



CUSTOMER ORDER PROCESSING SYSTEM  
FOR BANGKOK VINYL PROFILE CO., LTD.

by

Ms. Patcharin Kraiteerawut

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

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

November, 2000



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Project Title                      Customer Order Processing System for Bangkok Vinyl Profile Co., Ltd.

Name                                Ms. Patcharin Kraiteerawut

Project Advisor                  Air Marshal Dr. Chulit Meesajjee

Academic Year                  November 2000

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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.

Approval Committee:

*AM Chulit Meesajjee.*

(Air Marshal Dr. Chulit Meesajjee)  
Dean and Advisor

*[Signature]*

(Prof.Dr. Srisakdi Charmonman)  
Chairman

*Vichit Antach*

(Asst.Prof.Dr. Vichit Avatchanakorn)  
Member

*S. Thanyong*

(Assoc.Prof. Somchai Thayarnyong)  
MUA Representative

November 2000

## ABSTRACT

Bangkok Vinyl Profile Co., Ltd. was inaugurated in 1999. It imports uPVC profiles from Germany and China for its own fabrication and installation in Thailand. In addition, it imports all the fittings and accessories from both Germany, France and the United States of America. Each imported material depends on the requirements of the customers. Due to the initial stage on introducing the product to the market and high cost in import tax and other expenses, the company penetrates into the high market.

The existing order processing system is entirely based on manual system. Only some applications such as Microsoft Word and Excel are used. However there are a small number of employees in the company. The problems of workload, redundant document and slow in process are found to be the main obstacles in this working place.

The new proposed Information System is introduced to replace the manual order processing system to facilitate the employees and satisfy the customer. Microsoft Access 2000 is suggested to serve the company operations and budget. Also, this can reduce the number of stuffs who are responsible in handling the documents. Finally, the new proposed system can decrease risk in losing documents and customers due to slow in working process.

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## **I. INTRODUCTION**

### **1.1 Background of the Project**

With the sign of continuous growth of technology, many businesses around the world can simply link to one another. Many companies are doing their business across countries to serve both local and global demand. As a matter of fact, they try to keep themselves competitive to their rivals.

The information system is now playing a vital role in all fields of work. Certainly, it has a strong influences in the business sector. Many companies enhance itself by having the information technology and its own information system in house in order to obtain the most valuable information and gain more markets. Information system has the potential to improve products, services and the flow of information within the organization, for example, by giving customers easier access to products and services, improving the quality, giving the quicker response, and etc.

Bangkok Vinyl Profile Co., Ltd. is now applying a manual operation. Though the jobs assigned to each person in charge are not complicated, the tremendous mistakes are usually made. The flow of information still lacks order. Many customers complain about the slow response in customer inquiry, late delivery and incorrect pricing. The company, itself, is facing many problems such as the inaccurate reports, non-updated inventory data and non-updated pricing.

The customer order processing system is designed to help the company manage their customer orders efficiently. With the introduced computerized system, information of orders will be stored in the computer in a more systematic way. The computerized system designed for the order processing will replace the manual process which is the existing system.

This project contains almost all the needed information. It includes the problems of the current system, system planning, system analysis, system development, system design, system implementation, system budgeting and cost. A computerized order processing system would be able to support the company's goals by providing the necessary information for all related departments.

## **1.2 Objectives**

The company realized that the manual system is an obstacle to its growth compared to its competitors with advanced information system in house. BVP has great intentions to improve its own information system. BVP starts taking the first step of improvement for the company by developing the order processing system to facilitate all related departments. Information system of other fields will definitely be enhanced in the near future.

The objectives of the project should be clear and find out what problems they believe the system project would be solved or what situation should be improved and what they expect from the new system.

The objectives of this project are as follows:

- (1) To study and analyze the existing system of order system in the office in order to identify and design a computerized system for more effective work.
- (2) To identify the problems and user requirements.
- (3) To provide management with timely, reliable information and to enhance the workflow. The new system should also help in generating the report for management each month.
- (4) To identify Information System Requirement
- (5) To reduce the redundant or duplicate work and decrease the expenditure of the organization.



(6) To increase efficiency and effectiveness of the organization.

(7) To identify the business requirement

### **1.3 Scope of the Project**

The scope of this project is expected to rearrange the existing manual order system activated by Sales and Marketing Department. Normally, the outputs will be passed on the accounting department to issue the invoice and set the account receivable. Also, the output will notify the Production Department to produce and deliver the products to customers on time.

With the nature of the existing system as mentioned above, this project needs to initiate the proper management, especially in documentation, to all related departments and sections in order to smoothen the work method effectively and efficiently. The proposed system will provide the useful information of each order to all related departments. Additionally, the reports will be generated on time and accurately.

### **1.4 Deliverables**

This project is to study and review before further action of approval. This system development identifies the problems of the existing system. It enables the company to set criteria by considering the feasibility and determine the basic requirements of the proposed project.

This report produces the following deliverables:

- (1) A software package written in Microsoft Access for Windows can demonstrate user-interface screens and database management. The software also can work through years efficiently.
- (2) Screen Layout and Menu System for user interaction.
- (3) Attached documents for the order processing system contain:
  - (a) Cash Bill Register

- (b) Cheque Bill Register
  - (c) Return Bill Register
  - (d) Receipt
  - (e) Tax Invoice/Delivery Note
- (4) The documents produced by the proposed system contains:
- (a) Invoice
  - (b) Sale Order
  - (c) Debit Note for return bill
  - (d) Credit Note
- (5) Reports for operational and management levels:
- (a) Balance Settlement report
  - (b) Month sales report
  - (c) Sales analysis report
  - (d) Item sale analysis report
  - (e) Overdue Report
  - (f) Monthly Outstanding Report
  - (g) Sales Analysis

## **II. THE EXISTING SYTEM**

### **2.1 Background of the Organization**

Bangkok Vinyl Profile Co., Ltd. is a small size company. It is one of the few companies in Thailand which do the fabrication and installation of uPVC (Unplasticized PolyVinyl Chloride) windows and doors. This company is an affiliated company of V.N. Aluminum Co., Ltd., which does the fabrication and installation of aluminum. Even though the aluminum products are widely accepted and well known in Thailand. The board of V.N. Aluminum saw the potential of the future market that uPVC windows and doors will have a strong influence on the construction market in the near future. That gives the customers a new choice to decide on the new and different style of window and door system. They finally agreed to set up the new company named "Bangkok Vinyl Profile Co., Ltd." The company was inaugurated in July 1999. They import the uPVC profiles from German and China through the main regional office in Singapore. Materials are entirely imported, including fittings.

### **2.2 Location**

Bangkok Vinyl Profile Co., Ltd. (BVP) is located at 13/7-8 Ladplakao Road, JarakeBua, Khet Ladplao, Bangkok 10230 Thailand.

### **2.3 Bangkok Vinyl Profile Company: Departments**

The management style of the Bangkok Vinyl Profile is inherited from the V.N. Aluminum. They base on the family business. Manual operation and works are applied to every fields of the company. Only few software applications are used in some areas such as Microsoft Word for letter, Microsoft Excel for quotation.

The company manages through four departments as shown below:

- (1) Sales and Marketing Department



- (2) Accounting Department
- (3) Production Department
- (4) Administration Department

All these departments are related in many fields. However the company will firstly focus on Order Processing Systems.

Sales and Marketing Department:

Salespersons are divided into two sections;

- (1) Showroom base sales
- (2) Direct sales through the architect companies

The showroom base sales, the orders are faxed directly to the sales and marketing department at the main office for the further actions on each order. Direct sales will report directly to the main office.

Additional, BVP sales and marketing department has also earned benefits from commission in spite of using specified fittings from the contracted suppliers and selling aluminum for V.N. Aluminum. However, the proposed system will mainly focused on uPVC window and door system, which is the main selling unit of the company.

Accounting Department:

The accounting department is responsible for the Account Receivable, Account Payable and Petty Cash. The company also hires the accounting company to handle more complicated works such as the Value Added Tax, trial balance and annual closed balance. However the accounting department needs to properly keep all the documents to reconcile with the results from the accounting company.

Production Department:

The production department consists of sections as follows:

- (1) Production Planning: persons in this section need to calculate materials to be

used in each project or purchase order.

(2) Production Control: the products need to be checked before left the factory.

(3) Inventory and Material Management.

Administration Department:

The administrative officers will operate all the general paper works and generate the office supplies. The additional area of work for this department is they need to handle the materials procurement. Consequently, the production department will ask the administration department for the required materials. Every purchase of the materials needs to be reported to the general manager.

All matters in the company needs to be reported to the general manager. (See the organization chart)

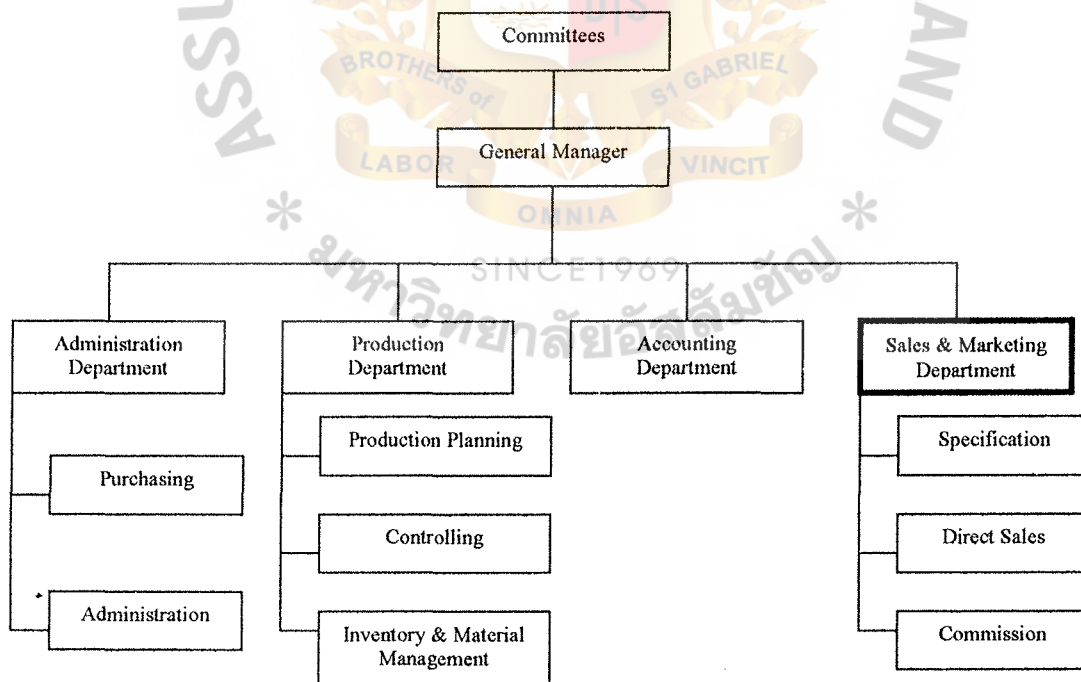


Figure 2.1. Organization Chart of Bangkok Vinyl Profile Co., Ltd.

### 2.3 Existing Business Functions

The existing order processing system is an activity that mainly links people from different department by manual work and communication to achieve certain goals. The primary function of the customer order processing system is to create information flows that support the following:

- (1) The details of order for the sale and marketing department, stock checking in the production department, who is responsible for production plan and control including inventory management, accounting department, and administration department.
- (2) Decision making of employees and management level in all related fields.
- (3) Fast response to customer inquiry.
- (4) Clear-cut job description in each area.

The ordering system in the existing environment is activated by the quotation. Salespersons need to cooperate with the production department once they receive the drawing from the customers. The production department will do the rough calculation on the amount of each material to be used. If there is no problem with inefficient stock, the salespersons can proceed to further process of price calculation, which is set by the administration department once the manager approves. If there are some problem with the stock, salesperson needs to ask for the customers' acceptance about the lead time and the delivery date which needs to be postponed. Once the order is made, the salesperson needs to pass the document of the confirmed order to the accounting department to set the account receivable. If the production department needs to order more materials, they have to inform the administration department for purchasing process. The administration department will pass the purchasing invoice to the accounting department for further payment.



The flow of information can also support the decision making of the employees, especially in sales and marketing department and manager. The manager can trace the record to see which type of the windows and doors increase the company's sales. The manager can decide, which materials should be ordered in a large amount to serve the market needs.

The sales and marketing department can use the benefit from the flow of information system to serve the customer inquiry to make sure that the customers do not turn to the competitors instead due to the company's slow process. However, with the existing system, the sales and marketing department faces so many problems in proceeding the order since there are many details to be included in the quotation. The confirmed order will be made once the customers confirm and accept the offered quotation.

The company uses the existing order system to create job description for all employees in the company. Since the company is a small company, it employs only few employees to work in each area. Each person handles many works to achieve the company goals. The interaction of the existing system is shown in Figure 2.1.

#### 2.3.1 Existing Process

The major processes of the existing order processing system in the company are as follows:

##### (1) Process produce price

All profiles are entirely imported from China and Germany. The administration department will calculate all the cost to make sure that all the handling costs are included such as Tax, freight charge, Vat, charge from the shipping agent, all charges from forwarder, labor cost, investment cost and depreciation cost. After summing up all those costs, the person in

charge will submit to the general manager for marking up. The manager needs to recheck and consider the exchange rate on the period that the company has to pay debts to the suppliers before marking up the price.

(2) Process order

Orders come from two sources. One is directly from the customers themselves and the others from the architect companies. Mostly sales persons need to offer many quotations to one customer before the deals have been done. Therefore, the price at the initial stage is not yet finite. Once the sales order has been made, the invoice, which refers to the final quotation will be handed to the customer. However, the price is mainly up to the manager's consideration.

(3) Process check the inventory

Before the final agreement on price between the company and the customers, the sales person needs to check whether the inventory can supply each specified materials for production or not. Also the sales person needs to keep inform the production department for the precise delivery date.

(4) Process add customer record

Once the customer accepts all the conditions such as price and delivery date from the company. The Sales and Marketing department will do the further process of ordering. If the customer is a new customer, the full information of each new customer must be given as the company's record before filing.

(5) Process produce customer order

After receiving the confirmed order from the customers, the Sales and Marketing department will produce the customer order including order number, products to be ordered, total price, signature of the sales person and authorizer.

(6) Process produce customer invoice

The customer details will be filled in the invoice. The customer invoice consists of invoice number, date, customer name, address, product item, price, vat value, and total price.

(7) Process delivery

After the Sales and Marketing department received the orders, they will pass the order to the production to make sure that the production department can produce and make delivery on time.

(8) Process settle the payment

Once the delivery has been made, the accounting department will settle the payment of each customer. The invoice and receipt will be sent to the customers by each salesperson.

(9) Process return goods

In case that there are some problems with the products, the customer may not accept the defected products. The claim may unexpectedly occur. The debit note will be made from the accounting department for customer's refund.

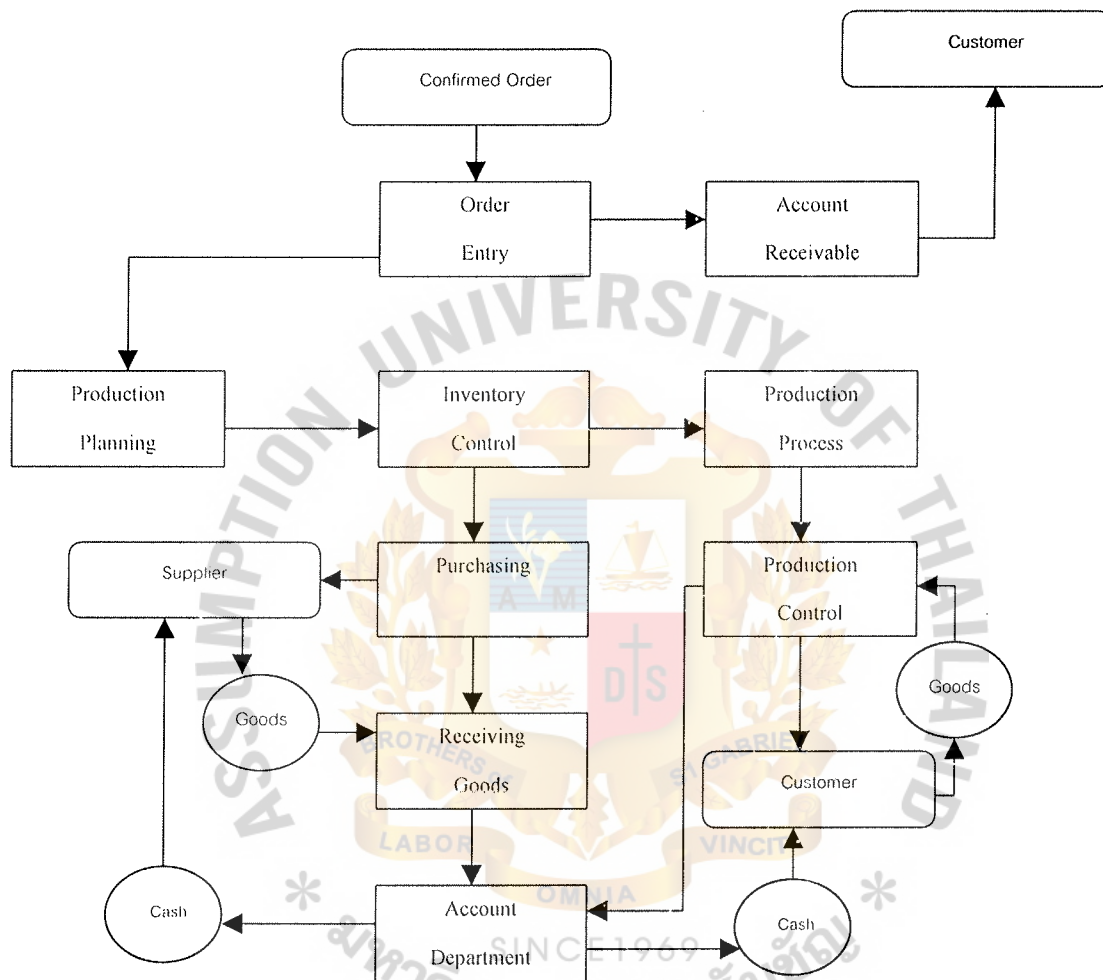


Figure 2.2. Interaction of the Existing System of Bangkok Vinyl Profile Co., Ltd.



## **2.4 Current Problems and Areas for Improvement**

### **2.4.1 Current Problems**

As mentioned earlier that the existing system is manually operated. Those manual systems cause many problems as follows;

- (1) Slow in process: Document handling from one department to another often delays the works. Since one department have to wait for the output from the others
- (2) Inaccuracy: Reports are wrongly generated by human error.
- (3) Less organized in both workflow and documentation. Some works are overlapped and some created documents are not needed. Job description is too ambiguous.
- (4) Errors are inevitable due to the human errors.

Hard to keep tract on each order: Many details need to be specified in the purchase order opened from the customer such as type of the profiles to be used in each items of each project, type of glass, type of fitting, the way to install the products, delivery date, installation date, credit term, installment, etc. With the manual system, the company found that some important details are unintentionally missing. Consequently, these vague details often bring the big argument to the company.

### **2.4.2 Areas of Improvement**

The areas of improvement is based on the understanding of the existing operation and business requirements. The order processing system will be more efficient. Also, it can provide a better operation in the company. The following are the critical points, which need to be developed after research is made.

- (1) Avoid redundant data by using the relation of data

- (2) The staffs can use the order number to retrieve all information concerning about the orders such as the order details and customer data.
- (3) Reduce the workloads by using computer-based system for processing data such as the staffs will not waste their time finding one information on the pile of papers.
- (4) Retrieve the information requested by staffs with few minutes are required.
- (5) Create the security to protect the data.
- (6) Retain the information concerning about the order in the database file and using relational database to generate the report or information for the business requirement.
- (7) Time of operation will be less.
- (8) Collect the statistical information by using computer-based system for decision making.
- (9) To reduce the printing works by using the relational database to perform the form of printing by using the data from the data files.
- (10) The computer-based system can reduce the errors due to human error since there is a error check.

With the use of computer-based system, it can reduce and eliminate the existing problems. In addition, the performances of all staffs will be improved since the new system will make the operation easier, faster and more productive than the existing manual system. Also, this can reduce the cost. The reports produced are mainly useful to the management level for their further decision making.

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

The proposed system is designed as a computerized system in order to facilitate all related activities on the order processing system. The order processing system is the initial step for Bangkok Vinyl Profile to enhance itself with the use of information technology. This order processing system is recognized to be the first priority step for system development. In order to give impression to the customers and to make sure that all the details given to the customers are correct and in consistent to the documents kept in related departments.

The proposed system has many benefits over the manual system as clarified below:

- (1) Provide more accurate information to the related departments
- (2) Information is up-to-date and reliable. This enables the management level to make fast and precise decision. It also supports the company's plans.
- (3) Fast responses to the customers.
- (4) Reduce the human-errors, which are often found in the manual system.
- (5) Inventory management is more likely to be tackled since the information of each material is more precise and clear.

#### **3.1 User's Requirement**

##### **3.1.1 Business Requirements**

- (1) More up-to-date, accurate and consistent information.
- (2) More reliable and easy-to-understand reports.
- (3) To retrieve information easier and faster.
- (4) The new system should be user-friendly.
- (5) The system should not be too complicate to understand and access.

- (6) Security and control should be provided for protecting data.
- (7) Back up and recovery should be designed.

### 3.1.2 Input Requirements

- (1) The customer information contains all details of customers. Those are customer code, customer name, customer address, telephone number, facsimile number, tax identification, name of contact person at the construction site, architect company(if any).
- (2) The sale order contains all details of order which are dealt between the company and the customer. It includes sales order number, customer information, payment term, delivery date, product description, unit price, discount and amount of sales.

### 3.1.3 Proposed Processes

- (1) Process produce selling price
  - (a) Get suppliers' invoices
  - (b) Suppliers' invoices transaction
  - (c) Get price list
- (2) Process check stock
  - (a) Match order
  - (b) Execute delivery notice
- (3) Process order
  - (a) Update customer record
  - (b) Confirm order
- (4) Process add customer record
  - (a) Get customer record
  - (b) Create customer record



- (5) Process validate sales order
  - (a) Get confirmed order
  - (b) Confirmed order transaction
- (6) Process produce customer invoice
  - (a) Prepare invoice
  - (b) Calculate invoice
  - (c) Approved invoice
  - (d) Print invoice
- (7) Process delivery
  - (a) Delivery Confirmation document
  - (b) Payment
  - (c) Transaction receipt
- (8) Process returned goods
  - (a) Validate invoice
  - (b) Approved refund
- (9) Process generate report
  - (a) Verify report request
  - (b) Summary stock
  - (c) Summary customer order
  - (d) Compute amount of sales
  - (e) Produce summary report

#### 3.1.4 Output Requirements

The output reports for the system are as follows:

- (1) Tax Invoice register
  - (a) To help accounting department on tax invoice controlling.

- (b) To show details of tax invoice issued on a specified date.
- (2) Return bill register
  - (a) To help accounting department on return bill control. The debit note will be reconciled with the return bill.
  - (b) To show details of return bill and debit note issued on a specified date.
- (3) Balance Settlement summary report
  - (a) To summarize each payment receipt on each day. Reconcile cheque received on cheque receipt.
  - (b) To summarize each payment receipt on each day. Reconcile cash received on cash receipt.
  - (c) To help accounting department settle the balance.
- (4) Daily sales report
  - (a) To summarize daily sales, containing sales order number, customer name, amount sales and grand total. The report also shows the balance of each sales order number.
  - (b) To show sales activities on each day.
- (5) Monthly sales report
  - (a) To show monthly sales report, sales balance and return of products. It includes total sales of the month, total return and net sales of the month.
- (6) Item sales report
  - (a) To show total order quantity, total return quantity of each item during each month.
  - (b) To summarize total item sales within a month.

- (c) To help administrative department predict the purchase of goods and trend of sales volume on each item.
- (7) Overdue report
  - (a) To report details of account receivable overdue for each customer, consisting of customer information, invoice overdue information, and summarize the total overdue amount.
  - (b) To facilitate the accounting department in following up the overdue debts.
- (8) Monthly outstanding report
  - (a) To show details of account receivable outstanding at the end of month, consisting of customer name, and invoice outstanding information, and summarize total account receivable outstanding amount.
  - (b) The status of the account receivable can be shown at the end of the month.
- (9) Sales analysis report
  - (a) To summarize and compare the total sales of the current year and the previous year.
  - (b) To facilitate sales forecasting and market planning.

### **3.2 System Design**

The system design can be categorized into the following parts:

#### **3.2.1 Output Design**

The primary reason for information systems is output. Output is what users need, and their needs are the primary purpose of any information system. Therefore, designers look at output first. Then they determine what types of data should be entered into and stored within the computer to produce that output.

### 3.2.2 Input Design

The goal of this phase of the system development life cycle is to design input documents and procedures so that transactions can be quickly and accurately brought into information systems.

### 3.2.3 Design of Input and Output Screens

The design of input screen based on the information needed for each activity. The relevant predefined details required on each process are very important since all activities are logically linked to one another. However, the input screen must be user-friendly to make sure that the staffs will not get a hard time to access or retrieve the information. The output screen will be based on specific layout, characteristics and format of information to be used.

### 3.2.4 Design of Files

The data needs to be stored in files for future output, historical reference, reduction of keystrokes, and triggering. The first two reasons are commonly understood. For the reduction of keystrokes means the lengthy data can be stored to avoid repeating entry at other times. For instance, operators enter a two-position product code instead of a twenty-character product description. Triggering, the information system store some data to trigger future management action. For example, reorder-point field leads to purchasing activity when the quantity of stock on hand falls below that reorder point.

For the new computerized order processing system, the design of files includes the nature and contents of the file itself. For example, the design will incorporate the storing of details of the customer information, order history, order details, suppliers' information, and other reference information.



### 3.2.5 Design of Database Interaction

The database is extremely important to the system whether larger or smaller system. It provides firms with increased data integrity and data consistency. The interaction with database can span multiple applications. The design database is a major concern on how to appropriately design the database interaction to ensure that there are no problems occurring after implementation. The good database design will cover the requirements and reduce problems.

### 3.2.6 Design of the Procedures

The procedure design will specify the tasks that must be prepared in using the system and the person who responds to complete each task. The important procedure includes the following:

- (1) Data entry procedure
- (2) Run time procedure
- (3) Error handling procedure
- (4) Security and backup procedure

### 3.2.7 Design of Program Specifications

The program specifications describe the design process of input data into the process and output data after process. This specification will be used as a way to produce the computer software. To design the computer software, it is important to ensure that:

- (1) The actual program must perform all tasks and in the manner intended for the application.
- (2) The structure of software divided into modules for testing and validating to make sure that it follows the procedures.

- (3) Future modification can be made in a efficient manner and with a minimum disruption to the design of the system.

### 3.3 Hardware and Software Requirements

#### 3.3.1 Hardware Requirements

The proposed system will be using the application of Microsoft Access as the first step in using computerized system to facilitate the activities within a company. To begin itself with the commonly used application, it requires a small budget in enhancing the system.

The hardware requirements of the proposed system can be summarized as follows:

- |                                |         |
|--------------------------------|---------|
| (1) Computer Server            | 1 unit  |
| (a) Pentium III 550 MHz        |         |
| (b) 9.1 GB Hard Disk Drive     |         |
| (c) 256 MB RAM                 |         |
| (d) 50X CD-ROM                 |         |
| (e) Keyboard 104 keys          |         |
| (f) Mouse                      |         |
| (g) 14" Console monitor screen |         |
| (h) APC-Back-UPS 600           |         |
| (2) PC Workstation             | 4 units |
| (a) Pentium II 500 MHz         |         |
| (b) 64 MB RAM                  |         |
| (c) 9.1 GB Hard Disk Drive     |         |
| (d) 256 MB RAM                 |         |
| (e) 50X CD-ROM                 |         |
| (f) Keyboard 104 keys          |         |

- (g) Mouse
- (h) 14" Console monitor screen
- (i) APC-Back-UPS 600
- (3) Printer 1 unit
  - (a) Hewlett Packard 660C
- (4) LAN accessories
  - (a) LAN switch 10/100
  - (b) HUB 8 port 10 MPBS
  - (c) UTP Cat 5 cable per meter "AMP"

### 3.3.2 Software Requirement

- (1) Window 2000 for server 2 Clients
- (2) Windows 98 Thai Edition
- (3) Microsoft Office 2000 Professional Thai Edition

### **3.4 Security and Controls**

#### **3.4.1 Authorization**

We need to make sure that the person accessing the system have a legal right to the requested information.

#### **3.4.2 Physical Security and Control**

The physical protection against damages must be provided. The place where computers and machines are located must be safe from fire, flood (water leakage) and other environmental hazards.

#### **3.4.3 Hardware Controls**

The processing unit should provide security features, such as storage protection keys.

#### **3.4.4 Operating system security**

The operating system should support the contents of storage and data files itself.

#### **3.4.5 Database Security**

The database has an access control which specifies who may read, write, delete, and change information in the database. All the database entries and modifications are required to be double-checked either from the screen display or from the printout that is generated after the process is finished.

#### **3.4.6 Program Security**

The Microsoft Access software has protection against illegal modifications through a well-designed control mechanism. All the data files and system programs are stored in secondary storage such as diskettes to ensure the correctness of data operation. All the files must be backed up every modification in the database.



### 3.5 System Cost Analysis

#### (1) Costs of Manual System

Table 3.1. Manual System Cost Analysis, Baht.

Cost items		Years				
		1	2	3	4	5
<u>Fixed Cost</u>						
Typewriter	2 units @ 5,200.	10,400.00	—	—	—	—
Calculator	12 units @ 900	10,800.00	—	—	—	—
Total Fixed Cost		21,200.00	—	—	—	—
<u>Operating Cost</u>						
<u>Salary Cost:</u>						
Sales Supervisor	1 person @ 22,000	22,000.00	24,200.00	26,620.00	29,282.00	32,210.20
<u>Staff:</u>						
Salesperson	4 persons @ 10,000	40,000.00	44,000.00	48,400.00	53,240.00	58,564.00
Document officer	3 persons @ 7,000.00	21,000.00	23,100.00	25,410.00	27,951.00	30,764.10
Accounting Officer	2 person @ 9,000.00	18,000.00	19,800.00	21,780.00	23,958.00	26,353.80
Total monthly salary Cost		101,000.00	111,100.00	122,210.00	134,431.00	147,874.10
Total Annual Salary Cost		1,212,000.00	1,333,200.00	1,466,520.00	1,613,172.00	1,774,489.20
<u>Office Supplies &amp; Miscellaneous Cost:</u>						
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	6,000.00	6,600.00	7,260.00	7,986.00	8,784.60
Miscellaneous	Per Annual	3,000.00	3,300.00	3,630.00	3,993.00	4,392.30
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		1,229,000.00	1,351,900.00	1,487,090.00	1,635,799.00	1,799,378.90
Total Manual System Cost		1,250,200.00	1,351,900.00	1,487,090.00	1,635,799.00	1,799,378.90

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

Year	Total Manual Cost	Accumulated Cost
1	1,250,200.00	1,250,200.00
2	1,351,900.00	2,602,100.00
3	1,487,090.00	4,089,190.00
4	1,635,799.00	5,724,989.00
5	1,799,378.90	7,524,367.90
Total	7,524,367.90	-

## (2) Costs of Computerized System

Table 3.3. Computerized System Cost Analysis, Baht.

Cost items	Years				
	1	2	3	4	5
<b>Fixed Cost</b>					
Hardware Cost:					
Computer Server Cost	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00
Workstation Cost	160,000.00	160,000.00	160,000.00	160,000.00	160,000.00
Total Hardware Cost	210,000.00	210,000.00	210,000.00	210,000.00	210,000.00
Maintenance Cost:					
Maintenance Cost	-	-	-	12,000.00	12,000.00
Total Maintenance Cost	-	-	-	12,000.00	12,000.00
Software Cost:					
Computer Server Cost	-	-	-	-	-
Network Cost	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00
Total Software Cost	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00
Implementation Cost:					
Advanced Training Cost	80,000.00	-	-	-	-
Basic Training Cost	65,000.00	-	-	-	-
Set up Cost	30,000.00	-	-	-	-
Total Implementation Cost	175,000.00	-	-	-	-
Office Equipment Cost:					
Calculator 12 Units @ 900	10,800.00	-	-	-	-
Total Office Equipment Cost	10,800.00	-	-	-	-
<b>Total Fixed Cost</b>	<b>415,800.00</b>	<b>230,000.00</b>	<b>230,000.00</b>	<b>242,000.00</b>	<b>242,000.00</b>
<b>Operating Cost</b>					
People-Ware Cost:					
Sales Supervisor 1 person @ 22,000	30,000.00	33,000.00	36,300.00	39,930.00	43,923.00
Staff:					
Salespersons 2 person @ 10,000	20,000.00	22,000.00	24,200.00	26,620.00	29,282.00
Document officer 1 person @ 7,000	7,000.00	7,700.00	8,470.00	9,317.00	10,248.70
Account Office 1 person @ 9,000	9,000.00	9,900.00	10,890.00	11,979.00	13,176.90
Total Monthly Salary Cost	66,000.00	72,600.00	79,860.00	87,846.00	96,630.60
Total Annual Salary Cost	792,000.00	871,200.00	958,320.00	1,054,152.00	1,159,567.20
Office Supplies & Miscellaneous Cost:					
Stationary 900 per month	10,800.00	11,880.00	13,068.00	14,374.80	15,812.28
Paper 700 per month	8,400.00	9,240.00	10,164.00	11,180.40	12,298.44
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	115,200.00	126,720.00	139,392.00	153,331.20	168,664.32
<b>Total Operating Cost</b>	<b>907,200.00</b>	<b>997,920.00</b>	<b>1,097,712.00</b>	<b>1,207,483.20</b>	<b>1,328,231.52</b>
<b>Total Computerized System Cost</b>	<b>1,323,000.00</b>	<b>1,227,920.00</b>	<b>1,327,712.00</b>	<b>1,449,483.20</b>	<b>1,570,231.52</b>

Table 3.4. Five Years Accumulated Computerized Cost, Baht.

Year	Total Computerized Cost	Accumulated Cost
1	1,323,000.00	1,323,000.00
2	1,227,920.00	2,550,920.00
3	1,327,712.00	3,878,632.00
4	1,449,488.20	5,328,120.20
5	1,570,231.52	6,898,351.72
Total	6,898,351.72	-

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

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

Year	Accumulated Manual Cost	Accumulated Computerized Cost
1	1,250,200.00	1,323,000.00
2	2,602,100.00	2,550,920.00
3	4,089,190.00	3,878,632.00
4	5,724,989.00	5,328,120.20
5	7,524,367.90	6,898,351.72

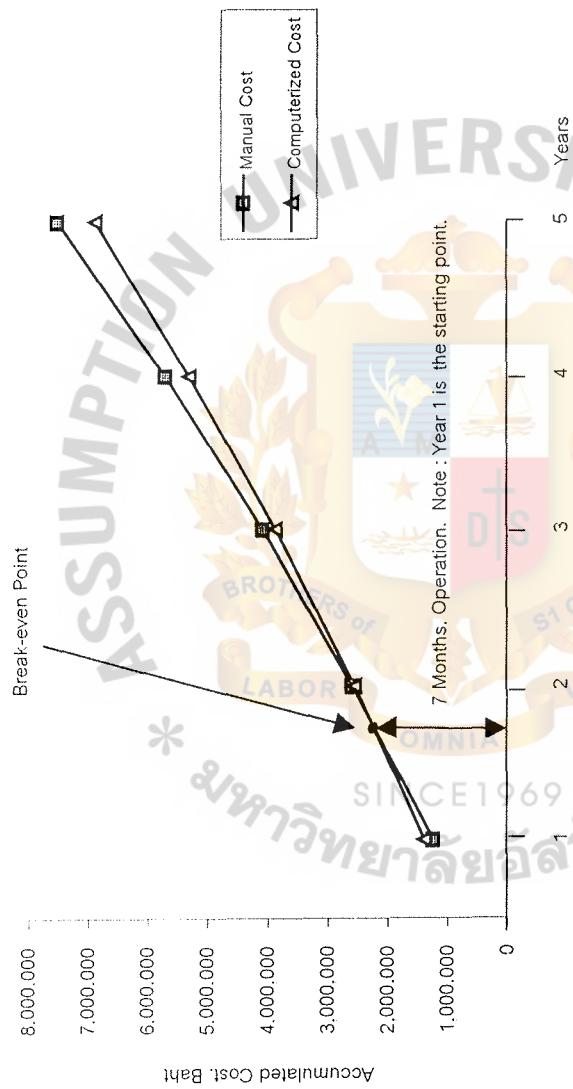


Figure 3.1. The Comparison of the System Costs between Computerized System and Manual System.



## **IV. PROJECT IMPLEMENTATION**

### **4.1 Overview of Project Implementation**

Project implementation is the process to assure that the information system is operational and then allowing users to take over its operation for the use and evaluation. Implementation of this project is concerned with the installation of the computerized system replacing the manual system. The implementation process is set up using the parallel concept. The process works on both the old system and the new system for the first period until the users are familiar with the new system. Therefore, it needs quite a long time in this period for the users to become familiar with the new system since they have to do double work. Different strategies for users training are used to make sure that each user understands his/her role in operating the new system.

### **4.2 Programming**

The database application program, Microsoft Access, is used to manage the database of the firm. Normalization is used to transform the complicated views and data stores to a set of smaller data structure. Queries, forms, tables, and reports are used to support users' needs.

### **4.3 Testing**

This stage concerns the executing of the program to find any errors before the system is actually used. Testing assures the quality of the system. Starting from desk check by following each step in the program on paper to check whether the routine works as it is written. Then follow by program testing, link testing, and full systems testing.

#### **4.4 Installation**

The system consultant presents a list of specification for the electrical wiring and outlets, air conditioning needs, humidity controls, and space requirements. That means site preparation needs to be properly managed for installation.

#### **4.5 Training**

Training is needed for both users and managers to interact and get familiar with the new computerized system. Training the users in using the new system is an important part of implementation since they must be able to run the system without the intervention of the analyst in the real environment. The user-friendly interface is essential since all users and manager of Bangkok Vinyl Profile Co., Ltd. are not computer literate. To make the user-friendly screen can stimulate them to use the computer. At the first running step, the new system and the old system run parallel in order to make all users get familiar with the new system. System analyst and vendor are assigned to train the users. Due to differences in background of each user, a combination of methods are needed, such as training manuals, lectures about procedures, discussion, question and answer, and practices.

#### **4.6 Results of the Implementation**

The problems that occurred during the test are that the users are not familiar with the computerized system due to their lack of experience in using the new system. Some of them may have bad attitude towards this new order processing system. We have to make them understand and find the new system benefit for themselves in their work area, especially in sales and marketing department. The interface screen is another important point to make it easier to the users to understand and make themselves familiar to the system. The program itself needs to be tested to make sure that it functions properly. That means several testing are carried out until reaching the

satisfactory stage. When the result of the final test is at the satisfactory level, the new system reaches the objectives of the project. However, if there are something wrong with the new computerized system, the testing process will be continuously conducted.



## V. CONCLUSIONS AND RECOMMENDATIONS

### 5.1 Conclusions

At present, every field of business is facing fierce competition. Therefore, the manual order processing system cannot catch up with the present increasing workloads. The salespersons often get a hard time in issuing the order to the customers since there are many details of the windows and doors to be included in the order. Unlike other products, most orders include many styles of windows which request different section of the profiles to be used such as casement window, sliding window, top hung window, and many types of doors. The salespersons usually have to take quite a long time in issuing the confirmed order.

The vital activities include issuing customer order, stock checking, customer invoice, and returned goods. The existing customer order system is found to be inefficient and several problems are located. The most important problems are redundant processes, time-consuming in customer services, and inability in information sharing among several departments. These problems cause difficulty in decision making for management, inefficient work, and customer dissatisfaction. A computerized system is proposed and designed to solve the above problems at the initial stage. It is initially installed for customer order management system. The output of the order processing system will also serve other activities in other related departments.

The project started by identifying the problems and objectives, then found out the information requirements by interviewing the users and making an observation. Context diagram and data flow diagrams are used to plan the input processes and the output of the business functions. Data dictionary and process specifications are developed from the data flow diagrams to list all the data items used in the system. The project provided cost and benefit analysis to compare cost of the existing system and the



new system. The tangible and intangible benefits of the new system over the existing system were presented. The project selected Microsoft Access application program for customer order management because it is efficient to manage the database. Also, it has a very user-friendly interface. Before the proposed system is used, it has been tested several times to ensure that it is free from any errors. The users have been trained by different strategies due to different backgrounds and knowledge among users.

#### Degree of Achievement of the Proposed System Compared with the Existing System

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

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

Process	Existing System	Proposed System
Produce Price Process	4 hrs.	3 hrs.
Order Process	45 mins.	15 mins.
Add Customer Record Process	Manually file	5 mins.
Produce Customer Invoice Process	25 mins.	5 mins.
Shipment Process	45 mins.	10 mins.
Returned Goods Process	1 hr.	10 mins.
Total	6 hrs. 55 mins.	2 hrs. 45 mins.

With the proposed system, the users can spend less time in the consequent steps of the order processing system. The proposed system gives a little improvement in pricing process due to the fluctuation in exchange rate. Mostly the manager will set the pricing for each lot of the purchased profiles and fittings. However the users can make a reference to the past orders which the profiles and fittings belonged to the same lot of the procurement.

The order process is strongly emphasized. Once the customers agree to each sale quotation, the employees can immediately key in the needed data into the computers for sale order issuing. The amendment in each sale order can easily be done through the computer system. Instead of manually typing and recalculating the price, the users can simply put the information into the computer system, which serves them with fast responses.

To add customer records into the proposed system, the users can enjoy fast information retrieval. The existing system, the users usually file the customer records manually. Some records later on were lost, incorrect, and obsolete. Some records were found to be redundant. With the new system, the users can simply add, edit and cancel customer records through the computer system.

The process in producing customer invoice will be easy for the users to handle since the information from each process is linked together. By putting the sales order number and amount to be collected, the output can easily be produced by the computer system.

The company also can serve the customers with a fast shipment process due to less time in tracking the customer information. The production department needs to set a schedule for delivery with the sales and marketing department.

If there is something wrong with the products, the customers can simply claim by showing the sales order and invoice to the company. The users can track the information rapidly through the computer system.

## **5.2 Recommendations**

Bangkok Vinyl Profile Co., Ltd. has long been using the manual system in all activities, some basic applications such as Microsoft Word and Microsoft Excel are used only in some area of work. Most of the employees certainly will have something against the new system since they are not familiar with it. The input screen and the output should not be too complicated for them to understand. The company also has to explain the benefits of this new system in order to make them accept this computerized system. In addition, some training courses are needed for example introduction to computer, DOS, Microsoft Word, Microsoft Excel, and Microsoft Access since it will make the users understand more about the computer system. Moreover the executives should have the evaluation from time to time to evaluate the performance.

The customer order processing system requires correct and up-to-date information from inventory department, which is not yet automated. The computerized system for inventory should later be designed to get more benefits in information sharing and accurate and fast updated inventory. In the computerized system, the data storage is very important. It should be maintained and updated from time to time to support the increase of information in the future. Another important point is the security of the system. Passwords must be assigned and updated for the new users and immediately deleted for the resigned users. A more sophisticated control and security of the system should be redesigned when organization is expanding.

Further enhance of the firm should be done step by step. The company should start from identifying the necessity and the problems that occur in other fields of work.

The accounting system and inventory systems are recommended to serve all activities in the company since these two systems are important to company's operation. Also, they can support the proposed order processing system to be able to work more efficiently.







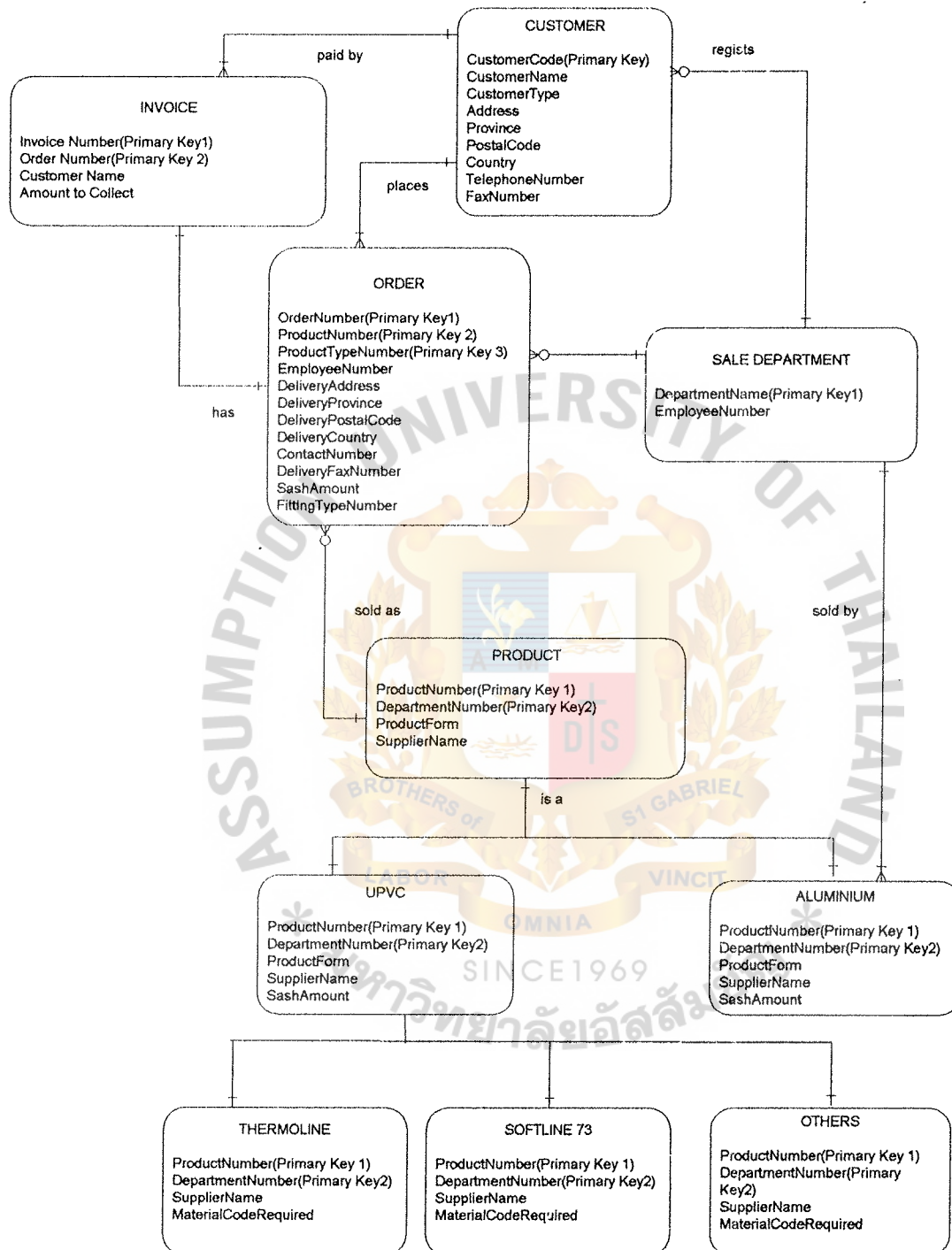


Figure A.1. Entity Relationship for the Proposed System.



## APPENDIX B

### DATA FLOW DIAGRAM

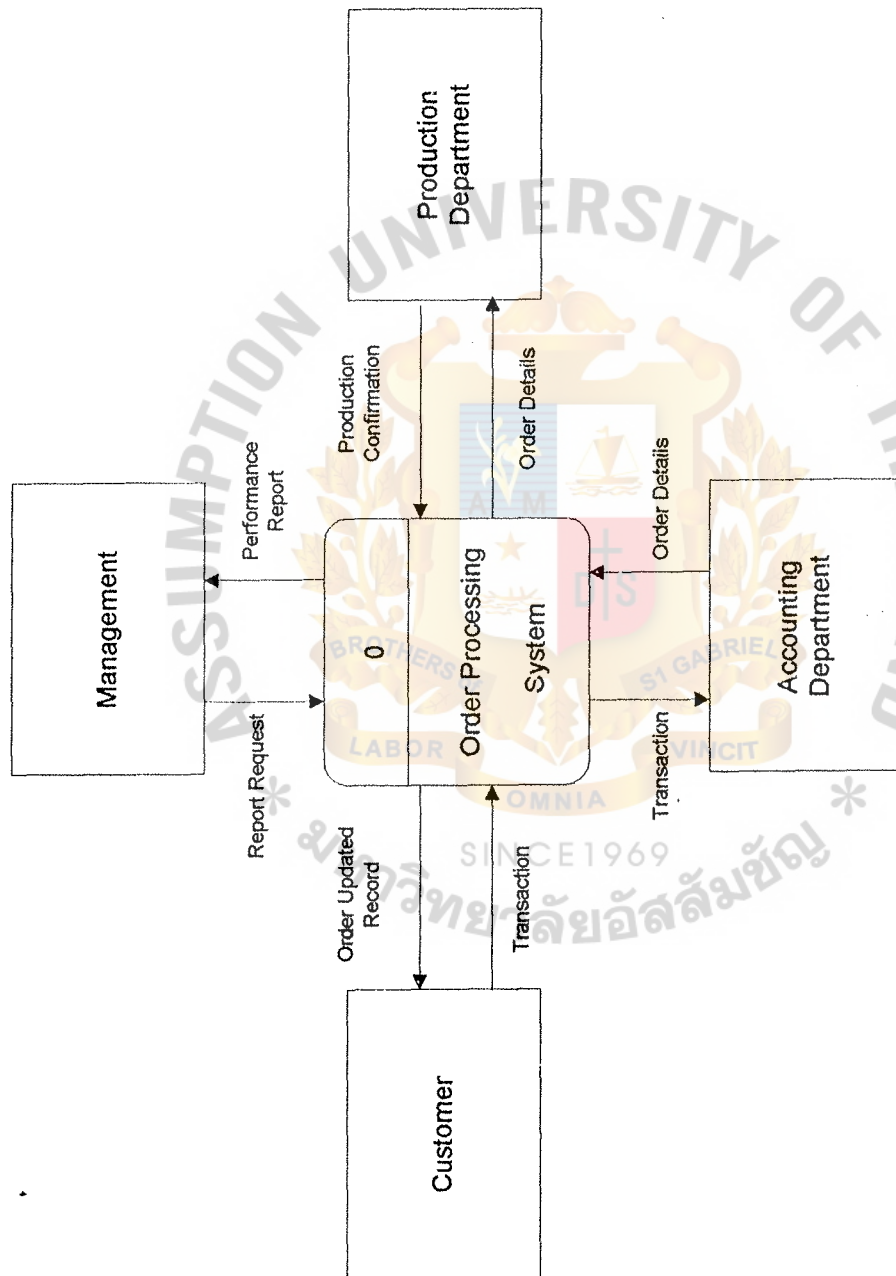


Figure B.1. Context Data Flow Diagram for Order Processing System of Bangkok Vinyl Profile Co., Ltd.



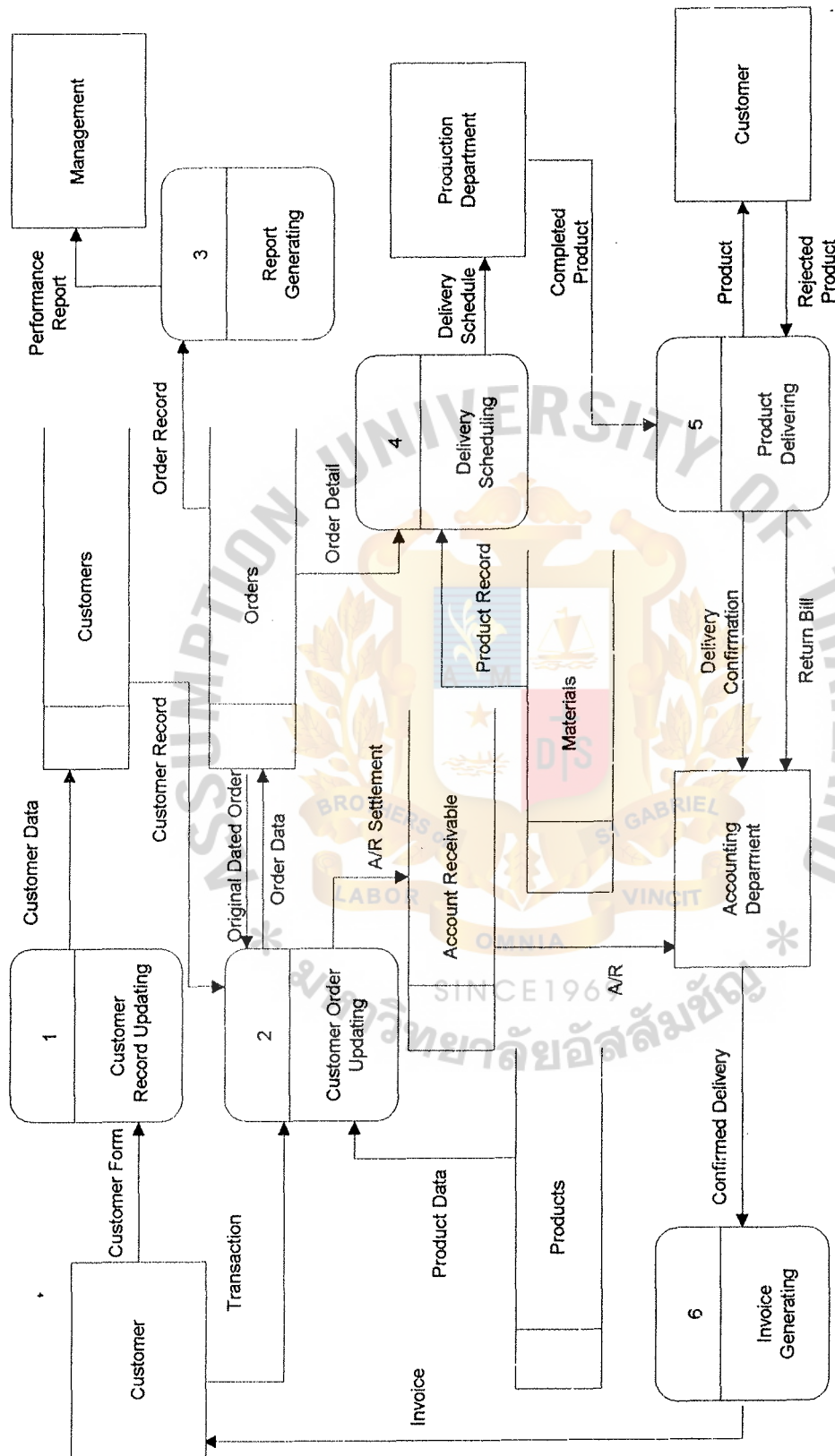


Figure B.2. Data Flow Diagram Level 0 of the Proposed System.

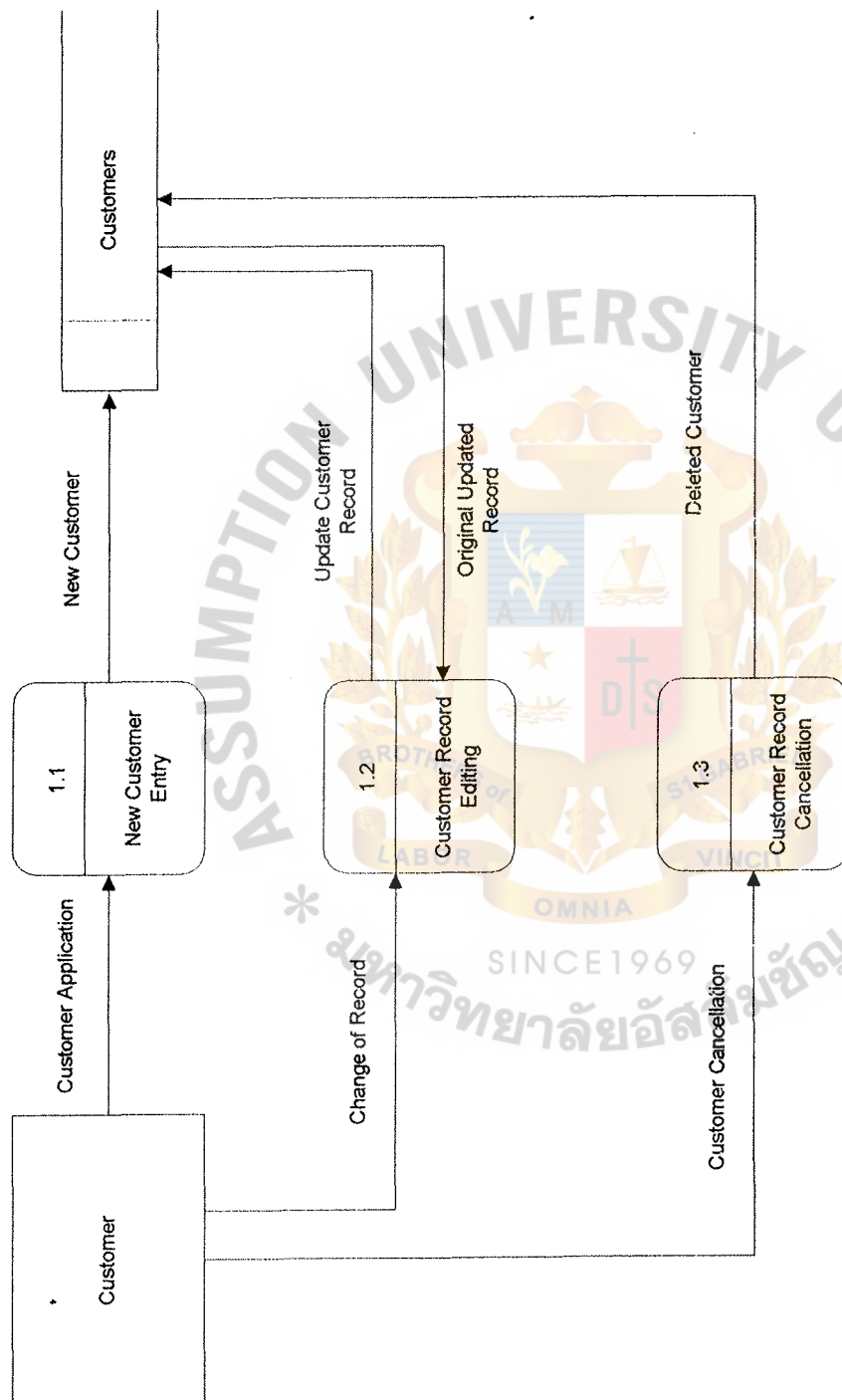


Figure B.3. Data Flow Diagram Level 1 of the Proposed System.

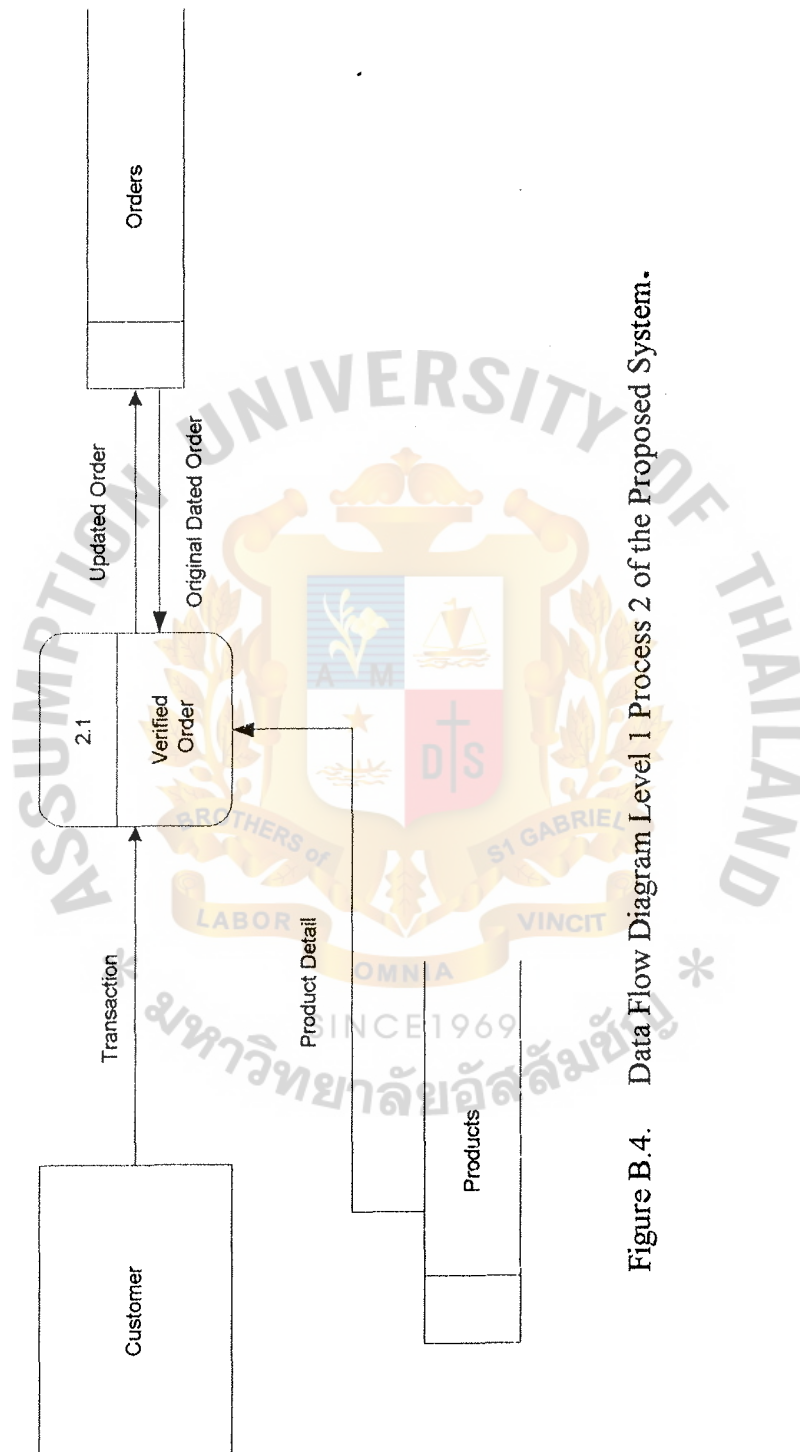


Figure B.4. Data Flow Diagram Level 1 Process 2 of the Proposed System.

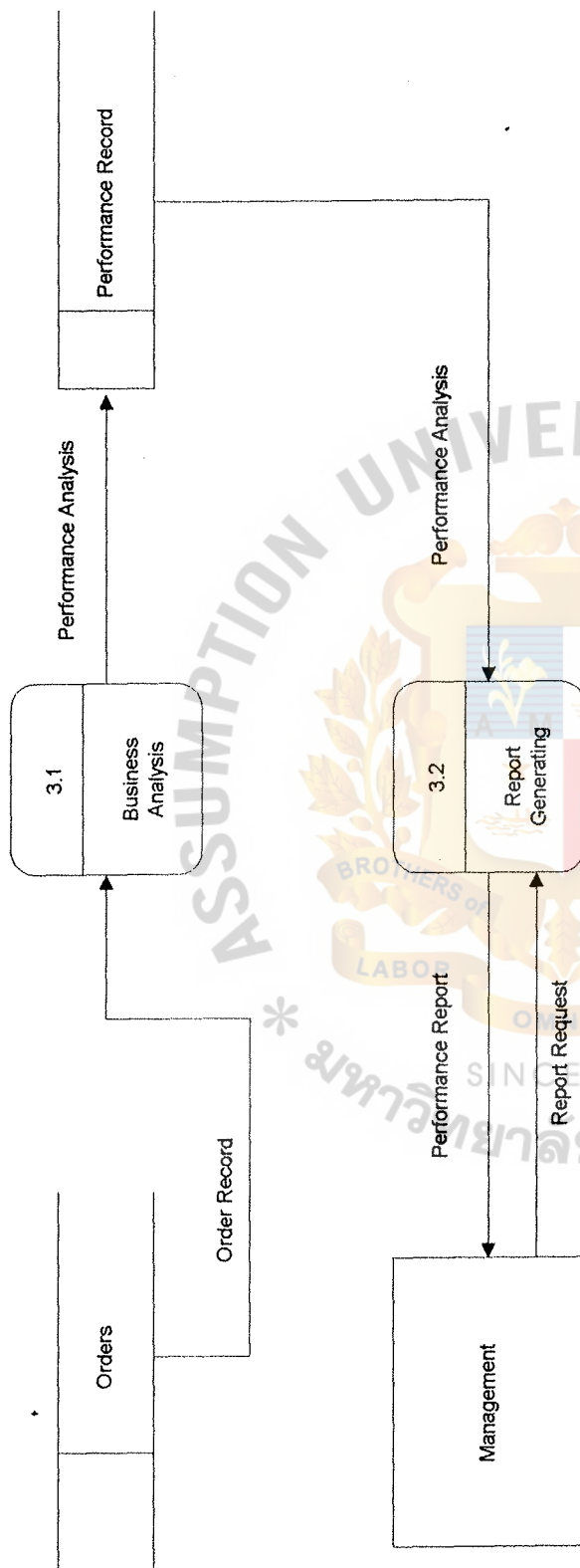


Figure B.5. Data Flow Diagram Level 1 Process 3 of the Proposed System.



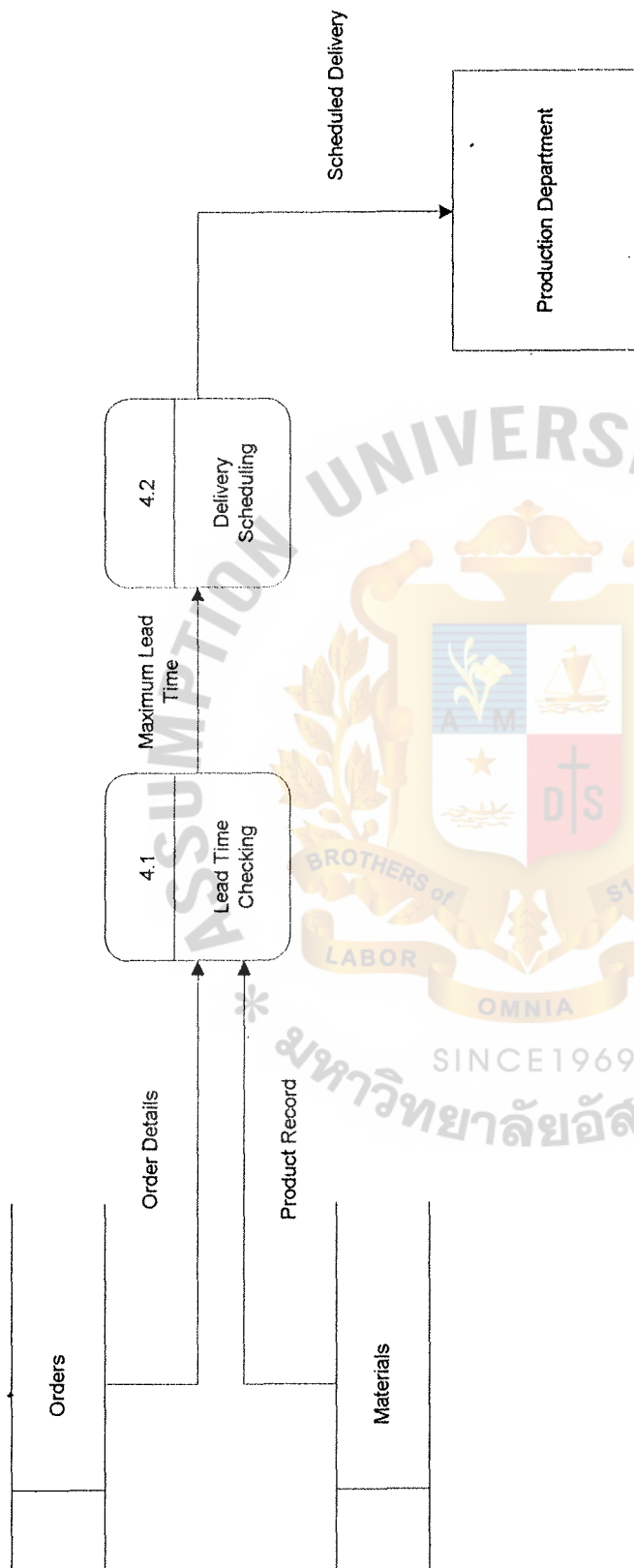


Figure B.6. Data Flow Diagram Level 1 Process 4 of the Proposed System.

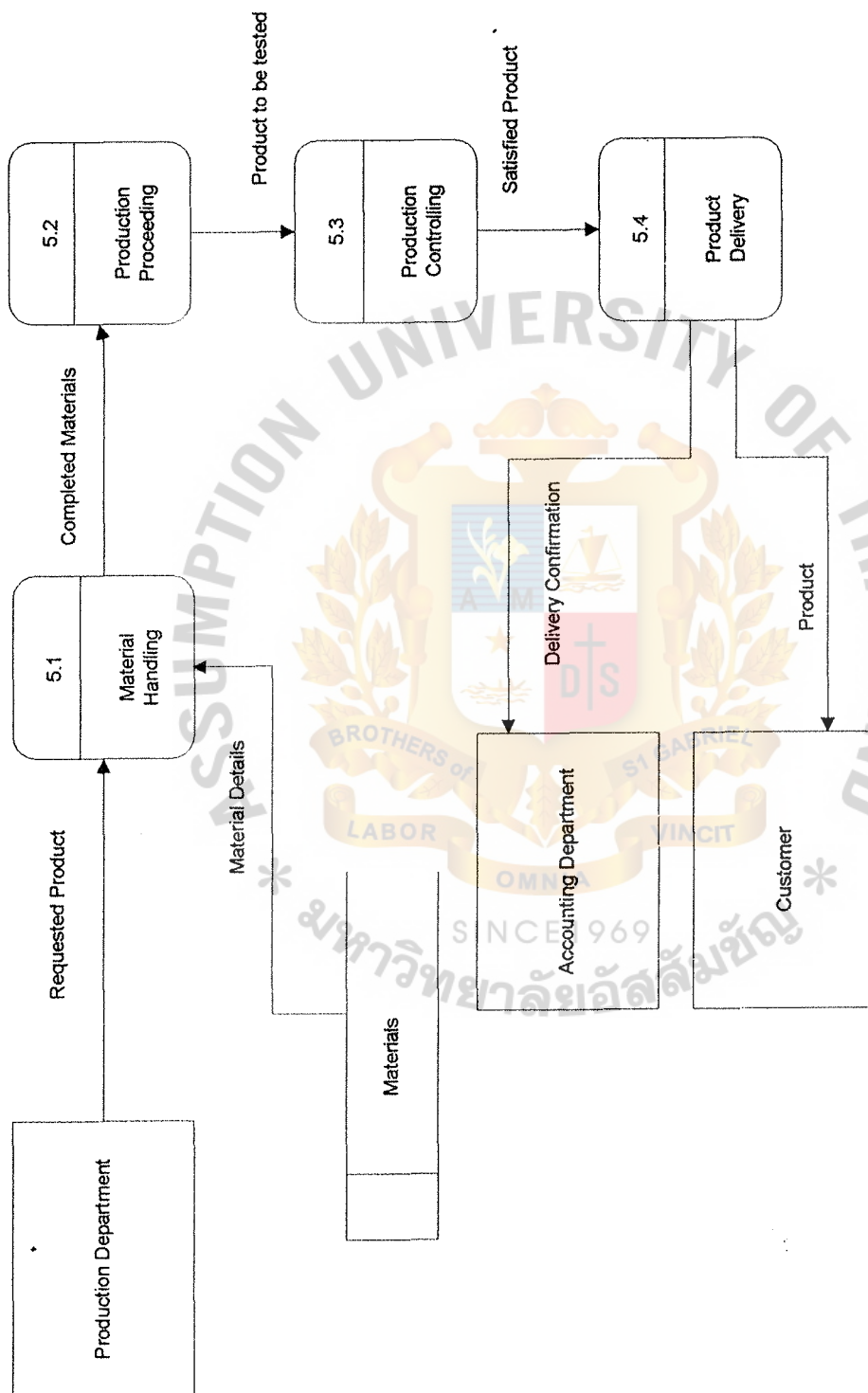


Figure B.7. Data Flow Diagram Level 1 Process 5 of the Proposed System.

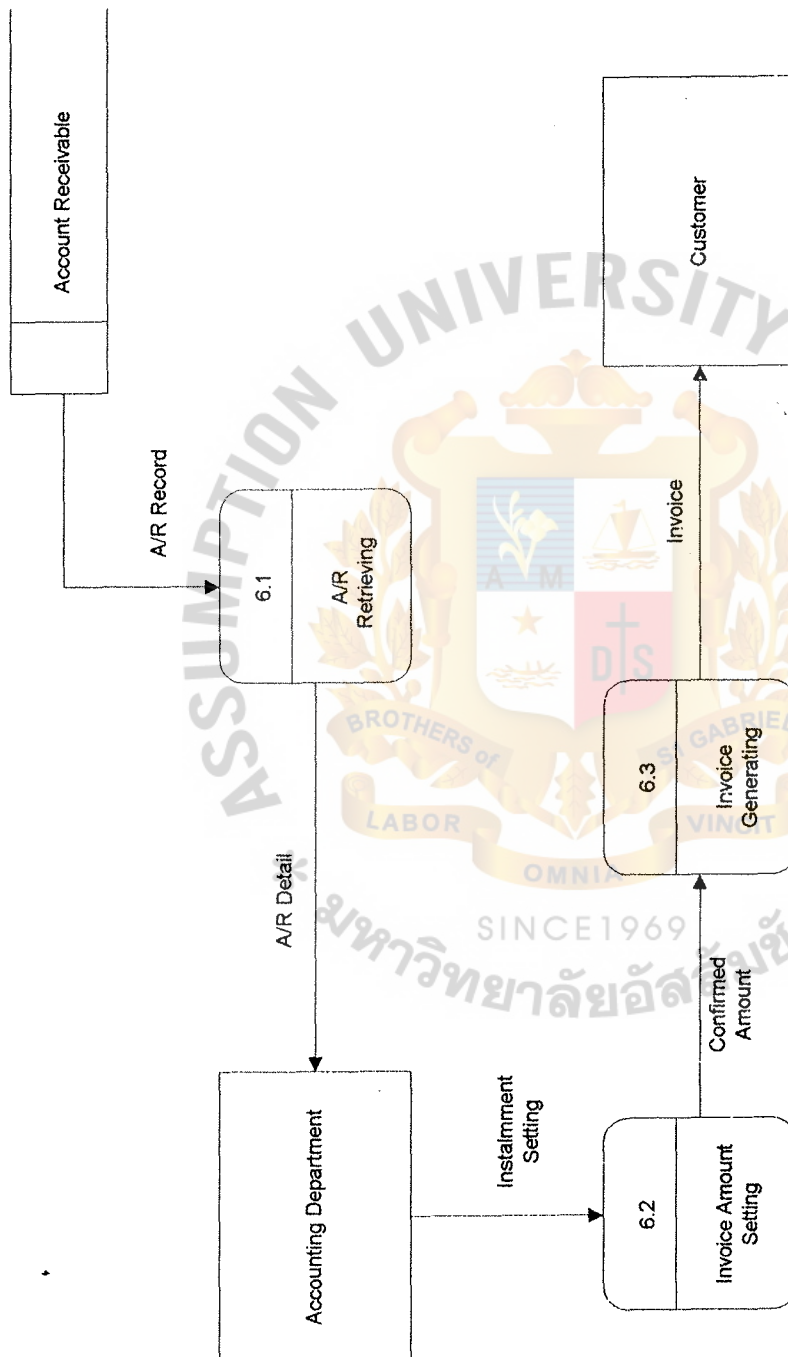


Figure B.8. Data Flow Diagram Level 1 Process 6 of the Proposed System.

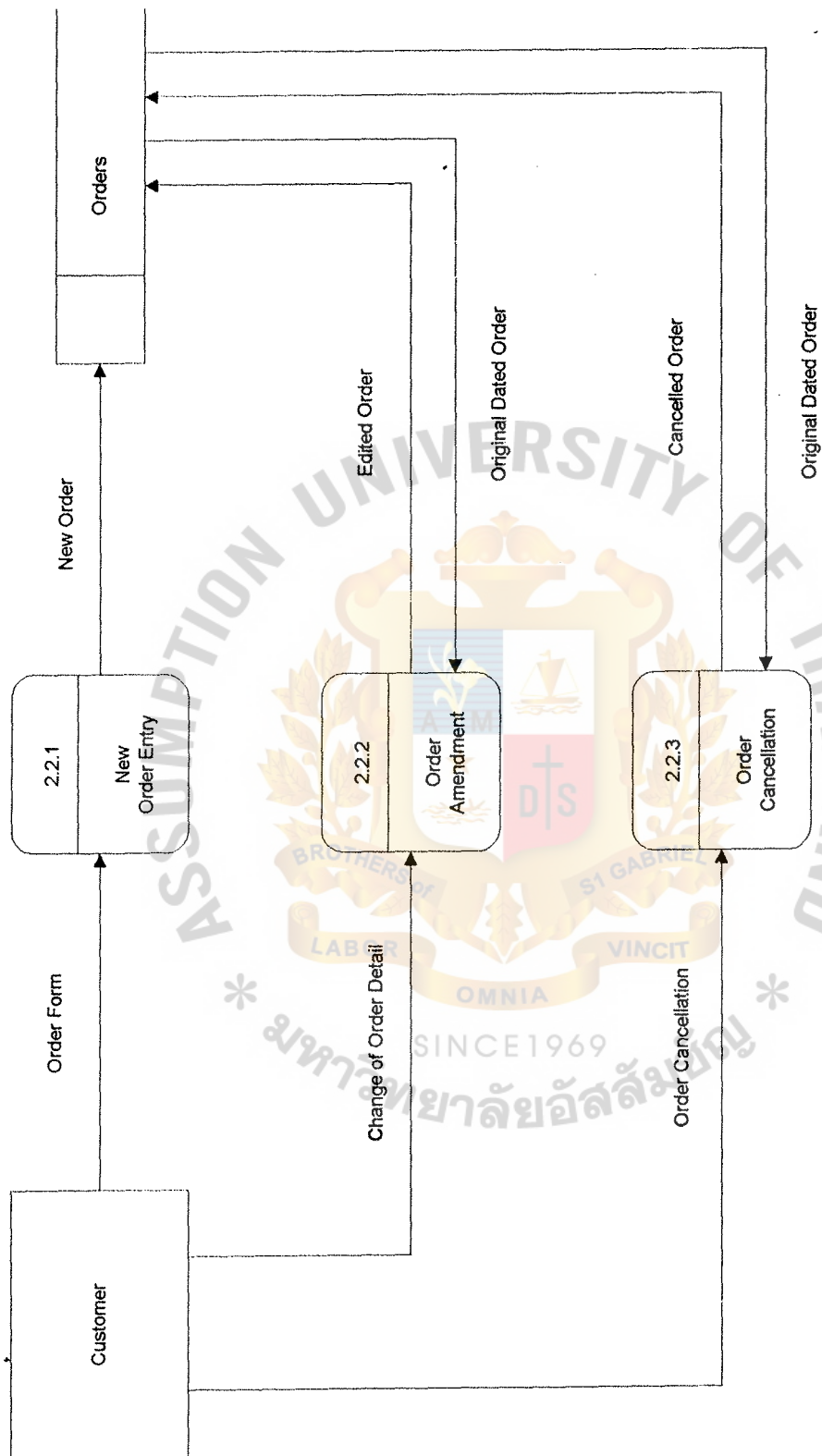


Figure B.9. Data Flow Diagram Level 2 Process 2 of the Proposed System.





## PROCESS SPECIFICATION

Table C.1. Process Specification of Process 1.1.1.

Process Name:	Record New Customer
Data In:	Customer Information
Data Out:	Customer Record
Process:	(1) Get customer data - customer name, customer title, address, phone number, fax number and assign new customer code (2) Record customer data into customer database
Attachment:	(1) Customer (2) Data Store D1

Table C.2. Process Specification of Process 1.1.2.

Process Name:	Amend Customer Information
Data In:	Updated Customer Information
Data Out:	Customer Record
Process:	(1) Get Updated customer data - customer name, address, phone number, fax number and assign new customer code (2) Record customer data into customer database
Attachment:	(1) Customer (2) Data Store D1

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Table C.3. Process Specification of Process 1.1.3.

Process Name:	Cancel Customer Information
Data In:	Customer Code
Data Out:	Deleted Customer Record
Process:	(1) Deleted Customer Information by Canceling customer code (2) Update customer database
Attachment:	(1) Customer (2) Data Store D1

Table C.4. Process Specification of Process 1.2.1.

Process Name:	Record New Order
Data In:	Order Information, Product Information
Data Out:	Order Record
Process:	(1) Get necessary order data – order number, customer code, product code, product type number, fitting code, sash amount, size, unit price, delivery place salesperson ID, and etc. (2) Calculate Order volume (3) Calculate Order Amount (4) Record order data into order database
Attachment:	(1) Order (2) Data Store D2

Table C.5. Process Specification of Process 1.2.2.

Process Name:	Amend Order Information
Data In:	Updated Order Information, Product Information
Data Out:	Updated order Record
Process:	<ol style="list-style-type: none"> <li>(1) Get updated order data – order number, customer code, product code, product type number, fitting code, sash amount, size, unit price, delivery place and etc.</li> <li>(2) Update order volume</li> <li>(3) Update order amount</li> <li>(4) Record updated order data into order database</li> </ol>
Attachment:	<ol style="list-style-type: none"> <li>(1) Order</li> <li>(2) Data Store D2</li> </ol>

Table C.6. Process Specification of Process 1.2.3.

Process Name:	Cancel Order Information
Data In:	Order Number
Data Out:	Deleted Order Record
Process:	<ol style="list-style-type: none"> <li>(1) Delete order record by canceling order number</li> <li>(2) Updated order database</li> </ol>
Attachment:	<ol style="list-style-type: none"> <li>(1) Order</li> <li>(2) Data Store D2</li> </ol>



Table C.7. Process Specification of Process 1.3.1.

Process Name:	Maintain Performance Record
Data In:	Order Information
Data Out:	Updated Performance Record
Process:	(1) Get customer, product and order details from order database (2) Calculate the total sale amount (3) Write daily and monthly sales report
Attachment:	(1) Data Store D4

Table C.8. Process Specification of Process 1.3.2.

Process Name:	Generate Performance Report
Data In:	Sales Period
Data Out:	Daily Report and Monthly Report
Process:	(1) Get requested sales period for report printing (2) Print out the requested report
Attachment:	(1) Data Store D4

Table C.9. Process Specification of Process 1.4.1.

Process Name:	Check Lead Time
Data In:	Order Information, Material Information
Data Out:	Maximum Lead Time of Order
Process:	<ol style="list-style-type: none"> <li>(1) Get customer, product and order details from order database</li> <li>(2) Match with the material details</li> <li>(3) Check material for each product</li> <li>(4) Check lead time for out of stock materials</li> </ol>
Attachment:	(1) Data Store D2, Data Store D5

Table C.10. Process Specification of Process 1.4.2.

Process Name:	Set Delivery Schedule
Data In:	Order Information, Material Information
Data Out:	Confirmed Delivery Schedule
Process:	<ol style="list-style-type: none"> <li>(1) Get customer, product and order details from order database</li> <li>(2) Calculate production lead time</li> <li>(3) Check for coincided delivery date</li> <li>(4) Confirm delivery date</li> </ol>
Attachment:	(1) Data Store D2

Table C.11. Process Specification of Process 1.5.1.

Process Name:	Update Material Record
Data In:	Order Information, Requested Materials
Data Out:	Updated Material Record
Process:	(1) Get materials detail – material number (2) Check the left on stock materials (3) Deduct the requested amount of each material (4) Update the left on stock materials
Attachment:	(1) Data Store D5

Table C.12. Process Specification of Process 1.6.1.

Process Name:	Get Account Receivable Record
Data In:	Account Receivable Information
Data Out:	Account Receivable Record
Process:	(1) Get account receivable details (2) Read account receivable details
Attachment:	(1) Data Store D6

Table C.13. Process Specification of Process 1.6.2.

Process Name:	Set Invoice Amount
Data In:	Account Receivable Information
Data Out:	Confirmed Invoice Amount
Process:	(1) Get account receivable details (2) Set invoice amount to be collected (3) Calculate the balance amount (4) Write the balance amount
Attachment:	(1) Data Store D6

Table C.14. Process Specification of Process 1.6.3.

Process Name:	Generate Invoice
Data In:	Invoice Number, Account Receivable Information
Data Out:	Invoice
Process:	(1) Get invoice number (2) Get account receivable details (3) Print invoice
Attachment:	(1) Data Store D6





Time: 18:42      Order Processing System      Date: 22/06/00

User ID: \_\_\_\_\_

Password: \_\_\_\_\_

Figure D.1. User Identification Screen.

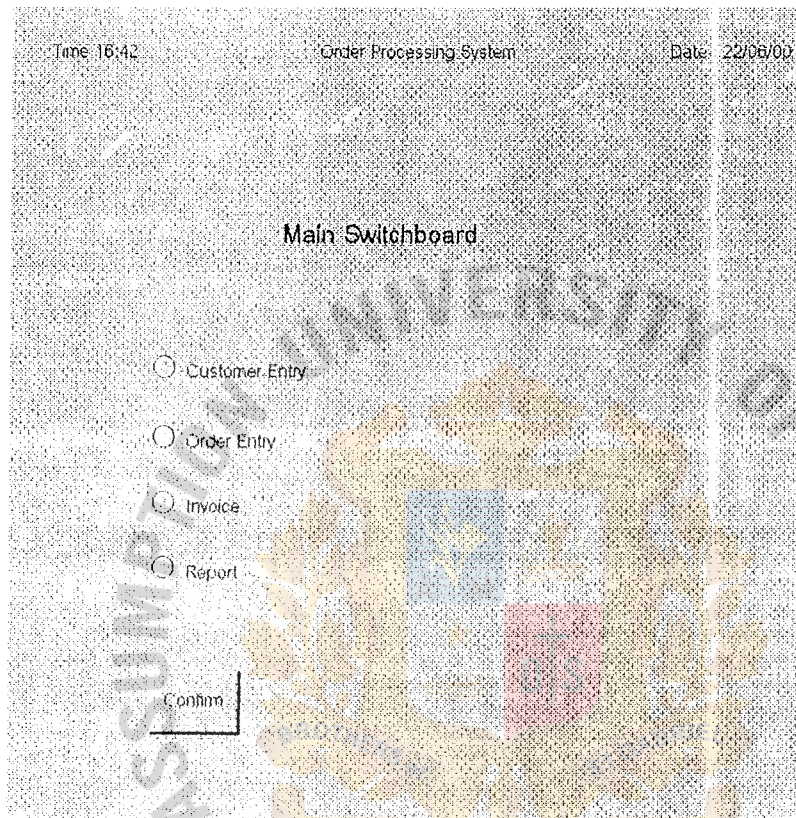


Figure D.2. Main Switchboard Screen.

Time 16:42      Order Processing System/Customer Entry      Date 22/06/00

1. New Entry      2. Amend      3. Cancel

---

Enter Selection: \_\_\_\_\_

Confirm      Cancel      Menu

Figure D.3. Customer Entry Screen.



Time 16:42      Order Processing System/ Customer Entry      Date 22/06/00

New Customer

---

Customer Code:       Type: 1 (Company) 2 (Partner) 3 (Mr.) 4 (Ms.)

Select Type:

Customer Name:

Address:

Province:       Postal Code:

Country:

Telephone:

Fax:

Figure D.4. New Customer Entry Screen.

Time 18:42      Order Processing System/Customer Entry      Date 22/06/00

Amend Customer Information

---

Customer Code:       Type: 1(Comapny) 2(Partner) 3(Mr.) 4(Ms.)

Type:

CustomerName:

Address:

Province:       Postal Code:

Country:

Telephone:

Fax:

Figure D.5. Amend Customer Entry Screen.



Time 18:42      Order Processing System/ Customer Entry      Date 22/06/00

Cancel Customer Information

---

Enter Customer Code

1	<input type="text"/>
2	<input type="text"/>
3	<input type="text"/>
4	<input type="text"/>
5	<input type="text"/>
6	<input type="text"/>
7	<input type="text"/>
8	<input type="text"/>

Figure D.6. Cancel Customer Entry Screen.

Time 16:42      Order Processing System\Order Entry      Date 12/06/00

1. New Entry      2. Amend      3. Cancel

Enter Selection : \_\_\_\_\_

Confirm      Cancel      Menu

Figure D.7. Order Entry Screen.



Time 16:42      Order Processing System/Order Entry      Date 22/06/00

New Order

---

Order Number:       Customer Code:

Item No.:

Product Form:       Size:

(1.1.SSW   1.2.SCW   1.3.STH   1.4.SFP   1.5.SSD   1.6.SFD)  
 (2.1.TSW   2.2.TCW   2.3.TTH   2.4.TFP)  
 (3.1.S58SW   3.2.Other)

Sash:       Filling:

Unit Price:       Filling Amount:

Quantity:       Unit(s):       Unit Price/set:

Total \_\_\_\_\_ Baht

Figure D.8. New Order Entry Screen.

Time: 16:42      Order Processing System/Order Entry      Date: 22/06/00

New Order

Page 2

---

Order Number: \_\_\_\_\_

Item No.:

Product Form:       Size:

(1.1.SSW   1.2.SCW   1.3.STH   1.4.SFP   1.5.SSD   1.6.SFO)  
 (2.1.TSW   2.2.TCW   2.3.TTH   2.4.TFP)  
 (3.1.S58SW   3.2.Other)

Sash:       Fitting:

Unit Price:       Fitting Amount:

Quantity:       Unit(s):       Unit Price:

Total: \_\_\_\_\_ Baht

Figure D.9. New Order Entry Screen (Continued).



Time 16:42      Order Processing System/Order Entry      Date 22/06/00

New Order      Page 3

---

Order Number: \_\_\_\_\_

Total \_\_\_\_\_ Baht      VAT 7% \_\_\_\_\_ Baht

Total Quantity \_\_\_\_\_ Unit      Grand Total \_\_\_\_\_ Baht

Delivery Date:

Payment:

Confirm      Cancel      Menu

Figure D.10. New Order Entry Screen (Continued).



Time: 16:42      Order Processing System/Order Entry      Date: 22/06/00

New Order      Page: 4

---

Order Number: \_\_\_\_\_

Delivery Place: \_\_\_\_\_

Remark: \_\_\_\_\_

Seller: \_\_\_\_\_ Authorizer: \_\_\_\_\_

Confirm      Cancel      Menu

Figure D.11. New Order Entry Screen (Continued).

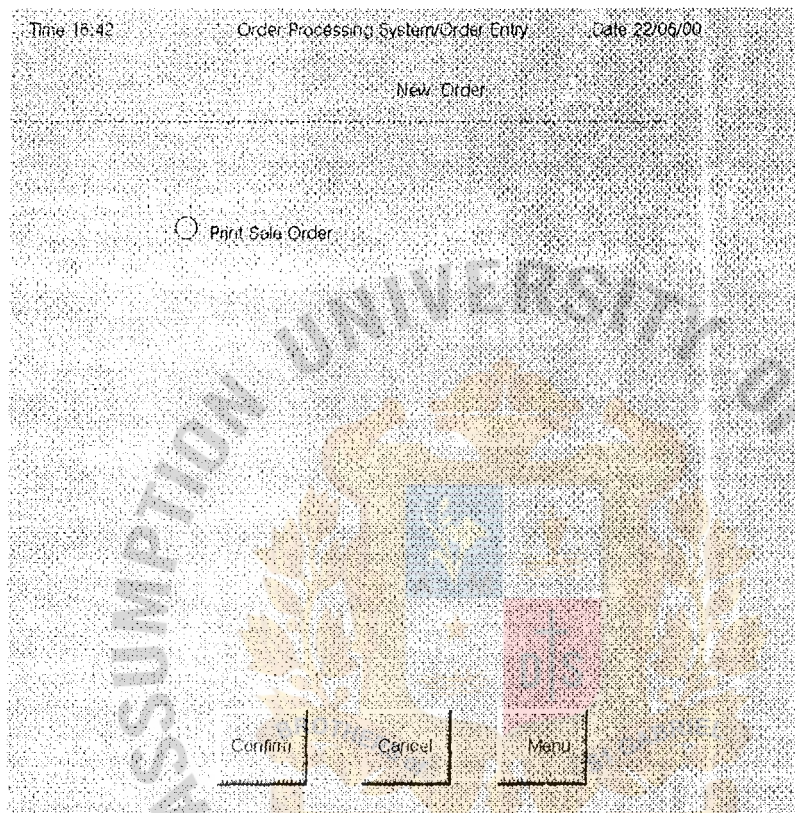


Figure D.12. Print New Order Entry Screen.

Time 16:42      Order Processing System\Order Entry      Date 22/06/00

Amend Order

---

Order Number:

Customer Name:

Item No.:

Product Form:       Size:

(1.1.SSW   1.2.SCW   1.3.STH   1.4.SFP   1.5.SSD   1.6.SFC)  
 (2.1.TSW   2.2.TCW   2.3.TTH   2.4.TFP)  
 (3.1.S58SW   3.2.Other)

Sash:       Filling:

Unit Price:       Filling Amount:

Quantity:       Unit(s):       Unit Price:

Total:  Baht

Figure D.13. Amend Order Entry Screen.



Time 18:42      Order Processing System/Order Entry      Date 22/06/00

Amend Order

---

Order Number: \_\_\_\_\_

Customer Name: \_\_\_\_\_

Item No.:

Product Form:       Size:

(1.1.SSW   1.2.SCW   1.3.BTH   1.4.SFP   1.5.SSD   1.6.SFD)  
 (2.1.TSW   2.2.TCW   2.3.TTH   2.4.TFP)  
 (3.1.S58SW   3.2.Other)

Sash:       Fitting:

Unit Price:       Fitting Amount:

Quantity:       Unit(s):       Unit Price:

Total: \_\_\_\_\_ Baht

Figure D.14. Amend Order Entry Screen (Continued).

Time 16:42      Order Processing System/Order Entry      Date 22/06/00

Amend Order      Page 3

---

Order Number: \_\_\_\_\_

Total \_\_\_\_\_ Baht      VAT 7% \_\_\_\_\_ Baht

Total Quantity \_\_\_\_\_ Unit      Grand Total \_\_\_\_\_ Baht

Delivery Date: \_\_\_\_\_

Payment: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Figure D.15. Amend Order Entry Screen (Continued).



Time 18:42      Order Processing System/Order Entry      Date 22/05/00

Amend Order      Page 4

---

Order Number: \_\_\_\_\_

Delivery Place: \_\_\_\_\_

Remark: \_\_\_\_\_

Seller: \_\_\_\_\_ Authorizer: \_\_\_\_\_

Figure D.16. Amend Order Entry Screen (Continued).

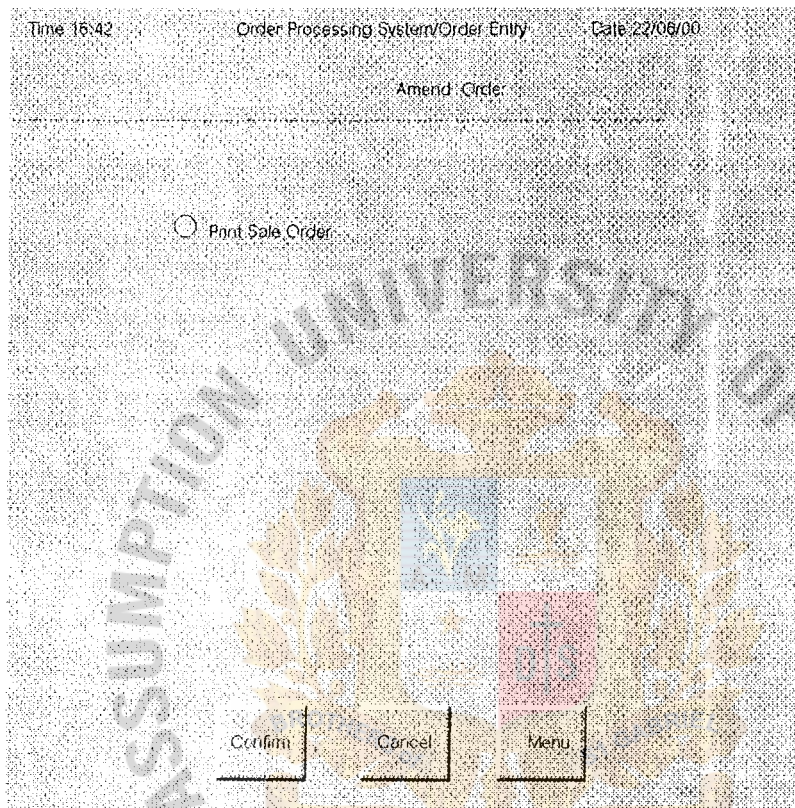


Figure D.17. Print Amend Order Entry Screen.

Time: 16:42      Order Processing System/Order Entry      Date: 22/06/00

Cancel Order

---

Enter Order Number

1	<input type="text"/>
2	<input type="text"/>
3	<input type="text"/>
4	<input type="text"/>
5	<input type="text"/>
6	<input type="text"/>
7	<input type="text"/>
8	<input type="text"/>

<input type="button" value="Confirm"/>	<input type="button" value="Cancel"/>	<input type="button" value="Menu"/>
--	---------------------------------------	-------------------------------------

Figure D.18. Cancel Order Entry Screen.



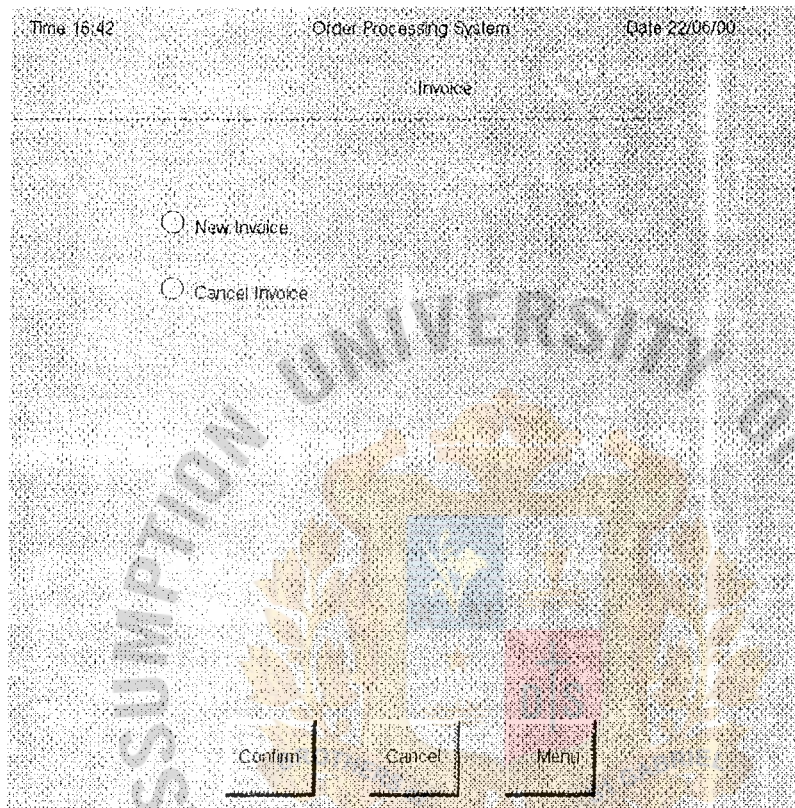


Figure D.19. Invoice Entry Screen.

Time 16:42      Order Processing System/Invoice      Date 22/06/00

New Invoice

---

Order Number:       Customer Code:

☐ Pay Full Amount

☐ Pay as Instalment

% of the total amount

Figure D.20. New Invoice Entry Screen.



Time 16:42      Order Processing System/Invoice      Date 22/06/00

New Invoice      Invoice No. \_\_\_\_\_

---

Order Number:       Customer Code:

Total Amount: \_\_\_\_\_ Baht

Vat: \_\_\_\_\_ Baht

Grand Total: \_\_\_\_\_ Baht

Balance in order: \_\_\_\_\_ Baht

Amount stated in Invoice: \_\_\_\_\_ Baht

Vat stated in Invoice: \_\_\_\_\_ Baht

Grand total stated in Invoice: \_\_\_\_\_ Baht

Balance in order: \_\_\_\_\_ Baht

Figure D.21. New Invoice Entry Screen (Continued).

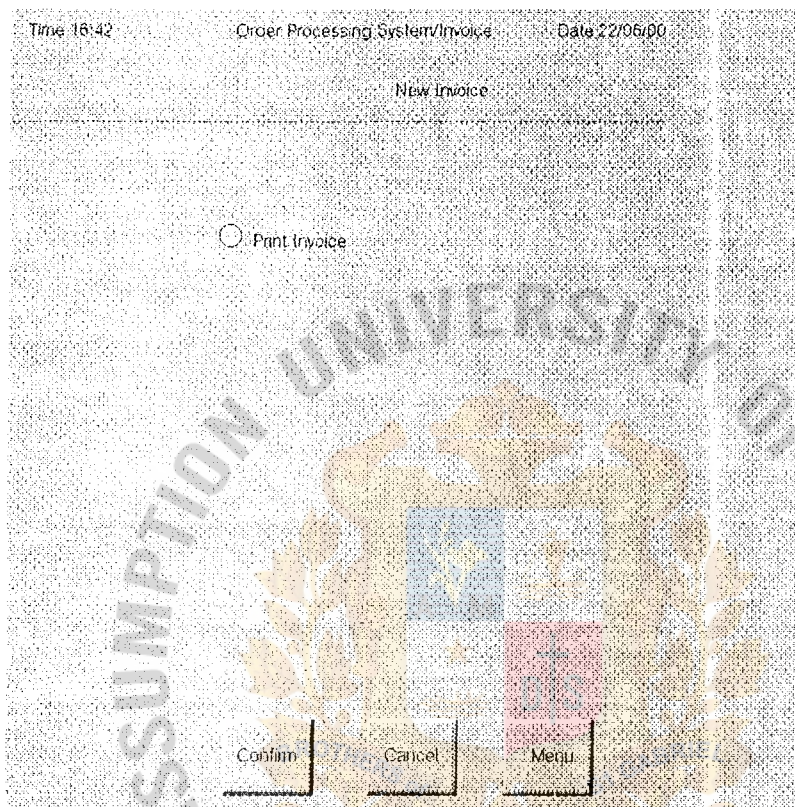


Figure D.22. Print Invoice Entry Screen.

Time: 16:42      Order Processing System/Invoice      Date: 22/06/00

Cancel Invoice

---

Enter Invoice Number:

1	<input type="text"/>
2	<input type="text"/>
3	<input type="text"/>
4	<input type="text"/>
5	<input type="text"/>
6	<input type="text"/>
7	<input type="text"/>
8	<input type="text"/>

Confirm      Cancel      Menu

Figure D.23. Cancel Invoice Entry Screen.



Time 18:42      Order Processing System/Report      Date 22/06/00

Reports

☐ Customer Lists

☐ Sale Order Print

☐ Balance Settlement Report

☐ Daily Sale Report

☐ Monthly Sale Report

☐ Item Sale Report

☐ Overdue Report

☐ Monthly Outstanding Report

Confirm      Cancel      Menu

Figure D.24. Report Entry Screen.





## APPENDIX E

### REPORT DESIGN

Customer List Report						Date 22/08/00
Customer Code	Customer Name	Address	Province	Tel.no.	Fax.No.	
A001	Asara Tinjan	59 Phayathai Rd., Pathuwan	Bangkok	254-8567	254-8596	
B001	Benjawan Rong	54 Ladprao Rd., Bangkok	Bangkok	539-4215	539-7414	
B002	Benjaporn Umpakit	88 Ladplakao Rd., Ladprao	Bangkok	521-5312	---	
C001	Chaiwat Chuttong	75 Wuttakard Rd., Jomthong	Bangkok	469-4487	---	
C002	Chamaipom Jalil	24 Ramkamheang Rd.,	Bangkok	374-5864	---	
H001	Hassawadee kunna	31 Ladplakao Rd., Ladprao	Bangkok	570-8424	---	
K001	Kung Kam	12 Ladplakao Rd., Ladprao	Bangkok	940-9785	940-8666	
P001	Patcharee Ongk	45 Yaowarad Rd.,	Bangkok	245-8965	---	
P002	Penchan Kongkaew	48 Ladprao Rd., Bangkok	Bangkok	512-6478	512-8457	
T001	Tippaporn Songkul	321 Ladprao Rd. Bangkok	Bangkok	514-2947	514-8234	
T002	Theme Co., Ltd.	241 Rachdapisek Rd., Ladyao	Bangkok	944-9254	944-9532	
R001	Rewadee Chan	24 Ramkamheang Rd.,	Bangkok	234-8964	---	

Figure E.1. A Customer List Report.

Balance Settlement Report						
Period:01/6/00-31/06/00				Date 22/08/00		
Order Date	Order No.	Seller	Customer Code/Name	Debit	Credit	Balance
10/6/00	J4120	001	T001/Tippaporn Songkul	204,530.00	204,530.00	0.00
12/6/00	J4121	101	T002/Theme Co., Ltd.	142,500.00	142,500.00	0.00
14/06/00	J4122	001	A001/Asara Tinjan	25,000.00	25,000.00	0.00
15/06/00	J4123	111	P002/Penchan Kongkaew	145,890.00	145,890.00	0.00
17/06/00	J4124	111	C001/Chaiwat Chuttong	850,780.00	850,780.00	0.00
20/06/00	J4125	001	R001/Rewadee Chan	1,500,080.00	1,000,000.00	-500,080.00
25/06/00	J4126	101	K001/Kung Kam	604,500.00	604,500.00	0.00
30/06/00	J4127	101	H001/Hassawadee kunna	421,200.00	421,200.00	0.00
Total Balance						-500,080.00

Figure E.2. A Balance Settlement Report.

Daily Sale Report				
Order Date	Order No.	Seller	Customer Code/Name	Date 23/08/00 Order Amount
22/08/00	J6111	001*	T003/Torn Penchan	112,400.00
Total Balance				112,400.00

Figure E.3. Daily Sale Report.



Monthly Sale Report					Date 30/09/00
Period : June 2000					
Order Date	Order No.	Seller	Customer Code/Name	Order Amount	
10/6/00	J4120	001	T001/Tippapom Songkul	204,530.00	
12/6/00	J4121	101	T002/Theme Co., Ltd.	142,500.00	
14/06/00	J4122	001	A001/Asara Tinjan	25,000.00	
15/06/00	J4123	111	P002/Penchana Kongkaew	145,890.00	
17/06/00	J4124	111	C001/Chaiwat Chuttong	850,780.00	
20/06/00	J4125	001	R001/Rewadee Chan	1,500,080.00	
25/06/00	J4126	101	K001/Kung Kam	604,500.00	
30/06/00	J4127	101	H001/Hassawadee kunna	421,200.00	
Total Balance				3,894,480.00	

Figure E.4. Monthly Sale Report.

Items Sale Report				
Order No.: J4120		Date 30/09/00		
Order Date	Customer Code/Name	Sold Items	Size(Width*Height)	Quantity
10/6/00	T001/Tippaporn Songkul	Softline Sliding Window 2 panels	2.40*1.20	1
		Softline Sliding Window 2 panels (A)	2.00*1.20	1
		Softline Sliding Window 2 Panels	3.00*1.90	4
		Thermoline Casement Window 4(OPA)	2.00*1.20	8
		Softline Sliding Door 4 panels	3.20*2.20	5
Used Fittings for order number J4120				
Multipoint Lock(for sliding)		Crescent Lock(for sliding)	Multipoint Lock(for casement)	Single Lock(for casement)
Window	5 sets	1	4	0
Door	5 sets	-	4	0

Figure E.5. Item Sale Report.

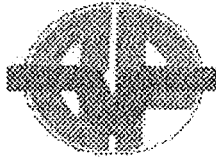
Overdue Report						
Period: June 2000		Date 22/08/00				
Order Date	Order No.	Seller	Invoice No.	Customer Code/Name	Debit	Credit
20/06/00	J4125	001	06294	R052/Rewadee Chan	1,500,080.00	1,000,000.00
					500,080.00	
					Total Overdue Balance	
					500,080.00	

Figure E.6. Overdue Report.

Monthly Outstanding Report					Date 22/08/00
Period: June 2000					
Order Date	Order No.	Seller	Invoice No.	Customer Code/Name	Credit
10/6/00	J4120	001	06289	T382/Tippaporn Songkul	204,530.00
12/6/00	J4121	101	06290	T391/Theme Co., Ltd.	142,500.00
14/06/00	J4122	001	06291	A295/Asara Tinjan	25,000.00
15/06/00	J4123	111	06292	P221/Penchan Kongkaew	145,890.00
17/06/00	J4124	111	06293	C124/Chaiwat Chuttong	850,780.00
20/06/00	J4125	001	06294	R052/Rewadee Chan	1,000,000.00
25/06/00	J4126	101	06295	K014/Kung Kam	604,500.00
30/06/00	J4127	101	06296	H025/Hassawadee konna	421,200.00
Total Account Receivable					3,394,400.00

Figure E.7. Monthly Outstanding Report.





**บริษัท บางกอก ไวนิล โปรไฟล์ จำกัด**  
**BANGKOK VINYL PROFILE CO., LTD.**

137-B LADPLAKAO RD., SARAKEBUA, LADPRAO, BANGKOK 10230 THAILAND  
 TEL. (662) 840-3794-55, 570-5683 FAX: (662) 840-3797

**ใบแจ้งหนี้/Sales Invoice**

ใบสั่งสินค้า/Order No.....

เลขที่อ้างอิง/Ref:.....

เลขที่/No.....

วันที่/Date:.....

รหัสลูกค้า/Cust.Code.....	สถานที่ส่ง/Deliver to.....
ชื่อลูกค้า/Cust.Name.....	.....
ที่อยู่/Address.....	โทร/Tel.....
.....โทร/Tel.....	ผู้รับ/Attn.....

ลำดับ ที่S/N	รหัส Prod. Code	รายการ/Description	จำนวน/ Quantity	หน่วย Unit	ราคา/หน่วย Unit Price	ราคารวม Total Amount
					ราคารวมTotal	
					ลด/Discount	
					ภาษีมูลค่าเพิ่ม	
					Vat...%	
					ราคาทั้งสิ้น/ Grand Total	

เงื่อนไข/Condition :

- 1.
- 2.
- 3.

ผู้ออกใบ/Issuer.....

ผู้มีอำนาจลงนาม/Authorizer.....

Figure E.8. Invoice Form.



**บริษัท บางกอก ไวนิล โปรไฟล์ จำกัด**  
**BANGKOK VINYL PROFILE CO., LTD.**

137-8 LA DPLAKAO RD., JARAKESUA, LADPRAO, BANGKOK 10230 THAILAND  
 TEL: (062) 540-3754-55, 575-9683 FAX: (062) 540-3757

**ใบสั่งขาย/Sales Order**

ใบสั่งสินค้า/Order No.....

เลขที่อ้างอิง/Ref:.....

วันที่/Date:.....

รหัสลูกค้า/Cust.Code.....	สถานที่ส่ง/Deliver to.....
ชื่อลูกค้า/Cust.Name.....	.....
ที่อยู่/Address.....	.....โทร/Tel.....
.....โทร/Tel.....	ผู้รับ/Aun.....

ลำดับ ที่S/N	รหัส Prod. Code	รายการ/Description	จำนวน/ Quantity	หน่วย Unit	ราคา/หน่วย Unit Price	ราคารวม Total Amount
					ราคารวม/Total	
					ลด/Discount	
					ภาษีมูลค่าเพิ่ม	
					Vat...%	
					ราคาทั้งสิ้น/ Grand Total	

เงื่อนไข/Condition :

1. ทางบริษัทฯ ขอรับมัดจำงวดแรกเป็นจำนวน 30 % ของยอดเงินทั้งหมด
2. ทางบริษัทฯ ขอรับชำระงวดที่สองเป็นจำนวน 50 % ของยอดเงินทั้งหมดเมื่อติดตั้งวงกบและบานเรียบร้อยแล้ว
3. ทางบริษัทฯ ขอรับชำระงวดที่สามเป็นจำนวน 20 % ของยอดเงินทั้งหมดเมื่อติดตั้งงานอุปกรณ์และกระจกเรียบร้อยแล้ว

ผู้ออกใบ/Issuer.....

ผู้มีอำนาจลงนาม/Authorizer.....

Figure E.9. Sales Order Form.



## DATA DICTIONARY

Table F.1. Data Dictionary of Customer Database.

Field Name	Meaning
Customer Code	Specific code for each customer
Customer Name	Name of the customer
Customer Type	Title of each customer such as Mr., Mrs., Ms, Company etc
Address	Address of the customer
Province	Province in which customer live in
Postal code	Code identify which district customer's address is located
Country	Specified country in which customer live in
TelephoneNumber	Telephone number of the customer
FaxNumber	Facsimile number of the customer



Table F.2. Data Dictionary of Order Database.

Field Name	Meaning
Order Number	Specified order number of each order
ProductNumber	Specified product number whether it is uPVC product of Aluminium product
ProductTypeNumber	Type of product such as SSW (Softline sliding window), TCW (Thermoline Casement Window)
ItemNumber	Item number to indicate how many items are included in the order
SashAmount	Sash indicator for each window or door of each item
FittingCode	Code identify the fitting to be used in each product type
EmployeeNumber	Seller identification number
DeliveryPlace	Place for products to be delivered
UnitPrice1	Price indicated on each fitting used
UnitPrice2	Price indicated on each product type (included fitting)
TotalPrice	Total price of all items
VatAmount	Amount percent of value added tax to be added on total price
GrandTotal	Total amount included VAT
Remarks	Spaces for more details to be stated in each order

Table F.3. Data Dictionary of Product Database.

Field Name	Meaning
ProductNumber	Specified product number whether it is uPVC product of Aluminium product
ProductFormNumber	Type of product such as SSW (Softline sliding window), TCW (Thermoline Casement Window)
SupplierName	Name of supplier
MaterialCodeRequired	Code of materials to be fabricated on each product form

Table F.4. Data Dictionary of Account Receivable Database.

Field Name	Meaning
InvoiceNumber	Number of the specified invoice
OrderNumber	Number of the order
CustomerName	Name of the customer
CustomerType	Title of each customer such as Mr., Mrs., Ms., Company.
Address	Address of the customer
Province	Province in which customer lives in
PostalCode	Code identifies which district customer's address is located
Country	Name of country
CreditAmount	Amount of money which is to be received on each order
DebitAmount	Amount of money which has already been paid
InvoiceBalance	Balance amount on each order



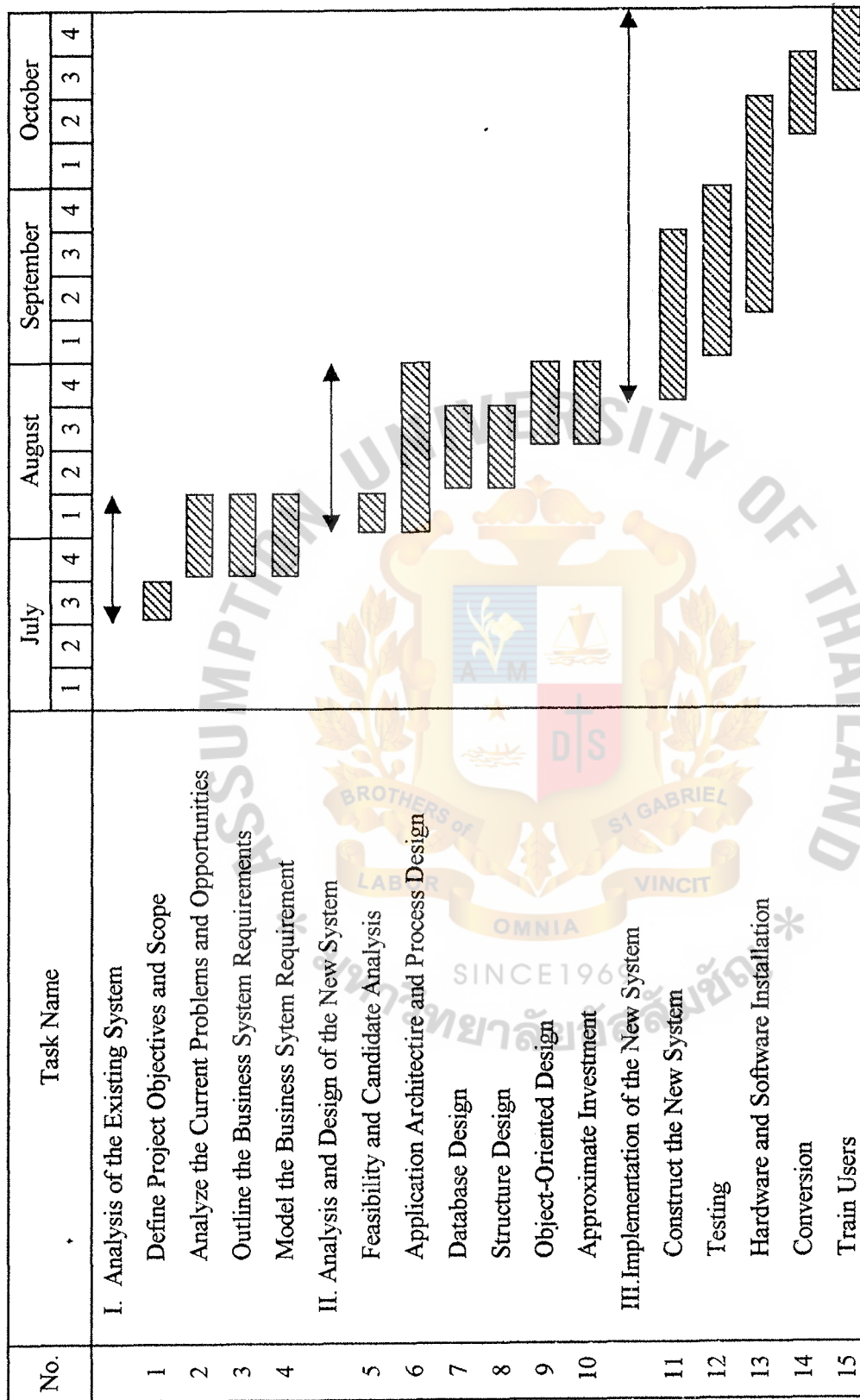


Figure G.1. Project Plan of Bangkok Vinyl Profile Co., Ltd.





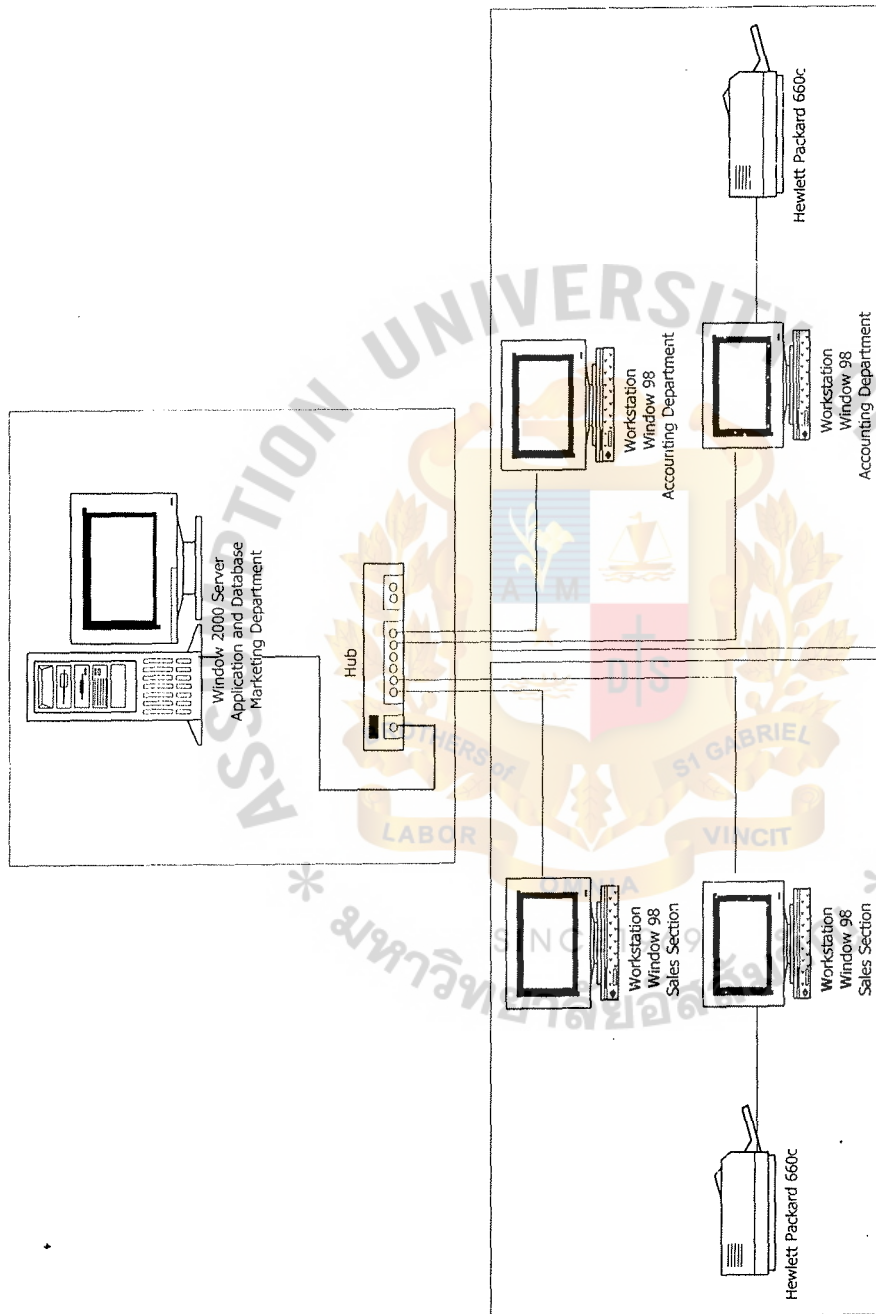


Figure H.1. Hardware Configuration of the Computerized System.



## APPENDIX I

### PAYBACK PERIOD

## I. Payback Period

The payback period method determines the length of time for the operation that the proposed system needs to pay back the cost of the investment before it becomes profitable. The payback period formula is shown below:

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

Where P = Payback period

I = Initial or Investment cost

R = Average annual return on investment  
(Tangible benefit - Operating cost)

T = Corporate tax rate in percentage (30%)

$$P = \frac{415,800}{(1-0.3) (1,060,200 - 792,000)}$$
$$= 2.15 \text{ years}$$

Pay back period (after tax) for the proposed system is 2.15 years.

### I.1 Benefit Expected

#### I.1.1 Tangible Benefit

- (1) Saving the salary of the officer 420,000 Baht

The reduction from 9 persons to 4 persons (5 officers) helps us to save the yearly cost approximately 420,000 baht

- (2) Reducing the equipment 400,200 Baht

- (3) Reducing the overtime expenses 240,000 Baht

The company normally pays the overtime wage around 20,000 Baht per month for the employees who work with manual system.

Total Saving 1,060,200 Baht



### I.1.2 Intangible Benefit

- (1) To reduce manual work which causes many problems
- (2) To increase the efficiency in every process of working
- (3) To increase the security for database files in Personnel Department
- (4) To decrease the costs in long term processing for the users
- (5) To decrease step and working time of processing
- (6) To decrease problem on duplication of data
- (7) Be easier to use for the users



Table I.1. Payback Analysis for the Proposed System, in Baht.

Cost items	Years					
	0	1	2	3	4	5
Investment Cost	-415,800					
Operation Cost		-792,000	-871,200	-958,320	-1,054,152	-1,159,567
Discount Factor for 12%	1.000	0.893	0.797	0.712	0.636	0.567
Time-adjusted cost	-415,800	-707,256	-694,346	-682,324	-670,441	-657,475
Cumulative Time-adjusted cost over lifetime	-415,800	-1,123,056	-1,817,402	-2,499,726	-3,170,167	-3,827,642
Benefits derived from operating of new system	0	1,060,200	1,166,220	1,282,842	1,411,126	1,552,239
Discount Factor for 12%	1.000	0.893	0.797	0.712	0.636	0.567
Time-adjusted cost	0	946,759	929,477	913,384	897,476	880,119
Cumulative Time-adjusted cost over lifetime	0	946,759	1,876,236	2,789,619	3,687,096	4,567,215
Cumulative lifetime time-adjusted cost+benefit	-415,800	-176,297	58,834	289,893	516,929	739,574

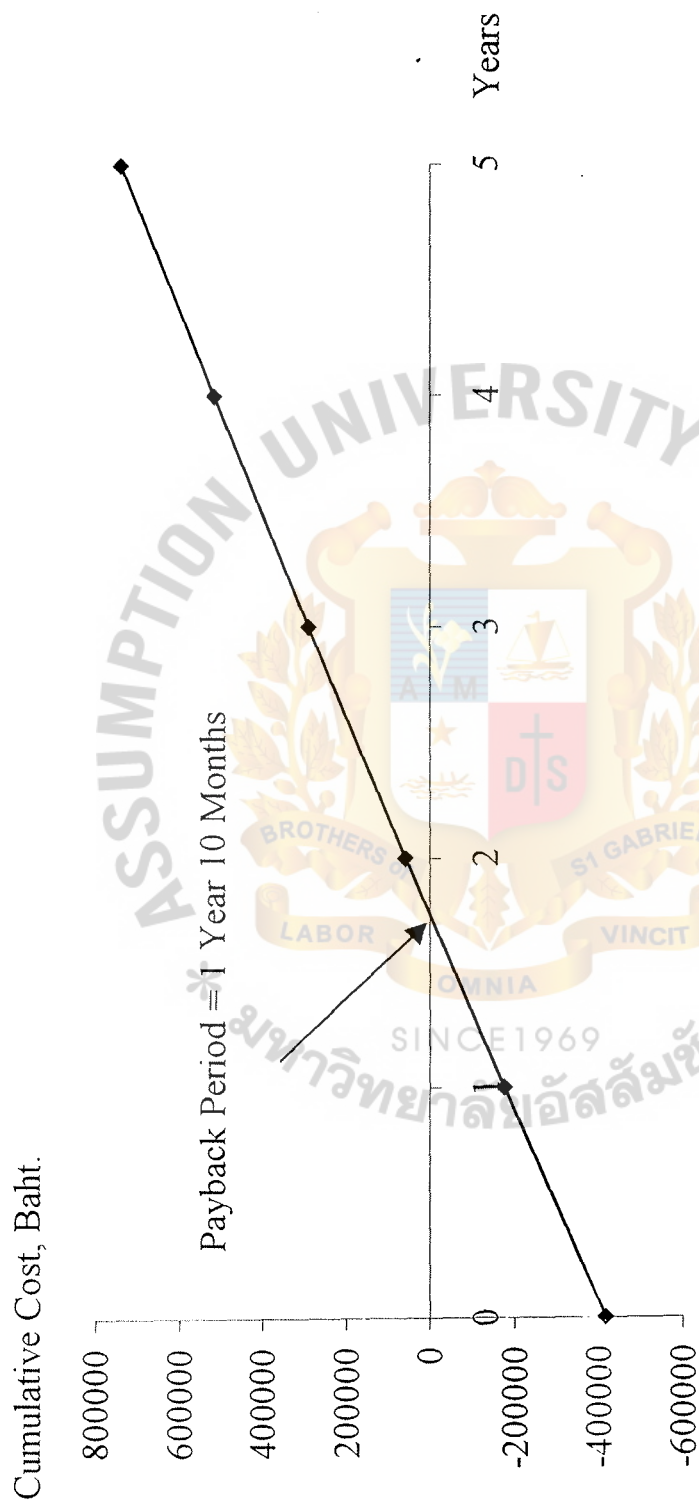


Figure I.1. Payback Analysis Graph for the Proposed Computerized System.

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