

**PREVENTIVE  
MAINTENANCE SCAN SYSTEM  
(PM SCAN)**

p- 1070

**PROJECT REPORT**

**SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS  
FOR THE AWARD OF THE DEGREE OF**

**M.Sc(APPILED SCIENCE SOFTWARE ENGINEERING)  
OF BHARATHIAR UNIVERSITY,COIMBATORE**

**SUBMITTED BY**

**DIVYA ROSHNI LEWIS  
Reg.No.0037S0089**

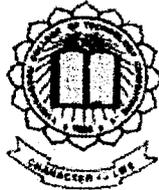
**GUIDED BY**

**EXTERNAL GUIDE**

**Mr. Sathy .  
Project Leader**

**INTERNAL GUIDE**

**Mr. Manikandan  
Lecturer**



**Department of Computer Science and Engineering**

**KUMARAGURU COLLEGE OF TECHNOLOGY**

**Coimbatore - 641006**

**SEPTEMBER 2003**

## **CERTIFICATES**

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Department of Computer Science and Engineering

**KUMARAGURU COLLEGE OF TECHNOLOGY**

(Affiliated to Bharathiar University, Coimbatore-641006)

## CERTIFICATE

This is to certify that the project work entitled

**PREVENTIVE MAINTENANCE SCAN SYSTEM  
(PM SCAN)**

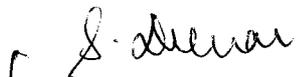
Done by

**DIVYA ROSHNI LEWIS**  
Reg.No.0037S0089

Submitted in partial fulfillment of the requirements for the award of  
the degree of

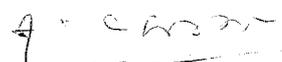
**Master Of Applied Science (Software Engineering) of  
Bharathiar University.**

Submitted for the university examination held on 29/09/2003

  
Professor and Head

  
Internal Guide

  
29/9  
Internal Examiner

  
External Examiner  
29/9



**LAWRENCE & ASSOCIATES (INDIA) PVT. LTD.**  
1206 : D – TIDEL PARK : TARAMANI : CHENNAI – 600 113 : INDIA  
Tel : ( 91 44 ) 22540033 / 34 : Fax : 22540030 : E-MAIL : lawrenceind@vsnl.com

September 23, 2003

**TO WHOM SO EVER IT MAY CONCERN**

This is to certify that Ms. Divya Roshni Lewis ( Reg No: 0037S0089) has successfully completed her project on "PM SCAN" under the guidance of Mr. Sathyanarayanan, for her Master of Science ( Software Engineering) degree as a part of her curriculum in our Organization from June 2<sup>nd</sup>, 2003 to September 22<sup>nd</sup>, 2003. During this period her performance and conduct was highly satisfactory.

We wish her success in her future endeavors.

A handwritten signature in black ink, appearing to read 'Vishnu Priya R.S.', written in a cursive style.

**VISHNU PRIYA R.S.**  
Manager- Human Resources

## DECLARATION

I here by declare that the project entitled  
"PREVENTIVE MAINTANENCE SCAN(PM SCAN)"

Done By

DIVYA ROSHNI LEWIS  
4<sup>th</sup> Year M.Sc SOFTWARE ENGINEERING

At

Lawrence And Associates  
(India) Private Limited  
1206-D Tidel Park  
4 Canal Bank Road Taramani  
Chennai- 600113

And submitted to

**KUMARAGURU COLLEGE OF TECHNOLOGY**  
(Affiliated to **Bharathiar University** )

**Master Of Applied Science (Software Engineering)**

is a report of work done by me during my period of study in  
Kumaraguru College of Technology,Coimbatore-641006

**Under the supervision and guidance of**  
**Mr. Sathya (Project Leader)**

Name of the  
Candidate

Register Number

Signature of the  
Student

DIVYA ROSHNI LEWIS 0037S0089



Date : /09/2003

## **ACKNOWLEDGEMENT**

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## ACKNOWLEDGEMENT

I wish to express my deep sense of gratitude to Dr. K.K.Padmanabhan, B.Sc.,(Engg), M.Tech, Ph.D., Principal, Dr. S.Thangasamy, Ph.D. m, Head Of the Department, Department Of Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore for providing me opportunity to take up this project.

I would like to place on record my thanks to my internal guide Mr.Manikandan(MCA) Department of Computer Science and Engineering whose encouragement proved to be stimulating. I am also grateful to all the staff members of the Department for their support and guidance throughout this project work.

I am grateful to Mr. Sathya Project Leader , Lawrence and Associates Pvt Limited , Chennai for giving me the opportunity to work on this project. I also wish to express my sincere gratitude and thanks to Mr. Anand for his keen interest and valuable suggestions throughout the project.

I am proud of my family for encouraging me whenever I was depressed, to face the challenges in the life and made the project a great success.

Above all with my whole heart I thank Lord Almighty for all the things he has given me and made me to face the world with enough boldness and courage to make each and every part of life and carrier to be a successful one .

**Divya Roshni Lewis**

## **SYNOPSIS**

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## SYNOPSIS

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The proper operation of mechanical, electrical and life safety systems does not occur automatically. It involves a detailed, systematic, predictive maintenance.

Program tailored to our needs and implemented with our personnel. To meet our needs for the maintenance industry, PM-Scan is used. This is scanner based computerized maintenance software program. It was designed with the utilization of bar code technology with custom symbol scanners on a palm OS platform. It not only verifies that a piece of equipment was looked at, but all the service database is automatically downloaded into the program's database each day, saving our personnel the cost of recreating the day's tasks by hand.

This project (PM-Scanning) can be used for small to very large facilities. PM-Scan is a fully automated database management system that resides both on the local machine and on powerful servers.

A company with all its infrastructure in a fair condition and with a pretty good profits has a chance of running into a loss if not maintained properly. If the minor falls in its machinery is not debugged in the right time would turn destructive damaging the total infrastructure. The process of maintenance is constructed and formulated using the PM-Scanning.

Each and every user has his own login and password. The employees every day work would be assigned to him very early (by PM-Scan). The employee could check his work schedule a day earlier or whenever ho likes to. The employee could do his everyday work viewing the work schedule through his login. The administrator has the overall view and control over the system.

## **CONTENTS**

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# TABLE OF CONTENTS

Page No

## **1. INTRODUCTION**

- 1.1 About the organization
  - 1.1.1. Infrastructural Resources
  - 1.1.2. Fields of Expertise
- 1.2. About the Project
- 1.3. Necessity of the system

## **2. SYSTEM STUDY AND PROBLEM FORMULATION**

- 2.1. Existing system.
- 2.2. Limitations of existing system
- 2.3. Proposed system
- 2.4. Advantages of proposed system
- 2.5. Feasibility study
  - 2.5.1. Technical feasibility study
  - 2.5.2. Economic feasibility study
  - 2.5.3. Operational feasibility study

## **3. SYSTEM SPECIFICATION**

- 3.1. Hardware specification
- 3.2. Software specification
- 3.3. Features of software

## **4. SYSTEM DESIGN AND DEVELOPMENT**

- 4.1. System
- 4.2. Dataflow diagrams
- 4.3. Module design
- 4.4. Database design

## **5. SYSTEM TESTING AND IMPLEMENTATION**

- 5.1. System testing
  - 5.1.1. Unit testing
  - 5.1.2. Integration testing
  - 5.1.3. Validation testing
  - 5.1.4. Output testing
- 5.2. System implementation
- 5.3. Post implementation review

## **6. SYSTEM SECURITY**

## **7. CONCLUSION AND FURTHER ENHANCEMENTS**

## **8. BIBLIOGRAPHY**

## **9. APPENDICES**

- 1. Screen layout (i/p, o/p)
- 2. Sample code

## **INTRODUCTION**

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# INTRODUCTION

## 1.1 About the Organization

Lawrence and associates (LAI) is one of the pioneers in the Indian IT market. They have developed and implemented solutions for multiple market segments, across a range of technologies, covering customers in India and overseas.

### 1.1.1 Infrastructural Resources

LAI makes true technology integration possible across multiple platforms, this was possible because of in-depth expertise in developing state-of-art indigenous solutions. LAI consultants are predominantly recruited, hired and trained in India's "silicon valley" state of Tamil Nadu.

All LAI consultants are experienced in advanced computing technologies, including:

1. UNIX, WINDOWS/NT, THIN CLIENT, CLIENT SERVER
2. C, C++, V/C++, CGI, HTML, JAVA, JAVA SCRIPTING, JAVA BEANS
3. ORACLE, SQL SERVER, SYBASE, INFORMIX, ACCESS

### 1.1.2. Fields of enterprise

LAI has setup overseas subsidiaries leveraging its expertise in total technology solutions and services. The international offices in the countries like st.Louis, Dallas, UK.

#### Certifications

1. Computer Associates(CA)Strategic Partner
2. Siebel Systems Strategic Partner
3. IBM Global Services Partner
4. Sprint Sub-contractor
5. Member St. Louis Minority Business Council
6. Member St. Louis Regional & commerce growth association
7. Member Dallas/Ft. Worth Minority development council
8. Small Disadvantages business
9. The INDUS entrepreneurs(T.I.E.)
- 10.ISO 9001:2001 certified.

Location:

Headquarters :

12882 Manchester Road, #204  
Des Peres, Missouri 63131(U.S.A)

INDIA:

1206-D Tidel Park: 4 canal bank road  
Taramani: Chennai-600 113.  
Tel: (91-44) 2540033 / 2540034  
Website:

## 1.2 ABOUT THE PROJECT

PM Scan – a customized scanner-based maintenance management system that brings 21st century technology to your maintenance operations. With PM Scan you can track scheduled and unscheduled maintenance tasks using the latest barcode technology and portable handheld maintenance tools. PM Scan helps you keep track of an almost unlimited amount of information about your activity.

This project is developed using MS Visual Basic 6.0, with Access as the database server.

## 1.3 NECESSITY OF THE SYSTEM

When the limitations of the existing system is situated, an alternative is suggested; it should obviously cover all the limitations and if possible go to step forward by introducing some new features. So proposal was made to computerize the data manipulation and information retrieval process. All the activities related to this are coordinated and controlled through computerization.

The manual storage of the data requires very high time consumption. After the computerization, some of the manipulation cannot be done as easily like the viewing of the record sets. This system enables us to have the easy performance of all the data transactions from table to table, because they are related to each other by their id. The system study use of the users to do more flops of data entry, modification, deletions and report preparation. This makes each and every data with more functionally and security.

**SYSTEM STUDY AND PROBLEM  
FORMULATION**

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## 2. SYSTEM STUDY AND PROBLEM FORMULATION

### **System study**

System study is the process of making a thorough study of the existing system and identifying the loopholes in the existing system. Nowadays we have lot of software for maintaining the home accounts. The problems that are faced in the existing system can be found out only through system study. Here we made a complete study about the existing system. We found the lag of the interactive in those existing system and all those existing system are made for the specific purpose and not in general.

The system study use of the user to do more flops of data entry, modification, deletions and report preparation. This makes each and every data with more functionally and security.

### **2.1 Existing system**

Existing system makes use of men & paper work i.e., all the records that has been transacted between various modules as indicated in the module design. The preparation of the bill and some other stock details maintenance may be inconvenient. The computerization also involves various problem.

## **2.2 Limitations of existing system**

The limitations of the existing system are

- a. Time consumption
- b. Lack in efficient retrieval process
- c. Improper handling of data
- d. Lack of security
- e. Duplication of records
- f. Data clustering
- g. Improper reporting of item details
- h. Inefficient space for data handling
- i. For a small concern they doesn't have indurations
- j. Such operators may charge high salary

## **2.3 Proposed system**

The system as proposed by this project is the various activities in the big concern. This system requires minimum effort than the traditional system. Before a project alternative solutions should be considered and technical constraints should be identified. Without this information it is break down of project task or management project schedule that provides a meaningful identification of process.

## **2.4 Advantages of Proposed system**

Advantages of proposed system are,

- a. Retrieval of specified tasks is made easy by employing of search method in the project.
- b. Data are organized as per form
- c. Prior reports of user's work.
- d. This package is made user friendly.

## **System Analysis**

System analysis is the process by which we obtain one or more conceptual solutions to the problem. This will help us to make a blueprint of how the exact system will look like. It involves the process of diagnosing problems, interpreting facts and thereby it helps us to propose the new system.

## **Problem analysis**

### **2.5 Feasibility study**

All projects are feasible – given unlimited resources and infinite time! Unfortunately, the development of a computer-

based system or product is more likely plagued by a security of resources and difficult dates. It is both necessary and prudent to evaluate the feasibility of a project at the earliest possible time.

Feasibility and risk analysis are related in many ways. If project risk is great, the feasibility of producing quality software is reduced.

A feasibility study is not warranted for systems in which economic justification is obvious, technical risk is low, few legal problems are expected, and no reasonable alternative exists. However if any of the preceding condition fail, a study of that area should be conducted.

The feasibility study is an important factor that analyzes the capability of a project. The main objective of feasibility study is to weigh up three types of feasibilities.

1. Technical feasibility.
2. Economic Feasibility.
3. Operational feasibility.

### 2.5.1 Technical Feasibility Study

Technical feasibility analysis makes a comparison between the level of technology available and the technology that is needed for the development of the project. The level of technology is determined by factors such as the software tools, machine environment, platform etc. since the resources for the development of this project are already available in the organization, this project is technically feasible.

A study of function performance and constraints that may affect the ability to achieve an acceptable system to any designated order.

Technical feasibility is frequently the most difficult area to assess at this stage of the product engineering process. Because objectives, functions and performance are somewhat hazy anything seems possible if the “right” assumptions are made. It is essential that the process of analysis and definition be conducted in parallel with an assessment of technical feasibility. In this way concrete specification may be judged as that are determined.

### 2.5.2 Economic feasibility study

Economic feasibility is the most important characteristic that has to be evaluated. This is necessary to give the economic justification of the project. The need hardware and software are already available in the organization. Hence the risk of financial non- feasibility does not exist. Thus it is found that the benefit overrides the cost. Hence the system is economically feasible. An evolution of development cost weighted against the ultimate income or benefit derived from the developed system.

Economic justification is generally the “bottom-line” consideration for most systems (notable exceptions sometimes include national defense systems, systems mandated by law, and high-technology applications such as the space program). Economic justification includes a broad range of concerns that include cost-benefit analysis, long-term corporate income strategies, impact on other profit centers or products, costs of resources needed for development and potential market growth.

### 2.5.3 Operational feasibility study

Operational feasibility study is necessary as it ensures that the project developed is successfully implemented in the organization. The operational feasibility of this project is high since it is user friendly and easy to operate.

A determination of any infringement, violation or liability that could result from the development of the system. An evolution of alternative approaches to the development of the system.

A feasibility study is not warranted for system in which economic justification is obvious. Technical risk is low, few legal problems are expected and no reasonable alternative needed for the project development.

# SYSTEM SPECIFICATION

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### 3. SYSTEM SPECIFICATION

#### 3.1. Hardware Specification

PROCESSOR	: 850 Hz
MEMORY	: 128 MB
KEYBOARD	: MICROSOFT
MOUSE	: LOGITECH
DISPLAY TYPE	: EGA/VGA
SERIAL PORTS	: 2F8/3F8
PARALLEL PORTS	: 378
CACHE MEMORY	: 512k
BASE MEMORY	: 640k
SPEAKER	: JS
CD-ROM	: SAMSUNG
MONITOR	: SAMSUNG

The increase in the RAM will make quick execution of the software and provides quick accessibility of the data from the tables.

#### 3.2. Software specification

OPERATING SYSTEM	: WINDOWS SERIES
FRONT END	: VISUAL BASIC 6.0
BACK END	: MS-ACCESS

### 3.3. Features of the Software

#### VISUAL BASIC 6.0

Microsoft Visual Basic is the fastest and easiest way to create applications for Microsoft windows. Visual Basic provides programmers with a complete set of tools simplify rapid application development.

The “visual” part refers to the method used to create the graphical user interface (GUI). Rather than writing numerous lines of code to describe the appearance and location of interface elements. Users simply drag and drop pre built objects into place on screen.

The basic parts refers to BASIC (Basic All Purpose Symbolic Instruction Code) language used by many programmers than any other language in the history of computing. Visual basic as evolved from the BASIC language and now contains several hundreds statements, function and keywords, many of which relates directly to the windows GUI. Visual Basic is considered to be one of the user interface development environment, allow professional to accomplish any thing that can be accomplished using any other windows programming language.

The Visual Basic programming language is not unique it Visual

Basic. The Visual Basic programming system, application edition included in the Microsoft Excel, Microsoft Access and many other windows application use the same language. The Visual Basic programming system, scripting edition (VB script) for internet programming is a subset of the Visual Basic language. Visual Basic has the tools, which is provided to the user to create a small utility, a large enterprise wide system, or even distributed application spanning the globe via the internet.

1. It also features a powerful set of built in controls that are provided for creating window based application. E.g. Command Buttons, checkbox Etc..,
2. An ActiveX component helps you in using the coding in the applications.
3. VB also provides a setup wizard, which is used to prepare an application for distribution.
4. VB lets you to prepare the Internet aware applications.
5. A dll is a set of procedures that are external to an application and can be called within the application when required. They are linked to the application at runtime, as they not bound to the executable file.
6. Visual Basic application can create .exe that uses VB virtual machine, so that it is possible to distribute the application freely.
7. Visual Basic is a user interface application development tool. It is

used to develop GUI using existing objects without writing numerous lines of codes.

8. The data access options of Visual Basic allow you to create databases and application for various database formats such as MS SQL server.
9. Using VB, we can create event driven applications. In a VB application code is executed in response to events. This is different from a procedural application in which code is execute.

## **MS-ACCESS**

Windows-based application:

Access is a windows-based application and therefore has an interface similar to windows. You can cut, copy and paste from any windows application to from Access.

Large Data Management Capacity:

Access maintains a single disk file for a database and all its associated object. Maximum size of the file can be 1 GB. The maximum size of table and objects is limited only by the amount of strong space that the users have. Access can also support a maximum of 255 users at a time.

### Importing, Exporting and Linking External Files:

Access lets you import from or export to FoxPro, Excel, Oracle and other data formats. Importing creates an access table; exporting an Access table creates a file in the format that you are exporting to. Linking means that you can use external data without creating an Access table.

### Wizards and Builders:

A wizard is a utility that helps you perform complex tasks by guiding you through the process. Wizards ask you questions about the content, style and format of the object that you want to create. Access contains nearly 100 wizards to design database, application, tables, forms, reports, graphs, mailing labels, controls and properties.

### Built in Security:

Since Access is a multi user database, security features are built into the DBMS. You can assign a password for loading access so that only authorized users can use it.

# **SYSTEM DESIGN & DEVELOPMENT**

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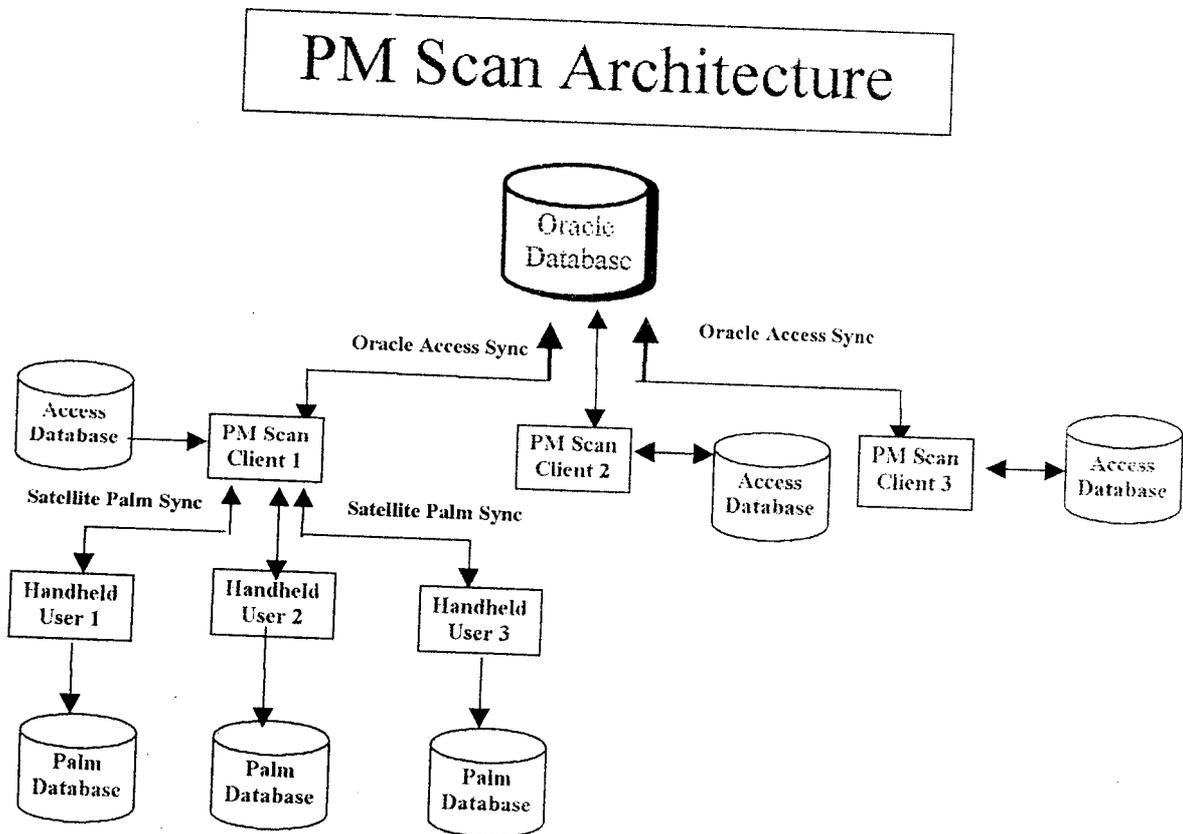
# SYSTEM

PM Scan – a customized scanner-based maintenance management system that brings 21st century technology to your maintenance operations.

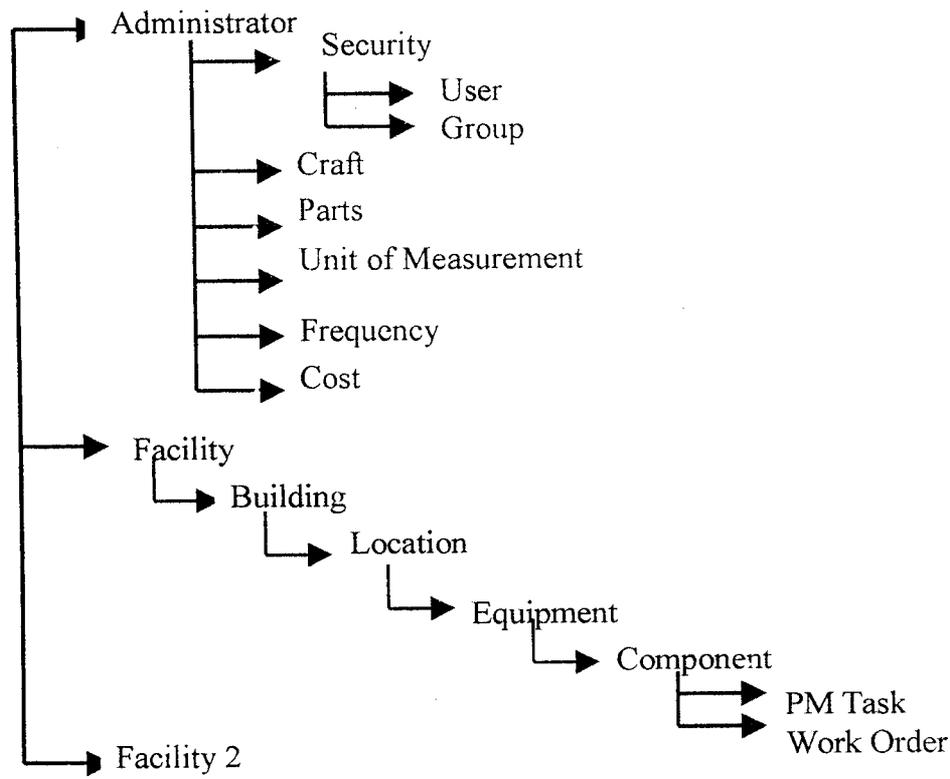
With PM Scan you can track scheduled and unscheduled maintenance tasks using the latest barcode technology and portable handheld maintenance tools.

PM Scan helps you keep track of an almost unlimited amount of information about your activity.

# ARCHITECTURE DESIGN

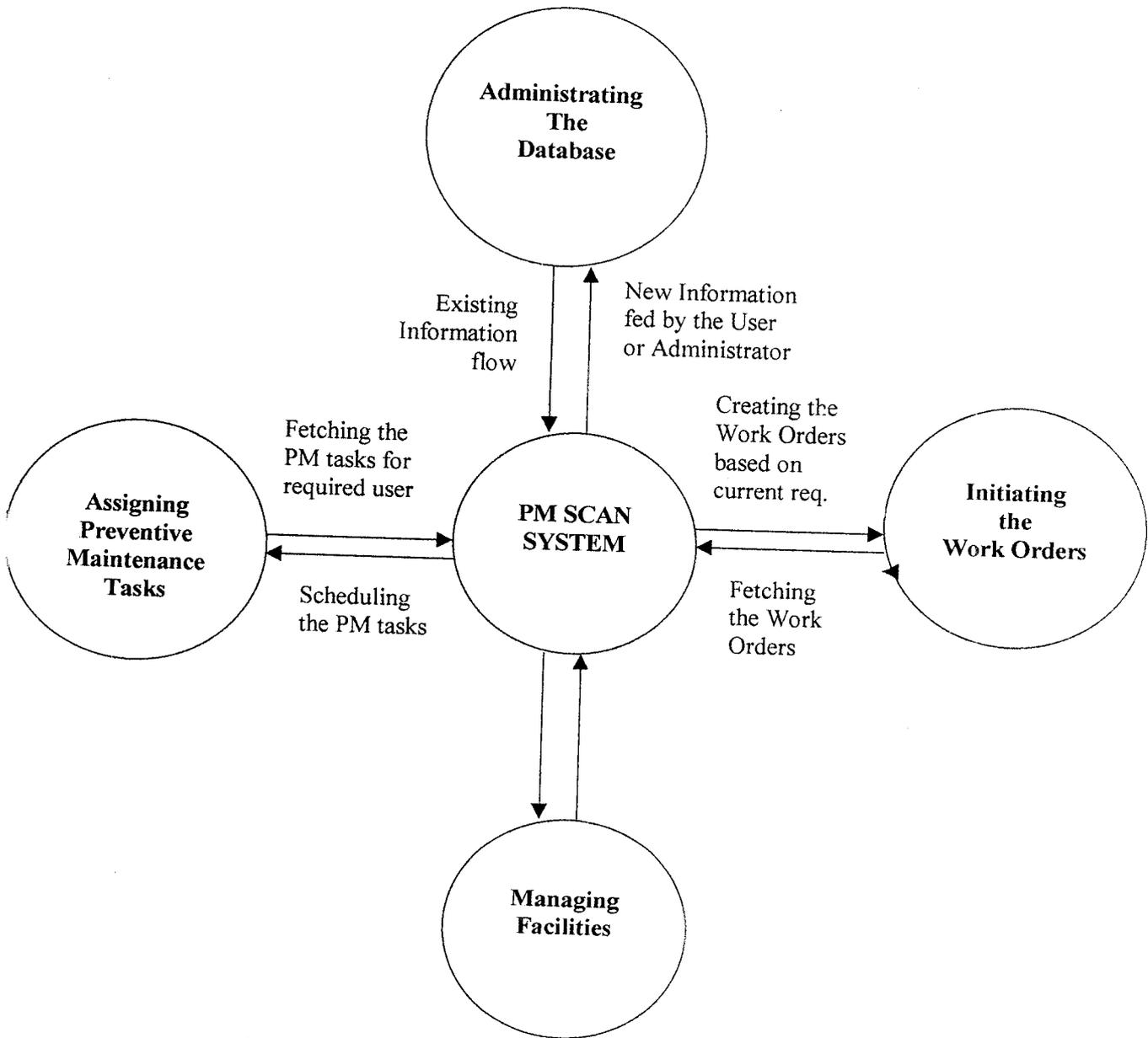


# PM Scan Overview



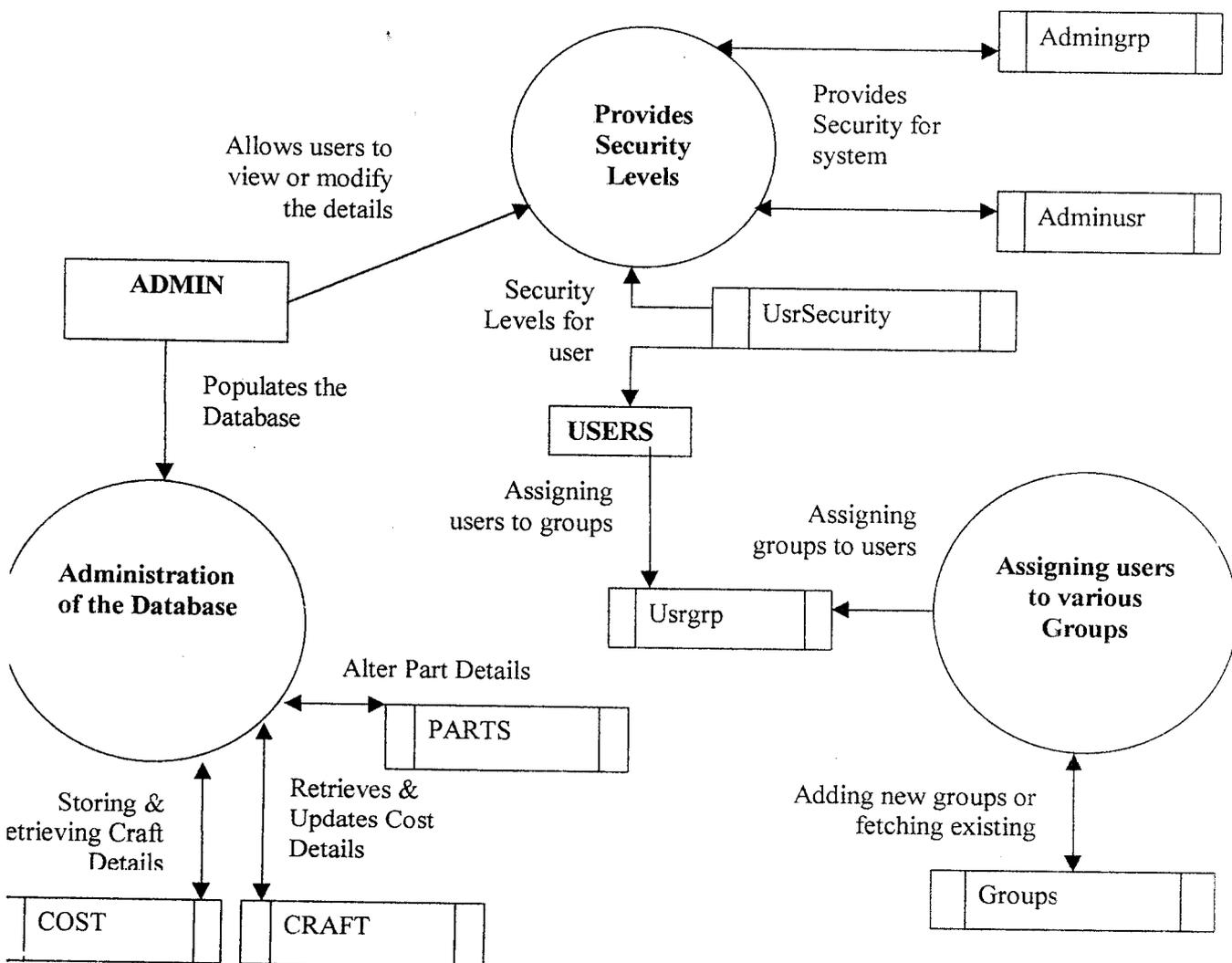
The PM Scan is basically divided into two main categories Administration and Facilities .Administration is the area where common database administration activities are performed and Facilities is where the actual maintenance is set up and recorded. In order to execute the maintenance work , there exists two main activities namely, PM tasks and Work Orders. PM Task is carried out for scheduled activities whereas Work Orders are carried out for unscheduled activities.

# CONTEXT DIAGRAM

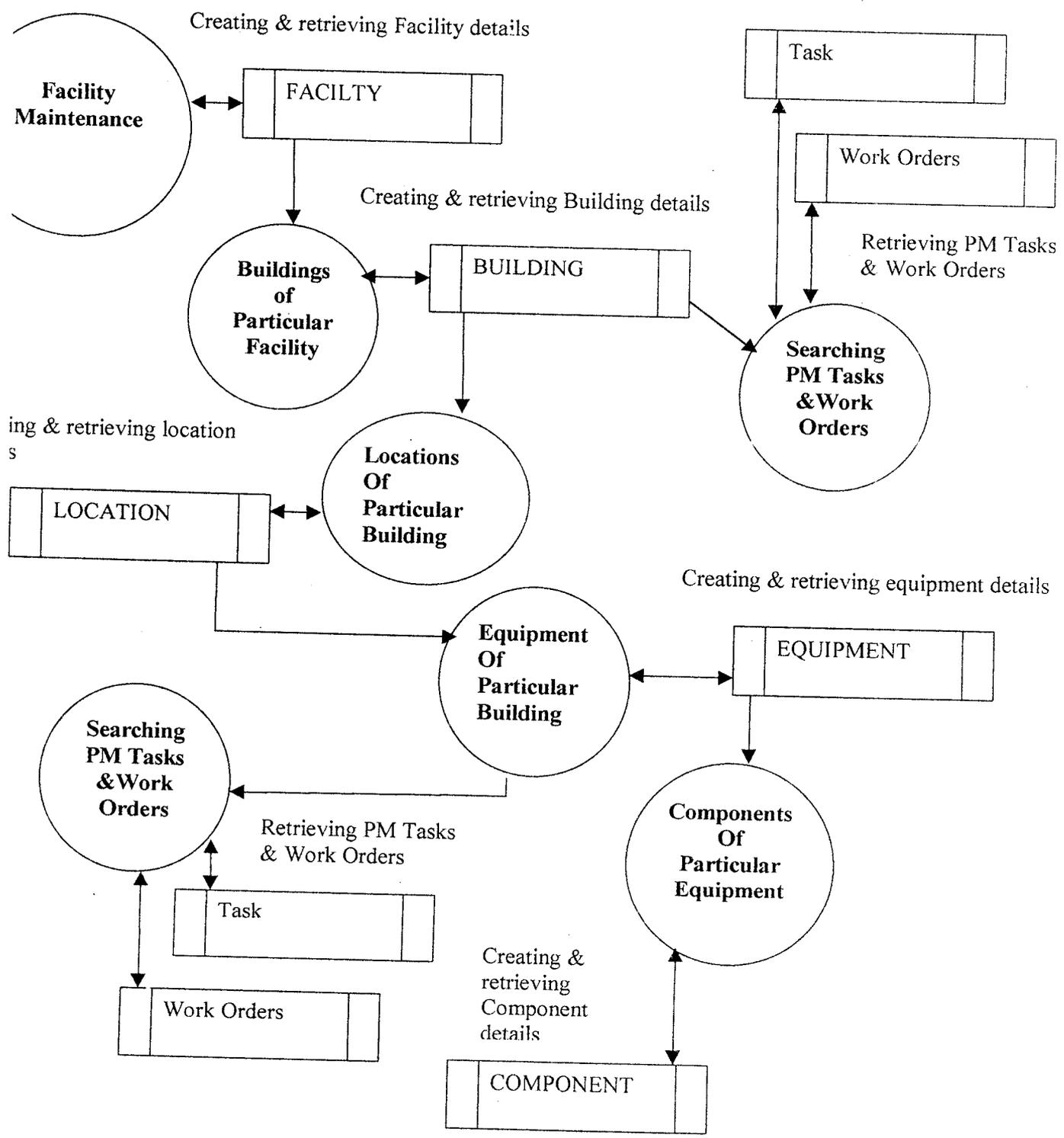


# DATA FLOW DIAGRAM

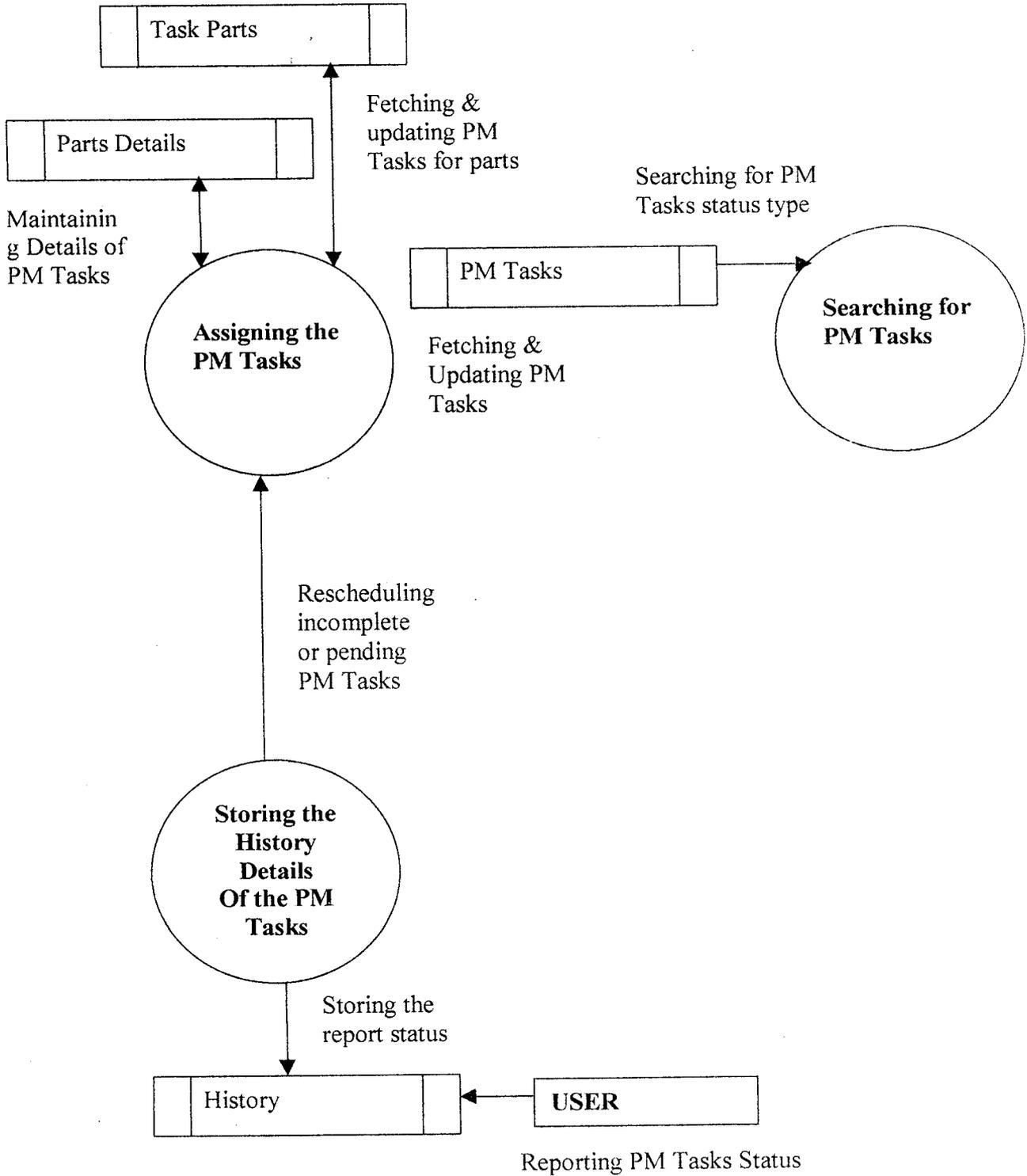
## 1.DATABASE ADMINISTRATION



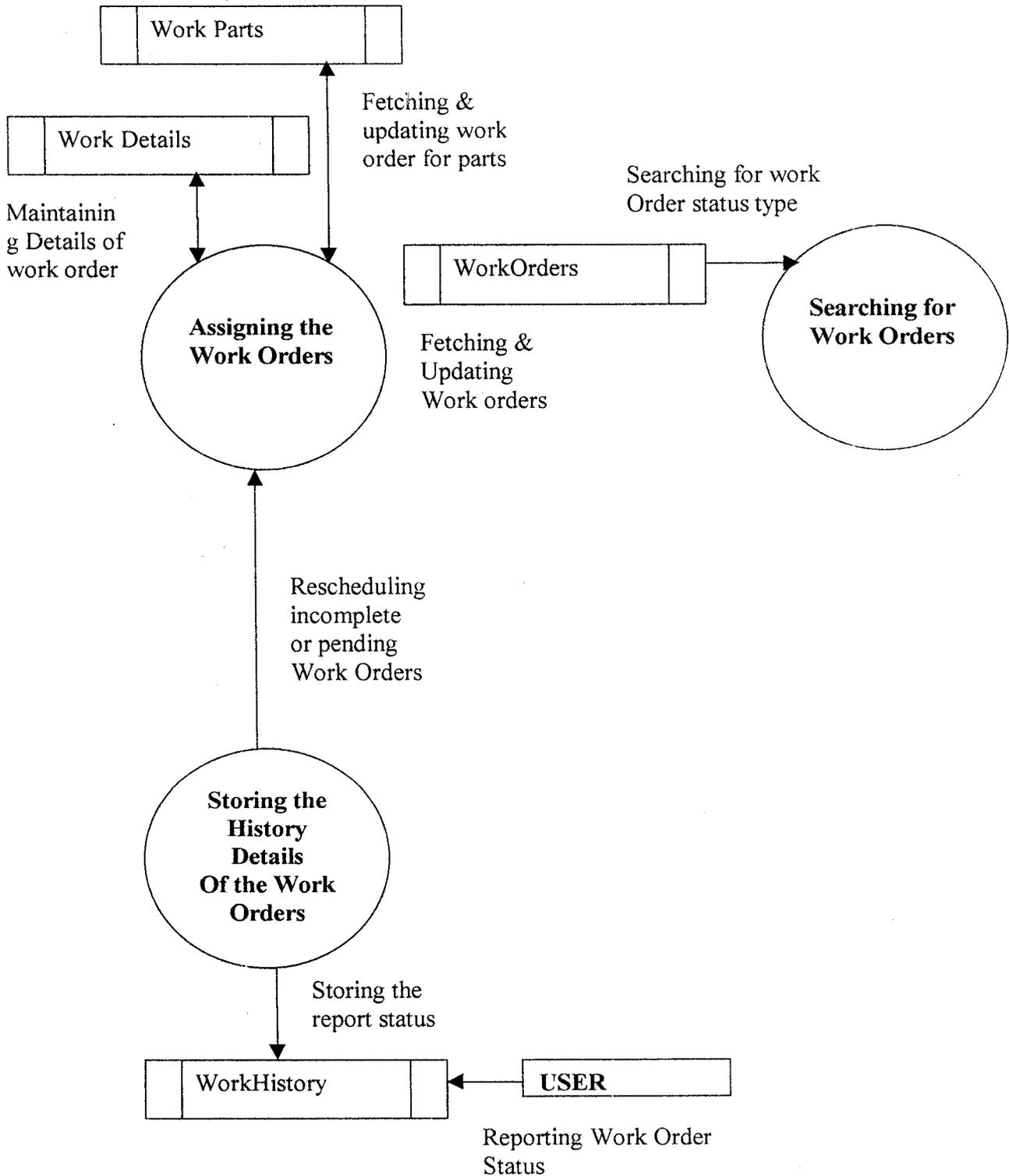
## 2.FACILITIES



### 3. PM TASKS



## 4. WORK ORDERS



## 4.3MODULE DESIGN

### I.DATABASE ADMISTRATION

#### 1. Security

This allows you to set up all the users of PM Scan from Administrators to Managers to Maintenance Technicians.

Each user can be given a Different Level of Security Access to the Program.

#### 2. Users

This list displays the basics of each user: Login name, User Name, Craft, Last In, Last Out. More details and settings can be displayed by opening the user window.

#### 3. Groups

It displays the current list of groups in the Contents Area. More details and settings can be displayed by opening the group window.

#### 4. Craft

Tree will display the current list of crafts in the Contents Area. This list displays the basics of each craft: Abbreviation, Craft Name, Type and Cost.

Crafts are used to assign maintenance personnel to maintenance activities.

## **5. Parts**

Displays the current list of parts in the Contents Area. This list displays the basics of each part: Part Description, category, supplier Name, Manufacturer Name and Address .

Parts are assigned to maintenance activities so that the user knows what parts are needed when preparing to perform the activity.

## **6. Unit of Measurement**

Tree will display the current list of units of measurement . Units of Measurement are used when adding parts to maintenance activity.

## **7. Frequency**

Tree will display the current list of frequency descriptions and the number of days for each frequency.

Frequency periods are used for scheduled PM Tasks to increment the date that the activity occurs.

## **8. Cost**

Tree will display the current list of cost codes and cost code descriptions in the Contents Area.

Cost codes are assigned to maintenance activities to allocate activities to cost categories, such as departments.

## **II.FACILITIES**

### **1. Facility**

It sets up all of the facilities you plan to maintain with PM SCAN.

While maintaining one facility is the typical configuration in PM SCAN, the program is flexible enough to accommodate an unlimited number of facility. This is handy for large setups with multiple campus or facilities split between multiple corporations.

### **2. Building**

The second level of Facilities is Building , it allows you to set up all the buildings you plan to maintain with PMSCAN.Tree will display the current

list of buildings for that facility in the Contents Area.

### **3. Location**

The third level of Facilities is location. It allows you to set up all of locations you plan to maintain with PM SCAN. Tree will display the current list of locations for that building in the Contents Area.

### **4. Equipment**

The fourth level of Facilities is Equipment. It allows you to set up all of equipment you plan to maintain with PM SCAN. While this may seem like the final sublevel of the tree, PM SCAN is actually set up not to maintain equipment, but to maintain components.

The sum of the maintenance on the components of a piece of equipment equals the total maintenance on the piece of equipment.

### **5. Component**

One of the most important concepts to grasp regarding the structure of PM SCAN is that every piece of equipment must have at least one component. Even if the component really is the piece of equipment itself, it must be broken down to the component level in order to be maintained.

So some items may have multiple components and some may only have one. Also, some items may have multiple components, plus a 'catch all' component that covers all maintenance not related to a specific component

It assigns PM Tasks and Work Orders for the piece of equipment as well as all of the components for the equipment.

### **III. PREVENTIVE MAINTENANCE ACTIVITIES (PM TASK)**

These activities are generally based on equipment manufacturers recommendations for servicing their equipment.

Many manufacturers operation and maintenance manuals break down maintenance activities into calendar periods, recommending daily, weekly, monthly, quarterly and or annual maintenance procedure. PM Tasks are designed to help you perform these preventive maintenance activities.

#### **PM TASK SET UP**

- PM Task are of two types – Active / Inactive
- PM Task can be created using add new or from the inactive PM task.
- To add parts to be used for the PM Tasks, click the Parts Details Button. This opens the task parts window.

- To add a list of details to be read and followed while performing a PM Task, click the Task Details Button.
- To view a list of Pm Tasks, left click on the sublevel called PM tasks. This will display in the contents area all PM Tasks already set up for the selected component.

### PM Task History

The data in the task history window is filled automatically by the application when it is sent back from a handheld computer and is displayed. In data order, the most recent historical record is displayed at the top of the list and the first historical record at the bottom of the list.

## **IV. REACTIVE MAINTENANCE ACTIVITIES (WorkOrder)**

Reactive maintenance activities in PM SCAN are called Work Orders. These are unscheduled tasks that are going to be performed on an as-needed basis. Work Orders are not necessarily always unforeseen or emergency situations, but they can be.

They are generally one-time maintenance items that may or may not be scheduled in advance. They may also be work items that are initiated outside of the maintenance department at specific request.

## Work Order Set Up

- Work order are of two types - Active / Inactive
- Work Order can be created using add new or from the inactive Work Order.
- To add a file attachment to the Work Order, click the Attachments button. This will open the Work Order File window.
- To add parts to be used for the Work Order, click the Parts Details Button. This opens the Work Order Parts window.
- To add a list of details to be read and followed while performing a Work order, click the Task Details button. This opens the Work Order Details window.
- To View a list of Work Orders, left-click on the sublevel called Work Orders. This will display in the Contents Area all of the Work Orders already setup for the selected component.

#### 4.4. DATABASE DESIGN

Database design is a crucial factor in the performance of a system, both in terms of system timings and in the case with which the system can be maintained or modified. The database has been designed based upon the entity relationship data model.

#### DATABASE NORMALIZATION

Normalization has been carried out for the following reasons.

1. To structure the data so that any pertinent relationship between entities can be represented.
2. To simplify the maintenance of the data through updates, insertions, deletions.
3. To reduce the need to structure if the reorganizes data when new application requirements arise.

#### TABLE DESIGN

Table Name: Activity Description

Purpose : contains activity description

Name	Type	Size
Activity Details	Text	255
Activity ID	Text	50
Activity Desc Sequence	Long Integer	4
IUD_Flag	Text	1
Insert_TS	Date/Time	8
Insert User ID	Text	50
Delete_TS	Date/Time	8
Delete User ID	Text	50
Update_TS	Date/Time	8



UpdateUserID	Text	50
--------------	------	----

Table Name: CRAFT

Purpose: contains details about craft

Name	Type	Size
CraftCode	Text	50
CraftDescription	Text	50
CraftType	Text	10
CraftCost	Long Integer	4
IUD_Flag	Text	1
Insert_TS	Date/Time	8
InsertUserID	Text	50
Delete_TS	Date/Time	8
DeleteUserID	Text	50
Update_TS	Date/Time	8
UpdateUserID	Text	50

Table: TAB\_LOCATION

Purpose: for storing details of location

Name	Type	Size
LocationCode	Text	50
BuildingCode	Text	50
FacilityCode	Text	50
LocationDescription	Text	100
LocationFloor	Text	50
LocationRoom	Text	10
LocationKey	Text	50
LocationSequence	Text	50
IUD_Flag	Text	1
Insert_TS	Date/Time	8
InsertUserID	Text	50
Delete_TS	Date/Time	8
DeleteUserID	Text	50
Update_TS	Date/Time	8
UpdateUserID	Text	50

Table Name: TAB\_FACILITY

Purpose: contains details of facilities

Name	Type	Size
FacilityCode	Text	50
FacilityDescription	Text	100
FacilityCity	Text	50
FacilityState	Text	20
FacilityContact	Text	50
FacilityAddress	Text	255
FacilityPhone	Text	13
FacilityZip	Text	20
FacilityEmail	Text	50
IUD_Flag	Text	1
Insert_TS	Date/Time	8
InsertUserID	Text	50
Delete_TS	Date/Time	8
DeleteUserID	Text	50
Update_TS	Date/Time	8
UpdateUserID	Text	50

# **SYSTEM TESTING & IMPLEMENTATION**

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## 5. SYSTEM TESTING AND IMPLEMENTATION

### 5.1 System Testing

Testing is an important aspect of the Software Development Life Cycle. Testing is the part where we confirm whether our project achieves the ultimate goal, which we have aimed for. Testing encompasses a set of activities that are conducted systematically. Testing begins at the module level and works “outward” toward the integration of the entire system. Different testing techniques are followed at different points. The purpose of testing a system is to identify various bugs and to fix them, thereby the accuracy of the system can be verified. The developed system is subjected to various testing strategies before it is implemented.

The testing and implementation they are important and final phases. All the process that has been done is just a trial or by assumption. All the required hardware & software is prepared for the testing so that some errors or some modifications may be required for further proceeding.

## 5.2 Unit Testing

In this testing, the smaller part of the project is tested first that is modules and the sub functions present in the project. It seems to be working satisfactorily with out the errors and that shows the unit testing is successful.

The candidate system is subjected to this test and the results are verified. Unit testing focuses on testing the individual modules. Each module is checked for its consistency. Data validation is done to avoid incorrect flow of data within the system. Uploading this application on the server, it was found that the system is capable of handling multiple requests from client. Execution tome and the response time for each module were checked and they were found to be few seconds. The modules were also checked by giving some invalid input for which the appropriate error messages were displayed and such entries were not accepted by the application.

Unit testing focuses verification effort on the smallest unit of software design the module. Unit testing is normally considered as an adjunct to the coding step. After source-level code has been developed, reviewed and verified for correct syntax, unit test case design begins.

### **5.1.1 Integration Testing**

The integration testing is a part that the software makes all behaviors and process required. The errors which are uncovered are integrated testing, are corrected during this phase. The collection of the functions are tested and found with errors are rectified. So that the result can be easily obtained in successful manner.

Integration testing is the testing, which is carried out after the unit testing. In this many unit tested modules are combined into subsystems, which are then tested, the goal here is to see if the modules. The main module is tested and the sub modules are tested to detect errors that occur due to the change in the interface. The system elements have been properly integrated and it is found that they perform their tasks well.

‘Integration testing’ is a systematic technique for constructing the program structure while conducting tests to uncover errors associated with interfacing. The objective is to take unit tested modules and build a program structure that has been dictated by design.

‘Top-down integration’ testing an incremental approach to construction of program structure. Modules are integrated by moving downward through the control module (main program).

‘Bottom-up integration’ testing, as its name implies, begins construction and testing with ‘Atomic Modules’. Because modules are integrated from the bottom-up, processing required for modules subordinate to a given available and the need for stubs is eliminated.

The registration testing, the last step in the integration testing was carried out various complications that aroused in the individual modules.

### **5.1.3 Validation Testing**

The integration testing is a part that the software makes all functions behaviors and process required. The errors which are integrated testing are corrected during this phase. The collection of the functions are tested and found with errors are rectified . So that the result can be easily obtained in a successful manner.

The validation part is very much essential for each application projects so that each data can be validated in a good manner. In some cases the records are created according to the key of the corresponding table to which it has been referenced for data constraint for good secured database. While testing the system by using test data errors are again uncovered and corrected by using above testing steps and corrections are also noted for future use. If there is any error then it is allowed for testing from the beginning.

The main aim of this testing is to verify that the software system does what it was designed for. This is also an important testing. Here only we will check for the correctness of the data. That mean the data may match the designed data type but it should be valid. For example in the work order, we check for the validation of the proper entry of the date.

Software validation is achieved through a series of black-box tests that demonstrate conformity with requirements. A test plan outlines the classes of tests to be conducted, and a test procedure defines specific test cases that be used in an attempt to uncover errors in conformity with requirements. After each validation test case has been conducted, one or two possible condition exists,

1. The function or performance characteristics conform to specification and are accepted, or
2. A deviation from specification is uncovered and a deficiency list is created. Deviation or error discovered at this stage in a project can rarely be corrected prior to scheduled completion.

An important element of the validation process is a “configuration review”.

The intent of the review is to ensure that all elements of the software configuration have been properly developed, are catalogued and have the necessary detail to support the maintenance phase of the software life cycle.

The configuration review, sometimes called an ‘Audit’.

### **5.1.3 User Interface Testing**

An interactive interface is a system that is dominated by interaction between the system and external agents, such as human, devices or other programs. The external agents are independent of the system, so their input cannot be controlled, although the system may solicit response from them . An interactive interface are the communications protocol between the system and the external agents, the syntax of possible interactions the presentation of output the flow of control within the system, the ease of understanding and user interface, performance and error handling.

The dynamic model dominates interactive interfaces. Objects in the model represent interaction elements, such as input and output tokens and presentation formats.

#### **5.1.4 Output Testing**

The output is major required part of the project. The output is tested for required format, if it does not acquire such format then the testing is done or any screen modification is alone for the further operations. The output testing is mainly for the two things they are,

On screen format

Print format

The screen is found to be correct as the designed according to the user needs for the hard copy also; the output comes out as specified by the user.

Hence output testing doesn't result in any correction in the system. Taking various types of data we do the above testing.

Preparation of test data a vital role in system testing. After preparing the test data the system under study is tested using the test data. While testing the system by using the test data. While testing the system by using the test data, errors are again uncovered and corrected by using the above testing and correction methods.

## **5.2 SYSTEM IMPLEMENTATION**

Implementation is the final and important phase. It involves user training, system testing and successful running of the developed proposed system. The user test the developed system and changes are made according to their needs. The testing phase involves the testing of developed system using various kinds of data.

An elaborate testing of data is prepared and the system is tested using that test data. While testing errors are noted and corrections are made. The users are trained to operate the developed system. Both hardware and software securities are made to run the developed system successfully in future

At the beginning of the development phase, a preliminary implementation plan is created to schedule and manage the many different activities that must be integrated into plan. The implementation plan is updated throughout the development phase, culminating in a change over

plan for the operation phase. The major elements of implementation plan are test plan training plan, equipment installation plan and a conversion plan.

## **5.1 POST IMPLEMENTATION**

Every system requires periodic evaluation after implementation. A post implementation review measures the system's performance against predefined requirements. Unlike system testing, which determines where the system fails so that the necessary adjustments can be made, a post implementation review determines how well the system continues to meet performance specifications. It also provides information to determine whether major redesign is necessary.

A post implementation review is evaluations of a system in terms of the extent to which the system accomplishes stated objectives and actual projects cost exceed initial estimates. It is usually a review of major problems that need converting and those that surfaced during the implementation phase. the primary responsibility for initiating the review lies with the user organization

**SYSTEM SECURITY**

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## **6. SYSTEM SECURITY**

System security refers to the technical innovation and procedures applied to the hardware and operating systems to protect against deliberate or accidental damage. Data security refers to the protection of data from loss, disclosure, modification and distraction. Prevention had been made using passwords while entering into the system and while updating crucial data.

### **SYSTEM INTEGRITY**

System integrity refers to the proper functioning of hardware, software, appropriate physical security and safety against external threats like wire-tapping. Data integrity makes sure that data do not differ from their original form. This is accomplished by proving validation at all input points.

### **PRIVACY**

It means the rights to the user organization to determine what information they are willing to share with others and protect the information from hacking.

An important feature that has been to be implemented in any project is security that has been offered by restricting the access of the information by third persons, since this project deals with maintenance of record details of the work order and PM task. Since the backend is VB Access the data cannot be easily accessible by outsiders or the third persons. Only the user will provided with rights.

The database is VB Access that can keep the data with in, as secured as possible and so without the id of the worker, the database non-functional, the id is the user name of the oracle. Since the application developed for the particular concern, all the employees have rights to access the information whenever necessary. The system secured in the outsiders cannot get into and access the information.

**CONCLUSION & FURTHER  
ENHANCEMENTS**

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## **CONCLUSION AND FURTHER ENHANCEMENTS**

The software has been designed to perform the 'Preventive Maintenance Scanning'. The programs for carrying out various activities have run successfully tested to ensure that the package meets the industry needs satisfactorily. The system is flexible and changes if any can be incorporated without much difficulty.

The system is tested using simple data. Its performance is good. The documents have been prepared and the system is now ready for the implementation. Some future enhancements can be foreseen for this system in the form of additional reports.

The system is especially developed to maintain the large facilities without any problem. The system consumes minimal amount of time and cost as compared to the human work. This PM Scan was developed by rectifying all demerits of the existing system.

## **BIBLIOGRAPHY**

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## **APPENDICES**

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# 1. SCREEN SHOTS

## 1. MAIN SCREEN

PM SCAN \_ | [ ] | X

File Search View PDA Help

	PM Tasks				
	Status	Activity	Description	Priority	Craft
Root	Inactive	PM Task	Semi-Annual Mainten...		
Global Settings	Inactive	PM Task	B-Monthly Fan Bearing...	High	Administrati...
Facilities	Active	PM Task	B-Monthly Fan Bearing...		

<ul style="list-style-type: none"> <li>Root</li> <li>Global Settings</li> <li>Facilities <ul style="list-style-type: none"> <li>Donald Danforth Plant Science <ul style="list-style-type: none"> <li>View All</li> <li>Buildings</li> <li>Locations</li> <li>Equipment</li> <li>Components</li> <li>PM Tasks and Work O</li> <li>Greenhouse <ul style="list-style-type: none"> <li>PM Tasks and Work O</li> <li>Hallway</li> <li>Outside <ul style="list-style-type: none"> <li>Packaged A/C Un <ul style="list-style-type: none"> <li>PM Tasks and History</li> <li>Fan</li> <li>Motor</li> <li>Unit <ul style="list-style-type: none"> <li>Work Orde</li> <li>PM Tasks</li> </ul> </li> </ul> </li> </ul> </li> <li>Packaged A/C Un</li> </ul> </li> </ul> </li> <li>Hazardous Materials</li> <li>Laboratory Building</li> <li>Maintenance</li> </ul> </li> </ul>	<p>6/23/2003 6:06 PM</p>
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------

Root\Facilities\Donald Danforth Plant Science Center\Maintenance\Outside\Exhaust Fan EF-13\Fan\PM

## 2) User Details

PM SCAN

File View PDA Help

Root

- Global Settings
  - Administration
    - Security
      - Users
      - Groups
    - Craft
    - Parts
    - Unit of Measurement
    - Frequency
    - Cost
  - Facilities
    - Donald Danforth Plant Sci
      - View All
      - Greenhouse
        - PM Tasks and W
        - Hallway
        - Outside
          - Packaged A/
            - PM Task
            - History
            - Fan
            - Motor
            - Unit
          - Work
          - PM T
        - Packaged A/C Unit AH
        - Hazardous Materials

User Details/Security

User Details Security Advanced Security

First Name: D. Dorrough

Last Name: donna

Username: \*

Password: \*

Member Of

Member Of	Available
Administration	admin
Third Party Contractors	Physical Plant

Domain: AD

Role: \*

Group: \*

Buttons: OK Cancel

Root\Global Settings\Administration\Security\Users

6/23/2003 6:19 PM

Craft

- admi - Owner
- MT - Maintenance Tech
- MT - Maintenance Tech
- MT - Maintenance Tech
- AD - Administration
- MT - Maintenance Tech
- MT - Maintenance Tech
- MT - Maintenance Tech
- TP - Third Party Contrac

### 3) PART MASTER

PM SCAN

File Search View PDA Help

Root

Global

Ad

Facilities

Parts

LUBE

mmtest

242342

2342342

Filters R Us

sdfrs

sdfrs

sd

sd

AR Arkansas

AZ Arizona

12312 012-3123

12312 012-3123

moharvel

rashan

Root\Global Settings\Administration\Parts 6/23/2003 6:11 PM

## 4) Facility Transaction

PM SCAN

File View PDA Help

Root

- Global Settings
  - Administration
    - Security
    - Craft
    - Parts
    - Unit of Measurement
    - Frequency
    - Cost
  - Facilities

Facility

Facility Name	Address	City
Donald Danforth Plant Science Center		

Facility

Facility Name: Donald Danforth Plant Science Center

Address:  Contact:

City:  Phone:

State:  E-Mail:

Zipcode:

Save OK Cancel

Root\Facilities

6/23/2003 6:14 PM

## 5) Building details

The screenshot displays the PM SCAN software interface. The main window is titled "Building" and shows details for a "Greenhouse". The interface includes a menu bar (File, View, PCA, Help), a toolbar with various icons, and a tree view on the left side. The tree view is expanded to show "Greenhouse" details, including "PM Tasks and Wor", "Hallway", "Outside", "Packaged A/C", "Fan", "Motor", "Unit", "Work C", "PM Ta", "Packaged A/C", "Hazardous Materials", "Laboratory Building", and "Maintenance". The main content area contains several input fields and a table. The table has a header "System Name" and a single row with an asterisk (\*). A "Data Maintenance" button is visible in the bottom right of the main content area. The status bar at the bottom left shows the path "Root\Facilities\Donald Danforth Plant Science Center". The date and time "6/23/2003 6:15 PM" are displayed in the bottom right corner.

PM SCAN  
File View PCA Help

Building

Greenhouse

System Name

Data Maintenance

6/23/2003 6:15 PM

Root\Facilities\Donald Danforth Plant Science Center

## 2. SAMPLE CODING

Option Explicit

Dim rs As ADODB.Recordset

Dim rs1 As ADODB.Recordset

Dim rs2 As ADODB.Recordset

Private Sub cmbNameManu\_Click()

Call getcon

If rs.State = 1 Then rs.Close

rs.Open "select manufactureaddress, manufacturecity, manufacturestate,  
manufacturezip, manufacturephone, manufacturecontact from  
tab\_manufacturer where manufacturename='" & cmbNameManu.Text &  
"'" , con, adOpenDynamic, adLockOptimistic

txtAddressManu.Text = rs.Fields(0)

txtCityManu.Text = rs.Fields(1)

cmbStateManu.Text = rs.Fields(2)

txtZipManu.Text = rs.Fields(3)

txtPhoneManu.Text = rs.Fields(4)

txtContactManu.Text = rs.Fields(5)

rs.Close

End Sub

Private Sub cmbNameManu\_LostFocus()

Dim i As Integer

For i = 0 To cmbNameManu.ListCount - 1

While cmbNameManu.Text = cmbNameManu.List(i)

i = i + 1

Exit Sub

Wend

```
Next  
End Sub
```

```
Private Sub cmbNameSupp_Click()  
Call getcon
```

```
If rs.State = 1 Then rs.Close  
rs.Open "select Supplieraddress, Suppliercity, Supplierstate,  
Supplierzipcode, Supplierphone, Suppliercontactname from  
tab_supplier where suppliername='" & cmbNameSupp.Text & "'",  
con, adOpenDynamic, adLockOptimistic
```

```
txtAddressSupp.Text = rs.Fields(0)  
txtCitySupp.Text = rs.Fields(1)  
cmbStateSupp.Text = rs.Fields(2)  
txtZipSupp.Text = rs.Fields(3)  
txtPhoneSupp.Text = rs.Fields(4)  
txtContactSupp.Text = rs.Fields(5)
```

```
rs.Close
```

```
End Sub
```

```
Private Sub cmbNameSupp_LostFocus()  
Dim i As Integer  
For i = 0 To cmbNameSupp.ListCount - 1  
While cmbNameSupp.Text = cmbNameSupp.List(i)  
i = i + 1  
Exit Sub
```

```
Wend
```

```
Next  
End Sub
```

```
Private Sub cmbPartCategory_Change()  
If flag = "MOD " Then  
cmbPartDescription.Text = ""  
Call getcon
```

Call Partdesc

```
If rs.State = 1 Then rs.Close
    rs.Open " select partdescription from tab_manufacturer where
categoryId="" & cmbPartCategory.Text & """, con, adOpenDynamic,
adLockOptimistic

    While rs.EOF <> True
        cmbPartDescription.SelText = rs.Fields(0)
        rs.MoveNext
    Wend
    rs.Close
End If

End Sub
```

Private Sub cmbPartCategory\_Click()

```
cmbPartDescription.Text = ""
Call getcon
Call Partdesc
If rs.State = 1 Then rs.Close
    rs.Open " select partdescription from tab_manufacturer where categoryId=""
& cmbPartCategory.Text & """, con, adOpenDynamic, adLockOptimistic
    While rs.EOF <> True
        cmbPartDescription.SelText = rs.Fields(0)
        rs.MoveNext
    Wend
    rs.Close
```

End Sub

Private Sub cmbPartCategory\_LostFocus()

```
Dim i As Integer
For i = 0 To cmbPartCategory.ListCount - 1
    While cmbPartCategory.Text = cmbPartCategory.List(i)
```

```
        i = i + 1
        Exit Sub

    Wend

Next

End Sub

Private Sub cmbPartDescription_LostFocus()

    Dim i As Integer
    For i = 0 To cmbPartDescription.ListCount - 1
        While cmbPartDescription.Text = cmbPartDescription.List(i)
            i = i + 1
            Exit Sub
        Wend
    Next

End Sub

Private Sub cmdCancel_Click()

    Unload Me
    flag = ""
    frmInterface.Show

End Sub

Private Sub cmdOk_Click()

    If flag = "ADD" Then
        Call getcon
        If rs1.State = 1 Then rs1.Close
    End If

End Sub
```

```
rs1.Open "select max(val(right(partcode ,len(partcode)-3))) from
tab_manufacturer", con, adOpenDynamic, adLockOptimistic
con.Execute "insert into tab_supplier (suppliernrno, suppliernrname,
supplieraddress,suppliernrcity,suppliernrstate,suppliernrzipcode,suppliernrphone,suppliernrcontactname) values ('" & txtSuppliernrno.Text & "','" &
cmbNameSupp.Text & "','" & txtAdderessSupp.Text & "','" &
txtCitySupp.Text & "','" & cmbStateSupp.Text & "','" & txtZipSupp.Text &
 "','" & txtPhoneSupp.Text & "','" & txtContactSupp.Text & "')
```

```
con.Execute "insert into tab_manufacturer (partcode, categoryid,
partdescription,manufacturenrname,manufacturenraddress,manufacturenrcity,manu
facturenrstate,manufacturenrzipcode,manufacturenrphone,manufacturenrcontact,supplie
nrno) values ('" & partcode & "','" & cmbPartCategory.Text & "','" &
cmbPartDescription.Text & "','" & cmbNameManu.Text & "','" &
txtAddressManu.Text & "','" & txtCityManu.Text & "','" &
cmbStateManu.Text & "','" & txtZipManu.Text & "','" &
txtPhoneManu.Text & "','" & txtContactManu.Text & "','" &
txtSuppliernrno.Text & "')
```

```
MsgBox "New part added"
```

```
rs1.Close
```

```
End If
```

```
If flag = "MOD" Then
```

```
    If rs.State = 1 Then rs.Close
```

```
        rs.Open "select partcode from tab_manufacturer where
partdescription='" & uname & "' "
```

```
con.Execute "update tab_manufacturer set partcode='" & rs.Fields(0) &
"',manufacturenrnumber='" & txtManufacturenrno.Text & "',
manufacturenrname='" & cmbNameManu & "',manufacturenraddress='" &
txtAddressManu & "',manufacturenrcity='" & txtCityManu &
"',manufacturenrstate='" & cmbStateManu.Text & "',manufacturenrzipcode='" &
txtZipManu & "',manufacturenrphone='" & txtPhoneManu &
"',manufacturenrcontact='" & txtContactManu & "',SupplierNo='" &
txtSuppliernrno & "',partdescription='" & cmbPartDescription.Text &
"',categoryid='" & cmbPartCategory.Text & "' where partdescription=" &
uname & "' "
```

```
del = MsgBox("Do you want to Delete " & uname & " ?", vbYesNo,  
"Message")
```

```
    If del = vbNo Then
```

```
        Exit Sub
```

```
    Else
```

```
        Call delete
```

```
        Call frmInterface.mycall
```

```
    End If
```

```
End If
```

```
End Sub
```

```
Public Sub Partcategory()
```

```
    Call getcon
```

```
    If rs.State = 1 Then rs.Close
```

```
        rs.Open " select categoryID from tab_category", con, adOpenDynamic,  
adLockOptimistic
```

```
        While rs.EOF <> True
```

```
            cmbPartCategory.AddItem rs.Fields(0)
```

```
            rs.MoveNext
```

```
        Wend
```

```
        rs.Close
```

```
End Sub
```

```
Public Sub Partdesc()
```

```
    Call getcon
```

```
    cmbPartDescription.clear
```

```
    If rs.State = 1 Then rs.Close
```

```
        rs.Open " select partdescription from tab_part where categoryid =" &  
cmbPartCategory.Text & "", con, adOpenDynamic, adLockOptimistic
```

```
        While rs.EOF <> True
```

```
            cmbPartDescription.AddItem rs.Fields(0)
```

```
rs.MoveNext
Wend
rs.Close
End Sub
```

```
Private Sub txtManufactureno_LostFocus()
Dim l As Integer
Dim s As String
Dim i As Integer
l = Len(txtManufactureno)
For i = 1 To l
s = Mid(txtManufactureno.Text, i, 1)
If Not ((Asc(s) >= 49 And Asc(s) <= 57) Or (Asc(s) >= 65 And Asc(s) <=
90)) Then
MsgBox "Only numbers are allowed"
txtManufactureno.Text = ""
txtManufactureno.SetFocus
End If
Next
End Sub
```

```
Public Sub ManuDetails()
Call getcon
If rs.State = 1 Then rs.Close
rs.Open " select manufacturename from tab_manufacturer", con,
adOpenDynamic, adLockOptimistic
While rs.EOF <> True
cmbNameManu.AddItem rs.Fields(0)
rs.MoveNext
Wend
rs.Close
End Sub
```

```
Public Sub SupplierName()
Call getcon
If rs.State = 1 Then rs.Close
rs.Open " select suppliername from tab_supplier", con,
adOpenDynamic, adLockOptimistic
```

```
con.Execute "update tab_supplier set suppliername='" &
cmbNameSupp.Text & "',Supplieraddress='" & txtAddressSupp.Text & "',
Suppliercity='" & txtCitySupp.Text & "', Supplierstate='" &
cmbStateSupp.Text & "', Supplierzipcode='" & txtZipSupp.Text & "',
Supplierphone='" & txtPhoneSupp.Text & "', Suppliercontactname='" &
txtContactSupp.Text & "' where supplierno='" & txtSupplierno.Text & """
```

```
    MsgBox "" & uname & " UPDATED "
rs.Close
End If
```

```
End Sub
```

```
Private Sub cmdPartCatAdd_Click()
```

```
Dim i As String
Dim j As String
i = cmbPartCategory.Text
j = cmbPartDescription.Text
```

```
Dim k As Integer
```

```
Dim c As Integer
```

```
For k = 0 To cmbPartCategory.ListCount - 1
```

```
    If cmbPartCategory.Text = cmbPartCategory.List(k) Then
```

```
        MsgBox "PartCategory Already Exsists.Please choose from the List"
```

```
        Exit Sub
```

```
    End If
```

```
Next
```

```
cmbPartCategory.AddItem (i)
```

```
con.Execute "insert into tab_category(categoryid) values ('" & i & "')" 
```

```
cmbPartCategory.Text = ""
```

```
Dim l As Integer
```

```
For l = 0 To cmbPartDescription.ListCount - 1
```

```
    If cmbPartDescription.Text = cmbPartDescription.List(l) Then
```

```
        MsgBox " PartDescription Already Exsists.Please choose from the
List"
```

```

        l = l + 1
        Exit Sub
    End If
Next
cmbPartDescription.AddItem (j)

If rs.State = 1 Then rs.Close
    rs.Open "select count(partcode)from tab_part ", con, 1, 2
        partcode = "PRT" & Val(rs(0)) + 1
con.Execute "insert into tab_part(partcode,categoryid,partdescription)
values(" & partcode & "," & i & "," & j & ")" "
cmbPartDescription.Text = ""

End Sub

Private Sub Form_Load()

Set rs = New ADODB.Recordset
Set rs1 = New ADODB.Recordset
Set rs2 = New ADODB.Recordset

If flag = "ADD" Then
    Call Partcategory
    Call Partdesc
    Call ManuDetails
    Call SupplierName
    If rs1.State = 1 Then rs1.Close
rs1.Open "select max(val(right(partcode ,len(partcode)-3))) from
tab_manufacturer", con, adOpenDynamic, adLockOptimistic
partcode = "PRT" & Val(rs1.Fields(0)) + 1
End If

If flag = "MOD" Then
cmdOK.Caption = "MODIFY"
Call PartCategoryMod
End If

If flag = "DEL" Then
Dim del As String

```

```
While rs.EOF <> True
    cmbNameSupp.AddItem rs.Fields(0)
    rs.MoveNext
Wend
rs.Close
```

End Sub

```
Private Sub txtSupplierno_LostFocus()
```

```
Dim l As Integer
Dim s As String
Dim i As Integer
l = Len(txtManufactureno)
For i = 1 To l
    s = Mid(txtManufactureno.Text, i, 1)
    If Not ((Asc(s) >= 49 And Asc(s) <= 57) Or (Asc(s) >= 65 And Asc(s) <=
90)) Then
        MsgBox "Only numbers are allowed"
        txtManufactureno.Text = ""
        txtManufactureno.SetFocus
    End If
Next
```

End Sub

```
Public Sub PartCategoryMod()
```

```
Call getcon
Call Partcategory
```

```
If rs.State = 1 Then rs.Close
rs.Open " select categoryID from tab_manufacturer where
partdescription="" & uname & """, con, adOpenDynamic,
adLockOptimistic
```

```
cmbPartCategory.Text = rs.Fields(0)
rs.Close
```

Call Partdesc

```
If rs.State = 1 Then rs.Close
    rs.Open " select partdescription from tab_manufacturer where
    categoryid=" & cmbPartCategory.Text & "", con, adOpenDynamic,
    adLockOptimistic
    cmbPartDescription.Text = rs.Fields(0)
rs.Close
```

```
If rs1.State = 1 Then rs1.Close
    rs1.Open "select
    manufacturennumber,manufacturename,manufactureaddress,manufactu
    recity,manufacturestate,manufacturezip,manufacturephone,manufactu
    recontact,SupplierNo from tab_manufacturer where categoryid=" &
    cmbPartCategory.Text & " ", con, adOpenDynamic,
    adLockOptimistic
```

```
    txtManufactureno.Text = rs1.Fields(0)
    cmbNameManu.Text = rs1.Fields(1)
    txtAddressManu.Text = rs1.Fields(2)
    txtCityManu.Text = rs1.Fields(3)
    cmbStateManu.Text = rs1.Fields(4)
    txtZipManu.Text = rs1.Fields(5)
    txtPhoneManu.Text = rs1.Fields(6)
    txtContactManu.Text = rs1.Fields(7)
    txtSupplierno.Text = rs1.Fields(8)
rs1.Close
```

```
If rs2.State = 1 Then rs2.Close
    rs2.Open "select suppliername,Supplieraddress, Suppliercity,
    Supplierstate, Supplierzipcode, Supplierphone, Suppliercontactname
    from tab_supplier where supplierno=" & txtSupplierno.Text & " ",
    con, adOpenDynamic, adLockOptimistic
```

```
cmbNameSupp.Text = rs2.Fields(0)
txtAddressSupp.Text = rs2.Fields(1)
txtCitySupp.Text = rs2.Fields(2)
cmbStateSupp.Text = rs2.Fields(3)
txtZipSupp.Text = rs2.Fields(4)
txtPhoneSupp.Text = rs2.Fields(5)
txtContactSupp.Text = rs2.Fields(6)
rs2.Close
```

```
txtManufactureno.Locked = True
End Sub
```

```
Public Sub delete()
```

```
con.Execute "delete from tab_manufacturer where partdescription='" &
uname & "' "
```

```
End Sub
```