



The Inventory Control System for Lumpinee Optic

by

Ms. Leela Kulvanich

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

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

November, 2001

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Project Title The Inventory Control System for Lumpinee Optic

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ABSTRACT

Information is one of the most valuable factors in doing business. Everyone realizes that giving the right information to the right person at the right time is a good practice which will contribute to proper decision making. But how to achieve this aim is still a problem because it cannot be easily accomplished manually.

This project is written to be submitted for CS 6998 System development, a project to address the Inventory Control System.

The existing information system is based on a manual method and a partly computerized system, most data are stored on paper, while some parts are stored in the Microsoft Access, and Excel stored in the file server. There are some general problems with the manual system, which are error-prone, wastes time its high operation costs are high.

The proposed Information System will be developed to replace the manual system and some computerized information system. It will solve the problems of the manual system and will make it easier to operate the system.

ACKNOWLEDGEMENTS

First of all, I would like to give special thanks to Air Marshal Dr. Chulit Messajjee for his patience and valuable guidelines given to me in doing this project. The project would not have been done without his supervision and dedication in spite of his limited time.

I would like to thank Lumpinee Optic for providing the valuable information in this project. I am also grateful to all the lecturers in the MS(CIS) program for program for providing their valuable knowledge during my study at Assumption University.

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I. INTRODUCTION

1.1 Background of Project Background

This project is the report of The Lumpinee Optic on the Inventory Information System. This report was convened at the request of CS 6998 System development project of MS (CIS) at Assumption University to address specific issues and analyze regarding the direction which the Inventory Department should take in developing and maintaining an automated Inventory Control System. The project has begun on August 1, 2001 and the expected date of concluding the project will be on November 30, 2001.

The Inventory Department of the Lumpinee Optic is responsible for frame of glasses and lens inventory management. Its main responsibilities are keeping inventory records, checking the stock balance, supporting inventory system, providing daily report, weekly report, monthly report and annual report supporting Financial Department, Purchasing Department and Accounting Department.

A computer-based information system is introduced to improve the efficiency of the inventory control system. In this project, the existing system is analyzed and the new system is designed not only to solve the current problems but also to serve for further expansion. After implementation the training is required to provide computer knowledge and to train the operational staff on job procedures of the computerized system.

1.2 Objectives of Project

The objectives of project can be classified as following:

- (1) To study the existing inventory system for Lumpinee Optic and identify the current problems of system.
- (2) To reduce the waste time for the process.
- (3) To decrease the errors incurred accidentally.
- (4) To identify the Information system requirement.
- (5) To design and develop a new information system based on all requirements.
- (6) To decrease the duplication of the information.

1.3 Scope of the Project

- (1) To Manage and checking inventory information which will record and update information such as sales, stock, turn over, gross profit margin.
- (2) To support inventory information when staff should order products.
- (3) To install the new system by using database management systems.
- (4) The new system will be designed as the computerization system.
- (5) The new computer system will provide the report that serves the needs and requirement from different users.

1.4 Deliverables

The deliverables for the project in Inventory Information System for Lumpinee Optic are as the follows:

- (1) Inventory information system
- (2) Inventory report
- (3) Inventory information system screen design
- (4) New hardware and software implementation
- (5) Input screen design

- (6) Output screen design
- (7) Requisition form design
- (8) Stock checking form
- (9) Stock status

1.5 Project Plan

This is the project of Lumpinee Optic on the Inventory Control System. This report began on August 1, 2001 and is expected to finish on November 30, 2001. The project plan of Inventory Control system of Lumpinee Optic is given in Figure 1.1.



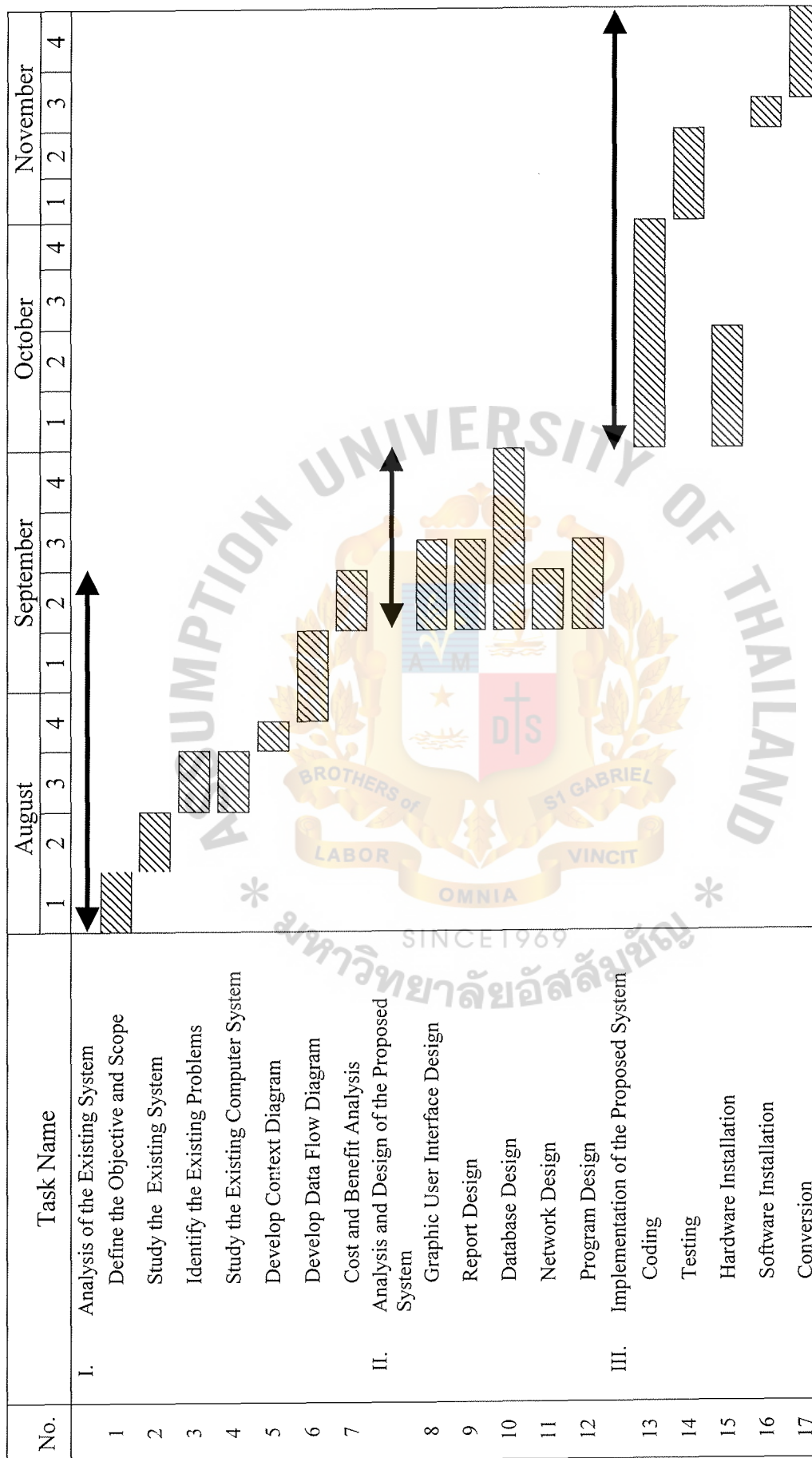


Figure 1.1. Project Plan of The Inventory Control System of Lumpinee Optic.

II. THE EXISTING SYSTEM

2.1 Background of the Company

Lumpinee Optic was established at the beginning of the year 1981. The shop has grown rapidly by increasing sales volume every month under the management of the shop top management as organization chart as shown on Figure 2.1. In each department, the manger has responsibility for planning, staffing, organizing, directing and controlling to meet the objective of the company.

Lumpinee Optic is located at 1921 Rama4 road, Lumpinee, Pathumwan, Bangkok Thailand.

2.2 Existing Business Functions

As mentioned earlier, there are four departments with different functions and responsibilities in Lumpinee Optic. The followings are details in each department.

(1) Purchasing Department

The department handles all orders from all suppliers.

(2) Sales Department

The department handles all needs related to all customers' satisfaction.

(3) Accounting Department

The department deals with all jobs such as making general accounting standard, producing payroll for all employees, etc.

(4) Inventory Department

The department is responsible for checking the stock of glasses and lens. The staff will keep record the stock and summarize all information to be reported.

The organization chart will be shown in Figure 2.1.

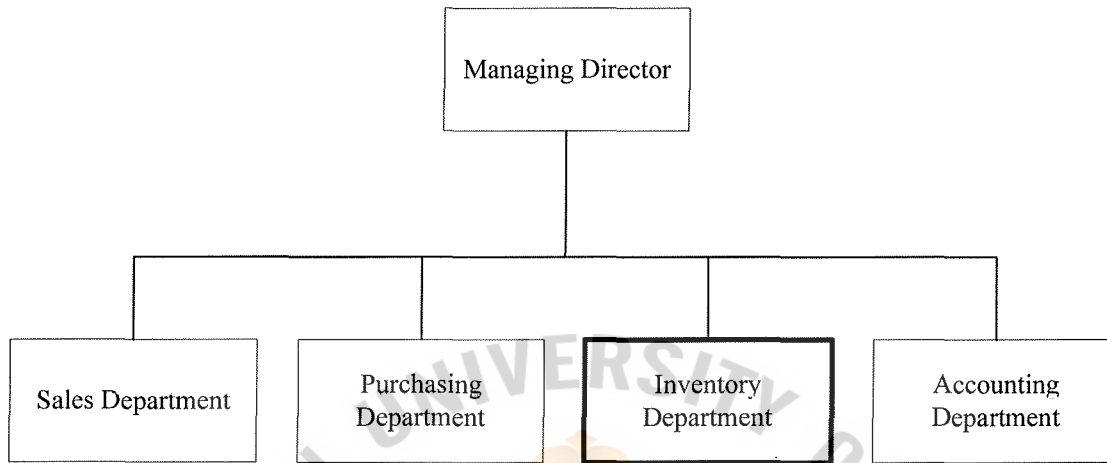


Figure 2.1. Organization Chart of Lumpinee Optic.

2.3 Current Problems and Areas for Improvement

2.3.1 Current Problems

The existing manual system always causes many problems as follows:

- (1) The amounts of material in the stock are not up to date.
- (2) The staff perform several mistakes in counting as well as in recording Stocks, forgetting to record receive or sell the goods and prepare documents.
- (3) The shop uses a lot of paper for the report and the documents.
- (4) There is no security control.

2.3.2 The Areas for Improvement

- (1) The improvement in the inventory management system will help in updating the stock of frames and lens automatically. So, the stall will not waste the time in recording the amounts of frames and lens in the stock cards. It also reduces the redundancy data.
- (2) The computerized system will help the staff in each department especially in

the inventory department perform their jobs effectively.

- (3) The new computer system will save and collect the data in the system.
- (4) The new computer system will have the system of security control.

The above problems can be solved by implementing a computerized system to replace the existing manual system. The proposed system will improve efficiency in all areas of the company and also solve the existing problems. Context diagram of the existing system is given in Figure 2.2.



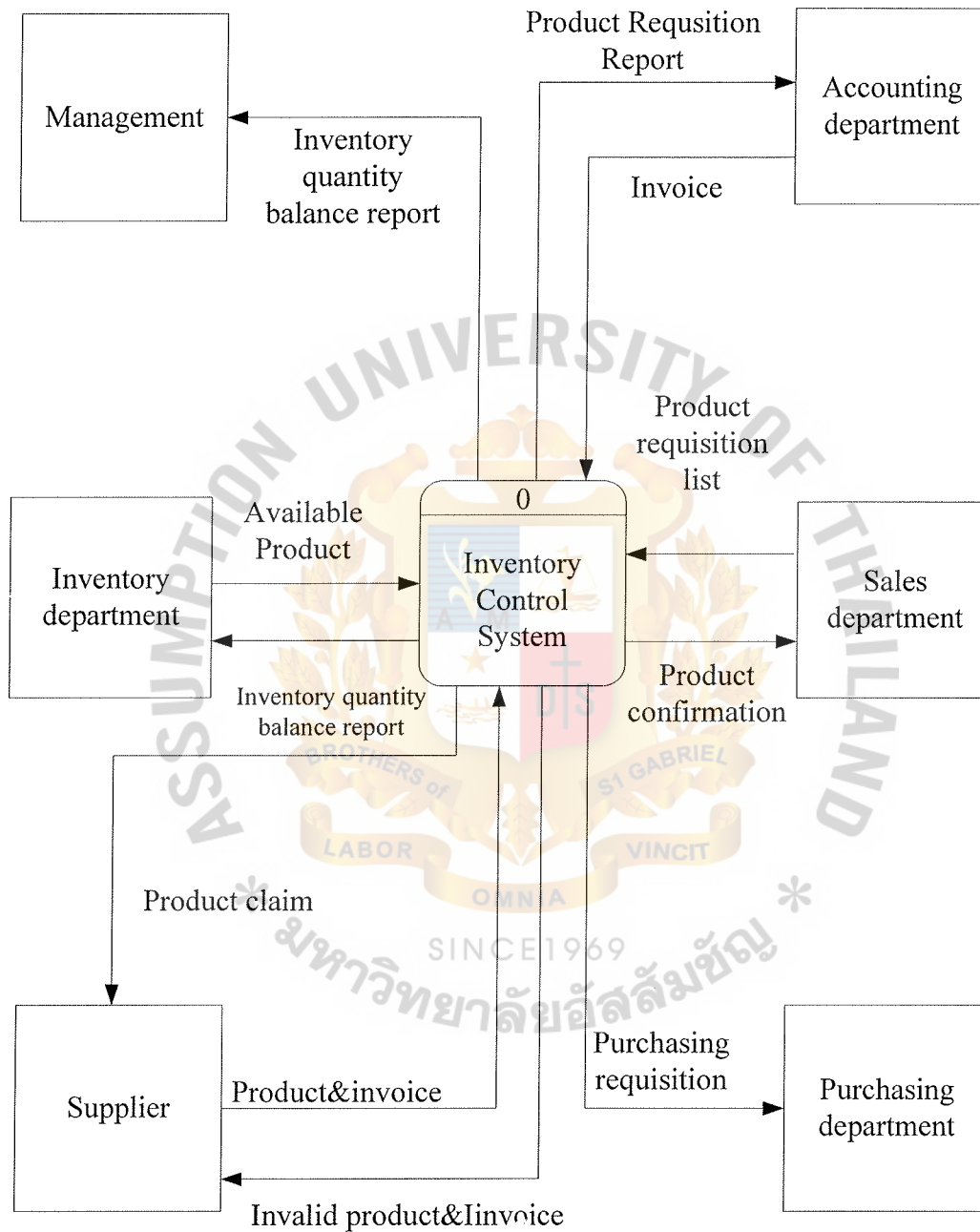


Figure 2.2. Context Diagram of Existing System.

III. THE PROPOSED SYSTEM

3.1 User Requirements

User requirements are very important to the system. Company uses user requirements as a source of developing information system. The discovery of user requirements will guarantee that users of this system will be satisfied with the proposed system. After interviewing with the users who are working on the inventory system, we found several activities that need improvement which could only be provided by the new system. The user requirements for the proposed system are as follows:

- (1) The new system should be easy to use.
- (2) It should reduce the material's loss problem.
- (3) The computerized system should help the inventory staff to control all information about safety stock and lead-time.
- (4) It should take a less time in generating information to support the manager in decision making.
- (5) It should generate purchase order and the monthly purchasing order report.
- (6) It should identify the user's access authority.
- (7) It should allow multiple users to access the information at the same time.
- (8) It should eliminate the redundancy of data.
- (9) It should allow the user to update, retrieve or delete the data at any time.

The proposed system is based on the requirements of the sales and inventory. The new system has been adapted to the usage of both sales and inventory activities. The system is defined into four parts which are the network architecture, data architecture, interface architecture, and the process architecture.

3.1 Requirement for the Proposed System

The requirement of inventory information system for Lumpinee Optic is to solve the problem in the existing system and improve work efficiency. The following are the requirements of system.

- (1) To remove unnecessary data redundancy in system.
- (2) To reduce unnecessary work (such as paper work) and increase speed and response time for process an order.
- (3) To reduce mistakes from collecting, reading, updating, deleting data.
- (4) To improve the speed and accuracy of gathering required data from the system for better decision-making.
- (5) To smooth the information exchange process between departments in the company.
- (6) To provide better information for planning in purchasing raw material and production plan.

The basic Economic Order Quantity Model (that is $2DC_o / C_h$) Inventories are idle goods and are waiting to be distributed. Company holds inventory in order to fill a request placed by the employee. The company deals with expenses concerned with financing and maintaining inventory. Inventory division has to answer these questions as to how much should be ordered and when the inventory for the items should be recorded to maintain the appropriate inventory cost. The Economic Order Quantity (EOQ) Model is applicable to calculate the appropriate answer to those two questions.

- (1) How much to order?
- (2) When to order?

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The EOQ formula is show as follows:

$$Q^* = 2DC_o / C_h$$

Where Q^* = Economic order quantity

D = Annual demand

C_o = Ordering Cost

C_h = Holding Cost

And

$$T^* = 240 Q^* / D$$

Where T^* = Optimal Cycle time to order

Q^* = Economic order quantity

D = Annual demand

Three supply types will be the example to show the calculation. The economic order quantity and time to order can be calculated as follows:

We have the glasses of Channel.

$$D = 1,000$$

$$C_o = 100$$

$$C_h = 700$$

$$Q^* = 2(1,000)(100)/700$$

$$= 286 \text{ units.}$$

$$T^* = 240(286) / 700$$

$$= 68 \text{ days.}$$

We have the glasses of Gucci.

$$D = 1,200$$

$$C_o = 100$$

$$C_h = 700$$

$$Q^* = 2(1,200)(100)/700$$

$$= 343 \text{ units.}$$

$$T^* = 240(343)/700$$

$$= 82 \text{ days.}$$

We have the glasses of Miyazawa.

$$D = 700$$

$$C_o = 100$$

$$C_h = 700$$

$$Q^* = 2(700)(100)/700$$

$$= 200 \text{ units.}$$

$$T^* = 240(200)/700$$

$$= 48 \text{ days.}$$

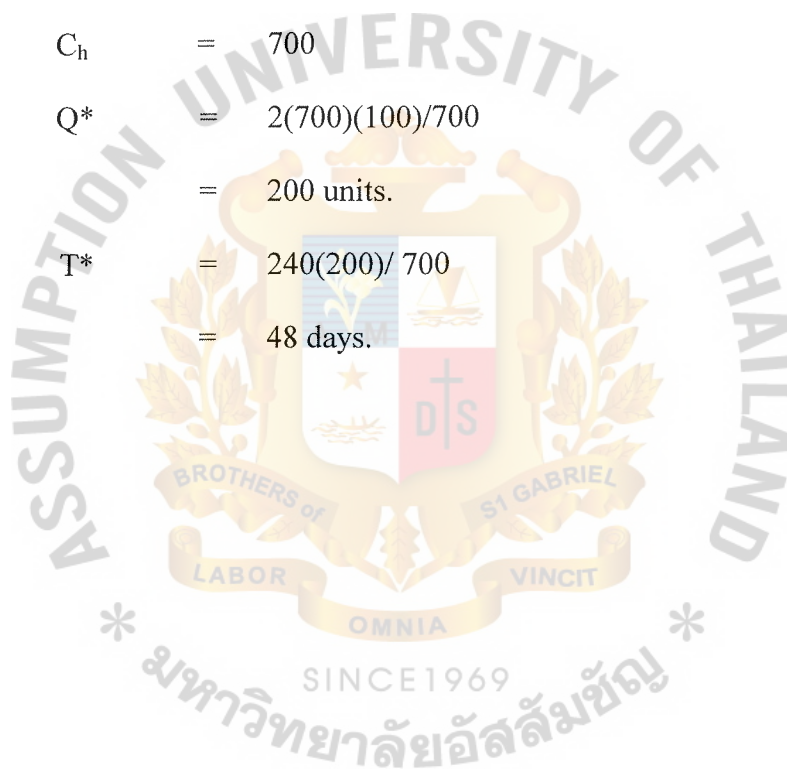


Table 3.1. Cost of Glasses of Channel at Different Order Quantity.

Order(Q)	Annual(D)	Ordering Cost(C_o)	Holding Cost(C_h)	Total Cost(TC)
12	1,000	24,000	60,000	84,000
24	1,000	65,000	35,000	100,000
36	1,000	45,000	5,000	50,000
48	1,000	50,000	30,000	80,000
60	1,000	60,000	40,000	110,000

Table 3.2. Cost of Glasses of Gucci at Different Order Quantity.

Order(Q)	Annual(D)	Ordering Cost(C_o)	Holding Cost(C_h)	Total Cost(TC)
12	1,200	20,000	40,000	60,000
24	1,200	30,000	50,000	80,000
36	1,200	40,000	40,000	80,000
48	1,200	20,000	70,000	90,000
60	1,200	10,000	90,000	100,000

Table 3.3. Cost of Glasses of Miyazawa at Different Order Quantity.

Order(Q)	Annual(D)	Ordering Cost(C_o)	Holding Cost(C_h)	Total Cost(TC)
12	700	35,000	15,000	50,000
24	700	30,000	30,000	60,000
36	700	22,000	48,000	70,000
48	700	15,000	65,000	80,000
60	700	20,000	70,000	90,000

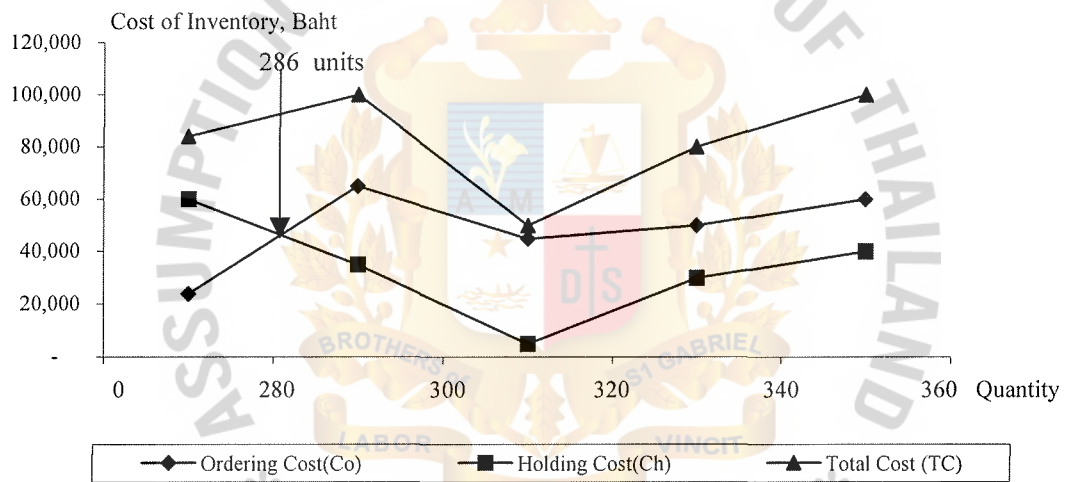


Figure 3.1. Annual Holding and Ordering Cost of Channel.

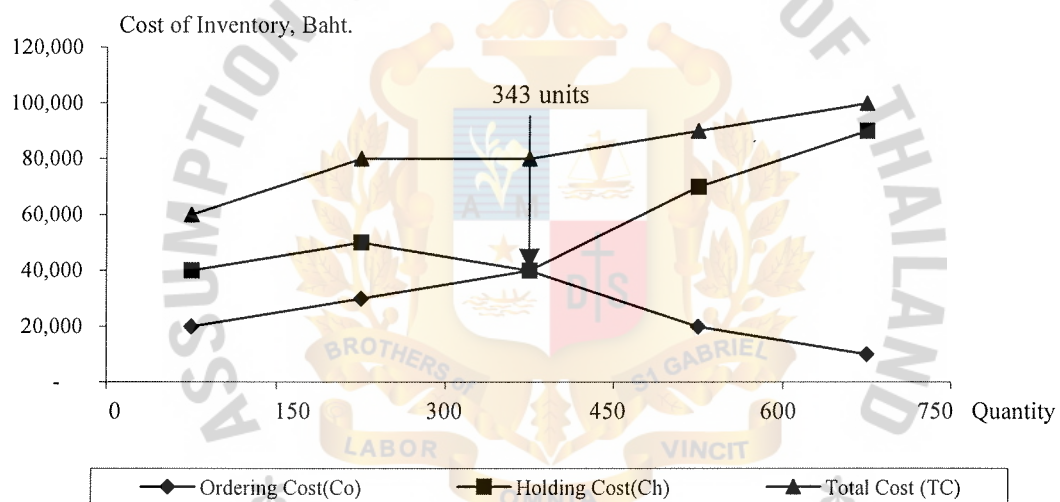


Figure 3.2. Annual Holding and Ordering Cost of Gucci.

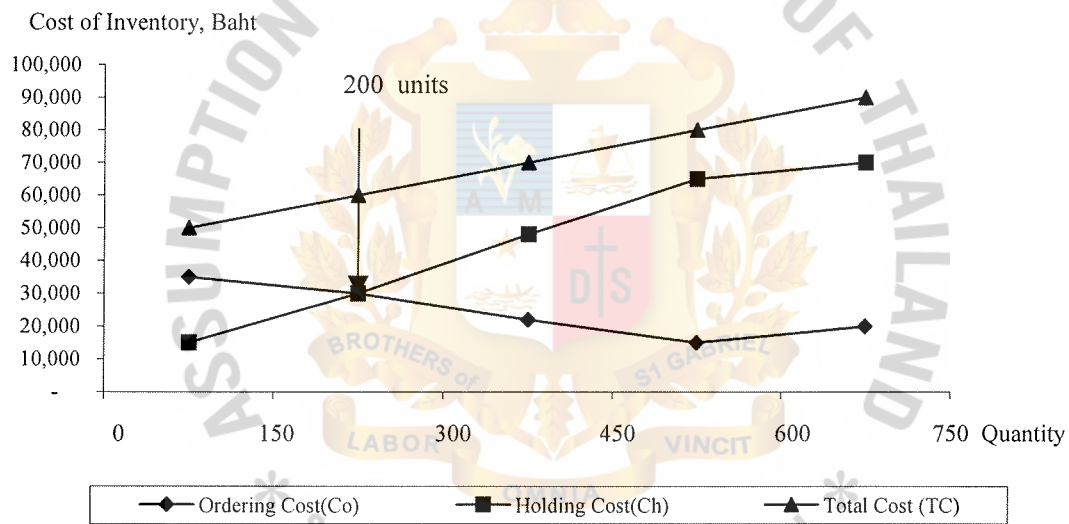


Figure 3.3. Annual Holding and Ordering Cost of Miyazawa.

3.2 System Design

The objective of the new system design is to convert the user requirement into a computer solution. There are many techniques in developing the proposed system and structural approach is used to accomplish this development. Therefore, in this project, the jobs done will be grouped into the following steps:

3.2.1 Design New Context Diagram and Data Flow Diagram

Context diagram is used to focus on data flowing in and out of the system and the processing of the data. In the context diagram, the area being studied is shown as a single circle in the center of diagram. It interacts with other external entities, shown by rectangles on the context diagram. The external entities provide information to it and receive information from it. Data flow diagram is the primary tool in the structured analysis that graphically illustrates a system's component process and the flow of data. The system analyst uses the data flow diagram to show how the data flows to, from, and within an information system and the process that transforms the data. The data flow is shown by lines with arrowheads indicating the direction of the flow. The data received from the system is called inputs and the data it produces is called outputs. The Context diagram and the data flow diagram of the proposed system are shown in APPENDIX A. and APPENDIX B.

3.2.2 Design of Structure Chart

Structure Chart is simply a diagram consisting of rectangular boxes, which represent the modules and connected by lines. To the sides of the connecting lines, the arrows indicate that something is passed either down to the lower module or back up to the upper one. The structure chart is shown in APPENDIX C.

3.2.3 Process Specifications

The process specifications represent the largest amount of detailed work in building a system. The activity of writing process specifications serve as a test of the data flow diagrams that have already been developed. The process specification needs additional input data flows or it produces additional output data flows. This process specification is shown in APPENDIX D.

3.2.4 Data Dictionary

Data dictionary defines the meaning and components of the terminator, data stored and dataflow. In database management system, data dictionary is an automated or manual file that stores definitions of data elements and data characteristics, authorization and security. This is shown in APPENDIX E.

3.2.5 Graphical User Interface Design

The graphical user interface designs (GUI) are the designs of input screens and the outcomes of the input for the system. The GUI allow direct manipulation of the graphical representation on screen, which can be accomplished with keyboard input, mouse. New user, unfamiliar with computer, can use the screen easily. This is shown in APPENDIX F.

3.2.6 Report Design

The report design is the part of system design for generating the report both on screen and on hand copy. This is shown in APPENDIX G.

3.2.7 Feasibility Analysis Design

Feasibility analysis is the process or the way used to measure the benefit or practicality of the information system development in an organization. There are four categories of feasibility analysis.

- (1) Operational feasibility (people oriented): used to measure how well the solution performs in the organization and the feeling or acceptability of the users.
- (2) Technical feasibility (computer oriented): a measure of the practicality of a specific technical solution and also the availability of the technical resources and expertise.
- (3) Schedule feasibility: is used to measure of how long this project should take to be developed.
- (4) Economic feasibility: dealing with the cost and benefits of the information system.

3.3 Hardware and Software Requirement

The followings are the hardware and software requirements for the proposed system.

3.3.1 Hardware Specification

- (1) File Server (1 set)
 - (a) CPU Intel Pentium III 800
 - (b) RAM 256 MB
 - (c) Monitor 15 inches Res. 1280 x 1024 Low Radiation
 - (d) Storage 80 GB HD with Quantum U DMA/66, 7200
 - (e) CD-ROM drives, 1.44 inch Disk
 - (f) High Tower case and Power 250W.
 - (g) Microsoft Keyboard and Mouse
- (2) Workstation (5 sets)
 - (a) CPU Intel Pentium III 600
 - (b) RAM 128 MB(bus 100 MHz.)

- (c) Monitor 15 inches
- (d) Storage 20 GB HD with Quantum
- (e) Medium Tower and Power 250W.
- (f) CD-ROM drives, 1.44 inch Disk
- (g) Microsoft Keyboard and Mouse
- (3) Printer
 - (a) Laser Printer: 3 sets of HP laser printer
- (4) UPS (Uninterruptible Power Supply) 500 VA : 1 set
- (5) Ethernet LAN Card (2 sets)
 - (a) Brand name Intel
 - (b) PCL Interface (32 bits)
 - (c) Build in transceiver
 - (d) 10/100 MBs
 - (e) Full Duplex
- (6) 1 set of HUB (8 ports)
- (7) Unshielded Twisted Pair Cable

3.3.2 Software Specification

To configure the software requirement, the following software is needed:

- (1) Windows NT server edition, This operating system is used in the file server in order to control all network activities of the proposed system.
- (2) Windows 2000, this operating system is used in 5 sets of workstations. It's needed to run program applications.
- (3) MS office 2000, It's a application software package to use in business transactions. It is necessary for better business document creation and other business function such as calculation, presentation and etc.

- (4) MS visual basic, This program is used for creating inventory information system. This programming language can create a user-friendly program and also able to handle and store large number of data.
- (5) Virus protection program.



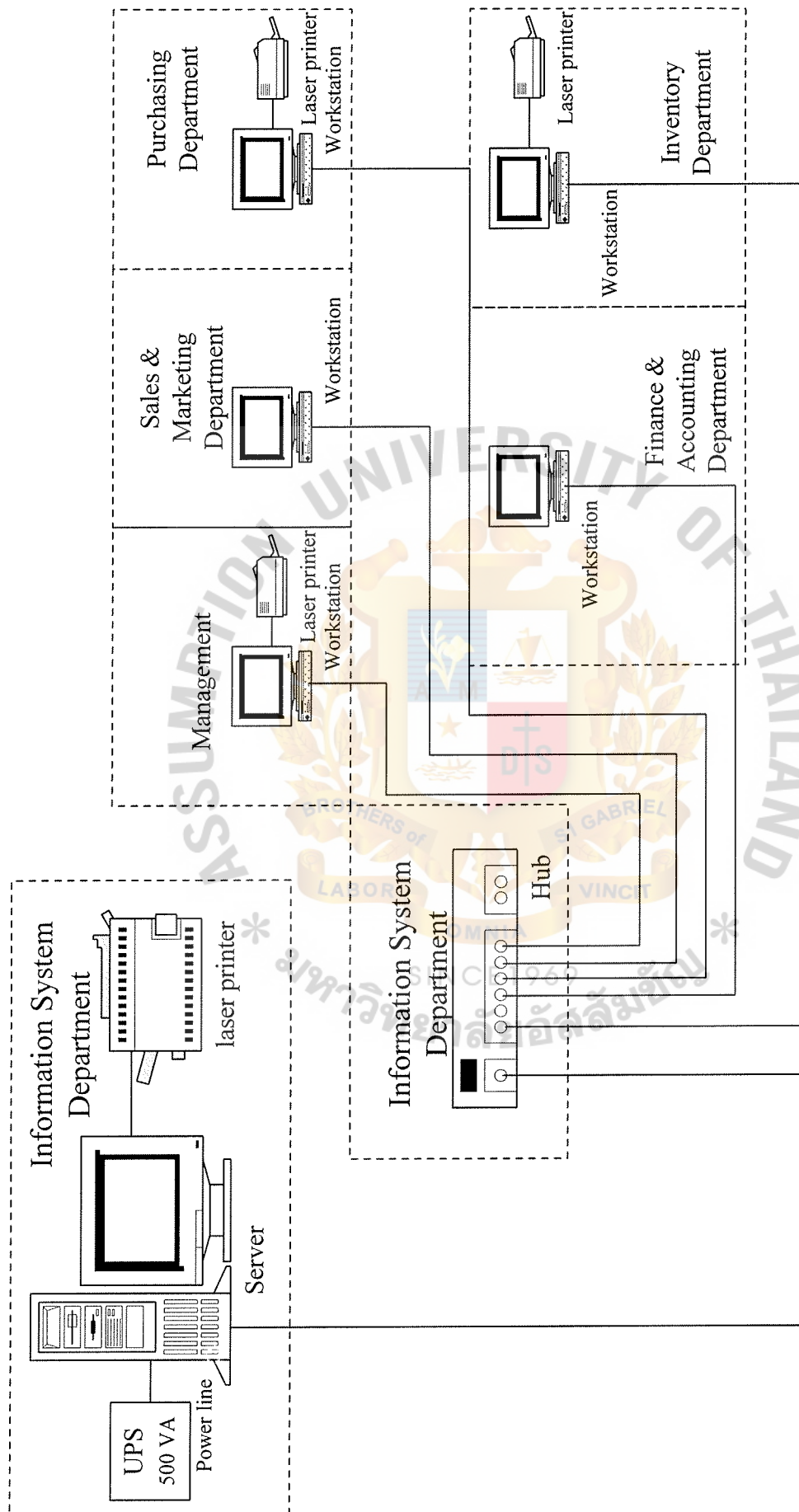


Figure 3.4. The Hardware Configuration of Inventory Control System.

3.4 Security and Controls of the Proposed System

The information in inventory control system is very important for many departments of Lumpinee Optic. Then the master file must be available to the system users to access whenever they need. Not only accessibility but also the prevention of unauthorized users must be performed by the computerized users must be performed by the computerized system. There are two kinds of security control, that Lumpinee Optic will use to prevent unauthorized users as follow:

3.4.1 Application Access

The username and password are assigned to the authorized users. Both of them are the first levels of security; every user must have a unique username. When they have a username, the system administrator can assign the least amount of access necessary for each user. Each user can perform only his or her functions.

3.4.2 Physical Security

For the physical security, Lumpinee Optic does not allow the system user to use suspected diskettes infected with any computer virus. The diskette must not be moved out of the computer room except the buck up diskettes. There will be no permission to eat, drink and smoke while operating a computer.

For the database back up, Lumpinee Optic decided to keep three back ups as follows:

- (1) Daily back up, we will do only information or database table that is daily changed by backing up the information to the diskette and saving it in the head office.
- (2) Weekly back up, we will perform this back up because some information does not require all day updating.

- (3) Monthly back up, we have to back all information in the database to prevent the unexpected event.

3.5 Cost and Benefit Analysis

3.5.1. Cost Analysis

The existing system of Lumpinee Optic is a manual, all documents are manually prepared and processed. Sometimes, they take a long time to do these processes. Accuracy of data is a problem. So they try to solve all these problems by using a computer system to manage the organization, to manage the data collection and to create report. To determine the costs and benefits of the proposed system, they need to know how much the system will cost and what benefits the system will provide.

Costs fall into two categories. There are system developing costs and system operation costs. System development costs are usually one time costs and will recur after the project has been completed. Unlike system development costs, system operating costs tend to recur throughout the life time of the system.

Costs of Existing System is shown on Table 3.4 and a five year accumulated existing system is shown on Table 3.5

Table 3.4. Existing System Cost Analysis, Baht.

Cost Items	Year1	Year2	Year3	Year4	Year5
Fixed Cost					
Workstations 1 units @ Cost 50,000	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
Software (spreadsheet) license	1,400.00	1,400.00	1,400.00	1,400.00	1,400.00
Typewriter 1 units @ 7,000	1,400.00	1,400.00	1,400.00	1,400.00	1,400.00
Total Fixed Cost	12,800.00	12,800.00	12,800.00	12,800.00	12,800.00
Operating Cost					
Staff					
Administrative 4 persons @ staff 15,000	60,000.00	66,000.00	72,600.00	79,860.00	87,846.00
A/R Clerk 3 persons @ 7,500	22,500.00	24,750.00	27,225.00	29,947.50	32,942.25
Total Monthly Salary Cost	82,500.00	90,750.00	99,825.00	109,807.00	120,788.25
Total Annual Salary Cost	990,000.00	1,089,000.00	1,197,900.00	1,317,690.00	1,449,459.00
Office Supplies & Miscellaneous Cost:					
Stationary Per Annum	10,000.00	11,500.00	13,225.00	15,208.75	17,490.06
Paper Per Annum	10,000.00	11,500.00	13,225.00	15,208.75	17,490.06
Utility Per Annum	35,000.00	40,250.00	46,287.50	53,230.63	61,215.22
Miscellaneous Per Annum	45,000.00	51,750.00	59,512.50	68,439.38	78,705.28
Annual Office Supplies & Miscellaneous Cost	20,000.00	115,000.00	132,250.00	152,087.50	174,900.63
Total Operating Cost	1,010,000.00	1,204,000.00	1,330,150.00	1,469,777.50	1,624,359.63
Total Manual System Cost	1,022,800.00	1,216,800.00	1,342,950.00	1,482,577.50	1,637,159.63

Table 3.5. Five Years Accumulated of Existing System Cost, Baht.

Year	Total Manual Cost	Accumulated Cost
1	1,022,800.00	1,022,800.00
2	1,216,800.00	2,239,600.00
3	1,342,950.00	3,582,550.00
4	1,482,577.50	5,065,127.50
5	1,637,157.63	6,702,287.13
Total	6,702,287.13	

Table 3.6. Estimated Cost of Proposed System, Baht.

Cost Items	Year1	Year2	Year3	Year4	Year5
<u>Development Cost</u>					
Hardware Cost:					
Computer Server Cost	350,000.00	350,000.00	350,000.00	350,000.00	350,000.00
Workstations Cost	200,000.00	200,000.00	200,000.00	200,000.00	200,000.00
Total Hardware Cost	550,000.00	550,000.00	550,000.00	550,000.00	550,000.00
Software Cost:					
Software Server 1 unit @ 250,000	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00
DBMS server software 1 unit @ 100,000	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00
DBMS client software 5 unit @ 10,000	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
Microsoft license 1 license @ 100,000	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00
Total Software Cost	100,000.00	100,000.00	100,000.00	100,000.00	100,000.00
Personnel Cost :					
System Analyst 1 hr @ 300 (400/hrs/each)	120,000.00	-	-	-	-
System Designer (400 hrs / each) 1 hr @ 300	120,000.00	-	-	-	-
Programmer (300 hrs./each) 1 hr @ 200	60,000.00	-	-	-	-
Total Personnel Cost	300,000.00	-	-	-	-
Maintenance Cost:					
Maintenance Cost (15% of license)	-	15,000.00	15,000.00	15,000.00	15,000.00
Total Maintenance Cost	-	15,000.00	15,000.00	15,000.00	15,000.00
Total Development Cost	950,000.00	665,000.00	665,000.00	665,000.00	665,000.00
<u>Operating Cost</u>					
Staff :					
Administrative staff 2 persons @ 10,000	20,000.00	22,000.00	24,200.00	26,620.00	29,282.00
A/R Clerk 1 persons @ 7,500	7,500.00	8,250.00	9,075.00	9,982.50	10,980.75
Total Monthly Salary Cost	49,000.00	30,250.00	33,275.00	36,602.50	40,262.75
Total Annual Salary Cost	588,000.00	363,000.00	399,300.00	439,230.00	483,153.00
<u>Office Supplies & Miscellaneous Cost:</u>					
Stationary Per Annum	5,000.00	5,500.00	6,050.00	6,655.00	7,320.50
Paper Per Annum	5,000.00	5,500.00	6,050.00	6,655.00	7,320.50
Utility Per Annum	15,000.00	16,500.00	18,150.00	19,965.00	21,961.50
Miscellaneous Per Annum	10,000.00	11,000.00	12,100.00	13,310.00	14,641.00
Annual Office Supplies & Miscellaneous Cost	10,000.00	38,500.00	42,350.00	46,585.00	51,243.50
Total Operating Cost	598,000.00	401,500.00	441,650.00	485,815.00	534,396.50
Total Computerized System Cost	1,548,000.00	1,066,500.00	1,106,650.00	1,150,815.00	1,199,396.50

Table 3.7. Five Years Accumulated of Proposed System, Baht.

Year	Total Proposed Cost	Accumulated Cost
1	1,548,000.00	1,0548,000.00
2	1,066,500.00	2,614,500.00
3	1,106,650.00	3,721,150.00
4	1,150,815.00	4,871,965.00
5	1,199,396.50	6,071,361.50
Total	6,071,361.50	

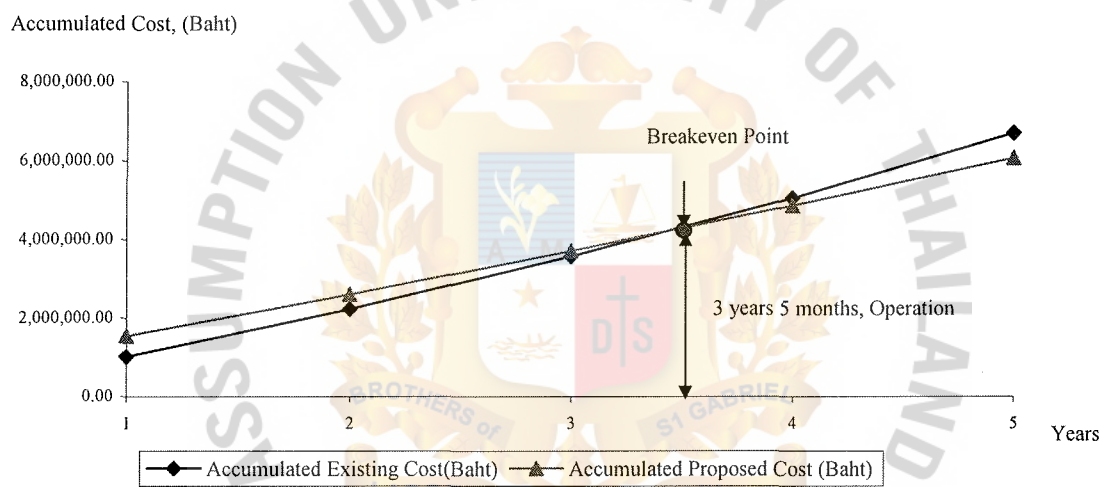
Breakeven Analysis

Breakeven analysis is the cost comparison(See Figure 3.4.). The costs of the proposed system intersect the costs of the existing system. At this point of intersection, the proposed system begins to generate a positive monetary return in comparison with the existing system. From now on, the amount invested in the new system will be offset by the saving the new system allows.

The period to the left of the intersection point is called the investment period. The period to the right is referred to as the return period. The breakeven point is the exact point in time that separates investment and return periods.

Table 3.8. Comparison of the System Costs between Existing System and Proposed System, Baht.

Year	Accumulated Existing Cost	Accumulated Proposed Cost
1	1,022,800.00	1,548,000.00
2	2,239,600.00	2,614,500.00
3	3,582,550.00	3,721,150.00
4	5,065,127.50	4,871,965.00
5	6,702,287.13	6,071,361.50



Note: Year 1 is the starting point.

Figure 3.4. Comparison Graph of the System Costs between Existing System and Proposed System.

Payback Analysis

The payback analysis technique for determining if and when an investment will pay for itself. Because system development costs are incurred long before benefits begin to accrue, it will take some time period for the benefits to overtake the costs. After implementation, you will incur additional operating expenses that must be recovered. Payback analysis determines how much time will lapse before accrued benefit over take accrued and continuing costs. This period of time is called the payback period.

Table 3.9. Payback Analysis for the Proposed System, Baht.

Cost Items	Year1	Year2	Year3	Year4	Year5
Development cost	-1,548,000				
Operation & maintenance cost		-232,200	-262,200	-292,200	-322,200
Discount factor for 12%	1.0000	0.8929	0.7972	0.7120	0.6355
Time adjusted costs (adjusted to present value):	-1,548,000	-207,331	-209,026	-208,046	-204,758
Cumulative time-adjusted cost over lifetime:	-1,548,000	-1,755,331	-1,964,357	-2,172,404	-2,377,162
Benefit derived from operation of new system	0	1,000,000	1,050,000	1,102,500	1,157,625
Discount factor for 12%	1.0000	0.8929	0.7972	0.7120	0.6355
Time adjusted costs (adjusted to present value):	0	892,900	837,060	784,980	735,671
Cumulative time-adjusted benefits overlife time:	0	892,900	1,729,960	2,514,940	3,250,611
Cumulative time-adjusted cost over lifetime:	-1,548,000	-862,431	-234,397	342,536	873,449

Table 3.10. Net Present Value Analysis of the Proposed System, Baht.

Cost Items	Year1	Year2	Year3	Year4	Year5	Total
Development cost	-1,548,000					
Operation & maintenance cost		-232,200	-262,200	-292,200	-322,200	
Discount factor for 12%	1.0000	0.8929	0.7972	0.7120	0.6355	
Present value of life time cost	-1,548,000	-207,331	-209,026	-208,046	-204,758	
Total present value of lifetime costs :						-2,377,162
Benefit derived from operation of new system	0	1,000,000	1,050,000	1,102,500	1,157,625	
Discount factor for 12%	1.0000	0.8929	0.7972	0.7120	0.6355	
present value of annual benefits :	0	892,900	837,060	784,980	735,671	
Total present value of lifetime benefits						3,250,611
Net present value of this alternative						873,449

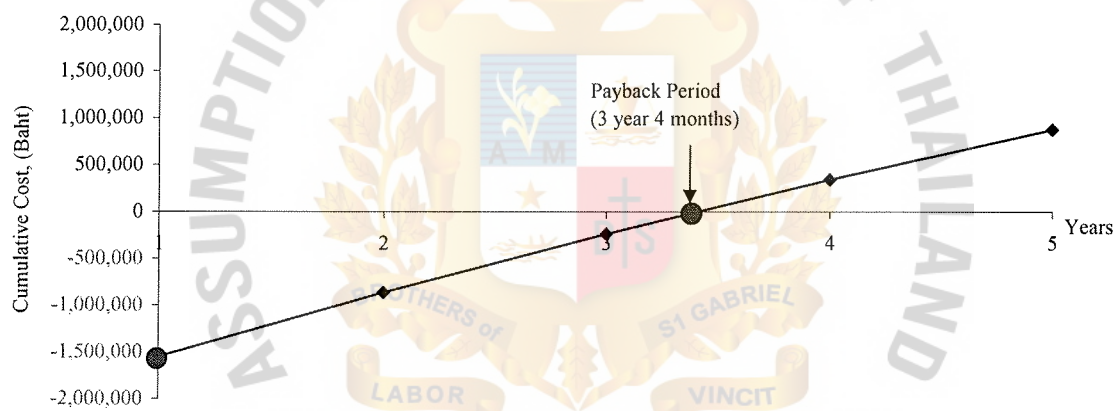


Figure 3.5. Payback Analysis of The Proposed System.

IV. PROJECT IMPLEMENTATION

The implementation of the proposed system will start after presenting this proposed system to the manager and getting his approval. There are three steps in order to implement this system

(1) Building

This step includes programming all required modules and combining them into a full program to satisfy user requirements.

(2) Testing

Testing all modules in the system software and also testing backup system and all hardware.

(3) Installation

Installing a finished system software and hardware and operating it.

4.1 Building the System

The proposed system starts with programming a desired program. It requires transforming all designs in the previous section into a real program.

This system uses Microsoft visual basic in order to program the proposed system, With the ability to handle large amount of data and flexibility of visual basic, the system will also use visual basic to handle all database.

All required hardware, software and all office equipment must be brought and connected together to create the proposed system and prepare it for the next step of development.

4.2 Testing the System

Testing is very important for the development of the proposed system because it can be used to discover hidden failure, bug, error and any needed requirement that can not be discovered at the design stage.

The following steps are for testing:

(1) Test program logic

In this step, the programmer will check all program functions to see any error or bug in any function of the program. The programmer will test the program in three levels.

- (a) Test individuals object in program to see how well they perform on their functions.
- (b) Test each page of program to see whether pages have any error or not and how well each object in program page works with each other.
- (c) System testing, this level will ensure that our system program is working properly when integrated with hardware and other system software.

(2) Test program with sample data and invalid data

This step will test the program by simply input sample data to see how the program will process them. Programmer and user will look at output of the program and compare it with prepared correct result.

This step will test the correctness of data processing in the system.

(a) Test with individual object

This test level will discover how each object in the system process of a sample data is.

(b) Test with individual page

This test level will discover how all objects in each program page process of a sample data is and see if new requirements are needed for the user. System development team can use this requirement in order to improve this program. Also see how each object in each page are linking together in data processing process.

(c) Link testing within a system.

This testing is implemented to ensure that each object linking is working as a requirement to see how each individual pages in the system are interdependent linking as a requirement or not. All sample data will be input into the system to ensure there is no problem and we also test by entering invalid data to see whether the program can detect it or not.

(3) System testing

All users and programmers will test the proposed system by opening a full system operation. In full operation, both hardware and software will be tested with a sample data to see how the proposed system works and to ensure that there are no error or malfunction occurring in the system. Also checking all required output is needed to see correctness and test all mistakes that may occur in the system to see whether the error detection procedure can detect it or not and how the system will detect and correct it.

Testing an operation procedure is required for users in the system to ensure that all users are clear and familiar with the procedure.

(4) Backup and recovery testing

This testing is important for the proposed system. Users must test backup procedure for the system to see any difficulty that may occur in the system and to test some errors that can occur during backup process such as power failure, program error, data error and etc.

(5) Concurrent Testing

Before replacing the existing system with the new one, it is required that both the existing system and the proposed system are run concurrently for one month to see any effects of the proposed system on the company and ensure that the proposed system can replace the existing system. This testing also can discover more user's needs in a real working environment and if an error occurs, so that the development team can continue to correct them to ensure smoothness of operation.

4.3 Implementing the System

After testing the proposed system, we need to implement it in the company. The proposed system will be implemented along with the existing system for one month in order to allow users to adapt to the proposed system.

In adoption periods (First month), The system requires:

- (a) Training and educating the users in order to ensure that they can use the system without the intervention of programmer and analyst.
- (b) Transforming the existing document into computer-based document in order to run a full-scaled proposed system
- (c) System analysts and programmers still keep the system under observations to make sure that the proposed system is able to run on a real business transactions.

V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Degree of Achievement of the Proposed System Compared with the Existing System

Table 5.1. shows the time spent on each process of the Proposed system compared with the Existing System. It shows that each process of the Proposed System spends less time than each process of the existing system, which has to pass many manual work steps. This table shows that the Proposed system is more efficient than the Existing system.

Table 5.1. The Comparison of Degree of Achievement between the Proposed System and the Existing System.

Process	Existing System	Proposed System
Collect Customer Information	30 Minutes	5 Minutes
Input & Issue Purchase Order Details	2 hours	25 Minutes
Get Product Details	30 Minutes	10 Minutes
Issue Reports	12 hours	30 Minutes
Total	15 hours	1.10 hours

Collect Customer Information Process, The existing system is taken more time than the proposed system because it has to correct by writing all of the information. For the proposed system, we can put all of the data in the computer and can easily sort the information.

Input and Issue Purchase Order Details Process, we have to add input and issue purchase order details by manual for the existing system but if we use the proposed system, it will automatically correct all the details.

Get Product Details Process, The product details have to search each category by using the existing system but it can sort and display all the details by using the proposed system.

Issue Reports Process, The proposed system can be printed out immediately, but in the existing system, we need to adjust and rewrite the report.

The current situation of the manual system in this company is simple and does not provide an easy way for the staff to work on their jobs. Then the proposed system is designed to replace the existing one. The new system should improve and solve some problems and at the same time provide a smooth and efficient work.

In conclusion, the new system, which requires a high budget, can be very efficient for the company. As the Inventory control system can reduce time and cost with its speed and accuracy, it also provides more security to keep the information into the system. In the future, the system may be developed and easy to upgrade so that the staffs can work more efficiently and smoothly.

5.2 Recommendations

After implementing the proposed system, the existing system should be kept running for a while until we make sure that there is no problems occurring in the proposed system.

Lumpinee Optic can use the information from the proposed system in many ways. It can use historical data in mathematical function in order to forecast sales in the future or to use it for general planning purpose.

Employee training is very important too. The company needs to train the existing users in many areas such as English usage and to be computer literate in order to prepare them for future expansion of the business and also for new programs in the future.

The company may adapt the computerized system to other departments in the company. This will increase the speed of work processing especially if the new system is connected with the existing computerized system. The company will move to an automated level that will reduce work cycle time and eliminate unnecessary paper work. The company can reduce lead-time. Marketing and sales will be easier to operate and faster to process their orders.

User authorities should be a major concern in the system. The system must enable the user to set a password with the user's needs for security. The company needs to set a schedule to revise the existing system to meet the needs for improvement and to do the necessary

Lumpinee Optic will plan to extend the business to the Internet by implementing E-commerce technology. This technology will increase sales potential for the company and also reduce some costs especially when it connects to company's main computer system.



APPENDIX A
ENTITY RELATIONSHIP DIAGRAM

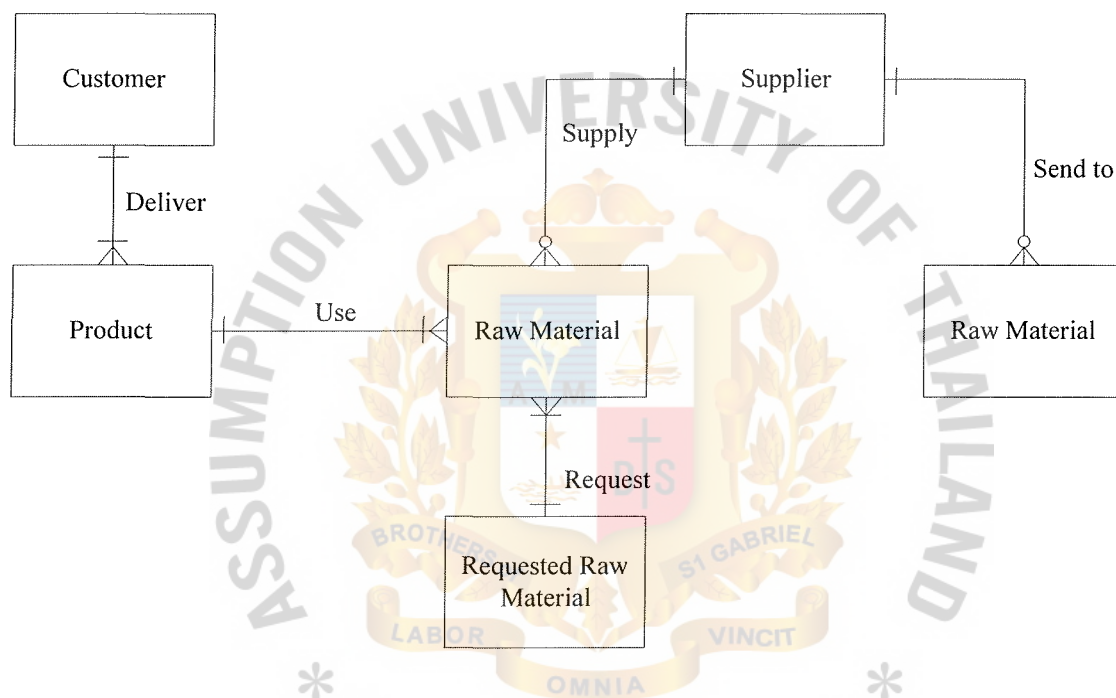


Figure A.1. Context Data Model.

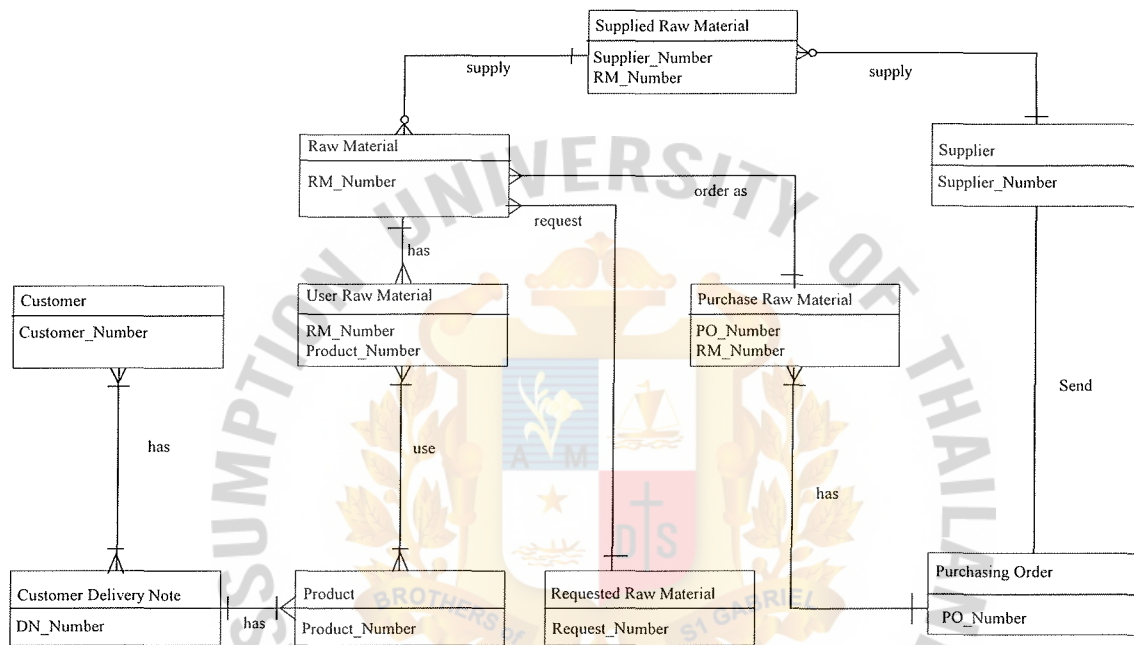


Figure A.2. Key-Based Data Model.

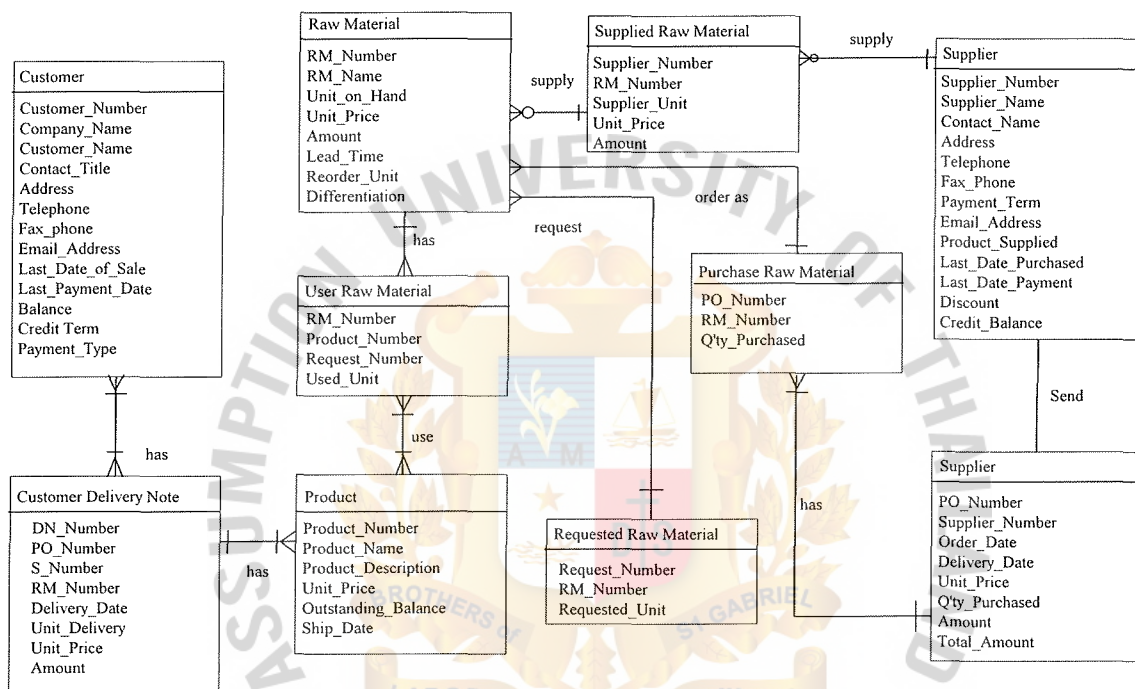
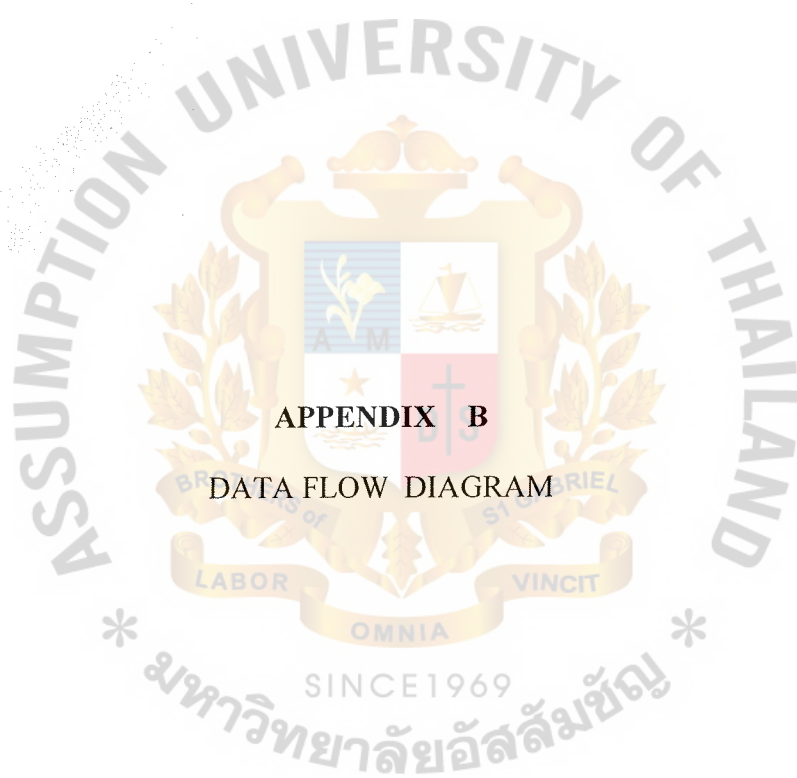


Figure A.3. Full Attributed Data Model.



APPENDIX B

DATA FLOW DIAGRAM

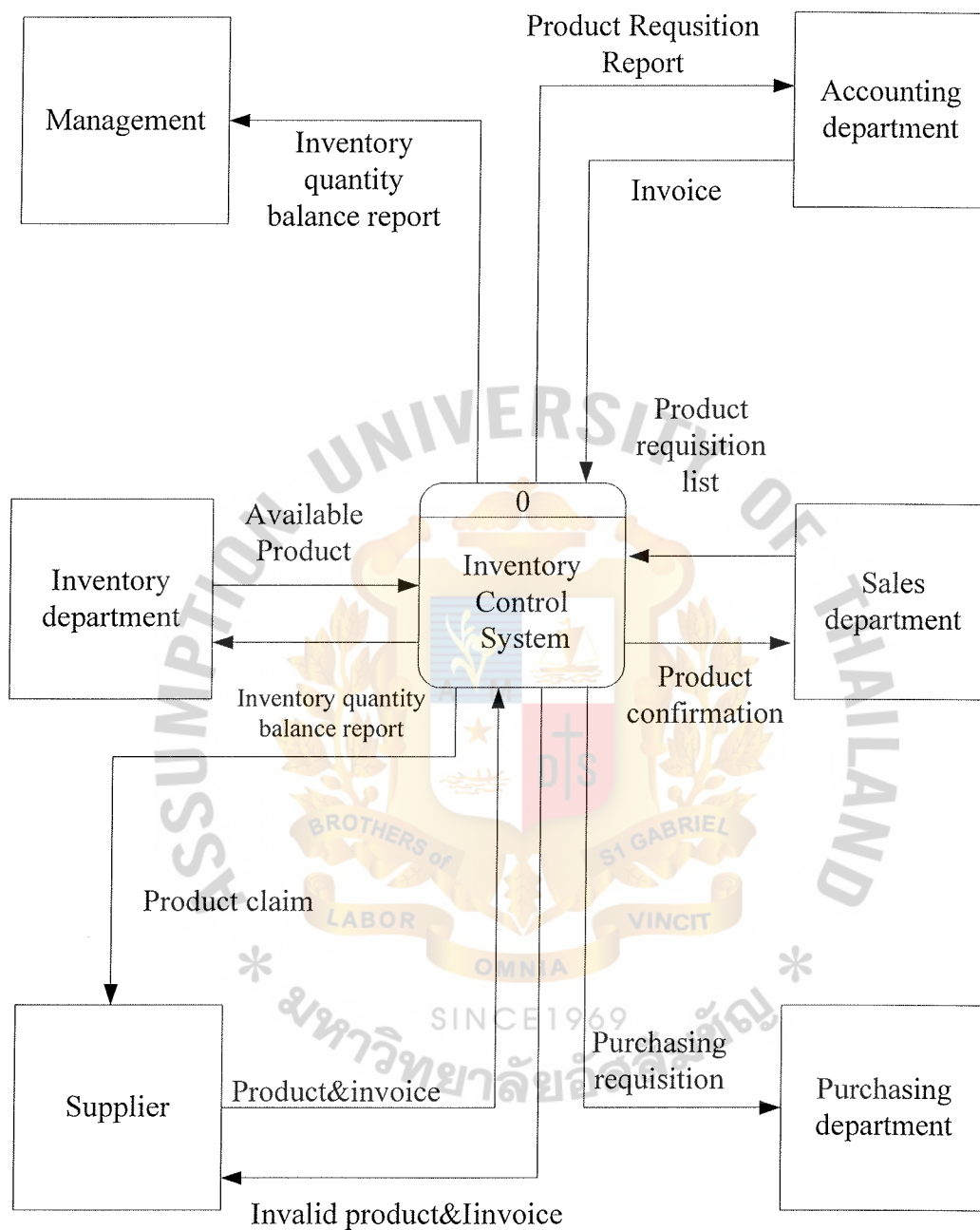


Figure B.1. Context Diagram of Existing System.

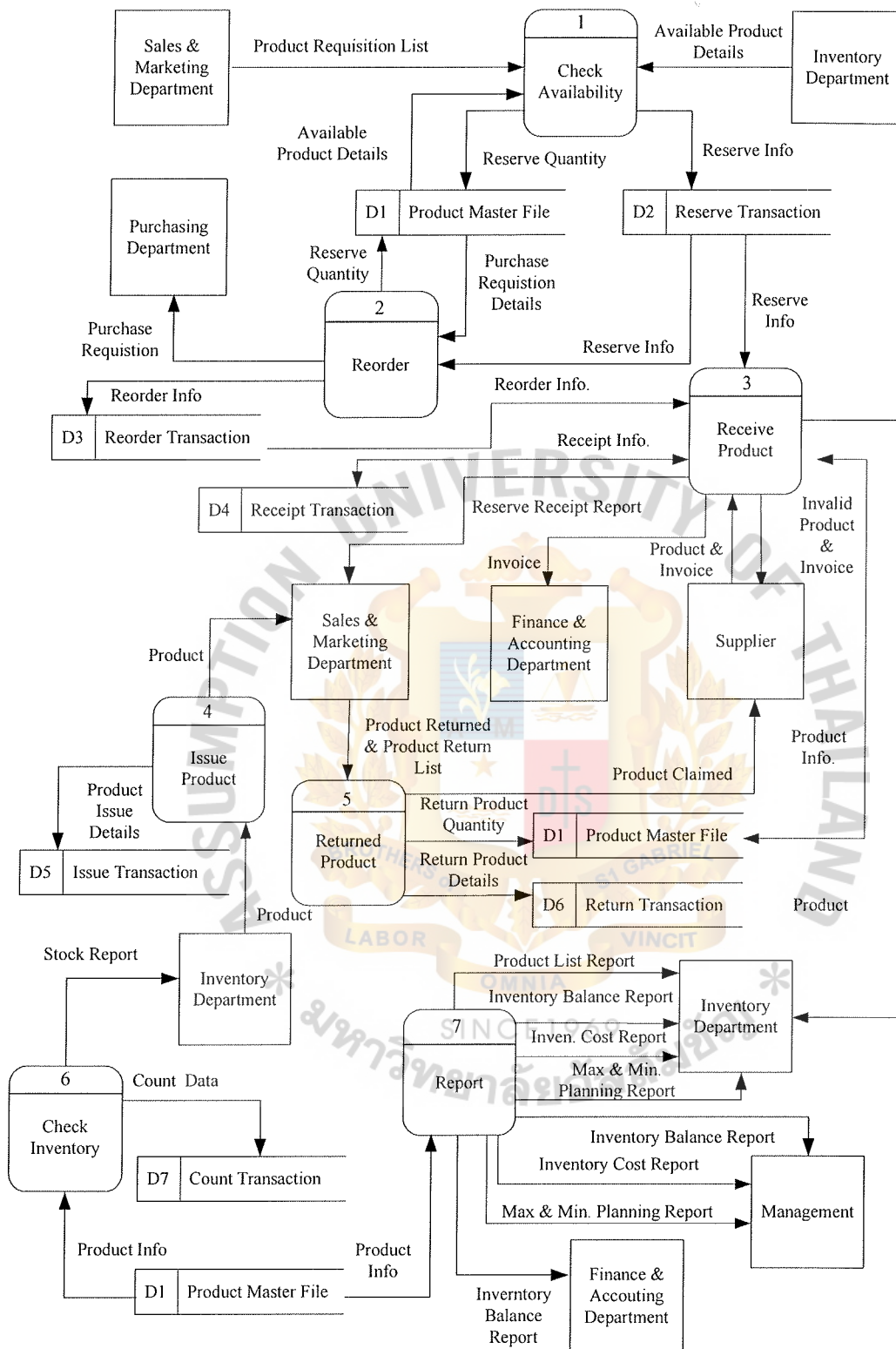


Figure B.2. Data Flow Diagram.

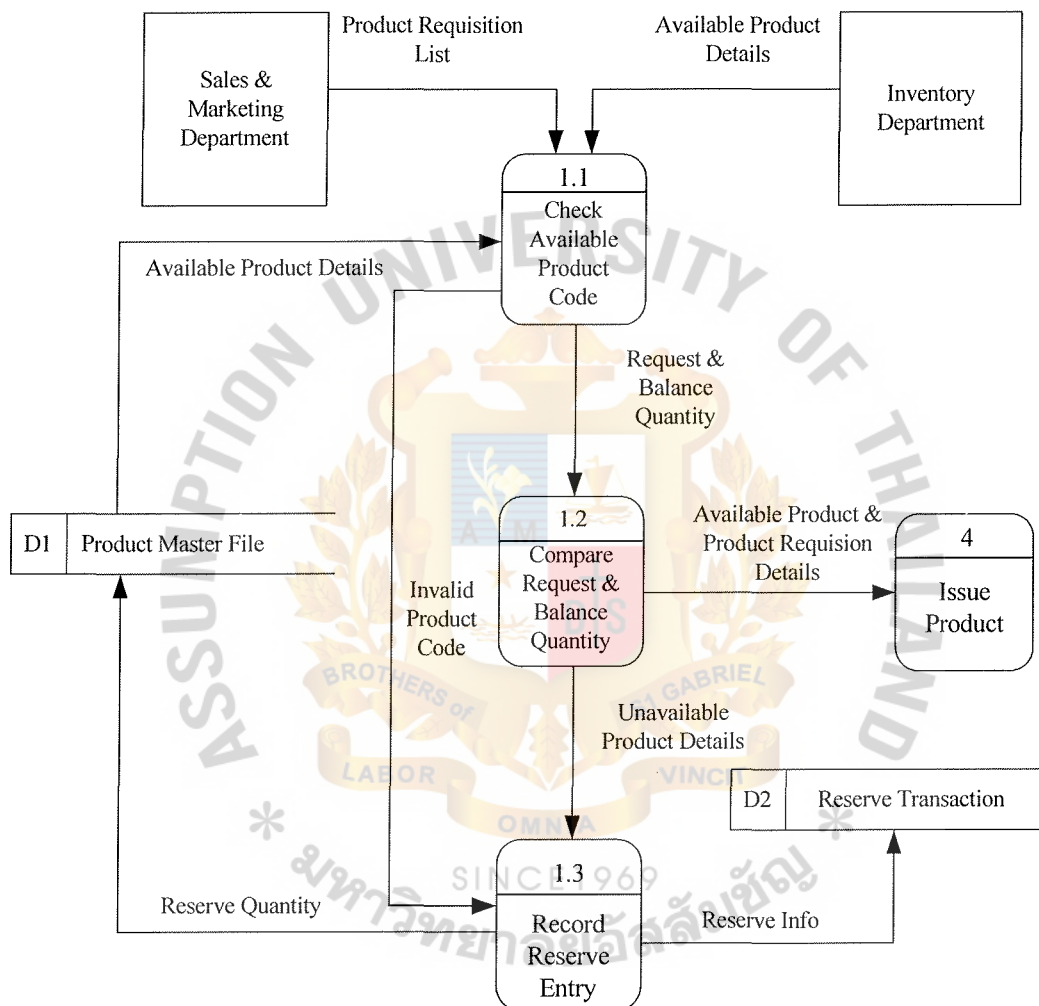


Figure B.3. DFD Level 1 of the Proposed System: Check Availability.

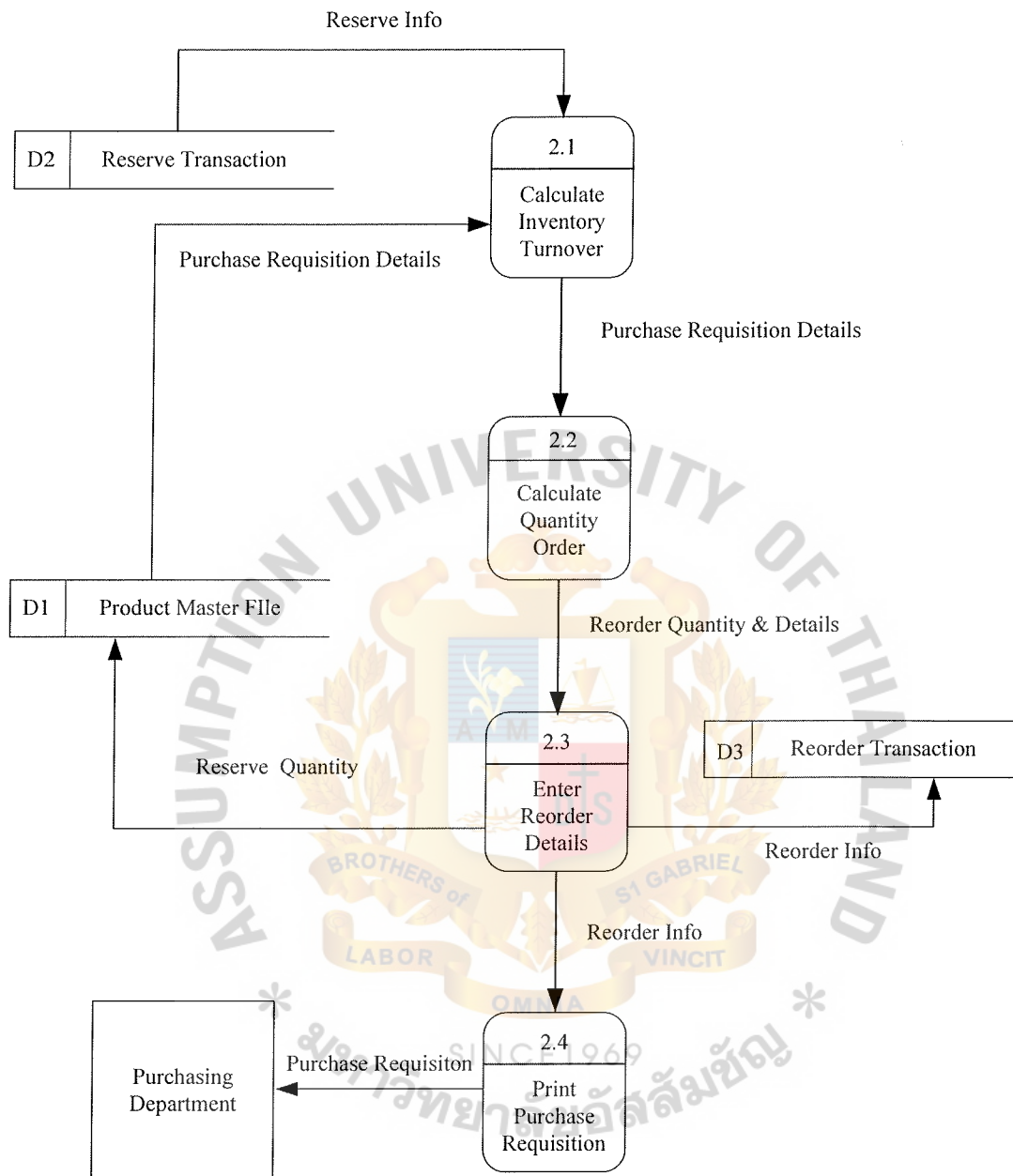


Figure B.4. DFD Level 1 of Proposed System: Reorder Product.

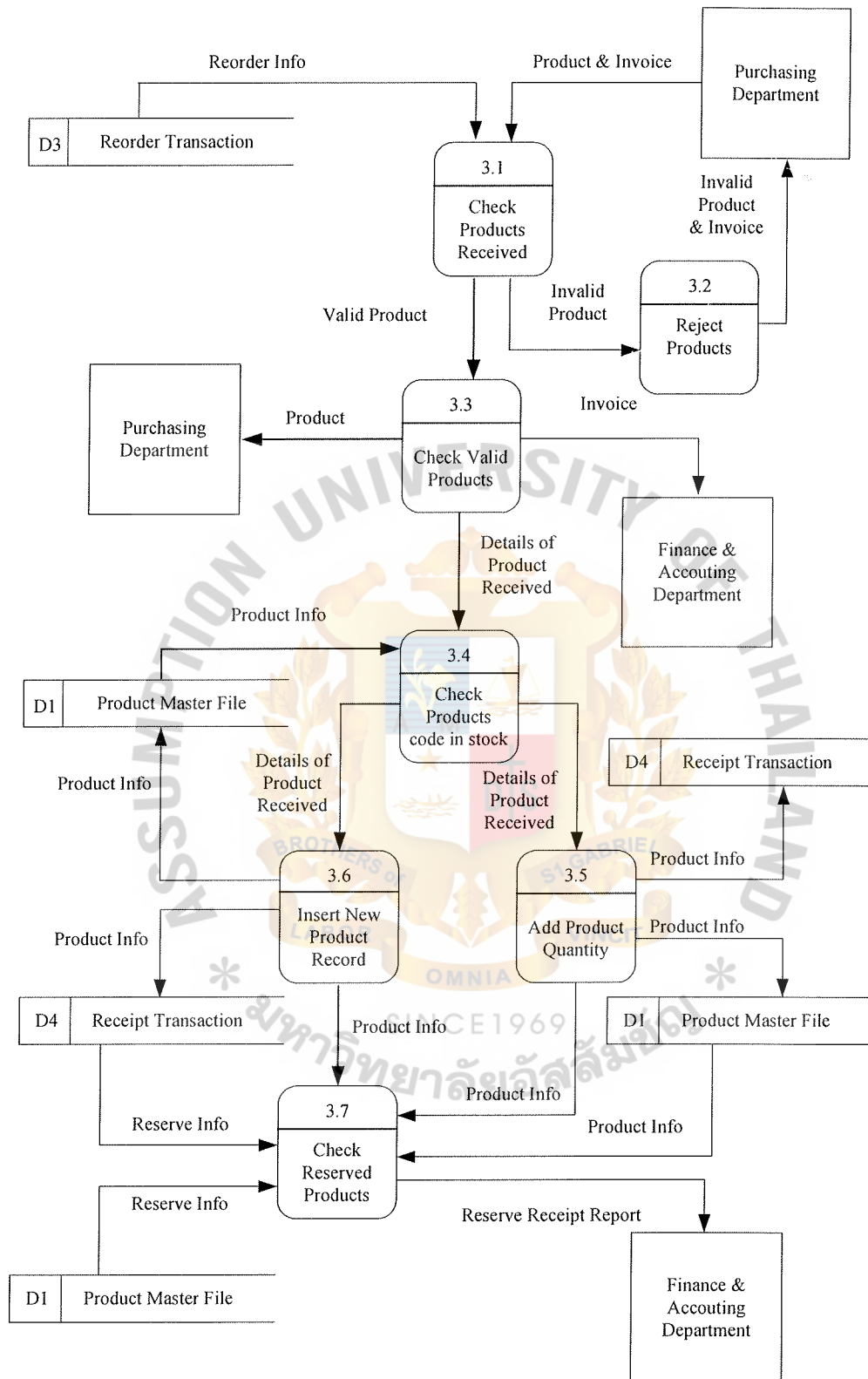


Figure B.5. DFD Level 1 of Proposed System: Receive Product.

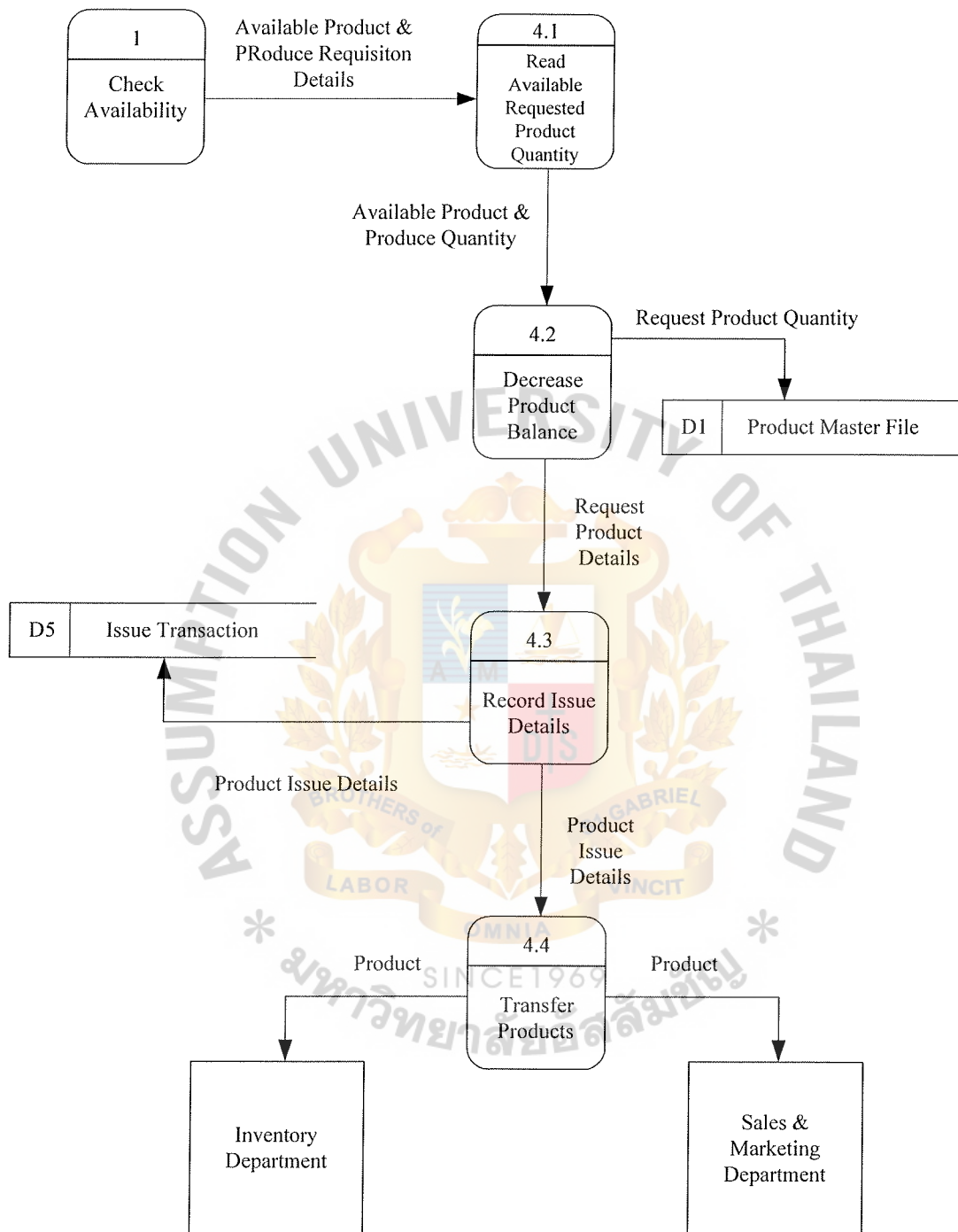


Figure B.6. DFD Level 1 of Proposed System: Issue Product.

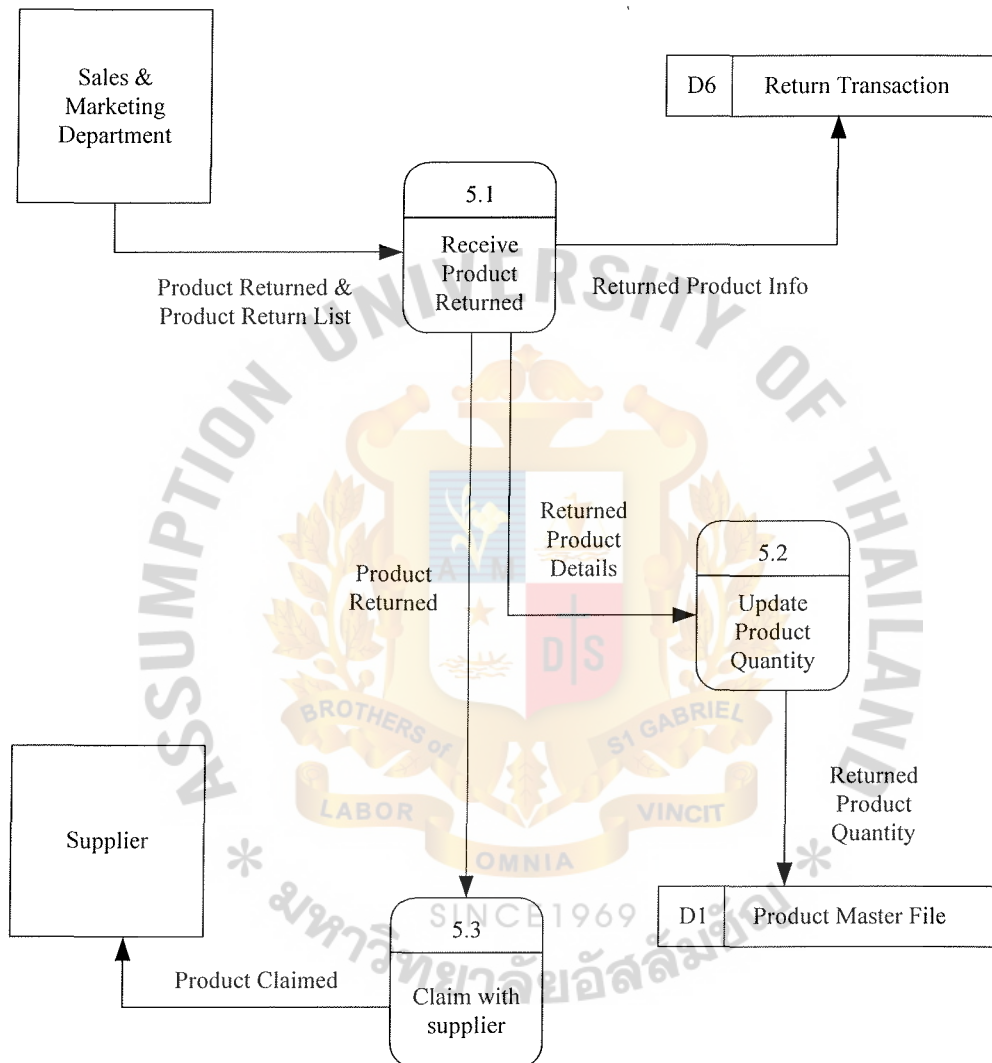


Figure B.7. DFD Level 1 of Proposed System: Return Product.

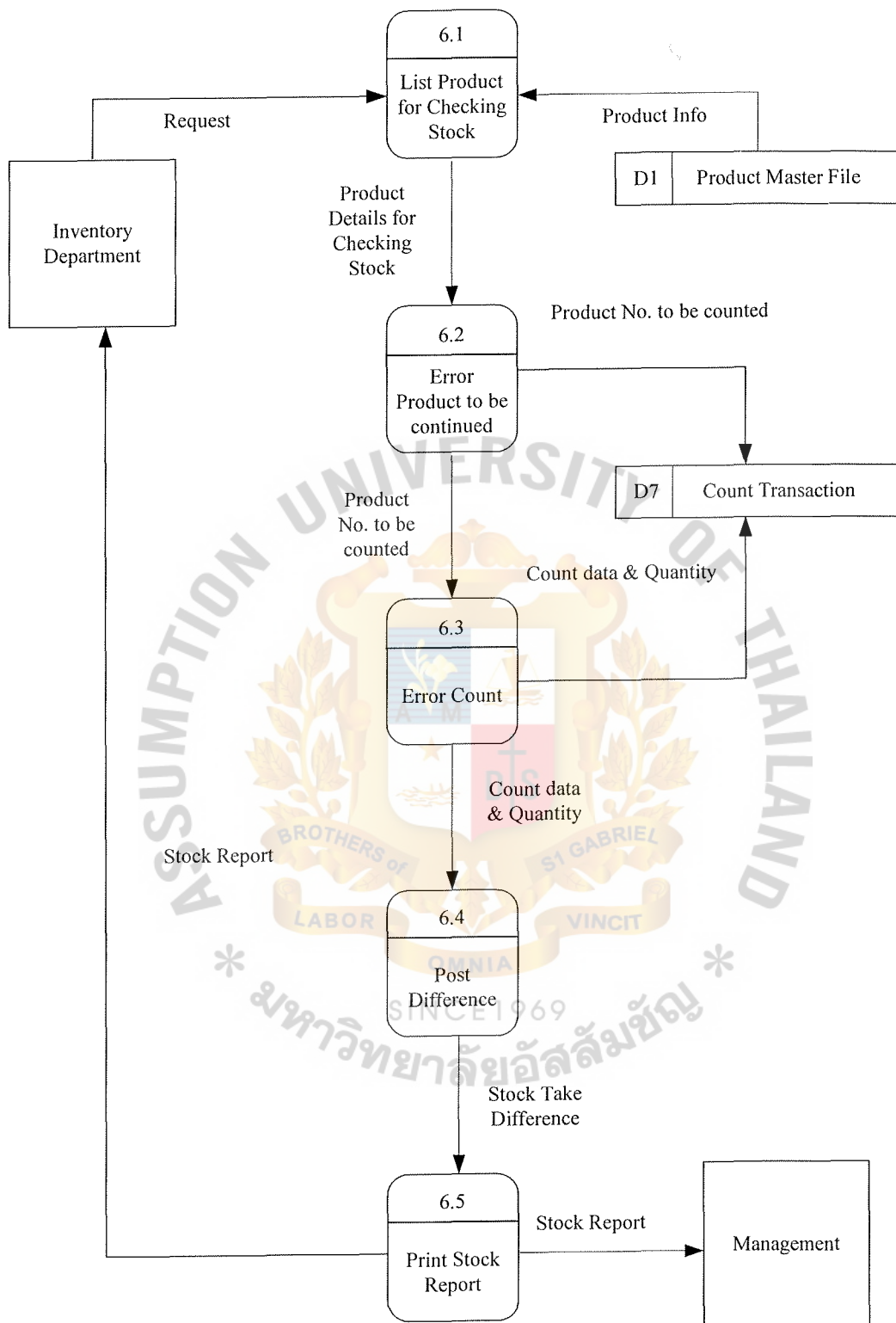
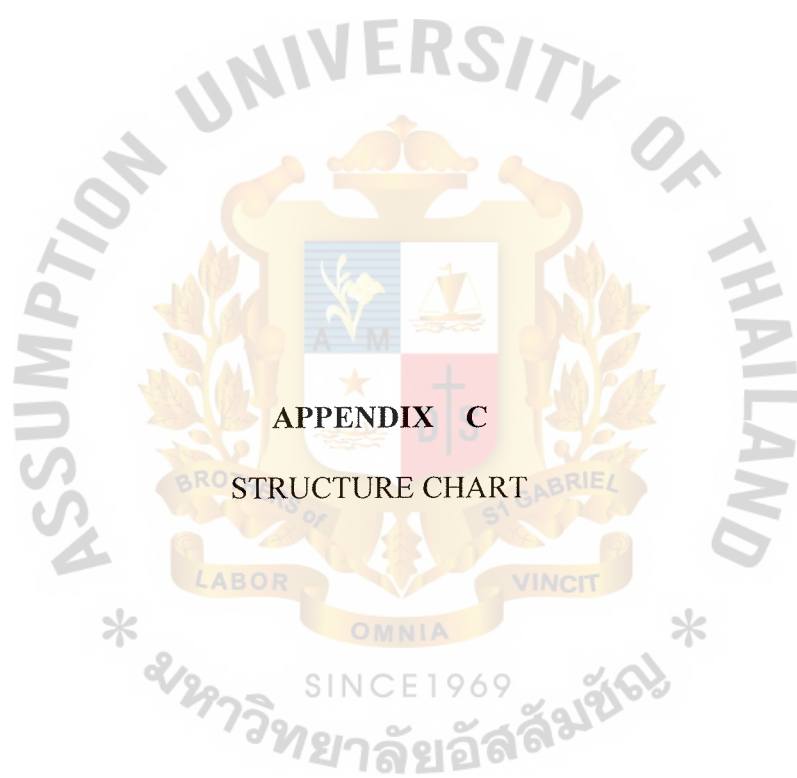


Figure B.8. DFD Level 1 of Proposed System: Check Inventory.



APPENDIX C

STRUCTURE CHART

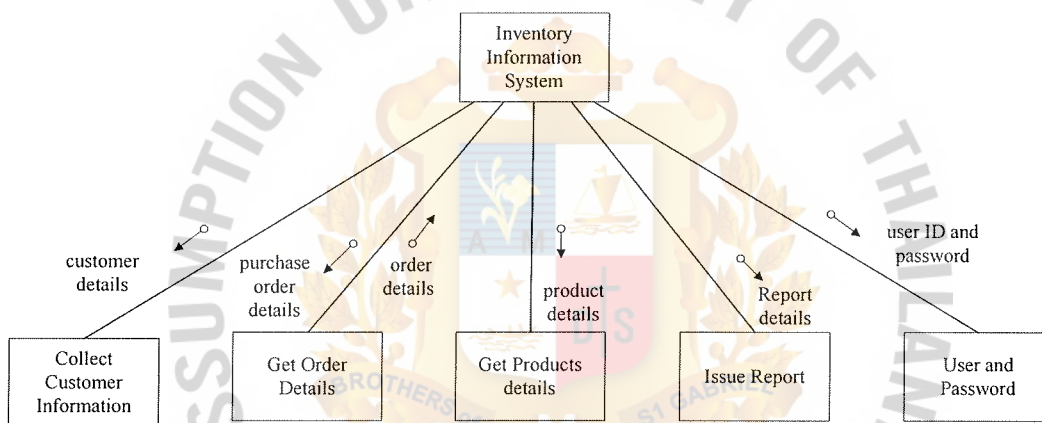


Figure C.1. Structure Chart of Inventory Control System of Lumpinee Optic.

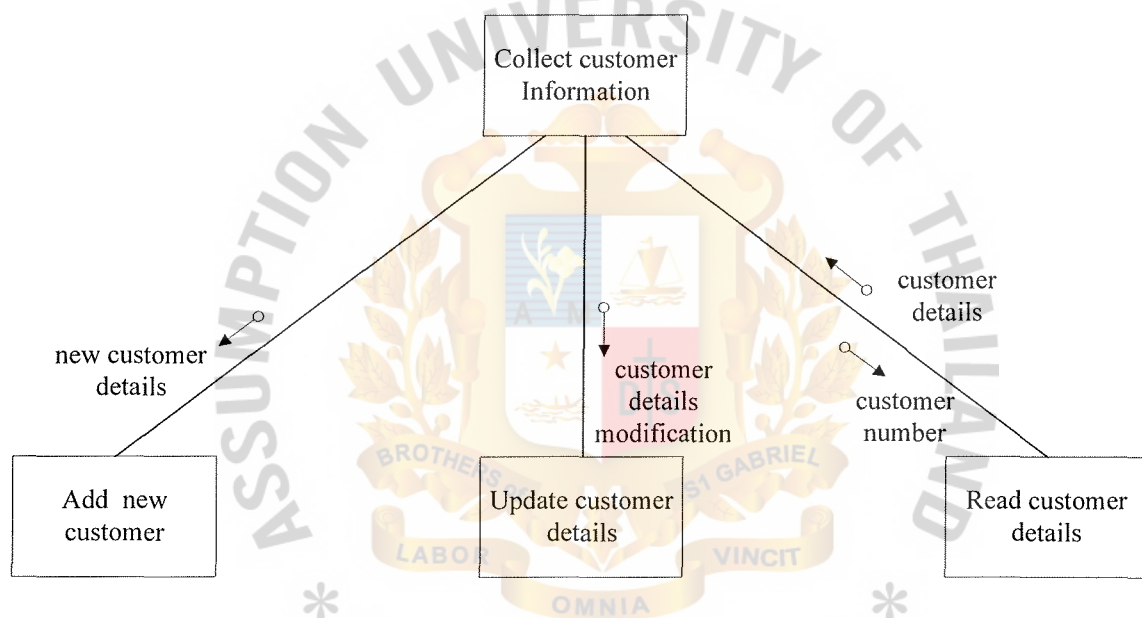


Figure C.2. Structure Chart of Collect Customer Information.

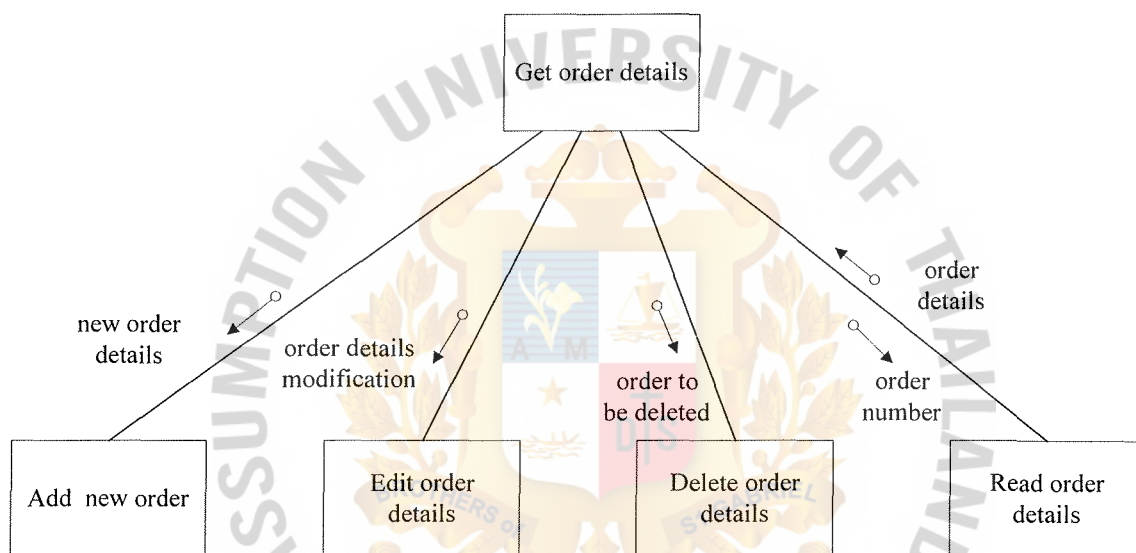


Figure C.3. Structure Chart of Get Order Details.

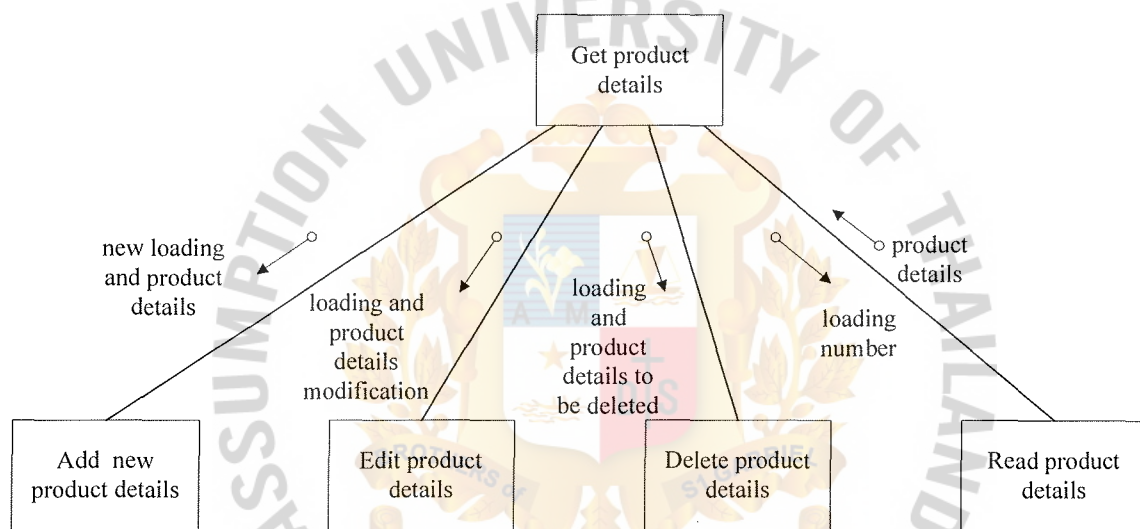


Figure C.4. Structure Chart of Get Product Details.

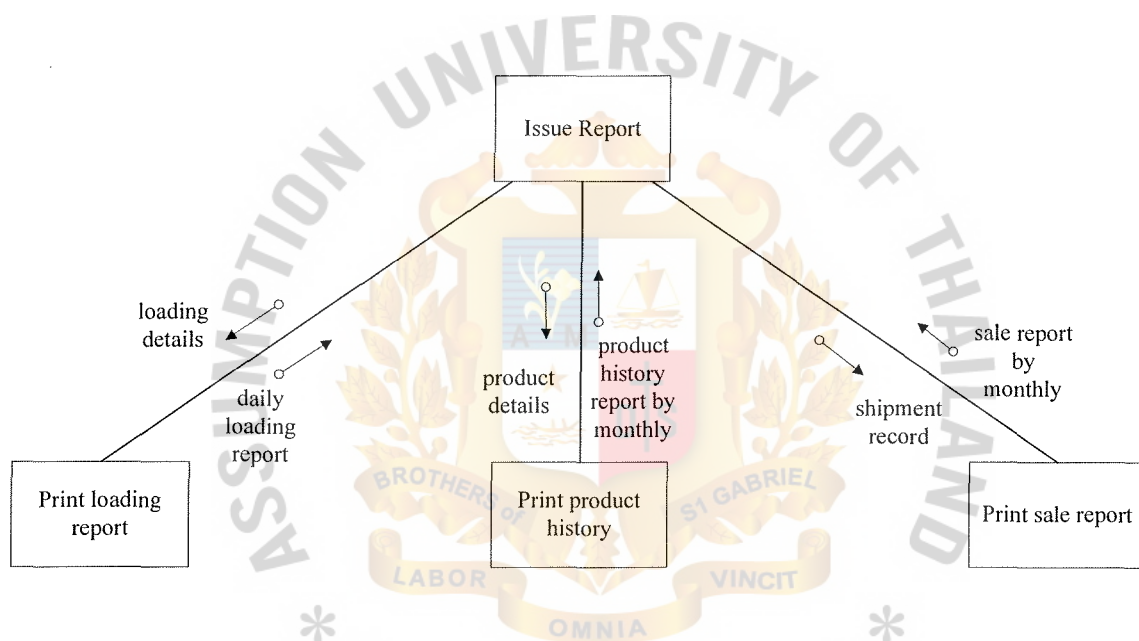


Figure C.5. Structure Chart of Issue Report.

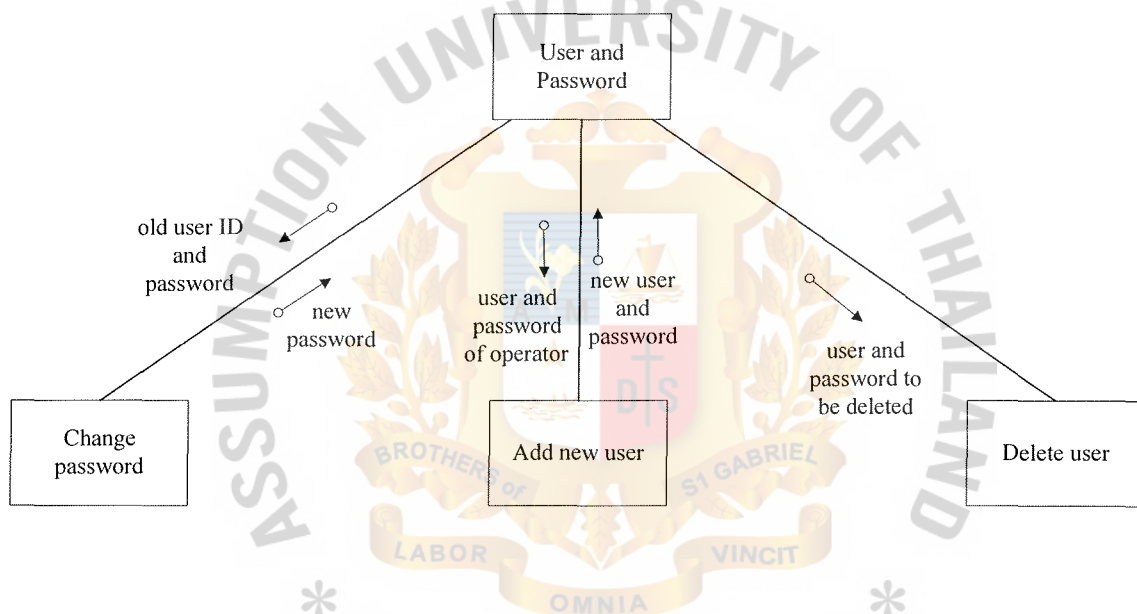


Figure C.6. Structure Chart of User and Password.



APPENDIX D
PROCESS SPECIFICATION

Table D.1. Process Specification of Process1.1.

Cost Items	Description
Process Name:	Check Available Product Code
Data In:	Product Requisition List Available Product Details
Data Out:	Request & Balance Quantity Unavailable Product Details
Process:	<ol style="list-style-type: none"> 1. Find product code in product master file. 2. If it has, show that balance quantity. 3. If it is not have, show that unavailable product.
Attachment:	<ul style="list-style-type: none"> • Product Master File

Table D.2. Process Specification of Process 1.2.

Cost Items	Description
Process Name:	Compare Request and Balance Quantity
Data In:	Request Quantity Balance Quantity
Data Out:	Available Product Product Requisition Details Unavailable Product Details
Process:	<ol style="list-style-type: none"> 1. Find product code in product master file and product requisition list. 2. If it has in both file, compare that request quantity is more than balance quantity. Show the excess amount as an unavailable amount, and quantity in stock. 3. If it has not in product code, show the unavailable product amount and issue product requisition to order from supplier.
Attachment:	<ul style="list-style-type: none"> • Product Master File • Product Requisition List

Table D.3. Process Specification of Process 1.3.

Cost Items	Description
Process Name:	Record Reserve Entry
Data In:	Unavailable Product Details
Data Out:	Reserve quantity and information
Process:	<ol style="list-style-type: none"> 1. Get unavailable product amount in unavailable product details and date require. 2. Add reserve amount in product master file. 3. Update reserve amount.
Attachment:	<ul style="list-style-type: none"> • Product Master File

Table D.4. Process Specification of Process 2.1.

Cost Items	Description
Process Name:	Calculation Inventory Turnover
Data In:	Purchase Requisition Details Reserve Information
Data Out:	Purchase Requisition details
Process:	<ol style="list-style-type: none"> 1. Get information from product master file and reserve file. 2. Find inventory turnover by product code $= (\text{quantity issue} * \text{cost per unit}) / (\text{beginning product master file} + \text{ending product master file} / 2)$. 3. Print inventory turnover by using product code.
Attachment:	<ul style="list-style-type: none"> • Product Master File

Table D.5. Process Specification of Process 2.2.

Cost Items	Description
Process Name:	Calculate Quantity Order
Data In:	Purchase Requisition details Inventory Turnover Details
Data Out:	Reorder Quantity and details
Process:	<ol style="list-style-type: none"> 1. Get information about purchase requisition details and inventory turnover rate. 2. Compare purchase requisition details with inventory turnover rate, correct or not. 3. Compute quantity reorder .
Attachment:	<ul style="list-style-type: none"> • Product Master File • Reorder File

Table D.6. Process Specification of Process 2.3.

Cost Items	Description
Process name:	Enter Reorder Details
Data In:	Reorder Quantity and details
Data Out:	Reorder Quantity and information
Process:	<ol style="list-style-type: none"> 1. Get reorder quantity and information. 2. Add reorder quantity in product master file. 3. Update reorder transaction file.
Attachment:	<ul style="list-style-type: none"> • Product Master File

Table D.7. Process Specification of Process 2.4.

Cost Items	Description
Process Name:	Print Purchase Requisition
Data In:	Reorder Information
Data Out:	Purchase Requisition
Process:	<ol style="list-style-type: none"> 1. Display purchase requisition information which show P/R No., P/R Date, Product Code, Product Name, Quantity, UOM, Price/Unit, Total Amount, Remark. 2. Check the correctness of information. 3. Print valid purchase requisition.
Attachment:	<ul style="list-style-type: none"> • Purchase Requisition

Table D.8. Process Specification of Process 3.1-3.2.

Cost Items	Description
Process Name:	<ol style="list-style-type: none"> 3.1 Check product received 3.2 Reject product
Data In:	Product received Reorder information
Data Out:	Valid product Invalid product
Process:	<ol style="list-style-type: none"> 1. Get reorder information and details of product received. 2. Check product received and reorder information, correct or not. 3. If it is correct, show it as valid product. 4. If it is not correct, contact the supplier about invalid product.
Attachment:	<ul style="list-style-type: none"> • Supplier • Staff

Table D.9. Process Specification of Process 3.3.

Cost Items	Description
Process Name:	Check Valid Product
Data In:	Valid Product Received
Data Out:	Details of Product Received
Process:	Get details of valid product received . Match quantity of product received with reorder information
Attachment:	Staff

Table D.10. Process Specification of Process 3.4.

Cost Items	Description
Process Name:	Check Product Code in Stock
Data In:	Details of Product Received Product Information
Data Out:	Details of Product Received
Process:	<ol style="list-style-type: none"> 1. Get product code. 2. Retrieve product code from product master file. 3. If it is old product code, add in product quantity. 4. If it is new product code(not found in product master file), insert new product record.
Attachment:	Staff

Table D.11. Process Specification of Process 3.5.

Cost Items	Description
Process Name:	Add Product Quantity
Data In:	Details of Product Received
Data Out:	Details of Product Received
Process:	<ol style="list-style-type: none"> 1. Get product code and product quantity. 2. Open product master file and add stock balance = Stock balance + Product quantity received in the supplier invoice.
Attachment:	<ul style="list-style-type: none"> • Staff • Supplier invoice

Table D.12. Process Specification of Process 3.6.

Cost Items	Description
Process Name:	Insert New Product Record
Data In:	Details of Product Received
Data Out:	Product Information
Process:	<ol style="list-style-type: none"> 1. Get product code, product name, Quantity. 2. Insert new record in product master file.
Attachment:	<ul style="list-style-type: none"> • Product Master File • Staff

Table D.13. Process Specification of Process 3.7.

Cost Items	Description
Process Name:	Check Reserve Products
Data In:	Product Information Receipt and Reserve Information
Data Out:	Reserve Receipt Report
Process:	<ol style="list-style-type: none"> 1. Get information and check that product received is the product reserve in reserve file. 2. Print details of product receipt by use reserve receipt.
Attachment:	<ul style="list-style-type: none"> • Product Master File • Staff

Table D.14. Process Specification of Process 4.1-4.2.

Cost Items	Description
Process Name:	4.1 Read Available Requested product Quantity 4.2 Decrease Product Balance
Data In:	Available Product Product Requisition Details
Data Out:	Available Requested Product Quantity
Process:	<ol style="list-style-type: none"> 1. Get product code and requested quantity. 2. Edit product information in product master file by stock balance = stock balance + requested quantity.
Attachment:	<ul style="list-style-type: none"> • Product Master file

Table D.15. Process Specification of Process 4.3.

Cost Items	Description
Process Name:	Reorder Issue Details
Data In:	Requested Product Details
Data Out:	Product Issue Details
Process:	1. Record Requested product details in issue transaction file.
Attachment:	<ul style="list-style-type: none"> • Issue file

Table D.16. Process Specification of Process 4.4.

Cost Items	Description
Process Name:	Transfer Product
Data In:	Product Issue Details
Data Out:	Product Transferred
Process:	1. Transfer Product to Sales & Marketing department.
Attachment:	<ul style="list-style-type: none"> • Staff • Goods

Table D.17 Process Specification of Process 5.1.

Cost Items	Description
Process Name:	Received Product Returned
Data In:	Product Returned Product Return List
Data Out:	Returned Product Information Product Returned
Process:	1. Get details of product in product return list from Sales & Marketing department and product returned. 2. Update return file.
Attachment:	<ul style="list-style-type: none"> • Sales & Marketing department • Staff

Table D.18 Process Specification of Process 5.2.

Cost Items	Description
Process Name:	Update Product Quantity
Data In:	Returned Product Details
Data Out:	Returned product Quantity
Process:	1. Add the quantity of product returned with quantity-on-hand in product master file.
Attachment:	<ul style="list-style-type: none"> • Product Master File

Table D.19. Process Specification of Process 5.3.

Cost Items	Description
Process Name:	Claim with Supplier
Data In:	Product Returned
Data Out:	Product Claimed
Process:	1. Contact supplier about the damaged product claim from the supplier.
Attachment:	<ul style="list-style-type: none"> • Staff • Supplier

Table D.20. Process Specification of Process 6.1.

Cost Items	Description
Process Name:	List Product for Checking Stock
Data In:	Request and Product Information
Data Out:	Product Details for Checking Stock
Process :	1. Check goods in stock and physical inventory occurs. 2. Perform product list after checking.
Attachment:	<ul style="list-style-type: none"> • Staff

Table D.21. Process Specification of Process 6.2.

Cost Items	Description
Process Name:	Enter product to be counted
Data In:	Product details for Checking stock
Data Out:	Product No. To be counted.
Process:	1. Count the product inventory.
Attachment:	<ul style="list-style-type: none"> Staff

Table D.22. Process Specification of Process 6.3.

Cost Items	Description
Process Name:	Enter Count
Data In:	Product to be counted
Data Out:	Count data and quantity
Process:	1. Go in inventory to count goods
Attachment:	<ul style="list-style-type: none"> staff

Table D.23. Process Specification of Process 6.4.

Cost Items	Description
Process Name:	Post Difference
Data In:	Count data and quantity
Data Out:	Stock take difference
Process:	1. Look the difference in physical inventory and the product list. 2. Adjust the difference to the stock.
Attachment:	• Staff

Table D.24. Process Specification of Process 6.5.

Cost Items	Description
Process Name:	Print Stock Report
Data In:	Stock take difference
Data Out:	Stock report
Process:	1. Get stock take difference and print it.
Attachment:	• Staff

Table D.25. Process Specification of Process 7.

Cost Items	Description
Process Name:	Report
Data In:	Product Information
Data Out:	Report
Process:	1. Select any reported topics to print.
Attachment:	<ul style="list-style-type: none"> staff





APPENDIX E

DATA DICTIONARY

DATA DICTIONARY

CUSTOMER

INFORMTION

Customer information	=	*The information of the customer necessary for company's document and process* {Customer_Number + Customer_Name}
Customer_Name	=	*The name of the customer's company*
Customer_Number	=	*The identification number used as customer reference number*
Address	=	*The address of customer of the company*
Telephone	=	*The telephone number*
Email_Address	=	*The electronic mail address*
Last_Date_of_Sales	=	*The last date that customer purchased our product*
Case_History	=	*The sight history*
RE_Cylinder_Axis	=	*Right Eye that adds cylinder and Axis*
LE_Cylinder_Axis	=	*Left Eye that adds cylinder and Axis*
PD	=	*The value of PD.*
Receiveing_Date	=	*The receiving Date*

PRODUCT

INFORMATION

Product_Number	=	*The identification number used as the glasses reference number*
Product_Name	=	*The brand name of product that the company can supply to the customer*
Unit_Price	=	*The price of the product by unit*
Outstanding_Balance	=	*The number of product available in stock*

USE RAW MATERIAL

INFORMATION

RM_Number	=	The identification number used as raw material Reference number*
RM_Name	=	*The name of raw material used to produce the product*
Unit_On_Hand	=	*The amount of raw material available in the stock*
Unit_Price	=	*The price of the raw material by unit*
Amount	=	*The value(bath) of all raw material by unit*
Supplier_Name	=	*The supplier name*

REQUEST RAW MATERIAL

INFORMATION

Request_Number	=	*The identification number used as request reference number*
RM_Number	=	*The identification number used as raw material reference number*
Request_Unit	=	*The amount of raw material required in

production*

PURCHASED RAW MATERIAL

INFORMATION

PO_Number	=	*The identification number used as purchase order reference number*
RM_Number	=	*The identification number used as raw material reference number*
QTY_Purchase	=	*The amount of raw material purchased*

PURCHASING ORDER

INFORMATION

PO_NUMBER	=	*The identification number used as purchase order reference number*
Supplier_Number	=	*The identification number used as supplier reference number*
Order_Date	=	*The date that company ordered raw material*
Delevery_Date	=	*The date that company will deliver the product to the customer*
Unit_Delivery	=	*The units of product ordered by customer*
Unit_Price	=	*The price of the product by unit*
QTY_Purchase	=	*The amount of raw material purchased*
Amount	=	*The value(baht) of all raw materials purchased*
Total_Amount	=	*The total value of all raw materials purchased*

SUPPLIER

INFORMATION

Supplier_Number	=	*The identification number used as supplier reference number*
Supplier_Name	=	*The name of the supplier*
Contact_Name	=	*The full name of the supplier*
Address	=	*The address of the supplier*
Telephone	=	*The telephone number*
Payment_Terms	=	*The duration allowed before executing the company or the supplier's payment processes*
Product_Supplied	=	*The name of the product that supplier supplied to the company*
Last_Date_of_Purchased	=	*The last date that company purchased raw material*
Last_Payment_Date	=	*The last date that company paid the bill*
Discount	=	*The discount rate for the raw materials*
Credit_Balance	=	*The amount of money that company did not pay to the supplier*

SUPPLIED RAW MATERIAL

INFORMATION

Supplier_Name	=	*The identification number used as supplier reference number*
RM_Name	=	*The identification number used as raw material reference number*
Supplied_Unit	=	*The amount of raw materials that supplier can supply to the company*
Unit_Price	=	*The price of the raw material by unit*
Amount	=	*The value(bath) of all raw materials*





APPENDIX F

USER INTERFACE DESIGN

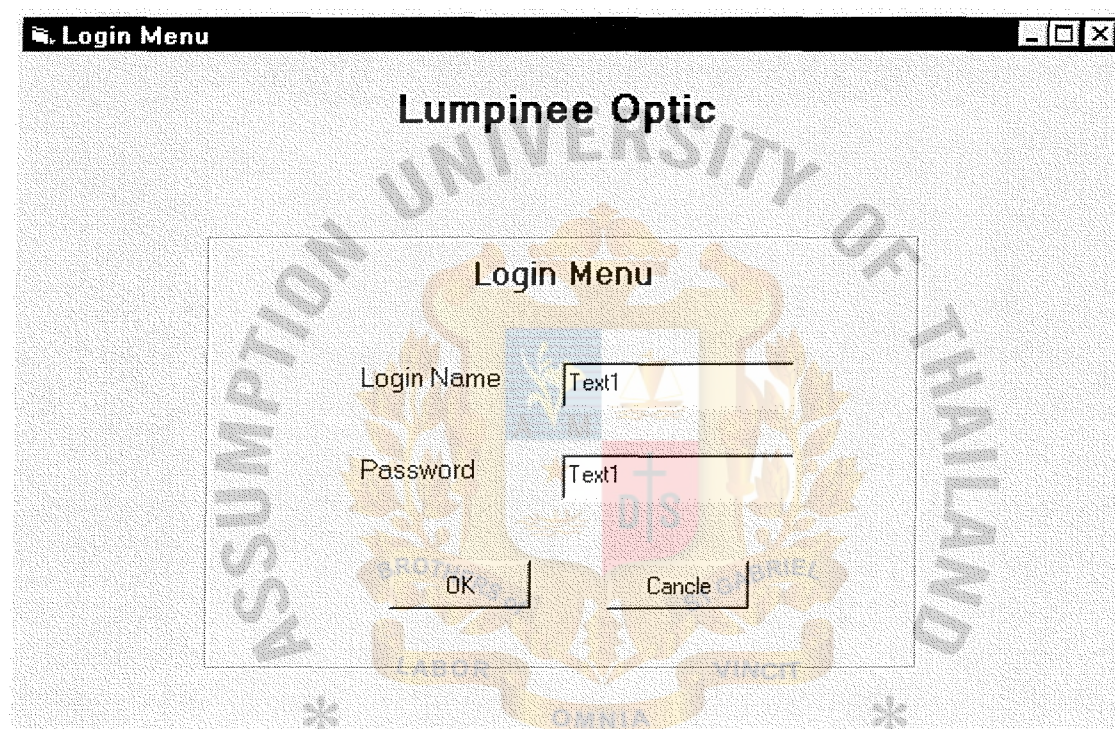


Figure F.1. Login Menu Screen.

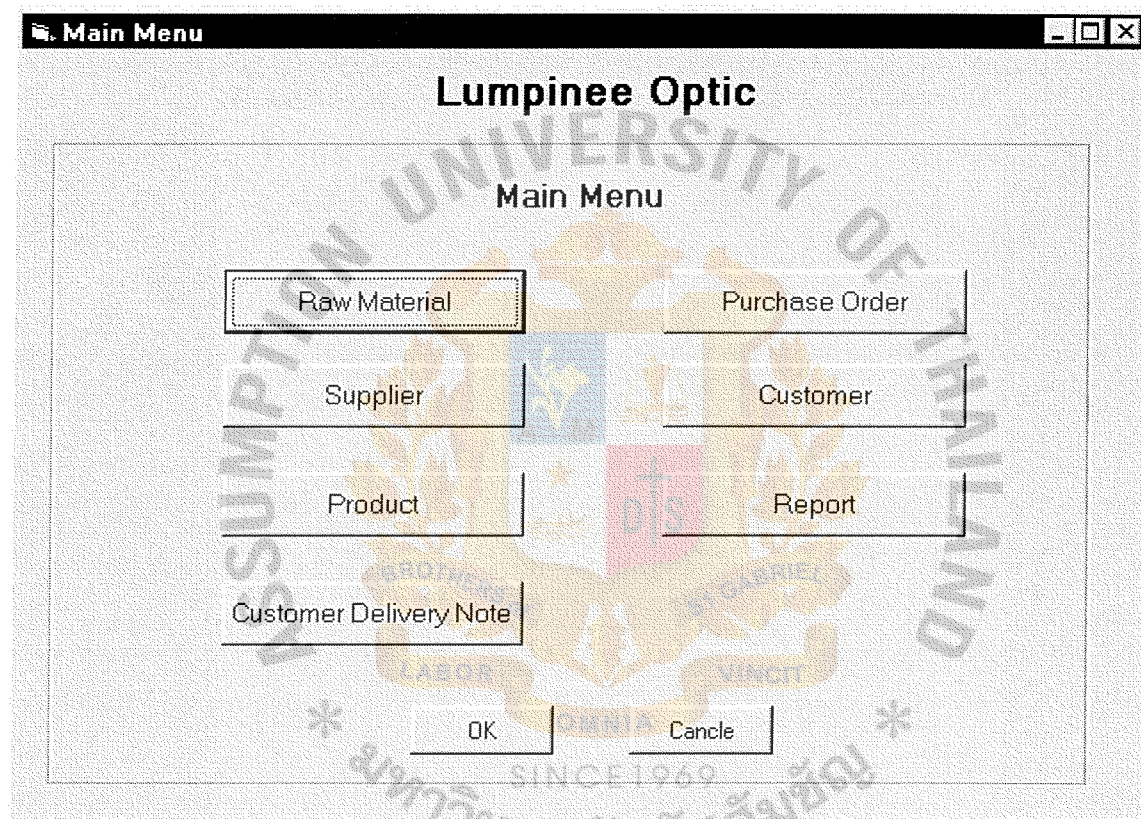


Figure F.2. Main Menu Screen.

Raw Material Information

Lumpinee Optic

Raw Material No.

Raw Material Name	<input type="text"/>	Picture (if available)	<input type="text"/>
Unit Price	<input type="text"/>		
Amount	<input type="text"/>		
Unit on Hand	<input type="text"/>		
Reorder Unit	<input type="text"/>	Raw Material Description	<input type="text"/>
Lead Time	<input type="text"/>		
Supplier Name	<input type="text"/>		

Figure F.3. Raw Material Information Screen.

Purchase Order Information

Lumpinee Optic

Purchase Order No.

Customer No.	<input type="text"/>	Raw Material No.	<input type="text"/>
Unit Price	<input type="text"/>	Supplier No.	<input type="text"/>
Quantity Purchased	<input type="text"/>	Order Date	<input type="text"/>
Amount	<input type="text"/>	Delivery Date	<input type="text"/>
Total Amount	<input type="text"/>	Date Required	<input type="text"/>

Figure F.4. Purchase Order Information Screen.

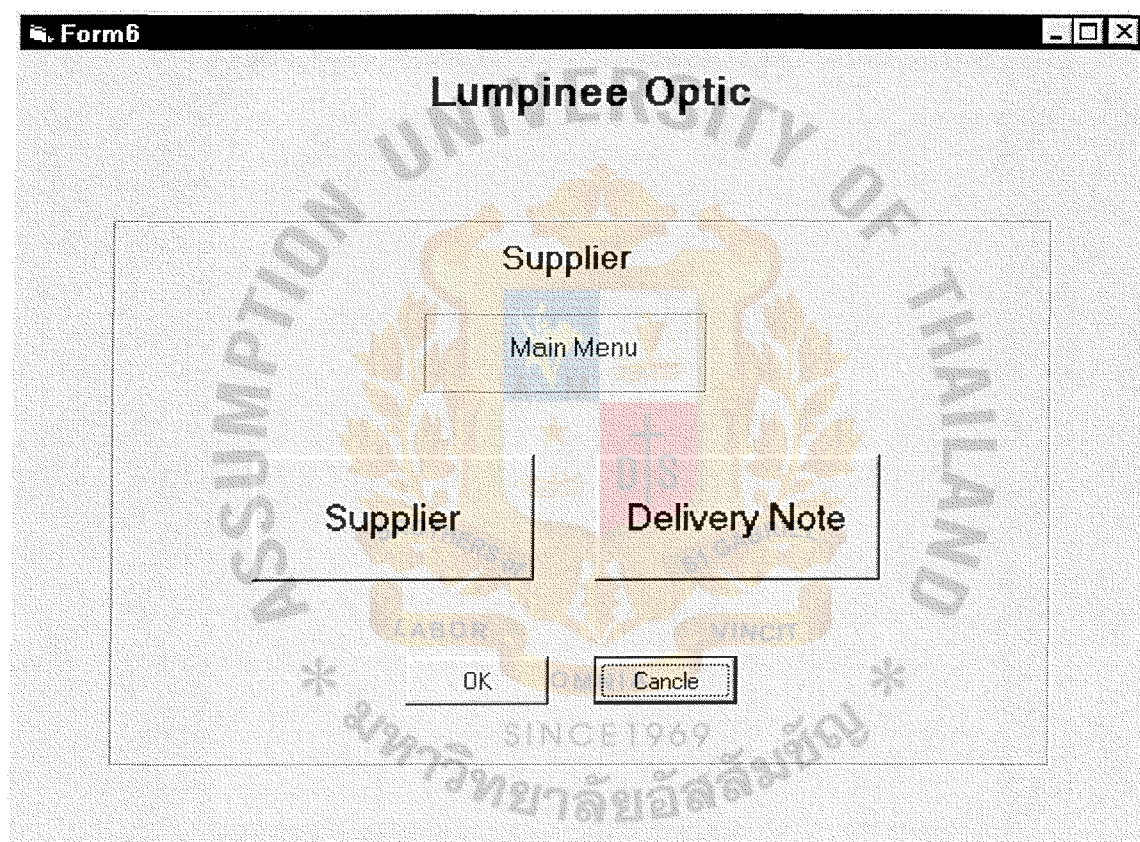


Figure F.5. Supplier Menu Screen.

Supplier Information

Lumpinee Optic

Supplier No.

Supplier Name	<input type="text"/>	Title	<input type="text"/>
Contact Name	<input type="text"/>	Phone	<input type="text"/>
Address	<input type="text"/>	Fax	<input type="text"/>
	<input type="text"/>	E-mail	<input type="text"/>

Raw Material Supplied	<input type="text"/>	Discount	<input type="text"/>	(%)
Credit Balance	<input type="text"/>	Last Date of Purchased	<input type="text"/>	
Payment Term	<input type="text"/>	Day(s)	Last Payment Date	<input type="text"/>

Figure F.6. Supplier Information Screen.

Customer Information

Lumpinee Optic

Customer No.

Customer Name	<input type="text"/>	Title	<input type="text"/>
Contact Name	<input type="text"/>	Phone	<input type="text"/>
Address	<input type="text"/>	Fax	<input type="text"/>
		E-mail	<input type="text"/>

Credit Term	<input type="text"/>	Day(s)	Payment Term	<input type="text"/>
Balance	<input type="text"/>	Unit(s)	Last Date of Sales	<input type="text"/>
Discount	<input type="text"/>	(%)	Last Payment Date	<input type="text"/>

Figure F.7. Customer Information Screen.

Product Information

Lumpinee Optic

Product No.

Product Name Outstanding Balance Unit(s)

Unit Price Baht Delivery Date

Customer No.

Picture (if available) Product Description

Figure F.8. Product Information Screen.

Delivery Note Information

Lumpinee Optic

Delivery Note Information

Delivery Note No.

Purchase Order No.

Raw Material No.

Supplier No.

Delivery Date

Baht Unit Delivery

Edit Add Preview Print Exit

Figure F.9. Delivery Note Information Screen.

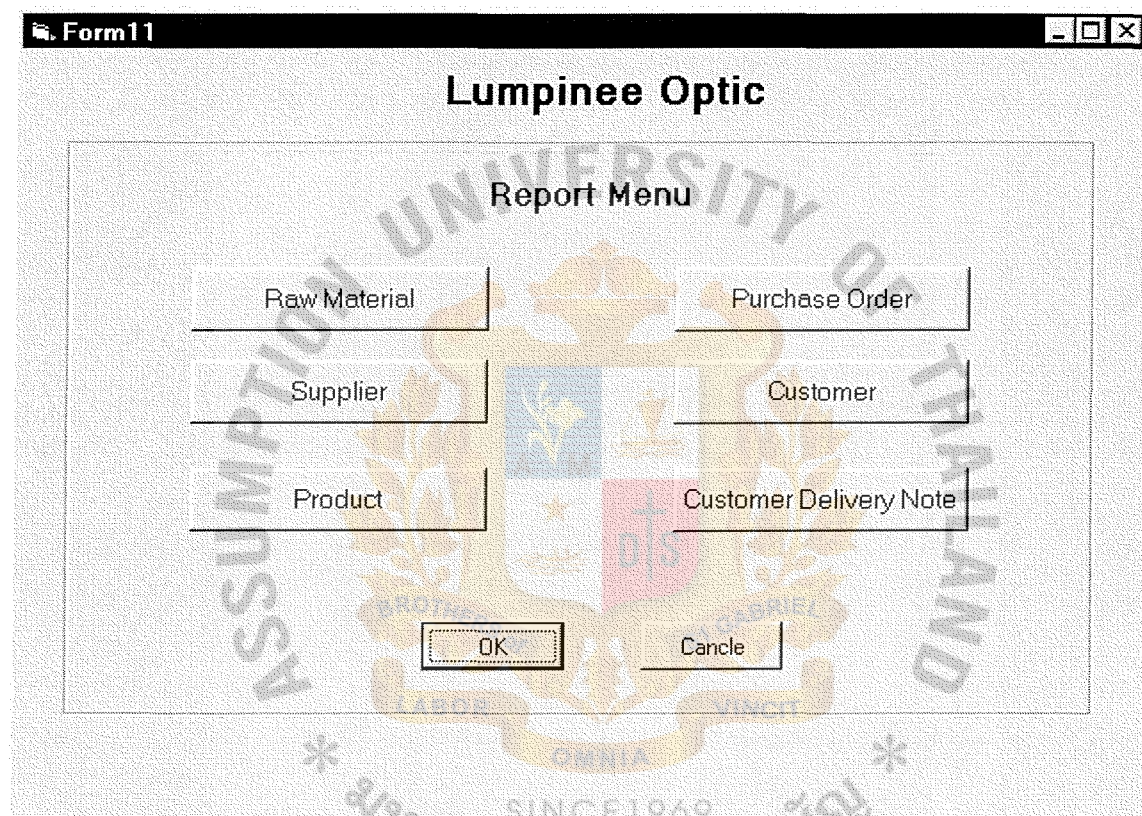


Figure F.10. Report Menu Screen.



LUMPINEE OPTIC

Product List Report

Product Code	Product Name	Category	UOM	Cost/Unit	Stock Balance
--------------	--------------	----------	-----	-----------	---------------

1.G-50	Gucci-red	sunglasses		9,900	5
2.G-51	Gucci-blue	sunglasses		9,900	4
3.G-52	Gucci-black	sunglasses		9,900	2
4.G-53	Gucci-brown	sunglasses		9,900	2
5.M-10	Miyazawa-green	sunglasses		5,900	3
6.M-11	Miyazawa-red	sunglasses		5,900	5
7.M-12	Miyazawa-blue	sunglasses		5,900	3

Total 24

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Figure G.1. Product List Report.

LUMPINEE OPTIC

Inventory Cost report

Product Code	Product Name	Category	UOM	Cost / Unit
1.G-50	Gucci-red	sunglasses		4,500
2.G-51	Gucci-blue	sunglasses		4,500
3.G-52	Gucci-green	sunglasses		4,500
4.G-53	Gucci-Black	sunglasses		4,500



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Figure G.2. Inventory Cost Report.

LUMPINEE OPTIC

Inventory Reserve Report

Product Code	Product Name	Category	UOM	Cost/Unit	Reserve Qty
1. G-50	Gucci-red	sunglasses		4,500	2
2. G-51	Gucci-blue	sunglasses		4,500	5
3. G-52	Gucci-green	sunglasses		4,500	4
4. G-53	Gucci-black	sunglasses		4,500	2

Total					13



The watermark is a circular logo for Assumption University of Thailand. It features a central shield with a cross and the letters 'D S'. Above the shield is a crown. The shield is flanked by two lions. Below the shield is a banner with the text 'LABOR OMNIA VINCIT'. The outer ring of the logo contains the text 'ASSUMPTION UNIVERSITY OF THAILAND' at the top and 'มหาวิทยาลัยอัสสัมชัญ' at the bottom, with 'SINCE 1969' in the center of the bottom arc.

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Figure G.3. Inventory Reserve Report.

LUMPINEE OPTIC

Inventory Reorder Report

Product Code	Product Name	Category	UOM	Cost/Unit	Reorder Qty
--------------	--------------	----------	-----	-----------	-------------

1. G-50	Gucci-red	sunglasses		4,500	2
2. G-51	Gucci-blue	sunglasses		4,500	5
3. G-52	Gucci-green	sunglasses		4,500	4
4. G-53	Gucci-black	sunglasses		4,500	2

				Total	13
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Figure G.4. Inventory Reorder Report.

LUMPINEE OPTIC

Inventory Receipt Report

Product Code	Product Name	Category	UOM	Receiving Date	Quantity
--------------	--------------	----------	-----	----------------	----------

1. G-50	Gucci-red	sunglasses		11/10/2001	2
2. G-51	Gucci-blue	sunglasses		11/10/2001	5
3. G-52	Gucci-green	sunglasses		11/10/2001	4
4. G-53	Gucci-black	sunglasses		11/10/2001	2

Total					13
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Figure G.5. Inventory Receipt Report.

LUMPINEE OPTIC

Inventory Issue Report

Product Code	Product Name	Category	UOM	Issue Date	Quantity
--------------	--------------	----------	-----	------------	----------

1. G-50	Gucci-red	sunglasses		11/10/2001	2
2. G-51	Gucci-blue	sunglasses		11/10/2001	5
3. G-52	Gucci-green	sunglasses		11/10/2001	4
4. G-53	Gucci-black	sunglasses		11/10/2001	2

Total	13
-------	----



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Figure G.6. Inventory Issue Report.

LUMPINEE OPTIC

Inventory Return Report

Product Return List No Date Returned Product Code Product Name UOM Qty

1. แว่นตา Gucci		11/10/2001	G-50	Gucci-red	1
2. แว่นตา Gucci		11/10/2001	G-51	Gucci-red	1
3. แว่นตา Gucci		11/10/2001	G-52	Gucci-red	1

Total 3

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Figure G.7. Inventory Return Report.

LUMPINEE OPTIC

Stock Report

Product Code	Product Name	Category	UOM	Stock Balance	Count Qty
1. G-50	Gucci-red	sunglasses		5	4
2. G-51	Gucci-blue	sunglasses		5	4
3. G-52	Gucci-green	sunglasses		5	2
4. G-50	Gucci-black	sunglasses		5	3
Total					13

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Figure G.8. Stock Report.

LUMPINEE OPTIC

Reserve Report

Reserve No 1

Date by Month 7/10/2001

Product Code	Product Name	UOM	Qty Unavailable	Qty Request	Date Required
--------------	--------------	-----	-----------------	-------------	---------------

G-50	Gucci-red	5	2		7/10/44
G-51	Gucci-blue	1	2		7/10/44
G-52	Gucci-green	5	2		7/10/44
G-53	Gucci-black	5	2		7/10/44



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Figure G.9. Reserve Report.

LUMPINEE OPTIC

Reserve Receipt Report

Product Code G-50

Product Name Gucci-red

Date	Qty On Request	Receiving Date	Quantity
------	----------------	----------------	----------

7/10/2001	2	10/10/2001	1
8/10/2001	2	11/10/2001	2
10/10/2001	2	12/10/2001	2

Total 5

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Figure G.10. Reserve Receipt Report.

LUMPINEE OPTIC

Reorder Report

P/R No G005

P/R Date 7/10/2001

Date	Qty On Request	Receiving Date	Quantity
7/10/2001	2	10/10/2001	2
8/10/2001	2	11/10/2001	2
10/10/2001	2	12/10/2001	2
Total			5

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Figure G.11. Reorder Report.

LUMPINEE OPTIC

Issue Report

Issue No. 5

Issue Date 10/10/2001

Product Code	Product Name	UOM	Quantity
1.G-50	Gucci-red		5
2.G-51	Gucci-blue		4
3.G-52	Gucci-black		2
4.G-53	Gucci-brown		2
5.M-10	Miyazawa-green		3
6.M-11	Miyazawa-red		5
7.M-12	Miyazawa-blue		3
Total			24

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Figure G.12. Issue Report.

LUMPINEE OPTIC

Receipt Report

Receiving No 5

Receiving Date 10/10/2001

P/R No	Product Code	Product Name	UOM	Quantity
1	G-50	Gucci-red		5

The watermark is a large, semi-transparent circular logo for Assumption University of Thailand. It features a central shield with a blue and white checkered pattern, a yellow star, and a red cross. The shield is flanked by golden laurel branches. Above the shield is a golden crown. The text 'ASSUMPTION UNIVERSITY OF THAILAND' is written in a semi-circle around the top. Below the shield, a banner reads 'BROTHERS of LABOR OMNIA VINCIT'. At the bottom, the Thai text 'มหาวิทยาลัยอัสสัมชัญ' and 'SINCE 1969' are visible.

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Figure G.13. Receipt Report.

LUMPINEE OPTIC

Inventory Balance Report

Product Code Product Name UOM Stock Balance Reorder Qty Reserve Qty Available Balance

G-50	Gucci-red		5			2
G-51	Gucci-blue		4			2
G-52	Gucci-green		2			1
G-53	Gucci-black		2			1
M-10	Miyazawa-green		5			4
M-11	Miyazawa-red		5			3
M-12	Miyazawa-blue		2			3
C- 20	Channel-black		5			3
Total			30			19



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Figure G.14. Inventory Balance Report.



APPENDIX H

FILE NAME

Table H.1. File Name: Product Master File.

No.	File Name	Type	Description	Width	Default
1	Product Code	Text	Product Code	15	Null
2	Product Name	Text	Product Name	40	Null
3	Category	Text	Category	20	Null
4	UOM	Text	Unit of Measure	10	Null
5	Cost/unit	Currency	Cost/unit	15	Null
6	Min_Qty	Number	Minimum Quantity	Long Integer	Null
7	Max_Qty	Number	Maximum Quantity	Long Integer	Null
8	Reorder Qty	Number	Reorder Qty	Long Integer	Null
9	Reserve Qty	Number	Reserve Qty	Long Integer	Null
10	Stock Balance	Number	Stock Balance	Long Integer	Null
11	Available Balance	Number	Available Balance	Long Integer	Null

Table H.2. File Name: Reserve File.

No.	File Name	Type	Description	Width	Default
1	Reserve No.	Text	Reserve Number	10	Null
2	PRL No.	Text	Product Requisition List Number	10	Null
3	Date	Date	Reserve Date	10	Null
4	Product Code	Text	Product Code	15	Null
5	Product Name	Text	Product Name	40	Null
6	QtyOnRequest	Number	Quantity on Request	Long Integer	Null
7	QtyUnavailable	Number	Quantity Unavailable	Long Integer	Null
8	UOM	Text	Unit of Measure	10	Null
9	Date Required	Date	Date Required	15	Null

Table H.3. File Name: Reorder File.

No.	File Name	Type	Description	Width	Default
1	P/R No.	Text	Purchase Requisition Number	10	Null
2	P/R Date	Text	Purchase Requisition Date	15	Null
3	Date Required	Date	Date Required	15	Null
4	Product Code	Date	Product Code	15	Null
5	Product Name	Text	Product Name	40	Null
6	Quantity	Text	Quantity	Long Integer	Null
7	UOM	Number	Unit of Measure	10	Null
8	Price/Unit	Text	Price per Unit	15	Null
9	Total Amount	Currency	Total Amount	15	Null
10	Remark	Memo	Remark	50	Null

Table H.4. File Name: Receipt File.

No.	File Name	Type	Description	Width	Default
1	Receiving No.	Text	Receiving No.	10	Null
2	Receiving Date	Date	Receiving Date	15	Null
3	P/R No.	Text	Purchase Requisition Number	10	Null
4	Product Code	Text	Product Code	15	Null
5	Product Name	Text	Product Name	40	Null
6	Quantity	Number	Quantity	Loge Integer	Null
7	UOM	Text	Unit of Measure	10	Null
8	Cost/Unit	Currency	Cost/Unit	15	Null
9	Total Amount	Currency	Total Amount	15	Null
10	Remark	Memo	Remark	50	Null

Table H.5. File Name: Issue File.

No.	File Name	Type	Description	Width	Default
1	Issue No.	Text	Issue Number	10	Null
2	Issue Date	Date	Issue Date	15	Null
3	Product Code	Text	Product Code	15	Null
4	Product Name	Text	Product Name	40	Null
5	Quantity	Number	Quantity	Long Integer	Null
6	UOM	Text	Unit of Measure	10	Null
7	PRL. No.	Text	Purchase Requisition List No.	10	Null
8	Remark	Memo	Remark	50	Null

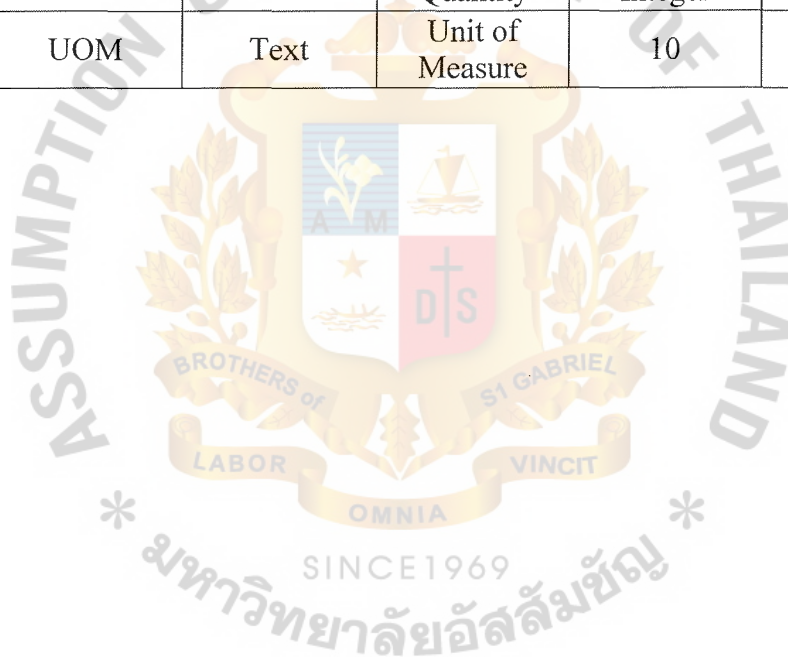
Table H.6. File Name: Return File.

No.	File Name	Type	Description	Width	Default
1	Product Code	Text	Product Code	10	Null
2	Returned Date	Date	Returned Date	15	Null
3	Product Code	Text	Product Code	15	Null
4	Product Name	Number	Product Name	40	Null
5	Quantity	Text	Quantity	Long Integer	Null
6	UOM	Number	Unit of Measure	10	Null
7	Reason	Memo	Reason	50	Null



Table H.7. File Name: Count File.

No.	File Name	Type	Description	Width	Default
1	Transaction No.	Text	Document Number	10	Null
2	Date	Date	Date	15	Null
3	Remark	Memo	Remark	50	Null
4	Product Code	Text	Product Code	10	Null
5	Product Name	Text	Product Name	40	Null
6	Count Qty	Number	Count Quantity	Long Integer	Null
7	UOM	Text	Unit of Measure	10	Null



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