A Summer Training Project Report On

PRINTER CARTRIDGE MANAGEMENT SYSTEM

At

INDIAN OIL CORPORATION LIMITED

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

BACHELOR OF TECHNOLOGY
From
Jaypee University of Engineering and technology,Guna

Training Period (1ˢᵗ Jun 2022 to 30ᵗʰ July 2022)

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ACKNOWLEDGMENT

I am highly obliged to Learning and Training Department (Mathura Refinery) for providing me this opportunity to intern at IOCL, Mathura. My special thanks to Mr. Rajendra Prasad (AM, L&D), Mr. Ram Raj (SM, L&D), Mr. D.C.Verma (DGM), Mr. Arun kumar (MNMEL) and Mr. Shailesh (AM) .

I would also like to express my sincere gratitude to DR.Amit Kumar srivastava (Coordinator of T&P Cell) and Mr.Navaljeet Singh for allowing me to do my industrial training at IOCL, Mathura (UP)

<u>CERTIFICATE</u>

This is to certify that the work contained in the report titled **Printer Cartridge Management System** is a bonafide work of **Shourya** and has been carried out under by supervision.

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Introduction/Objectives

INTRODUCTION

Indian Oil is India's flagship national oil company with business interests straddling the entire hydrocarbon value chain – from refining, pipeline transportation and marketing of petroleum products to exploration & production of crude oil & gas, marketing of natural gas and petrochemicals. It is the leading Indian corporate in the *Fortune* 'Global 500' listing, ranked at the 125th position.

At Indian Oil, operations are strategically structured along business verticals - Refineries, Pipelines, Marketing, R&D Centre and Business Development – E&P, Petrochemicals and Natural Gas. To achieve the next level of growth, Indian Oil is currently forging ahead on a well laid-out road map through vertical integration— upstream into oil exploration & production (E&P) and downstream into petrochemicals – and diversification into natural gas marketing and alternative energy, besides globalization of its downstream operations. Having set up subsidiaries in Sri Lanka, Mauritius and the United Arab Emirates

(UAE), Indian Oil is simultaneously scouting for new business opportunities in the energy markets of Asia and Africa.

ABOUT MATHURA REFINERY :-

Indian Oil Corporation Limited, or **IndianOil**, (BSE: 530965, NSE: IOC) is an Indian state-owned oil and gas company headquartered at Mumbai, India. It is India's largest commercial enterprise, ranking 98th on the Fortune Global 500 list in 2011. IndianOil and its subsidiaries account for a 47% share in the petroleum products market, 34.8% share in refining capacity and 67% downstream sector pipelines capacity in India. The Indian Oil Group of Companies owns and operates 10 of India's 19 refineries with a combined refining capacity of 65.7 million metric tons per year.

IndianOil operates the largest and the widest network of fuel stations in the country, numbering about 17606 (15557 regular ROs & 2049 KissanSewa Kendra). It has also started Auto LPG Dispensing Stations (ALDS). It supplies Indane cooking gas to over 47.5 million households through a network of 4,990 Indian distributors. In addition, IndianOil's Research and Development Center (R&D) at Faridabad supports, develops and provides the necessary technology solutions to the operating divisions of the corporation and its customers within the country and abroad. Subsequently, IndianOil Technologies Limited - a wholly owned subsidiary, was set up in 2003, with a vision to market the technologies developed at IndianOil's Research and

Development Center. It has been modeled on the R&D marketing arms of Royal Dutch Shell and British Petroleum.

The present manual Printer's Cartridge management system requires updating of a number of Cartridges. Different Cartridge have to be maintained for recording the different details, permitted details and employee details of the different discipline undergoing department. There is an increased risk of error in this manual system.

Redundancy of data creeps in the manual system and it becomes a time consuming process to answer management queries and prepare management reports. The manual Printers increases with the increase in the number of employee, which leads to the increase in number of Cartridges in the department.

In the view of above, a proposed computerized Printer's Cartridge Management System Application is strongly needed.

OBJECTIVES

The objective of the proposed system would be to overcome the limitations of the problems faced under manual system. There is a huge amount of work processed from the employee to get permit till his work completion, which needs proper management for

smooth running of organization. So, to reduce the workload and for efficient management, a computerized system would be required. The computerized data keeping will help the system to quickly locate the data and generate different types of reports.

The proposed system would implement an easy to use interface, so that it can be handled without much training. User-friendly interface helps and eases the work of data updating and consequently generating the updated records. The application would take care of the data integrity and validity, so that the unsuitable data would not be entered by misapprehension. An error free report is necessary for providing correct information. The permit tracking system would be able to maintain the database of the Cartridge stock correctly. Trainee job, date and time, working hours, etc should be asserted properly. This will lead to provide flexibility in the system.

Mathematical, accounting and logical errors would get automatically rectified in the proposed system. Reports can be generated on the click of a button. Design of the proposed system must take the following into consideration.

The Printer's Cartridge Management System Application should have all the data pertaining to the department working in the organization. The company consist of different department working under organization. The system should have all the records of the Cartridge stock, who has taken the permit in different units of refinery. A employee who has to accomplish work should be registered in the system. Then are being provided in the department itself, so the system should record the data of related to permits given in day to day work.

PROJECTCATEGORY:
RDBMS

RDBMS

RDBMS (Relational Database Management System) is a computer program for general-purpose data storage and retrieval that organize data into tables consisting of one or more containing the same set of data items (columns).

The RDBMS software includes utilities and program for maintaining the database system and programs for maintaining

the databases system. It includes different processes that are responsible to co-ordinate the database system.

Tools Used:

Front End: HTML, CSS, BOOTSTRAP

Back End: SERVLET

Repertory: DATA DYNAMICS ACTIVE REPORT.

Hardware Requirement:

Server Side: OPERATING SYSTEM - WINDOWS 2000 SERVER.

Client Side: OPERATING SYSTEM – WINDOWS –10.

Reasons for selection of Tools:

Features of Visual Studio: Visual Studio 8.0 is Microsoft's Rapid Application Development (RAD) tool. Visual Studio is fastest and easiest way to develop windows applications. It provides several new features that enhance the development process, some of them are

New data access features:

Support for data access model, enhanced data-bound control,

support for OLEDB etc.

New Controls:

An ADO data-bound control, a Grid control, a drop-down Calendar control, an Internet Explorer-style toolbar control, etc.

New Internet features:

Capability to write server-side applications for Internet Information server (ISS),
Support for HTML, etc.

New Languages features:

Capability to pass user-defined methods as procedure parameters and object properties, a new set of objects to support file-system access, etc.

New Component-creation features:

To create dynamically OLEDB

system from Microsoft that combines the relational Microsoft Jet Database Engine with a graphical user interface and software-development tools. It is a member of the Microsoft Office suite of applications, included in the Professional and higher editions or sold separately. In mid-May 2010, the currentversion of Microsoft Access 2010 was released by Microsoft in Office 2010; Microsoft Office Access 2007 was the prior version.

Access stores data in its own format based on the Access Jet Database Engine. It can also import or link directly to data stored in other applications and databases.[1]

Software developers and data architects can use Microsoft Access to develop application software, and "power users" can use it to build simple applications. Like other Office applications, Access is supported by Visual Basic for Applications, an object-oriented programming language that can reference a variety of objects including DAO (Data Access Objects), ActiveX Data Objects, and many other ActiveX components. Visual objects used in forms and reports expose their methods and properties in the VBA programming environment, and VBA code modules may declare and call Windows operating-system functions

Project Omega

Microsoft's first attempt to sell a relational database product was during the mid 1980s, when Microsoft obtained license to sell R:Base. In the late 1980s Microsoft developed its own

solution codenamed Omega. It was confirmed in 1988 that a database product for Windows and OS/2 was in development. It was going to include "EB" Embedded Basic language, which was going to be the language for writing macros in all Microsoft applications, but the unification of macro languages did not happen until the introduction of VBA. Omega was also expected to provide a front end to the Microsoft SQL Server. The application was very resource demanding and there were reports that it was working slow on then-available 386 processors. It was scheduled to be released in the 1st quarter of 1990, but in 1989 the development of the product was reset and it was rescheduled to be delivered no sooner than in January 1991. Parts of the project were later used for other Microsoft projects: Cirrus (codename for Access) and Thunder (codename for Visual Basic, where the Embedded Basic engine was used). After Access's premiere, the Omega project was demonstrated in 1992 to several journalists and included features that were not available in Access.

USE OF MICROSOFT ACCESS

Microsoft Access is used to make databases.

When reviewing Microsoft Access in the real world, it should be understood how it is used with other products. An all-Access solution may have Microsoft Access Forms and Reports managing Microsoft Access tables. However, Microsoft Access may be used only as the 'front-end', using another product for the 'back-end' tables, such as Microsoft SQL Server and non-Microsoft products such as Oracle and Sybase. Similarly, some

applications will only use the Microsoft Access tables and use another product as a front-end, such as Visual Basic or ASP.NET. Microsoft Access may be only part of the solution in more complex applications, where it may be integrated with other technologies such as Microsoft Excel, Microsoft Outlook or ActiveX Data Objects.

Access tables support a variety of standard field types, indices, and referential integrity. Access also includes a query interface, forms to display and enter data, and reports for printing. The underlying Jet database, which contains these objects, is multiuser-aware and handles record-locking and referential integrity including cascading updates and deletes.

Repetitive tasks can be automated through macros with point-and-click options. Microsoft Access is popular among non-programmers and professional developers alike. Non-programmers can create visually pleasing and relatively advanced solutions with very little or no code. It is also easy to place a database on a network and have multiple users share and update data without overwriting each other's work. Data is locked at the record level which is significantly different from Excel which locks the entire spreadsheet.

Microsoft offers a wide range of template databases within the program and for download from their website. These options are available upon starting Access and allow users to enhance a database with pre-defined tables, queries, forms, reports, and macros. Popular templates include tracking contacts, assets, issues, events, projects, and tasks. Templates do not include VBA code.

Microsoft Access offers also the ability for programmers to create solutions using the programming language Visual Basic

for Applications (VBA), which is similar to Visual Basic 6.0 (VB6) and used throughout the Microsoft Office programs such as Excel, Word, Outlook and PowerPoint. Most VB6 code, including the use of Windows API calls, can be used in VBA. Power users and developers can extend basic end-user solutions to a professional solution with advanced automation, data validation, error trapping, and multi-user support.

Database solutions created entirely in Microsoft Access are well suited for individual and workgroup use across a network. The number of simultaneous users that can be supported depends on the amount of data, the tasks being performed, level of use, and application design. Generally accepted limits are solutions with 1 GB or less of data (Access supports up to 2 GB) and performs quite well with 20 or fewer simultaneous connections (255 concurrent users are supported). This capability is often a good fit for department solutions. If using an Access database solution in a multi-user scenario, the application should be "split". This means that the tables are in one file called the back end (typically stored on a shared network folder) and the application components (forms, reports, queries, code, macros, linked tables) are in another file called the front end. The linked tables in the front end point to the back end file. Each user of the Access application would then receive their own copy of the front end file.

Applications that run complex queries or analysis across large datasets would naturally require greater bandwidth and memory. Microsoft Access is designed to scale to support more data and users by linking to multiple Access databases or using a back-end database like Microsoft SQL Server. With the latter design,

the amount of data and users can scale to enterprise-level solutions.

Microsoft Access' role in web development prior to version 2010 is limited. User interface features of Access, such as forms and reports, only work in Windows. In versions 2000 through 2003 an Access object type called Data Access Pages created publishable web pages. Data Access Pages are no longer supported. The Microsoft Jet Database Engine, core to Access, can be accessed through technologies such as ODBC or OLE DB. The data (i.e., tables and queries) can be accessed by web-based applications developed in ASP.NET, PHP, or Java.

Access 2010 allows databases to be published to SharePoint 2010 web sites running Access Services. These web-based forms and reports run in any modern web browser. The resulting web forms and reports, when accessed via a web browser, don't require any add-ins or extensions (e.g. ActiveX, Silverlight).

In enterprise environments, Microsoft Access is particularly appropriate for meeting end-user database needs and for rapid application development. Microsoft Access is easy enough for end users to create their own queries, forms and reports, laying out fields and groupings, setting formats, etc. This capability allows professional developers, as well as end users, to develop a wide range of applications to fulfill the needs of an organization or commercial purpose. Many technology departments enjoy Access's ease of use, thus allowing departmental users the ability to create highly focused applications, while allowing the technology departments to focus on the enterprise level systems that provide the information (enterprize data) to supported departments.

A compiled MDE or ACCDE version of an Access database can be created to prevent users from getting to the design surfaces to modify module code, forms, and reports. This is often used in environments where end-user modifications are discouraged or the application's code should be kept private.

Microsoft offers a runtime version of Microsoft Access 2007 for download. This allows people to create Access solutions and distribute it for use by non-Microsoft Access owners (similar to the wayDLLs or EXEs are distributed). Unlike the regular version of Access, the runtime version allows users to use the Access application but they cannot use its design surfaces.

Microsoft also offers developer extensions for download to help distribute Access applications, create database templates, and integrate source code control with Microsoft Visual SourceSafe.

Feature

Users can create tables, queries, forms and reports, and connect them together with macros. Advanced users can use VBA to write rich solutions with advanced data manipulation and user control.

The original concept of Access was for end users to be able to "access" data from any source. Other uses include: the import and export of data to many formats including Excel, Outlook, ASCII, dBase, Paradox, FoxPro, SQL Server, Oracle, ODBC, etc. It also has the ability to link to data in its existing location and use it for viewing, querying, editing, and reporting. This allows the existing data to change and the Access platform to always use the latest data. It can

perform heterogeneous joins between data sets stored across different platforms. Access is often used by people downloading data from enterprise level databases for manipulation, analysis, and reporting locally.

There is also the Jet Database format (MDB or ACCDB in Access 2007) which can contain the application and data in one file. This makes it very convenient to distribute the entire application to another user, who can run it in disconnected environments.

One of the benefits of Access from a programmer's perspective is its relative compatibility with SQL (structured query language) — queries can be viewed graphically or edited as SQL statements, and SQL statements can be used directly in Macros and VBA Modules to manipulate Access tables. Users can mix and use both VBA and "Macros" for programming forms and logic and offers object-oriented possibilities. VBA can also be included in queries.

Microsoft Access offers parameterized queries. These queries and Access tables can be referenced from other programs like VB6 and .NET through DAO or ADO. From Microsoft Access, VBA can reference parameterized stored procedures via ADO.

The desktop editions of Microsoft SQL Server can be used with Access as an alternative to the Jet Database Engine. This support started with MSDE (Microsoft SQL Server Desktop Engine), a scaled down version of Microsoft SQL Server 2000, and continues with the SQL Server Express versions of SQL Server 2005 and 2008.

Microsoft Access is a file server-based database. Unlike client–server relational database management systems (RDBMS), Microsoft Access does not implement database triggers, stored procedures, or transaction logging. Access 2010 includes table-level triggers and stored procedures built into the ACE data engine. Thus a Client-server database system is not a requirement for using stored procedures or table triggers with Access 2010. Tables, queries, Forms, reports and Macros can now be developed specifically for web base application in Access 2010. Integration with Microsoft SharePoint 2010 is also highly improved.

Microsoft Access can also import or link directly to data stored in other applications and databases. Microsoft Office Access 2007 and newer can import from or link to:

- Excel
- SharePoint lists
- text
- XML
- Outlook
- HTML
- dBase
- Paradox
- Lotus 1-2-3
- ODBC-compliant data containers, including:
    - Microsoft SQL Server
    - Oracle
    - MySQL
    - PostgreSQL

SYSTEM ANALYSIS

SYSTEM PLANNING: The most crucial phase of managing system project is planning to launch a system investigation. For doing this, we need a master plan dealing with the parts to be taken. The initial investigation has the objective of determining whether the need was there or not which is in fact the first step in system development life cycle i.e., the identification of need. There may be request for change, improvement or enhancement of the existing system. The initial investigation is one way of handling these needs. The objective to determine whether the request is valid/feasible, before a recommendation is reached to do nothing, improve, modify or enhance the existing system or to build a new one. The success of system depends largely on how accurately a problem is defined, thoroughly investigated and properly carried out through choosing among different sets of solutions. The user need identification and analysis are concerned with what the user needs rather than what user wants. Thus for an effective maintenance, proper follow-up and handling of the data resulting from different information in records, it is felt necessary

to develop a computerized sales, distribution & stock maintenance system, so that the monitoring and maintenance of data could be done efficiently.

Information Gathering: A key part of system analysis is gathering information about the present system. The developer must know what information is to be gathered and what to make of it. The proper use of tools for gathering information is the key to successful analysis. In the interest to get more potential information, we personally approached the senior officials of the concerned department.

Advantages of computerized Printer's CARTRIDGE Management system

Like any other computerized system, Permit Tracking System & Maintenance system also has the advantage of accuracy and efficiency, that is, accurate data maintenance, more fast access to data and faster retrieval. Following are some of the major advantages of computerized Automated Management:

- Easy to manage the records of various information of the parts.

- Easy to search the details of individual parts.

- Queries have become simple.

- Effortlessness in taking backups.

- Reports are automatically generated on the user's choice.

- It decreases/eliminates the need of paper that was earlier needed to keep records.

- Manpower requirements get drastically decreased

<u>Preliminary Investigation</u>

The software is being developed for Indian Oil Corporation Limited the government organization situated at Mathura . The software is meant to cater to the needs regarding permittee related data for the permit and also to automate the IS Department duty scheduling system.

The software would be useful for the day-to-day functions of the company, be it administrative functions, office record keeping etc. It is being specially designed keeping in mind the requirements of the company. The functions of this organisation is of a typical nature, very much similar to the activities carried out in any commercial organization. Hence, not much effort is

required in the study of the systems and processes that are to be automated.

To achieve this goal of devising a Printer's Cartridge Management System for the company, software needs to be developed for automated data management, record keeping, account maintenance and various other activities. But at present only administrative and academic activities are going to be automated as desired by the , so the analysis and subsequent software would focus on these two broad areas while scope is provided for inclusion of the other activities into the system without much effort.

To get the maximum use of the resources available and to extract maximum profit in today's competitive market, the company plans to introduce the information relay centers and guidance through Internet.

With the operations getting more and more technical today in the developing countries as well there is need to expand the limits and scope of operations of the company.

The new Printer's Cartridge Management System would directly provide assistance to the IS department to assess the performance of the employee, on a day-to-day basis as well as keep records

for future reference, which would be readily available at any instant of time. The management would save a lot of time and energy in retrieving records and generating reports, a job that takes days to accomplish manually would be completed in seconds using the proposed Automated Management. This would help build stronger image and have far reaching impact on their future projects.

What Cartridge Management System would be?

Printer's Cartridge Management System is supposed to be an automated system that would cover administrative functions of the IS Department in the first phase of development and thus provide facility of automated record keeping process, time scheduling and management, Printer's Cartridge allotment and monitoring, call reception and forwarding, call report generation, tracking performance Printer's Cartridge etc. It also provides options for management to provide proper security from unauthorized access

Topic	Remarks
The Project Needs:- 1. Infrastructure 2. Software requirements	Indian oil corporation needs to acquire infrastructures to host the Computerized services. As automation of the Permit Tracking System would be using small LAN to provide services, a user friendly & customized package has to be designed with compatible database architecture to store necessary data and information. For this a suitable network O/S, Front end and Back end tools has to be chosen.

FEASIBILITY STUDY

Feasibility study asks if the system will work when it is developed and installed. It tries to find out the technical, operational, social, financial and other barriers, if any, in the project development. For a project to be Successfully implemented there should be sufficient support for the project from management and users. There should be a curiosity for change from the management to

improve an existing system or to replace the older one because of its obsoleteness or to introduce new technology for greater performance. The users should be involved in the project planning. The project should not produce erroneous results, with proper security of company data.

Technical Feasibility system is said to be technically feasible if either there exists the required technology or the hospital is willing to go for the technology after the 'Cost & Benefit analysis' is done and the necessary technology exists. A project is also said technically feasible if further development of the software is possible. So far as this project is concerned, this project uses Asp.net as the front-end for net framework. So, the users find the same ease in operating the software as if they were operating the familiar Microsoft Windows based any other application. Further, the use of Oracle reduces most of the data maintenance activities like, inconsistencies in data, taking backups, though a specialized Database Administrator is required to do so. On the hardware part, the hospital has two options to choose from. The first option is to go for a standalone system and install the complete software on every system. The second option

is to go for a -server system, with the database server (Oracle) installed on the server with an operating system like Windows 2000 Server and this software on every . Of course, the third option is to go for remote booting with dumb terminals depending for everything on the server, including the processing needs.

This project is based on the second option of the '-Server' based networking. This reduces the inconsistencies in data that is possible with stand-alone systems and this also reduces the chance of overloading the server with lots of processing with processor-hungry dumb-terminals, which is caused by the third option.

Operational Feasibility

Considering analysis of the preliminary information obtained, the volume of data, numbers of application and rough output requirements, it is possible to arrive at some options on the hardware front. It is possible to arrive at some broad estimates of disk space requirements, data entry loads and print loads. Getting details of hardware and system software selection required the detailed input and output needs of the project, users of the

developed application and available resources. The study yielded the following results:

Hardware requirements to run the Application under consideration:-

Option1 :

The first option would be to go in for a PC. Automation will be done using a machine for all concerned departments. The configuration of machine would have a large disk capacity with a good printer attached to the main system for high volume printing. This configuration could be considered in consonance with option 1 for software development, with the common database residing in the centralized system and having facility of either online or offline data storage as well. This is a must for data security reasons.

Option 2:

The second option that could be considered would be to go in for a distributed network. The hardware could consist of a LAN (Windows 2000 Server O/S) with multiple nodes and a server. Each node would be located at the respective departments. All

common files and databases would be located and updated on the main server, with appropriate locks and security mechanisms being built in. the nodes would also enable local processing for standalone jobs, if any so that any node has a separate hard disk drive.

Economic Feasibility

Since the management is computer savvy and is already using one PC for small official / clerical jobs, they require a separate computer to be bought for the software to be installed only if their existing hardware does not meet the project requirements. There can be two options either the software is installed on a PC or a LAN is implemented. Since the later option would require purchase of additional computers and other LAN hardware devices, the department prefers to go out for a PC. So, the costs of element required here will be only related to the software and training of the personnel.

SOFTWARE ENGINEERING PARADIGM

APPLIED

Structured Analysis & Structured Analysis Tools used:

Structured analysis is a set of techniques and graphical tools that allow an analyst to develop a new kind of system specification that are easily understandable to the end-user and other non-technical and managerial people. The structured analysis tools used in this project are Data Flow Diagrams, Structure Charts, and Flow Charts etc.

Software Engineering:

Software Engineering is an engineering approach according to which, techniques and knowledge are systematically organized before they are applied to the development of software. We will define software to not only include software programs but also to the software-associated documentation required to develop, operate and maintain the programs. By defining the software in the broader sense, we wish to emphasize the necessity of considering the generation of timely documentation as an integral

part of the software development process. We can combine this with definition of engineering to produce the following definition.

The practical application of the scientific knowledge in the design and construction of computer programs and the associated documentation required developing, operating and maintaining them. Three main points should be made about this definition; the first is concerned with the necessity of considering a broad enough interpretation of the word "Design" to cover the extremely important activity of software requirement engineering. The second point is that the definition should cover the entire software life cycle, thus including those activities of redesign and modification often described as "Software Maintenance". The final point is that our store of knowledge of software, which can really be called "Scientific Knowledge", is rather small base upon which to build an engineering discipline.

Software Design

Software designs are the first of three technical activities design, code and test that are required to build and verify software. The flow of information during this technical phase of the software

requirements, manifested by information, functional, and behavioral models feed the design step. Using one of a number of design methods, the design produces a data design, an architectural design and a procedural design. The data design transforms the information domain model created during analysis into the data structures that will be required to implement the software.

The architectural design defines the relationship among major structural components of the programs. The procedural design transforms structural components into a procedural description of the software. Source code is written and testing is conducted to integrate and validate the software. Software design is the process through which requirements are translated into a representation of software. Informally, software is designed in two phases: preliminary design is concerned with the transformation of requirements into data & software architecture, whereas detailed design focuses on refinements to the architecture representation that lead to a detailed data structure and algorithmic representation for software.

Programming Techniques

On the successful completion of the design as per the user requirements, the next stage of coding was started.

The coding technique followed in this project has the following sequences:

1. First the code is written for a module.
2. It is tested to check if all functions are working properly.
3. A peer review is conducted on the code written.
4. If defects are found, a different approach is tested to perform the same set of tasks.
5. Code is again verified.
6. If further errors are found, then steps 3-5 are repeated until the code is felt error-free.
7. Then, the correct code is unit tested against sample data or special data.
8. If errors or inconsistencies are found, they were first tried to remove through current coding technique. If the code still contains errors, some other technique is tried.

9. The whole process is repeated until there are no more errors found.

Finally, an overall system testing or integration testing is done to ensure all the modules work together properly.

Software testing and reliability analysis is one of the most important activities in the software development life cycle. Almost every organization in now using disciplined test planning and some objective criteria such as "exercise every instruction" often with the aid of automated test monitoring tools and test case planning aids.

There are different programming techniques. These can be classified as:

1. **Unstructured Programming**
2. **Structured Programming**
3. **Object Oriented Programming**
4. **Event Oriented Programming**

The programming technique used in the project is event driven programming and because Microsoft Visual Basic is probably the best tool to implement such a programming technique, it has been chosen as the front-end GUI tool.

Quality Assurance:

Testing Techniques used:

Quality Assurance is the review of software product and related documentation for completeness, correctness, reliability and maintainability. It also includes assurance that the system meets the specification and the requirements for its intended use and performance.

Quality Assurance is done by:-
- Testing
- Verification and Validation

Testing

Testing is done in two phases- first all the individual modules are tested for their efficiency and fault tolerance. In the second phase, all these tested modules are grouped together and then tested as a complete system, which ensures proper communication among modules. Basically, we have to choose

from these two types of techniques to test the program from two view points - whether the programming logic works well (code testing) and the specification testing, within which, the program specifications are examined, to check what the program should do and how it should perform under various situations. For performing such tests, a sample test data is prepared, which can be either live data or an artificial one. Live data is the data that is directly taken from the organization and artificial data is the one that is specially prepared to make the program fail or to see how immune is the system to improper and invalid data

As all programming is divided into different modules and they will interact with each other to maintain the data and information. Modular structure is designed with the consideration of ease to maintain the logic for modification and maintenance. Since program has to interact with the database. Each module is interacting with database and give the desired output .

INTRODUCTION

This SRS is intended to explain the requirements for the project trainee database management system for , organization. The

software will be used by the developers of Indian oil corporation, associates and staff .

SCOPE:

The software developed will be named as **"Printer Cartridge Management System". The** Software is intended to carry out the following tasks:

1. Record Printer's cartridge details of the company .
2. Maintain record of Cartridge.
3. Record of the allotted Cartridge in units .
4. Maintain time and date schedule
5. Record of Live project.
6. Record the closing project details
7. Maintain record of closed project .
8. .Generate status report.
9. Generate end report of month.

Printer Cartridge Management System is going to provide a complete automated solution to the much-dreaded problem of record keeping. It will provide better categorization of files and faster processing of data. Wider   approach to preparation and

formatting of reports can be obtained by enhancement of search criteria as per   requirements of specific entities.

DEFINITIONS:

Management: The management of the IS department.

                 :The companies with which the signs a form for permit to do work etc.

User ID: Identification of user through the ID**.**

Department: The user of the company   who are entitled to take up the calls.

Duration: The time schedule aloted for the employee to do their job within duration

Report: The response of the employee for the permit forwarded to them**.**

GENERAL DESCRIPTION :

- **SOFTWARE PERSPECTIVE**

The computer hardware and peripheral equipment to be used:

Any PIII machine, with 10 GB hard disk or more space.

- **SOFTWARE FUNCTIONS**

The software will perform the following function.

REPORTS:

1. Acknowledgement of printer's Cartridge entry.

2. Enquiry about the hours permitted to do so.

3. Report of Departments

4. Annually Report.

BENEFITS:

The Project will yield both tangible and intangible benefits, both of which are equally important. While the former may be directly quantifiable, the later may not be. So, the management will need to consider the importance of later more in quantitative terms.

Tangible Benefits:
1. File maintenance becomes easier because the complexity of the files is reduced. Data is stored in simple and small files that are not only comfortable to work on, but also provide correct information as and when required by the system.
2. Security is provided from unauthorized users.
3. Reduction of holding costs of data like files, paper, storing space etc.

4. Increased monthly off-take because of better order servicing.

Intangible Benefits:

1. An attraction for subscribers and other patients.

2. Reduction in number of stock outs.

3. Timely information for management control.

The company will get the following benefits in terms of cost by the developed application:

The application prevents stock-outs, ensures better data management, provides greater storage space for its data and becomes a point of attraction for the new associate of the organisation. This helps in maintaining the quality level of operations and thus increase of 30% in current business is expected. Thus the project is beneficial in terms of cost also.

A project is feasible if it passes all the above tests. A system, that is technically feasible but the company isn't in a situation to invest such a huge investment that is, the project isn't economically feasible; the project can't be further developed. Likewise, a system, that is technically feasible and even if the hospital is ready to invest, but the concerned users aren't

interested at all in any change to the existing system, the project can't be developed.

CODE EFFICIENCY

Type of Test:

User Acceptance Test

Method:

The software product is regularly monitored for risk analysis and patient evaluation. The risk analysis involves analysis of alternatives and identification / resolving of risk. During the project life cycle, the product is re-engineered based on patient evaluation and assessment of each re-engineering is done at regular intervals. This technique may be used along with the spiral model of PDLC (This model is being used for development of the current Project).

Result:

PDLC Stage	Test Resut (0-10 Scale)
Front End Design	9.0
Data Entry & Design Modifications	8.5
Reports Design	7.0
Modified Reports Generation	8.1
Installation & Commissioning	9.5

Type of Test:

Performance Test

Method:

The software is tested for its performance standards, i.e. the task it is capable of performing as compared to the task it was expected to perform in the beginning of the Project.

Result:

The product scored 85% when tested on this front. It is capable of sending data to the database, receiving of the call, checking the status of the call, registration of associates and other and generating bills balances automatically along with many other tasks.

<u>OPTIMISATION</u>

TESTING STRATEGIES: These are of two types

CODE TESTING: The testing strategy examines the logic of the program. To follow this testing method, the analyst develops test cases that in executing every instruction in the program or module; that is every path through the program are tested. A path is a specific combination of conditions that handled by the program. In the Hospital Management & Maintenance system the code testing is the vital necessity. The process is done after a long duration when before lab testing and after through vendor testing. In this system the one path is change the account balance. The

correct request is submitted then the proper user id, data, and command entries are done.

SPECIFICATION TESTING: To perform specification testing, the analyst examines the specifications stating what the program should do and how it should perform under various conditions. The test cases are developed for each condition or combination of conditions and submitted for processing. By examining the program's result, the analyst can determine whether the program performs according to its specified requirements.

<u>VALIDATION CHECKS</u>

Validation refers to a different set of activities that ensure that the software correctly implements a specific function. Validation refers to a different set of activities that ensure that the software that has been built is traceable to patient requirements. When commercial systems are developed with the explicit intention of distributing them to the branches of the , they first go through

verification, sometimes called alpha testing. The feedback from the validation phase generally produces changes in the software to deal with errors and failures that are uncovered. Validation may continue for several months. During the course of validating the system, failure may occur and the software will be changed. Continued use may produce additional failures and the need for still more changes.

Types of Validation Checks

1. PROCESSING VALIDATION: when persons linked to the computer system only by communications lines use system, it is difficult to tell who the user is. In Hospital Management & Maintenance system when we use the system we can see the processing of the retrieval and addition is valid or not. Every process has written with a unique condition that prevents the error when the system has proceeded. Processing validation is the most vital part of the project.

2. TRANSACTION VALIDATION: Terminal and computers located at remote sites have the full capability of sending

anything over communication lines that can be entered through the keyboard, including data, processing requests, or commands to instruct the system to take a particular action. Transaction validation is the examination of input from a remote site to determine if it is acceptable for processing on the system. The project is designed to process these types of transaction: entering the registration form, sending the information, searching, and final confirmation. These all are used through the keywords entering to press the different commands buttons of form. Each entry is checked using the given conditions by the programmer.

TESTING

Testing plays a critical role in quality assurance for software. Due to its limitations of the verification methods for the previous phases, design and requirement faults also appear in the code. Testing is used to detect these errors, in addition to the errors introduced during coding phase. There are two approaches to testing: functional and structural. In functional testing the internal

logic of the system to be tested is not considered and test cases are decided based on requirement specifications. Equivalence class portioning, boundary value analysis, and cause effect graph are examples of methods for selecting test cases for functional testing. In structural testing, the test cases are decided entirely on the internal logic of the program. The most common methods are: i) control-flow based criterion are statement coverage and branch coverage and ii) common data flow based criteria are all definitions and all users. As the goal of testing is to detect faults in the programs, different levels of testing are often used. The levels of testing are classified as unit testing, integration testing, system testing and acceptance testing. Testing process usually starts with a test plan, which is the best document guiding the entire testing of the software.

Once the code has been generated, program testing begins. The testing process focuses on the logical internals of the software, ensuring that all statements have been tested. In this project the testing process is conducted by TESTING TECHNIQUES and TESTING STRATEGIES.

TESTING TECHNIQUES: Before proceeding for the testing of software following types of software tests were studied for their suitability to the conditions of the Project under study.

Testing based on SDLC (Software Development Life Cycle)

1. Unit Testing

2. System Testing

3. Acceptance Testing

Testing Based on Techniques

1. Black-box Testing

2. White-box Testing

3. Equivalence Partitioning

4. Boundary Analysis

5. Ad-hoc Testing

Specialized Testing

1. Volume Testing

2. Stress Testing

3. Performance Testing

4. Regression Testing

5. Interface Testing

6. Security Testing

7. Debugging

Considering the size, usability, life cycle and security requirements of the Project the necessary tests that were carried out along with the outcome of the same has been discussed as under.

The Product has been tested for:

i) User Acceptance,

ii) Performance,

iii) Security,

iv) Errors and

v) Stress.

IMPLEMENTATION

Implementation is the process of having systems personal check out and put new equipment into use, train users, install the new application, and construct any files of data needed to use it. Depending on the size of the organization that will be involved in using the application and the risk associated with its use, systems developers may choose to test the operation in only one area of the firm. Sometimes this will run the old and new systems together to compare the results. Implementation includes all those activities that take place to convert from the old system to the new. The new system may be totally new, replacing an existing manual or automated system, or it may be a major modification to an existing system. Implementation is an ongoing process. Implementation would cover the following steps:

1. Configuring of the computer system.
2. Loading of the developed software on the computer.
3. Training of operators at the 's locations.
4. Error identification and corrections there off.

Evaluation

Evaluation of the system is performed to identify its strength and weakness. The actual evaluation can occur along any of the following dimensions: -

1. **Operational Evaluation:** It is related to the assessment of the manner in which the system functions including ease of use, response time, overall reliability, and level of utilization.

2. **Organizational Impact:** It is related with the identification and measurement of benefits to the organization in such areas as financial concerns, operational efficiency and competitive impact.

3. **User Manager Assessment:** It deals with the evaluation of the attitudes of senior and user managers with in the organization as well as end users.

4. **Development Performance:** It is related with the evaluation of the development process in accordance with such yardsticks as overall development time and effort,

conformance to budgets and standards and other project management criteria.

MAINTENANCE

Maintenance work is based on existing software, as compared to development work that creates new software. Maintenance revolves around understanding the existing software and maintainers spend most of their time trying to understand the software they have to modify. Understanding the software means that understanding not only the code but also the related documents. During the modification of the software, the effect the change has to be clearly understood by the maintainer. To test whether those aspects of the system that are not supposed to be modified are operating as they were before modification, regression testing is done. In regression testing, we use old test cases to test whether new errors have been introduced or not.

Thus, maintenance involves understanding the existing software understanding the effect of change, making the changes to both code and documents, testing the new parts and retesting the old parts that were not changed. In order to make the maintainer job easier, it is necessary to prepare some supporting documents during software development. The complexity of maintenance task, coupled with the neglect of maintenance concerns during

development, makes maintenance the most costly activity in the life of software product.

SECURITY MEASURES

To do an adequate job on security, a systems analyst must analyze the risk, exposure, and costs and specify measures such as passwords and encryption to provide protection. The backup copies of software and recovery restart procedures must be available when needed.

SECURITY AGAINST UNAUTHORIZED ACCESS:

Use of administrator password: The password provides security to the administrator to prevent from unauthorized access of data by the operator or other end users.

User related checks and validations: For this software, the developer uses user related checks and validations from the user.

User authorization keys: Password checking for login of users.

SECURITY AGAINST DATA LOSS:

(1)   Provision of efficient data backup system: In this software an efficient system is used for adequate backup facility .

(2)   Offline data storage: This system is capable for offline data Storage**.**

(3)   Multiple database backup: The efficient system is use for this software to give multiple data backup**.**
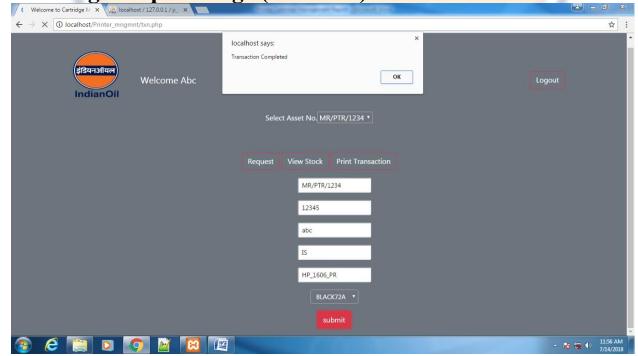
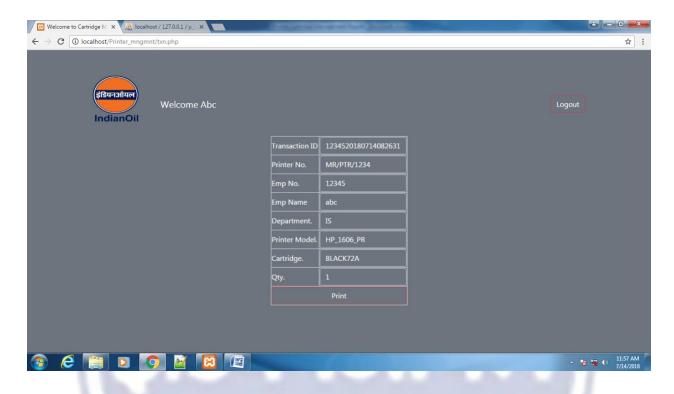# <u>RESULT</u>

Login Page for Admin and User

Admin Page

User Page

Cartridge Request Page (For User)

Transaction Reciept Page
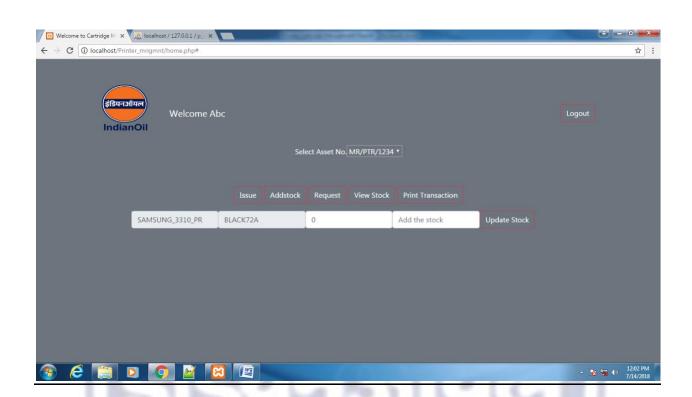

View Stock (For user)
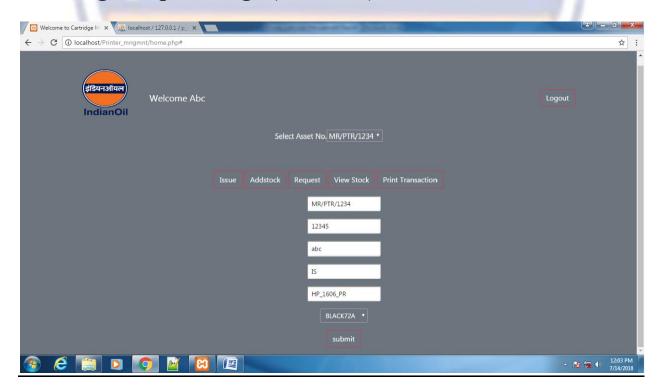
Print Last Transaction (For User)
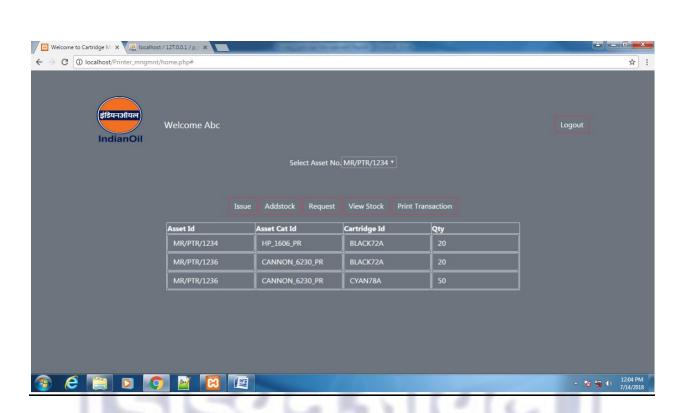

Cartidge Issue Page (For Admin)

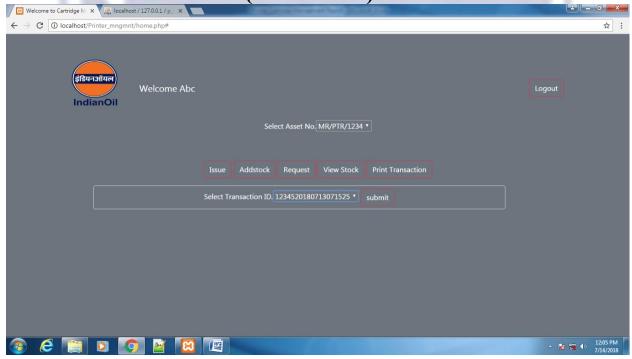# Add Stock Page (For Admin)

Cartridge Request Page (For User)

View Stock (For user)

Print Last Transaction (For Admin)

Limitations of The Project:

1. The system is developed keeping in view the specific requirements of client, its use in other organizations needs major adjustments, rather complete change in structure of some modules.
2. The project has been developed to run on windows platform. It would work only on MS Windows NT Server / 2000 Server (for use on networks) , Windows 9x / Millennium / XP (for standalone clients).
3. A definite backup storage device is suggested to be used to store necessary data in order to avoid serious loss of data.
4. The software covers only the sales and distribution aspect of the business, no information is provided about the personnel or accounting functions.

Future Aspects

There is always a scope of betterment and candidate system is not against this perception. At present the entire order and receipt system is performed manually. Since out system is going to implement computerization thus it gives the better redundancy,

time saving and help the concern authority to take appropriate action and necessary decision quickly and effectively. As far as our project covers all important details regarding permit tracing of Indian oil. Therefore in future it will help to gather such information about the company.

The main scopes are as follows:

- Storing large amount of data for future point of view.

- Reducing manual efforts for processing the records.

- Reducing manual efforts for maintaining the records.

- Reducing the lead-time.

It gives correct information about company status that has to be further interpreted

<u>Security</u>

1. In the multi user environment System where various users are working, date of one user has to be secured from that of another user

2.   All activities provided on different levels.

3.   The first level is its ability to create different types of users i.e. can create users who can have privileges such as only reading the data or both reading and modifying it.

4.   Second level of security is provided on the object level i.e. can control the access of tables for different users.

5.   The third level of security relates to access to table columns.

6.   Ease of Administration

7.   Transparent Indexing

8.   Backup and Recovery

9.   Fault Tolerance

10.   Application Development Tools

11.   Networking

<u>Bibliography</u>

The following books were consulted before going for the project as well as during project development:

1. Mastering Database Programming with Visual Basic 6.0 By EvangelosPetroutsos (BPB Publications)
2. Database System Concepts By Abraham Silberschatz, Henry F. Korth and S. Sudarshan (The McGraw Hill Hospital Inc.)
3. Analysis & Design of Information Systems By James A. Sen (McGraw Hill International Editions)