



The Ordering Tracking System on Internet
for Adison Corporation Co., Ltd.

by

Mr. Adisorn Chansrijaroenporn

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

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

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Project Title	The Ordering Tracking System on Internet for Adison Corporation Co., Ltd.
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Academic Year	March 17, 2002

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

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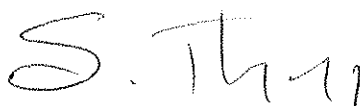
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ABSTRACT

Adison Co., Ltd., founded in 1977 and currently has more than 40,000 employees worldwide. It is the world's leading supplier of software for information management, and the world's second largest software company. The company offers its industry-leading database, application server, development tools and internet-enabled business application product for customer relationship management, finance, human resource and manufacturing to over 12,000 customers worldwide. Adison Co., Ltd. offers its products, along with related consulting, education and support services.

Support service and Order and shipping products are the mission of Adison Co., Ltd. on technical support is to help ensure the business success of its customers by providing comprehensive support for Adison Co., Ltd. sophisticated software solutions. Adison Co., Ltd. presently has skilled and experienced support staffs ready to serve customers and can link customers to other global support centers in order to receive 24 hours * 7 days services. Adison Co., Ltd. technical support programs contain a vast array of service that deliver telephone, and on-site support.

By employing a database system, the developed order processing system can promptly provide correct and punctual information about products, orders, order item list, and delivery order and expense reports. In addition, staffs can reserve products in advance and keep track of order and delivery status thoroughly. This can be ensured that the reserver can obtain products on schedule. All of the order processing data will not only be collected and formatted into order item list, delivery order and expense reports quickly, but also become information for decision making in economic order quantity (EOQ) which will reduce cost and increase productivity.

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I. INRODUCTION

1.1 Background of the Project

Information technology development consists of computer technology and communication technology. Computer technology helps people to have high efficiency and capability for all tasks. Not only, it can record a lot of data and process it into information formats of many styles which can be easily understood, describing each event and then forecasting what will happen in the future but also people can store unlimited information, and can indefinitely reuse it. Communication technology enables convenient and rapid uninhibited. The globe and Thailand is changing, moving an industry age to an information age. It changes ideas, organizational style and job performance and also affect quality of human life and work, and created a new business environment state as follows:

- (1) Digitization; powerful and far-reaching digital electronic services enable networked PC and workstation users to obtain information from outside their companies instantly without leaving their desks. Stock prices, periodicals, competitor data, industrial supplies catalogs, legal research, news articles, reference works, and weather forecasts are some of the kinds information that can be accessed online.
- (2) Globalization of the world's industrial economies greatly enhances the value of information to companies and offers new opportunities for businesses. Today, information systems provide the communication and analytic power that companies need in conducting trade and managing businesses on a global scale.

- (3) Mobility; By the needs of the general workforce and business society to access information from several sources.
- (4) Work groups generally are rapidly changing information needs, peak-load work schedules associated with project deadlines, and high communication requirements. Much of the work of an organization is done by informal task forces, interdepartmental committees, project teams, and committees.

1.2 Objectives of the Project

The objectives of the project are as follows:

- (1) To provide information on the product list, order item list, delivery orders, and expense report to enable correct and punctual timely ordering and delivery.
- (2) To reduce the time of collecting data for summarizing expense reports of each department to the accounting department.
- (3) To reduce duplicated data recording.
- (4) To enable decision making on products ordering and the appropriate quantity.
- (5) To make the ordering processing system easy to use.

1.3 Scope of the Project

This project covers only the tasks of ordering and delivery in the support department. The purpose of this project study emphasizes database design for order and delivery staff in the support department to implement the order processing system. The developer will develop the system by using System Development Life Cycle (SDLC), because it is the standard steps by steps development systems. This project's solution will cover the major aspects of our order processing system which contains of the following requirements.

- (1) To understand and analyze the existing manual order and delivery system in the support department to track the data flow and related documents. For example, name and details of customers' product usage, employees' information, and order and delivery document.
- (2) To design the proposed system to resolve the existing system's problems.
- (3) To design the database for the order processing system.

1.4 Deliverables

The following are the deliverables of this project.

- (1) Project introduction
 - (a) Background of the project
 - (b) Objectives
 - (c) Scope
- (2) Description of the current system
 - (a) Background of the existing system
 - (b) Current problems and area to be improved
- (3) Description of the new purposed system
 - (a) System(user) requirement
 - (1) Context Diagram
 - (2) Data flow Diagram
 - (b) System design
 - (c) Hardware and software requirement
 - (d) Security and controls
- (4) Project implementation
 - (a) Overview of project implementation
 - (b) Test plan and results

(5) Conclusions and recommendations

1.5 Project Plan

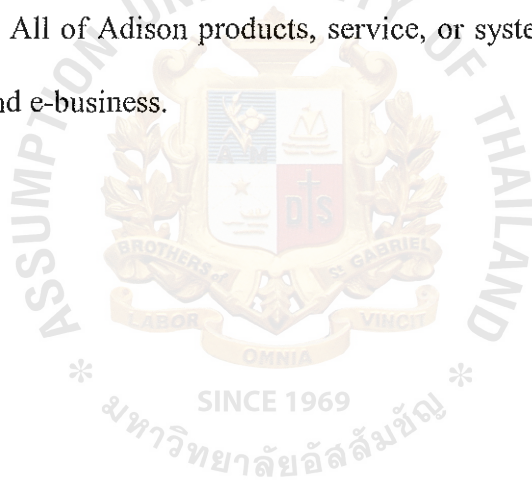
This project plan of the Ordering Tracking on Internet for Adison Coporation Co., Ltd. is given in Figure F.1.



II. THE EXISTING SYSTEM

2.1 Background of the Organization

Adison Corporation Co., Ltd. is a subsidiary of Adison Corporation. In 1990, Adison Corporation Co., Ltd. was established with initial registered capital of 25 million Baht. Currently, there are more than 170 customers. The company offers its industry-leading database, application server, development tools and internet-enabled business application products to the customer for their management, finance, human resource and manufacturing management. In addition, Adison is the biggest vendor of e-business software in the world. The business units of Adison are consulting, education and technical support. All of Adison products, service, or systems are compatible with Internet technology and e-business.



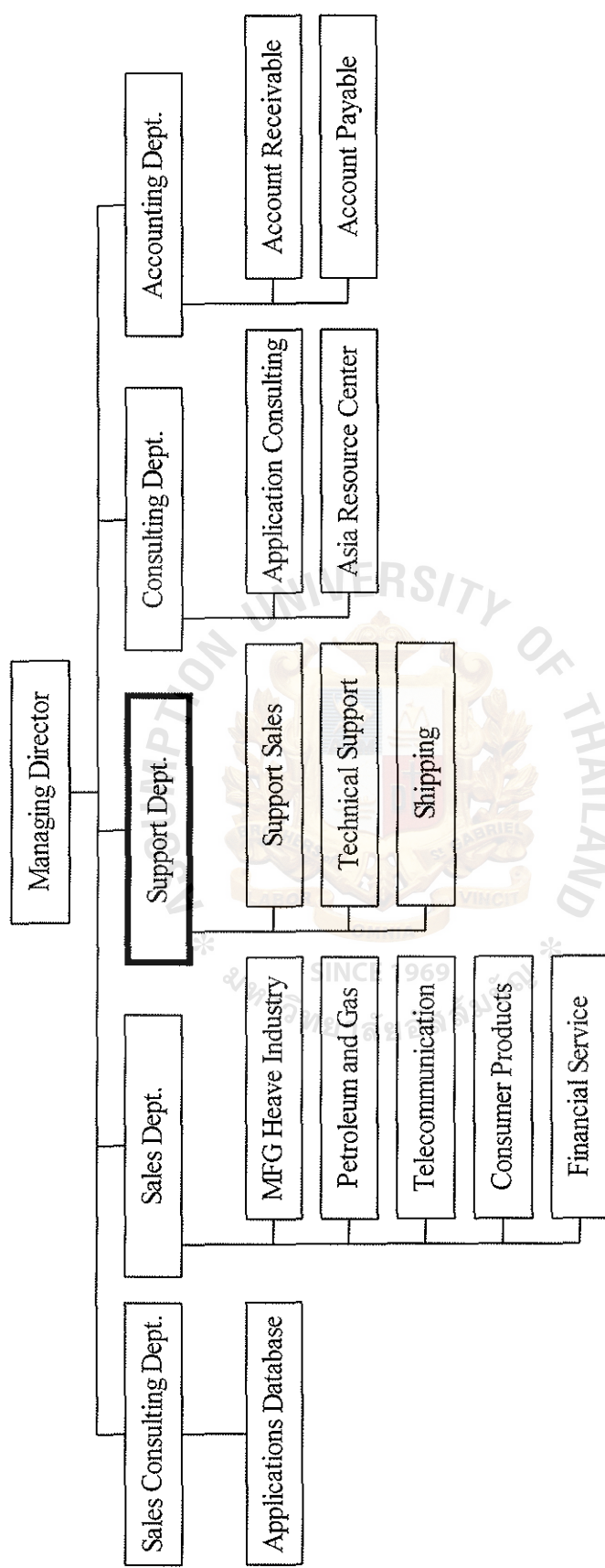


Figure 2.1. Organization Chart of Adison Coperation Co., Ltd.

2.2 Current Problems and Areas for Improvement

(1) Responsibilities of ordering and delivery staffs

To develop the order and delivery system, which will be discussed separately from the peripheral environment. The ordering and delivery staffs report directly to a support manager and the following responsibilities are coordinated:

- (a) Providing documents and information about the product to staff.
- (b) Ordering products from the warehouse, then receiving and issuing delivery order and deliver products to staff and customers.
- (c) Liaising with staff in the sale department to coordinate the precise delivery of products and ontime to the customers or staff.
- (d) Recording data of ordering and delivery product as required.
- (e) Issue expense reports for submitting to accounting department to deduct each department's product usage expense.

(2) Problems

There are several problems identified in the responsibilities above which are listed as follows:

- (a) In relative to providing product list and prices for the staff, the staff are recording the orderable product name, version, platform, and operating system in the product item list. However, this product information is usually and rapidly changing. Since there are many products, the product information come from many sources, and websites. Sometimes, some product information from some websites contradicts to other websites, such as one website showing that product A can be ordered while another website shows that product A

is not yet orderable. Therefore, the customer who gets information from the product item list sometimes orders obsolete or incorrect products.

- (b) In relative to recording product data order item list and delivery order, the product data listed in order item list is similar the product listed in delivery order. It is duplicated recording.
- (c) In relative recording order data in delivery order, the order data in delivery order is the same data recorded in staff's order. So it is duplicated recording which may increase error and delay in recording.
- (d) In relative filing product delivery and order files, staff is so often asked the delivery status, but there are too many documents on the desk to find the answer. Sometime, some files are missing or kept in the wrong files.
- (e) In relative issuing expense report, Ordering products in each department often meets problems, taking a long time, and mistake occurs. One report in each department needs over duplicated orders' information to be filled in, for example, how many products, and how much expense for each products which was ordered by staff and what department staff requested product are in a lot of errors, because there are a lot of data to be filled in expense report and a lot of calculation in the report.

2.3 Existing Computer System

Currently, the support department has existing equipment and computers that still work efficiently, and uses not more than two years. But we don't have ordering and delivery system on internet to support our department. All information about ordering

and delivery is kept with only shipping staffs. We don't have the information system to share and exchange information between other employees in support department. When other employees need information for supporting customers, they have to request from shipping staffs and if one day shipping staffs left we have to wait for them to support us. To wait is nothing if that customers' requirement isn't urgent but it is so often that the customers demand to rapidly serve them their ordering and delivery status. By building the ordering tracking system on Internet, the problem that often occurs in the support department would be solved.

However, creating this system requires no adding hardware and software, it uses only a manpower to design, coding and maintaining the new system. So it is the time to develop the new system to provide a better business process.



III. THE PROPOSED SYSTEM

3.1 System Specification

After studying the existing system such as business process, existing manual system and identifying the problems for the existing system, we conclude that the user's requirements are that they would like to develop a new document collecting and searching system, changed from a manual system to a computer system, and expect more efficient performance, which is fast and reduces mistakes. They need the most precise and perfect reports summarizing job execution. All the above the requirements, can be summarized as the following table:

Table 3.1. Summarize User Requirement.

Item	Requirement Description
1	Searching documents from the computers.
2	Rapidly able to create document without need to make a copy for reference.
3	Able to edit, adjust, or add more listing in the documents.
4	Rapidly and correctly able to create expense summarization of report for each department in each period.
5	Rapidly able to search product order and purchasing order.
6	Easily acknowledge information about products that customer has purchased, received and the amount of the purchasing.

3.2 Candidate Solution

After studying the user's requirements, we can summarize that requirements and define candidate's requirements of the new system as follows:

BS01: To develop the system with our staff while maintaining a manual system, but improving method and steps of the working and managing the collection of document system to be standard for rapid searching.

BS02: To develop the system with the worker by using database in keeping some parts of data of the system, such as keeping the customers' information into the database for rapid reference and the remaining parts of the system are still manual working.

BS03: To develop the system with the worker and system analysis of the company. The new system can store all necessary information into the database, and can rapidly search and create various reports for every department requisition.

After comparing all candidate solutions and user requirements, we can summarize as following table.

Table 3.2. The Business System Options for Each Candidate Solution.

No.	Requirements and Options	BS01	BS02	BS03
1	Able to search documents from the computer	F	B	A
2	Rapidly able to create the documents without creating any copies for reference	F	C	B
3	Able to edit, adjust, or add more listing in the documents	D	B	A
4	Rapidly and correctly able to create expense summarization report for each department in each period.	E	C	A
5	Rapidly able to acknowledge information about employee, purchasing order, purchasing products, and its amount	D	B	A
6	There are details of product delivery and rapidly able to search	D	A	A

Symbol A, B, C, E, F in the Table 3.2 represent 100%, 80%, 60%, 40%, 20%, and 0% to show level of capability of the system that can support the user requirements in ordering.

With above table, the third candidate(BSO3) can support requirements without any contradictory conditions and limitations of the department that wouldn't use a budget or generate a new budget in purchasing hardware or software. However, the new system can be easily studied by workers and doesn't need any more hardware and software. So that, for a business feasibility, we select the third candidate(BSO3) to develop the information system in purchasing and delivery to support department.

3.3 System Design

(1) The ordering and delivery analysis

After studying the existing system by interviewing the people concerned with this system and document in our department, we acknowledge the working steps, the data of existing system, and its problems. During analysis, we can clearly define user requirements and its problems. All related working units and input and output data of this system, are described with the context diagram Figure 3.1. as follows:

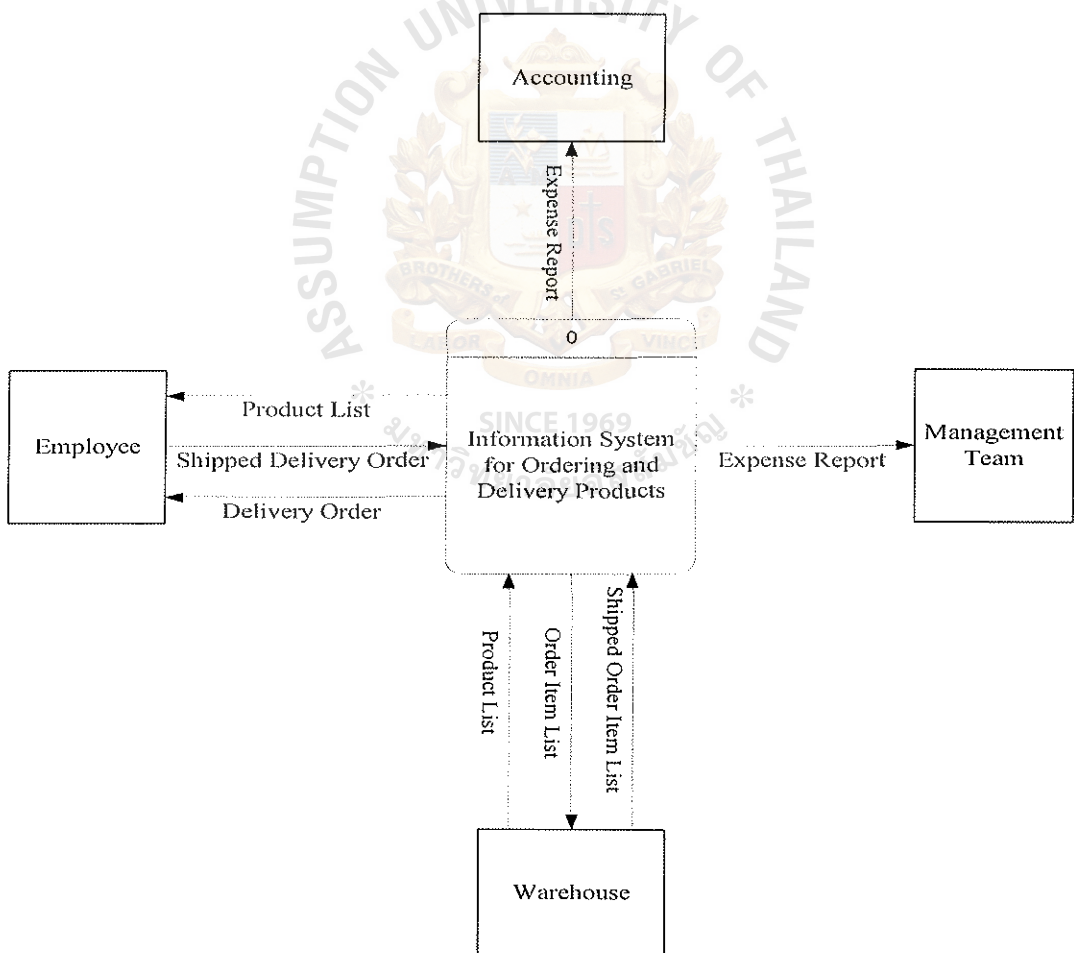


Figure 3.1. Context Diagram of the Ordering Tracking System on Internet.

After studying the ordering and delivery system, we found four external considerations, which contain staff, executive, accounting, and warehouse described as following:

Table 3.3. External Entity Description.

ID	Name	Description
A	Staff	<p>There are two types of staff as follows:</p> <p>1) Staffs who have responsibilities for purchasing goods for using in the department and keep them in the stock room.</p> <p>2) Sales who has responsibilities for contact the customers, creating proposals, until closing sale.</p>
B	Executives	<p>Executives of this system are the support managers who create policy, plan the business of support department, and assign tasks for each employee. An each month end, managers will evaluate each employee's performance and check the expense summary reports.</p>
C	Accounting	<p>Accounting department with this system is a part of expense deduction of each department. The accounting department has duties for creating dunning slip to the customer and entry the sale amount of each employee for creating a commission for each sale.</p>
D	Warehouse	<p>A producer who supports the information about products and delivery products to the employee that ordered via shipping.</p>

(2) Process design

The new system will support the employee and customers. Most information will be stored in the computer, and it is easy to create ad hoc reports depending on each requirement. We draw the data flow diagram that depicts the flow of data through the ordering tracking on the internet and the work or process performed by our system. It helps us to look through the developing system easily, and separating into context diagram. The context diagram is shown as follows and lower level data flow that shows the data flow in detail of each subsystem and process. However, level 1 is the data flow diagram that contains the whole subsystem of the Ordering Tracking System on Internet. It is shown in Figure A.1. The level 2 data flow diagrams, Figure A.2. – Figure A.4., show deep detail in each subsystem.

(3) Database Design

Database helps to reduce data inconsistency, data redundancy, and improves sharable information, etc. With this project, we use the Entity Relationship Model to draw the diagram. There are 6 entities for this system as Figure B.1. and Table B.1. show each entity meaning. And we can describe the relationship between each of both entity to become relational schema with Figure B.2. Further, there are Tables B.3. – B.7. that present the detail of data dictionary for each table.

(4) Input and Output Design

According to the relational schema, we can design the input and output screen of the system by using Oracle Developer 6i.

The first screen (Figure E.1.) presents the whole web sites that related with the Ordering Tracking System on Internet such as Order Management System, Order Processing System, Shipping Status Web site, Product Information Web Site, Letter for Staff, and Letter for Customer.

When we start to use the program, double click at the Order Processing System then the program shows Java Applet. After completing loading Java Applet, the screen pop up URL of the Ordering Tracking system then the Logon Screen request User Name, Password, and Database for a system security as show with Figure E.2.

After logon into the system, the screen shows the main menu for selecting program working as Figure E.3. When we want to entry the new department, we can do via a screen as Figure E.4.

When we want to add or edit transaction about staff, click Staff button from the Main Menu then the screen pops up same as Figure E.5. and Figure E.6. shows screen for working with the customer information.

In the customer screen, the user can transact about the customer's order by click order button for looking information of purchasing of that customer. Similarly, we click the Order button from the main menu, the program pops up in the same screen as Figure E.7.

When we press staff button, it's not much different from customer's screen. We can select employee's name and his ID that can easily do by filling some part of his name follow with % in the find box then click find button, see Figure E.8. For the customer, when we press customer button the screen automatic pops up the customers' name. If we want to search by ourselves, do the same as employee, Figure E.9.

When the user enters Delivery Date before Order Date or Order Date before Book Date, system will correct it. The system will reject the incorrect information into the database and show warning message at the bottom of the screen, see Figure E.10.

After complete entering order information, click Order Line button to select the products' list that you want to order as Figure E.11. If we want to update the Products' information, press Product button from the Main Menu, see Figure E.12.

Regarding reports and documents, only order and shipping staffs can use them. Therefore, programs aren't in the web site, but they are on the client site with run time program. Then we separate report programs from the other programs, because they do not relate to other employees.

When staff want to run the reports, click Start → Program then select the report or click at shortcut name of the report such as Order Item List, Delivery Order, Expense Report, etc. See Figure E.13. After click shortcut report's name, for example we choose Order Item List report, the screen pops up window to enter User Name, Password, and Database Name for login as Figure E.14. After complete entering User, Password, and Database, appear on screen to enter date range to submit report as Figure E.15.

After printed products list order by product name with Book Date range and there are order with producer's system with external order No. that issues by the producer's system for checking the products' status of each customer. To confirm those product lists ordered to abroad, when products arrive, staff enter receiving products by checking with the order item list and acknowledge those products from which order by looking from order ID in the order item list. Staff then, enter the order ID in the screen for printing the delivery note to employee and customers to sign later, see Figure E.16.

In each month, user will check the expense about order for employee and customer. The screen shows date range that delivered to user to select printing which date range, see Figure E.17. Each time of sending expense report, we can do it by email to be a report attached with email by click at Menu Bar then select File and Mail similar to Figure E.18. Then email window will pop up to enter email name that we want to send to, see Figure E.19.

If user would like to inquire any information in the system, we press Enter Query button that show as “?” then enter customer’s name that we would like to search. If enter with some part of names, we have to enter % at the tail then click Execute Query, see Figure E.20., the customer’s information will display, in other screen such as Employee, Department, Products, etc., we can query information similar to this way, Figure E.21.

Morover, we can query the information of delivery for each customer from a shortcut Customer Ship for checking whether that customer have received products in which time. To protect receiving products again or asking never receive any products, see Figure E.22.

When user wants to check amount of products, which one the most delivered in each date range in order to discuss to order amount of spare in case of urgency. Such urgent case does not often occur , but to prevent products shortage for order, see Figure E.23.

(5) User Interface

As mentioned in input/output design, the interface design will be web based design. It will be simple to search for users, similar to using the Internet.

3.4 Hardware and Software Requirement

Since support department have the existing efficiency computer equipment age not more than 2 years in usage, therefore these equipment can be used with the proposed system. The main point of intranet system is server. Server provides the service what is needed. With this proposed system, we need only one server to provide the full functions we require. The main service is web server and additional services are e-mail, calendar, and file. Web server also provides ability to access the data in Oracle database. The following table shows the detail of the selected intranet web server.

Table 3.4. The Hardware Specification for the Internet Web Server.

Hardware	Specification
CPU	Dual 800 MHz Intel Pentium III
Memory	256 MB ECC SDRAM or higher
Hard Disk	Quantum 10 GB or higher
CD-Read/Write Drive	Plextor 12/10/32X or higher
Floppy Drive	1.44 MB
Network Adapter	3COM Ethernet 100-Base-T
Display Adapter	VGA card AGP 8 MB
Monitor	15" ADI Microscan G500
Printer	HP LaserJet 2200
UPS	1000 VA

In the software part of intranet web server, we use Microsoft Windows NT Server to control and operate the intranet web server. The reasons are: it is stable, world widely used, supporting, easy to implement and use, and user-friendly interface. The web server is Oracle Web Database and database we choose Oracle Database 8i that has high capability and speed while accessing the data. We also install Common Gateway Interface (CGI) to run application at server side and response the result back to users. The last is VPN Boarder Manager service. This program helps to encrypt the message before sending and decrypt after receiving. It doesn't allow anyone to read the message if unauthorized. The following table shows the detail.

Table 3.5. The Software Specification for the Internet Web Server.

Software	Specification
Operating System	Microsoft Windows NT
Web Server	Oracle Web Database
Common Gateway Interface	Microsoft Active Server Page(ASP)
Database	Oracle Database 8i
Security Control	VPN Boarder Manager Service
Virus Scan	McAfee Virus Scan 5.15

Our employees of support department already have the efficiency computers hardware in their routine works. There is no need to change our existing client hardware. Its whole details are as follows:

Table 3.6. The Hardware Specification for the Client.

Hardware	Specification
CPU	650 MHz Intel Pentium III
Memory	128 MB SDRAM
Hard Disk	5 GB
CD-Read/Write Drive	24X CD-ROM
Floppy Drive	1.44 MB
Network Adapter	10/100 Ethernet, Fast Infrared
Display Adapter	VGA card AGP 4 MB
Monitor	14" SVGA

In the part of software, we require software for connecting the Internet, displaying the web based document, security control and Virus scan. The main software is web browser for operating internet system. They may be Internet Explorer 5.0, Opera 5.0, Netscape communication 5.0 or whatever. The Oracle Developer 6i application tools that we chose on the basis that it can write the program using technology of Network Computing Architecture (NCA) by acceptant to change Application User Interface Logic to install and maintain on the Middle Tier Server or Application Server that has less listener for connecting the internet.

Table 3.7. The Software Specification for the Client.

Software	Specification
Operating System	Microsoft Windows 98 Second Edition
Web Browser	Microsoft Internet Explorer 5.0
Application	Oracle Developer 6i
Message Security	Pretty Good Privacy(PGP) International
Security Control	VPN Boarder Manager Service
Virus Scan	McAfee Virus Scan 5.15

The following figure shows the hardware configuration. How each hardware component connects each other, One can observe the client connects the intranet server at the head office.



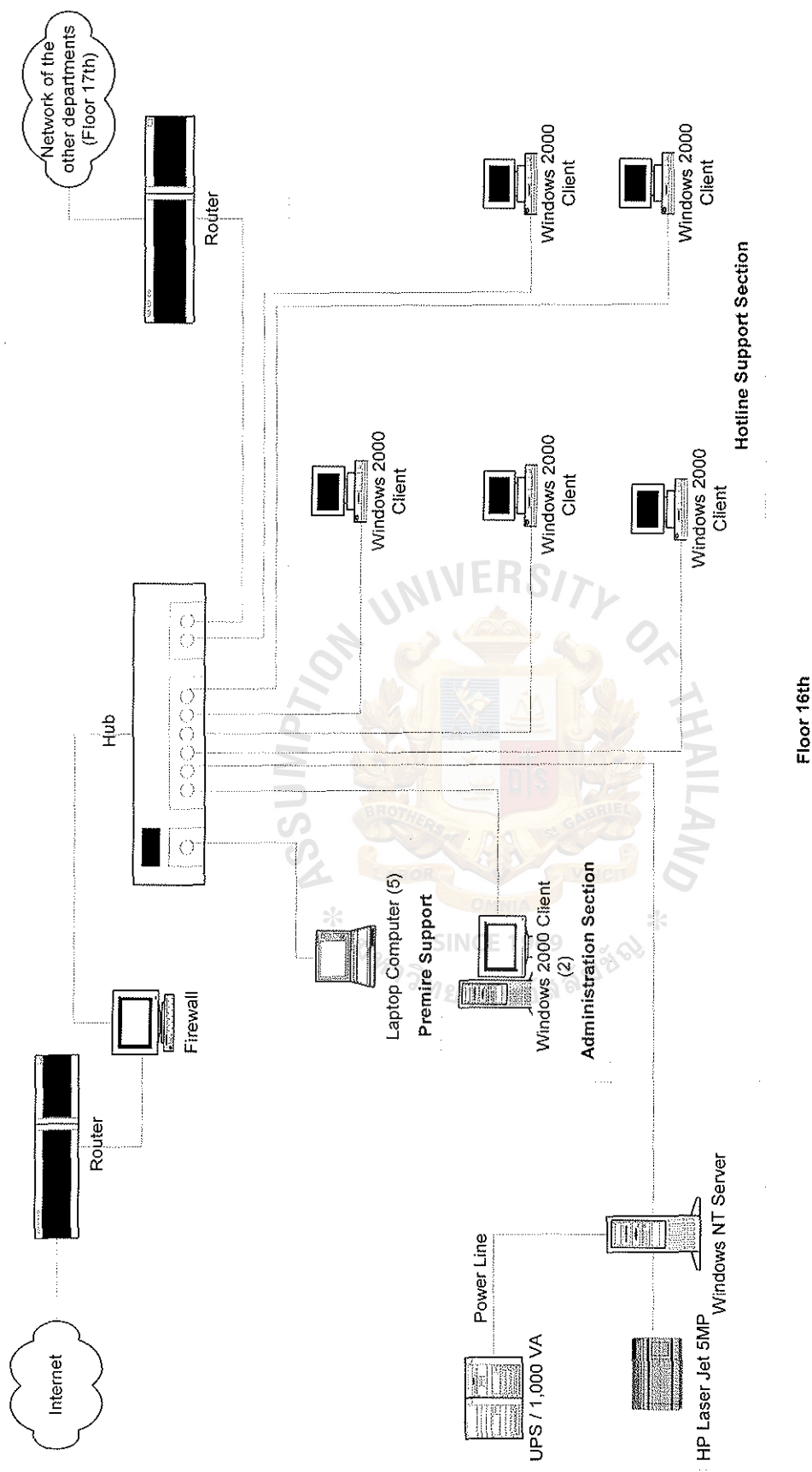


Figure 3.1. The Network Configuration of the Proposed System.

3.5 Security Control

Information and data are important and it is confidential for every organization. The security is used for this purpose. The only authorized person can access this database. Sometimes we need to exchange the information through the Internet in order to save cost from remote access. As we know, Internet is an open place. So everybody can use its service, the chance of unauthorized access is increased. Even in the absence of malicious intent, an intranet without access controls is at risk of accidental erasure or overwriting of documents. Ensuring security on an Internet is a matter of verify users who they claim to be, restricting data access where appropriate, and encrypting confidential communications to prevent interception. The following methods we use to increase the security of our system.

- (1) Password: Before one can use the service provided by intranet, one must login first. Each consulting department's member has his/her own password to login.
- (2) Virtual Private Network (VPN): VPN is a secure connection between two points across the Internet and available through Internet Service Providers. The VPN provides many features of a private network at much lower cost than using private leased telephone lines or frame-relay connections. Starting to use VPNs is to reduce our wide area networking expenses.
- (3) Firewall: The principal difference between the Web and an intranet is that whereas the Web is opened to anyone, the intranet is private and protected from public visits by firewall. The firewall consists of hardware and software placed between an organization's internal network an external network, including the Internet. The firewall is programmed to intercept

each message packet passing between the two networks, examine its characteristics, and reject unauthorized messages or access attempts.

- (4) Virus Scan: Computer virus is a critical and increasing threat to the computer based information system. Viruses are also mainly concerned with information destruction. So, we need to prevent the virus by installing the McAfee Virus scan software. It can detect and clean the virus out of the system. However, we need to update the virus definition every week in order to be able to cover new viruses.



Table 3.8. Candidate Matrix.

Characteristics	Candidate 1	Candidate 2	Candidate 3
Potion of system Computerized : A description of the portion of the computerized system.	Stock Response.	Stock Response	Stock Response
Benefit: The benefit of each alternative that the company should consider in order to make decision.	To gain competitive advantage and speed of processing	To support business process.	To support business process.
Servers and Workstations: The needs of server and workstation to support alternatives.	Pentium 800 MHz., RAM 256 MB for server, Pentium 650 MHz., RAM 128 MB for workstation.	Pentium 800 MHz., RAM 256 MB for server, Pentium 650 MHz., RAM 128 MB for workstation.	AMD AthlonXP 1533MHz., RAM 256 MB for server, AMD Duron 1000MHz., RAM 64 MB for client.
Software Tools Needed: Tools needs for facilitating each candidate such as computer programming languages.	Microsoft Windows NT. Internet Developer Suit.	Microsoft Windows 2000 Server. JAWA HTML	Linux. Delphi. HTML.
Method of Data Processing: An alternative solution to data processing.	Client/Server	Client/Server	Client/Server
Output Devices and Implications: The devices that will be used to show, present document information.	HP LaserJet 2200	HP LaserJet 2200	HP LaserJet 2200
Input Devices and Implications: A device that will be used to enter data into the system in order to store or process.	Keyboard and Mouse	Keyboard and Mouse	Keyboard and Mouse
Storage Devices and Implications: A description of the storage device that will allow information to be retrieved from databases.	Oracle 8i.	MySQL.	Microsoft Access 2000.
Training: A description of the alternative way of training and preparing our personnel for the new system.	To train the actual employees in company.	To train the new employees who have some knowledge.	To train the actual employees in company
Technical Staff: A description of the alternative way for the company to hire the people who have knowledge about the new technology.	Actual employees in company.	To hire the new employees who have the knowledge.	Actual employees in company.

Table 3.9. Alternative Candidate Requirement Analysis.

Characteristic	Candidate 1	Candidate 2	Candidate 3
Portion of System Computerized			
- Stock Response	X	X	X
Benefit			
- Competitive advantage	X		
- Support business process		X	X
Server			
- Pentium III 800 MHz	X	X	
- AMD AthlonXP 1533MHz.			X
Workstation			
- Pentium III 650 MHz.	X	X	
- AMD Duron 1000MHz.			X
Operation System			
- Linux			X
- Microsoft Windows NT	X		
- Microsoft Windows 2000 Server		X	
Software Tools			
- Internet Developer Suit	X		
- JAWA		X	
- Delphi			X
Method of Data Processing			
- Client/Server	X	X	X
Output Devices and Implications			
- HP LaserJet 2200	X	X	X
Input Devices and Implications			
- Keyboard	X	X	X
- Mouse	X	X	X
Storage Devices and Implications			
- Oracle 8i	X		
- MySQL		X	
- Microsoft Access 2000			X

Note: X Means Candidate which Support the Requirement Analysis.

Table3.10. Feasibility Analysis Matrix.

Feasibility Criteria	Wt.	Candidate 1	Candidate 2	Candidate 3
<u>Operational Feasibility</u> Functionality :A description of to what degree the candidate would benefit the organization. Political: A description of how well received this solution would be. Usability: A description of user ease of learning and use as well as satisfaction.	30%	The candidate supports all business requirements. Intel well accepted by all management since it is recommended by system development. Windows NT has more functions for Development, but users are not familiar with it. Score: 95	The candidate supports all business requirements. Intel well accepted by all management since it is recommended by system development. Windows 2000 Server, most familiar compared to Linux, but not flexible Score: 90	The candidate supports all business requirements. AMD not recommended by system development team but has lower price. Linux is the free operating system with more flexibility. Edit Plus does not help too many in developing. Score: 80
<u>Technical Feasibility</u> Technology: A description of the maturity of the technology used in each candidate. Expertise :An assessment of the technical expertise needed to develop, operate, and maintain the candidate system.	30%	Pentium is widely accepted and supported by various computers. The technical aspect of this candidate has been developed for some times and it has reached its maturity stage. Employees will have the experience supporting the developed system. Score: 95	Pentium is widely accepted and supported by various computers. The technical aspects of this candidate has been developed for some times and it has reached its maturity stage. Current employees are promoted and trained to support the system, they may not have any on hand experience. Score: 85	AMD is not as widely used compared to Pentium but its performances comparable. However not as many computer components support it compared to Pentium. Employees ill have the experience supporting the developed system. Score: 80
<u>Economic Feasibility</u> Cost to Develop(Baht): Payback Period: Net Present Value	30%	875,000.00 2 years 1,390,157.45 Score: 95	977,000.00 2 years 4 months 1,066,617.61 Score: 70	865,000.00 2 years 1,400,157.45 Score: 100
<u>Schedule Feasibility</u> An assessment of how long the solution will take to design and implement.	10%	4 months Score: 100	7 months Score: 75	5 months Score: 90
Ranking	100%	95.50%	86.00%	88.00%

3.6 Cost and Benefit Analysis

3.6.1 Cost Analysis

(1) Cost of Manual System

Table 3.11. Manual System Cost Analysis, Baht.

Cost items	Years				
	1	2	3	4	5
<u>Fixed Cost</u>					
Copying machine 1 machine	30,000.00	30,000.00	30,000.00	30,000.00	30,000.00
PCs 2 machine@90,000	50,000.00	40,000.00	30,000.00	30,000.00	30,000.00
Laser printer	8,000.00	8,000.00	8,000.00	8,000.00	8,000.00
MS office 2000 professional	6,000.00	6,000.00	6,000.00	6,000.00	6,000.00
Total Fixed Cost	94,000.00	84,000.00	74,000.00	74,000.00	74,000.00
<u>Operating Cost</u>					
<u>Salary Cost:</u>					
Shipping Officer 2 person @35,000	70,000.00	77,000.00	84,700.00	93,170.00	102,487.00
<u>Communication Cost:</u>					
Telephone (included foreign toll)	150,000.00	157,500.00	165,375.00	173,643.75	182,325.94
Facsimile (Fax)	50,000.00	52,500.00	55,125.00	57,881.25	60,775.31
Total communication Cost	200,000.00	210,000.00	220,500.00	231,525.00	243,101.25
<u>Office Supplies & Miscellaneous Cost:</u>					
Stationary Per Annual	20,000.00	22,000.00	24,200.00	26,620.00	29,282.00
Paper Per Annual	50,000.00	55,000.00	60,500.00	66,550.00	73,205.00
Utility Per Annual	20,000.00	22,000.00	24,200.00	26,620.00	29,282.00
Miscellaneous Per Annual	5,000.00	5,500.00	6,050.00	6,655.00	7,320.50
Total Annual Office Supplies & Miscellaneous Cost	95,000.00	104,500.00	114,950.00	126,445.00	139,089.50
Total Manual System Cost	459,000.00	475,500.00	494,150.00	525,140.00	558,677.75

Table 3.12. Five Years Accumulated Manual System Cost, Baht.

Year	Total Manual Cost	Accumulated Cost
1	459,000.00	459,000.00
2	475,500.00	934,500.00
3	494,150.00	1,428,650.00
4	525,140.00	1,953,790.00
5	558,677.75	2,512,467.75
Total	2,512,467.75	-

(2) Costs of Computerized System

Table 3.13. Computerized System Cost Analysis, Baht.

Cost items	Years				
	1	2	3	4	5
Fixed Cost					
Hardware Cost:					
Upgraded server	50,000.00	-	-	-	-
Hub 10/100mbs 24 ports	4,400.00	4,400.00	4,400.00	4,400.00	4,400.00
ADSL modem	3,000.00	3,000.00	3,000.00	3,000.00	3,000.00
Firewall device	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00
Total Hardware Cost	61,400.00	11,400.00	11,400.00	11,400.00	11,400.00
Maintenance Cost:					
Maintenance Cost	80,000.00	84,000.00	88,200.00	92,610.00	97,240.50
Software Cost:					
Microsoft Windows NT	7,000.00	7,000.00	7,000.00	7,000.00	7,000.00
Internet Developer Suit (Web DB + Tools)	150,000.00	-	-	-	-
Oracle 8i	50,000.00	-	-	-	-
Network Cable Cost	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00
Total Software Cost	238,000.00	8,000.00	8,000.00	8,000.00	8,000.00
Implementation Cost:					
Training Cost	2,000.00	-	-	-	-
Set up Cost	5,000.00	-	-	-	-
Total Implementation Cost	7,000.00	-	-	-	-
People-Ware Cost:					
System Analyst 1 person@4,500 (25 days)	112,500.00	-	-	-	-
System Designer 1 person@4,500 (25 days)	112,500.00	-	-	-	-
IT Specialist 2 person@3,000 (20 days)	120,000.00	-	-	-	-
Programmer 2 person@1,800 (20 days)	72,000.00	-	-	-	-
Total People-Ware Cost	417,000.00	-	-	-	-
Total Fixed Cost	487,000.00	103,400.00	107,600.00	112,010.00	116,640.50
Office Supplies & Miscellaneous Cost:					
Shipping Officer 1 person @35,000	35,000.00	38,500.00	42,350.00	46,585.00	51,243.50
Stationary Per Annual	15,000.00	10,500.00	11,025.25	11,576.25	12,155.06
Paper Per Annual	30,000.00	21,000.00	22,050.00	23,152.50	24,310.13
Miscellaneous Per Annual	2,000.00	1,700.00	1,870.00	2,057.00	2,262.70
Utility Per Annual	20,000.00	14,000.00	9,680.00	10,648.00	11,712.80
Total Office Supplies & Miscellaneous Cost	28,000.00	30,800.00	14,700.00	15,435.00	16,206.75
Total Operating Cost	102,000.00	85,700.00	91,995.00	98,805.75	106,178.14
Total Computerized System Cost	875,400.00	189,100.00	199,595.00	210,815.75	222,818.64

Table 3.14. Five Years Accumulated Computerized Cost, Baht.

Year	Total Computerized Cost	Accumulated Cost
1	875,400.00	875,400.00
2	189,100.00	1,064,500.00
3	199,595.00	1,264,095.00
4	210,815.75	1,474,910.75
5	222,818.64	1,697,729.39
Total	1,697,729.39	-

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

Table 3.15. The Comparison of the System Costs, Baht.

Year	Accumulated Manual Cost	Accumulated Computerized Cost
1	459,000.00	875,400.00
2	934,500.00	1,064,500.00
3	1,428,650.00	1,264,095.00
4	1,953,790.00	1,474,910.75
5	2,512,467.75	1,697,729.39

3.6.2 Benefit Analysis

We can classify benefit into 2 groups. The first one is tangible benefits and the second one is intangible benefit. Tangible benefit is benefit that can be quantified and assigned monetary value but intangible benefits are not easily quantified.

(1) Tangible benefits

(a) Reduction office supply usage	67,000.00 baht
(b) Reduction of human labor	
(1) Salary 35,000 * 1 person	420,000.00 baht
(c) Reduction of duplicated work (200 hrs.@145)	29,000.00 baht
Total Tangible Benefits	<u>516,000.00</u> baht

(2) Intangible benefits

- (a) Improve working environment: The proposed system enables the company to reorganize the office space and to eliminate any unnecessary cluster of paperwork.
- (b) Reduce the redundant routine works: The redundancy procedures, fault steps, and etc. can be eliminated by the new system.
- (c) Increase efficiency and accuracy in working process.
- (d) Improve decision making.

After we get the detail about benefits, we can calculate the payback analysis. The payback analysis technique is the method for determining if and when an investment will pay for itseft. In our proposed system, it spends approximately 1 year and 11 months to cover the investment cost with more profit in the further years (See Figure D.1.).

3.6.3 Payback Period

Payback analysis is technique for determining if and when an investment will pay for itself. On the other hand, it determines how much time will lapse before accrued benefits overtake accrued and continuing costs. This period of time is called the payback period. The payback period can be estimated by looking at payback analysis table, so we will know that the payback period for this project is around

We have to analyze the payback of the proposed system with the existing system to compare the budget cost with the actual cost and when it will recover.

3.6.4 Net Present Value (NPV)

The net present value of an investment alternative is considered the preferred cost-benefit technique by many managers, especially those who have substantial business schooling. Again, you initially determine the costs and benefits for each year of the system's lifetime. And again, we need to adjust all the costs and benefits back to present dollar values.

Figure D.2 illustrates the net present value technique. Costs are represented by negative cash flows while benefits are represented by positive cash flows. We have brought all costs and benefits for our example back to present value. Notice again that the discount rate for year 0 is 1.00 because the present value of a dollar in year 0 is exactly 1.

After discounting all costs and benefits, subtract the sum of the discount costs from the sum of the discounted benefits to determine the net present value. In our candidate 1 the solution being evaluated yields a net present value of 1,390,157.45. This means that if we would make by implementing this information systems solution.

3.6.5 Breakeven Analysis

Breakeven analysis is a technique, which is used to find the period that accumulative cost of current system is equal to accumulative cost of new system. The point that they equal is called breakeven point. The comparison of the system costs between the computerized costs and the manual costs is shown in Table 3.3. Breakeven point between the current system and the proposed system is shown in Figure 3.3.

Table 3.16. Comparison Cost of the Existing System and the Proposed System.

Cost Items	Years				
	1	2	3	4	5
Existing system	459,000.00	934,500.00	1,428,650.00	1,953,790.00	2,512,467.75
Proposed system	875,400.00	1,064,500.00	1,264,095.00	1,474,910.75	1,697,729.39
Difference	-416,400.00	-130,000.00	164,555.00	478,879.25	814,738.36

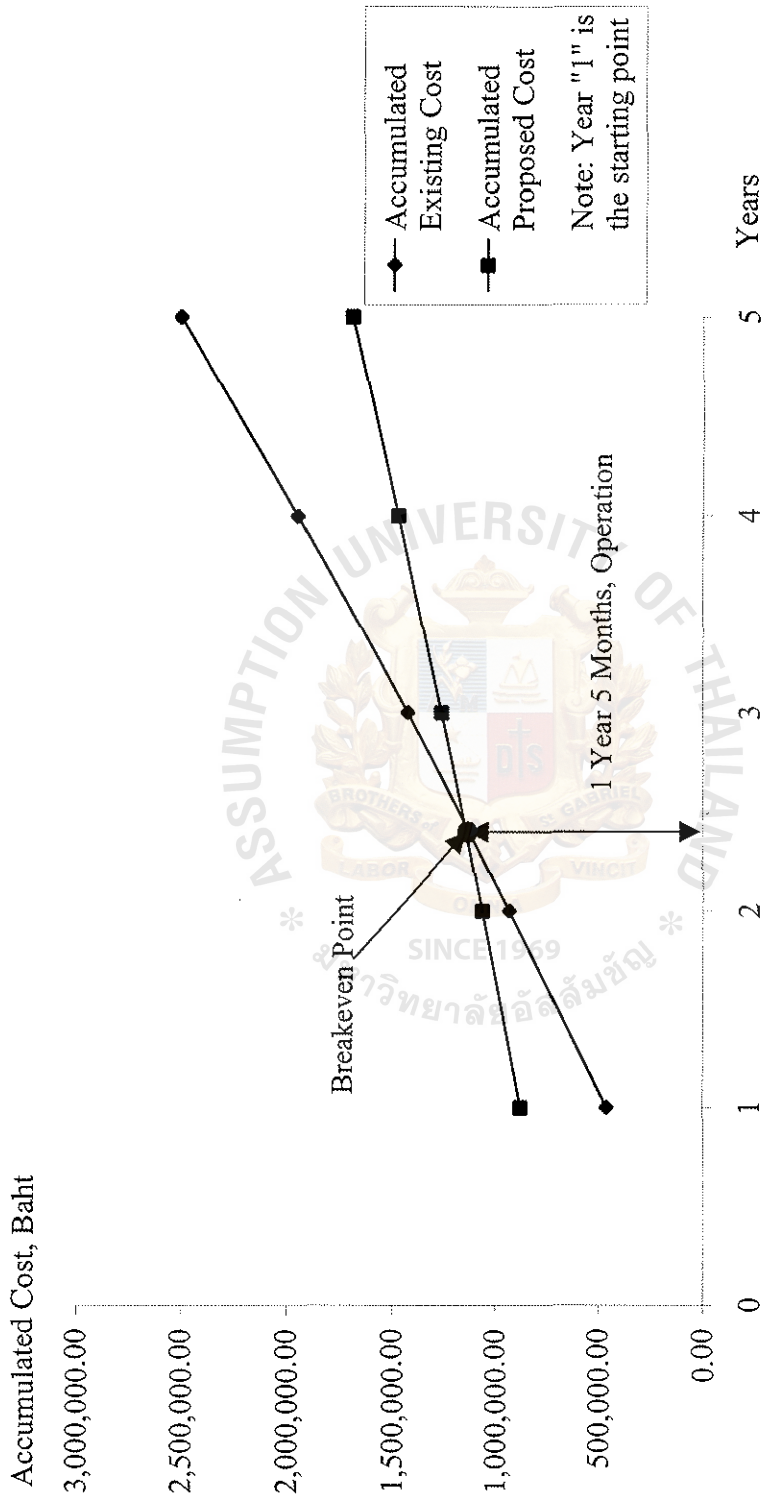


Figure 3.26. Cost Comparison between Existing System and Proposed System.

IV. PROJECT IMPLEMENTATION

4.1 Testing and Implementation

Testing of specific programs, subprograms, and total system are essential for quality assurance. Testing is done to turn up any existing problems with in programs and then interfaces before the system is actually used.

Testing of the proposed system is divided into the following:

(1) Program Testing

A programmer must create valid and invalid test data and test all possible cases. To create test data, he should test all minimum and maximum values possible.

(2) Link Testing

When programs pass testing individual program, they must go through link testing. Link testing checks the interdependent programs whether they can work together as planned.

(3) User Acceptance Testing

It is the responsibility of the users to make their own data to test the system in order to meet their requirements.

(4) Operating Acceptance Testing

To ensure that the proposed system will have functions in the production environment without adversely affecting the existing system.

(5) System Testing

The entire system is run. The objective of the system testing is to verify whether programs meet the original programming specifications and ensures

that the entire system totally functions, when all the programs are interconnected.

4.2 System Implementation

System implementation is the planned and orderly conversion from an existing system to the proposed system. It involves fine-tuning system elements in order to maximize efficiency and productivity. Part of the task includes completing documentation and evaluating the final design to make sure that the system meets desired goals and objectives.

A task list may be developed, specifying what must be done. Below is a task list that should be developed for purchase order and stock control system for the Daily Place Superstore.

(1) Prepare Changeover Timetable

All-at-Once changeover is considered because the existing system is not an automated system. In this approach, the existing system is abandoned and the proposed system becomes completely operational on a specific date. All planning and design, purchasing, training, ordering, and the like are finished before determined date. So, the proposed system is ready to go at the moment the existing system ceases to operate.

(2) Notify Employees

It officially informs workers of the possibility of system changes and explain how the change will affect employees and their working environment.

(3) Undertake Training and In-service Program

An intensive training of computer for each employee is needed.

(4) Monitor System for Trouble Spots

Time delays, debugging software, excessive costs, inconvenience to employees, inconvenience to other departments' employees are expected when the proposed system is first installed.

(5) Evaluate Performance

After installing the proposed system, the performance of the proposed system must be evaluated.

(6) Optimize Performance

The performance of the proposed system must be optimized.

(7) Complete System Documentation

All system documentation must be completed and presented.



V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The proposed system which replaces the old system can produce more benefits to organization. Its benefits concern about cost, management, information technology, organization, information and business solution.

The new system is a Graphic User Interface, so it's easy for the users who never use this system before, because there are various menus including clear description for easily selecting to use the new system. In addition, Oracle Web Database is used in keeping and creating database as a medium between users and programs. Besides, users don't need to know the detail of database structure.

The proposed system provides the following strategic qualitative factors.

- (1) The new system reduces time, duplicated working steps, faults, expense, storage for keeping document, and quantity of sparing goods without copying more documents.
- (2) The proposed system efficiently provides, ordering, delivery, seeking order status, and creating precisely expense reports on regular basis.
- (3) The recommended system provides more available time for shipping staffs, so that they can have more time to improve any weak point of their work in each process. As a result, staff and customer are satisfied with this system.

Table 5.1 shows the time performance on each process of the proposed system compared with the existing system. It shows that each process of the proposed system performs less time than each process of the existing system, which has to operate many work steps in manual system. Therefore, it can be concluded that the proposed system is more efficient and effective than the existing system.

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

Process	Existing System	Proposed System
Searching and Inquiry Process	10 mins.	2 mins.
Each Summary and Expense Reports	1 hr. 30 mins.	5 mins.
Approve Process	40 mins.	10 mins.
Delivery Process	1 hr. 30 mins.	5 mins.
Total	3 hrs. 50 mins.	22 mins.

Explanation of the degree of achievement of the proposed system:

Searching and Inquiry Process of the proposed system takes just only 2 minutes. It is designed to store all information into the database, so it can search information rapidly.

We can create reports according to the conditions and users' requirement by using database. With the existing system, we have to enter many data every time to create each report.

The existing system takes 40 minutes to perform the approving process, but the proposed system takes only 10 minutes, because it eliminates duplicated working steps. Just only once for entering data into the system all inquiries required information for doing the approving process.

Since the proposed system increases ability to approve purchase requisition and purchase order, so the delivery which is processed after them can be rapidly completed.

5.2 Recommendations

However, there are two concerns to maintain to consider for maintainable efficiency proposed system as follows:

- (1) Lack of updating data in database such as the data of products list, customer name, customer address, order date, delivery status, etc. If you don't update data you will not get up-to-date information so the mistake will occur during ordering or delivering products.
- (2) The new system needs cooperation from the staff who would like to order products. If no one does not cooperate, or do not understand how to apply the developed system for their jobs, it can not provide all possible efficiency that it can. The problem of the old system will still exist, Therefore, it is necessary to encourage users to know and understand the benefit of the developed system. If people in the organization are willing to learn by themselves, and frequently use the developed system and try to recommend to improve the developed system to work more efficiently, this system will surely solve company's problem, help staff work more efficiently and increase customers' satisfaction



APPENDIX A

DATA FLOW DESIGN

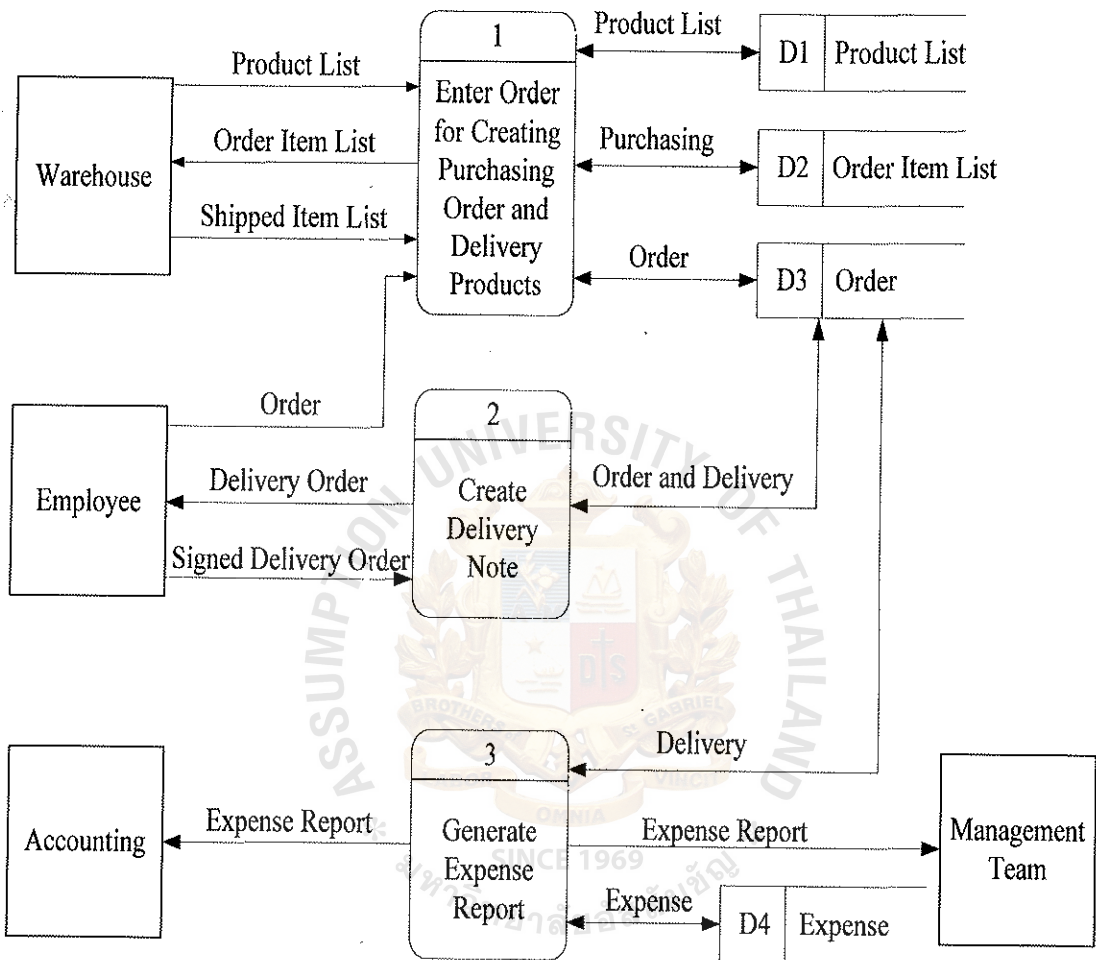


Figure A.1. Data Flow Diagram of the New System Level 1.

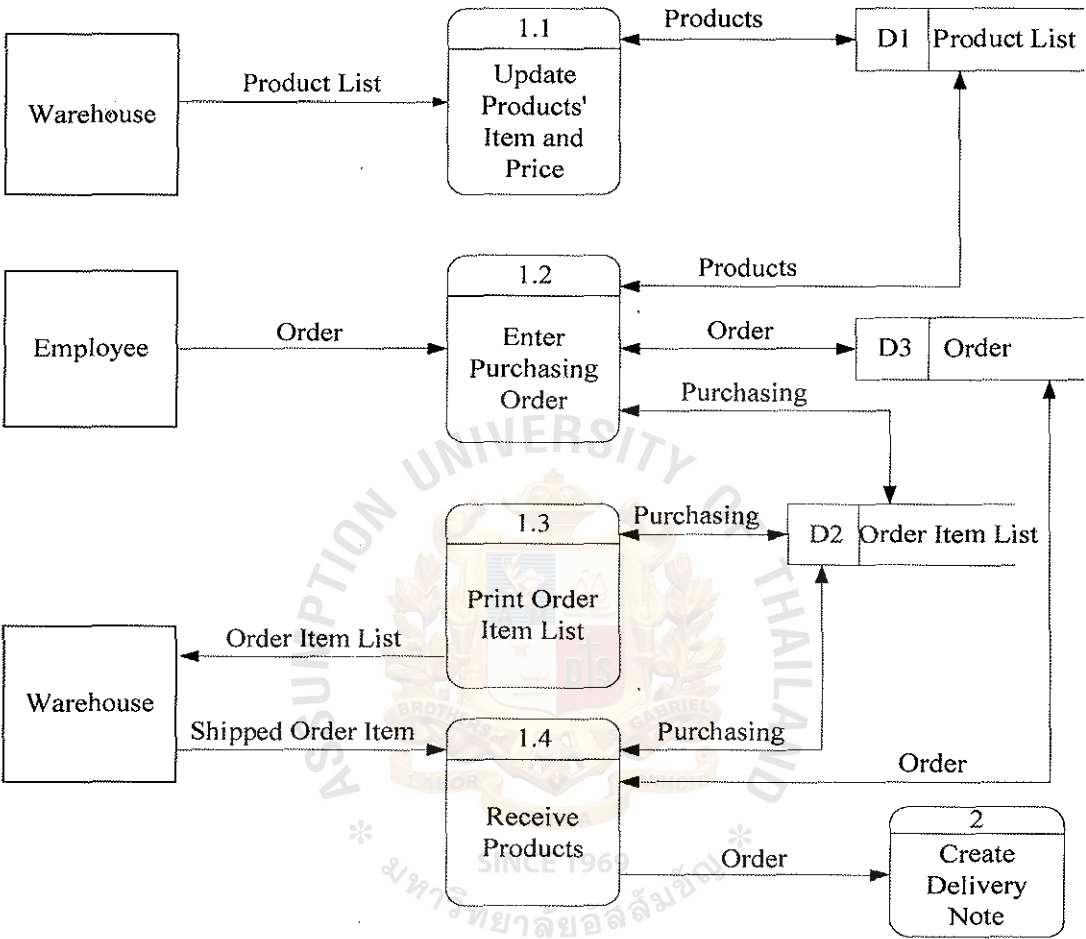


Figure A.2. Data Flow Diagram of the New System Level 2 (Create Purchasing Order).

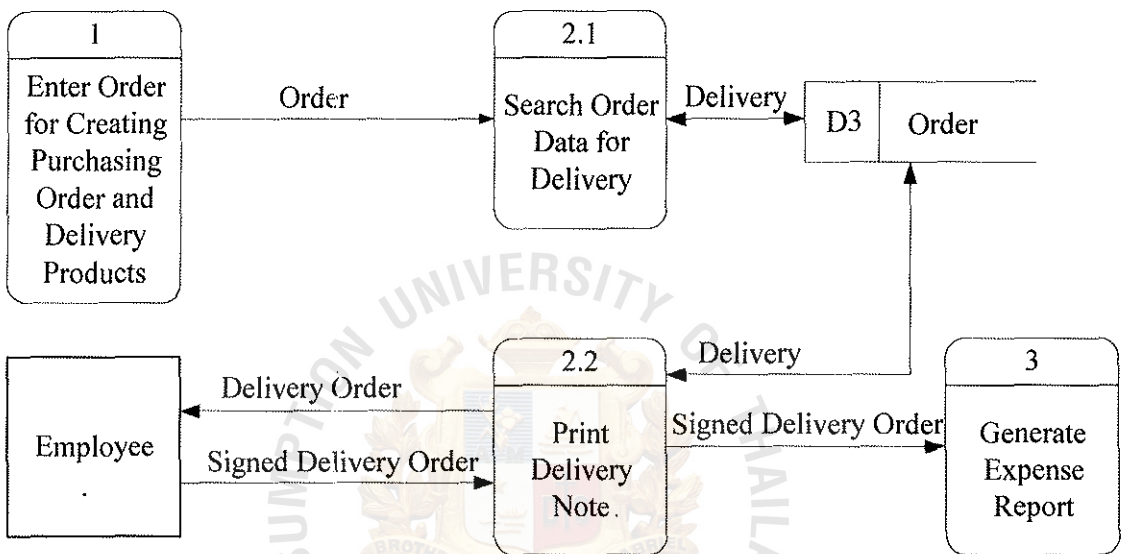


Figure A.3. Data Flow Diagram of the New System Level 2 (Create Delivery Note).

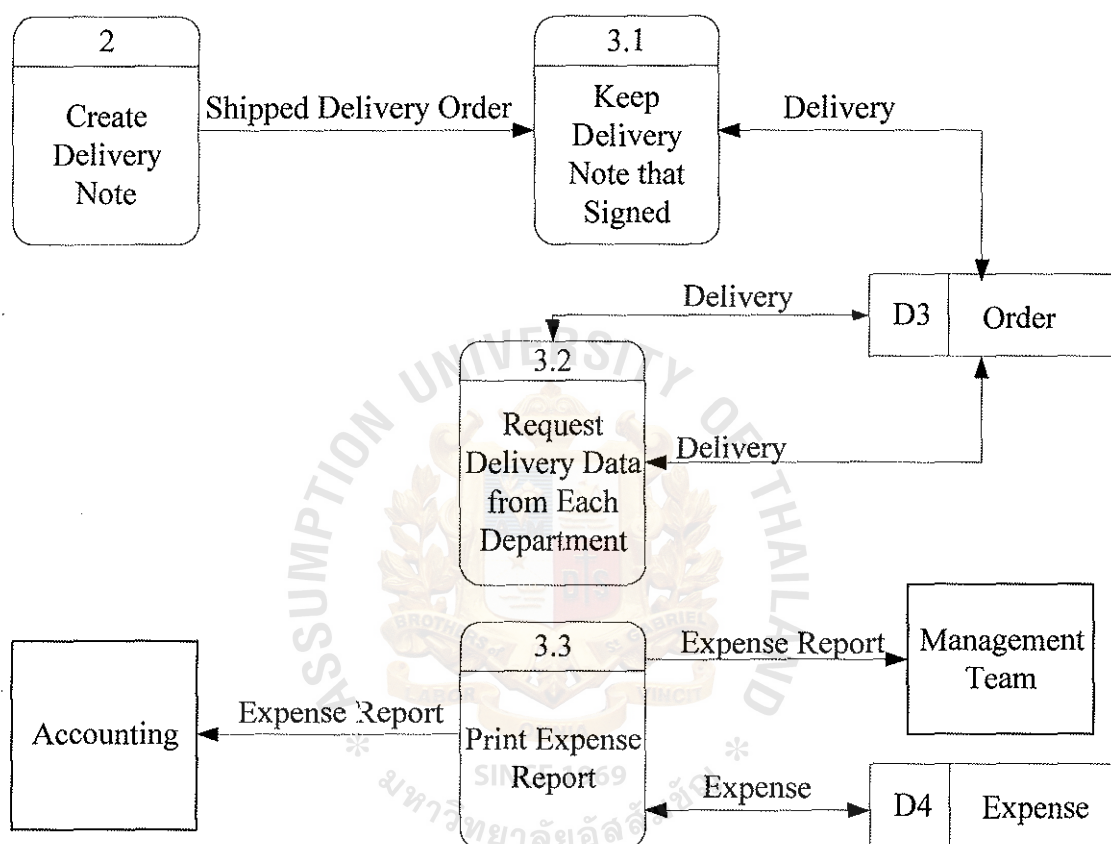


Figure A.4. Data Flow Diagram of the New System Level 2(Generate Expense Rep.).



APPENDIX B
DATABASE DESIGN

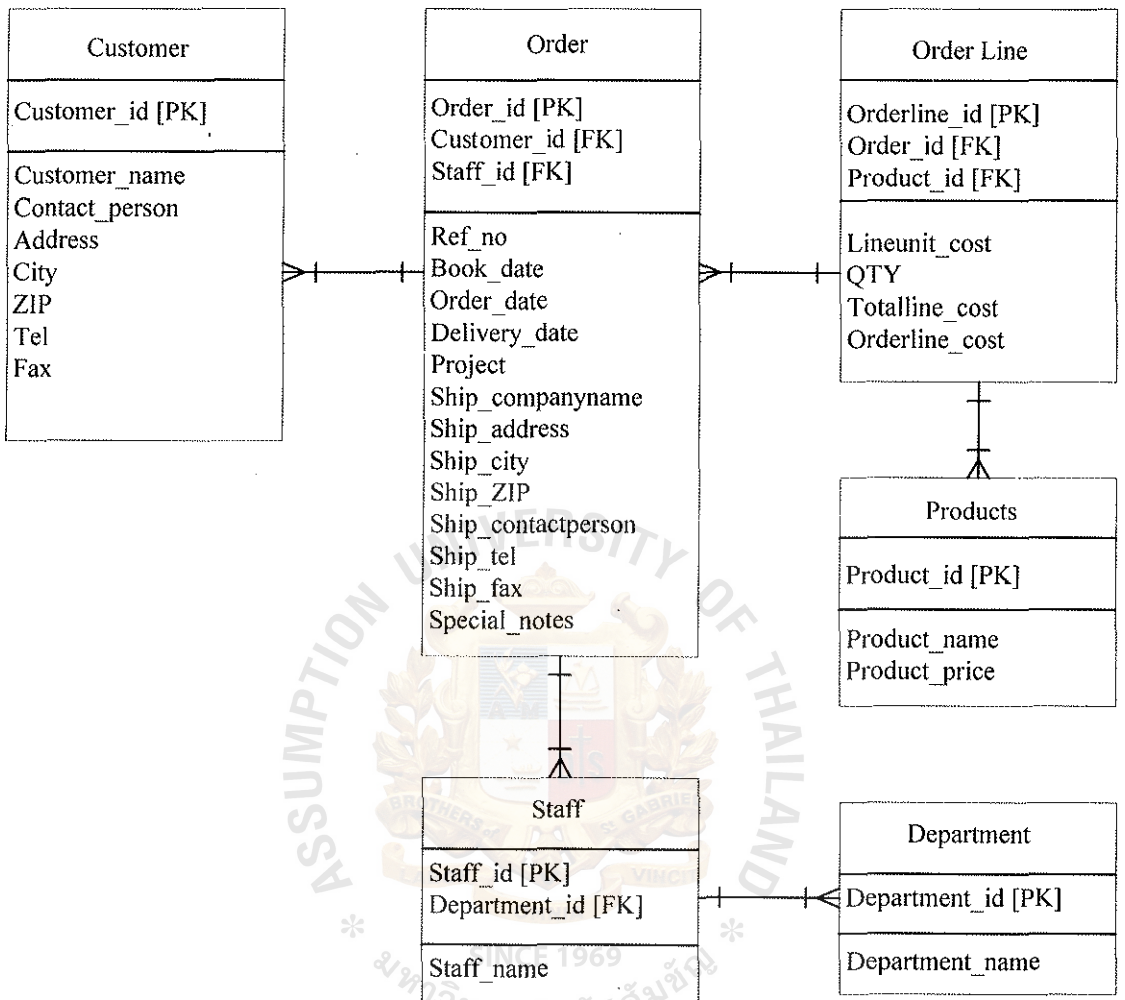


Figure B.1. E-R Diagram of the Ordering Tracking System on Internet.

Table B.1. The Name and Detail of All Entities in the System.

Entity Name	Entity Description
CUSTOMER	The information of the customers that ordered our products
STAFF	The information of employee that reserved order
DEPARTMENT	The information of the department that purchased products
ORDER	The information of purchasing
ORDER_LINE	The detail of products that to be purchased
PRODUCT	The information of the products

Table B.2. The Detail of CUSTOMER Table.

Field	Description	Type	Size	Required	Key	FK Table
Customer ID	Customer ID	Number	10	Yes	PK	
Customer Name	Name of the Customer	Varchar2	50	Yes		
Contact Person	Name of the contact person	Varchar2	50			
Address	Customer Address	Varchar2	80			
City	City	Varchar2	20			
Zip	Zip code	Varchar2	5			
Tel	Telephone No.	Varchar2	20			
Fax	Fax No.	Varchar2	20			

Table B.3. The Detail of STAFF Table.

Field	Description	Type	Size	Required	Key	FK Table
Staff ID	Staff ID	Number	10	Yes	PK	
Staff Name	Staff Name	Varchar2	50	Yes		
Dept ID	Department ID	Varchar2	10	Yes	FK	Department

Table B.4. The Detail of DEPARTMENT Table.

Field	Description	Type	Size	Required	Key	FK Table
Dept ID	Department ID	Number	10	Yes	PK	
Department Name	Department Name	Varchar2	20			

Table B.5. The Detail of PRODUCT Table.

Field	Description	Type	Size	Required	Key	FK Table
Product ID	Product ID	Number	10	Yes	PK	
Product Name	Product Name	Varchar2	80	Yes		
Price	Product Price	Varchar2	20	Yes		

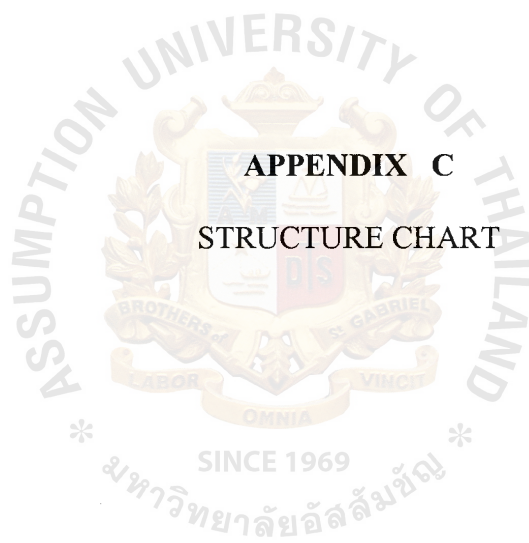
Table B.6. The Detail of ORDER Table.

Field	Description	Type	Size	Required	Key	FK Table
Order ID	Order ID	Number	10	Yes	PK	
Ref No	Reference no. of Purchasing Order	Varchar2				
Book Date	Order Reserved Date	Date				
Order Date	Purchase Date	Date				
Delivery Date	Delivery Date	Date				
Customer ID	Customer ID	Number	10		FK	Customer
Staff ID	Staff ID	Number	10	Yes	FK	Staff
Cost	Order Cost	Number	20			
Project	Project Name	Varchar2	50			
Ship_Address	Address to Ship	Varchar2	80			
Ship_City	City to Ship	Varchar2	20			
Ship_Contact Person	Name of Receiver	Varchar2	50			
Ship_Tel	Tel. no. to contact	Varchar2	20			
Ship_Fax	Fax no.to contact	Varchar2	20			
Special Note	Special Notes	Varchar2	50			

Table B.7. The Detail of ORDER LINE Table.

Field	Description	Type	Size	Required	Key	FK Table
Order Line Id	Order Line ID	Number	10	Yes	PK	
Order ID	Order ID	Number	10	Yes	FK	Order
Product ID	Product ID	Number	5	Yes	FK	Product
Unit Cost	Amount for each Line/Unit	Number	10	Yes		
QTY	Quantity	Number	10	Yes		
Total Cost	Total Amount for each Transaction	Number	10	Yes		





APPENDIX C
STRUCTURE CHART



APPENDIX D

USER INTERFACE DESIGN

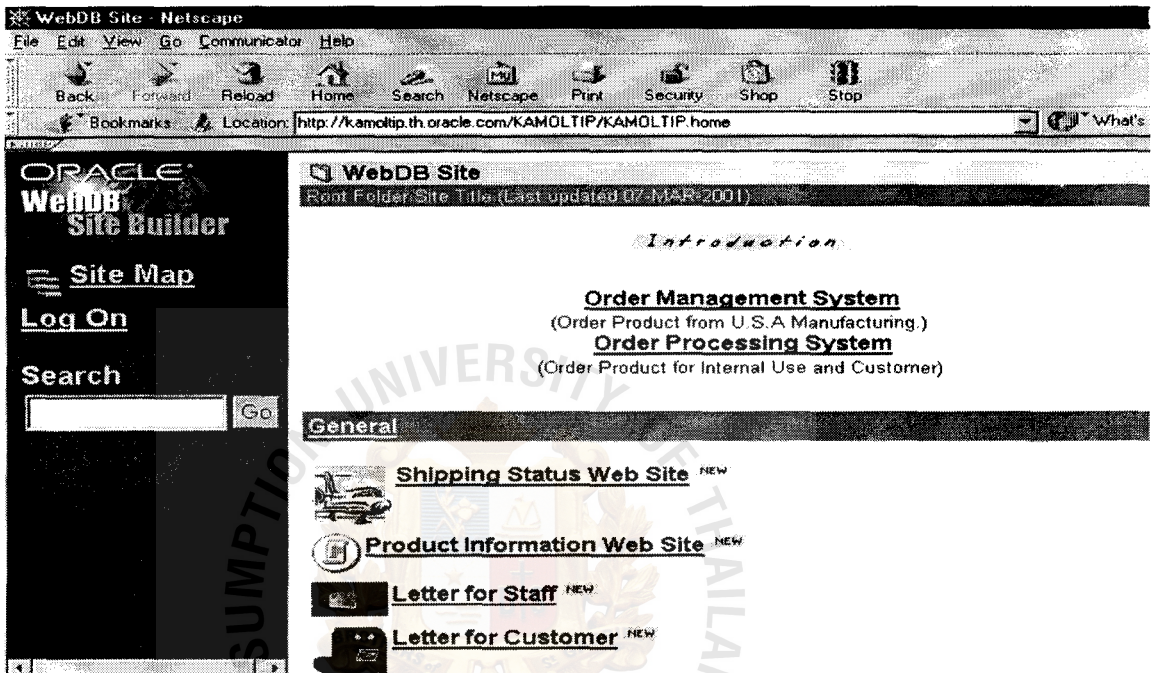


Figure D.1. Screen Present a Whole Web Sites That Related with the Ordering Tracking System on Internet.

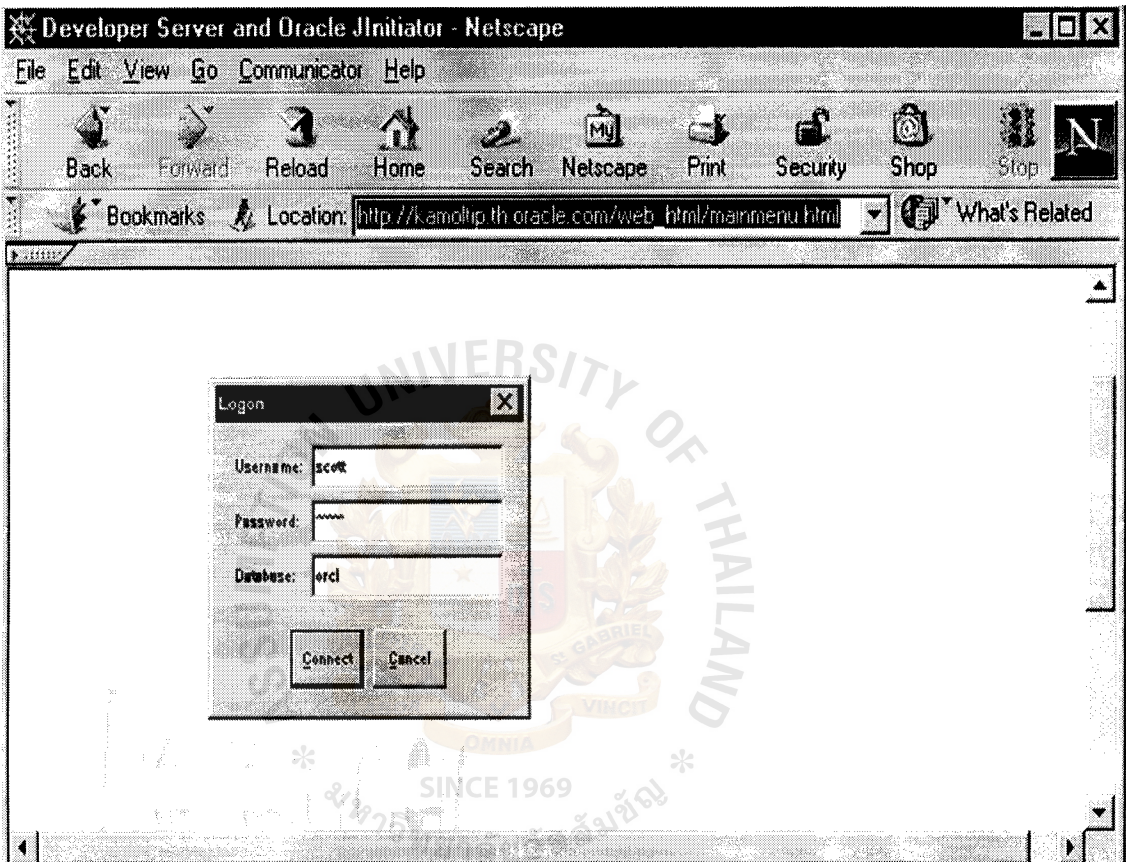


Figure D.2. Logon Screen of Ordering Tracking System.

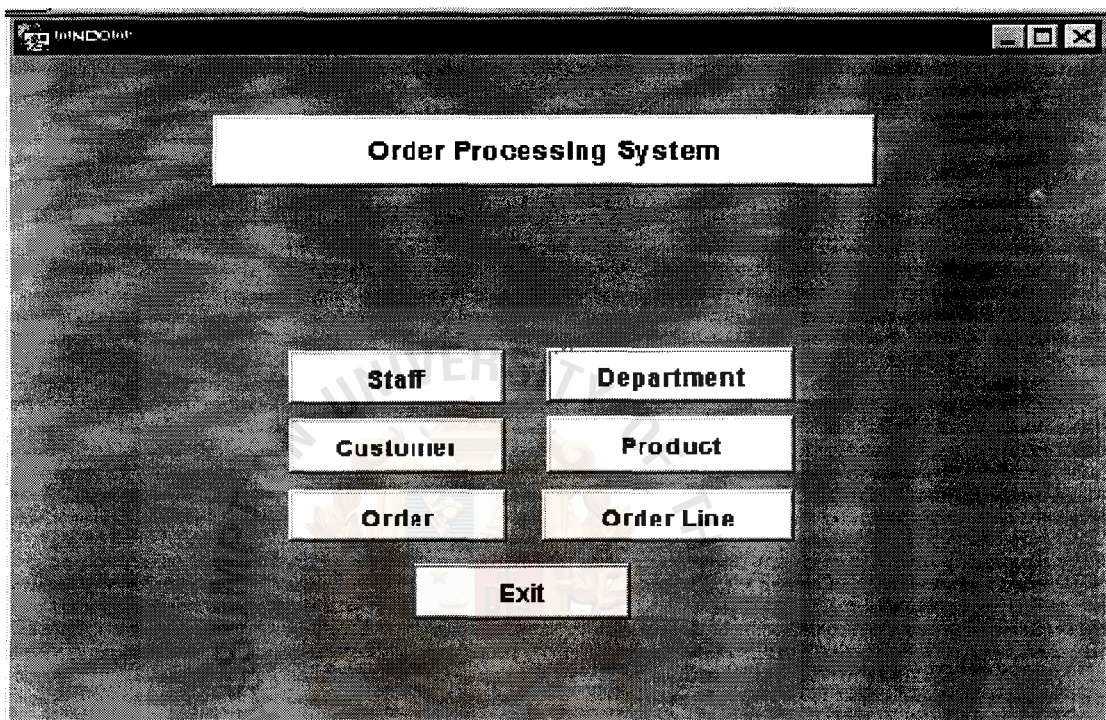


Figure D.3. Main Menu of Ordering Tracking System on Internet.

WINDOW1

Department Information

Main Menu Add Delete Clear Close Staff

Department Information

Department ID 2

Department Name Sales

Figure D.4. Screen for Entering and Inquiry Department.

WIN_STAFF

Staff Information

Main Menu Add Delete Clear Close Order

Staff Information

Staff ID 103

Staff Name Nontawan Chitwattananom

Department ID 1 Department Name

Figure D.5. Screen for Entering Editing Staff.

WIN_CUSTOMER

Customer Information

Main Menu Add Delete Clear Close Order

Customer

Customer ID 202

Customer Name Advanced Info Service Public Co Ltd

Address 15th fl,Shinnawatra tower II, 1291/1 Phaholyothin Rd.,Payathai

City Bangkok

Zip 10400

Contact Person Ms.Pornlipa Vorachit

Tel 299-6230

Fax 299-6214

Figure D.6. Screen for Entering and Inquiry Customer.

WIN_ORDER

Order Information

Main Menu

Add

Delete

Clear

Close

Order Line

Order

Ordend

302

Refno

T039-459

Staffid

103

Staff Name

Bookdate

01-DEC-2000

Orderdate

03-DEC-2000

Delivery Date

15-DEC-2000

Ship Product to

Customerid

207

Customer Name

Ship Company Name

Cannon Hi Tech (Thailand) Co.Ltd.

Ship Address

Hi-Tech Industrial Estate ,89 Moo 1.T.Bhan Lain,Ba

Ship City

Ayuthaya

Ship Zip

13160

Ship Contactpeson

Mr.Kriangkrai Juthawanic

Ship Tel

(035) 350-080

Ship Fax

(035)350100

Project

Specialnotes

Trial Licence

Figure D.7. Screen of Order and Delivery Products.

Staff Information

Find

%

Staffname	Staffid
Adisorn Chanarjanbhorn	108
Aree Archanainant	121
Chaisiri Jiwattanakul	122
Chirisuda Chantarungsri	123
Jiraporn Panacharas	130
Kamoltip Preeyadara	127
Kancharee Chivakul	116
Nontawan Chitwattanagorn	103
Oranong Upalawanna	128
Pattinee Jaokaew	129
Phannipa Tangtirachai	109
Ple	131
Porntevan Partomvong	110
Prateep Laochariyakul	111
Ruentong Srirat	124
Saisei Oyama	117
Saravut Thonglerts	112
Sarawut Jitvivatporn	113
Sayris Pibul	114

Find

OK

Cancel

Figure D.8. Screen for Searching Employees' Name and ID.

Customer Information

Find

%

Customername	Customerid
Advanced Info Service Public Co.Ltd.	202
Advanced Information Technology Co.Ltd.	203
Bangkok Bank Public Co.Ltd.,	204
Berli Jucker Public Co.Ltd.	205
Big C Supercenter Public Co.Ltd.,	206
Cannon Hi Tech (Thailand) Co.Ltd.	207
Cement Thai Chemical Co.Ltd.,	208
Digital Phone Co.Ltd.,	209
Ek-Chor Distribution System Co.Ltd.,	210
F.E.Zuellig (Bangkok) Co.Ltd.,	211
G.E.Capital (Thailand) Co.Ltd.,	212
Government Housing Bank	213
Iris-Itec Co.Ltd.,	214
K.R.Precision Public Co.Ltd.,	215
Logic Co.Ltd.,	216
Makro Office Center Co.Ltd.,	217
Material Automation (Thailand) Co.Ltd.,	218
Nan Yang Knitting Factory Co.Ltd.,	219
Nokia (Thailand) Ltd.,	220
	221

Find

OK

Cancel

Figure D.9. Screen for Searching Customers' Name and ID.

Oracle Forms Runtime

Action Edit Query Block Record Field Window Help

Order Information

Main Menu Add Delete Clear Close Order Line

Orderid	301	Bookdate	06-DEC-2000
Refno	PO.34/200	Orderdate	09-DEC-2000
Staffid	103	Staff Name	
		Delivery Date	08-DEC-2000
Ship Product to			
Customerid	202	Customer Name	
Company	Advanced Info Service Public Co.Ltd.		
Address	15th fl,Shinnawatra tower II, 1291/1 Phaholyothin		
City	Bangkok		
Zip	10400		
Contact	Ms.Porntipa Vorachit		
Tel	299-6230		
Fax	299-6214		
Project			

Delivery date is before Order Date!

Figure D.10. Checking Information of Entering Book, Order, and Delivery Date.

WIN_ORDERLINE

Order Line Information

Main Menu
Add
Delete
Clear
Close
Order

Line ID	Order ID	Product ID	LineUnitCost (US\$)	Qty	LineTotalCost (US\$)
1001	301	10234	40	1	40
	301	10235	40	1	40
	301	22708	30	1	30

Product Name

Figure D.11. Screen of Products' List for Order.

WINDOW1

Product Information

Main Menu Add Delete Clear Close Order

Product Information

Product Id 12403

Product Name Database Compaq Tru 64 OS 4.0 V8.0.6 CD Pack

Product Price 40

Figure D.12. Screen for Entering and Editing Products.



Figure D.13. Shortcut Name for Each Report.

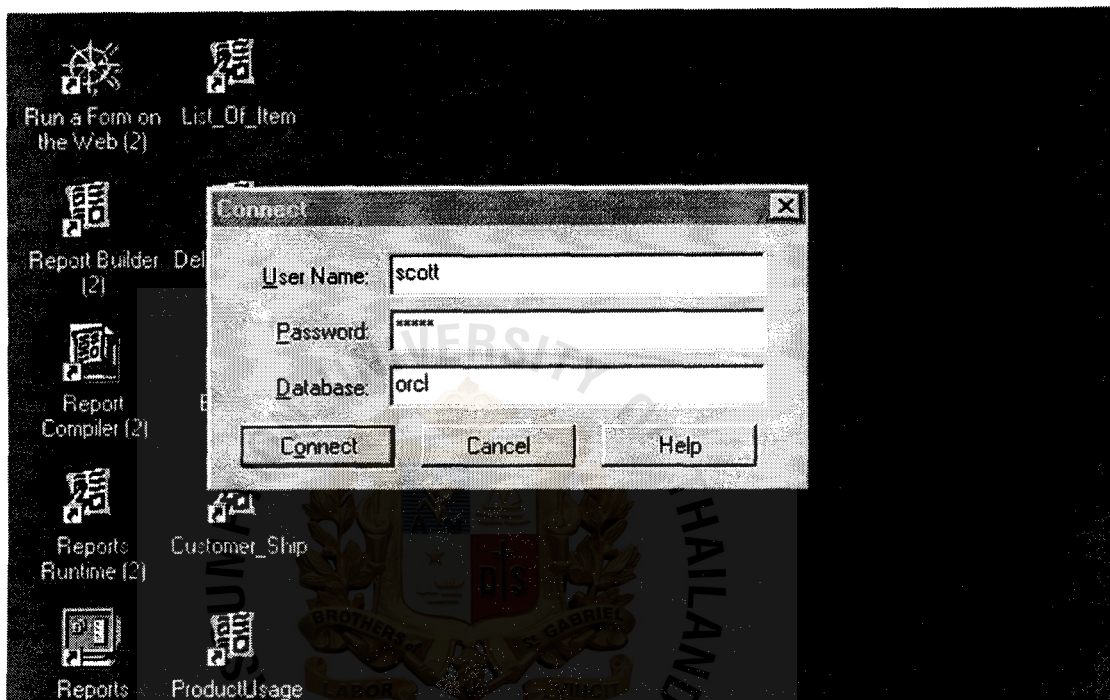


Figure D.14. Screen for Logon into the System for Running Reports.

LISTOFITEM: Runtime Parameter Form

File Edit View Help

Order Item List

Please select bookdate period .

P From Date 05-MAR-01

P To Date 08-MAR-01

(DD-MMM-YY)

Figure D.15. Screen for Entering Date Range to Submit Report.

DELIVERYORDER: Runtime Parameter Form

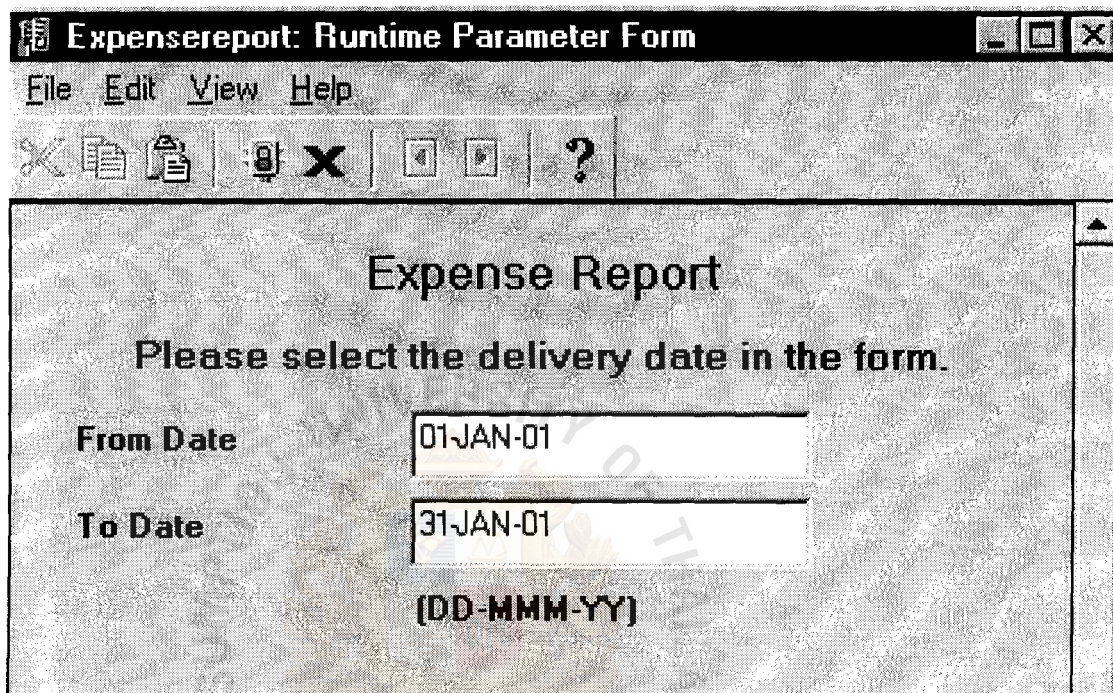
File Edit View Help

Delivery Order

Please fill in order_id in the form

Order Id

Figure D.16. Screen for Printing Delivery Note.



The image shows a screenshot of a software window titled "Expensereport: Runtime Parameter Form". The window has a menu bar with "File", "Edit", "View", and "Help". Below the menu bar is a toolbar with icons for file operations (like save, print, delete) and a help icon. The main content area is titled "Expense Report" and contains the instruction "Please select the delivery date in the form." Below this, there are two date selection fields. The first field is labeled "From Date" and contains the text "01-JAN-01". The second field is labeled "To Date" and contains the text "31-JAN-01". Below these fields, the date format "(DD-MMM-YY)" is displayed. A large, faint watermark is visible across the center of the form, featuring a crest and the text "SASSA SINCE 1969" and "มหาวิทยาลัยอัสสัมชัญ".

Expensereport: Runtime Parameter Form

File Edit View Help

Expense Report

Please select the delivery date in the form.

From Date 01-JAN-01

To Date 31-JAN-01

(DD-MMM-YY)

Figure D.17. * Screen for Choosing Type of Expense for Each Department.

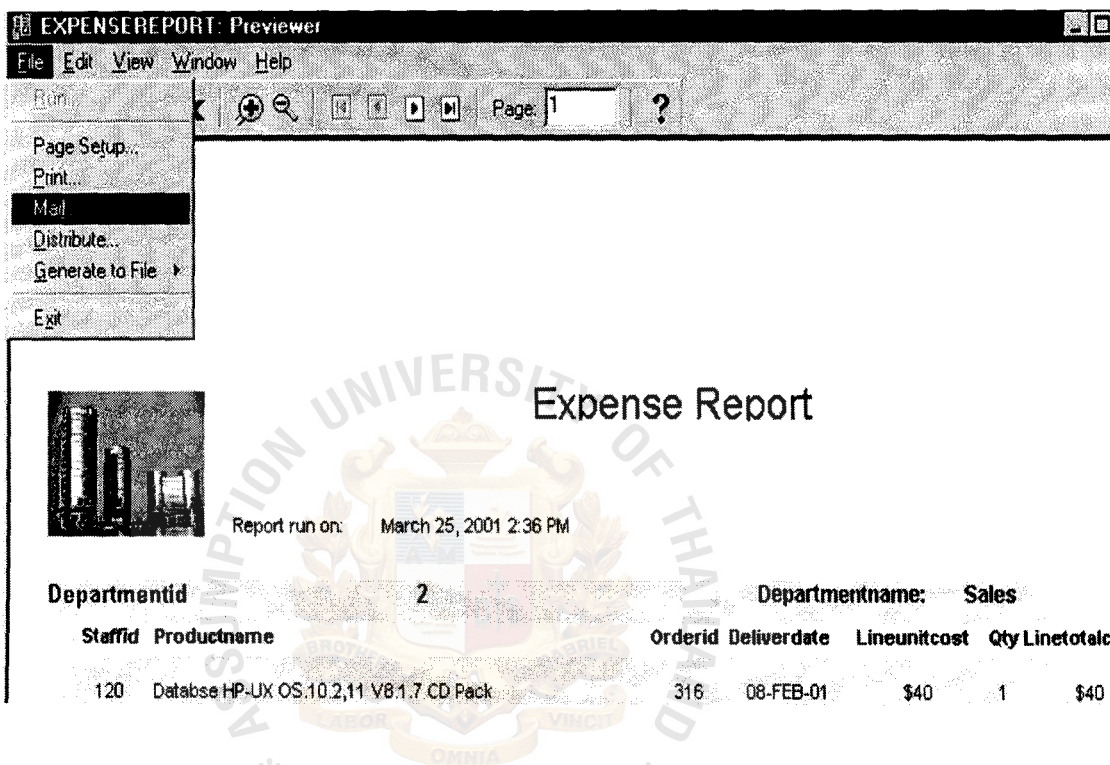


Figure D.18. Screen for Sending Report via Email.

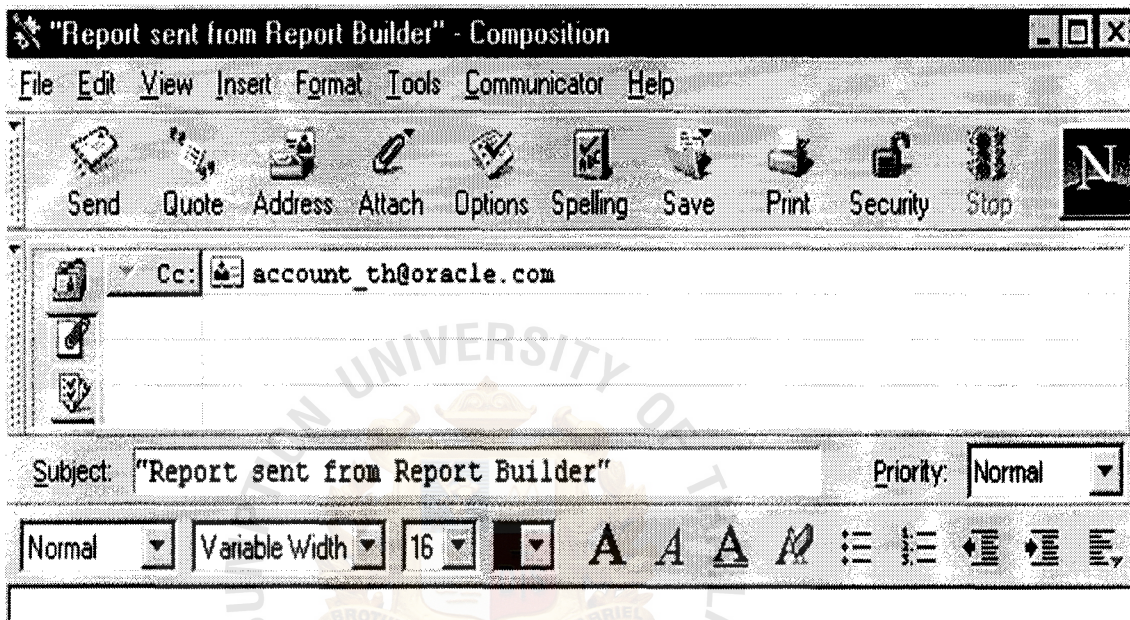


Figure D.19. Screen for Entering Email Name for Sending Report.

Oracle Forms Runtime

Action Edit Query Block Record Field Window Help

WIN_CUSTOMER

Customer Information

Main Menu Add Delete Clear Close Order

Customer Information

Cust_ID	
Company	Material%
Address	
City	

Figure D.20. Screen for Query Information.

Oracle Forms Runtime

Action Edit Query Block Record Field Window Help

WIN_CUSTOMER

Customer Information

Main Menu Add Delete Clear Close Order

Customer Information

Cust_ID	218
Company	Material Automation (Thailand) Co.Ltd..
Address	11th fl.,CTI Tower, 191/85 Ratchadapisek Rd.,Klongto
City	Bangkok
Zip	10110
Contact	Mr.Permphoon Thongs
Tel	261-5100
Fax	261-5109

Figure D.21. Screen Show Information after Press Execute Query Button.

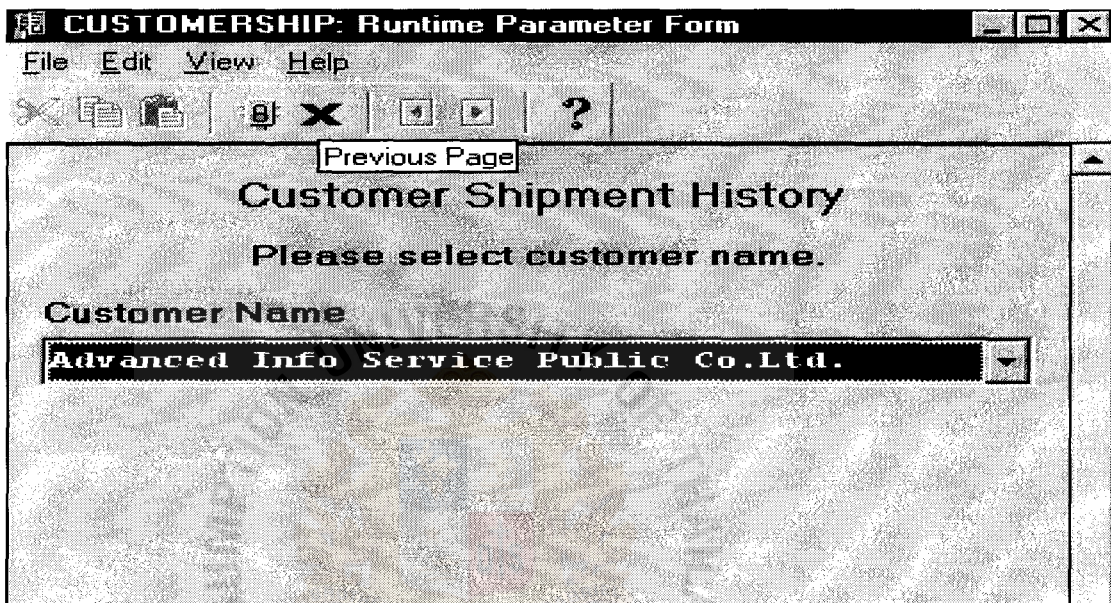


Figure E.22. Screen for Query Information about Delivery for Each Customer.

Report Builder for Windows 95 / NT - [PRODUCTUSAGE: Runtime Parameter Form]

File Edit View Help

X [] [] ?

Product Usage Report

Please select delivery date in the form.

From Date

To Date

(DD-MMM-YY)

Figure D.23. Screen for Query Amount of the Most Product Order.

APPENDIX E
COST ANALYSIS



Table E.1. Cost of Alternative Candidate 1, Baht.

Cost Items	Description	Amount	Unit Price	Price
1. Development Cost:	1.1 Personal Costs:			
	System Analysts (150 hrs./ea)	1	750.00	112,500.00
	System Designer (150 hrs./ea)	1	750.00	112,500.00
	IT Specialist (120 hrs./ea)	2	500.00	120,000.00
	Programmer (120 hrs./ea)	2	300.00	72,000.00
	Subtotal 1:			417,000.00
	1.2 Expense:			
	Training Cost	1	2,000.00	2,000.00
	Setup Cost			5,000.00
	Installation Cost			5,000.00
	Subtotal 2:			12,000.00
	1.3 New Hardware:			
	Server (Upgrade)	1	50,000.00	50,000.00
2. Operating Cost:	Switch (16 ports)	1	14,000.00	14,000.00
	U.P.S.	1	7,000.00	7,000.00
	Network Devices			23,000.00
	Subtotal 3:			94,000.00
	1.4 New Software:			
	Server Software	1	50,000.00	50,000.00
	DBMS Client Software	2	100,000.00	200,000.00
	Subtotal 4:			250,000.00
	Total Development Cost			773,000.00
	2.1 Personnel Costs:			
	Shipping Officer	1	35,000.00	35,000.00
	Subtotal 1:			35,000.00
	2.2 Office supply and Miscellaneous:			
	Stationery			15,000.00
	Paper			30,000.00
	Utility			20,000.00
	Miscellaneous			2,000.00
	Subtotal 2:			67,000.00
	Total Operating Cost			102,000.00
	Total Projected Annual Cost			875,000.00

Table E.2. Payback Analysis of Alternative Candidate 1, Baht.

Cost Item	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Development Cost	-773,000.00	-	-	-	-	-
Operation and Maintenance Cost	-	-102,000.00	-112,200.00	-123,420.00	-135,762.00	-149,338.20
Discount Factors (5%)	1.00	0.95	0.91	0.86	0.82	0.78
Time-Adjust Cost (Adjusted to Present Value)	-773,000.00	-96,900.00	-102,102.00	-106,141.20	-111,324.84	-116,483.80
Cumulative Time-Adjusted Cost Over Lifetime	-773,000.00	-869,900.00	-972,002.00	-1,078,143.20	-1,189,468.04	-1,305,951.84

Remark: Operating and Maintenance Cost Estimated-Annual Growth Rate of 5%

Benefit Derived from Operating of New System	-	516,000.00	567,600.00	624,360.00	686,796.00	755,475.60
Discount Factors (5%)	1.00	0.95	0.91	0.86	0.82	0.78
Time-Adjust Cost (Adjusted to Present Value)	-	490,200.00	516,516.00	536,949.60	563,172.72	589,270.97
Cumulative Time-Adjusted Cost Over Lifetime	-	490,200.00	1,006,716.00	1,543,665.60	2,106,838.32	2,696,109.29

Remark: Benefits Derived from Operation of New System Estimated Annual Growth Rate of 5%

Cumulative Lifetime Time-Adjusted Cost + Benefit	-773,000.00	-379,700.00	34,714.00	465,522.40	917,370.28	1,390,157.45
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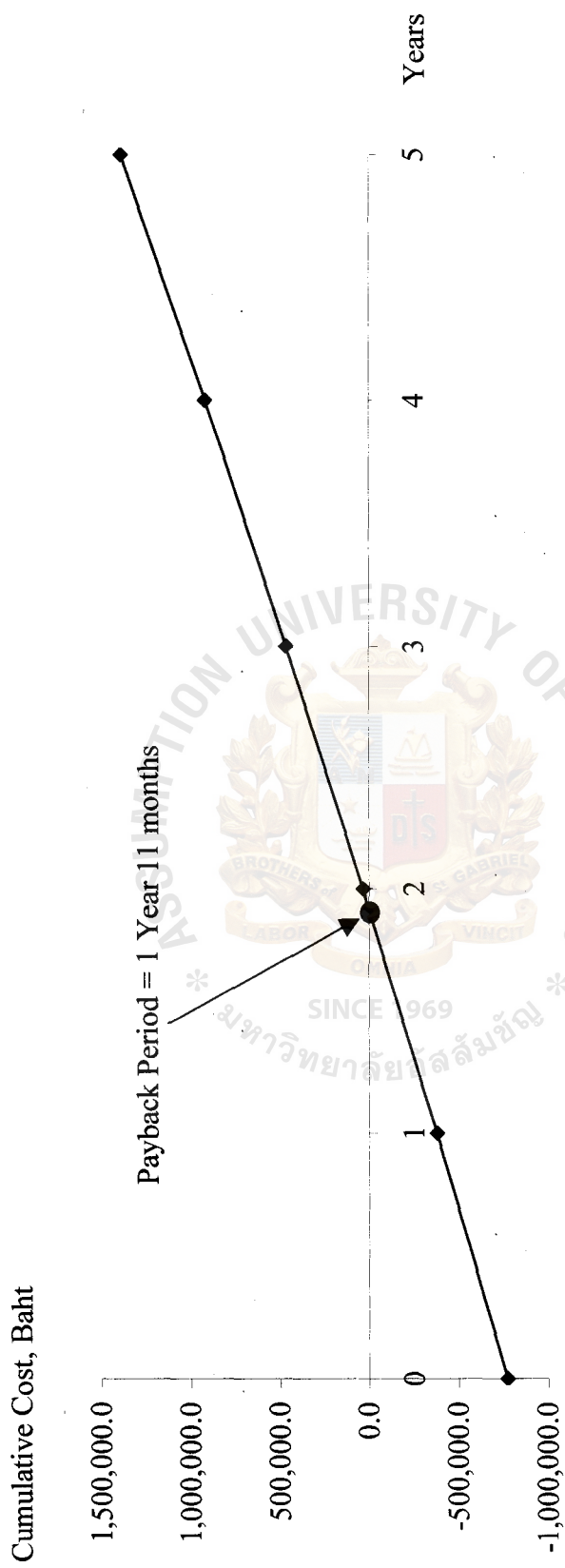


Figure E.1. Payback Period of Candidate 1.

Table E.3. Cost of Alternative Candidate 2, Baht.

Cost Items	Description	Amount	Unit Price	Price
1. Development Cost:	1.1 Personal Costs:			
	System Analysts (150 hrs./ea)	1	750.00	112,500.00
	System Designer (150 hrs./ea)	1	750.00	112,500.00
	IT Specialist (250 hrs./ea)	2	500.00	250,000.00
	Programmer (250 hrs./ea)	2	300.00	150,000.00
	Subtotal 1:			625,000.00
	1.2 Expense:			
	Training Cost	2	10,000.00	20,000.00
	Setup Cost			15,000.00
	Installation Cost			5,000.00
	Subtotal 2:			40,000.00
	1.3 New Hardware:			
	Server (Upgrade)	1	50,000.00	50,000.00
	Switch (16 ports)	1	14,000.00	14,000.00
	U.P.S.	1	7,000.00	7,000.00
	Network Devices			23,000.00
	Subtotal 3:			94,000.00
	1.4 New Software:			
	Server Software	1	50,000.00	50,000.00
	DBMS Client Software	2	13,000.00	26,000.00
	Subtotal 4:			76,000.00
	Total Development Cost			835,000.00
2. Operating Cost:	2.1 Personnel Costs:			
	Shipping Officer	1	35,000.00	35,000.00
	IT Specialist	1	40,000.00	40,000.00
	Subtotal 1:			75,000.00
	2.2 Office supply and Miscellaneous:			
	Stationery			15,000.00
	Paper			30,000.00
	Utility			20,000.00
	Miscellaneous			2,000.00
	Subtotal 2:			67,000.00
	Total Operating Cost			142,000.00
	Total Projected Annual Cost			977,000.00

Table E.4. Payback Analysis of Alternative Candidate 2, Baht.

Cost Item	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Development Cost	-835,000.00	-	-	-	-	-
Operation and Maintenance Cost	-	-142,000.00	-156,200.00	-171,820.00	-189,002.00	-207,902.20
Discount Factors (5%)	1.00	0.95	0.91	0.86	0.82	0.78
Time-Adjust Cost (Adjusted to Present Value)	-835,000.00	-134,900.00	-142,142.00	-147,765.20	-154,981.64	-162,163.72
Cumulative Time-Adjusted Cost Over Lifetime	-835,000.00	-969,900.00	-1,112,042.00	-1,259,807.20	-1,414,788.84	-1,576,952.56

Remark: Operating and Maintenance Cost Estimated-Annual Growth Rate of 5%

Benefit Derived from Operating of New System	-	516,000.00	567,600.00	624,360.00	686,796.00	755,475.60
Discount Factors (5%)	1.00	0.95	0.91	0.86	0.82	0.78
Time-Adjust Cost (Adjusted to Present Value)	-	490,200.00	516,516.00	536,949.60	563,172.72	589,270.97
Cumulative Time-Adjusted Cost Over Lifetime	-	490,200.00	1,006,716.00	1,543,665.60	2,106,838.32	2,696,109.29

Remark: Benefits Derived from Operation of New System Estimated Annual Growth Rate of 5%

Cumulative Lifetime Time-Adjusted Cost + Benefit	-835,000.00	-479,700.00	-105,326.00	283,858.40	692,049.48	1,119,156.73
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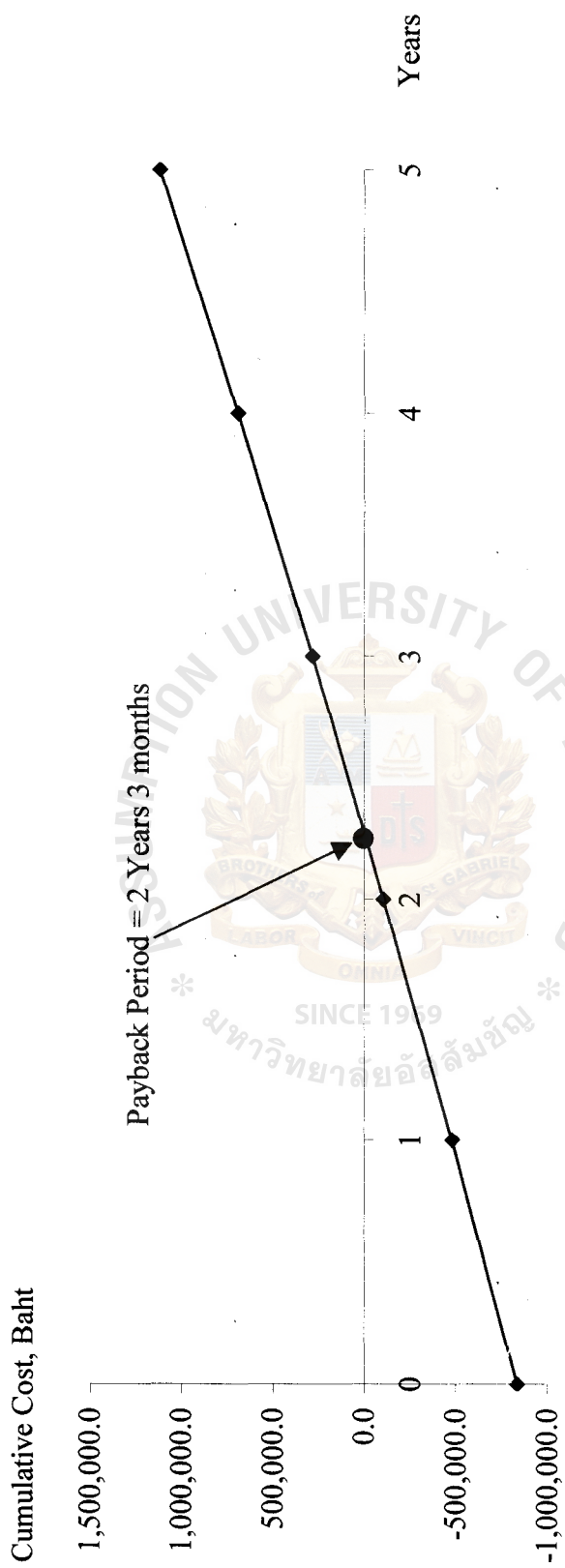


Figure E.2. Payback Period of Candidate 2.

Table E.5. Cost of Alternative Candidate 3, Baht.

Cost Items	Description	Amount	Unit Price	Price
1. Development Cost:	1.1 Personal Costs:			
	System Analysts (150 hrs./ea)	1	750.00	112,500.00
	System Designer (150 hrs./ea)	1	750.00	112,500.00
	IT Specialist (250 hrs./ea)	2	500.00	250,000.00
	Programmer (200 hrs./ea)	2	300.00	130,000.00
	Subtotal 1:			605,000.00
	1.2 Expense:			
	Training Cost	2	8,000.00	16,000.00
	Setup Cost			15,000.00
	Installation Cost			5,000.00
	Subtotal 2:			36,000.00
	1.3 New Hardware:			
2. Operating Cost:	Server (Upgrade)	1	50,000.00	50,000.00
	Switch (16 ports)	1	14,000.00	14,000.00
	U.P.S.	1	7,000.00	7,000.00
	Network Devices			23,000.00
	Subtotal 3:			94,000.00
	1.4 New Software:			
	Server Software	1	8,000.00	8,000.00
	DBMS Client Software	2	10,000.00	20,000.00
	Subtotal 4:			28,000.00
	Total Development Cost			763,000.00
	2.1 Personnel Costs:			
	Shipping Officer	1	35,000.00	35,000.00
	Subtotal 1:			75,000.00
	2.2 Office supply and Miscellaneous:			
	Stationery			15,000.00
	Paper			30,000.00
	Utility			20,000.00
	Miscellaneous			2,000.00
	Subtotal 2:			67,000.00
	Total Operating Cost			102,000.00
	Total Projected Annual Cost			865,000.00

Table E.6. Payback Analysis of Alternative Candidate 3, Baht.

Cost Item	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Development Cost	-763,000.00	-	-	-	-	-
Operation and Maintenance Cost	-	-102,000.00	-112,200.00	-123,420.00	-135,762.00	-149,338.20
Discount Factors (5%)	1.00	0.95	0.91	0.86	0.82	0.78
Time-Adjust Cost (Adjusted to Present Value)	-763,000.00	-96,900.00	-102,102.00	-106,141.20	-111,324.84	-116,483.80
Cumulative Time-Adjusted Cost Over Lifetime	-763,000.00	-859,900.00	-962,002.00	-1,068,143.20	-1,179,468.04	-1,295,951.84

Remark: Operating and Maintenance Cost Estimated-Annual Growth Rate of 5%

Benefit Derived from Operating of New System	-	516,000.00	567,600.00	624,360.00	686,796.00	755,475.60
Discount Factors (5%)	1.00	0.95	0.91	0.86	0.82	0.78
Time-Adjust Cost (Adjusted to Present Value)	-	490,200.00	516,516.00	536,949.60	563,172.72	589,270.97
Cumulative Time-Adjusted Cost Over Lifetime	-	490,200.00	1,006,716.00	1,543,665.60	2,106,838.32	2,696,109.29

Remark: Benefits Derived from Operation of New System Estimated Annual Growth Rate of 5%

Cumulative Lifetime Time-Adjusted Cost + Benefit	-763,000.00	-369,700.00	44,714.00	475,522.40	927,370.28	1,400,157.45
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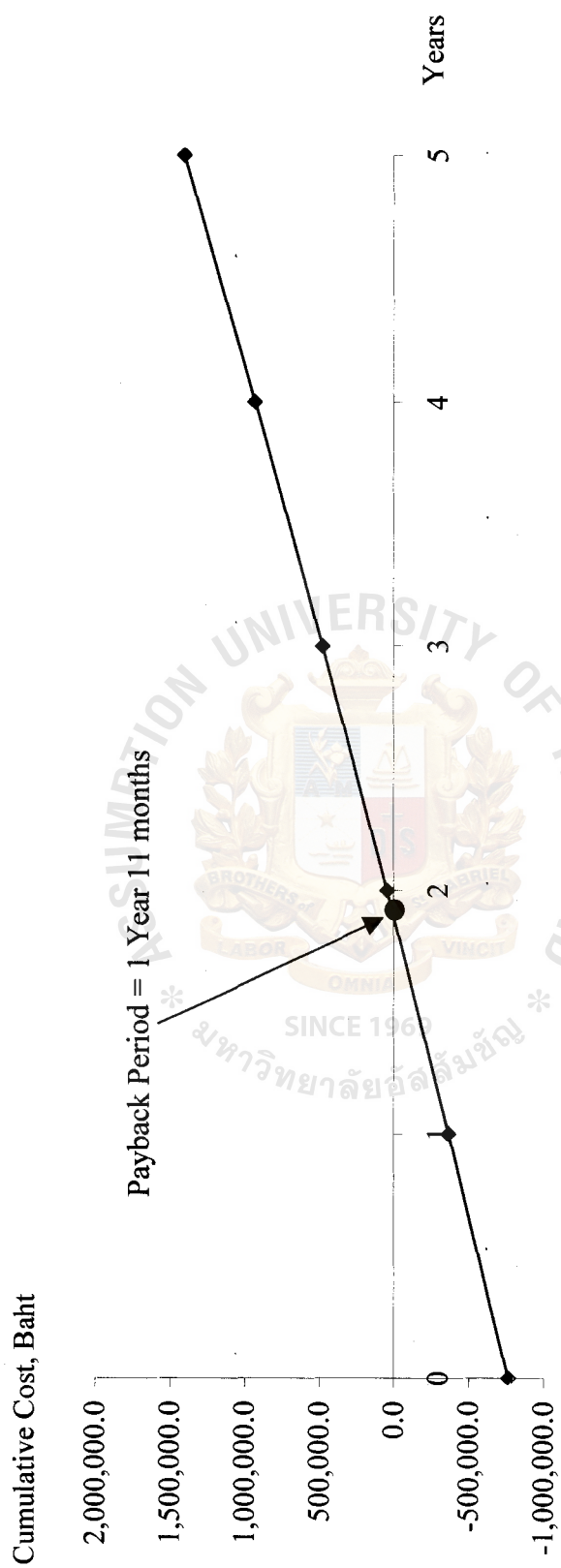
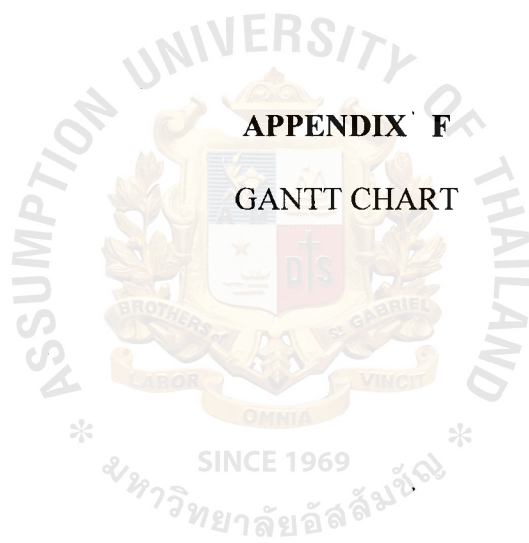


Figure E.3. Payback Period of Candidate 3.

APPENDIX F
GANTT CHART



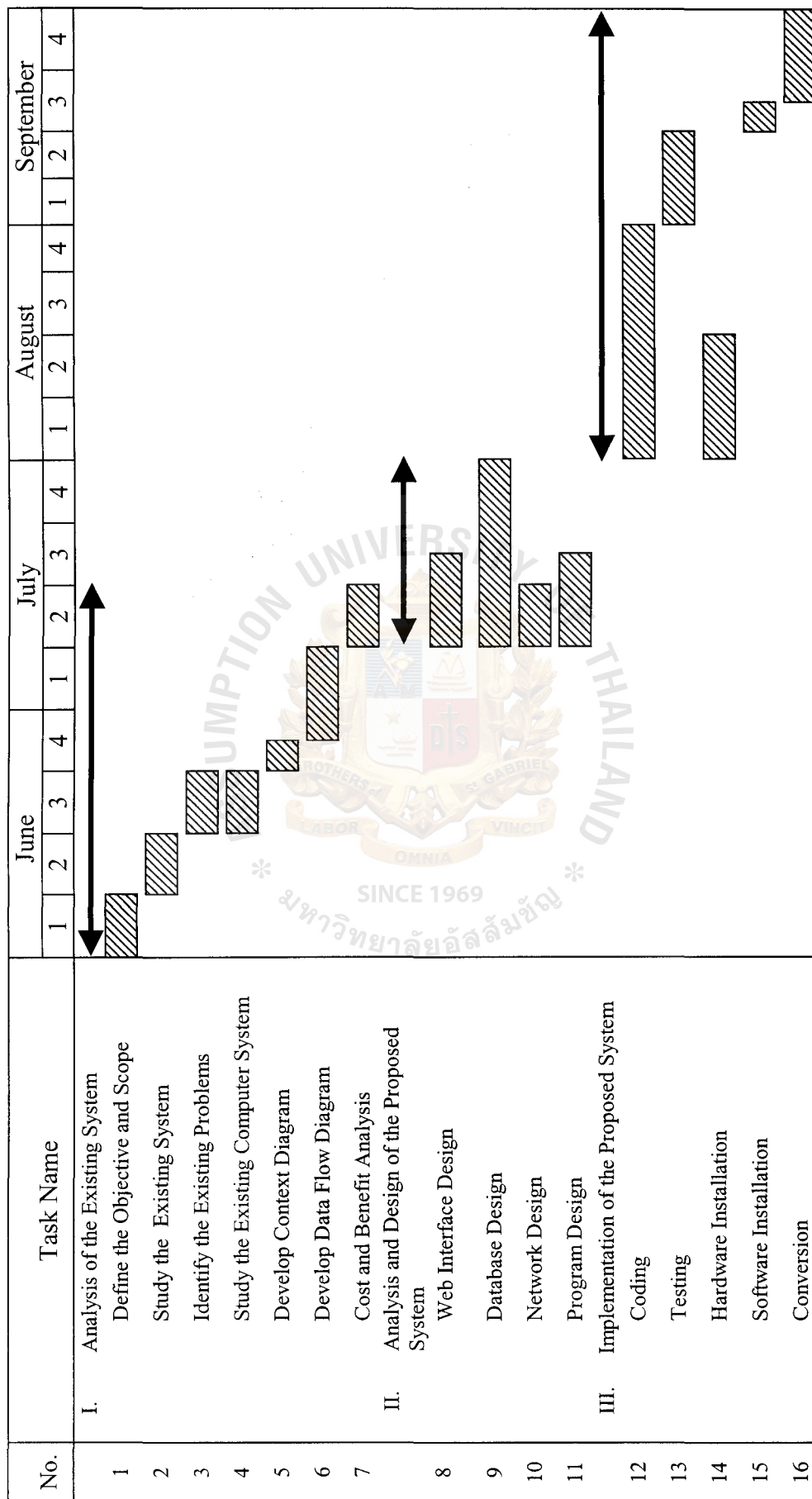


Figure F.1. Project Plan of Ordering Tracking on Internet for Adison Corporation Co., Ltd.

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