PURCHASING AND INVENTORY INFORMATION SYSTEM OF SENY COMPANY

by

Mr. Pongsakorn Jarusompopgul

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
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Project Title	Purchasing and Inventory Information System of Seny Company.
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Academic Year	March 2001

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 of the degree of Master of Science in Computer and Information Systems.

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ABSTRACT

Seny Company is a toy manufacturer located in Thailand. It produces good quality products. It has to deal with several suppliers who supply good quality parts. In order to produce good quality products, efficient and effective purchasing and inventory processes are required. Therefore, this project is to develop efficient and effective information system to facilitate the process of purchasing and maintaining good inventory operations.

The current system, Purchase Information System is based on the manual system. All the data are manually recorded and stored on paper. It requires many purchasing staffs to operate the system, and has to face many problems such as processing errors, inconsistent data, loss data, etc.

The proposed Purchasing and Inventory Information System is developed to replace the existing manual system. The new system is developed based on client/server architecture. The graphical user interfaces on client workstations are designed using Microsoft Access 97. The system helps to reduce the amount of paper work, the number of purchasing staffs and solve other common problems encountered in the manual system.

ACKNOWLEDGEMENTS

Several people have made contributions to this project. The Writer would like to acknowledge their efforts and thank them for their contributions.

He would like to thank Dr. Boonyarit Pokrud, his project advisor, for his valuable suggestions and advice given in to the preparation of this project.

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I. INTRODUCTION

1.1 Background of the Project

Seny company is a toy manufacturer. The company produces robots. The company has established a good relationship with various suppliers. As the business grows, the existing system can not handle the purchasing of raw materials and parts effectively and efficiently. The purchasing department is assigned to develop the new computerized system to operate the purchasing and inventory control of raw materials and parts.

The project, then, is developed to enhance the information processing system of the purchasing and inventory control under computerized system instead of the existing system.

1.2 Objectives of the Project

In order to be able to compete with the competitors, Seny management focuses on a computerized system. The management visions that the company needs to plan for the future expansion to keep up with the changing competitive environment. With this vision, the project objectives are as follows:

(1) To study and analyze the existing purchase information system and define the boundary of the proposed system based on present problems and user requirements.

(2) To design the computerized system to improve the efficiency and effectiveness of purchasing and inventory information system.

(3) To develop and test the software using Microsoft Access 97.

(4) To eliminate or reduce the problems in the existing system.

(5) To provide accuracy and timely information for operational level and management decision making.

1.3 Scope of the Project

The scope of the analysis covers the area of the purchasing and inventory management of raw materials and parts that are used to produce company's products. In purchasing management, the project provides information of suppliers, purchase requisitions and purchase orders. Supplier database is developed and maintained to provide general information such as name, address, and supplied raw materials and parts.

For inventory management, the project provides information of available raw materials and parts when the production department submits the purchase requisitions. Raw materials and parts that are supplied by the suppliers will be checked with the purchase orders. Wrong raw materials and parts will be sent back to suppliers. Validated raw materials and parts will be sent to the warehouse. The system provides the inventory reports that contains validated raw materials and parts information.

1.4 Deliverables

(1) Screen Interface

Screen interfaces are designed for easy to use. All screen interfaces are as follows:

(a) Main Menu Interface is shown in Appendix A, Figure A.1.

(b) Input Screen Interface is shown in Appendix A, Figure A.2.

(c) Table Screen Interface is shown in Appendix A, Figure A.3.

(d) Report Screen Interface is shown in Appendix A, Figure A.4.

(e) Edit Screen Interface is shown in Appendix A, Figure A.5.

(f) Supplier Input Screen Interface is shown in Appendix A, Figure A.6.

(g) Officer Input Screen Interface is shown in Appendix A, Figure A.7.

(h) Inventory Input Screen Interface is shown in Appendix A, Figure A.8.

(i) Department Input Screen Interface is shown in Appendix A, Figure A.9.

(j) Purchase Requisition Input Screen Interface is shown in Appendix A, Figure A.10.

(k) Purchase Order Input Screen Interface is shown in Appendix A, Figure A.11.

(l) Delivery Purchase Order Input Screen Interface is shown in Appendix A, Figure A.12.

(m) Supplied Part Input Screen Interface is shown in Appendix A, Figure A.13.

(n) Ordered Part Input Screen Interface is shown in Appendix A, Figure A.14.

(2) Data Flow Diagram

Data flow diagrams are designed to show the flow of the data among the processes in the computerized system.

(3) Entity Relationship Diagram

Entity relationship diagrams are designed to show the entities that will be used to developed the database.

(4) Database

Databases are designed to keep the data of the purchasing and inventory information system. All database tables are as follows:

(a) Purchase Requisition Table is shown in Appendix C, Table C.1.

(b) Department Table is shown in Appendix C, Table C.2.

(c) Ordered Part Table is shown in Appendix C, Table C.3.

(d) Inventory Table is shown in Appendix C, Table C.4.

(e) Supplier Table is shown in Appendix C, Table C.5.

(f) Supplied Part Table is shown in Appendix C, Table C.6.

(g) Purchase Order Table is shown in Appendix C, Table C.7.

(h) Delivery Purchase Order Table is shown in Appendix C, Table C.8.

(i) Officer Table is shown in Appendix C, Table C.9.

(5) Structure Chart

Structure charts are designed to show how the process has been partitioned into smaller more manageable processes, the hierarchy and organization of these processes. All structure charts are as follows:

(a) Structure Chart of Process Purchase Requisition is shown in Appendix F, Figure F.1.

(b) Structure Chart of Process Inventory Data is shown in Appendix F, Figure F.2.

(c) Structure Chart of Process Supplier Data is shown in Appendix F, Figure F.3.

(d) Structure Chart of Process Purchase Order is shown in Appendix F, Figure F.4.

(e) Structure Chart of Process Wrong Parts is shown in Appendix F, Figure F.5.

(f) Structure Chart of Process Validated Parts is shown in Appendix F, Figure F.6.

(6) Network Configuration

Network configuration is developed and designed to show the connection between the server and the clients. Network configuration is shown in Figure 3.11.

(7) Report Design

Management requests the reports from the computerized system to make the decisions. The computerized system generates the reports to the management as follows:

(a) Requested Part Report

Requested part report contains the information of the available parts that are requested by the production department. This report is shown in Appendix B, Figure B.1.

(b) Inventory Report

Inventory report contains the information of the raw materials and parts that are supplied by which suppliers, supplied quantity, which department, and ordered quantity. This report is shown in Appendix B, Figure B.2.

(c) Supplier Report

Supplier report contains the information of the suppliers such as Supplier ID, Supplier Name and Supplier Address. This report is shown in Appendix B, Figure B.3.

(d) Officer Report

Officer report contains the information of the officers who are responsible in the proposed system. This report is shown in Appendix B, Figure B.4.

(e) Part Report

Part report contains the information of the raw materials and parts that are stored in the warehouse. This report is shown in Appendix B, Figure B.5.

(f) Department Report

Department report contains the information of the department of the company. This report is shown in Appendix B, Figure B.6.

(g) Purchase Requisition Report

Purchase requisition report contains the information of the purchase requisition such as Purchase Requisition No, Department No, Part No, Quantity and Issued Date. This report is shown in Appendix B, Figure B.7.

(h) Purchase Order Report

Purchase order report contains the information of the purchase order such as Purchase Order No, Part No, Quantity and Issued Date. This report is shown in Appendix B, Figure B.8.

(i) Delivery Purchase Order Report

Delivery purchase order report contains the information of the delivery purchase order such as Purchase Order No, Supplier No, Part No and Delivery Date. This report is shown in Appendix B, Figure B.9.

(j) Supplied Part Report

Supplied part report contains the information of the parts that are supplied by the suppliers. This report is shown in Appendix B, Figure B.10.

(k) Ordered Part Report

Ordered part report contains the information of the parts that are ordered and requested by the departments. This report is shown in Appendix B, Figure B.11.

1.5 Project Plan

After the approval of the project from the management, the analyst plans the project phases as follows:

(1) Define the Existing System

This task is to define the objectives and the scope of the proposed system. It takes 3-4 days of the first month. It starts from January 1, 2001 to January 4, 2001.

(2) Study the Existing System

This task is to study and analyze the existing system. It takes 9-10 days of the first month. It starts from January 5, 2001 to January 14, 2001.

(3) Identify the Existing System Problems

This task is to identify the existing system problems. It takes 6-8 days of the first month. It starts from January 15, 2001 to January 23, 2001.

(4) Develop Context Diagram

This task is to develop the context diagram of the proposed system. It takes 5-6 days of the first month. It starts from January 24, 2001 to January 31, 2001.

(5) Develop Data Flow Diagram and Entity Relationship Diagram

This task is to develop the data flow diagram and entity relationship diagram of the proposed system. It takes 5-6 days of the first month. It starts from February 1, 2001 to February 6, 2001.

(6) Costs/Benefits Analysis

This task is to do costs and benefits analysis of the proposed system. It takes 7-8 days of the second month. It starts from February 7, 2001 to February 14, 2001.

(7) Interface Design

This task is to design the interface of the proposed system. It takes 7-8 days of the second month. It starts from February 15, 2001 to February 22, 2001.

(8) Report Design

This task is to design the reports that are generated in the proposed system. It takes 4-5 days of the second month. It starts from February 15, 2001 to February 19, 2001.

(9) Database Design

This task is to design and develop database to keep the data into the computer. It takes 13-14 days of the second month. It starts from February 15, 2001 to February 28, 2001.

(10) Network Design

This task is to design the network to connect between the server and the clients of the proposed system. It takes 11-12 days of the second month. It starts from February 15, 2001 to February 26, 2001.

(11) Program Design

This task is to develop the program to be used in the proposed system. It takes 13-14 days of the second month. It starts from February 15, 2001 to February 28, 2001.

(12) Coding

This task is to code the programs that are used in the proposed system. It takes 24-25 days of the third month. It starts from March 1, 2001 to March 25, 2001.

(13) Testing

This task is to test the programs that are used in the proposed system whether they can run properly and generate the results correctly or not. It takes 7-8 days of the third month. It starts from March 24, 2001 to March 31, 2001.

(14) Hardware Installation

This task is to install the hardware of the proposed system. It takes 5-6 days of the third month. It starts from March 1, 2001 to March 6, 2001.

(15) Software Installation

This task is to install the software of the proposed system. It takes 6-7 days of the fourth month. It starts from April 1, 2001 to April 7,

2001.

(16) Conversion

This task is to change the manual system into the computerized system. It takes 20-21 days of the fourth month. It starts from April 8, 2001 to April 30, 2001.

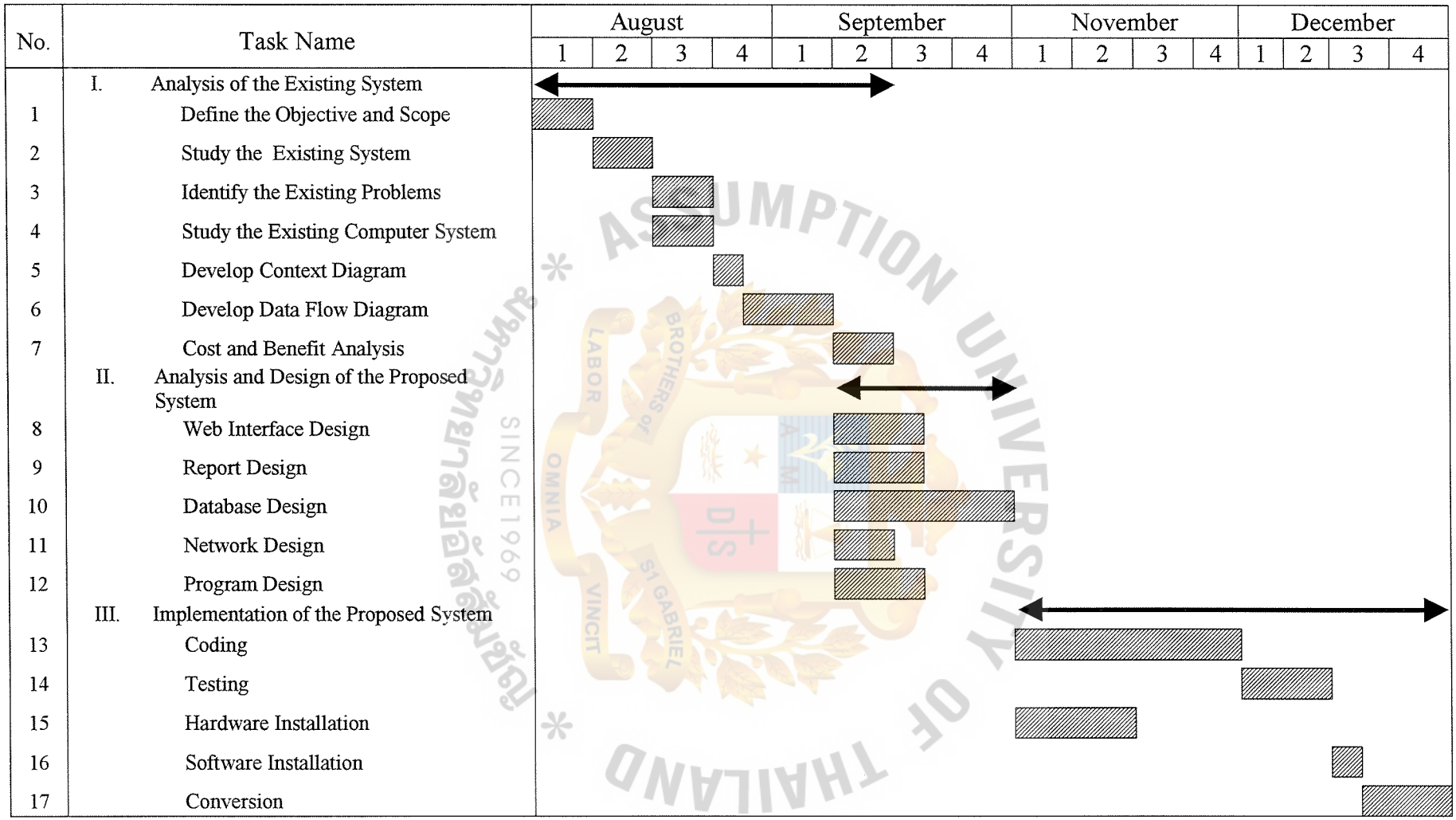


Figure 1.1. Project Plan.

II. THE EXISTING SYSTEM

2.1 Background of the Organization

Seny company is a toy manufacturer that was established in August 20, 1998. The company produces racing cars, robots, and dinosaurs. Its head office is located on Ladprao road. There are many company branches located on Silom, Bangkapi, Dindaeng and Ramkhamhaeng. The company produces toy. The factory is located on Ramkhamhaeng road. There are about 200 employees in the factory. The company's goal is to increase market shares and produce good quality products to satisfy customers. The company has established a good relationship with various customers and suppliers. The company brings new and high technology into the system in order to complete with competitors. The organization chart is shown in Figure 2.1.

The company has five departments as follows:

(1) Human Resource Department.

This department is responsible for human resources of the company.

(2) Accounting Department.

This department is responsible for making general the accounting standard, prepare trial balance and income statement, producing payroll for all employees, etc.

(3) Production Department.

This department is responsible for producing the company's products.

(4) Marketing Department.

This department is responsible for handling all orders from customers and selling the company's products to the customers.

(5) Purchasing Department.

This department is responsible for purchasing the raw materials and parts from various suppliers.

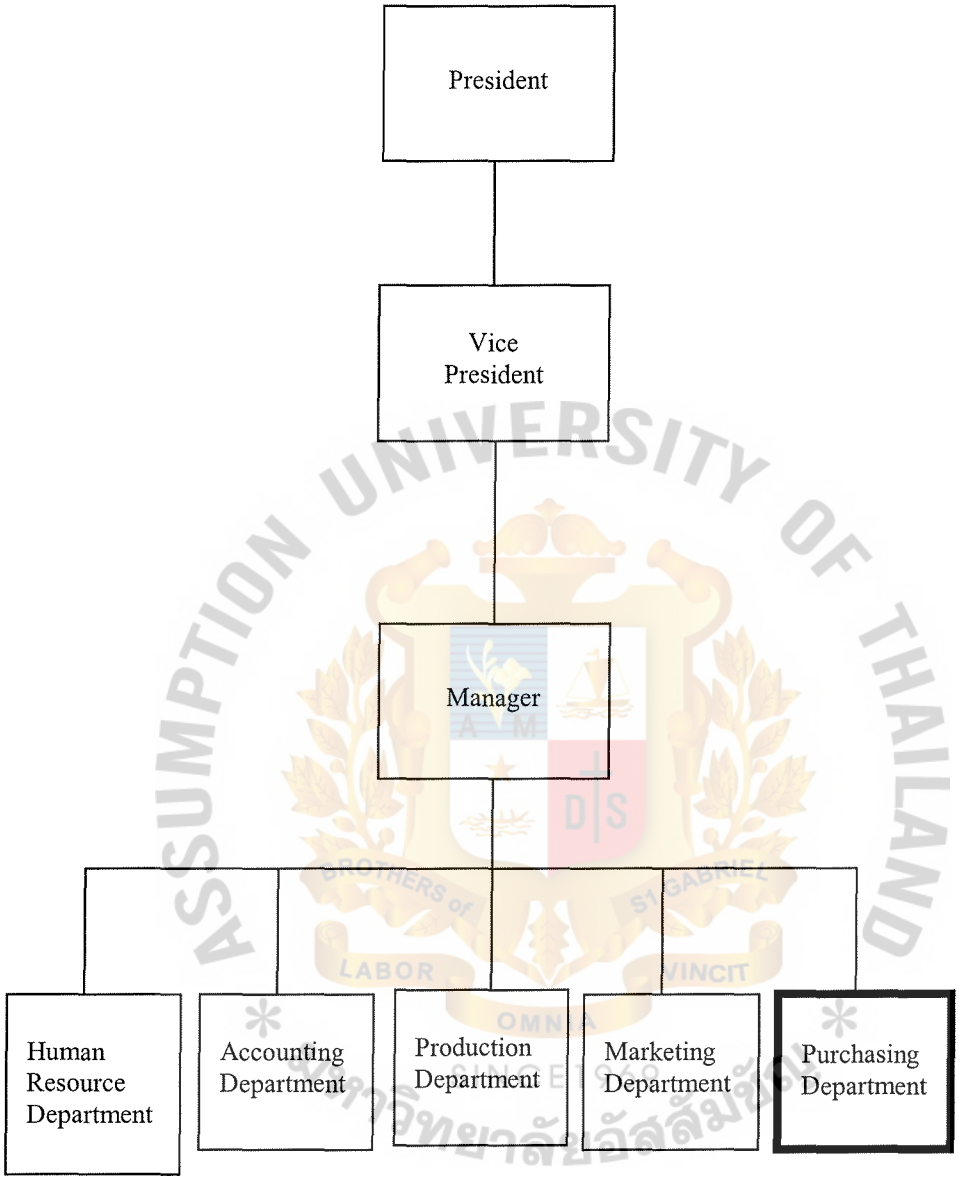


Figure 2.1. Organization Chart of Seny Company.

2.2 Existing Business Function

Purchase Requisitions (PR) that are sent by production department are the documents that initiate the purchasing transactions. Every purchase begins with these documents. When production department needs raw materials and parts to produce the company's products, production department prepares purchase requisitions manually. These purchase requisitions contain the data that clearly describes the requested raw materials and parts.

(1) Purchase requisition number.

(2) Issued date.

(3) Part number and department number.

(4) Part name, color, and quantity.

(5) Person who prepare and approve purchase requisition.

After purchasing department performs the procurement process, purchasing department prepares purchase orders by using the information from the purchase requisitions and supplier's information from purchasing agent. The purchase orders contain the following information.

(1) Purchase order number.

(2) Issued date.

(3) Part number and supplier number.

(4) Part name, color, and quantity.

(5) Person who prepare and approve purchase requisition.

Raw materials and parts that are sent by suppliers will be checked with purchase orders. Wrong raw materials and parts will be returned to the suppliers. Validated raw materials and parts are sent to the warehouse. Context data flow diagram of the existing system is shown in Figure 2.2.

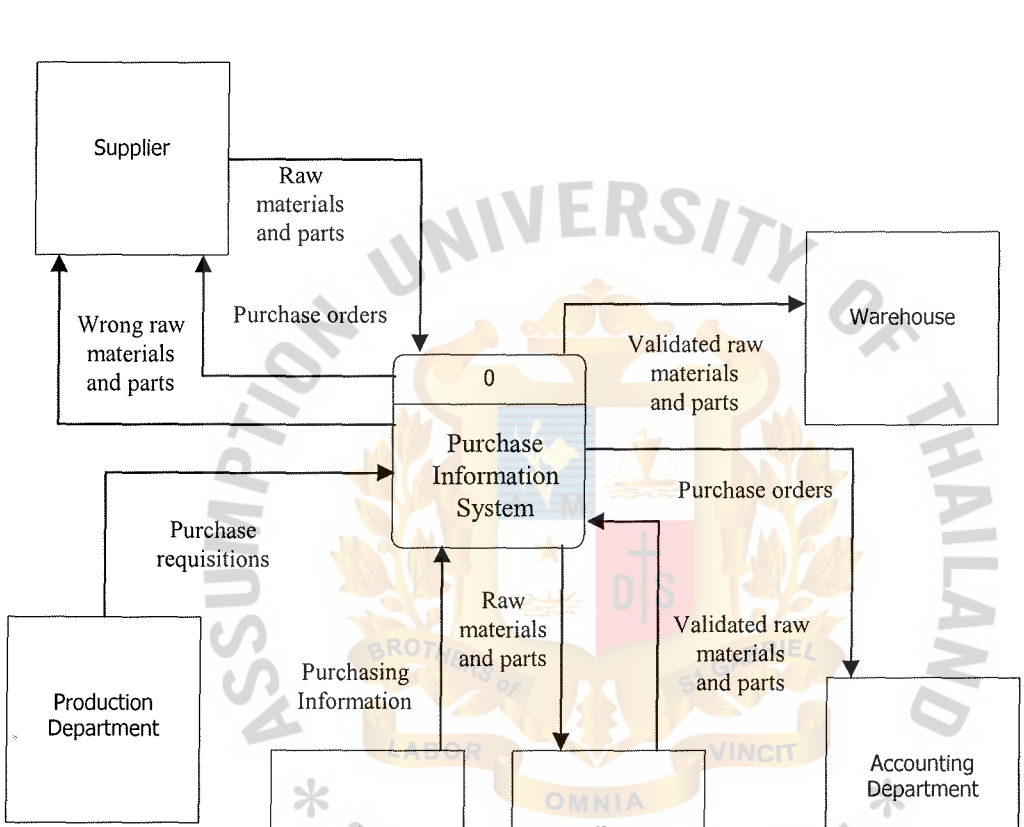


Figure 2.2. Context Data Flow Diagram of Existing System.

2.3 Current Problems and Area for Improvements

Since the whole system of the purchase information system are not integrated and mostly in manual system, some unnecessary works has been performed repeatedly and caused many problems which can be concluded as follows:

2.3.1 Redundant Works for Records Keeping

Many redundant data entries are processed for the order details starting from receiving purchase requisitions, checking supplier data and preparing purchase orders.

With the proposed system, data will be processed and entered only once for the purchase requisitions. Purchasing agent can easily retrieve the purchase requisition data from the database with no need to reenter it again.

2.3.2 Too Many Paper Works

The existing system depends on paper works. Supplier and purchase order data are recorded on paper which is the cause of the data loss. It takes a long time to access the data when management wants to use the data.

With the computerized system, purchase requisition, inventory, supplier and purchase order data are kept in the database in the computer. There is back up of the data that will be used when the original data are lost or destroyed.

2.3.3 Difficulties in Retrieval Process

Data is an important asset of the company. It will be used to produce useful information that will be used in the decision making process. In the existing system, all data are recorded on paper. Retrieval process takes a long time to bring the data into data processing system so management has to wait for information for a long time when they want to make a decision.

With the computerized system, data are kept and maintained in the computer. Retrieval process takes a short time to bring vast volumes of the data into the data processing system so the information can be produced on time.

2.3.4 Inconsistent and Incorrect Data

In the manual system, data are recorded on paper. Data is recorded many times so it causes inconsistent data. Sometimes data is not recorded correctly. Inconsistent and incorrect data are serious problems because management can not make effective and efficient decisions by using these data.

The computerized system can eliminate or reduce the inconsistent data by recording and keeping data only once in the computer. With the proposed system, data can be maintained and updated easily. Data will be checked and verified before recording the data into the computer. This can eliminate or reduce the incorrect data problem. Database is developed to keep the data in the computer.

III. THE PROPOSED SYSTEM

3.1 User Requirements

Base on studying and analyzing the existing system, the system analyst develops and proposes the proposed system that it will satisfy user's requirements and solve the existing problems. The user's requirements are as follows:

(1) The proposed system should generate correct and timely information.

(2) The proposed system should provide security to the data.

(3) The proposed system should generate consistent information.

(4) The proposed system should be easy to use.

(5) Back up and recovery system should be developed and designed to recover the data when the original data are damaged and destroyed.

(6) The several users should share information.

(7) The proposed system should generate the timely reports to the management.

(8) Input Interface Screen should be developed and designed.

3.2 System Specification

Seny company is a toy manufacturer company. As the business grows, there are many suppliers who establish relationships with the company. With the new and high technology, the company can develop and design the computerized system to increase the effectiveness and efficiency of the overall company's operations.

In the existing system, purchasing system is performed manually. There are many problems that occur in the existing system. Purchase order preparation takes a long time. There are incorrect, inconsistent and untimely data. Management can not make good decisions due to incorrect and untimely data. Lose data is a serious problem in the existing system.

In order to eliminate or reduce the previous problems in the existing system, the company has to develop and design the computerized system to replace the manual system. This new system improves the efficiency and effectiveness of the company's operations.

3.3 Context Diagram of Proposed System

Process model is a technique for organizing and documenting the structure and flow of data through a system process, logic, policies and procedures to be implemented by a system's process. Context diagram shows the overall system and data flow between the external entities. Purchase and Inventory Information System is the whole system, which starts from receiving the purchase requisition from the production department until sending the validated raw materials and parts to the warehouse. Production Department, Accounting Department, Supplier, Purchasing Agent, Management and Warehouse are the six external entities that communicate with the system. There are six subsystems in the proposed system as follows:

(1) Process purchase requisition subsystem is the process of purchase and inventory information system that processes the purchase requisition from the production department. It starts from receiving the purchase requisition from the production department. The purchase requisition information will be verified. The verified purchase requisition information will be used to process the purchase requisition. Processed purchase requisition details will be recorded into the purchase requisition database. Ordered part details will be recorded into the ordered part database. Department details will be recorded into the department database. Processed purchase requisition number will be sent to the production department.

(2) Process inventory data subsystem is the process of purchase and inventory information system that processes the inventory data. It starts from retrieving the inventory data from the inventory database and processing the inventory information from the inventory data. The inventory information will be verified. The verified inventory information will be sent to check availability process. Purchase requisition data will be retrieved from the purchase requisition database and used to process the purchase requisition information. The purchase requisition information will be verified. The verified purchase requisition information will be sent to the check availability process. Requested part information from the check availability process will be used to prepare the requested part report. The copies of the requested part report will be sent to the warehouse.

(3) Process supplier data subsystem is the process of purchase and inventory information system that processes the supplier data. It starts from retrieving the supplier data from the supplier database and processing the supplier information from the supplier data. The supplier information will be verified. The verified supplier information will be sent to process selected supplier information. Ordered part data will be retrieved from the ordered part database and used to process the ordered part information. The ordered part information will be verified. The verified ordered part information will be sent to process selected supplier information. Supplier number, name and address will be sent to the purchasing agent.

(4) Prepare purchase order subsystem is the process of purchase and inventory information system that prepares the purchase orders. It starts from receiving the supplier number, name and address from the purchasing agent. Supplier number, name and address will be verified. The verified supplier number, name and address will be sent to prepare purchase order. Supplied part data will be retrieved from the supplied part database and used to process the supplied part information. The supplied part information will be verified. The verified supplied part information will be sent to prepare purchase order. Purchase order details will be recorded into the purchase order database. The copies of the purchase orders will be sent to the suppliers and accounting department.

(5) Process wrong part subsystem is process of purchase and inventory information system that checks the raw materials and parts. It starts from receiving the raw materials and parts from the suppliers. Raw materials and parts and information will be sent into the process of comparison part with verified delivery purchase order information. Delivery purchase order data will be retrieved from the delivery purchase order database and are used to process the delivery purchase order information. Delivery purchase order information will be verified. The verified delivery purchase order information will be sent into the process of comparison part with verified delivery purchase order information. Officer details will be recorded into the officer database. Wrong raw materials and parts data are used to process wrong raw materials and parts information. Wrong raw materials and

parts information will be sent to the purchasing agent. Wrong raw materials and parts will be returned to the suppliers.

(6) Process validated parts subsystem is the process of purchase and inventory information system that checks the raw materials and parts. It starts from receiving the raw materials and parts from the suppliers. Raw materials and parts and information will be sent into the process of comparison part with verified delivery purchase order information. Delivery purchase order data will be retrieved from the delivery purchase order database and are used to process the delivery purchase order information. Delivery purchase order information will be verified. The verified delivery purchase order information will be sent into the process of comparison part with verified delivery purchase order information. Officer details will be recorded into the officer database. Validated raw materials and parts details will be recorded into the inventory database. Validated raw materials and parts details will be used to prepare the inventory report. The copies of the inventory reports are sent to the management. Validated raw materials and parts will be sent to the warehouse.

The context diagram of the proposed system is shown in Figure 3.1. The data flow diagram level 0 of the proposed system is shown in Figure 3.2. The data flow diagram level 1 of the proposed system of process purchase requisition is shown in Figure 3.3. The data flow diagram level 1 of the proposed system of process inventory data is shown in Figure 3.4. The data flow diagram level 1 of the proposed system of process supplier data is shown in Figure 3.5. The data flow diagram level 1 of the proposed system of prepare purchase order is shown in Figure 3.6. The data flow diagram level 1 of the

proposed system of process wrong part is shown in Figure 3.7. The data flow diagram level 1 of the proposed system of process validated part is shown in Figure 3.8.

3.4 Data Modeling

Data modeling is a technique for the company to document the system's data. It is required for defining, organizing and documenting the business data requirements that will be stored in a database. Data modeling is sometimes called database modeling because data modeling is usually implemented as database.

Drawing entity relationship diagrams or ERD is the most popular and simplest logical data modeling technique. ERD is used because it depicts data in terms of the entities and relationships described by the data.

Entity discovery is the first task in data modeling. It is the task that discovers the fundamental entities in the system that are described by the data. Purchase and Inventory Information System includes the following entities.

(1) Inventory

(2) Supplier

(3) Officer

(4) Purchase Order

(5) Department

(6) Purchase Requisition

(7) Supplied Part (Associative Entity)

(8) Ordered Part (Associative Entity)

(9) Delivery Purchase Order (Associative Entity)

The next task in data modeling is to construct the context data model, which contains only fundamental or independent entities that were previously discovered, and non-specific relationships also should be shown. Context entity relationship diagram is shown in Figure 3.9.

The next task is to identify the key of each entity. Normalization is the technique that is used to organize data attributes. This technique is used to group data attributes to form stable, flexible and adaptive entities.

1NF

To normalize the table into the 1NF, the repeating group or attributes that have multiple values for a single instance of the entity must be eliminated. All entities in the entity relationship diagram of the proposed system is already in the 1NF because there is no repeating group or attributes.

2NF

To further normalize the 1NF entity relationship diagram into 2NF, the entity that has concatenated or compound keys is checked to determine the partial dependency. Every non-key attributes should depend on both keys in the compound key. All entities in the entity relationship diagram of the proposed system is already in the 2NF because there is no partial dependency.

3NF

To further normalize the 2NF entity relationship diagram into 3NF, entity that has derived attributes and transitive dependencies will be eliminated. Non-key attribute should not depend on other non-key attributes. It should only depend on its primary key. All entities in the entity relationship diagram of the proposed system is already in the 3NF because there is no derived attributes and transitive dependencies. The 3NF entity relationship diagram of the proposed system is shown in Figure 3.10.

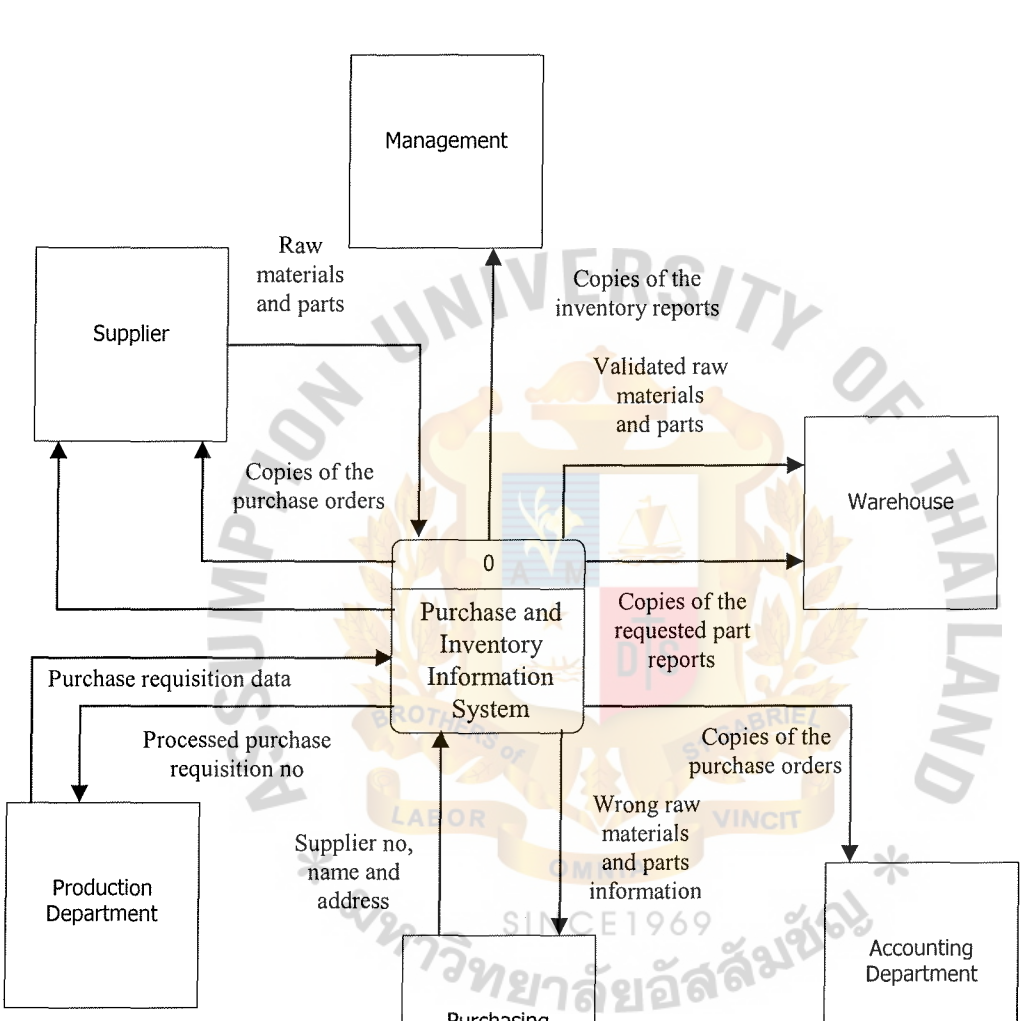


Figure 3.1. Context Data Flow Diagram of Proposed System.

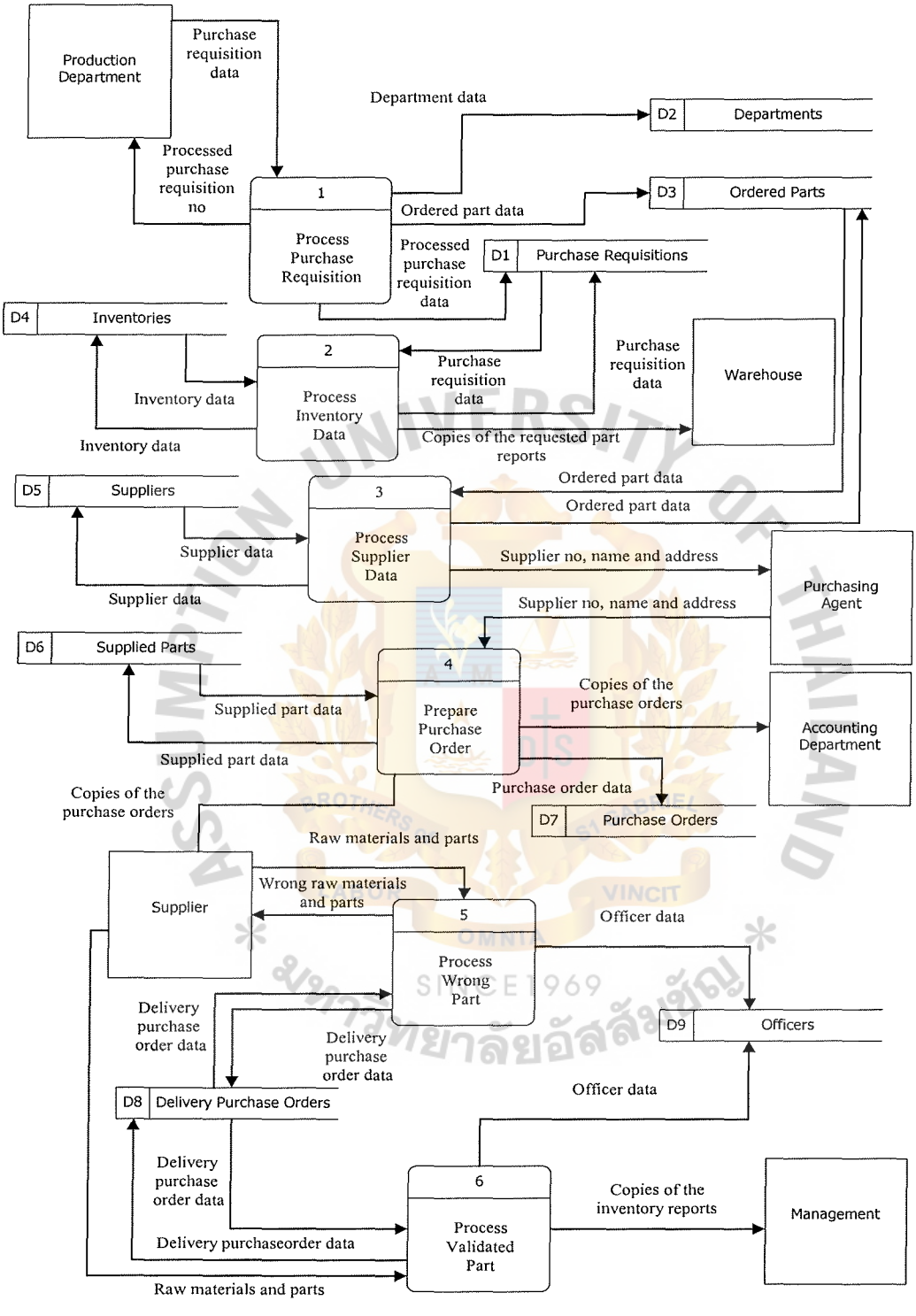


Figure 3.2. Data Flow Diagram Level 0 of the Proposed System.

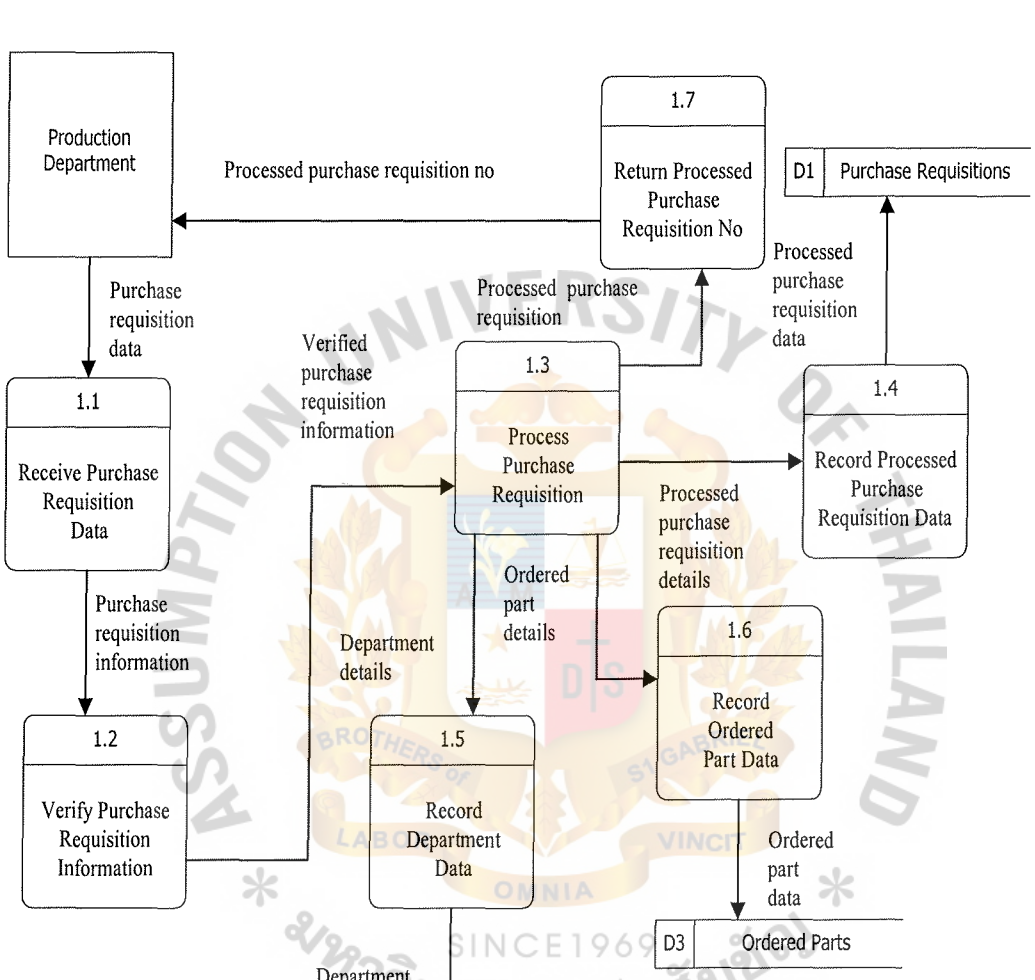


Figure 3.3. Data Flow Diagram Level 1 of Process Purchase Requisition.

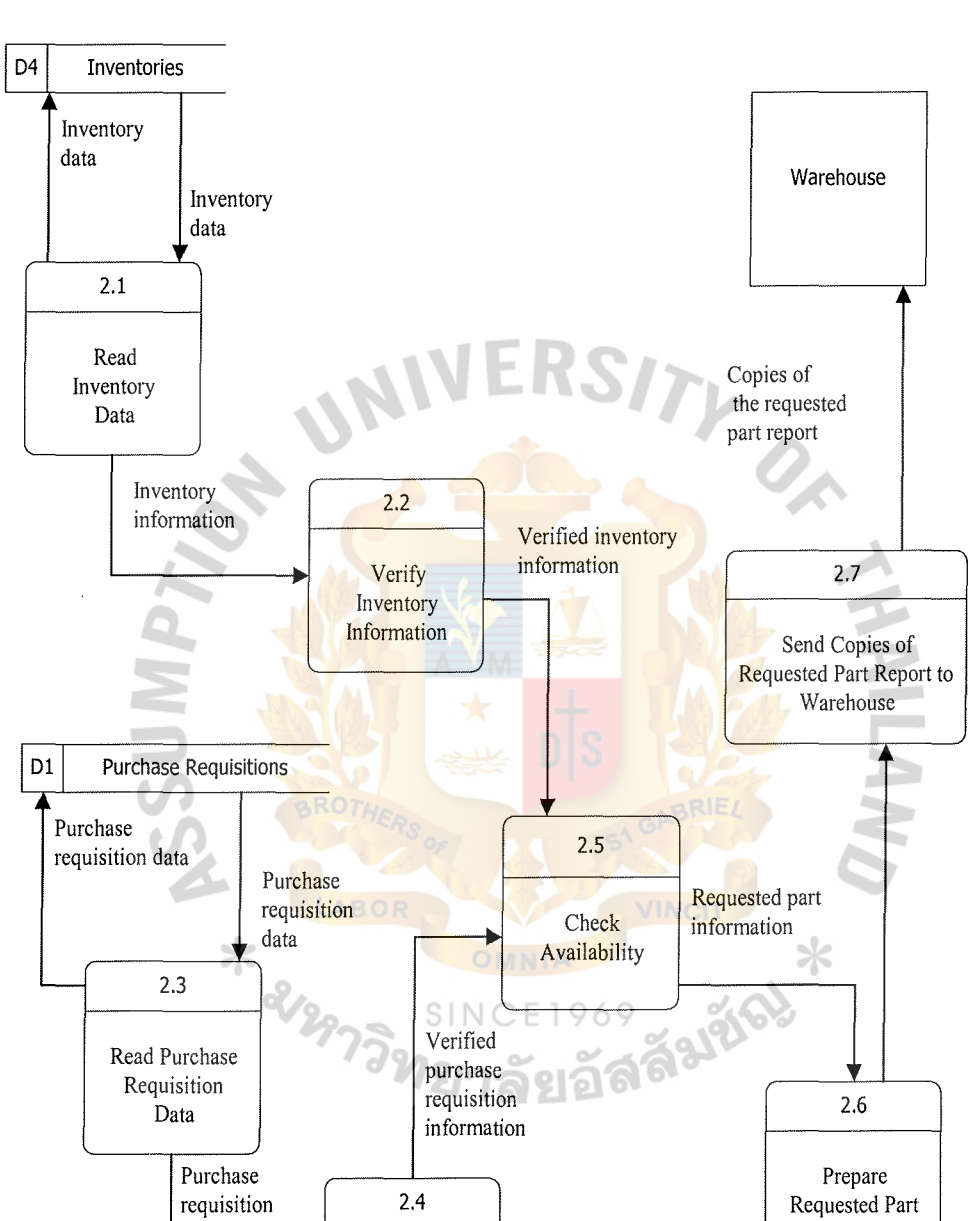


Figure 3.4. Data Flow Diagram Level 1 of Process Inventory Data.

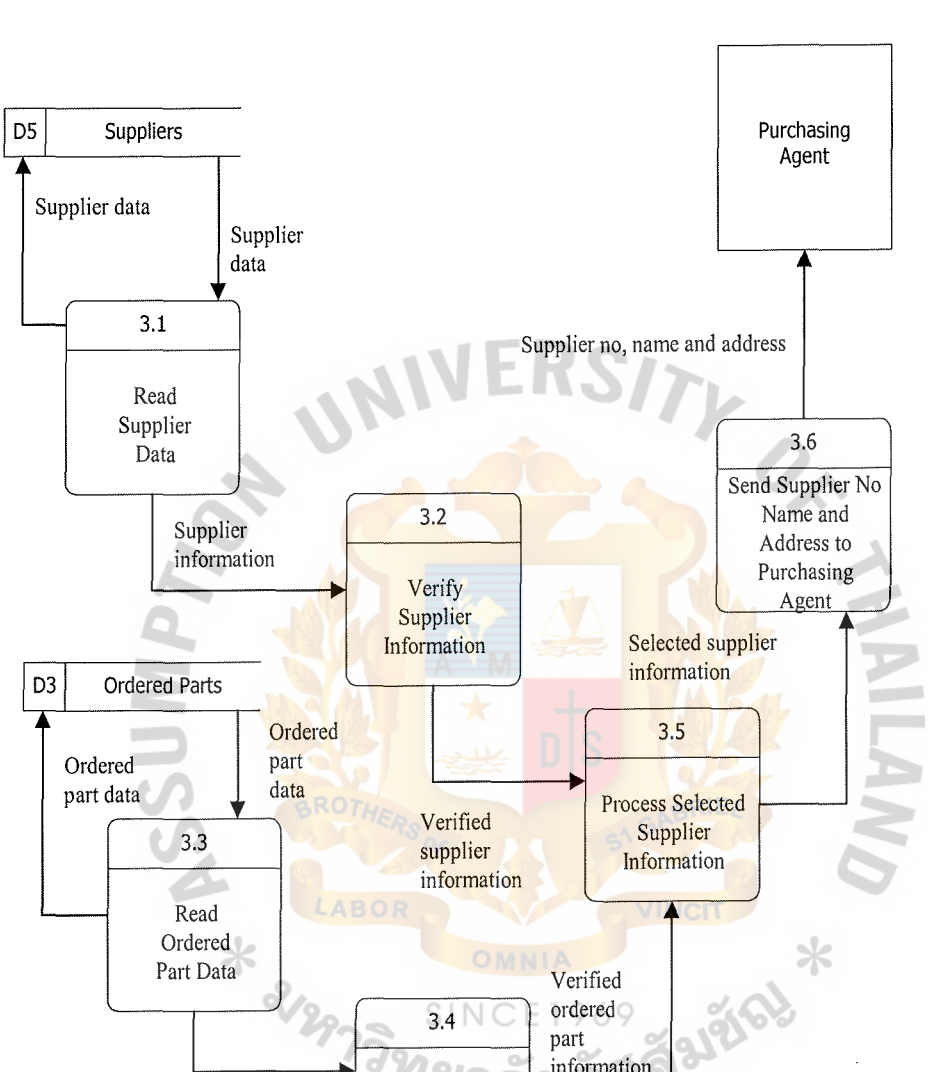


Figure 3.5. Data Flow Diagram Level 1 of Process Supplier Data.

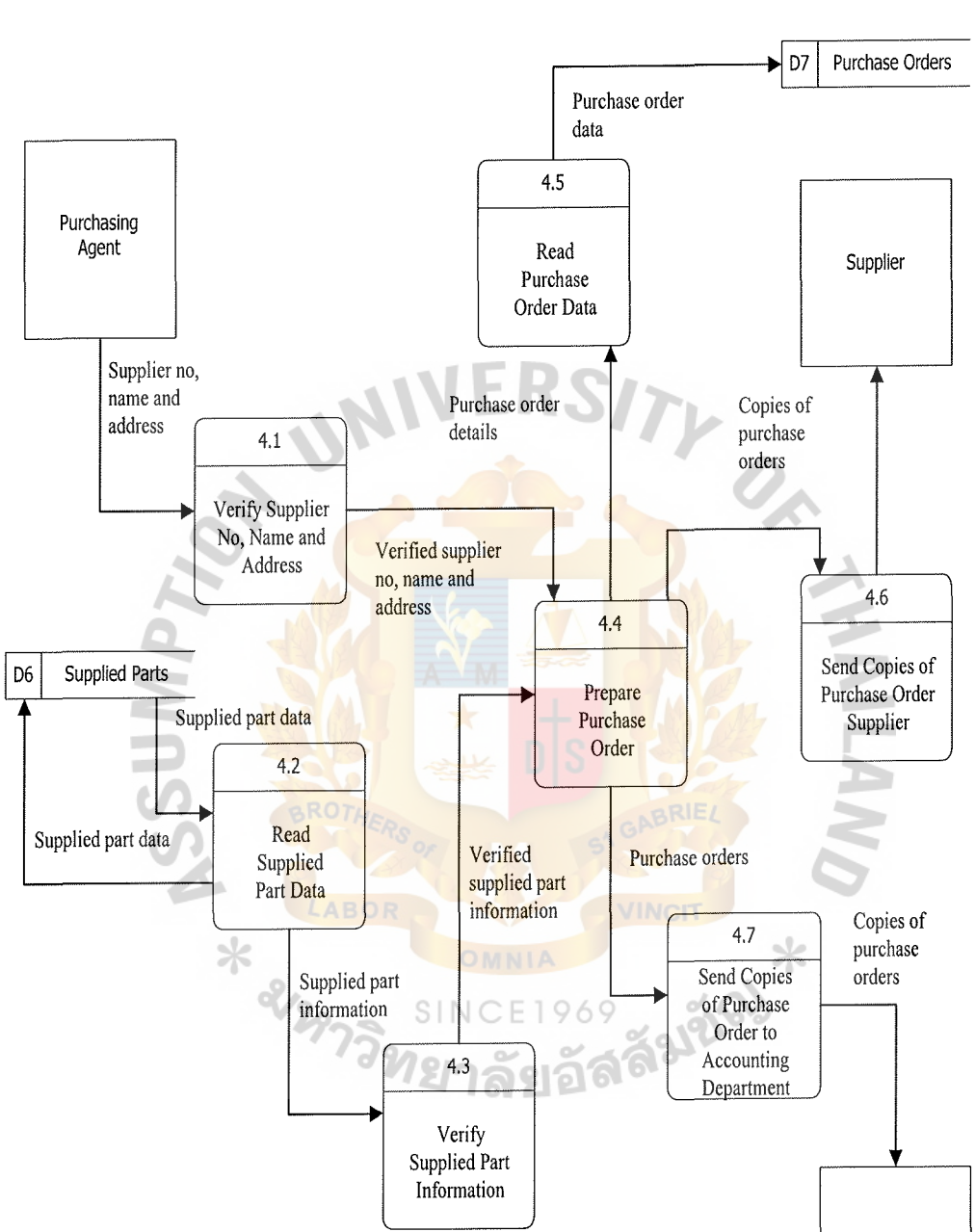


Figure 3.6. Data Flow Diagram Level1 of Prepare Purchase Order.

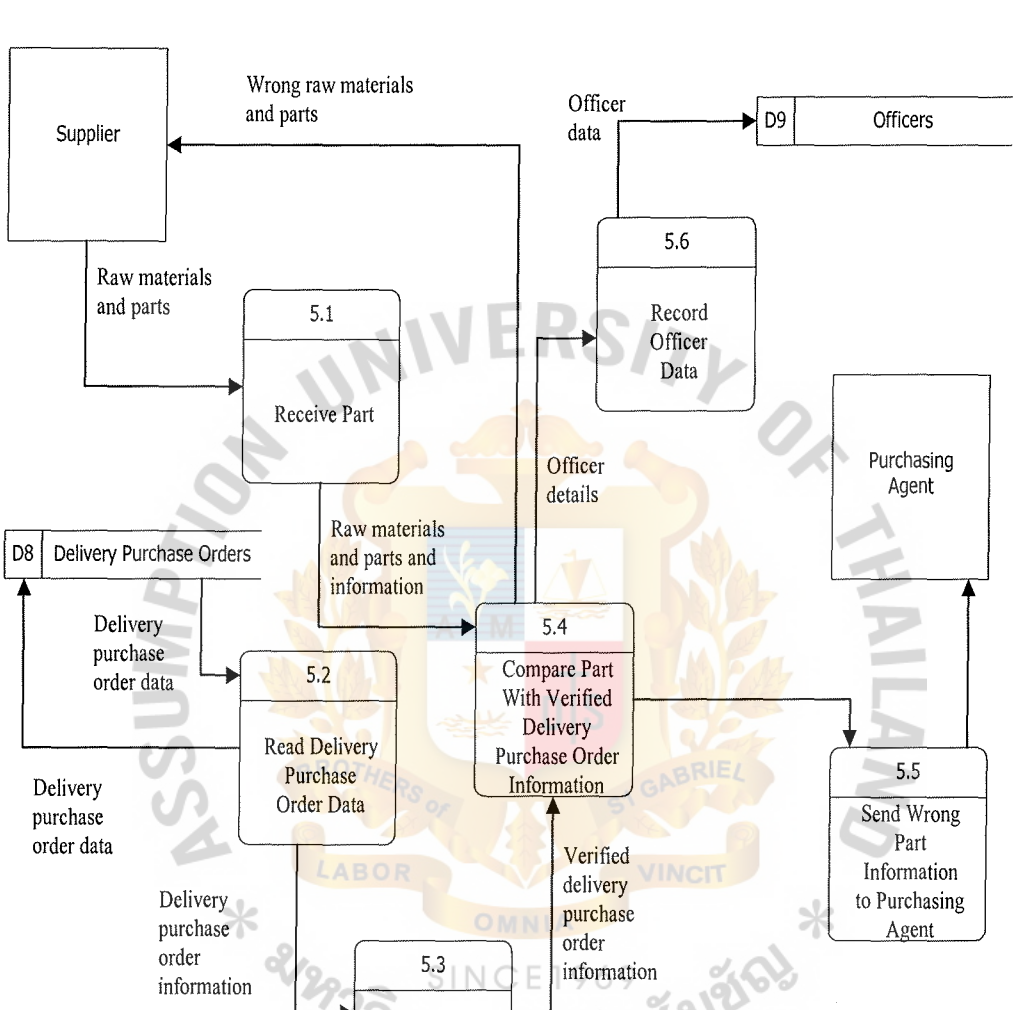


Figure 3.7. Data Flow Diagram Level 1 of Process Wrong Part.

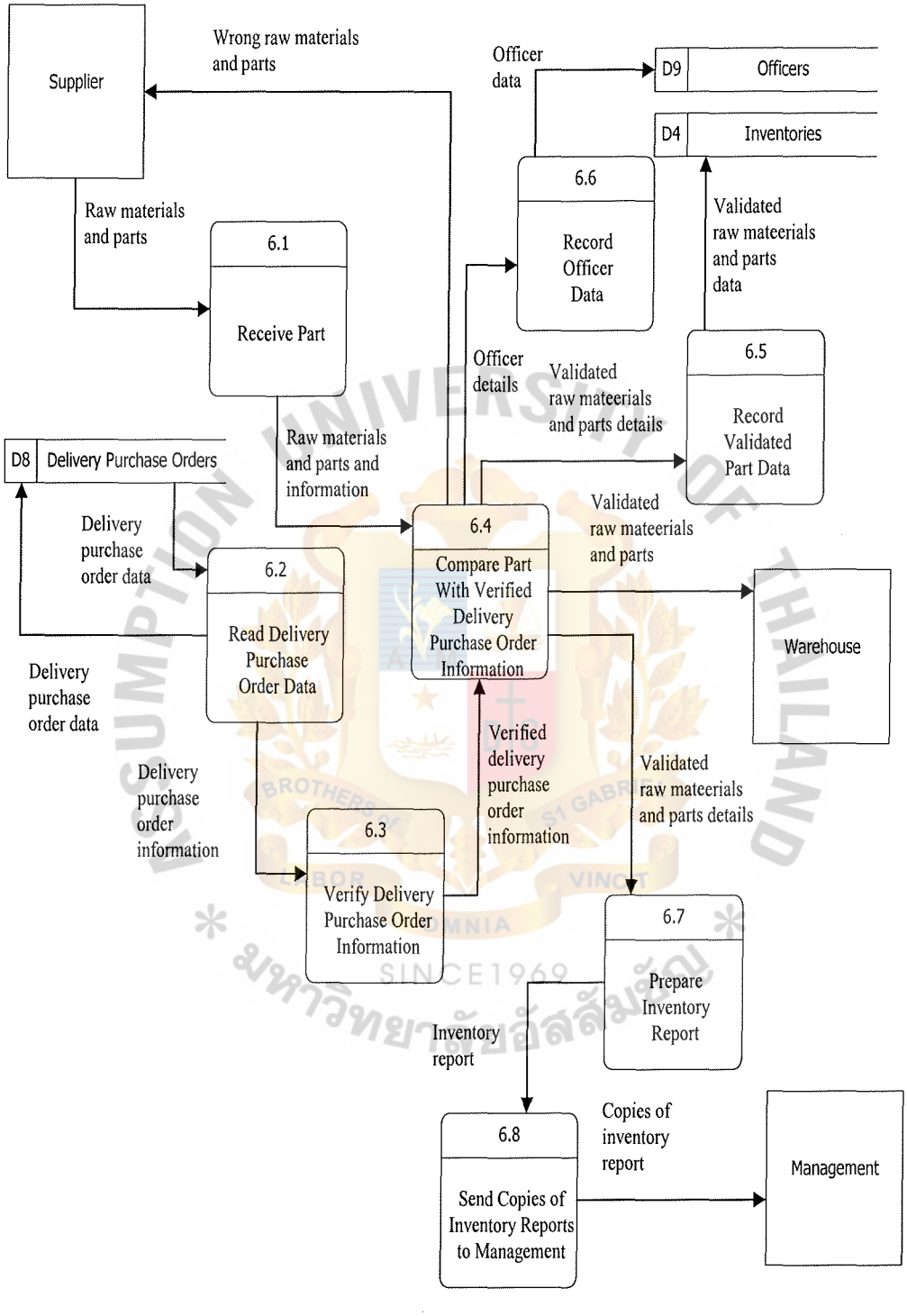


Figure 3.8. Data Flow Diagram Level 1 of Process Validated Part.

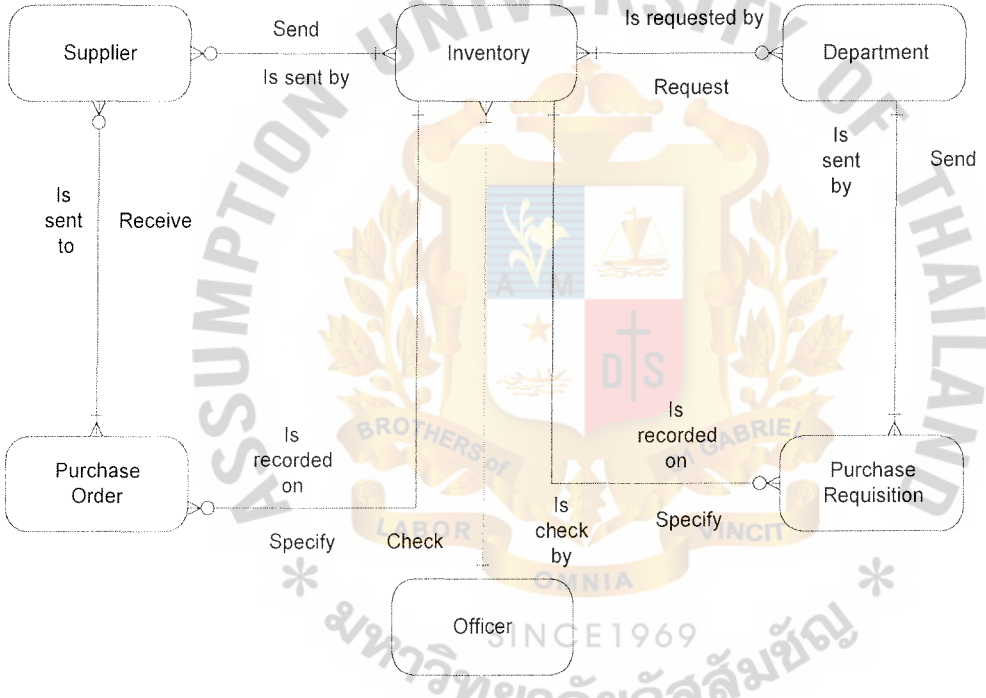


Figure 3.9. Context Entity Relationship Diagram of Proposed System.

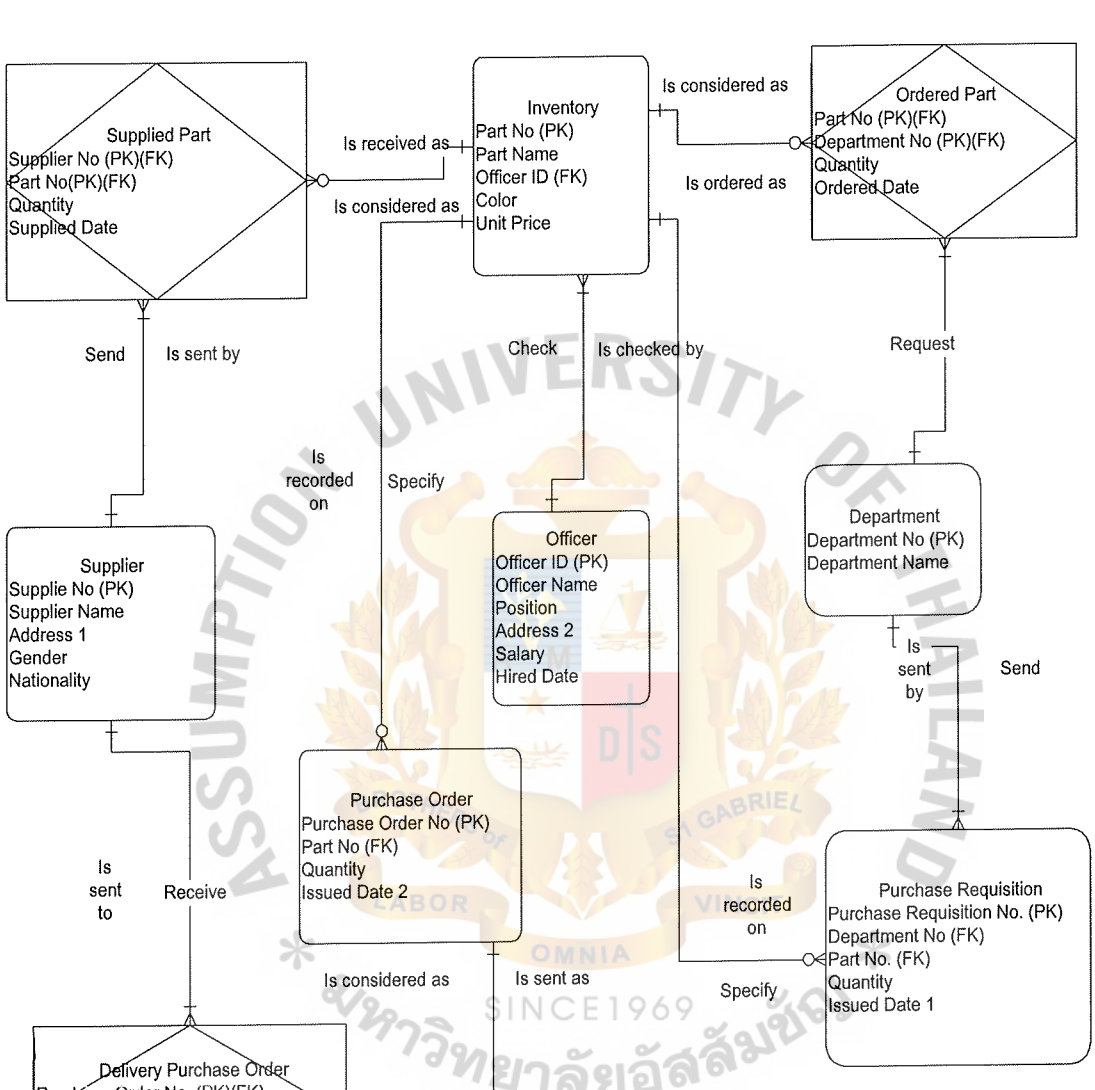


Figure 3.10. Entity Relationship Diagram of Proposed System 3NF.

3.5 Hardware and Software Specification

Seny company would like to replace the manual system by using computerized system to improve the company's operations. This system increases the efficiency and effectiveness of the company's operations.

The company would like to implement by using LAN and install it at each department. The new system uses LAN to link the devices in a single building and to allow resources to be shared between personal computers or workstations. The LAN configuration is shown in Figure 3.3 All hardware specifications of the system is shown in Table 3.1 and all software specifications of the system is shown in Table 3.2.

Table 3.1. Hardware Specification of the System, Baht.

Hardware	Specification	Cost
1 Set CPU for server.	Intel Pentium III 600 MHz 64 MB SD-RAM PC-133 20 GB ATA 66 HDD 40X CD-ROM Drive Mouse and Keyboard MAX 17" Monitor.	60,000
5 Sets CPU for workstations.	Intel Pentium III 450 MHz 64 MB SD-RAM PC-133 6.4 GB 7200 DMA 66 40X CD-ROM Drive Mouse and Keyboard MAX 14" Monitor.	250,000

Table 3.1. Hardware Specification of the System, Baht (Continued).

Hardware	Specification	Cost
1 HUB 8 ports.	DE 809 TX SPEC 8 PORT 100 MB/Sec.	6,000
6 Sets LAN Card.	D-Link DE 538 TX.	5,500
UTP Ethernet cable.	AMP 80 meters.	2,000
JACK (12 sockets).	RJ 45.	240
4 Sets UPS.	APC BACK UPS BK 6501 (600 VA).	30,000
3 Laser Printers	HP LASER JET 1100 A.	70,000
Total Hardware Cost		423,740

Table 3.2. Software Specification for the System, Baht.

Software Specification	Cost
MS Windows 98 for 5 licenses.	24,000
MS Office 97 for 6 licenses.	30,000
FrontPage 2000 for 6 licenses.	24,000
MS SQL Server 7.0	65,000
MS Windows NT	20,000
Total Software Cost	163,000

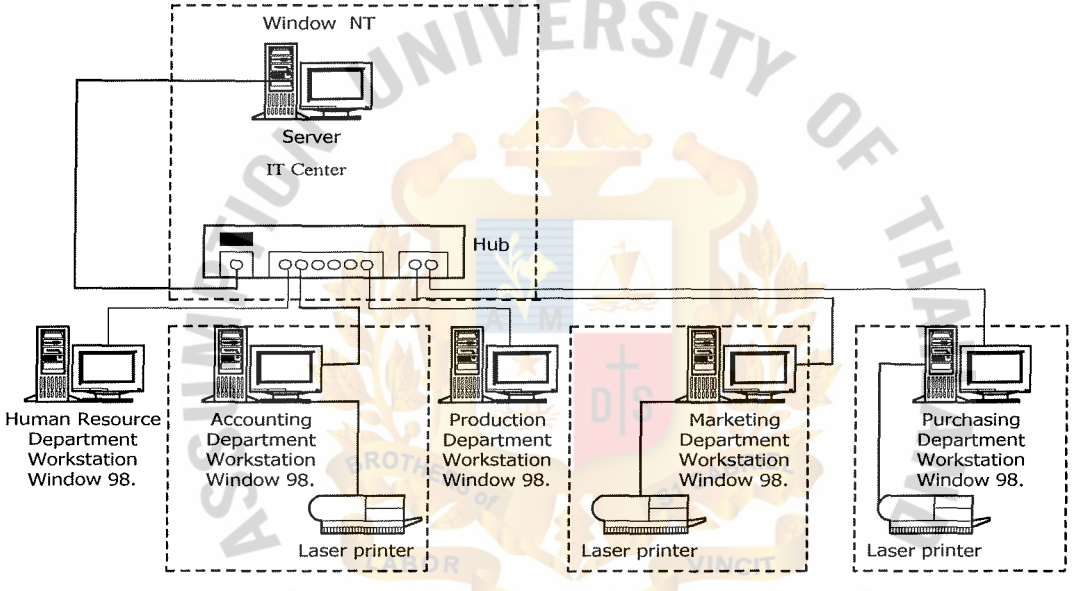


Figure 3.11. Hardware Configuration of Purchasing Department.

3.6 System Cost Analysis

Cost analysis is done to calculate and analyze the costs of the computerized system. The manual system cost analysis table is shown in Table 3.3. The computerized system cost analysis table is shown in Table 3.4. The five years accumulated manual system cost analysis table is shown in Table 3.5. The five years accumulated computerized system cost analysis table is shown in Table 3.6. The comparison of the system costs table is shown in Table 3.7. The costs and benefits analysis table is shown in Table 3.8. The comparison between the manual system costs and the computerized system costs graph is shown in Figure 3.12. The payback period analysis graph is shown in Figure 3.13.

From the Table 3.3., One purchasing manager and seven purchasing agents are employed in the manual system. The salary of each purchasing manager is 30,000 baht per month. The salary of each purchasing agent is 10,000 baht per month. 1,242,000.00, 1,343,100.00, 1,477,410.00, 1,625,151.00 and 1,787,666.10 are the total manual system costs of the first, second, third, fourth and fifth year respectively.

From the Table 3.4., One purchasing manager and fourth purchasing agents are employed in the manual system. The salary of each purchasing manager is 30,000 baht per month. The salary of each purchasing agent is 10,000 baht per month. 1,310,748.00, 1,252,548.00, 1,366,068.00, 1,505,940.00 and 1,642,549.20 are the total computerized system costs of the first, second, third, fourth and fifth year respectively.

From the Table 3.5., 1,242,000.00, 1,343,100.00, 1,477,410.00, 1,625,151.00 and 1,787,666.10 are the total manual system costs of the first, second, third, fourth and fifth year respectively. 1,242,000.00, 2,585,100.00, 4,062,510.00, 5,687,661.00 and 7,475,327.10 are the accumulated manual system costs of the first, second, third, fourth and fifth year respectively.

From the Table 3.6., 1,310,748.00, 1,252,548.00, 1,366,068.00, 1,505,940.00 and 1,642,549.20 are the total computerized system costs of the first, second, third, fourth and fifth year respectively. 1,310,748.00, 2,563,296.00, 3,929,364.00, 5,435,304.00 and 7,077,853.20 are the accumulated computerized system costs of the first, second, third, fourth and fifth year respectively.

From the Table 3.7., the accumulated computerized system cost of the first year is higher than the accumulated manual system cost of the first year because there is vast investment in the computerized system in the first years. The accumulated computerized system costs of the second, third, fourth and fifth year is lower than the accumulated manual system costs of the second, third, fourth and fifth year because the number of the purchasing staffs are reduced in the computerized system and there is no training costs.

From the Table 3.8., In the first year, the accumulated costs of the proposed system is higher than the accumulated benefits of the proposed system so the company gets lost. 110,748.00 is a lost of the company in the first year. The accumulated costs of the proposed system is lower than the accumulated benefits of the proposed system in the second, third, fourth and fifth year so the company gets profits. 36,704.00, 70,636.00, 172,526.00 and 229,899.80 are the benefits of the company in the second, third, fourth and fifth year respectively.

(1) Costs of Manual System

Table 3.3. Manual System Cost Analysis, Baht.

Cost Items	Years				
	1	2	3	4	5
Fixed Cost					
Typewriter 7 units @ 2,500	17,500.00	-	-	-	-
Calculator 5 units @ 700	3,500.00	-	-	-	-
Total Fixed Cost	21,000.00	-	-	-	-
Operating Cost					
Salary Cost					
Purchasing Manager 1 person @ 30,000	30,000.00	33,000.00	36,300.00	39,930.00	43,923.00
Staff					
Purchasing Agent 7 persons @ 10,000	70,000.00	77,000.00	84,700.00	93,170.00	102,487.00
Total Monthly Salary Cost	100,000.00	110,000.00	121,000.00	133,100.00	146,410.00
Total Annual Salary Cost	1,200,000.00	1,320,000.00	1,452,000.00	1,597,200.00	1,756,920.00
Office Supplies & Miscellaneous Cost					
Stationary Per Annual	5,000.00	5,500.00	6,050.00	6,655.00	7,320.50
Paper Per Annual	7,000.00	7,700.00	8,470.00	9,317.00	10,248.70
Utilities Per Annual	6,000.00	6,600.00	7,260.00	7,986.00	8,784.60
Miscellaneous expenses	3,000.00	3,300.00	3,630.00	3,993.00	4,392.30
Total Office Supplies & Miscellaneous Cost	21,000.00	23,100.00	25,410.00	27,951.00	30,746.10
Total Annual Operating Cost	1,221,000.00	1,343,100.00	1,477,410.00	1,625,151.00	1,787,666.10
Total Manual Cost	1,242,000.00	1,343,100.00	1,477,410.00	1,625,151.00	1,787,666.10

(2) Cost of Computerized System

Table 3.4. Computerized System Cost Analysis, Baht.

Cost Items	Years				
	1	2	3	4	5
Fixed Cost					
Hardware Cost:					
Computer Server Cost	12,000.00	12,000.00	12,000.00	12,000.00	12,000.00
Workstation Cost	72,748.00	72,748.00	72,748.00	72,748.00	72,748.00
Total Hardware Cost	84,748.00	84,748.00	84,748.00	84,748.00	84,748.00
Maintenance Cost:					
Maintenance Cost	-	-	-	15,000.00	14,250.00
Total Maintenance Cost	-	-	-	15,000.00	14,250.00
Software Cost:					
Computer Server Cost	-	-	-	-	-
Network Cost	32,600.00	32,600.00	32,600.00	32,600.00	32,600.00
Total Software Cost	32,600.00	32,600.00	32,600.00	32,600.00	32,600.00
Implementation Cost:					
Advanced Training Cost	60,000.00	-	-	-	-
Basic Training Cost	60,000.00	-	-	-	-
Set up Cost	40,000.00	-	-	-	-
Total Implementation Cost	160,000.00	-	-	-	-
Office Equipment Cost:					
Calculator 2 Units @ 700	1,400.00	-	-	-	-
Total Office Equipment Cost	1,400.00	-	-	-	-
Total Fixed Cost	278,748.00	117,348.00	117,348.00	132,348.00	131,598.00
Operating Cost					
People-Ware Cost:					
Purchasing Manager 1person @ 30,000	360,000.00	396,000.00	435,600.00	479,160.00	527,076.00
Staff:					
Purchasing Agent 4 persons @ 10,000	480,000.00	528,000.00	580,800.00	638,880.00	702,768.00
Total Annual Salary Cost	840,000.00	924,000.00	1,016,400.00	1,118,040.00	1,229,844.00
Officer Supplies & Miscellaneous Cost:					
Stationary 3,000 per month	36,000.00	39,600.00	43,560.00	47,916.00	52,707.60
Paper 3,000 per month	36,000.00	39,600.00	43,560.00	47,916.00	52,707.60
Utilities 6,000 per month	72,000.00	79,200.00	87,120.00	95,832.00	105,415.20
Miscellaneous 4,000 per month	48,000.00	52,800.00	58,080.00	63,888.00	70,276.80
Annual Office Supplies & Miscellaneous Cost	192,000.00	211,200.00	232,320.00	255,552.00	281,107.20
Total Operating Cost	1,032,000.00	1,135,200.00	1,248,720.00	1,373,592.00	1,510,951.20
Total Computerized System Cost	1,310,748.00	1,252,548.00	1,366,068.00	1,505,940.00	1,642,549.20

Table 3.5. Five Years Accumulated Manual System Cost, Baht.

Year	Total Manual System Cost	Accumulated Manual System Cost
1	1,242,000.00	1,242,000.00
2	1,343,100.00	2,585,100.00
3	1,477,410.00	4,062,510.00
4	1,625,151.00	5,687,661.00
5	1,787,666.10	7,475,327.10
Total	7,475,327.10	-

Table 3.6. Five Years Accumulated Computerized Cost, Baht.

Year	Total Computerized System Cost	Accumulated System Cost
1	1,310,748.00	1,310,748.00
2	1,252,548.00	2,563,296.00
3	1,366,068.00	3,929,364.00
4	1,505,940.00	5,435,304.00
5	1,642,549.20	7,077,853.20
Total	7,077,853.20	-

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

Table 3.7. The Comparison of the System Costs, Baht.

Year	Accumulated Manual Cost	Accumulated Computerized Cost
1	1,242,000.00	1,310,748.00
2	2,585,100.00	2,563,296.00
3	4,062,510.00	3,929,364.00
4	5,687,661.00	5,435,304.00
5	7,475,327.10	7,077,853.20

Table 3.8. Costs and Benefits Analysis, Baht.

Cost Items	Years				
	0	1	2	3	4
Total accumulated costs for proposed system	-1,310,748.00	-2,563,2969.00	-3,929,364.00	-5,435,304.00	-7,077,853.20
Total accumulated benefits for proposed system	1,200,000.00	2,600,000.00	4,000,000.00	5,607,830.00	7,307,753.00
Accumulated benefits after deducing accumulated costs	-110,748.00	36,704.00	70,636.00	172,526.00	229,899.80

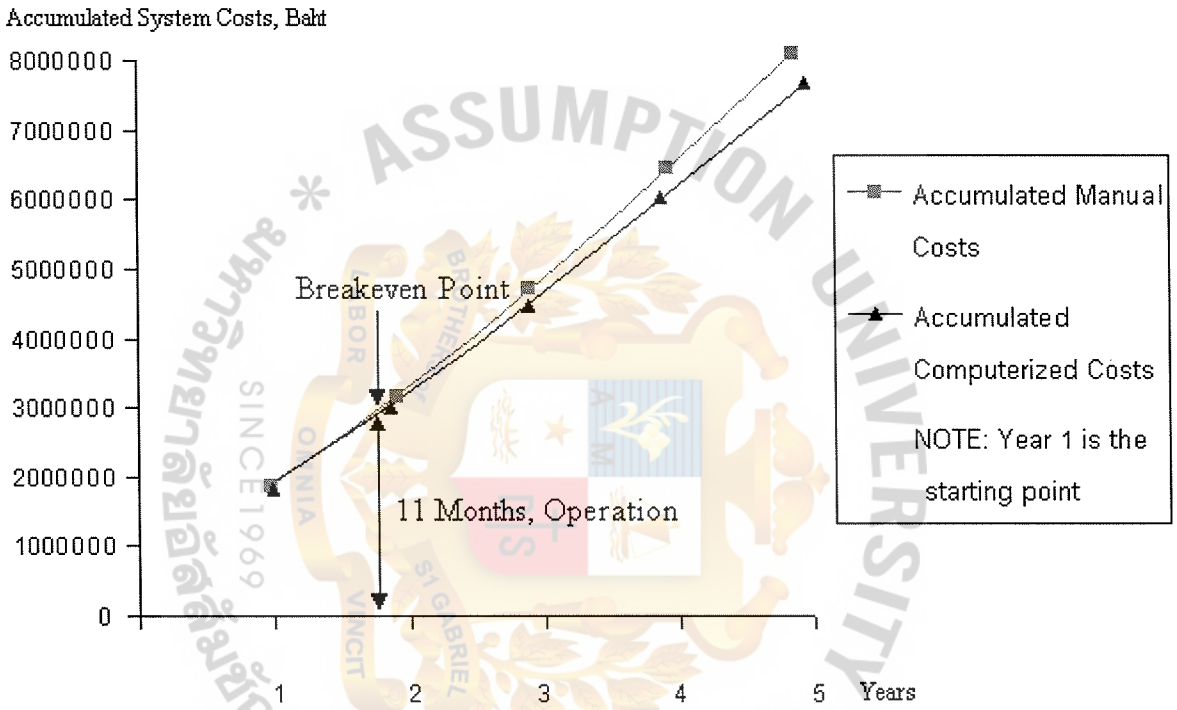


Figure 3.12. Comparison between Manual Costs and Computerized Costs.

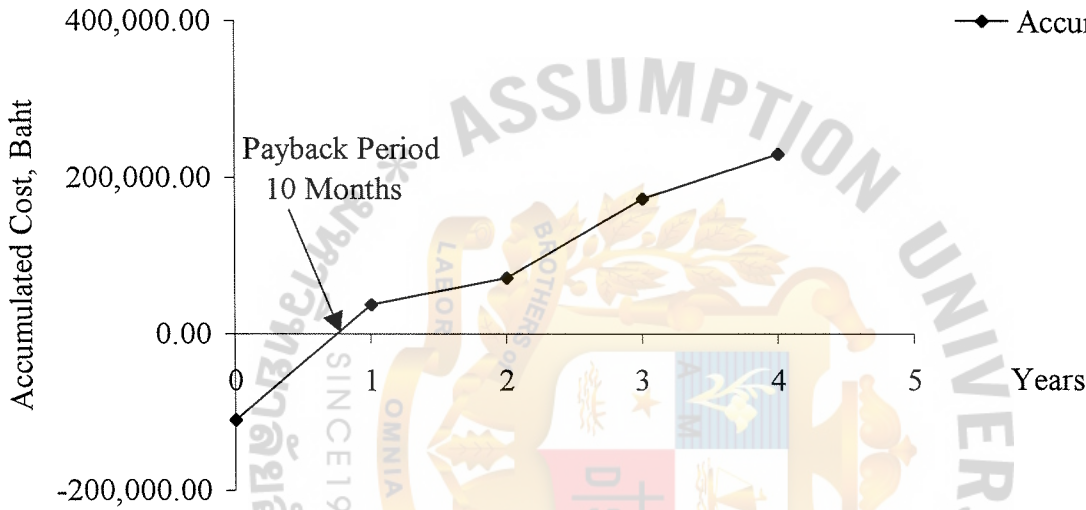


Figure 3.13. Payback Period Analysis.

3.6 Benefits

Intangible Benefits

(1) Improved purchasing operations.

(2) Reduced amount of paper works.

(3) Useful information from the system.

(4) Efficient and effective decision making process.

Tangible Benefits

(1) Reduced salary costs.

(2) Reduced paper costs.

Benefits for Proposed System = Reduced Salary Costs + Profits

1,200,000	=	360,000	+	840,000
1,400,000	=	396,000	+	1,004,000
1,400,000	=	435,600	+	964,400
1,607,830	=	479,160	+	1,128,670
1,699,923	=	527,076	+	1,172,847

IV. PROJECT IMPLEMENTATION

4.1 Overview of Project Implementation

System Implementation is the planned and orderly conversion from a current existing system to the new proposed information system. The final design should be evaluated first to make sure that the new proposed system can meet the desired goals and objectives, and the other remaining processes will be performed. The typical processes of the system implementation are:

(1) Software acquisition, development and installation.

(2) Hardware acquisition and installation.

(3) Personnel training.

(4) Site preparation.

(5) Data preparation.

(6) Testing.

(7) Conversion.

(8) Documentation.

4.2 Testing

Testing is the way of executing or running the program to detect errors. After the programmers design and code the program, they have to test the programs before installing them into the computer. Testing might be described as follows:

Unit testing, each module is tested to insure satisfaction. An individual program is tested to ensure that it can run properly and generate the results correctly. A test data is created and input to the system and the program is run to test the results. The program is correct if the results that are generated by the program is the same as the test results.

System testing, the purpose of system testing is to make sure that the whole program can run properly and correctly. An individual program is integrated into the big program. It is important to test each program whether it can run properly and generate the results correctly or not. Some program depends on the other programs. Some program may use the output of the other programs as the input to generate the output. The results will be useless if one program generates the incorrect output that is used by the other programs.

The programmer is responsible for testing the individual program to identify and eliminate the errors during program execution. Execution and logic errors are the serious problems in the computerized system. Execution error is the error that causes the program to terminate its operation abnormally. Logic error is the error that generates inaccurate and incomplete results to the users.

The system analyst is responsible for testing two or more programs that are integrated together. There are dependencies among these programs. The whole system generate the incorrect result if one program generate the incorrect output that is used as the input by the other programs. Some program can not run when one program has the execution error so the system analyst has to test to ensure that every program can run properly and generate the result correctly.

It is important to test the network that will be used in the proposed system. The network designers or the telecommunication specialists who design the network is responsible for testing the network. They have to ensure that one department can communicate with other departments through the computers over LAN network.

4.3 Data Conversion

All data in the existing system are recorded on the papers. These data will be converted into Microsoft Access 97 database. The next task is to check the correctness of the data after keying them into the computer.

It is too risky to change the manual system of the whole branches and the head office into the computerized system immediately. It is best to change only one branch's manual system into the computerized system and wait until there is no error in the computerized system.

Location conversion approach is implemented in the proposed system. It is the method that changes the manual system into the computerized system. Only the manual system of the Bangkapi branch is changed into the computerized system at the beginning. The computerized system will be installed to the whole branches and the head office when there is no error that is generated by the computerized system.

4.4 Security and Control

The proposed system uses computers to perform the purchasing and inventory operations. It is important to set the security and control regulations for the computerized system to protect the computer equipment and the data in the database from the unauthorized persons.

4.4.1 Physical Security

Computer equipment in the computer room should be protected from the unauthorized persons and thieves. The security regulations for accessing the computer room are set. There is a guard who stands in front of the computer room. Users have to sign in when they enter into the computer room and sign out when they exit the computer room. These are the ways to protect the computer equipment from the unauthorized persons.

4.4.2 Logical Security

In the proposed system, only the authorized person can access and retrieve the data in the database in the computer. Data are an important asset of the company so they need protection from the intruders and the unauthorized persons.

Since the data in the database are very important so they need to be protected from the unauthorized persons. Before accessing the data in the database, users have to enter the password on Microsoft Access. Users can use this program if they enter the correct password. The program will not show the password that they enter on the screen. This can protect other person to see the password.

There are back up for the data and the programs. It will be used to recover the data and the programs when the original data and programs are damaged or destroyed. Data are backed up daily.

4.5 Training

In order to be able to use the program to do the tasks effectively and correctly, users have to be trained. Since the existing system is the manual system, users are not familiar with the computerized system so they need to be trained how to use the computers in the computerized system.

Users are trained how to use Microsoft Access to input the data into the database, to search the data in the database, to update and maintain the data in the database and to generate the reports to the management. They are also trained how to use Microsoft Word and Excel to do their jobs.

4.6 Documentation

Documentation is the activity of recording facts and specifications of a system. It is important to do documentation of the proposed system. It can be used for future expansion. It can identify the problems of the proposed system.

Interviews and questionnaires are the most common methods that are used to gather the information of the proposed system from the users. These methods are used to identify the problems of the proposed system and check whether the proposed system can

serve the user's requirements or not. The proposed system will be modified if it can not serve the user's requirements.

V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The company's existing system is the manual system. As the usiness grows, the number of the suppliers who do business with the company is increasing. The existing system can not operate effectively and efficiently so the purchasing department develop and design the computerized system to replace the manual system.

After surveying and studying the existing system, the system analyst receives the user's requirements. The system designer designs the proposed system base on the user's requirements. The costs and benefits analysis is prepared to decide whether this proposed system is worth to invest or not.

According to the system cost comparison between the accumulated manual costs and accumulated computerized costs in the Table 3.7, the accumulated computerized costs is lower than the accumulated manual costs.

The computerized system reduces the number of the purchasing staffs who are employed in the existing system and the amount of the paper works.

The computerized system provides the benefit to the company. It provides the improved purchasing operations. It reduces the amount of the paper works. It provides useful and timely information. It reduces the salary costs.

The proposed system improves the sequence of the workflow for "Input Process", "Data Processing Process" and "Output Process". In input process, the required data will be checked and verified before sending them into the data processing process. In data processing process, the processing time is better and faster than the processing time of the existing system. In output process, reports are generated and sent to the management team and the department that requests the reports.

The proposed system uses the MS Access to develop the company's database. Data can be retrieved faster by using MS SQL. The proposed system reduces the number of the purchasing staffs who are employed in the existing system and deals with suppliers effectively and efficiently. The proposed system provides the fast and correct part's information to the warehouse when the production department requests the parts. The proposed system reduces the processing time and paper works of the existing system.

5.2 Recommendations

As the increasing trends of the information technology and the competitive environment, company try to use the new and high information technology to make the benefits to the company and compete with the competitors.

In order to be able to exchange the information with the suppliers effectively and efficiently, the purchasing department realizes the important of using Electronic Data Interchange (EDI). It enhances the ability to make timely and efficient decisions. It reduces time and administrative costs. It also reduces data entry mistakes by keying information only once.

As the increasing technology of networking, the company can do Electronic Commerce or E-Commerce. By using E-Commerce, the company can conduct business through the computers over the Internet. It can make transactions and communicate with the suppliers through the computers over the Internet.

As the emergence of advanced security technology of Secure Electronic Transaction technology (SET), the purchasing department can use electronic payment system over the Internet. The payment information can be transferred over the open networks such as the Internet by using an encryption technology.

Table 5.1. Table of Achievement.

Process Name	Manual System	Computerized System
Process Purchase Requisition	30 Minutes	15 Minutes
Process Inventory Data	30 Minutes	10 Minutes
Process Supplier Data	30 Minutes	10 Minutes
Prepare Purchase Order	40 Minutes	15 Minutes
Process Wrong Part	40 Minutes	15 Minutes
Process Validated Part	40 Minutes	15 Minutes

(1) Process Purchase Requisition

The proposed system uses the computers to process the purchase requisitions so the processing time is reduced. Data can be retrieved and recorded quickly.

(2) Process Inventory Data

The data in the database of the proposed system can be retrieved faster than the existing system by using Microsoft Access.

(3) Process Supplier Data

The data in the database of the proposed system can be retrieved faster than the existing system by using Microsoft Access.

(4) Prepare Purchase Order

The supplied part data in the database of the proposed system can be retrieved faster than the existing system by using

MicrosoftAccess. The processing time is reduced by using the computers to process the purchase orders.

(5) Process Wrong Part

The delivery purchase order data in the database of the proposed system can be retrieved faster than the existing system by using Microsoft Access. The officer data can be recorded quickly in the database in the computer. Using the computers reduce the processing time.

(6) Process Validated Part

The delivery purchase order data in the database of the proposed system can be retrieved faster than the existing system by using Microsoft Access. The officer data can be recorded quickly in the database in the computer. Using the computers reduce the processing time.

APPENDIX A

INTERFACE DESIGN

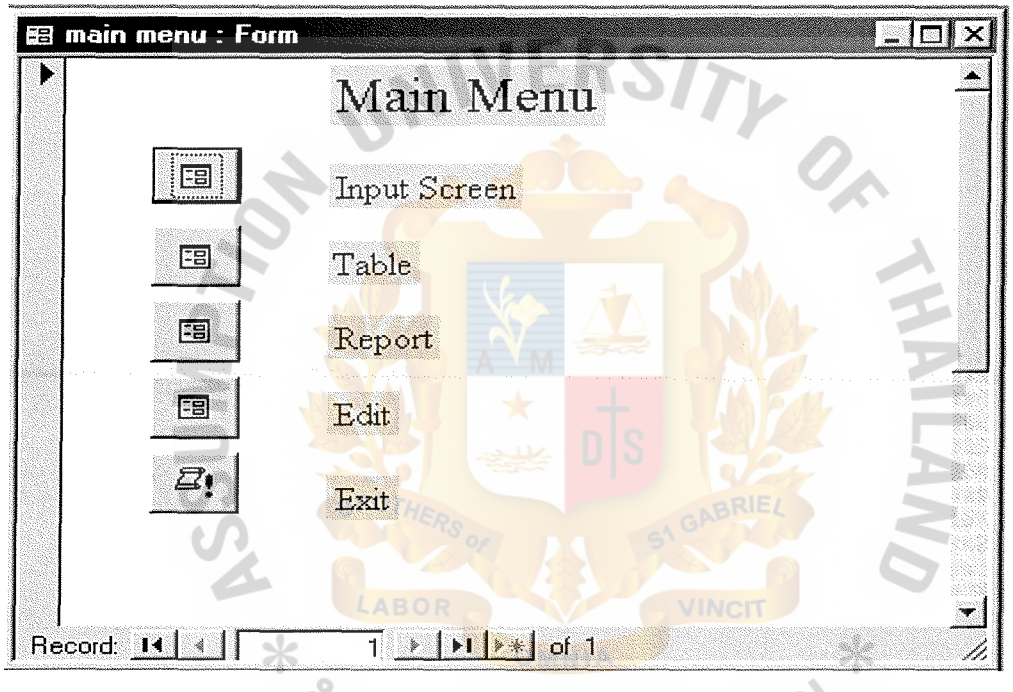


Figure A.1. Main Menu Interface.

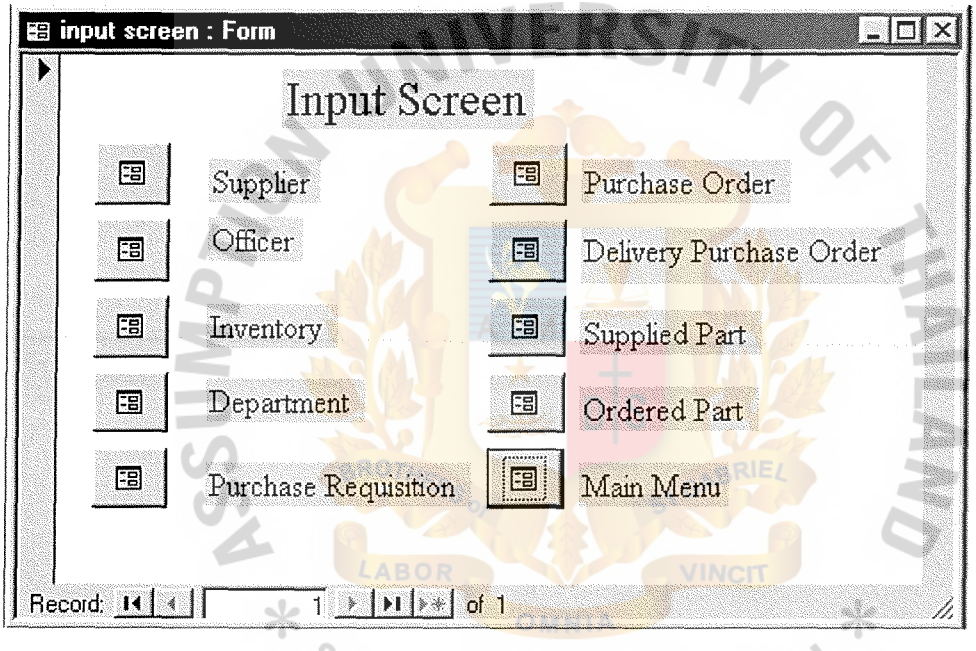


Figure A.2. Input Screen Interface.

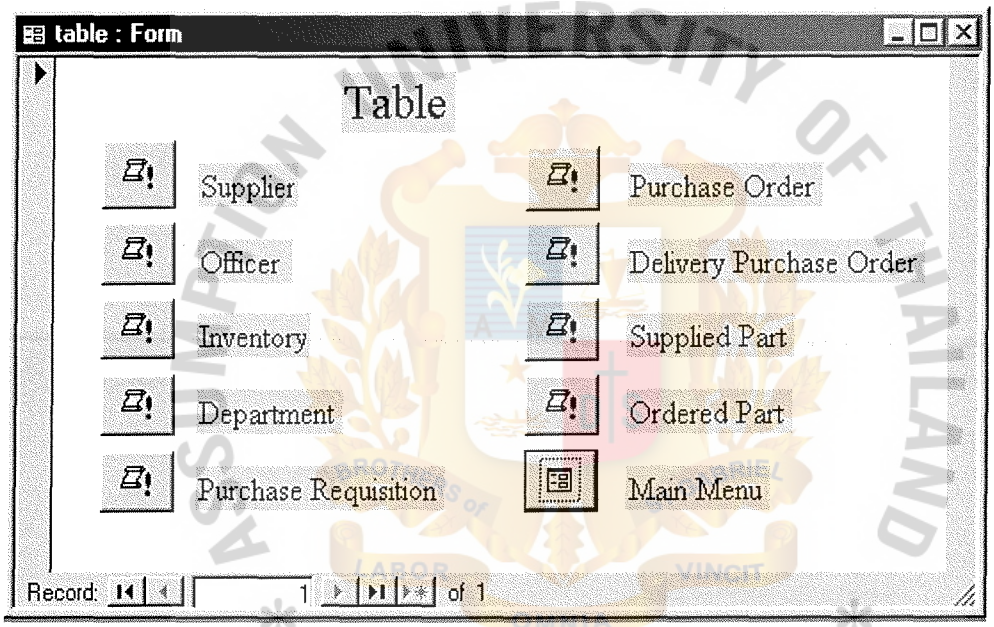


Figure A.3. Table Screen Interface.

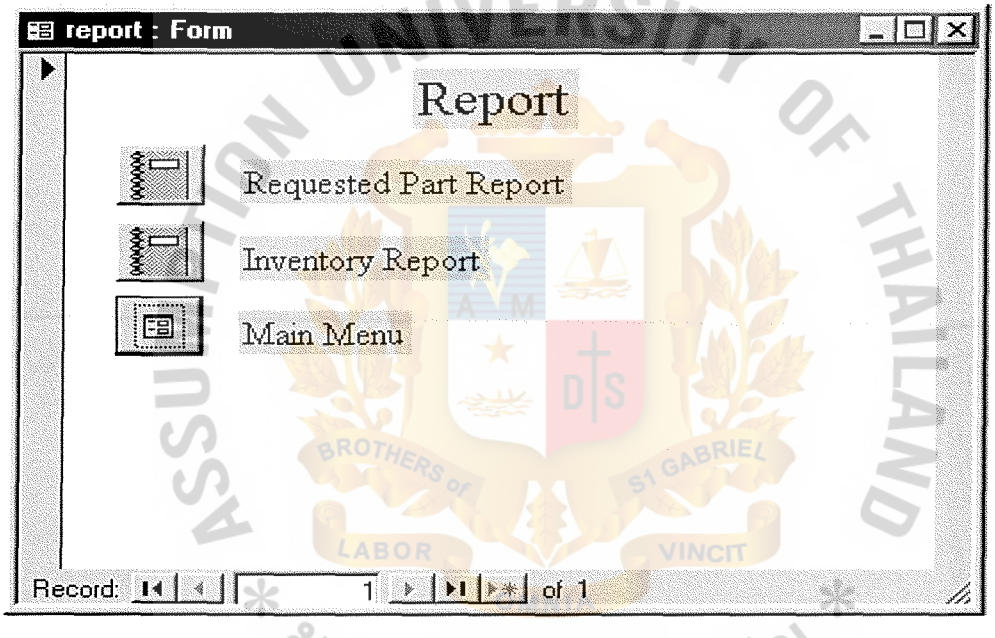


Figure A.4. Report Screen Interface.

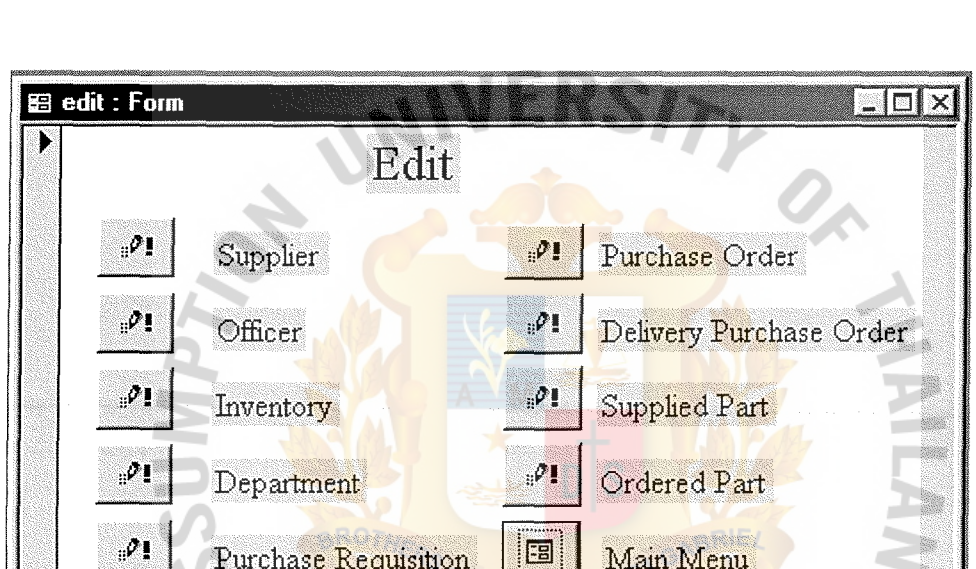


Figure A.5. Edit Screen Interface.

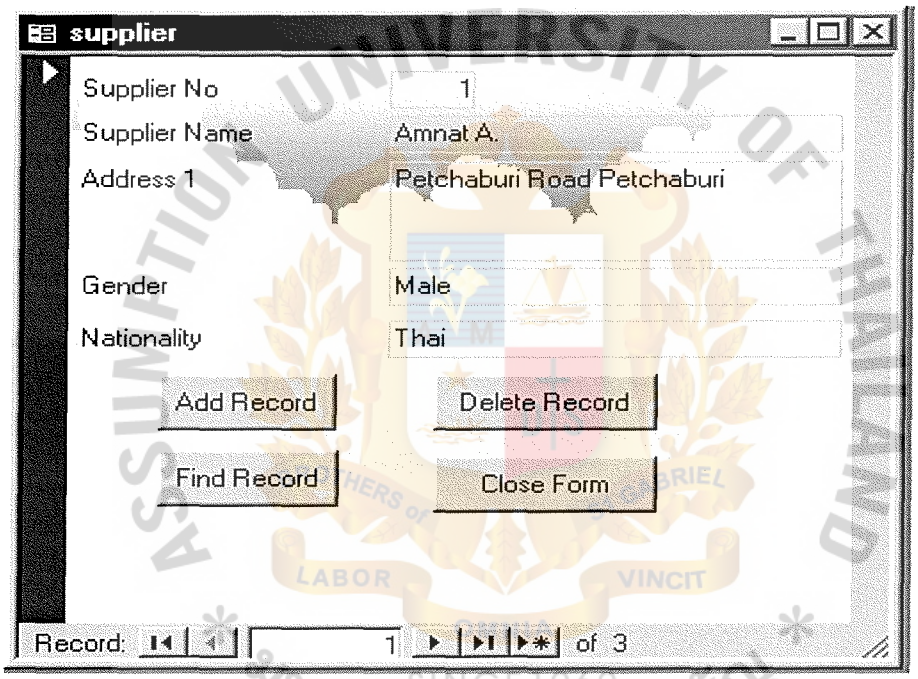


Figure A.6. Supplier Input Screen Interface.

Figure A.7. Officer Input Screen Interface.

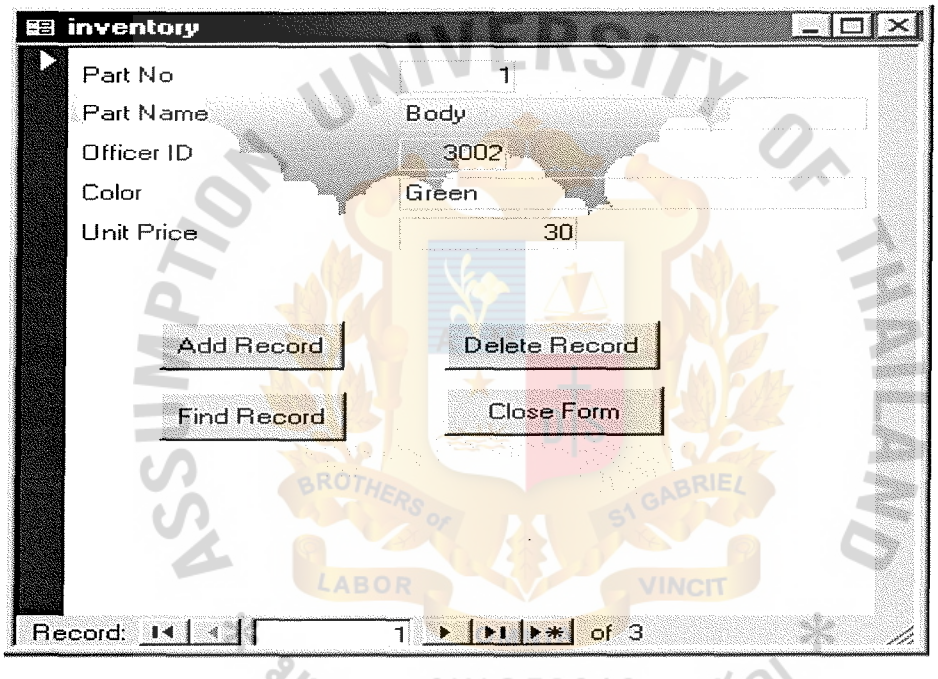


Figure A.8. Inventory Input Screen Interface.

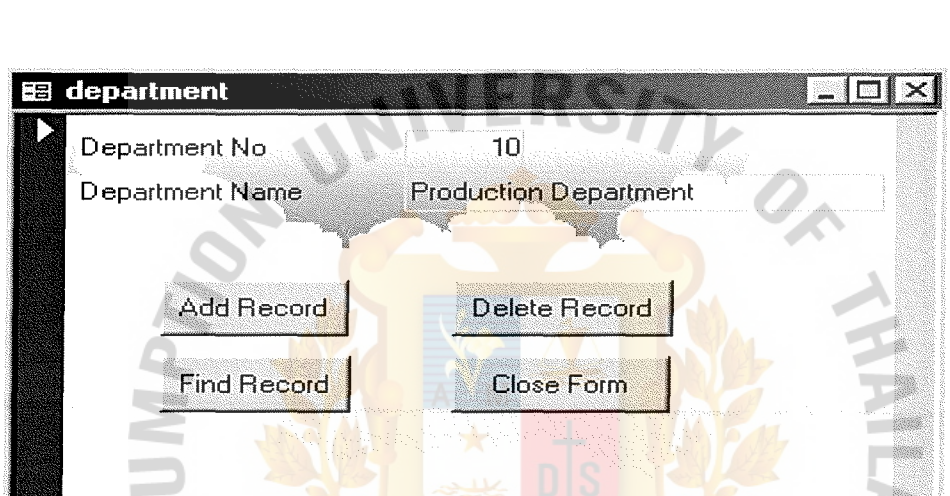


Figure A.9. Department Input Screen Interface.

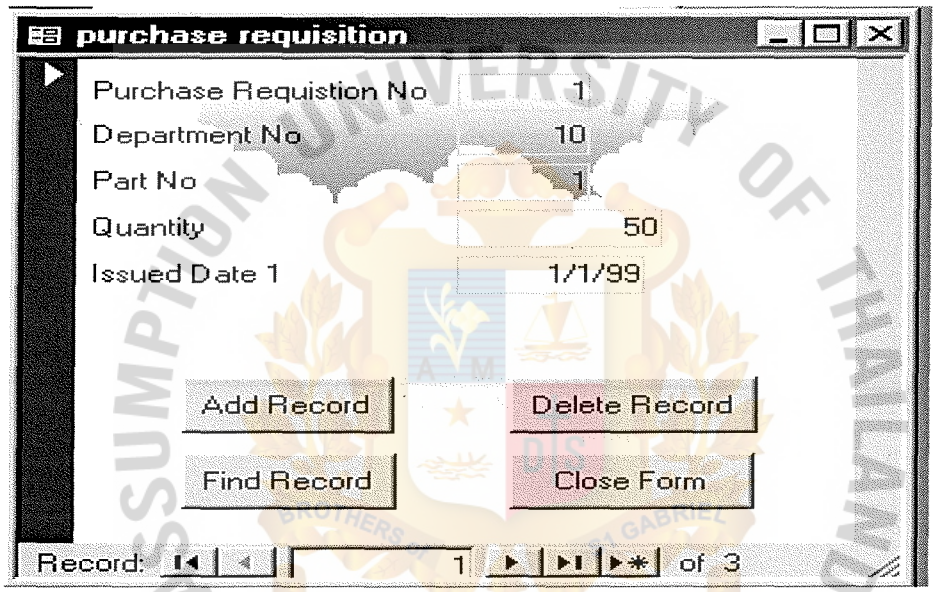


Figure A.10. Purchase Requisition Screen Interface.

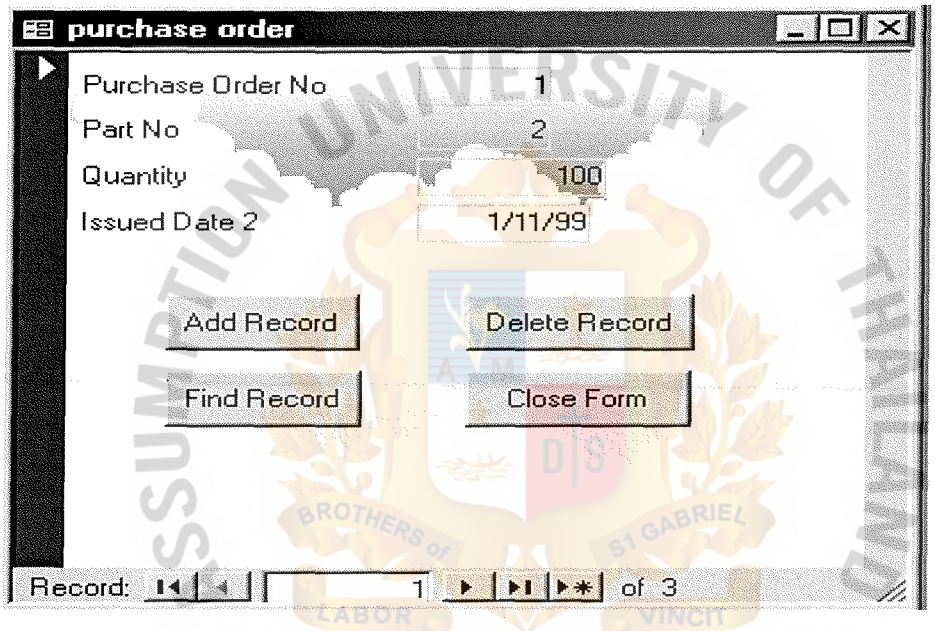


Figure A.11. Purchase Order Input Screen Interface.

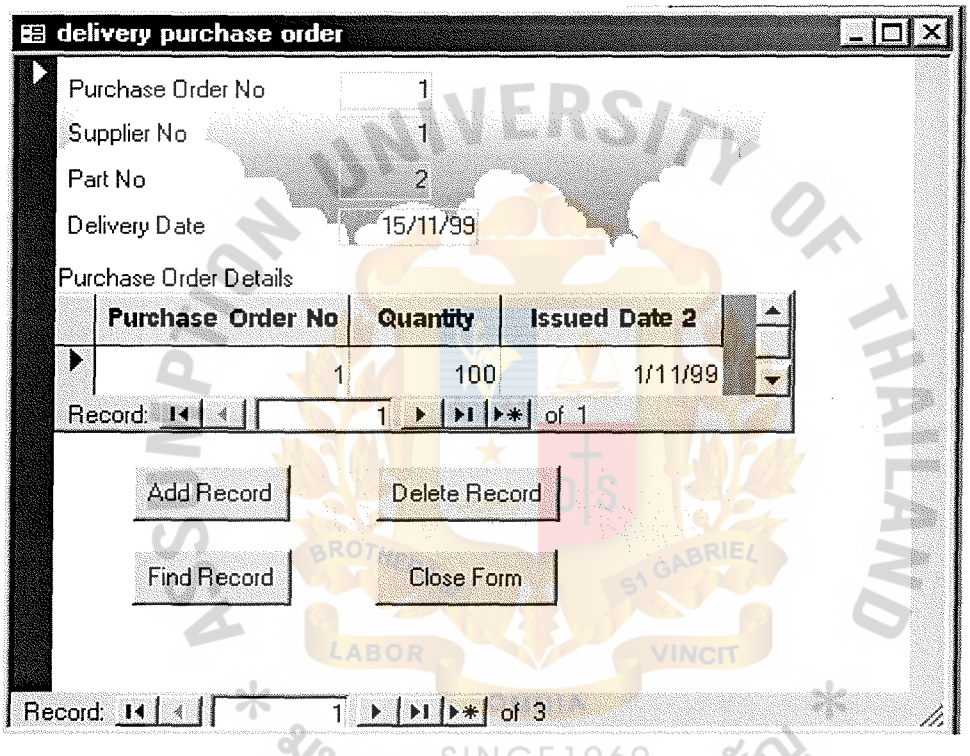


Figure A.12. Delivery Input Screen Interface.

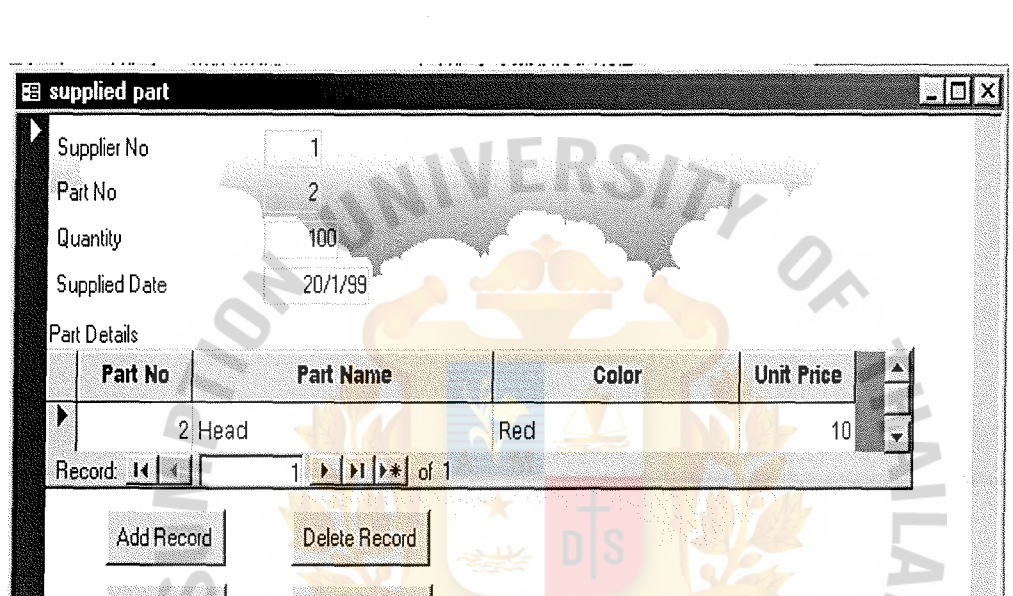


Figure A.13. Supplied Part Input Screen Interface.

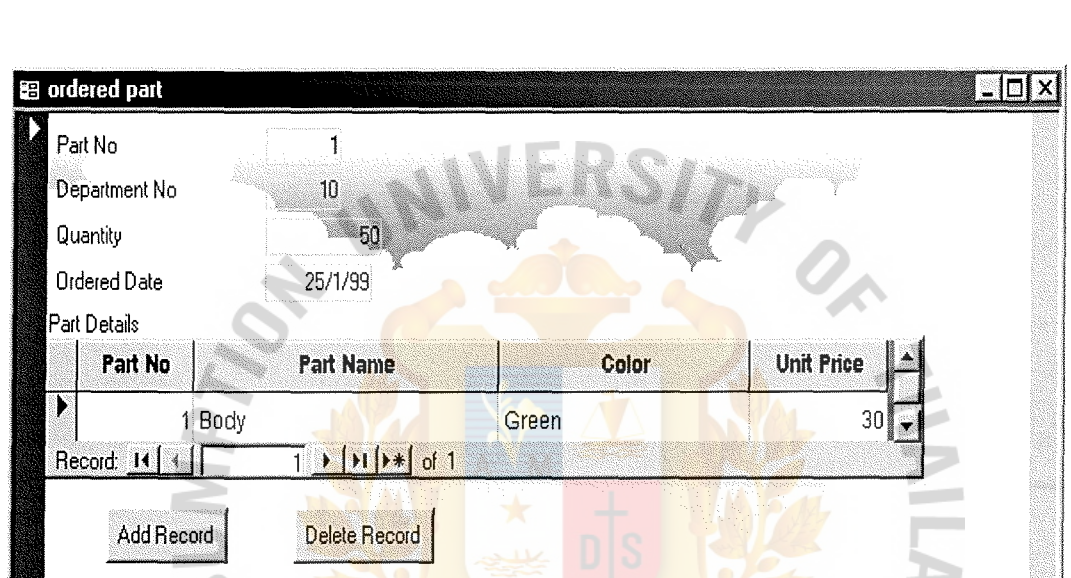
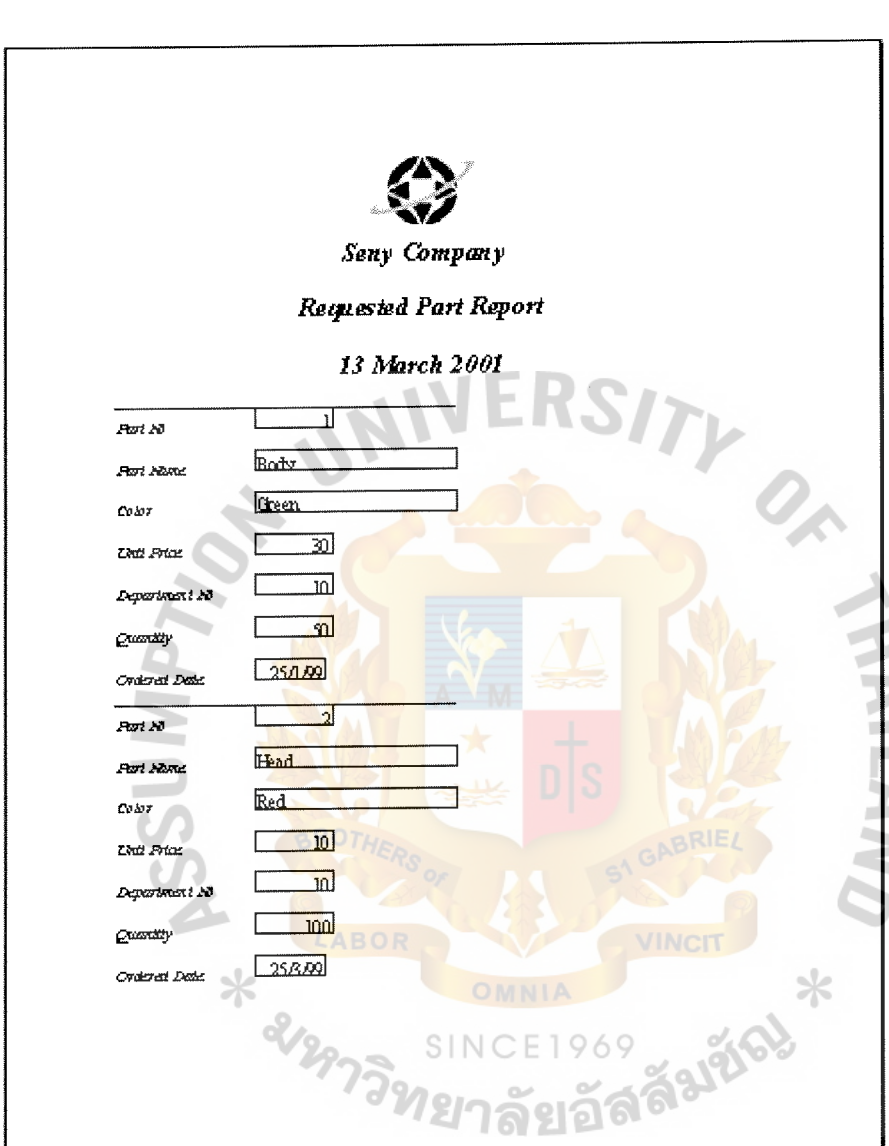


Figure A.14. Ordered Part Input Screen.

APPENDIX B

REPORT DESIGN



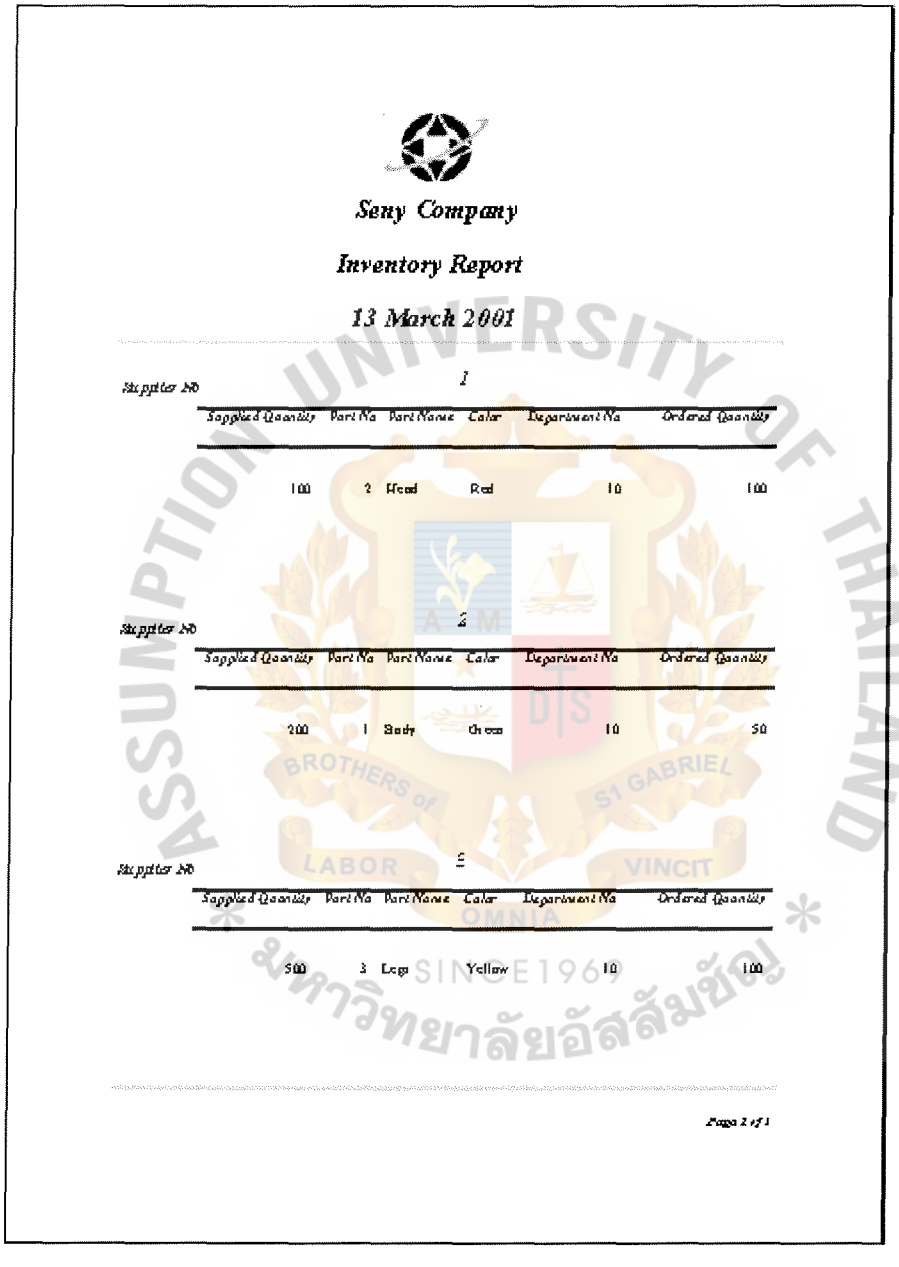
Seny Company

Requested Part Report

13 March 2001

Part ID	1
Part Name	Body
Color	Green
Unit Price	30
Department ID	10
Quantity	90
Ordered Date	25/1/99
Part ID	2
Part Name	Head
Color	Red
Unit Price	10
Department ID	10
Quantity	100
Ordered Date	25/3/99

Figure B.1. Requested Part Report.



Seny Company

Inventory Report

13 March 2001

Supplier No 1

Supplied Quantity	*Part No*	*Part Name*	*Color*	*Department No*	*Ordered Quantity*
100	2	Head	Red	10	100

Supplier No 2

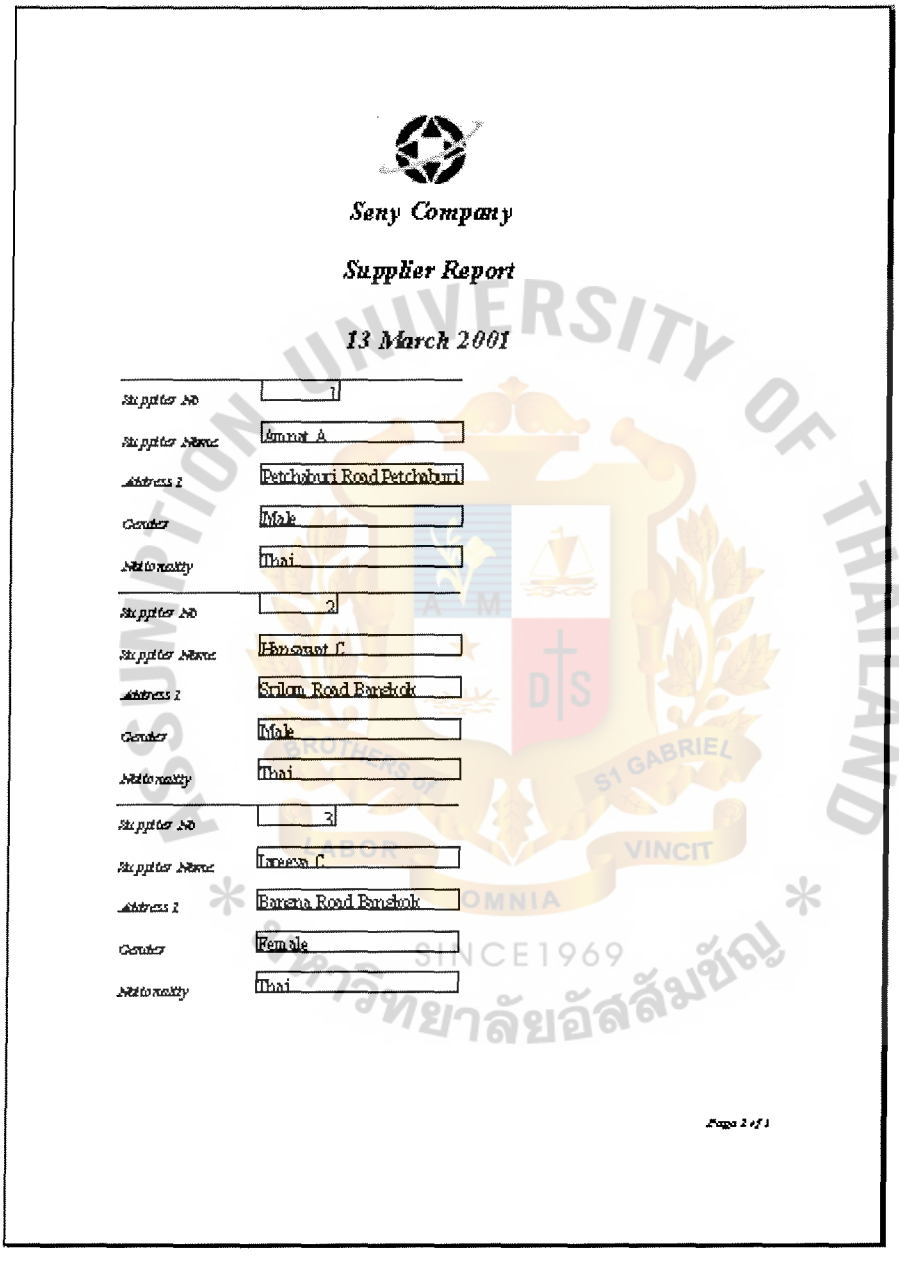
Supplied Quantity	*Part No*	*Part Name*	*Color*	*Department No*	*Ordered Quantity*
200	1	Body	Green	10	50

Supplier No 3

Supplied Quantity	*Part No*	*Part Name*	*Color*	*Department No*	*Ordered Quantity*
500	3	Legs	Yellow	10	100

Page 1 of 1

Figure B.2. Inventory Report.



Seny Company

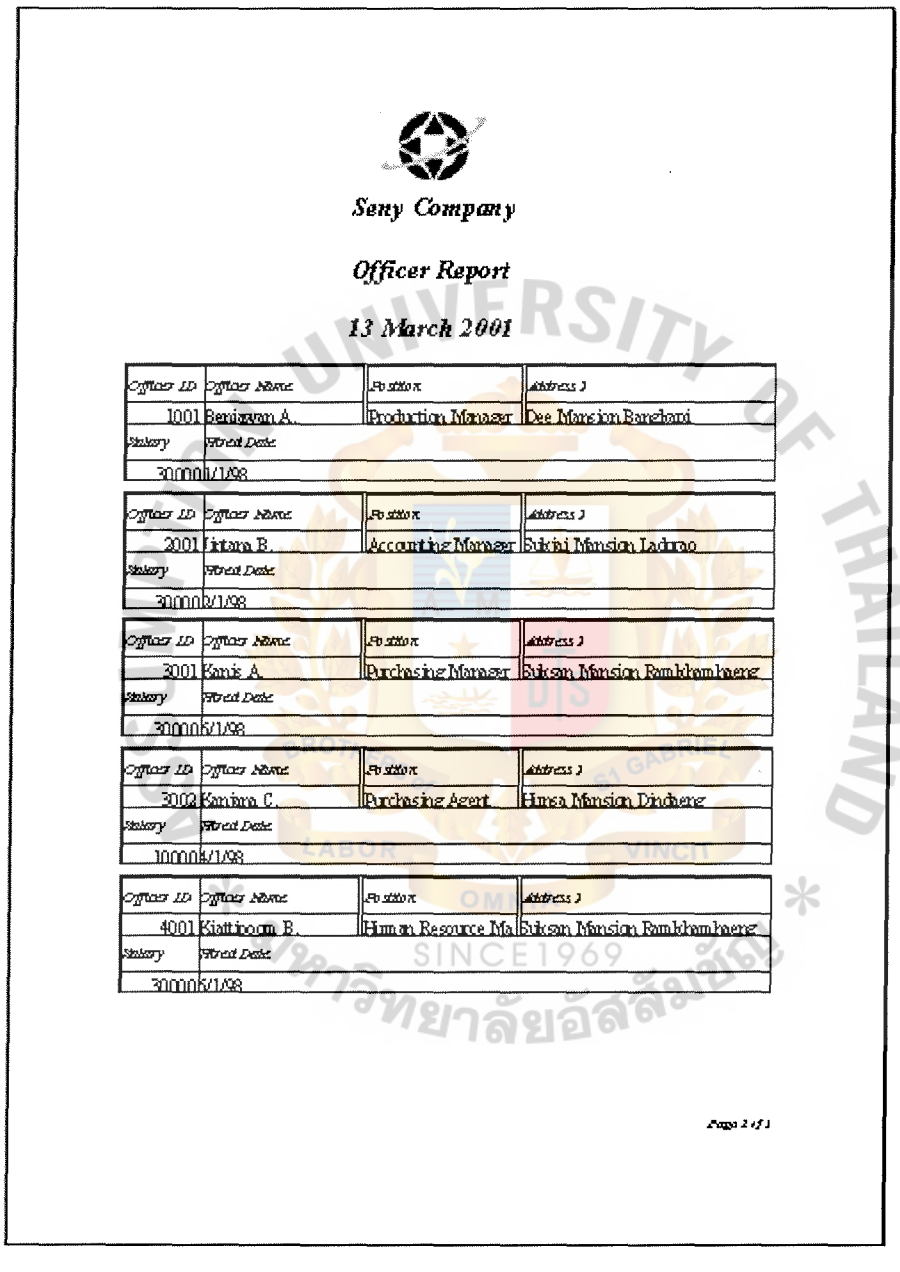
Supplier Report

13 March 2001

Supplier No	1
Supplier Name	Amnat A
Address 1	Petchaburi Road Petchaburi
Gender	Male
Nationality	Thai
Supplier No	2
Supplier Name	Hansanat C
Address 1	Srilom Road Bangkok
Gender	Male
Nationality	Thai
Supplier No	3
Supplier Name	Taneera C
Address 1	Banrama Road Bangkok
Gender	Female
Nationality	Thai

Page 1 of 1

Figure B.3. Supplier Report.



Seny Company

Officer Report

13 March 2001

Officer ID	Officer Name	Position	Address 1
1001	Benjawan A.	Production Manager	Dee Mansion Bangkhen
Salary	Start Date		
30000	1/1/98		

Officer ID	Officer Name	Position	Address 1
2001	Jittara B.	Accounting Manager	Sukhi Mansion Ladprao
Salary	Start Date		
30000	2/1/98		

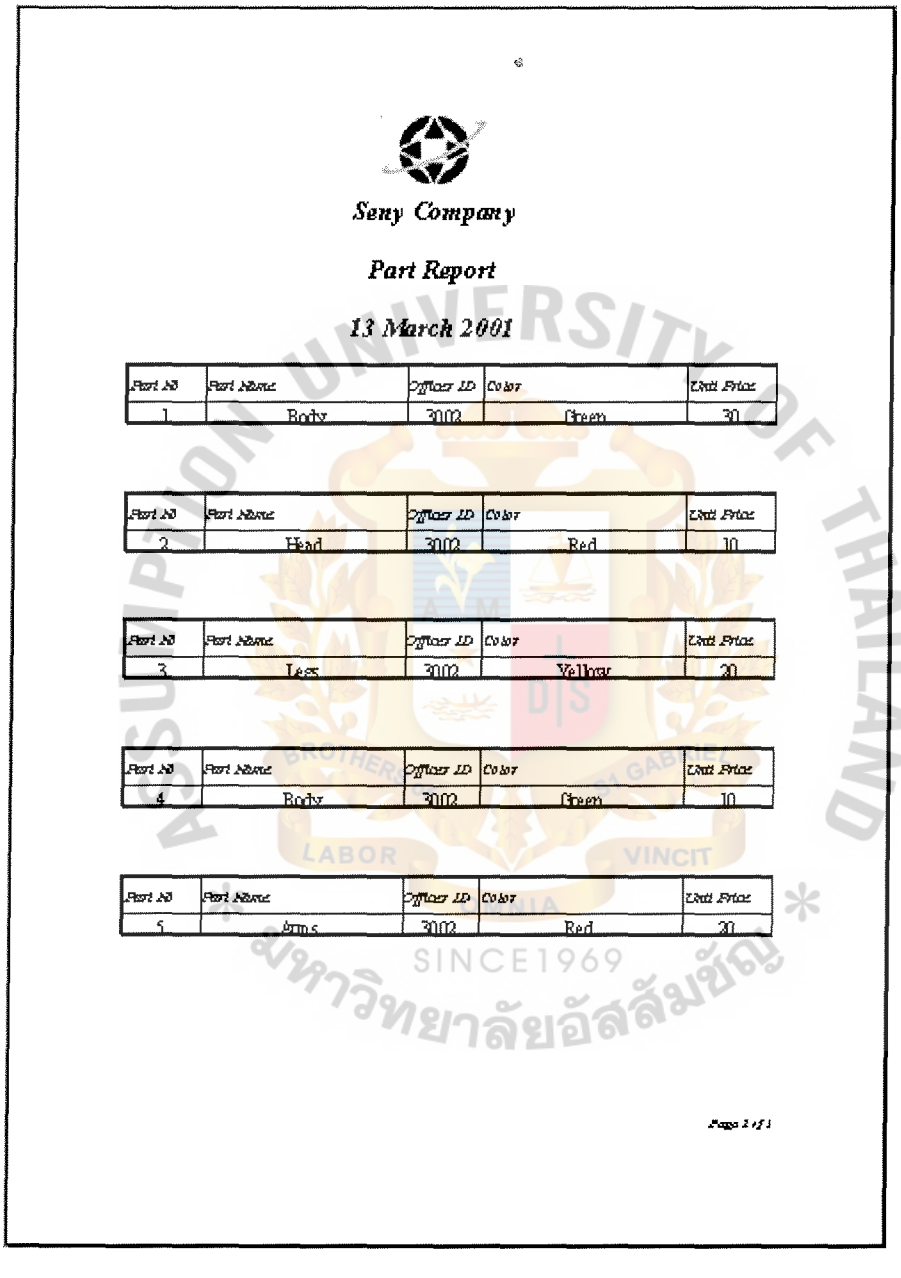
Officer ID	Officer Name	Position	Address 1
3001	Kanis A.	Purchasing Manager	Sukson Mansion Ramkhamhaeng
Salary	Start Date		
30000	6/1/98		

Officer ID	Officer Name	Position	Address 1
3002	Kanitra C.	Purchasing Agent	Hinsa Mansion Dindaeng
Salary	Start Date		
10000	8/1/98		

Officer ID	Officer Name	Position	Address 1
4001	Kittiboon B.	Human Resource Ma	Sukson Mansion Ramkhamhaeng
Salary	Start Date		
30000	6/1/98		

Page 1 of 1

Figure B.4. Officer Report.



Seny Company

Part Report

13 March 2001

Part ID	Part Name	Officer ID	Color	Unit Price
1	Body	3002	Green	30

Part ID	Part Name	Officer ID	Color	Unit Price
2	Head	3002	Red	10

Part ID	Part Name	Officer ID	Color	Unit Price
3	Legs	3002	Yellow	30

Part ID	Part Name	Officer ID	Color	Unit Price
4	Body	3002	Green	10

Part ID	Part Name	Officer ID	Color	Unit Price
5	Arms	3002	Red	30

Page 2 of 3

Figure B.5. Part Report.

Seny Company

Department Report

13 March 2001

Department ID	Department Name
10	Production Department

Department ID	Department Name
20	Accounting Department

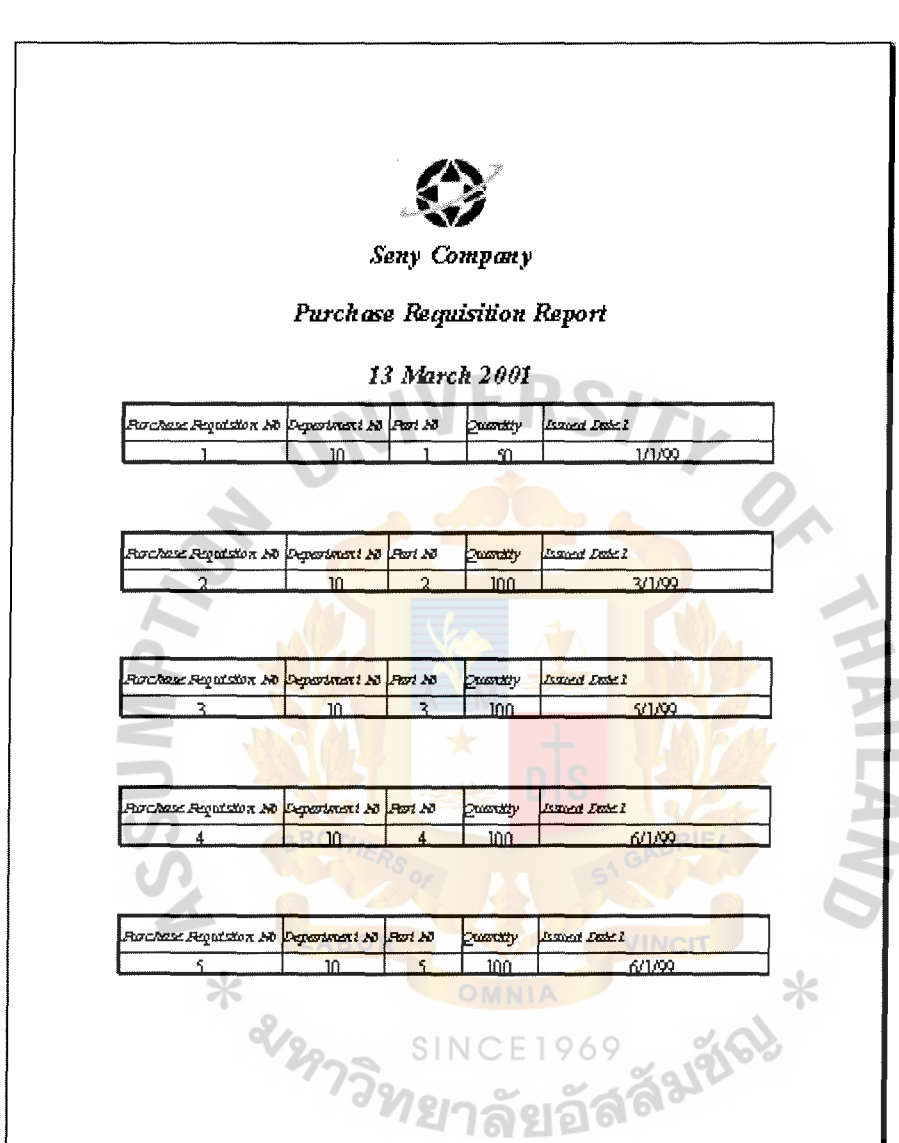
Department ID	Department Name
30	Purchasing Department

Department ID	Department Name
40	Human Resource Department

Department ID	Department Name
50	Marketing Department

Page 2 of 2

Figure B.6. Department Report.



Seny Company

Purchase Requisition Report

13 March 2001

Purchase Requisition No	Department No	Part No	Quantity	Issued Date
1	10	1	50	1/1/99

Purchase Requisition No	Department No	Part No	Quantity	Issued Date
2	10	2	100	3/1/99

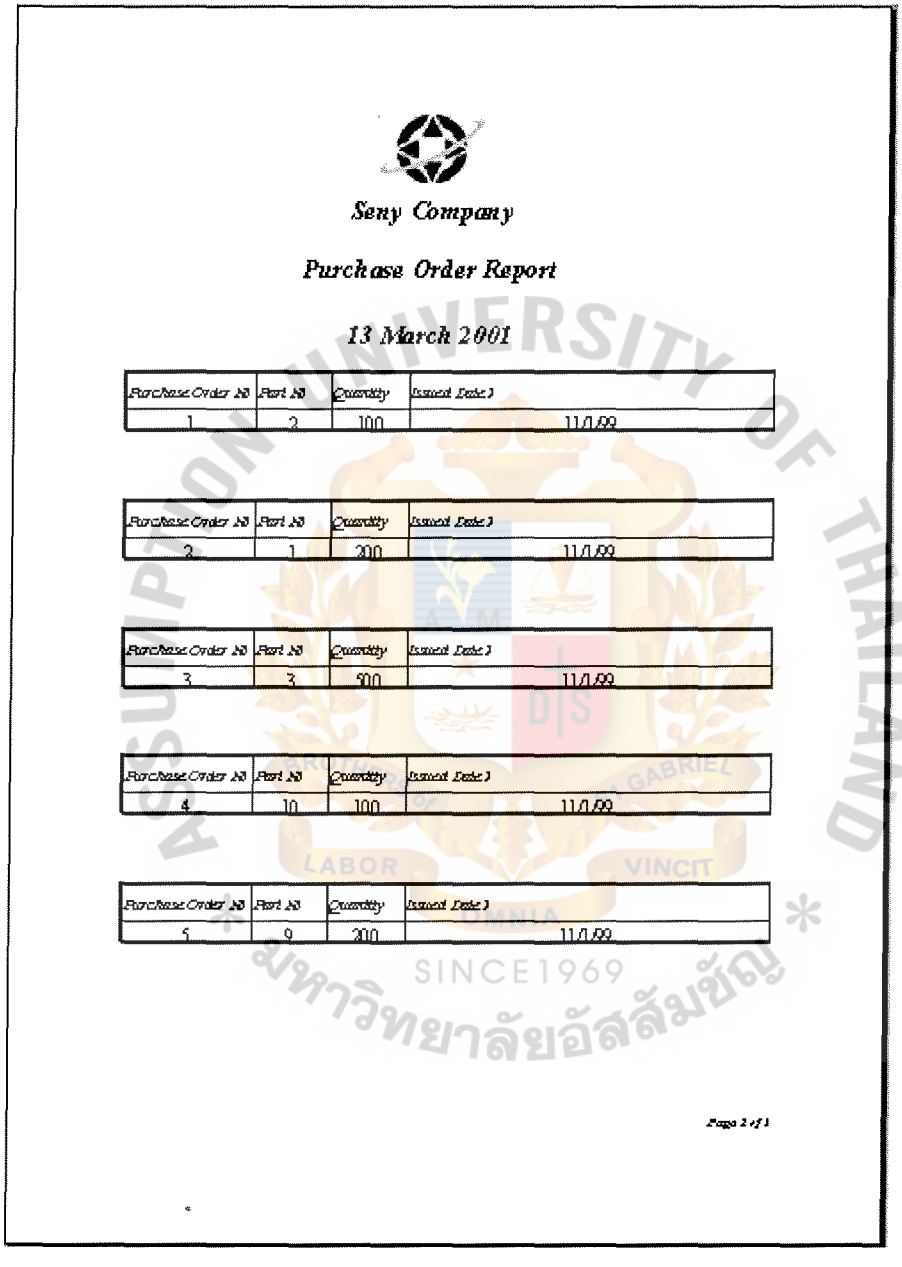
Purchase Requisition No	Department No	Part No	Quantity	Issued Date
3	10	3	100	5/1/99

Purchase Requisition No	Department No	Part No	Quantity	Issued Date
4	10	4	100	6/1/99

Purchase Requisition No	Department No	Part No	Quantity	Issued Date
5	10	5	100	6/1/99

Page 1 of 1

Figure B.7. Purchase Requisition Report.



Seny Company

Purchase Order Report

13 March 2001

Purchase Order No	Part No	Quantity	Issued Date)
1	2	100	11/1/99

Purchase Order No	Part No	Quantity	Issued Date)
2	1	300	11/1/99

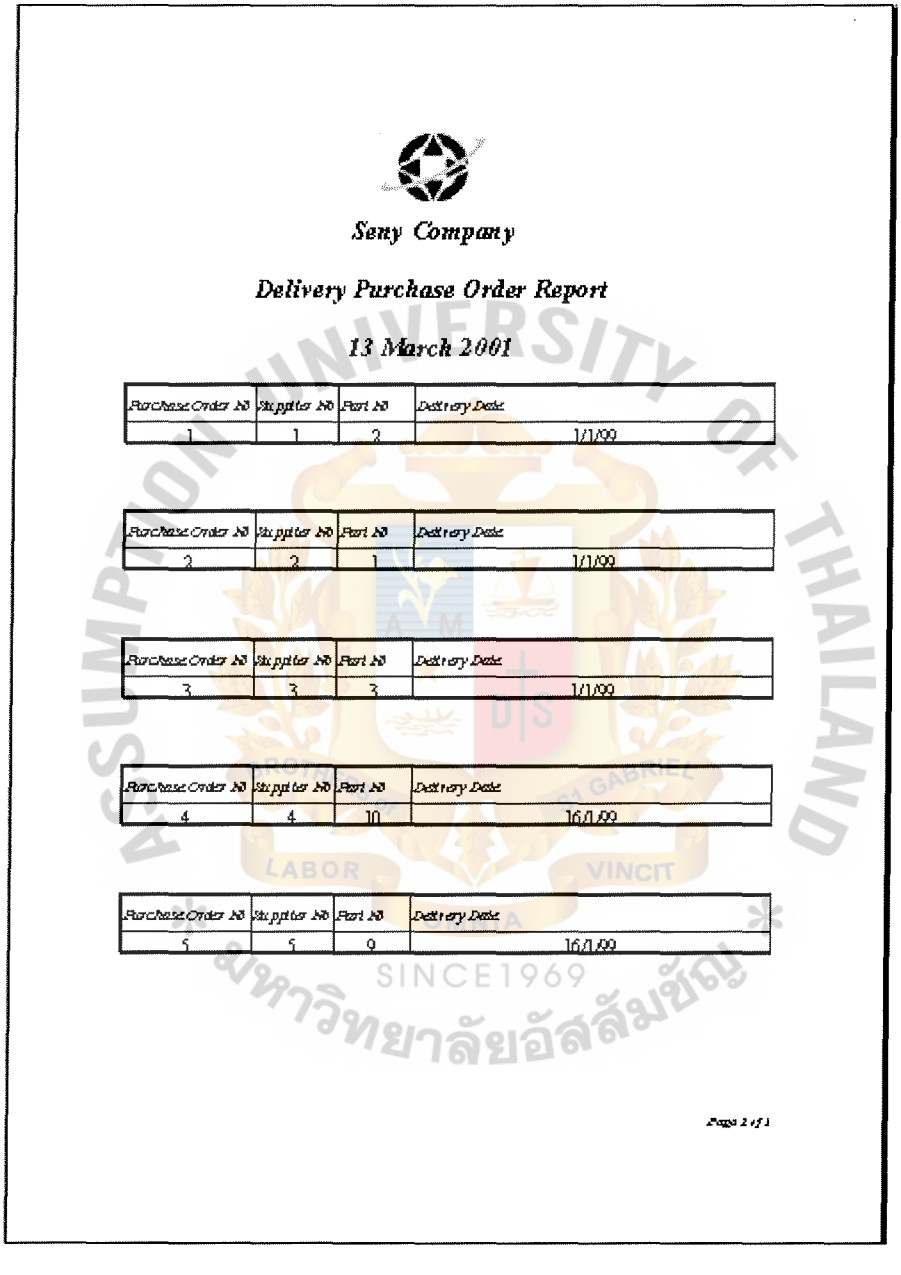
Purchase Order No	Part No	Quantity	Issued Date)
3	3	900	11/1/99

Purchase Order No	Part No	Quantity	Issued Date)
4	10	100	11/1/99

Purchase Order No	Part No	Quantity	Issued Date)
5	9	200	11/1/99

Page 2 of 3

Figure B.8. Purchase Order Report.



Seny Company

Delivery Purchase Order Report

13 March 2001

Purchase Order No	Supplier No	Part No	Delivery Date
1	1	2	1/1/99

Purchase Order No	Supplier No	Part No	Delivery Date
2	2	1	1/1/99

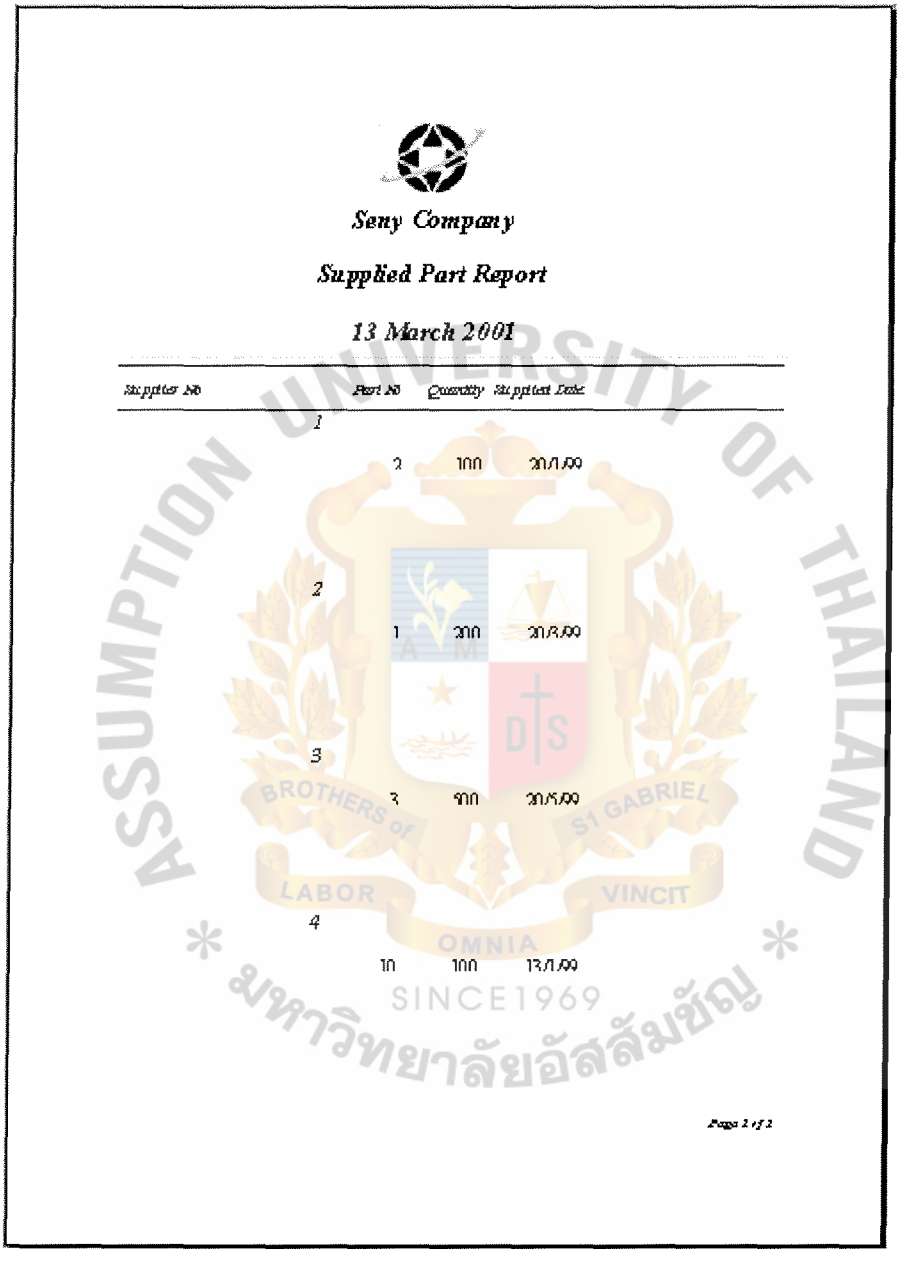
Purchase Order No	Supplier No	Part No	Delivery Date
3	3	3	1/1/99

Purchase Order No	Supplier No	Part No	Delivery Date
4	4	10	16/1/99

Purchase Order No	Supplier No	Part No	Delivery Date
5	5	9	16/1/99

Page 1 of 1

Figure B.9. Delivery Purchase Order Report.



Seny Company

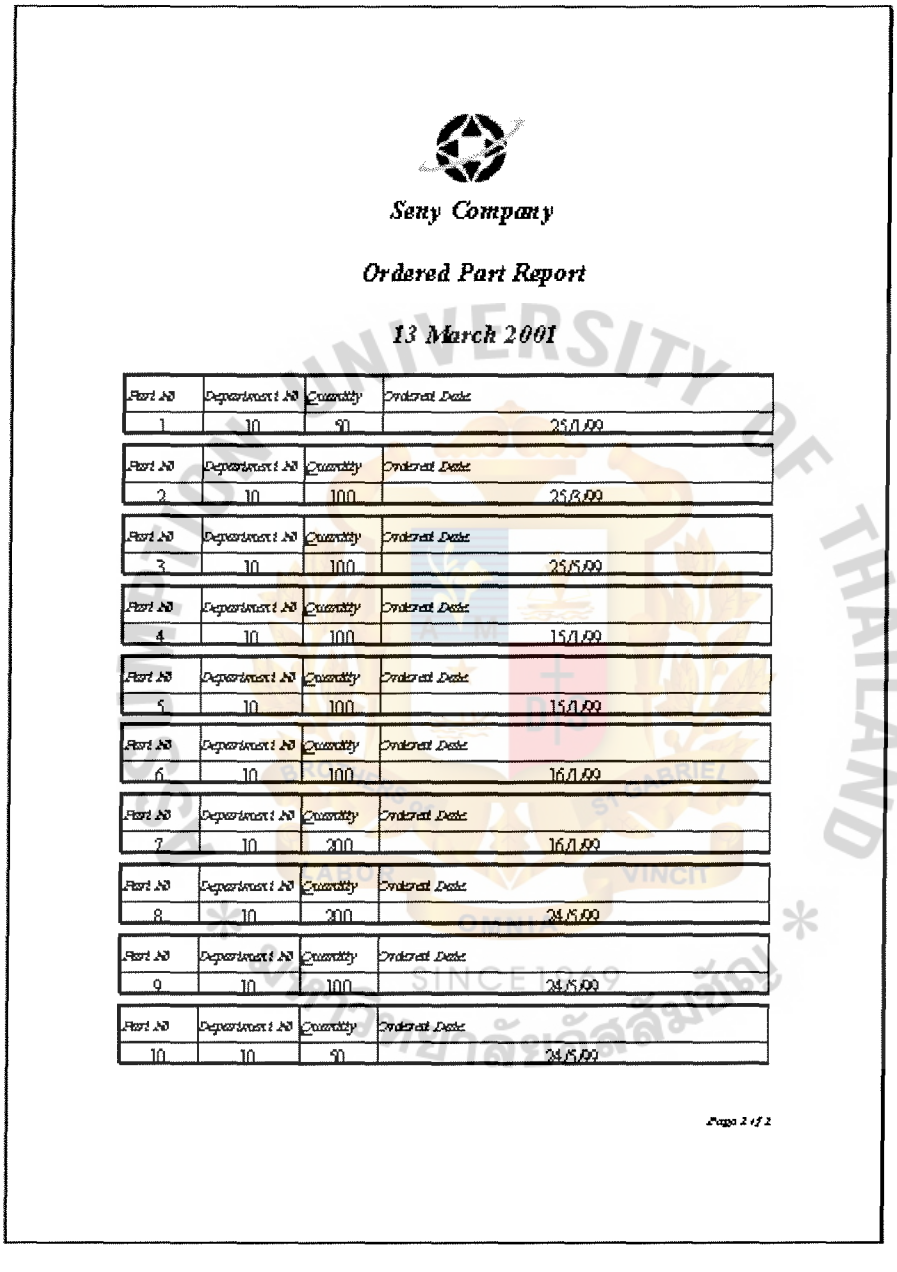
Supplied Part Report

13 March 2001

Supplier No	Part No	Quantity	Supplied Date
1			
	2	100	20/1/00
2			
	1	200	20/3/00
3			
	3	900	20/5/00
4			
	10	100	13/1/00

Page 1 of 1

Figure B.10. Supplied Part Report.



Seny Company

Ordered Part Report

13 March 2001

Part ID	Department ID	Quantity	Ordered Date
1	10	50	25/1/00
Part ID	Department ID	Quantity	Ordered Date
2	10	100	25/3/00
Part ID	Department ID	Quantity	Ordered Date
3	10	100	25/5/00
Part ID	Department ID	Quantity	Ordered Date
4	10	100	15/1/00
Part ID	Department ID	Quantity	Ordered Date
5	10	100	15/1/00
Part ID	Department ID	Quantity	Ordered Date
6	10	100	16/1/00
Part ID	Department ID	Quantity	Ordered Date
7	10	300	16/1/00
Part ID	Department ID	Quantity	Ordered Date
8	10	300	24/5/00
Part ID	Department ID	Quantity	Ordered Date
9	10	100	24/5/00
Part ID	Department ID	Quantity	Ordered Date
10	10	50	24/5/00

Page 2 of 2

Figure B.11. Ordered Part Report.

APPENDIX C

DATABASE DESIGN

Database D1.

Table C.1. Structure of Purchase Requisition Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key To Table	Check	Key Type
1	Purchase Requisition No	int	Y	Y				Primary Key
2	Department No	int	Y			Department		Attribute
3	Part No	int	Y			Inventory		Attribute
4	Quantity	int						Attribute
5	Issued Date 1	Date			Y		<1-Jan-01	Attribute

Database D2.

Table C.2. Structure of Department Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key To Table	Check	Key Type
1	Department No	int	Y	Y				Primary Key
2	Department Name	char (15)	Y					Attribute

Database D3.

Table C.3. Structure of Ordered Part Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key To Table	Check	Key Type
1	Part No	int	Y	Y		Inventory		Primary Key
2	Department No	int	Y	Y		Department		Primary Key
3	Quantity	int						Attribute
4	Ordered Date	date			Y		<1-Jan-01	Attribute

Database D4.

Table C.4. Structure of Inventory Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key To Table	Check	Key Type
1	Part No	int	Y	Y				Primary Key
2	Officer ID	int	Y			Officer		Attribute
3	Part Name	char (20)	Y					Attribute
4	Color	char (15)						Attribute
5	Unit Price	int	Y					Attribute

Database D5.

Table C.5. Structure of Supplier Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key To Table	Check	Key Type
1	Supplier No	int	Y	Y				Primary Key
2	Supplier Name	char (20)	Y					Attribute
3	Address	char (30)	Y					Attribute
4	Gender	char (6)			Y			Attribute
5	Nationality	char (10)			Y			Attribute

Database D6.

Table C.6. Structure of Supplied Part Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key To Table	Check	Key Type
1	Supplier No	int	Y	Y		Supplier		Primary Key
2	Part No	int	Y	Y		Inventory		Primary Key
3	Quantity	int						Attribute
4	Supplied Date	date			Y		<1-Jan-01	Attribute

Database D7.

Table C.7. Structure of Purchase Order Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key To Table	Check	Key Type
1	Purchase Order No	int	Y	Y				Primary Key
2	Part No	int	Y			Inventory		Attribute
3	Quantity	int						Attribute
4	Issued Date 2	date			Y		<1-Jan-01	Attribute

Database D8.

Table C.8. Structure of Delivery Purchase Order Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key To Table	Check	Key Type
1	Purchase Order No	int	Y	Y		Purchase Order		Primary Key
2	Supplier No	int	Y	Y		Supplier		Primary Key
3	Part No	int	Y			Purchase Order		Attribute
4	Delivery Date	date					<1-Jan-01	Attribute

Database D9.

Table C.9. Structure of Officer Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key To Table	Check	Key Type
1	Officer ID	int	Y	Y				Primary Key
2	Officer Name	char (20)	Y					Attribute
3	Position	char (10)						Attribute
4	Address	char (20)	Y					Attribute
5	Salary	int			Y			Attribute
6	Hired Date	date					<1-Jan-01	Attribute

APPENDIX D

PROCESS SPECIFICATION

Process Specification of Process 1.1

Name of the process:

Receive Purchase Requisition Data

Purpose of the process:

To receive purchase requisition data the production department.

Input of the process:

Purchase requisition data.

Output of the process:

Purchase requisition information.

Process:

(1) Receive the purchase requisition data.

(2) Prepare the purchase requisition information.

(3) Send the purchase requisition into the verify purchase requisition information process.

Process Specification of Process 1.2

Name of the process:

Verify Purchase Requisition Information.

Purpose of the process:

To verify purchase requisition information before processing purchase requisition

Input of the process:

Purchase requisition information.

Output of the process:

Verified purchase requisition information.

Process:

(1) Receive the purchase requisition information.

(2) Verify and check the purchase requisition information.

(3) Send the verified purchase requisition information to process purchase requisition.

Process Specification of Process 1.3

Name of the process:

Process Purchase Requisition.

Purpose of the process:

To process and approve purchase requisition.

Input of the process:

Verified purchase requisition information.

Output of the process:

(1) Processed purchase requisition.

(2) Processed purchase requisition details.

(3) Department details.

(4) Ordered part details.

Process:

(1) Receive the verified purchase requisition information.

(2) Process and approve the verified purchase requisition information.

(3) Send processed purchase requisition details into the record processed purchase requisition data process.

(4) Send department details into the record department data process.

(5) Send ordered part details into the record ordered part data process.

(6) Send processed purchase requisition into the return processed purchase requisition no process.

Process Specification of Process 1.4

Name of the process:

Record Processed Purchase Requisition Data.

Purpose of the process:

To record the processed purchase requisition data into the database in the computer.

Input of the process:

Processed purchase requisition details.

Output of the process:

Processed purchase requisition data.

Process:

(1) Receive the processed purchase requisition details.

(2) Record the processed purchase requisition data into the database.

Attachment:

(1) Purchase requisitions.

(2) Data Store D1.

Process Specification of Process 1.5

Name of the process:

Record Department Data.

Purpose of the process:

To record the department data into the database in the computer.

Input of the process:

Department details.

Output of the process:

Department data.

Process:

(1) Receive the department details.

(2) Record the department data into the database.

Attachment:

(1) Departments.

(2) Data Store D2.

Process Specification of Process 1.6

Name of the process:

Record Ordered Part Data.

Purpose of the process:

To record the ordered part data into the database in the computer.

Input of the process:

Ordered part details.

Output of the process:

Ordered part data.

Process:

(1) Receive the ordered part details.

(2) Record the ordered part data into the database.

Attachment:

(1) Ordered parts.

(2) Data Store D3.

Process Specification of Process 1.7

Name of the process:

Return Processed Purchase Requisition No.

Purpose of the process:

To send processed purchase requisition no to the production department.

Input of the process:

Processed purchase requisition.

Output of the process:

Processed purchase requisition no.

Process:

(1) Receive the processed purchase requisition.

(2) Send the processed purchase requisition no. to the production department.

Process Specification of Process 2.1

Name of the process:

Read Inventory Data

Purpose of the process:

To read or retrieve inventory data from database.

Input of the process:

Inventory data.

Output of the process:

Inventory information.

Process:

(1) Read the inventory data from the inventory database.

(2) Prepare the inventory information.

(3) Send the inventory data back to the inventory database.

(4) Send the inventory information into the verify inventory information process.

Attachment:

(1) Inventories

(2) Data Store D4.

Process Specification of Process 2.2

Name of the process:

Verify Inventory Information

Purpose of the process:

To verify the inventory information before sending it into check availability process.

Input of the process:

Inventory information.

Output of the process:

Verified inventory information.

Process:

(1) Receive the inventory information.

(2) Verify and check the inventory information.

(3) Send the verified inventory information to the check availability process.

Process Specification of Process 2.3

Name of the process:

Read Purchase Requisition Data

Purpose of the process:

To read or retrieve purchase requisition data from database.

Input of the process:

Purchase requisition data.

Output of the process:

Purchase requisition information.

Process:

(1) Read the purchase requisition data from the purchase requisition database.

(2) Prepare the purchase requisition information.

(3) Send the purchase requisition data back to the purchase requisition database.

(4) Send the purchase requisition information into the verify purchase requisition information process.

Attachment:

(1) Purchase requisitions.

(2) Data Store D1.

Process Specification of Process 2.4

Name of the process:

Verify Purchase Requisition Information

Purpose of the process:

To verify the purchase requisition information before sending it into the check availability process.

Input of the process:

Purchase requisition information.

Output of the process:

Verified purchase requisition information.

Process:

(1) Receive the purchase requisition information.

(2) Verify and check the purchase requisition information.

(3) Send the verified purchase requisition information to the check availability process.

Process Specification of Process 2.5

Name of the process:

Check Availability

Purpose of the process:

To check the available part in the warehouse.

Input of the process:

(1) Verified inventory information.

(2) Verified purchase requisition information.

Output of the process:

Requested part information.

Process:

(1) Receive the verified inventory information.

(2) Receive the verified purchase requisition information.

(3) Check the available part in the warehouse.

(4) Send the requested part information into the prepare requested part report process.

Process Specification of Process 2.6

Name of the process:

Prepare Requested Part Report.

Purpose of the process:

To prepare the requested part report that contains requested raw materials and parts information.

Input of the process:

Requested part information.

Output of the process:

Requested part report.

Process:

(1) Receive the requested part information.

(2) Prepare the requested part report.

(3) Send the requested part report to the send copies of the requested part report to warehouse process.

Process Specification of Process 2.7

Name of the process:

Send Copies of Requested Part Report To The Warehouse.

Purpose of the process:

To send the copies of the requested part report to the warehouse.

Input of the process:

Requested part report.

Output of the process:

Copies of the requested part report.

Process:

(1) Receive the requested part report.

(2) Prepare the copies of the requested part reports.

(3) Send the copies of the requested part reports to the warehouse.

Process Specification of Process 3.1

Name of the process:

Read Supplier Data.

Purpose of the process:

To read or retrieve supplier data from database.

Input of the process:

Supplier data.

Output of the process:

Supplier information.

Process:

(1) Read the supplier data from the supplier database.

(2) Prepare the supplier information.

(3) Send the supplier data back to the supplier database.

(4) Send the supplier information into the verify supplier information process.

Attachment:

(1) Suppliers.

(2) Data Store D5.

Process Specification of Process 3.2

Name of the process:

Verify Supplier Information.

Purpose of the process:

To verify the supplier information before processing selected supplier information.

Input of the process:

Supplier information.

Output of the process:

Verified supplier information.

Process:

(1) Receive the supplier information.

(2) Verify and check the supplier information.

(3) Send the verified supplier information to process selected supplier information.

Process Specification of Process 3.3

Name of the process:

Read Ordered Part Data.

Purpose of the process:

To read or retrieve the ordered part data from database.

Input of the process:

Ordered part data.

Output of the process:

Ordered part information.

Process:

(1) Read the ordered part data from the ordered part database.

(2) Prepare the ordered part information.

(3) Send the ordered part data back to the ordered part database.

(4) Send the ordered part information into the verify ordered part information process.

Attachment:

(1) Ordered parts.

(2) Data Store D3.

Process Specification of Process 3.4

Name of the process:

Verify Ordered Part Information.

Purpose of the process:

To verify the ordered part information before processing selected supplier information.

Input of the process:

Ordered part information.

Output of the process:

Verified ordered part information.

Process:

(1) Receive the ordered part information.

(2) Verify and check the ordered part information.

(3) Send the verified ordered part information to process selected supplier information.

Process Specification of Process 3.5

Name of the process:

Process Selected Supplier Information.

Purpose of the process:

To process the selected supplier information from the verified supplier and ordered part information.

Input of the process:

(1) Verified supplier information.

(2) Verified ordered part information.

Output of the process:

Selected supplier information.

Process:

(1) Receive the verified supplier information.

(2) Receive the verified ordered part information.

(3) Process the selected supplier information from the verified supplier and ordered part information.

(4) Send the selected supplier information to send supplier no., name and address to purchasing agent process.

Process Specification of Process 3.6

Name of the process:

Send Supplier No, Name and Address To The Purchasing Agent.

Purpose of the process:

To send the supplier no, name and address to the purchasing agent.

Input of the process:

Selected supplier information.

Output of the process:

Supplier no, name and address.

Process:

(1) Receive the selected supplier information.

(2) Prepare the supplier no, name and address.

(3) Send the supplier no, name and address to the purchasing agent.

Process Specification of Process 4.1

Name of the process:

Verify Supplier No, Name and Address.

Purpose of the process:

To verify the supplier no, name and address before sending it into the prepare purchase order process.

Input of the process:

Supplier no, name and address.

Output of the process:

Verified supplier no, name and address.

Process:

(1) Receive the supplier no, name and address.

(2) Verify and check the supplier no, name and address.

(3) Send the verified supplier no., name and address to the prepare purchase order process

Process Specification of Process 4.2

Name of the process:

Read Supplied Part Data

Purpose of the process:

To read or retrieve the supplied part data from the database.

Input of the process:

Supplied part data.

Output of the process:

Supplied part information.

Process:

(1) Read the supplied part data from the supplied part database.

(2) Prepare the supplied part information.

(3) Send the supplied part data back to the supplied part database.

(4) Send the supplied part information into the verify supplied part information process.

Process Specification of Process 4.3

Name of the process:

Verify Supplied Part Information.

Purpose of the process:

To verify the supplied part information before preparing the purchase order.

Input of the process:

Supplied part information.

Output of the process:

Verified supplied part information.

Process:

(1) Receive the supplied part information.

(2) Verify and check the supplied part information.

(3) Send the verified supplied part information into the prepare purchase order process.

Process Specification of Process 4.4

Name of the process:

Prepare Purchase Order.

Purpose of the process:

To prepare purchase orders that contain the supplier requested raw materials and parts information.

Input of the process:

(1) Verified supplier no, name and address

(2) Verified supplied part information..

Output of the process:

(1) Purchase orders.

(2) Purchase order details.

Process:

(1) Receive the verified supplier no, name and address.

(2) Receive the verified supplied part information.

(3) Prepare the purchase orders.

(4) Send the purchase orders to send copies of purchase orders to supplier process.

(5) Send the purchase orders to send copies of purchase orders to accounting department process.

(6) Send the purchase order details to record purchase order data.

Process Specification of Process 4.5

Name of the process:

Record Purchase Order Data.

Purpose of the process:

To record the purchase order data into the database in the computer.

Input of the process:

Purchase order details.

Output of the process:

Purchase order data.

Process:

(1) Receive the purchase order details.

(2) Record the purchase order data into the database.

Attachment:

(1) Purchase orders.

(2) Data Store D7.

Process Specification of Process 4.6

Name of the process:

Send Copies of Purchase Orders To Supplier.

Purpose of the process:

To send the copies of the purchase orders to the suppliers.

Input of the process:

Purchase orders.

Output of the process:

Copies of the purchase orders.

Process:

(1) Receive the purchase orders.

(2) Prepare the copies of the purchase orders

(3) Send the copies of the purchase orders to suppliers.

Process Specification of Process 4.7

Name of the process:

Send Copies of Purchase Orders To Accounting Department.

Purpose of the process:

To send the copies of the purchase orders to accounting department.

Input of the process:

Purchase orders.

Output of the process:

Copies of the purchase orders.

Process:

(1) Receive the purchase orders.

(2) Prepare the copies of the purchase orders

(3) Send the copies of the purchase orders to accounting department.

Process Specification of Process 5.1

Name of the process:

Receive Part

Purpose of the process:

To receive raw materials and parts from the suppliers.

Input of the process:

Raw materials and parts.

Output of the process:

Raw materials and parts and information.

Process:

(1) Receive the raw materials and parts.

(2) Prepare the raw materials and parts information.

(3) Send the raw materials and parts and information into the compare part with verified delivery purchase order information process.

Process Specification of Process 5.2

Name of the process:

Read Delivery Purchase Order Data.

Purpose of the process:

To read or retrieve the delivery purchase order data from database.

Input of the process:

Delivery purchase order data.

Output of the process:

Delivery purchase order information.

Process:

(1) Read the delivery purchase order data from the delivery purchase order database.

(2) Prepare the delivery purchase order information.

(3) Send the delivery purchase order data back to the delivery purchase order database.

(4) Send the delivery purchase order information into the verify delivery purchase order information process.

Attachment:

(1) Delivery purchase orders.

(2) Data Store D8.

Process Specification of Process 5.3

Name of the process:

Verify Delivery Purchase Order Information

Purpose of the process:

To verify the delivery purchase order information before comparing raw materials and parts with verified delivery purchase order information.

Input of the process:

Delivery purchase order information.

Output of the process:

Verified delivery purchase order information.

Process:

(1) Receive the delivery purchase order information.

(2) Verify and check the delivery purchase order information.

(3) Send the verified delivery purchase order information to compare part with verified delivery purchase order information process.

Process Specification of Process 5.4

Name of the process:

Compare Parts With Verified Delivery Purchase Order Information.

Purpose of the process:

To compare and check raw materials and parts with verified delivery purchase order information.

Input of the process:

(1) Raw materials and parts and information.

(2) Verified delivery purchase order information.

Output of the process:

(1) Wrong raw materials and parts.

(2) Wrong raw materials and parts data.

(3) Officer details.

Process:

(1) Receive the raw materials and parts and information.

(2) Receive the verified delivery purchase order information.

(3) Compare part with the verified delivery purchase order information.

(4) Send wrong raw materials and parts data to send wrong part information to purchasing agent process.

(5) Send officer details to record officer data process.

(6) Send wrong raw materials and parts to the suppliers.

Process Specification of Process 5.5

Name of the process:

Send Wrong Part Information To Purchasing Agent.

Purpose of the process:

To send wrong part information to the purchasing agent.

Input of the process:

Wrong raw materials and parts data

Output of the process:

Wrong raw materials and parts information.

Process:

(1) Receive wrong raw materials and parts data.

(2) Prepare wrong raw materials and parts information.

(3) Send wrong raw materials and parts information to the purchasing agent.

Process Specification of Process 5.6

Name of the process:

Record Officer Data

Purpose of the process:

To record the officer data into the database in the computer.

Input of the process:

Officer details.

Output of the process:

Officer data.

Process:

(1) Receive the officer details.

(2) Record the officer data into the database.

Attachment:

(1) Officers.

(2) Data Store D9.

Process Specification of Process 6.1

Name of the process:

Receive Part

Purpose of the process:

To receive raw materials and parts from the suppliers.

Input of the process:

Raw materials and parts.

Output of the process:

Raw materials and parts and information.

Process:

(1) Receive the raw materials and parts.

(2) Prepare the raw materials and parts information.

(3) Send the raw materials and parts and information into the compare part with verified delivery purchase order information process.

Process Specification of Process 6.2

Name of the process:

Read Delivery Purchase Order Data.

Purpose of the process:

To read or retrieve the delivery purchase order data from database.

Input of the process:

Delivery purchase order data.

Output of the process:

Delivery purchase order information.

Process:

(1) Read the delivery purchase order data from the delivery purchase order database.

(2) Prepare the delivery purchase order information.

(3) Send the delivery purchase order data back to the delivery purchase order database.

(4) Send the delivery purchase order information into the verify delivery purchase order information process.

Attachment:

(1) Delivery purchase orders.

(2) Data Store D8.

Process Specification of Process 6.3

Name of the process:

Verify Delivery Purchase Order Information

Purpose of the process:

To verify the delivery purchase order information before comparing raw materials and parts with verified delivery purchase order information.

Input of the process:

Delivery purchase order information.

Output of the process:

Verified delivery purchase order information.

Process:

(1) Receive the delivery purchase order information.

(2) Verify and check the delivery purchase order information.

(3) Send the verified delivery purchase order information to compare part with verified delivery purchase order information process.

Process Specification of Process 6.4

Name of the process:

Compare Parts With Verified Delivery Purchase Order Information.

Purpose of the process:

To compare and check raw materials and parts with verified delivery purchase order information.

Input of the process:

(1) Raw materials and parts and information.

(2) Verified delivery purchase order information.

Output of the process:

(1) Validated raw materials and parts.

(2) Validated raw materials and parts details.

(3) Officer details.

Process:

(1) Receive the raw materials and parts and information.

(2) Receive the verified delivery purchase order information.

(3) Compare part with the verified delivery purchase order information.

(4) Send validated raw materials and parts details to record validated part data process.

(5) Send officer details to record officer data process.

(6) Send validated raw materials and part details to prepare inventory report process.

(7) Send validated raw materials and parts to the warehouse.

Process Specification of Process 6.5

Name of the process:

Record Validated Part Data.

Purpose of the process:

To record the validated raw materials and parts data into the database in the computer.

Input of the process:

Validated raw materials and parts details.

Output of the process:

Validated raw materials and parts data.

Process:

(1) Receive the validated raw materials and parts details.

(2) Record the validated raw materials and parts data into the database.

Attachment:

(1) Inventories.

(2) Data Store D4.

Process Specification of Process 6.6

Name of the process:

Record Officer Data

Purpose of the process:

To record the officer data into the database in the computer.

Input of the process:

Officer details.

Output of the process:

Officer data.

Process:

(1) Receive the officer details.

(2) Record the officer data into the database.

Attachment:

(1) Officers.

(2) Data Store D9.

Process Specification of Process 6.7

Name of the process:

- Prepare Inventory Report.

Purpose of the process:

To prepare and produce inventory report from the validated raw materials and parts details.

Input of the process:

Validated raw materials and parts details.

Output of the process:

Inventory report.

Process:

(1) Receive the validated raw materials and parts details.

(2) Prepare the inventory report.

(3) Send the inventory report to the send copies of inventory reports to management process.

Process Specification of Process 6.8

Name of the process:

Send Copies of Inventory Report To Management.

Purpose of the process:

To send the copies of the inventory report to management.

Input of the process:

Inventory report.

Output of the process:

Copies of the inventory report.

Process:

(1) Receive the inventory report.

(2) Prepare the copies of the inventory reports.

(3) Send the copies of the inventory reports to management.

APPENDIX E

DATA DICTIONARY

DATA DICTIONARY

Table E.1. Data Dictionary of Seny Company Database of Entity Relationship Diagram.

Field Name	Meaning
Address 1	Street and Province Name of the Supplier address.
Address 2	Home and Street Name of the Officer address.
Color	The color of the parts which the production department requests.
Delivery Date	The date when the purchase orders are delivered to the suppliers.
Department Name	The name of the departments in the company.
Department No	The number of the departments in the company.
Gender	The condition of being male or female of the suppliers.
Hired Date	The date when the officer is hired or recruited to work in the company.
Issued Date 1	The date when the purchase requisitions are issued.
Issued Date 2	The date when the purchase orders are issued.
Nationality	The membership of a particular nation of the supplier.
Officer ID	The identification number of the officer in the company.
Officer Name	The name of the officer in the company.
Part Name	The name of the parts that are used to produce the Company's products.
Part No	The number of the parts that are used to produce the company's products.
Position	The position of the officer in the company.
Purchase Order No	The number of the purchase orders that are prepared by the Purchasing department.
Purchase Requisition No	The number of the purchase requisitions that are prepared by the purchasing department.
Quantity	The amount of the parts that are used to produce the company's products.
Salary	The salary of the officers in the company.
Supplier Name	The name of the suppliers who supply the raw materials and parts to the company.
Supplier No	The number of the suppliers who supply the raw materials and parts to the company.
Unit Price	The price of each raw materials and parts that are supplied by the suppliers.

Table E.2. Data Dictionary of Database of Data Flow Diagram.

Field Name	Meaning
Accounting Department	The department that is responsible for preparing trial balance.
Copies of the Inventory Reports	The copies of the inventory reports that are sent to management.
Copies of the Purchase Orders	The copies of the purchase orders that are sent to the suppliers and accounting department.
Copies of the Requested Part Reports	The copies of the requested part reports that are sent to the warehouse.
Delivery Purchase Order Data	The data of the delivery purchase orders in the database.
Delivery Purchase Order Information	The information of the delivery purchase orders.
Department Details	The details of the department in the company.
Inventory Data	The data of the inventories in the database.
Inventory Information	The information of the inventory in the warehouse.
Inventory Report	The reports that contain the validated raw materials and parts details.
Management	The team that requests the inventory report from the system.
Officer Details	The details of the officers in the company.
Ordered Part Data	The data of the ordered parts in the database.
Ordered Part Details	The details of the ordered part that requested by the production department.
Ordered Part Information	The information of the ordered parts that are requested by the production department.
Processed Purchase Requisition	The purchase requisition that that are processed by the purchasing department.
Processed Purchase Requisition Details	The details of the processed purchase requisition.
Processed Purchase Requisition No	The number of the processed purchase requisitions.
Production Department	The department that is responsible for producing the company's products.
Purchase Order Details	The details of the purchase orders.
Purchase Order	The document that contains the supplier number, name and address and supplied part information.

Table E.2. Data Dictionary of Database of Data Flow Diagram (Continued).

Field Name	Meaning
Purchase Requisition Data	The data of the purchase requisitions.
Purchase Requisition Information	The information of the purchase requisition.
Purchasing Agent	The purchasing staff in the purchasing department.
Raw Materials and Parts Information	The raw materials and parts and their Information.
Raw Materials and Parts	The raw materials and parts that are sent by the suppliers.
Requested Part Information	The information of the requested part.
Requested Part Report	The reports that contain the requested part information.
Selected Supplier Information	The information of the suppliers that are selected for preparing the purchase orders.
Supplied Part Data	The data of the supplied parts in the database.
Supplied Part Information	The information of the supplied parts.
Supplier Data	The data of the suppliers in the database.
Supplier Information	The information of the suppliers.
Supplier No, Name and Address	The number, name and address of the suppliers.
Supplier	The persons who supply the raw materials and parts to the company.
Validated Raw Materials and Parts Details	The details of the raw materials and parts that are sent to the warehouse.
Validated Raw Materials and Parts	The raw materials and parts that are sent to the warehouse.
Verified Delivery Purchase Order Information	The information of the delivery purchase orders that are verified.
Verified Inventory Information	The information of the inventory that are verified.
Verified Ordered Part Information	The information of the ordered parts that are verified.
Verified Purchase Requisition Information	The information of the purchase requisition that are verified.
Verified Supplied Part Information	The information of the supplied parts that are verified.
Verified Supplier Information	The information of the suppliers that are verified.
Verified Supplier No, Name and Address	The number, name and address of the suppliers that are verified.
Warehouse	The place that keep the company's inventory.

APPENDIX F

STRUCTURE CHART

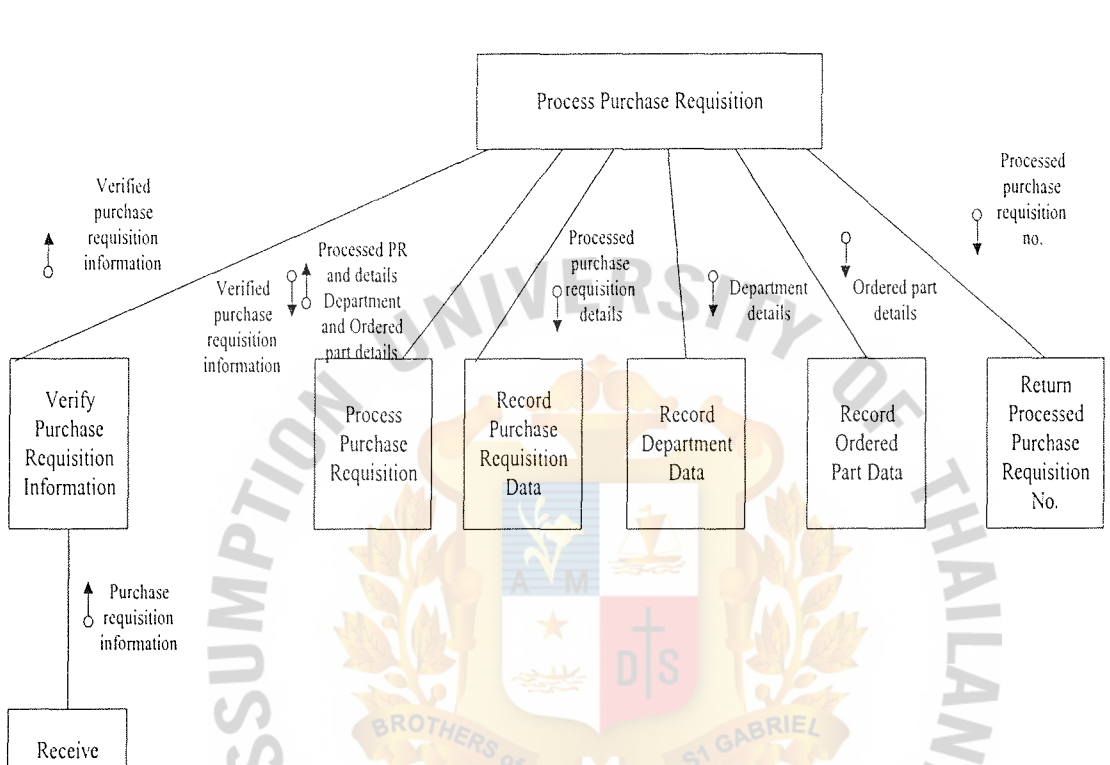


Figure F.1. Structure Chart of Process Purchase Requisition.

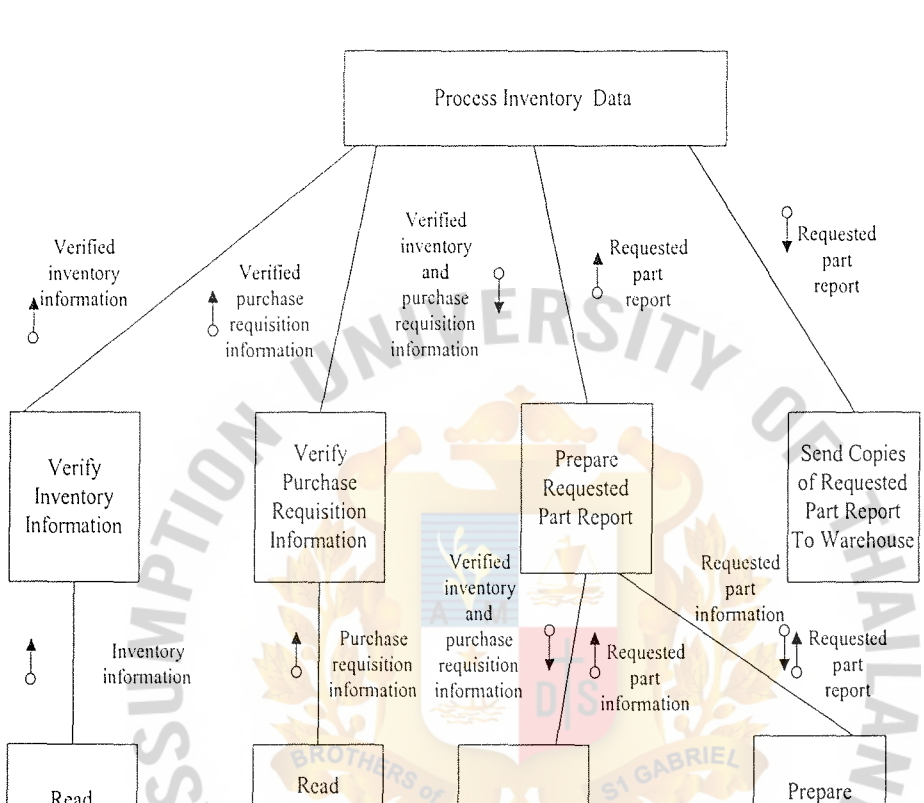


Figure F.2. Structure Of Process Inventory Data.

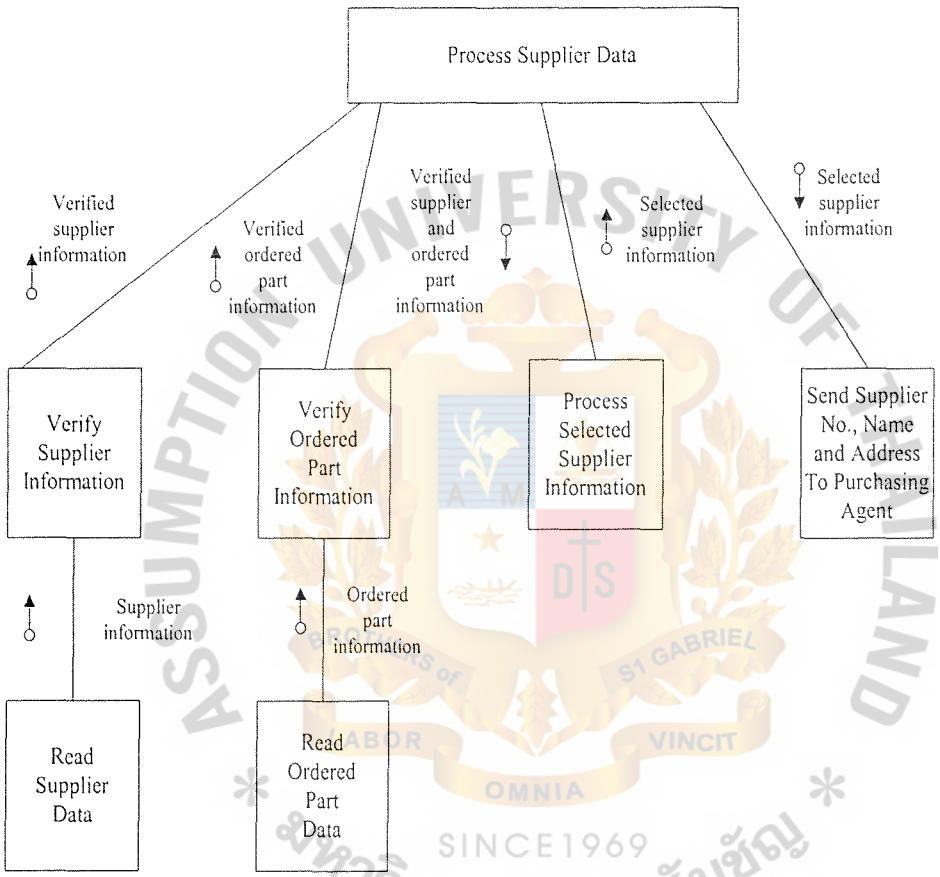


Figure F.3. Structure Chart of Process Supplier Data.

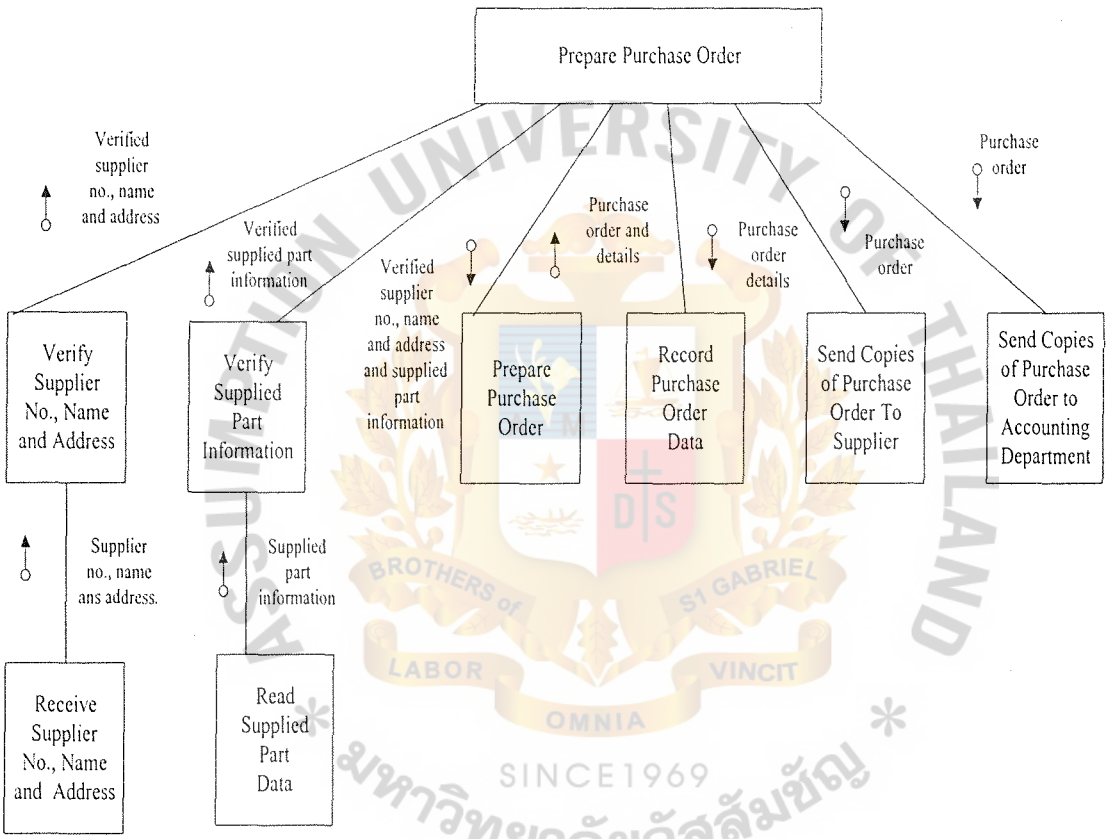


Figure F.4. Structure Chart of Process Purchase Order.

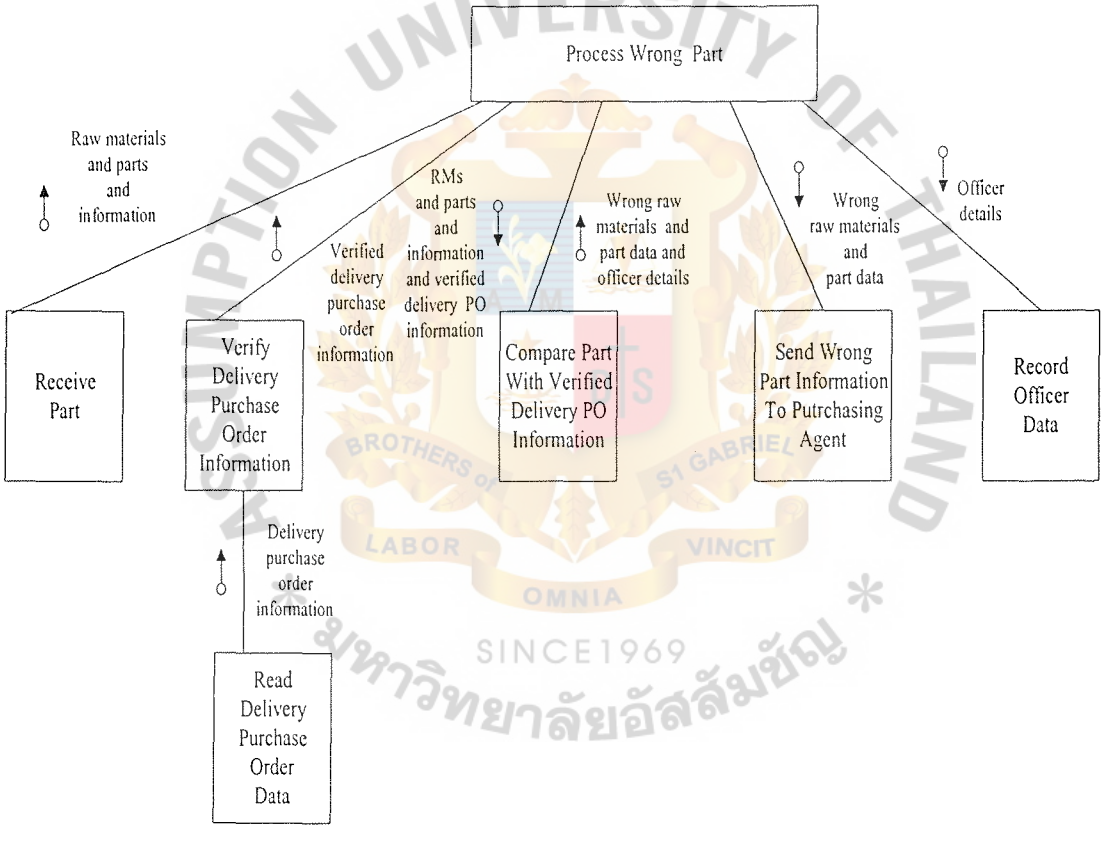


Figure F.5. Structure Chart of Process Wrong Parts.

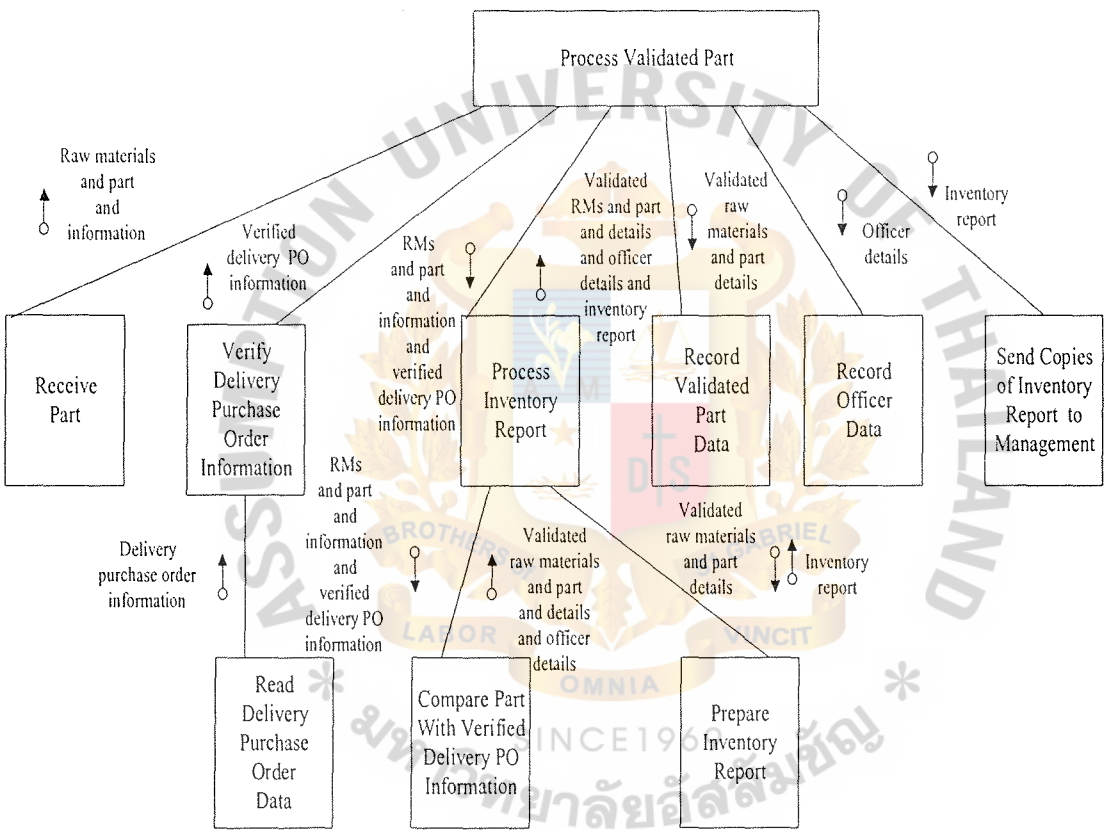


Figure F.6. Structure Chart of Process Validated Part.

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