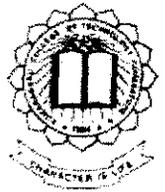


P-2749



PC ASSET MANAGEMENT SYSTEM

By

ZIPPORAH. D

Reg. No.: 71206621060

of

**KUMARAGURU COLLEGE OF TECHNOLOGY
COIMBATORE**



A PROJECT REPORT

Submitted to the

FACULTY OF INFORMATION AND COMMUNICATION ENGINEERING

*In partial fulfillment of the requirements
for the award of the degree*

of

MASTER OF COMPUTER APPLICATIONS

**ANNA UNIVERSITY
CHENNAI 600 025**

July 2009

BONAFIDE CERTIFICATE

Certified that this project report titled “PC Asset Management System” is the bonafide work of **Ms. Zipporah. D** (Register Number: **71206621060**) who carried out the research under my supervision. Certified further, that to the best of my knowledge the work reported herein does not form part of any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

M. G. G. S.
30/6/09
Supervisor

[Signature]
Head of the Department

Submitted to Project and Viva Examination held on 06-07-2009

[Signature]
6/7/09
Internal Examiner

[Signature]
6/7/09
External Examiner



Cognizant

Cognizant Technology Solutions India
Mountain Mist Campus, Unit -1, STPI -
No.363, KGISL Campus, Thudiyalur Road,
Coimbatore - 641035
Phone : (+91-0422) 3923000
Fax : (+91-0422) 3923060

www.cognizant.com

To whomsoever it may Concern

This is to certify that **Miss. Zipporah. D** a student of **Kumaraguru College of Technology**, had undergone a project titled **PC Asset management System** at **Cognizant Technology Solutions India Pvt.Ltd** under the guidance of **Mr. Senthil Raju (Assistant Manager Projects)**.

The duration of the project was from **01/11/08** and **01/05/09**.

We wish her all the success for her future endeavors

For Cognizant Technology Solutions India Pvt. Ltd.

Sunil Kumar. C
Human Resources

May 10, 2009

ABSTRACT

This application is a comprehensive, scalable PC Asset Management Solution for Windows networks. It offers contracts and vendors' management, detailed hardware and software inventory reports via a web interface and over your intranet, enabling you to track changes to your infrastructure and ensuring software license compliance.

It has an integrated asset management solution along with the basic help desk functions. It acts as a powerful suite to control the use of your computer.

The project provides an interactive display system and a display of a range of choices to be made by the users for ease of maintenance of the different software licenses, hardware inventory and contract management.

Services can be easily provided when a hardware or software problem is encountered in the PCs. When an employee encounters a problem and raises a request, the system displays the request to all hardware technicians for rectification, after which, feedback can be entered to rate the service done. Rewards will be awarded to the hardware technician with the best rating.

ACKNOWLEDGEMENT

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LIST OF ABBREVIATIONS

PCAMS	PC Asset Management System
AMC	Annual Maintenance Contract
ERP	Enterprise Resource Planning
CRM	Customer Relationship Management
ASP	Active Server Pages

CHAPTER 1

INTRODUCTION

1.1. ORGANIZATION PROFILE

Cognizant (NASDAQ: CTSH) is a leading provider of information technology, consulting and business process outsourcing services. Cognizant's single-minded passion is to dedicate our global technology and innovation know-how, our industry expertise and worldwide resources to working together with clients to make their businesses stronger. With over 50 delivery centers and 63,700 employees as of March 31, 2009, we combine a unique onsite/offshore delivery model infused by a distinct culture of customer satisfaction. A member of the NASDAQ-100 index and S&P 500 index, Cognizant is a Forbes 2000 company and a member of the Fortune 1000 and is ranked among the top information technology companies in Business Week's Hot Growth and Top 50 Performers listings.

Portfolio Of Services

Across each business segment, Cognizant provides a broad and expanding range of information technology consulting and business processing outsourcing services, including:

- Project-based application services
- Business and technology consulting
- Complex systems integration
- Application outsourcing
- Business process outsourcing
- IT infrastructure outsourcing
- Testing solutions, Analytics, ERP, CRM,
- Business Intelligence, Data Warehousing and
- Supply Chain Management

1.2. PROJECT OVERVIEW

This application is a comprehensive, scalable PC Asset Management Solution for Windows networks. It offers contracts and vendors' management, detailed hardware and software inventory reports via a web interface and over your intranet, enabling you to track changes to your infrastructure and ensuring software license compliance. It has an integrated asset management solution along with the basic help desk functions. It acts as a powerful suite to control the use of your computer.

The project provides an interactive display system and a display of a range of choices to be made by the users for ease of maintenance of the different software licenses, hardware inventories and contracts. Services can be easily provided when a hardware or software problem is encountered in the PCs.

Generally, the management will sign support contracts and AMCs with software and hardware vendors. Such contracts are tracked and managed. Vendor details and the assets covered under each contract are also managed. E-mail notifications are done to renew contracts before expiry. Purchase orders can be placed by administrators when a hardware or software is needed. Products ordered, products delivered and products returned are well tracked in this system.

This application is a user friendly tool for maintaining the details of all software licenses. Alerts are provided to the administrators before they expire. It is intended to be used by the hardware technicians and the administrators to manage the various software licenses used in the organization. It is also useful for the employees because it provides services when they encounter software or hardware related problems in their system. Feedback can be entered to rate the service done, using which rewards will be awarded.

CHAPTER 2

SYSTEM ANALYSIS

2.1 EXISTING SYSTEM

The details about the contracts, purchases, services and inventory used in the organization are not maintained in a centralized server. Usually an excel sheet is used to manage those details. The system administrator has to manually keep track of all the contract expiry dates and software expiry dates. Also, employees have to report the problems they've encountered in their system to the system administrator in-person. These operations are quite tedious and require lot of manual work.

DISADVANTAGES OF THE EXISTING SYSTEM

The problems which are perceived by the users of the existing system are

- Less efficiency and accuracy due to lot of manual entries
- More time delay for storing all the details
- Increased expenditure for preparing and maintenance since lot of paper work is involved
- Manual search has to be done to track the expiry dates of the contracts and the software being used which results in increased labor

Manual collection of information and preparation of reports is quite tedious

2.2 PROPOSED SYSTEM

A system is needed to manage all the information regarding the contracts, purchases and inventory particulars. This system must allow the user to feed in and manage the various data. They will maintain the details such as contracts, vendors, services, purchase orders, products delivered, products returned and the various inventory used in the organization. It must also provide options for employees to report their problems with respect to their PCs, where hardware technicians can view reports and immediately perform service.

The system being developed can be deployed on an internet or intranet, since it operates on a data that is stored in a central database on the server. It can be installed on any web server within the organization or hosted by any web hosting company.

The system must maintain all the above stated functionalities and generate various reports and alert messages to the administrators and users.

ADVANTAGES OF THE PROPOSED SYSTEM

- Maintenance of all the support and maintenance contracts in one place
- Track contract vendors and their contact details
- Knowledge of which assets are covered under which contracts
- Set up email notifications to renew contracts before expiry
- Creation of purchase orders
- Keep track of outstanding purchase orders and complete purchases
- Make easy decisions based on inventory reports
- Software License summary for entire network
- Improved customer service perception and satisfaction
- Increased accessibility through a single point of contact, communication and information
- Better quality and quicker turnaround of customer requests
- Enhanced focus and a proactive approach to service provision
- Better managed infrastructure and control

2.3 USER INTERFACE REQUIREMENTS

2.3.1 FUNCTIONAL REQUIREMENTS

Functionally, the system is required to perform the following

- The system must be easily configurable
- The system must have user-friendly interface so that data can be managed with minimum user interaction

- The system must provide adequate security features to secure data from unauthorized usage
- The system is protected from unauthorized access through the implementation of standard login procedure.
- Expiry alerts are generated through mail when a software license is about to expire.
- Email notifications to renew contracts before expiry
- Purchase order for hardware or software is placed after management's approval
- A hardware technician is allocated to the machine for which the service request was raised
- Best hardware technician is selected to provide rewards according to the employees' feedback
- Innovative ideas can be uploaded

2.3.1.1 INFORMATION FLOWS

The administrator is responsible for the following functions:

- Maintain Contract details
- Maintain Vendor details
- Raise Purchase Order
- Maintain Software Inventory
- View Software Expiry alerts
- Monitor Service Request's status
- View best rated hardware technicians
- Maintain installation guide
- View various reports

The hardware technician is responsible for the following functions:

- Performs service for the raised request
- Views best rated technicians
- Views installation guide
- Views various reports

The software employee is responsible for the following functions:

- Raises a request for service
- Enters feedback
- Uploads information to share with others
- Views Reports

2.3.2 NON-FUNCTIONAL REQUIREMENTS

• Performance Requirements

The static as well as dynamic requirements placed on the software or on human interaction are described in this section. Examples of performance requirements are as follows:

Static : Each controller workstation has a high resolution 2048 x 2048 pixel LG 20-inch color monitor.

Dynamic :

- All drag-and-drop operations are accomplished within 100 milliseconds during interaction sessions.
- Number of simultaneous users depend upon the number of work stations available
- Minimum Response time

• Speed And Latency Requirements

95% of the transactions shall be processed in less than one second.

• Considerations For Speed

There is a wide variation in the speed of different workstations.

• Reliability Requirements

The mean time to failure must be 100,000 hours.

- **Availability Requirements**

The system will run 24 hours a day and 7 days a week.

- **Security Requirements**

Preventive measures are built into the system to prevent accidental or malicious access to the software.

- **Maintainability Requirements**

The software must have complete commented documentation.

- **Quality Attributes**

These are the quality attributes in a project

- It should be reliable
- It should be portable
- It should be having easy usability
- It should be efficient
- It should be maintainable
- It should be Re-Usable

CHAPTER 3

DEVELOPMENT ENVIRONMENT

3.1 HARDWARE SPECIFICATIONS

RAM	128 MB
Hard Disk Size	40 GB and Above
Processor (with speed)	Intel Pentium III (800 MHz) and upwards
Display Device	SVGA Color
Keyboard	Standard Keyboard
Mouse	Standard Mouse

3.2 SOFTWARE SPECIFICATIONS

Operating System	Windows 2000 & XP
Front End	ASP.NET
Back End	Microsoft SQL Server 2005
Programming Interface	VB.NET
Application Server	Internet Information Server

3.3 SOFTWARE DESCRIPTION

Microsoft Visual Studio

Microsoft Visual Studio is an Integrated Development Environment (IDE) from Microsoft. It can be used to develop console and graphical user interface applications along with Windows Forms applications, web sites, web applications, and web services in both native code together with managed code. Visual Studio includes a code editor supporting intellisense as well as code refactoring. The integrated debugger works both as a source-level debugger and machine-level debugger. Other built-in tools include a forms designer for building GUI applications, class designer, and database schema designer.

Microsoft .Net Framework

It is a software framework that can be installed on any computers running Microsoft Windows operating systems. It includes a large library of coded solutions to common programming problems and a virtual machine that manages the execution of programs written specifically for the framework.

Common Language Runtime

The Common Language Runtime (CLR) is the virtual machine component of the .NET framework. All .NET programs execute under the supervision of the CLR, guaranteeing certain properties and behaviors in the areas of memory management, security and exception handling.

.Net Class Libraries

The .Net Framework provides many classes that help developers re-use code. The .Net class libraries contain code for programming topics such as threading, file I/O, database support, XML parsing, and data structures, such as stacks and queues, this entire class library is available to any programming languages that support the .NET Framework. This means that any functionality available to one language will also be available to any other .NET language.

ASP.NET

ASP.NET Web pages are used as programmable user interface for the Web application. An ASP.NET Web page presents information to the user in any browser or client device and implements application logic using server-side code. An ASP.NET Web page automatically renders the correct browser-compliant HTML for features such as styles, layout, and so on. Alternatively, you can design your ASP.NET Web pages to run on a specific browser such as Microsoft Internet Explorer and take advantage of browser-specific features. It is compatible with any language supported by the .NET common language runtime. As it is built on the Microsoft .NET Framework, it provides all the benefits of the framework like managed environment, type safety, and inheritance.

ADO.NET

ADO.NET is a set of computer software components that can be used by programmers to access data and data services. It is a part of the base class library that is included with the Microsoft.NET framework. It is commonly used by programmers to access and modify data stored in relational database systems, though it can also be used to access data in non-relational sources.

MS SQL Server 2005

SQL Server 2005 Express Edition is a scaled down, free edition of SQL Server, which includes the core database engine. While there are no limitations on the number of databases or users supported, it is limited to using one processor, 1GB memory and 4GB database files. The entire database is stored in a single .mdf file.

Features such as Common Language Runtime (CLR) integration, new data types such as VARCHAR (MAX) and XML, user-defined types, and user-defined aggregates are supported. SQL Server works very efficiently on Microsoft Windows Servers by processing queries in parallel (using multiple native threads within a single process to handle user requests) and minimizing additional memory requirements when more users are added.



Using Microsoft SQL Server, we can do a dynamic backup of the database while it's in use. Consequently, we do not have to force the users to exit the database to back up data unlike MS Access. This means the database can be running up to 24 hours a day, seven days a week. Unauthorized users can't get to the database file directly because they must access the server first. Thus security is provided.

In case of system failure (such as an operating system crash or power outage), Microsoft SQL Server has an automatic recovery mechanism that recovers a database to the last state of consistency. SQL Server reduces network traffic by processing database queries on the server before sending results to the client.

SQL Server Management Studio

SQL Server Management Studio is a GUI tool included with SQL Server 2005 and later for configuring, managing and administering all components within Microsoft SQL Server. The tool includes both script editors and graphical tools that work with objects and features of the server. SQL Server Management Studio replaces Enterprise Manager as the *primary management interface for Microsoft SQL Server since SQL Server 2005.*

A central feature of SQL Server Management Studio is the Object Explorer, which allows the user to browse, select, and act upon any of the objects within the server. It can be used to visually observe and analyze query plans and optimize the database performance among others. SQL Server Management Studio can also be used to create a new database, alter any existing database schema by adding or modifying tables and indexes, or analyze *performance.*

CHAPTER 4 SYSTEM DESIGN

4.1 ER DIAGRAM

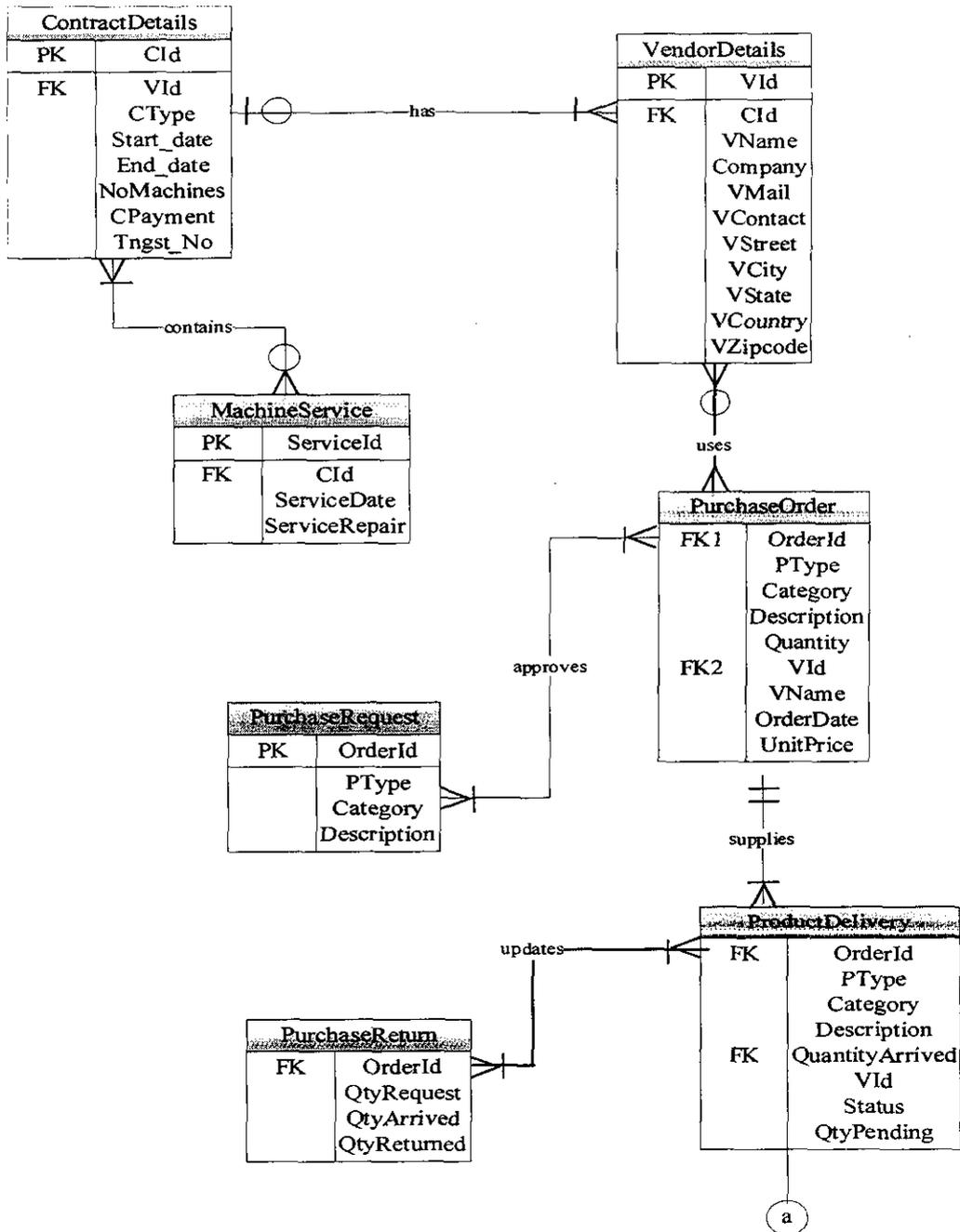


Figure 4.1: ER Diagram

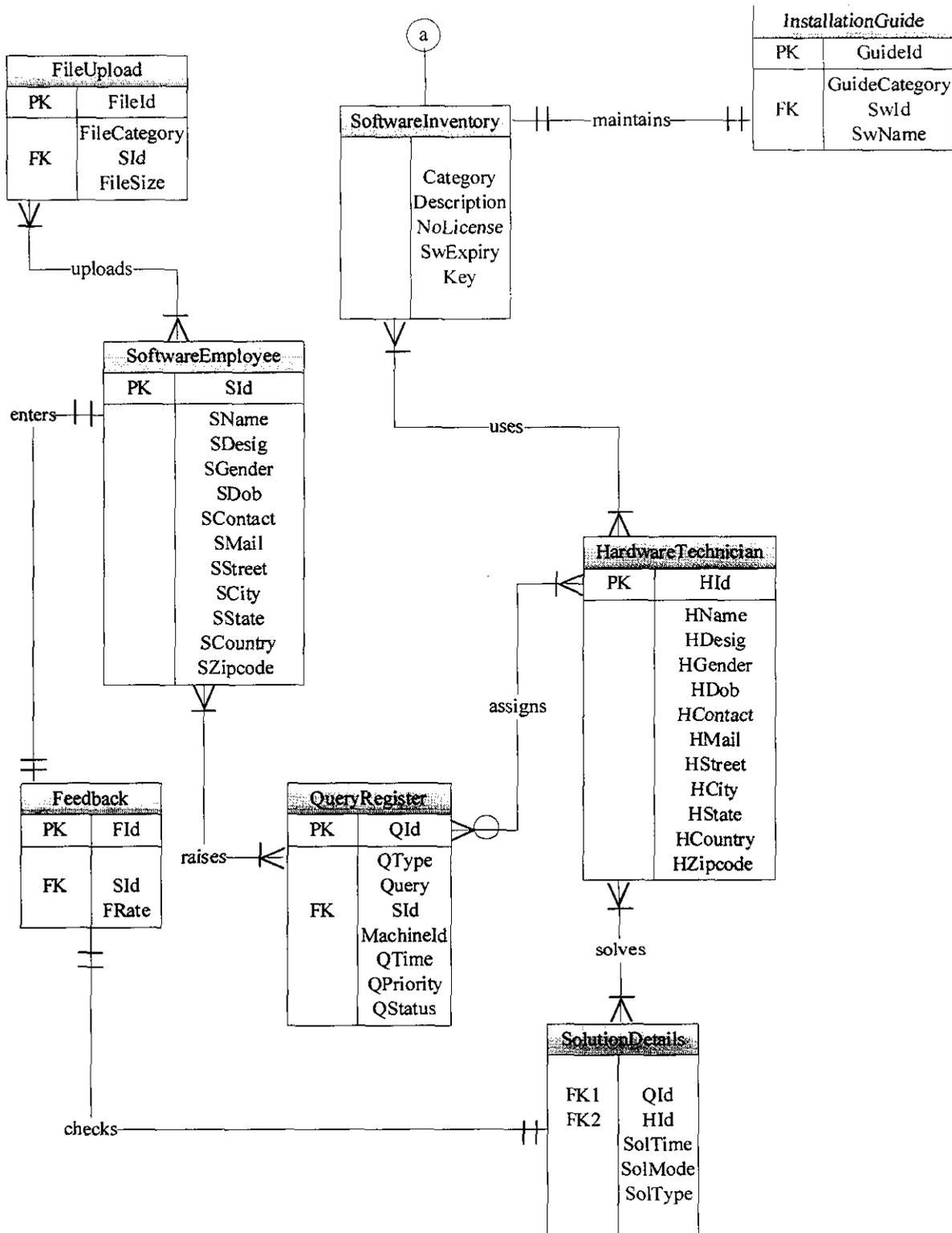


Figure 4.1(continued): ER Diagram

4.2 TABLE STRUCTURE

Table 4.1: Vendor Details

Column Name	Constraint	Data Type	Description
VId	Primary Key	Varchar	Identification of the vendor
VName	Null	Varchar	Name of the vendor
Company	Not Null	Varchar	Company
Mail	Not Null	Varchar	Mail Id
Contact	Not Null	Numeric	Contact Number
Street	Null	Varchar	Street
City	Not Null	Varchar	City
State	Not Null	Varchar	State
Country	Not Null	Varchar	Country
Zipcode	Not Null	Numeric	Zipcode

Table 4.2: Contract Details

Column Name	Constraint	Data Type	Description
Cid	Primary Key	Varchar	Identification of the Contract
CType	Not Null	Varchar	Type of Contract – Support contract, AMC, etc
VId	Foreign Key	Varchar	Identification of the vendor

Start_date	Not Null	Date/Time	Start date of contract
End_date	Not Null	Date/Time	End date of contract
NoMachines	Not Null	Numeric	Number of machines under contract
CPayment	Not Null	Numeric	Payment Amount
Tngst_No	Not Null	Varchar	TNGST Number

Table 4.3: Machine Service

Column Name	Constraint	Data Type	Description
ServiceId	Primary Key	Varchar	Identification of the Service done
Cid	Foreign Key	Numeric	Identification of the Contract
ServiceDate	Null	Date/Time	Date of the Service done
Repair	Null	Varchar	Description of the Service
Remarks	Null	Varchar	Remarks if any

Table 4.4: Purchase Request

Column Name	Constraint	Data Type	Description
OrderId	Primary Key	Varchar	Identification of the Purchase Request
PType	Not Null	Varchar	Type of Product needed –

			Hardware or Software
Category	Not Null	Varchar	Category of the product
Description	Not Null	Varchar	Description of the product

Table 4.5: Purchase Order

Column Name	Constraint	Data Type	Description
OrderId	Foreign Key 1	Varchar	Identification of Purchase Order
PType	Not Null	Varchar	Type of Product – Hardware or Software
Category	Not Null	Varchar	Category of the product
Description	Not Null	Varchar	Description of the product
Quantity	Not Null	Numeric	Quantity Needed
VId	Foreign Key 2	Varchar	Identification of Vendor who supplies products
VName	Null	Varchar	Vendor Name
ODate	Not Null	Date/Time	Date and Time when purchase order is raised
UnitPrice	Not Null	Numeric	Unit Price of the product

Table 4.6: Product Delivery

Column Name	Constraint	Data Type	Description
OrderId	Foreign Key 1	Varchar	Identification of the Purchase Order
PType	Not Null	Varchar	Type of Product – Hardware or Software
Category	Not Null	Varchar	Category of the product
Description	Not Null	Varchar	Description of the product
QuantityRequested	Not Null	Numeric	Quantity Requested
QuantityArrived	Not Null	Numeric	Quantity Arrived
QuantityPending	Not Null	Numeric	Quantity Pending
Vid	Foreign Key 2	Varchar	Identification of the vendor who issued
Status	Null	Varchar	Status of Delivery – Completely Arrived or Yet to Arrive

Table 4.7: Purchase Return

Column Name	Constraint	Data Type	Description
OrderId	Foreign Key 1	Varchar	Identification of the Purchase Order
QuantityRequested	Not Null	Numeric	QuantityRequested

QuantityAvailable	Not Null	Numeric	Quantity Arrived
QuantityReturned	Not Null	Numeric	Quantity Returned

Table 4.8: Software Inventory

Column Name	Constraint	Data Type	Description
Category	Foreign Key 1	Varchar	Category of the Software
Description	Foreign Key 2	Varchar	Description of the Software
NoLicense	Not Null	Numeric	Number of Licenses
Key	Not Null	Varchar	Serial Key
SwExpiry	Not Null	Date/Time	Expiry Date of the Software

Table 4.9: Query Register

Column Name	Constraint	Data Type	Description
Qry_id	Primary Key	Varchar	Identification of the Query
QDesc	Null	Varchar	Description of the problem
Sid	Foreign Key	Varchar	Software Employee's Id who raises the request
McId	Not Null	Varchar	Machine Id where the problem was encountered
Priority	Null	Varchar	Priority of the request – High,

			Medium, Low
Status	Not Null	Boolean	Status of the request – Open or Close

Table 4.10: Solution Details

Column Name	Constraint	Data Type	Description
Qry_Id	Foreign Key 1	Varchar	Identification of the Query
Hid	Foreign Key 2	Varchar	Hardware Technician who provided the solution
SolTime	Null	Date/Time	Date and Time of the Solution provided
SolMode	Null	Varchar	Through which mode was solution given – CD, Downloaded, Manual
SolType	Null	Varchar	Full or Partial or Temporary Solution

Table 4.11: Feedback

Column Name	Constraint	Data Type	Description
QId	Foreign Key 1	Varchar	Identification of the Query
Sid	Foreign Key 2	Varchar	Software Employee's Id who raised the request

FRate	Not Null	Varchar	Type of Rating
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Table 4.12: Installation Guide

Column Name	Constraint	Data Type	Description
Category	Foreign Key	Varchar	Category of the Software
SwName	Not Null	Varchar	Name of Software
Location	Not Null	Varchar	Path where the file is located

Table 4.13: File Upload

Column Name	Constraint	Data Type	Description
FileId	Primary Key	Numeric	Identification of the file
FileCategory	Null	Varchar	What Technology it is related to
Sid	Foreign Key	Varchar	Identification of Software Employee who uploads files
Location	Not Null	Varchar	Location of the file

Table 4.14: tbl_SoftwareEmployee

Column Name	Constraint	Data Type	Description
Sid	Primary Key	Varchar	Identification of Employee
Ename	Not Null	Varchar	Name of the Employee

Desig	Not Null	Varchar	Designation of the Employee
Gender	Not Null	Boolean	Gender – Male or Female
Dob	Not Null	Date/Time	Date of Birth
ContactNo	Not Null	Numeric	Contact Number
Email	Not Null	Varchar	e-mail ID
Street	Not Null	Varchar	Street
City	Not Null	Varchar	City
State	Not Null	Varchar	State
Country	Not Null	Varchar	Country
Zipcode	Not Null	Numeric	Zipcode
Username	Not Null	Varchar	User name of the Employee
Password	Not Null	Varchar	Password of the Employee

Table 4.15: tbl_HardwareTechnician

Column Name	Constraint	Data Type	Description
Hid	Primary Key	Varchar	Identification of the Hardware Technician
HName	Not Null	Varchar	Name of the Hardware Technician
Desig	Not Null	Varchar	Designation of the Hardware Technician

Gender	Not Null	Boolean	Gender -- Male or Female
Dob	Not Null	Date/Time	Date of Birth
ContactNo	Not Null	Numeric	Contact Number
Email	Not Null	Varchar	e-mail ID
Street	Not Null	Varchar	Street
City	Not Null	Varchar	City
State	Not Null	Varchar	State
Country	Not Null	Varchar	Country
Zipcode	Not Null	Numeric	Zipcode
Username	Not Null	Varchar	User name to login
Password	Not Null	Varchar	Password to login

4.3 USE CASE DIAGRAM

Level 0:

4.3.1 USE CASE SPECIFICATION: PC ASSET MANAGEMENT



Figure 4.2: PC Asset Management System use case

Level 1:

4.3.2 USE CASE SPECIFICATION: CONTRACT MANAGEMENT

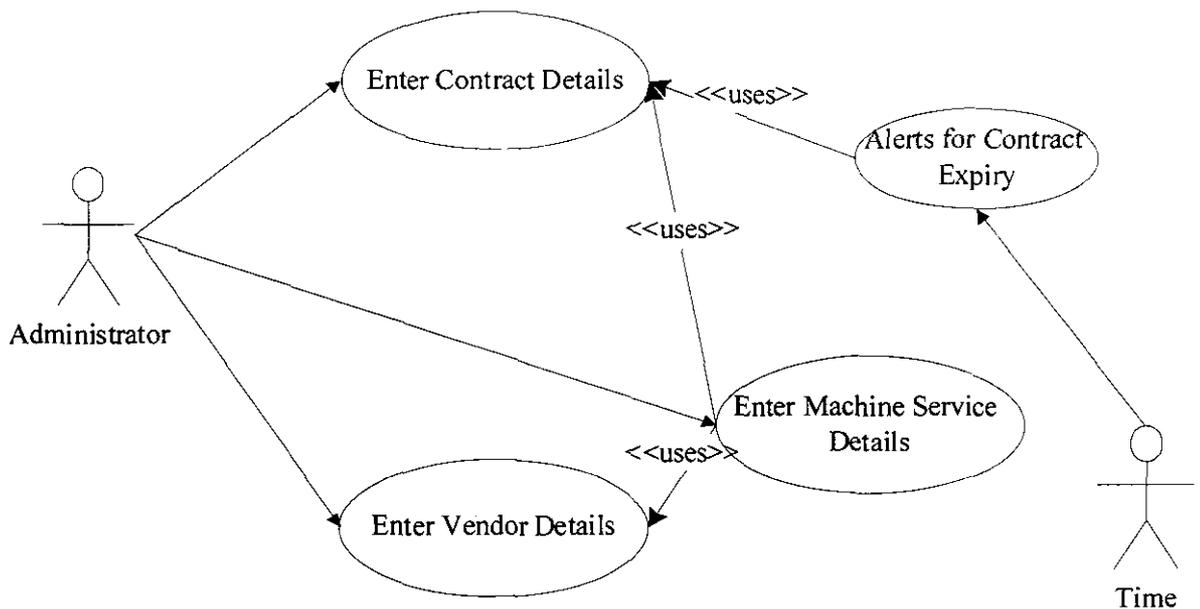


Figure 4.3: Contract Management use case

Brief Description

This use case allows the Administrator to enter contract details, vendor details and details of machines serviced.

Flow Of Events

The use case begins when the administrator selects the option 'Contract Management' on his home page.

Basic Flow

The Administrator selects the option 'Enter Vendor Details'. The following details should be entered – Vendor Id, Vendor Name, Mail Id, Contact Number and Address. When the 'Submit' button is clicked, the details should be updated in the database. The

Administrator then selects the option 'Enter Contract Details'. The following details should be entered – Contract Id, Contract Type, Vendor associated, Contract start and end dates, Number of machines under the contract and the monthly payment. The system generates expiry alerts when the contract is about to expire. When a service is performed on a machine by the contractor, the 'Machine Service' option is selected and details such as the description of the service and the date when the service was done are provided and the database is updated.

Alternative Flow

If the administrator chooses logout, the system should close the current session and must redirect to the home page.

Preconditions

The vendor must sign contracts for the contract details to be entered. Contract Expiry Alerts will be generated only when the contract expires. This alert generation is based on a timer.

Postconditions

Request for Contract renewal can be raised by the administrator to the management when he receives the expiry alert.

4.3.3 USE CASE SPECIFICATION: PURCHASE MANAGEMENT

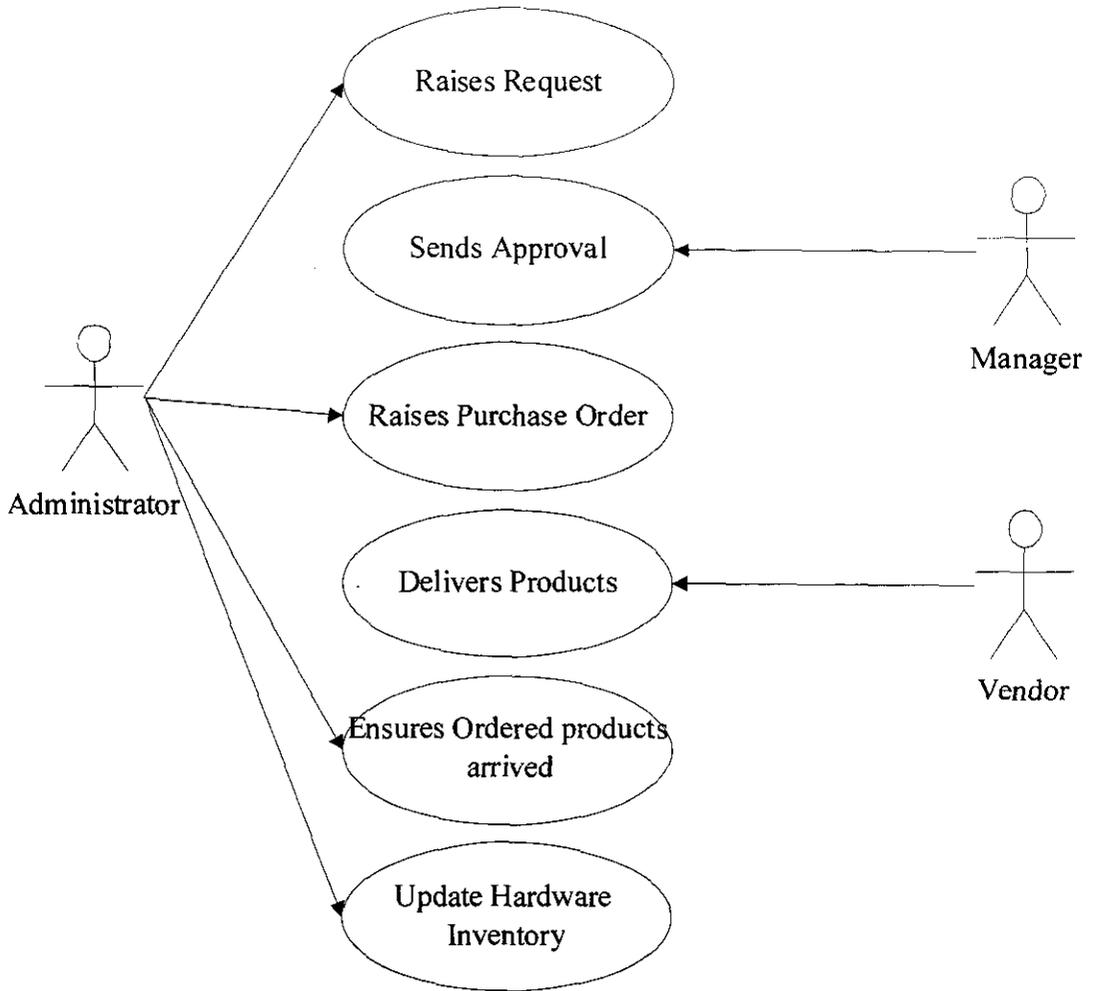


Figure 4.4: Purchase Management use case

Brief Description

This use case allows Administrator to raise a request. After the management's approval, the purchase order is raised. He also ensures that all ordered products have arrived during their delivery.

Flow Of Events

The use case begins when the administrator selects the option 'Purchase Order' on his home page.

Basic Flow

The Administrator selects the option 'Raise Request'. The following details should be entered – Request Id, Product needed, Product type and product description. When the 'Submit' button is clicked, the details should be updated in the database and also sent to the management. After approval from the management, the administrator raises the purchase order. The following details are entered – Order Id, Product, Quantity needed, Vendor details. The vendor supplies the products. After product delivery, the administrator ensures that all ordered products have arrived. In case of any external or internal damage in the products delivered, they can be returned which will be kept track.

Alternative Flow

If the management does not approve the request raised, purchase order cannot be raised. If the administrator chooses logout, the system should close the current session and must redirect to the home page.

Preconditions

Purchase order is raised only after the management's approval. Ensuring ordered products delivery is done only after the arrival of products.

Postconditions

The status of the product remains opened if they are not delivered. After delivery of products, the inventory must be updated.

4.3.4 USE CASE SPECIFICATION: SOFTWARE INVENTORY

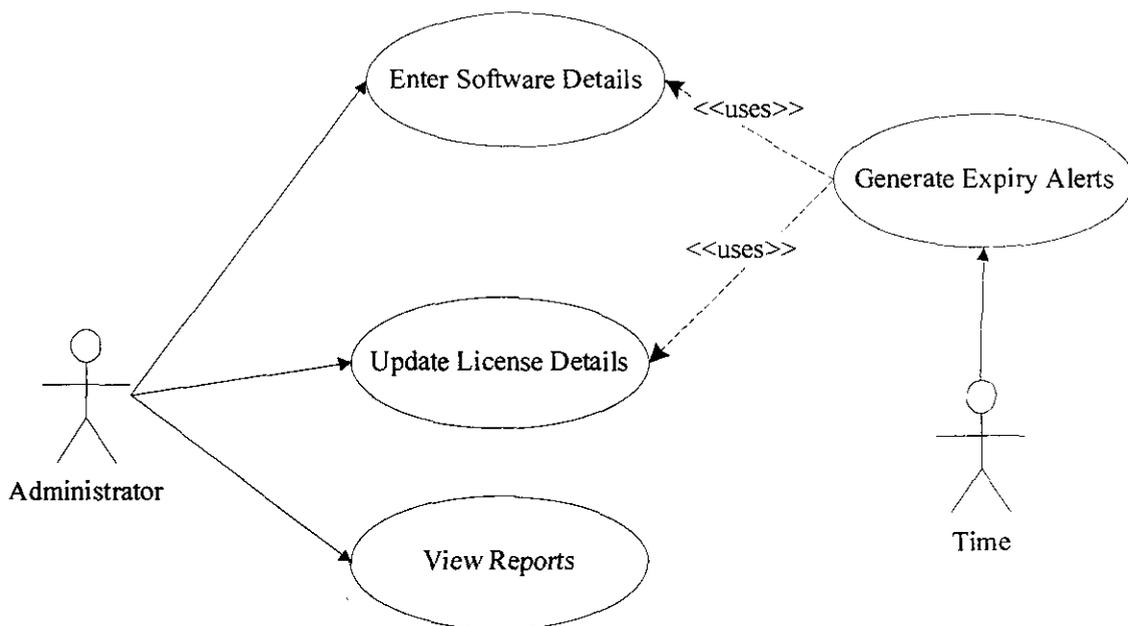


Figure 4.5: Software Inventory use case

Brief Description

This use case allows the administrator to enter the software details, update software licenses and to view reports. The system will generate expiry alerts based on a timer.

Flow Of Events

The use case begins when the Administrator selects the option 'Software Inventory Management' on the Admin home page.

Basic Flow

The administrator selects 'Software Inventory' option from the menu. The following details should be entered – Software Name, License key, Users Limit, Expiry Date, Issued vendor. When the 'Submit' button is clicked, the data has to be saved in the database. When the license is about to expire, the system generates alerts to the administrator, who in turn takes appropriate actions

Alternative Flow

If the administrator chooses logout, the system should close the current session and must redirect to the home page.

Preconditions

The expiry date field has to be filled for the expiry alert to take place.

Postconditions

The software inventory details have to be stored in the database. This will be used for viewing reports and generation of alerts.

4.3.5 USE CASE SPECIFICATION: SERVICE DESK

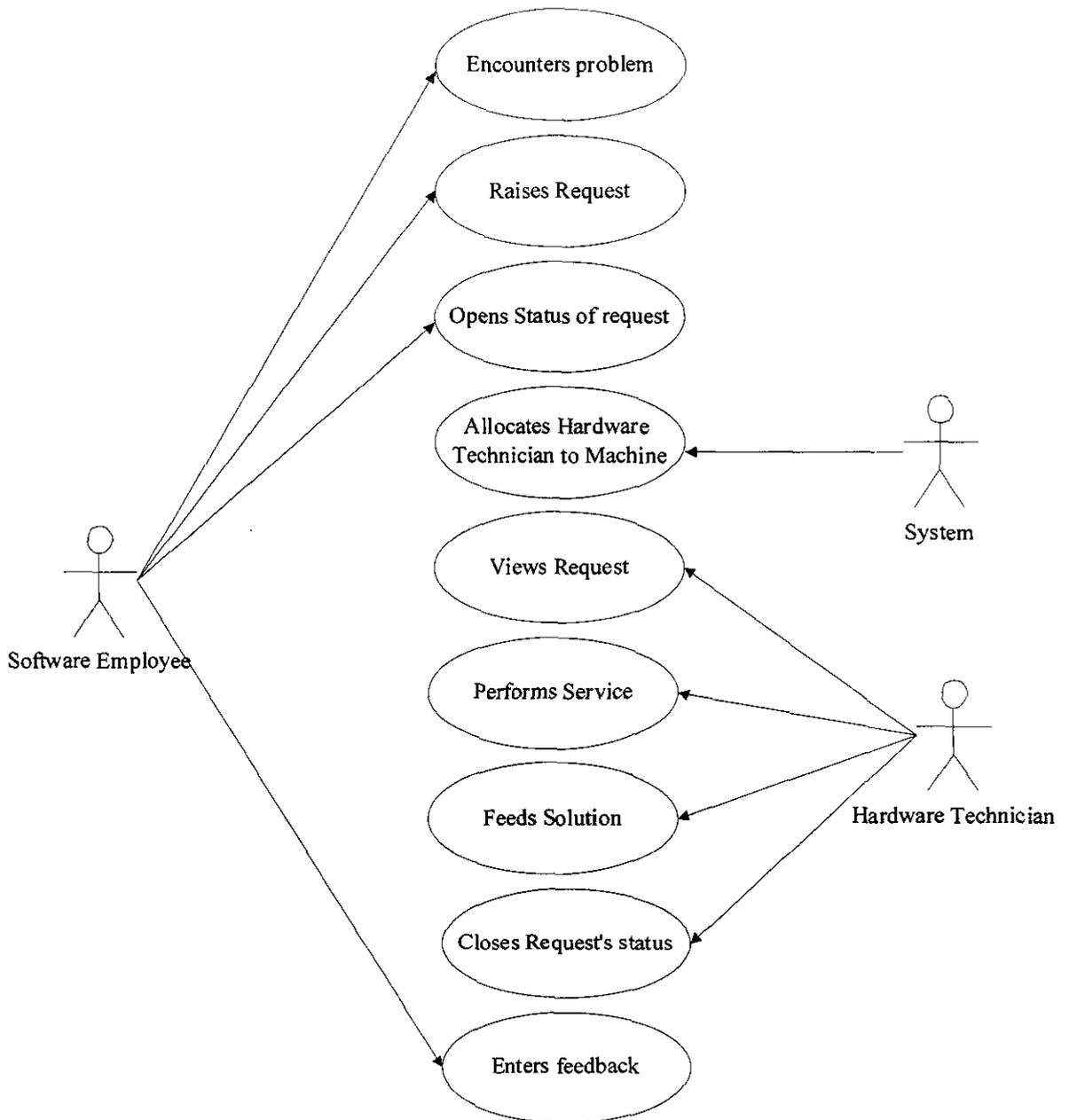


Figure 4.6: Service Desk use case

Brief Description

This use case allows the employee to raise a request. The hardware technician views the request, performs the service and closes the status.

Flow Of Events

The use case begins when the employee encounters a problem in his system and selects the option 'Service Desk' on his home page. It proceeds when the hardware technician views a request for service in his login.

Basic Flow

The employee selects 'Service Desk' option. The following details should be entered – Query Id, Problem, Machine Id, Priority, Employee's Id who raised the request. The status of the request will remain opened. When the 'Submit' button is clicked, the data has to be saved in the database. Then the system notifies in the hardware technician's service desk page. Any of the hardware technicians can accept the request and perform the service. After the service has been performed, the hardware technician fills the solution details – Query Id, Hardware Technician's Id who performed the service, Date and Time of solution given and type of solution. Also, he closes the status of the request.

Alternative Flow

If logout option is chosen from the current page, the system should close the current session and must redirect to the home page. If the hardware technician is not able to provide solution for the request, he must immediately report to the administrator.

Preconditions

The user who raises the request must be a software employee. If the priority is high, service has to be provided immediately.

Postconditions

Services with low priority can wait until a hardware technician becomes free.

4.3.6 USE CASE SPECIFICATION: FEEDBACK

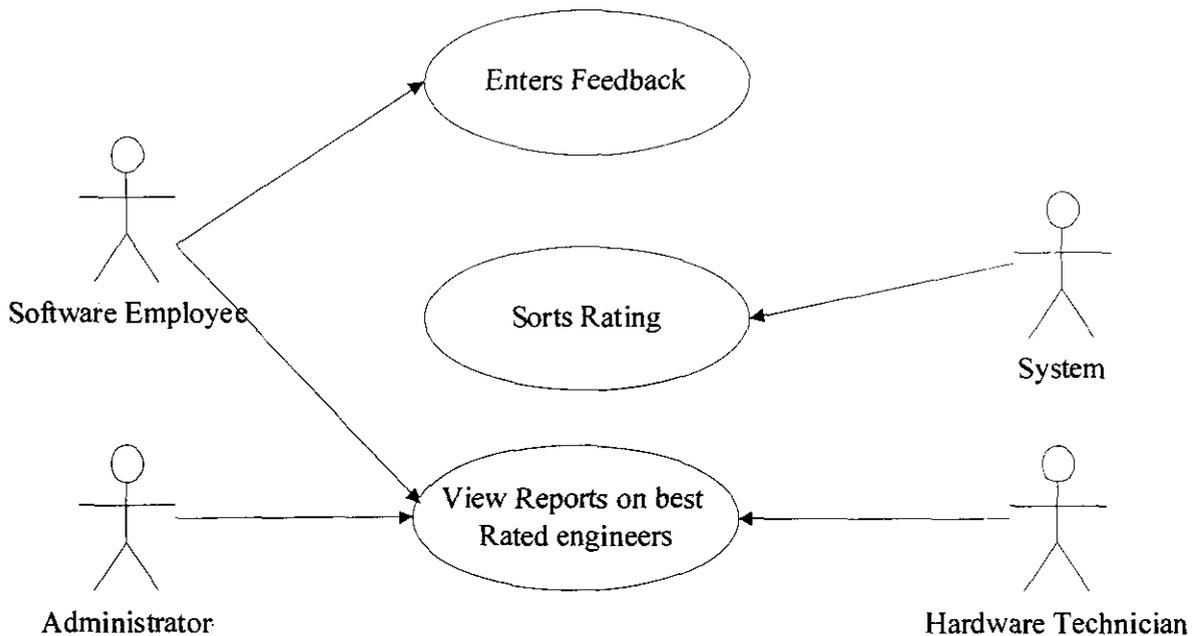


Figure 4.7: Feedback use case

Brief Description

This use case allows the software employee to enter feedback.

Flow Of Events

The use case begins after the hardware technician performs the service. The Software employee selects the option 'Feedback' on his home page to enter feedback.

Basic Flow

The employee selects 'Feedback' option. The following details should be entered – Query Id, Employee's Id who raised the request, Rating. When the 'Submit' button is clicked, the data has to be saved in the database. The system ranks the hardware technicians according to the rating specified. Rewards will be awarded to the best rated engineer. Everyone in the organization will be able to view the reports based on rating.

Alternative Flow

If logout is chosen from the current page, the system should close the current session and must redirect to the home page.

Preconditions

The user who enters feedback must be a software employee in the organization. Also, the hardware technician should have performed a service for the feedback to be entered.

Postconditions

The employee must enter feedback only after the service has been performed. The feedback has to be stored in the database which can be used to rank the hardware technicians later.

4.3.7 USE CASE SPECIFICATION: INSTALLATION GUIDE

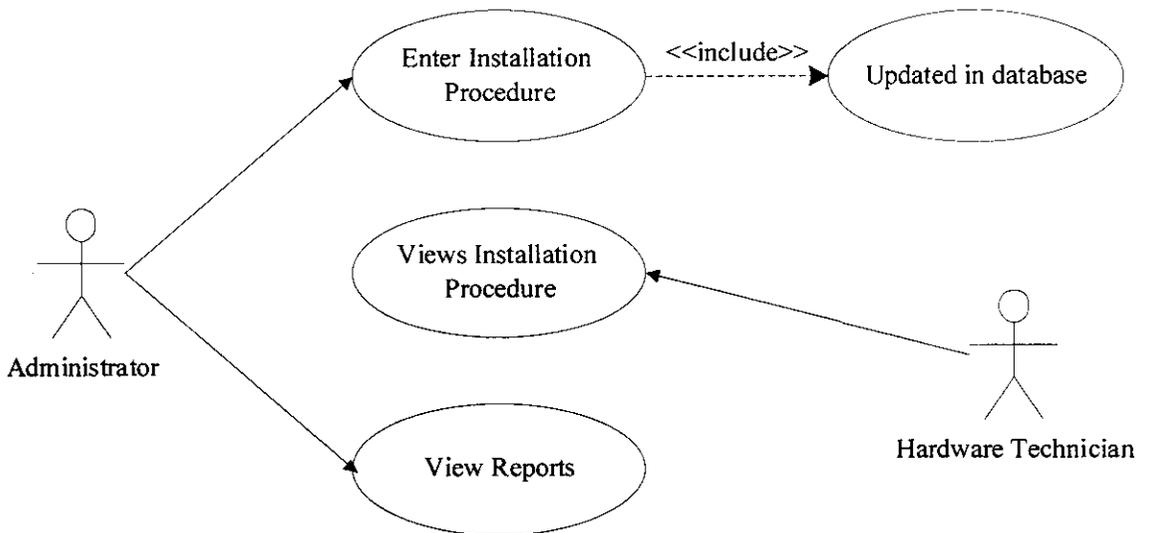


Figure 4.8: Installation Guide use case

Brief Description

This use case allows the Administrator to enter installation procedure. The hardware technician can view the installation procedures and the reports regarding it.

Flow Of Events

The use case begins when the administrator selects the option 'Installation Guide' on his home page.

Basic Flow

The Administrator selects the option 'Installation Guide'. The following details should be entered – Software Name, Category, Installation procedure.

Alternative Flow

If the administrator chooses logout, the system should close the current session and must redirect to the home page.

Preconditions

The user who inputs installation guide must be the system administrator.

Postconditions

The installation guide has to be stored in the database.

4.3.8 USE CASE SPECIFICATION: FILE UPLOAD

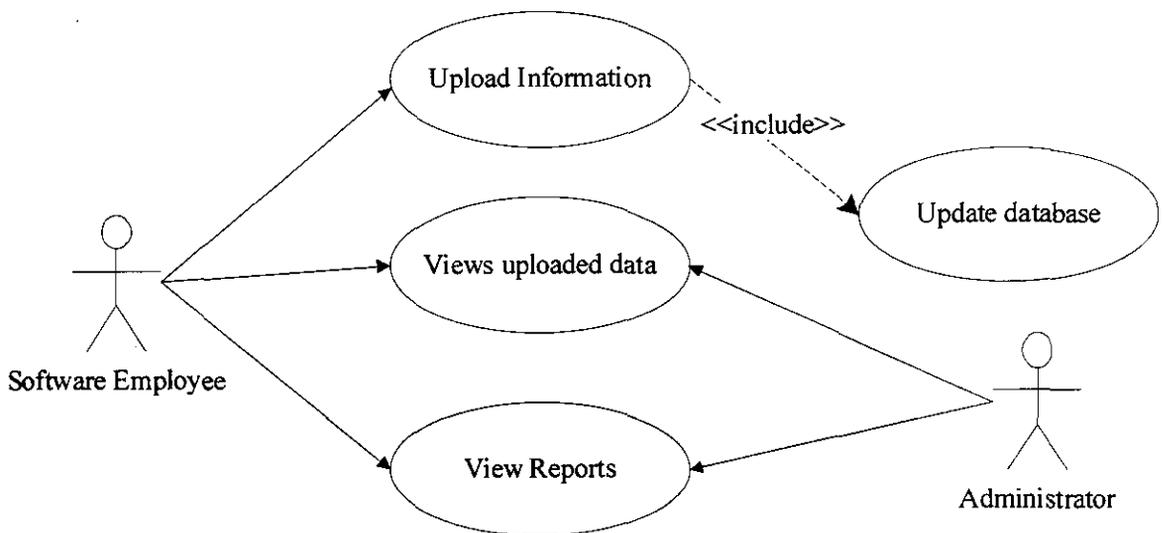


Figure 4.9: File Upload use case

Brief Description

This use case allows the employee to upload information.

Flow Of Events

The use case begins when the employee selects the option 'File Upload' on his home page.

Basic Flow

The employee selects the option 'File Upload'. The following details should be entered – *Information Category, employee Id who uploaded the information and the location of the file.*

Alternative Flow

If the employee chooses logout, the system should close the current session and must redirect to the home page.

Preconditions

The user who uploads information must be an employee.

Postconditions

The uploaded information must be stored in the database. It must also be available to be viewed by everyone.

CHAPTER 5

ARCHITECTURAL DESIGN

5.1 MODULE DESIGN

Contract Management module maintains the list of all vendors. It also manages the assets covered and the contracts signed by the management. E-mail notifications to renew contracts before expiry are provided to the management.

Purchase Management module is used to manage purchase orders. At first, the administrator raises a request to the management when a hardware or software is required. After the management's approval, the purchase order is prepared and sent to the management. The products delivered to the organization are well-tracked. The products returned by the organization are also managed. Therefore, it becomes very easy to keep track of products pending.

Software Inventory module maintains an inventory of the various software licenses that an organization has. It maintains software details such as the number of software licenses, type of license, license key, license validity, and so on. Alerts are generated when a software license is about to expire.

Service Desk module provides services to employees. An employee is likely to encounter problems related to hardware or software in his/her PC. Such problems can be solved by raising a request. Once the request is raised by the employee, this system allows all the hardware technicians to view the request. The status of the request will remain opened. Any of the hardware technicians can accept the request and perform service. The administrator will be able to track the machines with completed services and pending services. After servicing the machine, the status of the request will be closed.

Feedback module allows to rate the hardware technician. After rectification of the problem, employees can enter feedback and thus rate the hardware technicians according to their performance. Rewards will be provided at the end of the year to the hardware technician with the best rating.

Installation Guide module provides installation procedures for the various software products available in the organization. They can be used by the hardware technicians.

File Upload module enables employees to upload new ideas such as articles related to new technology and so on. They can be viewed by anyone in the organization.

CHAPTER 6

SYSTEM TESTING AND IMPLEMENTATION

6.1 OBJECTIVE OF TESTING

The objective of testing is to prove that there are no errors in the software. This is extremely difficult since developer cannot prove to be hundred percent accurate. Therefore the most useful and practical approach is with the understanding that testing is the process of executing a program with explicit intention of finding errors and check for the basic flow of the process.

6.2 TYPES OF TESTING

6.2.1 SYSTEM TESTING

Testing is a set of activities that can be planned in advance and conducted systematically. A number of testing strategies have been proposed; in literature all provide the software developer with the template for testing and having the following generic characteristics.

- Testing begins at the component level and works outward towards the integration of the entire computer based system.
- The developer of the software conducts testing and for large products an independent test group may be used.
- Testing and debugging are different activities but debugging may be accommodated in any testing strategy.

6.2.2 SOFTWARE TESTING TECHNIQUES

The test case design methods applied are

- White Box Testing
- Black Box Testing

6.2.2.1 WHITE BOX TESTING

Using this testing method it was assured that all the independent paths were exercised at least once. All the logical decisions on their true and false side were executed. All loops were executed at their boundaries.

6.2.2.2 BLACK BOX TESTING

Using this testing technique, incorrect and missing functions were identified and corrected, incorrect information, interfacing errors, performance errors, initialization errors and termination errors were also found using this technique.

6.2.3 SOFTWARE TESTING STRATEGIES

A strategy for the software testing integrates software test case design techniques into well planned series of steps that result in the successful construction of software. Any testing strategy must incorporate Test Planning, Test Case Design, Resultant Data Collection and Evaluation. The different levels of testing are:

6.2.3.1 UNIT TESTING

This kind of testing is to verify the smallest unit of the software module. This is also known as “Module Testing”. This test is carried out during the programming stage. This test ensures the expected output from each of the module. The modules include contract management, purchase management, inventory management, service desk, installation guide, file upload and alerts generation module. Exceptions have been handled and appropriate error messages have been given in each module so as to avoid abnormal termination of the program. Table 6.1 shows a sample of test cases for unit testing.

Test Case

Table 6.1: Test Case for Contract Details

S.No.	Test Case Name	Test Case Description	Expected Result	Actual Result	Test Script Status
1	Contract Identification	When the 'New' button is clicked, contract ID should be generated which must be unique	Contract ID should be auto generated. Accepted entry	Contract ID is auto generated. Accepted entry	Pass
2	Vendor Identification	From the Vendors combo box, a vendor will be selected	The selected vendor will be displayed on the top of the combo box. Accepted entry	Selected vendor is displayed. Accepted entry	Pass
3	Vendor Identification	From the Vendors combo box, do not select anything	Error message should be displayed	Error message is displayed	Pass
4	Contract Beginning Day	The text box is left empty	Error message should be displayed	Error message is displayed	Pass
5	Contract Beginning Day	The calendar button is selected to fill the text box	The selected date should be displayed in the text box.	The selected date is displayed in the text box.	Pass

			Accepted entry	Accepted entry	
6	Contract Ending Day	The text box is left empty	Error message should be displayed	Error message is displayed	Pass
7	Contract Ending Day	The calendar button is selected to fill the text box	The selected date should be displayed in the text box. Accepted entry	The selected date is displayed in the text box. Accepted entry	Pass
8	Number of Machines	The Number of machines text box contains a null value	Error message should be displayed	Error message is displayed	Pass
9	Number of Machines	The Number of machines text box contains special characters such as \$,&,@,#	Error message should be displayed	Error message is displayed	Pass
10	Number of machines	The Number of machines text box contains number and characters such as 3MC	Error message should be displayed	Error message is displayed	Pass
11	Number of machines	The Number of machines text box contains a number only such as which	Accepted entry	Accepted entry	Pass

		is a valid number			
12	Payment	Payment text box contains a number	Accepted entry	Accepted entry	Pass
13	Payment	Payment text box contains a number and characters such as Rs.3000	Error message should be displayed	Error message is displayed	Pass
14	Payment	Payment text box contains special characters such as \$499	Error message should be displayed	Error message is displayed	Pass
15	Save	Save button is clicked	All the details should be saved in the database	Details are saved in the database	Pass

6.2.3.2 INTEGRATION TESTING

This kind of testing is a systematic testing for constructing tests to uncover errors associated within the interface. The objective is to take unit tested modules and build a program structure. All the modules are combined and tested as a whole. The system underwent a series of Integration tests that recorded smooth transmission of data from one module to the other. The bottom up approach was applied. In this project the developed system is tested after integrating various modules together, and the detected errors were corrected.

6.2.3.3 VALIDATION TESTING

Validation testing is carried out to verify whether the software functions works in a manner that is expected by the customer. So alpha Testing was done to ensure validity. Table 6.2 shows a sample of test cases for integration and validation testing.

Test Case

Table 6.2: Test Case for Purchase Management

S.No.	Test Case Name	Test Case Description	Expected Result	Actual Result	Test Script Status
1	Purchase Order ID	Valid Purchase Order ID is selected from the combo box provided	Details such as Product type, category, description, vendor ID, requested quantity should be retrieved from the database and displayed on the corresponding fields	Details are retrieved from the database and are displayed on the corresponding fields	Pass
2	Quantity Arrived	A Valid number is given as input	Accepted entry	Accepted entry	Pass
3	Quantity Arrived	A set of characters are given as input such as 'qty'	Error message should be displayed	Error message is displayed	Pass
4	Quantity Arrived	A set of special characters are given as input such as 4%'5*4	Error message should be displayed	Error message is displayed	Pass
5	Quantity	Null value is	Error message should	Error message is	Pass

	Arrived	given as input	be displayed	displayed	
6	Status	Products are pending	The status should be 'Not yet completely arrived'	The status is set to 'Not yet completely arrived'	Pass
7	Status	Ordered Products have arrived	The status should be set to 'Completely Arrived'	The status is set to 'Completely Arrived'	Pass
8	Return Quantity	Valid Number is specified as input	The returned quantity should be deducted from the delivered quantity and the database should be updated. Accepted entry	The returned quantity is deducted from the delivered quantity and the database is updated. Accepted entry	Pass
9	Return Quantity	Characters are specified such as 'qty'	Error message should be displayed	Error message is displayed	Pass
10	Return Quantity	Special characters such as 4%&5*8 are specified	Error message should be displayed	Error message is displayed	Pass
11	Save	Save button is clicked	Details should be stored in the database	Details are stored in the database	Pass

6.3 SYSTEM IMPLEMENTATION

Implementation is putting a planned system into action. Implementation refers to the final process of moving the solution from the development status to the production status. Depending on your project, this process is often called deployment, go-live, rollout or installation. There is a phase in the software life cycle where the actual software is implemented. The result of this phase consists of source code, together with documentation to make the code more readable. The stage of systems development in which hardware and software are acquired developed and installed the system is tested and documented, people are trained to operate and use the system, and an organization converts to the use of a newly developed system.

6.4 MAINTENANCE

The objectives of this maintenance work are to make sure that the system gets into work all time without any bug. Provision must be made for environmental changes which may affect the computer or software system. This is called the maintenance of the system. Nowadays there is the rapid change in the software world. Due to this rapid change, the system should be capable of adapting these changes. In this project, processes can be added without affecting other parts of the system.

CHAPTER 7

CONCLUSION

“PC Asset Management System” simplifies complicated manual tasks easier. It increases the efficiency and the response time, thus making all the users happy. The main feature set of this system are

- Can easily keep track of contract vendors and their contract details
- Keep track of outstanding purchase orders and completed purchases
- Effective decisions could be taken easily when up-to-date inventory information is available
- Email notifications to remind contracts and software expiry
- Better quality and quicker turnaround of service requests
- Can produce required reports easily and on time

All the implications concerned with this project are solved. The fruitful results of this system are faster access of data, shorter processing times, increased accuracy, requires less space to store and higher quality of service

CHAPTER 8

FUTURE ENHANCEMENT

“PC Asset Management System” will greatly reduce the manual work in the organization. It helps to create a paperless office. Though the system has been developed to the complete satisfaction of the user, enhancements are always possible. The system is designed in such a way that new features can be added without much difficulty. In future, the system can be modified to automatically collect the expiry dates when software is installed in the network.

The system is developed in such a way that if any modification and enhancements are needed in future, it can be done at ease, without disturbing the proper working of the system. The system can be changed easily depending on organizational policy constraints.

According to the needs arising in the long run time, service desk can be modified like a discussion forum where the technicians' job of finding the machine and rectifying it himself will be reduced. Thus employees can rectify their own problems by obtaining their solution from the discussion which will save time.

CHAPTER 9

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- 3) <http://msdn.microsoft.com>
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- 5) <http://wikibooks.com>

APPENDIX A

SCREEN SHOTS

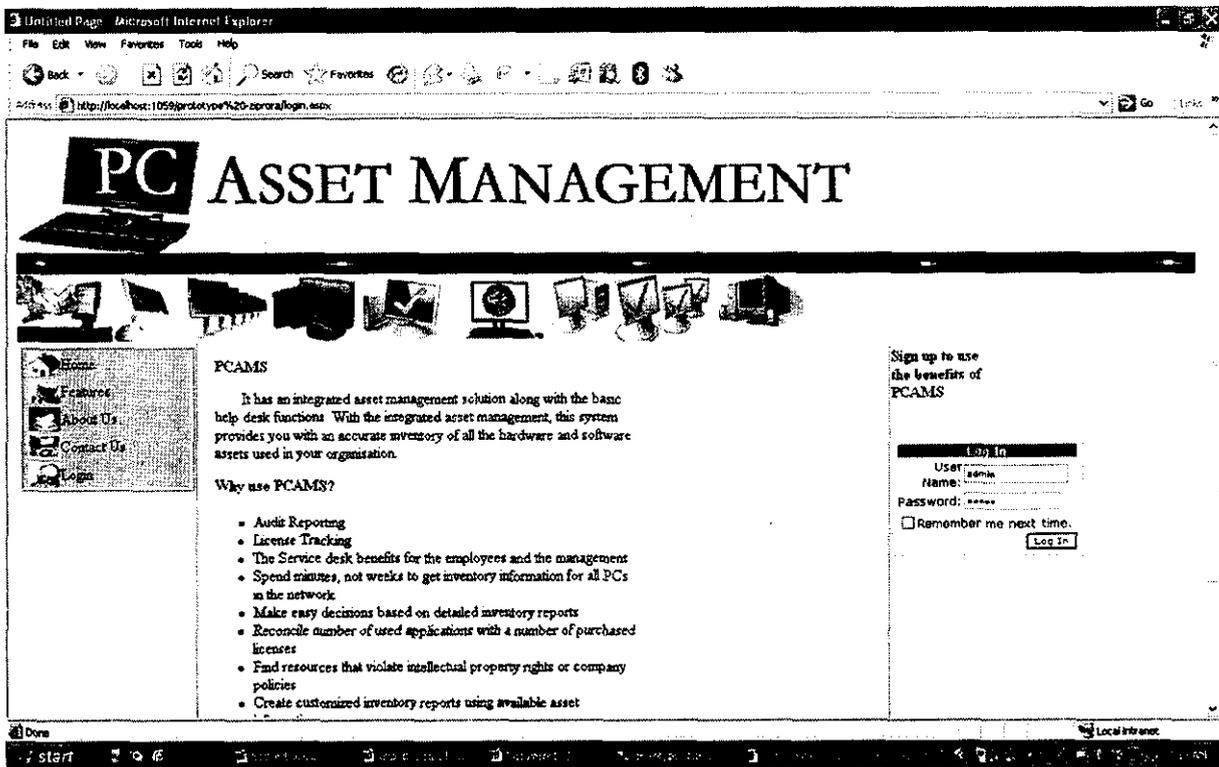


Figure A 1.1: Login Form

Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Search Favorites Home Go
http://localhost:1059/prototype%20-zipora/vendor4.aspx

Welcome Administrator HOME SIGN OUT

VENDOR DETAILS

Vendor Identification	vendor6
Vendor Name	Ashley
Company	Microsoft
Contact Number	9872379742
E-Mail	techbit@gmail.com
Street	Bngde st
City	Bangalore
State	Tamilnadu
Country	India
Zipcode	562001

Done Local intranet

Figure A 1.2: Vendor Details Form

Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Search Favorites Home Go
http://localhost:1059/prototype%20-zipora/contractdetails.aspx

CONTRACT DETAILS

Contract Identification	contract6
Payment Type	Yearly
Vendor Identification	Ashley
Contract Beginning Day	6/1/2009
Contract Ending Day	6/1/2010
Number of Machines under the Contract	3
Payment in Rs.	3000.00
TNGST No.	ang34-23

New Update Cancel

Updated 09/05/2009 © Ziporah, D.

Done Local intranet

Figure A 1.3: Contract Details Form

Unfiled Page - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Home Search Favorites

Address http://localhost:1059/prctype%20zproal/machineService.aspx

Welcome Administrator. [HOME](#) [SIGN OUT](#)

MACHINES UNDERGONE SERVICE

- Home
- Contract Management
- Purchases Management
- Inventory Management
- Service Desk
- User Creation
- Installation Guide
- File Upload
- Reports

Service Identification: Service5

Contract Identification: contract6

Date of Service done: 6/13/2009

Service Description: Monitor problem

Remarks: Monitor has been replaced

Updated 09-05-2009 © Zipperah. D

Figure A 1.4: Machine Service Form

Unfiled Page - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Home Search Favorites

Address http://localhost:1059/prctype%20zproal/requrPermission.aspx

PC ASSET MANAGEMENT

Welcome Administrator. [HOME](#) [SIGN OUT](#)

REQUEST PERMISSION TO RAISE PURCHASE ORDER

Enter the details

Order Identification: PO1

Product Type:
 Hardware
 Software

Product Category: DVD R/W Drive

Product Description: Samsung

ReqOrder_id	Product type	Product Category	Product description
PO1	Hardware	Printer	HP Deskjet Line Printer
PO10	Software	Microsoft	Microsoft Visual Studio

Figure A 1.5: Permission for Purchase Order Form

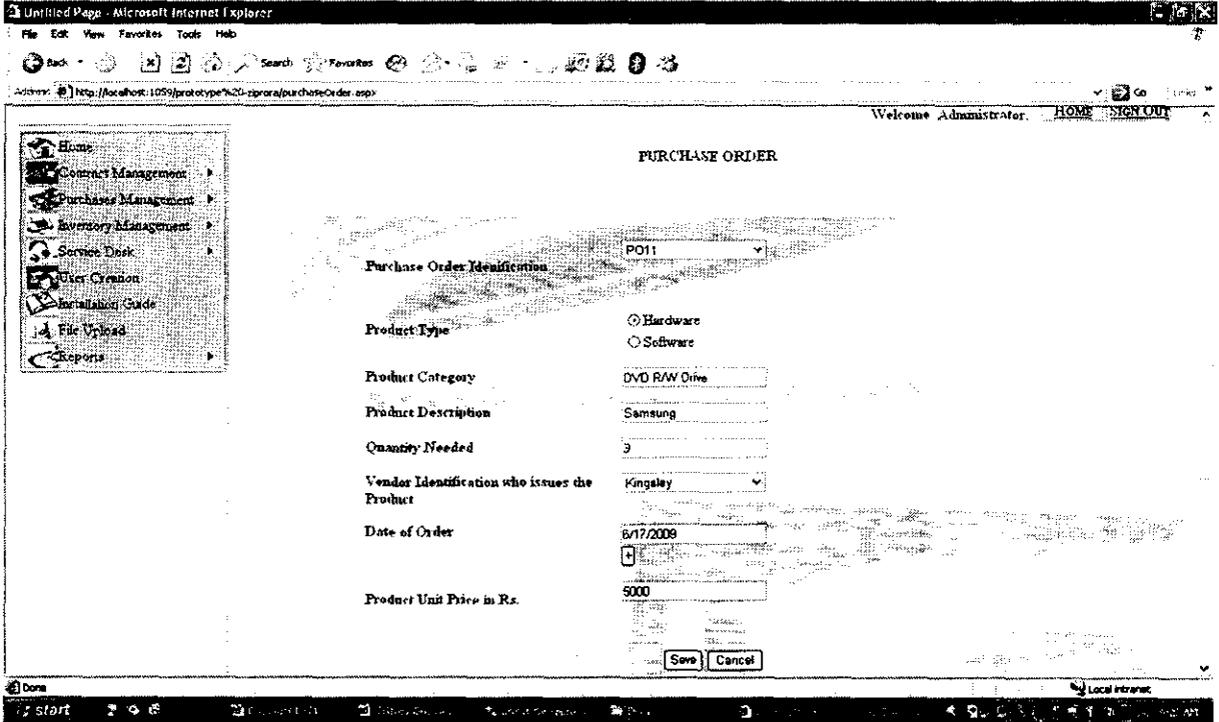


Figure A1.6: Purchase Order Form

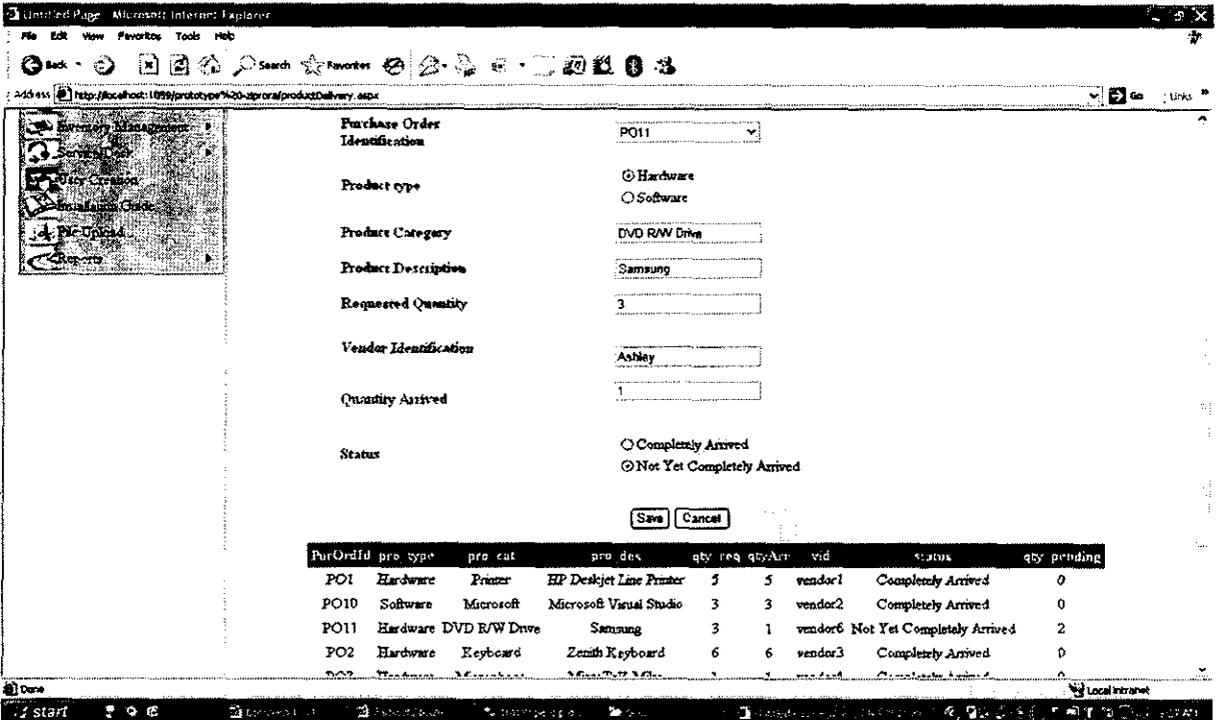


Figure A 1.6: Products Delivery Form

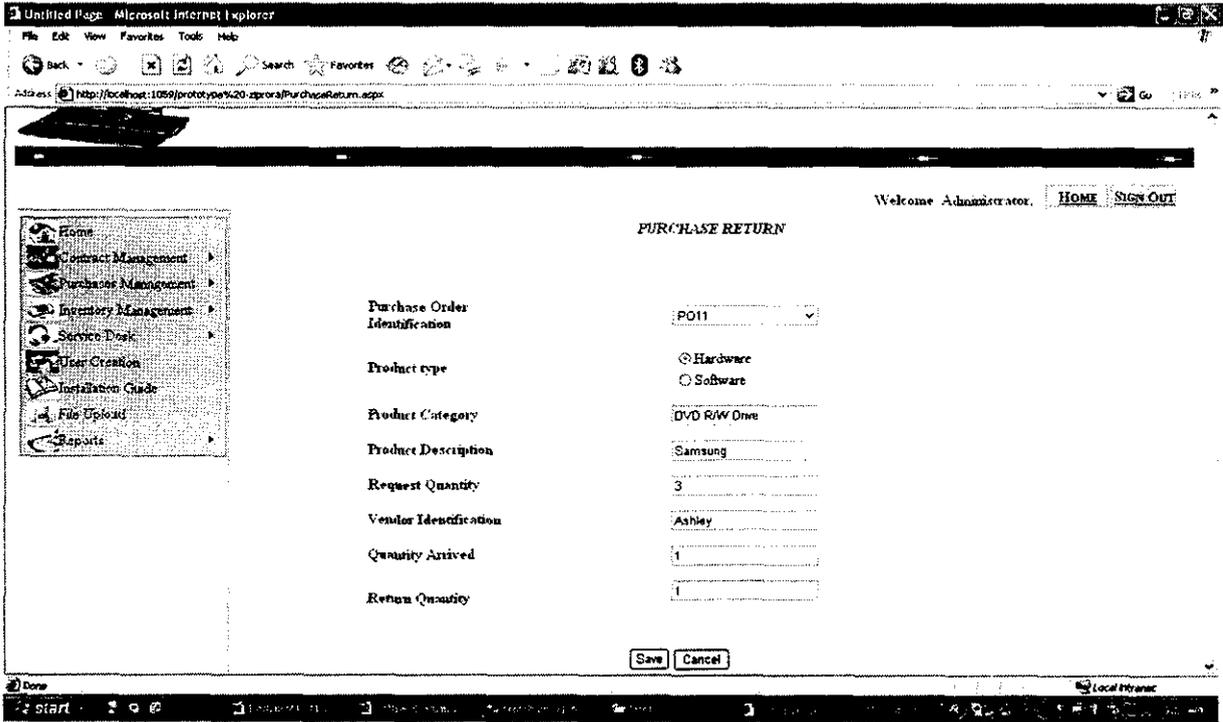


Figure A 1.7: Purchase Return Form

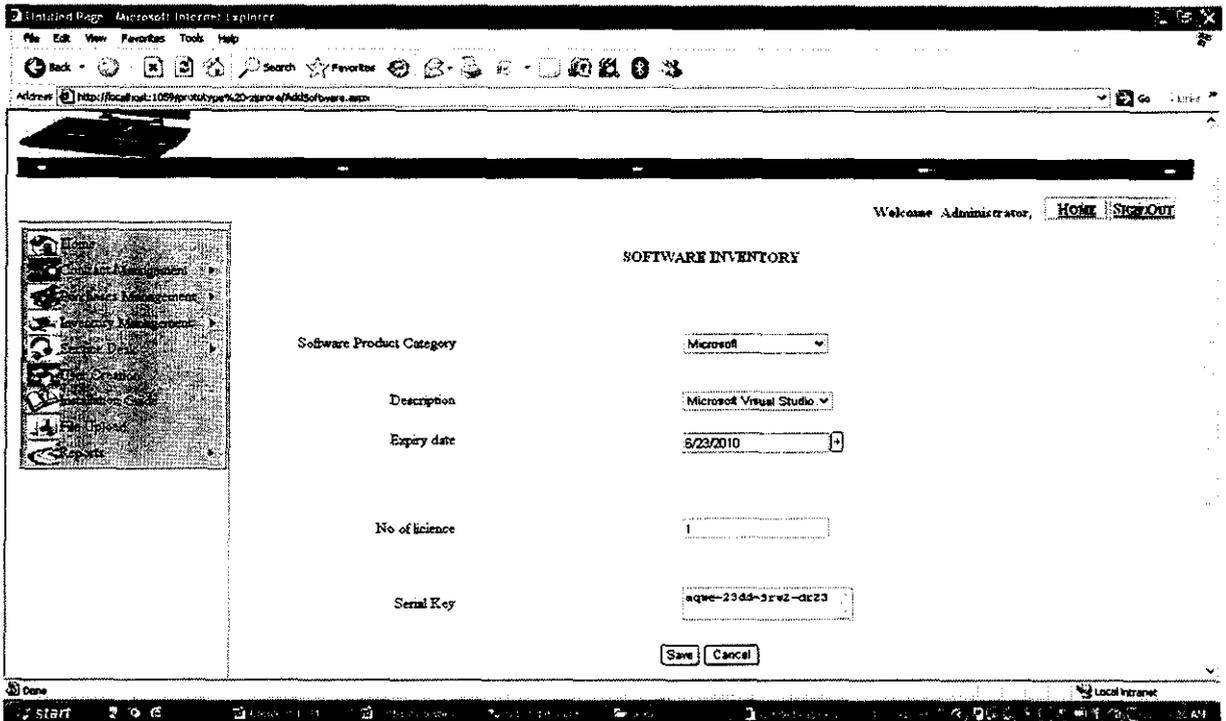


Figure A1.8: Software Inventory Form

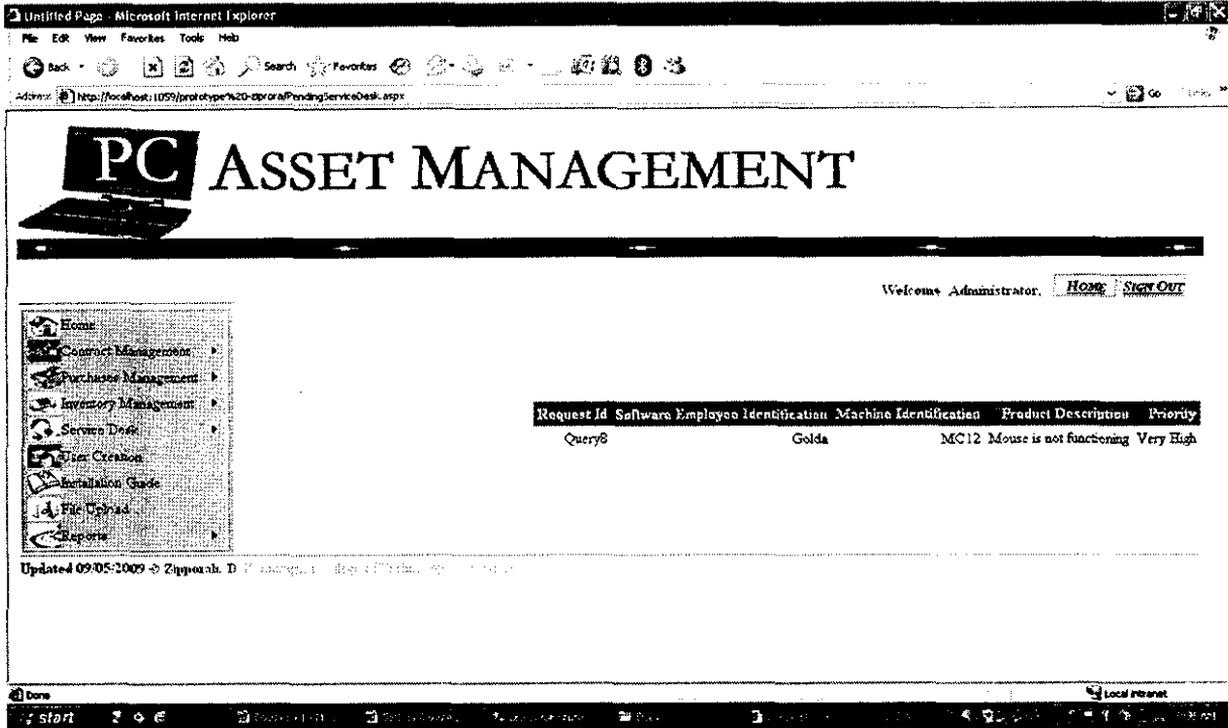


Figure A 1.10: Admin View of Pending Services

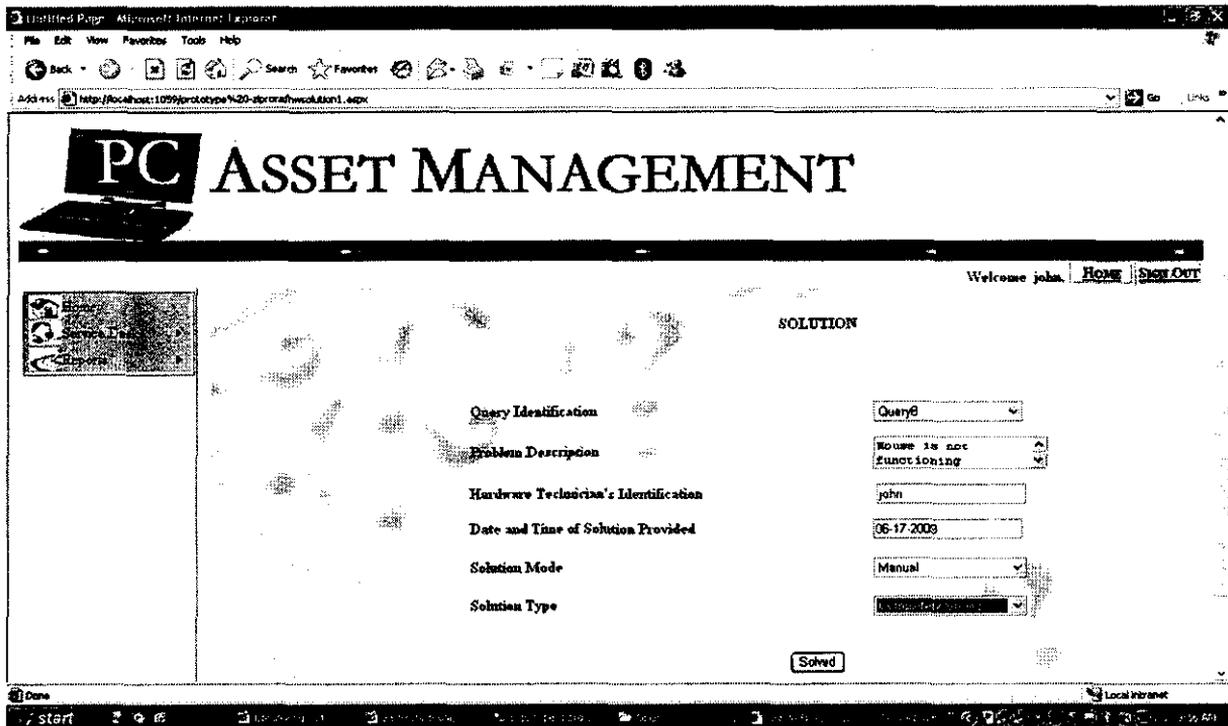


Figure A 1.11: Solution Details Form

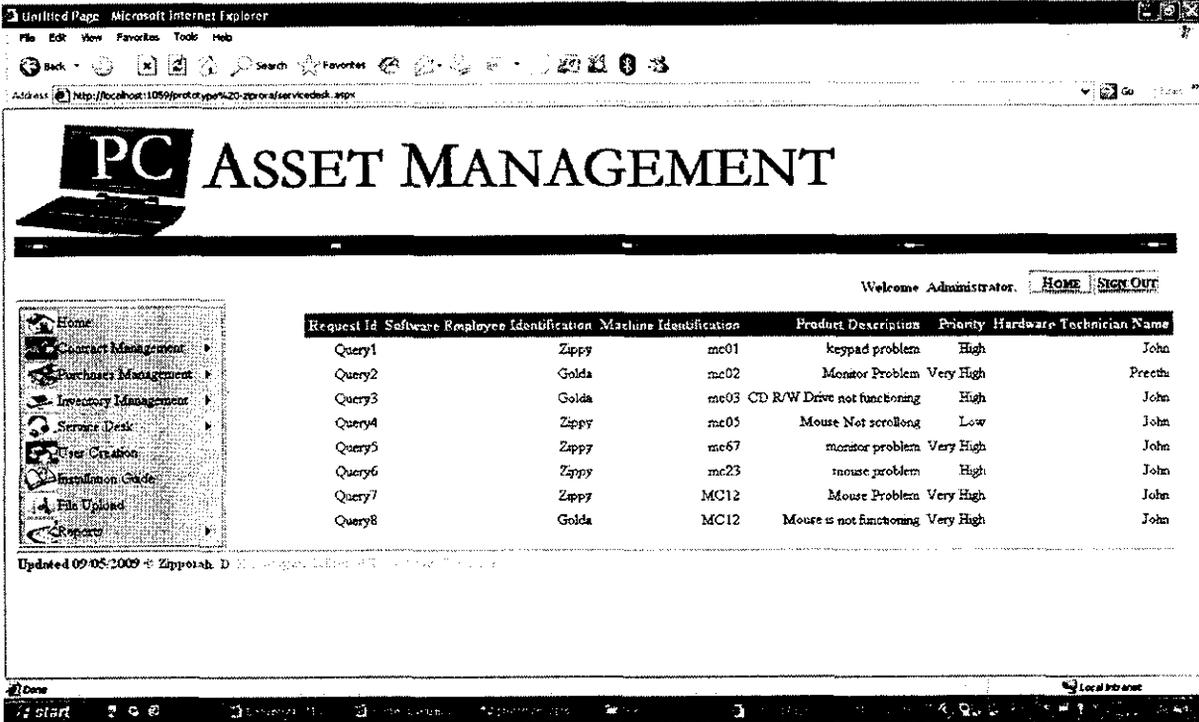


Figure A 1.12: Admin View of Services Performed

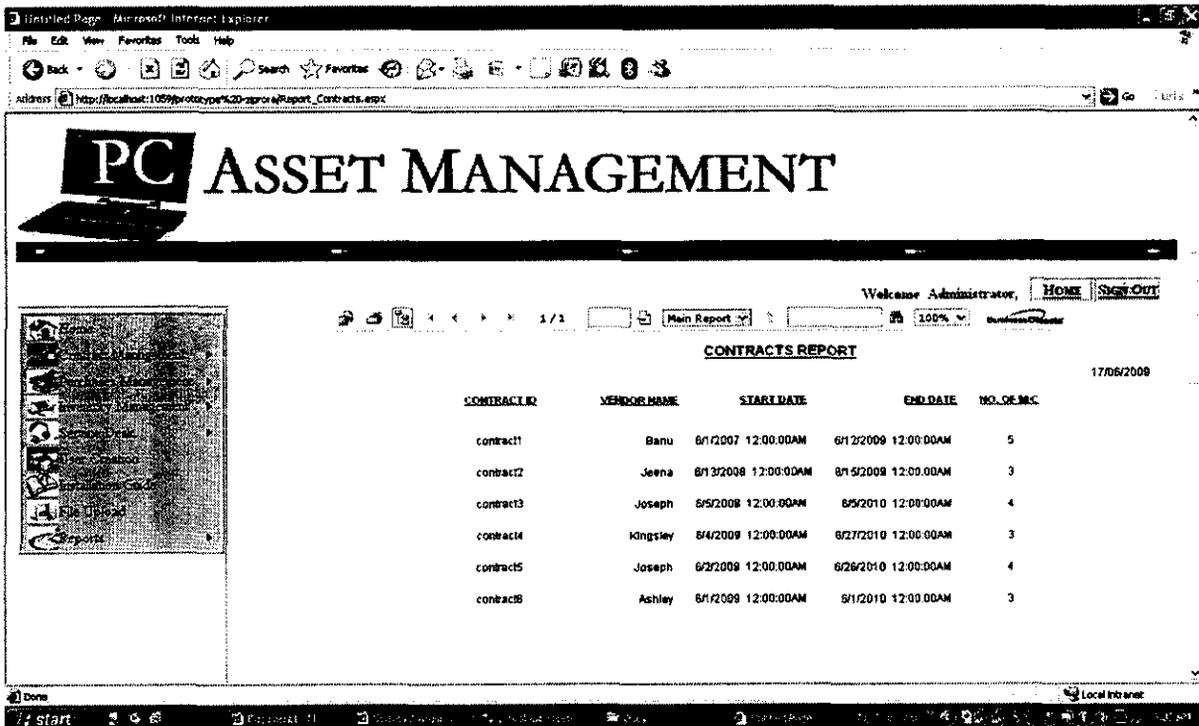


Figure A 1.13: Contracts Report

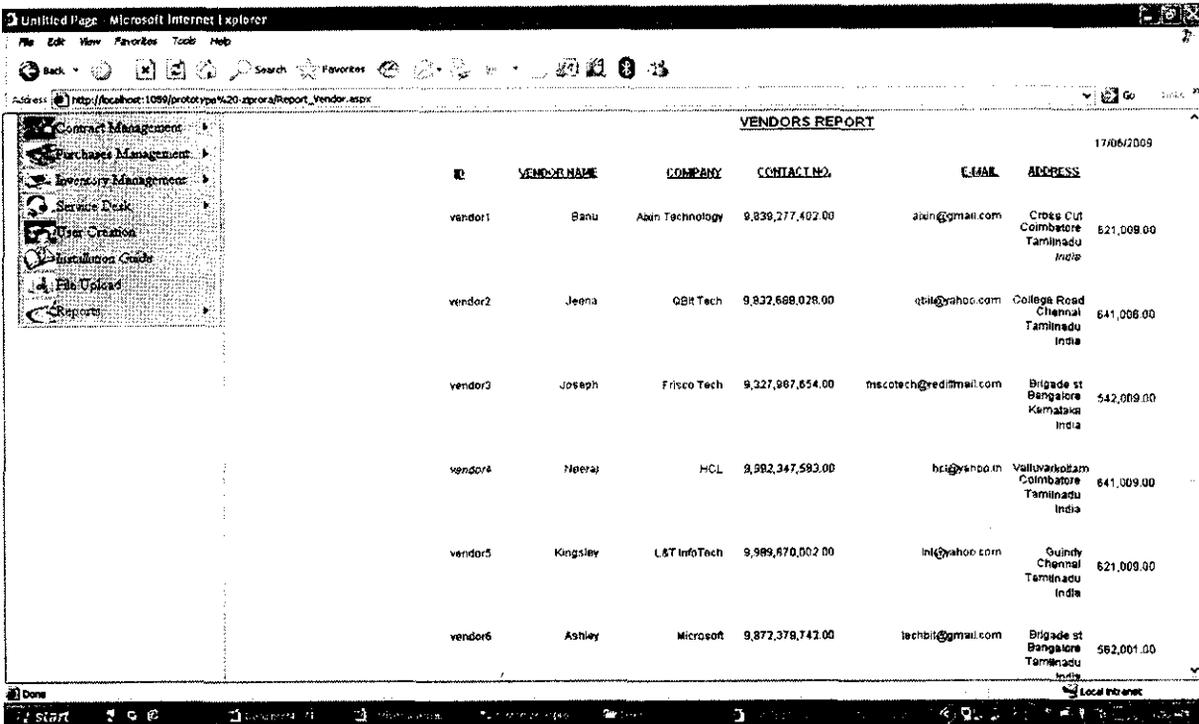


Figure A 1.14: Vendors Report

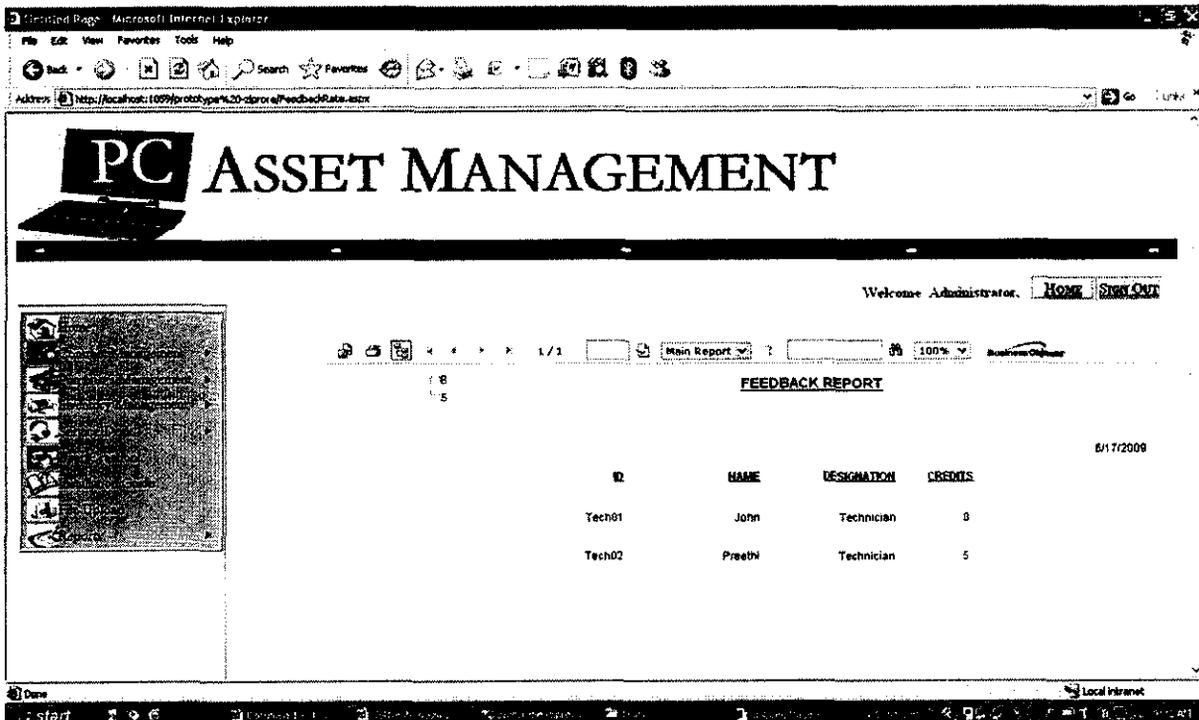


Figure A 1.15: Feedback Report