Inventory Control System for Snack and Confectionary Distributor

by

Ms. Chantana Amornnarumit

A Final Report of the Six-Credit Course
CS 6998 - CS 6999 System Development Project

Submitted in Partial Fulfillment
of the Requirements for the Degree of
Master of Science
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Project Title	Inventory Control System for Snack and Confectionary Distributor
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Academic Year	July 21, 2002

The Graduate School of Assumption University has approved this final report of the six-credit course, CS 6998 – CS 6999 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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ABSTRACT

Inventory operation is considered a major business function for KS Co., Ltd., a snack and confectionary product distributor. The current inventory control system of the company operates manually and subsequently encounters many serious problems such as time-consuming process of stock checking, human errors, great volume of paperwork and out-of-date information to support the management in its decision making. This project aims to introduce computerization to the existing inventory operation of the company and solve the above problems related to manual operations.

A computerized inventory control system is proposed to replace the existing system. Development of a new system is based on structured system analysis and design approach using well-accepted tools such as data flow diagrams, structure charts, ER diagrams, etc. The new system is implemented and found to greatly contribute to the improvement of the inventory operation of the company. The new system uses computer database to store various information such as customer information, order information, sales information, stock information, etc. Generation of report of various formats can be done more efficiently. Cost-benefit analysis is performed and indicates the worthiness of investment in the new system.

ACKNOWLEDGEMENTS

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Finally, the writer is grateful to her parents and her friends for their support in achieving her educational goal.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

I. INTRODUCTION

1.1 Background of the Project

KS Co., Ltd. is a company of small size, which purchases products such as snacks and confectionary products from manufactures and distributes to customers. KS Co., Ltd. has operated for more than 15 years.

There were not many problems in the past but now the business has grown and the process of selling and purchasing of products occur simultaneously many times. Sometimes, the information about stock was not up to date. Most processes were operated manually by humans who could not cope with a higher amount of and more complicated information. Moreover, those problems caused the wrong analysis and planning for the departments related to the organization. KS would like to solve the problem by using the computer because of its accuracy and speed. It needs to be organized and systematized for the benefits of both the customers and the company.

Because of increasing number of customers and competitors, the existing system, which is operated manually, is not adequate any more. Things have changed and there are many problems. KS decided to develop the Inventory Control System for snack and confectionary distributor by using a new computerized system. The new computerized system will further assist the sole keeper in managing inventory by automatically checking stocks and keeping track of unused items. This computerized system will retrieve the stock information from a database accurately, which is faster than the manual system and also supports large volume of selling and purchasing process. The new system is faster and more accurate in generating reports to support decision-making.

1.2 Objectives of the Project

The objectives of Inventory Control System for Snack and Confectionary Distributor are as follows.

(1) To understand and analyze the current inventory system of the company.

(2) To identify problems and users requirements: Study the requirements of users and design the computer information system according to those requirements.

(3) To use information system analysis as a tool to improve the computer's process and operation by using computer-based information system.

(4) To obtain and provide more accurate, faster and consistent inventory information.

(5) To minimize the paper work.

(6) To improve data controlling and data sharing among related units.

(7) To reduce mistakes and errors of the manual system.

(8) To reduce cost of human resource and office supplies.

1.3 Scope of the Project

This project will cover parts of Inventory Control System which will cover the following functions.

(1) Customer and sales order process

This function is performed to get a customer and sales order and retrieve all necessary information to process an order and generate sale report.

(2) Inventory Control

This function includes entering, searching and updating of product information to support checking available and missing products and

generate an inventory report.

(3) Product Ordering

This function generates product orders, which come from customers and salespeople.

(4) Product Purchasing

This function generates product purchases when needed from suppliers.

(5) Generate report

(a) Sales report

(b) Customer report

(c) Inventory report

(d) Purchasing report

(e) Purchase Order report

(f) Supplier Information report

(g) Best Seller report

(h) Top ten customer report

(i) Safety stock report

1.4 Deliverables

The deliverables of the project on KS Inventory Control System are as follows.

(1) Data Modeling (ER Diagram)

(2) Process Modeling (Context Diagram, Data Flow Diagram)

(3) System Specification (Hardware and software specification)

(4) Input Design (Input Screen)

(5) Output Design (Report from system)

(6) Structured design (Structured Chart)

(7) Process Specification (Detail for each process in system)

1.5 Project Plan

The project plan can be defined as follows:

(1) Analysis of the existing system.

(a) Define the objective and scope.

(b) Study the existing system.

(c) Identify the existing problem.

(d) Develop contextual diagram.

(e) Develop data flow diagram.

(f) Cost and benefit analysis.

(2) Analysis and Design of proposed system.

(a) User Interface design.

(b) Report design.

(c) Database Design.

(d) Network design.

(e) Program design.

(3) Implementation of proposed system.

(a) Coding

(b) Testing.

(c) Hardware Installation.

(d) Software Installation.

(e) Conversion.

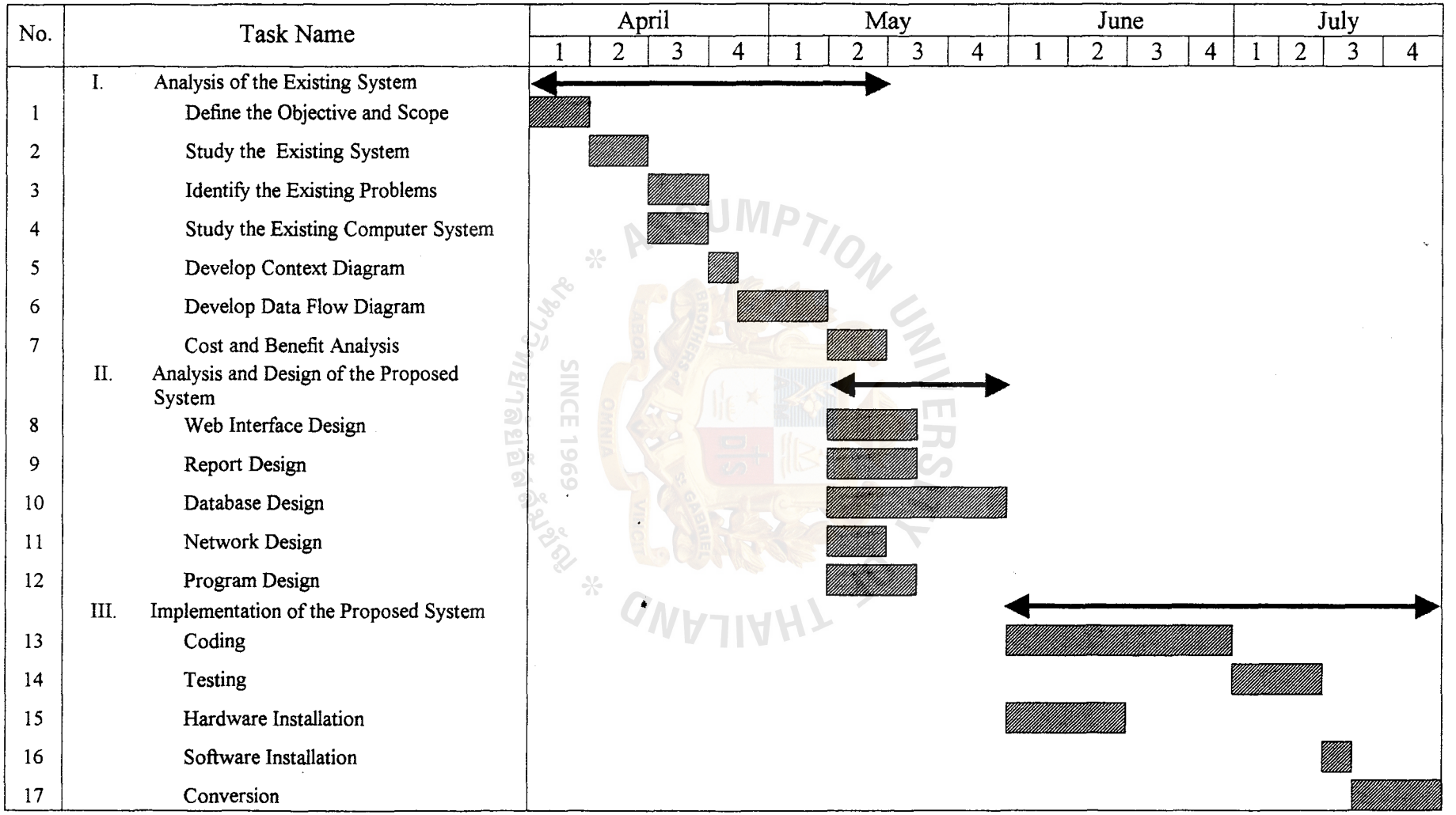

Figure 1.1. Project Plan of Inventory Control System.

II. THE EXISTING SYSTEM

2.1 Background of the Organization

KS Co., Ltd. is a snack , candy and confectionary product distributor. It has been operating for more than 15 years. It was established in 1985. The organization is divided into five departments and has the Managing Director in control. The organization chart for KS Co.,Ltd. is shown in Figure 2.1. Today, the company business is growing with high competition and the company must compete with local and overseas competitors.

The company has to develop and maintain quality and offer the best service according to the customer's needs. Therefore, the company has decided to restructure its organization and to improve the effectiveness of operation. The company must improve and replace the manual system with the computerized system .The computer capability will reduce the company's budget and mistakes in the long run. From the advantages of the computerized system, the company will get more profit sales and will be faster in providing service and transactions. In addition, the system must support and prepare to solve any problem that happens and improve and control security of available data access. Then the company must concentrate on information system especially the inventory information system which supports controlling and managing the product stock.

Any problems that occur within the company must be solved and studied rapidly to prepare for more effective shipping to more customers and control high volume product lines. Thus the proposed system is to manage and improve the inventory information system and to analyze and decide correctly, reduce the cost for duplication and errors and provide more effective and efficient operations in stock management.

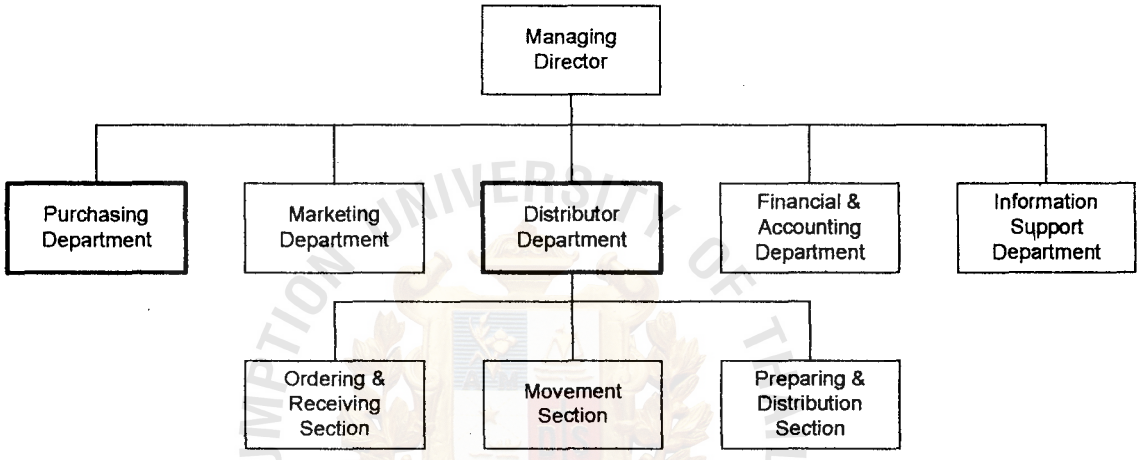

Figure 2.1. Organization Chart of KS Company Limited.

2.2 Current Problems and Areas for Improvement

2.2.1 Current Problems

At present the whole system of KS Co., Ltd. is a manual system which the staff and officers must repeat to operate transaction process many times since there are errors. KS's problems are as follows:

(1) The staff and officers take much time for checking available product after receiving the customer's order.

(2) Inaccuracy in calculation and controlling safety stock of the product. This causes excessive stock of some products and insufficient stock of certain products.

(3) A lot of paper work created by the existing system makes it hard to search for the data and causes the storage problem as data lost or mistakes in recording the data.

(4) The manual system is not efficient for staff and officers in providing the up-to-date information for operating business transactions.

(5) Inefficient data sharing between departments causes delays in decision making and in solving daily problems.

(6) Most reports do not cover all of the information needed. Then the managing department cannot promptly make decisions or solve current problems.

(7) No security control for all documents.

2.2.2. Areas for Improvement.

The company will analyze the whole problem and decide to solve it by using the new system which will be designed to improve in the following:

(1) The improvement of the inventory control system must prepare calculation of stock automatically and correctly by replacing the manual system with

the computer system. The staff can check available products faster and the officers also create transaction reports quickly and accurately. Furthermore, the computer provides faster customer service and yields customer satisfaction.

(2) The company can reduce human labor and human errors by using the new system which has a higher capacity.

(3) The company can control the stock accurately and solve the problem of shortage or excess of product stock by using the new system which is a computer system.

(4) The new system provides more reliable and correct information for decision making and forecasting for management.

(5) The new system can control the security of company information.

The context diagram of the existing system and Data Flow Diagram of the existing system are shown in Figures 2.2 and 2.3.

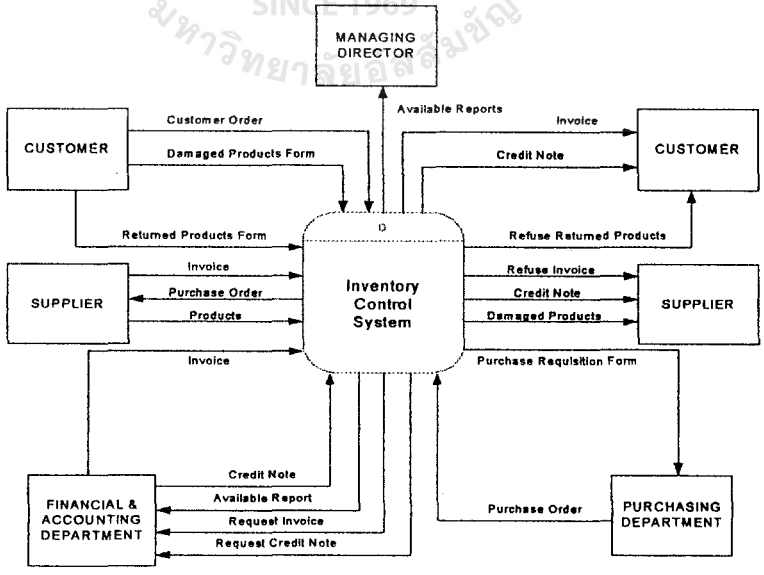

Figure 2.2. The Context Diagram of Existing System.

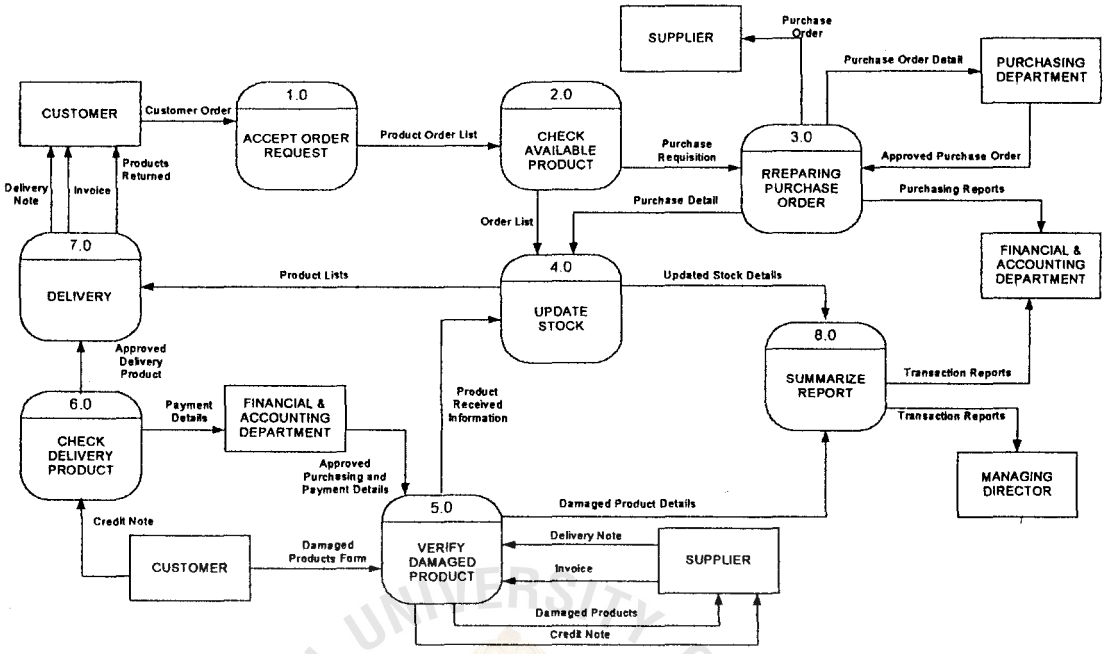

Figure 2.3. Data Flow Diagram of Existing System.

2.3 Existing Manual System

The existing business functions of KS Co., Ltd. can be classified according to each department as follows:

(1) The Purchasing Department is responsible for controlling purchase of each products , maintaining cost, contacting suppliers and attributing purchasing order to each supplier.

(2) The Marketing Department is responsible for receiving and controlling sales order from customers. Moreover, this department also creates market plans and strategies.

(3) The Financial and Accounting Department is responsible for controlling the cash flow of the company and also allocating the budget for operating business transactions.

(4) The Distribution Department is responsible for managing, controlling and distributing products to each customer using the first come first serve basis.

(5) The Information Support Department is responsible for providing the business information and transaction information to support the problem solving.

III. THE PROPOSED SYSTEM

3.1 Requirement Analysis

The user's requirements should be taken into consideration in order to implement the proposed system. Information is gathered process and used as the guideline to design the suitable system to meet the user's requirements and solve problems in the existing system. The new computerized system is designed and implemented to replace the existing manual system. After all the problems are identified and evaluated, the business requirements for the new system can be summarized as follows.

(1) The system should be more reliable and all transactions can be processed easily, fast, accurately and error-freely.

(2) The new system design employs user-friendly interface and all forms created by the new system should be standard.

(3) The proposed system can adjust and update stock at the same time. Then the inventory can be organized easily and can be accessed quickly with updated information. The new system can check product availability quickly and accurately to control order process and stock control.

(4) The system has the security control which allows only authorized staffs to login into the system with their usernames and passwords.

(5) The proposed system can reduce the task redundancy and enable sharing of information between departments. Furthermore, the information is updated automatically, which saves time for each transaction.

(6) Reports can be generated faster and more accurately with the proposed system. These reports can be used to analyze and prepare business planes.

(7) The product in and out can be updated simultaneously. Then the company can manage and control the flow of distributing products to each customer faster and more correctly.

(8) The new system has the EOQ model (Economic Order Quantity), which helps the company to determine the best order size using a cost minimization approach.

3.2 System Analysis

For better understanding of the new system requirement, the logical model is drawn to describe the system independent of any technical implementation. In this project, data modeling and process modeling techniques are used to document business requirement. The details of each technique are described as follows.

Data Modeling

It is a technique for defining, organizing and documenting a requirement of the system's data. The data model is called an entity relationship diagram (ERD) which is the most popular technique of data modeling.

The fundamental entities in the proposed system are customer, order, purchase, product and supplier. There are three levels of data model developed: context data model, key-based data model and fully attributed data model.

The context data model represents entities and nonspecific relationship entities. Context Data Model of the proposed system is illustrated in Appendix A.

The next data model is "Key based data model". It contains more details of each entity; the primary and foreign key are added to specific entities. It eliminates nonspecific relationship entities. Customer, product and supplier have a single attribute primary key. Customer order, order, purchase order, order product, purchase and supplier purchase have two attributes.

The last data model is "Fully attributed data model". It shows all attributes of each entity that are captured and stored in the database. It requires the understanding of the data attributes for the system before determining all attributes.

The complete entity relationship diagram of the proposed system is shown in Appendix A.

Process Modeling

The process modeling is a technique for showing how those data are captured and used. To construct the process model, the context diagram is firstly drawn to establish the initial project scope which shows how the system interfaces to other systems, businesses and external organizations. Figure 3.1 illustrates the context diagram of the proposed system. There are five external entities, which are Managing Director, Purchasing Department, Customer, Supplier and Financial & Accounting Department.

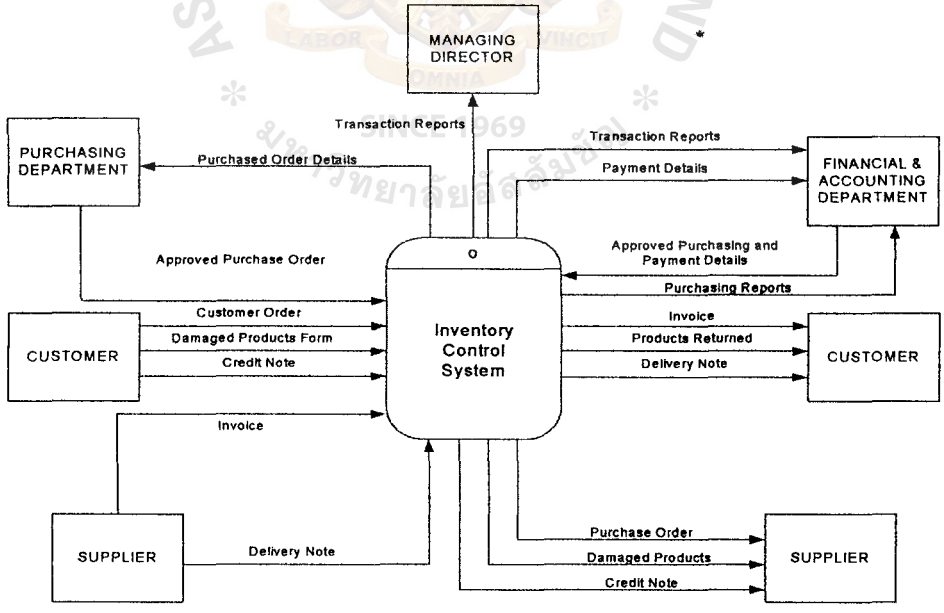

Figure 3.1. Context Diagram of Proposed System.

After the Context Diagram is defined, the next step is the functional decomposition diagram, which is created to show the top-down structure of a system. It is the outline and scope for drawing the data flow diagram. The functional decomposition diagram of the Proposed System is shown in Figure 3.2.

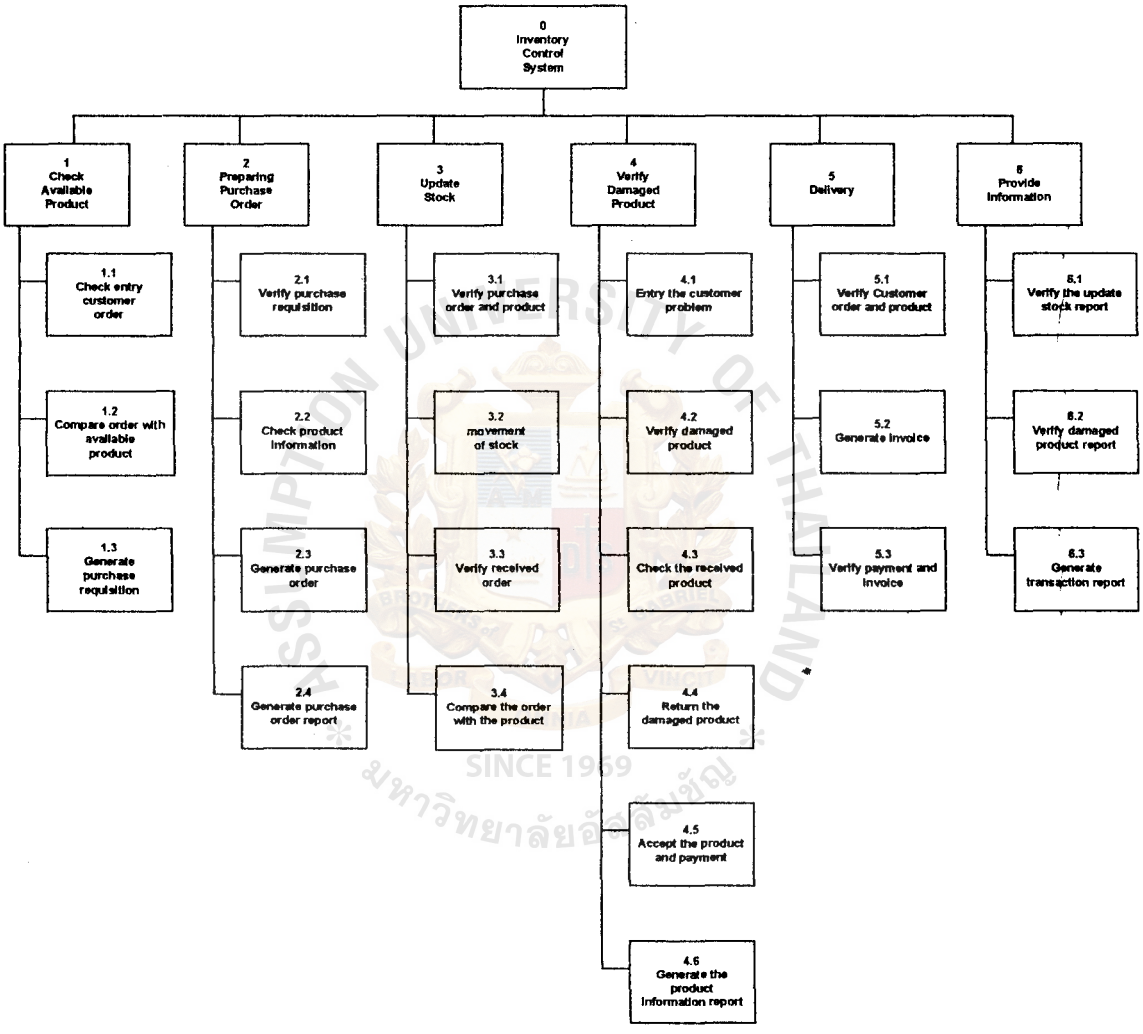

Figure 3.2. Functional Decomposition of Proposed System.

The next step is to draw data flow diagram (DFD) which consists of processes, data store, external entities and data flow. Data Flow Diagram has many levels of details which used the technique of functional decomposition to create it. The details of each main process can be explained as follows:

(1) Checking available stock process.

The process is to get order from customers and check the quantity of each product in the stock.

(2) Preparing purchase order process.

After receiving purchase requisition and getting approved purchase order from the purchasing department, this process will check the supplier information and send purchase order to each supplier.

(3) Update stock process.

This process will update stock information of product from customer orders and receive product from suppliers. This process also includes checking and controlling the movement of stock.

(4) Verify damaged product process.

This process verifies damaged products from customers and checks details of received products.

(5) Delivery process.

This process checks customer orders and verifies customer payments before preparing delivery of products to customers.

(6) Provide information process.

This process generates whole transaction reports and sends them to top management and some concerned department.

Figure 3.3. Shows the Data Flow Diagram of Proposed System. The lower levels of the Data Flow Diagram are shown in Appendix B.

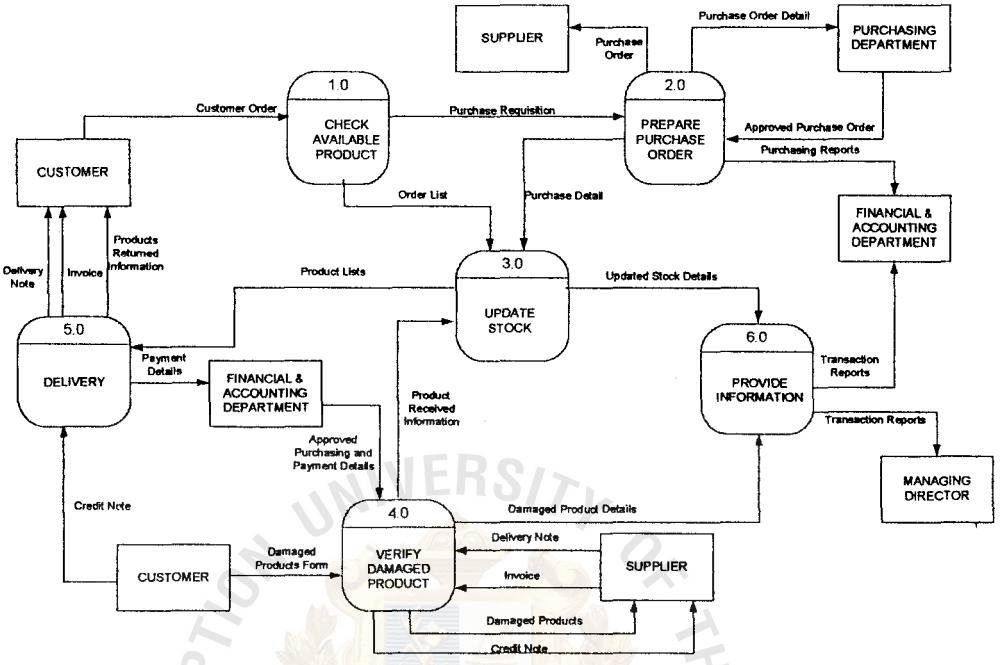

Figure 3.3. Data Flow Diagram of Proposed System.

3.3 System Design

The new system design was created to meet all the user's requirements and to solve the current problems of the company. The computerized system is introduced to improve the working performance of all departments and provide an efficient and accurate data that enables management to plan and forecast the market and sales trends.

The previous requirement analysis section is focused on the logical aspects of the system but the system design will emphasize the system implementation. There are many design techniques to construct the system to achieve the objective of the project. And the details of each design technique are explained as follows.

Candidate Solution Analysis

The alternative candidate solution comes from the development team and users. From reviewing the system specification, there are three candidate solutions for the proposed system.

(1) Candidate 1: MS C ++ & MS SQL Server 7.0

MS C ++ is used for application development tool and MS SQL Server 7.0 for database. MS C ++ is an easy development tool, which facilitates the development of the new application and also easier to create database.

(2) Candidate 2: Oracle Developer 2000 & Personal Oracle 8.0

Oracle Developer 2000 is the development tool in this solution and DBMS is the Personal Oracle 8.0. This solution supports a multi-user environment and relational database technology. But this solution is rather difficult to use and implement.

(3) Candidate 3: MS Visual Basic 6.0 & MS SQL Server 7.0

MS Visual Basic 6.0 is a very popular development tool. With this solution, MS Visual Basic 6.0 is the visual style which makes it easier to develop and implement. For DBMS, MS SQL Server 7.0 is chosen since it is suitable for Window platform.

The candidate solution needs to be analyzed to get more details. The Candidate system matrix is used to explain the characteristics of each alternative as shown in Table 3.1.

Table 3.1. Candidate System Matrix.

Characteristics	Candidate 1	Candidate 2	Candidate 3
Portion of System Computerized Brief description of that portion of the system that would be computerized in this candidate.	Fully supports all relevant units that are involved in inventory management process	same as candidate 1	same as candidate 1
Benefits Brief description of the business benefits that would be realized for this candidate.	Easy to develop and implement.	Powerful DBMS and application that perform tasks more efficient.	Application development and Implementation is easy with fast learning and can be modified as user needs.
Server and Workstations A description of the server and workstation needed to support this candidate.	Server: Pentium4 2.0 GHz PC : Pentium 4 1.5 GHz	Server: Pentium4 2.0 GHz PC : Pentium 4 1.5 GHz	Server: Pentium4 2.0 GHz PC : Pentium 4 1.5 GHz
Software tools needed Software tools needed to design and build the candidate (eg., database management system, emulators, operating system, language etc,) Not generating applicable if applications software package are to be purchased.	Windows 2000 Server Windows ME MS C ++ MS SQL Server 7.0	Windows 2000 Server Windows ME Developer 2000 Personal Oracle 8.0	Windows 2000 Server Windows ME MS Visual Basic 6.0 MS SQL Server 7.0
Application software A description of the software to be purchased, built, accessed, or some combination of these techniques.	Custom Solution	Custom Solution	Custom Solution
Method of data processing Generally some combination of: on-line batch, deferred batch, remote batch, and real-tome.	Database stored on server and processed on workstation	Oracle users a two-tier Client/Server architecture with a powerful database server.	Same as candidate 1.
Output Devices and Implications. A description of output devices that would be used, special output requirements(eg., network, preprinted form,etc) and output considerations (eg., timing constraints)	Display Monitor Canon LBP 810	Display Monitor Canon LBP 810	Display Monitor Canon LBP 810
Input Devices and Implications A description of input methods to be used, input devices (eg., keyboard, mouse,etc) special input requirements(eg.' new or revised form of which data would be input) and input considerations(eg., timing of actual inputs)	Keyboard and mouse	Keyboard and mouse	Keyboard and mouse
Storage Devices and Implications Brief description of what data would be stored, what data would be accessed from existing stores, what storage media would be used, how much storage capacity would be needed, and how data would be organized.	MS SQL Server DBMS with 20 GB storage capacity.	Oracle DBMS with 50 GB storage capacity.	MS SQL Server DBMS with 30 GB storage capacity.

Feasibility Analysis

Once alternative candidates are identified, the feasibility of each candidate is then analyzed. The following are the four criteria for evaluating the feasibility of each solution.

(1) Operational feasibility

It measures whether the candidate solution fulfills the user's requirements or not and to what degree. Candidate 2 can satisfy user requirements better than other solutions with powerful functions.

(2) Technical feasibility

It measures the practicality of the candidate solution. It determines whether the company has the necessary technology, technical resources and expertise in using the candidate solution or not. Candidate 2 is the most difficult to implement. Although the other two solutions are slightly different in technical implementation, they are still easier than candidate 2.

(3) Schedule feasibility

It indicate whether the solution can be designed and implemented within an acceptable period or not, Candidate 3 takes only four months to develop and implement; however, candidate 1 is also take four months to develop.

(4) Economic feasibility

It identifies whether the solution is cost-effective or not. In order to determine the economic feasibility, cost benefit analysis techniques are applied. Candidate 3 is the most economical as it consumes the smallest

amount of investment with the shortest payback period, while candidate 2 takes the largest investment among all candidate solutions.

Once all feasibility criteria are evaluated, the weight of each criterion must be identified for evaluating the candidate solution. Candidate 3 is the most suitable alternative for the proposed system, because it takes the lowest development time and cost with acceptable performances. The analysis results are shown in Table 3.2 below.

Table 3.2. Feasibility Analysis Matrix.

Feasibility Criteria	Wt.	Candidate 1	Candidate 2	Candidate 3
Operational Feasibility Functionality. A description as to what degree the candidate would benefit the organization and how well the system would work. Political, A description of how well received this solution would be from user management ,user, and organization perspective	30%	Fully support the user requirement in terms of both functionality and business process Score:90	Fully support the user requirement in terms of both functionality and business process Furthermore, it provides a space for further development Score:90	Fully support the user requirement and implementation because additional software is required for PC. Score:90
Technical Feasibility Technology. An assessment of the maturity, availability (or ability to acquire), and desirability of the computer technology needed to support this candidate. Expertise. An assessment of the technical expertise needed to develop, operate, and maintain the candidate system.	20%	Microsoft SQL Server is Company standard for DBMS. While MS C ++ is application development, Microsoft C ++ 6.0 MS SQL Server 7.0 Score:80	Oracle is the leading DBMS software that provides high efficiency. But programmers have little experience with Oracle product. This requires the continuous training course for operating and maintaining the system. Score:75	Programmer is familiar with MS products therefore this reduces development process. Microsoft Visual Basic 6.0 and MS SQL Server 7.0 Score:85
Economic Feasibility Cost to develop (Baht) Payback Period: Net present value (Baht): Detailed calculations:	30%	 Approximately 234,500 Approximately 1.75 Yrs. Approximately 458,919 See Appendix C Score:90	 Approximately 276,000 Approximately 2.14 Yrs. Approximately 294,174 See Appendix C Score:80	 Approximately 214,500 Approximately 1.6 Yrs. Approximately 478,919 See Appendix C Score:95
Schedule Feasibility An assessment of how long the solution will take to design and implement.	20%	Approximately 5 months Score:80	Approximately 6 months Score:70	Approximately 4 months Score:90
Ranking	100%	86	80	90.5

3.4 Hardware and Software Requirement

The appropriate hardware and software specification are important for changing to the new system and save cost in implementing a new system. Decision to change to proposed system need a consideration about the cost of the existing system and the proposed system.

In this project, we focus on the network system. We will increase the efficiency of the system by changing from stand-alone system to network system.

The star topology is the best choice for connecting 4 workstations and 1 server. The hardware and software specification are shown in the Tables 3.3 – 3.7. The network architecture of the proposed system is shown in Figure 3.4.

Table 3.3. The Hardware Specification for the Server.

Hardware	Specification
CPU	Pentium 4 2.0 GHz
Cache Memory	256 KB
Primary Memory	256 MB
Hard Drive	60 GB
Floppy Drive	3.5" 1.44 MB
CD-Rom Drive	52X
Input Device	Keyboard 104 keys, Mouse
Network Adapter	3COM 10/100 Mbps
Display Monitor	17" SVGA

Table 3.4. The Hardware Specification for the Workstation.

Hardware	Specification
CPU	Pentium 4 1.5 GHz
Cache Memory	256 KB
Primary Memory	128 MB
Hard Drive	20 GB
Floppy Drive	3.5" 1.44 MB
CD-Rom Drive	52X
Input Device	Keyboard 104 keys, Mouse
Network Adapter	3COM 10/100 Mbps
Display Monitor	15" SVGA

Table 3.5. Other Hardware Specifications.

Hardware	Specification
Printer	CANON LBP 810
Scanner	ACER Scan Prisa S2W 3300
HUB	8 port
UPS	DOUBLE-G 1000 VA

Table 3.6. Software Specifications for Server.

Software	Specification
Operation System	Microsoft Window 2000 Server
Application Server	Microsoft Visual Basic 6.0
Database Server	Microsoft SQL Server 7.0

Table 3.7. Software Specification for Client computer.

Software	Specification
Operation System	Microsoft Window Me
Application Software	Microsoft Office 98

3.5 Security and Control

Security for the computer system is important and one which has appropriate protection for the computer system. It is not only the day-to-day protection of the computer hardware and software, but also the integrity, privacy and accuracy of data. The principal requirement of security standard is preventing unauthorized access and alteration to the system.

The proposed system will provide the method in controlling and protecting the security problem in the following:

(1) User Access Control

The system must have the user identities (ID) and passwords are assigned to authorized users. The user who responds to use the system must be specified in advance before granting the level of accessing to the system. The system will check the user ID and password and allow only authorized users to access the system information.

For managers, they have their controlled own administrative IDs for access to all systems and respond to assigned and normal users.

(2) Data Access Control.

All data can be updated or modified depending on the level of authorized users. The staffs are allowed to only inquire about the data and

update some part of the data. But the manager can access and update the whole data system.

(3) Auditing

The system must have audit to prevent altering the data in the system. The Auditor is responsible for monitoring the changing of system and controlling accessing by users.

(4) Back up and Recovery.

The system must back up files on a daily, weekly and monthly basis to make the system more confident and ensure that all the data are available. And the recovery process of the system must ensure that all relevant staff knows how to restore data and system.

(5) File Server Security Control.

File Server Security Control will be given both hardware and software. For the hardware, the server should be kept in a locked room which only the authorized persons can enter.

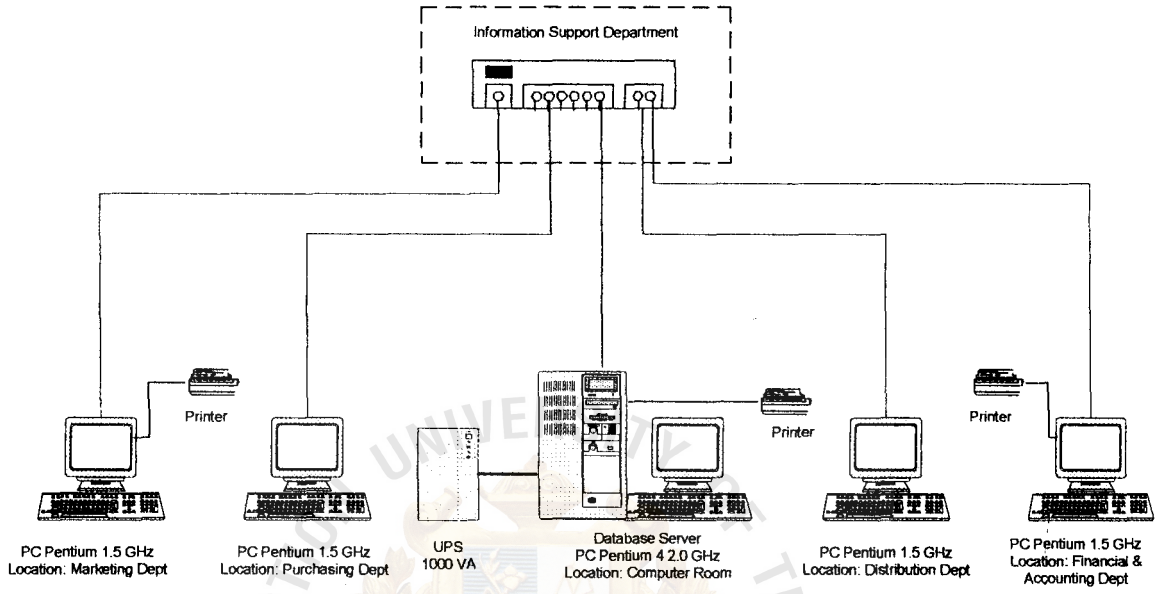

Figure 3.4. Network Configuration of the Proposed System.

3.6 Cost/Benefit Analysis

The comparing of cost and benefit between the existing system and the proposed system is the reason for replacing the existing system with the proposed system. The cost information for both systems is shown in table and figures form which provide or clear picture of cost comparison between both system.

Moreover, the benefits of the new system are presented in tangible and intangible terms. And the break-even analysis and payback period analysis are used to show the benefit over cost after implementation of the proposed system.

(1) Cost of the existing system.

Cost of the existing system is the staff cost since the system operates manually. The cost is classified into fixed cost and operating cost. The details of the existing cost are shown in Table 3.8.

(2) Cost of the proposed system.

There are various costs associated with the development of the proposed system which is divided into fixed cost and annual operating cost. The cost includes hardware cost, software cost, people ware cost and also includes maintenance cost that specifies the cost for keeping the equipment in good condition.

The new computerized system reduces the number of staffs and officers but it requires some investment in computer hardware and software. The details of the cost of the proposed system are shown in Table 3.10.

(3) Comparison of system costs.

The comparison of the system costs between the existing system and proposed system is summarized in Tables 3.9 and 3.11.

Table 3.8. Existing System Cost Analysis, Baht.

Cost items		Years				
		1	2	3	4	5
Fixed Cost						
Laser Printer	1 unit @ 12,000	2,200.00	2,200.00	2,200.00	2,200.00	2,200.00
Calculator	4 units @ 1000	800.00	800.00	800.00	800.00	800.00
Total Fixed Cost		3,000.00	3,000.00	3,000.00	3,000.00	3,000.00
Operating Cost						
Salary Cost:						
Inventory Manager	1 person @ 25,000	25,000.00	27,500.00	30,250.00	33,275.00	36,602.60
Staff :						
Stock officer	2 persons @ 10,000	20,000.00	22,000.00	24,200.00	26,620.00	29,282.00
Receiving clerk	3 persons @ 9,000	27,000.00	29,700.00	32,670.00	35,937.00	39,530.70
Dispatch officer	2 persons @ 7,000	14,000.00	15,400.00	16,940.00	18,634.00	20,497.40
Total monthly salary Cost		86,000.00	94,600.00	104,060.00	114,466.00	125,912.60
Total Annual Salary Cost		1,032,000.00	1,135,200.00	1,248,720.00	1,373,592.00	1,510,951.20
Office Supplies & Miscellaneous Cost:						
Stationary	Per Annual	9,000.00	9,900.00	10,890.00	11,979.00	13,176.90
Paper	Per Annual	13,000.00	14,300.00	15,730.00	17,303.00	19,033.30
Utility	Per Annual	32,000.00	35,200.00	38,720.00	42,592.00	46,851.20
Miscellaneous	Per Annual	8,500.00	9,350.00	10,285.00	11,313.50	12,444.85
Total Annual Office Supplies & Miscellaneous Cost		62,500.00	68,750.00	75,625.00	83,187.50	91,506.25
Total Annual Operating Cost		1,094,500.00	1,203,950.00	1,324,345.00	1,456,779.50	1,602,457.45
Total Manual System Cost		1,097,500.00	1,206,950.00	1,327,345.00	1,459,779.50	1,605,457.45

Table 3.9. Five-Year Accumulated Manual System Cost, Baht.

Year	Total Manual Cost	Accumulated Cost
1	1,097,500.00	1,097,500.00
2	1,206,950.00	2,304,450.00
3	1,327,345.00	3,631,795.00
4	1,456,779.50	5,088,574.50
5	1,605,457.45	6,694,031.45
Total	6,694,031.95	-

Table 3.10. Estimated Cost of Proposed System, Baht.

Cost items	Years				
	1	2	3	4	5
Fixed Cost					
Hardware Cost:					
Computer Server Cost 1 Unit@60,000	12,000.00	12,000.00	12,000.00	12,000.00	12,000.00
Workstation Cost 4 Units@25,000	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00
Laser Printer 2 Unit@12,000	4,800.00	4,800.00	4,800.00	4,800.00	4,800.00
Scanner 1 Unit@5,500	1,100.00	1,100.00	1,100.00	1,100.00	1,100.00
HUB 1Unit@12,000	2,400.00	2,400.00	2,400.00	2,400.00	2,400.00
UPS 1000 VA 1Unit@5,500	1,100.00	1,100.00	1,100.00	1,100.00	1,100.00
NIC 5Units@1,200	1,200.00	1,200.00	1,200.00	1,200.00	1,200.00
UTP cable	500.00	500.00	500.00	500.00	500.00
Total Hardware Cost	43,100.00	43,100.00	43,100.00	43,100.00	43,100.00
Maintenance Cost	8,000.00	8,000.00	8,000.00	8,000.00	8,000.00
Software Cost:					
Server Software	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00
Client Software	3,500.00	3,500.00	3,500.00	3,500.00	3,500.00
Total Software Cost	7,500.00	7,500.00	7,500.00	7,500.00	7,500.00
People-Ware Cost:					
System Analyst 6 months@16,000	96,000.00	-	-	-	
Network Specialist 1 month @20,000	20,000.00	-	-	-	-
Programmer 2 months@12,000	48,000.00	-	-	-	-
Total People-Ware Cost	164,000.00	-	-	-	
Implementation Cost:					
Basic Training Cost	25,000.00	-	-	-	-
Installation Cost	5,000.00	-	-	-	-
Total Implement	30,000.00	-	-	-	-
Total Fixed Cost	252,600.00	58,600.00	58,600.00	58,600.00	58,600.00
Operating Cost					
People-Ware Cost:					
Inventory Manager 1 person @ 25,000	25,000.00	27,500.00	30,250.00	33,275.00	36,602.60
Staff:					
Stock Officer 1 person @ 10,000	10,000.00	11,000.00	12,010.00	13,310.00	14,641.00
Receiving Clerk 1 person @ 9,000	9,000.00	9,900.00	10,890.00	11,979.00	13,176.90
Dispatch Officer 2 person @ 7,000	14,000.00	15,400.00	16,940.00	18,634.00	20,497.40
Computer Supporter 1 person@12,000	12,000.00	13,200.00	14,520.00	15,972.00	17,569.20
Total Monthly Salary Cost	70,000.00	77,000.00	84,700.00	93,170.00	102,487.00
Total Annual Salary Cost	840,000.00	924,000.00	1,016,400.00	1,118,040.00	1,229,844.00
Office Supplies & Miscellaneous Cost:					
Stationary	4,000.00	4,400.00	4,840.00	5,324.00	5,856.40
Paper	9,000.00	9,900.00	10,890.00	11,979.00	13,176.90
Utility	32,000.00	35,200.00	38,720.00	42,592.00	46,851.20
Miscellaneous	3,000.00	3,300.00	3,630.00	3,993.00	4,392.00
Annual Office Supplies & Miscellaneous Cost	48,000.00	52,800.00	58,080.00	63,888.00	70,276.80
Total Operating Cost	888,000.00	976,800.00	1,074,480.00	1,181,928.00	1,300,120.80
Total Computerized System Cost	1,140,600.00	1,035,400.00	1,133,080.00	1,240,528.00	1,358,720.80

Table 3.11. Five-Year Accumulated Computerized System Cost Analysis, Baht.

Year	Total Computerized Cost	Accumulated Cost
1	1,140,600.00	1,140,600.00
2	1,035,400.00	2,176,000.00
3	1,133,080.00	3,309,080.00
4	1,240,528.00	4,549,608.00
5	1,358,720.80	5,908,328.80
Total	5,908,328.80	–

Table 3.12. The Comparison of the Accumulated Manual Cost and the Accumulated Proposed Cost, Baht.

Year	Accumulated Manual Cost	Accumulated Proposed Cost
1	1,097,500.00	1,140,600.00
2	2,304,450.00	2,176,000.00
3	3,631,795.00	3,309,080.00
4	5,088,574.50	4,549,608.00
5	6,694,031.95	5,908,328.80

(4) Benefit Analysis

The benefit of the proposed system may be divided into two parts: tangible and intangible benefit. The tangible benefit is usually measured in economic value. The intangible benefit is difficult to measure in quantity. The details of these benefits are summarized as follows:

Tangible Benefits

Tangible benefits can be measured in terms of unit cost saving or profit. After implementing the new system, the computer can group benefits into three categories as shown in Appendix C.

(a) Cost Saving

The proposed system helps to reduce the number of staff and officers for operating the system. And the demand of paper and stationary is reduced. Then the proposed system saves salary cost, office supplies expense and miscellaneous expenses.

(b) Reduction of operating time.

From the comparison of the total operating time between the existing system and the proposed system, the new system yields more efficient work with less operating time.

Intangible Benefits

The intangible benefits of the proposed system are classified into the follows:

(a) Improving customer goodwill.

(b) Better in decision making for the management team with accurate information.

(c) Reducing human errors in doing documentation.

(d) Improving employee morale.

(5) Break-even Analysis

Break-even Analysis shows the point where the accumulative cost of the existing system is equal to the accumulative cost of the proposed system. At the beginning, the cost of the proposed system is higher than the cost of the existing system since the new system has the development cost and hardware and software investment. But in the long run, the proposed system cost is reduced. The break-even analysis is shown in Figure 3.5.

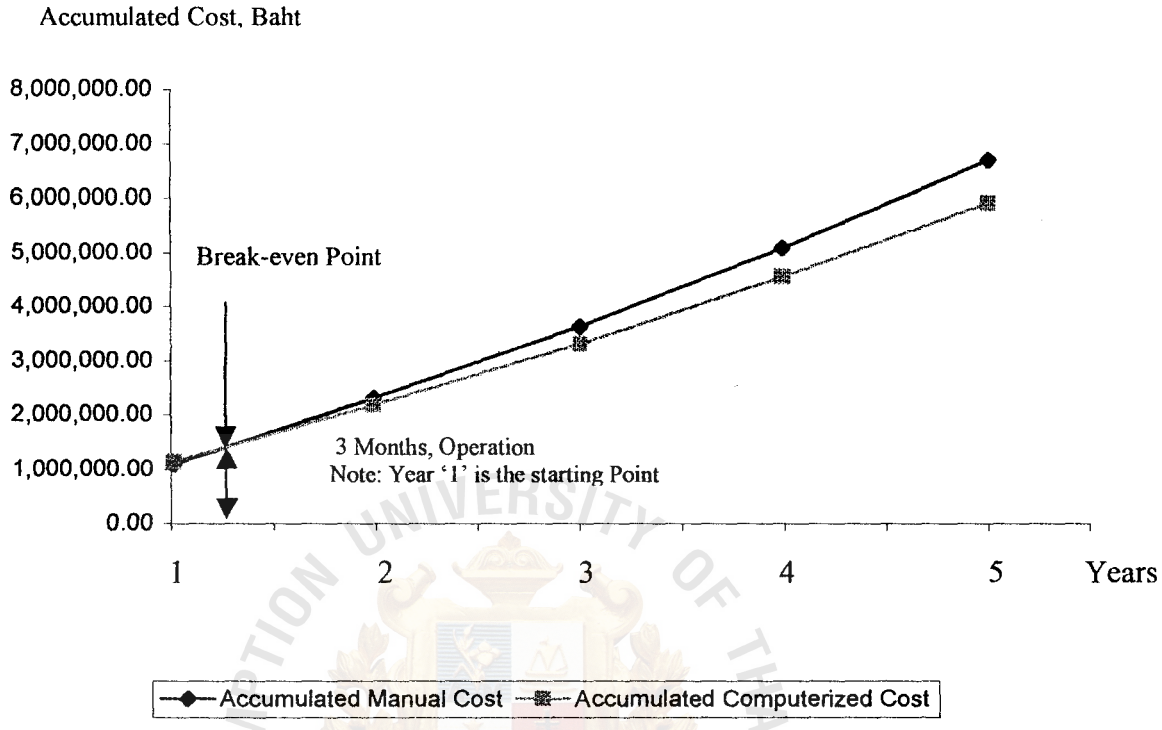

Figure 3.5. Break-even Analysis.

(6) Payback Period

System development costs are incurred long before benefit begins to accrue. So it will take some time for the benefit to overtake the cost, and this period of time is called the "payback period". Payback analysis determines how much time will cover the investment. It will estimate whether the amount of investment of the proposed system is worth investing or not.

Figure 3.6 shows the payback period of the proposed system that has already been calculated to evaluate the candidate solution (see the full details of payback calculation in Table C.6. in Appendix C).

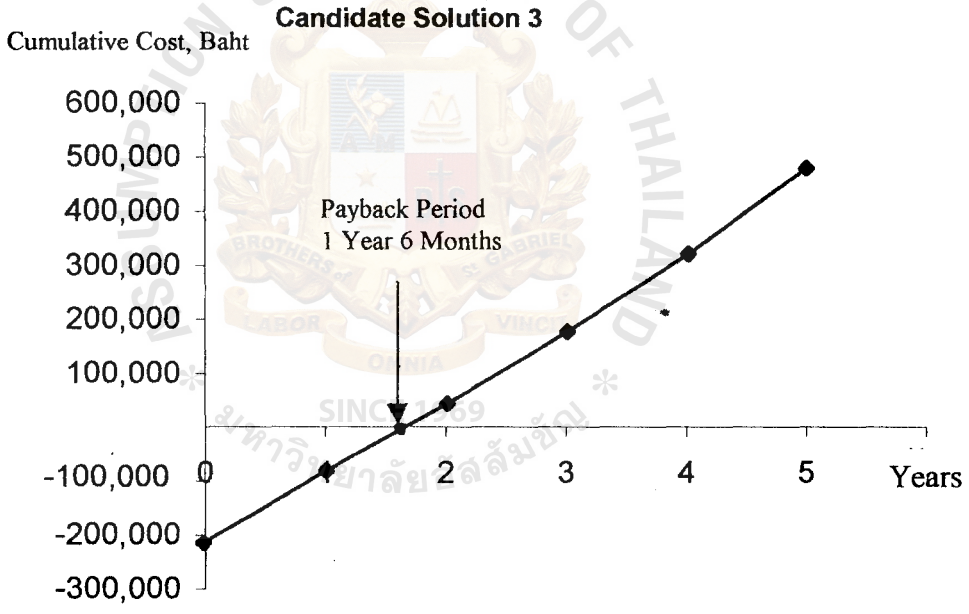

Figure 3.6. Payback Period Analysis of the Proposed System.

IV. PROJECT IMPLEMENTATION

4.1 Overview of Project Implementation

The project implementation is the part of the proposed system process after both the system analyst and users have discussed any current problems and tried to solve these problems and come to an agreement about the new proposed process to support their needs.

The implementation process is concerned with the installation of the computerized system replacing the manual system and using the parallel run concept. The process works on both the old system and the new one for the first period of time. The staff and officers are trained to give more understanding and to become familiar with the new system to ensure that they can use the new system correctly and smoothly. However, the new system is tested to ensure that it can work properly.

4.2 Stage of Project Implementation

This implementation phase of the new system is when the programs of the new system are written to perform business. Both the analyst and the programmer must understand how the system operates from studying the relevant document. This stage also includes the installation process of the new system, database and network.

Testing is done to ensure there is no error and both the programmer and the user departments make sure that they are implemented into the new system as required.

4.3 Training and Documentation

Training the users to interact with the computer-based system is an important part of the implementation since they must be able to run the proposed system without intervention from the analyst or programmer. The new system's document is collected for developing and studying in the future.

During the training, the user manual must be established to support the users so that they can study and train by themselves.

4.4 Conversion

At this stage, the overall system is running the program, interfacing with the different files of data, utilizing the communication networks and interfacing with the user.

This project selects the parallel conversion in which both the old system and the proposed system are operated for a short period of time. This method ensures that all major problems in the new system will be solved before the old system is discarded.

4.5 System Maintenance

When the proposed system has been replace to operate instead of the old system, the system needs maintenance during operation.

After the proposed system operates for some period of time, it is necessary to evaluate the performance of the system on a quarterly basis and consider whether the system needs to be improved or not.

V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Nowadays, we cannot refuse that the computer has such a major role in our lives. Particularly we have come to deal with loads of work. Therefore with the ability of the computer, we can reduce the budget and errors in operating businesses.

KS Co., Ltd. was a small snack and confectionary distributor that normally operated business transactions manually which created a lot of paper work and wasted time. Moreover, KS Co., Ltd. had many problems which created lack of efficiency in operating transactions.

The problem is mostly incorrect data which the users or staff must recheck many times. The controlling of stock is not efficient and some product stock are either short or too much. These problems cause difficulty in the decision making for the management and result in inefficient work.

Then the company studied and developed the proposed system to solve their problem. The system was created as a tool of increasing efficiency for data control, timely and accurate information, decreasing paper work, faster operation, sharing data among departments, reducing mistakes and errors etc.

The development of the proposed system needs to study and identify the problems of the current system by interviewing and observing each user. Since the proposed system integrates the order process, the inventory process and the purchasing process to meet the user requirements, this reduces response time and cost per transaction. The Cost and Benefit Analysis section can prove the benefit of saving cost and time. The project uses Microsoft Visual Basic to create friendly user interface which allows users to enter, update, delete, inquiry and print reports easily and use SQL Server to manage

database for inventory information system. The proposed system was tested many times before used by users and programmers to ensure that it runs smoothly and the correct data are available. The users and officers need to be trained to familiar with the proposed system and understand the process of the system.

The proposed system improves the standard of management and control which also decreases time for operation, cost and duplication of work. The time spent on each process of the proposed system compared with the existing system is shown in Table 5.1.

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

Process	Existing System	Proposed System
Check Available Stock	15 mins.	30 secs.
Search Supplier	3 mins.	10 secs.
Generate purchase Order	5 mins.	1 min.
Update Stock	30 mins.	3 mins.
Generate Report	30 mins.	3 mins.
Inquiry Process	8 mins.	5 secs.

There are 6 processes of the proposed system, which perform in less time than the existing system and all processes are in the following details:

(1) Check Available Stock

The stock of each product will be reduced. The officers and staff can recover inventory information directly.

(2) Search Supplier

The information of suppliers are arranged in listing, which the staff and officer can easily search.

(3) Generate Purchase Order

The proposed system makes the process of purchasing order easier and can be done correctly and quickly.

(4) Update Stock

The proposed system can update stock for each product correctly and rapidly, and so that staff can operate the business transactions faster.

(5) Generate Report

The summarization of transactions and documents can be generated in an easier way and can support each department in the decision-making.

(6) Inquiry Process

The computer works automatically and the staff and officers can access information faster than from the old system.

5.2 Recommendations

The proposed system should be developed further in the next phase in using the bar code in handling stock (input and output processes) and which replaces entering data, by the keyboard. Then it will reduce some errors in entering data. Furthermore as the competition in business is high, the company should arrange for weekly meetings to discuss and exchange opinions.

After the proposed system is installed, the company needs to analyze available information which are essential in developing, controlling and planning. And the computerized system has to be adjusted to best fit with the user's requirements.

The technology trend should be considered because it grows very rapidly. E-business should be the new business operation since it is the way to capture customers with low investment. The company should expand according to the market changes to compete with the competitors.

APPENDIX A

ENTITY RELATIONSHIP DIAGRAM

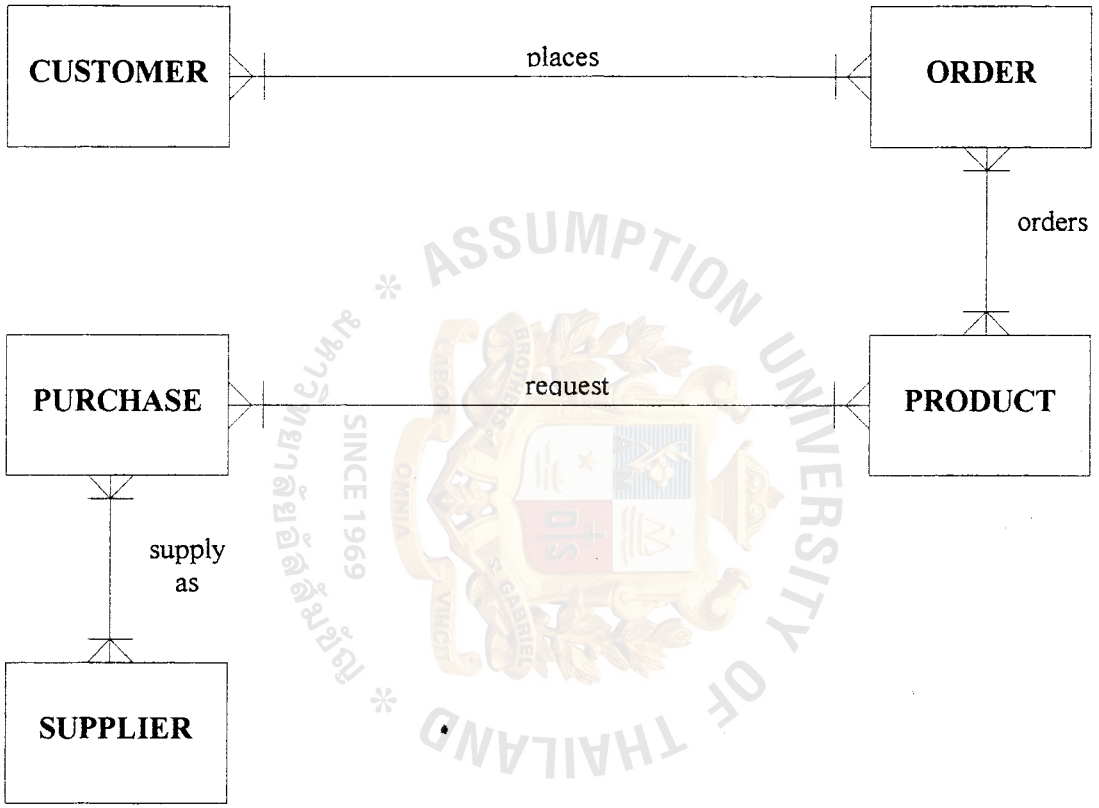

Figure A.1. Context Data Model of the Proposed System.

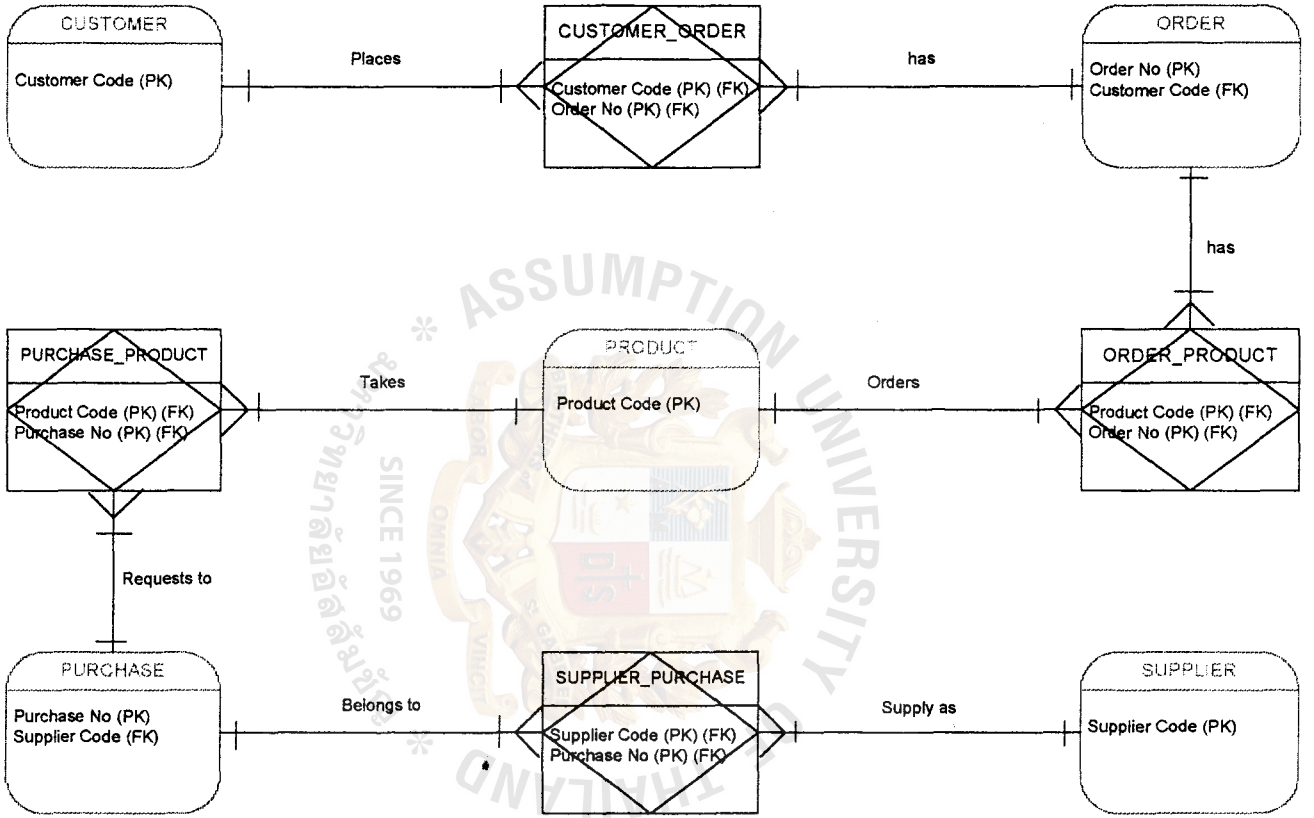

Figure A.2. Key-Based Data Model of the Proposed System.

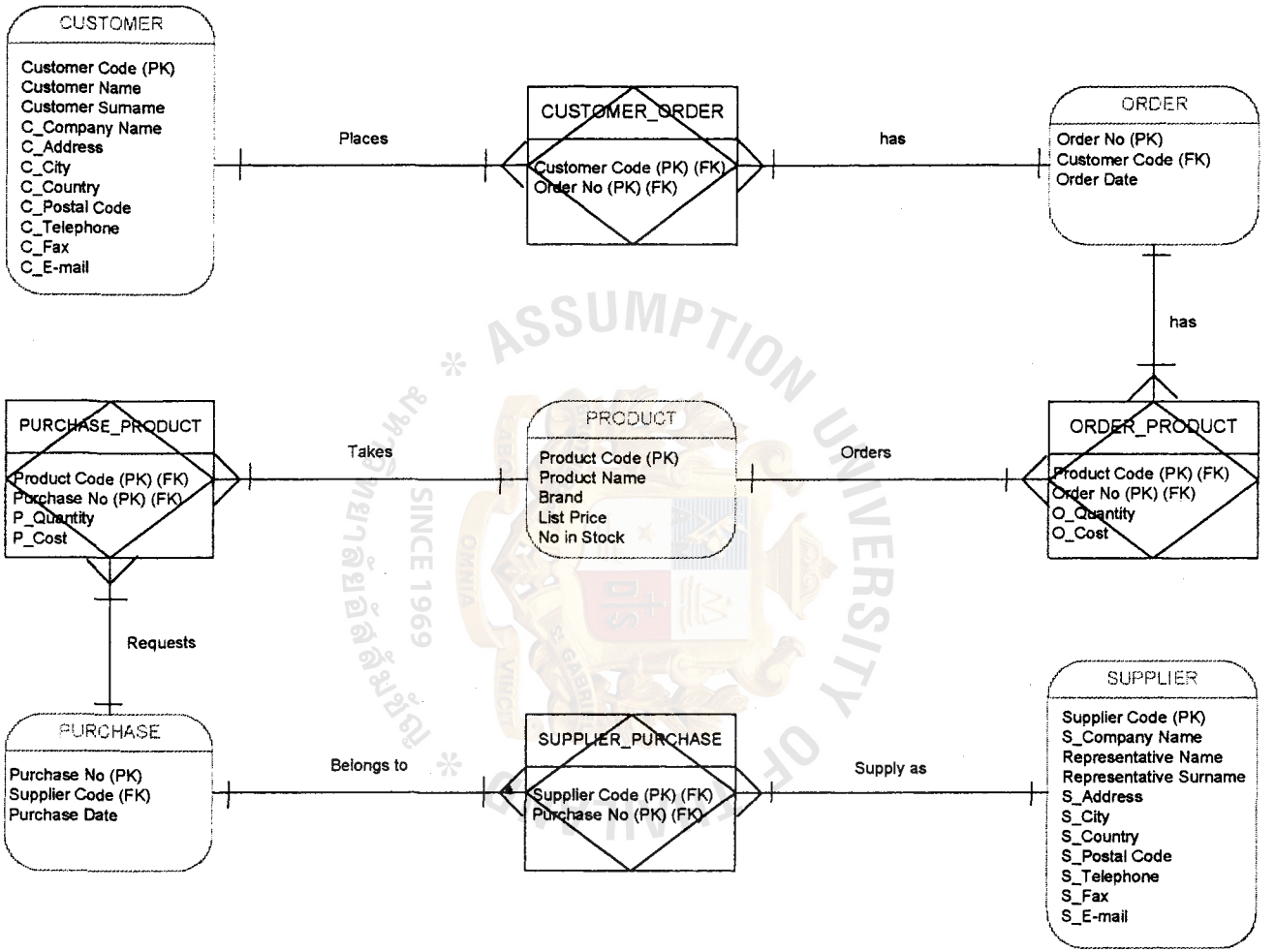

Figure A.3. Fully Attributed Data Model of the Proposed System.

APPENDIX B

DATA FLOW DIAGRAM

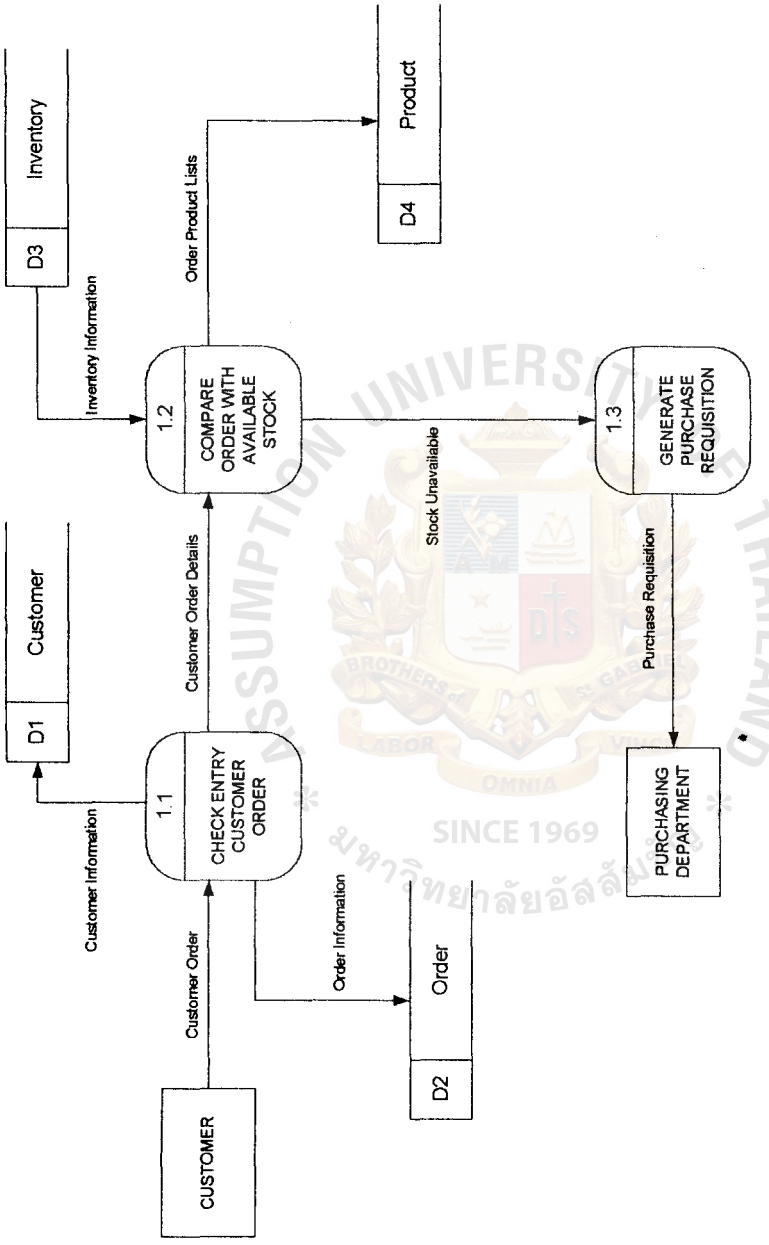

Figure B.1. Data Flow Diagram of Check Available Stock Process.

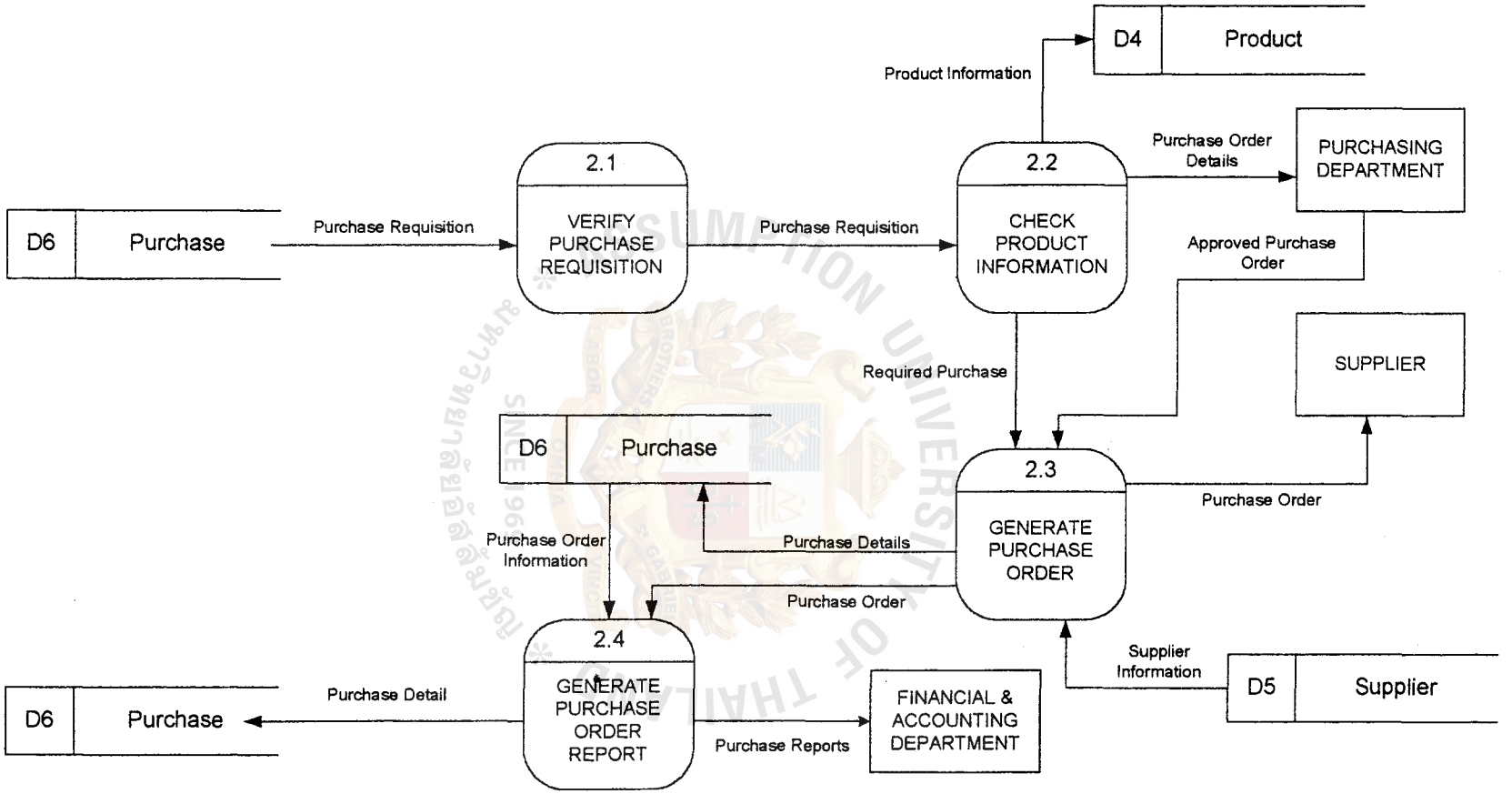

Figure B.2. Data Flow Diagram of Check Preparing Purchase Order Process.

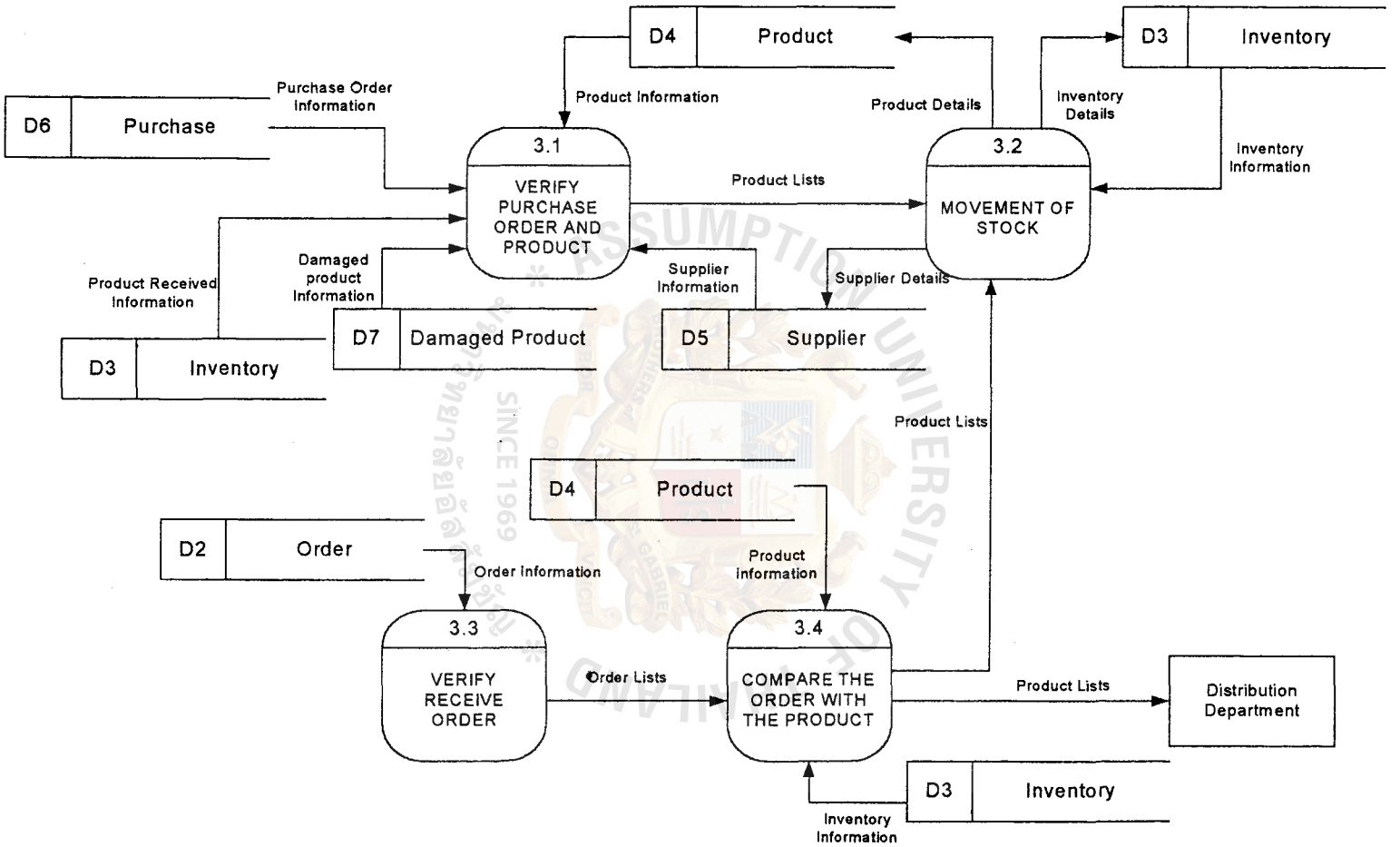

Figure B.3. Data Flow Diagram of Check Updated Stock Process.

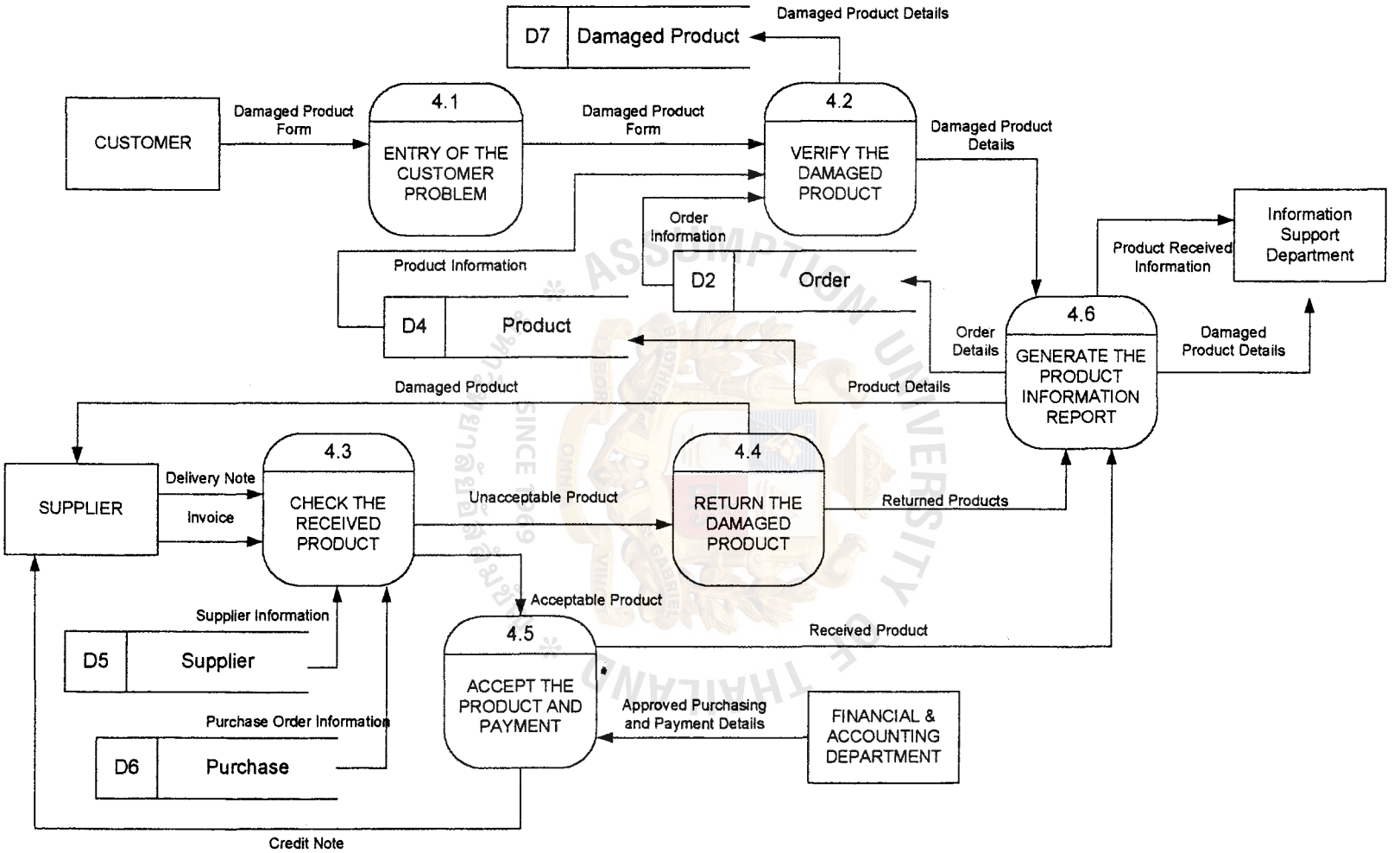

Figure B.4. Data Flow Diagram of the Verification of the Damaged Product Process.

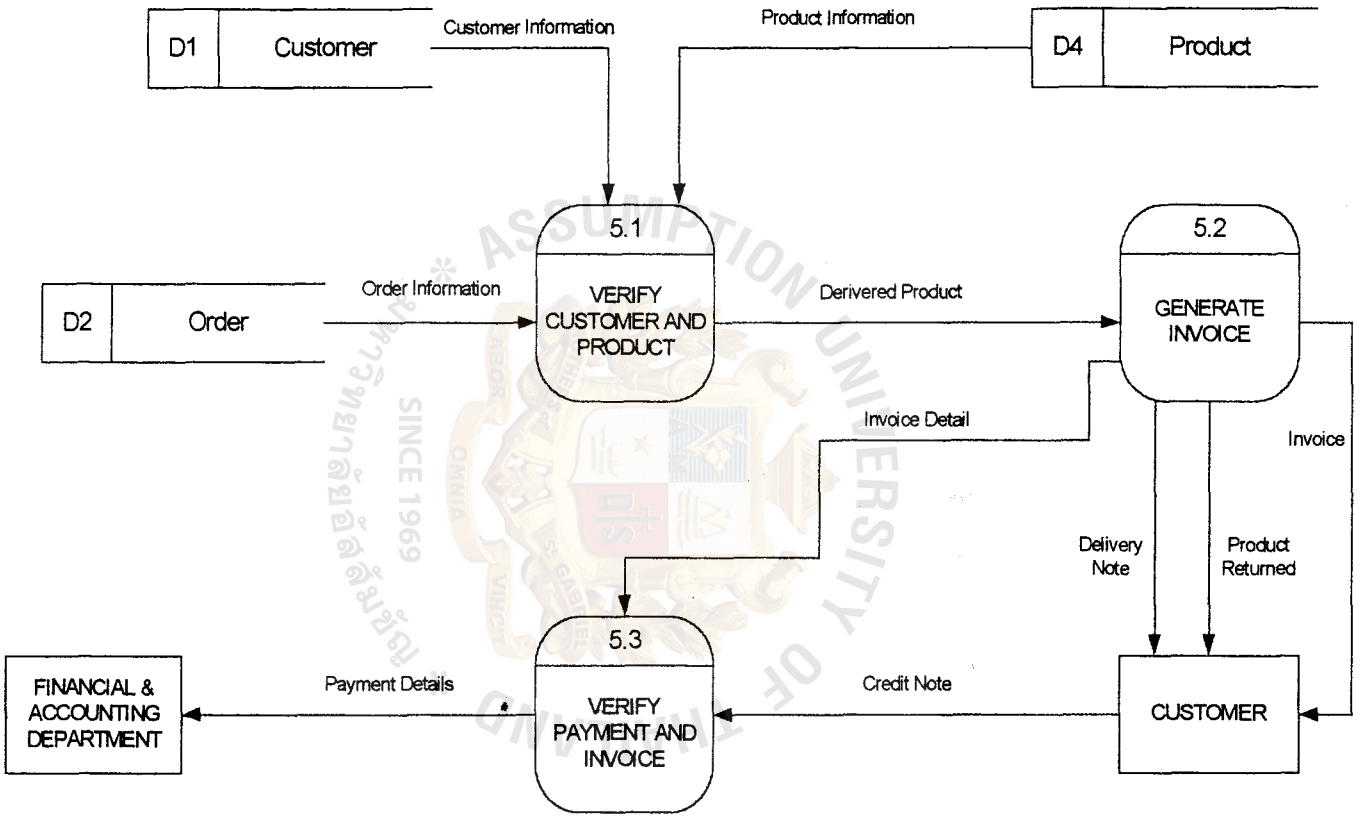

Figure B.5. Data Flow Diagram of Delivery Process.

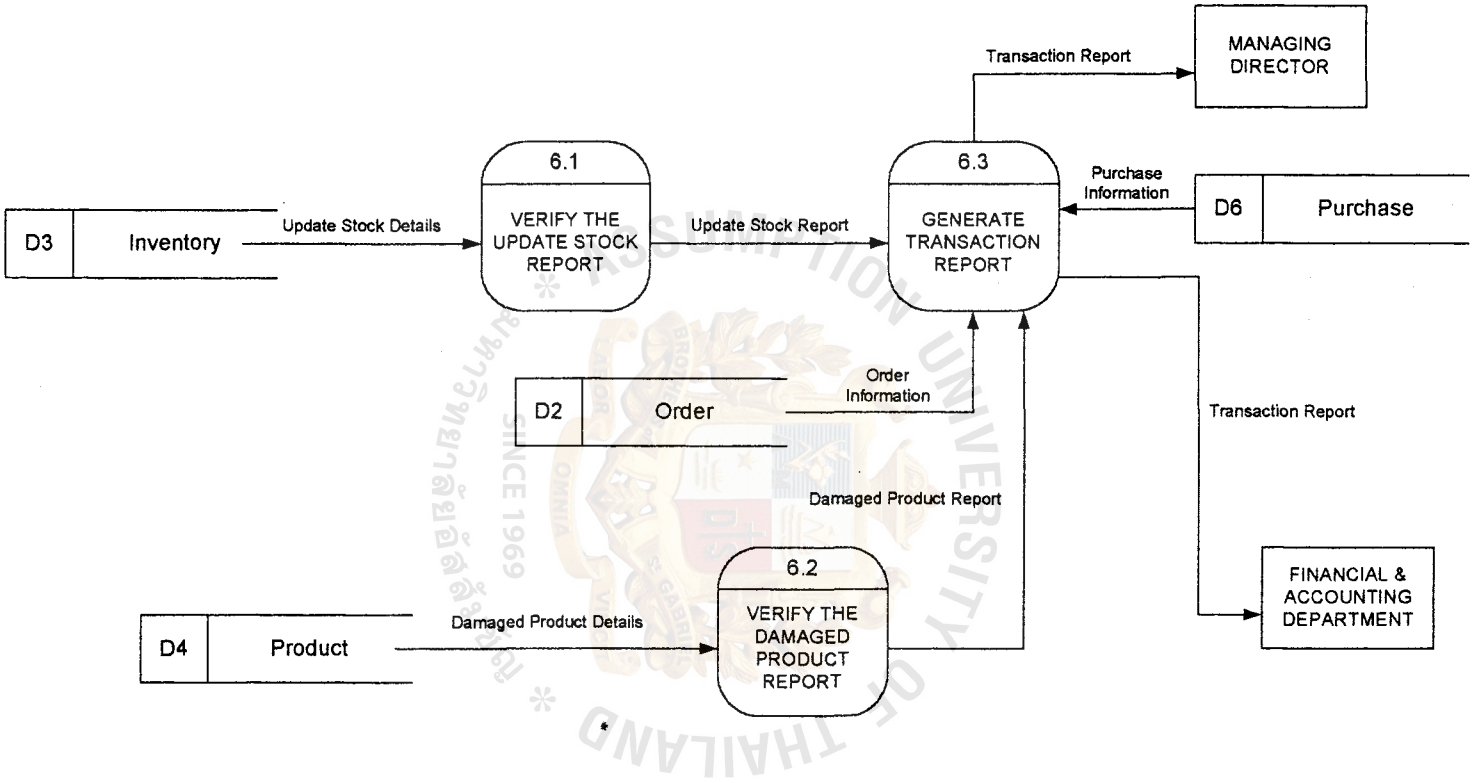

Figure B.6. Data Flow Diagram of Provide Information Process.

APPENDIX C

FEASIBILITY ANALYSIS

Table C.1. Estimated Cost of Candidate 1, Baht.

Cost items	Year 1	Year 2	Year 3	Year 4	Year 5
System Development Cost					
1. Hardware Cost					
Server 1 Set@ 60,000 Baht	12,000	12,000	12,000	12,000	12,000
UPS 1 Set@ 5,000 Baht	1,000	1,000	1,000	1,000	1,000
Total Hardware Cost	13,000	13,000	13,000	13,000	13,000
2. Software Cost					
Server Software 1 License @ 20,000	4,000	4,000	4,000	4,000	4,000
Client Software 1 License @ 17,500	3,500	3,500	3,500	3,500	3,500
Total Software Cost	7,500	7,500	7,500	7,500	7,500
3. People-Ware Cost					
System Analyst 1 Person @ 6 Months @16,000	96,000	-	-	-	-
Network Specialist 1 Person @1 Month @ 25,000	25,000	-	-	-	-
Programmer 1 Person @4 Months @ 12,000	48,000	-	-	-	-
Total People-Ware Cost	169,000	-	-	-	-
4. Implementation Cost					
Training Cost	35,000	-	-	-	-
Installation Cost	10,000	-	-	-	-
Total Implementation Cost	45,000	-	-	-	-
Total System Development Cost	234,500	20,500	20,500	20,500	20,500
Operating Cost					
1. Maintenance Cost					
Hardware Maintenance Cost 5,000 Baht/Annum	5,000	5,500	6,050	6,655	7,320.50
Software Maintenance Cost 3,000 Baht/Annum	3,000	3,300	3,630	3,993	4,392.30
Total Maintenance Cost	8,000	8,800	9,680	10,648	11,712
2. Personal Cost					
Inventory Manager 1 Person @ 25,000 Baht/Month	25,000	27,500	30,250	33,275	36,602.60
Stock Officer 1 Person @ 10,000 Baht/Month	10,000	11,000	12,010	13,310	14,641
Receiving Clerk 1 Person @ 9,000 Baht/Month	9,000	9,900	10,890	11,979	13,176.90
Dispatch Officer 2 Person @ 7,000 Baht/Month	14,000	15,400	16,940	18,634	20,497.40
Computer Supporter 1 Person @ 12,000 Baht/Month	12,000	13,200	14,520	15,972	17,569.20
Total Monthly Personal Cost	70,000	77,000	84,700	93,170	102,487
Total Annual Personal Cost	840,000	924,000	1,016,400	1,118,040	1,229,844
3. Office Supplies & Miscellaneous Cost					
Stationary 4,000 Baht / Annum	4,000	4,400	4,840	5,324	5,856.40
Paper 9,000 Baht / Annum	9,000	9,900	10,890	11,979	13,176.90
Utility 32,000 Baht / Annum	32,000	35,200	38,720	42,592	46,851.20
Miscellaneous 3,000 Baht / Annum	3,000	3,300	3,630	3,993	4,392
Annual Office Supplies & Miscellaneous Cost	48,000	52,800	58,080	63,888	70,276.80
Total Operating Cost	896,000	985,600	1,084,160	1,192,576	1,311,833.60
Total Computerized System Cost	1,130,500	1,006,100	1,104,660	1,213,076	1,332,333.60

Table C.2. Estimated Cost of Candidate 2, Baht.

Cost items	Year 1	Year 2	Year 3	Year 4	Year 5
System Development Cost					
1. Hardware Cost					
Server 1 Set@ 60,000 Baht	12,000	12,000	12,000	12,000	12,000
UPS 1 Set@ 5,000 Baht	1,000	1,000	1,000	1,000	1,000
Total Hardware Cost	13,000	13,000	13,000	13,000	13,000
2. Software Cost					
Server Software 1 License @ 20,000	8,000	8,000	8,000	8,000	8,000
Client Software 1 License @ 17,500	6,000	6,000	6,000	6,000	6,000
Total Software Cost	14,000	14,000	14,000	14,000	14,000
3. People-Ware Cost					
System Analyst 1 Person @ 6 Months @16,000	96,000				
Network Specialist 1 Person @2 Month @ 25,000	50,000				
Programmer 1 Person @4 Months @ 12,000	48,000				
Total People-Ware Cost	194,000				
4. Implementation Cost					
Training Cost	40,000				
Installation Cost	10,000				
Total Implementation Cost	55,000				
Total System Development Cost	276,000	27,000	27,000	27,000	27,000
Operating Cost					
1. Maintenance Cost					
Hardware Maintenance Cost 5,000 Baht/Annum	8,000	8,800	9,680	10,648	11,712
Software Maintenance Cost 3,000 Baht/Annum	5,000	5,500	6,050	6,655	7,320.50
Total Maintenance Cost	13,000	14,300	15,730	17,303	19,033.30
2. Personal Cost					
Inventory Manager 1 Person @ 25,000 Baht/Month	25,000	27,500	30,250	33,275	36,602.60
Stock Officer 1 Person @ 10,000 Baht/Month	10,000	11,000	12,010	13,310	14,641
Receiving Clerk 1 Person @ 9,000 Baht/Month	9,000	9,900	10,890	11,979	13,176.90
Dispatch Officer 2 Person @ 7,000 Baht/Month	14,000	15,400	16,940	18,634	20,497.40
Computer Supporter 1 Person @ 12,000 Baht/Month	12,000	13,200	14,520	15,972	17,569.20
Total Monthly Personal Cost	70,000	77,000	84,700	93,170	102,487
Total Annual Personal Cost	840,000	924,000	1,016,400	1,118,040	1,229,844
3. Office Supplies & Miscellaneous Cost					
Stationary 4,000 Baht / Annum	4,000	4,400	4,840	5,324	5,856.40
Paper 9,000 Baht / Annum	9,000	9,900	10,890	11,979	13,176.90
Utility 32,000 Baht / Annum	32,000	35,200	38,720	42,592	46,851.20
Miscellaneous 3,000 Baht / Annum	3,000	3,300	3,630	3,993	4,392
Annual Office Supplies & Miscellaneous Cost	48,000	52,800	58,080	63,888	70,276.80
Total Operating Cost	901,000	991,100	1,117,210	1,226,231	1,346,154.10
Total Computerized System Cost	1,177,000	1,018,100	1,144,210	1,253,231	1,373,154.10

Table C.3. Estimated Cost of Candidate 3, Baht.

Cost items	Year 1	Year 2	Year 3	Year 4	Year 5
System Development Cost					
1. Hardware Cost					
Server 1 Set@ 60,000 Baht	12,000	12,000	12,000	12,000	12,000
UPS 1 Set@ 5,000 Baht	1,000	1,000	1,000	1,000	1,000
Total Hardware Cost	13,000	13,000	13,000	13,000	13,000
2. Software Cost					
Server Software 1 License @ 20,000	4,000	4,000	4,000	4,000	4,000
Client Software 1 License @ 17,500	3,500	3,500	3,500	3,500	3,500
Total Software Cost	7,500	7,500	7,500	7,500	7,500
3. People-Ware Cost					
System Analyst 1 Person @ 6 Months @16,000	96,000				
Network Specialist 1 Person @1 Month @ 25,000	25,000				
Programmer 1 Person @4 Months @ 12,000	48,000				
Total People-Ware Cost	164,000				
4. Implementation Cost					
Training Cost	25,000				
Installation Cost	5,000				
Total Implementation Cost	30,000				
Total System Development Cost	214,500	20,500	20,500	20,500	20,500
Operating Cost					
1. Maintenance Cost					
Hardware Maintenance Cost 5,000 Baht/Annum	5,000	5,500	6,050	6,655	7,320.50
Software Maintenance Cost 3,000 Baht/Annum	3,000	3,300	3,630	3,993	4,392.30
Total Maintenance Cost	8,000	8,800	9,680	10,648	11,712
2. Personal Cost					
Inventory Manager 1 Person @ 25,000 Baht/Month	25,000	27,500	30,250	33,275	36,602.60
Stock Officer 1 Person @ 10,000 Baht/Month	10,000	11,000	12,010	13,310	14,641
Receiving Clerk 1 Person @ 9,000 Baht/Month	9,000	9,900	10,890	11,979	13,176.90
Dispatch Officer 2 Person @ 7,000 Baht/Month	14,000	15,400	16,940	18,634	20,497.40
Computer Supporter 1 Person @ 12,000 Baht/Month	12,000	13,200	14,520	15,972	17,569.20
Total Monthly Personal Cost	70,000	77,000	84,700	93,170	102,487
Total Annual Personal Cost	840,000	924,000	1,016,400	1,118,040	1,229,844
3. Office Supplies & Miscellaneous Cost					
Stationary 4,000 Baht / Annum	4,000	4,400	4,840	5,324	5,856.40
Paper 9,000 Baht / Annum	9,000	9,900	10,890	11,979	13,176.90
Utility 32,000 Baht / Annum	32,000	35,200	38,720	42,592	46,851.20
Miscellaneous 3,000 Baht / Annum	3,000	3,300	3,630	3,993	4,392
Annual Office Supplies & Miscellaneous Cost	48,000	52,800	58,080	63,888	70,276.80
Total Operating Cost	896,000	985,600	1,084,160	1,192,576	1,311,833.60
Total Computerized System Cost	1,110,500	1,006,100	1,104,660	1,213,076	1,332,333.60

Table C.4. Payback Period for the Candidate 1, Baht.

Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
System Development Cost:	-234,500					
Annual Operating Cost		-896,000	-1,006,100	-1,104,660	-1,213,076	-1,332,333.60
Discount factor for 3%	1.000	0.971	0.943	0.915	0.888	0.863
Time-Adjusted Costs(Adjusted to Present Value)	-234,500	-870,016	-948,752.30	-1,010,763.90	-1,077,211.49	-1,149,803.90
Cumulative time-adjusted costs over life time:	-234,500	-1,104,516	-2,053,268.30	-3,064,032.20	-4,141,243.69	-5,291,047.58
Benefits derived from operation of the new system	0	1,034,000	1,137,400	1,251,140	1,376,254	1,513,879.40
Discount factors for 3%	1.000	0.971	0.943	0.915	0.888	0.863
Time-adjusted benefits (Adjusted to Present Value)	0	1,004,014.00	1,072,568.20	1,144,793.10	1,222,113.55	1,306,477.92
Cumulative time-adjusted benefits over life time	0	1,004,014.00	2,076,582.20	3,221,375.30	4,443,488.85	5,749,966.77
Cumulative Life Time-Adjusted Costs +Benefits	-234,500	-100,502.000	23,313.90	157,343.10	302,245.16	458,919.19

Table C.5. Payback Period for the Candidate 2, Baht.

Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
System Development Cost:	-276,000					
Annual Operating Cost		-901,000	-1,018,100	-1,144,210	-1,253,231	-1,373,154.10
Discount factor for 3%	1.000	0.971	0.943	0.915	0.888	0.863
Time-Adjusted Costs(Adjusted to Present Value)	-276,000	-874,871	-960,068.30	-1,046,952.15	-1,112,869.13	-1,185,031.99
Cumulative time-adjusted costs over life time:	-276,000	-1,150,871	-2,110,939.30	-3,157,891.45	-4,270,760.58	-5,455,792.57
Benefits derived from operation of the new system		1,034,000	1,137,400	1,251,140	1,376,254	1,513,879.40
Discount factors for 3%	1.000	0.971	0.943	0.915	0.888	0.863
Time-adjusted benefits (Adjusted to Present Value)	0	1,004,014.00	1,072,568.20	1,144,793.10	1,222,113.55	1,306,477.92
Cumulative time-adjusted benefits over life time	0	1,004,014.00	2,076,582.20	3,221,375.30	4,443,488.85	5,749,966.77
Cumulative Life Time-Adjusted Costs +Benefits	-276,000	-146,857.000	-34,357.10	63,483.85	172,728.27	294,174.21

Table C.6. Payback Period for the Candidate 3, Baht.

Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
System Development Cost:	-214,500					
Annual Operating Cost		-896,000	-1,006,100	-1,104,660	-1,213,076	-1,332,333.60
Discount factor for 3%	1.000	0.971	0.943	0.915	0.888	0.863
Time-Adjusted Costs(Adjusted to Present Value)	-214,500	-870,016	-948,752.30	-1,010,763.90	-1,077,211.49	-1,149,803.90
Cumulative time-adjusted costs over life time:	-214,500	-1,084,516	-2,033,268.30	-3,044,032.20	-4,121,243.69	-5,271,047.58
Benefits derived from operation of the new system	0	1,034,000	1,137,400	1,251,140	1,376,254	1,513,879.40
Discount factors for 3%	1.000	0.971	0.943	0.915	0.888	0.863
Time-adjusted benefits (Adjusted to Present Value)	0	1,004,014.00	1,072,568.20	1,144,793.10	1,222,113.55	1,306,477.92
Cumulative time-adjusted benefits over life time	0	1,004,014.00	2,076,582.20	3,221,375.30	4,443,488.85	5,749,966.77
Cumulative Life Time-Adjusted Costs +Benefits	-214,500	-80,502.000	43,313.90	177,343.10	322,245.16	478,919.19

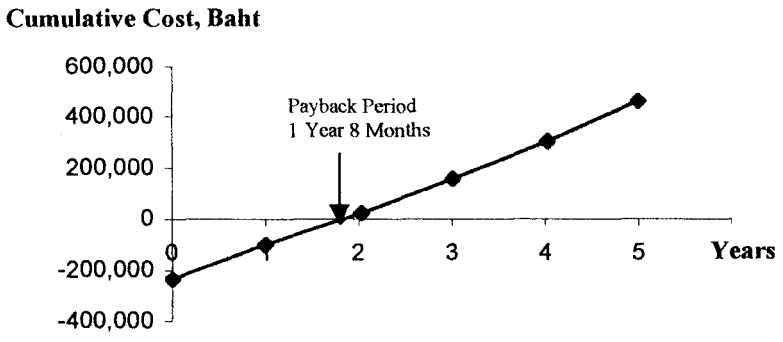

Figure C.1. Payback Period for Candidate 1.

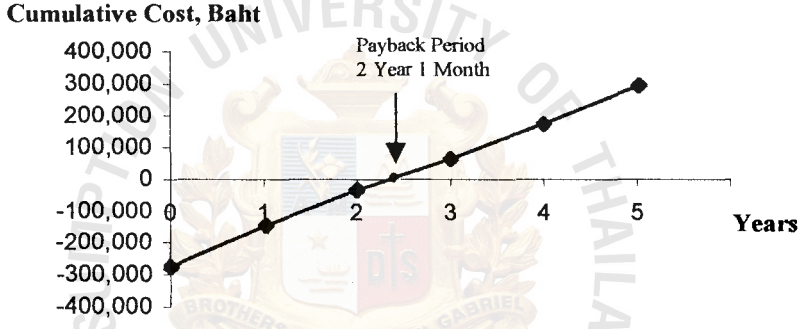

Figure C.2. Payback Period for Candidate 2.

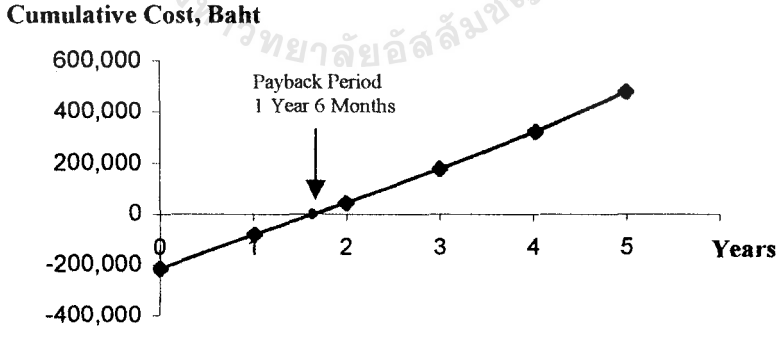

Figure C.3. Payback Period for Candidate 3.

Table C.7. Net Present Value for the Candidate 1, Baht.

Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
System Development Cost:	-234,500					
Annual Operating Cost		-896,000	-1,006,100	-1,104,660	-1,213,076	-1,332,333.60
Discount factor for 3%	1.000	0.971	0.943	0.915	0.888	0.863
Time-Adjusted Costs(Adjusted to Present Value)	-234,500	-870,016	-948,752.30	-1,010,763.90	-1,077,211.49	-1,149,803.90
Cumulative time-adjusted costs over life time:	-234,500	-1,104,516	-2,053,268.30	-3,064,032.20	-4,141,243.69	-5,291,047.58
Benefits derived from operation of the new system	0	1,034,000	1,137,400	1,251,140	1,376,254	1,513,879.40
Discount factors for 3%	1.000	0.971	0.943	0.915	0.888	0.863
Time-adjusted benefits (Adjusted to Present Value)	0	1,004,014.00	1,072,568.20	1,144,793.10	1,222,113.55	1,306,477.92
Cumulative time-adjusted benefits over life time	0	1,004,014.00	2,076,582.20	3,221,375.30	4,443,488.85	5,749,966.77
Cumulative Life Time-Adjusted Costs +Benefits	-234,500	-100,502.000	23,313.90	157,343.10	302,245.16	458,919.19

Table C.8. Net Present Value for the Candidate 2, Baht.

Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
System Development Cost:	-276,000					
Annual Operating Cost		-901,000	-1,018,100	-1,144,210	-1,253,231	-1,373,154.10
Discount factor for 3%	1.000	0.971	0.943	0.915	0.888	0.863
Time-Adjusted Costs(Adjusted to Present Value)	-276,000	-874,871	-960,068.30	-1,046,952.15	-1,112,869.13	-1,185,031.99
Cumulative time-adjusted costs over life time:	-276,000	-1,150,871	-2,110,939.30	-3,157,891.45	-4,270,760.58	-5,455,792.57
Benefits derived from operation of the new system		1,034,000	1,137,400	1,251,140	1,376,254	1,513,879.40
Discount factors for 3%	1.000	0.971	0.943	0.915	0.888	0.863
Time-adjusted benefits (Adjusted to Present Value)	0	1,004,014.00	1,072,568.20	1,144,793.10	1,222,113.55	1,306,477.92
Cumulative time-adjusted benefits over life time	0	1,004,014.00	2,076,582.20	3,221,375.30	4,443,488.85	5,749,966.77
Cumulative Life Time-Adjusted Costs +Benefits	-276,000	-146,857.000	-34,357.10	63,483.85	172,728.27	294,174.21

Table C.9. Net Present Value for the Candidate 3, Baht.

Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
System Development Cost:	-214,500					
Annual Operating Cost		-896,000	-1,006,100	-1,104,660	-1,213,076	-1,332,333.60
Discount factor for 3%	1.000	0.971	0.943	0.915	0.888	0.863
Time-Adjusted Costs(Adjusted to Present Value)	-214,500	-870,016	-948,752.30	-1,010,763.90	-1,077,211.49	-1,149,803.90
Cumulative time-adjusted costs over life time:	-214,500	-1,084,516	-2,033,268.30	-3,044,032.20	-4,121,243.69	-5,271,047.58
Benefits derived from operation of the new system	0	1,034,000	1,137,400	1,251,140	1,376,254	1,513,879.40
Discount factors for 3%	1.000	0.971	0.943	0.915	0.888	0.863
Time-adjusted benefits (Adjusted to Present Value)	0	1,004,014.00	1,072,568.20	1,144,793.10	1,222,113.55	1,306,477.92
Cumulative time-adjusted benefits over life time	0	1,004,014.00	2,076,582.20	3,221,375.30	4,443,488.85	5,749,966.77
Cumulative Life Time-Adjusted Costs +Benefits	-214,500	-80,502.000	43,313.90	177,343.10	322,245.16	478,919.19

Table C.10. Benefit of the Proposed System, Baht.

Benefit items	Year 1	Year 2	Year 3	Year 4	Year 5
1. Personal Reduction					
Stock Officer 1 Person @ 10,000 Baht/Month	10,000	11,000	12,100	13,310	14,641
Receiving Clerk 2 Person @ 9,000 Baht/Month	18,000	19,800	21,780	23,958	26,353.80
Monthly Personal Reduction Benefit	28,000	30,800	33,880	37,268	40,994.80
Total Annual Personal Reduction Benefit	336,000	369,600	406,560	447,216	491,937.60
2. Operating Time Saving					
Stock Officer 1 Person @ 5,000 Baht/Month	5,000	5,500	6,050	6,655	7,321
Receiving Clerk 2 Person @ 4,000 Baht/Month	4,000	4,400	4,840	5,324	5,856.40
Dispatch Officer 2 Person @ 3,000 Baht/Month	6,000	6,600	7,260	7,986	8,785
Elimination of possible long run cost	30,000	33,000	36,300	39,930	43,923
Reduction communication cost	12,000	13,200	14,520	15,972	17,596.20
Monthly Operating Time Saving	57,000	62,700	68,970	75,867	83,453.70
Total Annual Operating Time Saving	684,000	752,400	827,640	910,404	1,001,444
3. Office Supplies & Miscellaneous Cost Reduction					
Stationary	5,000	5,500	6,050	6,655	7,320.50
Paper	4,000	4,400	4,840	5,324	5,856.40
Miscellaneous	5,500	6,050	6,655	7,321	8,053.10
Annual Office Supplies & Miscellaneous Cost Reduction	14,000	15,400	16,940	18,634	20,497.40
Total Benefit from implementing computerized system	1,034,000	1,137,400	1,251,140	1,376,254	1,513,879.40

APPENDIX D

STRUCTURE DESIGN

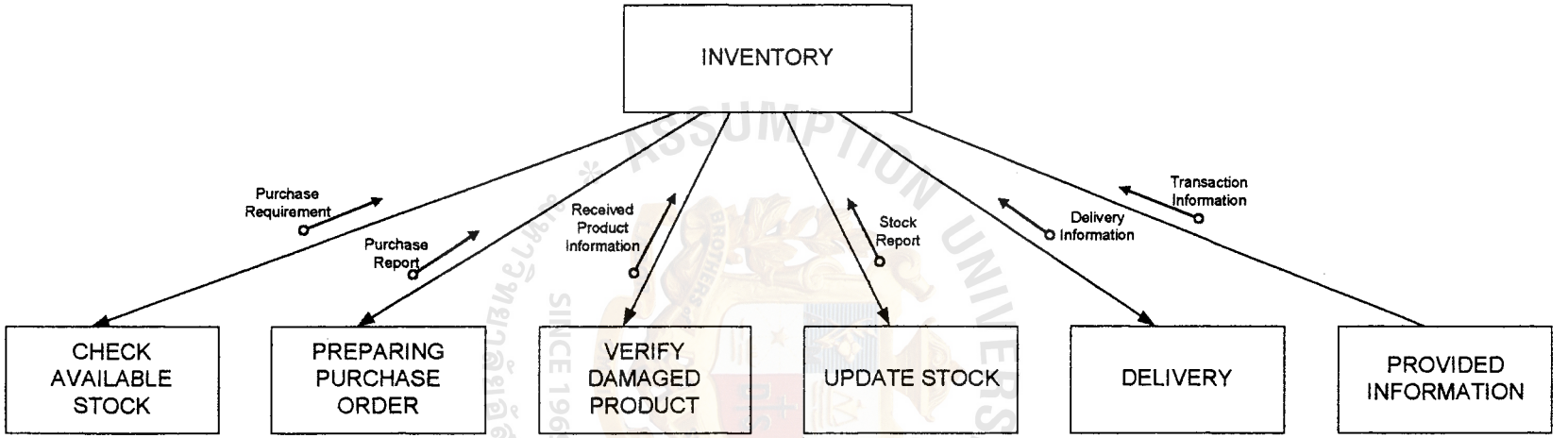

Figure D.1. Structure Chart for Inventory System.

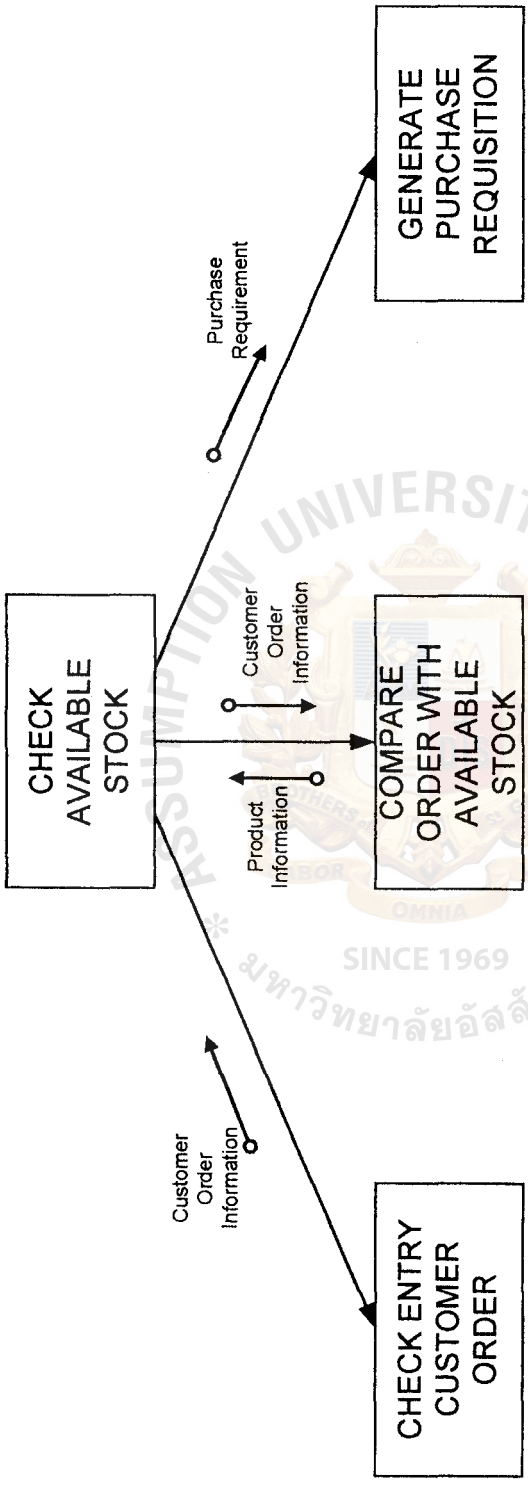

Figure D.2. Structure Chart of Check Available Stock.

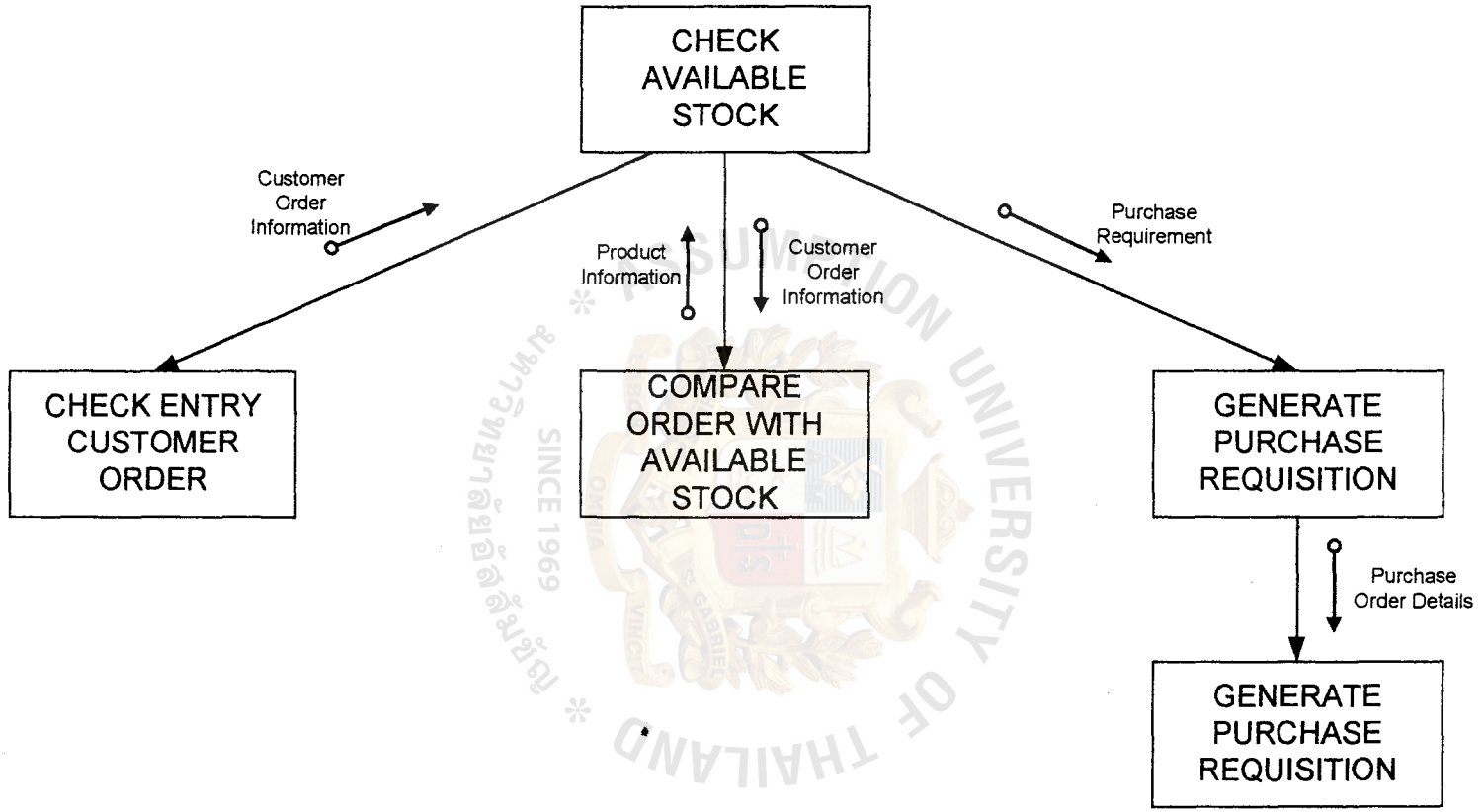

Figure D.3. Structure Chart of Preparing Purchase Order.

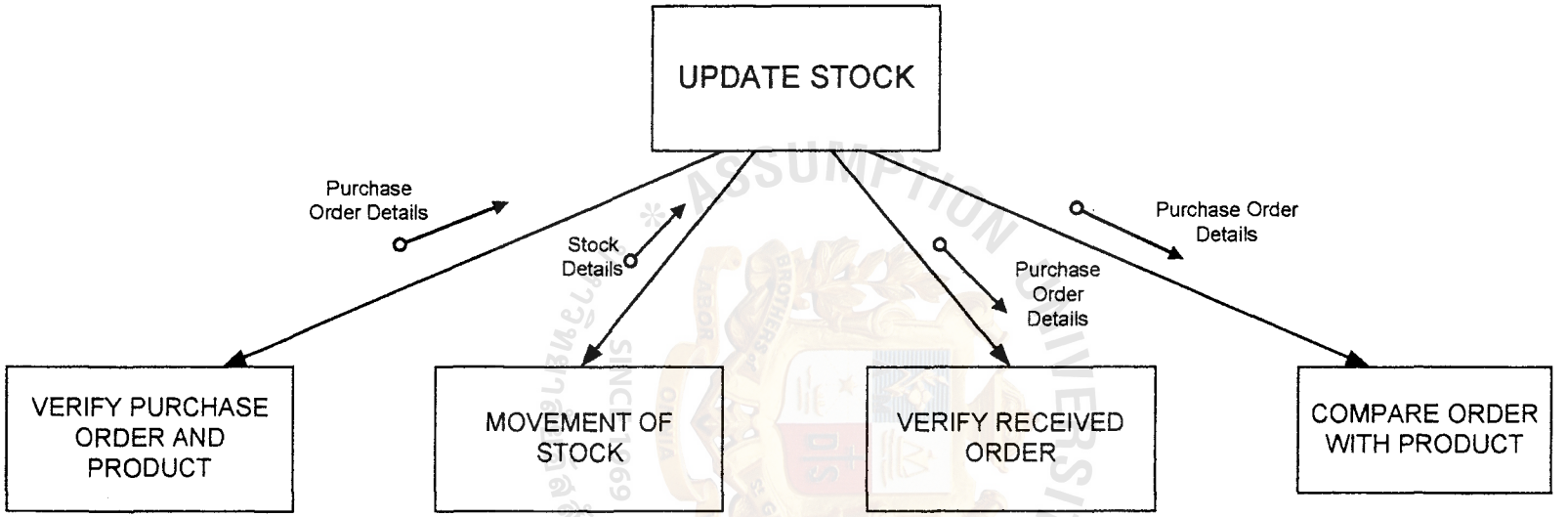

Figure D.4. Structure Chart of Update Stock.

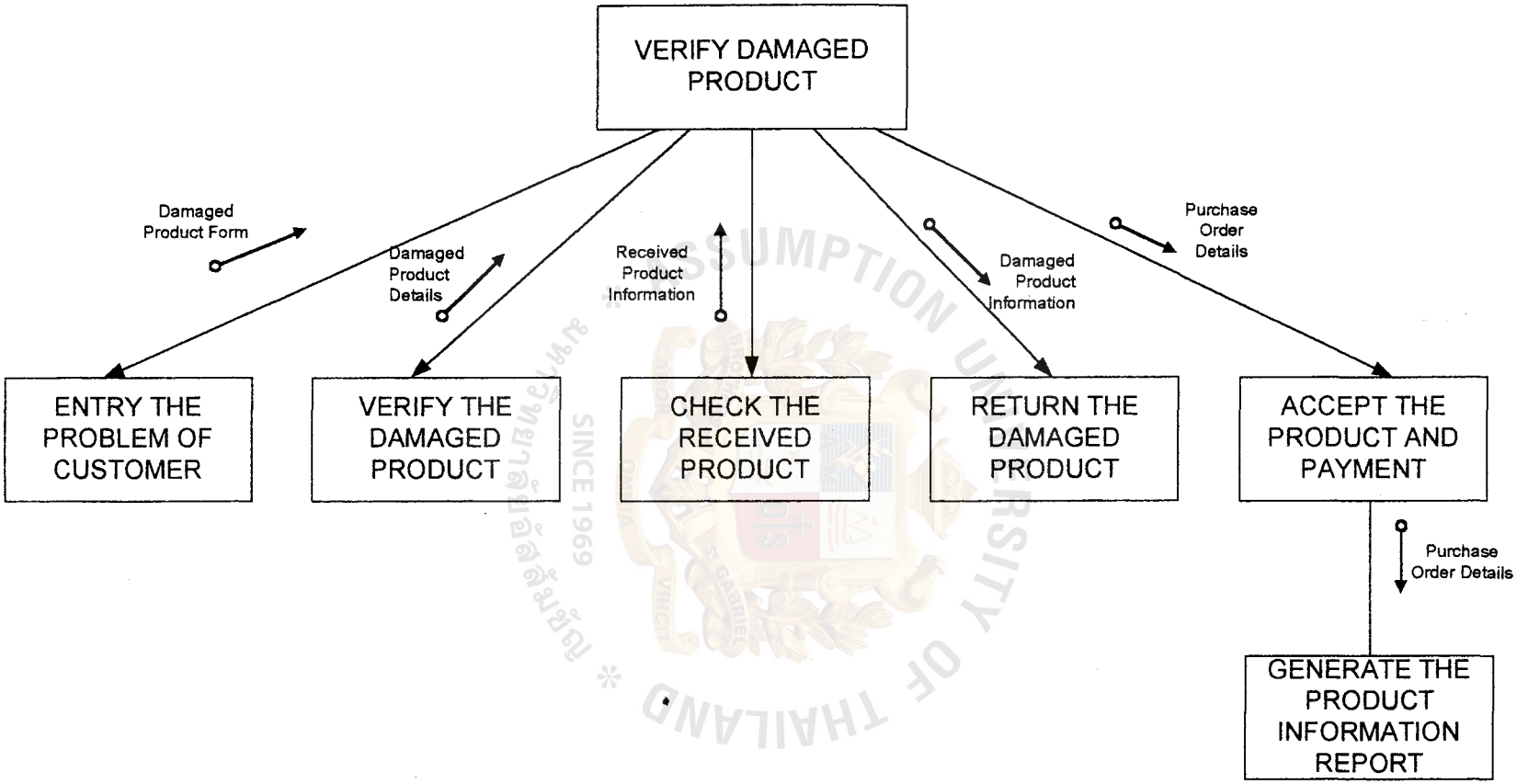

Figure D.5. Structure Chart of The Verification of the Update Stock.

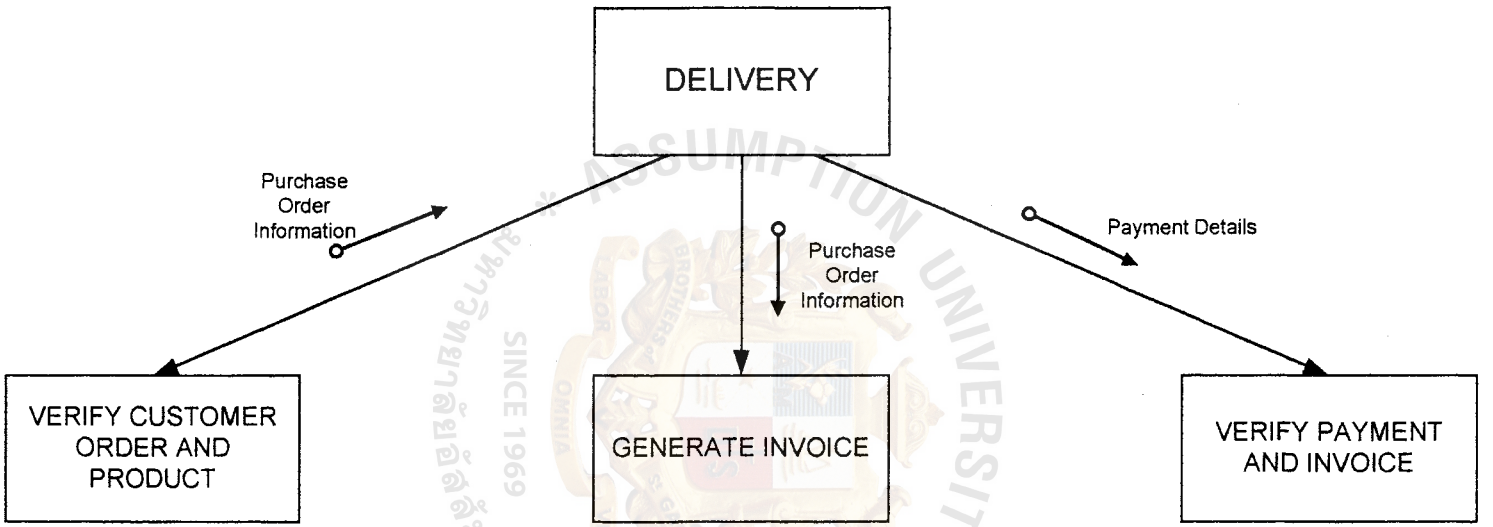

Figure D.6. Structure Chart of Delivery.

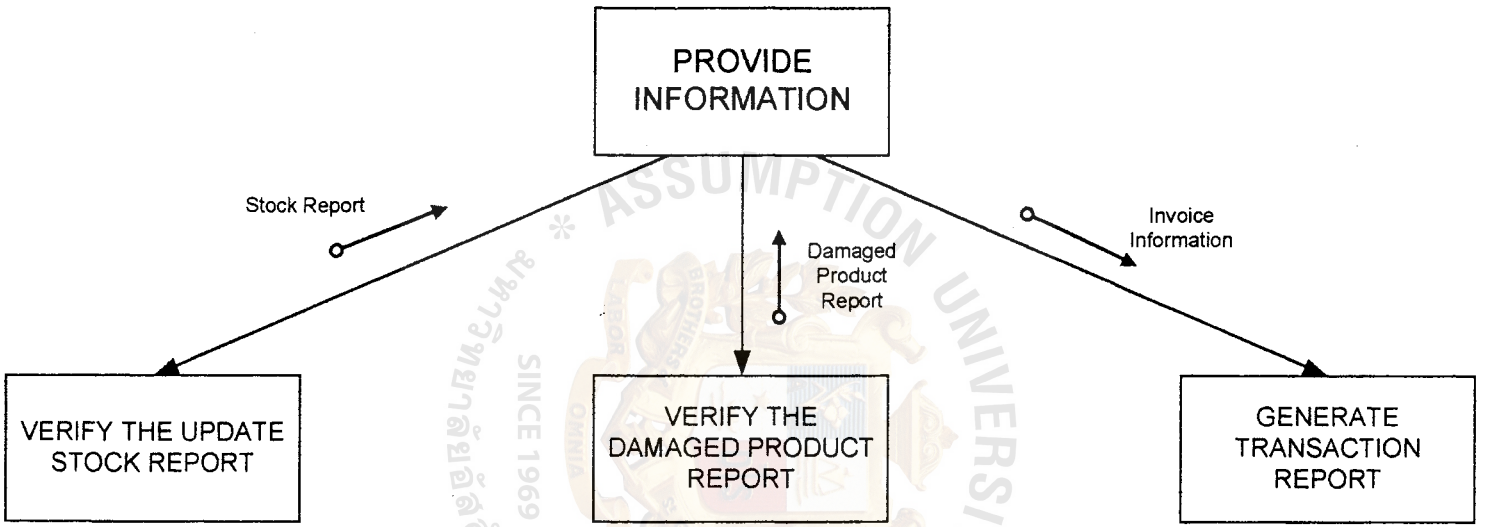

Figure D.7. Structure Chart of Provide Information.

APPENDIX E

PROCESS SPECIFICATION

PROCESS SPECIFICATION

Table E.1. Process Specification of Process 1.0.

Items	Descriptions
Process name:	Activity 1 - Check Available Stock
Data In:	Customer Order.
Data Out:	1. Requirement for purchasing. 2. Order lists.
Process:	1. Receive acknowledge of customer order. 2. Check the order form. 3. Generate the purchase requirement.

Table E.2. Process Specification of Process 2.0.

Items	Descriptions
Process name:	Activity 2 - preparing Purchase Order
Data In:	1. Purchase Requisition 2. Approved Purchase Order.
Data Out:	1. Purchase Order Information 2. Purchase Order form
Process:	1. Verify the purchase requirement. 2. Check the supplier information. 3. Send the purchase requirement to purchase department.

Table E.3. Process Specification of Process 3.0.

Items	Descriptions
Process name:	Activity 3 - Update Stock
Data In:	1. Order lists. 2. Goods received information. 3. Purchase Information.
Data Out:	1. Goods lists for delivery 2. Updated stock Information.
Process:	1. Verify data of received goods. 2. Check the movement of stock control. 3. Prepare the transaction of goods information.

Table E.4. Process Specification of Process 4.0.

Items	Descriptions
Process name:	Activity 4 - Verify Damaged Goods
Data In:	1. Invoice details. 2. Delivery note information 3. Approved purchasing. 4. Damaged goods form.
Data Out:	1. Payment Information. 2. Returned the damaged goods information 3. Goods received information.
Process:	1. Verify the damaged goods form of customer. 2. Check the received goods details from supplier. 3. Prepare the payment for supplier.

Table E.5. Process Specification of Process 5.0.

Items	Descriptions
Process name:	Activity 5 - Delivery
Data In:	1. Goods lists. 2. Payment information.
Data Out:	1. Returned goods information. 2. Delivery goods information. 3. Invoice details.
Process:	1. Check the customer order and the dispatched goods. 2. Verify the payment from the customer. 3. Prepare the goods for delivery.

Table E.6. Process Specification of Process 6.0.

Items	Descriptions
Process name:	Activity 6.0 - Provide information
Data In:	1. Damaged goods information. 2. Update stock information.
Data Out:	Transaction report.
Process:	1. Verify the update stock information. 2. Verify the damaged goods information. 3. Generate report for top management and Accounting Department.

Table E.7. Process Specification of Process 1.1.

Items	Descriptions
Process name:	Activity 1.1 - Check entry of customer order
Data In:	Customer order details.
Data Out:	1. Customer information 2. Order information.
Process:	1. Get acknowledge of the customer order. 2. Check the order form.

Table E.8. Process Specification of Process 1.2.

Items	Descriptions
Process name:	Activity 1.2 - Compare order with available stock
Data In:	1. Inventory information. 2. Customer order information.
Data Out:	1. Stock unavailable data. 2. Order lists.
Process:	1. Verify the customer order. 2. Check the product in stock.

Table E.9. Process Specification of Process 1.3.

Items	Descriptions
Process name:	Activity 1.3 - Generate purchase requisition
Data In:	Stock unavailable data.
Data Out:	Purchase requisition.
Process:	1. Verify Stock unavailable data. 2. Make a purchase order requirement.

Table E.10. Process Specification of Process 2.1.

Items	Descriptions
Process name:	Activity 2.1 - Verify purchase requisition
Data In:	Purchase requisition.
Data Out:	Approved purchase requisition.
Process:	Check the purchase requisition form.

Table E.11. Process Specification of Process 2.2.

Items	Descriptions
Process name:	Activity 2.2 - Check product information
Data In:	1. Approved purchase requisition. 2. Product information.
Data Out:	1. Purchase order details. 2. Requirement of purchase.
Process:	1. Get the product requisition. 2. Compare the product details with the purchase requisition.

Table E.12. Process Specification of Process 2.3.

Items	Descriptions
Process name:	Activity 2.3 - Generate purchase order
Data In:	1. Requirement of purchase. 2. Approved purchase order. 3. Supplier information.
Data Out:	Purchase order information.
Process:	1. Get approved purchasing 2. Make the purchase order. 3. Verify the supplier information.

Table E.13. Process Specification of Process 2.4.

Items	Descriptions
Process name:	Activity 2.4 - Generate purchase order report
Data In:	1. Purchase order information.
Data Out:	1. Purchase information. 2. Purchase reports.
Process:	1. Check the purchase order information. 2. Make the report of purchasing.

Table E.14. Process Specification of Process 3.1.

Items	Descriptions
Process name:	Activity 3.1 - Verify purchase order and product
Data In:	1. Purchase information. 2. Goods received information. 3. Damaged goods information. 4. Supplier information.
Data Out:	Product lists.
Process:	1. Check the purchase order and goods received. 2. Verify the damaged goods information.

Table E.15. Process Specification of Process 3.2.

Items	Descriptions
Process name:	Activity 3.2 - Movement of stock
Data In:	1.Inventory information. 2. Product lists.
Data Out:	Update stock information.
Process:	1. Get received goods information. 2. Check customer order information. 3. Generate the movement of goods of inventory.

Table E.16. Process Specification of Process 3.3.

Items	Descriptions
Process name:	Activity 3.3 - Verify purchase order
Data In:	1. Order lists. 2. Customer order information.
Data Out:	Valid order lists
Process:	Verify the customer order information.

Table E.17. Process Specification of Process 3.4.

Items	Descriptions
Process name:	Activity 3.4 - Compare the order with product
Data In:	1. Order lists. 2.Product information.
Data Out:	1. Customer order information. 2.Goods lists.
Process:	1. Get order lists. 2. Check the customer order and product information.

Table E.18. Process Specification of Process 4.1.

Items	Descriptions
Process name:	Activity 4.1 - Entry of the problem of customer
Data In:	Damaged goods form.
Data Out:	Valid damaged goods form.
Process:	1. Get the damaged goods form. 2. Verify the damaged goods form. 3. Send the valid goods form the activity 4.2.

Table E.19. Process Specification of Process 4.2.

Items	Descriptions
Process name:	Activity 4.2 - Verify the damaged product
Data In:	1. Valid damaged goods from. 2. Order information. 3. Product information.
Data Out:	Damaged goods information.
Process:	1. Get the valid damaged goods from. 2.Ckeck order information. 3.Verify the product information. 4.Generate damaged goods information.

Table E.20. Process Specification of Process 4.3.

Items	Descriptions
Process name:	Activity 4.3 - Check the receive product
Data In:	1. Delivery information. 2. Invoice information. 3.Supplier information. 4. Purchase order information.
Data Out:	1. Acceptable goods information. 2. Unacceptable goods information.
Process:	1. Verify purchase order and product. 2. Compare invoice with purchase order. 3. Verify the product received.

Table E.21. Process Specification of Process 4.4.

Items	Descriptions
Process name:	Activity 4.4 - Return the damage product
Data In:	Unacceptable goods information.
Data Out:	Return the damage goods.
Process:	1. Prepare the return of damaged goods. 2. Send the damaged goods to supplier.

Table E.22. Process Specification of Process 4.5.

Items	Descriptions
Process name:	Activity 4.5 - Accept the product and payment
Data In:	1. Approved purchasing. 2. Payment information. 3. Acceptable goods.
Data Out:	Credit note.
Process:	1. Get the approved purchasing. 2. Verify purchase information and payment information. 3. Send the credit note to supplier.

Table E.23. Process Specification of Process 4.6.

Items	Descriptions
Process name:	Activity 4.6 - Generate the product information report
Data In:	1.Damaged goods information. 2. Returned goods information. 3. Received goods information.
Data Out:	1. Received goods report. 2. Damage goods report.
Process:	1. Generate the received goods report. 2. Make the damaged goods report.

Table E.24. Process Specification of Process 5.1.

Items	Descriptions
Process name:	Activity 5.1 - Verify customer order and goods
Data In:	1. Goods lists. 2. Customer information. 3. Order information.
Data Out:	Dispatched goods information.
Process:	1. Prepare the delivery goods. 2. Send the information of dispatched goods to activity 5.2.

Table E.25. Process Specification of Process 5.2.

Items	Descriptions
Process name:	Activity 5.2 - Generate invoice
Data In:	Dispatched goods information.
Data Out:	1. Delivery note. 2. Invoice. 3. Goods returned.
Process:	1. Make the delivery note and invoice. 2. Verify the goods for return to customer.

Table E.26. Process Specification of Process 5.3.

Items	Descriptions
Process name:	Activity 5.3 - Verify payment and invoice
Data In:	1. Invoice details. 2. Credit note.
Data Out:	Payment information.
Process:	1. Get invoice and credit note details. 2. Verify the invoice and credit note details. 3. Send the payment information to account department.

Table E.27. Process Specification of Process 6.1.

Items	Descriptions
Process name:	Activity 6.1 - Verify the update stock report
Data In:	Update stock report.
Data Out:	Valid update stock report.
Process:	1. Get the update stock details. 2. Verify the update stock details. 3. Generate the update stock report. 4. Send the update stock report to activity 6.3.

Table E.28. Process Specification of Process 6.2.

Items	Descriptions
Process name:	Activity 6.2 - Verify the damage goods report
Data In:	Damage goods report.
Data Out:	Valid damage goods report.
Process:	1. Get the damage goods report. 2. Check the damage goods report.

Table E.29. Process Specification of Process 6.3.

Items	Descriptions
Process name:	Activity 6.3 - Generate transaction report
Data In:	1. Update stock report. 2. Damaged goods report.
Data Out:	Transaction report
Process:	5. Get the update stock report and damage goods report. 6. Verify the update stock report and damage goods report. 7. Generate the transaction report. 8. Send the transaction report to top management and accounting department.

APPENDIX F

DATA DICTIONARY

Table F.1. Data Dictionary of Inventory System Database.

Field Name	Description
Brand	Brand of the product.
C_Address	The address of the customer.
C_City	City where the customer lives.
C_Country	Country where the customer lives.
C_Company Name	Name of the customer's company.
C_E-mail	E-mail address of the customer.
C_Fax	Fax number of the customer.
C_Postal Code	Postal code of the area where the customer lives.
C_State	state where the customer lives.
C_Telephone	Telephone number of the customer.
Customer Code	Customer Identification number.
Customer Name	Name of person who contacts Home Audio Co., Ltd.
Customer Surname	Surname of person who contacts Home Audio Co., Ltd.
List Price	Standard price.
No in Stock	Units left in stock.
O_Cost	Cost of the product ordered.
O_Quantity	Quantity of the product ordered.
Order Date	The date of order placement.
Order No	Identification number of the order.
P_Cost	Cost of the product purchased.
P_Quantity	Quantity of the product purchased.
Product Code	Identification order product and damaged product.
Purchase Date	The date of purchase placement.
Purchase No	Identification number of the purchase.
Representative Name	Name of person who contacts Home Audio Co., Ltd.
Representative Surname	Surname of person who contacts Home Audio Co., Ltd.

Table F.1. Data Dictionary of Inventory System Database. (Continued)

Field Name	Description
S_Address	The address of the supplier.
S_City	City where the supplier's company is located.
S_Company Name	Name of the supplier's company
S_Country	Country where the supplier's company is located.
S_E-mail	E-mail address of the supplier.
S_Fax	Fax number of the supplier.
S_Postal Code	Postal Code of the area where the supplier's company is located.
S_State	State where the supplier's company is located.
S_Telephone	Telephone number of the supplier.
Supplier Code	Supplier Identification number

APPENDIX G

DATABASE DESIGN

Table G.1. Customer Table.

No.	Field Name	Field Type	Key Type	Foreign Key
1	Customer Code	Text (5)	Primary Key	-
2	Customer Name	Text (15)	Attribute	-
3	Customer Surname	Text (20)	Attribute	-
4	C_Company Name	Text (30)	Attribute	-
5	C_Address	Text (30)	Attribute	-
6	C_City	Text (15)	Attribute	-
7	C_Country	Text (30)	Attribute	-
8	C_Postal Code	Text (10)	Attribute	-
9	C_Telephone	Text (15)	Attribute	-
10	C_Fax	Text (15)	Attribute	-
11	C_E-mail	Text (20)	Attribute	-

Table G.2. Customer_Order Table

No.	Field Name	Field Type	Key Type	Foreign Key
1	Customer Code	Text (5)	Primary Key	Customer Table
2	Order No	Text (6)	Primary Key	Order Table

Table G.3. Order Table

No.	Field Name	Field Type	Key Type	Foreign Key
1	Order No	Text (6)	Primary Key	-
2	Customer Code	Text (5)	Attribute	Customer Table
3	Order Date	Date/Time (8)	Attribute	-

Table G.4. Order_Product Table.

No.	Field Name	Field Type	Key Type	Foreign Key
1	Product Code	Text (6)	Primary Key	Product Table
2	Order No	Text (6)	Primary Key	Order Table
3	O_Quantity	Number (5)	Attribute	-
4	O_Cost	Number (10)	Attribute	-

Table G.5. Product Table.

No.	Field Name	Field Type	Key Type	Foreign Key
1	Product Code	Text (6)	Primary Key	-
2	Product Name	Text (30)	Attribute	-
3	Brand	Text (15)	Attribute	-
4	List Price	Number (5)	Attribute	-
5	No in Stock	Number (5)	Attribute	-

Table G.6. Purchase_Product Table.

No.	Field Name	Field Type	Key Type	Foreign Key
1	Product Code	Text (6)	Primary Key	Product Table
2	Purchase No	Text (6)	Primary Key	Purchase Table
3	P_Quantity	Number (5)	Attribute	-
4	P_Cost	Number (10)	Attribute	-

Table G.7. Purchase Table.

No.	Field Name	Field Type	Key Type	Foreign Key
1	Purchase No	Text (6)	Primary Key	-
2	Supplier Code	Text (5)	Attribute	Supplier Table
3	Purchase Date	Date/Time (8)	Attribute	-

Table G.8. Supplier_Purchase Table.

No.	Field Name	Field Type	Key Type	Foreign Key
1	Purchase No	Text (6)	Primary Key	Purchase Table
2	Supplier Code	Text (5)	Primary Key	Supplier Table

Table G.9. Supplier Table.

No.	Field Name	Field Type	Key Type	Foreign Key
1	Supplier Code	Text (5)	Primary Key	-
2	S_Company Name	Text (30)	Attribute	-
3	Representative Name	Text (15)	Attribute	-
4	Representative Surname	Text (20)	Attribute	-
5	S_Address	Text (30)	Attribute	-
6	S_City	Text (15)	Attribute	-
7	S_Country	Text (30)	Attribute	-
8	S_Postal Code	Text (10)	Attribute	-
9	S_Telephone	Text (15)	Attribute	-
10	S_Fax	Text (15)	Attribute	-
11	S_E-mail	Text (20)	Attribute	-

APPENDIX H

USER INTERFACE DESIGN

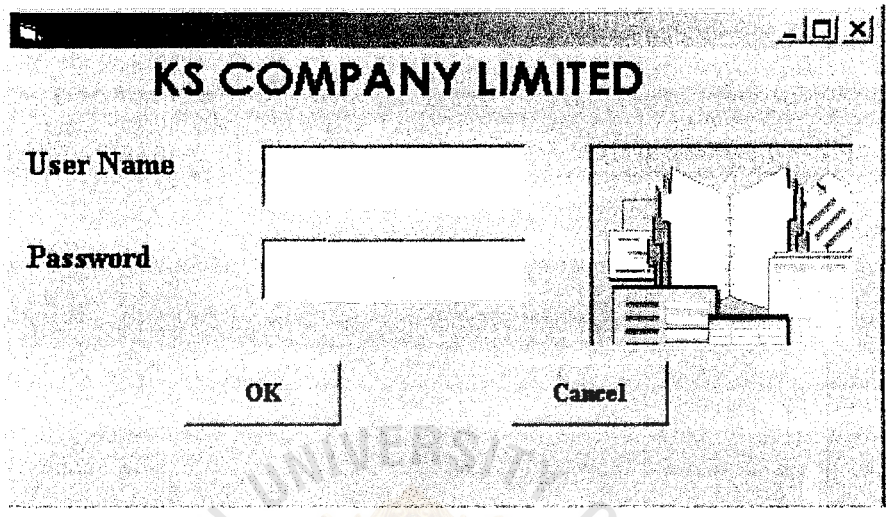

Figure H.1. Log in Screen.

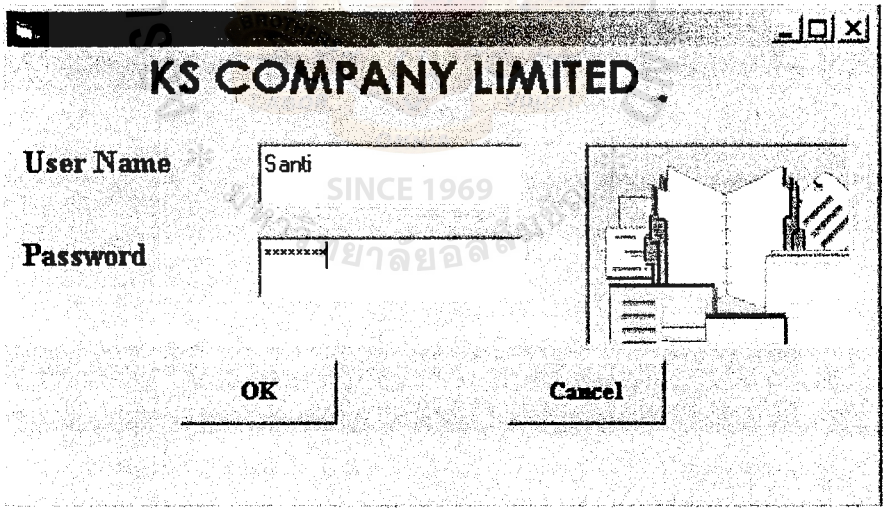

Figure H.2. Log in Screen.

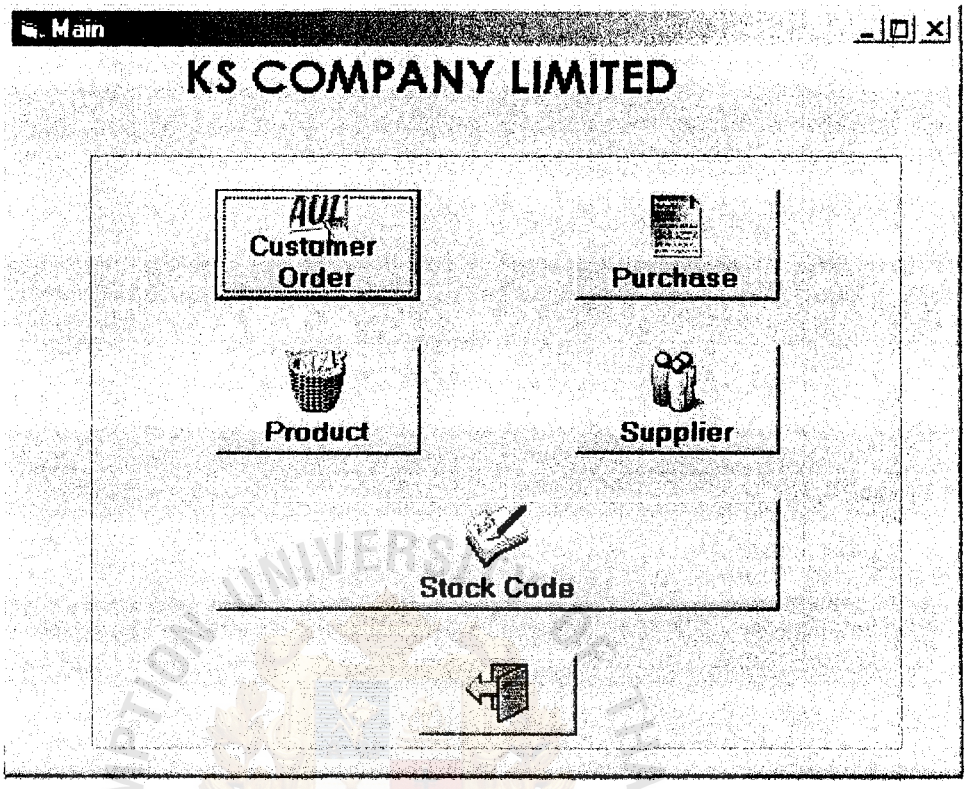

Figure H.3. KS Company Main Menu.

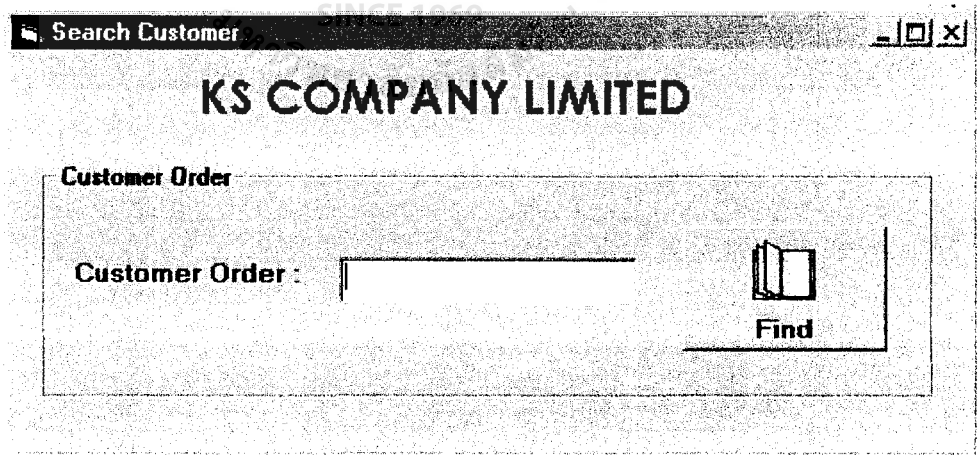

Figure H.4. Customer Order Search.

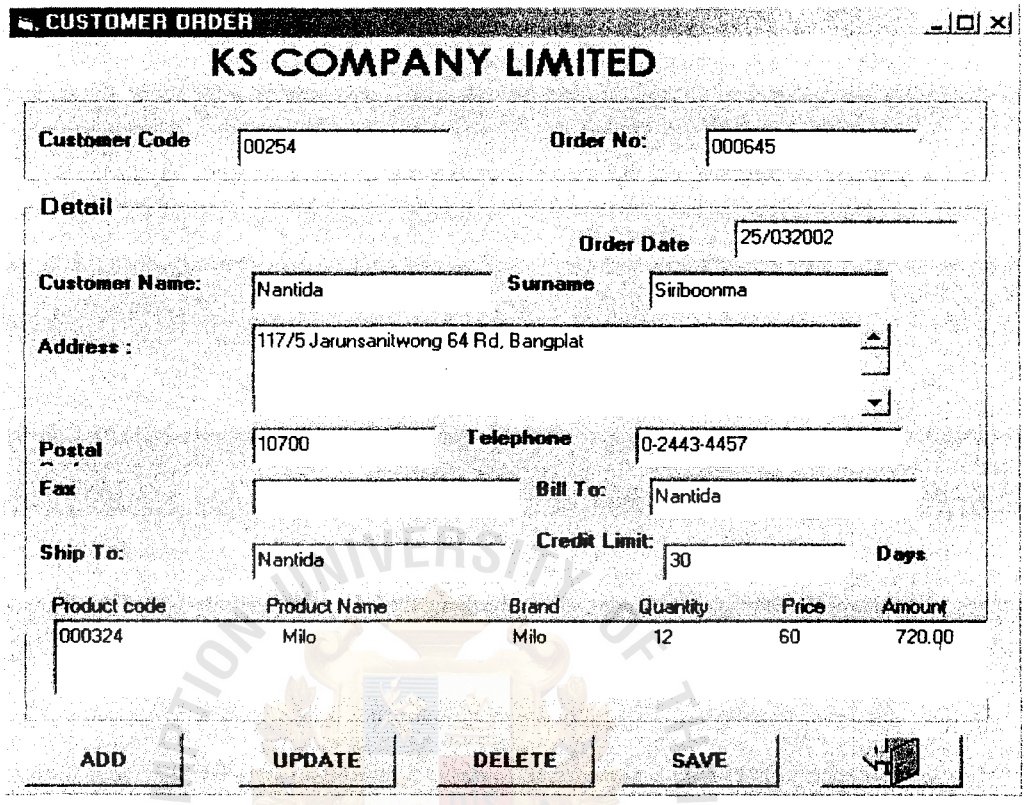

Figure H.5. Customer Order Screen.

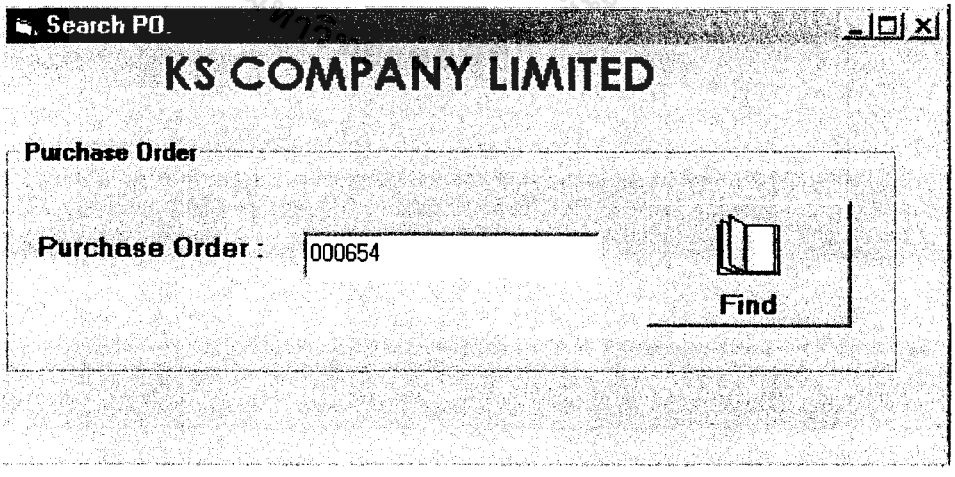

Figure H.6. Purchase Order Screen.

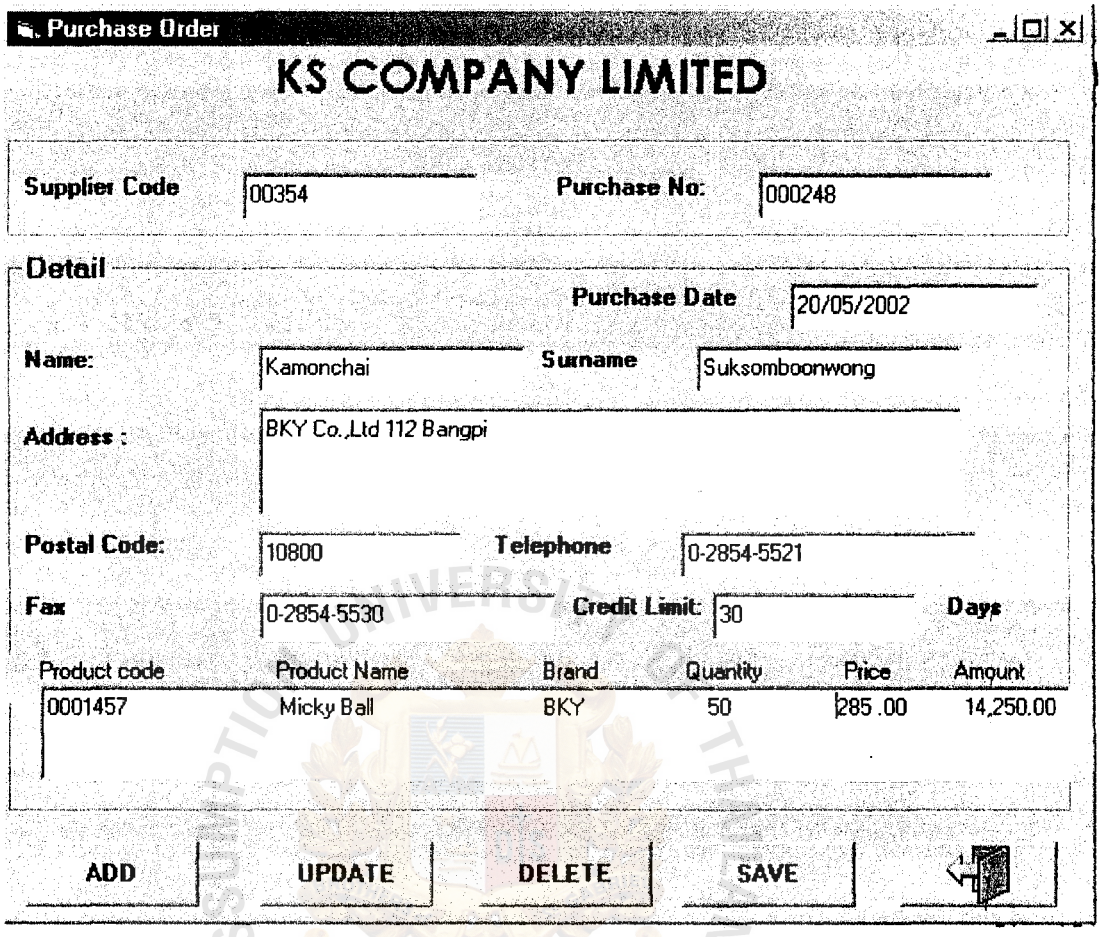

Figure H.7. Purchase Order.

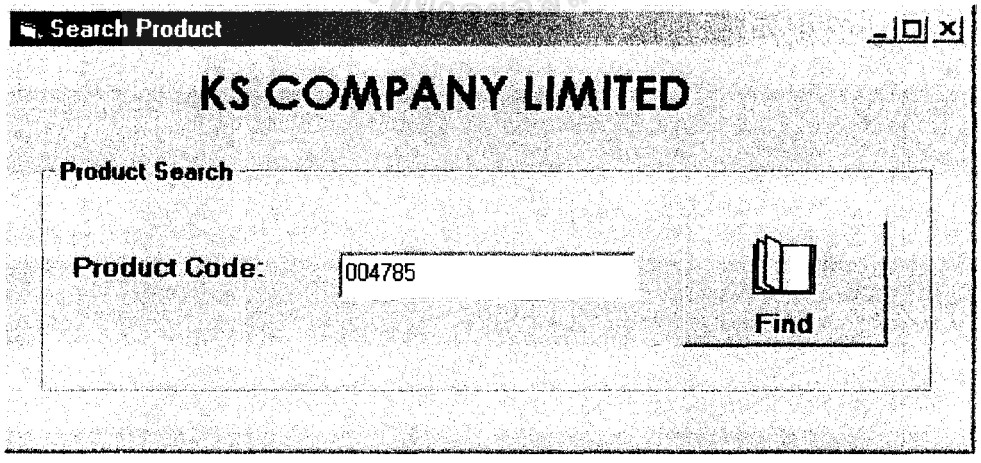

Figure H.8. Product Detail Search.

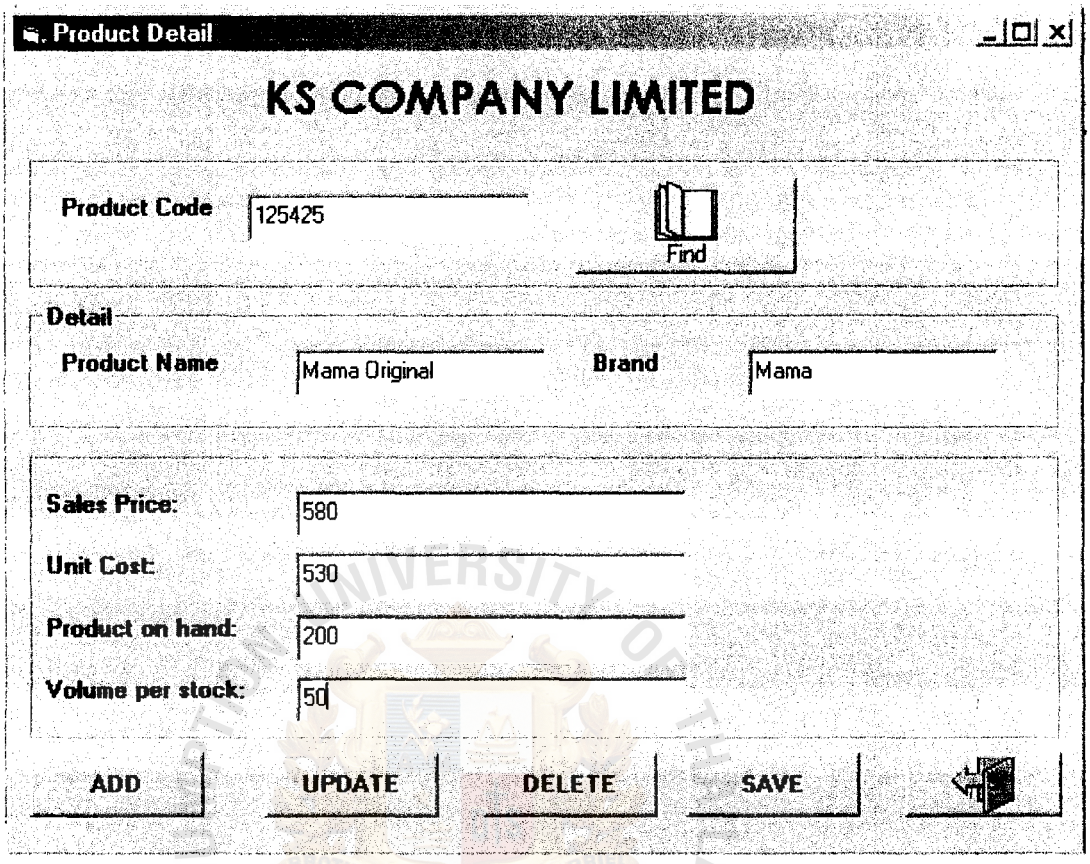

Figure H.9. Product Detail

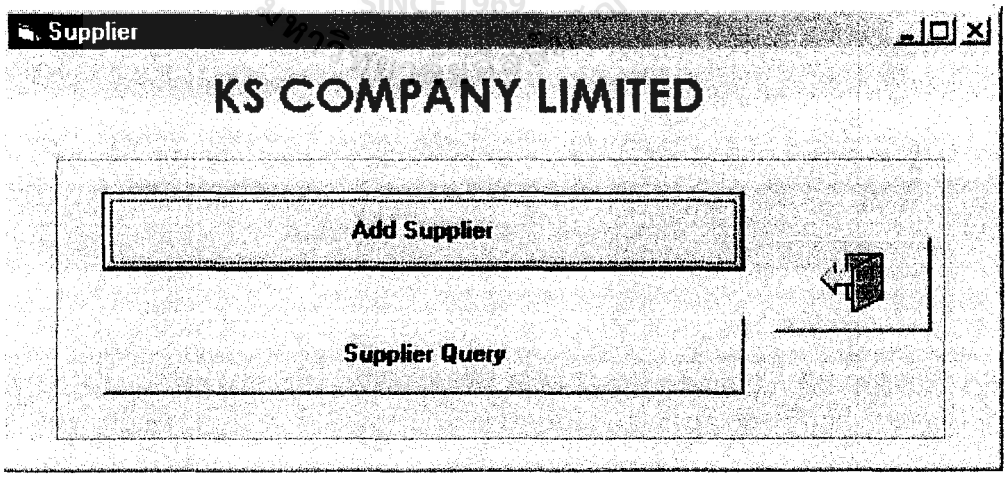

Figure H.10. Supplier Query Select

Figure H.11. Supplier Query.

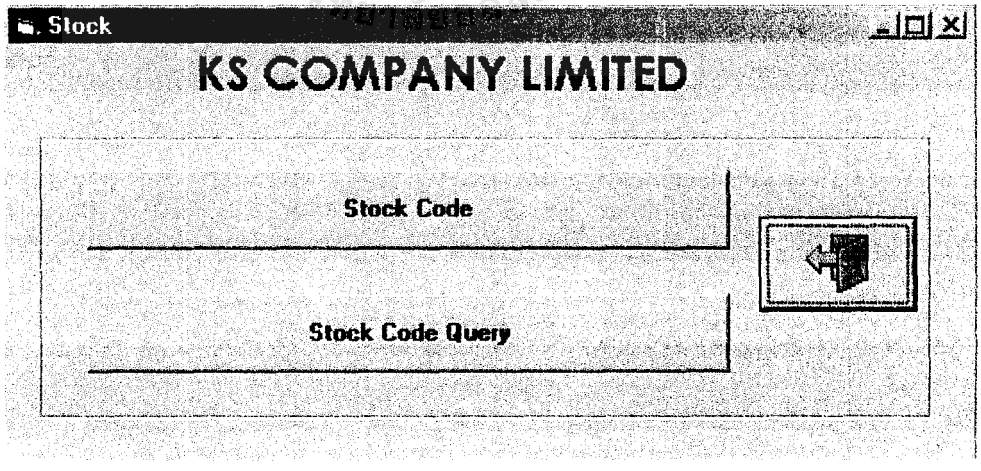

Figure H.12. Stock Code Select.

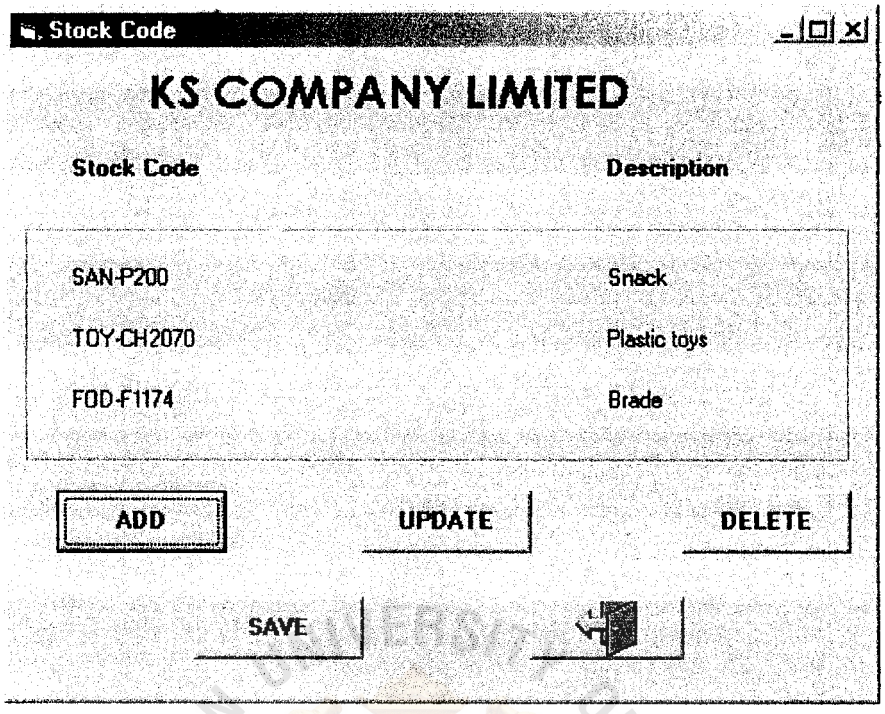

Figure H.13. Stock Code.

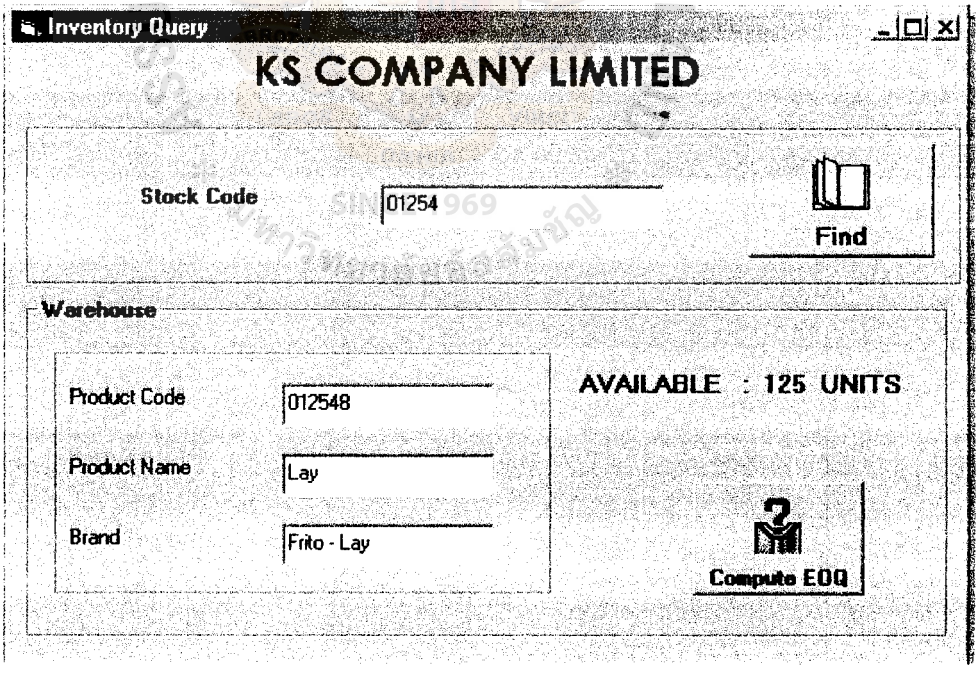

Figure H.14. Stock Code Query.

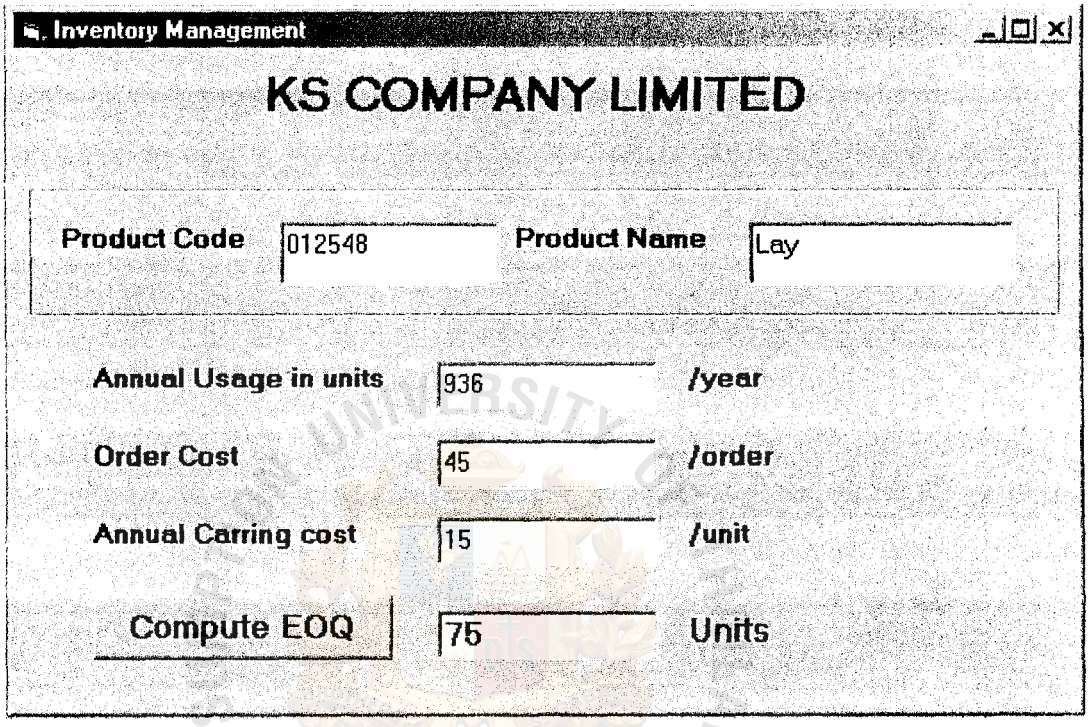

Figure H.15. Compute EOQ Screen.

APPENDIX I

REPORT DESIGN

KS COMPANY LIMITED

CUSTOMER REPORT PAGE 001

DATE: 99/99/9999

Customer Code	Customer Name	Customer Surname	Address	Telephone	Date Opened	Amount
00001	Apichart	Booraphan	172 Silom Rd	0-2657-8542	03/01/2002	17900.00
00002	Chanchai	Akeudom	254 Lunloung Rd,	0-2254-5486	12/01/2002	79800.00
00003	Chokchai	Suwanwong	47/9 Charoundkrung	0-2548-6578	07/02/2002	8220.00
00004	Teeradetch	Punwattana	258/5-6 Jarunphon	0-2215-5487	15/02/2002	34970.00
00005	Udomrat	Saranuwat	77 Arunamarin Rd	0-2433-6648	19/02/2002	9(7)V9(2)

Figure I.1. Customer Report.

KS COMPANY LIMITED

PRODUCT DETAIL REPORT PAGE 001

DATE: 99/99/9999

Product Code	Product Name	Brand	Unit Cost	Unit Price	Product On Hand
001200	Lay-Bar BQ	Lay	380.00	400.00	200
001201	Lay - Pizza	Lay	380.00	400.00	150
001202	Micky Ball	Sang Udom	580.00	590.00	70
001203	Jelelight	Srinana	360.00	385.00	300
001204	Jelemix	Srinana	275.000	290.00	100

Figure I.2. Product Details Report.

KS COMPANY LIMITED

INVOICE REPORT PAGE 001

DATE: 99/99/9999

Invoice Code	Customer Name	Order Code	Invoice Date	Quantity	Unit Price	Amount
000120	Apichart	000100	03/01/2002	50	245.00	12250.00
000121	Chanchai	000101	12/01/2002	25	478.00	11950.00
000122	Chokchai	000510	07/02/2002	20	285.00	5700.00
000123	Teeradetch	005478	15/02/2002	20	470.00	9400.00
000124	Udomrat	001950	19/02/2002	5	538.00	2690.00

Figure I.3. Invoice Report.

KS COMPANY LIMITED

ORDER LIST REPORT PAGE 001

DATE: 99/99/9999

Order Code	Customer Name	Customer Code	Product Code	Required Date	Quantity	Unit Price	Amount
000100	Apichart	00001	001200	03/01/2002	50	245.00	12250.00
000101	Chanchai	00002	001201	12/01/2002	25	478.00	11950.00
000510	Chokchai	00003	001202	07/02/2002	20	285.00	5700.00
005478	Teeradetch	00004	001203	15/02/2002	20	470.00	9400.00
001950	Udomrat	00005	001204	19/02/2002	5	538.00	2690.00

Figure I.4. Order List Report.

KS COMPANY LIMITED

TOP TEN BEST SOLD REPORT PAGE 001

DATE: 99/99/9999

No	Product Code	Product Name	Brand	Unit Cost	Unit Price	Quantity	Amount
1	001200	Lay-Bar BQ	Lay	380.00	400.00	200	80000.00
2	001201	Lay - Pizza	Lay	380.00	400.00	100	40000.00
3	001202	Micky Ball	Sang Udom	580.00	590.00	220	129800.00
4	001203	Jelelight	Srinana	360.00	385.00	70	26950.00
5	001204	Jelemix	Srinana	275.000	290.00	130	37700.00

Figure I.5. Top Ten Best Sold Report.

KS COMPANY LIMITED

SUMMARY OF SALES REPORT PAGE 001

DATE: 99/99/9999

Product Code	Product Name	Brand	Unit Price	Quantity	Amount
001200	Lay-Bar BQ	Lay	380.00	200	80000.00
001201	Lay - Pizza	Lay	380.00	100	40000.00
001202	Micky Ball	Sang Udom	580.00	220	129800.00
001203	Jelelight	Srinana	360.00	70	26950.00
001204	Jelemix	Srinana	275.000	130	37700.00

Figure I.6 Summary of Sales Report.

KS COMPANY LIMITED

DELIVERY ORDER REPORT PAGE 001

DATE: 99/99/9999

No	Product Code	Product Name	Brand	Unit Price	Quantity	Amount
1	001200	Lay-Bar BQ	Lay	380.00	200	80000.00
2	001201	Lay - Pizza	Lay	380.00	100	40000.00
3	001202	Micky Ball	Sang Udom	580.00	220	129800.00
4	001203	Jelelight	Srinana	360.00	70	26950.00
5	001204	Jelemix	Srinana	275.000	130	37700.00

Figure I.7. Delivery Order Report.

KS COMPANY LIMITED

SUMMARY OF SALES REPORT PAGE 001

DATE: 99/99/9999

Product Code	Product Name	Brand	Unit Cost	Unit Price	Product In	Product Out	Product On Hand
001200	Lay-Bar BQ	Lay	380.00	400.00	150	50	100
001201	Lay - Pizza	Lay	380.00	400.00	250	120	130
001202	Micky Ball	Sang Udom	580.00	590.00	100	70	30
001203	Jelelight	Srinana	360.00	385.00	130	60	70
001204	Jelemix	Srinana	275.000	290.00	100	50	50

Figure I.8. Product History Report.

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