



BUSINESS PROCESS AND ITS INFORMATION SYSTEM
REDESIGN FOR DIRECT MARKETING BUSINESS

by

Mr. Somkiat Lilitprapun

A Final Report of the Three - Credit Course
CE 6998 Project

Submitted in Partial Fulfillment
of the Requirements for the Degree of
Master of Science
in Computer and Engineering Management
Assumption University

November, 2000

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Project Title Business Process and Its Information System Redesign for Direct
Marketing Business


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The Graduate School of Assumption University has approved this final report of the three-credit course, CE 6998 PROJECT, submitted in partial fulfillment of the requirements for the degree of Master of Science in Computer and Engineering Management.

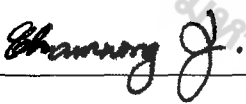
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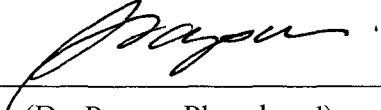
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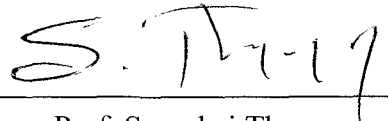
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November 2000

ABSTRACT

Direct Response TV or as shortly called “DRTV” is one of many direct marketing tools. Since Siam TV Media aggressively launched its first TV commercial spots in the name of “TV Media”, Shopping via TV has become very popular. The reasons behind this are the convenience and satisfaction money-back guarantee. The customers just sit in front of their television sets and order the products by just dialing the telephone number on the TV spot. The products will be delivered to them by the address they give. The 30-day satisfaction guarantee allows them to return the products within 30 days if they are not satisfied with the products and are refunded the money. E-Commerce is another distribution that diversify the market.

However, though the company has operated the business for more than 3 years, the slow delivery is the problem that the company has encountered. This is due to many manual and duplicated processes that slower the elapse time of the delivery. The information system that supports the process is also the root cause of the problem. Due to many non-compatible systems of different departments, the operation staffs are required to input, edit, the same data in different systems. This crates human error and human resource redundancy. The result of slow delivery is the up-front cancellation. The customers refuse to receive the products they order by the reason of slow delivery than they expect. This project will study and analyze the business process and its supported information system that affects the delivery process. The solution to the problem will be proposed by choosing the best from 3 candidates. The proposed system and information system will also be compared with the existing system in term of cost and benefit. The proposed process and its information system are aimed to reduce the delivery elapse time and up-front cancellation.

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TABLE OF CONTENTS

<u>Chapter</u>	<u>Page</u>
ABSTRACT	i
ACKNOWLEDGEMENTS	ii
LIST OF FIGURES	v
LIST OF TABLES	vii
I. INTRODUCTION	1
1.1 Background of the Project	1
1.2 The Objectives of the Project	2
1.3 The Scope of the Project	2
1.4 Methodology	2
1.5 Deliverables	3
II. THE EXISTING PROCESS AND INFORMATION SYSTEM	4
2.1 Industry Overview	4
2.2 Company Overview	5
2.3 Existing Core Process	7
2.4 Existing Workflow	8
2.5 Existing Information System	12
2.6 Problem Definition	15
2.7 Area of Improvement	16
III. THE PROPOSED BUSINESS PROCESS AND INFORMATION SYSTEM	17
3.1 User Requirement	17
3.2 Process Design	18

<u>Chapter</u>	<u>Page</u>
3.3 System Design	18
3.4 Hardware and Software Requirement	29
3.5 Security and Controls	30
3.6 Benefit and Cost Analysis	32
IV. PROJECT IMPLEMENTATION	41
4.1 Programming and Building	41
4.2 Testing	41
4.3 Training	42
4.4 Conversion	42
4.5 Production and Maintenance	43
V. CONCLUSIONS AND RECOMMENDATIONS	44
5.1 Conclusions	44
5.2 Recommendations	47
APPENDIX A WORK FLOW OF THE PROCESS	49
APPENDIX B DATA FLOW DIAGRAM	52
APPENDIX C DETAILED CALCULATION OF 3 PROPOSED SYSTEM	62
APPENDIX D EXAMPLE OF PROCESS SPECIFICATION	66
APPENDIX E WEB INTERFACE DESIGN	69
APPENDIX F PROJECT PLAN	76
BIBIOGRAPHY	78

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
2.1 The Organization Chart	6
2.2 Core Business Process: Order Release	7
2.3 Business Process: Refund Order	7
2.4 Company Information System	14
3.1 Network Architecture	27
3.2 Breakeven Analysis	37
A.1 E-Commerce Order Process	50
A.2 Telemarketers' Order Process	50
A.3 Payment Process	51
A.4 Delivery Process	51
B.1 Context Diagram of the Proposed System	53
B.2 DFD Level 0 Of the Proposed System	54
B.3 DFD Level 1 Process 1: E-Commerce Order Entry	55
B.4 DFD Level 1 Process 2: DRTV Order Entry	56
B.5 DFD Level 1 Process 3: Delivery Process	57
B.6 DFD Level 1 Process 4: Order Update: Cash Collection	58
B.7 DFD Level 1 Process 5: Order Update: Upfront Cancellation	59
B.8 DFD Level 1 Process 6: Refund Process	60
B.8 DFD Level 1 Process 7: Customer Service	61
E.1 Home Page	70
E.2 Thailand Home Page	71
E.3 Shopping Page	72

<u>Figure</u>	<u>Page</u>
E.4 Web Order Module	73
E.5 Web Payment and Delivery Module	74
E.6 Order Confirmation	75
E.3 Shopping Page	72
F.1 Project Plan	77



LIST OF TABLES

<u>Table</u>	<u>Page</u>
2.1 Process Elapse Time	11
3.1 Candidates System Matrix	21
3.2 Feasibility Analysis Matrix	25
3.3 Hardware Specification for Server	29
3.4 Software Specification for Server	29
3.5 Hardware Specification for Each Client Machine (6 Machines)	30
3.6 Software Specification for Each Client	30
3.7 Cost of the existing system	33
3.8 Cost of the Proposed System	34
3.9 Cost Comparison between the Existing System and New System Over 5 Years	36
3.10 Sales Volume Analysis	38
3.11 Payback Period Analysis	39
5.1 Area of Improvement	46
C.1 Estimated Cost Of Candidate I: Visual Fox Pro	63
C.3 Estimated Cost Of Candidate II: Borland J builder & Oracle	64
C.4 Estimated Cost Of Candidate III: Visual Basic 6.0	65
D.1 Process Specification of Process 1.1	67
D.2 Process Specification of Process 1.2	67
D.3 Process Specification of Process 1.3	68
D.4 Process Specification of Process 1.5	68

I. INTRODUCTION

1.1 Background of the Project

Siam TV Media is a leading Direct Response TV company, known as “TV Media”. Its business is mainly to sell innovative products via TV and deliver the products to the customers as fast as possible . Those services provide the customers convenience to shop. They just sit in front of Television and order via phone, the product will be delivered to them by the company delivery agent. Today, e-commerce web site is another distribution channel to serve the customers who want to buy TV Media products. This is one form of direct marketing. Furthermore, the company has the 5 retailing shops.

Though the company has been operating the business for 3 years, it is still facing the problem of late fulfillment of the products. The customers get the ordered products too late. It causes the customers to cancel the product order. The customers refuse to receive the products that they ordered. Therefore, the revenue that the company expects at the time of order taking does not reach the fulfillment of order. The cancellation of orders due to late delivery and cancellation problems arises from the business process and information system that does not fully support the business operation. Many operation tasks of the process do not help the company accelerate the total business process. And many repetitive activities are done manually because of the information systems of each business unit which are separated. For example, E-Commerce order management module belongs to a system while telemarketing order management system has its own . However, orders from web site require the personnel to input order data to telemarketing order management system. So, double entry and 1 more personnel are required.

The company realizes the causes and effects. Redesigning process and information system must be proposed and implemented to achieve the mission, to fulfill the customer's needs for their ordered products as soon as possible and to reduce cancellation rate and to use IT as strategic weapon.

1.2 The Objectives of the Project

The objectives of the Business process and Information System Redesign project are as follows:

- (1) To study the existing business process and its information system
- (2) To propose new business process information system that suits the proposed process with cost effectiveness and cancellation rate reduction

1.3 The Scope of the Project

The project will cover the following focuses

- (1) The analysis of the existing business process and its system
- (2) Cost and Benefit of the present system
- (3) The analysis, design and development of a new business process and its support information system, as well as its costs and benefits
- (4) Recommendation for the company process and its information system

1.4 Methodology

To make this project effective, the system analysis and design is applied. The part of quality management system may be used. The steps in doing the project are as follows:

- (1) The existing process and its information system interview to the key management team and some operation staff
- (2) Documentation of the process and define its costs and benefit
- (3) Propose the new process and its information system to solve the problem

- (4) Documentation of the new process and express its costs and benefit
- (5) Implementation plan
- (6) Recommending the new process to solve the company key problems

1.5 Deliverables

The new process under unlimited budget is that unnecessary and duplicated tasks are eliminated and the information system that can support the new process will be introduced. However, the new process and new information system must be cost-effective.



II. THE EXISTING PROCESS AND INFORMATION SYSTEM

2.1 Industry Overview

DRTV stands for Direct Response TV. It is one form of direct marketing tools. DRTV focuses on niche market. We can call it “Home Shopping”. By this type of business operation, the customers can shop without going outside the home. They just watch TV advertisement and call up by the telephone number on TV and order the products with the DRTV Company’s telemarketers. In a few days, the product that they order will be delivered to their given address. The business provides the convenience for the customers. They do not need to drive out and face the traffic or go from another province to buy the products.

The key success factors in this kind of business, according to chief operation office of TV Media, are:

- (1) Products
- (2) Media
- (3) Delivery process

The first 2 factors require the marketing management to push them. The fitted business process is the answer for the last one. Most of the customers who order by phone want the products as soon as possible or as the company promises.

DRTV companies in Thailand can deliver the products to Bangkok customers at the average of 3 – 4 days and upcountry customers within the average of 15 – 20 days. We can see that the elapse time is too long. It needs improvement.

2.2 Company Overview

Siam TV Media was established in 1996. The company is a joint venture between Thai shareholders and TV Media Holdings, Singapore. The mission of the company is to be no.1 in DRTV business. TV Media Holdings has its subsidiaries in Japan and Korea.

TV Media also has a significant chain of retail outlets in all population center of Thailand, carrying our "As Seen On TV" products. One policy that attracts the customers to buy the products is "30-day satisfaction and money-back guarantee". The customers can return the products to the company if they are not satisfied with the products. The company will refund full amount of product value to them.

In the year 2000, E-Commerce is a new trend of future business. TV Media Holdings intends to extend the distribution channel to the Internet. Therefore, TV Media's E-commerce web site was built. www.tv-innovations.com is its web site.

To satisfy the new distribution channel objective, E-Commerce division is established. Since the promotion of the web site on TV, there are a lot of numbers of visitors entering the site and order the products. Through this new channel, the company can access the new market. It also provides customers the convenience to shop.

Since the company has established e-commerce division, it reorganized the organization. The business process and fulfillment department also replaced the logistics department. This new department's responsibility is to manage the business process and fulfillment. The new organization chart is as follows:

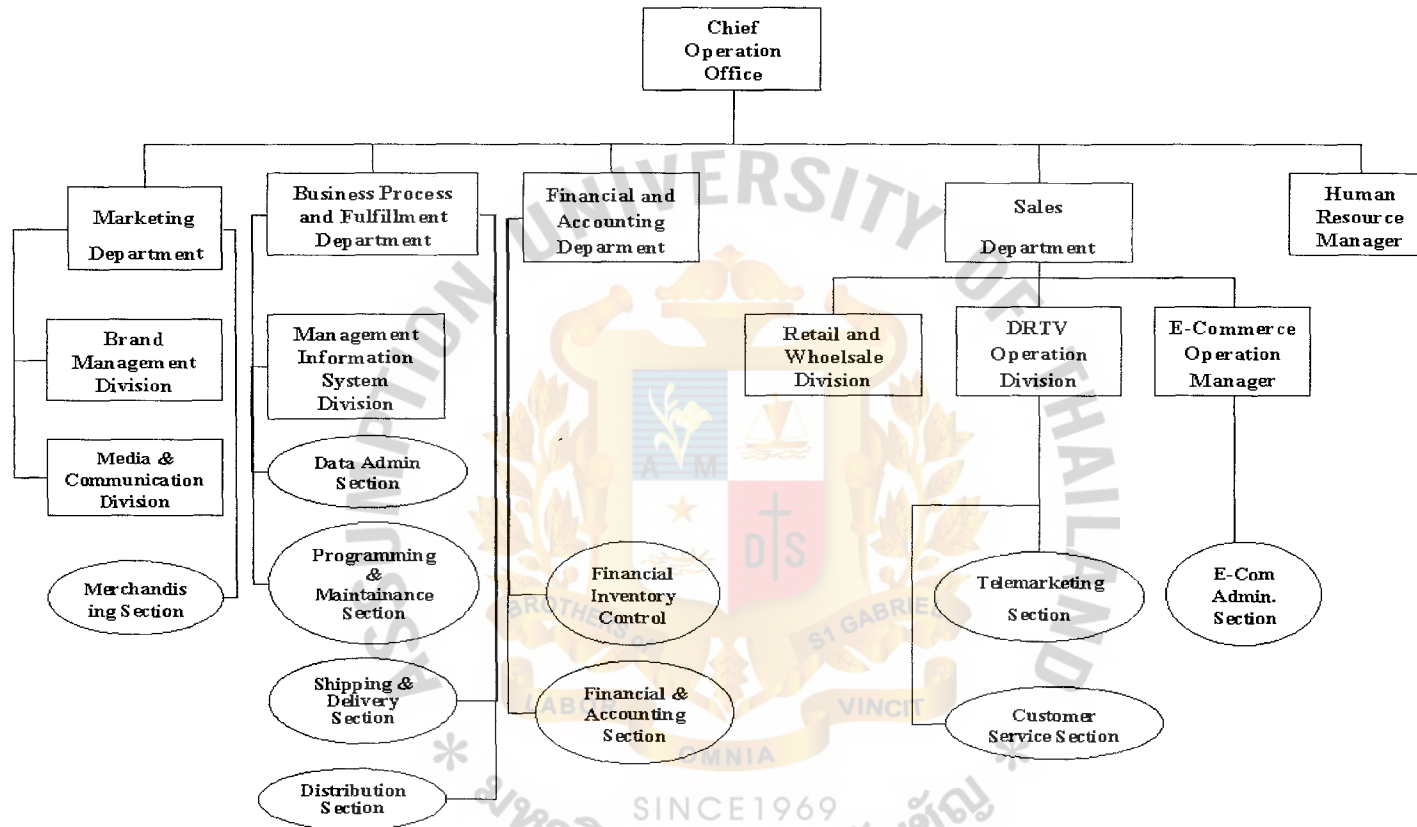


Figure 2.1. Organization Chart.

Because the company has not its own warehouse, so the company 's distribution and warehouse sections are located in another place. The location is too far from the office.

2.3 Existing Core Process

The business units can be follows:

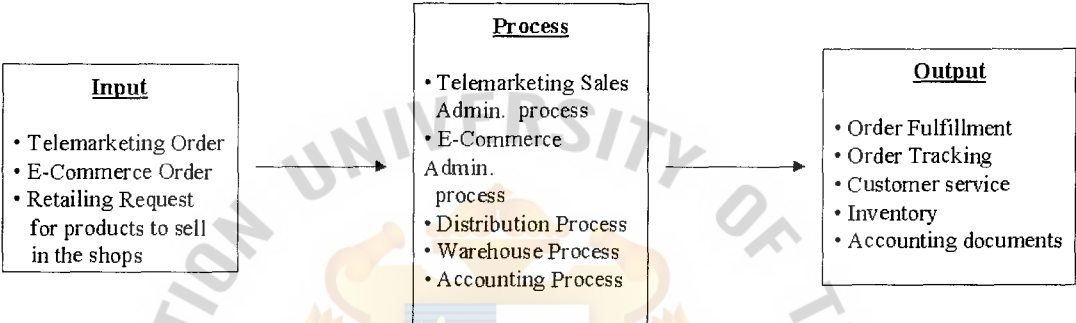


Figure 2.2. Core Business Process: Order Release.

The company has the satisfaction money-back guarantee. Its process is shown below:

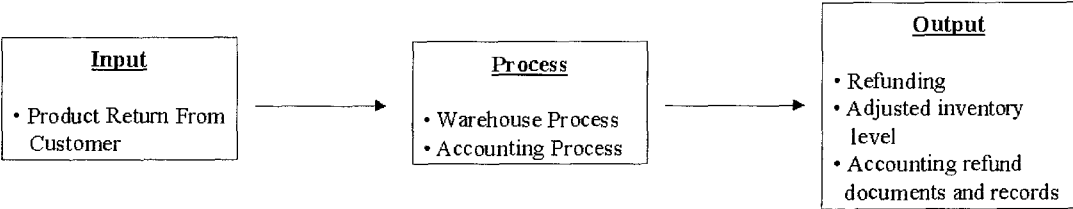


Figure 2.3. Business Process: Refund Order.

2.4 Existing Workflow

The company workflow can be described as follows:

2.4.1 E-Commerce

- (a) The customer orders via the internet
- (b) E-Commerce Administration staff daily checks the order in web admin module via internet whose database is located at Singapore.
- (c) Printing out web Order information
- (d) Key in such data into Sales Admin. System in Thailand
- (e) Printing out Delivery Order
- (f) Delivery process starts

2.4.2 DRTV by Telemarketing

- (a) Telemarketers take orders from customer
- (b) Key in such data into Sales Admin. System
- (c) Printing Delivery Order
- (d) Delivery Workflow starts

2.4.3 Payment Verification Workflow

- (a) D/O is submitted to Finance Department
- (b) Finance staff key in the D/O to the system to update the sales data in Finance information system
- (c) Check Type of the payment
- (d) Credit card payment will be verified on offline-basis
- (e) Submit D/O to MIS department
- (f) Delivery Process starts

2.4.4 Delivery Workflow

- (a) MIS data admin. staff checks the order data and delivery order hardcopy whether both is consistent
- (b) Transfer the data to distance distribution section
- (c) Distribution staff picks up the hard copy
- (d) Distribution staff checks whether data and hardcopy are consistent
- (e) Requesting warehouses to withdraw the products
- (f) Deliver the products to the customers by the mode of delivery
- (g) The customer makes payment if order type is cash payment.

2.4.5 Order status update: Cash Collection for COD, COP

- (a) All order is back to TV Media
- (b) Finance staff updates the order status in Sales Admin. System, the inventory in the system is also updated
- (c) Finance staff inputs the data into accounting system. The inventory system of the accounting system is also updated
- (d) At the end of every month, Finance, MIS and Outsourcing company must reconcile the inventory with each other

2.4.6 Order status update: Return by Up-front Cancellation

- (a) All order are back to TV Media
- (b) Finance , MIS staff updates the order status in Accounting System and Sales Admin System consecutively, the inventory in the systems are also updated
- (c) Finance staff inputs the data into accounting system. The inventory system of the accounting system is also updated
- (d) At the end of every month, Finance, MIS and Outsourcing company must reconcile the inventory with each other

2.4.7 Customer Service

- (a) Customers request the information about their orders status or information about their order
- (b) Customer service check orders in the Sales Admin system
- (c) Due to the longer elapse time of transferring data and hardcopy between distribution section and MIS & Finance section, the update in the main office systems are delayed
- (d) Customer service phones to the distance distribution section for the order status information
- (e) The customer service answers the customers

For a clearer understanding of the elapse time of the process, Table 2.1 shows the elapse time of the process. The company must spend 20 days and 13 hr for Bangkok and 35 days and 13 hr for upcountry to complete the whole process.

Table 2.1. Process Elapse Time.

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Process	Scope of process	Elapse Time
E-commerce order-Taking	From customer orders to order entry	½ day
DRTV order-taking	From customer orders to order entry	1 days
Delivery process	From Order entry completed to delivery products to customers get the products	BKK – 2 days UPC : 7 – 15 days
Order update: cash collection	From D/O hardcopy back to its data which is input into system	3 days
Order update : up-front cancellation,	From D/O hardcopy back to its data which is input into system	3 days
Inventory adjusting: Order cancellation	From warehouse submitting stock adjustment report to stock data which is updated in the system	3 days
Refund process	From the customer return products to customers get the money	9 days
Customer service : customer Info. Search	From customer inquiry to data search completed	1 hr
Total Process	From customer order to Customer service	BKK: 20 days and 13 hr UPC : 35 days and 13 hr

2.5 Existing Information System

The company has its own 3 information systems, which are:

(1) E-Commerce Administration system:

This system is located at Singapore. The web database system is also there. However, to operate the transaction, the order and customer data must be re-keyed into Siam TV Media's Telemarketing Sales Admin system

(2) Telemarketing Sales Admin system

This system is the core sales information Admin system. In the system, It includes sales process function, as well as inventory function. All orders from e-commerce and telemarketing must be input in this system because the inventory must be used at the same location. The company uses Microsoft Access for the sales admin purpose.

(3) Accounting system

The system is used to manage the account information and control and monitor the value of the inventory. The department picks "Express" application for its accounting and financial responsibilities

Because Siam TV Media rents outside warehouses and distribution systems, the company has separated the system from the main office as shown in Figure 2.4.

(4) Distribution system

This system is developed through FOX PRO for win. The data transaction from MIS staff of Siam TV media must extract data manually and send the data to distance distribution section via email.

(5) Warehouse management system

The outsourcing company's warehouse manages Siam TV Media's inventory by MS Excel 97. The system is unrelated to the distribution and Siam TV Media's system. Therefore, at the end of every month, Finance, MIS Department of Siam TV Media must reconcile the inventory level.



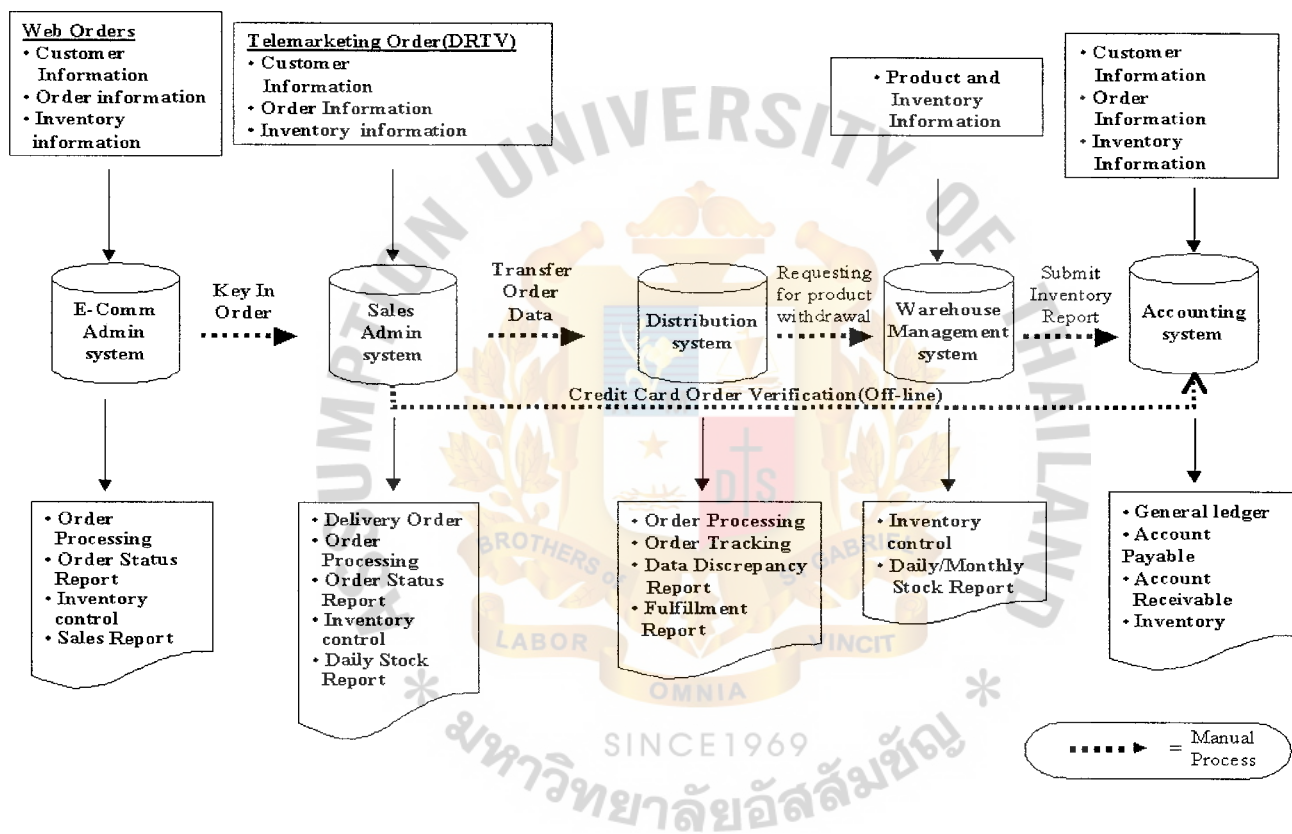


Figure 2.4. Company Information System.

2.6 Problem Definition

The following problems are what the company encounters. The existing process and workflow creates a lot of problems as follows:

- (1) According to the business process and workflow, elapse time of ordering to order fulfillment is too long. Some orders are cancelled by the customers due to longer time
- (2) Web order information requires checking and printing order from web. The order will be re-keyed in the sales system.
- (3) There are a lot of manual processes which use the same data. This creates:
 - (a) Duplication of process
 - (b) Non-integrity of data, for example, inventory information at warehouse, sales admin system and accounting system
 - (c) More personnel to do manual activities such as re-keying the web order in the sales admin system, to re-input all order information into accounting system, reconciliation of the data in different systems
 - (d) Credit order verification delays the delivery process of credit cards orders which are regarded as the first priority order to be delivered
 - (e) Human error exists due to duplication of re-input of data
- (4) Cancellation rate is high because of slow delivery. The company has low revenue due to unfulfilled orders.
- (5) Customers complain about the refund service when they return the products by the satisfaction guarantee policy but it takes long to get the money. The company image should reduce elapse time of refund process.

2.7 Area of Improvement

- (1) Total business process, shorten elapse time of workflow
- (2) Unnecessary or duplicated activities in all work flow
- (3) Integrate the separate system into one system



III. PROPOSED BUSINESS PROCESS AND INFORMATION SYSTEM

The purposes of the new process and system should be fulfilled the following objectives.

- (1) To help reducing the delivery elapse time from ordering to order fulfillment
- (2) To create consistency, integrity and accuracy of the data

3.1 User Requirement

To design the new business process and the information system, the requirement of the users must be detailed as the system features. The requirement of the users can be described as follows:

- (1) Not complicated process and activities
- (2) System needs to be reliable and produce accurate data
- (3) User-friendly interface
- (4) Appropriate security system
- (5) Flexibility to customization

The new design of the process and information system should also perform the following results:

- (1) Reduce work process and redundancy of the activities in the work flow
- (2) Increase process effectiveness and efficiency
- (3) Reduce errors from the process
- (4) Reduce paperwork or manual activities that create no value to the system
- (5) Integrate 5 separate systems into one system
- (6) Maintain the consistency, integrity and security of the data
- (7) Easy-to-use system
- (8) Generate reports that can be used across the departments

3.2 Process Design

The proposed process is designed in order to solve the existing problems. The core business processes are divided into the following sub-processes.

- (1) Order taken from web site
- (2) Order taken from Telemarketers
- (3) Processing order and delivery of product
- (4) Order Update: Cash Collection
- (5) Order Update: Upfront-Cancellation
- (6) Refund process
- (7) Customer service process

3.3 System Design

3.3.1 The information system

The new information system must satisfy the above users' requirement. The system will consist of the following input and output:

Input

- (1) Customer Details from web site (See web interface in Appendix A) and Telemarketers
- (2) Customer Order Detail from web site and Telemarketers
- (3) Product Detail and information
- (4) Return Reason

Output

- (1) Delivery order
- (2) Invoice
- (3) Delivery Report
- (4) Order Status Tracking

- (5) Daily/Weekly/Monthly/Sales report
- (6) Order Fulfillment report
- (7) Daily Inventory Level report (Stock Report)
- (8) Monthly Stock Movement report

3.3.2 Candidate System Solution

(a) Candidate Solution 1

Microsoft Visual Fox Pro 6.0 is introduced to develop the database application. It is appropriate for building the multi-tier application and 32-bit database application. The data connection through Jet Database Engine Version 3.5. The platform is Microsoft Windows NT 4.0. The client's Operating system is Windows 98.

(b) Candidate Solution 2

Oracle 8 is database application for this candidate. Borland J Builder 2.0 is used to develop the application. Such application can be operated across many platforms. It provides platform-independence. The server operates on Microsoft Windows NT 4.0, while the client's side is on Windows 98.

(c) Candidate Solution 3

Visual Basic 6.0 is developing tool. SQL server is the database application. The applications are flexible and convenient to work with the Microsoft Office and other back-office application software. The server will operate on Windows NT 4.0 and the clients are on Microsoft Windows 98.

3.3.3 System Evaluation

To find out which is the system that is the most appropriate for the company, The candidates will be analyzed and evaluated. Each solution has pro's and con's. The candidate system matrix in Table 3.1 will show the system characteristics of each candidate



Table 3.1. Candidate System Matrix.

Characteristics	Candidate 1	Candidate 2	Candidate 3
Portion of System Computerized	Sales & Order Processing, Inventory management and distribution	Sales & Order Processing, Inventory management and distribution	Sales & Order Processing, Inventory management and distribution
Benefits	(1) Supports the DBMS (2) Satisfy some user requirements	(1) Satisfy User Requirements (2) Flexibility for future expansion	(1) Satisfy User Requirements (2) Easy to maintain
Server & Clients	(1) Pentium II 433 MHz with SD-RAM 128 MB, Window NT (1 unit) (2) Intel Pentium Celeron 433 MHz or Greater ,64 MB SD Ram (Clients 7 units)	(1) Pentium II 433 MHz with SD-RAM 128 MB, Window NT (1 unit) (2) Intel Pentium Celeron 433 MHz or Greater ,64 MB SD Ram (Clients 7 units)	(1) Pentium II 433 MHz with SD-RAM 128 MB, Window NT (1 unit) (2) Intel Pentium Celeron 433 MHz or Greater ,64 MB SD Ram (Clients 7 units)
Software Tools Needed	(1) Visual Fox Pro 6.0 (2) Visio Professional 5.0 (3) Internet Explorer 4.0	(1) Borland J Builder 2.0 (2) Visio Professional 5.0 (3) Internet Explorer 4.0	(1) Visual Basic 6.0 (2) Internet Explorer 4.0
Application Software	Package Solution	Custom Solution	Custom Solution
Method of Data Processing	Client / Server	Client / Server	Client / Server
Output Devices and Implications	(1) Dot Matrix Printer: Epson LQ 2080I & LQ 1070+ (2) Laser Printer HP Laser Jet 1100	(1) Dot Matrix Printer: Epson LQ 2080I & LQ 1070+ (2) Laser Printer HP Laser Jet 1100	(1) Dot Matrix Printer: Epson LQ 2080i & LQ1070+ (2) Laser Printer HP Laser Jet 1100
Input Devices and Implications	Keyboard & Mouse	Keyboard & Mouse	Keyboard & Mouse
Storage Devices and Implications	MS Jet Database Engine 3.5 with Hard Disk 10GB arrayed capability.	Oracle 8.0 for Windows NT with Hard Disk 10GB arrayed capability.	SQL Server with Hard Disk 10GB arrayed capability.

The advantages and disadvantages of the 3 candidates are described as follows:

The 1st candidate: Visual Fox Pro 6.0 & MS jet Engine

Advantages:

- (1) Works under client/server environment
- (2) ODBC driver is not required
- (3) user-friendly
- (4) Shortens project implement duration

Disadvantages

- (1) Shortens project implement duration
- (2) Less customization, so it is not flexible to customize the application for the future use and large size of database
- (3) Difficult for new user or programmers to learn
- (4) It cannot satisfy many criteria of user requirements such as less customization, difficult to learn

The 2nd candidate: Oracle 8 and Borland J Builder 2.0

Advantages:

- (1) Works under client/server environment
- (2) Support multi-user environment
- (3) Convenient to maintain due to its object-oriented scheme's code reusability
- (4) Platform-independence
- (5) Customization for future use and support the larger database
- (6) Good security system
- (7) Internet and internet supports

Disadvantages

- (1) Requires longer time to implement

- (2) Complexity of language required the expertise
- (3) Less number of Oracle programmers in Thailand

The 3rd candidate: Visual Basic 6.0 and SQL server

Advantages:

- (1) Less complexity
- (2) Better work with Microsoft Application family because the tool is developed by Microsoft Company
- (3) Convenient to maintain
- (4) Custom Solution
- (5) Availability of developers and programmers
- (6) Less duration of implement schedule than the 2nd candidate

Disadvantages

- (1) Best suits with Microsoft products family
- (2) Efficiently operating on Windows NT
- (3) Slower Processing of SQL than Oracle if the database size is larger

The feasibility of all solution candidates will be studied in 4 scopes; Operational, Technical, Economic and Schedule feasibility.

- (1) Operational feasibility is to study whether the proposed candidates can meet the business requirement
- (2) Technical feasibility is to study whether the proposed candidates can be implemented with the available resources in 2 criterion which are
 - (a) Technology Criteria is to study the availability of the existing technology both inside and outside the company
 - (b) Expertise Criteria is to study the availability of the expertise who can develop the system candidates

- (c) Economic feasibility is to study the benefit against the costs of the solution. The benefit will outweigh the cost. It is worth doing the solution in terms of money figure.
- (d) Schedule feasibility is to study the duration for developing the system.

All feasibility criteria will be given weight. Each Candidate will be given score according to the feasibility scope. Then candidates' scores will be summarized and ranked. The best ranked candidate will be chosen as the new system. The feasibility matrix is shown in Table 3.2.

3.3.4 Data Flow Diagram

The data flow diagram depicts the flow of the data throughout the process. It represents how the data is edited, updated, erased in the database. It also shows how data flow to, from and within and the information system and the processes that transform the data.

The data flow diagram will be shown in Appendix B

- (1) Context diagram
- (2) Data flow diagram level 0
- (3) Data flow diagram level 1 of all process

Table 3.2. Feasibility Matrix.

Feasibility Criteria	Weight	Candidate 1	Candidate 2	Candidate 3
Operational Feasibility	30%	Support the database user requirement but difficult to modify the software Score: 80	Fully support user required functionality. Scores: 100	Fully support user required functionality. Score: 100
Technical Feasibility - Technology - Experts	30%	Existing Hardware and Software meets the minimum requirement of the system and Visual Fox is fast-development software Available expertise Score: 80	Existing Hardware and Software meets the minimum requirement of the system. Java application provides wide range of feature and Oracle supports the larger database size in the future Very few available experts on this language. Requiring the well trained oracle programmer Score: 75	MS Visual Basic is powerful to work with Microsoft family. SQL Server is compatible with MS Visual Basic. Adequately available expertise Score: 85
Economic Feasibility - Cost to Develop - Payback Period - Detailed Costs	30%	Approximately 907,000 Baht 1 year 2 month See Appendix C Score: 85	Approximately 1,012,000 Baht Over 5 years See Appendix C Score: 75	Approximately 932,000 Baht 1 year 2 month See Appendix C Score: 80
Schedule Feasibility	10%	6 months Score: 85	8 months Score: 80	6 months Score: 85
Ranking	100%	82.0%	83.0%	88.0%

3.3.5 Structure Chart

The chart provides overview of the system. The top-down chart depicts the relationship of each structure level. It tells the programmer the overview of the program.

3.3.6 Database design Structure Chart

The Relationship Database Management System (RDBMS) is conducted for the proposed system. The data in RDBMS is represented in form of table and its relationship. The data fields of every table in the proposed system are the same as the existing Tele Sales Admin system. There are only some changes in the new proposed system.

3.3.7 Application Architecture

Network Architecture

The proposed system is configured as Wide Area Network. This type of network serves the distance sections which are warehouse and distribution section. The topology in the office is Star Network because of the central processing of the system. Every workstation is connected to the central file server. The communication media is twisted wire and interconnected to HUB.

To interconnect with the distance sections, modem is the communication device that allows the Terminal at distribution and warehouse sites connect with central server at the office.

Because another distribution channel is web site, the connection of the web server at Singapore and Siam TV media 's database is by leased line through KSC ISDN Service at 56 Kb.

The Network Architectures are shown in Figure 3.1

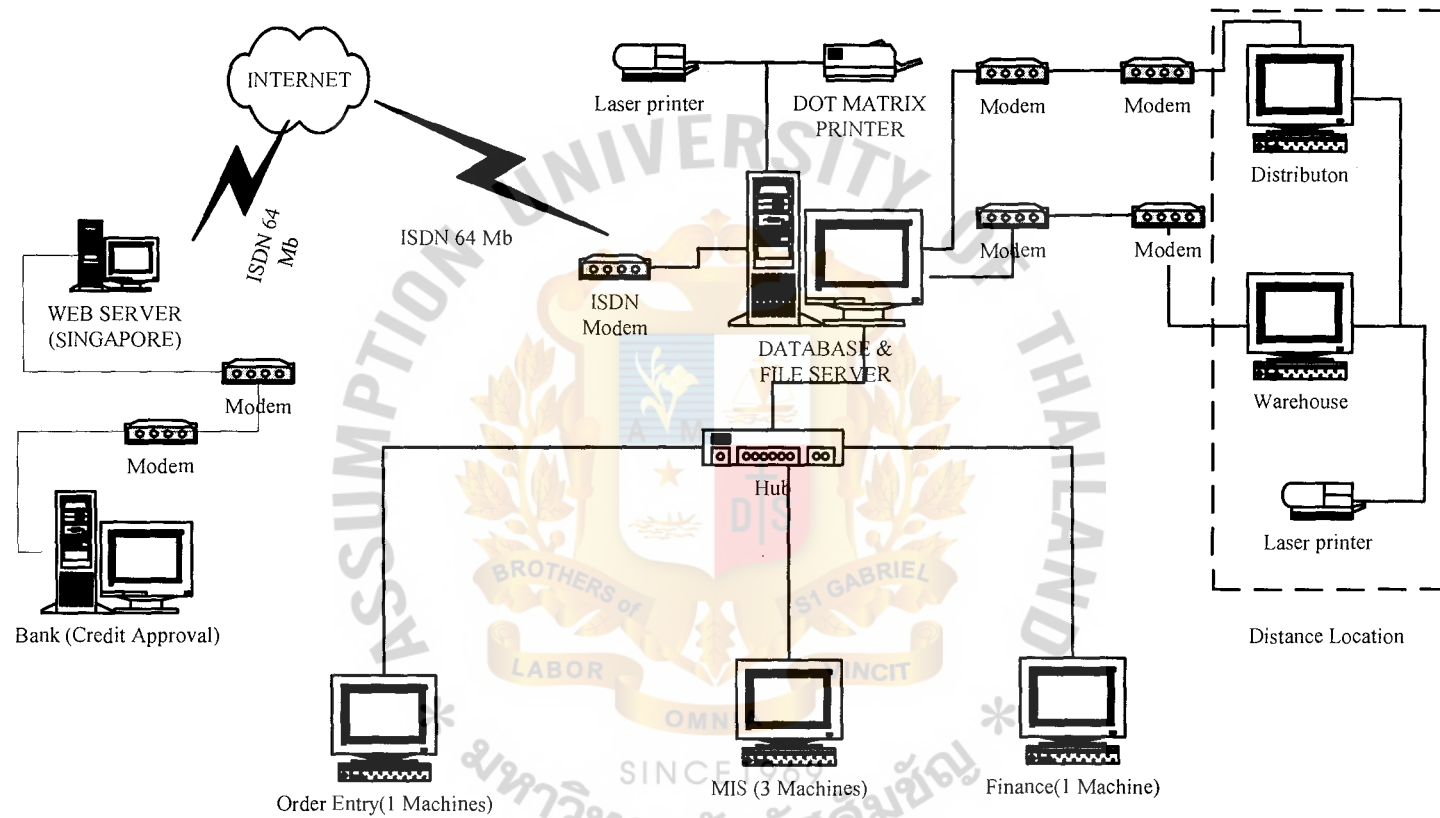


Figure 3.1. Network Architecture.

Data Architecture

The relational database model is selected. The data is stored in table. Each table will be made relation.

The RDBMS that is used is SQL server. The data will be processed centrally in the server.

Interface Architecture

By Using Visual Basic, GUI is the interface that the applications present the result in graphical form. It provides the more convenience for the developers to create the interface for the users. The developers just drag and drop the provided components that represent the instructions. Therefore, user-friendly is an important feature of this object-oriented programming tool.

The interface for the application, which is redesigned, will let the users access, seek, retrieve, edit and erase the data in the database easier and faster. The authorization to access the application and databases will be written.

Process Architecture

Visual Basic provides more convenience for programmers to write the program. Event-Driven feature allows the programmer to drag and drop the objects to create events. The events in Visual Basic are the predefined instruction code. Instead of writing the code, The programmer does not need much instruction code. Process to write the program is short.

In user side, GUI allows the users to instruct the program to execute by clicking the button or ticking the mark etc. The users do not need to use any text instruction code to instruct the program execute.

3.4 Hardware and Software Requirement

The below tables describe the required hardware and software for the system; both server and clients.

Table 3.3. Hardware specification for Server.

Hardware	Specification
CPU	Pentium II- 433 MHz.
Memory	SDRAM 128 Mb.
Hard Disk	SCSI 10 GB
CD-ROM Drive	40 X or higher
Floppy Drive	1.44 MB
Network Adapter	Ethernet 10-Base T
Display Adapter	SVGA card
Display	14" monitor
UPS	1k VA Power

Table 3.4. The Software Specification for Server.

Software	Specification
Operating System	Microsoft Windows NT Server 4.0
Database Server	Microsoft SQL Server 6.5

Table 3.5. Hardware Specification for Each Client Machine (6 Machines).

Hardware	Specification
CPU	CERELON 433 MHz.
Memory	32 MB or higher
Hard Disk	4.3 GB or higher
CD-ROM Drive	20X or higher
Floppy Drive	1.44 MB
Network Adapter	Ethernet 10-Base T
Display Adapter	SVGA card
Display	14" SVGA monitor

Table 3.6. Software Specification for Each Client Machine.

Software	Specification
Operating System	Microsoft Windows 98
Web browser	Microsoft Internet Explorer 4.0 or higher Or Netscape Communicator 4.0 or higher
Application Software	Microsoft Office 97 Professional Edition Application Program Visual Basic Runtime Library Virus Protection Program

3.5 Security and Control

3.5.1 Security issue

Changing from separate systems to central system creates the security problem. Different users will bring unwanted data into the system or bringing the secret data out of the company. To make the system more secure, we must set a measurement, procedure and control method to protect the system. The concerns of the security are

(1) Intrusion and unauthorized access to the system

To prevent the system from this problem, the access control system will be one module in the application. Users are required to enter their username and password before accessing to the system.

The authentication or access level will be a part of the security control. The operation staff can access only in their involving functions. For example, telemarketers can only enter their order but cannot change the status of the order, the inventory section staff can update and adjust the inventory level but cannot change the order details, etc.

a) Viruses

This type of intruding files ruins both software and hardware. To prevent computer viruses, the virus detection and killing program will be installed in every computer. The program will check whether there are virus in the computer, if so, the program will automatically kill the virus.

* The new types of virus are released every minute. The users must download the virus definition every 3 months to update their virus protection capability

b) Hardware and software Failure

The hardware and software requires correct and appropriate operation by the users. Because most users are not the power users, expertise in computers, hardware defect from use may happen. The training in order that they can use the system correctly will be contributed to the users. The maintenance section will

periodically check the system to ensure that there are no system failure or operation discrepancies.

c) Electronic failure

The system is functioning because of electricity. If the electricity is shut down, it also stops working. UPS is introduced. It helps the system not shut down immediately when electricity fails. When the electricity flow stops, electrical flow in system is still maintained for a while, possibly 20 – 30 minutes. Then we have time to shut down temporarily

3.5.2 Control Issue

The control is categorized into:

- (1) Input Control. All data that is entering the system will be validated by the logic of the program to ensure the right input
- (2) Output Control. Because the output is controlled by the system, it will be standardized

3.6 Benefit and Cost Analysis

3.6.1 Cost Analysis

To compare the costs of the existing and proposed system, comparative Break-even analysis technique and Payback period will be calculated. Before comparing the old one to the new one, the whole costs of such 2 systems are broken down. And then comparisons are as shown in table 3.7. and table 3.8.

Table 3.7. Cost of the Existing System.

Cost Items	Bahts	Bahts
FIXED COSTS		
1 Server		80,000
8 Personal Computers		320,000
2 Printer		25,000
Software		40,000
Total Fixed Costs		465,000
PROJECTED ANNUAL OPERATING COSTS:		
Personnel:		
1 Managers (45,000 per month)	540,000	
1 Operation staff		
- 2 Order entry Personnel (10,000 per month)	120,000	
- 1 Database Maintenance (15,000 per month)	180,000	
- 1 System Maintenance (25,000 per month)	300,000	
- 2 Inventory and Distribution Data Updating staff (5,000 per month)	120,000	
- 2 Financial staff (20,000 per month)	240,000	
Total Personnel Expenses		1,500,000
Office Supplies (4,500 per month)		54,000
Utility (7,000 Per month)		84,000
Internet Fee:Corporate (10,000 per month)		120,000
Depreciation expenses:		
- Hardware: 1 Server (4 Years to go, Initial Costs = bth 80,000)	16,000	
8 Clients (4 Years to go, Initial Costs/machine = bht 40,000)	64,000	
- Software (Server and Client Software) (4 Years to go, Initial costs/client = 40,000)	8,000	
Total Depreciation		88,000
Total Operating Costs		1,846,000

Table 3.8. Cost of the Proposed System.

Cost Items	Bahts	Bahts
Development Costs		
1 File Server Upgrade		5,000
1 Additional ISDN Modem		12,000
1 Server		80,000
6 Personal Computers		240,000
2 Printer		25,000
Software:		
Server software		40,000
DBMS Development Software		60,000
Client Software		-
Personnel:		
1 System Analyst (4 Months; bht 25,000 /month)		100,000
1 Programmer (6 Months; bht 20,000 /month)		120,000
1 System Architecture (2 Months; bht 30,000 /month)		60,000
1 Database Specialist (4 Months; bht 25,000 /month)		100,000
Implementation Cost :		
Training Costs		50,000
Setup Costs		40,000
Total Development Costs :		932,000
PROJECTED ANNUAL OPERATING COSTS:		
1 Managers (45,000 per month)	540,000	
1 Operation staff		
- 1 Order entry Personnel (bht 5,000 per month)	60,000	
- 1 Database Maintenance (bht 15,000 per month)	180,000	
- 1 System Maintenance (bht 25,000 per month)	300,000	
- 1 Inventory and Distribution Data Updating staff (bht 5,000 per month)	60,000	
- 1 Finance staff (bht 10,000 per month)	120,000	
Total Personnel Expenses		1,260,000
Monthly ISDN Service fee (bht 20,000 per month)		240,000
Office Supplies (bht 1,500 per month)		18,000
Utility (bht 3,000 per month)		36,000
Depreciation expenses :		
- Hardware: 1 Server (4 Years to go, Initial Costs = bht 80,000)	16,000	
6 Clients (4 Years to go, Initial Costs/machine = bht 40,000)	48,000	
- Software (New)	20,000	
Total Depreciation		84,000
Total Projected Annual Costs:		1,638,000

3.6.2 Breakeven Analysis

This technique aims to find when the accumulated cost of the proposed system can be equal to the accumulated cost of the existing system.

The accumulated cost of the existing one consists of the operating costs. The accumulated cost of the proposed system consists of the development cost and its operating cost. Figure 3.8 also shows the cumulative cost of both systems. The cost of the new system can meet the break-even point within one year. To find out how long the brake-even exactly can be met, we need to interpolate the duration that can be calculated as follows

$$\begin{aligned} & 1 \text{ Year} + \frac{259,000}{(259,000 - (-901,400))} \\ & = 1.23 \text{ Years} = 1 + (12 \times .23) \\ & = 1 \text{ year 2 months} \end{aligned}$$

Table 3.9. Costs Comparison between Existing System and New System Over 5 Years.

Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Cost Of Existing System						
Total Fixed Costs	465,000					
PROJECTED ANNUAL OPERATING COSTS:						
Total Personnel Operating Costs		1,500,000	1,650,000	1,815,000	1,996,500	2,196,150
Office Supplies (4,500 per month)		54,000	59,400	65,340	71,874	79,061
Utility (7,000 Per month)		84,000	92,400	101,640	111,804	122,984
Internet Fee: Corporate (10,000 per month)		120,000	132,000	145,200	159,720	175,692
Total Depreciation		88,000	88,000	88,000	88,000	-
Total Costs:	465,000	1,846,000	2,021,800	2,215,180	2,427,898	2,573,888
Accumulated Costs		2,311,000	4,332,800	6,547,980	8,975,878	11,549,766
Costs of Proposed System						
Total Development Costs:	932,000					
PROJECTED ANNUAL OPERATING COSTS:						
Total Personnel Expenses		1,260,000	1,386,000	1,524,600	1,677,060	1,844,766
Monthly ISDN Service fee (20,000 per month)		240,000	264,000	290,400	319,440	351,384
Office Supplies (1,500 per month)		18,000	19,800	21,780	23,958	26,354
Utility (3,000 per month)		36,000	39,600	43,560	47,916	52,708
Total Depreciation		84,000	84,000	84,000	84,000	84,000
Total Projected Costs:	932,000	1,638,000	1,793,400	1,964,340	2,152,374	2,359,211
Accumulated Cost		2,570,000	3,431,400	3,757,740	4,116,714	4,511,585
Cost Difference		259,000	- 901,400	-2,790,240	-4,859,164	- 7,038,180

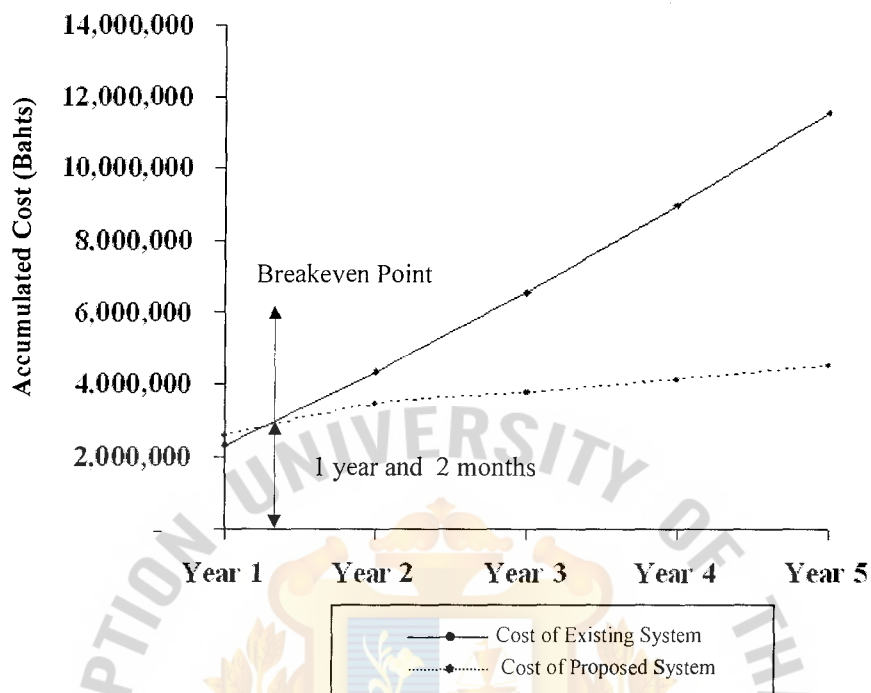


Figure 3.2. Breakeven Analysis.

3.6.3 Benefit Analysis

After the new process and system is implemented, though there are costs to develop the system, there are also the benefit that can be 2 categories as follows:

(1) Tangible Benefit

To minimize the cost of personnel is the tangible benefit of the proposed process and information system. The cost that we can reduce can be understood as follows:

- (a) Cancellation rate will be expectedly reduced from 30% to 20% of Revenue. The cost of cancellation will turn into the increasing net sales. There is 33% decrease in cancellation volume. The company can collect more money by 14% from the existing one. The proposed system cannot reduce all cancellation because there are chances of

customers to refusing receiving the products by many reasons such as no money at that time, the products is not the same quality as seen on TV, etc. The revenue and cancellation rate can be derived from table below. The incremental revenue is $16,800,000 - 14,700,000 = 2,100,000$ bahts/mth.

Table 3.10. Sales Volume Analysis.

Items	Existing Process & System 30% Cancellation rate	New Process & System 20% Cancellation rate	% Change
Estimated sales volume per month	21,000,000	21,000,000	0%
Cancel volume	(6,300,000)	(4,200,000)	-33%
Net Sales	14,700,000	16,800,000	14%

- (b) Cost of salary will be saved. The numbers of the personnel are reduced to 6 from 8. It saves 240,000 bahts annually.
- (2) Intangible Benefit
- (a) Data integrity and reliability increase because of single point of data entry and no data redundancy, especially in inventory data
 - (b) Better use of inventory data to forecast the stock
 - (c) Human error due to multiple data entry is reduced
 - (d) Less workload of employee
 - (e) Improve company image
 - (f) Enhance the marketing tool by promoting faster service campaign
 - (g) The customer satisfaction will increase

The new process and system will help the company increase its operation effectiveness and efficiency. The customer satisfaction will also improve.

3.6.4 Payback Period

To analyze how long the costs of new system' s initial investment will be recovered, payback period is calculated by dividing the original costs of proposed system by Annual cash flow. If the time to pay money back to the investment is lower than expectation, the project is rejected.

The Payback period is calculated below by cumulating net cash inflow until it covers the initial costs. The cumulative net cash flow of the proposed system can cover the initial cost within 1 year.

Table 3.11. Payback Period Analysis.

Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Cost of Existing System						
Development Costs	-465,000					
PROJECTED ANNUAL OPERATING COSTS:						
Discounted factor(12 % Discount Rate)	1.0000	0.8930	0.7970	0.7120	0.6360	0.5670
Time-Adjusted Costs	-465,000	- 1,648,478	-1,611,375	-1,577,208	-1,544,143	- 1,459,394
Accumulated Costs	-465,000	- 2,113,478	-3,259,853	-3,188,583	-3,121,351	- 3,003,538
Costs Of Proposed System						
Benefit Derived from new system						
- Increased Sales Volumn		2,100,000	2,310,000	2,541,000	2,795,100	3,074,610
- Decreased Salary		240,000	264,000	290,400	319,440	351,384
Total Benefit		2,340,000	2,574,000	2,831,400	3,114,540	3,425,994
Discounted factor (12 % Discount Rate)	1.0000	0.8930	0.7970	0.7120	0.6360	0.5670
Time-Adjusted Costs		2,089,620	2,051,478	2,015,957	1,980,847	1,942,539
Accumulated Costs		2,089,620	4,141,098	4,067,435	3,996,804	3,923,386
Cost Difference		- 23,858	881,245	878,852	875,453	919,849

3.6.5 Net Present Value Analysis

Net Present Value method is another way to evaluate the proposed project. It requires the cost of new proposed system be compared with the net cash inflows over the years. In this project, 5 year is time period for analysis. The cost and cash inflows will be compared on present value basis. This means that the investment cost and operation expenses over 5 years are discounted to the present value. And the benefits or cash inflows do so. Then net present value will be extracted by comparing both costs and benefits. If the net present value is positive, the proposed system will be chosen or vices versa. The net present value of the proposed system is equal to 919,849 bahts. The proposed system gets positive cash flow and can be accepted.



IV. PROJECT IMPLEMENTATION

The implementation of the project starts from approval from the management committee. The implementation is divided into 4 stages

4.1 Programming and Building

In this phase, all design specification will be translated into program code. The system analysts and designers will work closely with the software developers. All detailed documents of files transaction, report layouts and other design details will be used to code the program.

A team of developers will be assigned the tasks for developing each module of the program. Because this project is medium-sized, there is only one programmer.

In this phase, every hardware will be configured. All computers will be checked whether the system software and VB-runtime files are installed. The computer hardware for operation of different system in the office is connected via LAN. The hardware for communication through leased line will be installed. This hardware let Singapore's web server connect with database server in Thailand office. The system hardware at main office and the warehouse will also be connected via modem.

4.2 Testing

After all activities in the 1st phase are completed, to make sure that the system will work properly and effectively and meet the objectives, testing will be conducted. We will test the system by 3 types.

(1) Unit Testing

The problems that make the program fail will be found out. When the problems are pinpointed, the solution to the problems will be sought and

selected, Then the problems will be solved. The system security is also examined and corrected.

(2) System Testing

This phase intends to test the system as a whole. The discrete modules will function together as planned. Performance time, capacity storage, recovery and restart capability, and capacity of the storage.

(3) Acceptance Testing

The user will evaluate the system and the management will review how well it works in this phase. When all parties test until they accept the system, both users and management will certify the system.

4.3 Training

The process and system function when the personnel operates their jobs. Before the system starts, the training is required. The operation staff will learn how to use new system and to operate their activities correctly as expected.

The personnel will be trained by the programmers about the use of new system and by the process designer about how to operate by following the new process

4.4 Conversion

This phase is the process of changing from old system to the new system. The users must be trained in order to be familiar with the new system and work correctly as planned process. Documentation of all process, workflow will be written as manual and distributed to the users. The implementation in this stage must be done carefully to ensure the accuracy of the system and process as planned.

In this stage, the old data from the system will be transferred. Before transferring, the order entry and order printing must be temporarily pending. The warehouse should withdraw every product items for all order. The order module for website is also

temporarily closed. The cut-off time for pending the old process must be scheduled. After the transfer process completes, the new process, workflow and information system start. The new system will replace the old system. This approach is called “Direct Cut-over Approach”.

4.5 Production and Maintenance

Once the new process and system are implemented the conversion is completed, the production stage will begin. During this stage, the users and system developers will together review the process and the information system. The feedback from using the system will be collected and determined how well the process and system can meet the objectives.

The system requires maintenance. The maintenance section will do the change of hardware if it does not work properly. The process must be reviewed and improved then documented. The continuous correction of error must be done periodically. The maintenance objectives are to improve the process and system efficiency.

V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

By the study and analysis of the existing system, the root causes of the late delivery problems are the slow business process and its supported information system. The process and its multiple systems create a lot of work redundancy, such as double data entry in the system. It also caused the unnecessary costs and expenses, for example, paper work, reconciliation personnel, etc. The intangible cost is the customer dissatisfaction due to slow or late delivery.

The proposed process and information system aims to solve these problems. To find out the solution, the existing one is studied. The existing process is broken down into sub-processes or workflows: E-commerce order-taking, DRTV order-taking, delivery process, order update: cash collection, order update: up-front cancellation, inventory control, Refund process, customer service process. From the study, its information systems are different. There are 5 systems. Each system requires the same data and operation staff to execute the operation process that creates the workload and redundancy.

The proposed process is designed and evaluated its feasibility. The system is designed and selected the best solution candidates to help the company reach its objectives.

The proposed process still has 7 sub processes. The change is the information system. However, on-line processing replaces the manual process. To achieve this solution, the new system is proposed. The solution to the system is selected among 3 alternatives. The best one is analyzed by the costs and benefit analysis.

On-line processing, Visual Basic and SQL server is the solution. The distance communication among main office server, warehouse and distribution section and Singapore web server will be connected through modem and leased line.

The proposed system aims to make the delivery elapse time shorter. The area of improvement depicting by processing time can be shown in Table 5.1.

The new system also reduces the unnecessary costs and expenses from the cost – benefit analysis and economical feasibility study. The payback period to the project is less than 1 year.



Table 5.1. Area of Improvement.

Process	Scope of process	Existing process and system	Proposed process and system
E-commerce order-Taking	From customer orders to order entry	½ day	10 Minutes
DRTV order-taking	From customer orders to order entry	1 days	6 hrs
Delivery process	From Order entry completed to delivery products to customers get the products	BKK – 2 days UPC : 7 – 15 days	BKK: 1 days UPC: 5 – 15 days
Order update: cash collection	From D/O hardcopy back to its data which is input into system	3 days	5 Sec.
Order update : up-front cancellation,	From D/O hardcopy back to its data which is input into system	3 days	5 Sec.
Inventory adjusting: Order cancellation	From warehouse submitting stock adjustment report to stock data is updated in the system	3 days	Eliminated Activities
Refund process	From the customer return products to customers get the money	9 days	7 days
Customer service	From customer inquiry to data search completed	1 hr	3 sec.
Total		BKK:20 days and 13 hr. UPC : 35 days and 13 hr	BKK:16 days and 42 hr. UPC : 30 days and 21 hr

5.2 Recommendations

Though new process and system helps the company improve the total process and workflow, the result of the improvement can be seen vividly in Bangkok Area. Upcountry delivery still depends on cash on parcel mode. The delivery durations are still long.

It is recommended that the further study should aim to reduce the delivery elapse time for upcountry delivery. However, the costs of implementation this solution should be carefully studied. The company should find out what is the optimal solution to integrate the existing system and process with the new ones. Logistics or supply chain management knowledge should be applied to the study. To achieve these objectives, Distribution network and its routes should be carefully planned. If such plan can be implemented, information system that supports work process of such strategy must also let the customer service section serve the customer faster.

Warehouse management across the provinces should be located close to the distribution centers of each routing center to eliminate delivery cost of transferring the goods between warehouse and distribution units. Renting the warehouse or Build new one are the alternatives to be evaluated. The below area of further study may be choices to improve the company operation.

1. Costs and Benefit of product distribution network across the province
2. Information system supporting product distribution network. In the future, the company may apply Virtual Private Network (VPN) or EDI as communication system among the distance distribution centers. So it should realize the security system in such communication
3. Process improvement across network

Before any further study, the customer satisfaction level should be researched.

Customer in the upcountry may or may not accept the elapse time of delivery.





APPENDIX A

WORKFLOW OF THE PROCESS

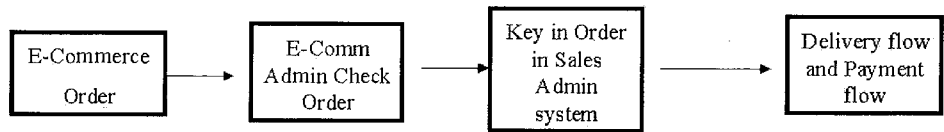


Figure A.1. E-Commerce Order Process.

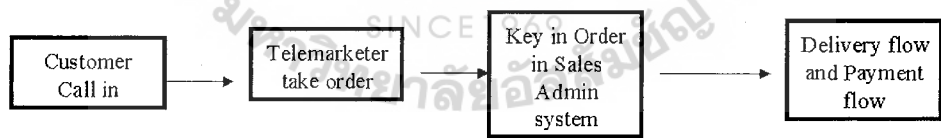


Figure A.2. Telemarketers' Order Process.

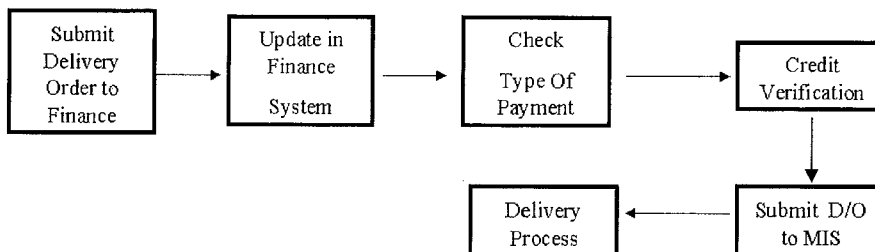


Figure A.3. Payment Process.

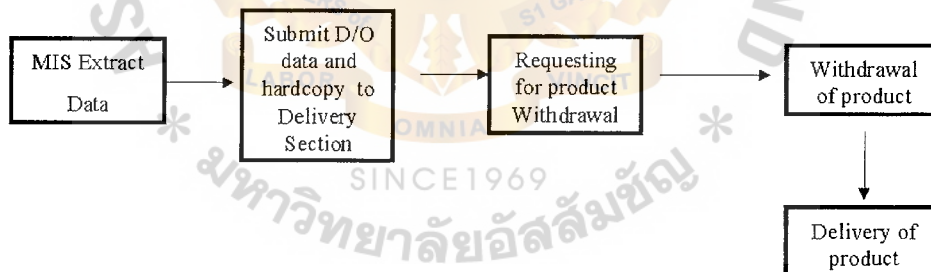


Figure A.4. Delivery Process.



APPENDIX B

DATA FLOW DIAGRAM

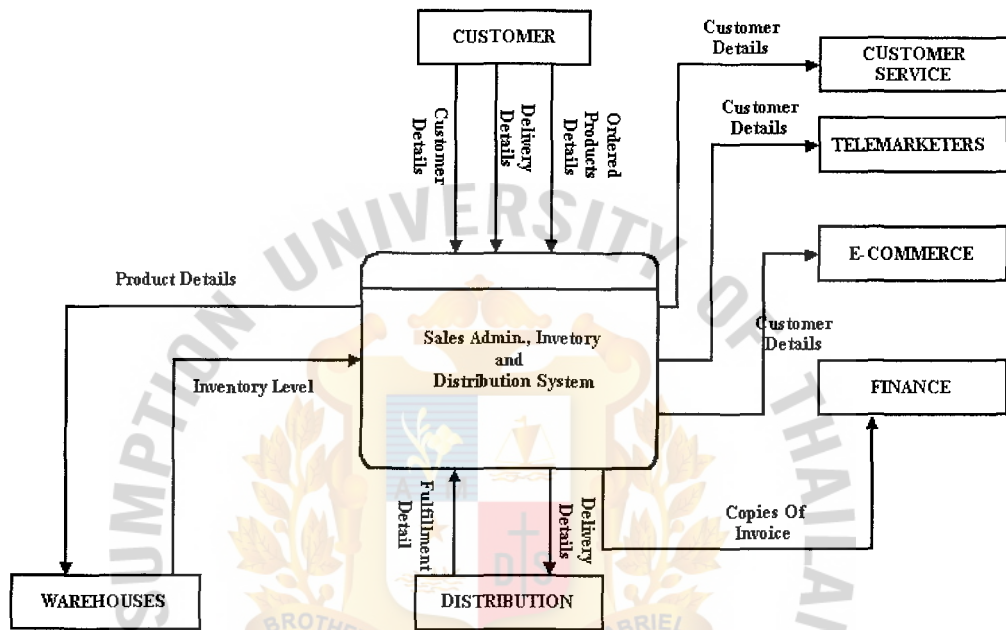


Figure B.1. Context Diagram of the Proposed System.

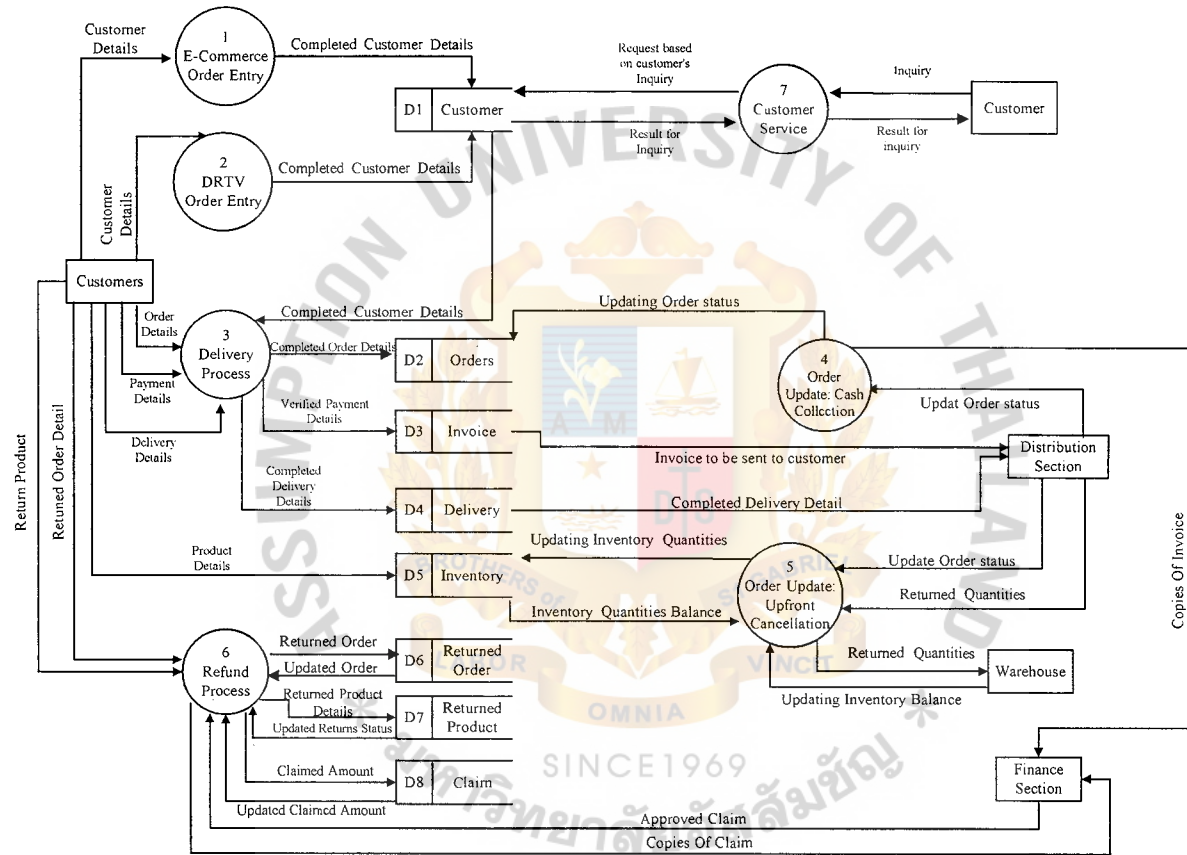


Figure B.2. DFD Level 0 of the Proposed System.

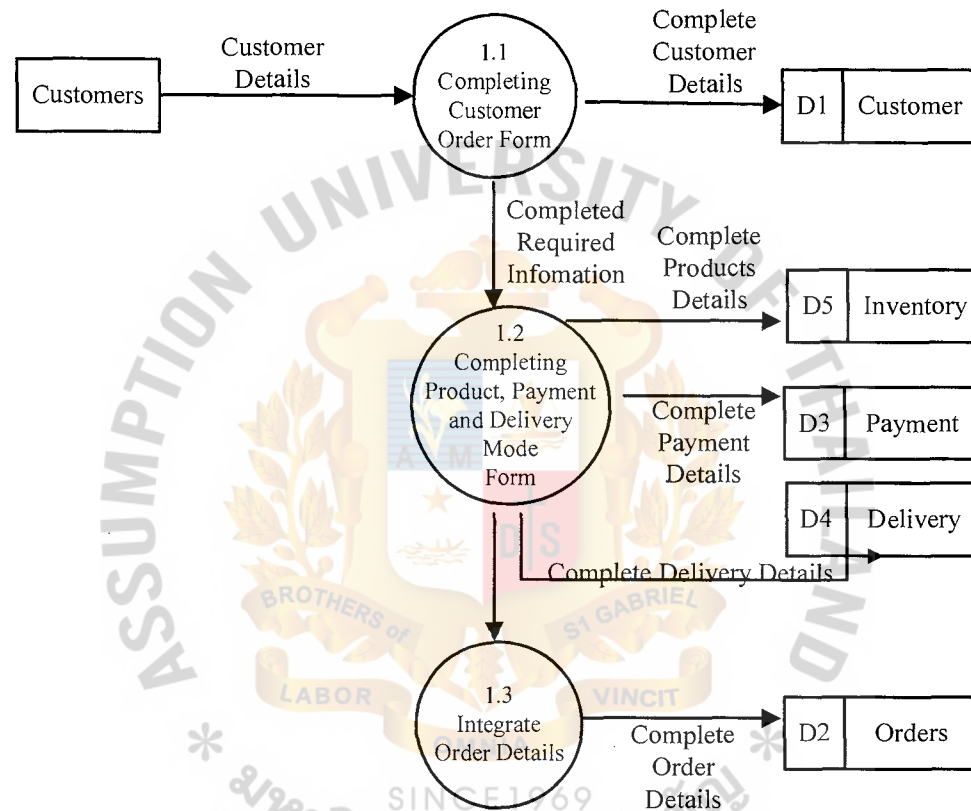


Figure B.3. DFD Level 1 Process 1: E-Commerce Order Entry.

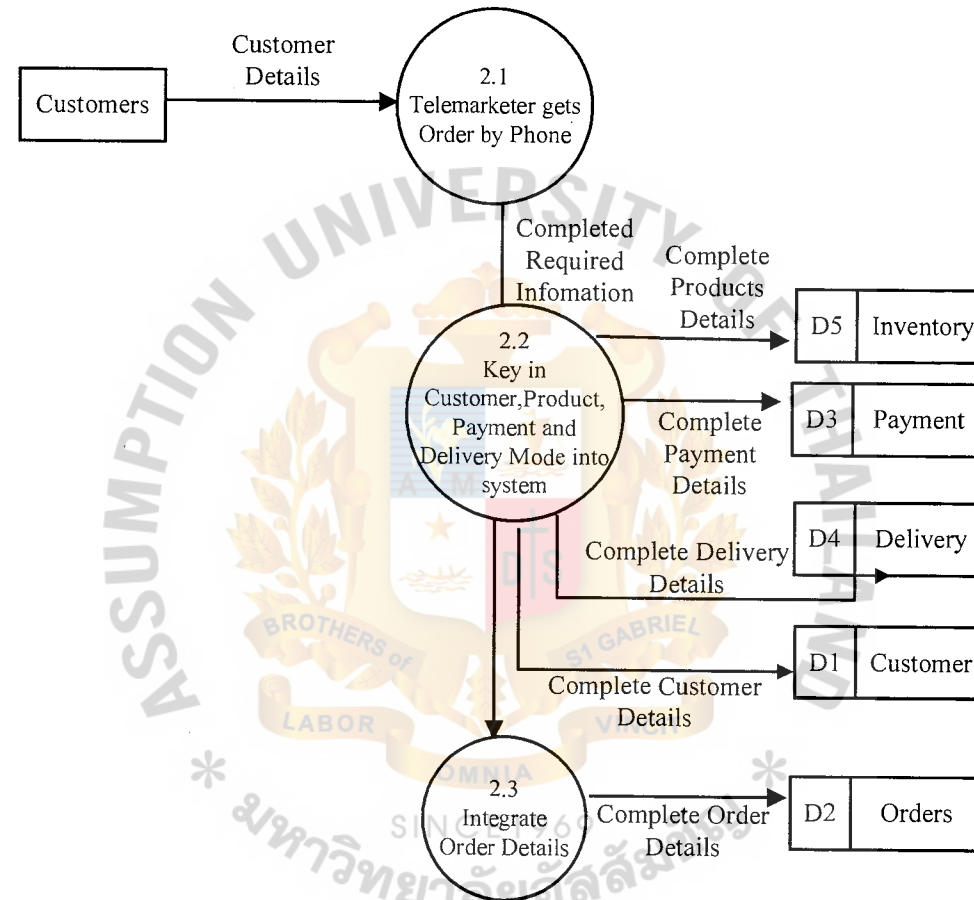


Figure B.4. DFD Level 1 Process 2: DRTV Order Entry.

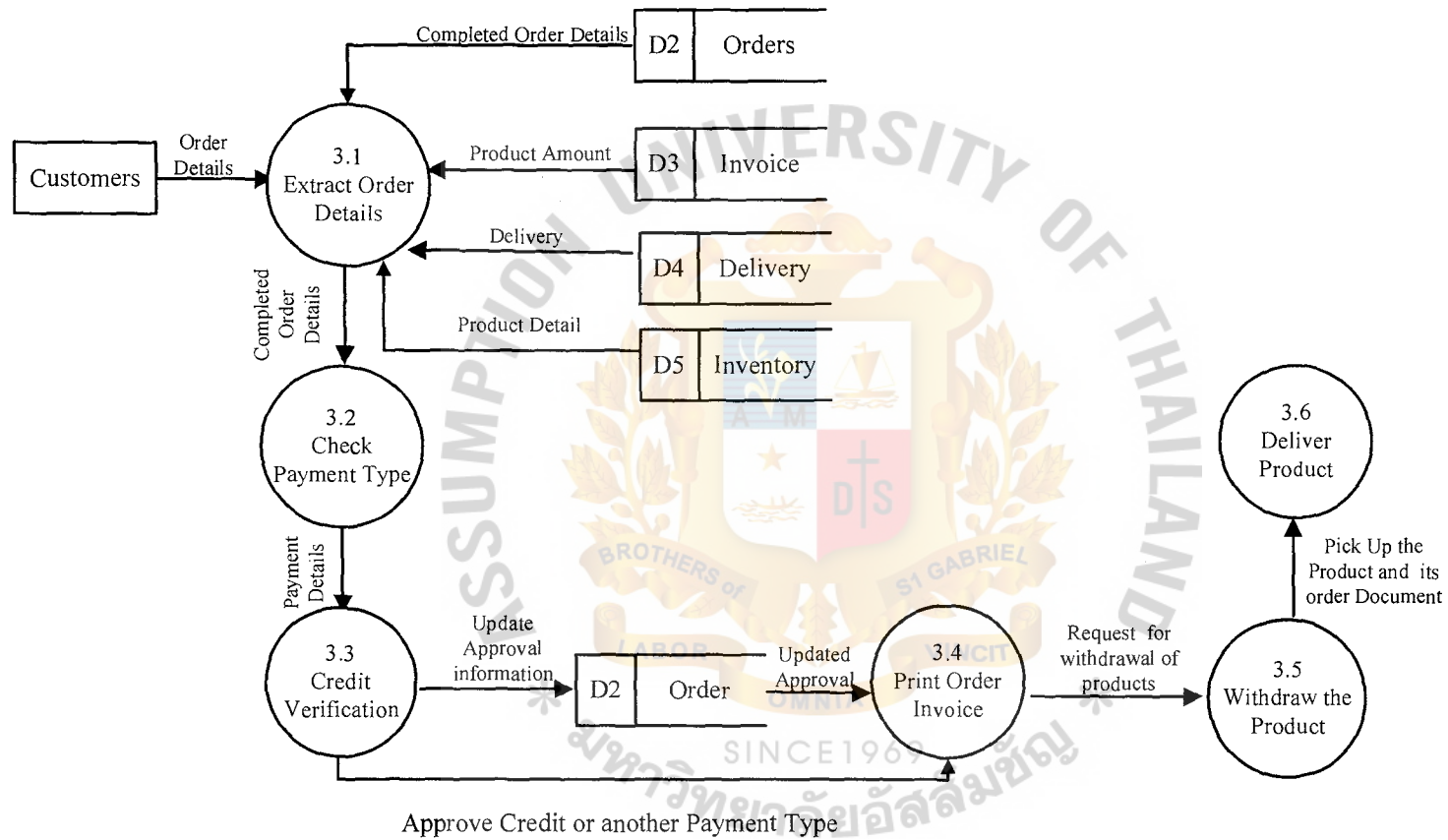


Figure B.5. DFD Level 1 Process 3: Delivery Process.

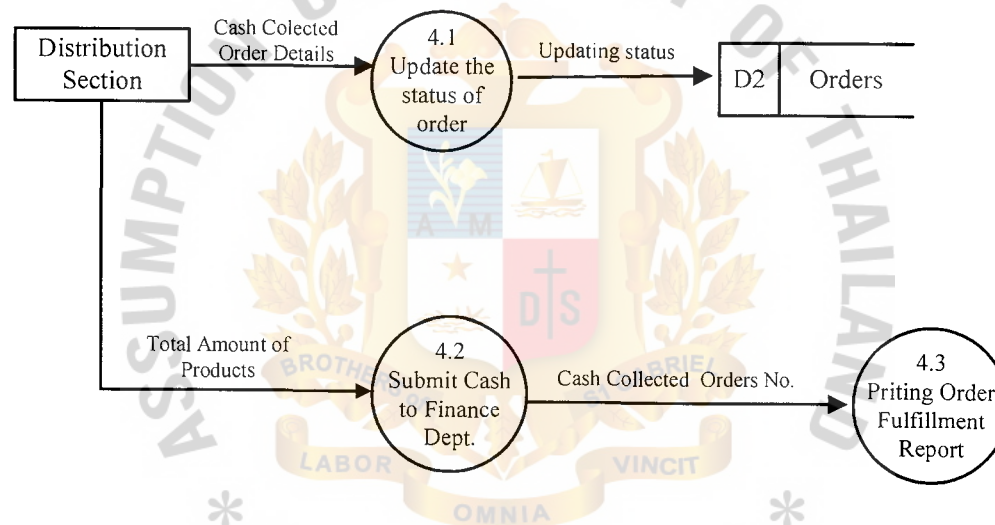


Figure B.6. DFD Level 1 Process 4: Order Update: Cash Collection.

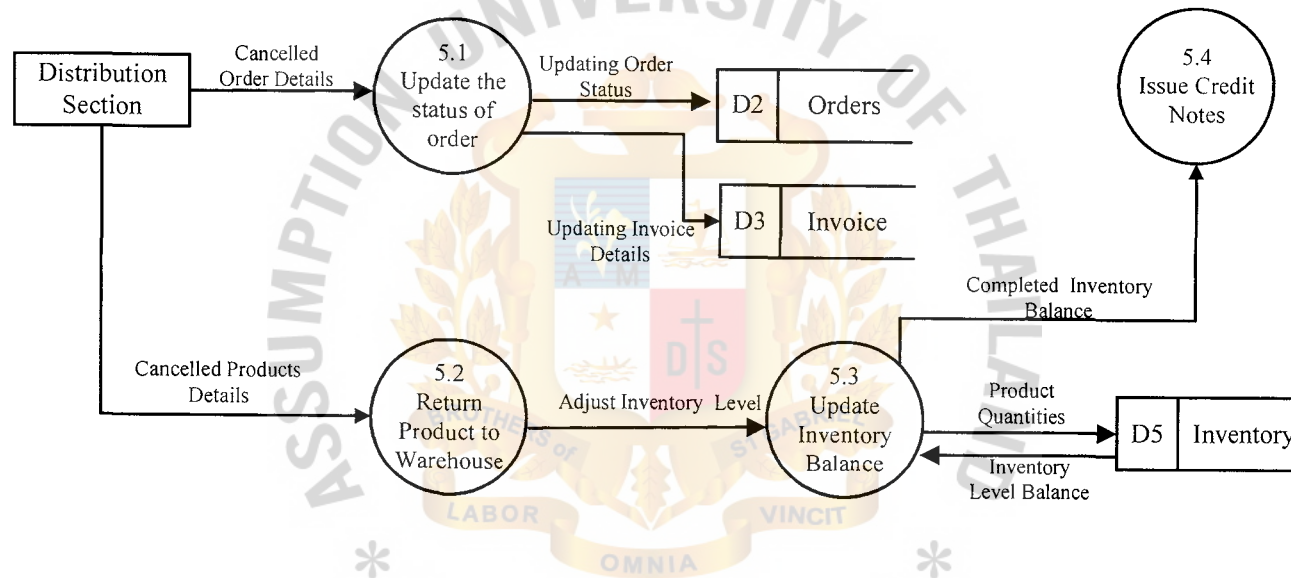


Figure B.7. DFD Level 1 Process 5: Order Update: Upfront Cancellation.

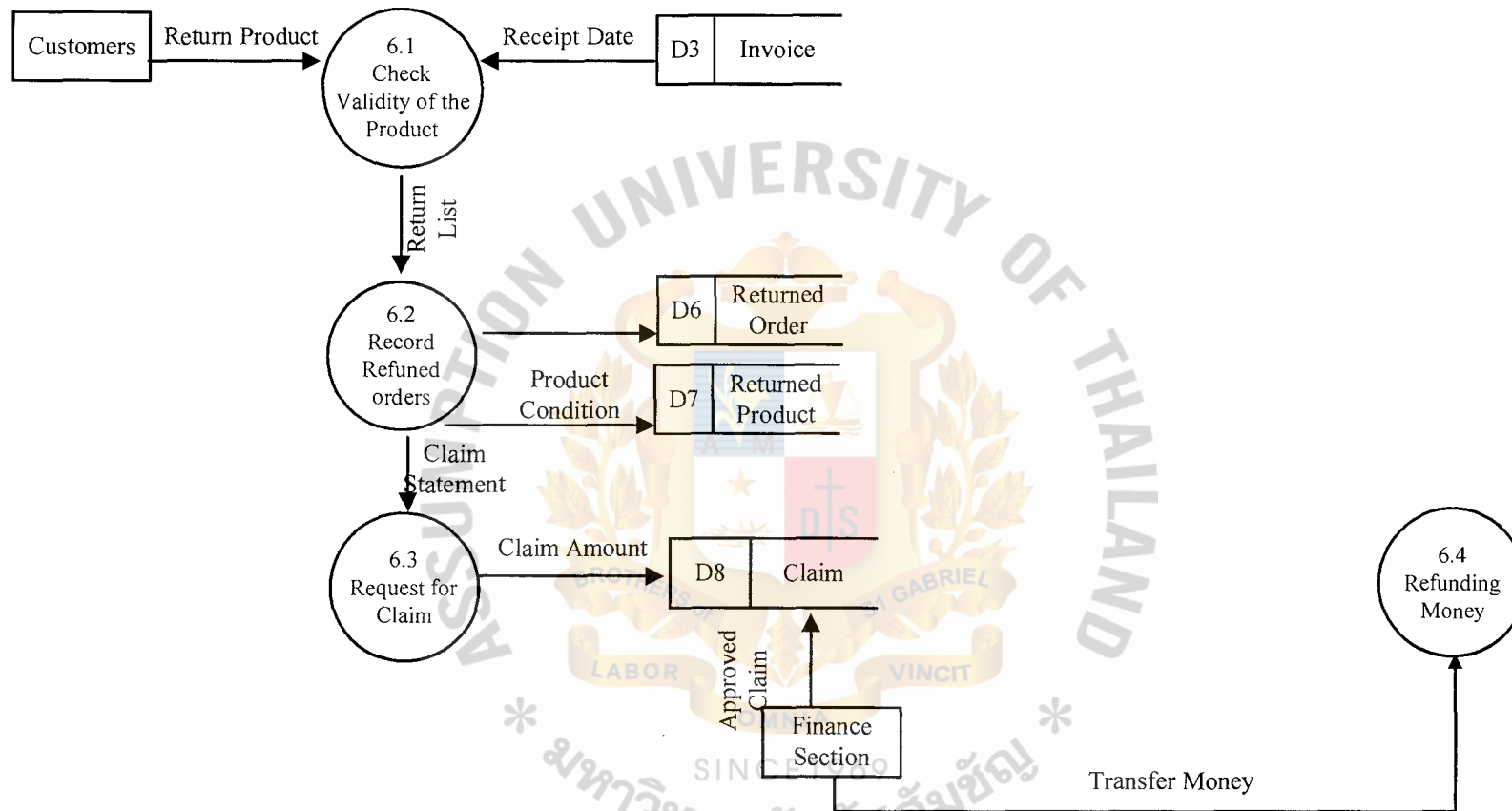


Figure B.8. DFD Level 1 Process 6: Refund Process.

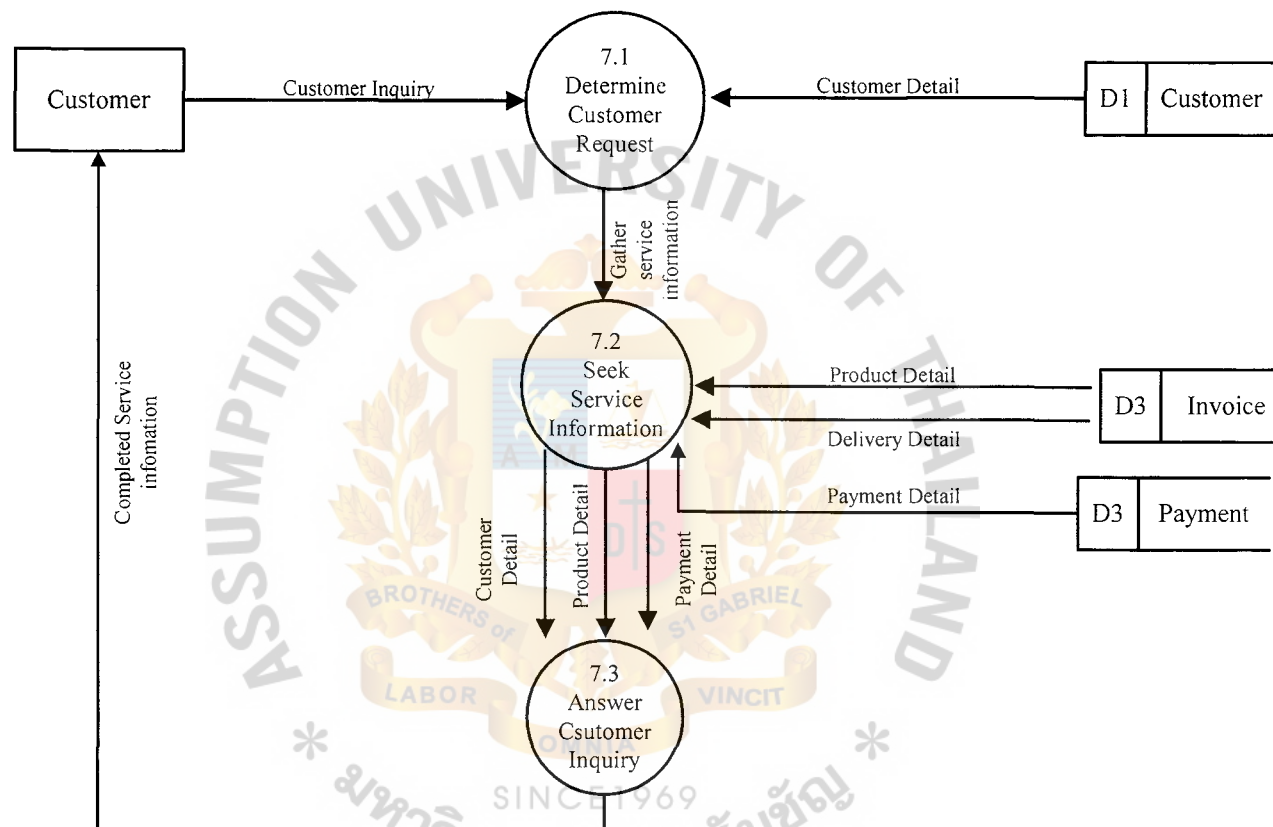


Figure B.9. DFD Level 1 Process 7: Customer Service.

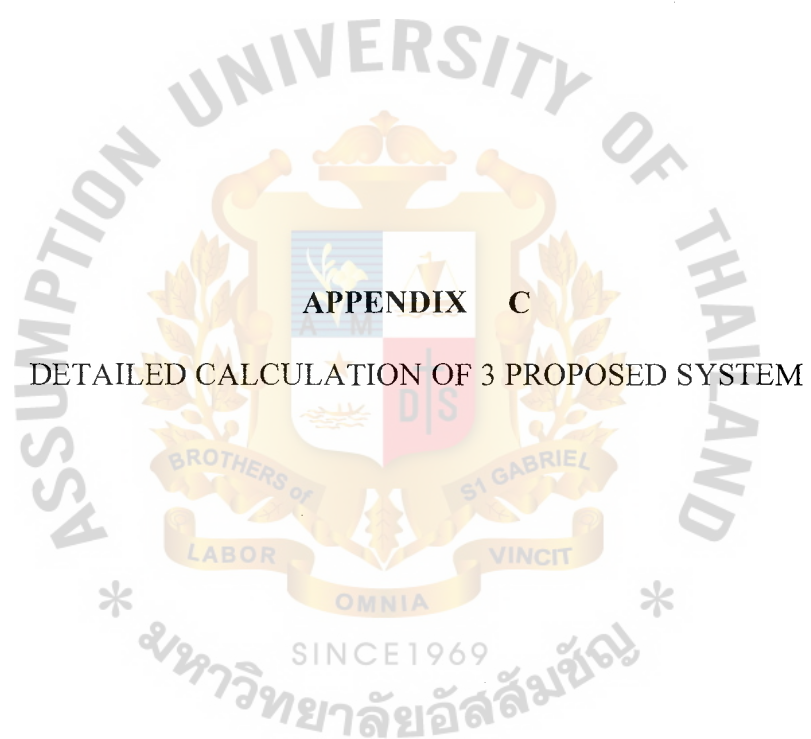


Table C.1. Estimated Costs of Candidate Solution I: Visual Fox Pro.

Cost Items		
1 File Server Upgrade		5,000
1 Additional 56K External Modem for web order		12,000
1 Additional ISDN Modem		12,000
1 Server		80,000
6 Personal Computers		240,000
2 Printer		25,000
Software:		
Server software		40,000
DBMS Development Software		23,000
Client Software		-
Personnels:		
1 System Analyst (4 Months; bht 25,000 /month)		100,000
1 Programmer (6 Months; bht 20,000 /month)		120,000
1 System Architecture (2 Months; bht 30,000 /month)		60,000
1 Database Specialist (4 Months; bht 25,000 /month)		100,000
Implementation Cost :		
Training Costs		50,000
Setup Costs(ISDN setup + others)		40,000
Total Development Costs :		907,000
PROJECTED ANNUAL OPERATING COSTS:		
1 Managers (45,000 per month)	540,000	
Operation staff		
- 1 Order entry Personnel (5,000 per month)	60,000	
- 1 Database Maintenance (15,000 per month)	180,000	
- 1 System Maintenance (25,000 per month)	300,000	
- 1 Inventory and Distribution Data Updating staff (5,000 per month)	60,000	
- 1 Finance staff (10,000 per month)	120,000	
Total Personnel Expenses		1,260,000
Monthly ISDN Service fee (20,000 per month)		240,000
Office Supplies (1,500 per month)		18,000
Utility (3,000 per month)		36,000
Depreciation expenses :		
- Hardware: 1 Server (4 Years to go, Initial Costs = bht 80,000)	16,000	
6 Clients (4 Years to go, Initial Costs/machine = bht 40,000)	48,000	
- Software (New)	12,600	
Total Depreciation		76,600
Total Projected Annual Costs :		1,630,600

Table C.2. Estimated Costs of Candidate Solution II : Borland J Builder & Oracle.

Cost Items		
1 File Server Upgrade		5,000
1 Additional ISDN Modem		12,000
1 Server		80,000
6 Personal Computers		240,000
2 Printer		25,000
Software:		
Server software		40,000
DBMS Development Software		80,000
Personnels:		
1 System Analyst (4 Months, bht 25,000 /month)		100,000
1 Programmer (6 Months; bht 30,000 /month)		180,000
1 System Architecture (2 Months; bht 30,000 /month)		60,000
1 Database Specialist (4 Months; bht 25,000 /month)		100,000
Implementation Cost :		
Training Costs		50,000
Setup Costs(ISDN set up+ others)		40,000
Total Development Costs :		1,012,000
PROJECTED ANNUAL OPERATING COSTS:		
1 Managers (45,000 per month)	540,000	
Operation staff		
- 1 Order entry Personnel (5,000 per month)	60,000	
- 1 Database Maintenance (15,000 per month)	180,000	
- 1 System Maintenance (25,000 per month)	300,000	
- 1 Inventory and Distribution Data Updating staff (5,000 per month)	60,000	
- 1 Finance staff (10,000 per month)	120,000	
Total Personnel Expenses		1,260,000
Monthly ISDN Service fee (20,000 per month)		240,000
Office Supplies (1,500 per month)		18,000
Utility (3,000 per month)		36,000
Depreciation expenses :		
- Hardware: 1 Server (4 Years to go, Initial Costs = 80,000 bht)	16,000	
6 Clients (4 Years to go, Initial Costs/machine = 40,000 bht)	48,000	
- Software (New)	24,000	
Total Depreciation		88,000
Total Projected Annual Costs :		1,642,000

Table C.3. Estimated Costs of Candidate Solution III : Visual Basic 6.0.

Cost Items		
Development Costs		
1 File Server Upgrade		5,000
1 Additional ISDN Modem		12,000
1 Server		80,000
6 Personal Computers		240,000
2 Printer		25,000
Software:		
Server software		40,000
DBMS Development Software		60,000
Personnels:		
1 System Analyst (4 Months; bht 25,000 /month)		100,000
1 Programmer (6 Months; bht 20,000 /month)		120,000
1 System Architecture (2 Months; bht 30,000 /month)		60,000
1 Database Specialist (4 Months; bht25,000 /month)		100,000
Implementation Cost :		
Training Costs		50,000
Setup Costs		40,000
Total Development Costs :		932,000
PROJECTED ANNUAL OPERATING COSTS:		
1 Managers (45,000 per month)	540,000	
1 Operation staff		
- 1 Order entry Personnel (5,000 per month)	60,000	
- 1 Database Maintenance (15,000 per month)	180,000	
- 1 System Maintenance (25,000 per month)	300,000	
- 1 Inventory and Distribution Data Updating staff (5,000 per month)	60,000	
- 1 Finance staff (10,000 per month)	120,000	
Total Personnel Expenses		1,260,000
Monthly ISDN Service fee (20,000 per month)		240,000
Office Supplies (1,500 per month)		18,000
Utility (3,000 per month)		36,000
Depreciation expenses :		
- Hardware: 1 Server (4 Years to go, Initial Costs = 80,000 bht)	16,000	
6 Clients (4 Years to go, Initial Costs/machine = 40,000 bht)	48,000	
- Software (New)	20,000	
Total Depreciation		84,000
Total Projected Annual Costs :		1,638,000



APPENDIX D

EXAMPLE OF PROCESS SPECIFICATION

Table D.1. Process Specification of Process 1.1.

Process Name	E-Commerce Orders
Input:	Order details & Customers Details
Output:	E-Commerce order Details
Process:	<ol style="list-style-type: none"> 1. Receive Requested Order detail from web 2. Verify Order Details 3. Verify Order No. 4. Automatically update the order detail into Request Order File 5. Approve Orders
Attachment	<ul style="list-style-type: none"> • E-Commerce • Telemarketing

Table D.2. Process Specification of Process 1.2.

Process Name	DRTV Orders
Input:	Order details & Customers Details
Output:	DRTV Order Details
Process:	<ol style="list-style-type: none"> 1. Telemarketers receive order 2. Read Product No. from Requested Order 3. Check the physical number of ordered product in Warehouse 4. Match the physical balance with logical Balance 5. Send the accurate product balance to process 1.3
Attachment	<ul style="list-style-type: none"> • Orders • Warehouse • Products

Table D.3. Process Specification of Process 1.3.

Process Name	Verification of Payment
Input:	Payment Details & Mode of Payment
Output:	Payment approval
Process:	<ol style="list-style-type: none">1. Check type of order2. Request for credit approval3. Update approval4. Printing Invoice5. Submit list of approval and invoice to distribution section
Attachment	<ul style="list-style-type: none">• Orders• Finance• Distribution section

Table D.4. Process Specification of Process 1.5.

Process Name	Delivery of product
Input:	Order details & Customers Details
Output:	Product withdrawal report & Product s
Process:	<ol style="list-style-type: none">1. Distribution printing invoices at site2. Request for withdrawal of the products3. Delivery of product to customer
Attachment	<ul style="list-style-type: none">• Orders• Warehouse• Products



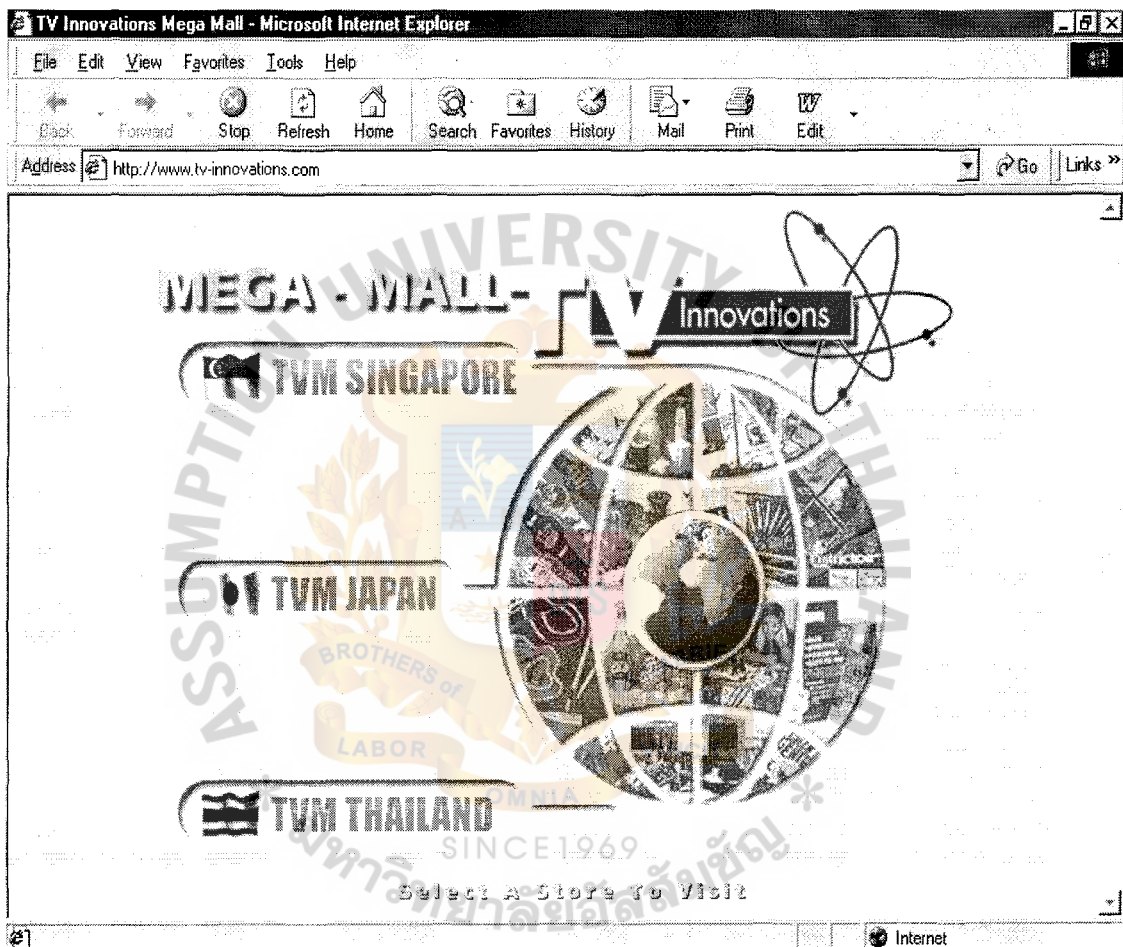


Figure E.1. Home Page.

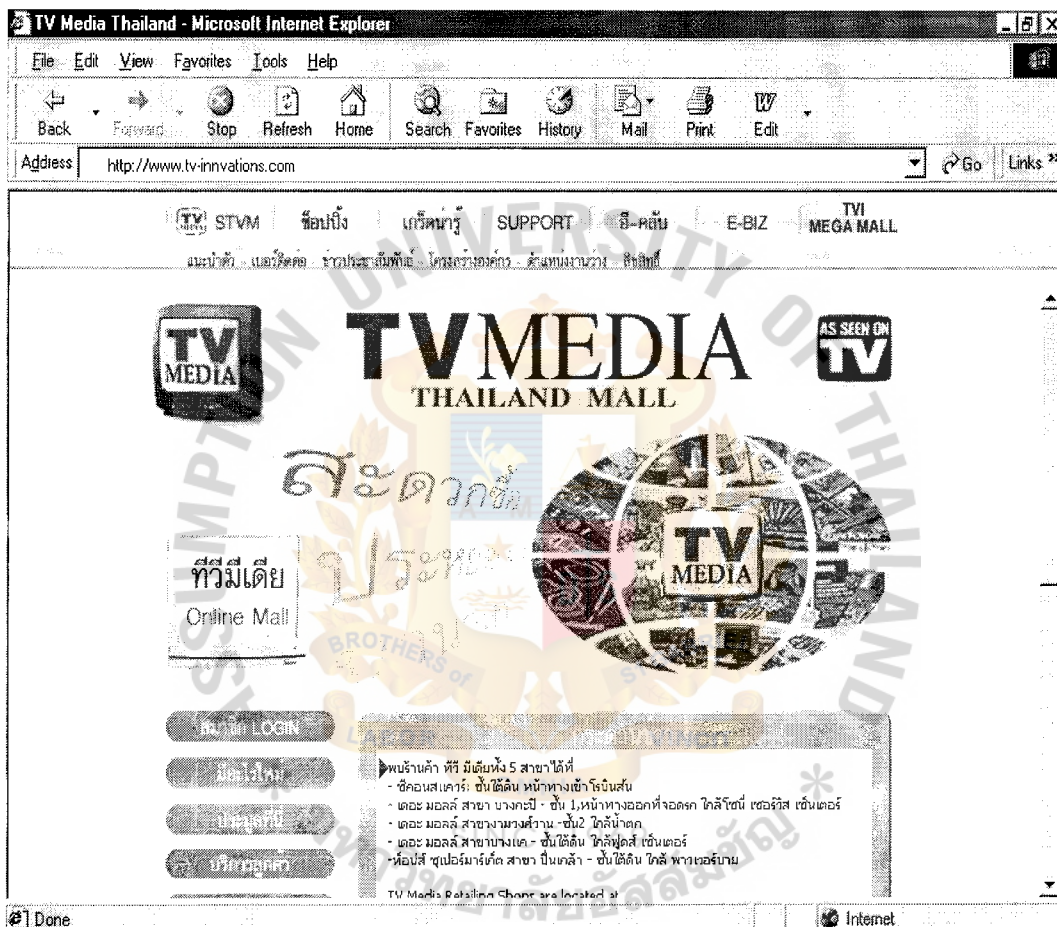


Figure E.2. Thailand Home Page.

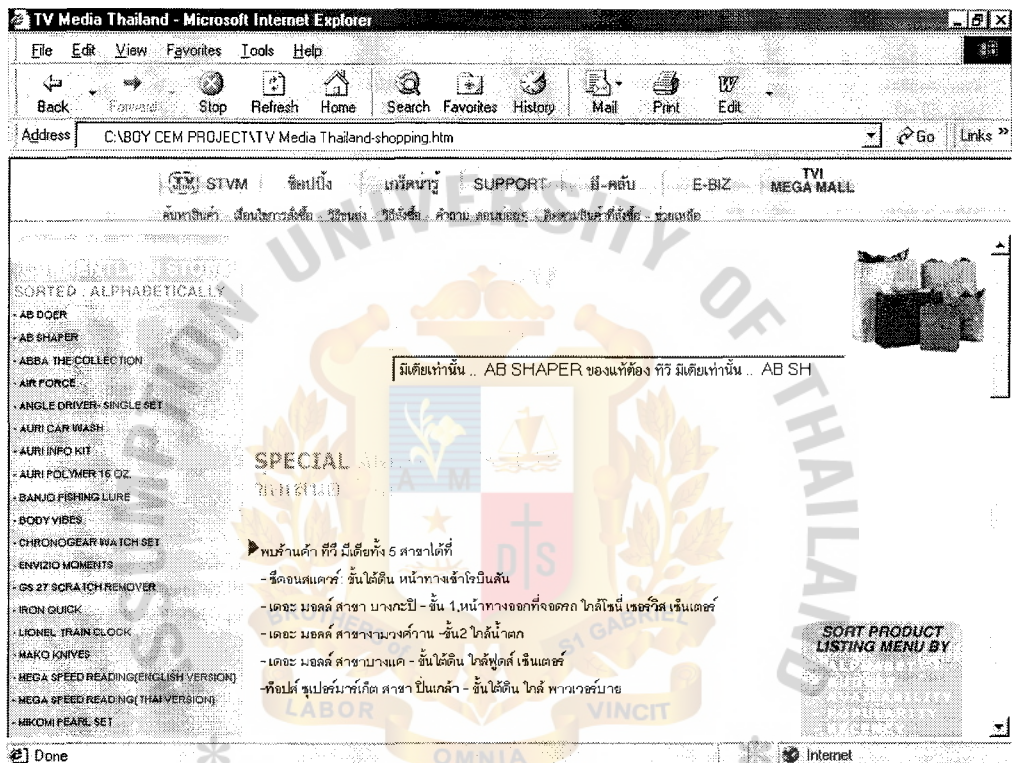


Figure E.3. Shopping Page.



Figure E.4. Web Order Module.

STEP 1

Full Name 姓名	BOBBY
Delivery Address 送货地址	128 DDD ROAD
Country 国家	SINGAPORE
Telephone 电话号码	THAILAND
Mobile or Pager 手机号码	
Facsimile 传真	
Email 电邮	yes@thaimail.com

STEP 2




Cash On Delivery 货到付款	<p>For COD, Billing and Delivery Address Will Be The Same. Additional \$2 COD Surcharge Will Be Added To The Order Total.</p> <p>如采用“货到付款”，汇寄账单地址将与送货地址相同，还必须加两元附加费。</p>
Credit Card 信用卡	<p>CREDIT CARDS ACCEPTED</p> <p>   </p>

Figure E.6. Web Payment and Delivery Module.

FINAL

最终




TV MEDIA SINGAPORE
371 Beach Road,
#05-09, Key Point,
Singapore 199597
Tel: (65) 2923422 Fax: (65) 2958355

PENDING ORDER
订单处理中


Order Type 订单类型	Order No. 订单号码	Order Date 订货日期	Log ID 登入ID
WWC	T3080610767	11/17/2000	11011


Deliver To 送至


BOBBY

 128 DDD ROAD

Singapore


 THAILAND




 yer@thsimail.com


Bill To 账单


BOBBY

 128 DDD ROAD

Singapore

 THAILAND



 yer@thsimail.com

Description & Code 描述及编号	Quantity 数量	Unit Price 单一价钱	Total 总结
AB SLIDE <small>Code: ABSLI001R Moneyback: 14 day(1)</small>	1	119.80	119.80

即时总结 Sub Total 116.31

托运费 Shipping 4.90

货到付款附加费 COD Surcharge 2.00

税务 (3%) Tax (3%) 3.49

总计 Total Payable 126.70

Figure E.7. Order Confirmation.



No	Activities	June				July				August				September				October				November			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	System analysis	←			→																				
	- Identify existing process & system																								
	- Identify problems																								
	- Documentation or work flows																								
2	Detailed Analysis and Design				←				→																
	- Gather information about the effective system to find out the candidates																								
	- Analysis and select the candidates																								
	- Develop DFD, Structure chart of the proposed																								
3	Implementation									←															→
	- Screen Layout																								
	- Report Layout																								
	- Progrmming																								
	-Data Conversion																								
	- Testing																								
	- Documentation & Training																								
	- Proposed Process and system starts																								

Figure F.1. Project Plan.

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