Practical Development of Information System in Business Context: Sale and Inventory System for Tong Mong Kol Company

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Submitted in Partial Fulfillment
of the Course BIS 4995 Information Systems Development
Bachelor's Degree of Business Administration
in Business Information Systems Program
Assumption University

March, 2003

Project Name:	Practical Internship Sales and Inventory System for Tong Mongkol Company, Tong Mongkol Co., LTD.
Developers:	Mr. Jun Sreesurichan Mr. Jedsada Utamawatin Miss. Chothip Oveerawong
Advisor:	A. Somchai Chaowapattanawong

The Department of Business Information Systems, ABAC School of Management has approved the aforementioned project, which includes complete Project Write-up and System submitted as the fulfillment of the 3-credit course BIS 4995 Information System Development towards the requirements for the Bachelor's Degree of Business Administration in Business Information Systems

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PROJECT WRITE-UP

Prepared by

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Figure 1-2 Project Plan for [Tong Mong Kol Industry][Tong Mong Kol System]

I. INTRODUCTION

1.1 Background of the Organization

Tong Mong Kol Industry has been established in year 2001. This company is seems to be like sole proprietorship, it means manager works in a lot of fields in the organization. It is a factory that produces about hard plastic. The process of producing is by injection machine. The examples of products are battery cover, household plastic product, medicine bottle, etc. All transaction is makes by customer order.

All raw materials are imported by other company, and are delivered to this company order by order. Usually there are not more than 2-3 kinds of plastic stock in the store.

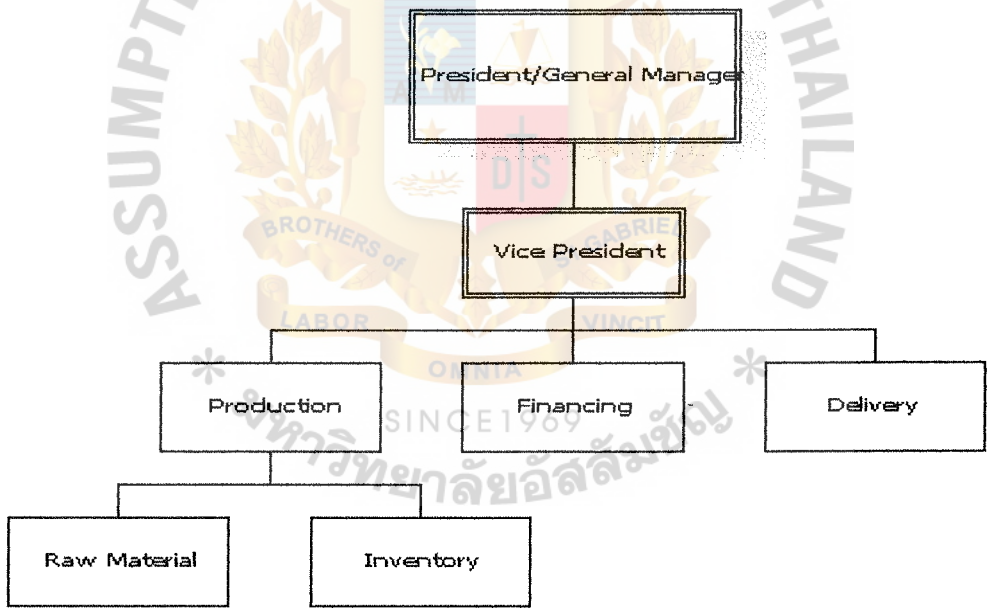

Figure 1-1 Organization Chart

1.2. Objectives of the System

- To introduce computerize into the existing system so that it reduces the complexity of work.
- To prepare report for manager to make all decision in organization
- To reduce mistake in placing the invoice
- To increase speed of setting machine each time for each product
- To make reliable record for all department such as Raw material, Inventory, Delivery, and Payment
- To make it easy for manager to control the whole organization

1.3 Scope of the System

1.3.1 Raw Material Control

This part will be used for controlling all material coming in and out from raw material department.

- Updating/Editing raw material profiles
- To record all transactions about raw material flow in/out from department
- To make raw material stock report for manager.

1.3.2 Ordering Control

This part is used to fill in all orders from our customers

- Computerize system to keep all information about customer order
- Updating and editing the customer profiles
- To prepare the daily material needed document to acquire the material from the material storeroom
- To prepare documents for production department e.g. amount needed for each product lot, specification for each product

1.3.3 Production Control

This module runs under the ordering control. It means when the order is accepted, production control will start working

- To update and edit the Product Specification
- To prepare the machine setting for each product
- To prepare raw material required for each piece of product

1.3.4 Inventory

This part is used in order to check the flow of finished products.

- To update the inventory that have been delivered
- To update the Inventory that are in the stock
- To update the inventory that are in process
- To make finish good inventory report for manager.

1.3.5 Delivery

This part is to keep all record for delivery process.

- To prepare the temporary bills of products being deliver
- To record all the delivery transactions e.g. name of driver, quantity delivered, etc.
- To prepare all delivery reports

1.3.6 Billing

This part is used to prepare the payment and receive transactions.

- To prepare Invoices and Receives for the customers
- To prepare all payment reports

II. THE EXISTING SYSTEM

2.1 Background of Existing System

All materials are purchased from a few suppliers. Usually there is not more than two or three materials store in organization stock e.g. PP, PS. When there is an order from customer, required materials will be delivered to the production part.

In production part, Quality Control people will control all processes. The qualified product will be wrapped in temporary packages, so it is available just for delivery. All finished products will be stored in Inventory department.

For payment system, this company provides only two way of payment that are by cash and 180-days credits.

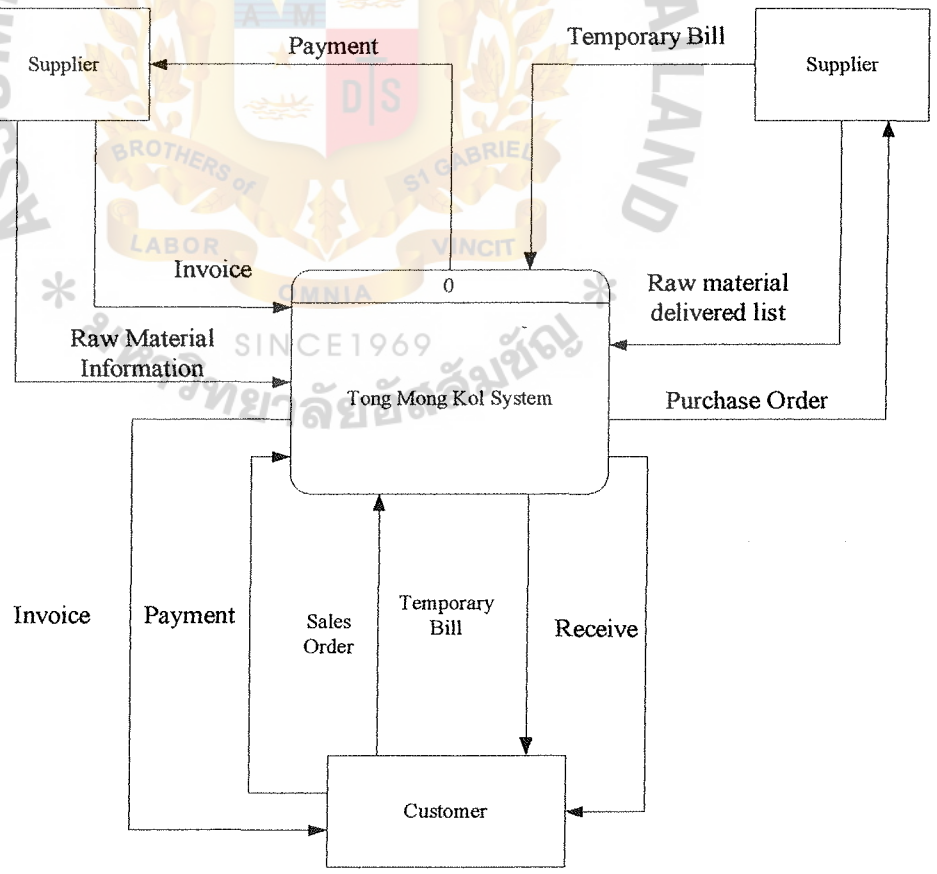

Figure 2-1 Context Diagram of Existing System

2.2 Problem Definition

(1) **Duplication of work:** waste time of new machine setting all the time

(2) **Slow manually system:** for example preparing bills, check stock

(3) **No support information in making decision:** it is very difficult to make decision about the trend of order

III. THE PROPOSED SYSTEM

3.1 System Specification

(1) Hardware Requirements

Table 3-1 Hardware Requirements

HAREWARE	SPECIFICATION
CPU	Celeron 1.2GHz
RAM	256
Hard disk	40 GB

We choose Celeron for this hardware specification because it is enough for this application and cost saving instead of using Pentium. We can maximize Ram and Hard Disk for future expansion.

(2) Software Requirements

Table 3-2 Software Requirements

SOFTWARE	SPECIFICATION
Operating System	Windows ME
Application	Microsoft Access, Visual Basic 6.0, Crystal Report

We use window ME because this application is not involve with networking on the job. Meanwhile, we use VB because it is compatible with window ME along with Microsoft Access to keep all database files. Finally, Crystal Report would be use to produce the report because of its ability to make a formal report to manager.

3.2 System Design

(1) Data Flow Diagram

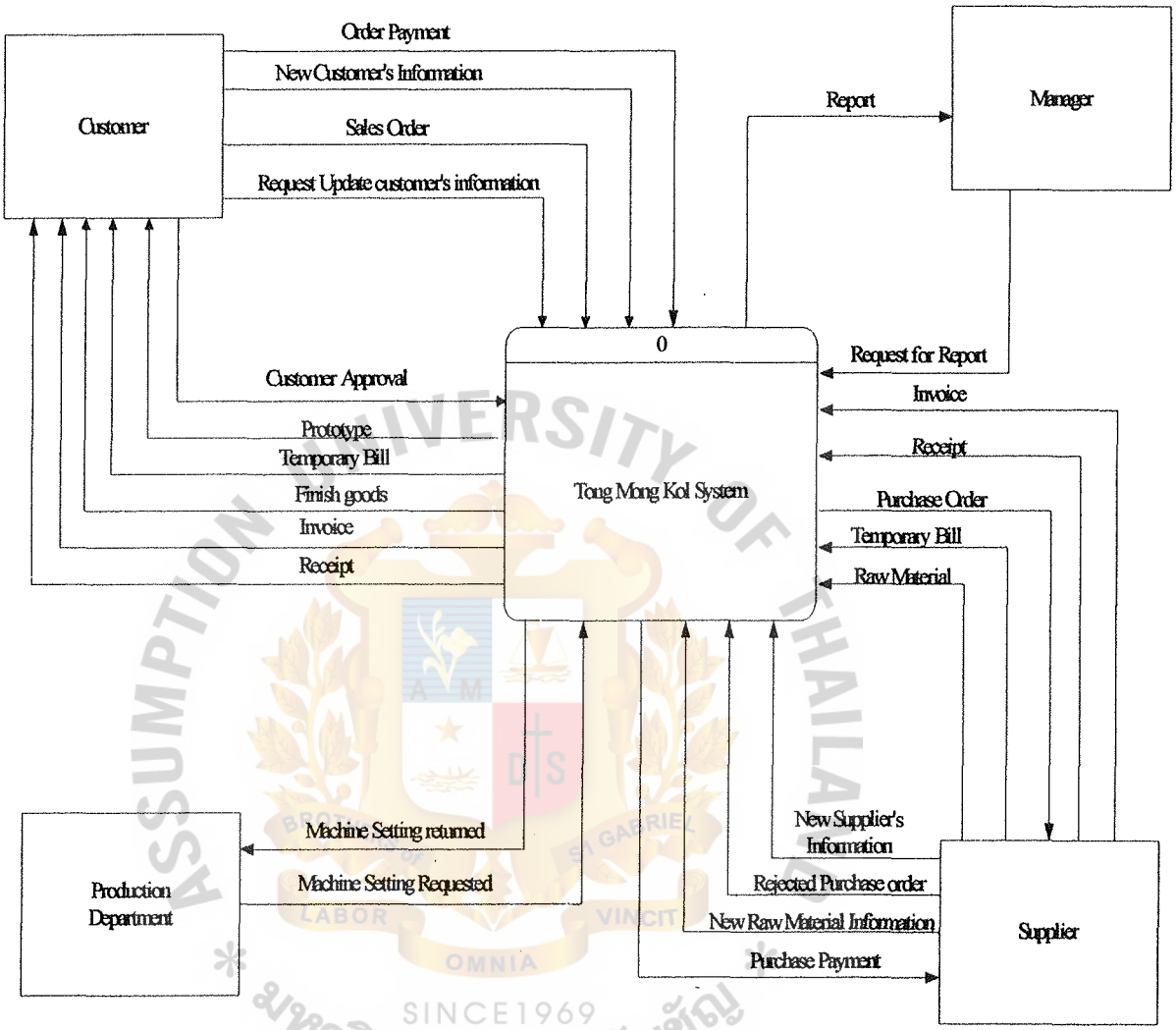

Figure 3-1 Context Diagram

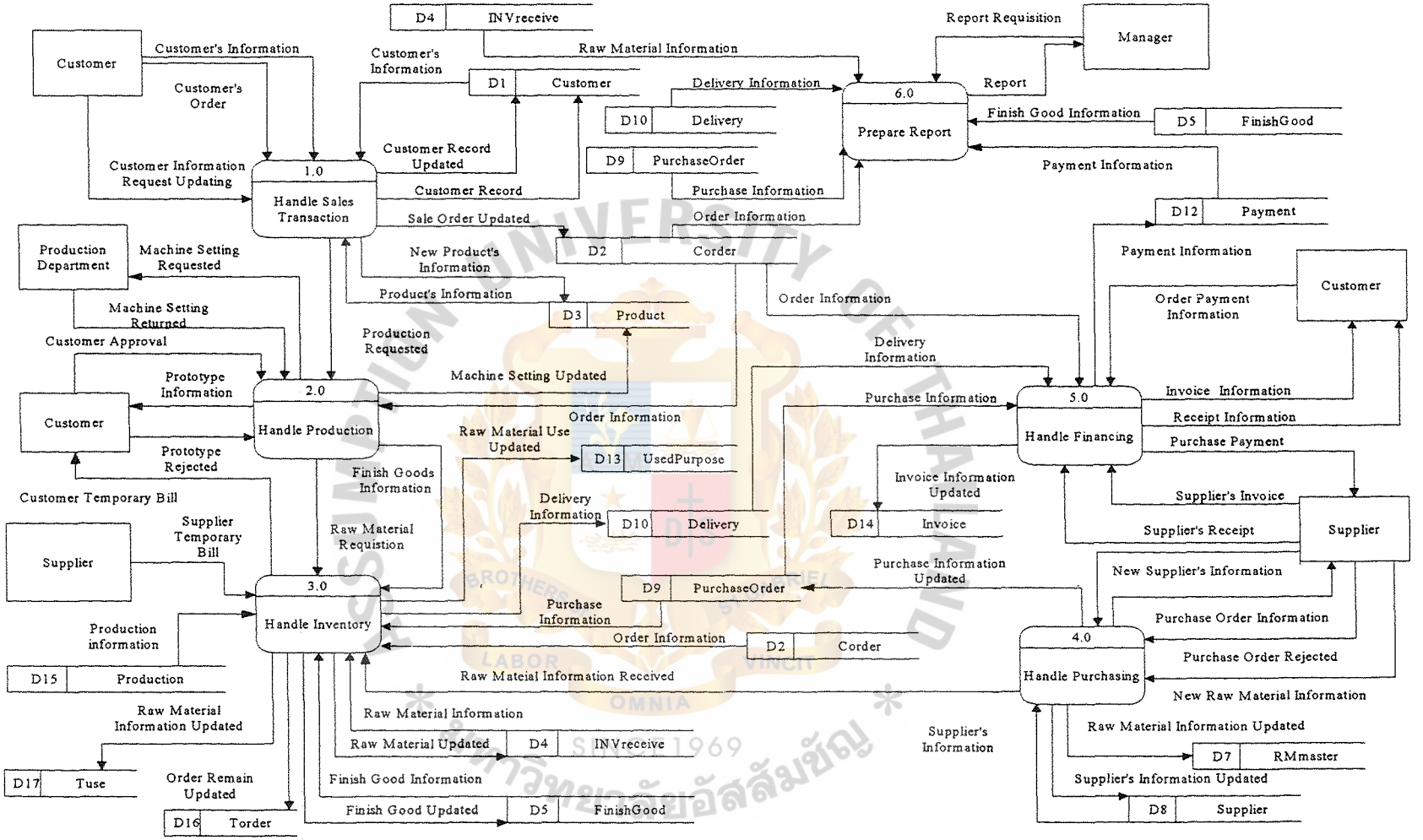

Figure 3-2 Data Flow Diagram – Level 0

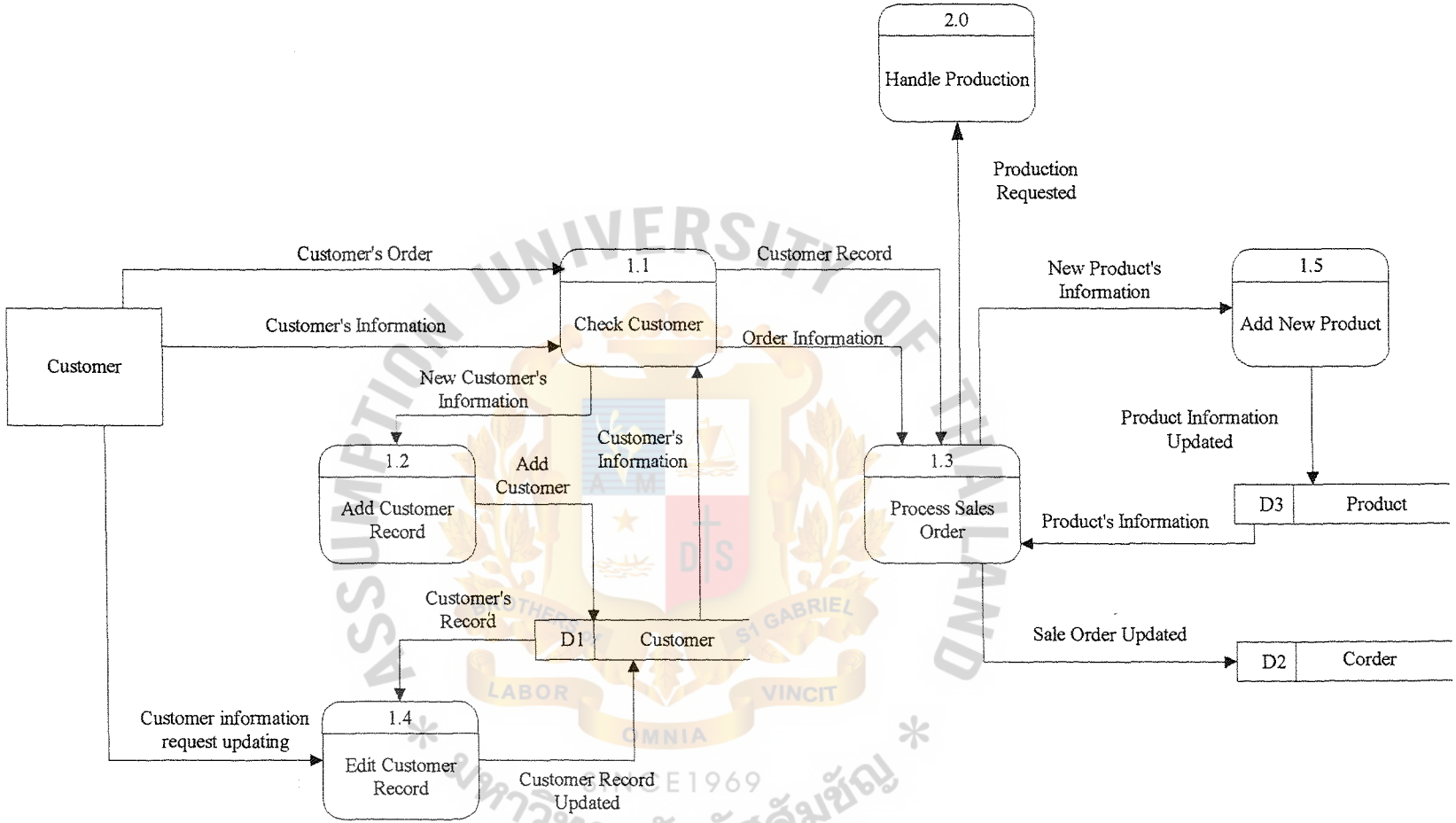

Figure 3-3 Data Flow Diagram – Level 1 for Process 1

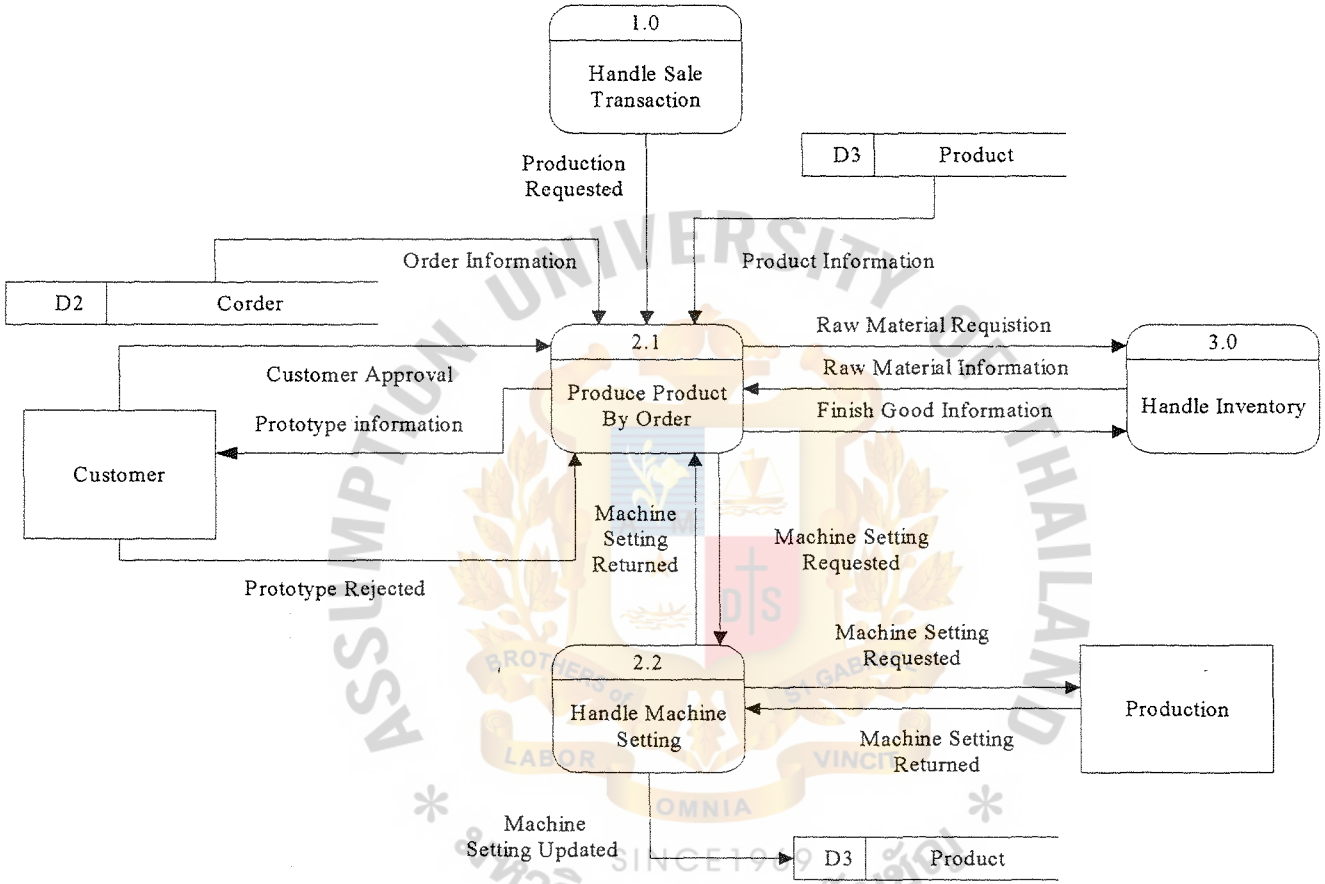

Figure 3-4 Data Flow Diagram – Level 1 for Process 2

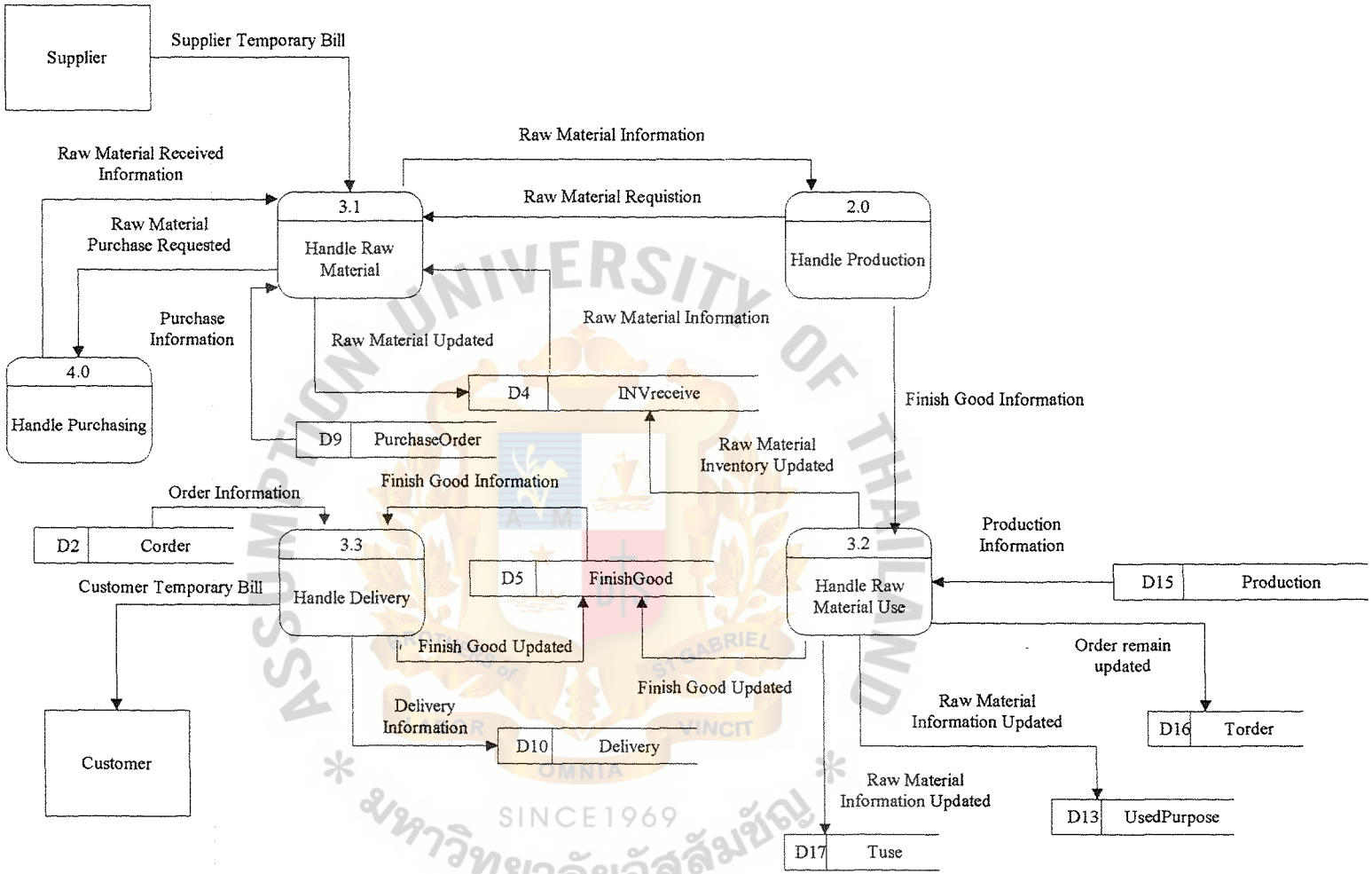

Figure 3-5 Data Flow Diagram – Level 1 for Process 3

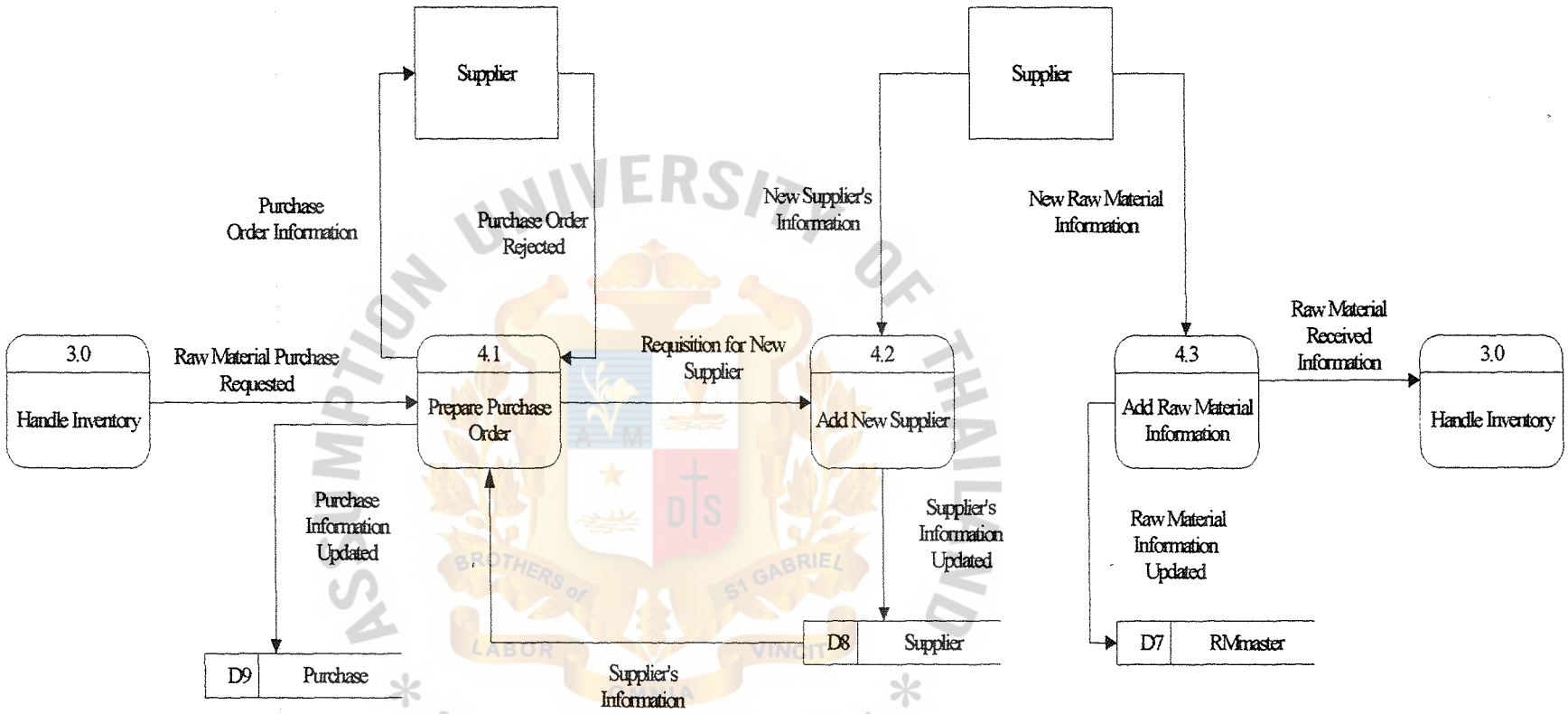

Figure 3-6 Data Flow Diagram – Level 1 for Process 4

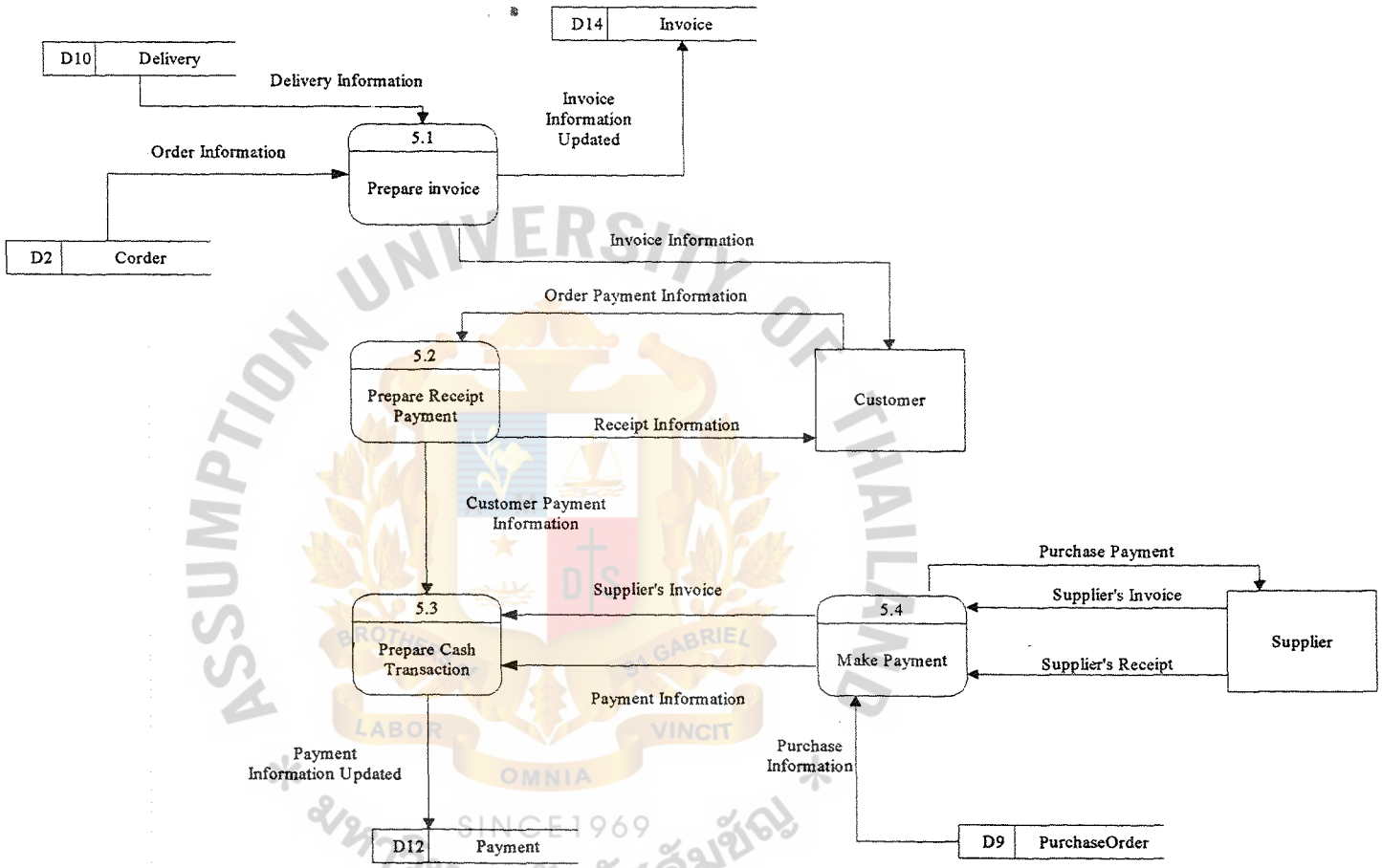

Figure 3-7 Data Flow Diagram – Level 1 for Process 5

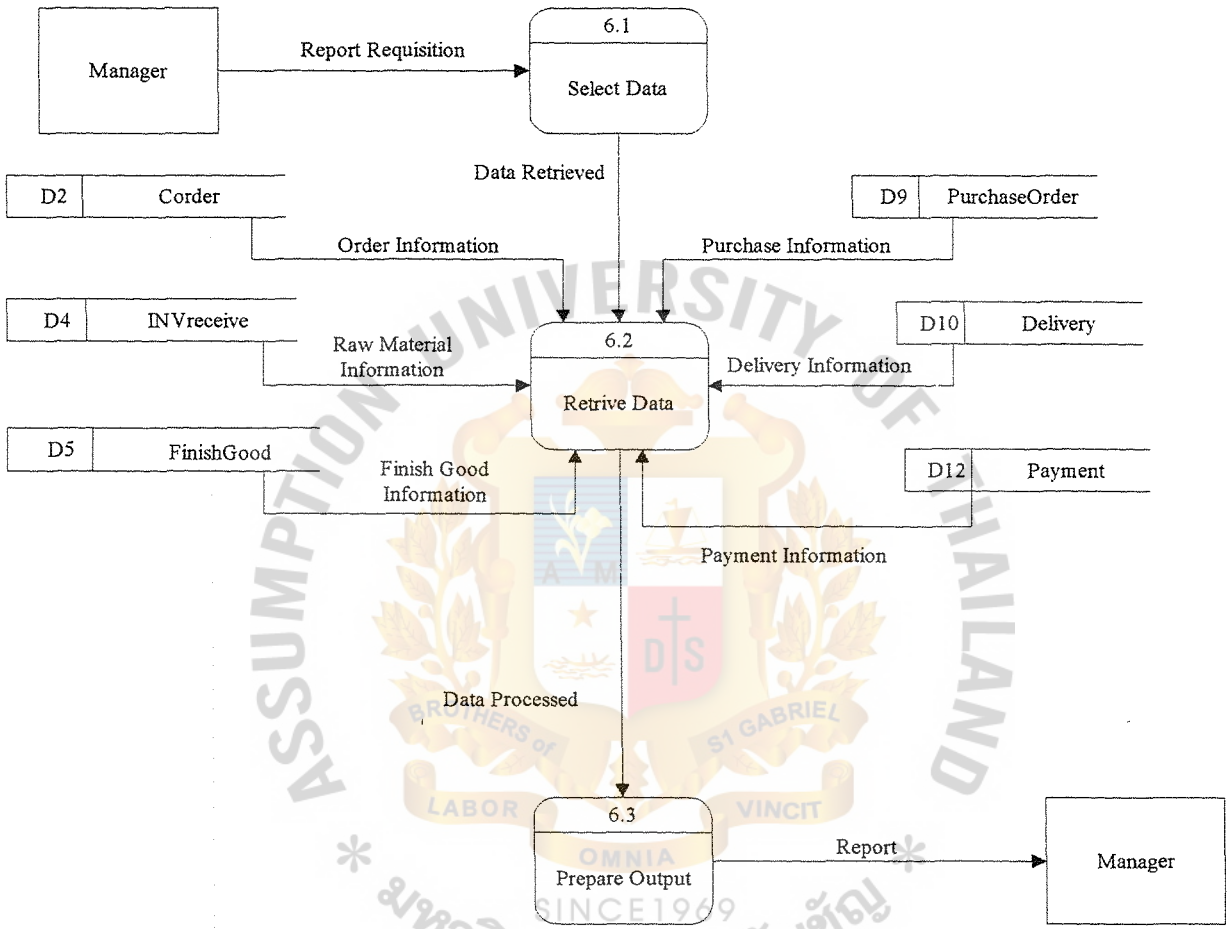

Figure 3-8 Data Flow Diagram – Level 1 for Process 6

(2) Entity Relationship

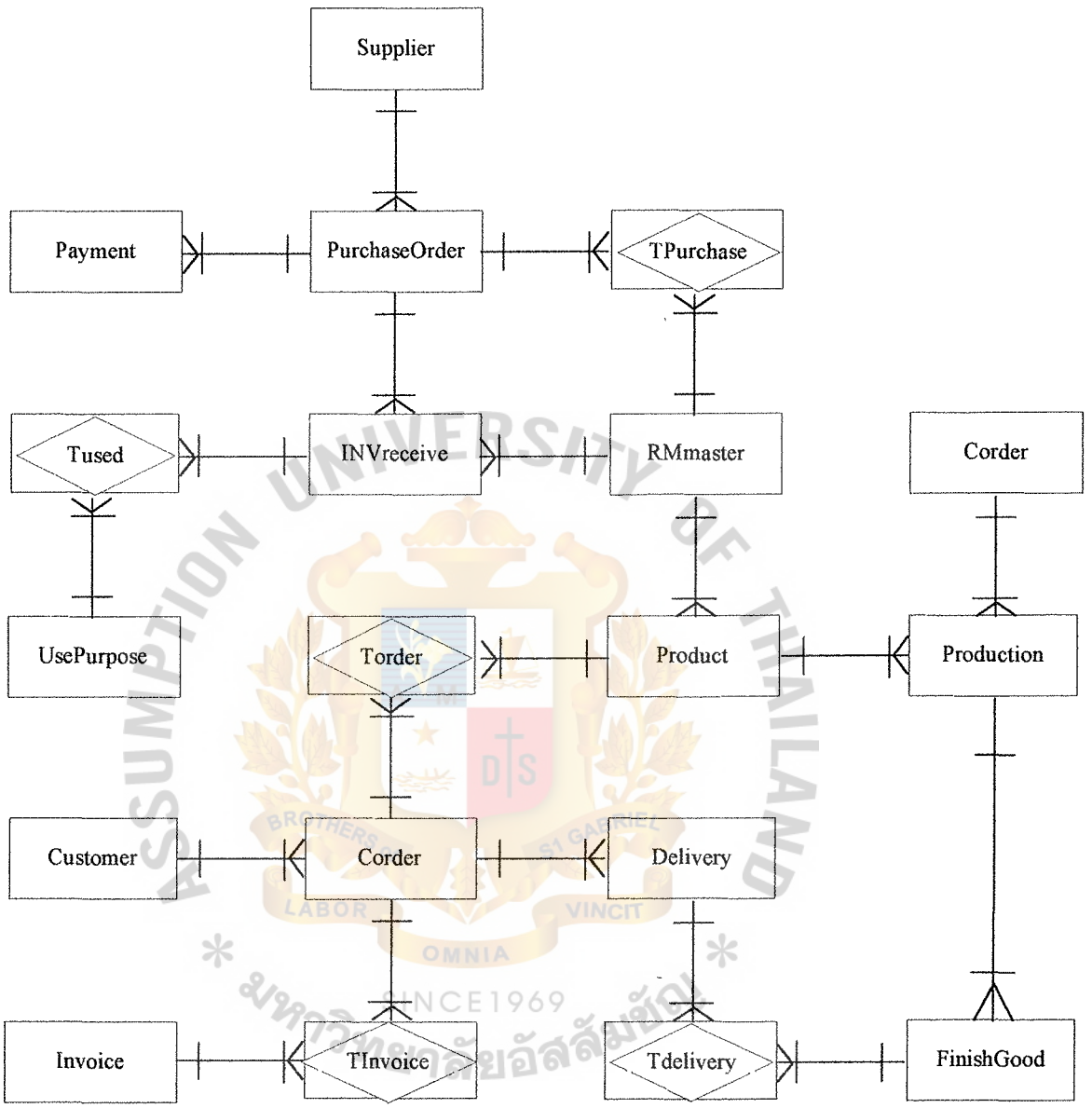

Figure 3-9 Entity-Relationship Diagram

(3) Database Design

Database is the foundation of the system development in keeping all records. The usage of normalization is use to normalize tables to avoid the least of data redundancy. These is the list of database tables in the system.

1. Author: Use to keep the Log-in detail (See Appendix A, Figure A-2)
2. Corder: Keep the information about the sale order that the customer place order to the company (See Appendix A, Figure A-5)
3. Customer: Keep the information about the customer in detail (See Appendix A, Figure A-1)
4. Delivery: Keep the information of delivery the product to the customer (See Appendix A, Figure A-4)
5. FinishGood: Keep information of finish goods stock after production (See Appendix A, Figure A-6)
6. Invoice: Keep the invoice as reference of goods (See Appendix A, Figure A-7)
7. INVreceive: Keep all detail information about the inventory that the company received form the supplier. (See Appendix A, Figure A-8)
8. Payment: Keep details about the payment for all the transaction (See Appendix A, Figure A-9)
9. Product: Keep the information about the product that the company produced (See Appendix A, Figure A-10)

10. Production: The details of production per day (See Appendix A, Figure A-11)
11. PurchaseOrder: The purchase order that used to order the raw materials from the supplier (See Appendix A, Figure A-12)
12. Receipt: The receipt that the company issued to supplier. (See Appendix A, Figure A-3)
13. RMmaster: Keep all details about the raw materials in the production part (See Appendix A, Figure A-13)
14. Supplier: Keep all details about the supplier that the company have to contact. (See Appendix A, Figure A-14)
15. Tdelivery: The details about the delivery transaction (See Appendix A, Figure A-15)
16. TInvoice : The sub table that of Invoice Table and Corder table. (See Appendix A, Figure A-16)
17. Torder: The sub details about the order table to do the transaction (See Appendix A, Figure A-17)
18. Tpurchase: The sub details about the purchase table to do the transaction (See Appendix A, Figure A-18)
19. Tused: The sub table that used to keep the details about how much the company used raw material. (See Appendix A, Figure A-19)
20. UsePurpose: Purpose in using raw materials. (See Appendix A, Figure A-20)

For the detail of each database can be found in the Database Design in the Appendix A.

(4) Process Specification

Table 4-1 Process Specification for Process 1.0

Process Name:	Handle Sales Transaction
Data In:	(1) Customer's Information (2) Customer Order (3) Customer Information Request Updating (4) Product's Information
Data Out:	(1) Customer Record Updated (2) Customer Record (3) Sale Order Updated (4) New Product's Information (5) Production Requested
Process:	(1) Add, edit, and update customer information. (2) Receive sales order from customer and record into the order file. (3) Retrieve product information from product files (4) Add new product information according sales order.
Attachment:	(1) Customer (2) Data store D1 (3) Data store D2 (4) Data store D3 (5) Process 2.0

Table 4-2 Process Specification for Process 1.1

Process Name:	Check Customer
Data In:	(1) Customer Order (2) Customer's Information
Data Out:	(1) New Customer's Information (2) Customer Record (3) Order Information
Process:	(1) Receive sale order from customer (2) Receive customer information and check whether this customer already has an account with our company. (3) If customer does not have the exitsing account, this customer will be treated as new customer. (4) If customer already have an account then customer's order will flow to Process 1.3 to process sale order.
Attachment:	(1) Customer (2) Data store D1

Table 4-3 Process Specification for Process 1.2

Process Name:	Add Customer
Data In:	(1) New Customer's Information
Data Out:	(1) Add Customer
Process:	(1) Add new customer when the checking process detect that this is a new customer whom the exitent in database is not yet known. (2) Update this information into customer file.
Attachment:	(1) Data store D1

Table 4-4 Process Specification for Process 1.3

Process Name:	Process Sales Order
Data In:	(1) Customer Record (2) Order Information (3) Product's Information
Data Out:	(1) Production Requested (2) New Product's Information (3) Update Order
Process:	(1) Receive customer's order and customer record. (2) Retrieve product information to process sale order. (3) Add new product information if customer order for new product.

	(4) Record the sale order information into the order file (5) Request for production to begin.
Attachment:	(1) Data Store D2 (2) Data store D3 (3) Process 2.0

Table 4-5 Process Specification for Process 1.4

Process Name:	Edit Customer
Data In:	(1) Customer information request updating (2) Customer's Record
Data Out:	(1) Customer's Record Updated
Process:	(1) Receive request update customer's information. (2) Retrieve customer information from customer file. (3) Edit customer in formation and make update into the customer file.
Attachment:	(1) Customer (2) Data store D1

Table 4-6 Process Specification for Process 1.5

Process Name:	Add New Product
Data In:	(1) New Product's Information
Data Out:	(1) Product Information Updated

Process:	(1) Receive new product information from the sale order. (2) New product's information need to be update in the product file.
Attachment:	(1) Date store D3

Table 4-7 Process Specification for Process 2.0

Process Name:	Handle Production
Data In:	(1) Production Requested (2) Customer Approval (3) Prototype Rejected (4) Machine Setting Returned (5) Order Information
Data Out:	(1) Request for Maching setting (2) Machine Setting Updated (3) Raw Material Requistion (4) Prototype Information (5) Finish Goods Information
Process:	(1) Receive request for production from process 1.0 (2) Prepare the machine by setting according to the record or try to set up new setting for new product and keep record into product file (3) Get the order and product information to

	produce the product by order (4) Produce prototype and send to customer for approval. (5) After receive approval from customer, production of entire order will be produce. (6) Send the finish goods information to process 3.0
Attachment:	(1) Production Department (2) Customer (3) Process 3.0 (4) Data store D2 (5) Data store D3

Table 4-8 Process Specification for Process 2.1

Process Name:	Produce Product By Order
Data In:	(1) Production Requested (2) Order Information (3) Customer Approval (4) Product Information (5) Raw Material Information (6) Prototype Rejected (7) Machine Setting Returned
Data Out:	(1) Prototype Information (2) Raw Material Requistion (3) Finish Good Information

	(4) Machine Setting Requested
Process:	(1) Receive request for Prodcution (2) Get Machine Setting, Raw Material, Order and Product Information to produce product by order. (3) Send Prototype Information to get customer approval. (4) Receive prototype rejection, the new prototype will be send again. (5) After get customer approval, production of entire order will be produce. (6) Send Finish Good Information to inventory for storage.
Attachment:	(1) Customer (2) Data store D2 (3) Data store D3 (4) Process 1.0 (5) Process 2.2 (6) Process 3.0

Table 4-9 Process Specification for Process 2.2

Process Name:	Handle Machine Setting
Data In:	(1) Machine Setting Requested (2) Machine Setting Returned
Data Out:	(1) Machine Setting Returned

	(2) Machine Setting Returned (3) Machine Setting Updated
Process:	(1) Get Machine Setting value for production. (2) Set new machine setting value for the new production that does not yet have or edit information of machine setting value is needed. (3) Return machine setting to produceproduct.
Attachment:	(1) Production Department (2) Process 2.1 (3) Data store D3

Table 4-10 Process Specification for Process 3.0

Process Name:	Handle Inventory
Data In:	(1) Raw Material Requisition (2) Finish goods information (3) Purchase information (4) Order information (5) Raw material information (6) Product information (7) Supplier Temporary Bill (8) Raw Material Information Received
Data Out:	(1) Raw Material Use Updated (2) Delivery information (3) Raw Material Updated

	(4) Finish Good Updated (5) Order Remain Updated (6) Customer Temporary Bill (7) Raw Material Information Updated
Process:	(1) Receive request for raw material. (2) Get raw material information to check stock for production. (3) Require to purchase raw material if it reach minimum stock, then send request for purchasing to process 4.0 (4) Receive raw material and supplier temporary bill and update into inventory. (5) Compare raw material received and supplier temporary bill with purchase information. (6) Receive finish goods information from process 2.0 (7) Update into the finish goods inventory files (8) Update raw material use of how much raw materials are used in the production. (9) Retrieve order information to prepare delivery document. (10) Delivery goods and customer temporary bill.

Attachment:	(1) Customer (2) Data store D2 (3) Data store D4 (4) Data store D5 (5) Data store D9 (6) Data store D10 (7) Data store D13 (8) Data store D15 (9) Data store D16 (10) Data store D17 (11) Process 2.0 (12) Process 4.0 (13) Supplier

Table 4-11 Process Specification for Process 3.1

Process Name:	Handle Raw material
Data In:	(1) Raw Material Requistion (2) Purchase Information (3) Raw Material Information (4) Supplier Temporary Bill (5) Raw Material Received Information
Data Out:	(1) Raw Material Information (2) Raw Material Updated (3) Requisition for Raw Material Purchase
Process:	(1) After receive request for raw material,

	send the return request for raw material to Production. (2) Receive raw material and supplier temporary bill. (3) Send request for purchasing to process 4.0, if the raw material alert information of raw material shortage is appear. (4) Compare temporary bill with purchase information (5) Update raw material information into file when receive temporary bill with the raw material ordered from supplier.
Attachment:	(1) Data store D4 (2) Data store D9 (3) Process 2.0 (4) Process 4.0 (5) Supplier

Table 4-12 Process Specification for Process 3.2

Process Name:	Handle Raw Material Use
Data In:	(1) Finish Goods Information (2) Production Information
Data Out:	(1) Finish Good Updated (2) Raw Material Inventory Updated (3) Order remain Updated

	(4) Raw Material Information Updated
Process:	(1) Receive finish goods information from process 2.0 (2) Update finish goods inventory files (3) Update raw material inventory. (4) Update raw material information about its usage and quantity use during production into files.
Attachment:	(1) Data store D4 (2) Data store D5 (3) Data store D13 (4) Data store D15 (5) Data store D16 (6) Data store D17 (7) Process 2.0

Table 4-13 Process Specification for Process 3.3

Process Name:	Handle Delivery
Data In:	(1) Order Information (2) Finish Goods Information
Data Out:	(1) Delivery Information (2) Finish Good Updated (3) Customer Temporary Bill
Process:	(1) Retrieve order information and delivery information to prepare delivery document.

	(2) Send the delivery information and temporary bill to be deliver to customer. (3) Update finish good inventory after delivery to customer.
Attachment:	(1) Customer (2) Data store D2 (3) Data store D5 (4) Data store D10

Table 4-14 Process Specification for Process 4.0

Process Name:	Handle Purchasing
Data In:	(1) New Supplier's Information (2) Purchase Order Rejected (3) New Raw Material Information (4) Supplier's Information
Data Out:	(1) Purchase Order Information (2) Raw Material Information Updated (3) Supplier's Information Updated (4) Purchase Information Updated
Process:	(1) Receive request for purchasing from process 3.0 (2) Send purchase order information to supplier (3) Find new supplier if purchase order has been rejected

	(4) Add new supplier information and new raw material information (5) Update purchase file
Attachment:	(1) Data store D7 (2) Data store D8 (3) Data store D9 (4) Supplier (5) Process 3.0

Table 4-15 Process Specification for Process 4.1

Process Name:	Prepare Purchase Order
Data In:	(1) Raw Material Purchase Requested (2) Purchase Order Rejected (3) Supplier's Information
Data Out:	(1) Purchase Order Information (2) Purchase Information Updated (3) Requisition for New Supplier
Process:	(1) Receive request for purchasing from process 3.0 (2) Send purchase order to supplier (3) Send request for new supplier to process 4.2 when purchase order has been rejected (4) Update purchase information
Attachment:	(1) Data store D8 (2) Data store D9

	(3) Process 3.0 (4) Process 4.2 (5) Supplier

Table 4-16 Process Specification for Process 4.2

Process Name:	Add New Supplier
Data In:	(1) Requisition for New Supplier (2) New Supplier's Information
Data Out:	(1) Supplier's Information Updated
Process:	(1) Receive request for new supplier from process 4.1 (2) Find new supplier information. (3) Add new supplier information into supplier file
Attachment:	(1) Process 4.1 (2) Data store D8

Table 4-17 Process Specification for Process 4.3

Process Name:	Add Raw material
Data In:	(1) New Raw Material Information
Data Out:	(1) Raw Material Information Updated (2) Raw Material Received Information
Process:	(1) Receive new raw material information from supplier (2) Add new raw material information

	(3) Send the received raw material information Process 3.0 to process the inventory.
Attachment:	(1) Data store D7 (2) Supplier (3) Process 3.0

Table 4-18 Process Specification for Process 5.0

Process Name:	Handle financing
Data In:	(1) Order information (2) Delivery information (3) Order payment (4) Supplier's Invoice (5) Supplier's Receipt (6) Purchase Information
Data Out:	(1) Purchase payment (2) Invoice Information Updated (3) Invoice Information (4) Receipt Information (5) Purchase Payment
Process:	(1) Retrieve order information prepare invoice for customer and update invoice information into file. (2) Receive order payment information from customer.

	(3) Prepare receipt and send to customer (4) Receive supplier's invoice. (5) Retrieve purchase information to compare with the supplier's invoice. (6) Make payment to supplier and receive supplier's receipt information. (7) Record payment information into payment file
Attachment:	(1) Data store D2 (2) Data store D9 (3) Data store D10 (4) Data store D12 (5) Data store D14 (6) Supplier (7) Customer

Table 4-19 Process Specification for Process 5.1

Process Name:	Prepare Invoice
Data In:	(1) Delivery Information (2) Order Information.
Data Out:	(1) Invoice Information (2) Invoice Information Updated
Process:	(1) Get order information and delivery information to prepare invoice. (2) Send the invoice information to customer

Attachment:	(1) Date store D2 (2) Data store D10 (3) Data store D14

Table 4-20 Process Specification for Process 5.2

Process Name:	Prepare Receipt Payment
Data In:	(1) Order payment Information
Data Out:	(1) Receipt Information (2) Customer Payment Information
Process:	(1) Receive order payment information from customer (2) Prepare and send receipt to customer (3) Send customer payment information to process 5.2
Attachment:	(1) Customer (2) Process 5.2

Table 4-21 Process Specification for Process 5.3

Process Name:	Prepare Cash Transaction
Data In:	(1) Customer Payment Information (2) Supplier's Invoice
Data Out:	(1) Payment information (2) Payment Information Updated
Process:	(1) Receive the customer payment information from process 5.1

	(2) Receive supplier's invoice from process 5.3 (3) Record payment information into payment file.
Attachment:	(1) Data store D12 (2) Process 5.1 (3) Process 5.3

Table 4-22 Process Specification for Process 5.4

Process Name:	Make Payment
Data In:	(1) Supplier's Invoice (2) Supplier's Receipt (3) Purchase Information
Data Out:	(1) Purchase payment (6) Payment information
Process:	(1) Receive invoice information from supplier (2) Retrieve purchase information to compare with the supplier's invoice. (3) Send payment information to supplier. (4) Receive receipt information from supplier. (6) Send payment information to process 5.2 to be recorded.
Attachment:	(1) Supplier (4) Process 5.2

Table 4-23 Process Specification for Process 6.0

Process Name:	Prepare report
Data In:	(1) Raw Material Information (2) Delivery Information (3) Purchase Information (4) Order Information (5) Payment Information (6) Finish Goods Information (7) Report Requisition
Data Out:	(1) Report
Process:	(1) Receive request for report from manager. (2) Analyze the data to be used (3) Retrieve the necessary data (4) Produce report (5) Send report to manager
Attachment:	(1) Data store D2 (2) Data store D4 (3) Data store D5 (4) Data store D9 (5) Data store D10 (6) Data store D12 (7) Manager

Table 4-24 Process Specification for Process 6.1

Process Name:	Select data
Data In:	(1) Request for report
Data Out:	(1) Data Retrieved
Process:	(1) Receive the request for report from manager (2) Analyze the data to be used (3) Send the retrieve data command to process 6.2
Attachment:	(4) Manager (5) Process 6.2

Table 4-25 Process Specification for Process 6.2

Process Name:	Retrieve data
Data In:	(1) Raw Material Information (2) Delivery Information (3) Purchase Information (4) Order Information (5) Payment Information (6) Finish Goods Information (1) Report Requisition
Data Out:	(1) Data Retrieved
Process:	(1) Receive the data need to be use in process from process 6.1. (2) Retrieve the necessary data

	(3) Send processed data to process 6.3
Attachment:	(1) Data store D2 (2) Data store D4 (3) Data store D5 (4) Data store D9 (5) Data store D10 (6) Data store D12 (7) Process 6.3

Table 4-26 Process Specification for Process 6.3

Process Name:	Prepare output
Data In:	(1) Data Processed
Data Out:	(1) Report
Process:	(1) Receive processed data from process 6.2 (2) Produce report (3) Send report to manager
Attachment:	(1) Manager (2) Process 6.2

(5) Data Dictionary

Table 5-1 Data Dictionary

Data Item	**Meaning**
Author	File that contain user priority to use the program
CapacityPerDay	Maximum capacity per day of each product can produce
Complete	To check whether the production has been complete compare to the quantity order or not
CompletePayment	To check whether which purchase order has been paid to supplier
cooling	Machine setting value
Corder	File that contain records of sale orders
CostperUnit	Cost of raw material per unit
custADDR	Customer's Address
custFAX	Customer Fax number
custID	Identification of customers assigned by the company
custMAIL	Customer E-mail
custNAME	Customer Name and people to contact with
Customer	The file containing all information about customer
Customer Approval	The approvement of prototype received from customer
Customer Information Request Updating	Updating of the information of the customer through the process
Customer Payment Information	Record customer payment to the invoice given
Customer Record	Record customer information into data store named 'Customer'
Customer Temporary Bill	The temporary bill that the company issued to the customer
Customer's Information	Information of existing customer provides for processing needed
Customer's Order	The order of the customer
Customer's Record Updated	Updating of the information of the customer through the process

custTEL	Customer Telephone number
Data Processed	The data that used to process the function of production part
Data Retrieved	Request data to be retrieve to process the output report
Delivery	The file containing all information about delivery
Delivery Information	Information of delivery needed to be stored in data store name 'Delivery'
dvDATE	The delivery date promised in the order
dvNAME	Name of truck driver
dvNO	The number of delivery assigned automatically to the delivery report
dvQTY	Quantity that deliver to customer
ejection	Machine setting value
FGComplete	A mark of whether finish good ordered has been totally completely produce
fgLOT	Lot code of finish good
Finish Good Information	The information of finished goods needed for the inventory department
Finish Goods Updated	Updating information of the finished goods needed for the inventory department
finishDate	Finish good finish date
FinishGood	File that contain about finish good in stock
FinishProduce	The check mark remind that the orders have been completely produce
GrandTotal	Total value that include Total + Vat that need to be charge to customer
injection	Machine setting value
Invoice	File that contain about invoice information
Invoice Information	Information of all invoices that given to customer
Invoice Information Updated	Updating information of all invoices that given to customer
InvoiceDate	Invoice assign date
InvoiceNo	Invoice number
INVreceive	File that contain about receive of raw material from supplier
IssueInvoice	Remind of whether the invoice has been issue out or not yet

IsSuspend	Supplier suspension status
IsSuspend	Customer suspension status
lotID	Lot code of raw material received
lowpres	Machine setting value
Machine Setting Requested	Request production department to get machine setting value
Machine Setting Returned	Production department return manchine setting value for the product to be produced
Machine Setting Updated	New machine setting value is updated into file
mclose1	Machine setting value
mclose2	Machine setting value
mclose3	Machine setting value
minSTOCK	Minimum number of stock that the company can go on with production while wait for the new supply of raw material arrive
mopen1	Machine setting value
mopen2	Machine setting value
mopen3	Machine setting value
mouldopen	Machine setting value
New Customer Information	The information of the new customer
New Product's Information	Record of the new product ordered by customer
New Raw Material Information	Information of new kind of raw material from supplier
New Supplier's Information	Information of new supplier receive to be record
number	Machine setting value
Order Information	Information on sale order from the customer
Order Payment Information	Payment for product receive from customers
Order Remain Updated	Updating information of the remaining order
orderDate	Date of the sale order transaction
orderREMARK	Any remark about the order
password	Security setted to check user entity
Payment	File that contain about payment information
Payment Information	Information of payment needed to be store in data store named 'Payment'
Payment Information Updated	Updating information of payment needed to be store in data store named 'Payment'
pmAMT	Total amount of payment
pmDATE	Date of payment to supplier

pmID	Payment id given to the payment bill
prDATE	The date of making the purchase order
price	Price of each product
prID	Purchase id assigned to each purchae order
priority	The level of authority to use the program
Product	File that contain about product information
Product Information Updated	Updating information of the product
Production	File that contain about production information
Production information	Information during the production whether the order has been completely finish
Production Requested	The request of material used in the production
ProductionDate	Date of the production of each product
Product's Information	Information of existing product requested from
proID	Product id given to each product
proNAME	Product name
Prototype Information	Prototype information of product sending to customer in order to prevent misunderstading
Prototype Rejected	The rejection of the prototype information of product sending to customer
prTOTAL	Total cost of purchase
Purchase Information	Information of the purchase order placed to supplier
Purchase Information Updated	Updating information of the purchase order placed to supplier
Purchase Order	Order of purchasing written to suppliers
Purchase Order Rejected	The rejection of the purchasing order written to supplier
Purchase Payment	Payment for purchasing to suppliers
PurchaseOrder	Purchase order information placed to supplier

Purposed	Record purpose of using each raw material
QTYCutted	Quantity of raw materialthat has been cutted after finish good has been completely produced
QTYDeliver	Amount of quantity order that has been deliver to customer
QtyFinish	Finish good quantity complete
QtyInStock	Total finish good in stock
QtyOrder	Quantity order for each product
QTYorder	Total quanity purchase from supplier
QTYperunit	Quantity of raw material per unit that need to be use
QTYreceive	Quantity that received for supplier
QTYremain	Quantity of raw material that not yet deliver from supplier
QTYremain	Quantity remain in Torder file that has not yet deliver to customer
Raw Material Information	Information of raw material in stock
Raw Material Information Updated	Updating information of raw material in stock
Raw Material Inventory Updated	Updating information of raw material in inventory
Raw Material Purchase Requested	The amount of raw material purchase needed in production part
Raw Material Received Information	The information of raw material received
Raw Material Requisition	The needed of raw material through the production process
Raw Material Updated	Updating of raw material information
Raw material use purpose information	Record the purpose of using raw material during the production
Receipt Information	Document give to customer after payment
receiveDate	Date that the company receive raw material
ReceiveDate	Date of customer paid the invoice
Reciept	File that contain number of receipt given to customer
RecieptNo	Receipt number assign to the receipt of each invoice to give to customer for the confirm invoice payment

Report	Document prepare to manager to help him making decision
Report Requisition	The request of the report prepare to the manager
Request for Production	The request sending from Sale department to Production department
Requisition for New Supplier	The requirement for the new supplier
rmALERT	Minimum number of stock that need to be alert to the user and remind the user that it is time to purchase
rmComplete	To check whether raw material of this purchase has beem completely delivered from supplier
rmDescription	Description of each raw material
rmID	Raw material id given to each raw material
RMmaster	Raw material master file that contain about raw material information
rmNAME	Raw material name
RMstock	The amount of raw material in the stock
Sales Order Updated	Updating of the sales order file
sforward1	Machine setting value
sforward2	Machine setting value
sforward3	Machine setting value
sreturn1	Machine setting value
sreturn2	Machine setting value
supADDR	Supplier's address
supFAX	Supplier Fax number
supID	Identification of supplier assign by company
supMAIL	Supplier E-mail
supNAME	Name of supplier available for ordering raw material
Supplier Temporary Bill	Supplier send the temporary bill with raw material ordered
Suppliers	The file containing all information about suppliers
Supplier's Information	Information of the supplier
Supplier's Information Updated	Updated information of the supplier
Supplier's Invoice	Supplier send the invoice information requesting the company's payment

Supplier's Receipt	Supplier send the receipt information after receive the payment
supTEL	Supplier Telephone number
tem1	Machine setting value
tem2	Machine setting value
tem3	Machine setting value
tem4	Machine setting value
tem5	Machine setting value
Supplier Temporary Bill	Bill that send along with delivery from supplier to tell the detail of delivery and price
Total	Total amount of sale order by customer
UsedDate	Date that raw material has been use
useID	Id assigned each time that raw material has been use
UsePurpose	File that contain about reason of using raw material
user	User Name who allow to access the program
VAT	Vat that need to be charge to customer at 7%

(6) Interface Design

(1) Customer Information (See Appendix B, Figure B-5)

User can input customer information and search customer through this interface. User can also edit customer information if there is any changes such as customer address, therefore, information can be update anytime as well as cancel the record if user put the wrong information. Issue of invoice date can be specify by selecting one of the radio button

(2) Customer Search (See Appendix B, figure B-6)

User can search through the list of customers or specify by customer's name of alphabet, for example, user can look for every customer who start with letter 'A'.

(3) Delivery (See Appendix B, Figure B-10)

When finish good is ready to be distribute to customer, the delivery paper can be print out through this interface. The delivery number and delivery are automatically generated with the input of deliver name. Each time of delivery will base on the order selected to be deliver. The order has to be selected first to do other function in this interface otherwise user can not input any data or print out the delivery paper. After the order is selected, the customer information will automatically come up and products that are ready to be deliver need to be select with the input of how much to be deliver.

(4) Finish Good Inventory (See Appendix B, Figure B-12)

After the finish good has been produce, it need to be stock. Finish good Lot id will be automatically assign. ProductionID need to

be selected to stock the product according to order ID from sale order. Update Inventory will be done when Quantity Finished is input to specify the number to be stock.

(5) Inventory Receive (See Appendix B, Figure B-11)

Raw material receive will be assign by LotID for many raw materials can come within the same day. With each lot of raw material, purchase order ID need to be choose to retrieve purchase information to compare raw material receive with purchase order. The real amount of raw material received will be input and update into raw material stock.

(6) Invoice (See Appendix B, Figure B-14)

Invoice document will be generate by select customer who need to make payment and the order that need to be pay with. More order can be add, if one customer need to pay more than one order. Remove of order can be done when user select the wrong order and cancel the action can be execute also.

(7) Login Page (See Appendix B, Figure B-1)

To allow user to use this program and check user's authority to use the program because some function will not be applicable for other department to use.

(8) Machine Setting (See Appendix B, Figure B-19)

Machine setting value can be view by select product ID that the user want to view. When user click at OK button, all machine value will be retrieve. If there is any case that the machine setting need to

be change or update, add new value for new product, or cancel the action, it can be done by selecting the action that user want to take.

(9) Payment (See Appendix B, Figure B-15)

When the company request to make payment to supplier, purchase order id need to be chose to specify what purchase need to be pay. All other information about specific purchase order will be retrieve. And purchase order will be remark in the record that this purchase has been paid.

(10) Product Information (See Appendix B, Figure B-7)

Product can be search through this interface. User can add new product information, if there is any. Or if there is any information need to be change on the existing product can be done by select the edit button and update button when the information have been change.

(11) Product Search (See Appendix B, Figure B-8)

User can search through the list of product or specify by product's name of alphabet, for example, user can look for every product that start with letter 'A'.

(12) Production (See Appendix B, Figure B-20)

Product will be produce base on the order selected. The quantity to produce the product will be input to calculate the estimation of how much raw material should be use. If there is any remark from customer to specify the type of product will be retrieve as well as all other information.

(13) Purchase Order (See Appendix B, Figure B-18)

When there is an alert that raw material need to be purchase, purchase order need to be generate to place the order to supplier. In this interface, supplier need to be selected beforehand otherwise user can not select raw material that need to be order as well as other function. Both supplier and raw material can be search with the supplier search page and raw material search page. When supplier is selected, raw material need to be choose to place the order. Information of purchasing raw material will be show in datagrid and total amount automatically calculate. User can check the correction of purchase order before update the information to the file.

(14) Raw Material Information (See Appendix B, Figure B-9)

Raw material can be search through this interface. User can add new raw material information, if there is any. Or if there is any information need to be change on the existing raw material can be done by select the edit button and update button when the information have been change. Minimum stock and minimum alert need to be set with each raw material to remind the user to make the purchase order.

(15) Raw Material Search (See Appendix B, Figure B-10)

User can search through the list of raw material or specify by raw material's name of alphabet, for example, user can look for every raw material that start with letter 'A'.

(16) Raw Material Use (See Appendix B, Figure B-21)

Everytime that raw material has been check out, the purpose of usage need to be specify whether it use for production or other. For

production, after production process, quantity of raw material use during production need to be input. ProductionID need to retrieve information of what product is select to produce and from what finish good lot. For other usage, each raw material need to be know of how much has been use and how much is remain in stock.

(17) Receipt (See Appendix B, Figure B-16)

After customer make payment, company will generate receipt print out to give to supplier. Receipt will base on the invoice number that the customer make the payment on. Information retrieve will include customer information and the amount that is paid.

(18) Sale Order(See Appendix B, Figure B-17)

Order will be generate when customer request to make order. In this interface, customer need to be selected beforehand otherwise user can not select all other function are locked. Both customer and product can be search with the customer search page and product search page. When customer is selected, product need to be choose to place the order. Information of product ordered will be show in datagrid and total amount automatically calculate. User can check the correction of order before update the information to the file.

(19) Supplier Information (See Appendix B, Figure B-3)

User can input supplier information and search supplier through this interface. User can also edit supplier information if there is any changes such as supplier address, therefore, information can be update anytime as well as cancel the record if user put the wrong information.

(20) Supplier Search (See Appendix B, Figure B-4)

User can search through the list of supplier or specify by supplier's name of alphabet, for example, user can look for every supplier who start with letter 'A'.

(21) Raw Material Order (See Appendix B, Figure B-26)

Report can be select to show all raw materials that have been order from all supplier in specific date and month. Also specify which raw material order from whom can be select with specify date and month.

(22) Main Menu (See Appendix B, Figure B-2)

User can access to the program upon the user's priority that the user had login in previous step, for example, Marketing Department user can enter to the program with password that provided and the tasks or information that program specify for market user access are general and marketing information. Other functions are not provided because they belong to other user's department to use.

(23) Stock Checking Page (See Appendix B, Figure B-28)

Prepare report on the information about quantity stock of both raw material and finish good. User can select certain product name to check quantity in each finish good lot. Also, user can check raw material by name to check certain raw material in stock.

(24) Delivery Report (See Appendix B, Figure B-22)

Prepare delivery information of what product have been deliver for what order number and quantity deliver.

(25) Payment per Month (See Appendix B, Figure B-23)

Prepare report of what purchase orders have been paid and the amount paid.

(26) Purchase Per Supplier (See Appendix B, Figure B-24)

Prepare report of the purchase of each supplier. All supplier can be choose to print out with specify date and month. As well as specify supplier can be choose to print out with specify date and month.

(27) Receive per Month (See Appendix B, Figure B-25)

Prepare detail of each order can generate sale. User can select to show only within certain period such as this month or last two month, etc.

(28) Sales Per Customer(See Appendix B, Figure B-27)

Prepare report to show all customer who place order with the company at what amount or by just specify customer within the period selected.

(29) Sale per Product (See Appendix B, figure B-29)

* Prepare report of what product had been sold in the specific period. All product can be selected to be show or by specify product type.

For the detail of each interface can be found in the Interface Design in Appendix B.

(7) Report Design

(1) Purchase Per Supplier (See Appendix C, Figure C-4)

Print report of the purchase of each supplier. All supplier can be choose to print out with specify date and month. As well as specify supplier can be choose to print out with specify date and month.

(2) Raw Material Order (See Appendix C, Figure C-8)

Report can be select to show all raw materials that have been order from all supplier in specific date and month. Also specify which raw material order from whom can be select with specify date and month.

(3) Sales Per Customer (See Appendix C, Figure C-6)

Report can be generate to show all customer who place order with the company at what amount or by just specify customer within the period selected.

(4) Sale per Product (See Appendix C, Figure C-7)

* Generate report of what product had been sold in the specific period. All product can be selected to be show or by specify product type.

(5) Delivery Report (See Appendix C, Figure C-10)

Generate delivery information of what product have been deliver for what order number and quantity deliver.

(6) Amount Receive per Month (Appendix C, Figure C-9)

Detail of each order can generate sale

(7) Payment per Month (See Appendix C, Figure C-5)

Report of what purchase orders have been paid and the amount paid.

(8) Invoice (See Appendix C, Figure C-1)

Generate report of order that customer need to make payment on and this transaction need to be signed and date of signing this document need to be specify.

(9) Machine Setting (See Appendix C, Figure C-11)

Report of each product's machine setting value to give to production department to set up the machine.

(10) Production (See Appendix C, Figure C-12)

Report of what product for what order need to be produce and assigned the production id and date and quantity produce.

(11) Purchase Order (See Appendix C, Figure C-2)

Report of what raw material ordered from what supplier and date specified. Also, cost per unit, quantity order and total amount that already calculate are shown.

(12) Finished Good Stock (See Appendix C, Figure C-14)

Report of total finished good stock quantity on each order to keep update of finished good stock information.

(13) Raw Material Stock Status (See Appendix C, Figure C-15)

Report of each raw material quantity remaining in each lot of inventory with. It also compare whether the quantity remaining has reached warning of raw material that need to make a purchase.

(14) Temporary Bill (See Appendix C, Figure C-13)

It is the report that need to be deliver to customer about their producto purchase to the company. It has the information of customer, product and total amount that customer need to pay.

(15) Receipt (See Appendix C, Figure C-3)

Generate receipt report after customer made payment of the product ordered and give to customer.

For the detail of each report can be found in the Report Design in Appendix C.

IV. SYSTEM IMPLEMENTATION

4.1 Overview of the System Implementation

The new system will be implement with Parallel Conversion method due to the existence of the company has been using manual system, therefore, people in the company might not be comfortable to use computerize program for their inventory system. Even though, this is its disadvantage, but later on the employees will see system effectiveness such as faster in reteiving records, receive sale order, alert of minimum in stock, find purchase order, etc. Also, while the old and new system are running at the same time, reliability of result can be check and error can be detect at first glance. So, when the new system totally replace the old system, employer and employees can be rely that the result of using computerized system and manual system will be the same.

4.2 Test Plan

The new written system program needed to be tested with trial and error for early detection during system development. Testing plan should include the testing of interface between subsystems, the correctness of output, and the reliability of the system documentation and output. The program can be test with test data in case of user may input the wrong data. The examples are as follow:

- The ID of anything should be fix within its length.
- The price of the product should only be in positive number. The alert of input the wrong integer with show up.
- The search of any information can be use from only one alphabet or more to find the information. The search is need in the system because no one can remember everything.

- The Total, Vat and Grand total of any order will be calculated automatically after the product has been ordered.
- The system have the confirmed page before changing any information to the sure that the use would like to execute the action such as the pop up window appear to ask the user that "Are you sure you want to record no 'sup1006'", or "Record is updated", etc.
- Every page have the Main bottom to go back to the main menu.
- Every page also have the Cancel bottom to cancel the action that is happening.

V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Tong Monkol's inventory system is the system that includes the flow of raw material and finish good within the company. The system is proposed for improving working cycle time, reduce job's redundancy, and create the MIS report for decision making to manager. Moreover, this system reduces the user's error for recording transactions as the program will automatically pop-up warning message box. Also, all paper document will be recorded in company's database, so this would reduce problem of losing documents and documents search can be easily done because of record can be reterive faster. Stock will be automatically updated with the help of this inventory control system. So the system will result in effectiveness of transaction flow, stock update, reduce troublesome of filing documents and redundancy of data.

5.2 Recommendations

Since the program is newly developed and the company has been using manual system at the start of its establishment, therefore, it is worthwide to set up training program to all employees. So they can be fimilar and adapt to the program faster and disadvantage of using parallel conversion in the system implementation would be diminish. In the future, if the company is expanding to other branches or get larger, the system performance can be drawn back due to more records that need to be keep, so the company can purchase its own server to its increase system performance. If there is other branch in the future, supply chain management can be apply may be to improve its transportation route to imporve lead time or any others to reduce the company's cost.

APPENDIX A
DATABASE DESIGN

Table A-1 Customer Table

No.	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key Type	FK Referenced Table
1	custID	varchar (5)	Y	Y			Primary Key	
2	custNAME	varchar (50)	Y				Attribute	
3	custADDR	varchar (150)					Attribute	
4	custMAIL	varchar (50)			Y		Attribute	
5	custFAX	varchar (50)				(99)-999-9999	Attribute	
6	custTEL	varchar (50)				(99)-999-9999	Attribute	
7	custINVOICE	varchar (10)					Attribute	
8	IsSuspend	Yes/No					Attribute	

Table A-2 Author Table

No.	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key Type	FK Referenced Table
1	user	varchar (50)	Y	Y			Primary Key	
2	password	varchar (50)	Y				Attribute	
3	priority	varchar (50)					Attribute	

Table A-3 Receipt Table

No.	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key Type	Foreign Key to Table
1	RecieptNo	varchar (10)	Y	Y			Primary Key	
2	InoviceNo	varchar (10)					Foreign Key	Invoice
3	RecieveDate	Date/Time				DD-MMM-YY	Attribute	

Table A-4 Delivery Table

No.	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key Type	FK Referenced Table
1	dvNO	varchar (10)	Y	Y			Primary Key	
2	dvNAME	varchar (50)	Y				Attribute	
3	orderNO	varchar (10)					Foreign Key	Corder Table
4	proID	varchar (10)					Foreign Key	Product Table
5	dvDATE	Date/Time				DD-MMM-YY	Attribute	
6	dvQTY	long int					Attribute	

Table A-5 Corder Table

No.	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key Type	FK Referenced Table
1	orderNO	varchar (10)	Y	Y			Primary Key	
2	custID	varchar (5)	Y				Foreign Key	Customer Table
3	orderDate	Date/Time				DD-MMM-YY	Attribute	
4	Total	Currency					Attribute	
5	VAT	Currency					Attribute	
6	GrandTotal	Currency					Attribute	
7	FinishProduce	Yes/No					Attribute	
8	IssueInvoice	Yes/No					Attribute	

Table A-6 Finish Good Table

No.	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key Type	FK Referenced Table
1	fgLOT	varchar (9)	Y	Y			Primary Key	
2	ProductionID	varchar (10)	Y				Foreign Key	Production Table
3	QtyFinish	long int					Attribute	
4	QtyInStock	long int					Attribute	
5	finishDate	Date/Time				DD-MMM-YY	Attribute	
6	FGComplete	Yes/No					Attribute	

Table A-7 Invoice Table

No.	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key Type	FK Referenced Table
1	invoiceNo	varchar (10)	Y	Y			Primary Key	
2	InvoiceDate	Date/Time				DD-MMM-YY	Attribute	
3	Total	double int					Attribute	
4	ISReceive	Yes/No					Attribute	

Table A-8 INVreceive Table

No.	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key Type	FK Referenced Table
1	lotID	varchar (10)	Y	Y			Primary Key	
2	prID	varchar (9)	Y				Foreign Key	PurchaseOrder Table
3	rmID	varchar (6)					Foreign Key	RMmaster Table
4	QTYrecieve	double int					Attribute	
5	QTYremain	double int					Attribute	
6	receieveDate	Date/Time				DD-MMM-YY	Attribute	

Table A-9 Payment Table

No.	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key Type	FK Referenced Table
1	pmID	varchar (10)	Y	Y			Primary Key	
2	prID	varchar (9)	Y				Foreign Key	PurchaseOrder Table
3	pmDATE	Date/Time				DD-MMM-YY	Attribute	
4	pmAMT	Currency					Attribute	

Table A-10 Product Table

No.	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key Type	FK Referenced Table
1	proID	varchar (5)	Y	Y			Primary Key	
2	proNAME	varchar (50)	Y				Attribute	
3	price	currency					Attribute	
4	ejection	long int					Attribute	
5	sforward1	long int					Attribute	
6	sforward2	long int					Attribute	
7	sforward3	long int					Attribute	
8	sreturn1	long int					Attribute	
9	sreturn2	long int					Attribute	
10	number	long int					Attribute	
11	mopen1	long int					Attribute	
12	mopen2	long int					Attribute	
13	mopen3	long int					Attribute	
14	mclose1	long int					Attribute	
15	mclose2	long int					Attribute	

16	mclose3	long int					Attribute	
17	mouldopen	long int					Attribute	
18	lowpres	long int					Attribute	
19	injection	long int					Attribute	
20	cooling	long int					Attribute	
21	tem1	long int					Attribute	
22	tem2	long int					Attribute	
23	tem3	long int					Attribute	
24	tem4	long int					Attribute	
25	tem5	long int					Attribute	
26	rmID	varchar (6)					Foreign Key	RMmaster Table
27	QTYperunit	long int					Attribute	
28	CapacityPerDay	long int					Attribute	
29	IsSuspend	Yes/No					Attribute	

Table A-11 Production Table

No.	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key Type	FK Referenced Table
1	ProductionID	varchar (10)	Y	Y			Primary Key	
2	orderNO	varchar (10)	Y				Foreign Key	Corder Table
3	proID	varchar (5)					Foreign Key	Product Table
4	QtyOrder	long int					Attribute	
5	ProductionDate	Date/Time				DD-MMM-YY	Attribute	
6	UseID	varchar (10)					Foreign Key	UsePurpose Table
6	Complete	Yes/No					Attribute	
7	RMStock	Yes/No					Attribute	

Table A-12 PurchaseOrder Table

No.	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key Type	FK Referenced Table
1	prID	varchar (9)	Y	Y			Primary Key	
2	supID	varchar (7)	Y				Foreign Key	Supplier Table
3	prTOTAL	double int					Attribute	
4	prDATE	Date/Time				DD-MMM-YY	Attribute	
5	CompletePayment	Yes/No					Attribute	

Table A-13 RMmaster Table

No.	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key Type	FK Referenced Table
1	rmID	varchar (6)	Y	Y			Primary Key	
2	rmNAME	varchar (50)	Y				Attribute	
3	rmDescription	varchar (150)					Attribute	
4	rmALERT	long int					Attribute	
5	minSTOCK	long int					Attribute	
6	IsSuspend	Yes/No					Attribute	

Table A-14 Supplier Table

No.	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key Type	Foreign Key to Table
1	supID	varchar (7)	Y	Y			Primary Key	
2	supNAME	varchar (50)	Y				Attribute	
3	supADDR	varchar (150)					Attribute	
4	supMAIL	varchar (50)			Y		Attribute	
5	supFAX	varchar (50)				(99)-999-9999	Attribute	
6	supTEL	varchar (50)				(99)-999-9999	Attribute	
7	IsSuspend	Yes/No					Attribute	

Table A-15 Tdelivery Table

No.	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key Type	Foreign Key to Table
1	dvNO	varchar (10)	Y	Y			Primary Key	
2	fgLOT	varchar (9)					Foreign Key	FinishGood Table

Table A-16 TInvoice Table

No.	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key Type	Foreign Key to Table
1	InvoiceNo	varchar (10)	Y	Y			Primary Key	
2	OrderNo	varchar (10)	Y				Concatenate Key	

Table A-17 Torder Table

No.	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key Type	FK Referenced Table
1	orderNO	varchar (10)	Y	Y			Primary Key	
2	proID	varchar (5)	Y				Foreign Key	Product Table
3	QTYorder	long int					Attribute	
4	QTYremain	long int					Attribute	
5	QTYDeliver	long int					Attribute	
6	orderREMARK	varchar (150)					Attribute	

Table A-18 Tpurchase Table

No.	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key Type	FK Referenced Table
1	prID	varchar (9)	Y	Y			Primary Key	
2	rmID	varchar (6)	Y				Foreign Key	RMmaster
4	CostperUnit	currency					Attribute	
5	QTYorder	long int					Attribute	
6	rmComplete	Yes/No					Attribute	

Table A-19 Tused Table

No.	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key Type	Foreign Key to Table
1	useID	varchar (10)	Y	Y			Primary Key	
2	lotID	varchar (9)					Foreign Key	INVrecieve Table
3	QTYCutted	long int					Attribute	

Table A-20 UsePurpose Table

No.	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key Type	Foreign Key to Table
1	useID	varchar (10)	Y	Y			Primary Key	
2	Purposed	varchar (150)					Attribute	
3	UsedDate	Date/Time				DD-MMM-YY	Attribute	

APPENDIX B
INTERFACE DESIGN

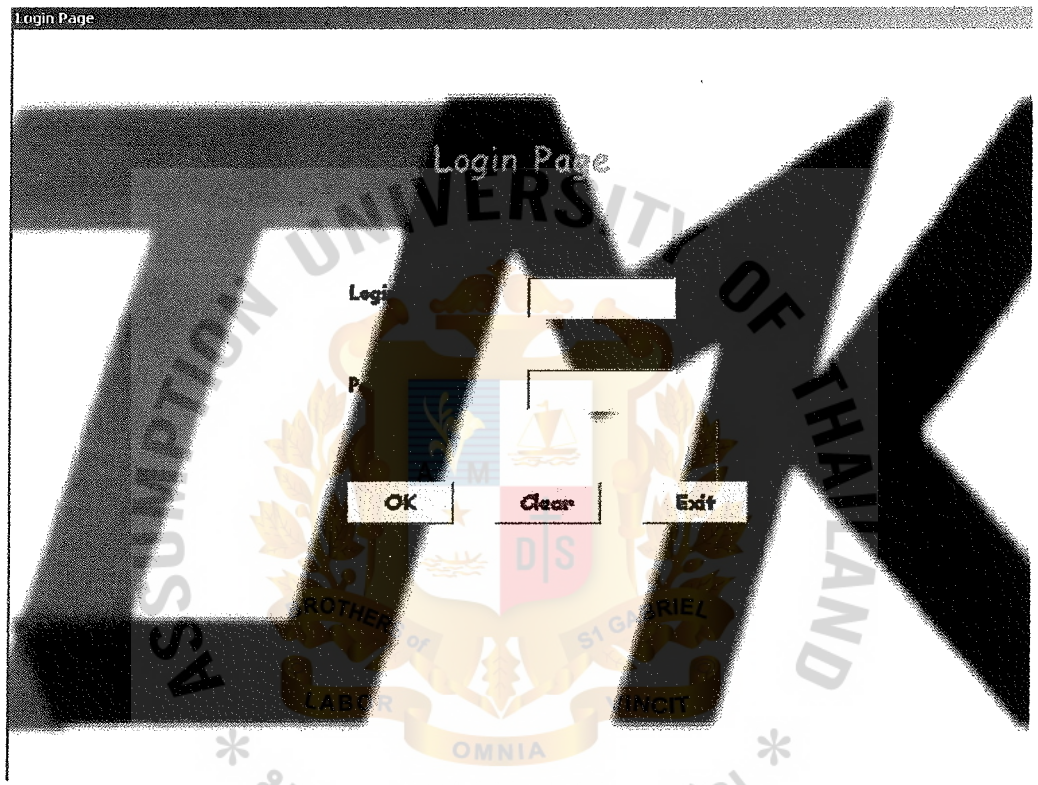

Figure B-1 Login Form

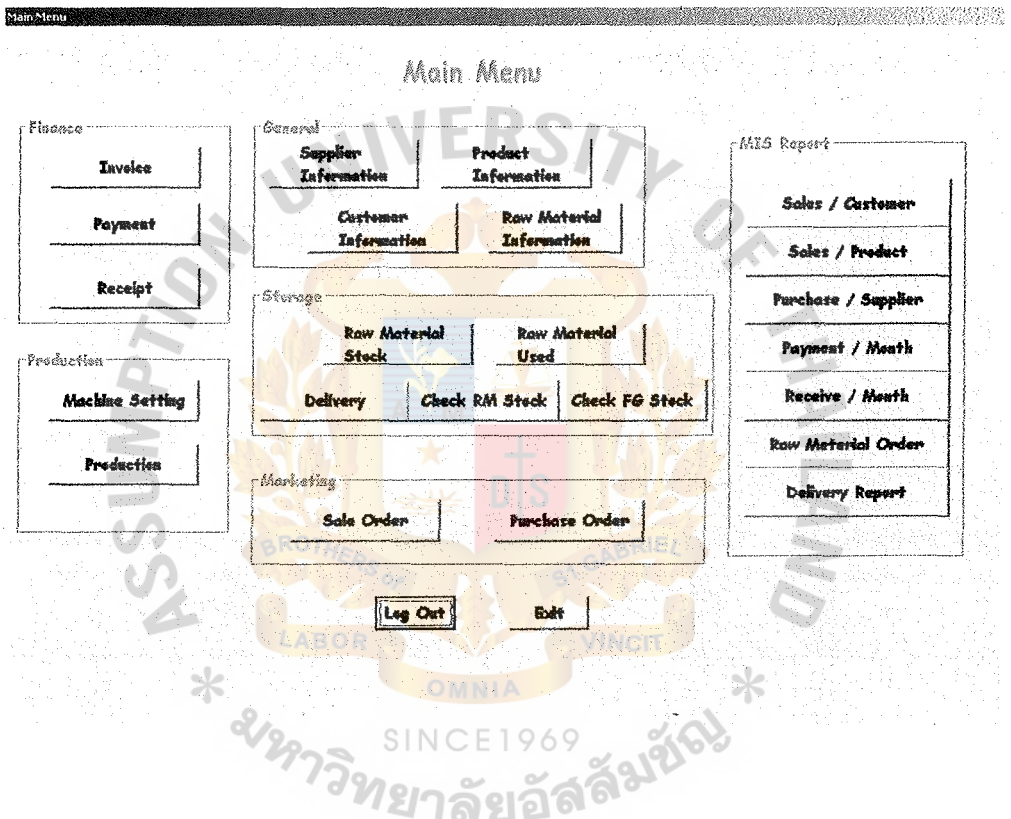

Figure B-2 Main Menu Form

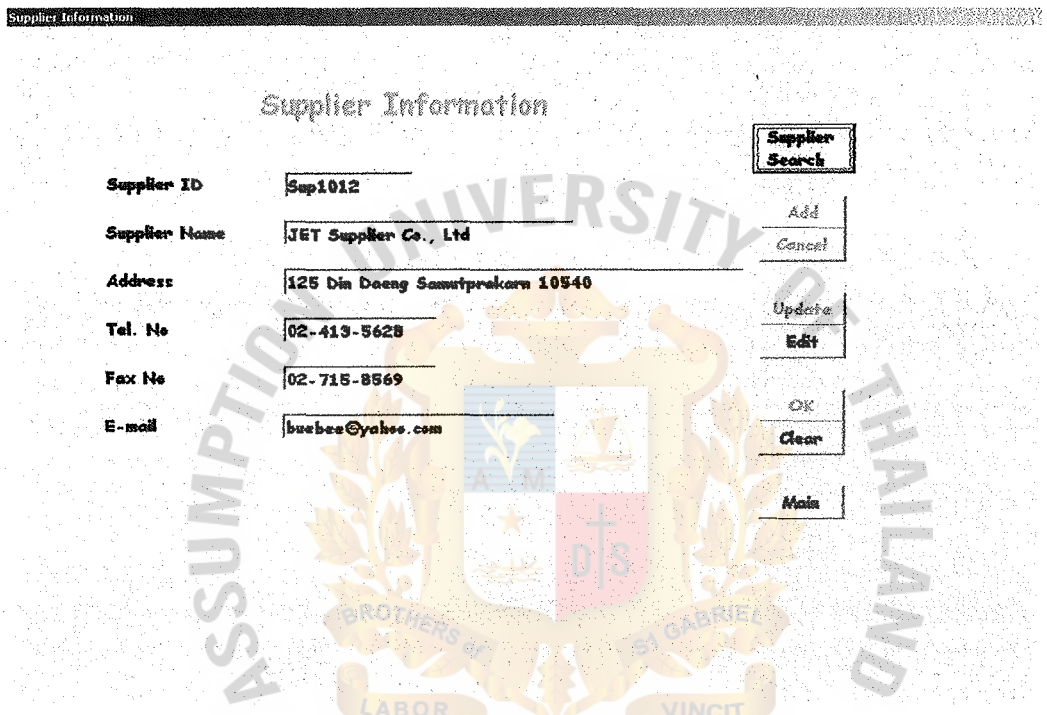

Figure B-3 Supplier Information Form

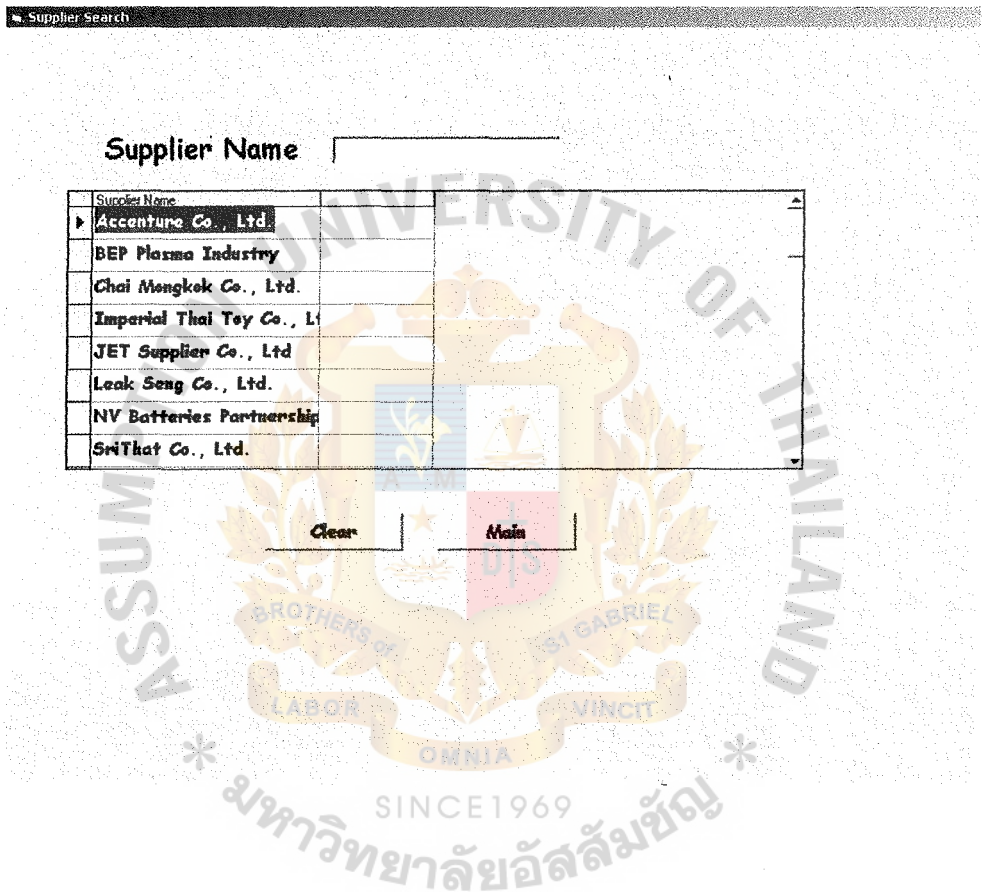

Figure B-4 Supplier Search Form

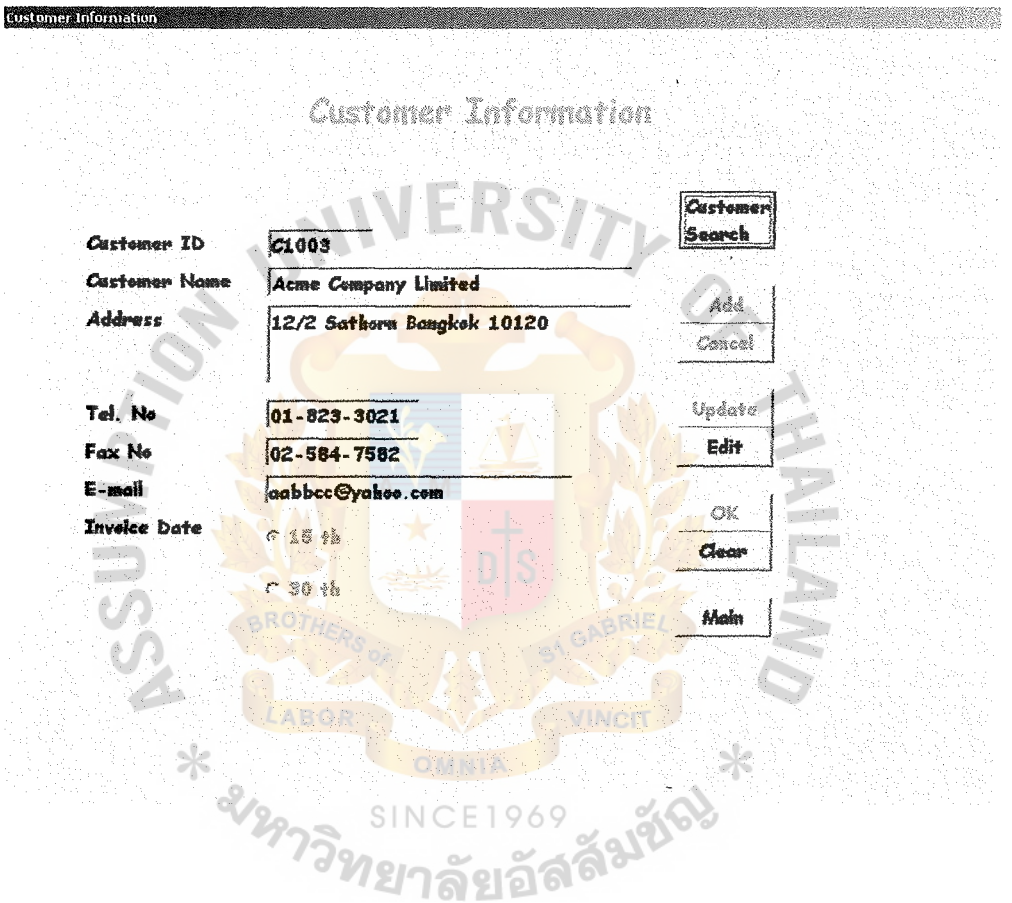

Figure B-5 Customer Information Form

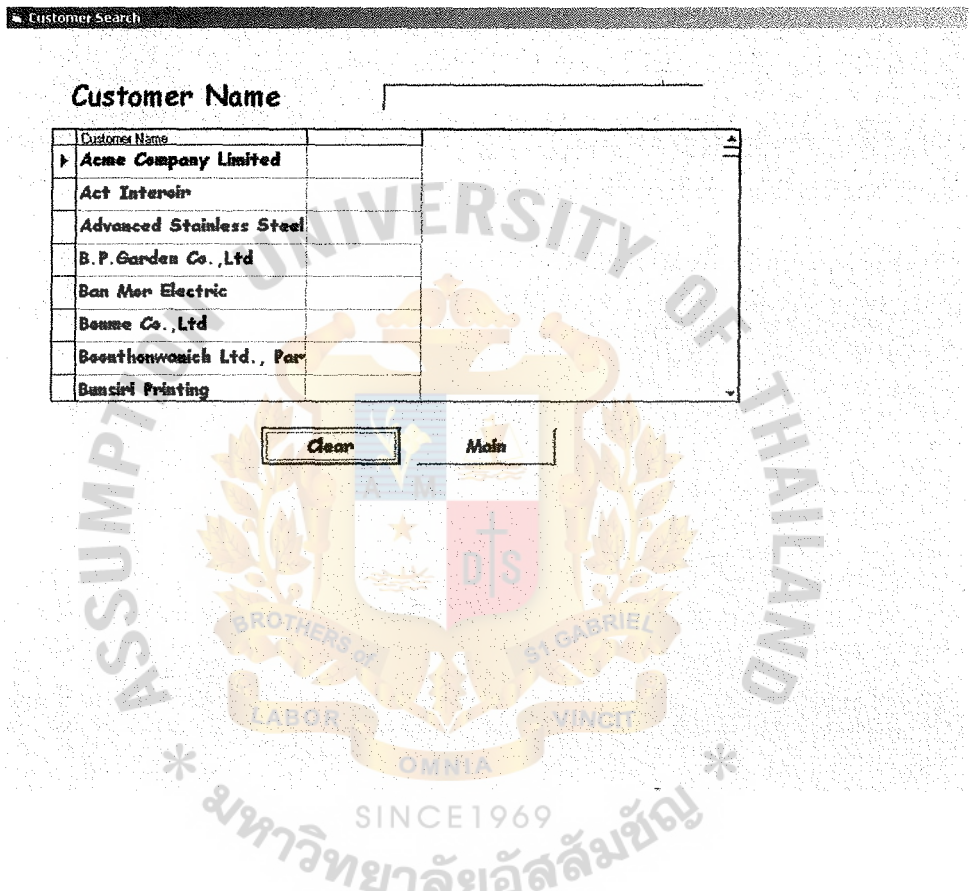

Figure B-6 Customer Search Form

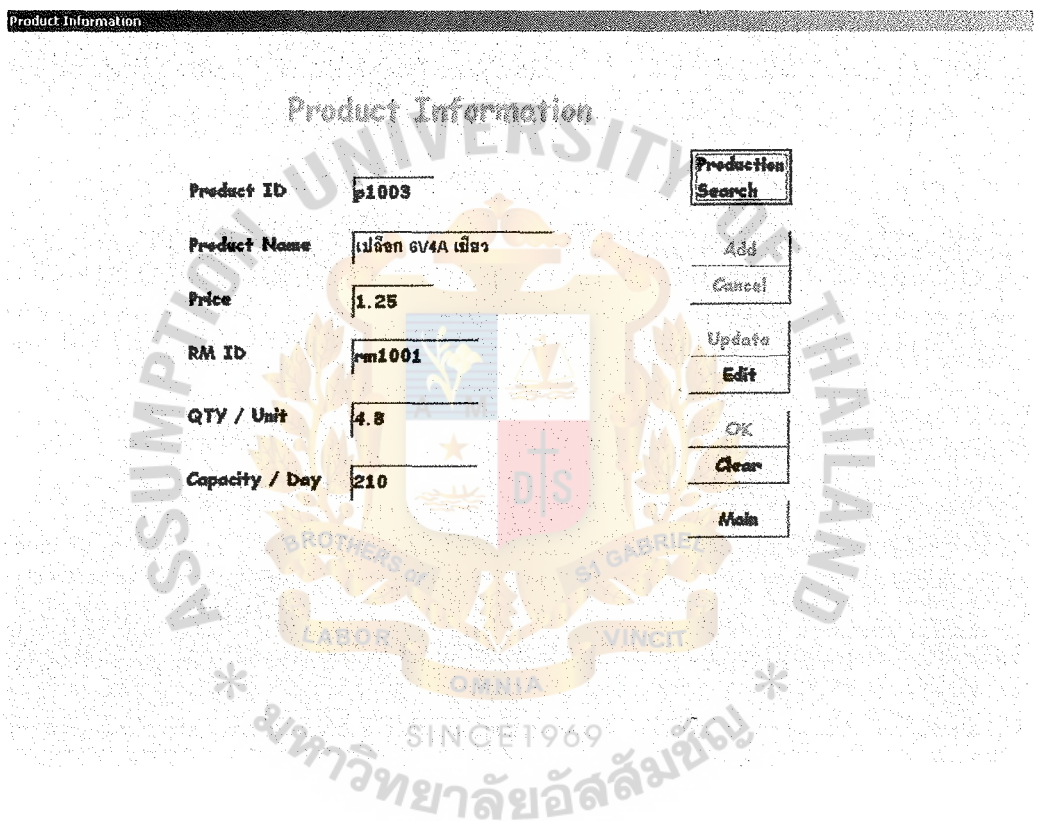

Figure B-7 Product Information Form

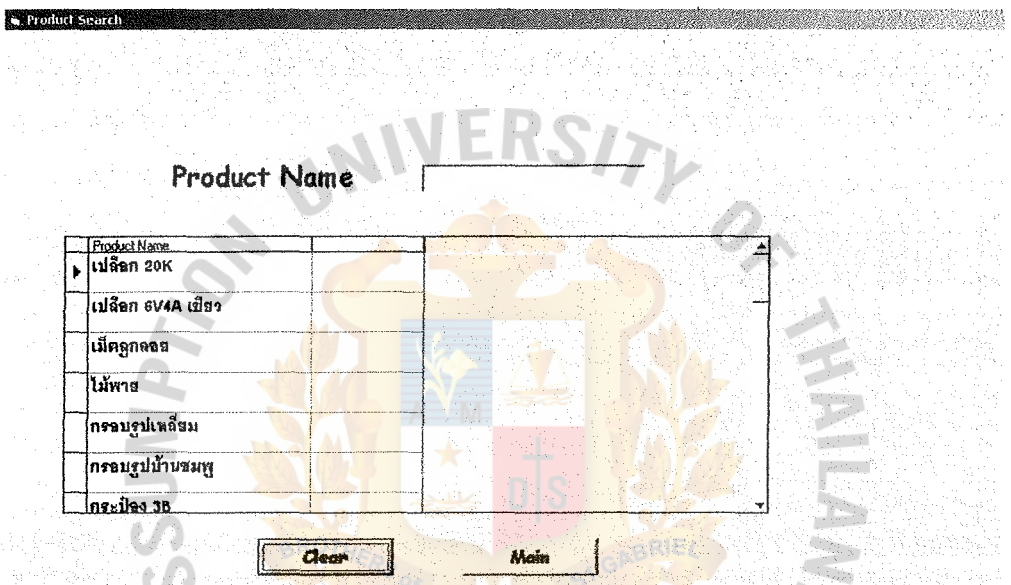

Figure B-8 Product Search Form

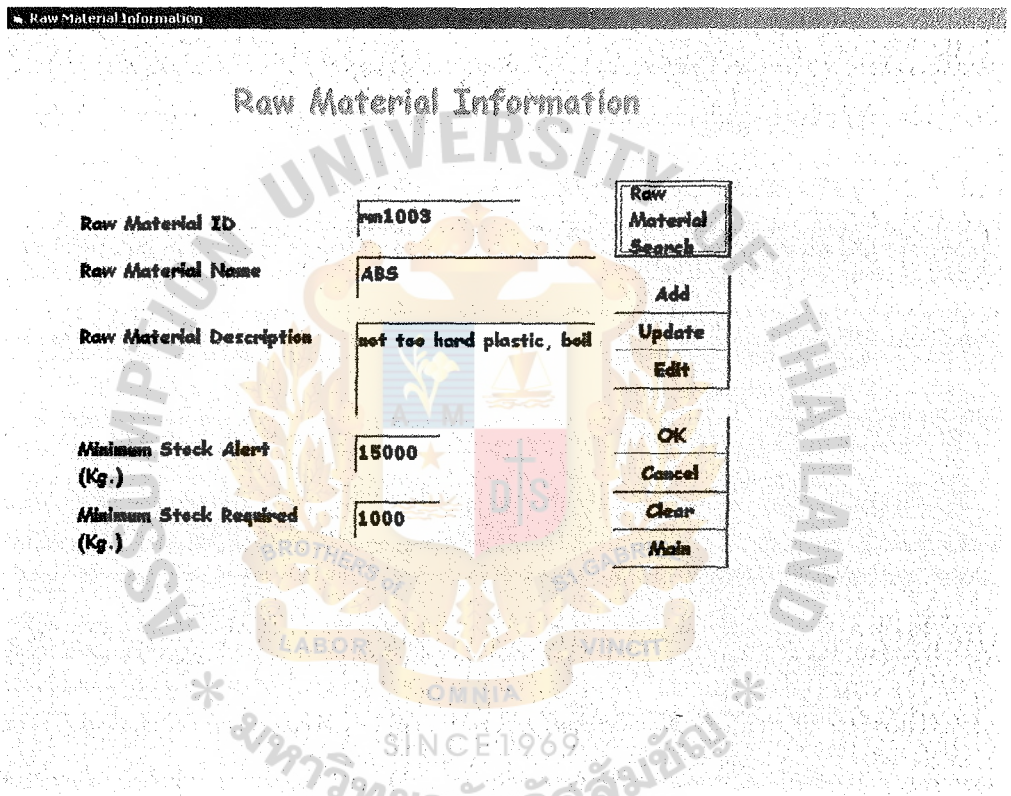

Figure B-9 Raw Material Information Form

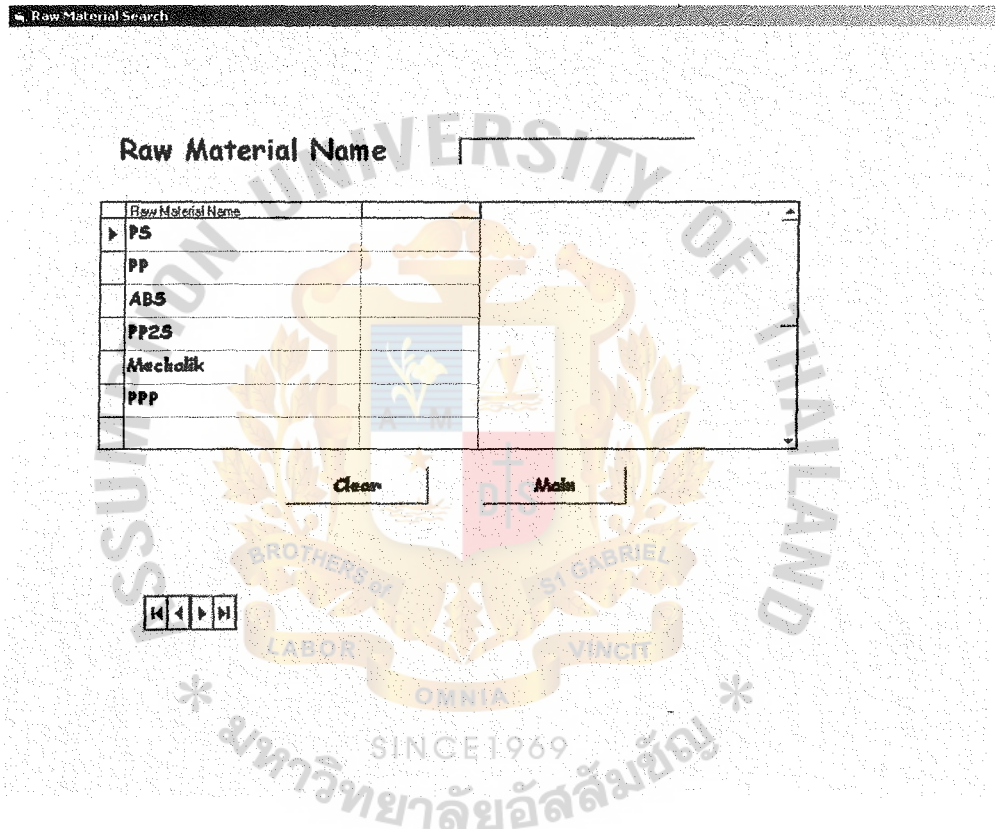

Figure B-10 Raw Material Search Form

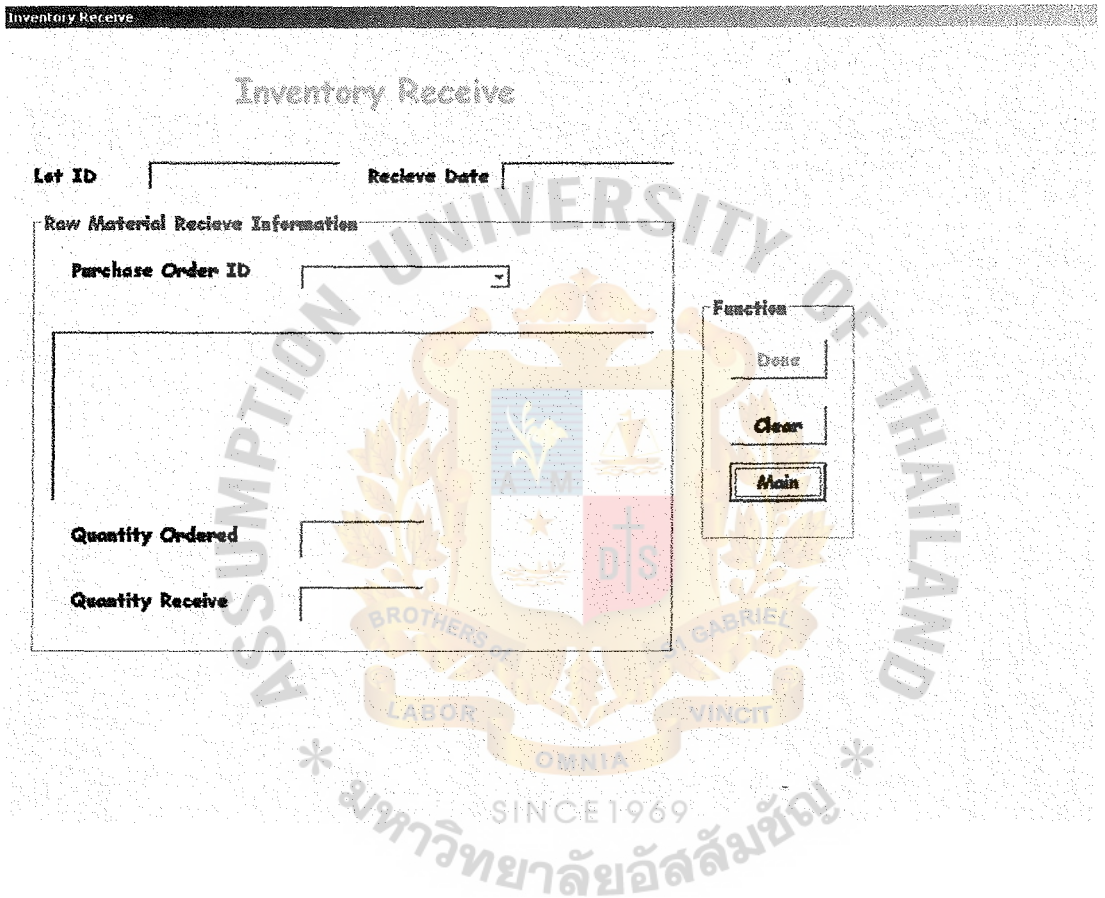

Figure B-11 Inventory Receive Form

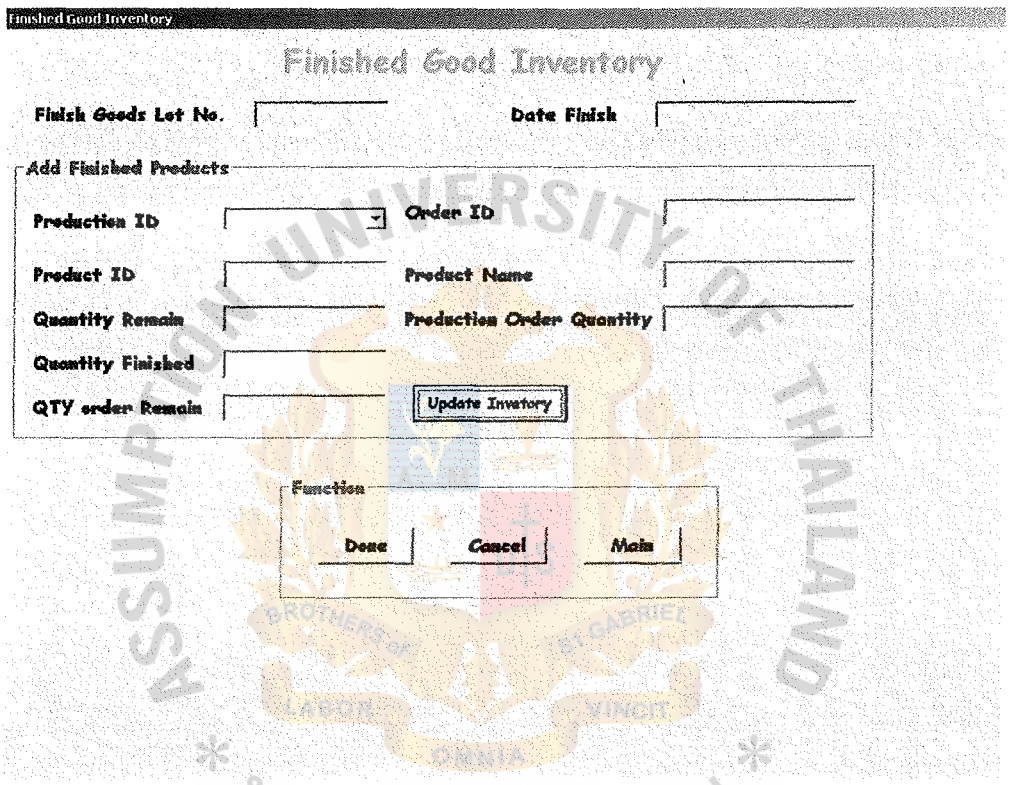

Figure B-12 Finish Good Inventory Form

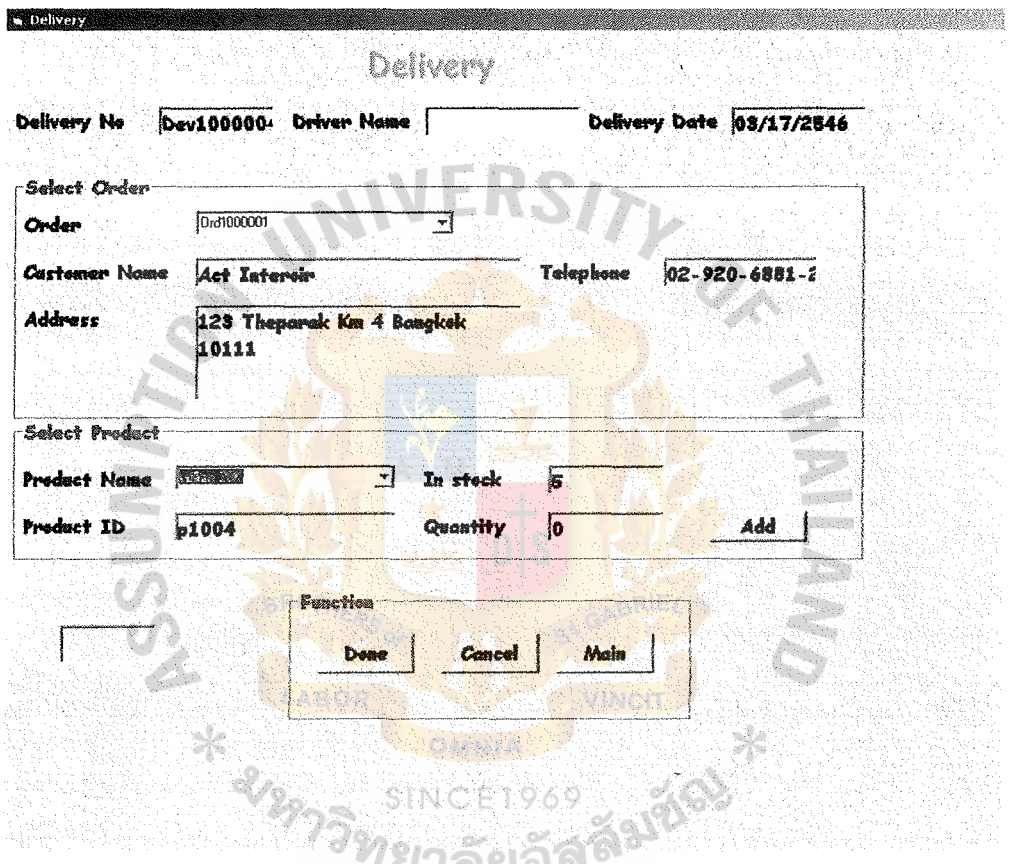

Figure B-13 Delivery Form

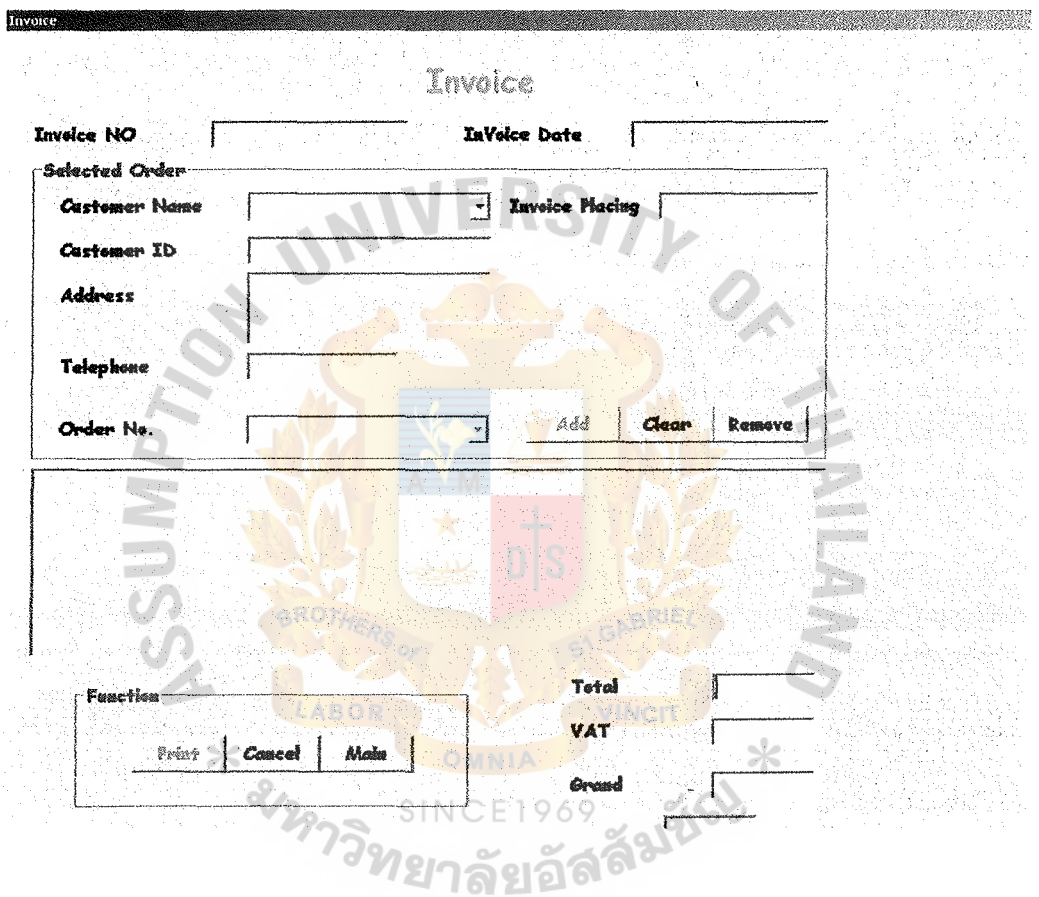

Figure B-14 Invoice Form

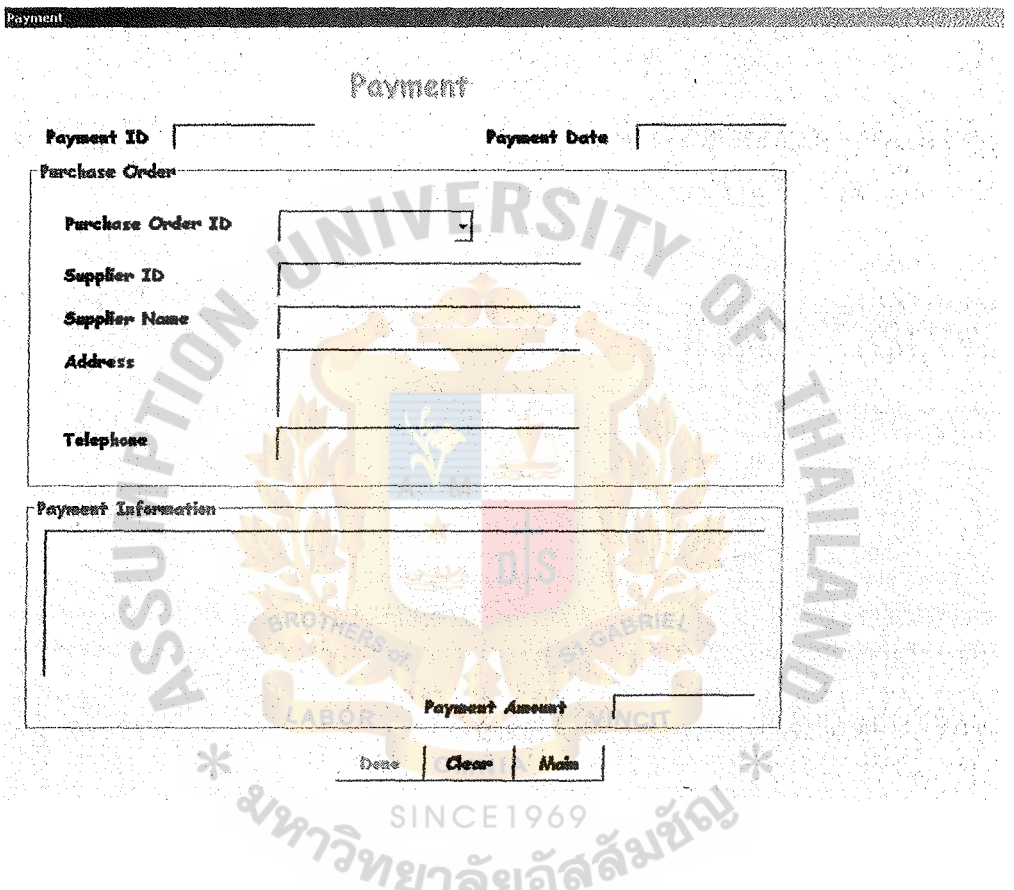

Figure B-15 Payment Form

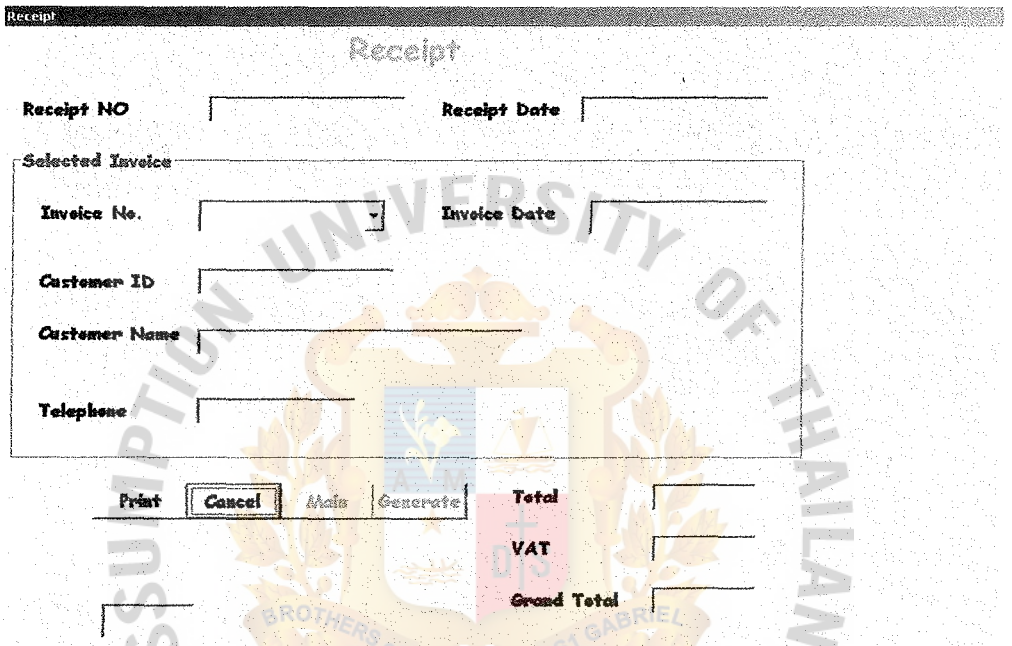

Figure B-16 Receipt Form

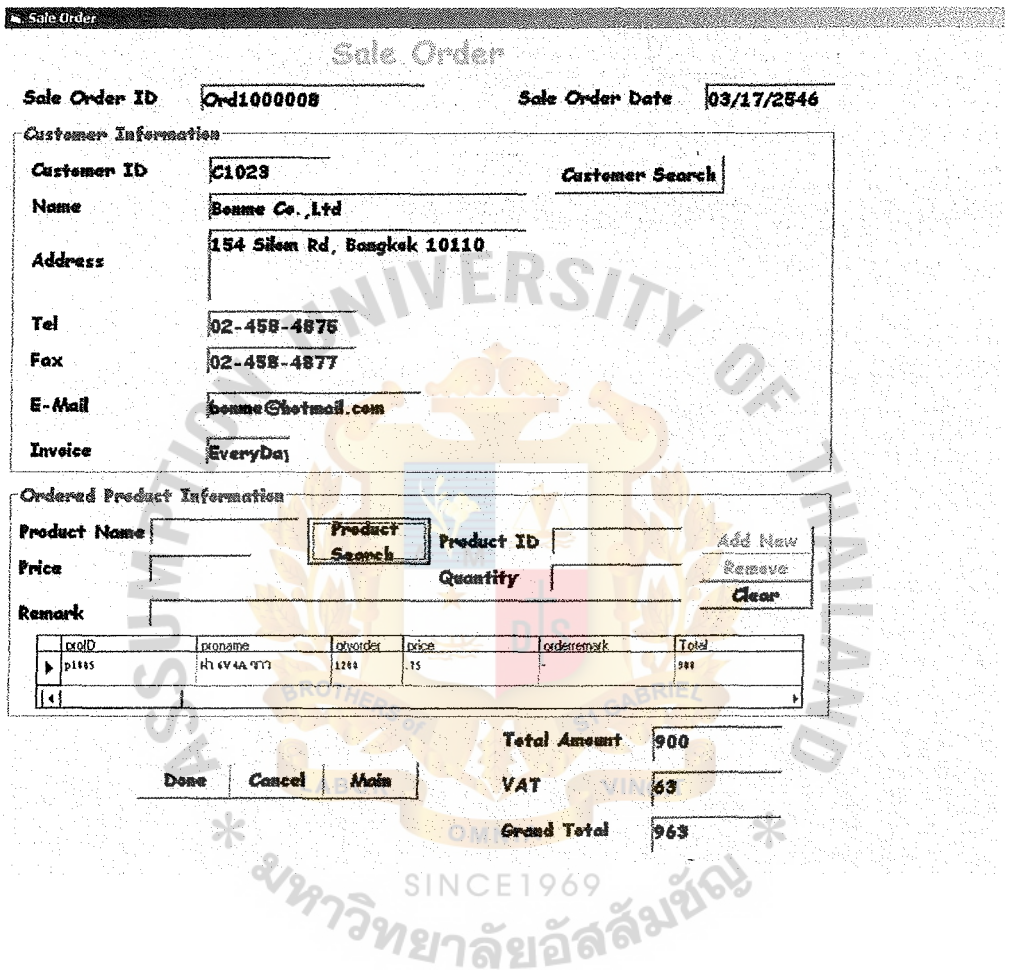

Figure B-17 Sale Order Form

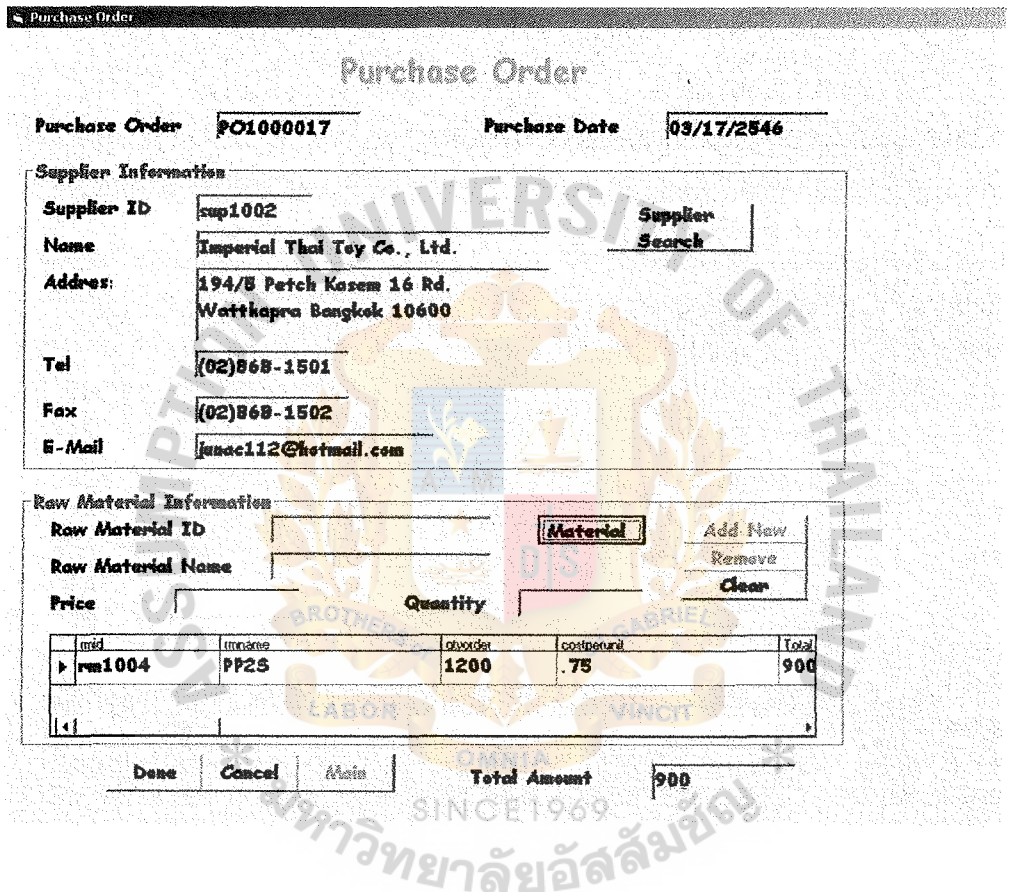

Figure B-18 Purchase Order Form

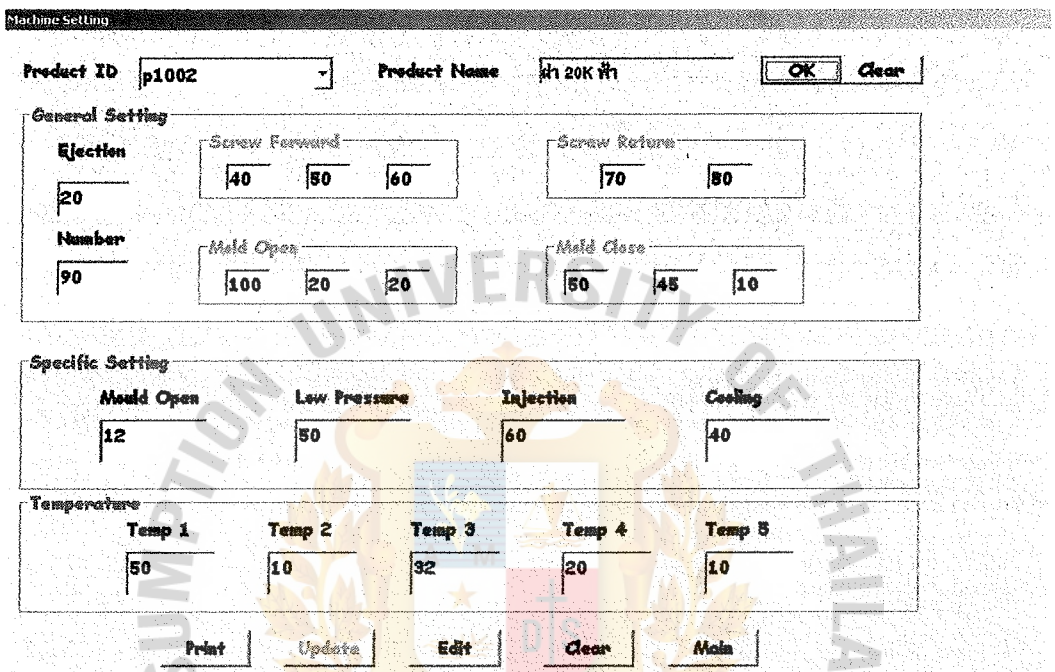

Figure B-19 Machine Setting Form

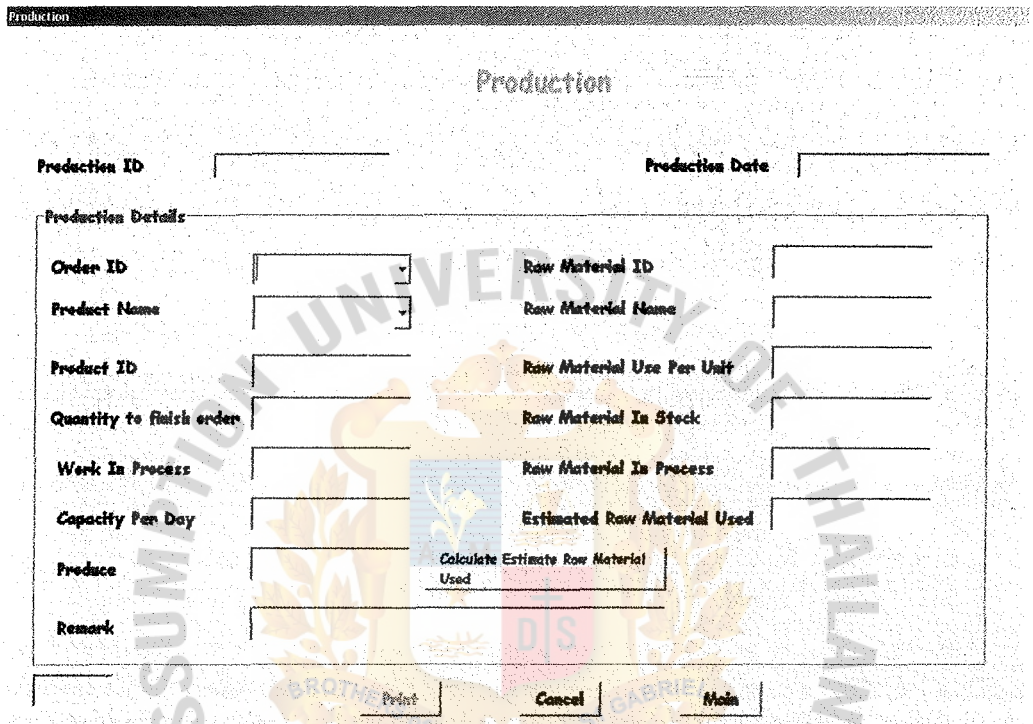

Figure B-20 Production Form

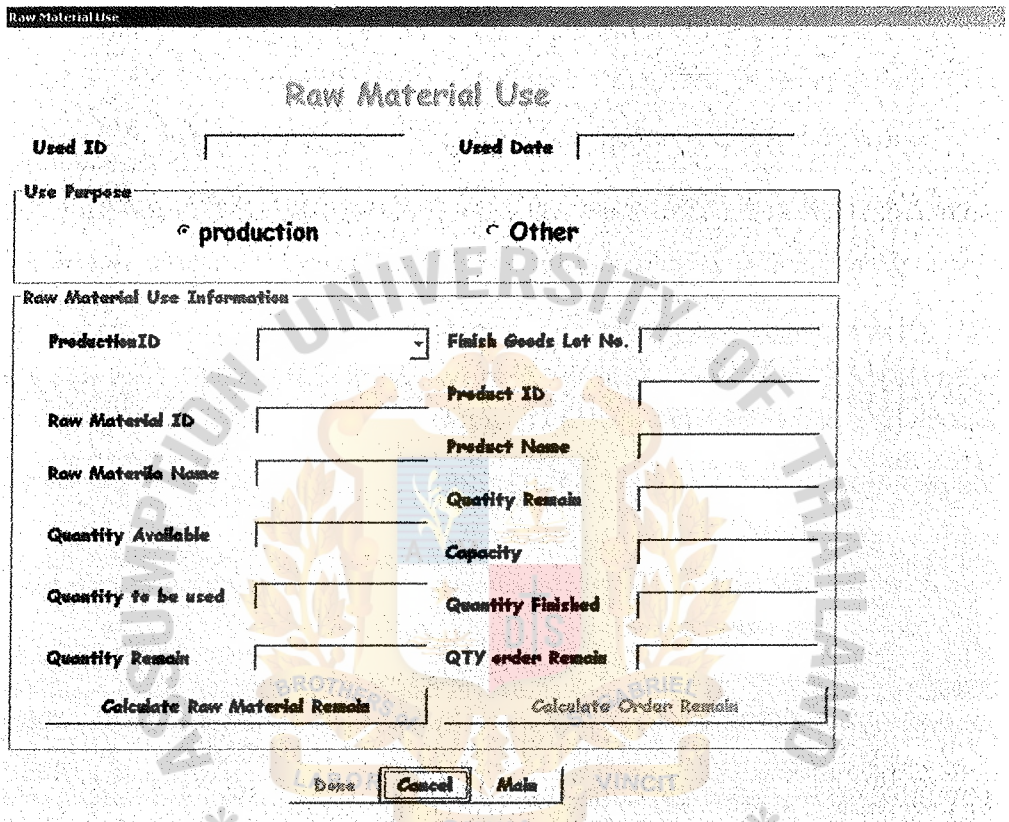

Figure B-21 Raw Material Use Form

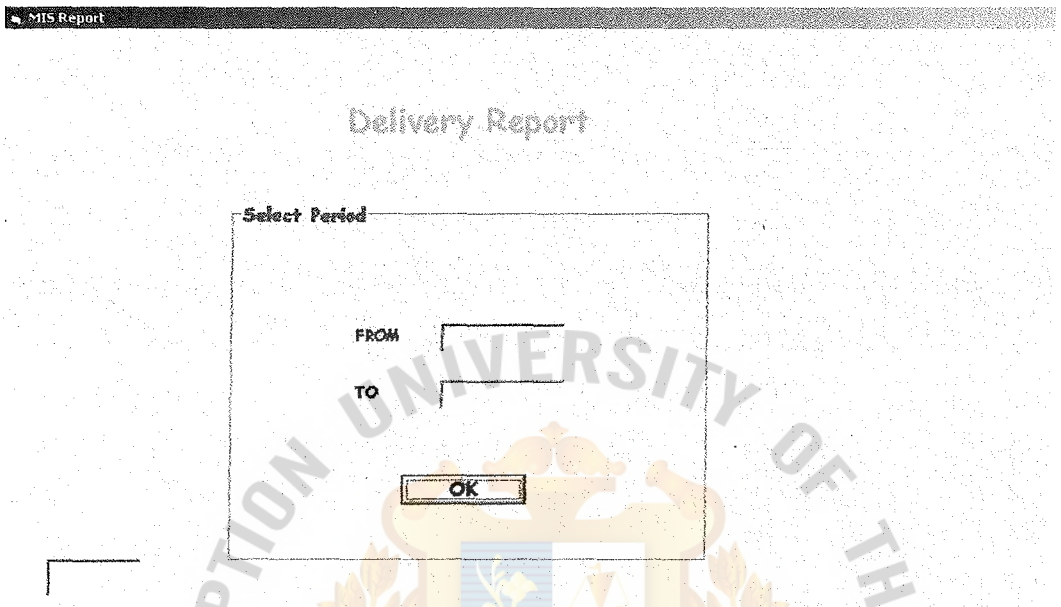

Figure B-22 Delivery Report Form

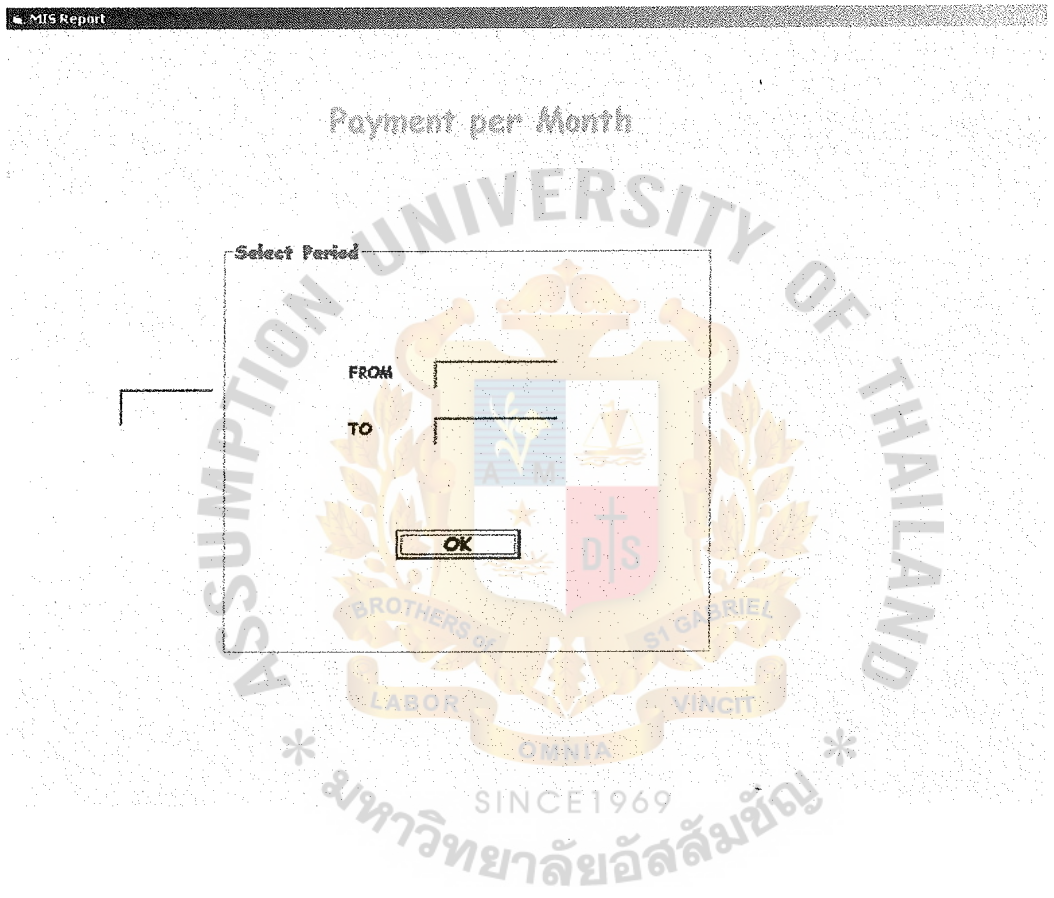

Figure B-23 Payment Per Month Report Form

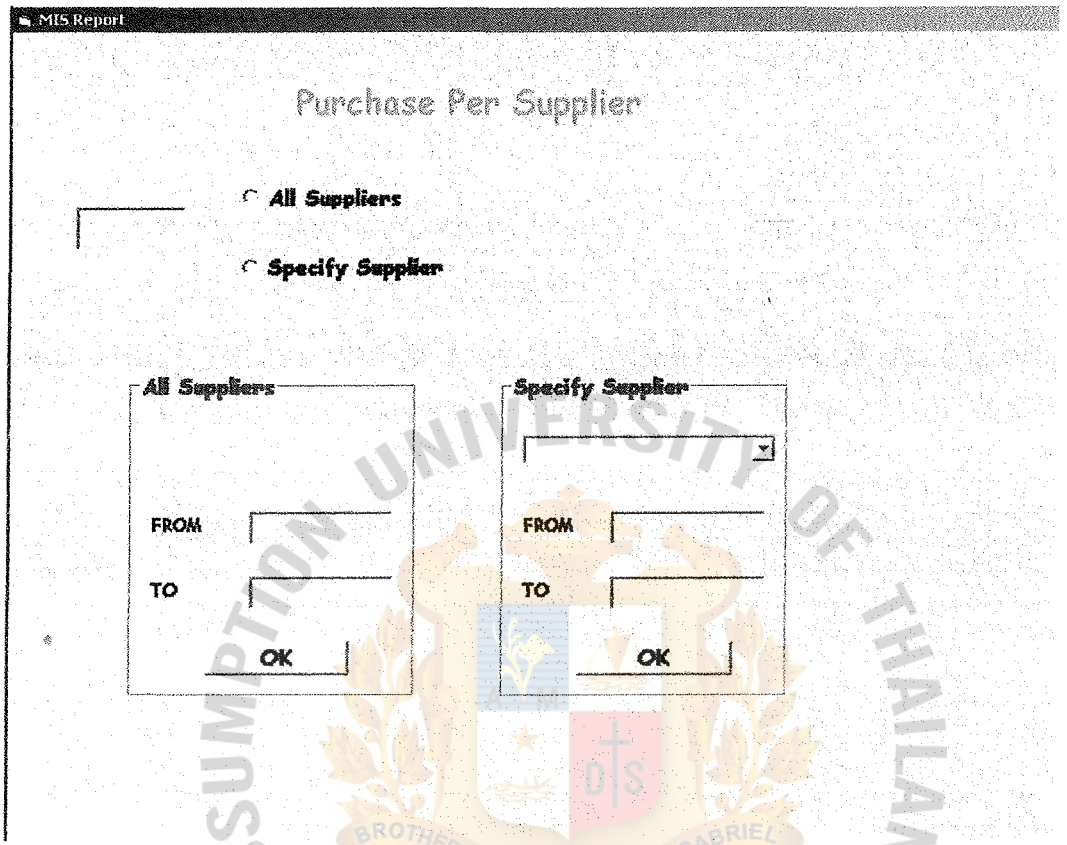

Figure B-24 Purchase Per Supplier Report Form

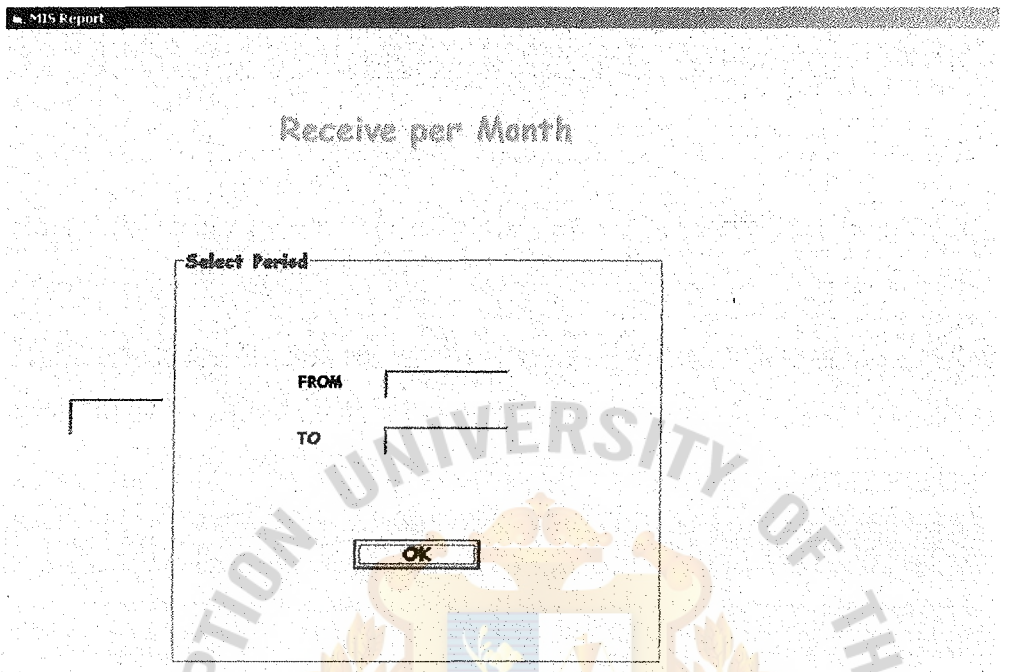

Figure B-25 Receive per Month Report Form

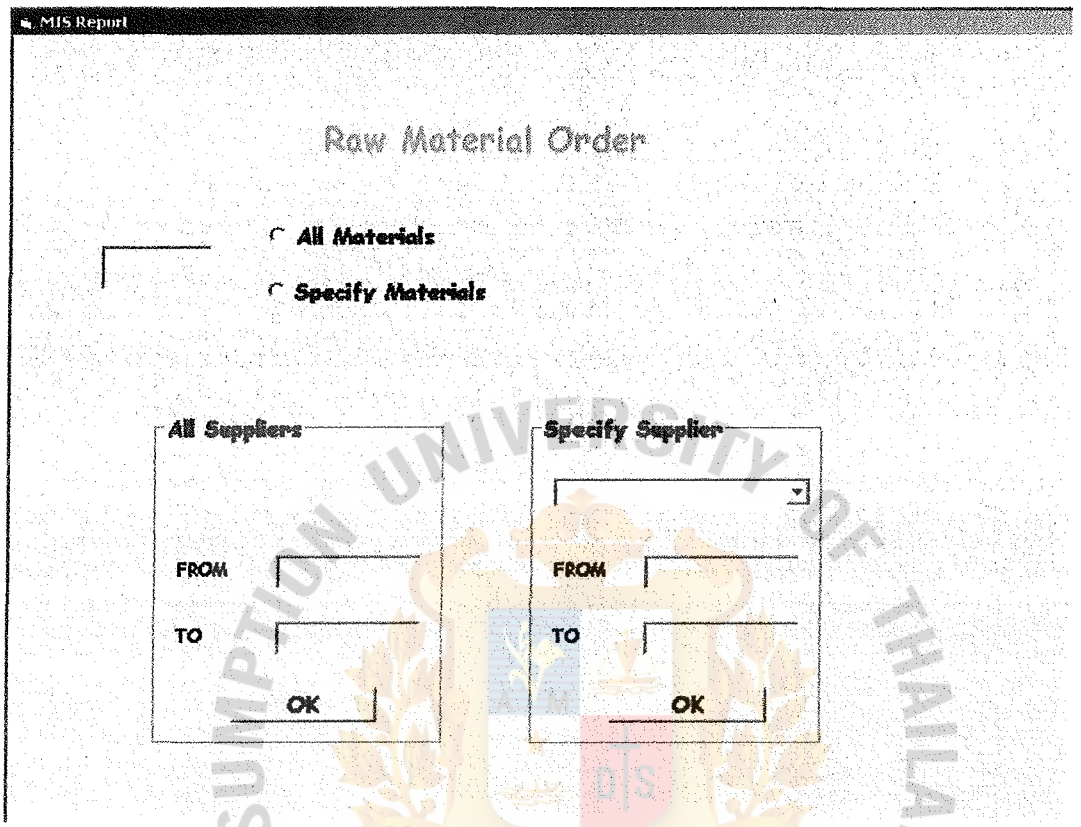

Figure B-26 Raw Material Order Report Form

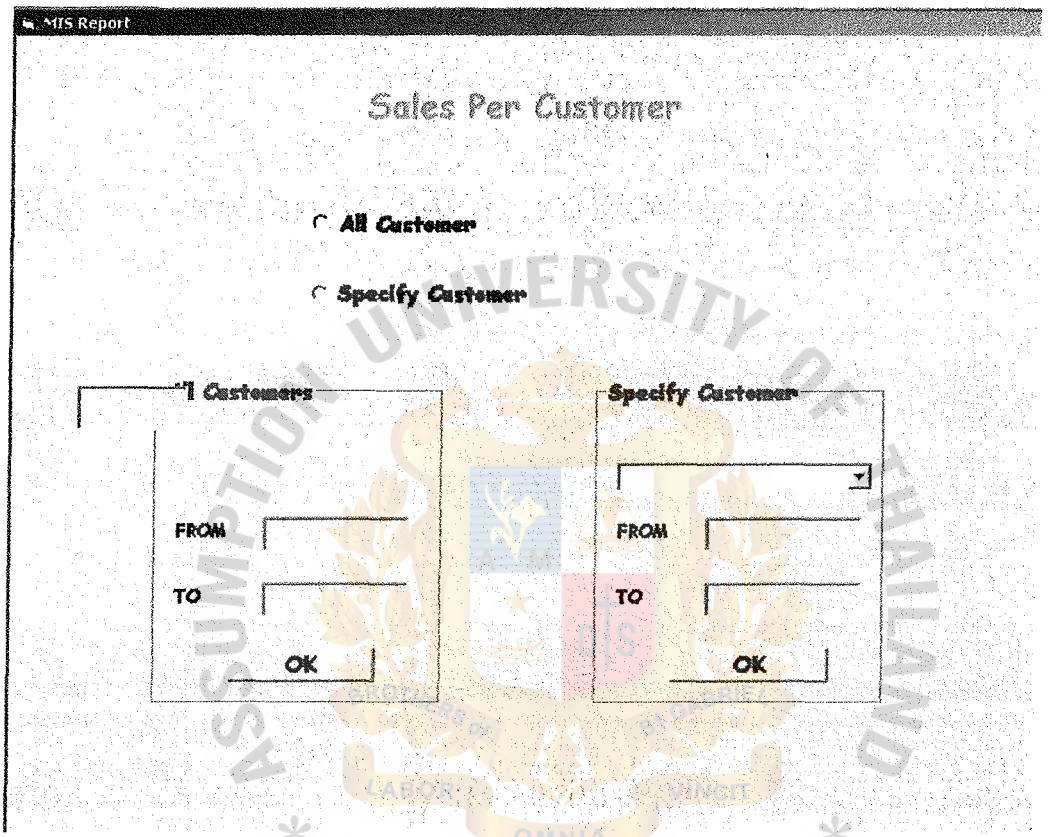

Figure B-27 Sales Per Customer Report Form

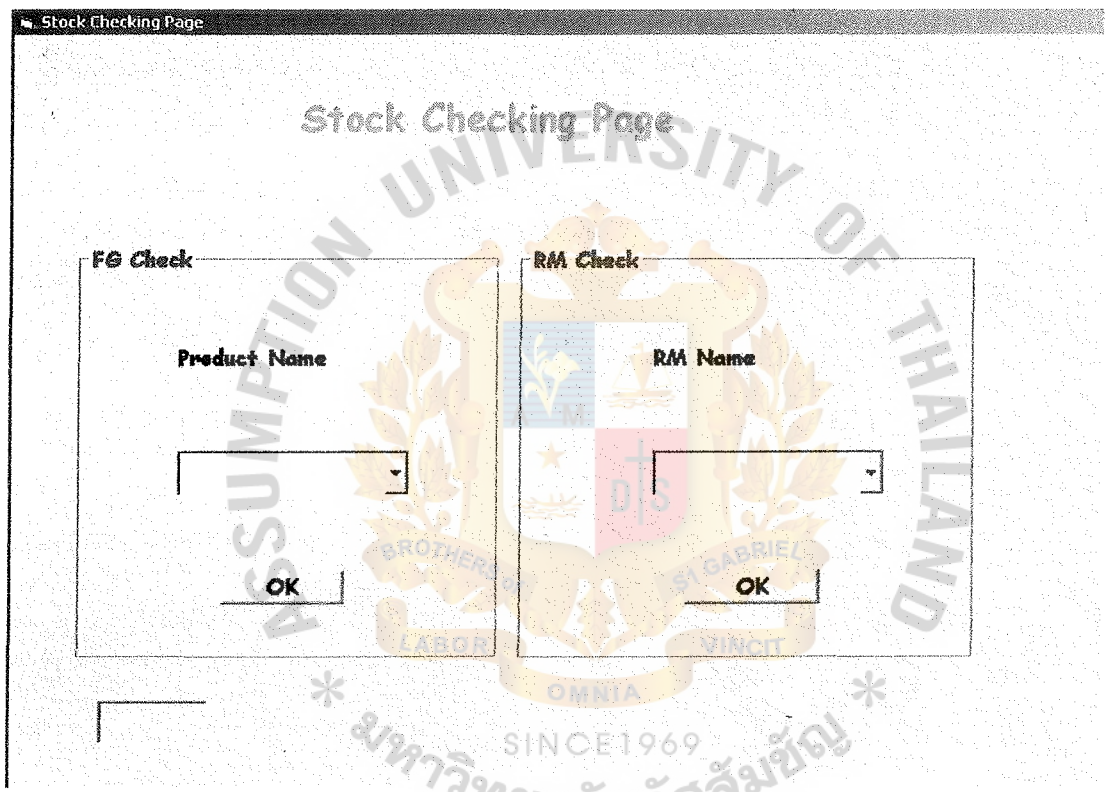

Figure B-28 Stock Checking Report Form

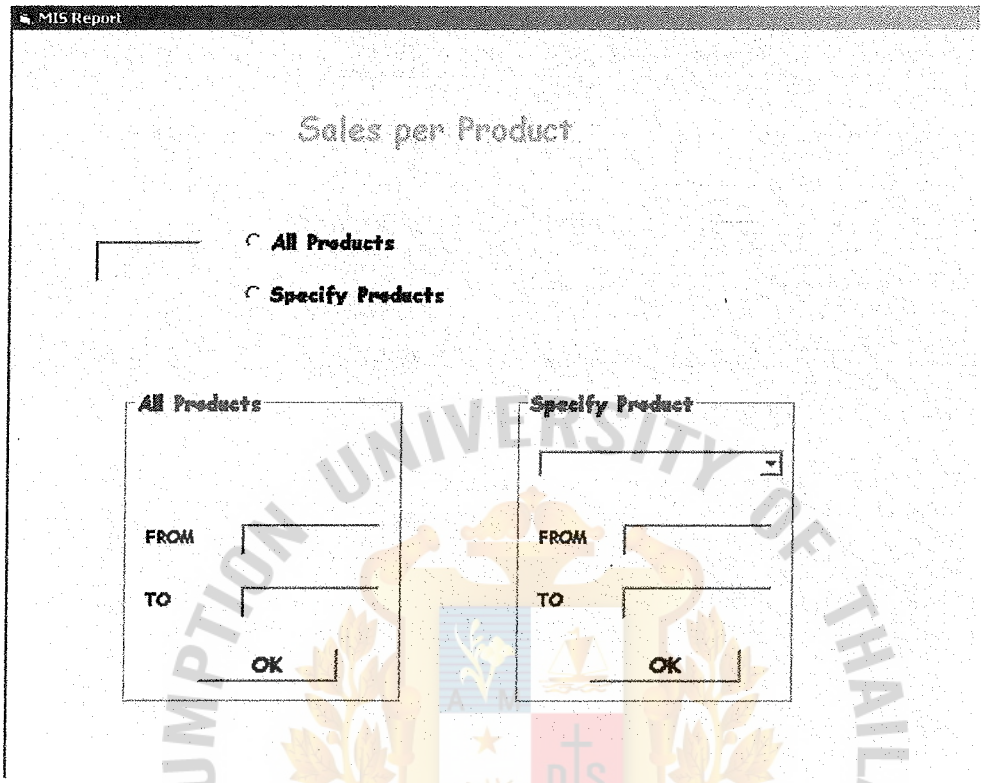

Figure B-29 Sales per Product Report Form

APPENDIX C
REPORT DESIGN

Invoice

Invoice No : INV1000001

Tong Monkol Industry Co., Ltd.
79/15 Theparak Rd. Bangpleeyai Bangplee
Samutprakarn 10540
Tel. 759-7620-1

Customer Name : YIH Temasak (Thailand) Co ,Ltd

Address : 96/8-9 M 9 Rama 2 Rd, Bangmod, Bangkok 10150

Tel : 02-452-0427-33 **DATE:** 17/3/2540

Order No	Order Date	Total	VAT	GrandTotal
Ord1000001	03-พฤษภาคม-1460	฿ 9,000.00	฿ 756.00	฿ 9,756.00
	Grand Total :	**฿9,000.00**	**฿756.00**	**฿9,756.00**

All transactions above are correct

Sign ..... Date .....

Page 1 of 1

Figure C-1 Invoice Report

Purchase Order

Purchase ID :
PO1000005

Tong Monkol Industry Co., Ltd.
79/15 Theparak Rd. Bangpleeyai Bangplee
Samutprakarn 10540
Tel. 759-7620-1

Supplier Name : Chai Mongkok Co., Ltd.

Address : 99/9 Theparak Rd Bangpu Samutprakarn 10540

DATE: 17/3/2546

Tel : (02)457-8526

Raw Material Name	Quantity Order	Cost / Unit	Total
PP	100	฿ .50	50.00
PP	1,000	฿ 10.00	10,000.00
PP2S	100	฿ 100.00	10,000.00
PP	100	฿ 100.00	10,000.00
PP2S	100	฿ 100.00	10,000.00
Mechalik	1,000	฿ 10.00	10,000.00
PP	100	฿ .10	10,010.00
PP2S	1,000	฿ 10.00	10,010.00
PP2S	10,000	฿ 1.00	10,000.00
PP	10	฿ 100.00	1,000.00

Grand Total : 81,070.00

All transactions above are authorized

Authorize ..... Date .....

Page 1 of 1

Figure C-2 Purchase Order Report

Receipt

Reciept No : REP1000001

Tong Monkol Industry Co., Ltd.
79/15 Theparak Rd. Bangpleeyai Bangplee
Samutprakarn 10540
Tel. 759-7620-1

Customer Name : YHI Temasak (Thailand) Co.,Ltd

Address : 96/8-9 M 9 Rama 2 Rd. Banumod. Bangkok 10150

Tel : 02-452-0427-33 **DATE:** 17/3/254

Invoice No	Order No	Total	VAT	Grand Total
INV1000001	ord1000001	฿ 9,000.00	฿ 756.00	฿ 9,756.00
Grand Total :		**฿9,000.00**	**฿756.00**	**฿9,756.00**

All the above transactions are approved

Authorizer ..... Date .....

Page 1 of 1

Figure C-3 Receipt Report

Purchases Per Supplier

17/3/2546

Supplier Name	Supplier ID	Supplier Tel
NV Batteries Partnership	**sup1001**	**(02)759-7621**

Purchase ID	Purchase Date	Total
pr1001	12-มีนาคม-2003	100.00

NV Batteries Partnership 100.00

Viriya Co., Ltd.	sup1004	(02)280-8710

Purchase ID	Purchase Date	Total
PO0000002	02-มีนาคม-2003	200.00

Viriya Co., Ltd. 200.00

Grand Total: **300.00**

Figure C-4 Purchase Per Supplier Report

DMK

Payment Per Month

17/3/2546

Purchase ID	Purchae Date	Purchase Value
PO0000001	12-มีนาคม-2003	100.00
PO0000002	02-มีนาคม-2003	200.00
	TOTAL	**300.00**

Figure C-5 Payment Per Month Report

Sales Per Customer

17/3/254

Customer Name	Customer ID	Customer Tel		
Act Interoir	c1001	02-920-6881-		
Order No	**Order Date**	**Total**	**VAT**	**Grand Total**
Ord0001	02-มกราคม-2003	฿30.00	฿7.00	฿37.00
Ord0002	28-กุมภาพันธ์-200	฿30.00	฿7.00	฿37.00
Ord0003	30-มกราคม-2003	฿30.00	฿7.00	฿37.00
Ord0006	20-มกราคม-2003	฿30.00	฿7.00	฿37.00
		฿120.00	฿28.00	฿148.00
Sunnic Trading Co., Ltd.	c1002	02-945-6001-		
Order No	**Order Date**	**Total**	**VAT**	**Grand Total**
Ord0004	12-กุมภาพันธ์-200	฿30.00	฿7.00	฿37.00
Ord0005	17-กุมภาพันธ์-200	฿30.00	฿7.00	฿37.00
		฿60.00	฿14.00	฿74.00
Grand Total:		**฿180.00**	**฿42.00**	**฿222.00**

Page 1 of 1

Figure C-6 Sales Per Customer Report

Sales Per Product

17/3/254

Product Name		Product ID		
ไม้พาย		p0010		
Order No	**Order Date**	**Quantity Order**	**Price**	**Total**
Ord1000001	09-มีนาคม-2003	200	฿6.00	฿1,200.00
		200.00		฿1,200.00
เฝือก 20K		p1004		
Order No	**Order Date**	**Quantity Order**	**Price**	**Total**
Ord1000001	09-มีนาคม-2003	100	฿5.75	฿575.00
		100.00		฿575.00

Grand Total: **฿ 1,775.00**

Page 1 of 1

Figure C-7 Sales Per Product Report

17/3/2546

Raw Material Receive Report

Raw Material ID	Raw Material Name				
rm1005	Mechalik				
Purchase ID	**QTY Order**	**QTY Recieve**	**Recieve Date**	**RM Cost**	**Total**
PO1000004	1,000	1,000.00	09-กันยายน-2003	฿10.00	฿10,000.00
Mechalik	1,000.00	1,000.00			฿10,000.00
Grand Total:	**1,000.00**	**1,000.00**			**฿ 10,000.00**

Figure C-8 Raw Material Order Report

Amount Receive Per Month

17/3/254

Order No	Order Date	Total	VAT	GrandTotal
Ord1000001	14-มีนาคม-2003	฿14,545,452.00	฿1,018,181.64	฿15,563,633.64
Ord1000002	14-มีนาคม-2003	฿20.00	฿1.40	฿21.40
Ord1000003		฿.00	฿.00	฿.00
Ord1000004	14-มีนาคม-2003	฿1,080.00	฿75.60	฿1,155.60
	TOTAL	**฿14,546,552.00**	**฿1,018,258.64**	**฿15,564,810.64**

Figure C-9 Amount Receive Per MonthReport

TMK

Delivery Report

Delivery No :

17/3/2546

Delivery Date	Order No	Product Name	Driver Name	Quantity

Figure C-10 Delivery Report

17/3/2546

Machine Setting

Product Name : ลูกกลมเหลี่ยม

Product ID : p1001

Eiection	
50	
Number	
50	

S Forward 1	S Forward 2	S Forward 3	S Return 1	S Return 2
10	20	30	50	5
M Open 1	**M Open 2**	**M Open 3**	**M Close 1**	**M Close 2**	**M Close 3**
60	60	50	50	70	80

Mold Open	Low Pressure	Iniection	Cooling
90	10	30	65

Temp 1	Temp 2	Temp 3	Temp 4	Temp 5
10	45	12	52	63

Figure C-11 Machine Setting Report

Production Order

Production ID :
PRO1000001
17/3/2546

Production Date	Order No	Production ID	Product Name	Qty C
09-มีนาคม-2003	Ord1000001	p1004	แล็อก 208	

Figure C-12 Production Order Report

Temporary Bill

Delivery No : dv1001

Tong Monkol Industry Co., Ltd.
79/15 Theparak Rd. Bangpleeyai Bangplee
Samutprakarn 10540
Tel. 759-7620-1

Customer Name : Act Interoir

Address : 123 Theparak Km 4 Bangkok 10111

DATE: 17/3/254(

Tel : 02-920-6881-2

Driver Name : bac

Product ID	Product Name	Quantity	Price	Total
p1001	๑๐๐๐	1,000	฿ .40	฿ 400.00

Grand Total : **฿400.00**

All transactions above are correct

Sign ..... Date .....

Page 1 of 1

Figure C-13 Customer Temporary Bill Report

Finished Good Stock

17/3/2546

Product Name : เม็ดยา 20K

Production ID	Quantity in Stock	Order No.
pro1000001	800	Ord1000001
	800.00	

Grand Total: **800.00**

Figure C-14 Finished Good Stock Report

Raw Material Stock Status 17/3/2546

RM ID : rm1003

RM Name : ABS

Lot ID	Quantity Remain	RM Alert
LOT1000004	1,000.00	1,500
	1,000.00	**1,500.00**

Lot ID	Quantity Remain	RM Alert
LOT1000005	1,000.00	1,500
LOT1000001	2,000.00	1,500
	3,000.00	**3,000.00**

Lot ID	Quantity Remain	RM Alert
LOT1000002	2,500.00	1,500
	2,500.00	**1,500.00**

Lot ID	Quantity Remain	RM Alert
LOT1000003	2,500.00	1,500
	2,500.00	**1,500.00**

Page 1 of 2

Figure C-15 Raw Material Stock Status Report

BIBILOGRAPHY

1. Utamawatin, Chantawut. General Manager. Interview, 5 December 2002.

2. Saetung, Sunee. Sales Manager. Interview, 5 December 2002.

3. Kendall, Kenneth E. and Kendal, Julie E. **Systems Analysis And Design.** New Jersey: Prentice-Hall, 1999.