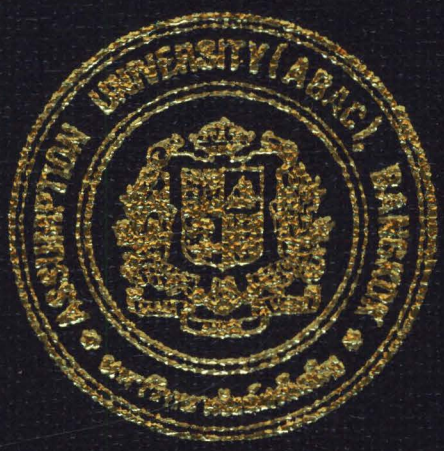

Practical Development of Information System in Business Context: TIARA Online System for TIARA Company Limited

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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:	TIARA Online System for TIARA Company Limited
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Advisor:	A. Swati Prabhu
Academic Year:	2002

The Department of Business Information Systems, ABAC School of Management has approved the aforementioned project, which includes complete Project Write-up and System submitted in 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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Practical Development of Information System in Business Context:
TIARA Online System for TIARA Company Limited

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March, 2003

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มหาวิทยาลัยอัสสัมชัญ

I. INTRODUCTION

1.1 Background of the Organization

TIARA Company Limited is located on 64 Moo 3, Wat Rai King Rd. Songkanong Sampran Nakorn Pathom. It has been operated in cosmetics field for over 20 years. By using high technology machine from Taiwan and England, this allows the company to introduce high quality product to the customer. Now, TIARA becomes successful as the major cosmetic exporter in Thailand to many countries all over the world. TIARA offers many kinds of products such as lipsticks, pressed powder, eye shadow, brush on, shampoo, conditioner and body lotion with many different colors and styles provided.

Ms. Chureeporn, who specialized in selling cosmetic product and had knowledge about the product line, and Mr. Pichet, her husband who is an expert in marketing field, have established TIARA in 1994. Both of them saw an opportunity from high growth rate of cosmetics sales and high return that is generated from sales. So, they started to launch this business under TIARA brand name in Thailand. The first factory of TIARA was located on Chan Road and its main market was in Pahurad, Han bridge, Sampeng and Khlong Toei. As TIARA became more successful, it began to export the product to many countries.

Nowadays, TIARA business depends solely on the export with a wide variety of product offerings. TIARA is doing business with the best regard of customer satisfaction through its product lines and series. In this information age, TIARA promises to lead more accurate levels of production and more targeted communication through the World Wide Web technology.

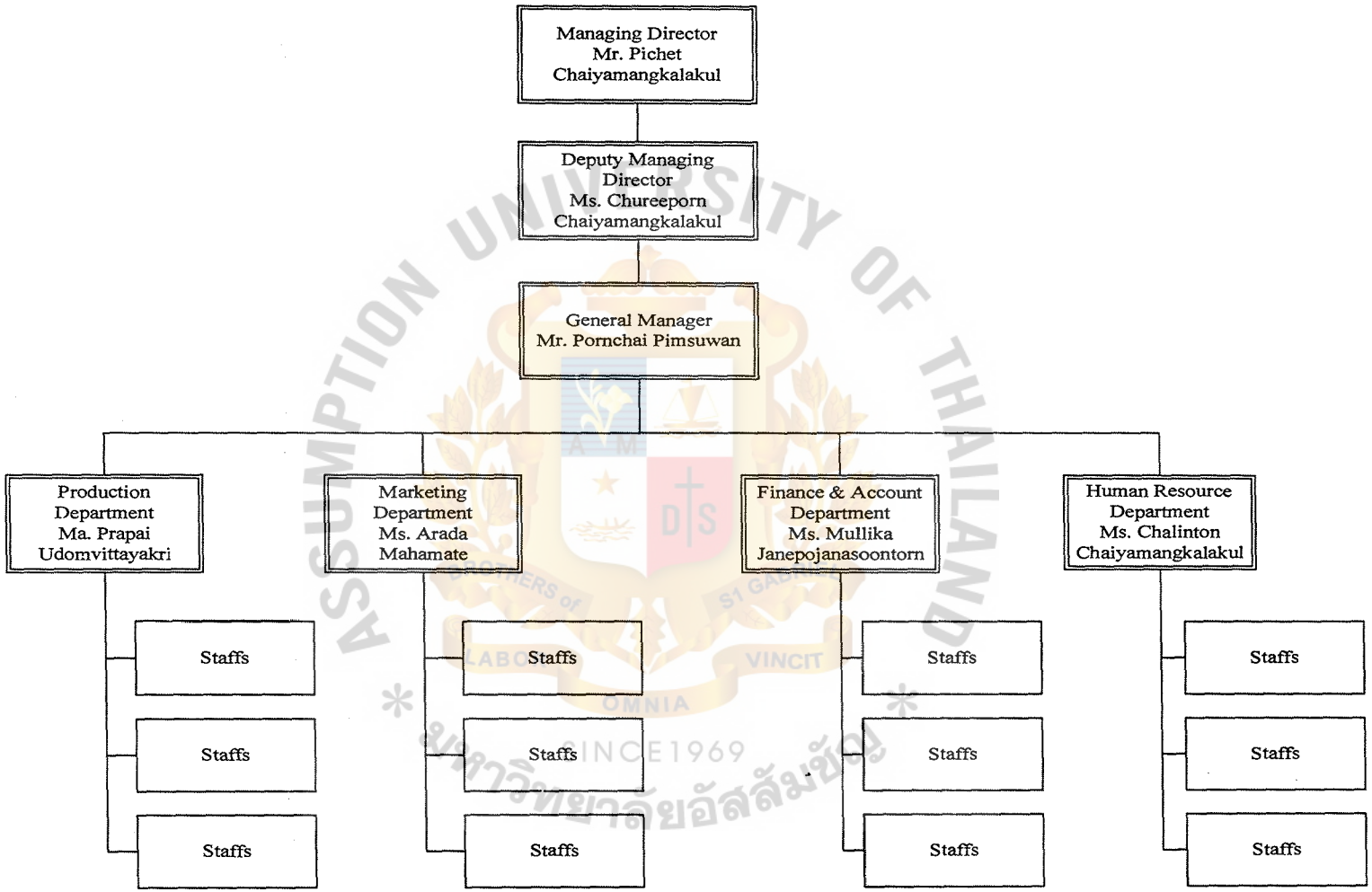

Figure 1-1 Organization Chart

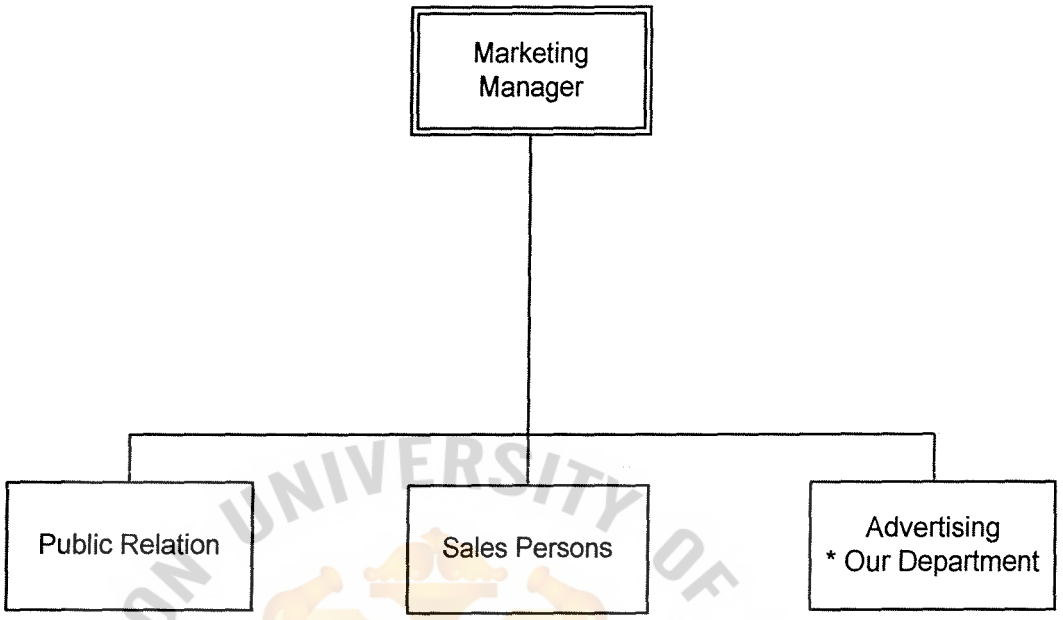

Figure 1-2 Marketing Department Chart

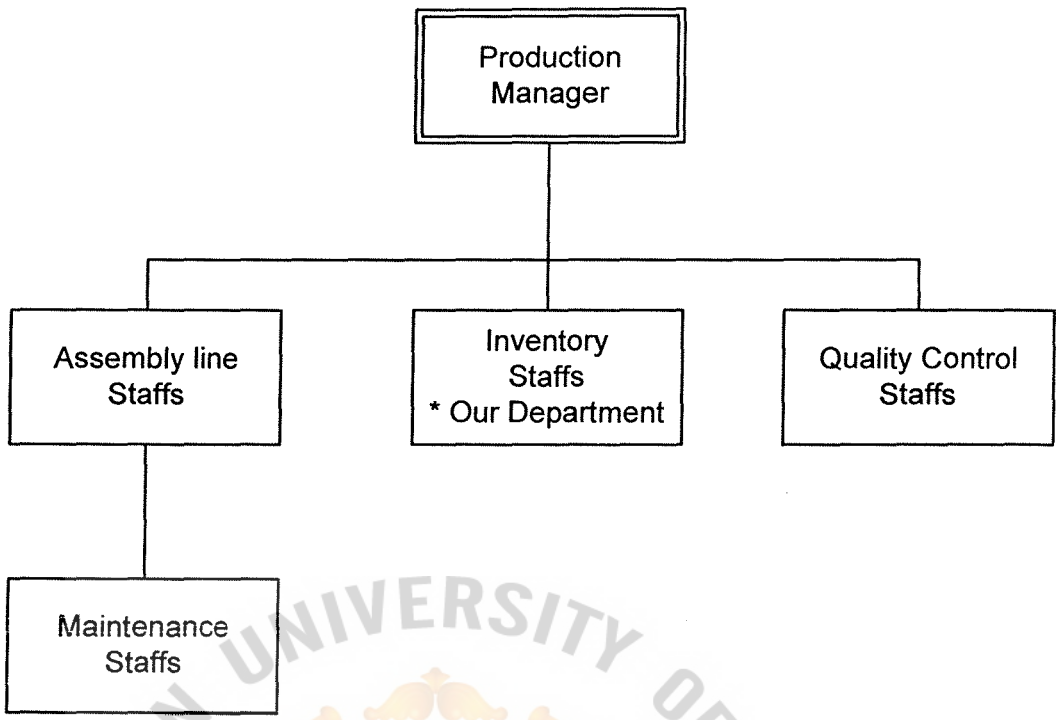

Figure 1-3 Production Department Chart

1.2 Objectives of the System

With the proposed system, which's computerized, the main functions are to make the company to be known in the worldwide, improve the communication to the customers more effectively and accurately and to computerize the inventory system of the company. So, we have set the following objective:

(1) To present the company and the company's products worldwide.

(2) To improve the communication system with the customers.

(3) To increase the effectiveness and reduce the time in the inventory system.

(4) To make the purposed system work accurately.

1.3 Scope of the System

(1) To create the website to present the information of the company and the details of company's products.

(2) To create an Online Order System for the customers.

(3) To create the inventory system that can add, update and delete the inventory and manage by using FIFO method.

(4) To separate the access level between the customers and staffs.

(5) To create community bulletin board area in the website to provide discussion.

(6) To provide tip and technique of the cosmetic and beauty zone in the website.

1.4 Project Plan

Most function of existing system is manual, so we try to develop it to be a computerized system by using the interactive professional web site. The inventory management function will be done on the web site also.

For the proposed system, we plan to use the web site to present the example of our products. The customers can place the order on the web. So the communication process to customer will be easier than existing system. We will manage inventory by kept the data in database, so we will know the time when you want to reorder and this will lead to working faster and more accurate. We will provide the bulletin board on the web for the discussion between the company, suppliers and customers.

No.	Task Name	November				December				January				February			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
	I. Analysis of the Existing System																
1.	Study the Existing System																
2.	Identify the Existing Problems																
3.	Existing Data Flow Diagram																
	II. Preliminary Investigation																
4.	Define the objectives and scope																
5.	Hardware Requirements																
6.	Software Requirements																
	III. Analysis and Design of the Proposed System																
7.	Data Flow Diagram																
8.	Entity-Relationship Diagram																
9.	Database Design																
10.	Process specification																
11.	Data Dictionary																
12.	Interface Design																
13.	Report Design																
	IV. Implementation of the Proposed System																
14.	Coding																
15.	Testing																
16.	Documentation																

Figure 1-4 Project Plan of TIARA Online System

II. THE EXISTING SYSTEM

2.1 Background of Existing System

The existing system will produce the products on demand of the customers, so they do not have the finished goods inventory for the new customers or new products requirement at the company. The process begins when the customers order the products. After that the company will check the raw material required to produce those products such as box, press, plastic cover and etc. If it's not enough, they will order it from the supplier. They also check the other kind of raw material such as chemical. They will order the specified raw material if the quantity is not enough to produce the finished goods. If they have all raw materials that are required to produce the finished goods then the production process will begin.

For the payment process, the company has two types of customers that have difference payment process. First is the regularly customers which are the foreigner. At first the customers need to transfer 30% of the payment to our company's bank. For the rest of payment, before the customers will pay to our bank, they need to send the shipping document in order to guarantee the rest of payment during exporting merchandise. For the second type of customers is exporter, they have to pay 30% cash plus with order bills. And the rest of payment, they will pay by cheque later.

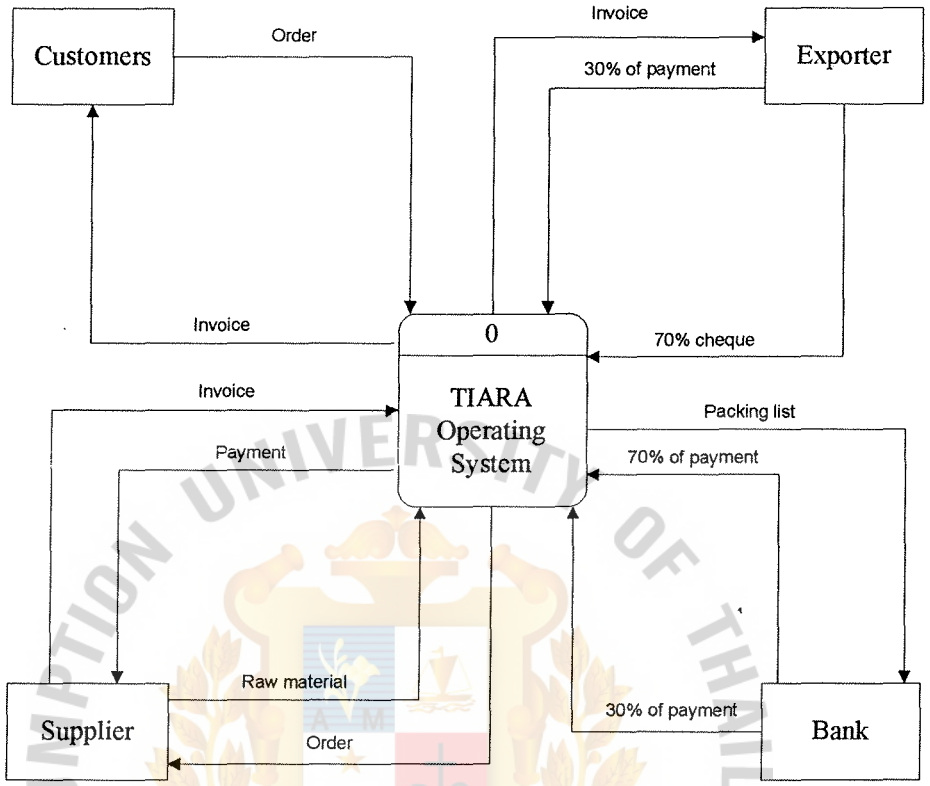

Figure 2-1 Context Diagram of Existing System

2.2 Problem Definition

(1) The company is not well-known in the world market.

The company brand is not international so the amount of potential customers is small. Most of the customer knows the company by word of mouth. This is the limitation of increasing sales volume and profit.

(2) Ineffective and inefficient communication with the customers.

Normally, the communication between the company and the customers is by telephone and fax either the order process or after sales service. The cost of communication via telephone or fax is too high and inflexible. There is a possibility of misunderstanding between them.

(3) Manual inventory system.

It is very difficult to know the amount of inventory either finished goods or raw material because there is no inventory management process. If the company wants to know the exactly amount of raw material inventory, the company need to check the order bill to see the details of the inventory that we have used then calculate with the remaining inventory that we have on hand. So this is very difficult to know when and how much to order the raw material.

III. THE PROPOSED SYSTEM

3.1 System Specification

(1) Hardware Requirements

Table 3-1 Hardware Requirements

HAREWARE	SPECIFICATION
CPU	Pentium 4.2 Ghz (A)
RAM	DDR 256 MB
Hard disk	Maxtor 40 GB ATA 133

This hardware specification is look like the high-end computer with high cost. But in fact, the price of Pentium 4 processor is not different from Pentium III too much, so we choose to use it because of the performance comparing with the price is very cheap. And the DDR RAM is used because it has the very effective performance with the lower price than RD RAM. For hard disk, we will use 40 gigabytes because it is the standard of computer now and the price is not too expensive.

(2) Software Requirements

Table 3-2 Software Requirements

SOFTWARE	SPECIFICATION
Operating System	Microsoft Window 2000
Application	1. Microsoft Office XP 2. PHP language 3. My SQL server 4. Norton Anti Virus

We use Microsoft Windows 2000 as the operating system because it is the very good and the most reliable operating system for today. And the Microsoft Office XP, we use to handle the documents in the company. We will use PHP language to create the Online website system. Because it is the open sources languages, so it is free of charge. And the My SQL Server, we use to create the database in the website that are the bulletin board and inventory system. The last software is Norton Antivirus, this software is the most popular in every computers. Because the ease of use and very good in protecting the computer from the virus, especially in internet or online business.

3.2 System Design

(1) Data Flow Diagram

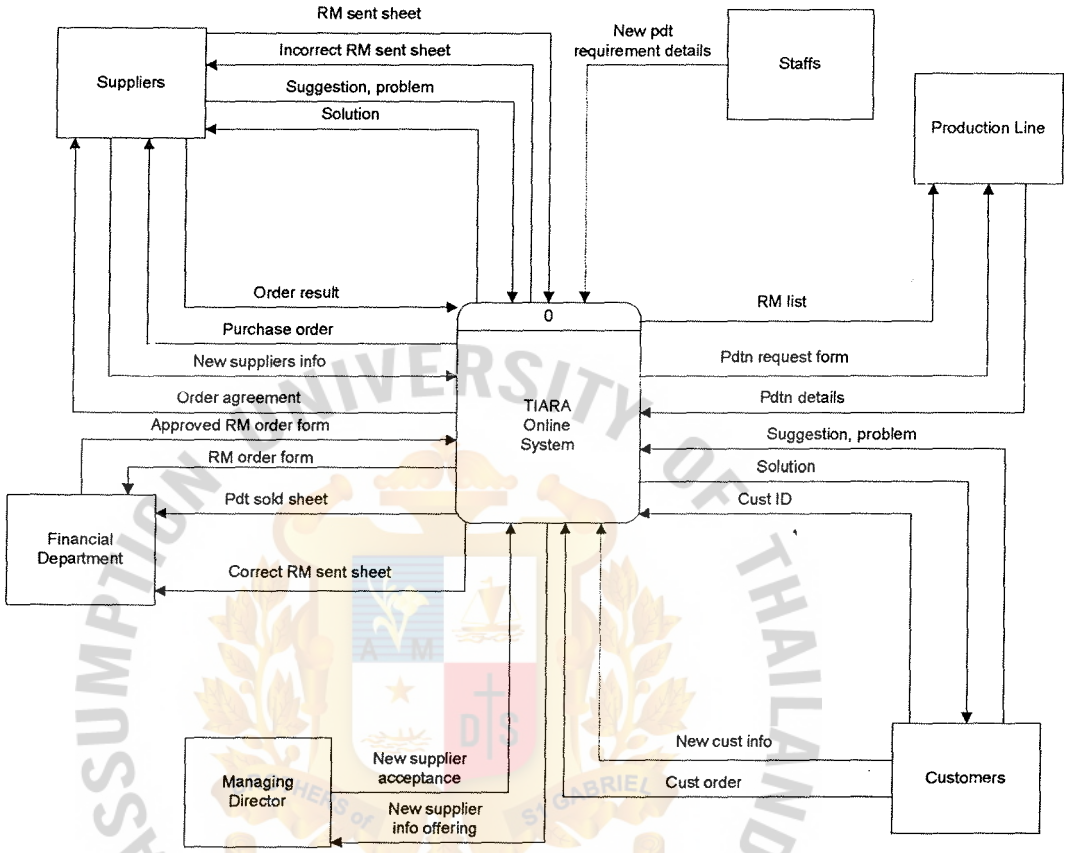

Figure 3-1 Context Diagram

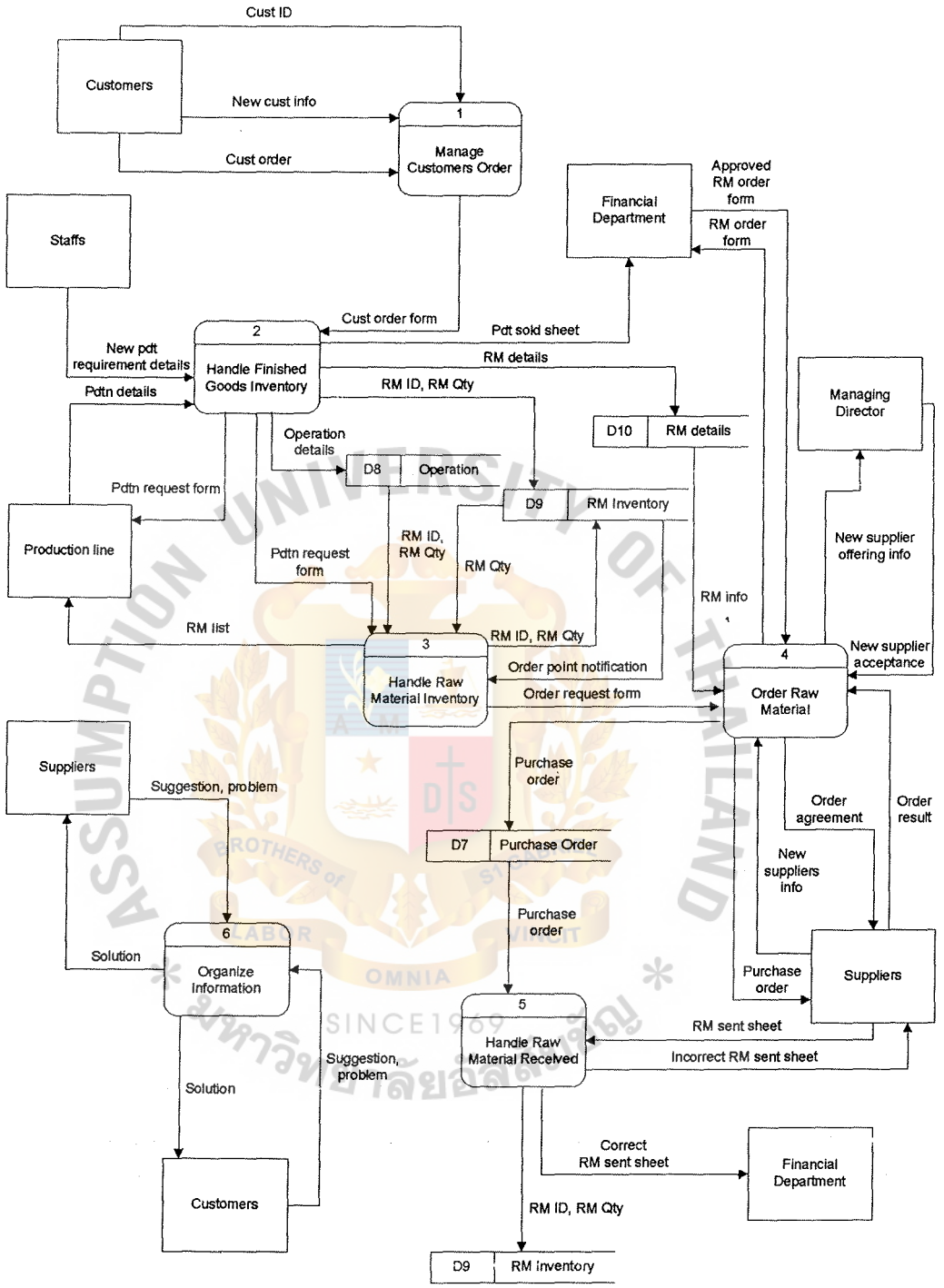

Figure 3-2 Data Flow Diagram – Level 0

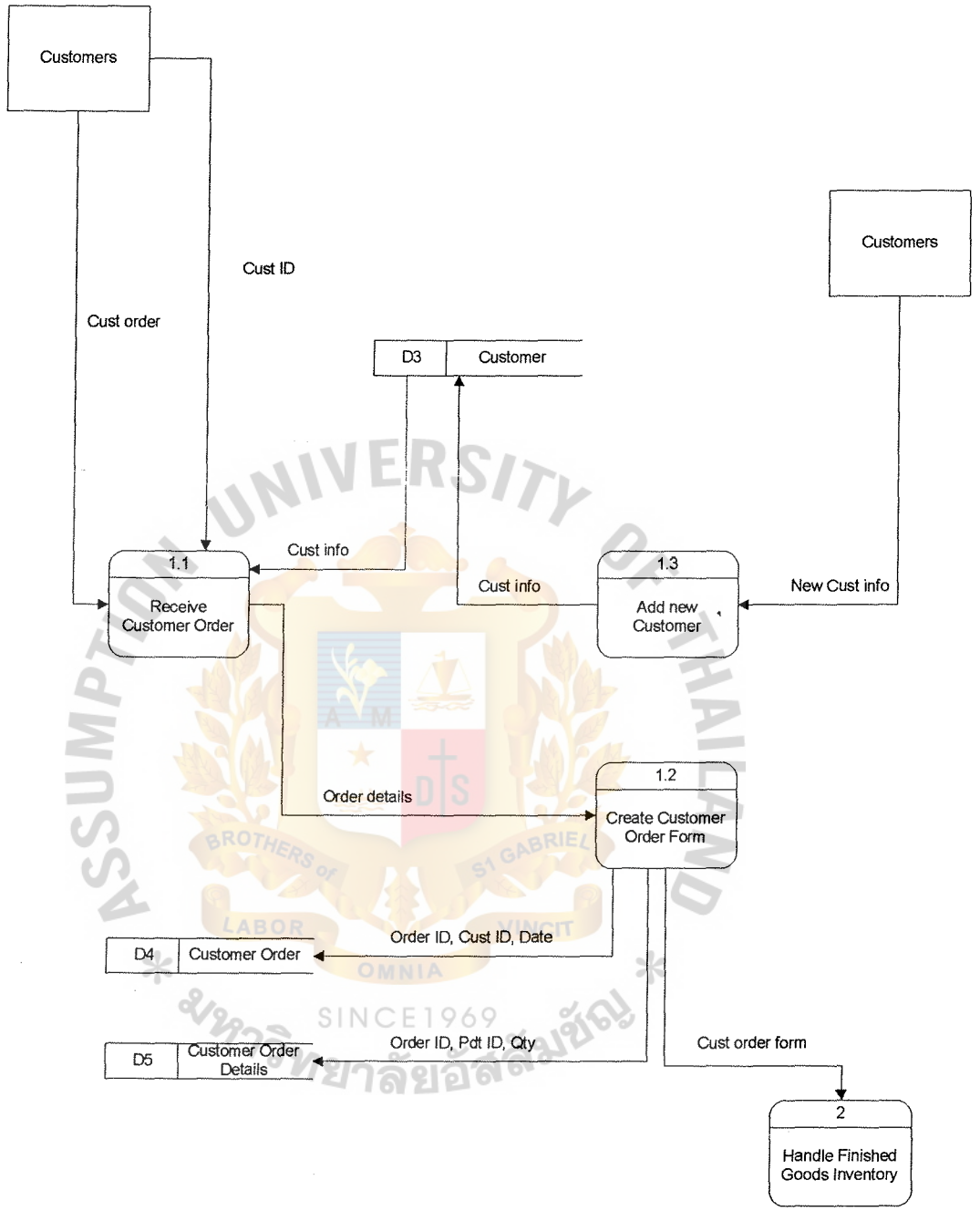

Figure 3-3 Data Flow Diagram – Level 1 for Process 1

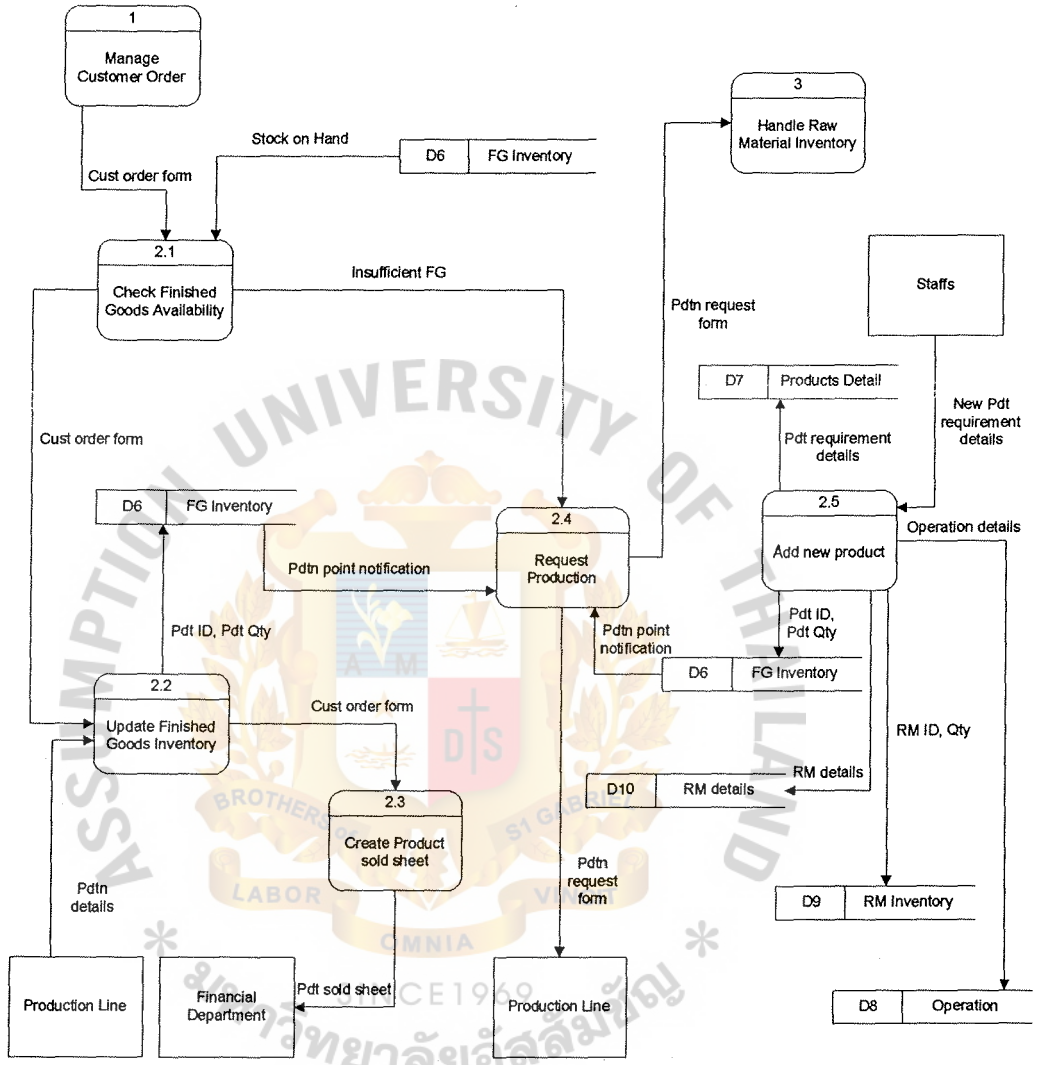

Figure 3-4 Data Flow Diagram – Level 1 for Process 2

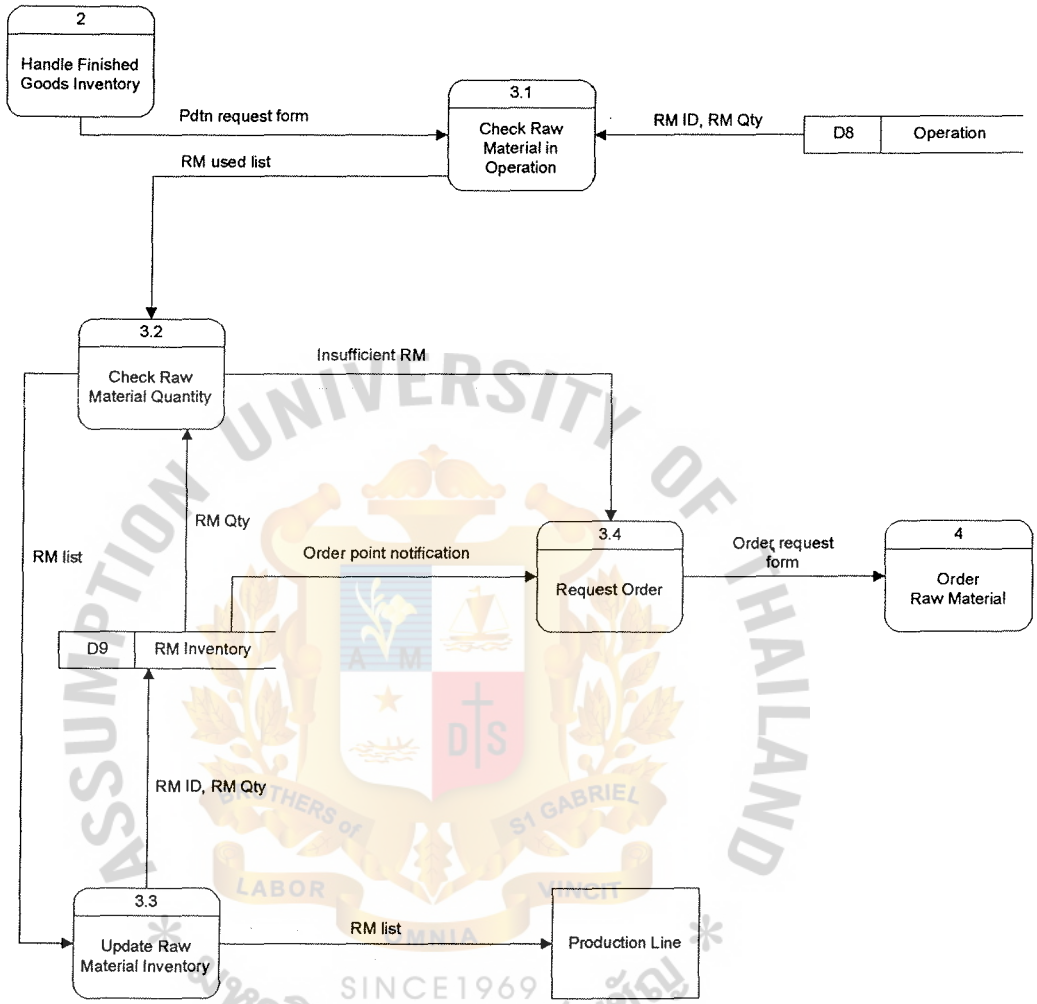

Figure 3-5 Data Flow Diagram – Level 1 for Process 3

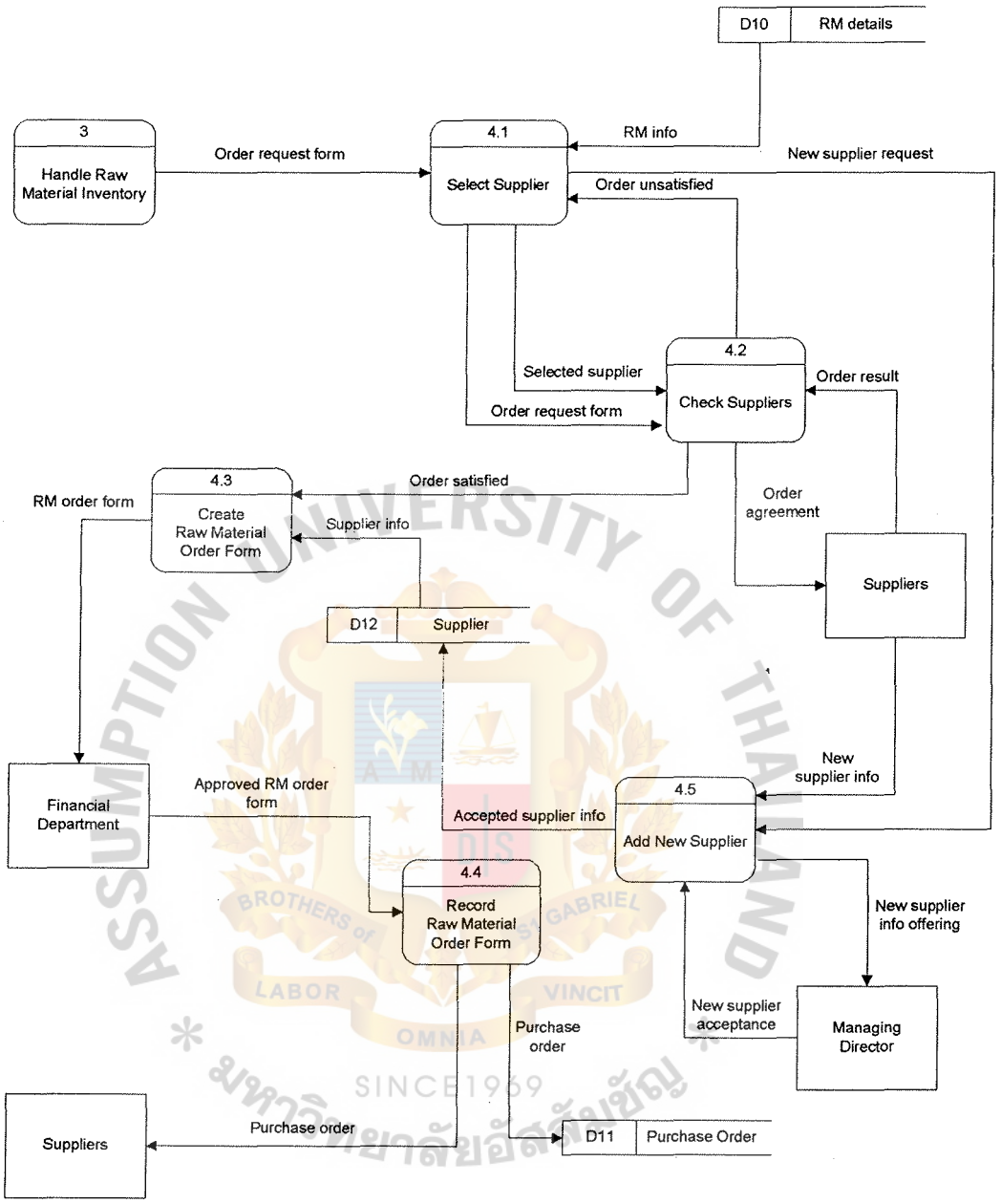

Figure 3-6 Data Flow Diagram – Level 1 for Process 4

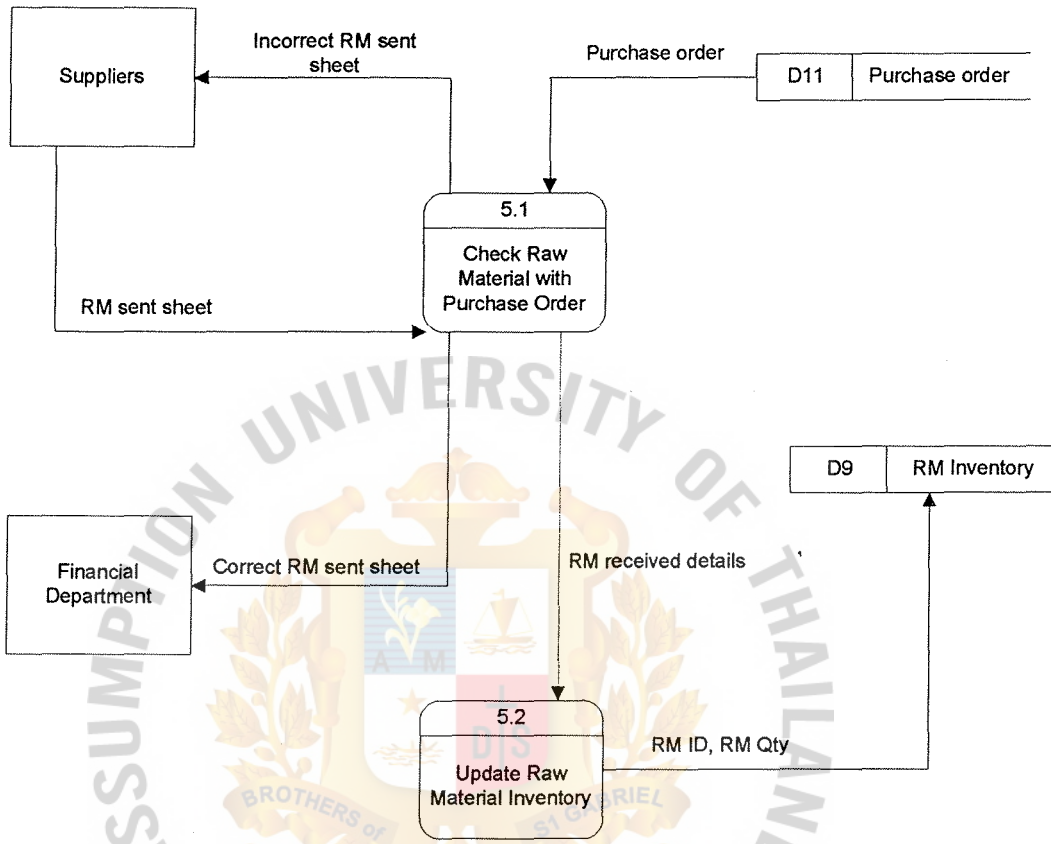

Figure 3-7 Data Flow Diagram – Level 1 for Process 5

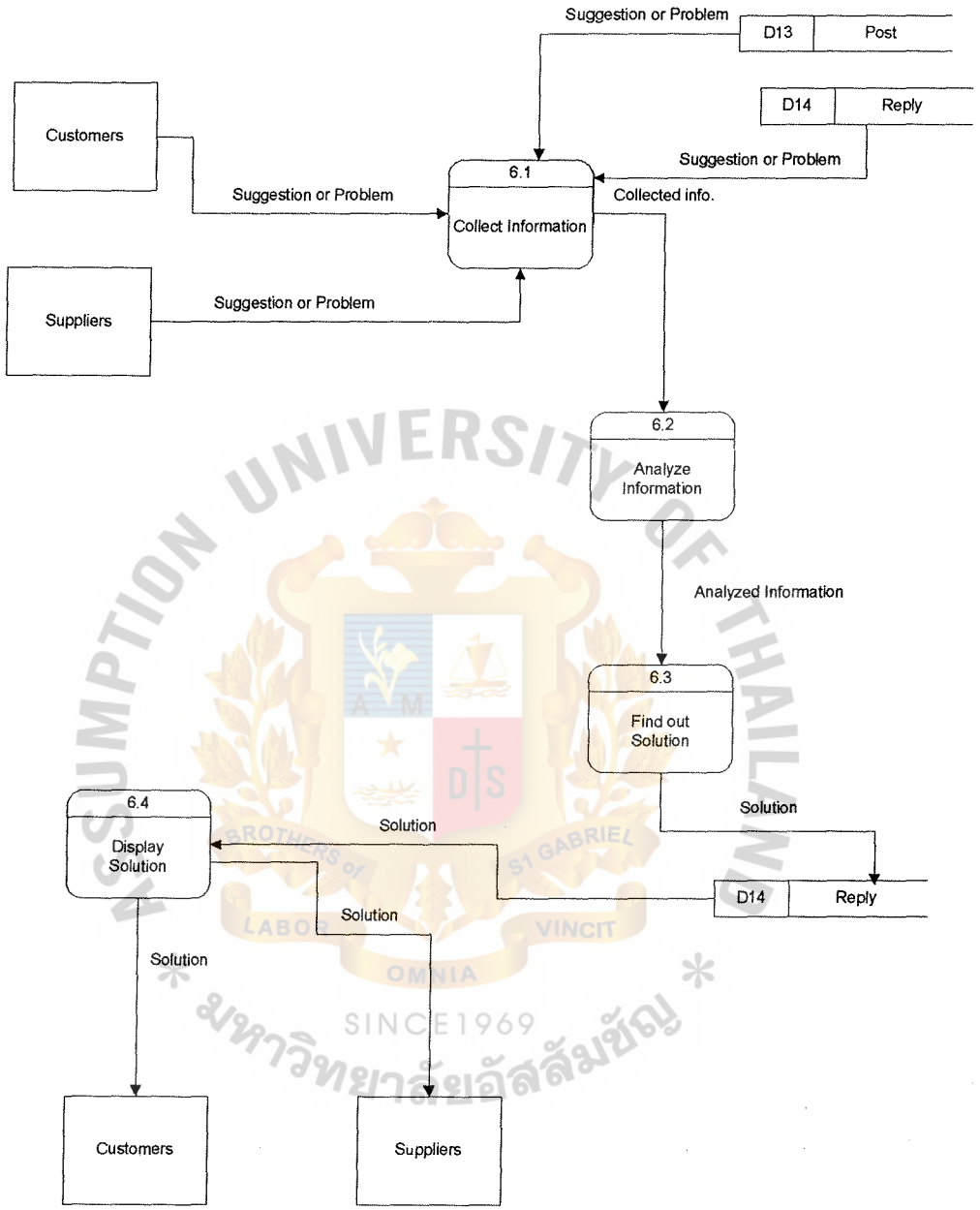

Figure 3-8 Data Flow Diagram – Level 1 for Process 6

(2) Entity-Relationship Diagram

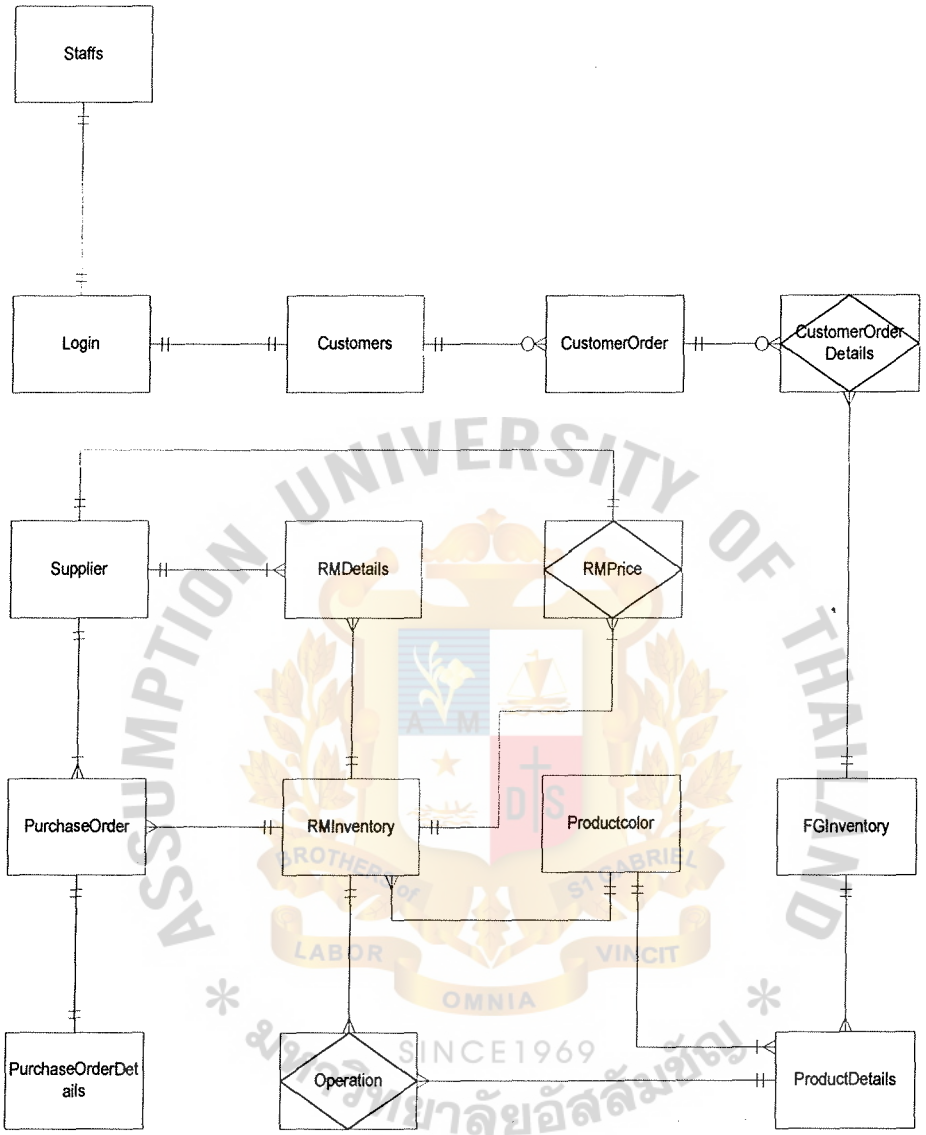

Figure 3-9 Entity-Relationship Diagram for Inventory System

Figure 3-10 Entity-Relationship Diagram for Bulletin Board

(3) Database Design

For the database system, there are 2 separate databases in the entire system. The first one is Inventory Database that is used to record the day-to-day operation data. The other one is used to keep the data from the bulletin board that will be analyzed to find the benefit result for the company.

1. Inventory System Database

- Staffs
- Login
- Customers
- CustomerOrder
- CustomerOrderDetails
- FGInventory
- ProductDetails
- Productcolor
- Operation
- RMInventory
- RMDetails
- RMPrice
- PurchaseOrder
- PurchaseOrderDetails
- Supplier

Staffs

This table will keep the information of the staffs in the company. It will keep the staffs ID, name of staffs, address, phone number and login ID of the staffs.

Login

This table will keep the login ID of staffs and customers in the company. It is also used to keep the password of staffs and customers to separate the access level.

Customers

This table will keep the information of the customers. It will contain the customer ID, name, address, phone, credit types, e-mails and login ID of the customers.

CustomerOrder

This table will keep the order records that are ordered by the customer. Also, it contains the date record that the specific order is happened.

CustomerOrderDetails

This table will keep the details of the specific order from the customer that is linked from the CustomerOrder table. It will keep the record of finished goods that customers have ordered, quantity and price.

FGInventory

This table will store the stock on hand information of the finished goods that ready to delivery to the customers. It will keep the finished goods ID, price, quantity on hand and date produced of those products.

ProductDetails

This table will keep the details of the specific finished goods linked from the FGInventory. It will keep the name of the product, its ID and description of the products and the operation ID of that product.

Productcolor

This table will used to keep the information about the product color of every product. It will keep the color ID, RMID and the quantity used in operation.

Operation

This table is used to keep the information about the combination of raw material required to produce the product. It states the type and the quantity of raw materials that are required to produce the finished goods or the products.

RMInventory

This table keeps the stock on hand information of the raw materials. It will keep the raw materials ID, quantity and date received of those raw materials for the use of FIFO method.

RMDetails

This table will keep the details of the specific raw materials linked from RMInventory. It will keep the name of materials, its ID and description of the raw materials.

RMPrices

This table wills the price of raw materials. It will show the list of supplier that supply that raw materials and the price.

PurchaseOrder

This table is used to keep the purchase order information. It will keep the order date and the supplier that the company deals with.

PurchaseOrderDetails

This table used to keep the details in purchase order. It will keep the raw materials that company order, quantity and price.

Supplier

This table will keep the information of supplier. It will keep the supplier ID, name, address, phone and e-mail to contact supplier.

2. Bulletin Board Database

- Post
- Reply

Post

This table will keep the data that customers and suppliers posting the comment or suggestion. It will keep the post ID, body of the message, date and time when the message is posted.

Reply

This table will keep the data that customers and suppliers reply to the specific post topics. It contains reply ID, post ID, body, date and time of reply.

*For the details of database design, you can see at Appendix A.

(4) Process Specification

Table 3-3 Process Specification for Process 1.0

Process Name:	Manage Customers Order
Data In:	(1) Customer ID (2) New Customer Information (3) Customer order
Data Out:	(1) Customer order form
Process:	(1) Get Customer ID and order (2) Retrieve customer information from Data Store D3 (3) Create customer order form (4) Store it into Data Store D4 and D5 (5) Get new customer information (6) Store into Data Store D3
Attachment:	(1) Customers (2) Process 2.0

Table 3-4 Process Specification for Process 1.1

Process Name:	Receive Customer Order
Data In:	(1) Customer ID (2) Customer order (3) Customer information
Data Out:	(1) Order details
Process:	(1) Get customer ID (2) Get customer order (3) Retrieve customer information from the customer database (4) Collected all information and send order details to make the form
Attachment:	(1) Customers (2) Data Store D3 (3) Process 1.2

Table 3-5 Process Specification for Process 1.2

Process Name:	Create Customer Order Form
Data In:	(1) Order details
Data Out:	(1) Order ID (2) Customer ID (3) Date (4) Product ID
Process:	(1) Get the order details (2) Make the customer order form (3) Store the customer order details into Data Store D4 and D5 (4) Send customer order form to Process 2.0
Attachment:	(1) Data Store D4 (2) Data Store D5 (3) Process 2.0

Table 3-6 Process Specification for Process 1.3

Process Name:	Add new customer
Data In:	(1) New Customer Information
Data Out:	(1) Customer Information
Process:	(1) Get new customer information from customer (2) Add customer information into Data Store D3
Attachment:	(1) Customers (2) Data Store D3

Table 3-7 Process Specification for Process 2.0

Process Name:	Handle Finished Goods Inventory
Data In:	(1) Customer order form (2) New product requirement details (3) Production details
Data Out:	(1) Product sold sheet (2) Raw materials details (3) Raw materials ID (4) Raw materials Qty (5) Operation details (6) Production request form
Process:	(1) Get the customer order form (2) Check finished good availability (3) If product is sufficient, update finished good inventory by FIFO Method (4) Create product sold sheet and send to financial department and store into data store D6 (5) If product is insufficient, request the production to production line (6) Send the raw material requirement to Process 3.0 (7) Get new product requirement from staff and store into data store D6 (8) Keep operation details into data store D8 (9) Keep raw material details into data store D9

	and D10
Attachment:	(1) Staffs (2) Production line (3) Financial department (4) Data Store D8 (5) Data Store D9 (6) Data Store D10 (7) Process 1.0 (8) Process 3.0

Table 3-8 Process Specification for Process 2.1

Process Name:	Check Finished Goods Availability
Data In:	(1) Customer order form (2) Stock on Hand
Data Out:	(1) Customer order form (2) Insufficient Finished Goods
Process:	(1) Get customer order form (2) Retrieve stock on hand from Data Store D6
Attachment:	(1) Data Store D6 (2) Process 1.0 (3) Process 2.2 (4) Process 2.4

Table 3-9 Process Specification for Process 2.2

Process Name:	Update Finished Goods Inventory
Data In:	(1) Customer order form (2) Production details .
Data Out:	(1) Customer order form (2) Product ID (3) Product Quantity
Process:	(1) Get customer order form (2) Update finished good inventory sold into Data Store D6
Attachment:	(1) Production line (2) Data Store D6 (3) Process 2.1 (4) Process 2.3

Table 3-10 Process Specification for Process 2.3

Process Name:	Create Product sold sheet
Data In:	(1) Customer order form
Data Out:	(1) Product sold sheet
Process:	(1) Get customer order form (2) Create product sold sheet and send to financial department
Attachment:	(1) Financial department (2) Process 2.2

Table 3-11 Process Specification for Process 2.4

Process Name:	Request Production
Data In:	(1) Insufficient Finished Goods (2) Production point notification
Data Out:	(1) Production request form
Process:	(1) Get production request when insufficient finished goods or reach production point notification (2) Send production request form to production line and process 3.0
Attachment:	(1) Production line (2) Data Store D6 (3) Process 3.0

Table 3-12 Process Specification for Process 2.5

Process Name:	Add new product
Data In:	(1) New production requirement details
Data Out:	(1) Production requirement details (2) Product ID (3) Product Quantity (4) Raw material details (5) Raw material ID (6) Raw material Quantity (7) Operation details
Process:	(1) Get new product requirement details from staffs (2) Store the product details into Data Store D7 (3) Store product ID and quantity into Data Store D6 (4) Store Operation Details into Data Store D8 (5) Store Raw material ID and quantity into D9 (6) Store Raw material details into D10
Attachment:	(1) Staffs (2) Data Store D6 (3) Data Store D7 (4) Data Store D8 (5) Data Store D9 (6) Data Store D10

Table 3-13 Process Specification for Process 3.0

Process Name:	Handle Raw Material Inventory
Data In:	(1) Production request form (2) Raw material ID (3) Raw material Quantity (4) Order point notification
Data Out:	(1) Raw material ID (2) Raw material quantity (3) Raw material list (4) Order request form
Process:	(1) Check the raw materials that require in operation by retrieve information from Data Store D8 (2) Get the raw materials use list then check the quantity of raw material (3) Update raw material when the company used I the operation (4) Request order raw material when it is insufficient or reached order point notification
Attachment:	(1) Production line (2) Data Store D8 (3) Data Store D9 (4) Data Store D10 (5) Process 2.0 (6) Process 4.0

Table 3-14 Process Specification for Process 3.1

Process Name:	Check Raw Material in operation
Data In:	(1) Production request form (2) Raw material ID (3) Raw material quantity
Data Out:	(1) Raw material used list
Process:	(1) Get the production request form (2) Check the raw material requirement for operation by retrieve information from Data Store D8 (3) Send raw material used list to check quantity
Attachment:	(1) Data Store D8 (2) Process 2.0 (3) Process 3.2

Table 3-15 Process Specification for Process 3.2

Process Name:	Check Raw Material quantity
Data In:	(1) Raw material used list (2) Raw material quantity
Data Out:	(1) Raw material list (2) Insufficient raw material
Process:	(1) Get raw material used list (2) Check the quantity of raw material use in the list by retrieve the quantity from Data Store D9 (3) Send raw material list to update (4) Send insufficient raw material information to order raw material from supplier
Attachment:	(1) Data Store D9 (2) Process 3.3 (3) Process 3.4

Table 3-16 Process Specification for Process 3.3

Process Name:	Update raw material inventory
Data In:	(1) Raw material list
Data Out:	(1) Raw material ID (2) Raw material quantity (3) Raw material list
Process:	(1) Get the raw material list and update into Data Store D9 (2) Send the raw material list to production line
Attachment:	(1) Production line (2) Data Store D9 (3) Process 3.2

Table 3-17 Process Specification for Process 3.4

Process Name:	Request Order
Data In:	(1) Insufficient Raw material (2) Order point notification
Data Out:	(1) Order request form
Process:	(1) Request order the raw material when insufficient raw material or reach order point notification
Attachment:	(1) Data Store D9 (2) Process 3.2 (3) Process 4.0

Table 3-18 Process Specification for Process 4.0

Process Name:	Order Raw Material
Data In:	(1) Raw material information (2) Order request form (3) Approved order form (4) New supplier acceptance (5) New supplier information (6) Order result
Data Out:	(1) Purchase order (2) Raw material order form (3) New supplier offering information (4) Order agreement
Process:	(1) Get order request form and then select supplier by retrieve the information from Data Store D10 (2) Check the order agreement from the supplier. If it is unsatisfied select new supplier and check again (3) Create raw material order form and send to financial department for approval (4) Record the purchase order into Data Store D11 and send to supplier (5) Get new supplier information and add supplier into Data Store D12 after getting the approval from Managing Director

Attachment:	(1) Financial department (2) Managing director (3) Suppliers (4) Data Store D7 (5) Data Store D10 (6) Process 3.0

Table 3-19 Process Specification for Process 4.1

Process Name:	Select supplier
Data In:	(1) Order request form (2) Raw material information (3) Order unsatisfied
Data Out:	(1) Selected supplier (2) Order request form (3) New supplier request
Process:	(1) Select supplier by retrieve information from Data Store D10 (2) Send order request with selected supplier to check the order agreement (3) Request new supplier information when the company have new supplier
Attachment:	(1) Data Store D10 (2) Process 3.0 (3) Process 4.2 (4) Process 4.5

Table 3-20 Process Specification for Process 4.2

Process Name:	Check Supplier
Data In:	(1) Selected supplier (2) Order request form (3) Order result
Data Out:	(1) Order unsatisfied (2) Order satisfied (3) Order agreement
Process:	(1) Check the order agreement from selected supplier (2) If order satisfied, send the order to create order form (3) If order unsatisfied, back to process 1.0 to select supplier
Attachment:	(1) Suppliers (2) Process 4.1 (3) Process 4.3

Table 3-21 Process Specification for Process 4.3

Process Name:	Create raw material order form
Data In:	(1) Order satisfied (2) Supplier information
Data Out:	(1) Raw material order form
Process:	(1) Get order satisfied to create order form by retrieve supplier information from Data Store D12 (2) Send raw material order form to financial department for approval
Attachment:	(1) Financial department (2) Data Store D12 (3) Process 4.2

Table 3-22 Process Specification for Process 4.4

Process Name:	Record raw material order form
Data In:	(1) Approved order form
Data Out:	(1) Purchase order
Process:	(1) Get approved order form from financial department and store into Data Store D11 and send to supplier
Attachment:	(1) Financial department (2) Suppliers (3) Data Store D11

Table 3-23 Process Specification for Process 4.5

Process Name:	Add new supplier
Data In:	(1) New supplier information (2) New supplier request (3) New supplier acceptance
Data Out:	(1) Accepted supplier information (2) New supplier information offering
Process:	(1) Get new supplier information and send to Managing director (2) If accepted the supplier information, then store into Data Store D12
Attachment:	(1) Managing director (2) Suppliers (3) Data Store D12

Table 3-24 Process Specification for Process 5.0

Process Name:	Handle Raw Material Received
Data In:	(1) Purchase order (2) Raw material sent sheet
Data Out:	(1) Raw material ID (2) Raw material quantity (3) Correct raw material sent sheet (4) Incorrect raw material sent sheet
Process:	(1) Check raw material with purchase order from Data Store D7 (2) If match, update raw material into Data Store D9 and correct raw material sent sheet to financial department (3) If not, return to supplier with incorrect raw material sheet
Attachment:	(1) Financial department (2) Suppliers (3) Data Store D7 (4) Data Store D9

Table 3-25 Process Specification for Process 5.1

Process Name:	Check raw material with purchase order
Data In:	(1) Raw material sent sheet (2) Purchase order
Data Out:	(1) Correct raw material sent sheet (2) Incorrect raw material sent sheet (3) Raw material received details
Process:	(1) Check the raw materials sent from supplier with the purchase order from Data Store D11 (2) If correct, sent the correct raw material sent sheet to financial department and to process 5.2 (3) If incorrect, return to the supplier with incorrect raw material sent sheet
Attachment:	(1) Financial department (2) Suppliers (3) Data Store D11 (4) Process 5.2

Table 3-26 Process Specification for Process 5.2

Process Name:	Update raw material inventory
Data In:	(1) Raw material received details
Data Out:	(1) Raw material ID (2) Raw material quantity
Process:	(1) Get raw material received details to update the raw material ID and quantity into Data Store D9
Attachment:	(1) Data Store D9 (2) Process 5.1

Table 3-27 Process Specification for Process 6.0

Process Name:	Organize Information
Data In:	(1) Suggestion (2) Problem
Data Out:	(1) Solution
Process:	(1) Collected the suggestion or problem from customers, suppliers or retrieve from Data Store D13 (2) Analyze information to separate the problems and tips (3) Find the solution by matching problem and tip (4) Display solution to customers and suppliers
Attachment:	(1) Customers (2) Suppliers

Table 3-28 Process Specification for Process 6.1

Process Name:	Collect information
Data In:	(1) Problem (2) Suggestion
Data Out:	(1) Collected information
Process:	(1) Get the suggestion or problem from customers and suppliers or retrieve from Data Store D13 (2) Send collected information to Process 6.2
Attachment:	(1) Customers (2) Suppliers (3) Data Store D13 (4) Process 6.2

Table 3-29 Process Specification for Process 6.2

Process Name:	Analyze information
Data In:	(1) Collected information
Data Out:	(1) Problems (2) Tips
Process:	(1) Analyze information to separate problem and tip, then go to find out the solution at process 6.3
Attachment:	(1) Data Store D14 (2) Process 6.1 (3) Process 6.3

Table 3-30 Process Specification for Process 6.3

Process Name:	Find out solution
Data In:	(1) Problems (2) Tips
Data Out:	(1) Solution
Process:	(1) Find out solution by match the problems and tips then store into Data Store D14
Attachment:	(1) Data Store D14

Table 3-31 Process Specification for Process 6.4

Process Name:	Display solution
Data In:	(1) Solution
Data Out:	(1) Solution
Process:	(1) Display solution to customers and suppliers by retrieve information from Data Store D14
Attachment:	(1) Customers (2) Suppliers (3) Data Store D14

(5) Data Dictionary

Table 3-32 Data Dictionary of TIARA Online System

Field Name	Meaning
Accepted supplier Info	Supplier Information that is approved by Managing Director
Analyzed Information	The information that analyzed already
Approved RM order form	Approved raw material order form from Financial department
Collected info	Collected Information
Correct RM sent sheet	Correct Raw material sent sheet
Cust ID	Customer identification
Cust Info	Customer's Information (Cust name + Cust address + Cust phone + Cust Credit type + Cust E-mail)
Cust order	The order of customer
Cust order form	Customer order form
Date	Customer order date
Incorrect RM sent sheet	Incorrect raw material sent sheet
Insufficient FG	Insufficient Finished good inventory to sent to customer
Insufficient RM	Insufficient Raw material inventory when production line occur

New Cust Info	New customer's information Alias to Cust Info
New pdt requirement details	New product requirement details
New supplier acceptance	Accept new supplier
New supplier Info	New supplier information (Supplier ID + Supplier Name + Supplier Address + Supplier phone + Supplier E-mail)
New supplier info offering	New supplier information offering Alias to New supplier Info
New supplier request	Request of new supplier
Operation details	The details of the operation (Operation ID + Product ID + Product Quantity + RM ID + RM Quantity)
Order agreement	The agreement between the company and supplier when we order
Order details	Customer order details
Order ID	Order identification
Order point notification	Point that used to order raw materials when it reach
Order request form	Form use to order raw materials
Order result	The result of the order
Order satisfied	The satisfied order

Order unsatisfied	The unsatisfied order
Pdt ID	Product Identification
Pdt Qty	Product Quantity
Pdt requirement details	Product requirement details
Pdt sold sheet	Product sold sheet
Pdtn details	The details of production (Product ID + Product Quantity + Date produced)
Pdtn point notification	Production point notification when the quantity is reach
Pdtn request form	Form use to request the production
Problem	Problem from customers, suppliers and external data
Purchase order	Purchase order used to send to supplier
RM details	The details of raw materials (RM ID + RM Qty + RM Description + Price)
RM ID	Raw materials Identification
RM Info	Raw material's Information Alias to RM details
RM list	List of All raw materials used in production
RM order form	Form used to order raw materials
RM Qty	Raw materials Quantity
RM received details	Details of raw material receive (RM ID + Qty + Date received)
RM sent sheet	Raw material sent sheet

RM used list	Raw material use in production
Selected supplier	Supplier that we selected to order
Solution	Solution from customers, supplier and external data
Stock on hand	Product quantity on hand
Suggestion	Suggestion from customers, suppliers and external data
Supplier Info	Supplier's Information
	Alias to New Supplier Info
Tips	Tips after analyze information

(6) Interface Design

- Login Screen
- Customer Order Screen
- Customer Profile Screen
- Finished Goods Inventory Screen
- Product Profile Screen
- Raw Material Inventory Screen
- Raw Material Operation Screen
- Raw Material Order Screen
- Select Supplier Screen
- Supplier Profile Screen
- Bulletin Board Screen
- History Record Screen
- Website Designed Screen

Login Screen

This screen used to separate the access level between visitors, customers and staffs. It required the password to access, so those of peoples who have no authorities to access cannot get into the pages for customers or staffs.

Customer Order Screen

This screen is in both the staffs and customers access level. Because staffs have to put the customer order into the database and this screen used for

receive the customers order from the website also, so we will provide this screen into the customers and staffs parts.

Customer Profile Screen

This screen can be access only by staffs because we do not want customers to modify their profile because the error can occur every time. This screen will show the customers information such as Customer ID, name, address, zip code, country, city, state, contact number and e-mail address. The staffs can search the information about the customers that they want and they can modify the information and delete the customer's data from database also. They can use this page to add new customer into the database.

Finished Goods Inventory Screen

This screen is in the staff's part only. It will used to keep the stock on hand of the finished goods, how much quantity left in the stocks and date produce. So they will know what time they have to produce more products. And they can manage the FIFO from this screen. And the staffs can update the finished goods when the production line producing it.

Products Profile Screen

This screen will show information about the products that we sell to the customers. It will show the product ID, name, price etc. And the staffs can modify the products profile or delete the product that the company doesn't want to produce anymore and they can add the new product too.

Raw Materials Inventory Screen

The purpose of this screen is similarly to the finished goods inventory screen but it will show the information of the raw materials, how much quantity in the stock, date receive. So the staffs can analyze and know when they have

to order the raw materials from the suppliers and what the products that they have to order are. And they can manage the FIFO from this screen, and the staffs can update the raw materials used in the operation when the production line producing it.

Raw Materials Operation Screen

This screen will show the information of the raw materials used in operation for producing the products. The staffs can search the product that they want then the information of raw materials used in operation for that product will show and they can go to produce it and update the raw materials inventory.

Raw Materials Order Screen

This screen used to order the raw materials when it reaches the reorder point or the insufficient raw materials occur, so the staffs can use this form to put the raw materials that they want and the suppliers that they would like to order. And then this form will be print and sent to financial department for approve.

Select Supplier Screen

This staffs can search the raw materials that they want to order and then the name lists of suppliers will show with the price of raw materials. The staffs can select whether to order the raw materials from many suppliers and then the result will be show in the raw materials order screen.

Supplier Profile Screen

This screen will show information about suppliers. It will show the ID, name, address, zip code, country, city, state, telephone number, fax and e-mail address of suppliers. And staffs also can modify the information of the

suppliers or delete it from the database, and the staffs can add the new suppliers into database also.

Bulletin Board Screen

This screen consists of many screens such as list of topic screen, post screen, update screen and reply screen, so the customers can post any problems or suggestion for our products or the company then the staffs will check the bulletin board daily and reply the message to the customers.

History Record Screen

This screen is for customers only. They can go to view their history order record from this screen.

Website Designed Screen

This screen is used to capture the visitors to increase the number of the customers, it will consist of homepage screen, company profile screen, product catalog screen, faq screen, contact us and login screen. In the product catalog screen will show the picture of the each product line and when the visitors click it, the page will show the picture, tone and color of the products. So the visitors can see all of our products and this can be help to increasing the number of customers and can sell the product 24 hours via the internet.

*For the figure of interface design, see more details at Appendix B.

(7) Report Design

- Customer Order
- Raw Materials Order
- Raw Materials Checking Form
- Production Request
- Supplier Information

Customer Order

This report will show information about the customer order, it will contain order ID, date, and lists of the items that they order also include prices and quantity. The customers can print and keep it as evidence.

Raw Materials Order

This report will show the information the raw materials we want to order from which's suppliers. It will contain lists of raw materials, quantity and price and this form will be sent to financial department for approve and used to check when the raw materials arrive at the company.

Raw Materials Checking Form

This form will used to check when the raw materials arrive at the company. After the staffs checked the raw materials from the suppliers, they will put the result into this form.

Production Request

This form is used when the finished goods in the stock has not enough items to delivery to customers, then staffs will sent this form to the production line. This report will contain the list of the products that production line has to produce.

Supplier Information

This report will be sent to managing director when the company has new suppliers, so the managing director can analyze it and make the decision to order the raw materials from new suppliers or not, this report will contains the supplier name, address, zip code, country, city, state, contact number, e-mail address and the lists of raw materials that this suppliers can offer our company.

*For the figure of report design, see more details at Appendix C.

IV. SYSTEM IMPLEMENTATION

4.1 Overview of the System Implementation

After implementing computerized system, the company will has more distribution channels which are selling products on Internet. And all customers can access any time so the company might able to serve customers which live in any place and this lead to increasing in number of customer. Moreover, when customer satisfied with our company service they also help us to create word of mouth. And influence from customer to customer is stronger than any advertisement from the company.

For order system, customer will able to order easily, no need to contact our company by fax or telephone which is Costs Company and customer quite high. This provides convenience to customer and also creates customer's satisfaction which lead customer to come back and make an order again. When customers have any problem or suggestion, they can contact us via bulletin board.

For inventory control system, all information will be kept in database so it's easy and more convenience to retrieve information. Staffs no need to go out to check inventory stock since the system will check the quantity of raw material and make an alert when the quantity reach the order notification point.

On summarize, if all processes run on the computerize system, all information will flow, fast and smooth. Then there will not have a problem about waste of time for waiting the information. Moreover, customers and staffs can use and work more convenience via Internet.

4.2 Test Plan

Testing process should be implemented in every step not just at the end users. Thus, we decided to test the interfaces between subsystems, the correctness of output, usefulness and understandability of system documentation and outputs. And because there are many stakeholders in the system, so the system should be tested by each of them such as programmer, analyst, operators and users.

We will start testing process with test data. At this step, programmer will create valid and invalid test data. They will test the program by the module of the subsystem. For example, he enters the number in the textbox, which character is not allowed. In the opposite way, he enters character in the textbox with the number that is not allowed. The programmer also enters wrong data into the system to check whether the program is correctness or not.

After test data, link testing should be considered next. This step will check whether the program can work interdependent. For the subsystem, the system analyst will create the data and test whether the output will come up as he was design or not. For example, supplier information, he will enter supplier ID then checks whether the data about supplier information will retrieve. And he also add, and delete then check whether the program can add, and the primary key such as supplier ID will be automatically run or not.

Next step is the full systems testing. This step users and operators will test the system in order to determine whether the menus and interfaces design are clearly and easily understand.

From the testing module of three interface design, they will read the output and explain what they understood. They have to find the output according to the instruction, if they can go to the right menu quickly without hesitated. It means the systems are

clear. And if they can get all outputs, which are a requirement in the instruction within the limited of time, it means all processes are flow properly. Because if the process is not flow the users have to switch many form in order to get the output and it wastes time.

Since the company never has computerized system, so we decided to implement parallel. Before implementing permanent computerized system, we consider to testing the project plan by implement the new system for a temporary.

After implementing the computerized system by direct, we find that the staffs satisfy with new system but they are not familiar with it. So we have train the staff for the new system.

While implementing the new system for schedule lists, we found that some users are not able to add or edit. Sometime they delete the data by mistake and it caused a lot of problem.

For purchase order form, we found that the users do not know how to put the input in order to request the raw materials. Sometime the users did not put complete input, thus make the program error. And they did not know how to put the input in order to search for request record. Sometime the users did not put the correct ID or they leave some space in that input. So the users could not search the output.

We realized problems on the above so we decided to provide training program to staffs. After training the staffs for couple months, we find that almost staff can work on new system more efficiency. We also found that, the system can work more smooth and faster, no stuck on any process.

When all processes can run smoothly, any problem that occur in the TIARA Company we are able to solve it immediately, so we can get the customers all the time because the using the website can create the 24 hours shop. And when customers

satisfy, they will choose to use our service again and they also tell their friends to come to buy our product, which leads world of mouth. And the revenue will increase because more customers come to buy our products. For new inventory control, staff can work faster because all information is kept in the database so it's easy to retrieve data. And also save time to get any information, it's also reducing paper within the company.

The propose system helps both customer and our company to communicate effectively. Since customer able to contact us any time, 24 hour via our website. Customer can make an order online, so business can run faster and smoother and that also increase number of customer.

V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

After we study the existing system of TIARA company limited. We found that there is no computerized system in this company. And we found some problem about the communication between the company and customers. They used only phone and fax to contact with theirs customers which leads to high cost and wasted a lot of time because most of the customers of this company are foreigner and the rest is exporter. And this company manage theirs stock by manually, they have to used the staffs to checks the number of stock and every information are keep in the paper, sometime they cannot find the information when they want. And this company wants us to created new distribution channel for this company which is selling their product on the internet but they are B2B business. It means that the number of customers will not have a lot. So we decided to created the website for B2B business that can advertising their products and can attract more customers to increase their sale volume and profit and we will integrated the website with the computerized inventory system, so the staffs can manage the stock easier than the existing system with more effectively and we decided to includes the bulletin board to improve the communication between the company and customers to become more effective and efficiency and create the stronger relationship to the customers than the existing system. The proposed system can help the company to increase the number of customers by increasing the satisfaction to the customers, then the existing customers are loyalty to our company and they will advertise our company by using word of mouth, so the company will gain a lot benefit when they implement the proposed system.

5.2 Recommendations

For the best effectiveness of the system, after implementation of the proposed system, we suggest that the staffs should maintain and control the system well enough. The staffs should analyze the data whether the data is out of date or not. It should not keep the much outdate data because it will lead to inefficient in the system. And there will no storage space enough to keep a lot of unimportant data.

There is a possibility to design and implement the whole system for the TIARA company for the purpose that the overall system will be united. When the whole system become one, it is easy to transfer and share information because the format is the same. We do not have to think about compatibility between systems.

APPENDIX A
DATABASE DESIGN

Table A-1 Staffs Table

No	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key	FK Referenced Table
1	StaffsID	int (5)	Y	Y		99999	PK	
2	StaffsName	varchar (50)	Y					
3	StaffsAddress	varchar (100)	Y					
4	StaffsPhone	varchar (9)				(02)-999-9999		
5	StaffsEmail	varchar (50)			Y			
6	LoginID	char (7)	Y	Y			FK	Login

Table A-2 Login Table

No	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key	FK Referenced Table
1	LoginID	varchar (6)	Y	Y		999999	PK	
2	Loginpwd	varchar (12)	Y					
3	Status	int (1)						

Table A-3 Customers Table

No	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key	FK Referenced Table
1	CustID	int (5)	Y	Y		99999	PK	
2	CustName	varchar (50)	Y					
3	CustAddress	varchar (80)						
4	CustZip	varchar (5)						
5	CustCountry	varchar (30)						
6	CustState	varchar (30)			Y			
7	CustPhone	varchar (30)				02-999-9999		
8	CustFax	varchar (30)				02-999-9999		
9	CreditTypes	varchar (30)						
10	CustEmail	varchar (50)			Y			
11	LoginID	char (7)	Y	Y			FK	Login

Table A-4 CustomerOrder

No	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key	FK Referenced Table
1	CustorderID	int (7)	Y	Y		9999999	PK	
2	CustID	int (5)	Y	Y		99999	FK	Customer
3	Orderdate	Date/Time	Y			YYYYMMDD		

Table A-5 Custorderdetails Table

No	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key	FK Referenced Table
1	CustorderID	int (7)	Y	Y		9999999	FK	Customerorder
2	FGID	varchar (9)	Y	Y		XXXXX99	FK	FGInventory
3	QtySell	double				####		
4	Pricesell	double				#,###,###.00		

Table A-6 FGInventory Table

No	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key	FK Referenced Table
1	FGID	varchar (9)	Y	Y		XXXXX99	PK	
2	FGQty	double				####		
3	Dateproduce	Date/Time	Y			YYYYMMDD		

Table A-7 Productdetails Table

No	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key	FK Referenced Table
1	FGID	varchar (9)	Y	Y		XXXXX99	FK	FGInventory
2	FGName	varchar (70)	Y					
3	FGPrice	Double						
4	ColID	int (7)	Y				FK	Productcolor
5	OperationID	int (7)	Y				FK	Operation

Table A-8 Productcolor Table

No	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key	FK Referenced Table
1	ColID	int (7)	Y	Y		XXXXXXX	PK	
2	Name	varchar (50)						
3	Qty	Double				####		
4	RMID	varchar (7)	Y	Y			PK	RMInventory

Table A-9 Operation Table

No	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key	FK Referenced Table
1	OperationID	int (7)	Y				PK	
2	Productname	varchar (30)	Y	Y		XXXXX99		
3	FG_Qty	double				####		
4	RM_ID	varchar (9)	Y	Y		XXXXX99	FK	RMInventory
5	RM_Qty	double				####		

Table A-10 RMInventory Table

No	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key	FK Referenced Table
1	RMID	varchar (9)	Y	Y		XXXXX99	PK	
2	RMQty	double				####		
3	Datereceive	Date/Time				DD-MM-YYYY	PK	
4	SupID	int (5)	Y	Y		XXXXX	FK	Supplier

Table A-11 RMdetails Table

No	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key	FK Referenced Table
1	RMID	varchar (9)	Y	Y		XXXXX99	FK	RMInventory
2	RMName	varchar (100)	Y					

Table A-12 RMprice Table

No	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key	FK Referenced Table
1	RMID	varchar (9)	Y	Y		XXXXX99	FK	RMInventory
2	SupID	int (5)	Y	Y			FK	Supplier
3	Price	double						

Table A-13 Purchaseorder Table

No	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key	FK Referenced Table
1	RMOrderID	varchar (7)	Y	Y		9999999	PK	
2	SupID	int (5)	Y	Y		99999	FK	Supplier
3	OrderDate	Date/Time	Y	Y		YYYYMMDD	FK	RMInventory

Table A-14 Purchaseorderdetails Table

No	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key	FK Referenced Table
1	RMOrderID	varchar (7)	Y	Y		9999999	PK	
2	RMID	varchar (7)	Y	Y		99999	FK	RMInventory
3	Qtyorder	Double				####		
3	OrderDate	Date/Time	Y	Y		YYYYMMDD		

Table A-15 Supplier Table

No	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key	FK Referenced Table
1	SupID	int (5)	Y	Y		99999	PK	
2	SupName	varchar (50)	Y					
3	SupAddress	varchar (100)						
4	SupZip	varchar (5)						
5	SupCountry	varchar (30)						
6	SupCity	varchar (30)						
7	SupState	varchar (30)			Y			
8	SupPhone	varchar (30)				02-999-9999		
9	SupFax	varchar (30)			Y	02-999-9999		
10	SupEmail	varchar (50)			Y			

Table A-16 Post Table

No	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key	FK Referenced Table
1	ID	int (6)	Y	Y		999999	PK	
2	Subject	text	Y					
3	Body	varchar (100)						
4	Name	varchar (50)						
5	Date	Date/Time				DD-MM-YYYY		

Table A-17 Reply Table

No	Field Name	Field Type	Index	Unique	Nullable	Validity Check	Key	FK Referenced Table
1	ID	char (6)	Y	Y		999999	PK	
2	RefID	char (6)	Y	Y		999999	FK	Post
3	Replyby	varchar (50)						
4	Body	text						
5	Date	Date/Time				DD-MM-YY		

APPENDIX B
INTERFACE DESIGN

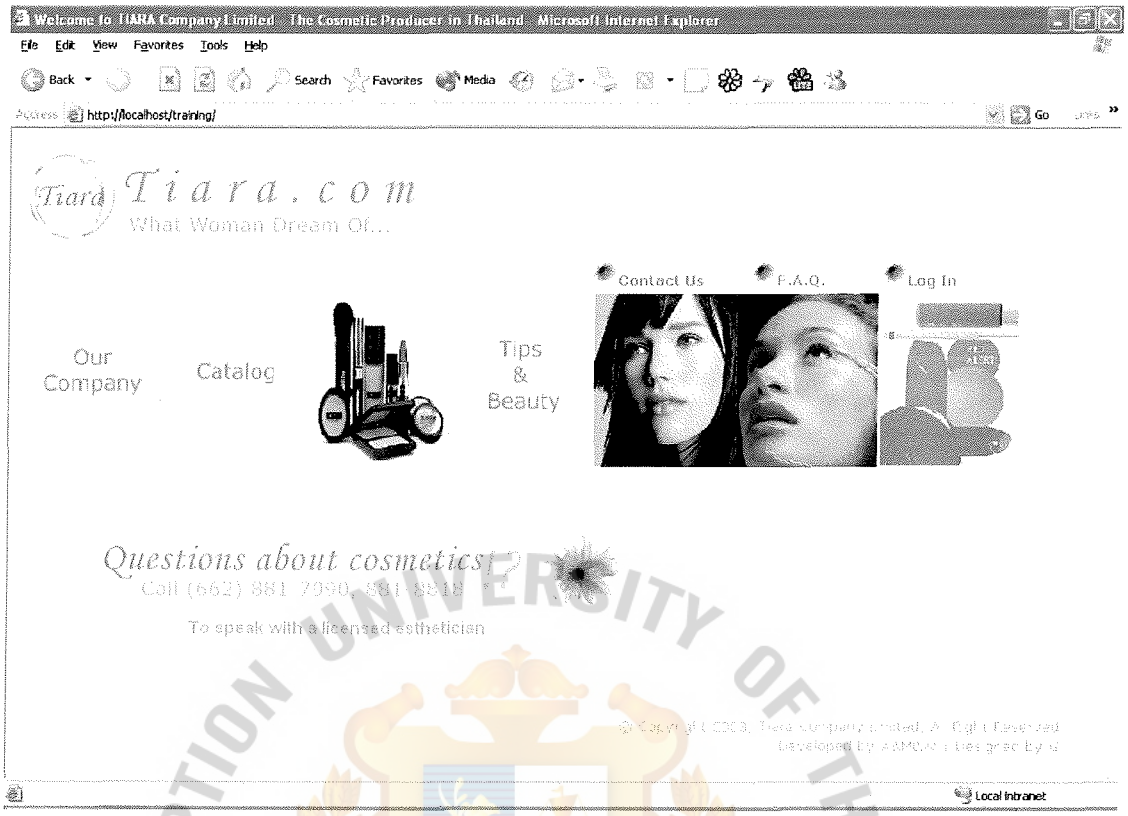

Figure B-1 Website Screen

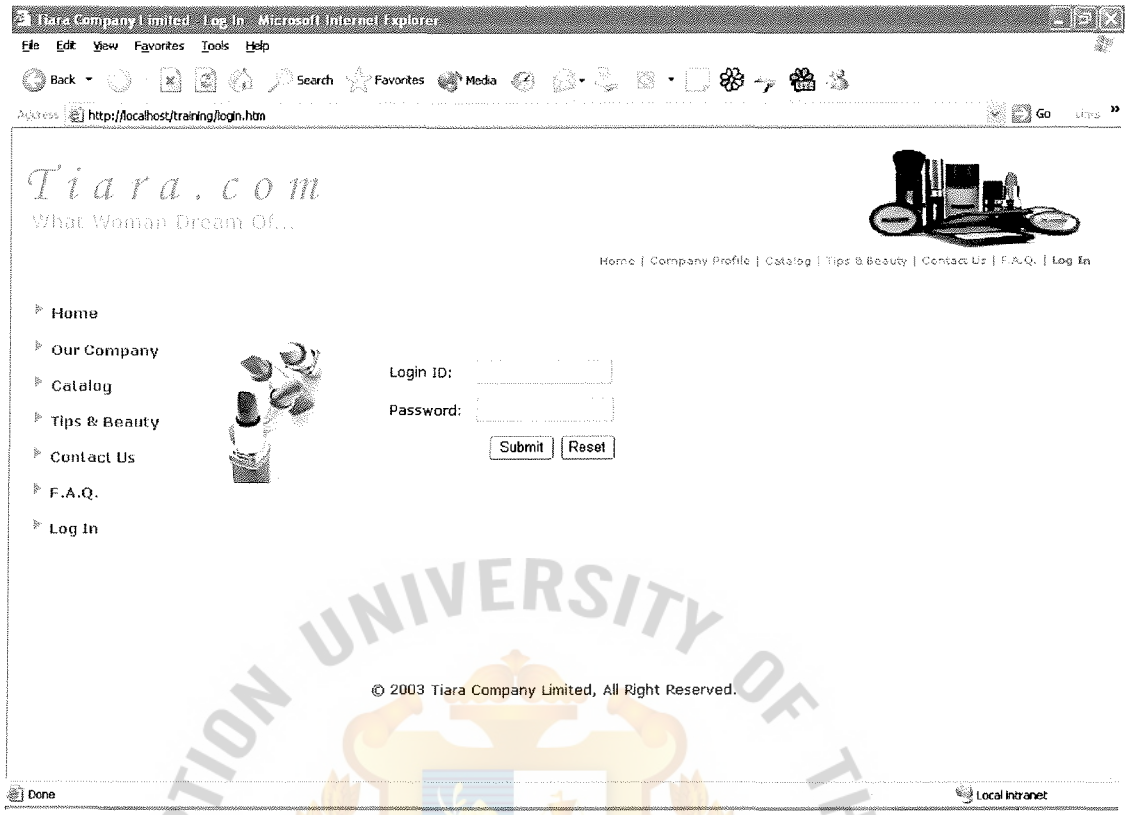

Figure B-2 Login Screen

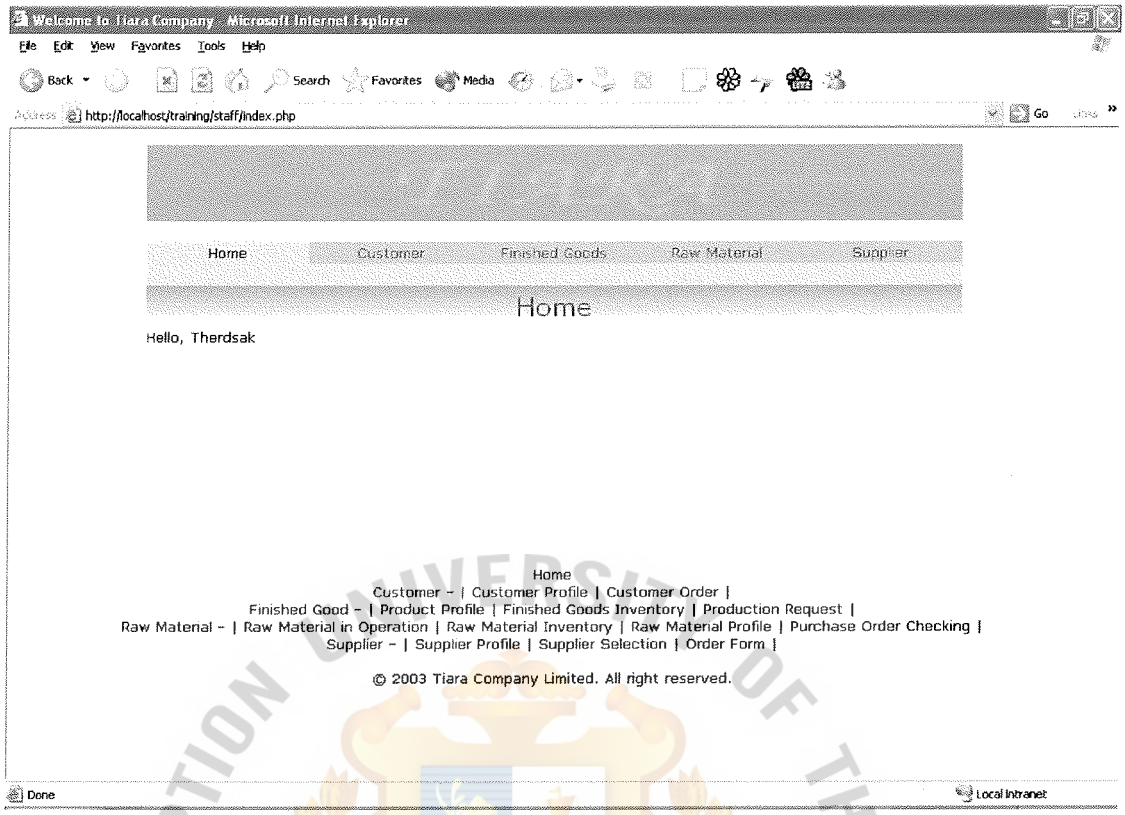

Figure B-3 Staff Home Screen

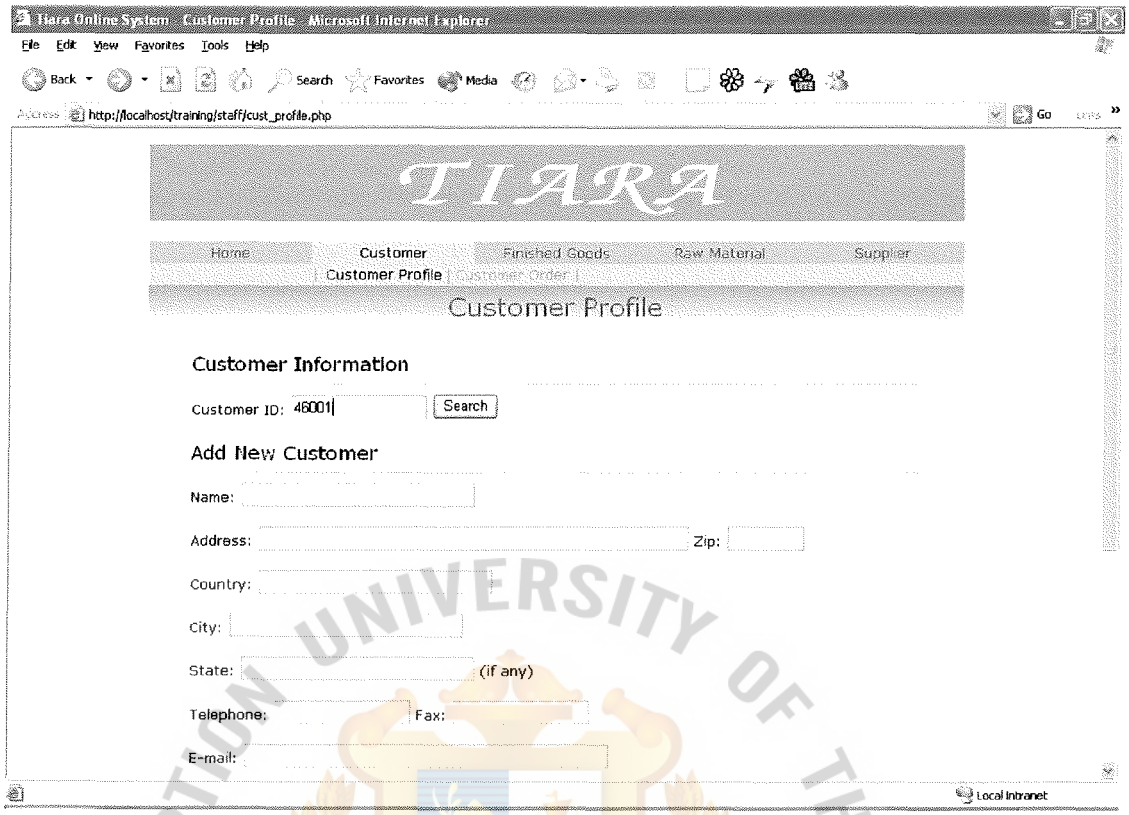

Figure B-4 Customer Profile Screen

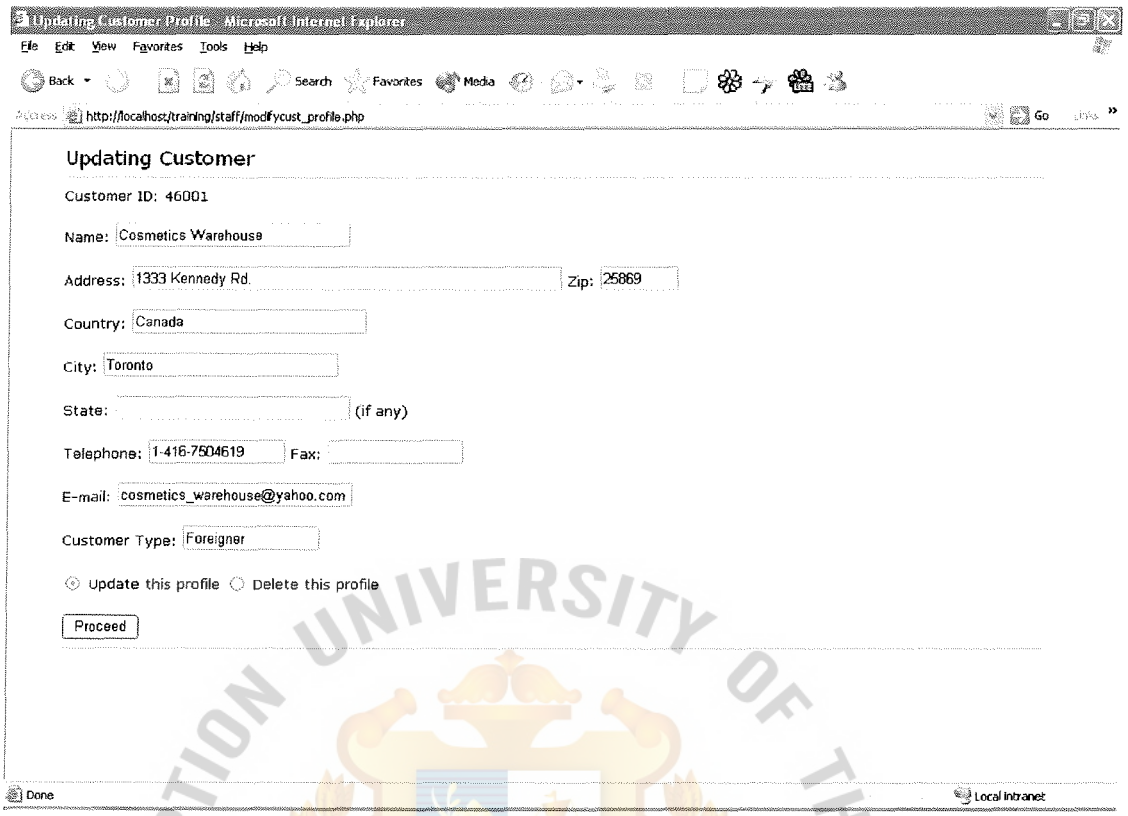

Figure B-5 Update Customer Profile Screen

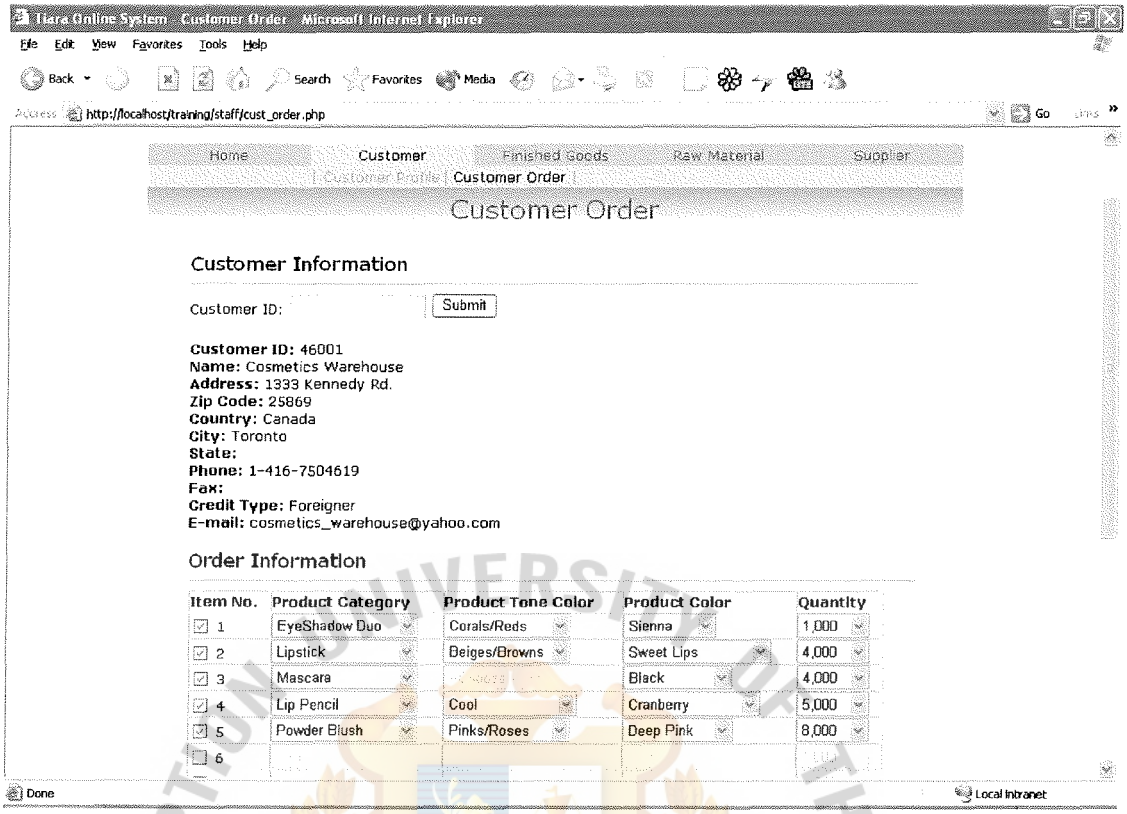

Figure B-6 Customer Order Screen

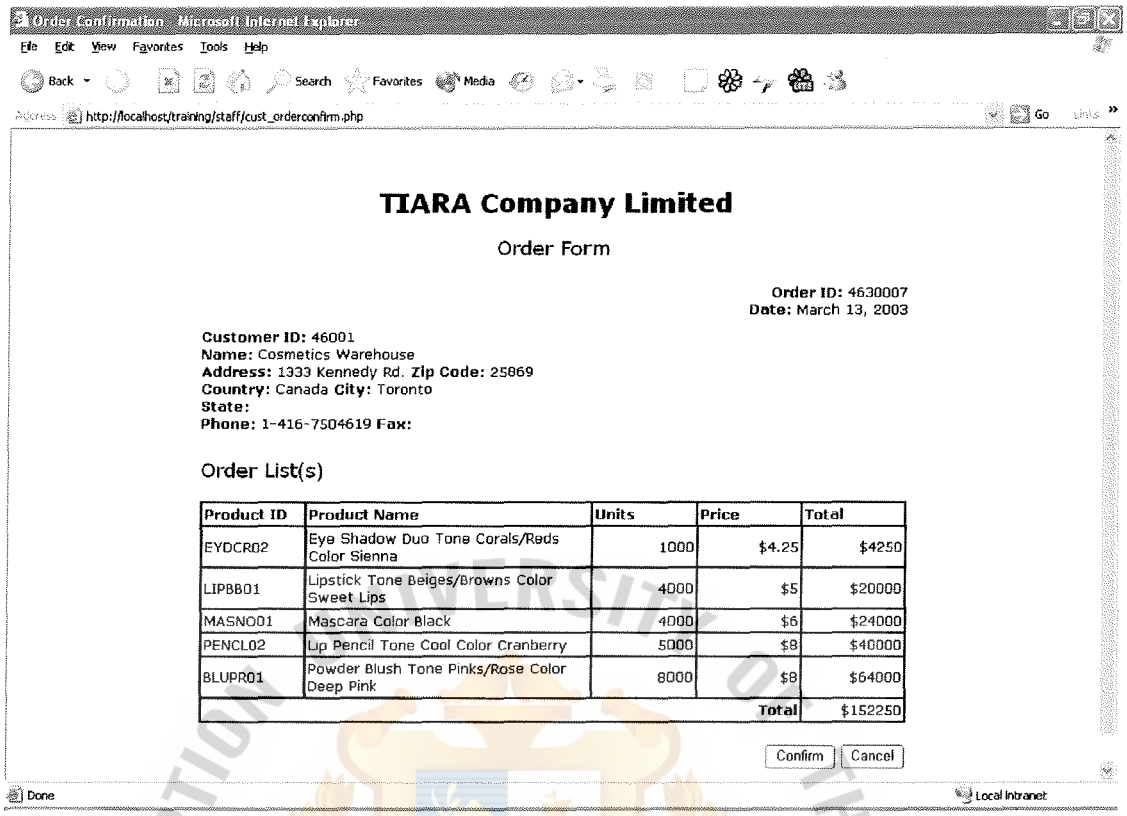

Figure B-7 Customer Order Confirm Screen

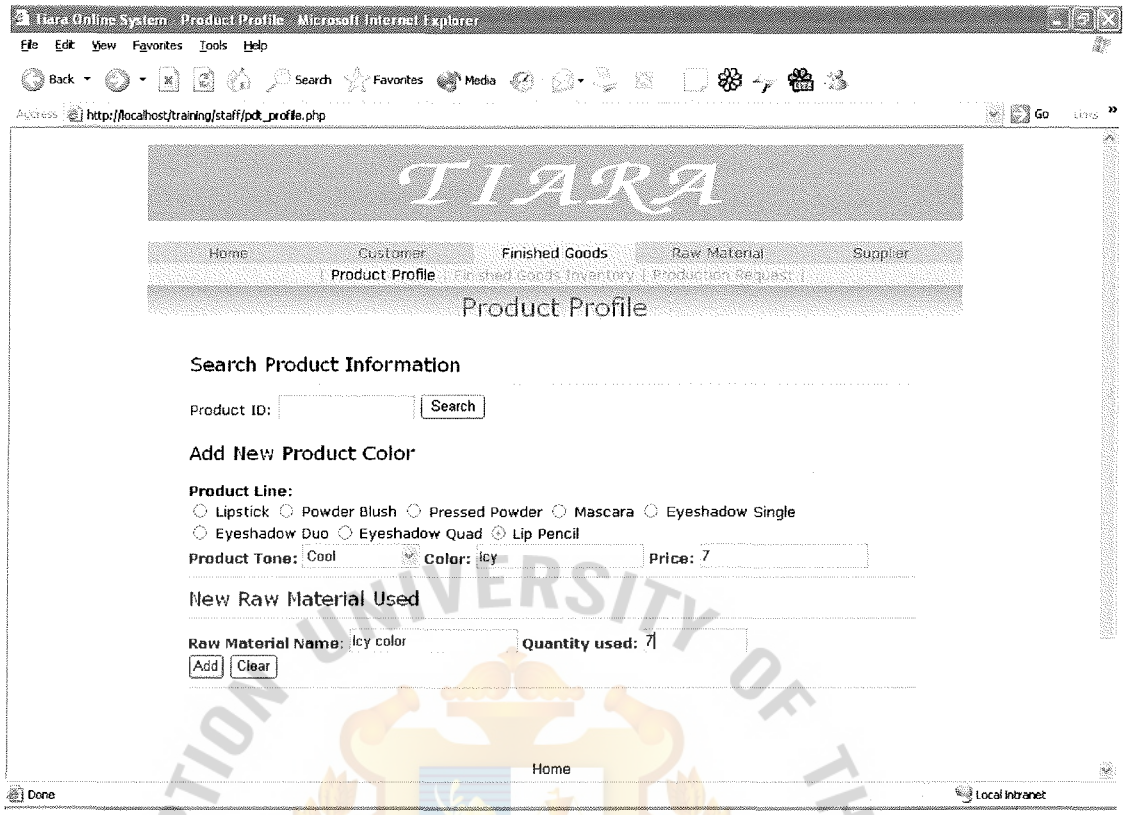

Figure B-8 Product Profile Screen

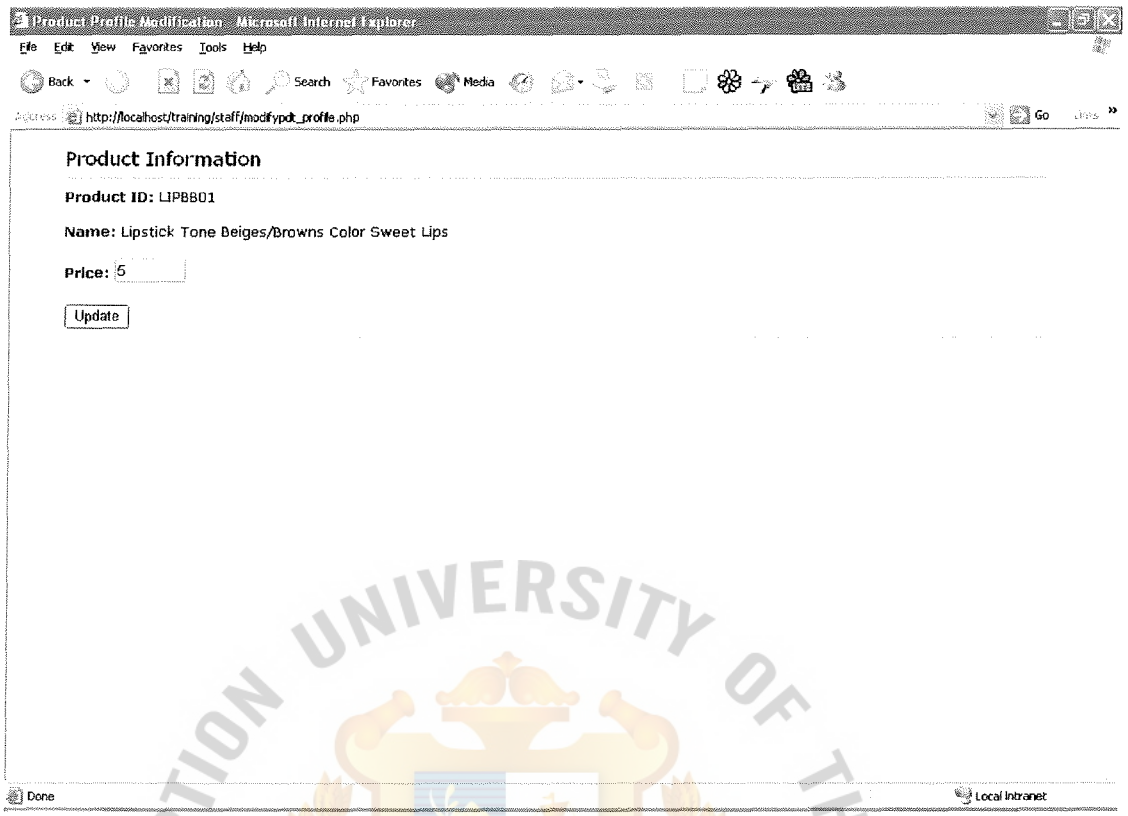

Figure B-9 Product Update Information Screen

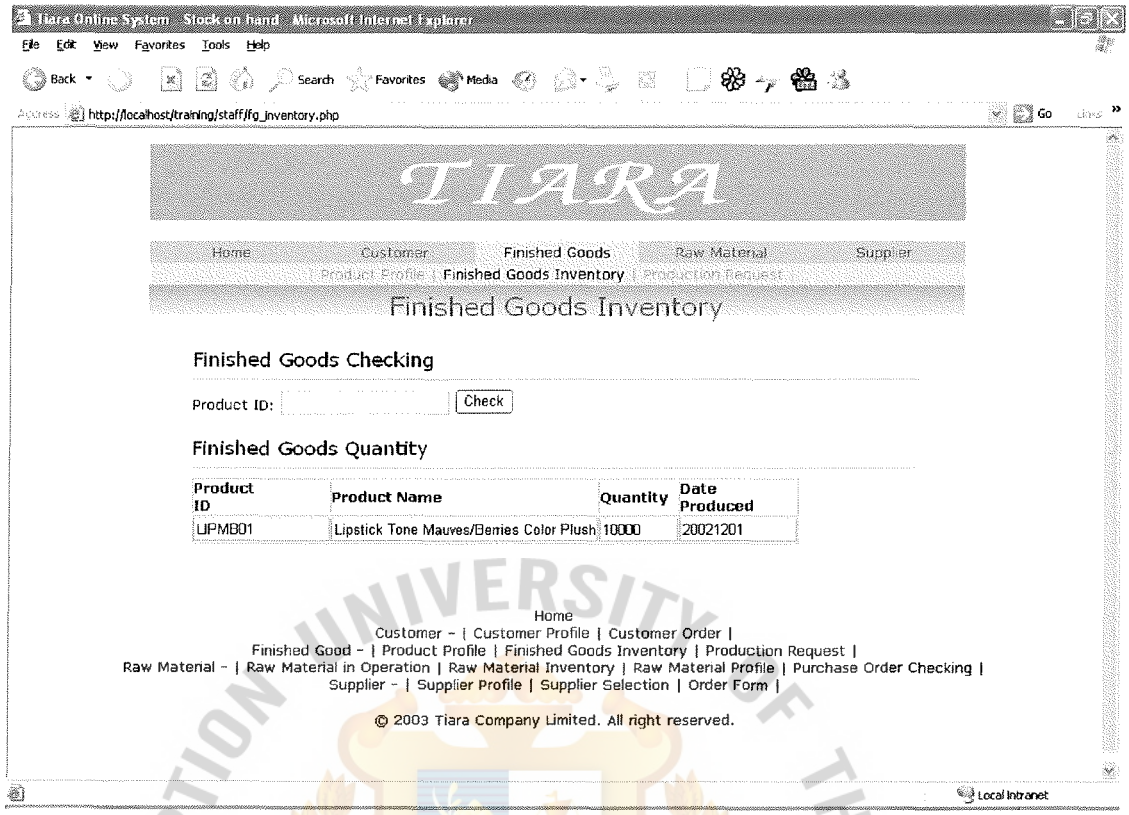

Figure B-10 Finished Goods Inventory Screen

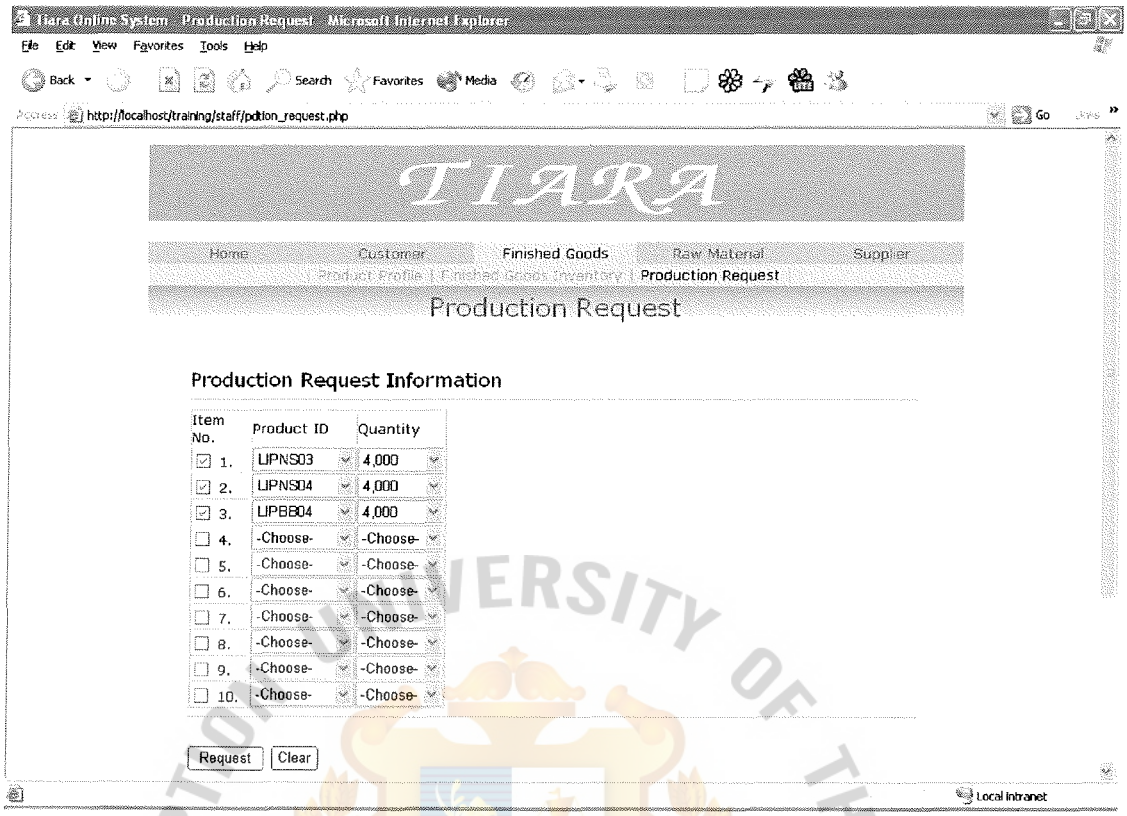

Figure B-11 Production Request Screen

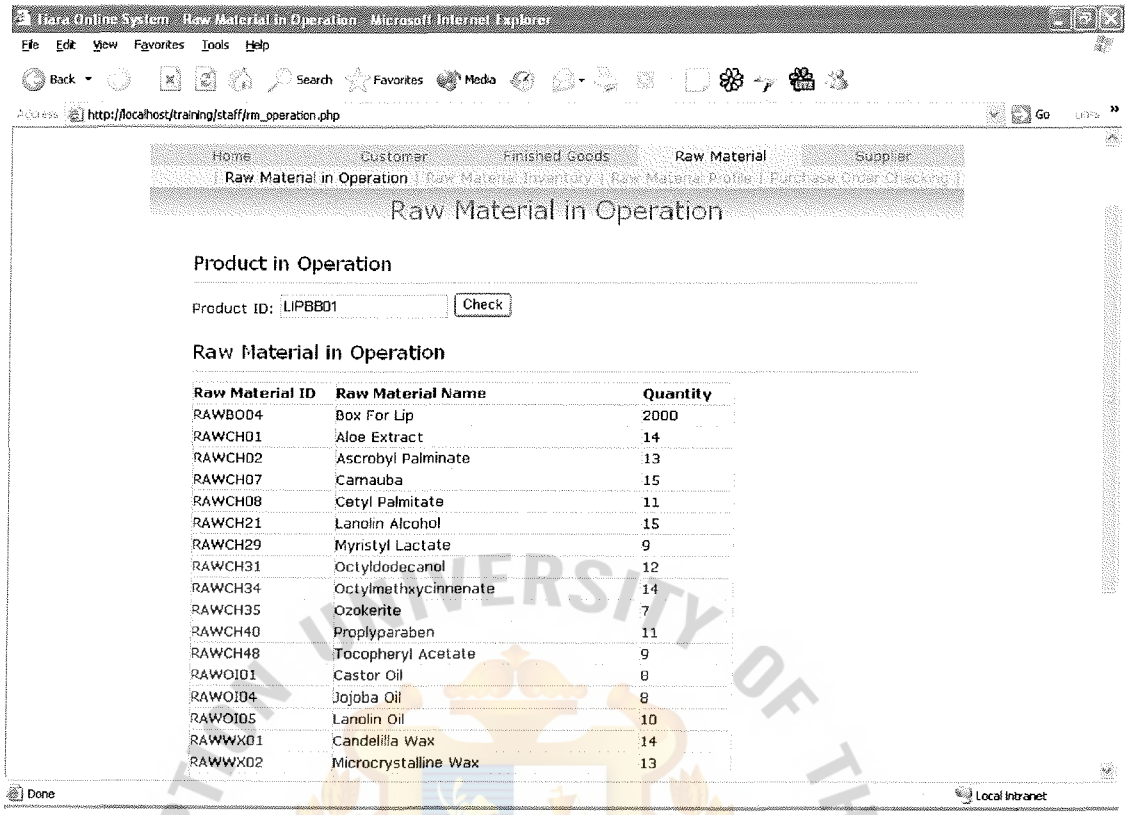

Figure B-12 Raw Material in Operation Screen

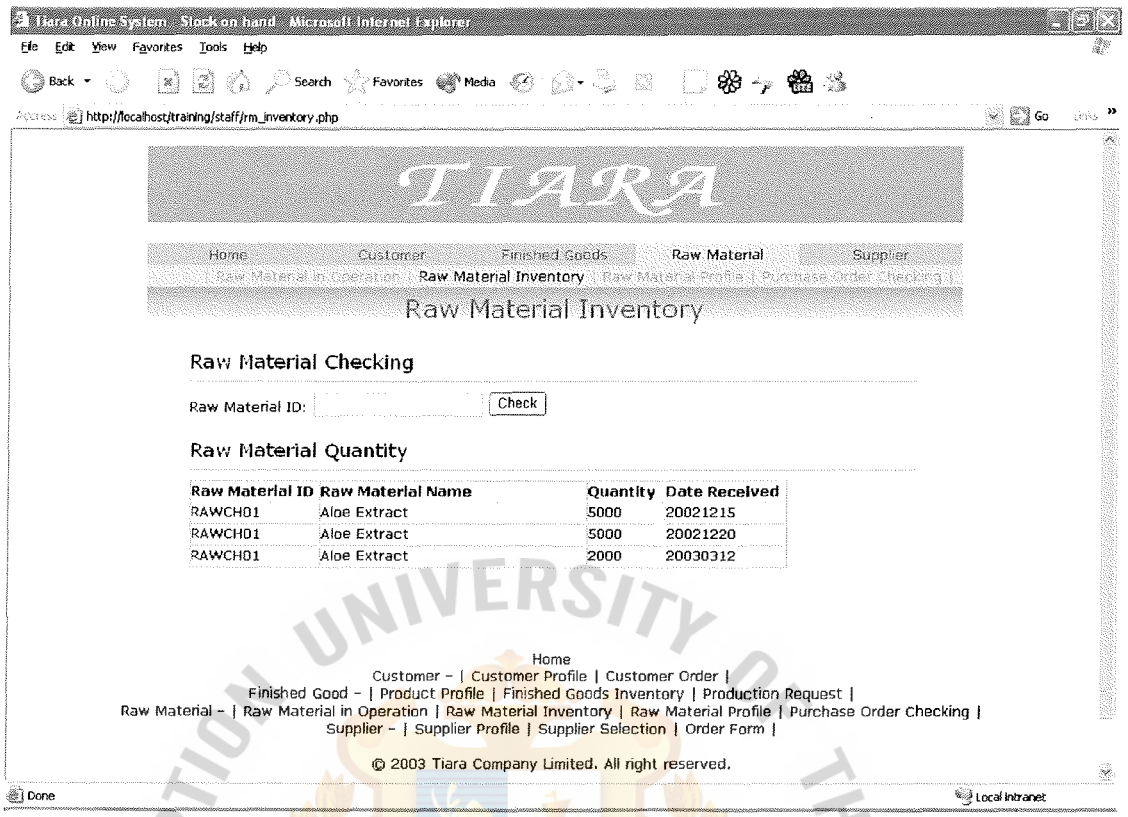

Figure B-13 Raw Material Inventory Screen

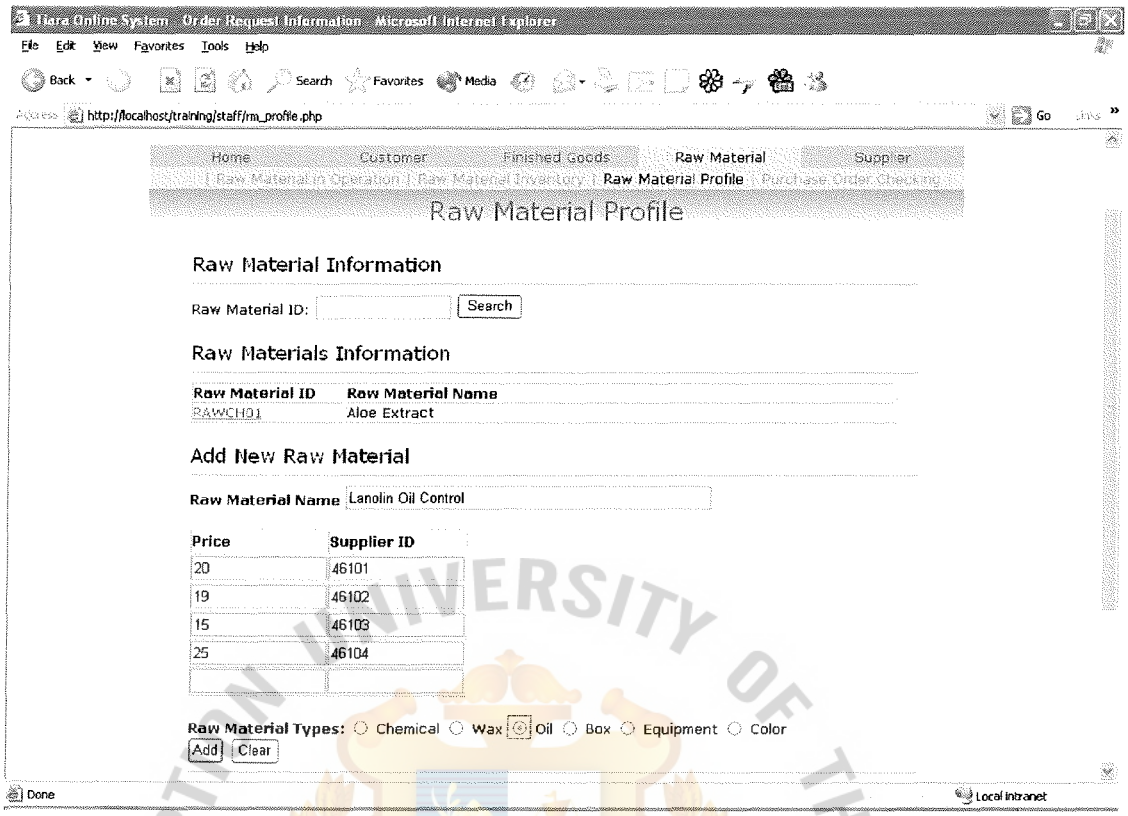

Figure B-14 Raw Material Profile Screen

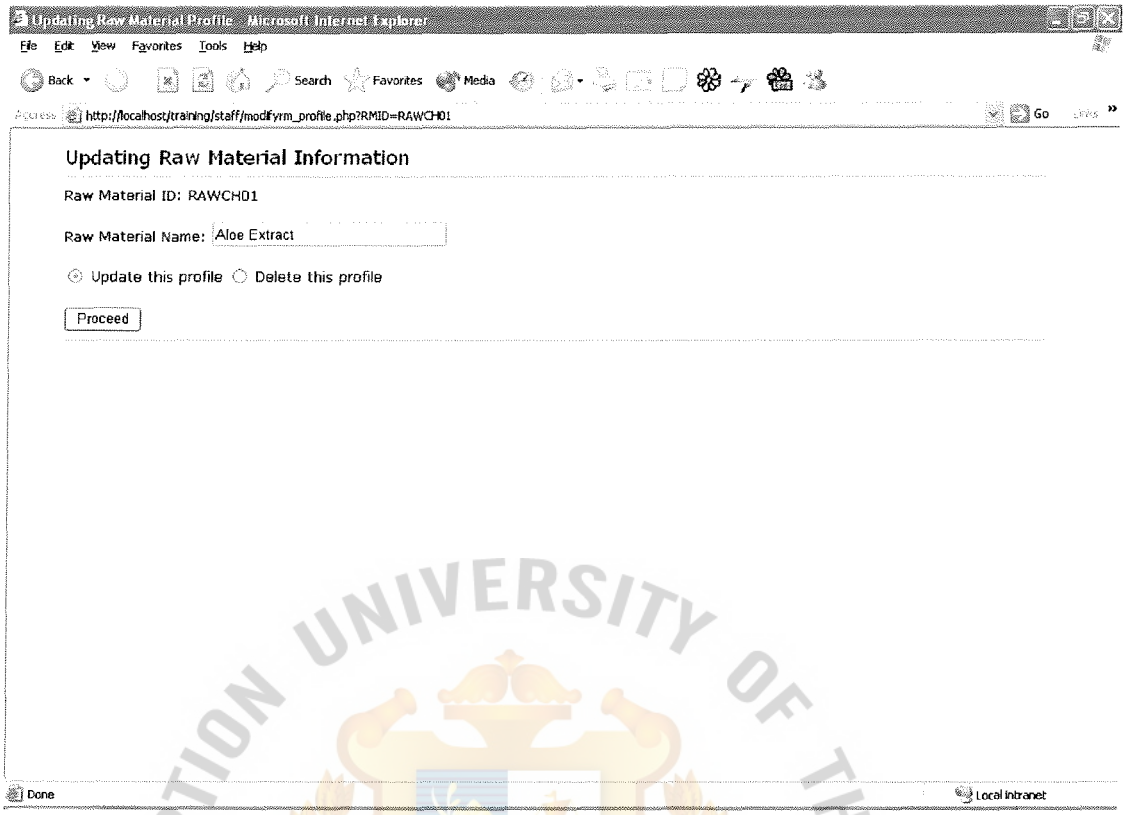

Figure B-15 Raw Material Update Information Screen

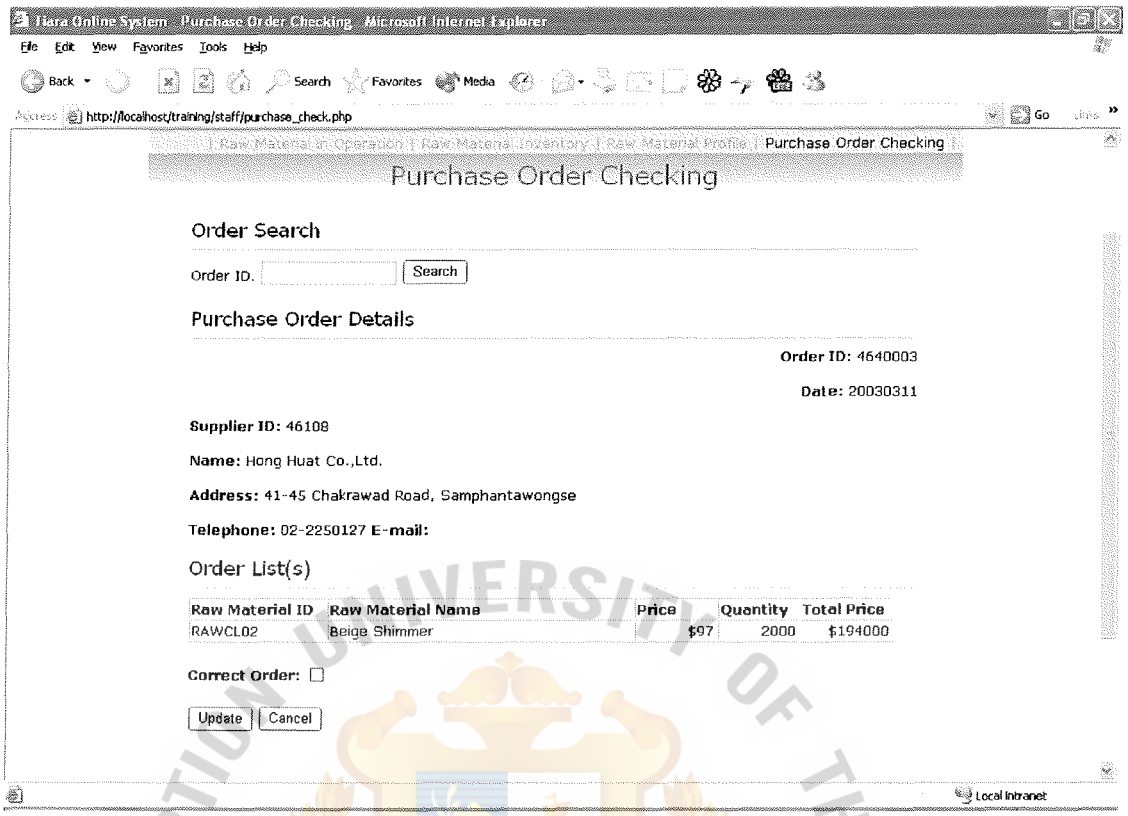

Figure B-16 Raw Material Purchase Order Checking Screen

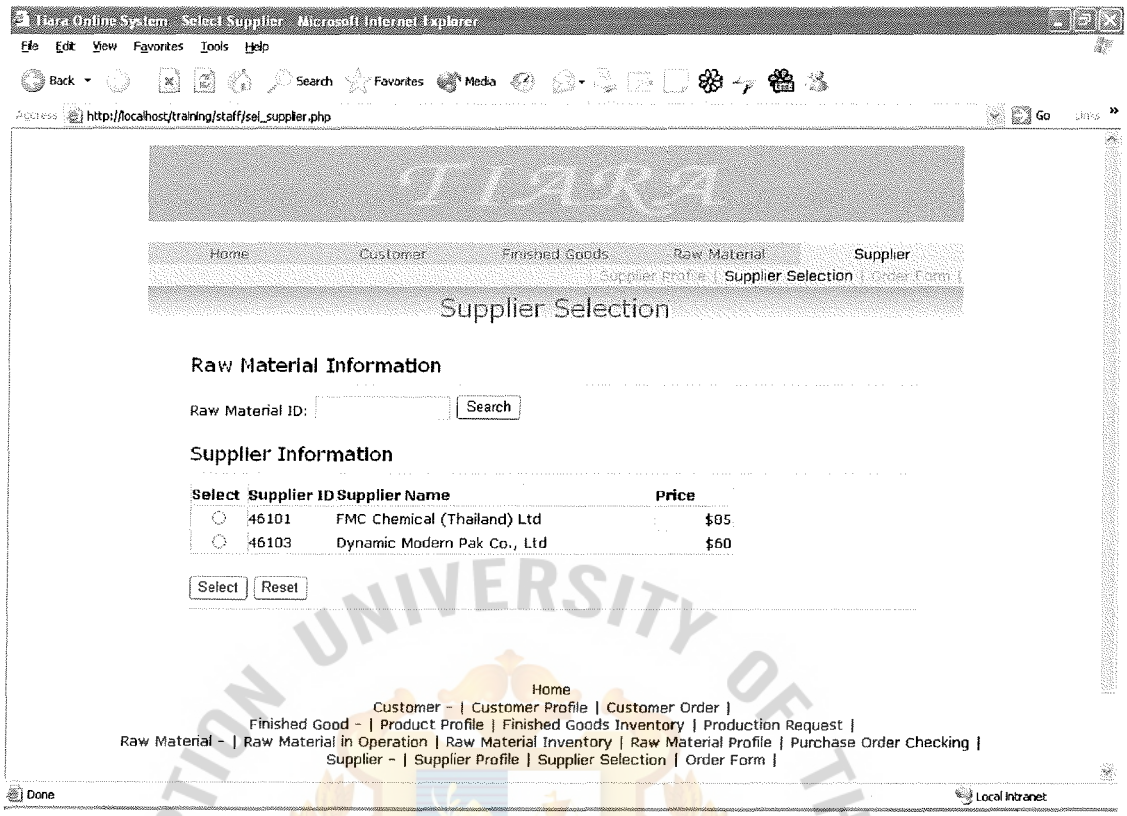

Figure B-17 Supplier Selection Screen

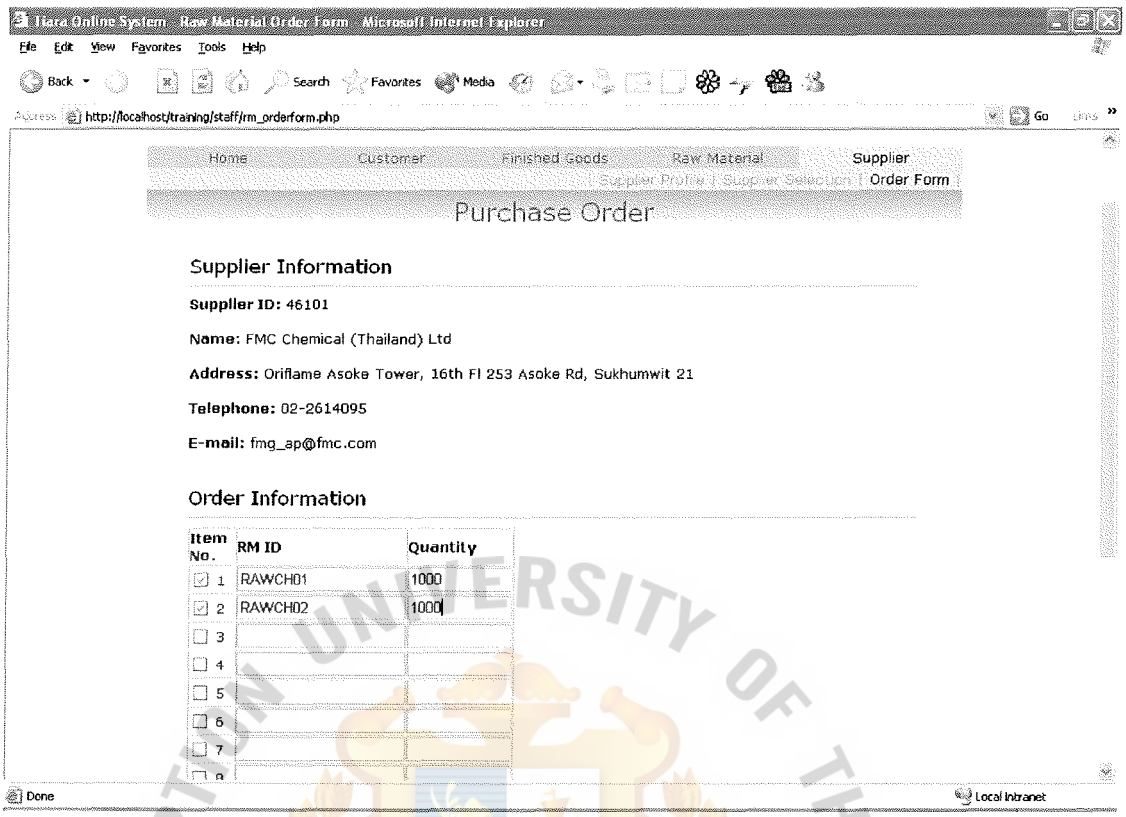

Figure B-18 Purchase Order Screen

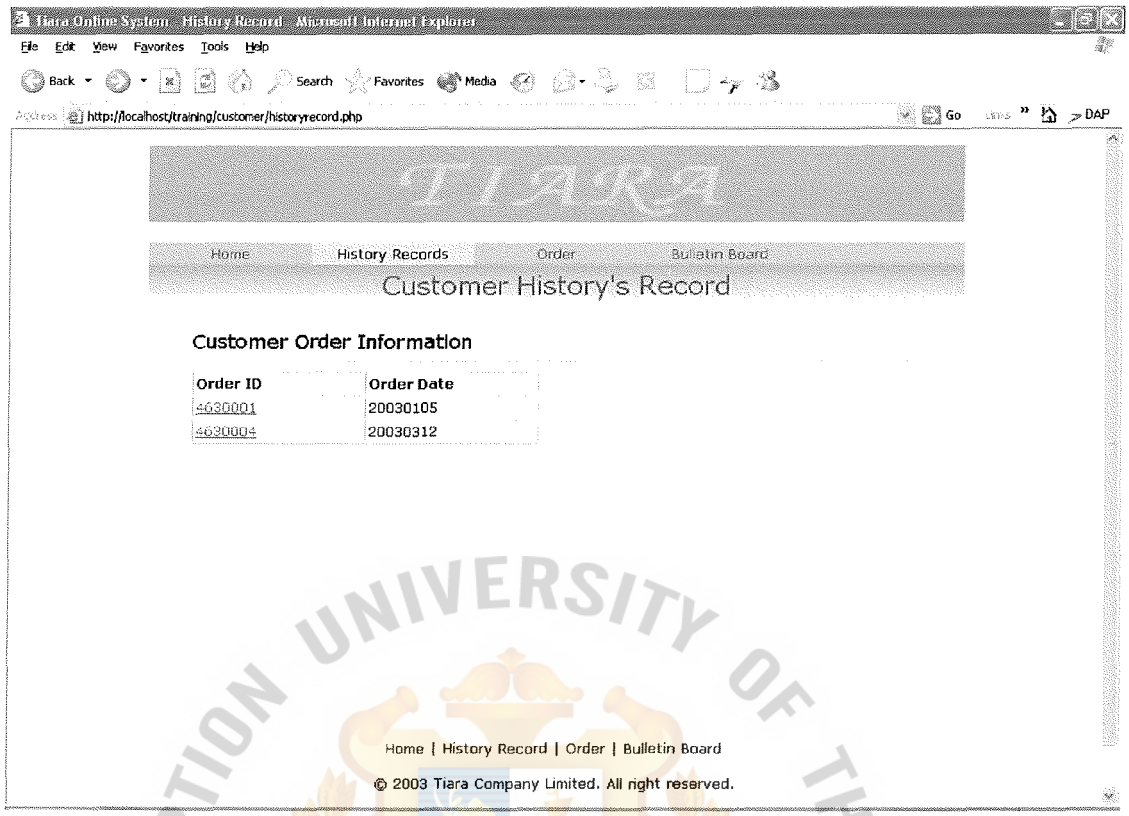

Figure B-19 History Record Screen

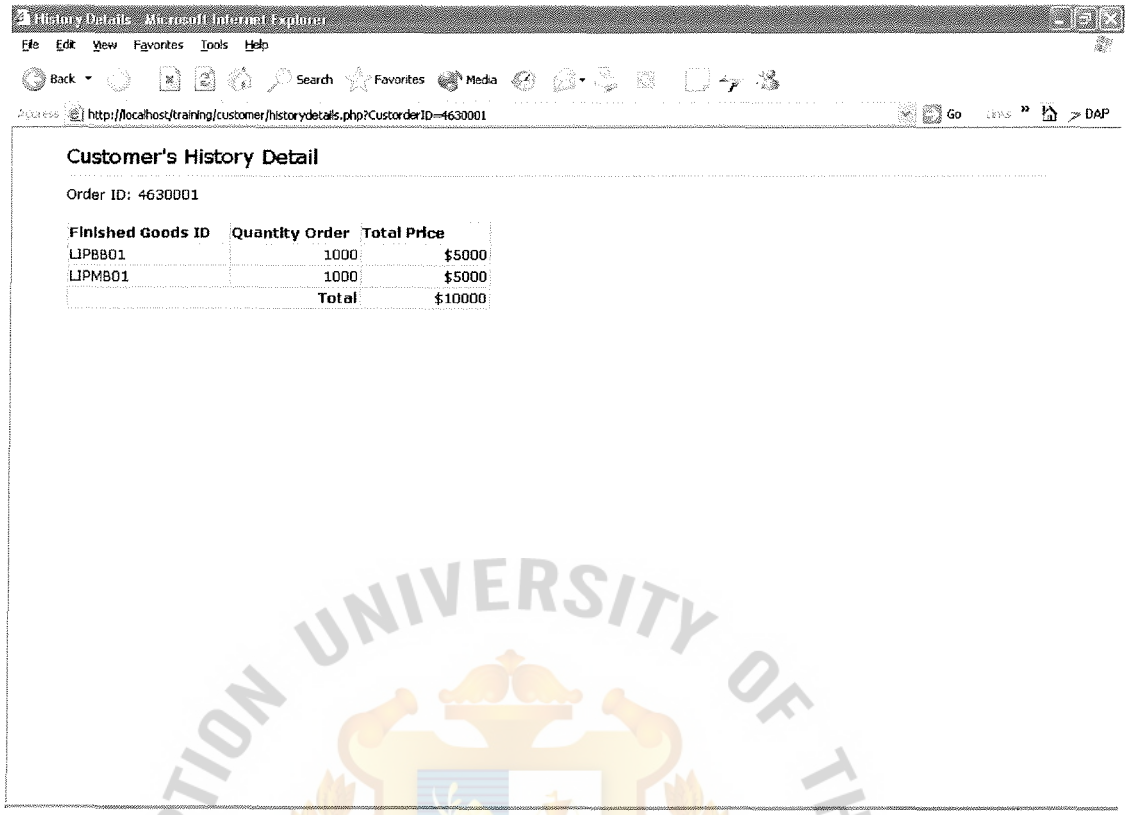

Figure B-20 History Record Detail Screen

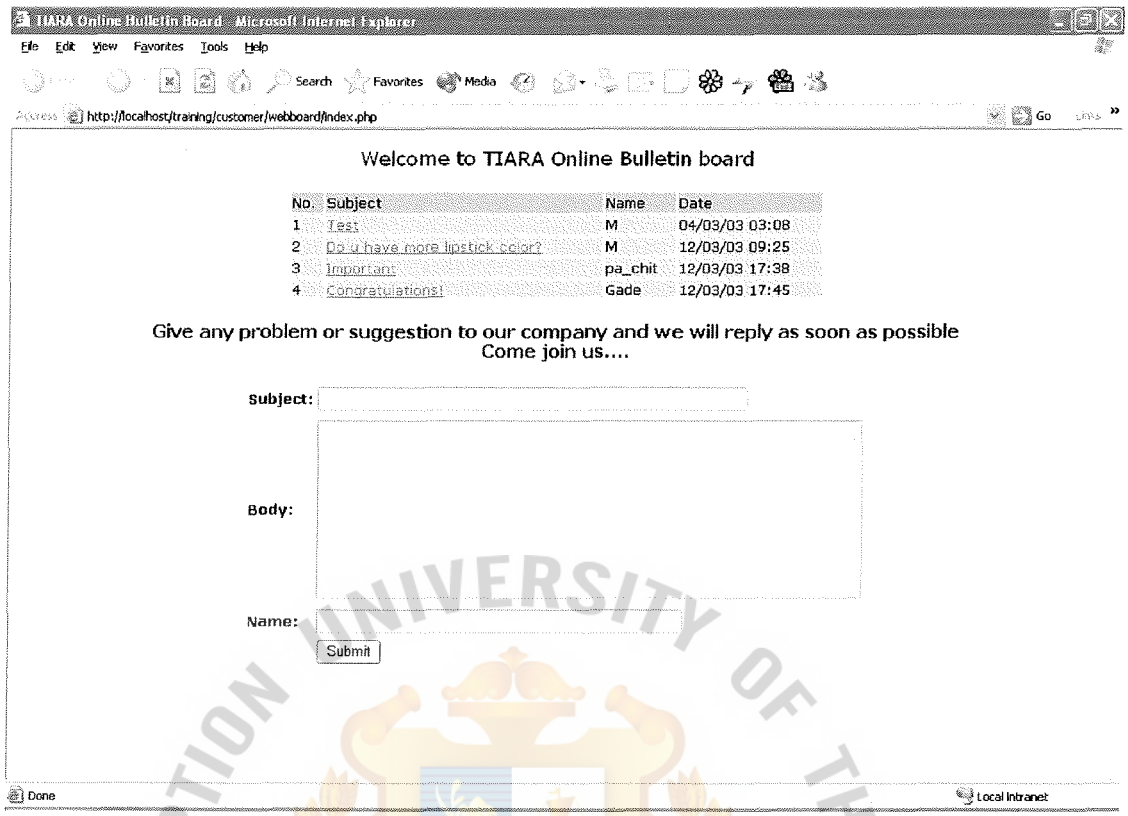

Figure B-21 Bulletin Board Index Screen

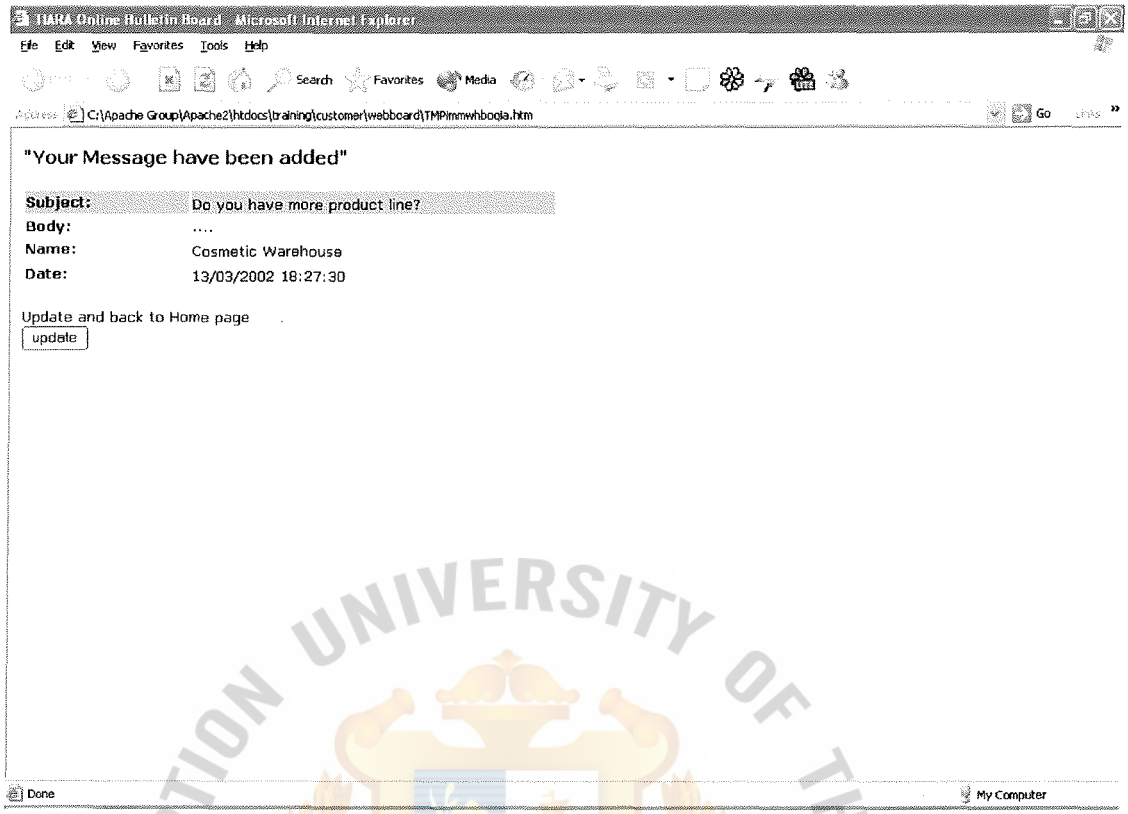

Figure B-22 Update Post Screen

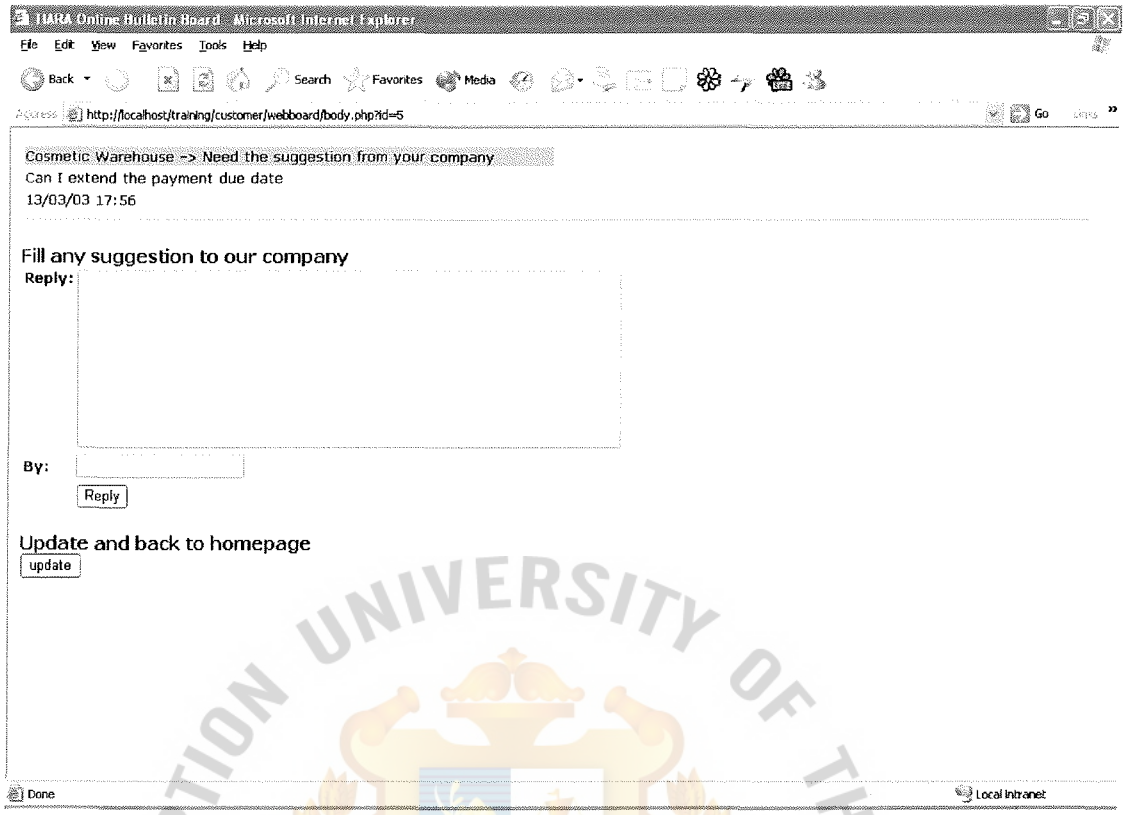

Figure B-23 Reply Screen

APPENDIX C
REPORT DESIGN

TIARA Company Limited

Customer Order

Order ID: 4630001
Date: 11-03-2003

Customer ID: 46001
Name: Cosmetic Warehouse
Address: 1333 Kennedy Rd. **Zip:** 25869
Country: Canada **City:** Toranto
Phone: 1-416-7504619 **Fax:** -

Order Lists

Product ID	Name	Unit	Price	Total Price
LIPBB01	Lipstick Tone Beiges/Brown Color sweeplip	1000	5	5000
LIPMB01	Lipstick Tone Mauves/Berries Color Plush	1000	5	5000

Figure C-1 Customer Order

TIARA Company Limited

Raw Materials Order

Order ID: 4640001
Date: 09-12-2002

Supplier ID: 46101
Name: FMC Chemical (Thailand) Ltd
Address: Oriflame Asoke Tower 16 flr., Sukhumwit 21 **Zip:** 10110
Country: Thailand **City:** Bangkok
Phone: 02-2614095 **Fax:** 02-2614099

Order Lists

RM ID	Name	Unit	Price	Total Price
RAWCH01	Aloe Extract	2000	85	170000
RAWCH06	Carmine	1000	96	96000
RAWCH30	Octyl Pamitate	4000	10	40000

Figure C-2 Raw Material Order

TIARA Company Limited

Raw Materials Checking Form

Order ID: 4640001
Date: 09-12-2002

Supplier ID: 46101
Name: FMC Chemical (Thailand) Ltd
Address: Oriflame Asoke Tower 16 flr., Sukhumwit 21 **Zip:** 10110
Country: Thailand **City:** Bangkok
Phone: 02-2614095 **Fax:** 02-2614099

Order Lists

RM ID	Name	Unit	Price	Total Price
RAWCH01	Aloe Extract	2000	85	170000
RAWCH06	Carmine	1000	96	96000
RAWCH30	Octyl Pamitate	4000	10	40000

□ **Checked the order**

Figure C-3 Raw Materials Checking Report

TIARA Company Limited

Production Request Form

Date: 09-12-2002

Product Request Lists

Product ID	Product Name	Units
LIPBB07	Lipstick Tone Beiges/Browns Color Chocolate Frosting	6000
BLUCR01	Powder Blush Tone Corals/Reds Color Coral Myth	8000
BLUBB03	Powder Blush Tone Beiges/Brown Color Earthen Rose	4000

Figure C-4 Product Request

TIARA Company Limited

New Supplier Information

Date: 15-03-2002

Supplier Name: Thai Chemical
Address: 458 Muang Thong **Zip:** 10500
Country: Thailand **City**: Bangkok
Phone: 02-4859598 **Fax:** 02-4859599

Item Lists

RM ID	Name	Price
RAWCH01	Aloe Extract	84
RAWCH06	Carmine	90
RAWCH30	Octyl Pamitate	10

Figure C-5 New Supplier Information Report

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