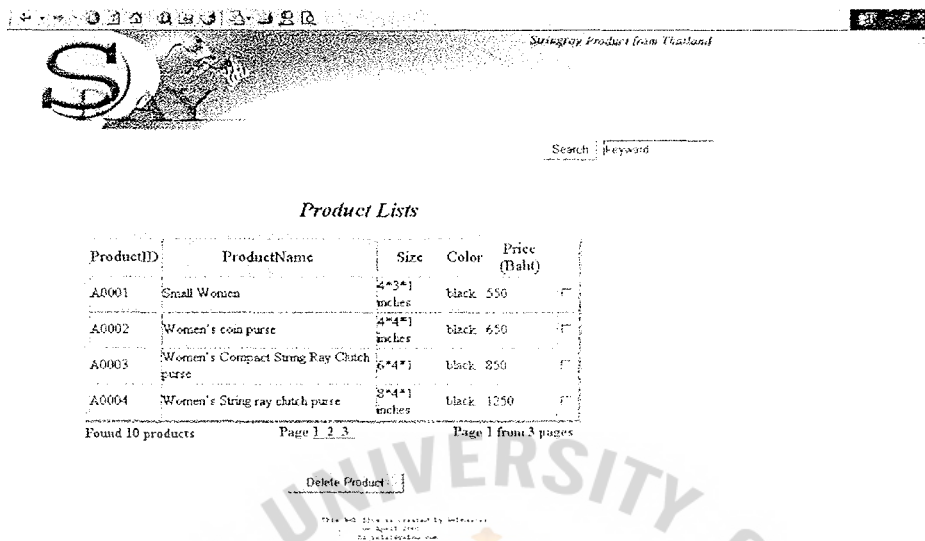
Figure G.16. List of Deleting Product.

Screen Definition

A list of product is shown to the administrator. The administrator checks on the check box to indicate which product to be deleted. After the administrator clicked on the **Delete button**, the program calls to an asp file on the server. The productID to be deleted will be recorded by the program. Then, the program scans all productID on the database to find the matched productID for deletion.
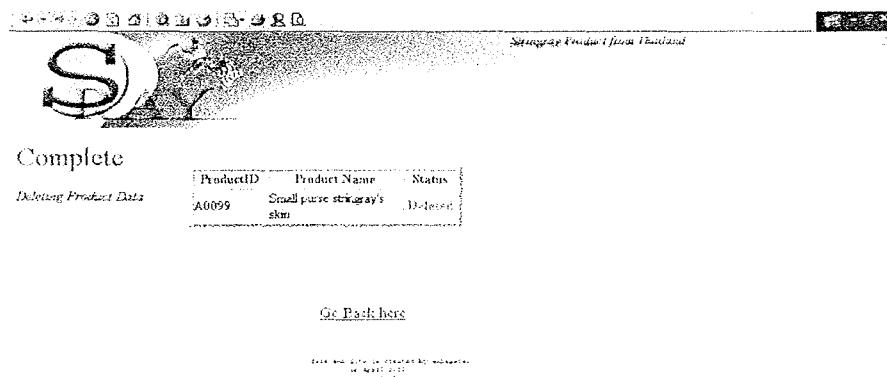
Figure G.17. Delete Product Data on the Database.

Screen Definition

This web page means the matched product data on the database is completely deleted.

Product Lists

ProductID	ProductName	Size	Color	Price (Baht)	
A0001	Small Women	4*3*1 inches	black	550	update
A0002	Women's coin purse	4*4*1 inches	black	650	update
A0003	Women's Compact String Ray Clutch purse	6*4*1	black	850	update
A0004	Women's String ray clutch purse	8*4*1 inches	black	1250	update
A0005	Small Women's purse	4*3*1 inches	black	450	update
A0006	Women's coin purse	4*4*1 inches	black	650	update
A0007	Women's Compact String Ray Clutch purse	6*4*1	black	950	update

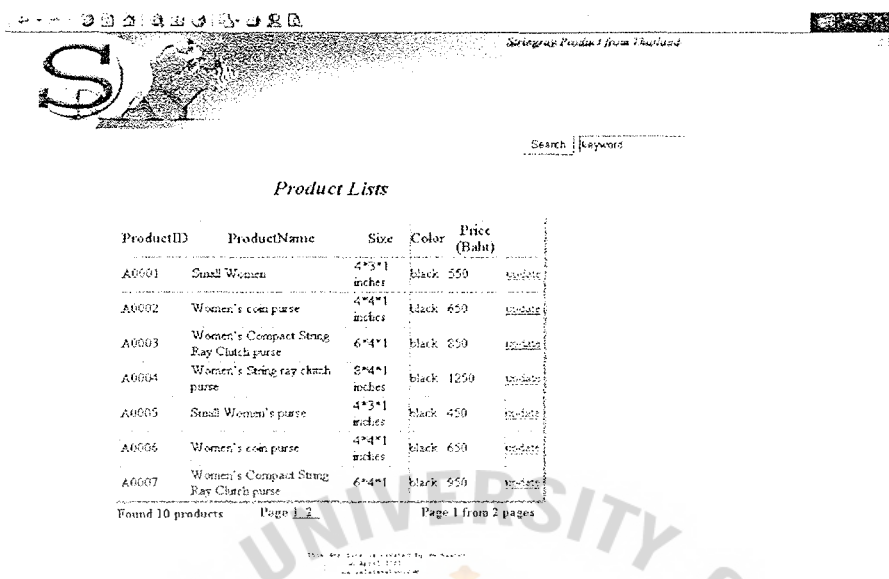Found 10 products   Page 1 2   Page 1 from 2 pages

Figure G.18.   Updating Product Data.

Screen Definition

The administrator enters a keyword to find the needed product data. The program calls to an asp file on the server to find the matched product's name on the database. The result from searching will be displayed on the computer's screen. If the needed product data is not found, a "**Not found**" message (Figure H.6.) will be shown to the administrator.

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Figure G.19. List on Updating Product.

Screen Definition

A list of product to be updated is shown to the administrator. The administrator clicks on the word "**update**", which link to an asp file on the server. The particular product data will be retrieved and displayed to the administrator.

Figure G.20. Update Product Data.

Screen Definition

The administrator updates the product data on each column. After the administrator clicks on **Update button**, the updated product data replace the old version of data on the database.

Figure G.21. Update Product Data on the Database.

Screen Definition

This web page means the product data is completely updated on the database.

Figure G.22. Deleting Customer Data.

Screen Definition

The administrator enters a keyword to find the needed customer data. The program calls to an asp file on the server to find the matched customer's name on the database. The result will be displayed on the computer's screen as a list of customer's name. If the needed customer data is not found, a "**Not found**" message (Figure H.6.) will be shown to the administrator

Figure G.23.   List of Deleting Customer.

Screen Definition

A list of customer is shown to the administrator. The administrator checks on the check box to indicate which customer to be deleted. After the administrator clicked on the **Delete button**, the program calls to an asp file on the server.   The customerID to be deleted will be recorded.   Then, the program scans all customerID on the database to find the matched cusotmerID for deletion.
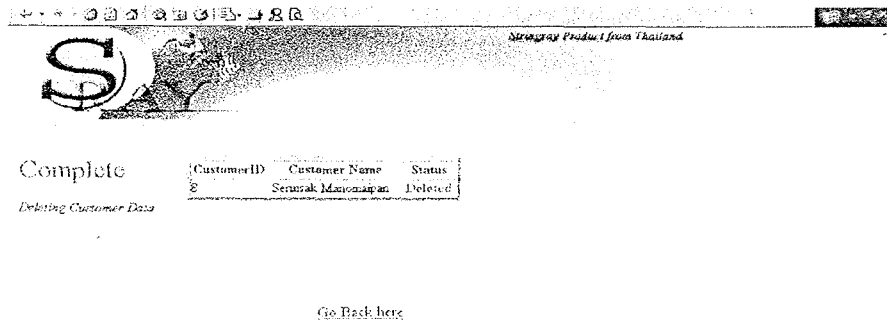
Figure G.24. Delete Customer Data on the Database.

Screen Definition

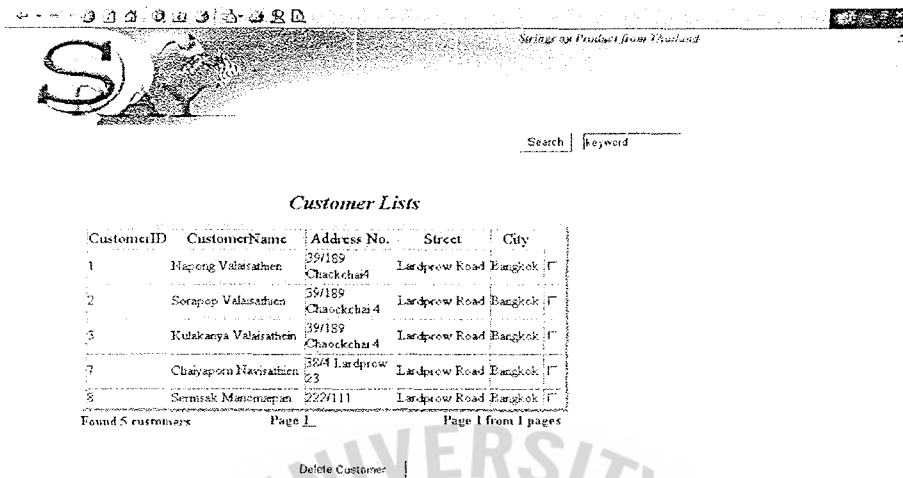This web page means the needed customer data is completely deleted on the database.
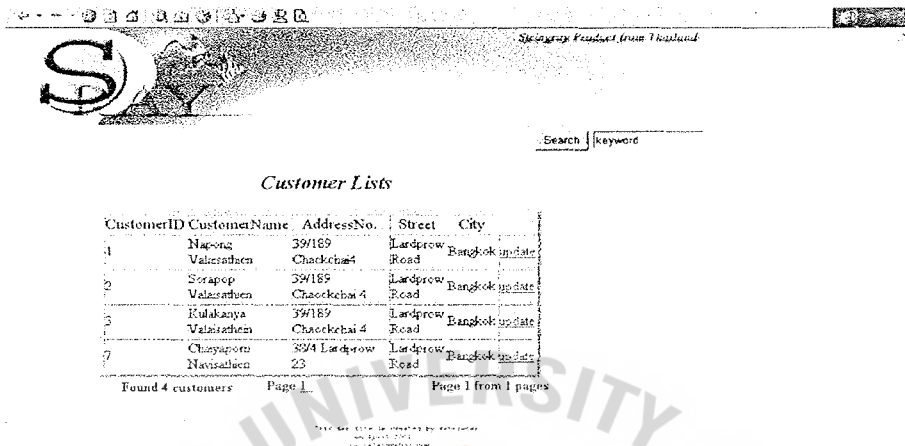
Figure G.25.   Updating Customer Data.

Screen Definition

The administrator enters the keyword to find the needed customer data.   The program calls to an asp file on the server to find the matched customer's name on the database.   The result will be displayed on the computer's screen.   If the needed customer data is not found, a "**Not found**" message (Figure H.6.) will be shown to the administrator

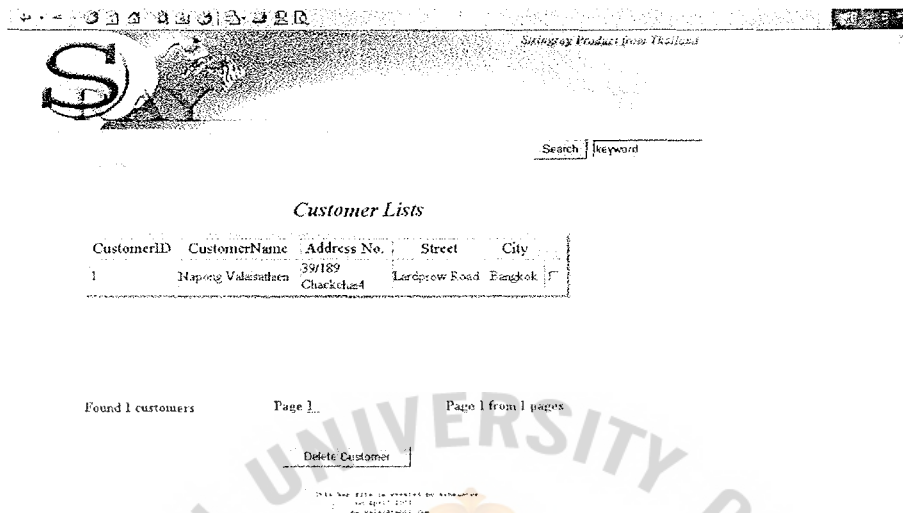Figure G.26.   List of Updating Customer.

Screen Definition

A list of customer to be updated is shown to the administrator. The administrator clicks on the word **update**, which link to an asp file on the server. The particular customer data will be retrieved and displayed to the administrator.

Figure G.27. Update Customer Data.

Screen Definition

The administrator can update the customer data on each column. After the administrator clicks on **Update button,** the updated customer data replace the old version of customer data on the database.

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Figure G.28.   Update Customer Data on the Database.

Screen Definition

This web page means the old version on customer data is completely replaced with the new version of customer data.

Figure G.29.   Checking Customer's Order.

Screen Definition

This web page allows the administrator to check a customer's order.   The administrator selects an ordered date for checking.   After the administrator clicked on **Check button**, the program calls to an asp file on the server to receiver the date and to search the ordered data on the database.

Order Detail

Order Detail

InvoiceID	ReceiverName	InvoiceDate	
25	Chayaporn Harvestaen	12/6/2544 20:30:55	detail
26	Semsak Manonukpan	12/6/2544 20:34:59	detail
27	Semsak Manonukpan	14/6/2544 22:31:52	detail

Found 3 products   Page 1   Page 1 from 1 pages
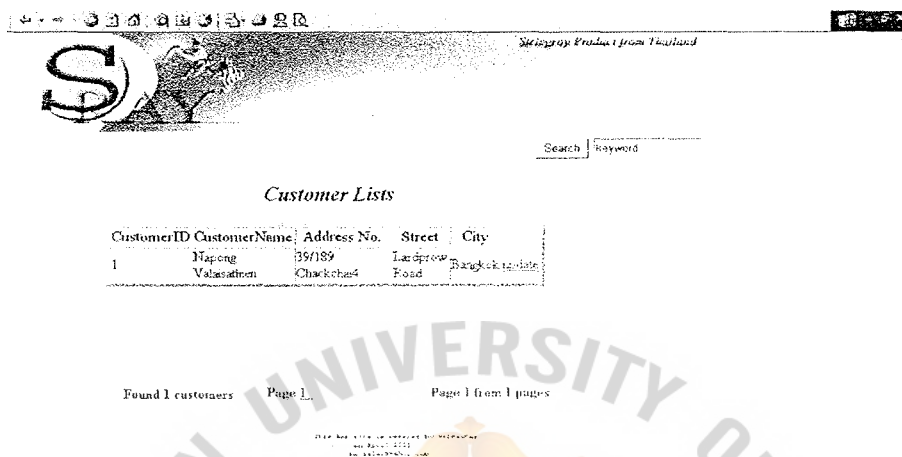
Figure G.30.   List of Customer's Order.

Screen Definition

A list of customer's order is shown to the administrator. The administrator clicks on the word **update**, which link to an asp file on the server. The particular customer's order data will be retrieved and displayed to the administrator.

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Order Detail

InvoiceID	ProductID	ProductName	Price	Item
26	A0003	Women's Compact Sting Ray Clutch purse	950	12
26	A0004	Women's Sting ray clutch purse	1250	14

Send To

ReceiverName	Sermsak Manomaipan
Address Number	128/94
Street	Lardprow 101 Road
District	Bangkapi
City	Bangkok
Postal Code	10400
Telephone No.	3781413
E-mail	serm@hotmail.com

Total Item	2	*Total Price*	28950

Figure G.31.   Customer's Order.

Screen Definition

This web page is to display all customer's order detail. It includes ordered product data and receiver data.

APPENDIX   H

REPORT DESIGN

The NV Company Limited

39/189 Lardpow Road, Bangkapi, Bangkok 10230   Tel. no. 931-4135, 538-5543

39/189 โชคชัย 4 ถนนลาดพร้าว, บางกะปิ, กรุงเทพฯ 10230 โทร. 931-4136, 53856

INVOICE

No.
เลขที่ 0001

Tax ID เลขประจำตัวผู้เสียภาษีอากร	CustoemrID รหัสลูกค้า	Order Date วันที่สั่งซื้อ	Payment Term กำหนดชำระ	Due Date วันครบกำหนดชำระ
3 10103728 4	001	19/11/2000 23:51:50	Net 30 Days	20/12/2000

Customer Name	Suwat Meechai
Address Number	31
Street	Phayathai
District	Rakataewee
City	Bangkok
Postal	10400
Telphone No.	247-1532
Email	su@bangkok.com

Product ID รหัสสินค้า	Product Name ชื่อสินค้า	Price ราคา	Item จำนวนสินค้า
A0009	Small Women's purse	450	3
A0001	Small Women's purse	450	1

Total items จำนวนสินค้าทั้งหมด	4

Total price ราคารวม	5050.00
VAT ภาษีมูลค่าเพิ่ม 7%	353.5
Grand Total จำนวนเงินทั้งสิน (Baht)	5,403.5

for The NV Company Limited

ในนามของ   บริษัท NV จำกัด

Owner of The NV Co.,Ltd.

เจ้าของกิจการ

22/11/2000

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The NV Company Limited

39/189 Lardpow Road, Bangkapi, Bangkok 10230   Tel. no. 931-4135, 538-5543

39/189 โชคชัย 4 ถนนลาดพร้าว, บางกะปิ, กรุงเทพฯ 10230 โทร. 931-4136, 53856

INVOICE

No.
เลขที่   0002

Tax ID เลขประจำตัวผู้เสียภาษีอากร	CustoemrID รหัสลูกค้า	Order Date วันที่ตั้งซื้อ	Payment Term กำหนดชำระ	Due Date วันครบกำหนดชำระ
3 10103728 4	002	28/11/2000 15:08:54	Net 30 Days	29/12/2000

Customer Name	Teerapat Pathara
Address Number	84/15
Street	Sukhumvit 23
District	Klongton
City	Bangkok
Postal	10110
Telphone No.	664-6321
Email	tee@mail.com

Product ID รหัสสินค้า	Product Name ชื่อสินค้า	Price ราคา	Item จำนวนสินค้า
A0001	Small Women's purse	450	6

Total items 6 จำนวนสินค้าทั้งหมด	

Total price ราคารวม	2,700.00
VAT ภาษีมูลค่าเพิ่ม 7%	189.0
Grand Total จำนวนเงินทั้งสิน (Baht)	2,889.00

for The NV Company Limited

ในนามของ   บริษัท NV จำกัด

Owner of The NV Co.,Ltd.

เจ้าของกิจการ

30/11/2000

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The NV Company Limited

39/189 Lardpow Road, Bangkapi, Bangkok 10230   Tel. no. 931-4135, 538-5543

39/189 โชคชัย 4 ถนนลาดพร้าว, บางกะปิ, กรุงเทพฯ 10230 โทร. 931-4136, 53856

Tax ID เลขประจำตัวผู้เสียภาษีอากร	CustoemrID รหัสลูกค้า	Order Date วันที่สั่งซื้อ	Payment Term กำหนดชำระ	Due Date วันครบกำหนดชำระ
3 10103728 4	001	19/11/2000 23:51:50	Net 30 Days	20/12/2000

Customer Name	Suwat Meechai
Address Number	31
Street	Phayathai
District	Rakataewee
City	Bangkok
Postal	10400
Telphone No.	247-1532
Email	su@bangkok.com

Product ID รหัสสินค้า	Product Name ชื่อสินค้า	Price ราคา	Item จำนวนสินค้า
A0009	Small Women's purse	450	3
A0001	Small Women's purse	450	1

Total items	4
จำนวนสินค้าทั้งหมด	

Total price ราคารวม	5050.00
VAT ภาษีมูลค่าเพิ่ม 7%	353.5
Grand Total จำนวนเงินทั้งสิ้น (Baht)	5,403.5

Receipt of cash/cheque   No.   Date

ได้รับเงินสด/เช็ค ธนาคาร _____ เลขที่ ____ วันที่ _____

The sum of จำนวน Baht บาท _____

Collector   Date Received

ผู้รับเงิน   วันที่รับเงิน

for The NV Company Limited

ในนามของ   **บริษัท NV จำกัด**

_____

Authorized Signature

ผู้มีอำนาจอนุมัติ

25/12/2000

The NV Company Limited

39/189 Lardpow Road, Bangkapi, Bangkok 10230   Tel. no. 931-4135, 538-5543

39/189 โชคชัย 4 ถนนลาดพร้าว, บางกะปิ, กรุงเทพฯ 10230 โทร. 931-4136, 53856

Ref No. เลขที่ 0002

Tax ID เลขประจำตัวผู้เสียภาษีอากร	CustoemrID รหัสลูกค้า	Order Date วันที่สั่งซื้อ	Payment Term กำหนดชำระ	Due Date วันครบกำหนดชำระ
3 10103728 4	002	28/11/2000 15:08:54	Net 30 Days	29/12/2000

Customer Name	Teerapat Pathara
Address Number	84/15
Street	Sukhumvit 23
District	Klongton
City	Bangkok
Postal	10110
Telphone No.	664-6321
Email	tee@mail.com

Product ID รหัสสินค้า	Product Name ชื่อสินค้า	Price ราคา	Item จำนวนสินค้า
A0001	Small Women's purse	450	6

Total items 6
จำนวนสินค้าทั้งหมด

Total price ราคารวม	2,700.00
VAT ภาษีมูลค่าเพิ่ม 7%	189.0
Grand Total จำนวนเงินทั้งสิ้น (Baht)	2,889.00

Receipt of cash/cheque   No.   Date   for The NV Company Limited
ได้รับเงินสด/เช็ค ธนาคาร _____ เลขที่ _____ วันที่ _____   ในนามของ **บริษัท NV จำกัด**

The sum of จำนวน Baht บาท _____

_____   _____   -------------------------------------
Collector   **Date Received**   **Authorized Signature**
ผู้รับเงิน   วันที่รับเงิน   ผู้มีอำนาจอนุมัติ
                                                            31/12/2000

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