



Supply Chain Management System

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Bonafide Certificate

Certified that this project report titled SUPPLY CHAIN MANAGEMENT SYSTEM is the bonafide work of Mr. JAGDISH .O. BOHRA (Reg No. 71202621016) 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.

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ABSTRACT

Supply Chain Management System (SCMS) is a business tool that management uses to operate the business day-in and day-out. It is usually comprised of several modules such as a financial module, a purchase module, or a production module. Each of these modules share information that is housed within the database structures on which the SCMS system was coded. SCMS helps to break down barriers between departments within a company. For example, many times the sales department may be selling 25% more product than the production department can produce. By utilizing an SCMS system, the sales department, purchasing department all have access to the up-to-date information that is needed to operate smoothly within any manufacturing environment.

This integrated system takes care of all the aspects to run a big or small enterprise from customer requirement study to production, sales to accounts management and provide in time information to the management authorities about trends and enables them to decide future plans. The system also takes care of the privacy of data for the company, security, maintenance of data and track out different processes of the enterprise and finding out responsible authorities.

SCMS attempts to integrate business processes across departments onto a single enterprise-wide information system. The major benefits of SCMS are improved coordination across departments and increased efficiencies across business processes. The immediate benefit after implementing SCMS systems we can expect is reduced operating costs, such as lower inventory control cost, lower production costs, lower marketing costs and lower help desk support costs.

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CHAPTER 1 INTRODUCTION

1.1 About the Project

Computers have become an essential part of an organizational information processing because of the power of technology and the volume of the data to be processed. Through the technology, the manual process, defects and time consumption can be reduced. That's in all the area of business, computer technology are widely being implemented. Hence the inception of computers had a great role in reducing large task to a simpler one.

Thus, **Supply Chain Management System (SCMS)** is a business tool that management uses to operate the business day-in and day-out. It is usually comprised of several modules such as a financial module, a purchase module, or a production module. Each of these modules share information that is housed within the database structures on which the SCMS system was coded. SCMS helps to break down barriers between departments within a company. For example, many times the sales department may be selling 25% more product than the production department can produce. By utilizing an SCMS system, the sales department, purchasing department all have access to the up-to-date information that is needed to operate smoothly within any manufacturing environment.

This integrated system takes care of all the aspects to run a big or small enterprise from customer requirement study to production, sales to accounts management and provide in time information to the management authorities about trends and enables them to decide future plans. The system also takes care of the privacy of data for the company, security, maintenance of data and track out different processes of the enterprise and finding out responsible authorities. SCMS attempts to integrate business processes across departments onto a single enterprise-wide information system. The major benefits of SCMS are improved coordination across departments and increased efficiencies across business processes. The immediate benefit after implementing SCMS systems we can expect is reduced operating costs, such as lower inventory control cost, lower production costs, lower marketing costs and lower help desk support costs.

The next benefit after implementing SCMS systems we can expect is facilitation of day-to-day management . The implementation of an SCMS system helps establishment of a backbone data warehouse, SCMS allows better accessibility to data so that management can have up-to-the-minute access to information for decision making. SCMS software offers ability to track actual costs of activities and perform activity based costing.

1.2 Goals of the Project

The objective of the project is to maintain a good relationship between the departments of the organization. The pit falls of maintaining departments relationship manually is overridden through this system. This system supports the various departments within the organization to share and interact with each other in a comfort and timely manner. This system also provides an excellent decision making module that helps the management to make decision regarding the purchase and manufacturing of items and his customer satisfaction.

CHAPER 2

SYSTEM STUDY

This chapter provides the System Requirement and Specification, Hardware and Software Requirements, Software Overview used for the completion of the Project.

2.1 Software Requirement and Specification

The Software Requirements Specification is a technical specification of requirements for the software product. The goal of software requirements definition is to completely and consistently specify the technical requirements for the software products in a concise and unambiguous manner.

The Software Requirements Specification is based on the system definition high-level requirements specified during initial planning are elaborated and more specific in order to characterize the features that the software product will incorporate the requirement specification is primarily concerned with functional and a performance aspect of the software product and emphasis is placed on specifying product characteristics without implying how the product will provide those characteristics.

Desirable properties of a Software Requirements Specification

- Correct
- Complete
- Consistent
- Unambiguous
- Functional
- Verifiable
- Traceable.

2.2 Hardware Specifications

The project was developed on a computer with the following configuration:

| CPU | PENTIUM IV |
|-------------------|------------|
| RAM | 128 MB |
| POWER SUPPLY | 300 V |
| ADAPTER TYPE | VGA |
| FLOPPY DISC DRIVE | 1.44 MB |
| HARD DISC DRIVE | 40 GB |
| OPERATING SYSTEM | WINDOWS XP |

Table 2.2.1 Hardware Specification

2.3 Software Specifications

The project was developed using the following software's

| Front End | J2EE(JSP,JDBC) |
|-----------|--------------------------|
| Back End | Microsoft SQL Server 7.0 |
| Server | Tomcat 4.1 |

Table 2.3.1 Software Specification

2.4 SOFTWARE OVERVIEW

2.4.1 J2EE and it features

Information Technology Departments had always sought ways to create core effective computer applications. One approach is client/server architecture, which uses a two-tier where client side software requests from server side software. Common Gateway Interface technology was a technology that was adopted by many co-operations. But CGI technology addressed the problem of interfacing web clients with co-operate infrastructure. But this technology was not scalable to meet the dramatic increase in the number of clients who needed to access corporate resources. Thus J2EE came into existence.

Client/Server architecture exploded from two-tier architecture to a multiclient architecture, where a client's request to a server generates requests to the other servers that are connected together through a backbone network. Sun Microsystems has tried to define the function of a java application server clearly that all implementations play on the level field. J2EE supports multi tired architecture rather different from a standalone, monolithic application. Applications that run in their servers typically have separate parts of clients, business logic and database. A tier is an abstract concept that defines a group of technologies that provides one or more services to its clients. A client is concerned about sending a request for service and receiving results from service. The middle tier is the J2EE server that does the calculations and the processing. The third tier is the database server.



JEEE ARCHITECTURE

Fig 2.1

The applications are designed to handle thousands of users simultaneously 24 hours a day, 7 days a week without any downtime. J2EE is a versatile technology because application components built using J2EE are able to communicate with each other behind the scenes using standard communication methods such as HTTP, SSL, HTML, RMI & IIOP. Java Beans, Java Servlets and Java Server Pages are core components of J2EE.

2.4.2 JAVA SERVLETS

Servlets are modules that run inside request/response – oriented services and extend them in some manner.



OS

Fig 2.2

A servlet can call on other services and servlets to satisfy a request. They can be moved from one servlet engine to another. Servlets handle request/respond operations in an extremely clean, simple and efficient manner. In the java programming model, the business logic is handled by java beans and the presentation logic by servlet or java server pages. Servlets greatly improve portability, as they do not have to be recompiled for different OS.

2.4.3 JAVA SERVER PAGES(JSP)

JSP makes the pages easier to edit with the standard HTML authoring tools. JSP also enables java expressions and code to be intermixed with HTML tags and text. JSP is a server-side program that is similar in design and functionality to a java servlet. A JSP is a HTML page with embedded servlet code that is surrounded by <% and %> tags. The servlet code, sometimes-called scriplet can use predefined variables:

- Request: the servlet request
- Response: the servlet response
- Out: the output writer
- In: the input reader

2.4.4 JAVA DATABASE CONNECTIVITY(JDBC)

JDBC is Sun Microsystems standard SQL database access Interface providing uniform access to a wide range of relational database. It consists of a set of classes and interfaces in the java programming language.

Establishing a connection involves two steps:

- 1. Loading the driver
- 2. Making the connection



JAVA DATABASE CONNECTIVITY Fig 2.3

Loading Driver and Making the Connection

A one-line code for JDBC-ODBC bridge driver is used for loading the driver. To connect to the DBMS an appropriate driver is used with the help of code. JDBC driver manager plays a key role in facilitating connection with the required Database by loading the appropriate driver. Java coding is written to accomplish these tasks.

2.4.5 Microsoft SQL Server 7.0 SQL Server Features

Microsoft® SQL Server[™] supports a set of features that result in the following benefits:

Ease of installation, deployment, and use

SQL Server includes **a** set of administrative and development tools that improve your ability to install, deploy, manage, and use SQL Server across several sites.

Scalability

The same database engine can be used across platforms ranging from laptop computers running Microsoft Windows® 95/98 to large, multiprocessor servers running Microsoft Windows NT®, Enterprise Edition.

Data warehousing

SQL Server includes tools for extracting and analyzing summary data for online analytical processing (OLAP). SQL Server also includes tools for visually designing databases and analyzing data using English-based questions.

System integration with other server software

SQL Server integrates with e-mail, the Internet, and Windows.

The Project uses MS-SQL server 7.0 as backend to store the data in the various tables.

2.4.6 NetCharts 4.6

NetCharts 4.6 is an application developed by Visual Mining for easy generation of Graphical reports .

NetCharts Applets is one member of a suite of charting solutions offered by Visual Mining. All of the products are written entirely in Java and use Visual Mining's *Chart Definition Language* (CDL) as a basis for defining and generating charts. All of the products in the suite are capable of generating the same charts. The products differ primarily in the way in which they are integrated into the software infrastructure of a user's application.

The Visual Mining Suite of Chart Generation Solutions

NetCharts Applets

NetCharts Applets, Visual Mining's first chart generation product, is a set of Java applets that render charts. NetCharts Applets is popular with users who want to deploy applets in web browsers and users who want to chart-enable desktop applications written in Java.

NetCharts Pro

NetCharts Pro is a Java programmer's component library for use in creating data visualization solutions. Its Java API allows programmatic creation and manipulation of individual chart attributes. NetCharts Pro can create images of charts and graphs in popular web formats such as JPEG and PNG, making it ideally suited for server-side use in chart enabling servlets or JSP pages.

NetCharts Server

NetCharts Server is a stand-alone service that can generate charts, graphs, tables, or compete reports. It can be used in conjunction with an entire range of web infrastructures from the simplest CGI scripts, to the most sophisticated Enterprise Application servers. Its simple HTTP based interface

can be used by nearly any server-side web programming language (e.g. ASP, JSP, Java, CFML, PERL and C) to dynamically create charts, graphs, tables, and reports.

NetCharts Designer

NetCharts Designer is a desktop integrated development tool that creates and manages data connectivity, graph, table, and page templates for NetCharts Server.

Chart Definition Language

All of Visual Mining's charting solutions use the Chart Definition Language (CDL) to create and manipulate charts. This common use of CDL makes it easy to preserve chart definitions when moving from one product to another.

CHAPTER 3

SYSTEM ANALYSIS

System analysis is concerned with investigating and analyzing which is used to gain an understanding of the existing system and what is required.

3.1 EXISTING SYSTEM

There arises a conflict in the organization when the departments cannot be maintained properly and that is subjected to be a great loss for our company. Currently customers are managed manually. Customer are esteemed in every concern because they are the source of income for any companies.

In the existing system all the organization work are handled manually. Each department has its own register to record its information. It is difficult to identify the stock as the company grows. Information regarding customer, warehouse, branches, sales, production, stock are difficult to handle. To make decision regarding sales or purchase ,management has to browse through entire records, which is time consuming and tedious.

Disadvantages in Existing System

 It is a time consuming job to extract any information from the bulky registers.

- There is more chance for human errors to happen.
- More manpower is required.
- Increases time/cost overheads.
- Increases processing overheads.
- Very low security over data.

3.2PROPOSED SYSTEM

The proposed system is developed to overcome the common difficulties that are found in the manually maintained existing system. The system is developed in order to meet the demand requirements in the existing system boundaries such as Department-Organization-Management activities.

In the proposed system, departments can interact within the organization through online. By utilizing an SCMS system, the sales department, production department, operations management, marketing, financial department, purchasing department all have access to the up-to-date information that is needed to operate smoothly within any manufacturing environment.

This integrated system takes care of all the aspects to run a big or small enterprise from customer requirement study to production, sales to accounts management and provide in time information to the management authorities about trends and enables them to decide future plans. The system also takes care of the privacy of data for the company, security, maintenance of data and track out different processes of the enterprise and finding out responsible authorities.

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This system used in an organization is maintained by the administrator, who governs the overall flow of information within the system. The administrator can create an agents, helpdesks, assets and knowledgebase. He can associate asset to a particular helpdesk and can also associate a group of agents in a

hierarchical manner to that particular helpdesk to serve the customer in a better and timely manner.

Advantages

- More manpower is reduced
- No need to maintain information in bulky registers
- Less chance for human errors to happen
- Time consumption is reduced
- Decreases processing overheads
- Very high security over the data
- Easy to forecast sales
- Management decision can be easily made

3.3 MODULE FUNCTIONALITIES

The proposed system consist of five modules. They are,

3.3.1 Production module

Module Description: This integrated module, which is a part of a total SCMS solution, takes care of the complete material management, planning and purchase system. This module covers whole of Production Cycle including Inventory Management, Vendor Management, Costing and Planning, Quality Control Management, Labor Management.

3.3.2 Administration module

Module Description: : This module is basically designed for management of the system and flow of information within the organization. This module provide the administrator to create , edit ,remove employee ,company, supplier's ,customers information. The administrator is been provided with rights to allocate the employees with different modules based on his designation and department he belong. Access power is provided to the user to maintain security of data within and outside the organization.

3.3.3 Marketing Module

Module Description : This module is basically targeted for the proper available resource utilization and to project out the right man at right place. This module includes Pay Roll, Resource Development Plan

3.3.4 Purchase Module

Module Description : This module is basically targeted for the proper available resource utilization and purchase of raw material, management of stock, inventory control.

3.3.4 Support Strategic Planning Module

Module Description :This module is basically designed for management to make better decisions. NetCharts are developed for management to make decision towards planning for purchase, customer requirements, demands forecasting.

3.4 FEASIBILITY STUDY

The main purpose of feasibility study is to determine whether the problem is worth solving. Feasibility study is high-level capsule version of the extra system analysis and design process. The success of a system also lies in the amount of feasibility study done on it. There are three main feasibility tests performed. They are

Operational Feasibility

During feasibility analysis, operational feasibility study is necessary as it ensures that the project developed is successfully implemented in the organization. According to software engineering principles, operational feasibility or in other words usability should be high. A thorough analysis is done and found that the system is operational.

Technical Feasibility

Technical feasibility takes care of the technical issues that are to be tested to see whether to see whether the system is feasible. Technical feasibility analysis makes a comparison between the level of technology available and the technology that is needed for the project. The level of technology is determined by factors such as the software tools available, the machine environment, platform etc since, the resource required for the development of the project is already available in the organization, and this project is technically feasible.

Economical Feasibility

This is the most important aspect that has to be critically evaluated. The costs and benefits have to be estimated. Considering the cost factor, since the client is ready to pay a reasonable amount, which will be more than the cost of developing the system, the system will be economically feasible.

CHAPTER 4

SYSTEM DESIGN

4.1 INPUT DESIGN

Input to the system can be defined as the information that is to be provided to the system that is used for further processing by the system to obtain meaningful information, which helps in decision making.

This section deals with the usage guidelines and description pertaining to the input information. Input design consists of developing specification and procedures necessary for processing the data entered.

Input design is the part of overall system design, which requires very careful attention. The collection of input data is most expensive part of the system in terms of both equipment used and number of people involved. Input design is a process of converting user originated inputs to computer based format.

The objectives followed while doing input design is controlling the data entered that is preventing the entry of invalid data; all the validation checks to be done on the data entered are specified.

The types of data that can be entered during the data entry are Variable data – data that changes for each transaction, Identification data - data that uniquely identifies the item being processed, and Calculated data – data that are being calculated from data currently entered.

Input screens are designed to accept input from the user. Here the screens are more user friendly i.e., it directs the user to easily enter the input

values without much ambiguity. Standard procedures and check conditions are given in the screen. The screen layout are given in the appendix.

4.2 OUTPUT DESIGN

Output from the system can be defined as the processed information that is generated by the system in a specified format using the information available.

Computer output is the most important and direct information source to the user. Output design is a process that involves designing necessary outputs in the form of reports that should be given to the users according to the requirements.

Efficient, inteiligible output design should improve the systems relationship with the user and help in decision making. Since, the management for decisions directly refers the reports and to draw conclusions they must be simple, descriptive and clear to use.

4.3 Data Base Design

4.3.1 Table Name : User_Login

| Field Name | Data Type |
|------------|-------------|
| Liser Id | Integer |
| | Varchar(20) |
| User_Name | Integer |
| Emp_Code | Varchar(20) |
| Password | |

4.3.2 Table Name User_Registration

| Field Name | Data Type | |
|-------------|-------------|--|
| User_Name | Varchar(20) | |
| User_ld | Integer | |
| Emp_Code | Integer | |
| Department | Varchar(10) | |
| Designation | Varchar(20) | |
| Acc Power | Integer | |
| Pass_Allot | Varchar(20) | |
| | | |

| Data Type |
|-------------|
| Integer |
| Varchar(20) |
| Integer |
| |

Table 4.3.3 Table Name Company_Master

Table 4.3.4 Table Name Cust_Master

| Field Name | Data Type |
|-----------------|-------------|
| Acc Code | Integer |
| Cust Name | Varchar(20) |
| Address1 | Varchar(20) |
| Address2 | Varchar(20) |
| Place | Varchar(20) |
| Pincode | Integer |
| • • • • • • • • | |

Table 4.3.5 Table Name Item_Master

| Field Name | Data Type | |
|------------|-------------|--|
| Item Code | Integer | |
| Itom Name | Varchar(20) | |
| | Varchar(20) | |
| | Varchar(20) | |
| UOM | Integer | |
| Unit_Rate | Varchar(20) | |
| Color | Valona(20) | |

Table 4.3.6 Table Name Warehouse_Master

| Field Name | Data Type | and Anna Anna Anna Anna Martine Anna Anna Anna Anna Martine Anna Anna Anna Anna Anna Anna Anna An |
|------------|-------------|---|
| W Code | Integer | |
| Name | Varchar(20) | |
| Addross1 | Varchar(20) | |
| Address1 | Varchar(20) | |
| | Varchar(20) | |
| Place | <u> </u> | |

| Field Name | Data Type |
|------------|-------------|
| Emp Code | Integer |
| Emp_Name | Varchar(20) |
| Address1 | Varchar(20) |
| Address2 | Varchar(20) |
| DOB | Varchar(20) |
| DOJ | Varchar(20) |
| City | |
| Pincode | |

Table 4.3.7 Table Name Employee_Master

Table 4.3.8 Table Name Purchase_Order_Tran

| Field Name | Data Type |
|------------|-------------|
| Po Number | Integer |
| Oo Number | Integer |
| | Varchar(20) |
| | Integer |
| Sup_Coue | Varchar(20) |
| Sup_Name | Varchar(20) |
| Address1 | Varchar(20) |
| Address2 | |
| City | Varchai(20) |
| Item Code | Integer |
| Otv | Integer |
| Bato | Integer |
| | Integer |
| Tot_Value | |

Table 4.3.9 Table Name Arrival_Tran

| Field Name | Data Type |
|----------------|-------------|
| Po_No | Integer |
| Arrival_Number | Integer |
| Arrival_Date | Varchar(20) |
| W_Code | Integer |
| Item_Code | Integer |
| Qty | Integer |
| Rate | Integer |
| | |

Table 4.3.10 Table Name Rawmaterial_Stock

| Field Name | Data Type |
|------------|-------------|
| W_Code | Integer |
| Item_Code | Integer |
| Item_Name | Varchar(20) |
| Qty | Integer |
| Tot_Rate | Integer |

Table 4.3.11 Table Name Production_Detail

| Field Name | Data Type | |
|---------------|-------------|--|
| W Code | Integer | |
| Sup Code | Integer | |
| Sup Otv | Integer | |
| Brod Code | Integer | |
| Prod Name | Varchar(20) | |
| Oty Produced | Integer | |
| Qly_Floudcod | Integer | |
| Unit_Produced | | |

L

Table 4.3.12 Table Name Product_Stock

| Field Name | Data Type | |
|-------------|-------------|--|
| Prod. Code | Integer | |
| Prod Name | Varchar(20) | |
| Linit Price | Integer | |
| | Integer | |
| | integer | |
| | | |

| Field Name | Data Type |
|-------------|-------------|
| Law No | Integer |
| | Varchar(20) |
| Inv_Date | Integer |
| Acc_Code | |
| Cust Name | Varchar(20) |
| Addross | Varchar(20) |
| Address | Varchar(20) |
| Place | Integer |
| Pincode | integer |
| Prod Code | Integer |
| Brod Name | Varchar(20) |
| Flou_Name | Integer |
| Qty | Integer |
| Unit_Price | hitege. |
| Gross_Price | Integer |
| Discount | Integer |
| | Integer |
| Net_Rage | |

Table 4.3.13 Table Name Sales_Detail_Tran

4.4 Data Flow Diagram

4.4.1 Level 0 (User SCMS Interaction)





4.4.4 LEVEL 3 (Marketing Module DFD)



4.4.5 LEVEL 4(SCMS Internal Flow DFD)



CHAPTER 5

SYSTEM TESTING

Software testing is a critical element of software quality assurance and represents the ultimate reviews of specification, design and coding. Testing presents an interesting anomaly for the software. Testing is vital to the success of the system. Errors can be injected at any stage during development. System testing makes a global assumption that if all the parts of the system are correct, the goal will be successfully achieved. During the testing, the program to be tested is executed with set of test data and the output of the program for the test data is evaluated to determine if the programs are performing as expected. A series of testing are performed for the application developed. The testing steps are

- Unit Testing
- Integration Testing
- Validation Testing
- Output Testing

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5.1 Unit Testing

Unit testing focuses verification effort on the smallest unit of the software design, this is known as module testing. Since the application has modules the testing is individually performed on each module. Using the details design description as a guide, important control paths are tested to uncover errors within the boundary of the module. This testing was carried out during programming stage itself. In this testing step each module is found to be working satisfactorily as regards to the expected output from the module.

Here individual modules were taken and test data from company were collected and tested to see that they work proper. By this unit testing the errors in each module can be easily traced and removed. The errors may be syntactical or of semantics. Each Module is tested separately and the logical errors are also removed in every module.

5.2 Integration Testing

Data can be test across interface, one module can have adverse effect on another; sub function when combined may not produce the desired function. Integration testing is a systematic technique for constructing the program structure while at the same time conducting test to uncover errors associated within the interface.

The objective is to take unit tested modules and built a program structure that has been dictated by design. All modules are combined in this testing step. The entire program is tested as a whole. Correction is difficult at this stage because the isolation of causes is complicated by the vast expense of the entire program. Thus in the integration testing step all the errors uncover are corrected for the next testing step.

5. 3 Validation Testing

At the culmination of the integration testing, software is completely assembled as a package. Interfacing errors have been uncovered and corrected and a final series of software test-validation testing begins.

Software validation is achieved through a series of biack box tests that demonstrate conformity with requirement. After validation test has been conducted, one of two conditions exists.

The function or performance characteristics confirm to specifications is accepted. A validation from specification is uncovered and a deficiency created. Deviation or errors discovered at this step in this project is corrected prior to completion of the project with the help of the user by negotiating to establish a method for resolving deficiencies. The application has been tested by using validation testing and found to be working satisfactorily.

5.4 Output Testing

After performing the validation testing, the next step is output testing of the application, since no application will be useful if it does not produce the required output in the specific format. The output is verified by providing sample values. The results have already been obtained for the same values by working them out manually. The result generated by the application is compared with that of the results obtained manually to find out the correctness.

CHAPTER 6

CONCLUSION AND FUTURE OUTLOOK

An attempt has been made to computerize the Supply Chain Management System and is implemented at LOTUS THREAD COMPANY Ltd, Coimbatore and developed at MAT Inc ,up to the satisfaction of the company. On-line validation in all areas wherever requires is taken care off. The necessary reports are generated for the view of customers and suppliers over on-line. Before the introduction of computer systems, the works were done through the manual system. The computerized system automatically enquires and updates all relevant informations and it is found that it has successfully overcome the pitfalls in the manual system. The system finally generates a strong relationship between the various departments in an organization as well as in the various branches of an organization. The system helps the management in making decision regarding the purchase and sales. The system indirectly helps the organization in satisfying the customer by knowing their preferences.

Comparative analysis is carried out and it is viewed that the new system is successfully working for the test data provided by the users and they hope that the software will be extremely helpful to the company.



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