CPK Trading Purchasing System for Safety Shoes Product

by

Ms. Sureeporn Teerachaiwutikul

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	CPK Trading Purchasing System for Safety Shoes Product
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Academic Year	July 28, 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 for the degree of Master of Science in Computer Information Systems.

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ABSTRACT

This project covers the analysis, design and implementation of an information system for CPK Trading Co.,Ltd. The scope of this project covers the inventory and purchasing section and its related activities. The problems of existing system are product storage, items missing or misplaced, too much quantity in stock for some period of time but insufficient at the others, many document and documents processes.

To analyze the existing system and to design the new computer system to meet the expectation and requirements of the executives, to give up-to-date information to the management and customers and suppliers in time, the new computerized system will provide the efficiency and effectiveness for the inventory and purchasing control. A new computerized system for the purchase section is designed to replace the existing manual system. It is expected to provide the inventory and purchasing information rapidly and allow immediate access to the information. Moreover, it provides the convenience and fast services for recording, finding or reporting the purchasing and inventory information.

The study of this project begins with problem definitions and existing system analysis. By using tools such as data flow design diagrams to describe the information flow, the new system can be designed to solve the limitations and to meet users' expectations. It will solve the problem of manual system and decrease the high maintenance cost.

ACKNOWLEDGEMENTS

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I. INTRODUCTION

1.1 Background of the Project

This project was created from the effort of Purchasing Section of CPK Trading Co., Ltd. to improve the quality and quantity of purchasing output. In the past, the purchaser takes much time consuming action for approval process because there are many redundant process documents in duplicated purchasing system and price comparison in analyzing. Now business environment has changed, many transactions have increased resulting from the increase in production volume but purchasers are still using manual operations to order and approve purchase orders. This resulted in delay of order and production.

1.2 Objectives of the Project

The objectives of this project are as follows:

(1) To analyze the existing system and design a new system computerized system for more effective work.

(2) To identify user requirement.

(3) To identify business requirement.

(4) To identify information system requirement.

(5) To design and develop a new system based on all requirements.

(6) To improve the efficiency and effectiveness of the organization about the procurement system.

(7) To support the ever increasing data within the organization.

(8) To reduce manual work and duplication of work.

(9) To complete and propose readily accessible information about current status of purchase orders and inventory so that planners can forecast the plan for production.

1.3 Scope of the Project

To study, analyze and design the Purchasing system starting from receiving the requirements from the requesters to purchase inventory and/or non-inventory and issue the purchase order to suppliers.

(1) To collect the users' requirements

(2) To investigate the problems of the current manual system

(3) To establish a new system to help the users eliminate or minimize the human errors of keying data in to the system

(4) To design screen layout, input-output form and reports to help users and management make use of the information

(5) To create the on-line programs to show the status of purchase order, and inventory

(6) To design screen layout to key in the details of inventory for purchase order

(7) Cost/Benefit of the new system

1.4 Deliverables

The activities of the project can be classified in three phases as follows:

Phase I System Analysis (Existing System)

(1) Define the problem. The study of inventory and purchasing department is Responsible for purchasing information system w hich involves the following activities:

(a) Discuss with management, collect data and identify problem areas.

(b) Study written procedures and identify procedural problems.

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(c) Observe the current system.

(d) Interview involved personnel and identify system problems.

(e) Gather the other data

(f) Evaluate the findings.

(g) Conclude the definition of the problems.

(h) Discuss the findings with the management and identify the problems.

(2) Develop study plan

(3) Gather the information on the area and between the areas under study. The study of inventory and purchasing department involves the following activities:

(a) Interview with personnel affected.

(b) Study written procedures.

(c) Gather background information on the area under study and its interactions.

(4) Understanding the Existing Requirements:

(a) Combine the general background, the interactions and the understanding of the each department in order to develop a complete understanding of the entire system.

(b) Document the existing system in detail.

Phase II Detailed Analysis and Design (New System)

(5) Define the New System Requirements

(a) Define inputs, outputs, operations and the resources.

(b) Take into account the current requirements, the future requirements and requirements imposed by management.

(6) Design the New System

    (a) Design inputs, outputs, operations and the resources.

    (b) Document the new designs.

(7) Develop the Economic Cost Comparisons. This includes the evaluation of costs and benefits of the proposed system.

Phase III Implementation (New System)

The implementation involves building and installing the new system. It emphasizes training people. However it is not included in this project.

1.5 Project Plan

The project analysis uses the Gantt Chart to be the general form of scheduling tool and specific form of project management control activity. The project will be done according to the schedule shown in terms of the Gantt Chart.

This project started on June 1, 2001. It was done according to the format as illustrated in Figure 1.1 Gantt Chart of Activity for CPS.

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No.	Task Name	June 1	June 2	June 3	June 4	July 1	July 2	July 3	July 4	Aug 1	Aug 2	Aug 3	Aug 4	Sep 1	Sep 2	Sep 3	Sep 4
	I. Analysis of the Existing System	◄──────────────────►															
1	Define the Objective and Scope	█															
2	Study the Existing System		█														
3	Identify the Existing Problems			█													
4	Study the Existing Computer System			█													
5	Develop Context Diagram				█												
6	Develop Data Flow Diagram					█											
7	Cost and Benefit Analysis						█										
	II. Analysis and Design of the Proposed System						◄──────►										
8	Interface Design						█										
9	Report Design						█										
10	Database Design						█	█									
11	Network Design						█										
12	Program Design						█										
	III. Implementation of the Proposed System									◄────────────────────────────────────►							
13	Coding									█	█	█					
14	Testing												█	█			
15	Hardware Installation									█	█						
16	Software Installation														█		
17	Conversion															█	█

Figure 1.1. Project Plan of CPS Purchasing Information System.

II. THE EXISTING SYSTEM

2.1 Background of the Organization

CPK Trading Co., Ltd. manufactures the safety shoes. It is also a distributor of several brands of safety shoes. The corporation provides all types of safety shoes such as oil and non-oil resistance safety shoes, electricity safety shoes, and chemical safety shoes. The major departments are as follows:

2.1.1 Marketing Department

This department is very important because it has a part of selling, purchasing, and inventory controlling. There are 2 divisions of this department as follows:

(1) Sales Division: to respond to customers in domestic area.

(2) Planning Division: to respond to checking the stock of products and sales operation plan from sales division and ordering the products to balance the inventory from purchasing and inventory division.

(3) Purchasing Division: to respond to checking the stock of products and buying the products to balance the inventory from the domestic supplier and oversea supplier.

2.1.2 Financial and Accounting Department: to respond to the cash flow and capital of company and banking document and to respond to the payables of the company.

2.1.3 Factory Department

For this department, it is about the delivery and product inventory which is divided into 2 divisions as follows:

(1) Delivery Division: to respond to delivering the requested products to customers.

(2) Product Inventory Division: to monitor raw materials and the products for selling to customers.

The organization chart of the CPK Trading Company is depicted in Figure 2.1.

2.2 Existing Business Function

The existing function of the company can be summarized as follows:

Process 1:

Sales department sends sales operation plan to planning section to check the customer's product request, then check the availability of the products.

Process 2:

Inventory section checks the availability of products by counting all items on the shelf manually and check with the file.

Process 3:

When the inventory section checks the availability of products, and they are available, the inventory will issue the items by withdrawing the quantity out of the file.

Process 4:

When the products are unavailable on the shelf, the inventory section will send the off stock list to planning section in order to issue order by purchase. Purchasing section prepare the purchase process by checking the supplier information.

Process 5:

When the products are unavailable and the purchasing section have already ordered the items to the supplier, the products are delivered to the company. The inventory section will receive the ordered products by manually recording the quantity on the file and keep the items on the shelf. The inventory will send the supplier invoice to accounting department for payment.

2.3 Current Problems and Area for Improvement

The executives of the selected company are interviewed and requirements are recorded. The current problems and areas for improvements of the existing system can be summarized as follows:

(1) Products are out of stock, or over and under balance. It is difficult and spends more time on checking the inventory status and inventory valuation of all transactions.

(2) The numbers of transaction items are so large that it is difficult to update all transactions completely, that leads to too much investment on inventory.

(3) Updating the stocks is too late; there are many kinds of stock items. Moreover, items are always missing or misplaced.

(4) Management cannot forecast and produce the purchasing plan.

2.4 Context Diagram and Data Flow Diagram of the Existing System

Context Diagram of the existing Purchasing and Inventory System is shown in Figure A.1 while the Data Flow Diagram of Existing System Level 0 is shown in Figure A.2.
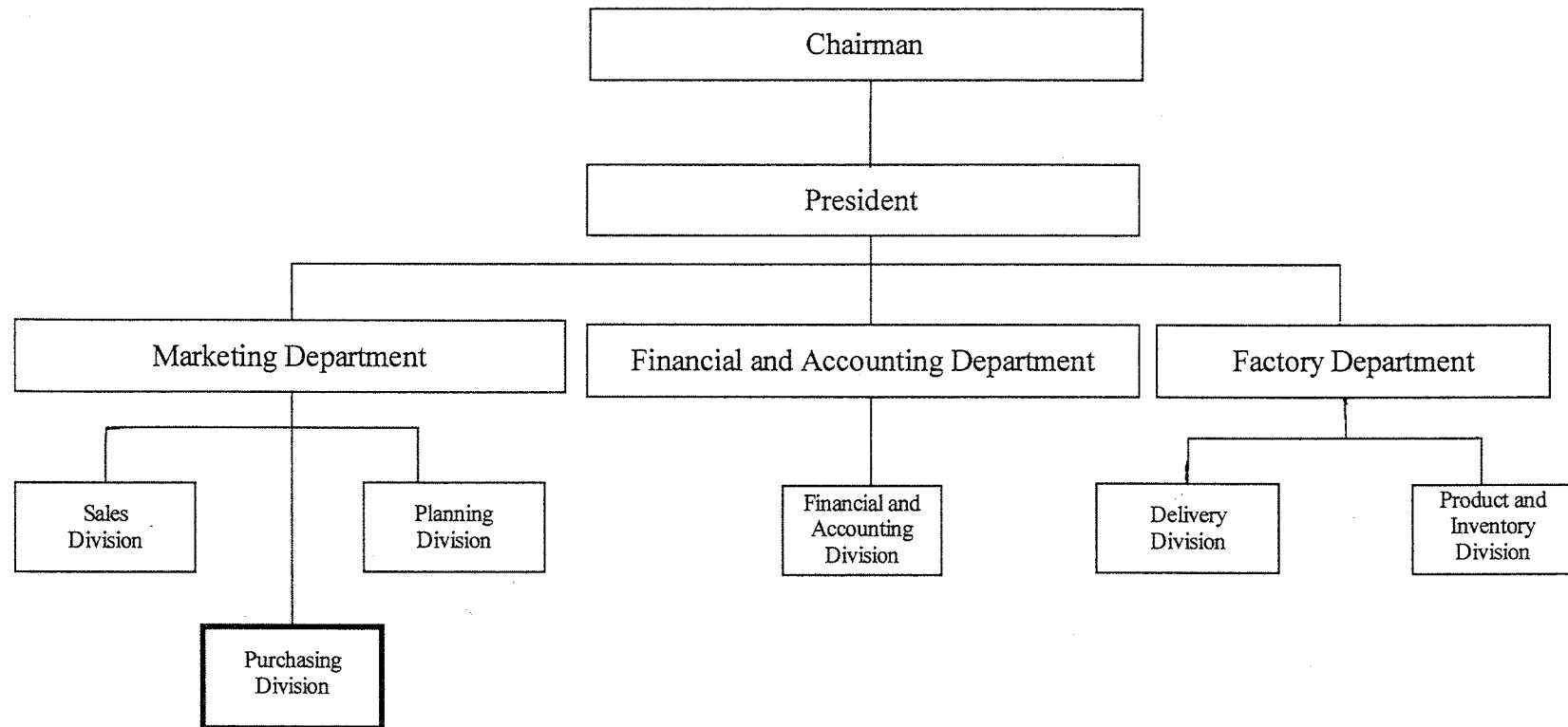
Figure 2.1.   The Organization Chart of CPK Trading System Co., Ltd.

III. THE PROPOSED SYSTEM

3.1 System Specification

The proposed database for purchasing and inventory system will provide the purchasing and inventory section with the computerized information system instead of the manual system and also provide several benefits to both operational level and management level.

For operational level, it will:

(1)   Improve the working method

(2)   Reduce data entry error

(3)   Reduce paper movement

(4)   Shorter processing time

Streamline purchasing and invoicing process

For management level, it will:

(1)   Provide existing information more rapidly or provide immediate access to data, which now does not activate.

(2)   Provide more up-to-date information instead of the original month-end or three month-end.

(3)   Provide more accurate information either in terms of arithmetical accuracy or in terms of closer representative of the real world.

Database design of the proposed system is carried out and the result file specifications are giving in Appendix B.

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3.2 System Design

System Design is the evaluation of alternative solutions and the specification of a detailed computer-based solution. It is also called physical design. There are many strategies or techniques for performing. In this CPS system, system design includes Process Design, Database Design, File Design, input design, Output Design, and Interface Design.

3.2.1 Process Design

Process Modeling is the technique for organizing and documenting the structure and flow of data through the system's process and/or the logic, policies, and procedures to be implemented by the system's process. We use a Context Diagram to define the scope or boundary of this project. The context diagram of the Existing system and Proposed system will be shown in Figures A.1 and A.2 of Appendix A respectively. Additionally, in this project, we use a Data Flow Diagram (DFD) as a tool to depict the flow of data through a system and the work of processing performed by that system. The data flow diagram level 0-1 of the existing system and the proposed system will be shown in Figures A.3 – A.12 of Appendix A.

3.2.2 Database Design

DBMS is responsible for access to a database, one of the first steps in installing and using a database involves telling the DBMS the logical and physical structure of the data and relationship among the data in the database. The DBMS can refer to a schema to find where to access the requested data in relation to other prices of data. A DBMS also acts as a user interface by providing a view of the database.

Data dictionary contains the name of the data item aliases or other names that may be used to describe the item, the range of values that can be used, the type of data, the amount of storage needed for the item.

Some of the typical uses of data dictionary are to:

(1) Provide a standard definition of terms and data elements.

(2) Assist programmers in designing and writing programs.

(3) Simplify database modification.

(4) Reduce data redundancy.

(5) Increase data reliability.

(6) Provide faster program development.

(7) Provide easier modification of data and information.

The CPS database and data dictionaries are depicted in Figures G.1-G.4 of Appendix G respectively.

3.2.3 File Design

There are 11 files for this project which are Material Master File, On Stock List File, Off Stock List File, MRP Database File, Purchase Requisition File, Vendor Master File, Purchase Order File, Warehouse File, Payment File, Goods Receipt File, Sales Operation File. The master files are typically fixed length records. Associative entities from the data model are typically joined into the transaction records to form variable-length records. The information about each file, which includes file name, type of file, width of file, and description will be shown in Tables H.1-H.11 of Appendix H.

3.2.4 Input Design

For CPS input design, we need to consider many alternatives and methods before designing the inputs, because accurate data input is so critical to successful processing, file maintenance, and output. We also consider human factor and internal controls for input design. Source document of our system is a paper form used to record data that will eventually be input to a computer. Data capture is the identification of new data to be input. It will be best to capture the data as soon as possible after it is originated.

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Screen display form and source document is designed to be easy for the system user to complete and facilitate rapid data entry. In this project we select the Microsoft Visual Basic to be the program that we will use for this system. Developing graphical user interfaces for the new application involves two stages for input design. In the first stage, we focus on correctly identifying the confirming content of input and, consistent with the repository based programming, identifying property or characteristic for that input data. The second stage deals with the overall appearance or look and feel of the input. This stage is typically referred until the designer has given consideration to the overall appearance and working of the entire application interface.

3.2.5 Output Design

Output presents information to system users. Outputs are the most visible component of a working information system. They are the justification for the system. During system analysis, we define output needs and requirements, but we did not design those outputs. So at this stage we design effective output for system users. There are two basic types of computer outputs in this system the first type is external output which are printers. Some are designed as turn around documents. The second type is internal outputs, which stay inside the system to support the system users and manager. Those outputs fulfill management reporting and decision support requirements. The output medium for this system, which identify where the output information is reordered on is paper. The format output for this system is tabular output which using columns of text and numbers.

3.2.6 Interface Design

Interface design for this system is specification of conversation between system user and the computer. This conversion generally results in either input or output possibly both. The type of interface design that we use in this system is menu selection.

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The menu selection presents a list of alternatives or options to users. The selecting menu option in this system is iconic menu. The system user selects the design alternative or option by clicking on the icon, which shows the topic that is associated with that option. The GUI are used to develop the interface for this system. We develop the applications that takes the advantage of the look and feel of Window-based application. The program that we select for our system is Microsoft Visual Basic.

3.3 Hardware and Software Specification

The hardware & software specifications for the proposed system are shown in the Tables 3.1 and 3.2 respectively.

Table 3.1. The Hardware Specification.

Hardware	Specification
HUB	Multiconnector port (HUB) 1 Set, Lan card 10/100, RJ 45
UTP	UTP cable
Processor	Intel Pentium IV for computer server, Inter Pentium III 866 MHz for work station.
RAM	512 MB SDRAM for computer server, 128 MB SDRAM for work station
Hard Disk	Seagate 84 GB for computer server, Seagate 20 GB for work station
Floppy Disk Drive	1.44 MB
Cache Memory	512 MB
VGA Card	Super VGA on board
CD-ROM Drive	Creation 52X
Monitor	ADI 15" Flat Square
Keyboard	108 Keys

Table 3.1.   The Hardware Specification (Continued).

Hardware	Specification
UPS	1000 VA
Dot Matrix Printer	Pin 24 Pins, Speed 330 CPS, Memory 16 KB

Table 3.2.   The Software Specification.

Software	Specification
Operating System	Novell Network Version 4.0 (5 Users), Microsoft Windows 98 Thai Edition
Application System Software	Microsoft Windows 98 Professional (Thai Edition) Version 8.0, Microsoft Visual Basic Version 6.0 Edition, Microsoft Word 97Thai Edition, Microsoft Power Point 97Thai Edition, Norton Utilities, Norton Anti Virus, Printer Driver, LAN Card System, Other Application Program.

All work station in the purchasing department are connected by 1 computer server. They are centralized by LAN (Local Area Network) System and Novell Network version 2.0 (5 users). There is 1 printer in this system for the different purposes. The Network Architecture for CPK Trading Purchasing and Inventory System is depicted on Figure 3.1. This system uses Norton Utilities to protect and Norton Anti Virus to make system more safe and protect the system network to be free from virus.

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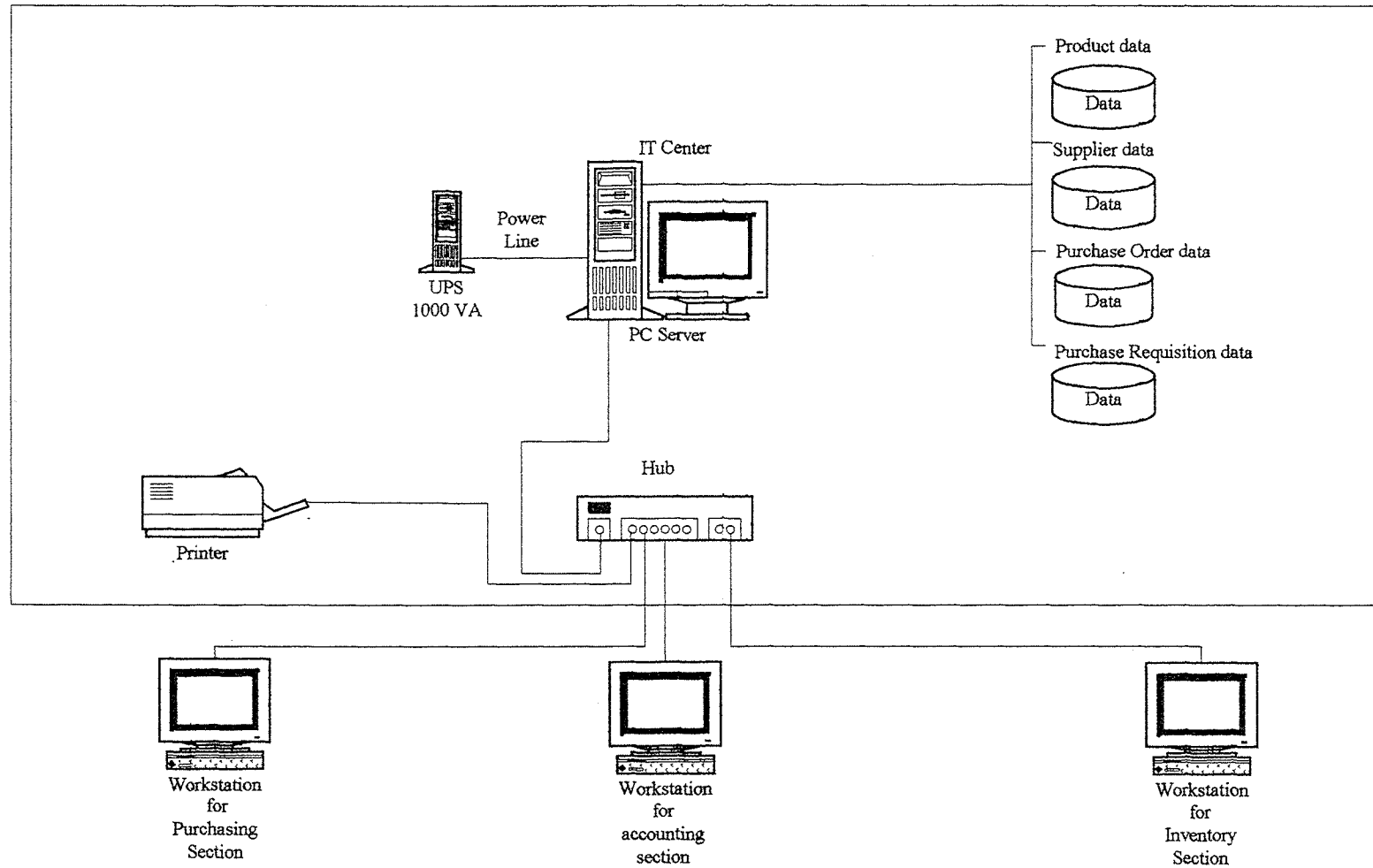
Figure 3.1. Network Architecture for CPK Trading System Co., Ltd.

3.4 Security and Control

The following security and controls are considered for the computer-based system.

(1) Only an authorized person can access the system and do data entry, modify, and correct the data.

(2) All the data first and system programs must be stored on the secondary storage medium such as floppy diskette to ensure the correctness of data and system operation in case of program failure.

(3) Backup all the files every time the database is updated or modified. And it is recommended that the backup should be done within that day and separately kept all the files in a secure place, and label all the backup copies.

(4) All source documents must be stored in a security place to prevent unauthorized persons to modify.

(5) The computer hardware office must be securely locked after office hours.

(6) Only an authorized person should sign in the source document as requests and the copy of those documents should be sent to other related sections for reference.

(7) Stamp the source documents at the time of inputting to ensure against inputting the same source documents twice.

(8) Ensure that the operators receive adequate training on the use of the new system.

(9) When the computer is turned on, the user must check the correctness of data that the reports will have the current date printed on them.

(10) Visually scan output reports for completeness and proper formatting.

3.5 System Cost Analysis

3.5.1 Cost Analysis

(1) Costs of Manual System

Table 3.3. Manual System Cost Analysis, Baht.

Cost items		Years				
		1	2	3	4	5
Fixed Cost						
Typewriter	1 unit @ 8,500	8,500.00	-	-	-	-
Calculator	5 units @ 1,150	5,750.00	-	-	-	-
Total Fixed Cost		14,250.00	-	-	-	-
Operating Cost						
Salary Cost:						
Inventory Manager	1 person @ 25,000	25,000.00	27,500.00	30,250.00	32,500.00	35,000.00
Staff:						
Stock officer	1 person @ 15,000	15,000.00	17,000.00	20,000.00	23,000.00	25,000.00
Receiving clerk	1 person @ 9,000	9,000.00	12,000.00	14,000.00	16,000.00	19,000.00
Total monthly salary Cost		49,000.00	56,500.00	64,250.00	71,500.00	79,000.00
Total Annual Salary Cost		588,000.00	678,000.00	771,000.00	858,000.00	948,000.00
Office Supplies & Miscellaneous Cost:						
Stationary	Per Annual	36,000.00	42,000.00	44,400.00	48,000.00	54,000.00
Paper	Per Annual	84,000.00	90,000.00	102,000.00	114,000.00	126,000.00
Utility	Per Annual	60,000.00	66,000.00	72,000.00	78,000.00	88,200.00
Miscellaneous	Per Annual	24,000.00	26,400.00	30,000.00	32,400.00	35,400.00
Total Annual Office Supplies & Miscellaneous Cost		204,000.00	224,400.00	248,400.00	272,400.00	303,600.00
Total Annual Operating Cost		792,000.00	902,400.00	1,019,400.00	1,130,400.00	1,251,600.00
Total Manual System Cost		806,250.00	902,400.00	1,019,400.00	1,130,400.00	1,251,600.00

Table 3.4. Five Years Accumulated Manual System Cost, Baht.

Year	Total Manual Cost	Accumulated Cost
1	806,250.00	806,250.00
2	902,400.00	1,708,650.00
3	1,019,400.00	2,728,050.00
4	1,130,400.00	3,858,450.00
5	1,251,600.00	5,110,050.00
Total	5,110,050.00	–

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(2)   Costs of Computerized System

Table 3.5.   Computerized System Cost Analysis, Baht.

Cost items	Years				
	1	2	3	4	5
Fixed Cost					
Hardware Cost:					
Workstation Cost with UPS Cost	35,000.00	35,000.00	35,000.00	35,000.00	35,000.00
Total Hardware Cost	35,000.00	35,000.00	35,000.00	35,000.00	35,000.00
Maintenance Cost:					
Maintenance Cost	--	--	--	25,000.00	10,000.00
Total Maintenance Cost	--	--	--	25,000.00	10,000.00
Software Cost:					
Computer Server Cost	--	--	--	--	--
Network Cost	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00
Total Software Cost	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00
Implementation Cost:					
Advanced Training Cost	35,000.00	--	--	--	--
Basic Training Cost	20,000.00	--	--	--	--
Set up Cost	10,000.00	--	--	--	--
Total Implementation Cost	65,000.00	--	--	--	--
Office Equipment Cost:					
Calculator 3 Units @ 1,150	3,450.00	--	--	--	--
Total Office Equipment Cost	3,450.00	--	--	--	--
Total Fixed Cost	118,450.00	50,000.00	50,000.00	75,000.00	60,000.00
Operating Cost					
People-Ware Cost:					
Inventory Manager 1 person @ 25,000	25,000.00	27,500.00	30,250.00	32,500.00	33,000.00
Staff:					
Stock Officer 1 person @ 15,000	15,000.00	17,000.00	20,000.00	23,000.00	25,000.00
Total Monthly Salary Cost	40,000.00	44,500.00	50,250.00	55,500.00	58,000.00
Total Annual Salary Cost	480,000.00	534,000.00	603,000.00	666,000.00	696,000.00
Office Supplies & Miscellaneous Cost:					
Stationary 1,500 per month	35,000.00	65,000.00	35,000.00	15,000.00	12,500.00
Paper 5,000 per month	105,000.00	125,000.00	45,000.00	35,000.00	30,000.00
Utility 5,000 per month	105,000.00	125,000.00	45,000.00	35,000.00	21,500.00
Miscellaneous 3,000 per month	61,550.00	96,500.00	47,000.00	29,000.00	15,000.00
Annual Office Supplies & Miscellaneous Cost	306,550.00	411,500.00	172,000.00	114,000.00	79,000.00
Total Operating Cost	306,550.00	730,000.00	775,000.00	863,000.00	775,000.00
Total Computerized System Cost	905,000.00	995,500.00	825,000.00	855,000.00	835,000.00

Table 3.6. Five Years Accumulated Computerized Cost, Baht.

Year	Total Computerized Cost	Accumulated Cost
1	905,000.00	905,000.00
2	995,500.00	1,900,500.00
3	825,000.00	2,725,500.00
4	855,000.00	3,580,500.00
5	835,000.00	4,415,500.00
Total	4,415,500.00	–

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

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

Year	Accumulated Manual Cost	Accumulated Computerized Cost
1	806,250.00	905,000.00
2	1,708,650.00	1,900,500.00
3	2,728,050.00	2,725,500.00
4	3,858,450.00	3,580,500.00
5	5,110,050.00	4,415,500.00

Accumulated Cost, Baht
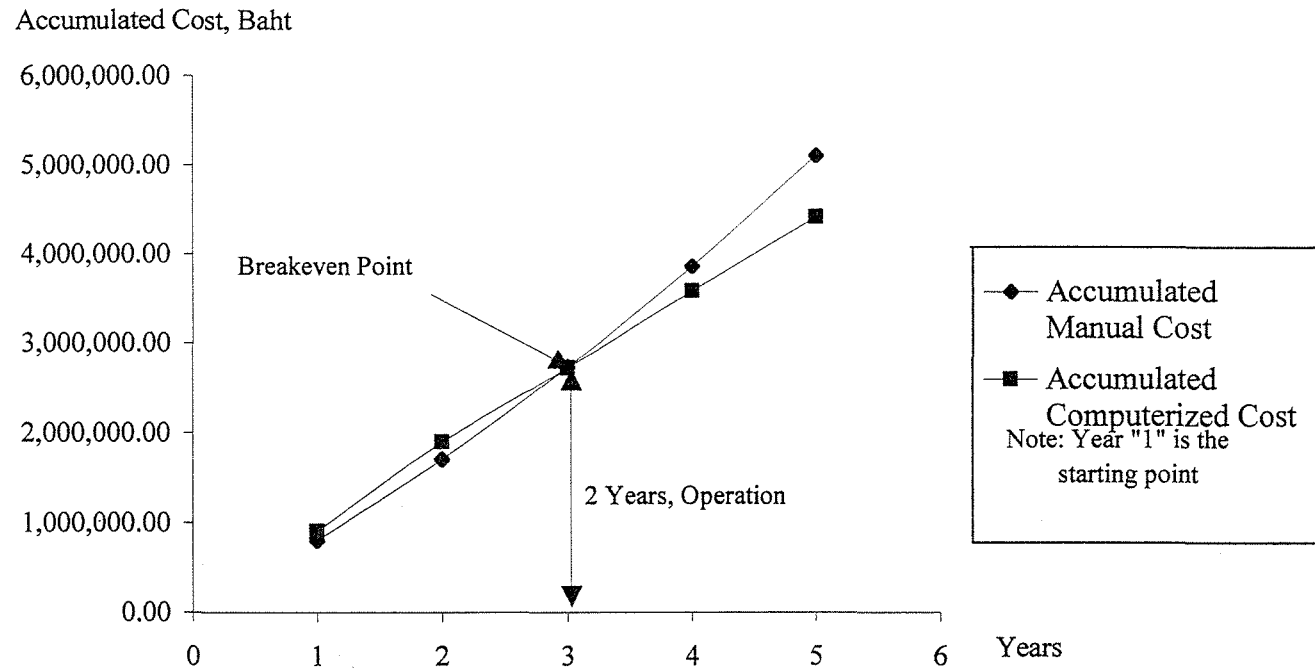
Figure 3.2.   Cost Comparison between Manual and Computerized System.

3.5.2 Benefit Analysis

    (a)   Intangible Benefits:

          (1)   Increase efficiency in work process

          (2)   Reduce volume of paper produced and handle

          (3)   Improve working process by providing accurate, security control

          (4)   Increase customer satisfaction

          (5)   Increase employee motivation

    (b)   Tangible Benefits:

          (1)   Fewer processing error

          (2)   Reduced responses

          (3)   Reduced expenses

          (4)   Increase sales

          (5)   Saving on overtime expenses

3.5.3 Payback Period

The Payback Analysis, technique is a simple and popular method for determining if and when an investment will pay for itself. The lifetime costs are gradually increasing over the six-year period because operating costs are being incurred. But also notice that the lifetime benefits are accruing at a much faster pace. Lifetime benefits will over the lifetime cost between years 2.

Table 3.8. Payback Analysis for the Proposed System, Baht.

| Cost Items	Years					
	0	1	2	3	4	5
Development Cost	-905,000.00	0	0	0	0	0
Operation & maintenance cost	0	-50,000.00	-50,000.00	-50,000.00	-75,000.00	-65,000.00
Discount factors for 12%	1.000	0.893	0.797	0.712	0.636	0.567
Time-adjusted costs (adjusted to present value)	-905,000.00	-44,650.00	-39,850.00	-35,600.00	-47,700.00	-36,855.00
Cumulative time-adjusted costs over lifetime	-905,000.00	-949,650.00	-989,500.00	-1,025,100.00	-1,072,800.00	-1,109,655.00
Benefits derived form operation of new system	0	350,000.00	400,000.00	450,000.00	500,000.00	550,000.00
Discount factors for 12%	1.000	0.893	0.797	0.712	0.636	0.567
Time-adjusted costs (adjusted to present value)	0	312,550.00	318,800.00	320,400.00	318,000.00	311,850.00
Cumulative time-adjusted costs over lifetime	0	312,550.00	631,350.00	951,750.00	1,269,750.00	1,581,600.00
Cumulative lifetime time-adjusted cost + benefit	-905,000.00	-637,100.00	-358,150.00	-73,350.00	196,950.00	471,945.00
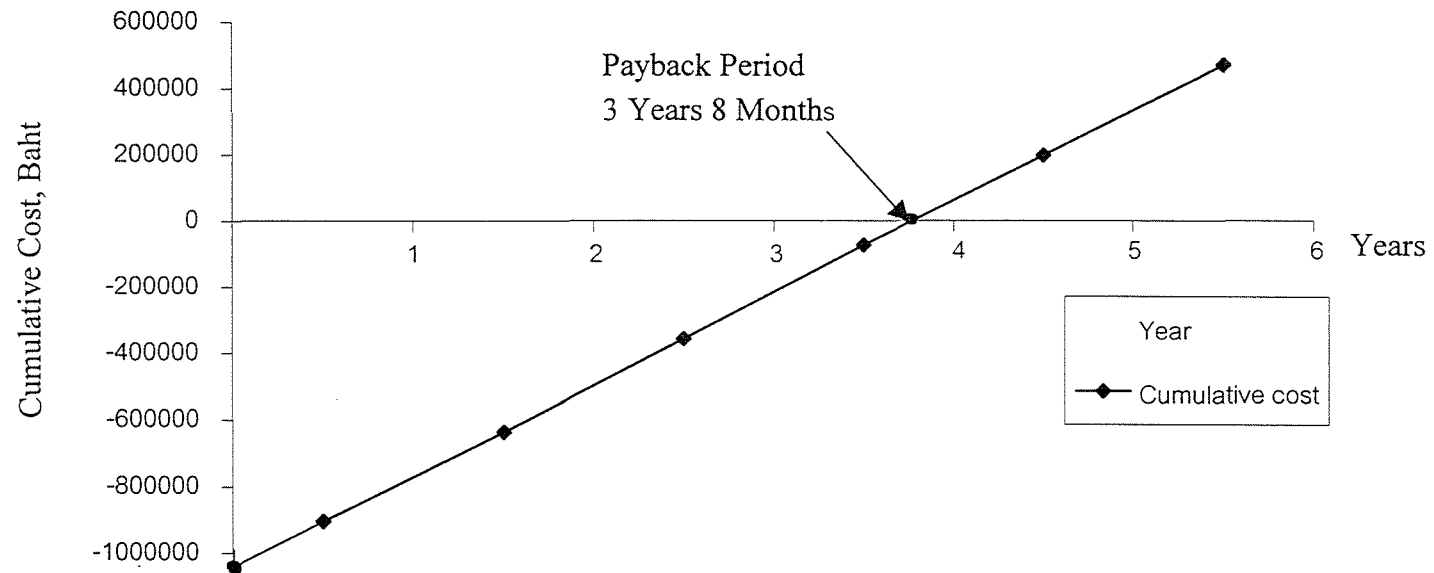
Figure 3.3. Payback Analysis.

IV. PROJECT IMPLEMENTATION

4.1 Overview of Project Implementation

After the management accepts the new system, the implementation will be started. Implementation of the new system is a major task as it is often the most difficult part of this project. It consists of the installation of the new system and the removal of the current system. It is concerned with hardware, software, and peopleware.

During the implementation, unexpected problems often occur. Solutions to these problems usually require modification to the original design.

The implementation process consists of four stages, which have to be performed in sequence. The four stages of implementation are as follows:

(1) Programming

All needed application programs will be written and/or ready to perform any computerized operating functions.

(2) Testing

Testing of specific program, subsystems, and total systems is essential to quality assurance. Testing must be done before the system is actually activated. Testing stage involves of the following:

(a) Testing individual program

(b) Data testing

(c) Link testing

(d) Module testing

(e) User acceptance testing

(f) System testing

These testings will be described in detail in title 4.2 Test Plan and Result.

(3)   Installation

Hardware installation usually involves vendors especially in case of on-line and real-time systems. While software installation involves loading all the written application programs onto the computer and getting them ready for operation.

(4)   Training

User training can be classified into:

(a)   Overview training: all people in the organization must learn or get some knowledge benefits to cooperate with the user of the system.

(b)   Detailed training: only users of the system must participate to know how to operate the system.

The well-designed and technically elegant systems can succeed or fail because of the way they are operated and used. Therefore, training provided to personnel is very critical to successful implementation.

4.2   Test Plan and Result

As this purchasing system is directly related to purchase order of the company, it is essential to have a quality assurance. Normally, these are what should be primarily tested.

(1)   Test the purchasing process starting from users log on the system page of filling the purchasing form.

(3)   Test the scalability of server with a large amount of data.

(4)   Test the affect of purchasing system to the back-end system

(5)   Test timeliness in responding e-mail

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(6) Test personnel and other supports to the system

These testing plans can be technically described as follows:

(1) Testing individual program. It is completed during the programming task by the development team. Program testing concentrates on the programs themselves in an attempt to make sure that each program works properly.

(2) Data testing. The testing consists of running a new or modified program, which appears to be working correctly with sample data. The sample data should be enough to cover all the conditions the program will encounter in its predictable future.

(3) Link testing. This is to test the upstream and downstream feeds between different programs and modules. These tests concentrate on the relationship between programs to ensure that the data created by one program is correct relatively to the program that follows it.

(4) Module testing. It is the process of testing the individual module that makes up the work program. This often consists of ensuring that the interfaces between modules work as they should and that these individual modules do not have an adverse effect on one another.

(5) User acceptance testing. It is the users' responsibility to make their own data to test the system, which meets requirements.

(6) System testing. This is to ensure that all the programs of the new system work together as they should. Acceptance evaluates the extent to which the new system meets user requirements under normal operating conditions, This is often the last chance to test and re-link the program before the software is converted from development to operations.

(7)   Operation acceptance testing. This is to ensure that the proposed system will function in the production environment without adversely affecting the existing system.

Testing was successfully completed from module testing through integration testing. The errors found during the tests were minor ones, which were fixed. The system performance should meet the stated objectives.

The Gantt Chart is shown in Figure 1.1.

V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Such redundancies, duplicate document, inaccurate customer and stock records, time consuming from irregular workflow, and a significant amount of budget spent on paperwork are the results of the manual operation system. During the analysis phase, it is obvious that the information derived from the proposed system could support the top management in the decision-making process in order to gain competitive advantage. Form Cost and Benefit Analysis, the proposed system is definitely beneficial to the company in a very short payback period. This Purchasing Order System has completed all the phases of System Development Life Cycle method and has achieved its objectives and scopes with satisfying performances.

Table 5.1. shows the time spent on each process of the Proposed System compared with the Existing System.

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

Process	Existing System	Proposed System
Update and Maintain Record Process	30 mins.	10 mins.
Stock Checking Process	30 mins.	5 mins.
Order Product Process	10 mins.	5 mins.
Accounting Process	15 mins.	5 mins.
Pay Vendor Invoice Process	5 mins.	2 mins.
Produce Report Process	1 hr.	15 mins.
Total	2.5 hrs.	42 mins.

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From Table 5.1 Degree of achievement between the Proposed System and Existing System, we can analyze that we can save time for every main process of purchasing system. User can update and maintain record, stock checking, order product, accounting process, pay vendor invoice and produce report easily and on time because system will update information all the time and online.

5.2 Recommendations

Problems usually come along with changes, hence, there must be plans and practices for every single section of the company in order to be ready for the conversion from the existing system to the proposed system.

Some recommendations for the success of the implementation of the proposed system are as follows:

(1) In the future, we will use bar code or web base to make the order to supplier and promote our products to customers.

(2) Purchasing system is not a stand alone system. It is designed on PC LAN network system that will share all the database system to support all of the daily operations, many authorized departments can access into this system for retrieving the data. Even in the future, if we have a new requirement system or new software, we can add the new system to interface with Purchasing System to get the same data since all purchasing data are kept in the RDBMS centralized network in the client/server system.

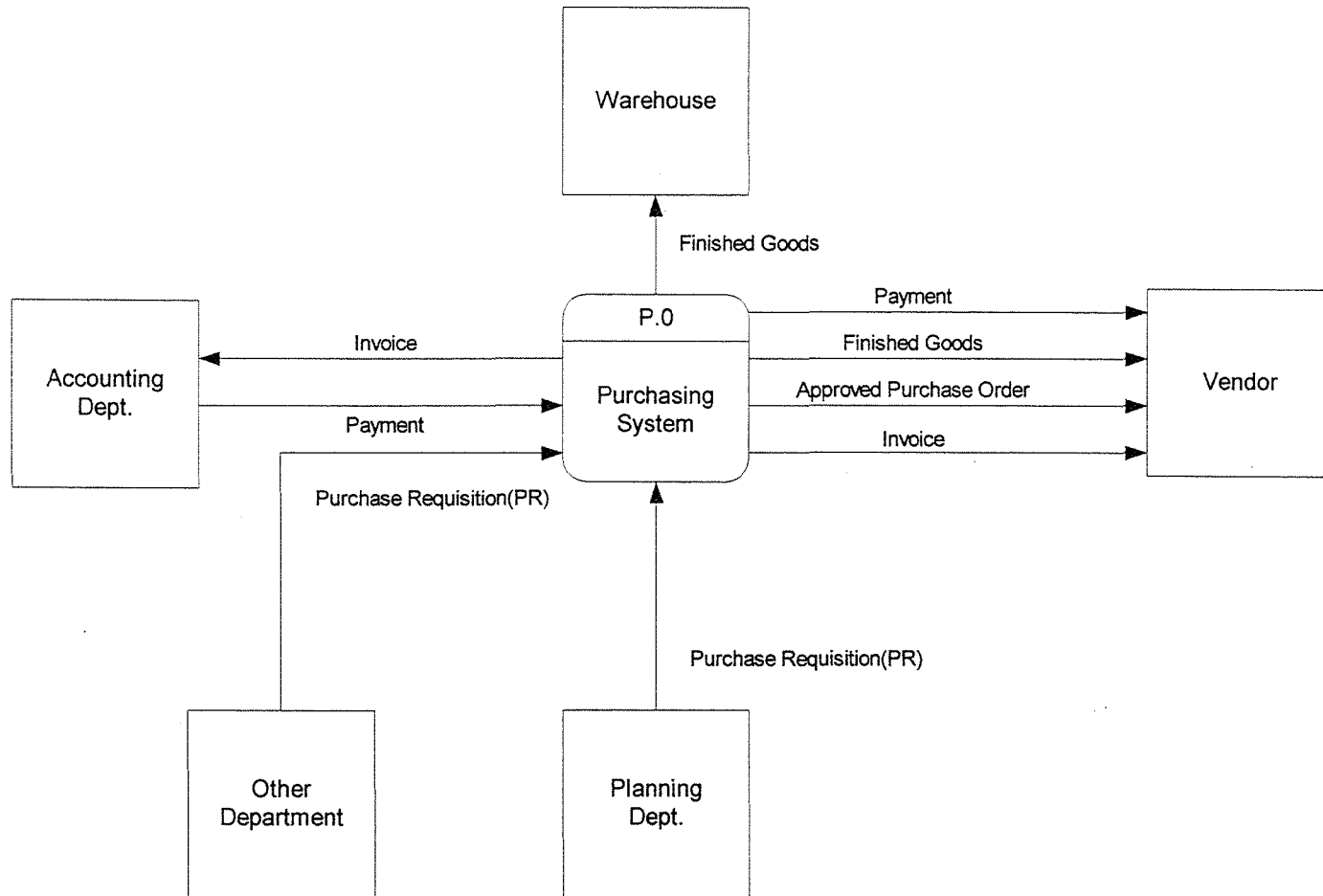# APPENDIX   A

CONTEXT DIAGRAM DESIGN

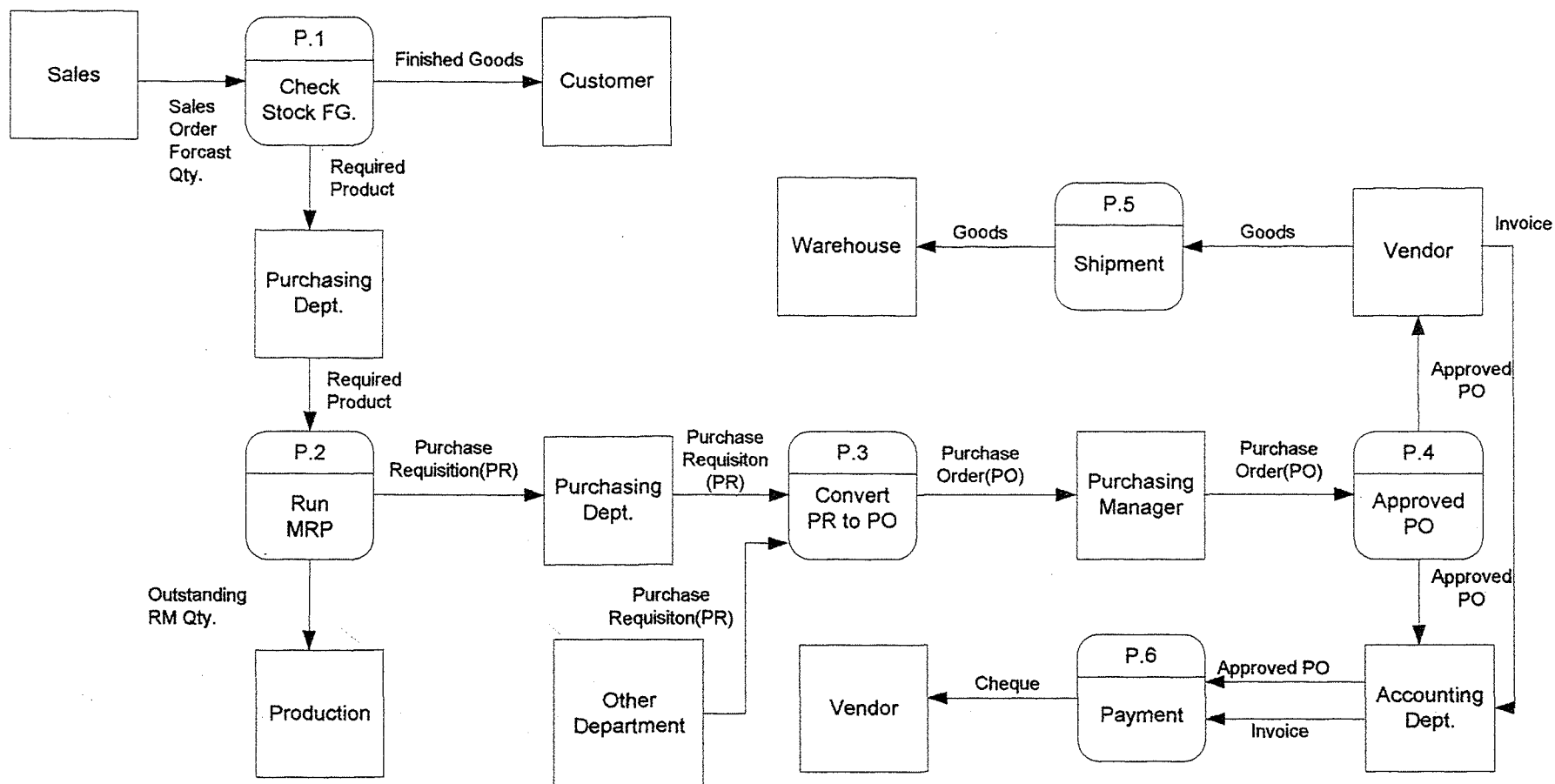Figure A.1.   Context Diagram of the Existing System.

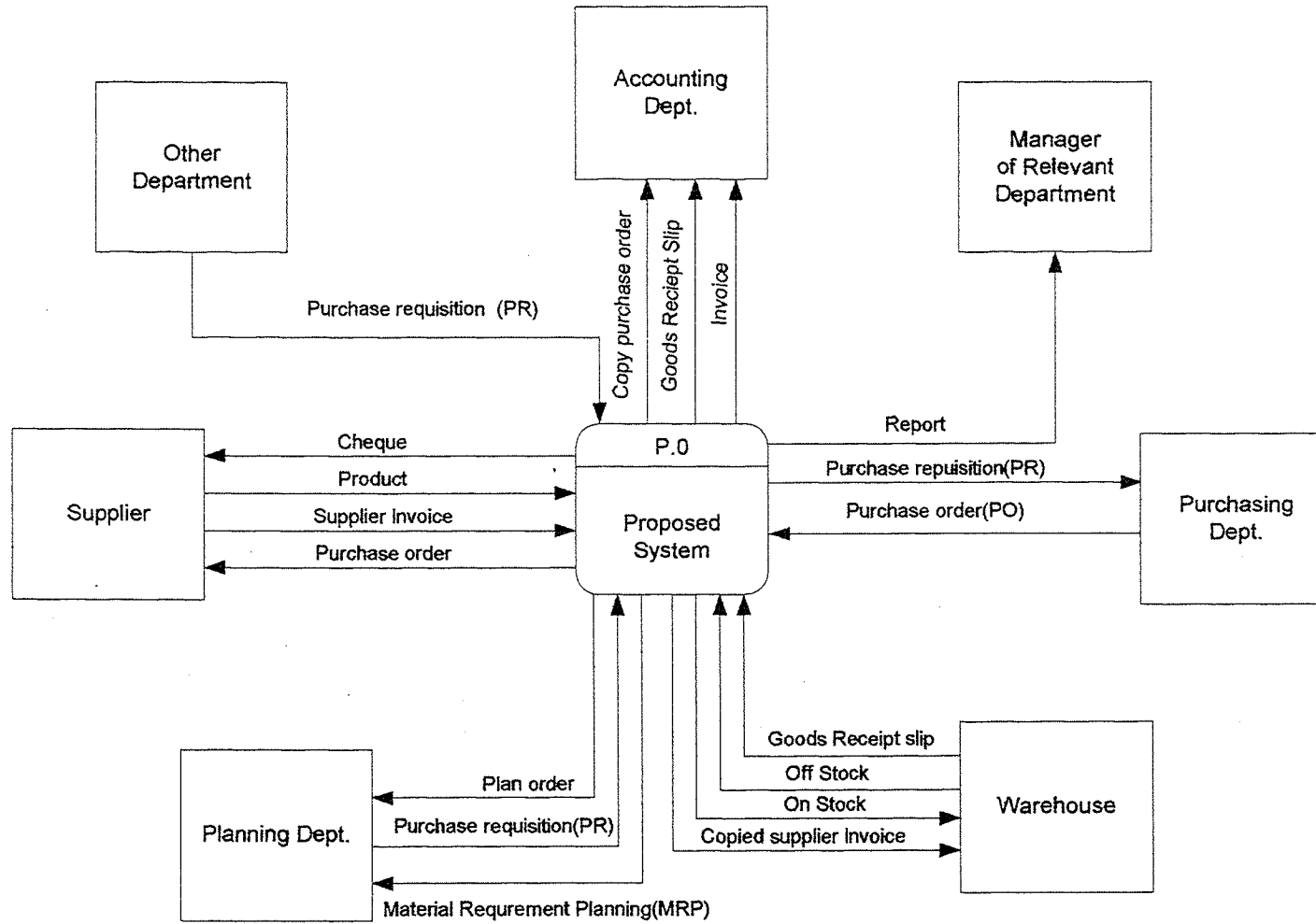Figure A.2. Data Flow Diagram (Level 0) of Existing System.

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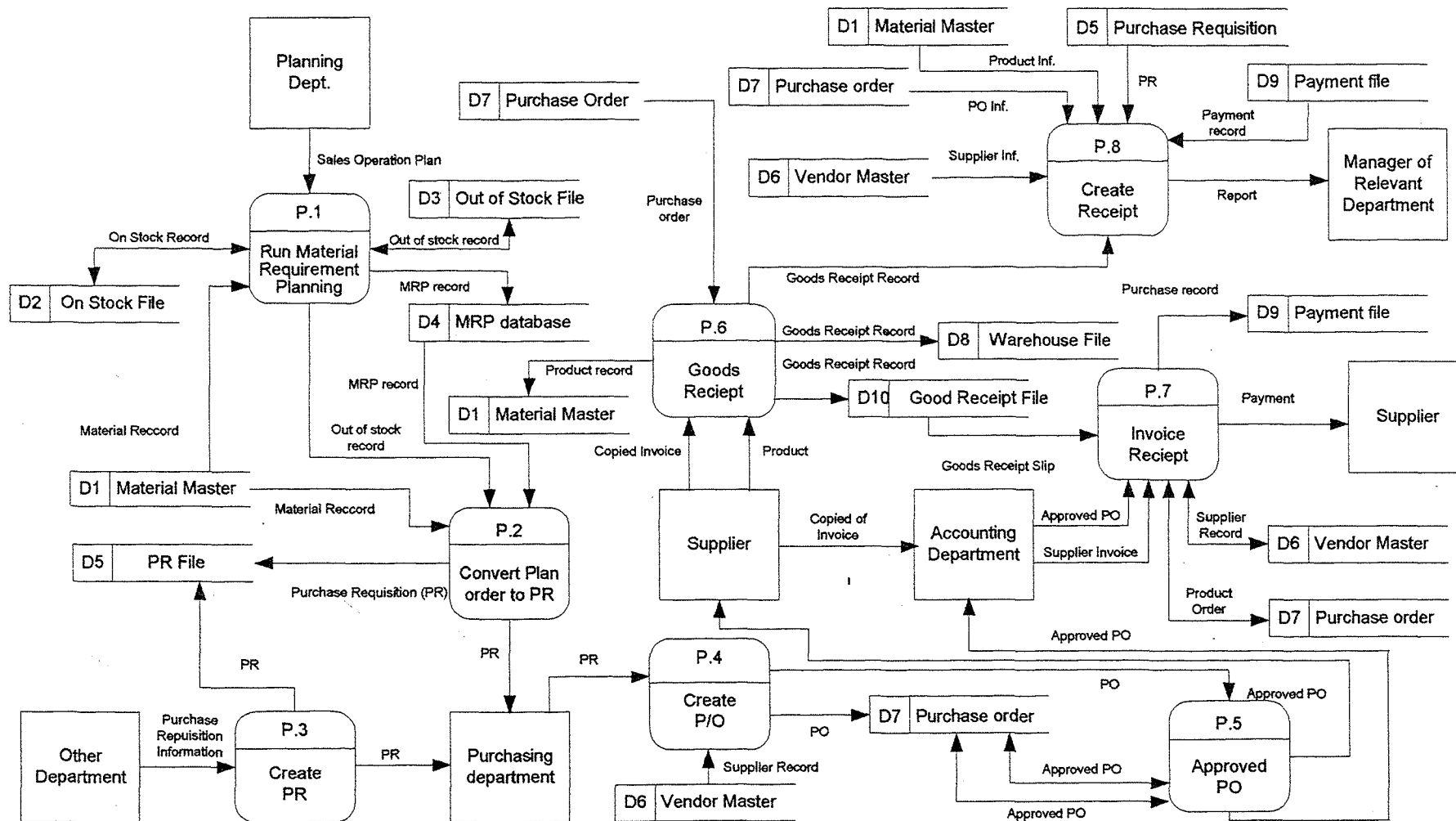Figure A.3.   Context Diagram of Proposed System.

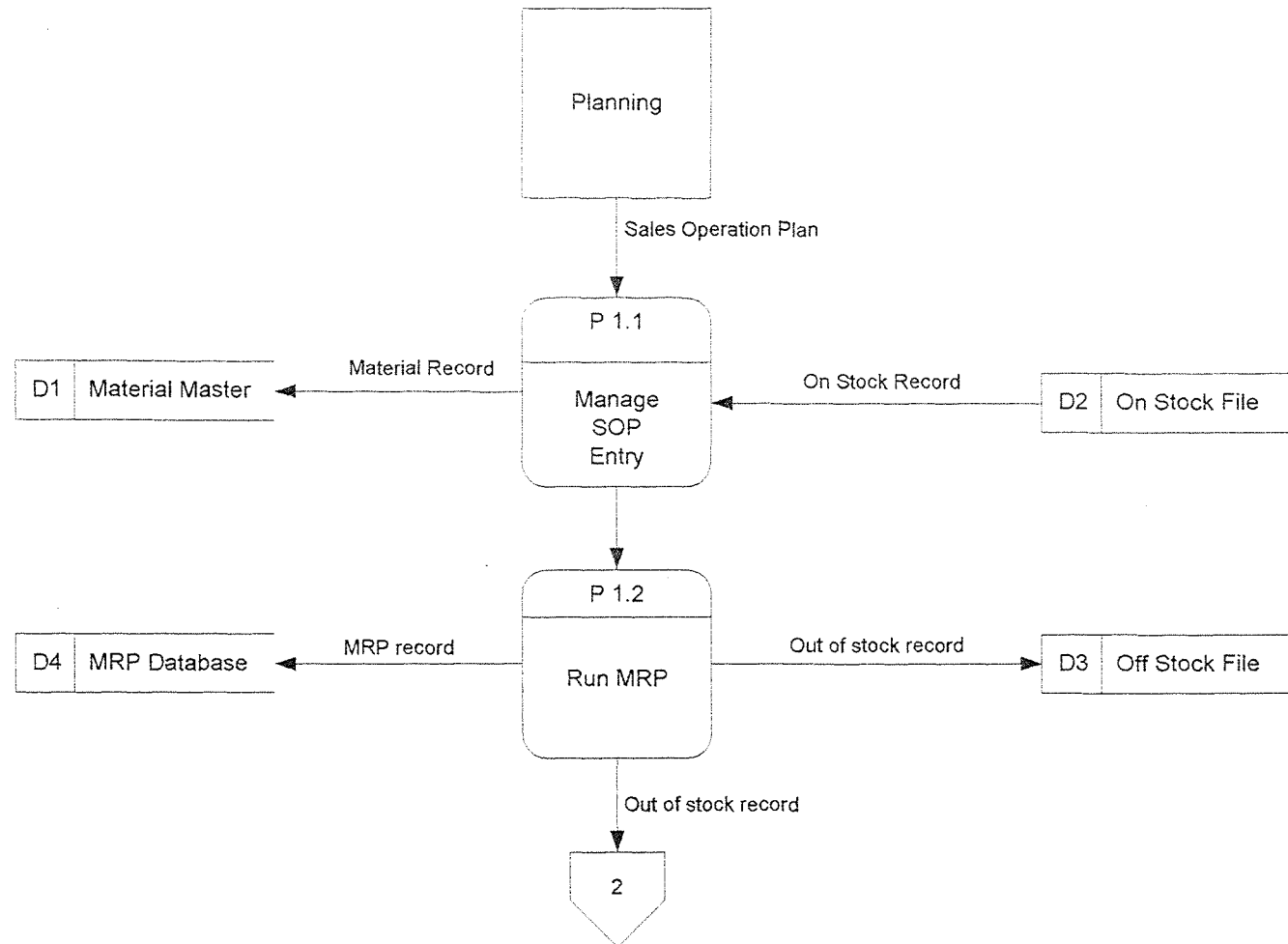Figure A.4.   Data Flow Diagram (Level 0) of the Proposed System.

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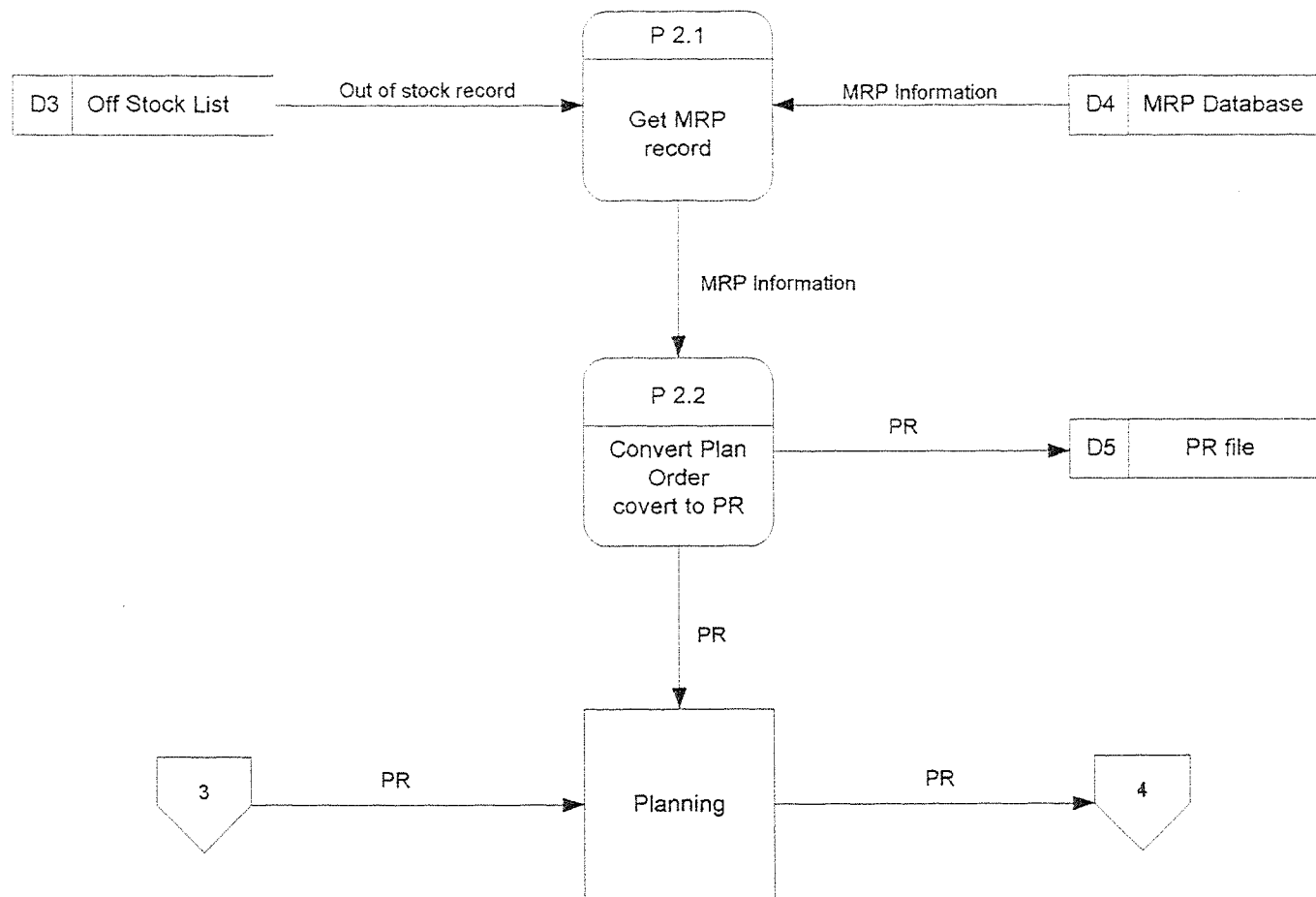Figure A.5. Data Flow Diagram (Level 1) of Proposed System, Process 1: Run Material Requriement Planning.

Figure A.6.   Data Flow Diagram (Level 1) of Proposed System, Process 2: Convert Plan Order to PR.

```
┌─────────────┐                          ┌─────────────┐
│             │      PR Information       │    P 3.1    │
│   Other     │ ───────────────────────► ├─────────────┤
│ Department  │                          │    Input    │
│             │                          │ Requisition │
│             │                          │    form     │
└─────────────┘                          └─────────────┘
                                                │
                                                │ PR Form
                                                ▼
                                         ┌─────────────┐
                                         │    P 3.2    │
                                         ├─────────────┤
                                         │             │
                                         │  Approved   │
                                         │     PR      │
                                         │             │
                                         └─────────────┘
                                                │
                                                ▼
                                         ┌─────────────┐       PR          ┌─────────────┐
                                         │    P 3.3    │ ───────────────►  │             │
                                         ├─────────────┤                   │ Purchasing  │
                                         │             │                   │    Dept.    │
                                         │   Create    │                   │             │
                                         │     PR      │                   │             │
                                         └─────────────┘                   └─────────────┘
                                                │
                                                │ PR
                                                ▼
                                  ┌────┬──────────────────┐
                                  │ D5 │ Purchase Oreder   │
                                  └────┴──────────────────┘
```
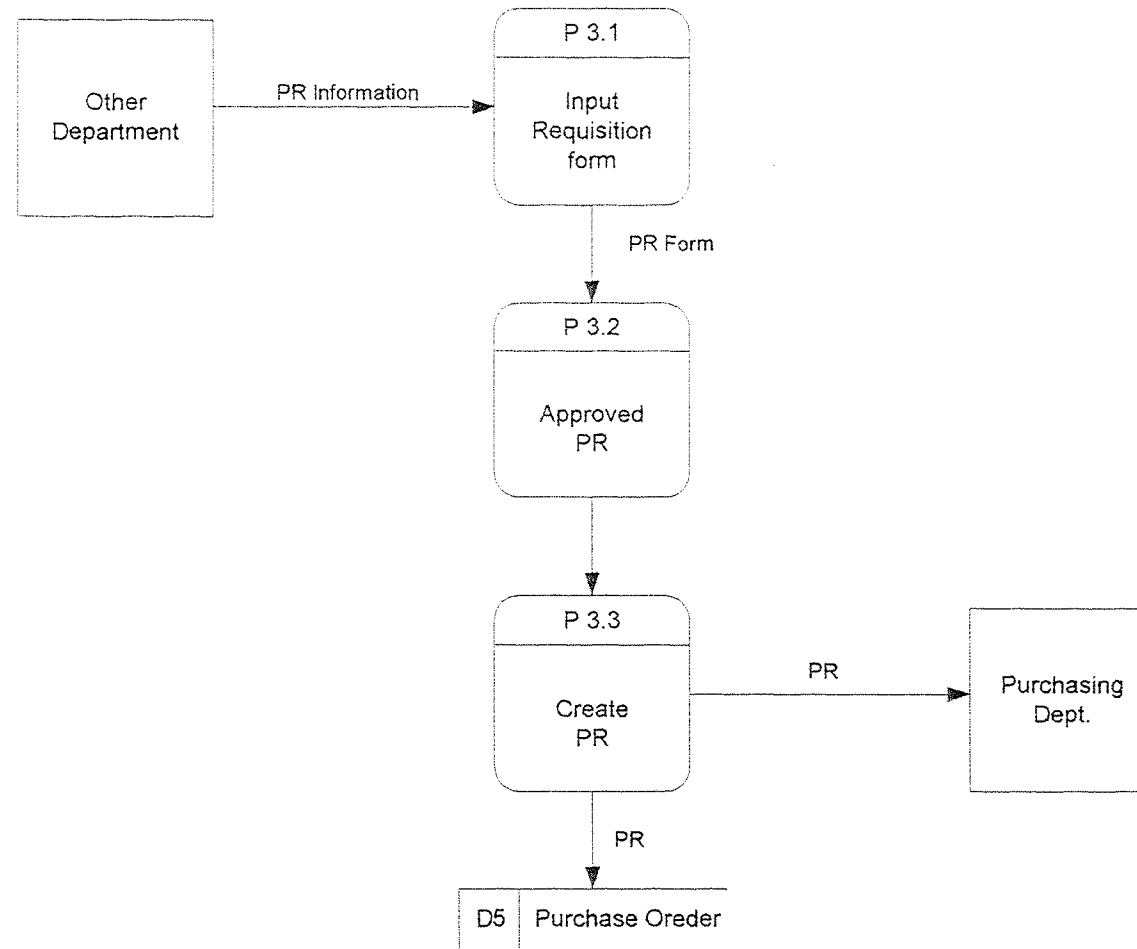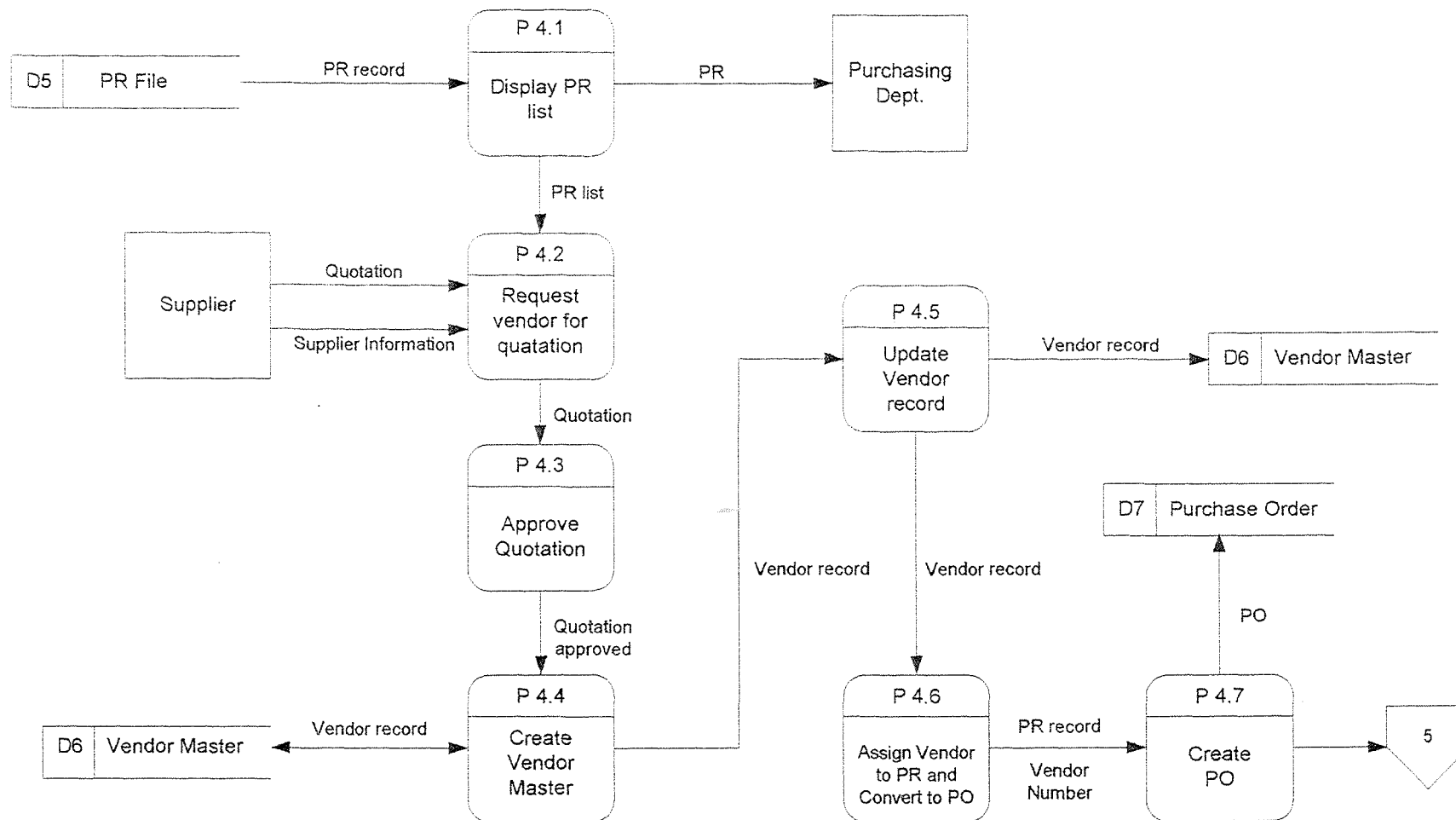
Figure A.7.   Data Flow Diagram (Level 1) of Proposed System, Process 3: Create PR.

Figure A.8.   Data Flow Diagram (Level 1) of Proposed System, Process 4: Create PO.

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| D7 | Purchase Order |

P 5.1

Get PO record

PO

PO record

P 5.2

Approve PO

Supplier

Approved PO

Approved PO

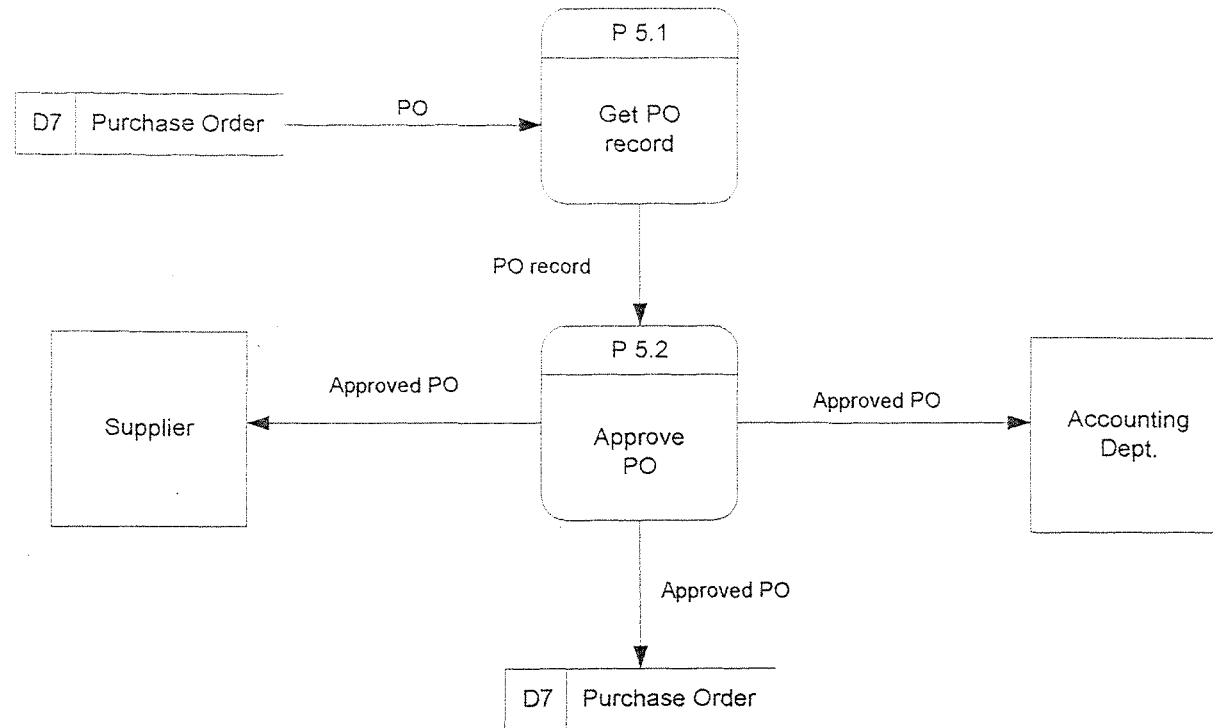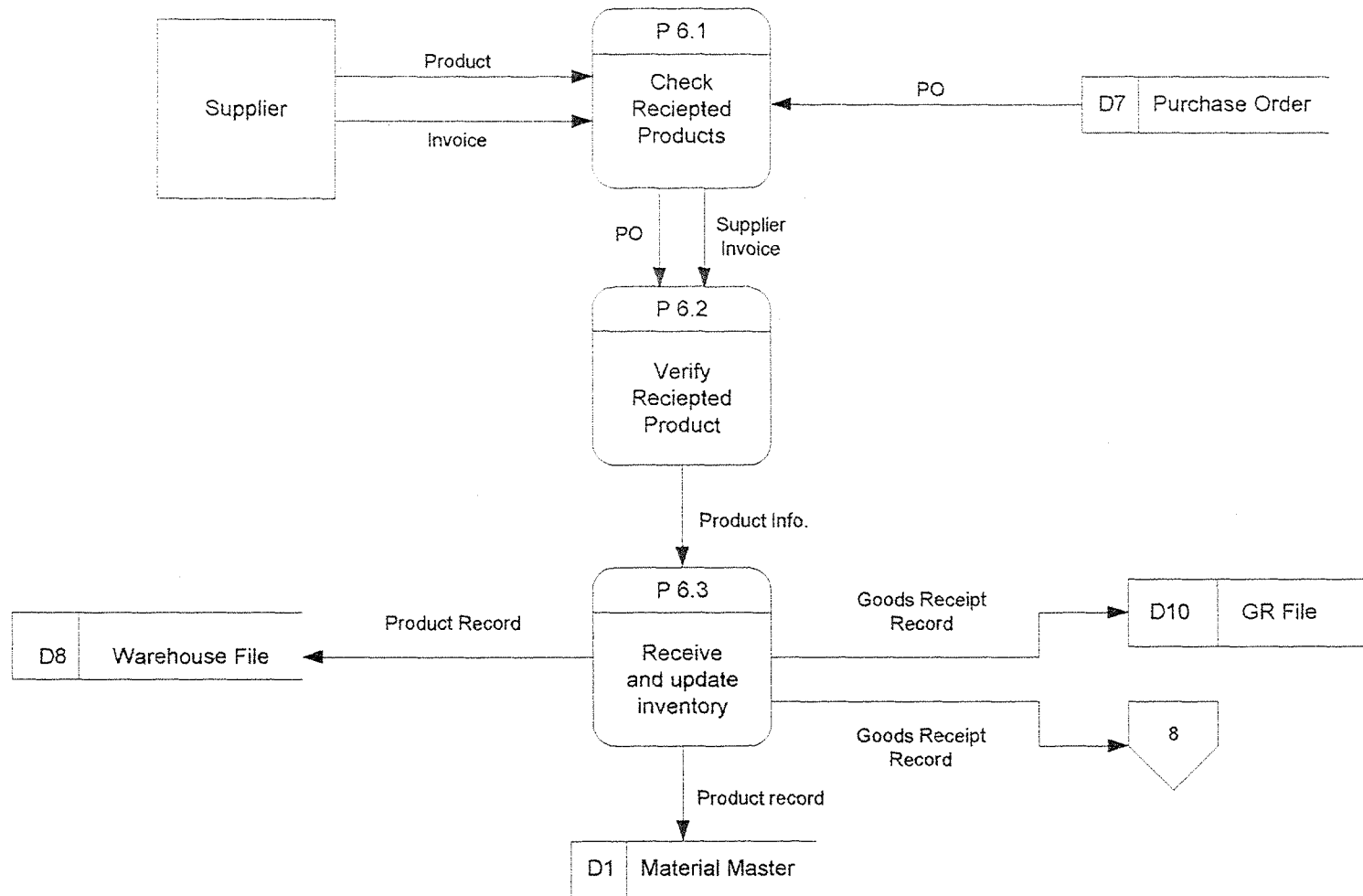Accounting Dept.

Approved PO

| D7 | Purchase Order |

Figure A.9.   Data Flow Diagram (Level 1) of Proposed System, Process 5: Approve PO.

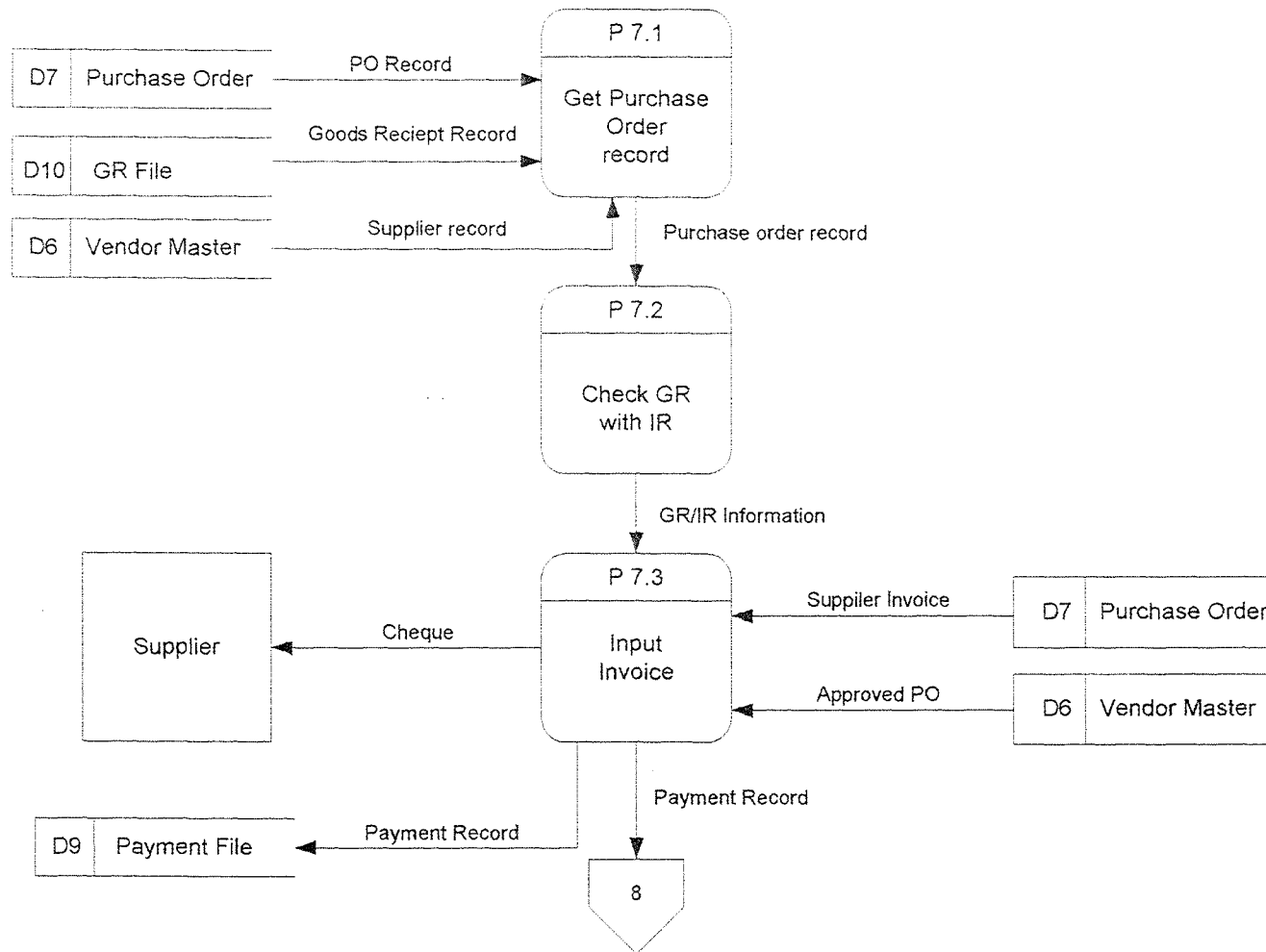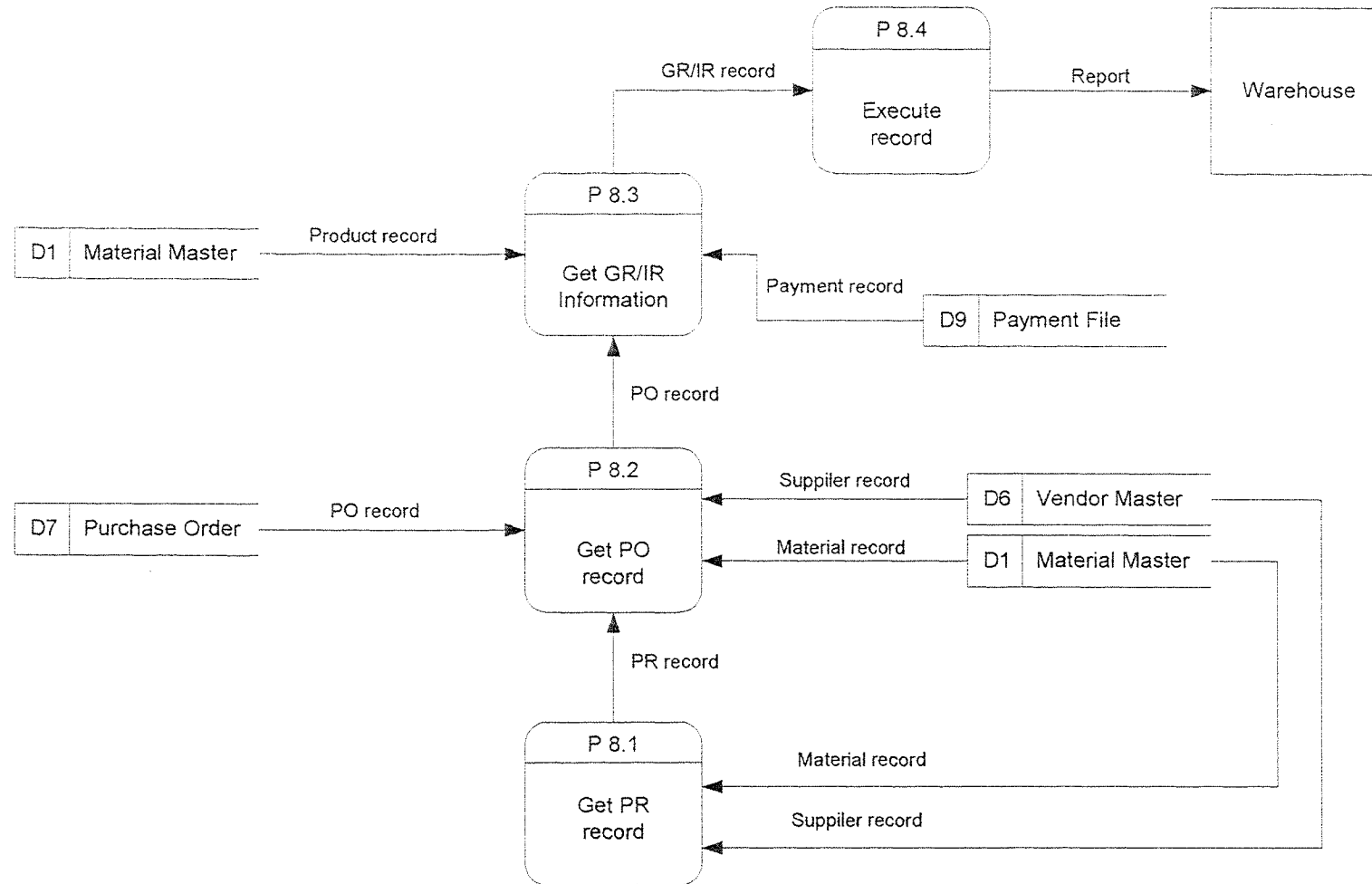Figure A.10. Data Flow Diagram (Level 1) of Proposed System, Process 6: Goods Reciept.

Figure A.11.   Data Flow Diagram (Level 1) of Proposed System, Process 7: Invoice Reciept.

Figure A.12.   Data Flow Diagram (Level 1) of Proposed System, Process 8: Create Report.
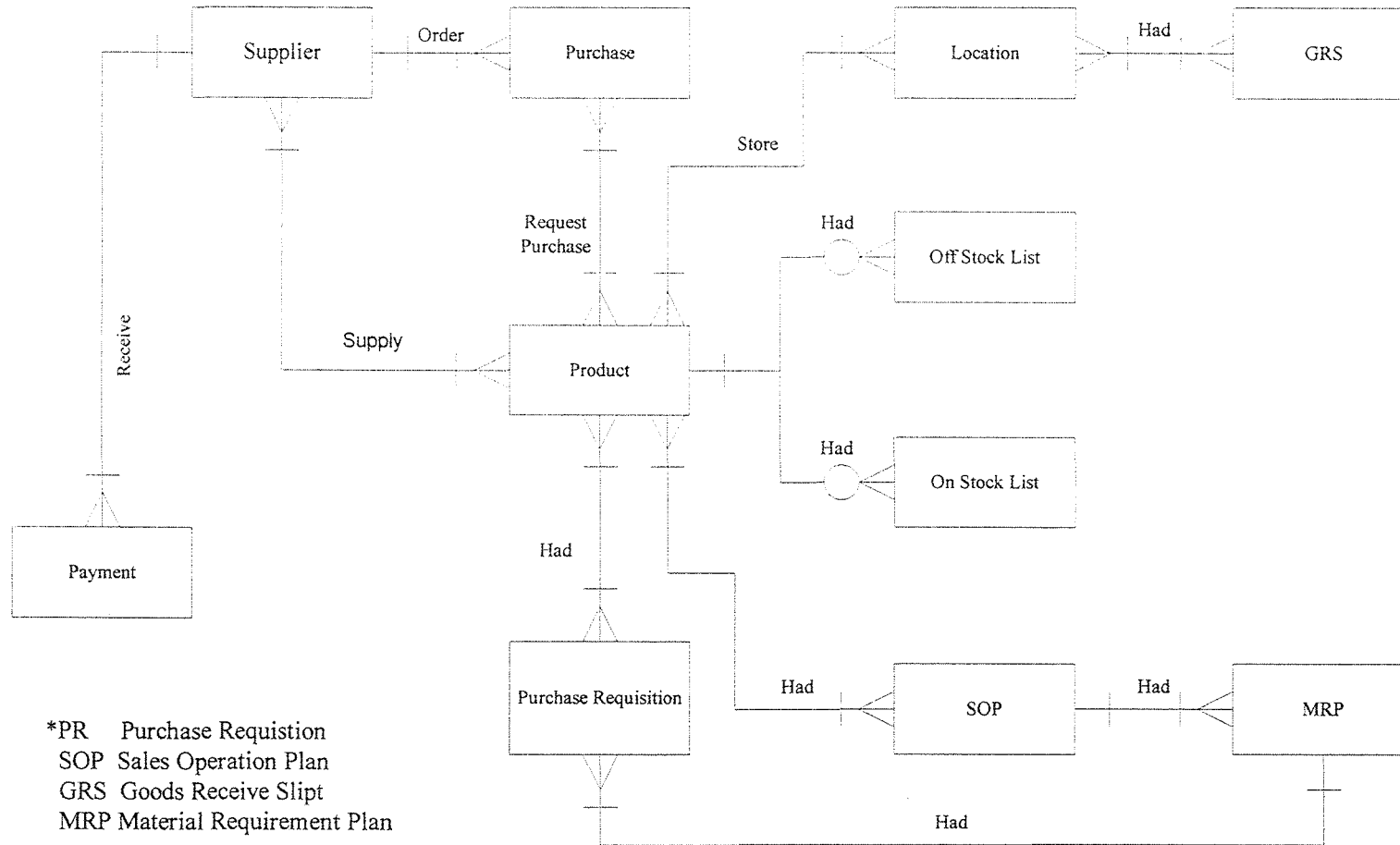
APPENDIX   B

DATABASE DESIGN

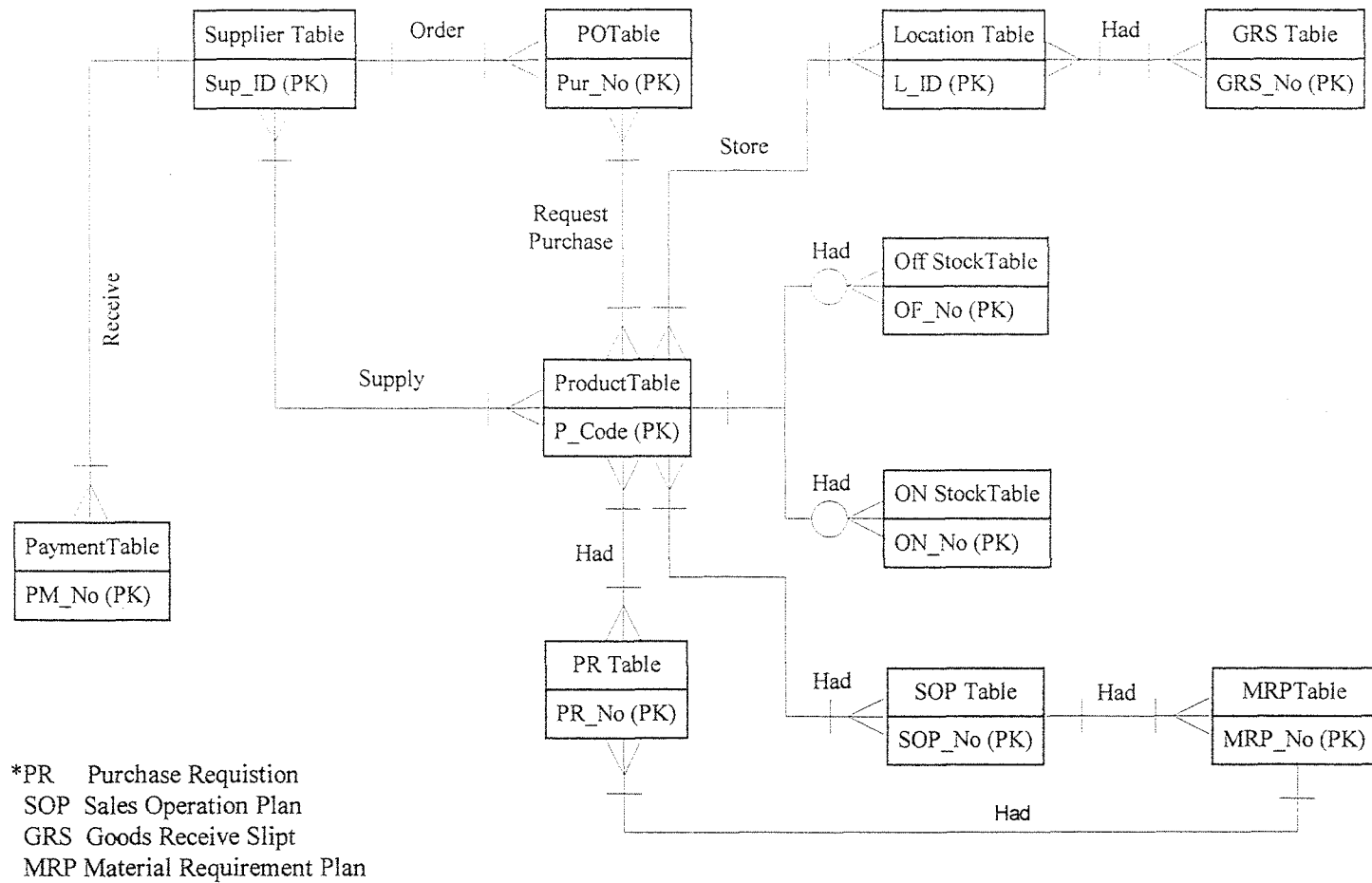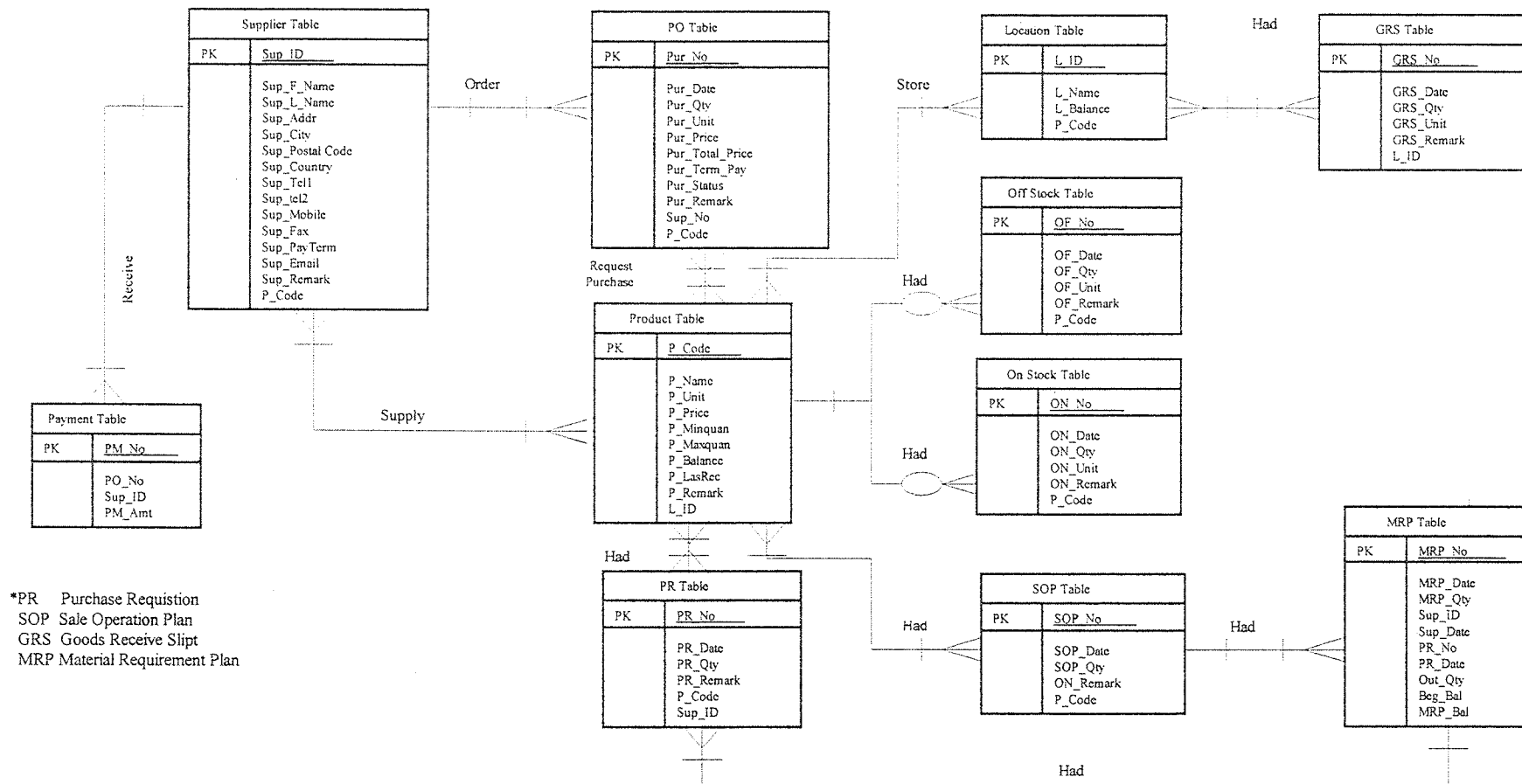Figure B.1. Context ER Diagram for CPK Purchasing System.

*PR   Purchase Requistion
SOP   Sales Operation Plan
GRS   Goods Receive Slipt
MRP Material Requirement Plan

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Figure B.2.   CPKS Key-Based Data Model.

Supplier Table

PK	Sup_ID
	Sup_F_Name
	Sup_L_Name
	Sup_Addr
	Sup_City
	Sup_Postal Code
	Sup_Country
	Sup_Tel1
	Sup_tel2
	Sup_Mobile
	Sup_Fax
	Sup_PayTerm
	Sup_Email
	Sup_Remark
	P_Code

PO Table

PK	Pur_No
	Pur_Date
	Pur_Qty
	Pur_Unit
	Pur_Price
	Pur_Total_Price
	Pur_Term_Pay
	Pur_Status
	Pur_Remark
	Sup_No
	P_Code

Location Table

PK	L_ID
	L_Name
	L_Balance
	P_Code

GRS Table

PK	GRS_No
	GRS_Date
	GRS_Qty
	GRS_Unit
	GRS_Remark
	L_ID

Off Stock Table

PK	OF_No
	OF_Date
	OF_Qty
	OF_Unit
	OF_Remark
	P_Code

Product Table

PK	P_Code
	P_Name
	P_Unit
	P_Price
	P_Minquan
	P_Maxquan
	P_Balance
	P_LasRec
	P_Remark
	L_ID

On Stock Table

PK	ON_No
	ON_Date
	ON_Qty
	ON_Unit
	ON_Remark
	P_Code

Payment Table

PK	PM_No
	PO_No
	Sup_ID
	PM_Amt

PR Table

PK	PR_No
	PR_Date
	PR_Qty
	PR_Remark
	P_Code
	Sup_ID

SOP Table

PK	SOP_No
	SOP_Date
	SOP_Qty
	ON_Remark
	P_Code

MRP Table

PK	MRP_No
	MRP_Date
	MRP_Qty
	Sup_ID
	Sup_Date
	PR_No
	PR_Date
	Out_Qty
	Beg_Bal
	MRP_Bal

Relationship labels: Order, Store, Had, Receive, Request Purchase, Had, Supply, Had, Had, Had, Had, Had, Had

*PR   Purchase Requistion
SOP Sale Operation Plan
GRS Goods Receive Slipt
MRP Material Requirement Plan

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Figure B.3.   CPKS Key-Based Data Model.

APPENDIX   C

SCREEN DESIGN
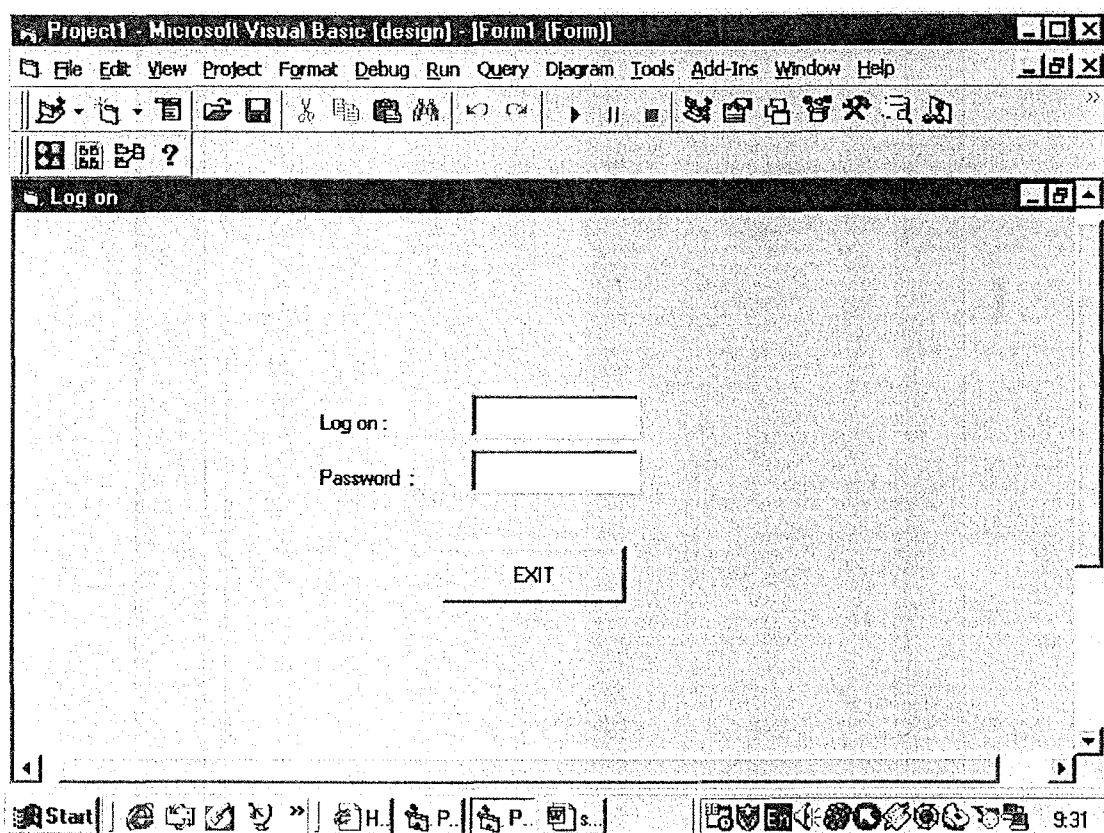
Figure C.1.   Log On Form.

Figure C.2. Main Menu Form.

Figure C.3.   Product Form.

Figure C.4.   Supplier Form.

Figure C.5.   Location Form.

Figure C.6.   Off Stock Form.

Figure C.7.   On Stock Form.

Figure C.8.   Purchase Order Form.

Figure C.9. Purchase Requisition Form.

Figure C.10.   Sales Operation Plan Form.

Figure C.11.   Goods Receipt Slip Form.

Figure C.12.   Material Requirement Plan Form.
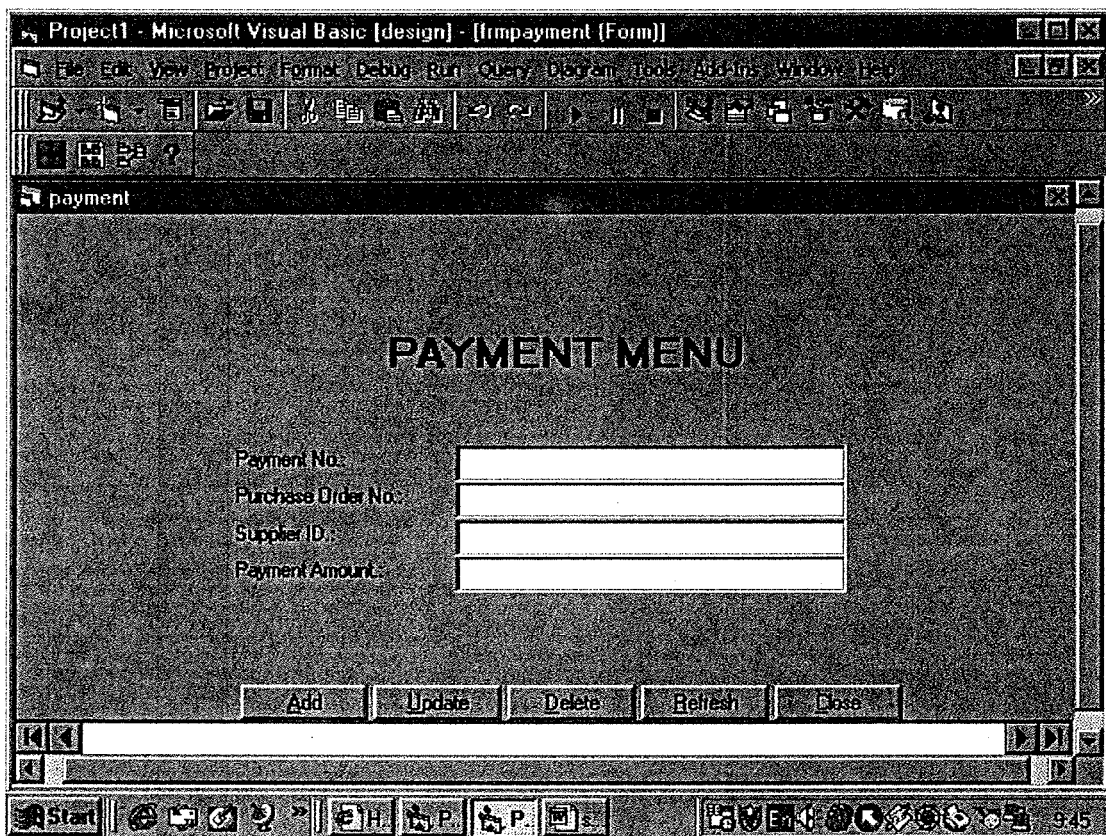
Figure C.13.   Payment Form.
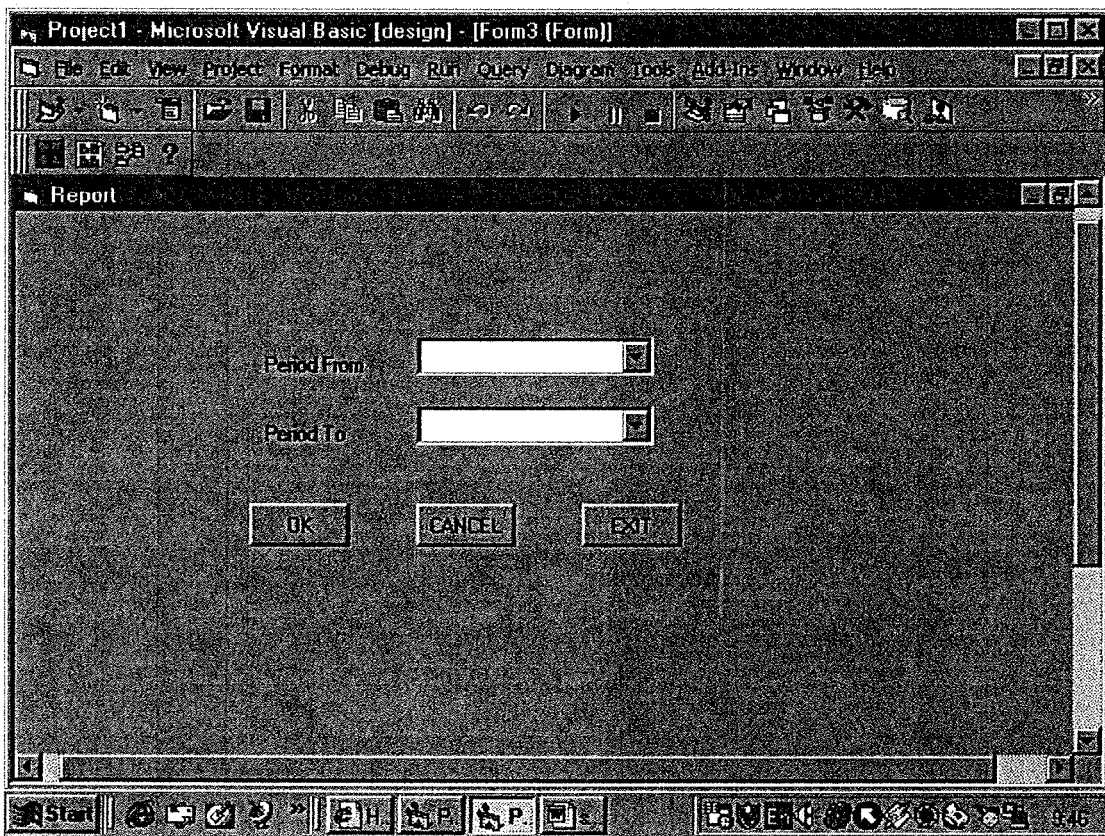
Figure C.14. Report Form.

APPENDIX   D

REPORT DESIGN

Vendor No.	Vendor Name	Purchase Order No.	Material No.	Material Name	Amount	Curr.	Payment Date
001	บริษัท โรงฟอกหนังรุ่งฟ้า จำกัด	10001	101	หนังเรียบสีดำ	50,250.00	Thb	15/7/44
005	บริษัท บางกอกโฟม จำกัด	10002	102	ฟองน้ำวิทยาศาสตร์	5,500.00	Thb	17/6/44
007	บริษัท ลิ้มพีวีซี จำกัด	10003	105	ซับพีวีซีดำ	10,000.00	Thb	12/6/44
001	บริษัท โรงฟอกหนังรุ่งฟ้า จำกัด	10004	103	หนังอัดลาย	25,000.00	Thb	15/7/44
003	สยามการช่าง	10005	105	หัวเหล็ก	10,000.00	Thb	30/6/44
006	บริษัท กาวไทย จำกัด	10006	104	กาว	12,500.00	Thb	31/7/44
001	บริษัท โรงฟอกหนังรุ่งฟ้า จำกัด	10007	103	หนังอัดลาย	35,000.00	Thb	20/6/44

REMARKS:

Figure D.1.   Supplier List Report.

Product Code	Product description	Unit of measure	Location	Price	Currency
C001S	Safety Shoes C001S	Pairs	001	350.00	THB
C001SS	Safety Shoes C001SS	Pairs	001	360.00	THB
C001ST	Safety Shoes C001ST	Pairs	001	370.00	THB
C001E	Safety Shoes C001E	Pairs	002	380.00	THB
C001ES	Safety Shoes C001ES	Pairs	002	390.00	THB
C002S	Safety Shoes C002S	Pairs	003	420.00	THB
C002SS	Safety Shoes C002SS	Pairs	003	430.00	THB
C002E	Safety Shoes C002E	Pairs	004	450.00	THB
C002ES	Safety Shoes C002ES	Pairs	004	470.00	THB
C003S	Safety Shoes C003S	Pairs	005	500.00	THB
C003SS	Safety Shoes C003SS	Pairs	005	520.00	THB

Figure D.2.   Supplier List Report.

Purchase Requisition No.	Purchase Requisition Date	Material No.	Material Name	Quantity	UOM	Vendor No.	Vendor Name	Delivery Date
00001	01/05/44	101	หนังเรียบสีดำ	5,250.00	cm3	001	บริษัท โรงฟอกหนังรุ่งฟ้า จำกัด	15/5/44
00002	12/05/44	102	ฟองน้ำวิทยาศาสตร์	20.00	sheets	005	บริษัท บางกอกโฟม จำกัด	17/5/44
00003	9/05/44	105	ซับพีวีซีดำ	400.00	yards	007	บริษัท ลิ้มพีวีซี จำกัด	12/5/44
00004	25/5/44	103	หนังอัดลาย	1,250.00	cm3	001	บริษัท โรงฟอกหนังรุ่งฟ้า จำกัด	15/5/44
00005	12/05/44	105	หัวเหล็ก	500.00	pairs	003	สยามการช่าง	30/5/44
00006	29/05/44	104	กาว	10.00	gallons	006	บริษัท กาวไทย จำกัด	31/5/44
00007	17/05/44	103	หนังอัดลาย	5,275.00	cm3	001	บริษัท โรงฟอกหนังรุ่งฟ้า จำกัด	20/5/44

REMARKS:

Figure D.3.   Purchase Requisition List Report.

Tracking No.	Purchase Requisition No.	Purchase Requisition Date	Material No.	Material Name	Quantity	UOM	Vendor No.	Vendor Name
	Purchase Order No.	Purchase Order Date						
1	00001	01/05/44	101	หนังเรียบสีดำ	5,250.00	cm3	001	บริษัท โรงฟอกหนังรุ่งฟ้า จำกัด
	10001	01/05/44						
2	00002	12/05/44	102	ฟองน้ำวิทยาศาสตร์	20.00	sheets	005	บริษัท บางกอกโฟม จำกัด
	10002	12/05/44						
3	00003	9/05/44	105	ซับพีวีซีดำ	400.00	yards	007	บริษัท ลิ้มพีวีซี จำกัด
	10003	9/05/44						
REMARKS:								

Figure D.4. Purchase Transaction per Requisition Tracking Number List Report.

Purchase Order No.	Purchase Order Date	Material No.	Material Name	Quantity	UOM	Vendor No.	Vendor Name	Delivery Date
10001	01/05/44	101	หนังเรียบสีดำ	5,250.00	cm3	001	บริษัท โรงฟอกหนังรุ่งฟ้า จำกัด	15/5/44
10002	12/05/44	102	ฟองน้ำวิทยาศาสตร์	20.00	sheets	005	บริษัท บางกอกโฟม จำกัด	17/5/44
10003	9/05/44	105	ซับพีวีซีดำ	400.00	yards	007	บริษัท ลิ้มพีวีซี จำกัด	12/5/44
10004	25/5/44	103	หนังอัดลาย	1,250.00	cm3	001	บริษัท โรงฟอกหนังรุ่งฟ้า จำกัด	15/5/44
10005	12/05/44	105	หัวเหล็ก	500.00	pairs	003	สยามการช่าง	30/5/44
10006	29/05/44	104	กาว	10.00	gallons	006	บริษัท กาวไทย จำกัด	31/5/44
10007	17/05/44	103	หนังอัดลาย	5,275.00	cm3	001	บริษัท โรงฟอกหนังรุ่งฟ้า จำกัด	20/5/44

REMARKS:

Figure D.5.   Purchase Order List Report.

Location	Product Code	Product description	Quantity	UOM
001	C001S	Safety Shoes C001S	10.00	pairs
	C001SS	Safety Shoes C001SS	5.00	pairs
	C001ST	Safety Shoes C001ST	20.00	pairs
002	C001E	Safety Shoes C001E	5.00	pairs
	C001ES	Safety Shoes C001ES	3.00	pairs
003	C002S	Safety Shoes C002S	7.00	pairs
	C002SS	Safety Shoes C002SS	5.00	pairs
004	C002E	Safety Shoes C002E	2.00	pairs
	C002ES	Safety Shoes C002ES	10.00	pairs
005	C003S	Safety Shoes C003S	5.00	pairs
	C003SS	Safety Shoes C003SS	2.00	pairs
006	C003E	Safety Shoes C003E	2.00	pairs
	C003ES	Safety Shoes C003ES	3.00	pairs

Figure D.6.   Stock Overview List Report.

PRODUCT CODE		หนังผิวเรียบ		
LOCATION		00000		
Date	Requirement Item	Requirement Description	Required Quantity	Avaliable Quantity
03/05/2001	Stock			1,250.00
03/05/2001	Pditem	Safety Stock	-100.00	1,150.00
06/05/2001	Pditem	Production Order	500.00	1,650.00
07/05/2001	Pditem	Production Order	250.00	1,900.00
08/05/2001	Ppditem	Plan Production Order	-1,650.00	250.00
09/05/2001	Pritems	001	5,250.00	5,500.00
10/05/2001	Ppditem	Plan Production Order	-750.00	4,750.00

Figure D.7.　Material Requirement Planning (MRP) List Report.

Vendor No.	Vendor Name	Purchase Order No.	Purchase Order Date	Material No.	Material Name	Quantity	UOM	Delivery Date
001	บริษัท โรงฟอกหนังรุ่งฟ้า จำกัด	10001	01/05/44	101	หนังเรียบสีดำ	5,250.00	cm3	15/5/44
005	บริษัท บางกอกโฟม จำกัด	10002	12/05/44	102	ฟองน้ำวิทยาศาสตร์	20.00	sheets	17/5/44
007	บริษัท ลิ้มพีวีซี จำกัด	10003	9/05/44	105	ซับพีวีซีดำ	400.00	yards	12/5/44
001	บริษัท โรงฟอกหนังรุ่งฟ้า จำกัด	10004	25/5/44	103	หนังอัดลาย	1,250.00	cm3	15/5/44
003	สยามการช่าง	10005	12/05/44	105	หัวเหล็ก	500.00	pairs	30/5/44
006	บริษัท กาวไทย จำกัด	10006	29/05/44	104	กาว	10.00	gallons	31/5/44
001	บริษัท โรงฟอกหนังรุ่งฟ้า จำกัด	10007	17/05/44	103	หนังอัดลาย	5,275.00	cm3	20/5/44
REMARKS:								

Figure D.8.   Purchase Order List by Vendor List Report.

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Material No.	Material Name	Vendor No.	Vendor Name	Purchase Order No.	Purchase Order Date	Quantity	UOM	Delivery Date
101	หนังเรียบสีดำ	001	บริษัท โรงฟอกหนังรุ่งฟ้า จำกัด	10001	01/05/44	5,250.00	cm3	15/5/44
102	ฟองน้ำวิทยาศาสตร์	005	บริษัท บางกอกโฟม จำกัด	10002	12/05/44	20.00	sheets	17/5/44
105	ซับพีวีซีดำ	007	บริษัท ลิ้มพีวีซี จำกัด	10003	9/05/44	400.00	yards	12/5/44
103	หนังอัดลาย	001	บริษัท โรงฟอกหนังรุ่งฟ้า จำกัด	10004	25/5/44	1,250.00	cm3	15/5/44
105	หัวเหล็ก	003	สยามการช่าง	10005	12/05/44	500.00	pairs	30/5/44
104	กาว	006	บริษัท กาวไทย จำกัด	10006	29/05/44	10.00	gallons	31/5/44
103	หนังอัดลาย	001	บริษัท โรงฟอกหนังรุ่งฟ้า จำกัด	10007	17/05/44	5,275.00	cm3	20/5/44
REMARKS:								

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Figure D.9.   Purchase Order List by Material List Report.

Vendor No.	Vendor Name	Purchase Order No.	Material No.	Material Name	Amount	Curr.	Payment Date
001	บริษัท โรงฟอกหนังรุ่งฟ้า จำกัด	10001	101	หนังเรียบสีดำ	50,250.00	Thb	15/7/44
005	บริษัท บางกอกโฟม จำกัด	10002	102	ฟองน้ำวิทยาศาสตร์	5,500.00	Thb	17/6/44
007	บริษัท ลิ้มพีวีซี จำกัด	10003	105	ซับพีวีซีดำ	10,000.00	Thb	12/6/44
001	บริษัท โรงฟอกหนังรุ่งฟ้า จำกัด	10004	103	หนังอัดลาย	25,000.00	Thb	15/7/44
003	สยามการช่าง	10005	105	หัวเหล็ก	10,000.00	Thb	30/6/44
006	บริษัท กาวไทย จำกัด	10006	104	กาว	12,500.00	Thb	31/7/44
001	บริษัท โรงฟอกหนังรุ่งฟ้า จำกัด	10007	103	หนังอัดลาย	35,000.00	Thb	20/6/44
REMARKS:							

Figure D.10.   Payment List Report.

APPENDIX   E

STRUCTURE CHART
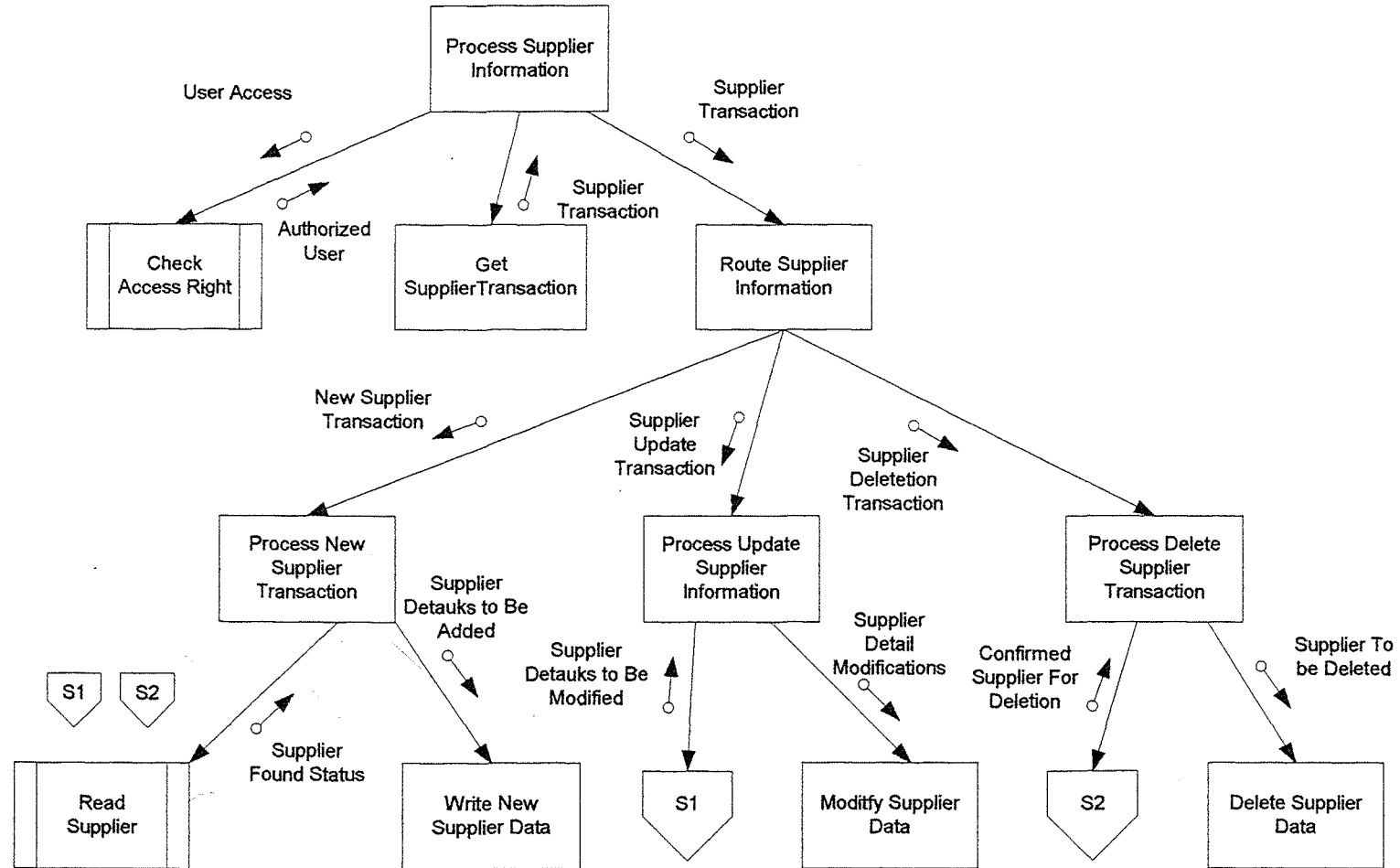
Figure E.1.   Structure Chart - Process Supplier Information of the Proposed System.
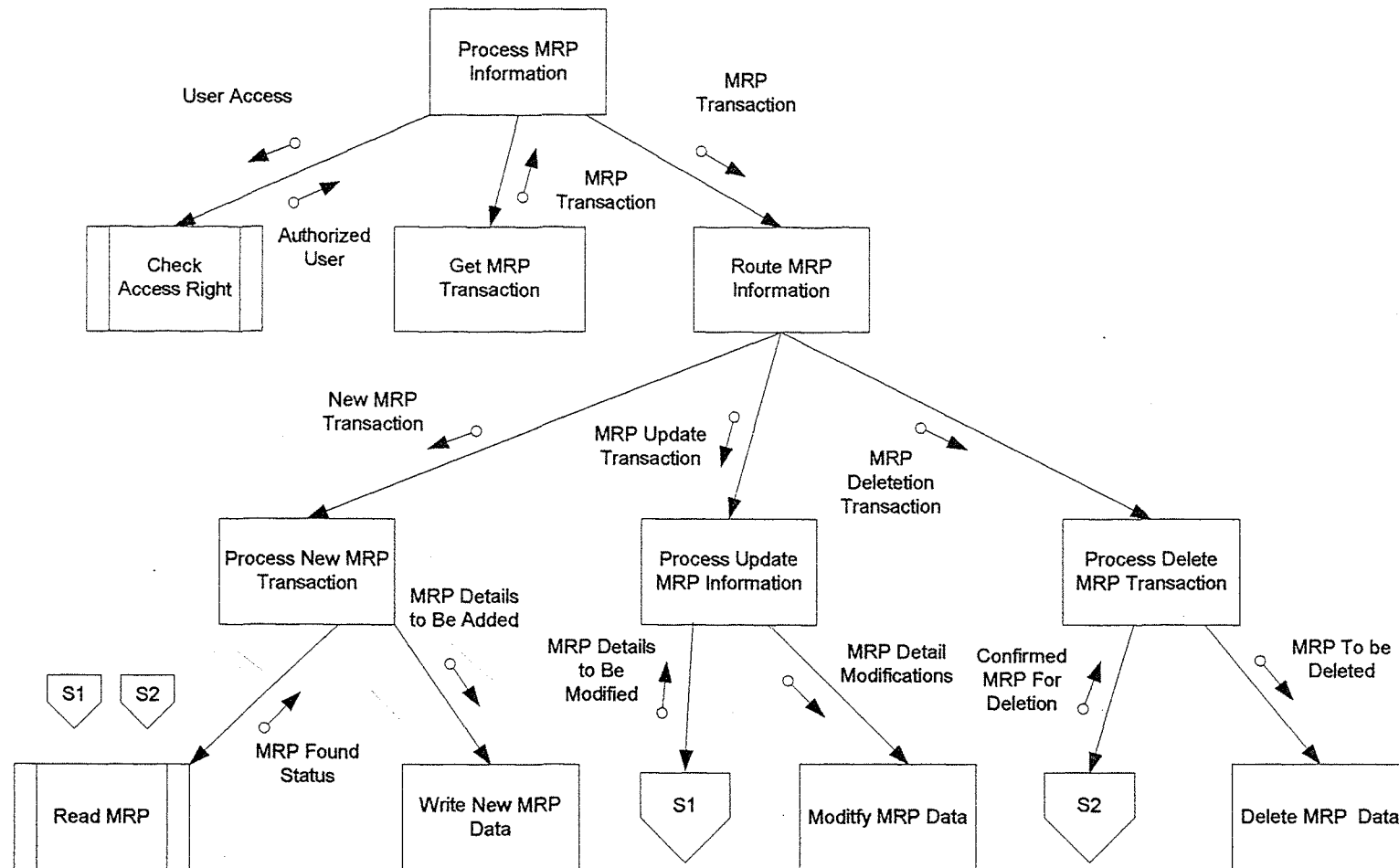
Figure E.2.   Structure Chart - Process MRP Information of the Proposed System.
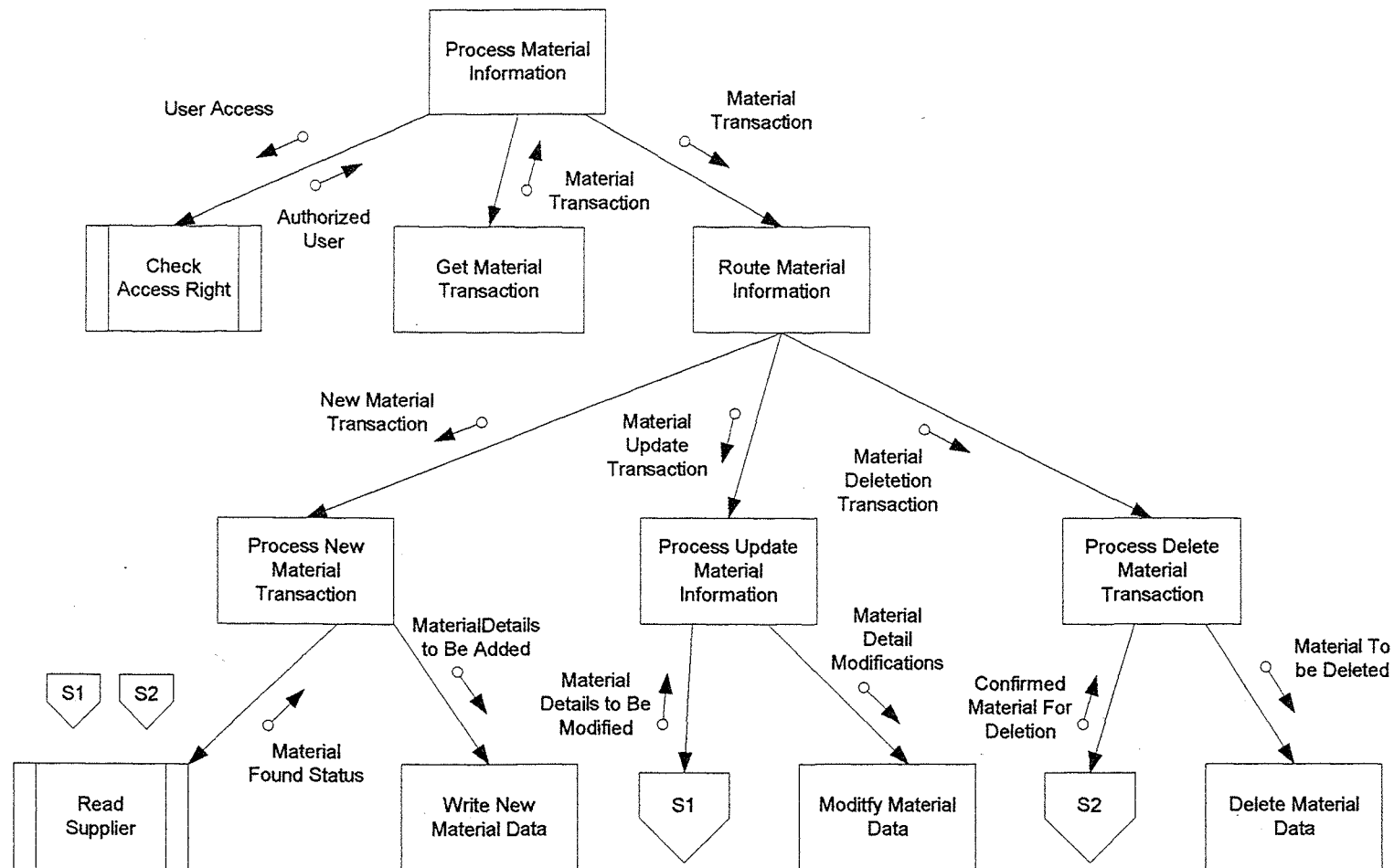
Figure E.3.   Structure Chart - Process Material Information of the Proposed System.
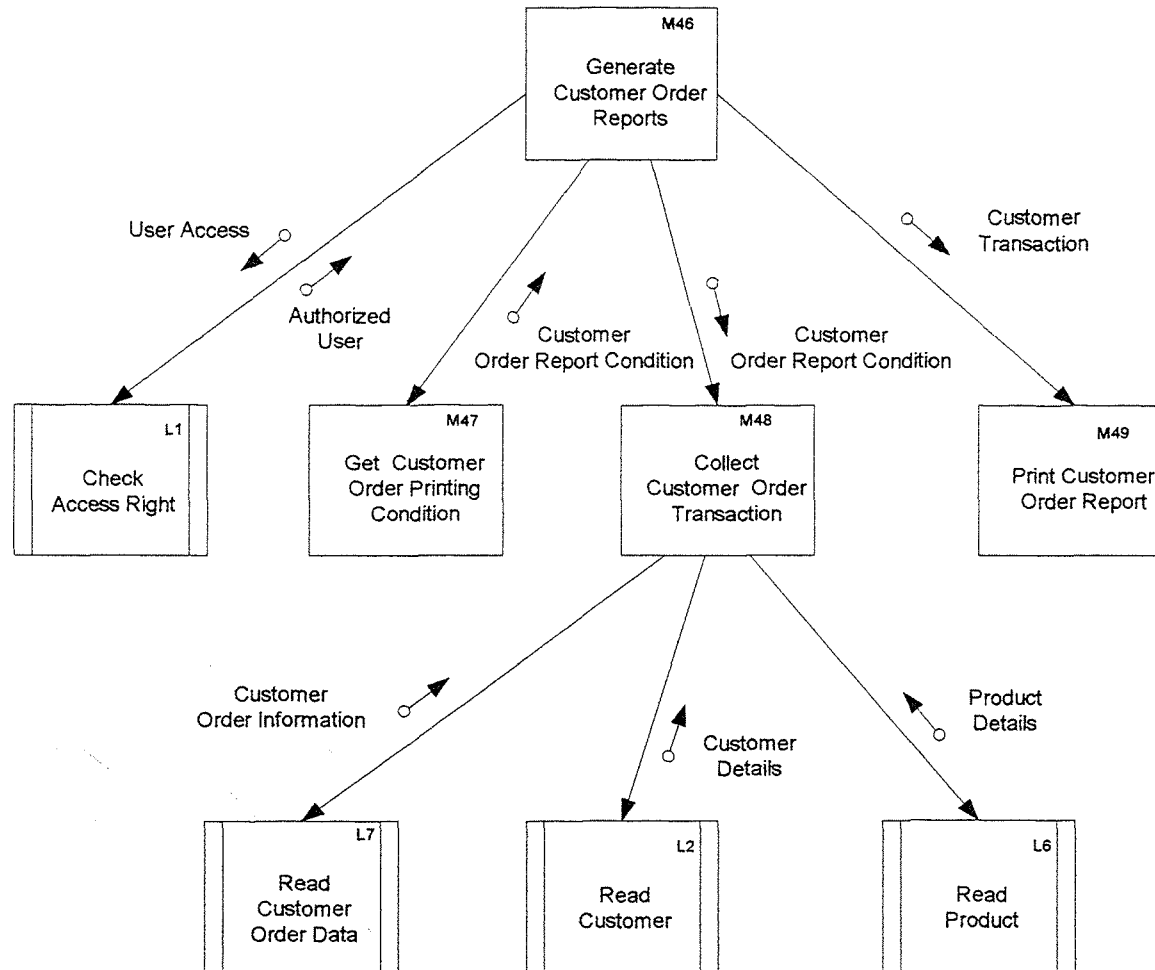
Figure E.4.   Structure Chart - Generate MRP Order Reports of the Proposed System.
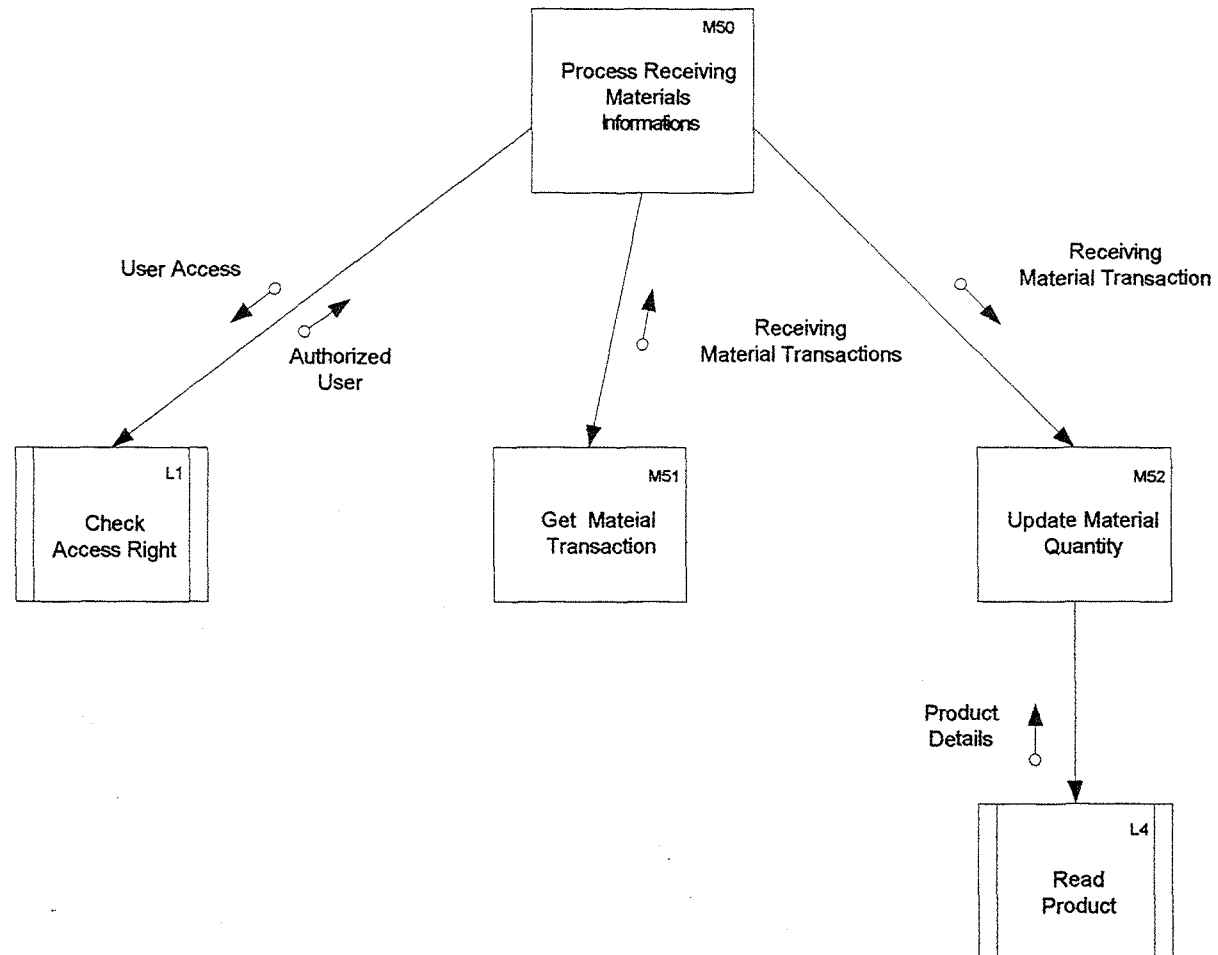
Figure E.5.   Structure Chart - Processing Receiving Materials Information of the Proposed System.
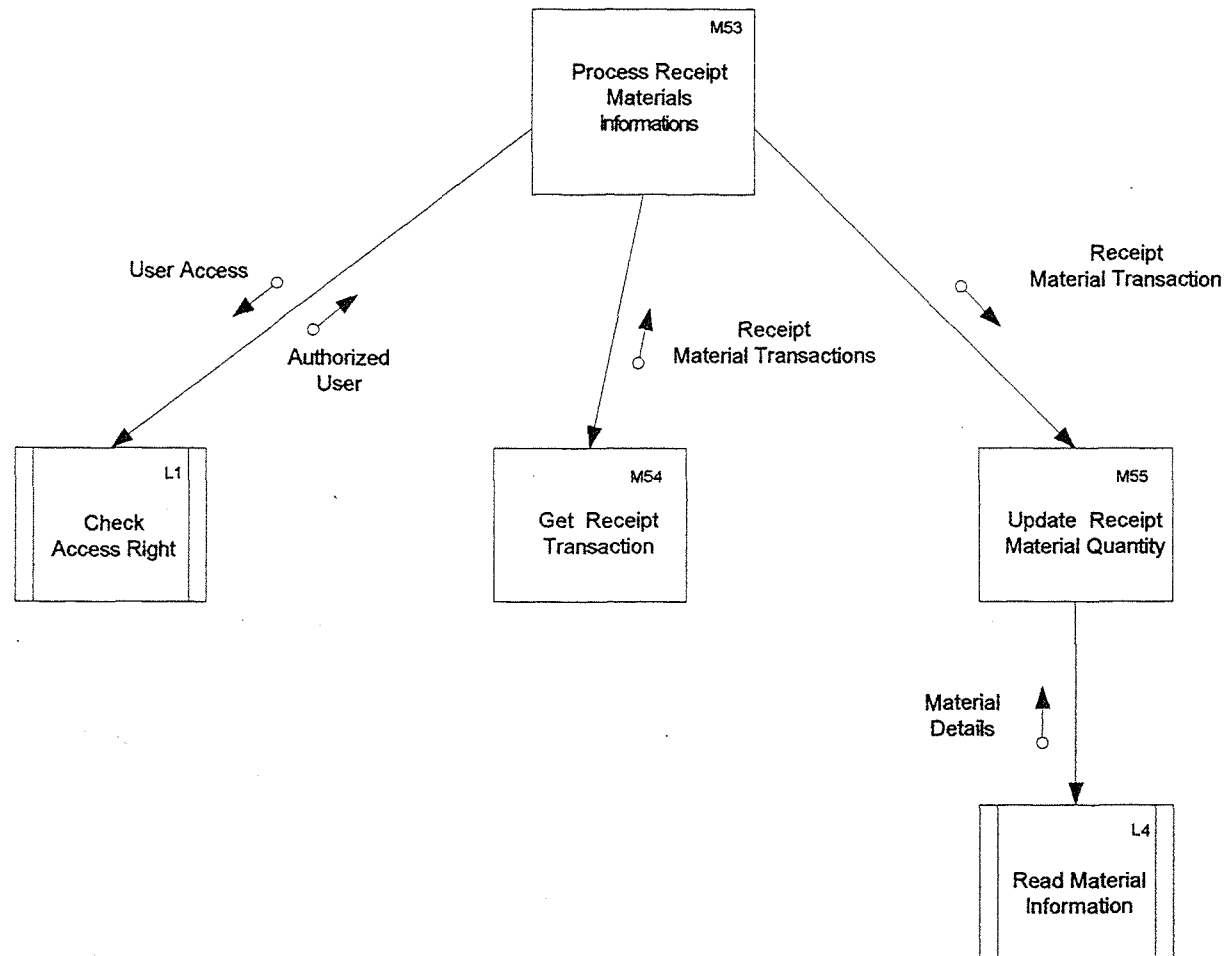
Figure E.6. Structure Chart - Processing Goods Receipt Materials Information of the Proposed System.
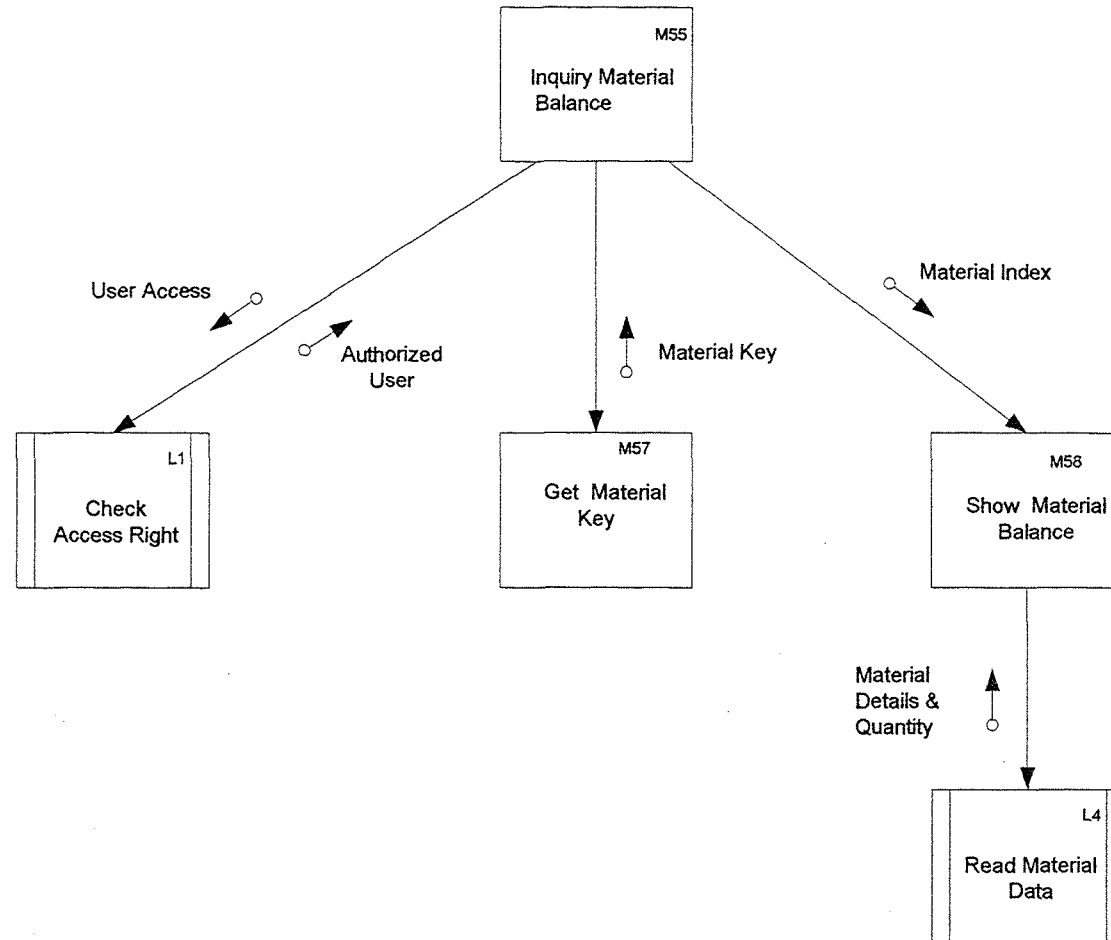
Figure E.7.   Structure Chart - Inquiry Material Balance of the Proposed System.
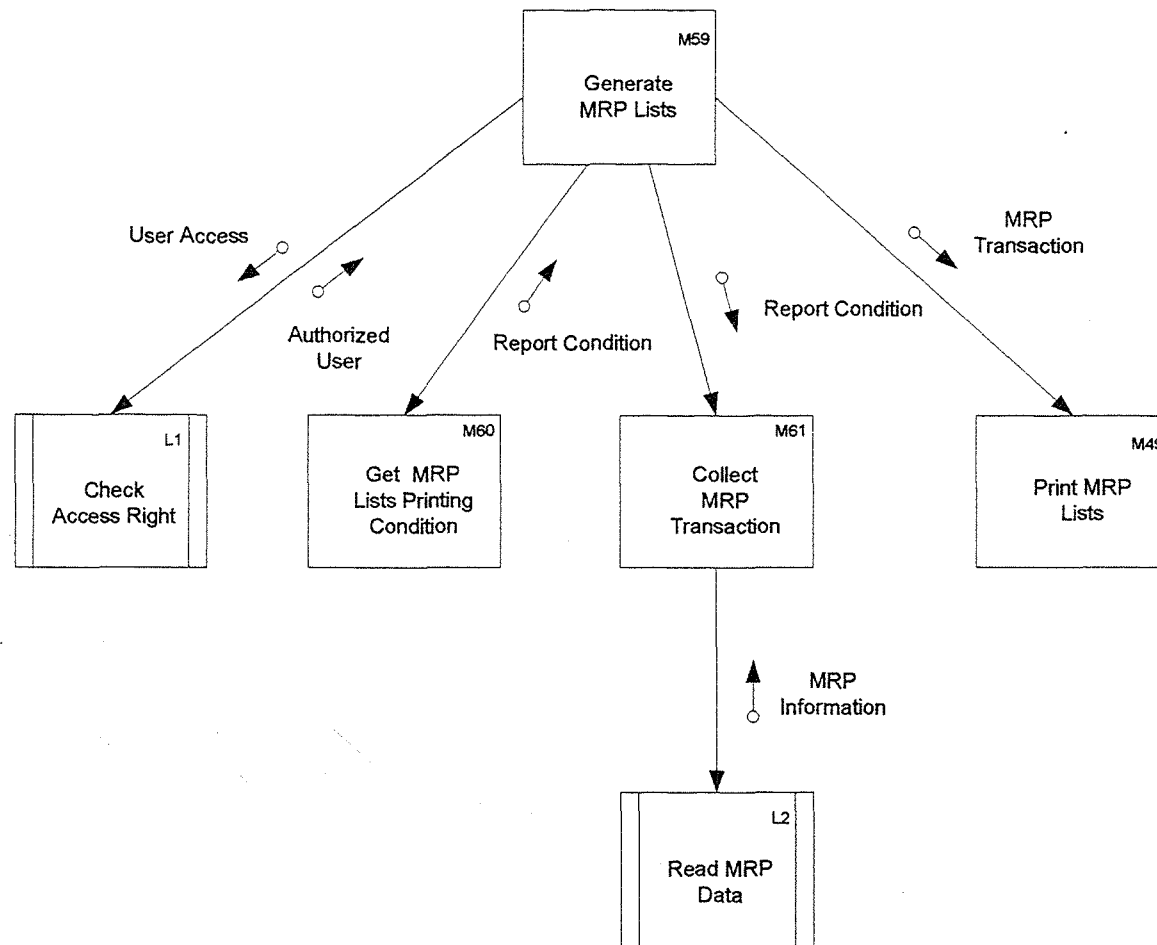
Figure E.8.   Structure Chart - Generate MRP Lists of the Proposed System.
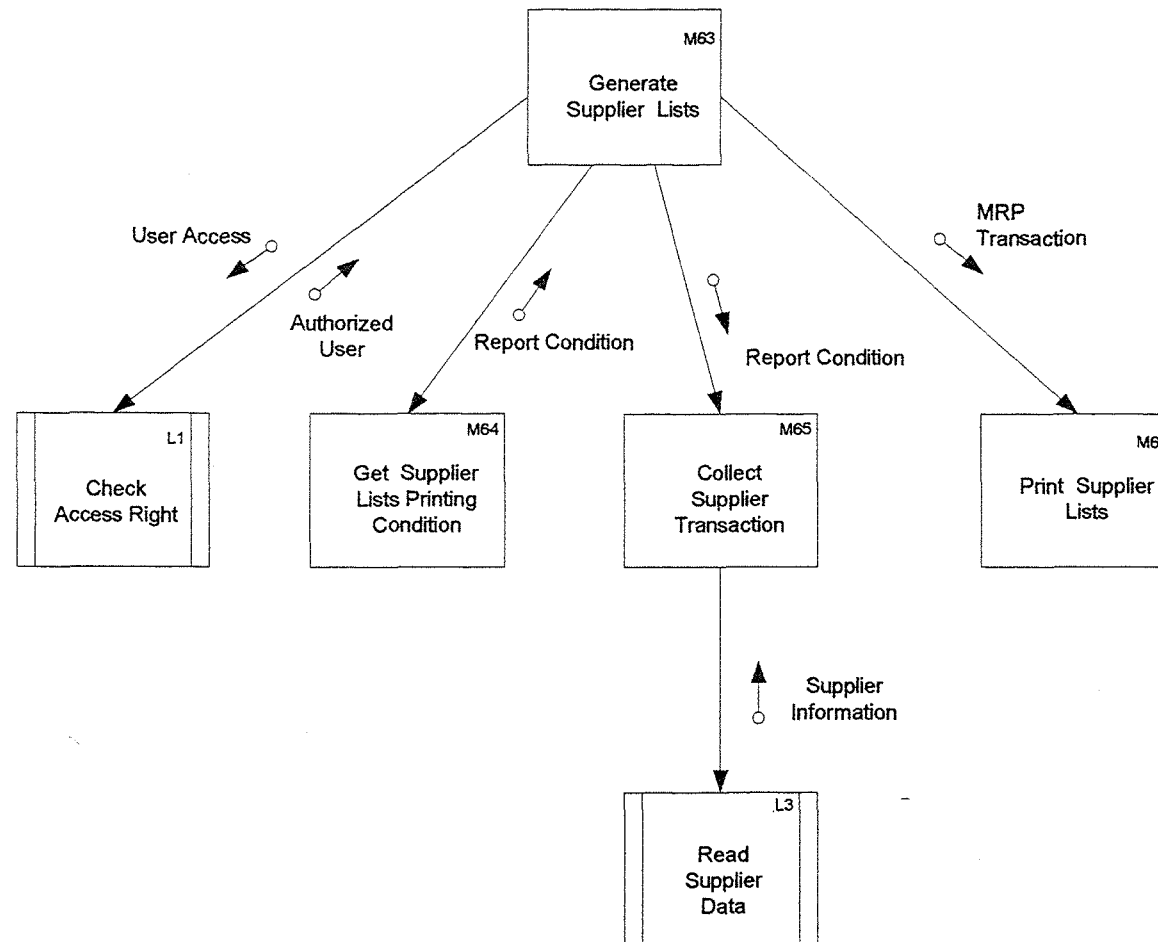
Figure E.9. Structure Chart - Generate Supplier Lists of the Proposed System.
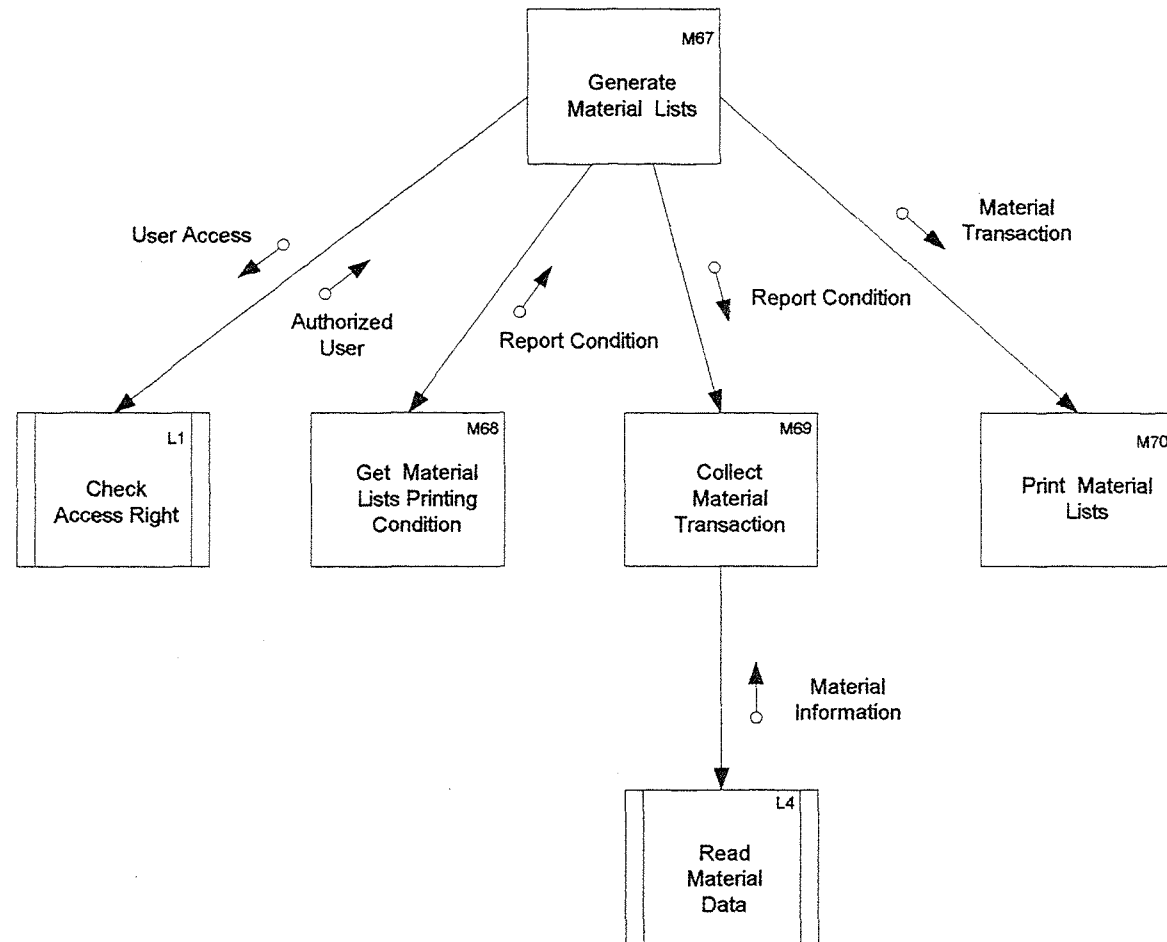
Figure E.10.   Structure Chart - Generate Material Lists of the Proposed System.
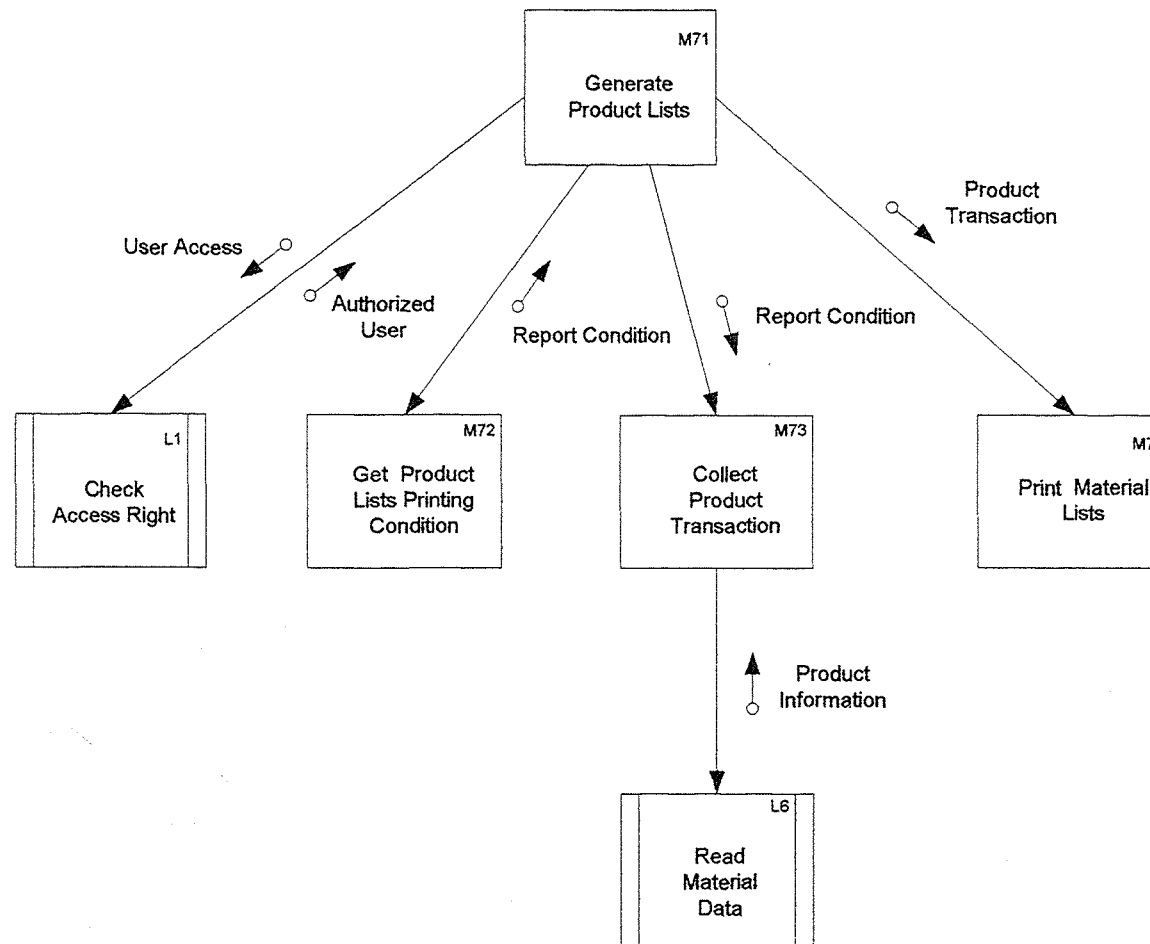
Figure E.11.   Structure Chart - Generate Product Lists of the Proposed System.
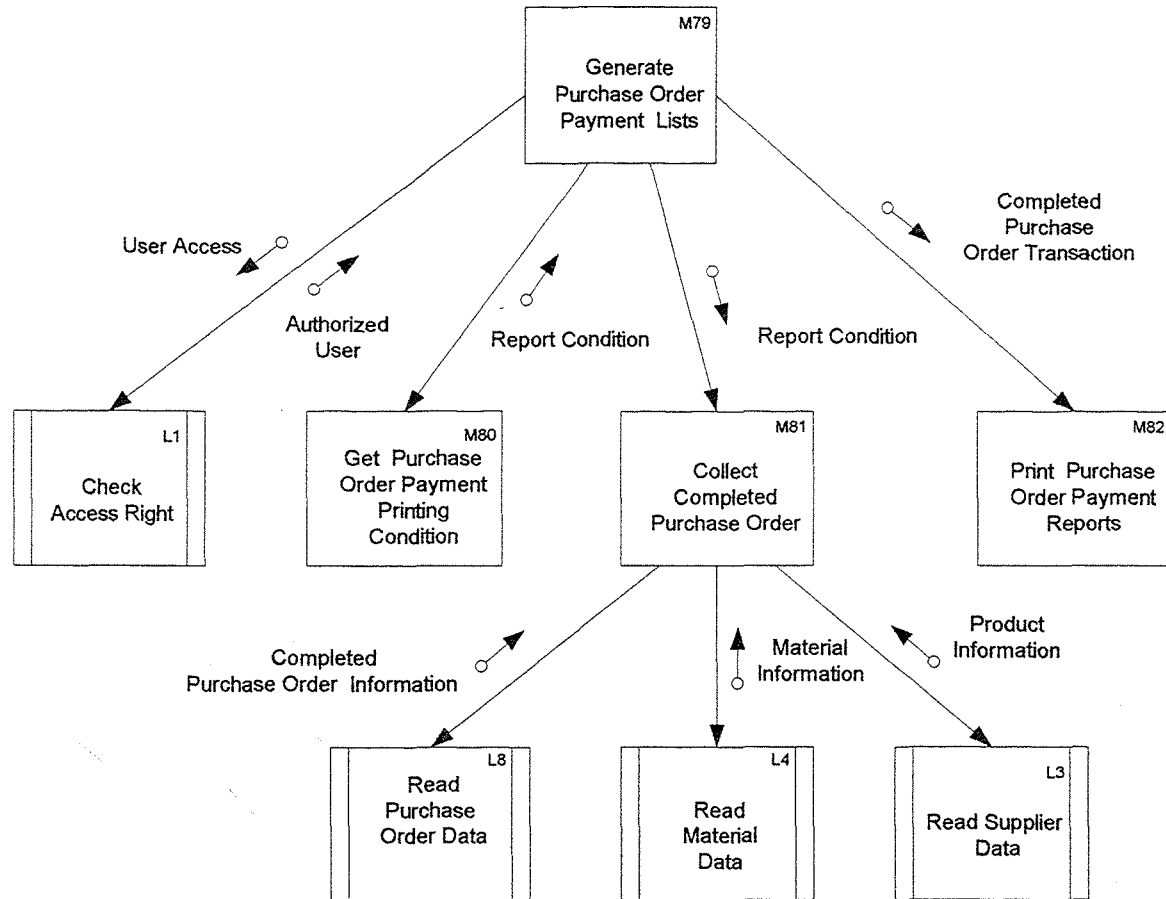
Figure E.12. Structure Chart - Generate Purchase Order Payment Lists of the Proposed System.
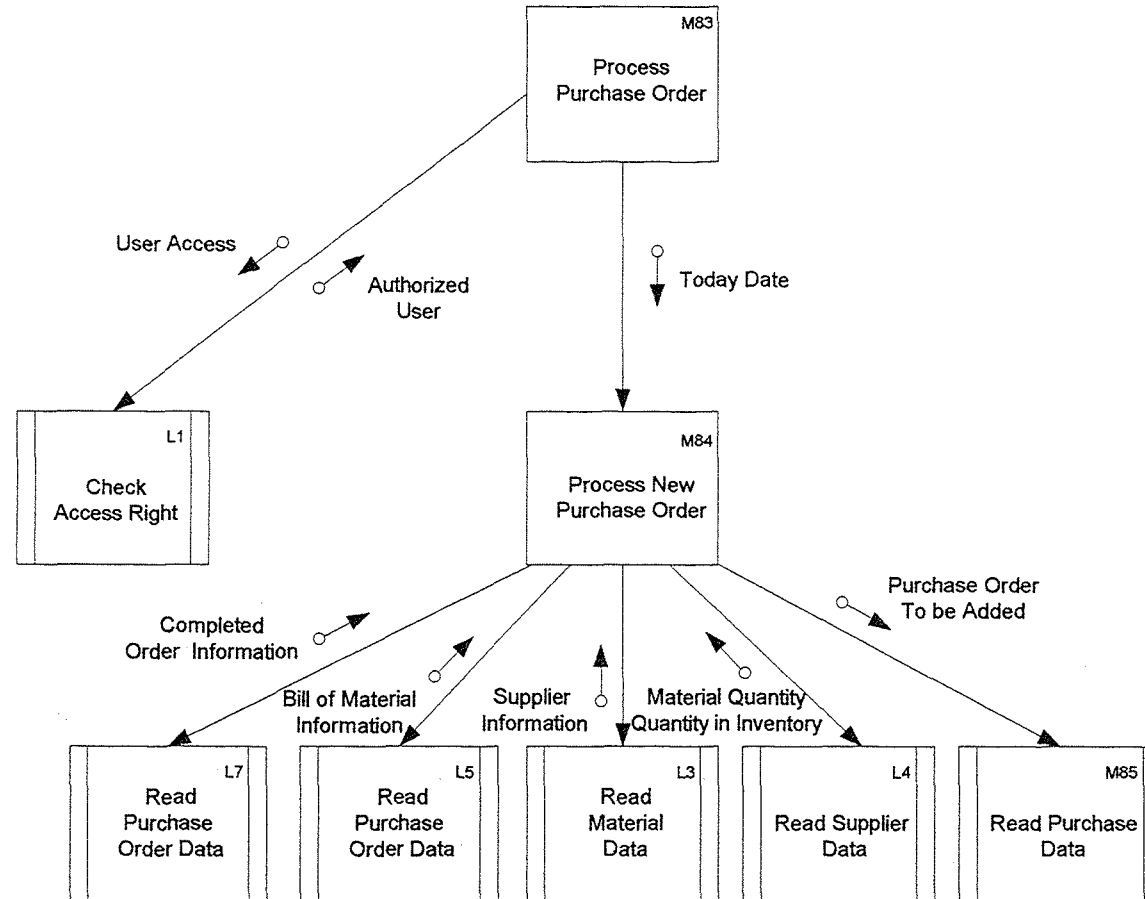
Figure E.13. Structure Chart - Process Purchase Order of the Proposed System.
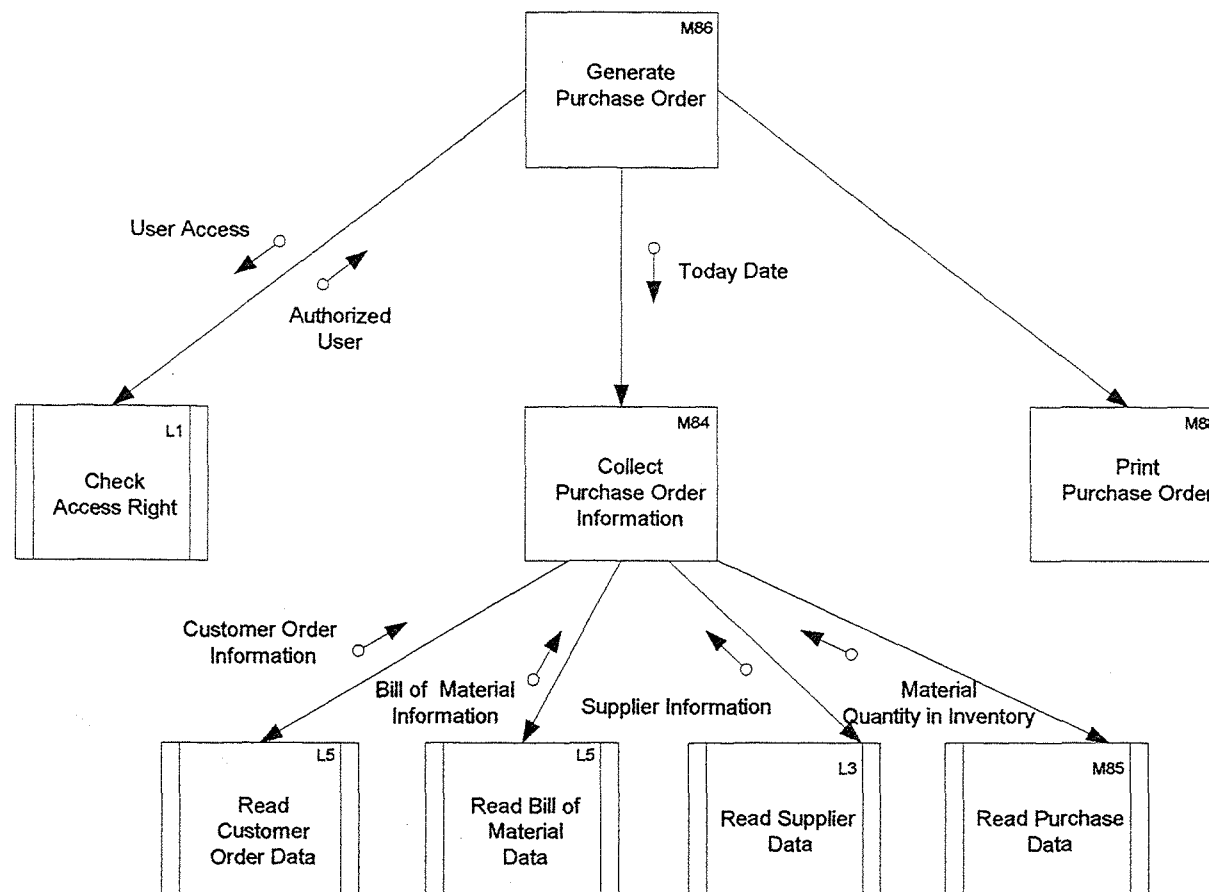
Figure E.14.   Structure Chart - Generate Purchase Order of the Proposed System.
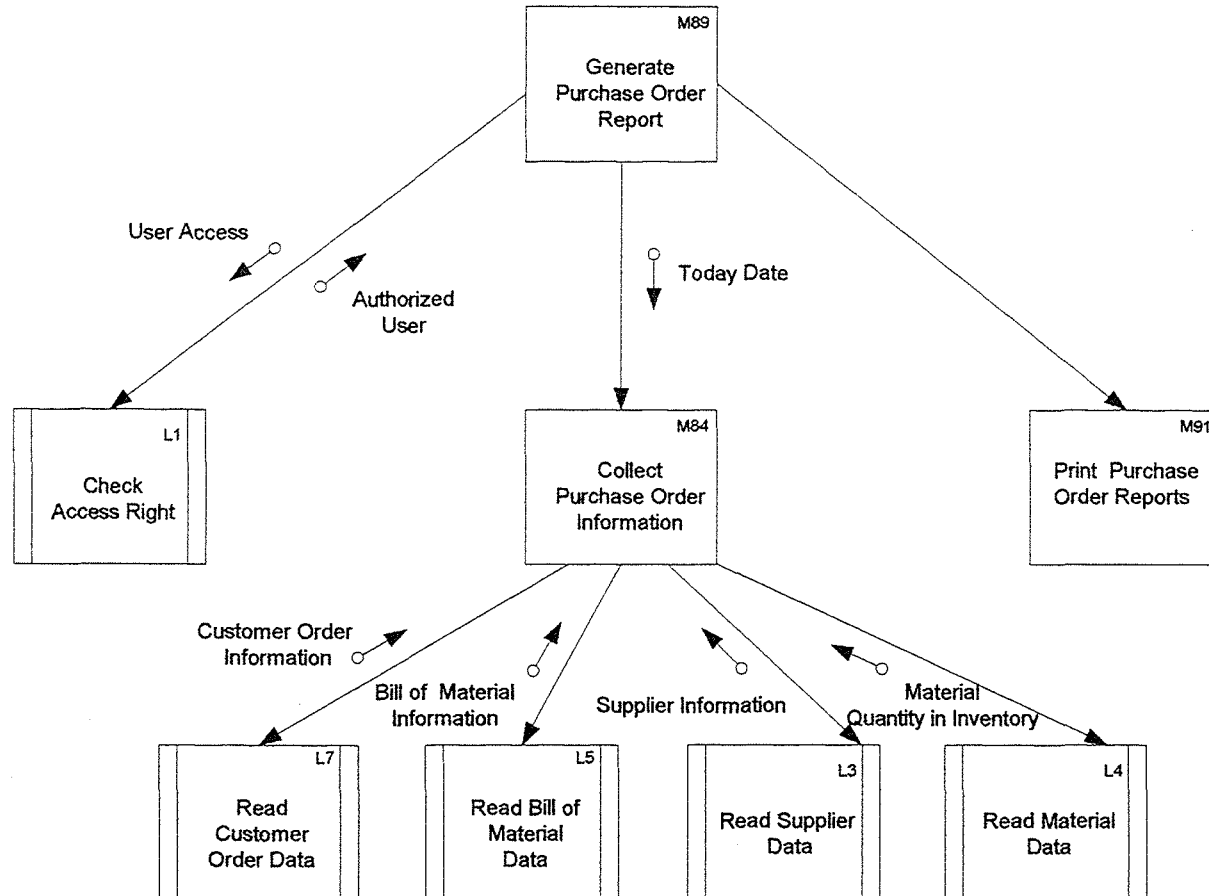
Figure E.15.   Structure Chart - Generate Purchase Order Reports of the Proposed System.
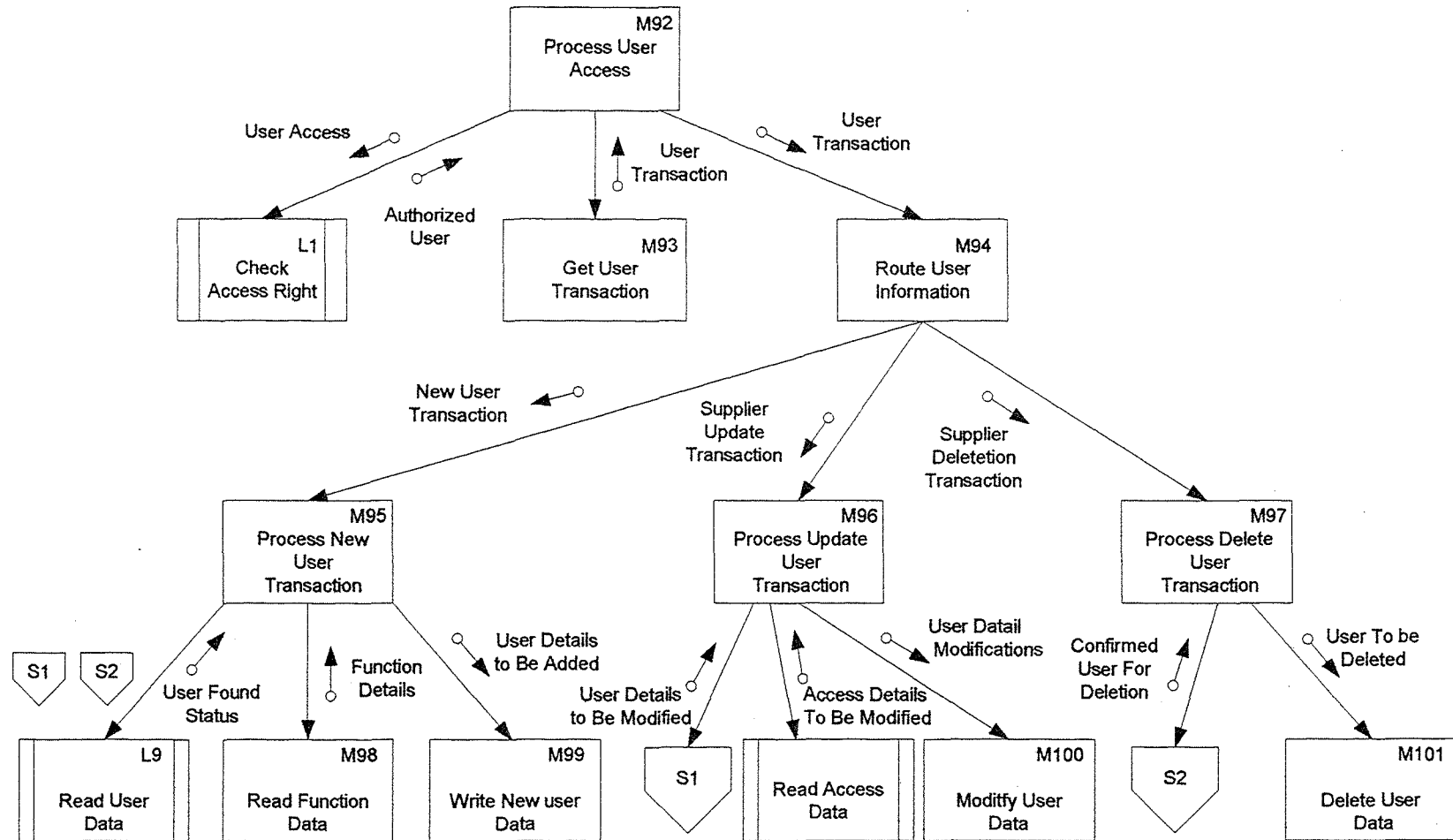
Figure E.16. Structure Chart - Process User Information of the Proposed System.

APPENDIX   F

PROCESS SPECIFICATION

PROCESS SPECIFICATION

Table F.1.   Process Specification of Process 1.1.

Items	Descriptions
Process Name:	Run material requirement planning
Data In:	Sale operation plan On stock record Product record
Data Out:	Out of stock record MRP record
Process:	(1) Manage sale operation plan (2) Run material requirement planning
Attachment:	(1) Planning department (2) Data store D1 (3) Data store D2 (4) Data store D3 (5) Data store D4

Table F.2.   Process Specification of Process 2.1.

Items	Descriptions
Process Name:	Convert plan order to purchase requisition
Data In:	Out of stock record MRP information
Data Out:	Purchase requisition (PR)
Process:	(1) Get MRP record (2) Convert plan order to purchase requisition
Attachment:	(1) Data store D3 (2) Data store D4 (3) Data store D5 (4) Purchasing department

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Table F.3. Process Specification of Process 3.1.

Items	Descriptions
Process Name:	Create purchase requisition
Data In:	Purchase requisition information
Data Out:	Purchase requisition
Process:	(1) Input requisition form (2) Approve purchase requisition (3) Create purchase requisition
Attachment:	(1) Other department (2) Purchasing department (3) Data store D5

Table F.4. Process Specification of Process 4.1.

Items	Descriptions
Process Name:	Create purchase order
Data In:	Purchase requisition record Quotation Supplier information Vendor record
Data Out:	Purchase order (PO) Vendor record
Process:	(1) Display purchase requisition list daily and allocate purchase requisition to purchaser (2) Request vendor for quotation (3) Approve quotation (4) Create vendor master (5) Update vendor record (6) Assign vendor to purchase requisition and convert to purchase order (7) Create purchase order
Attachment:	(1) Supplier (2) Purchasing department (3) Data store D4 (4) Data store D5 (5) Data store D6 (6) Data store D7

Table F.5. Process Specification of Process 5.1.

Items	Descriptions
Process Name:	Approve purchase order
Data In:	Purchase order
Data Out:	Approve purchase order
Process:	(1) Get purchase order record (2) Approve purchase order
Attachment:	(1) Data store D7 (2) Supplier (3) Accounting department

Table F.6. Process Specification of Process 6.1.

Items	Descriptions
Process Name:	Goods receipt
Data In:	Product Invoice Purchase order
Data Out:	Product record Goods receipt Goods receipt information Product record
Process:	(1) Check received product (2) Verify received product (8) Receive and update inventory
Attachment:	(1) Supplier (2) Warehouse (3) Data store D1 (4) Data store D7 (5) Data store D10

Table F.7. Process Specification of Process 7.1.

Items	Descriptions
Process Name:	Invoice receipt
Data In:	Purchase order record Goods receipt slip Supplier record Supplier invoice Approved purchase order
Data Out:	Cheque Purchase transaction
Process:	(1) Get purchase order record (2) Check goods receipt with invoice receipt (3) Input invoice
Attachment:	(1) Data store D6 (2) Data store D7 (3) Data store D9 (4) Data store D10 (5) Warehouse (6) Supplier

Table F.8. Process Specification of Process 8.1.

Items	Descriptions
Process Name:	Create report
Data In:	Product record Purchase order record Material record Supplier record Purchase requisition record Payment record
Data Out:	Report
Process:	(1) Get purchase requisition record (2) Get purchase order record (3) Get Goods receipt/Invoice receipt information (4) Execute report
Attachment:	(1) Data store D1 (2) Data store D6 (3) Data store D7 (4) Data store D9 (5) Manager of relevant department

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APPENDIX   G

DATA DICTIONARY

DATA DICTIONARY

Table G.1.   Data Dictionary of CPK Trading Database.

Field Name	Meaning
Pur no	The purchase order number
Pur Date	Date that purchase order is issued
Pur Qty	The quantity that purchase order is ordered
Pur Unit	Unit of measure that use for purchase order
Pur Price	Price that purchase order is ordered
Pur Tot_pr	Total price that purchase order is ordered
Pur Term_pay	Term of payment for purchase order
Pur Del_date	The date when the product is delivered to the warehouse
Pur Status	Status of purchase order
Pur Remark	The reason that explain for purchase order
Sup ID	The code of supplier
Sup F_name	First name of supplier
Sup L_name	Last name of supplier
Sup Addr	Home no. of supplier address
Sup Addr2	Street name of supplier address
Sup City	City of supplier address
Sup Post_code	Postal code of supplier address
Sup Country	Country of supplier address
Sup Tel1	Telephone number of supplier address
Sup Tel2	Telephone number of supplier address
Sup Mobile	Mobile phone number of supplier address
Sup Fax	Fax number of supplier address
Sup Product	Product that supplier sell
P Code	The code of product
P Name	Name of product
P Unit	Unit of measure that use for this product
P Price	The cost of this product
P Minquan	Minimum quantity that require for product
P Maxquan	Maximum quantity that require for product
P Balance	Balance quantity that remain for product
P Last Rec	Last record for transaction movement
P Remark	The reason that explain for product
SOP No	The code of sale operation plan
SOP Date	The date when sale operation plan is planned
SOP Quan	The quantity that sale operation plan is forecasted
SOP Remark	The reason that explain for sale operation plan
PR No	The code of purchase requisition
PR Date	The date when purchase requisition is issued
PR Qty	The quantity that purchase requisition is requested
PR Remark	The reason that explain for purchase requisition
L ID	The code of location in warehouse
L Name	The name of location in warehouse

Table G.1. Data Dictionary of CPK Trading Database (Continued).

Field Name	Meaning
L Bal_qty	The balance quantity that keep in the this location
MRP No	The code of material requirement planning
MRP Date	The date when material requirement planning is planned
MRP Out_qty	The outstanding quantity that remain in MRP
MRP Beg_bal	The beginning quantity that remain in MRP
MRP Bal	The balance quantity that will be converted to purchase
GRS No	requisition
GRS Date	The code of goods receipt slip
GRS Qty	The date when goods receipt slip is issued
GRS Unit	The quantity that goods receipt slip is received to warehouse
PM No	The unit of measure that use in goods receipt slip
PM Amt	The code of payment number
OF No	The amount that is paid to supplier
OF Date	The code of off stock list
OF Qty	The date when the off stock list is issued
OF Unit	The quantity that off stock list show out of stock balance
OF Remark	The unit of measure that use in off stock list
ON No	The reason the explain for off stock list
ON Date	The code of on stock list
ON Qty	The date when on stock list is issued
ON Unit	The quantity that on stock list show outstanding balance
ON Remark	The unit of measure that use in on stock list
	The reason the explain for on stock list

APPENDIX   H

FILE DESIGN

CPK Trading Database

Database D1

Table H.1.   Structure of Product Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	P_Code	Text (8)	Y	Y	Y			Primary Key
2	P_Name	Text (50)			Y			Attribute
3	P_Unit	Text (5)			Y			Attribute
4	P_Price	Curr(10)	Y					Attribute
5	P_Minquan	Num(15)	Y					Attribute
6	P_Maxquan	Num(15)	Y					Attribute
7	P_Balance	Num(15)	Y					Attribute
8	P_LasRec	Date(8)			Y		(1-Jan-01)	Attribute
9	P_Remark	Text (50)			Y			Attribute
10	L_ID	Text (8)	Y			Location ID		Attribute

Database D2

Table H.2.   Structure of Node On Stock Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	ON NO	Text(8)	Y	Y				Primary Key
2	ON Date	Date(8)			Y		(1-Jan-01)	Attribute
3	ON Qty	Num(15)	Y					Attribute
4	ON Unit	Text(5)			Y			Attribute
5	ON Remark	Text(50)			Y			Attribute
6	P Code	Text(8)	Y			Product Code		Attribute

Database D3

Table H.3.   Structure of Off Stock Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	OF NO	Text(8)	Y	Y				Primary Key
2	OF Date	Date(8)			Y		(1-Jan-01)	Attribute
3	OF Qty	Num(15)	Y					Attribute
4	OF Unit	Text(5)			Y			Attribute
5	OF Remark	Text(50)			Y			Attribute
6	P Code	Text(8)	Y			Product Code		Attribute

Database D4

Table H.4. Structure of Material Requirement Plan(MRP) Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	MRP No.	Text(8)	Y	Y				Primary Key
2	MRP Date	Date(8)			Y		(1-Jan-01)	Attribute
3	MRP Qty	Num(15)	Y					Attribute
4	SOP No.	Text(8)			Y	Sale Operation No.		Attribute
5	SOP Date	Date(8)			Y		(1-Jan-01)	Attribute
6	PR No.	Text(8)			Y	Purchase Requisition No.		Attribute
7	PR Date	Date(8)			Y		(1-Jan-01)	Attribute
8	Out_Qty	Num(15)	Y					Attribute
9	Beg_Bal	Num(15)	Y					Attribute
10	MRP Bal	Num(15)	Y					Attribute
11	P Code	Text(8)			Y	Product Code		Attribute
12	OF No.	Text(8)			Y	Off Stock No.		Attribute
13	ON No.	Text(8)			Y	ON Stock No.		Attribute

Database D5

Table H.5. Structure of Purchase Requisition (PR) Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	PR No.	Text(8)	Y	Y				Primary Key
2	PR Date	Date(8)			Y		(1-Jan-01)	Attribute
3	PR Qty	Num(15)	Y					Attribute
4	P Code	Text(8)	Y			Product Code		Attribute
5	SOP No.	Text(8)	Y			Sale Operation Plan No.		Attribute
6	PR Remark	Text(50)			Y			Attribute

Database D6

Table H.6.   Structure of Supplier Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	SUP No.	Text(8)	Y	Y				Primary Key
2	SUP_F_Name	Text(30)			Y			Attribute
3	SUP_L_Name	Text(30)			Y			Attribute
4	SUP Addr	Text(20)			Y			Attribute
5	SUP City	Text(15)			Y			Attribute
6	SUP P_Code	Num(6)			Y			Attribute
7	SUP Country	Varchar(15)			Y			Attribute
8	SUP Tel1	Text(10)			Y			Attribute
9	SUP Mobile	Text(10)			Y			Attribute
10	SUP Fax	Text(10)			Y			Attribute
11	P Code	Text(8)	Y			Product Code		Attribute
12	SUP Term	Text(10)			Y			Attribute
13	SUP E_Mail	Text(20)			Y			Attribute
14	SUP Remark	Text(50)			Y			Attribute

Database D7

Table H.7.   Structure of Purchase Order (PO) Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	Pur No.	Text(8)	Y	Y				Primary Key
2	Pur Date	Date(8)			Y		(1-Jan-01)	Attribute
3	Pur Qty	Num(15)	Y					Attribute
4	Pur Unit	Text(5)			Y			Attribute
5	Pur Price	Curr(15)	Y					Attribute
6	Pur Tot Price	Curr(15)	Y					Attribute
7	Pur Term	Text(5)			Y			Attribute
8	Pur Del Date	Date(8)			Y		(1-Jan-01)	Attribute
9	Pur Status	Text(3)			Y			Attribute
10	Pur Remark	Text(50)			Y			Attribute
11	SUP No.	Text(8)	Y			Supplier Code		Attribute
12	P Code	Text(8)	Y			Product Code		Attribute

Database D8

Table H.8. Structure of Location Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	L ID	Text(8)	Y	Y				Primary Key
2	L Name	Text(20)			Y			Attribute
3	P Code	Text(8)	Y			Product Code		Attribute
4	L Balance	Num(15)			Y			Attribute

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Database D9

Table H.9. Structure of Payment Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	PM No.	Text(8)	Y	Y				Primary Key
2	PO No.	Text(8)	Y			Purchase Order No.		Attribute
3	SUP No.	Text(8)	Y			Product Code		Attribute
4	PM Amt	Curr(15)	Y					Attribute

Database D10

Table H.10.   Structure of Goods Receipt (GR) Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	GRS No.	Text(8)	Y	Y				Primary Key
2	GRS Date	Date(8)			Y		(1-Jan-01)	Attribute
3	GRS Qty	Num(15)	Y					Attribute
4	GRS Unit	Text(5)			Y			Attribute
5	GRS Remark	Text(50)			Y			Attribute
6	L ID	Text(8)	Y			Location ID		Attribute

Database D11

Table H.11.   Structure of Sale Operation Plan(SOP) Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	SOP No.	Text(8)	Y	Y				Primary Key
2	SOP Date	Date(8)			Y		(1-Jan-01)	Attribute
3	SOP Qty	Num(15)	Y					Attribute
4	P Code	Text(8)	Y			Product Code		Attribute
5	SOP Remark	Text(50)			Y			Attribute

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