

ROOTS CENTRALISED SERVICE AUTOMATION SYSTEM

PROJECT WORK DONE AT

ROOTS INDUSTRIES LIMITED
Coimbatore

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

**MASTERS OF SCIENCE (APPLIED SCIENCE/
COMPUTER TECHNOLOGY)**

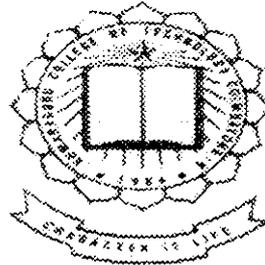
OF BHARATHIAR UNIVERSITY, COIMBATORE
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APRIL 2003

Dept. of Computer Science & Engineering

Kumaraguru College Of Technology

(Affiliated to Bharathiar University)

COIMBATORE-641 006

CERTIFICATE

This is to certify that the project work entitled

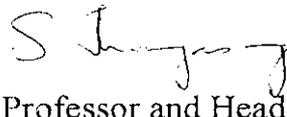
ROOTS CENTRALISED SERVICE AUTOMATION SYSTEM

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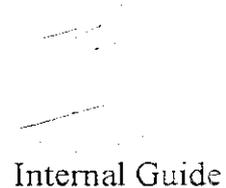
SANGEETHA JAYAGOPAL

Reg.No: 0137Q0050

Submitted in partial fulfillment of the requirements for the award of the degree of Master
Of Science (Applied Science/Computer Technology) of
Bharathiar University.

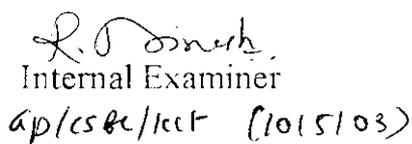


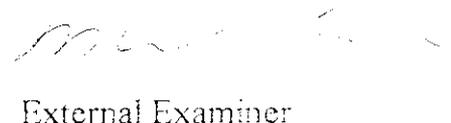
Professor and Head



Internal Guide

Submitted for the university examination held on 10.05.2008


Internal Examiner
ap/csb/lect (1015103)


External Examiner

DECLARATION

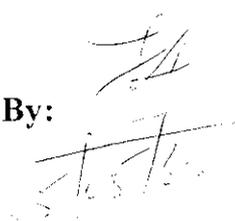
I hereby declare that the project entitled **ROOTS CENTRALISED SERVICE AUTOMATION SYSTEM** submitted to Bharathiar University as the project work of Master of Computer Science (Applied Science/Computer Technology), is a record of original work done by me under the supervision and guidance of **Mr. Santhosham M.C.A., ROOTS INDUSTRIES LIMITED, Coimbatore** and **Mr. Sivan Arul Selvan, M.Sc., M.C.A., PGDPMIR., [REDACTED], (M.Phil.), Lecturer, Department of Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore** and this project work has not found the basis for the award of any Degree/Diploma/Associateship/Fellowship or similar title to any candidate of any university.

Place : Coimbatore

Date : 08.05.2018


Signature of the Student

Counter Signed By:



06.05.2003

PROJECT WORK CERTIFICATE

This is to certify that Ms.Sangeetha Jayagopal, Final year M.Sc., (Applied Science – Computer Technology) Student of Kumaraguru College of Technology, Coimbatore has done a project on “**ROOTS CENTRALISED SERVICE AUTOMATION SYSTEM**” in our organisation during the period from November 2002 to April 2003.

for **ROOTS INDUSTRIES LIMITED,**

B. Neelamurthy
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AGM-Corporate HRD



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ACKNOWLEDGEMENT

I thank the **Almighty** for showering his blessings towards me in completing the project successfully. I express my sincere love and respect to my **Mother** for supporting me throughout this project completion.

I express my profound respect and sincere gratitude to **Dr.K.K.Padmanaban Ph.D**, *Principal, Kumaraguru College Of Technology, Coimbatore*, for his kind co-operation in allowing me to take up this project work.

I record my sincere thanks to **Dr.S.Thangasamy Ph.D**, *Head of the Department, Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore* for allowing me to take up the project at ROOTS INDUSTRIES LIMITED, Coimbatore.

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I am greatly privileged to express my deep gratitude to my guide **Mr.Sivan Arul Selvan**, M.Sc., M.C.A., PGDPMIR., MISTE., (M.Phil.), *Lecturer, Department of Computer Science and Engineering, Kumaraguru College of Technology*, for his valuable advice and encouragement throughout the project work. I also owe my sincere thanks to **Mr.Dinesh, M.S.** *Course Coordinator, Master of Science, Kumaraguru College of Technology, Coimbatore* for his guidance and immense support throughout the project.

I express my sincere heartfelt thanks to **Mrs.Rajeshwari** Head of RAPPL Sales of *ROOTS INDUSTREIS LIMITED, Coimbatore* for her support in finishing my project. I also take immense pleasure in thanking everyone at ROOTS INDUSTRIES LIMITED who were directly or indirectly involved in the success of this project.

SYNOPSIS

The project entitled **ROOTS CENTRALISED SERVICE AUTOMATION SYSTEM** done on the DOT NET Platform has been done partly for the **ROOTS INDUSTRIES LIMITED**, Coimbatore. The Centralized Service Automation System is developed for the Horn Service Department of ROOTS. The Service department will spread at different locations of the company.

The Service department of ROOTS receives horns for service from the clients. These entries have to be made in the reception of the Service Department. These horns based upon the defectiveness are send to various locations for being serviced. The defective details of the received horns are now available on the network, where the service will be made based on the basic input. This network facility gives the user more flexibility to handle the data and reduces man power.

The project is basically divided into three modules...

- Masters
- Transactions
- Reports

The project is all about the details stored in MASTERS and with accordance the corresponding TRANSACTIONS are made forth and the REPORTS are generated.

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1. Introduction

1.1 Project Overview

1.2 Organization Profile

1. INTRODUCTION

1.1. PROJECT OVERVIEW

The overview of the Centralized Service Automation System is that, it is being developed as an expansion of the existing system. This project is a part of the newly developed Centralized Automation System. The company is adapting themselves with the new technology by implementing this system. The application is basically developed on DOT NET. As a module of the Centralized Automation System we are developing for the ROOTS -- Horn Service Division. The customer with the defective horns will be dealing with the service department. The customers will be received and the details of the horns will be entered and a receipt will be given to the customer. Now the horns will be sent to the respective service centers based on the type of defectiveness. The details of the particular horn will be viewed through out the network because the data is available throughout the network. As soon as the horns are serviced they will be sent to corresponding places for delivery. This is the basic flow of the system. Besides this the user will be giving different input details and also has been given the flexibility to generate reports.

OBJECTIVES:

Consider a situation whereby all the records of the services were maintained manually. This can be a set of maintained records as files and printout papers, where in every entry has to be taken down manually. This is filed separately for the different horns and their corresponding categories. These horns are in terms of Electric horns and Air Horns. Special access permissions and security checks are maintained for authorized users. At the same time the data and the reports of the services must be made at different points of the intranet setup of the company in an

easy and efficient manner. The end user must be confronted with an easy to use, user friendly application which the user feels comfortable with and at the same time can generate the corresponding reports for the services made pertaining to the different constraints and requirements.

SOLUTION:

Creation of an application as per the company standards which requires an extensive research, analysis and study of the various departments of the company, the various reports that are to be generated from the services, a wide range of network within the company, a front end which gives the power and flexibility to work with in the generation of reports and finally, a back end which provides security, integration and fast access.

What does the Centralized Service Automation System do?

It provides an infrastructure to create and manage various horns that arrive for service to the company into a printable format. The masters file includes the various details of the horns available and the spare parts available and the customers at various areas based on regions, state, district and zonal. It also includes details of the horns if available within the warranty service or not. The transactions are made based on the masters and so forth are the reports generated.

The project is split into three modules...

- ✓ Maintenance of master files where in all data are stored in SQL server.
- ✓ Performing the transactions related to the Master files so forth storing them.
- ✓ Generation of reports based on the transactions made from the Master files.

1.2. ORGANIZATION PROFILE

ROOTS INDUSTRIES (P) LIMITED, headquartered at Coimbatore in South India, is a pioneer in manufacturing radiator coolant recovery systems in India and were also the first to introduce the servo brakes for light motor vehicles. The company promoted by Mr.K.Ramaswamy, master degree holder in Automobile Engineering from Lincoln Technical Institute, USA, diversified to manufacture high frequency wind tone horns developed indigenously and later started the promotion of various pneumatic horns.

With its new vibrating horns taking the market by a storm, the company currently holds the number one position in the market. From 3,600 horns in 1978_79,the sales Figures hence touched 1.5 million in 1995-96. The company today is the leading supplier to the OE manufacturers such as Hindustan Motors, Premier Automobiles, TELCO, Bajaj, Mahendra, LML, Maruthi Suzuki, PAL Peugeot, UNO, Rover, etc. The turn over of the company is approximately 30 Crores.

Roots have entered into technical collaborations with Robert Bosch SA. This will help them to increase their production capacity to 3 million horns per annum. M/S J.Osawa & Co Japan, one of the largest industrial groups in that country, has chosen Roots for their tie-up arrangement to manufacture their J-Horns for the Japanese market.

Currently the company has gone in for diversification by starting manufacture of floor cleaning machines in collaboration with Hako Unerkis-Ambh & Co of Germany. The products are exported to various countries like Japan, Germany, Sweden, and Australia and others. ROOTS AUTO PRODUCTS (P) LTD is a group of roots industries. It was promoted by Mr. K.Ramaswamy and Mr. K.Krishnaswamy Gounder in 1984. The company manufactures various types of air horns for use in the automobile industry. The company is located at Ganapathy in Coimbatore. The company has been Consistently making profits since its inception. Mr. K. Ramaswamy, Chairman and Managing director of Roots industries LTD closely supervises the activities of the company along with his efficient team of executives.

Product Range

The company manufactures various types of air horns for heavy vehicles, namely.

- Air Horn Assy
- Jumbo Horn Assy
- Twin Jumbo Horn Assy
- Musical Jumbo Horn Assy
- Melody Maker
- Tritone Maker
- Horn Control for T. T
- Horn Control for T.J etc.

The products range around 45 types with specific features.

Distribution Channels In India

The company has mainly two distributors for the whole of India:

- Malik Singh & Sons (P) Ltd.

The head office is at Delhi and covers Northern India including Gujarat & Calcutta.

- Premier Auto Electrical Ltd.

The head office is at Bombay and they cover the remaining part of India. The two distributors are free to appoint any number of retailers, sub-dealers or stockiest. They are the original equipment suppliers to Hindustan Motors, Tiruvalluvar and Escorts.

Exports

The countries to which the products are exported are Sri Lanka, South Africa, Lebanon, Egypt, Syria, USA, Jordan, Morocco, Malaysia, Indonesia and Mauritius.

Production Capacity

The Production capacity of ROOT AUTO PRODUCTS (P) LTD is

- | | |
|--------------------|----------|
| • Switch Assembly | 3,00,000 |
| • Air Horns | 2,50,000 |
| • Horn Controllers | 60,000 |

New Products

The company has introduced one new horn called Cleartone, which has done, well in the market. They also plan to modify an existing type of horns namely the Jumbo.

2. System Study & Analysis

2.1 Existing System

2.2 Proposed System

2. SYSTEM STUDY & ANALYSIS

2.1. EXISTING SYSTEM

The existing system is one, where in records are maintained manually in an order difficult to revise. This involves a step-by-step procedure of generating and maintaining single records of n number of distributors along with the details about the horns and their corresponding spare parts. The classification of zonal, regional, state wise, spare part details are tedious and cumbersome to be maintained. The data if needed to be available to other departments such as Quality Control have to go through a series of processes manually and there becomes a set back of viewing the reports. The company requires that the data and the status of the service of the horns from each distributor is been available in the network. This would not be possible if the records are maintained manually. The existing system does not offer a platform, which can be easily worked upon or manually manipulated by the end user.

2.2. PROPOSED SYSTEM

The proposed system consists of computation and automation of the entire details in the service department. Each individual detail about the horns along with their unique code are maintained. Data such as Regional distributors, State distributors, Zonal distributors, along with each of their code are also maintained. This helps in the betterment in retrieval of details about the status of the horns. There exists separate details of the horns, their set of distributors, general customer details and also details about the spare parts of the horns available and their existing complaints of the horns.

DEFINING THE PROBLEM

The company uses the manual record of details about the services made and their rectifications there forth. Earlier records to be retrieved are tedious and difficult to maintain future enhancements. This methodology does not provide any effective way to control or analyze the status of the horns being serviced and those dispatched. Thus the existing system does not play a vital role in the management and administration.

The drawbacks observed in these existing systems are summarized below...

i. No Centralized System :

The existing system does not have a centralization, where the data has to be referred with the manual records which has to be supervised by the Quality Assurance executives.

ii. No Database Storage :

This system does not store details or the summary to a database, which will be very useful for the future references and information retrieval.

iii. No effective And Clear Reports Are Generated :

Reports about the horns and the distributors, the services done to the horns received, the details on zonal, region, state, and district are all not made possible. Just the delivery chellan along with the dispatch receipts are available. Thus the major reports are not generated.

2.3. REQUIREMENTS FOR THE NEW SYSTEM:

Software:

Easy to use interface is the primary concern. The user should not fear that he / she is using a complicated device and so must be very careful in its usage, nor should any complications be felt while using the device lest they should switch to conventional methods of automation.

The System should not interfere in the normal working of other processes nor cause any Operating System violations.

The System should be able to be operated on varying degree of Baud Rates (The rate at which Data is transmitted in a given interval of time).

As the company is a Non IT based enterprise, a user manual is made available in printed form for the ease of reference at the time of usage.

2.4. USER CHARACTERISTICS:

The system is developed with the main objective as user friendliness. User interaction and message dialogue boxes are made so as to make the user aware of the performance and what the user has currently done with regard to the software system.

The user of the application will be a Non-Technical person where in he has to be trained and also has be given a User Manual Guide to have quick reference in the initial stage of the implementation of the project.

During the implementation of the project, more care should be taken to transfer from the existing system to new system; the transfer of data has to be made perfectly. The new system has to be tested with the Real Time data before implementing to avoid run time problems. So all primitive measures has to be taken to overcome any problem.

3. Programming Environment

3.1. Hardware Configuration

3.2. Software Requirements & description

3. PROGRAMMING ENVIRONMENT

3.1. Hardware Configuration

Supporting Operating System:

- Windows 2000 server.

Minimum Hardware Requirements:

- Processor Speed : 800 MHz.
- Memory : 128 MB RAM.
- Hard Disk Capacity : Min 2 GB.
- Monitor : SVGA Monitor.
- Mouse : Logitech.
- Keyboard : 101 keys.

3.2. Software Requirements and description

- Front-End Tool : VB.Net.
- Back-End Tool : SQL Server.

Visual Basic.Net

The new Visual Basic .NET offers Visual Basic developers the most productive tool for building Microsoft .NET-connected applications. Use your existing skills in Visual Basic to create more powerful Windows-based applications and address today's deployment issues.

To use Visual Basic .NET Standard, you need:

Minimum Requirements	
Processor	450-megahertz (MHz) Pentium II-class processor, 600-MHz Pentium III-class processor recommended
Operating System	Visual Basic .NET Standard can be installed onto any of the following systems: <ul style="list-style-type: none">• Microsoft Windows® Server 2003• Windows XP• Windows 2000 Professional• Windows 2000 Server
Memory	<ul style="list-style-type: none">• Windows Server 2003: 160 megabytes (MB) of RAM• Windows XP Professional: 160 MB of RAM• Windows 2000 Professional: 96 MB of RAM• Windows 2000 Server: 192 MB of RAM

Hard Disk	<ul style="list-style-type: none"> • 500 MB of available space required on system drive, 1.5 gigabytes (GB) of available space required on installation drive • Additional 1.9 GB of available space required for optional MSDN Library documentation
Drive	CD-ROM or DVD-ROM drive
Display	Super VGA (1024 x 768) or higher-resolution display with 256 colors
Mouse	Microsoft Mouse or compatible pointing device

OVERVIEW OF VB.NET

Visual Basic .NET 2003 provides the easiest, most productive language and tool for rapidly building applications for Microsoft Windows® and the Web. Ideal for existing Visual Basic developers as well as new developers in the Microsoft .NET development environment, Visual Basic .NET 2003 delivers enhanced visual designers, increased application performance, and a powerful integrated development environment (IDE) to get you on the fast track to application development. Developers can use Visual Basic .NET 2003 to:

- **Address today's Windows and Web development challenges more effectively.**

Intuitive visual designers for Windows Forms and Web Forms provide a single development model for building both rich desktop applications and broad –reach WEB applications.

- **Upgrade and reuse existing Visual Basic code.**

The enhanced Visual Basic .NET Upgrade Wizard, now available in all editions of Visual Basic .NET and Visual Studio .NET, enables you to upgrade existing Visual Basic 6.0 applications to Visual

Basic .NET. Existing Visual Basic components can also be seamlessly referenced and consumed within the context of Visual Basic .NET 2003 applications.

Advantages

Solve Today's Tasks More Effectively

Microsoft Visual Basic .NET 2003

Powerful Windows-based Applications in Less Time

In addition to great Visual Basic .NET 2002 features such as a powerful new forms designer, an in-place menu editor, and automatic control anchoring and docking, Visual Basic .NET 2003 delivers new productivity features for building more robust applications easily and quickly. With an improved integrated development environment (IDE) and a significantly reduced startup time, Visual Basic .NET 2003 offers fast, automatic formatting of code as you type, improved IntelliSense®, an enhanced object browser and XML designer, and much more.

Simplified Deployment

With Visual Basic .NET 2003, you can build applications more rapidly and deploy and maintain them with greater efficiency. XCOPY-deployment and Web auto-download of Windows-based applications combine the simplicity of Web page

deployment and maintenance with the power of rich, responsive Windows-based applications.

Flexible, Simplified Data Access

Tackle any data access scenario easily with ADO.NET and ADO data access. The flexibility of ADO.NET enables data binding to any database, as well as classes, collections, and arrays, and provides true XML representation of data. Seamless access to ADO enables simple data access for connected data binding scenarios. Using ADO.NET, Visual Basic .NET developers can gain high-speed access to Microsoft SQL Server™, Oracle, DB2, Microsoft Access, and more.

Improved Coding

Code faster and more effectively. A multitude of enhancements to the code editor, including enhanced IntelliSense, smart listing of code for greater readability, and a background compiler for real-time notification of syntax errors transform you into a rapid application development (RAD) coding machine.

Build the Applications of Tomorrow Today



Direct Access to the Platform

Visual Basic .NET 2003 developers have full access to the powerful capabilities available in the new and improved .NET Framework 1.1. Using Visual Basic .NET

2003, developers can easily access the event log, performance counters, and file system—eliminating the need to use cumbersome 'Declare' statements. The new Windows Service project template enables Visual Basic developers to build real Microsoft Windows NT® Services.

Full Object-Oriented Constructs

Create reusable, enterprise-class code using full object-oriented constructs. Language features include full implementation inheritance, encapsulation, and polymorphism. Structured exception handling provides a global error handler and eliminates spaghetti code.

Upgrade for Success



Reuse Existing Investments

Reuse all your existing ActiveX® Controls. Windows Forms in Visual Basic .NET 2003 provide a robust container for existing ActiveX controls. In addition, full support for existing ADO code and data binding enable a smooth transition to Visual Basic .NET 2003.

The Easiest, Most Popular Language

Develop applications using the most readable and easy-to-write programming language available. Background compilation provides instant feedback and mark for error detection.

SQL Server

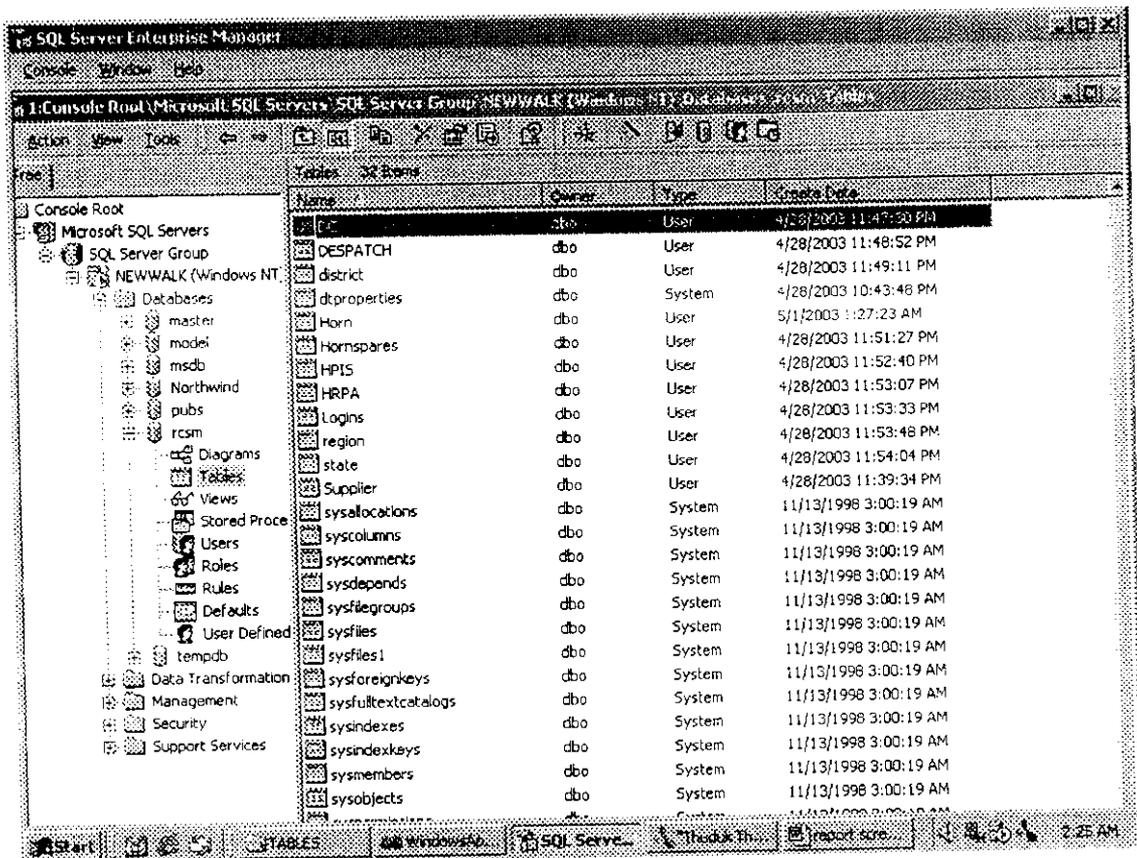
Microsoft SQL server 7.0 enhances the performance, reliability, and scalability by earlier release of SQL server by making the processes of developing applications, managing systems, and replicating data easier than ever. The new and enhanced features in SQL server 7.0 features comply with the American National Standards Institute (ANSI) SQL-92 standards and with the Federal Information Processing Standards (FIPS 127-2) as established by the national Institute of Standards and Technology (NISI).

The server includes these new components: MS query, SQL Trace, Microsoft Distributed Transaction Coordinator (MS DTC), OLE Automation Stored Procedures, SQL Server Web Assistant, and Simple Network Management Protocol Management Information Base (SNMP MIB) AND SNMP agent. New client components include Ms Query, SQL Trace, MS DTC (client), and SQL Server Web Assistant and other ODBC drivers for homogeneous replication use.

SQL Server 7.0 Adds new Transact –SQL capabilities and provides some significant enhancements. SQL Server 7.0 features comply with ANSI SQL -92 standards and with the Federal Information Processing Standards (FIPS 127-2) as established by NIST. The new CUBE and Rollback operators are useful in writing data warehousing and decision support system applications. Transact –SQL changes for SQL Server 7.0 Extend the ability to temporarily disable constraints during replication, thereby eliminating the effort required to drop and then add constraints as with earlier version of SQL Server, provide the ability to dump add

load a single table; provide the ability to use Data Definition Language (DDL) statements within transaction; and enable row-level locking during INSERT operations. Other Transact-SQL enhancement include.

SQL Server Enterprise Manager



The enterprise manager is an important component of MS SQL which is used for managing the database components. These range from creation of tables, diagrams, stored procedures etc. The above screen shot gives the detailed working of the Enterprise Manager for the creation of tables. Tables are created by right clicking on the keyword “Tables” and selecting “New Table”. Once the fields are

created, the table is populated by the user. This is done in the design phase of the table layout.

Tables can be linked based on primary and foreign keys in a simple diagrammatic representation as the one shown above. Here, the fields of each table are listed and, links can be made and understood by dragging the cursors over the various fields.

4. System Design & Development

- 4.1. Input Design*
- 4.2. Process Design*
- 4.3. Output Design*

4. SYSTEM DESIGN AND DEVELOPMENT

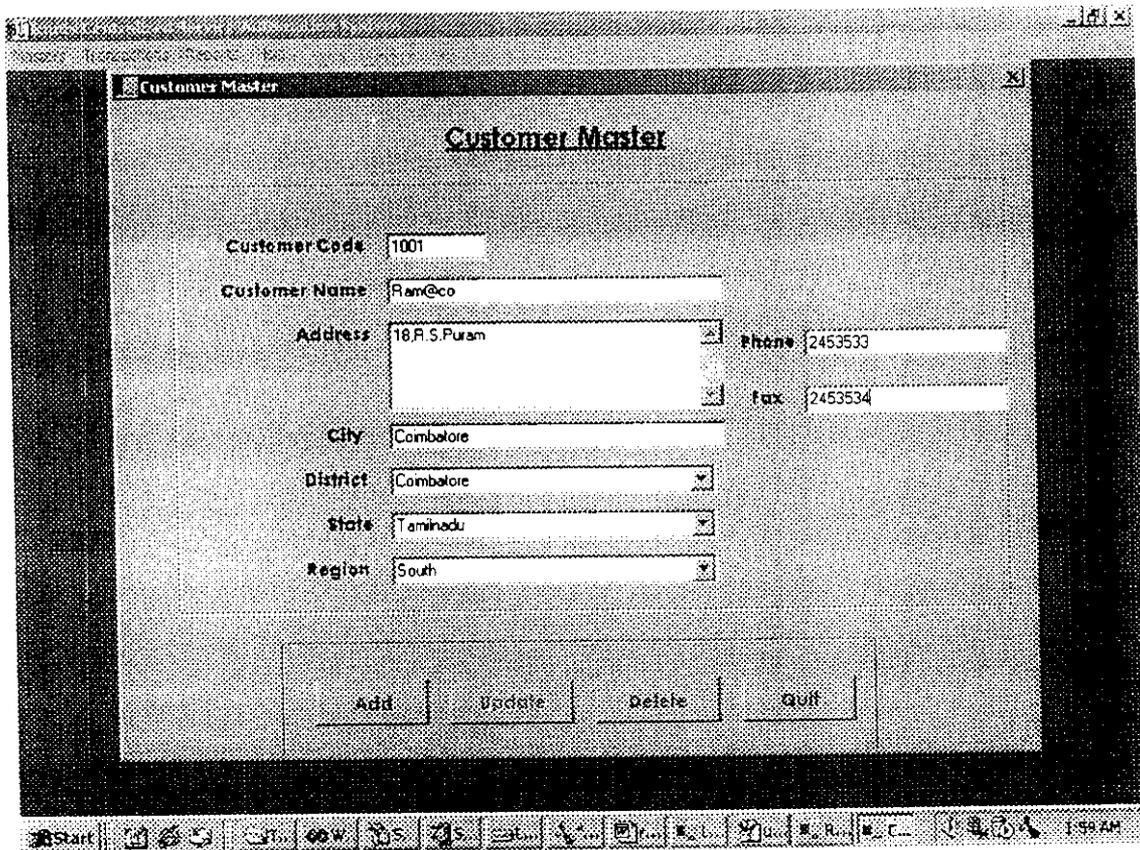
4.1 Input Design

The various inputs given are the distributor's details along with the horn details that are being sent for the service. The various links act as portals to the different processes. To create a report, we can both select an existing report and make changes to the various fields as well as the inbuilt procedures.

The first step involved is the entry of the master files. These are the records that are being maintained for easy retrieval and usage.

The list of master records maintained are...

- ❖ CUSTOMER DETAILS
- ❖ HORN TYPE DETAILS
- ❖ STATE DETAILS
- ❖ DISTRICT DETAILS
- ❖ REGIONAL DETAILS
- ❖ DELIVERY CHELLAN DETAILS
- ❖ SERVICE INPUT DETAILS
- ❖ SPARE – PARTS DETAILS
- ❖ DESPATCH DETAILS
- ❖ WARRANTY CLAIM INPUT DETAILS



Customer Code – Each customer or distributor is provided with unique customer code. These codes are maintained for future references.

Customer Name – The customer name or the company name is being maintained in this details.

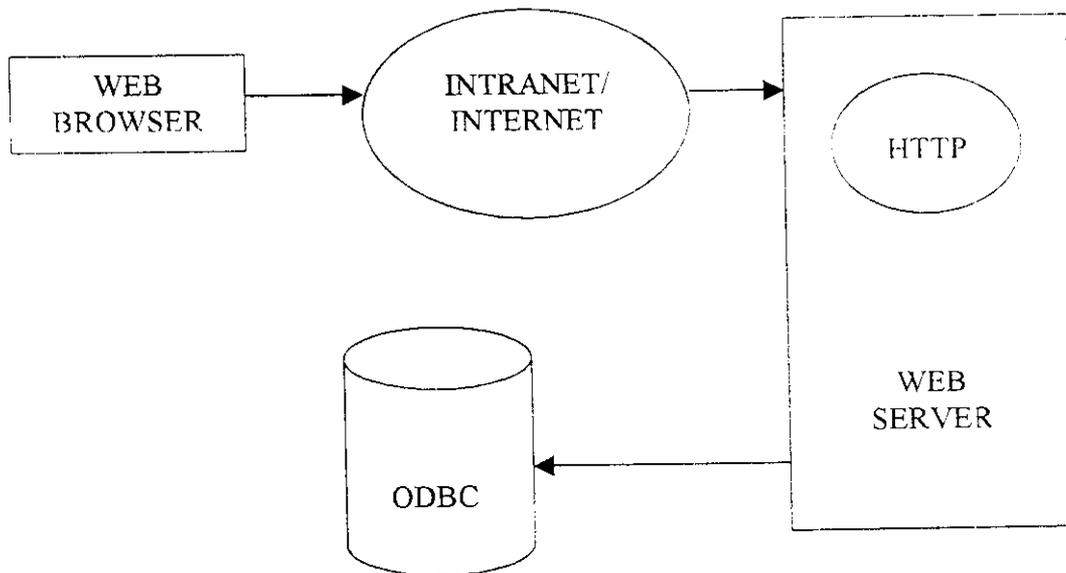
So forth the other details of the customer such as his address, phone, fax, the city he resides in the state and the region.

The buttons that exist in the above given screen are,

- ADD – Once a customer detail has been set with all the necessary parameters, on clicking this button, the detail is created and stored in the database.
- UPDATE – This button helps in updating any changes in the existing customer detail.
- DELETE – This button deletes an unwanted customer details.
- QUIT – This quits the current master file.

4.2. Process Design

A user can be either an end-user, an administrator or a worker from another department who would like to know the details of the spare parts or likewise. The user accesses one of the terminals situated anywhere in the company's premises. The user becomes the web browser as in the figure below.

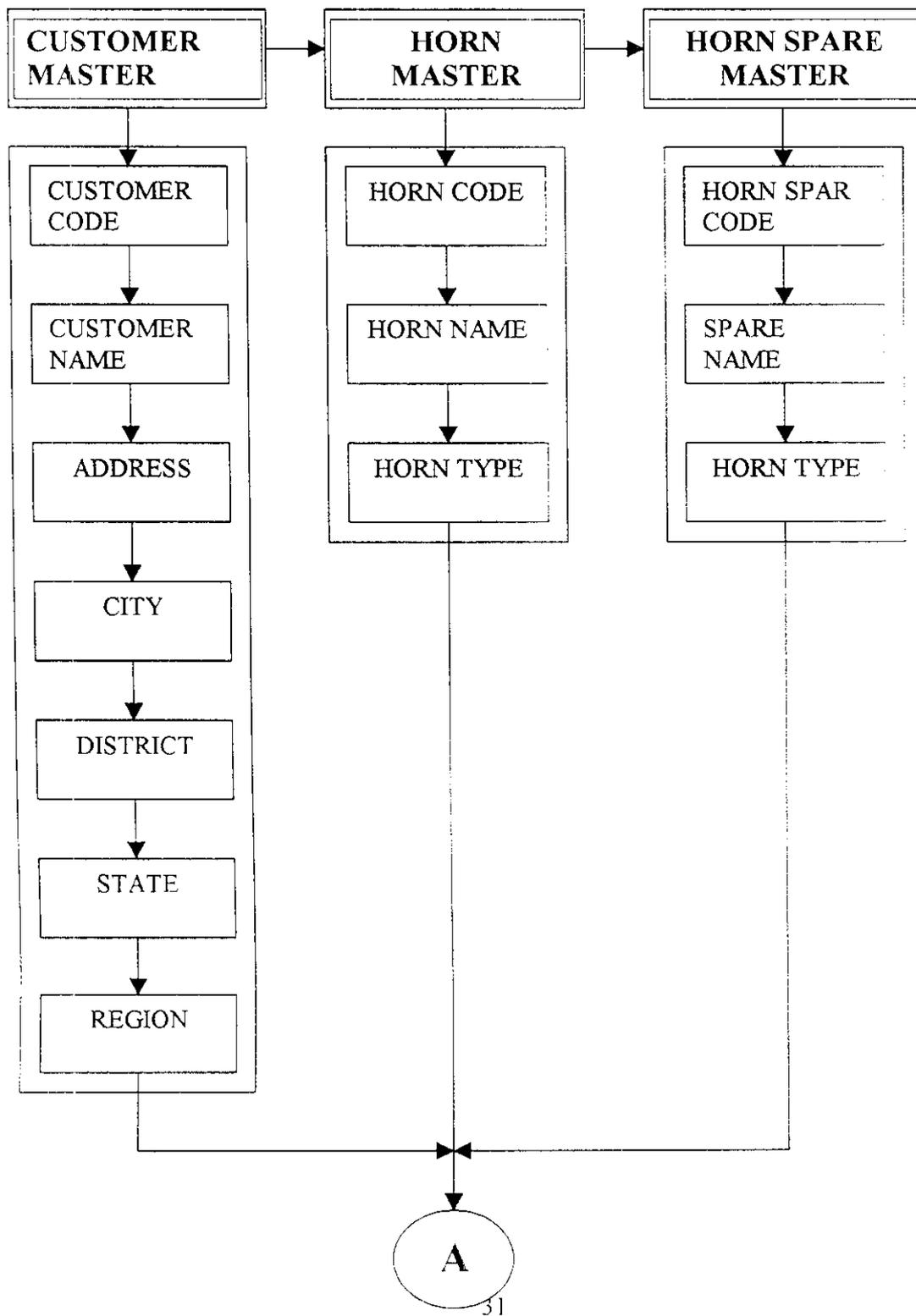


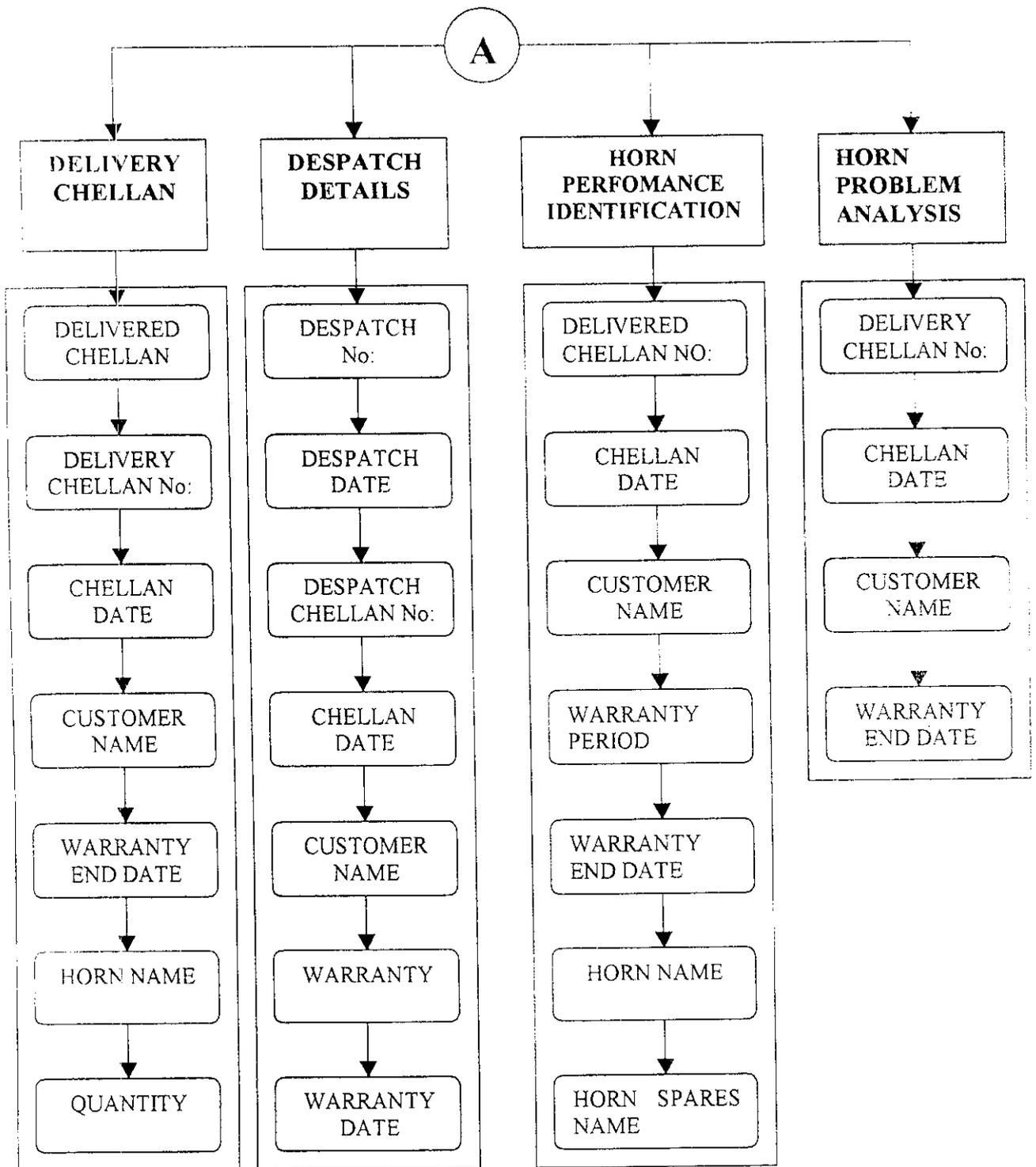
(fig. Flow diagram of data access and transition)

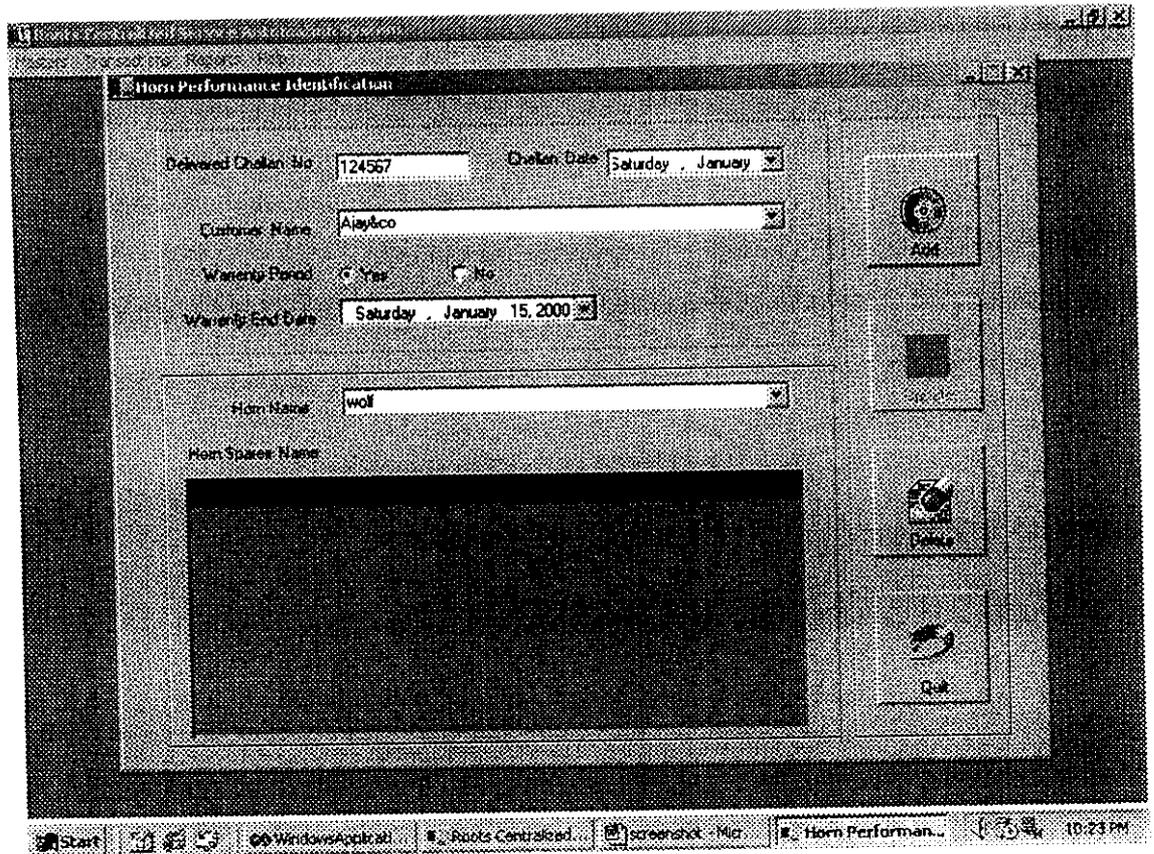
Next, the user would like to access the information, which is being held in the database. Thus via an intranet connection in case of a small network or the internet in case of a large network, the information required by the web browser is passed via the network to the web server.

The web server gets in contact with the database via the Other Database Connectivity feature, which is compliant with SQL queries. The information retrieved is first checked for security concerns and later sent back in the same path that the request came in. This is finally shown on the graphical interface of the computer device in an easy and understandable manner.

FLOW OF CONTROL





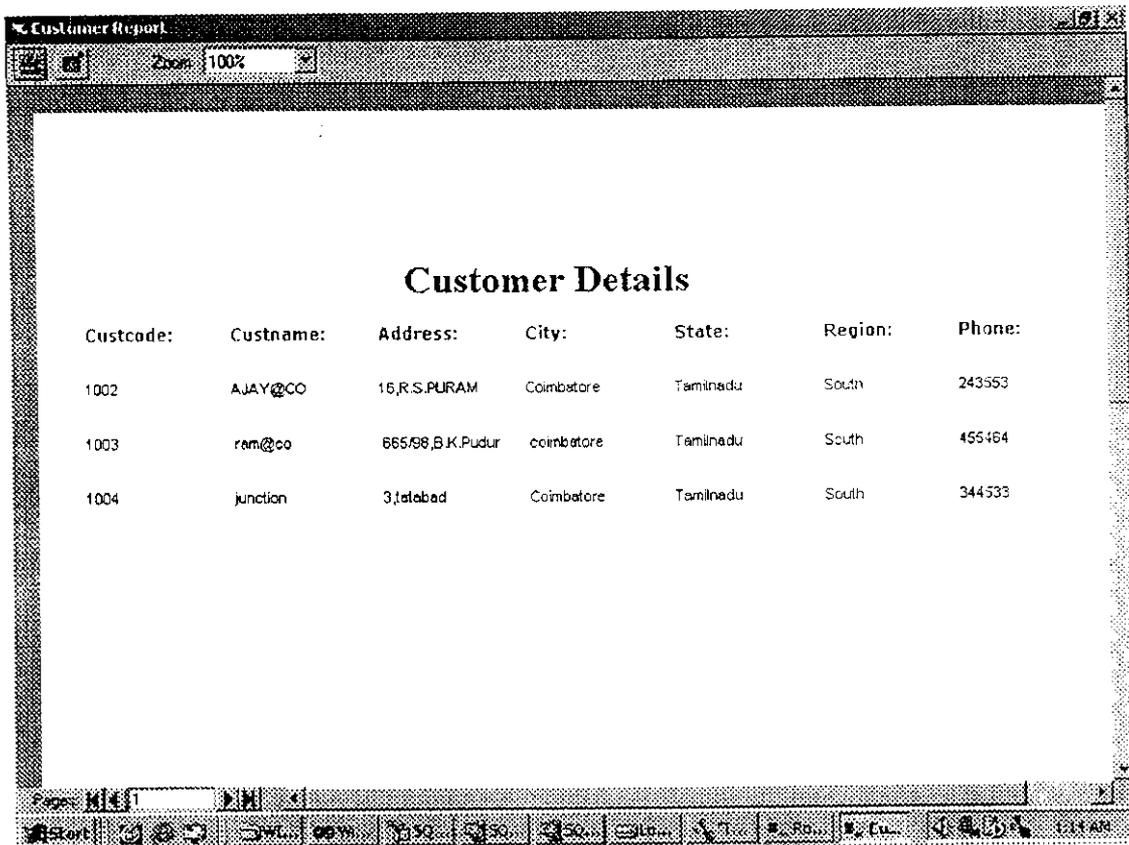


The transaction file includes...

- ❖ Horn Performance Identifications
- ❖ Delivery Chellan
- ❖ Despatch Details
- ❖ Horn Problem Analysis

4.3. Output Design

After the master files are entered and the transactions are being made, the required reports are generated in the printable format and also for viewing and saving purposes. These reports are maintained for future references.



The screenshot shows a window titled "Customer Report" with a zoom level of 100%. The window displays a table titled "Customer Details" with the following data:

Custcode:	Custname:	Address:	City:	State:	Region:	Phone:
1002	AJAY@CO	15,R.S.PURAM	Coimbatore	Tamilnadu	South	243553
1003	ram@co	665/98,B.K.Pudur	coimbatore	Tamilnadu	South	455464
1004	junction	3,tatabad	Coimbatore	Tamilnadu	South	344533

5. System Testing & Implementation

5.1. System Testing

5.2. System Implementation

5. SYSTEM TESTING AND IMPLEMENTATION

5.1. System Testing

System testing is a quality assurance function with objective of verifying the software design by evaluating the structural interface and procedural elements.

The goal of the system testing is to force the software to fail so that errors may be uncovered. A successful test is one that uncovers errors, rather than one for which no errors are found. System testing is the most tedious unpredictable and expensive phase in software development. To ease the situation, a distinct test chronology maybe defined. The system testing actually begins with the preliminary and detailed design reviews. These manual pre-implementation tests can isolate a significant percentage of all faults in the software.

First, all the modules are individually unit tested and after the successful completion of unit testing, an integration test plan is developed to incorporate each module into the overall software structure.

- Unit Testing – Each module is tested individually and the module interface is verified for consistency with the designed specification. All important processing paths and error handling paths are tested for the expected results.

A) Successful user input into RCSAS

Result	Problems	Remedy	Conclusion
Successful	None so Far	NA	No mistakes in the processing of input.

B) Successful Generation of Reports.

Result	Problems	Remedy	Conclusion
Successful	Appearance of unknown Symbols towards the End of each page	Not decided as yet	No mistakes in the generation of reports.

- **User Interface** - The various links present for user interaction are,
- Transactions...

Results : All are working correctly as per requirements.

- **Integration Testing** – A comprehensive integration testing is carried out using integrated test plans in the design phase of the development as guide to ensure the behavior of functions with live data.

Results - The various Unit-Tested modules were integrated and tested in accordance to their relation with other modules and they were found to be working in perfect harmony.

➤ **Validation Testing** - Software validation is achieved through a series of tests that demonstrates conformity with requirements. Thus the proposed system under consideration has been tested by validation and found to be working satisfactorily.

5.2. System Implementation

To successfully implement the system developed, planning is necessary. Proper planning is done to take care of the following -

- The implication of the system as a real time system
- Resources available for the system using the product
- Changeover

Changeover is the process of shifting from the existing system to the new system. The changeover from the existing system to the new system takes place after system testing and found to meet all requirements required by the company.

Implementation procedures

- Installation of the prerequisite software which includes, VB.NET which would work on the operating system windows 2000 server.
- Microsoft SQL should be installed as version 7.0 or version 2000 and a connection should be established between the application and the database by specifying the proper connection string.

6. *Conclusion*

6. CONCLUSION

ROOTS CENTRALIZED SERVICE AUTOMATION SYSTEM is remarkably easy to adapt and use both for the end users as well as for the developers and administrators. The various options, settings and in-depth propagation of the functioning and development of this application has indeed sought its use to the maximum. It has been designed and developed with the objective of providing a cool and stable analysis of the service status. The way it has been developed ensures the quality and efficiency.

The users to the application are provided with a wide range of functionalities which also includes,

- ❖ Easy selection and user interaction methods.
- ❖ Analysis of reports and account of spare parts and horns.
- ❖ Sorting of distributors on bases of region, zone, state or district.
- ❖ Security access and permission done by administrators.
- ❖ Grouping of reports and horns according to the requirements.

The management can be assured of the project to seeing fully trained, fully confident, gaining maximum advantage for ROOTS INDUSTRIES LIMITED and their business as is possible from this application, now, and on into the future.

7. Scope for future developments

7. SCOPE FOR FUTURE DEVELOPMENTS

Areas of enhancement:

- ❖ View Graph Option
- ❖ Administration Options

View Graph Option

In addition to tabular details the graphical content can also be enhanced by creating and displaying graphical reports in a variety of formats. In the reports the display itself would be an option to change the type of graph can be added. A Toolbar can be formalized which will present all the report options - Column, Pie, Bar, Line and Refresh.

Administration Options

Users

RCSAS can be enhanced to create individual users with username and password for login. Creating users allows the administrator to assign users to groups that are associated with specific details such as management of spare parts, horns, or zonal, region state distributors individually. In this way, the administrator can give users access to certain details and prevent them from viewing others.

Groups

Groups can contain both Users and Details, providing an easy way to assign each detail access to users

Procedures

A module can be implemented which allows the administrator to determine what procedures are available for detail creation, which can enhance centralization to a large extent making it, more flexible. All procedures in the database will be included but the Administrator can determine which to show and which to hide from the list of procedures.

8. References

8. REFERENCES

VB.Net

Dot Net Complete Reference

Black Book

www.microsoft.com

SQL Server 7.0

SQL Server Manager

www.microsoft.com

9. Appendix

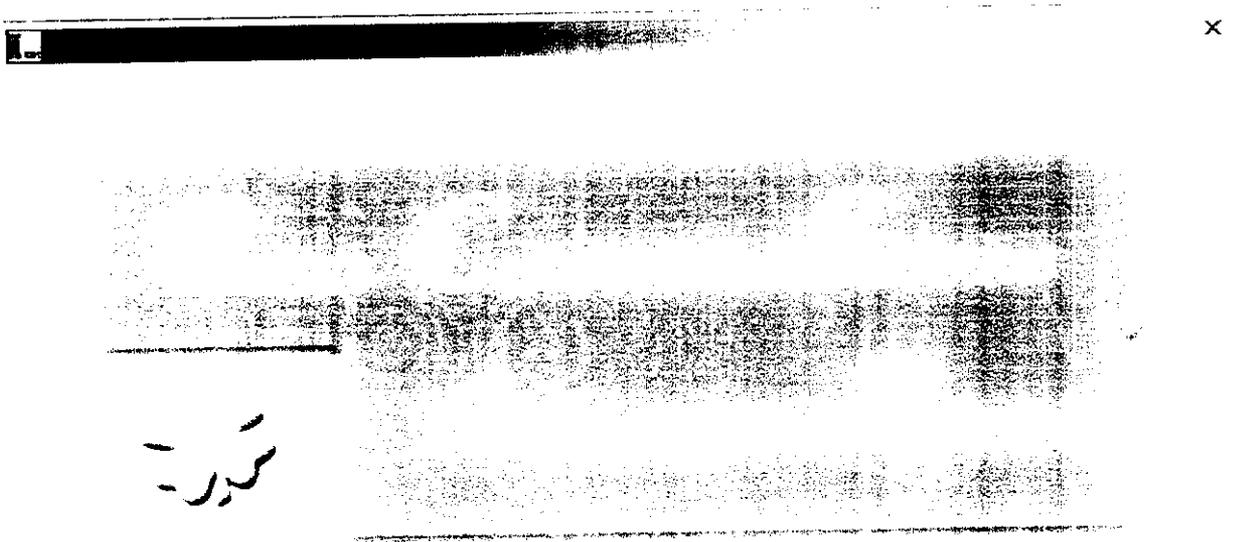
9.1. Screen Formats

9.2. Table Design

9. APPENDIX

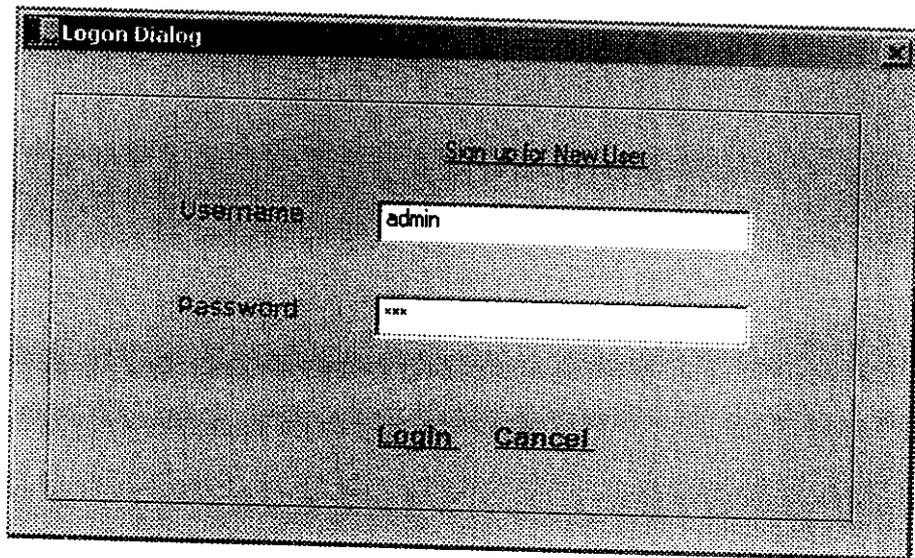
9.1. SCREEN FORMATS

The following are the screenshots in the project



This is the beginning of the application software.

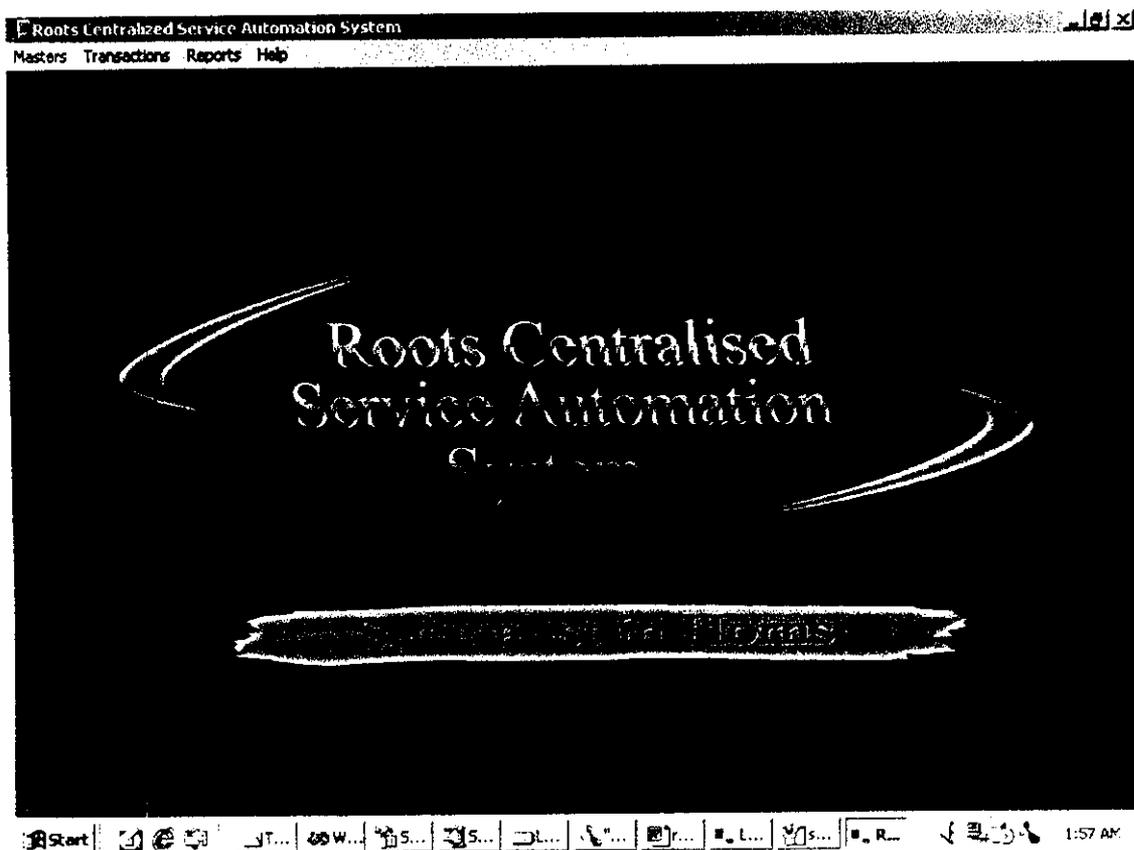
LOGIN



The image shows a screenshot of a "Logon Dialog" window. The window has a title bar with the text "Logon Dialog" and a close button. Inside the window, there is a "Sign up for New User" link. Below this, there are two input fields: "Username" with the text "admin" and "Password" with masked characters "****". At the bottom of the dialog, there are two buttons: "Login" and "Cancel".

Each administrator is given a user name and password so as to allow only authorized users.

This is the screen shot, which appears after the authorized user being logged in.



This screen welcomes the user to enter into the details regarding the horn details along with the spare parts.

MASTER FILES

The screenshot shows a window titled "Customer Master" with a form containing the following fields and values:

Customer Code	1001	Phone	2453533
Customer Name	Ram@co	Tax	2453534
Address	18,R.5.Puran	City	Coimbatore
City	Coimbatore	District	Coimbatore
District	Coimbatore	State	Tamilnadu
State	Tamilnadu	Region	South
Region	South		

At the bottom of the form are four buttons: Add, Update, Delete, and Quit.

The above screen shot is the CUSTOMER MASTER FILE, which describes the details of the customer and the region from where the customer originates. Each customer is provided with an individual unique code.

SUPPLIER MASTER

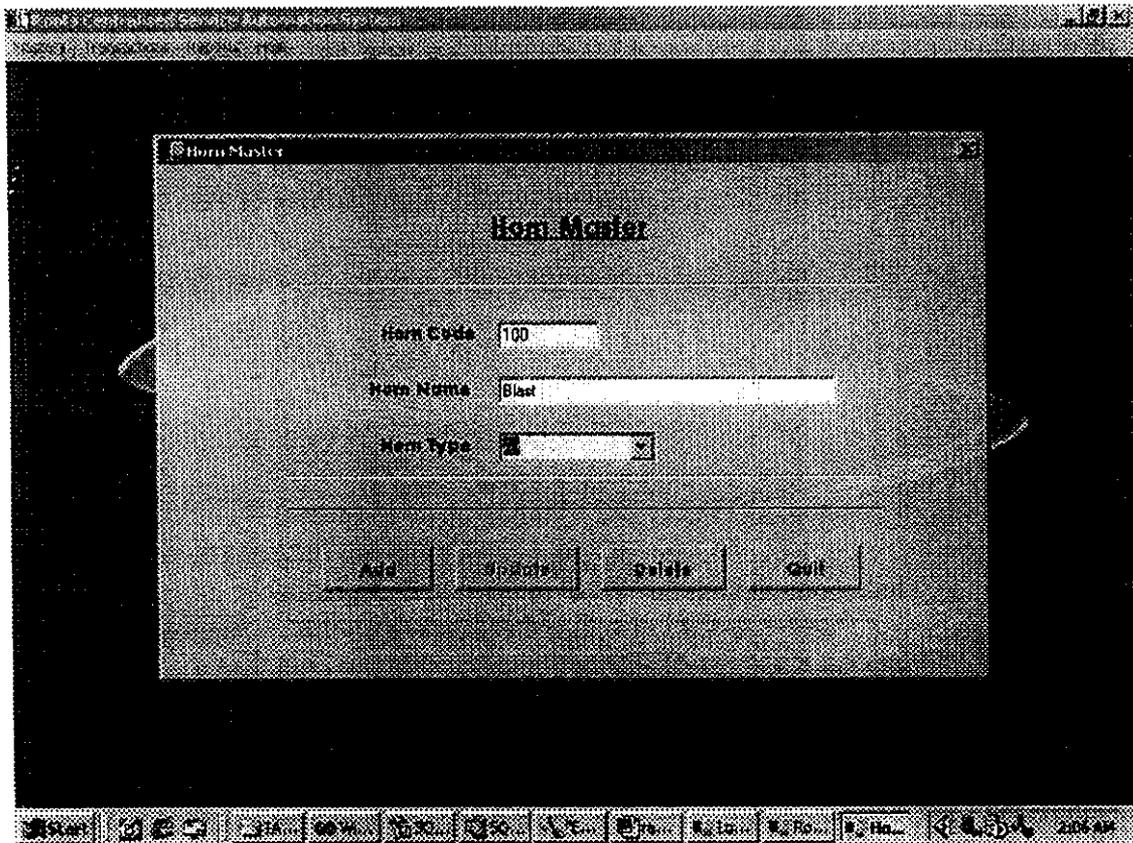
The screenshot displays a window titled "Supplier Master" with the following fields and values:

Supplier Code	1001
Supplier Name	Junction Spares
Address	134.B.K.Pudur
City	Coimbatore
District	Coimbatore
State	Tamilnadu
Region	South
Phone	2667737
Fax	2555333

At the bottom of the form, there are four buttons: Add, Update, Delete, and Quit.

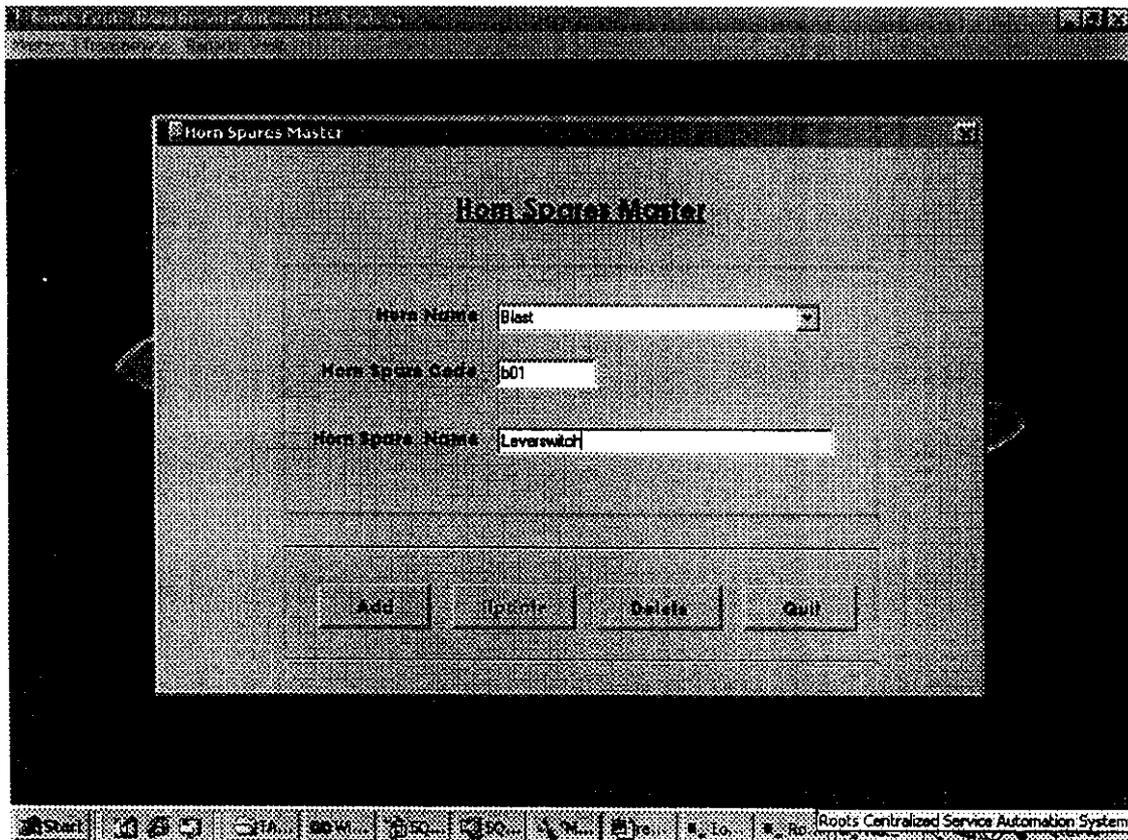
The above screen shot is the SUPPLIER MASTER FILE, which describes the details of the supplier and the region from where the supplier originates. Each supplier is provided with an individual unique code.

HORN MASTER



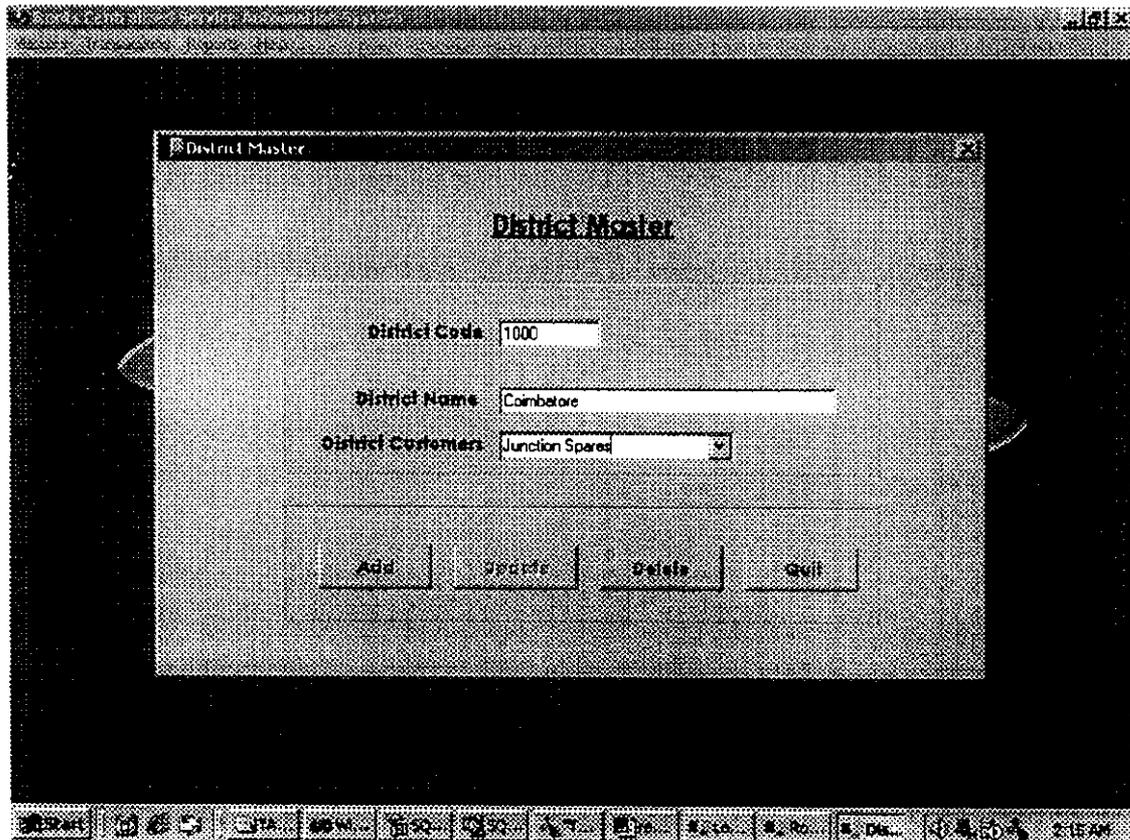
The above screen shot is the HORN MASTER FILE, which describes the details of the horn and the type of the horn if either AIR or ELECTRICAL. Each horn is provided with an individual unique code.

HORN SPARE MASTERS



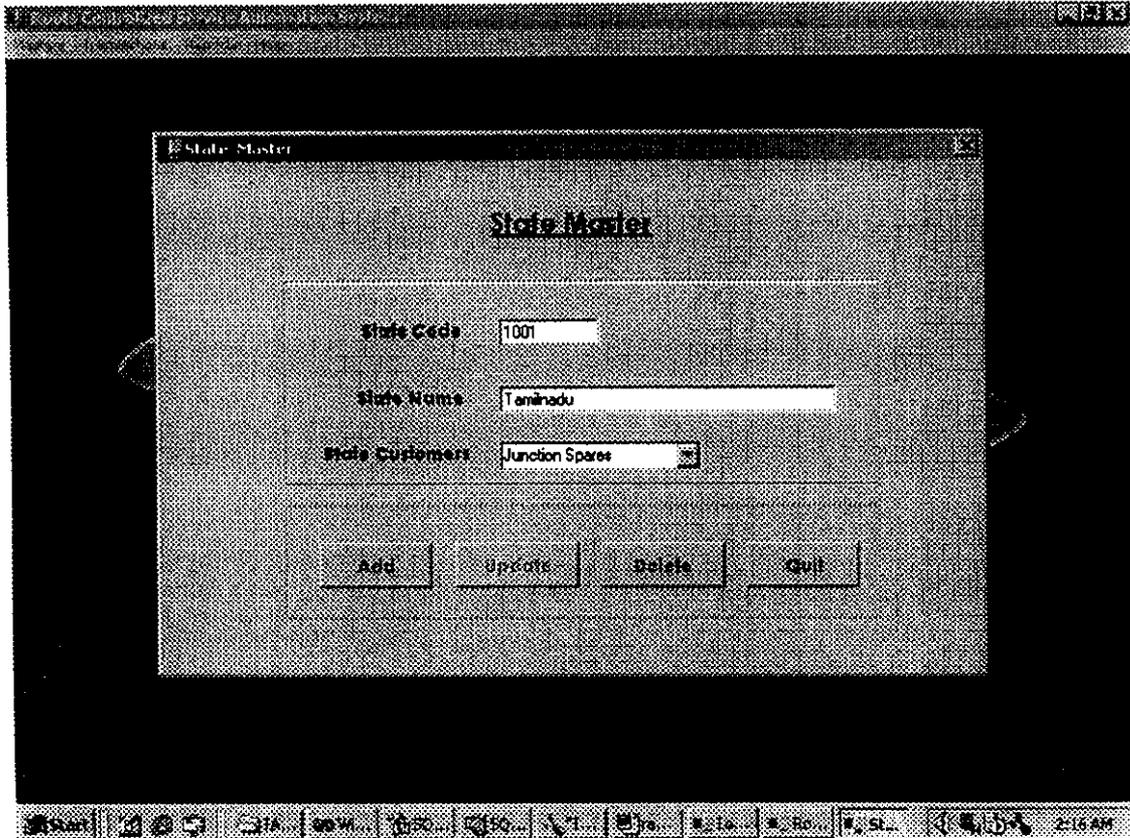
The above screen shot is the HORN SPARE MASTER FILE, which describes the name of the horn and the spare name of the horn. Each horn spare is provided with an individual unique code.

DISTRICT MASTER



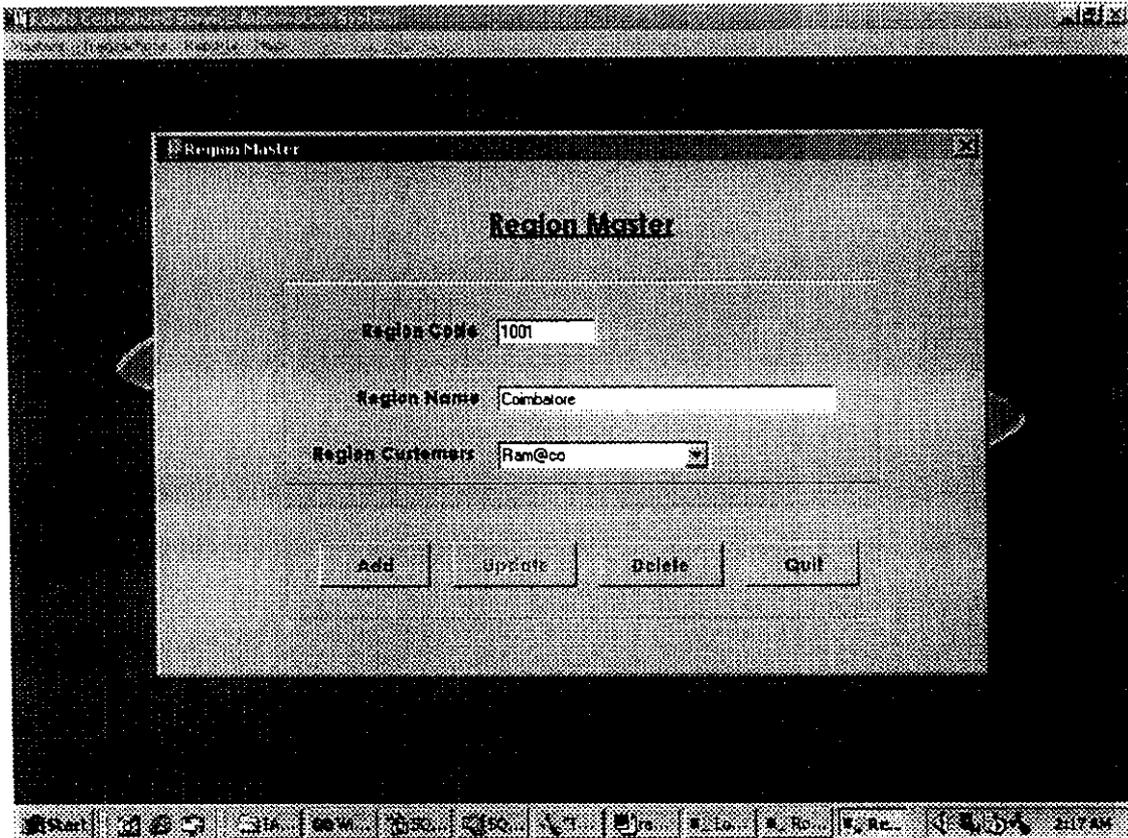
The above screen shot is the DISTRICT MASTER FILE, which describes the name of the district and the customer list who have purchased the horn. Each district is provided with an individual unique code.

STATE MASTER



The above screen shot is the STATE MASTER FILE, which describes the name of the State and the customer list who have purchased the horn. Each state is provided with an individual unique code.

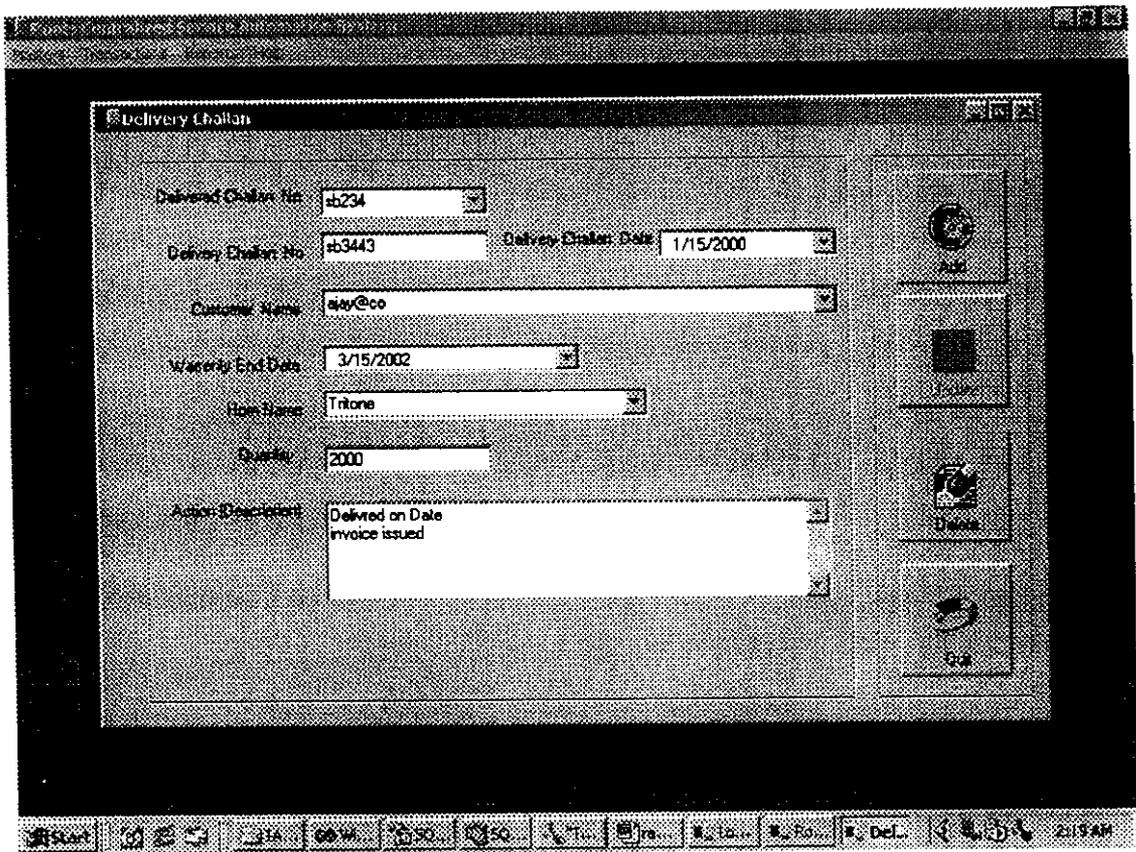
REGION MASTER



The above screen shot is the REGION MASTER FILE, which describes the name of the Region and the customer list who have purchased the horn. Each region is provided with an individual unique code.

TRANSACTIONS

DELIVERY CHELLAN



Delivery Chellan No	sb234		
Delivery Chellan No	sb3443	Delivery Chellan Date	1/15/2000
Customer Name	jay@co		
Warranty End Date	3/15/2002		
Horn Name	Tritone		
Quantity	2000		
Action/Description	Delivered on Date invoice issued		

The delivery chellan details hold the details of the customer who have send the respective horns for services. It also holds information of the horns if are available within the warranty period and the amount of horns they have send for service.

HORN PERFORMANCE IDENTIFICATION:

The screenshot displays a software window titled "Horn Performance Identification". The window contains a form with the following fields and values:

- Chassis No: ab123
- Chassis Date: 1/15/2000
- Customer Name: Junction Spares
- Warranty Period: Yes No
- Warranty End Date: 1/15/2000
- Horn Name: Blast
- Horn Spares Name: (empty)

On the right side of the form, there is a vertical toolbar with four icons: "Add", "Edit", "Delete", and "Print".

The above screen shot is the Transaction File. It depicts the Horn Performance Identification. It receives the details of the customer, horn and the spare names.

DESPATCH DETAILS

The screenshot shows a window titled "Despatch Details" with the following fields and controls:

- Despatch No.:** d12403
- Despatch Date:** 1/15/2000
- Delivery Order No.:** d454
- Order Date:** 1/15/2000
- Customer Name:** Junction
- Warranty Extension Flag:** Yes No
- Warranty Date:** 4/18/2002
- Remarks:** delivered before despatch date

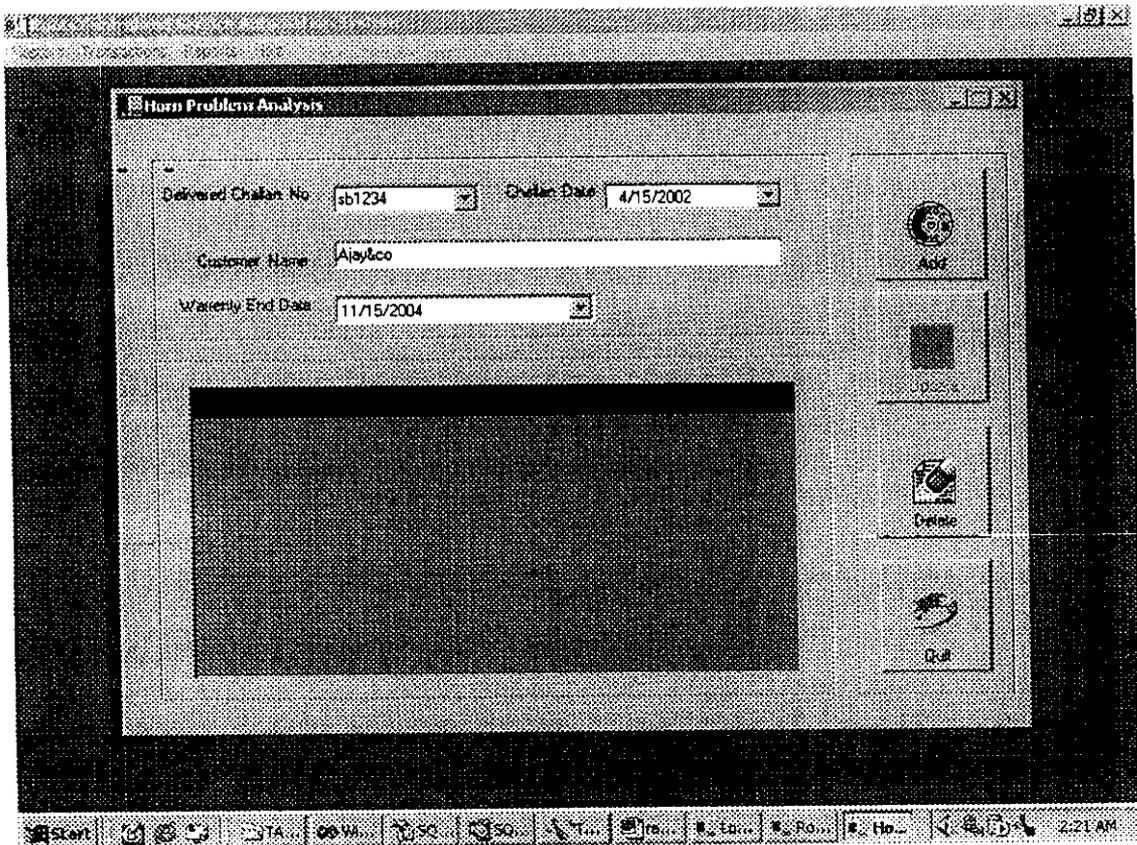
On the right side of the window, there is a vertical toolbar with icons for:

- ADD
- EDIT
- DELETE
- OK

The Windows taskbar at the bottom shows the Start button, several application icons, and the system tray with the time 2:31 AM.

The above screen shot is also a transaction file, which depicts the Despatch details. The details mentioned here are of those horns, which have been, completed service and those that are to be despatched. It also includes information of whether they are within warranty period.

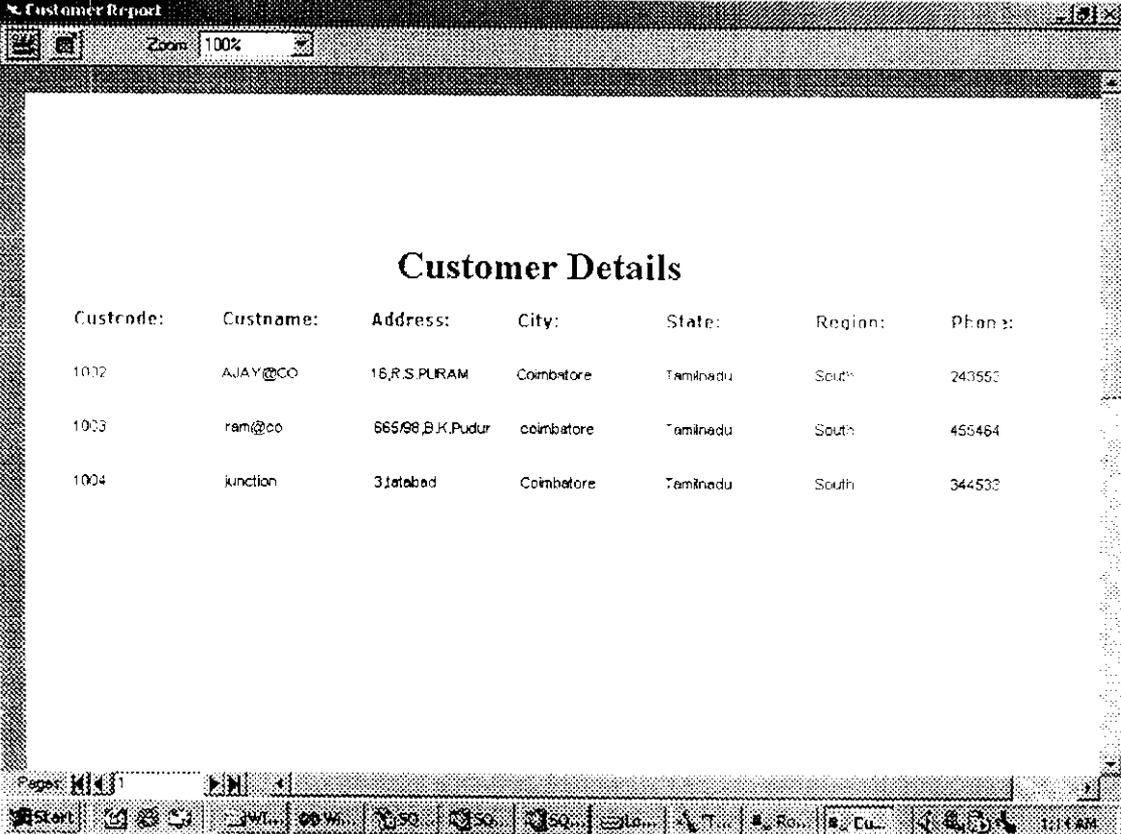
HORN PROBLEM ANALYSIS



The above screen shot is also a transaction file, which depicts the Analysis of Horn Problems. Each customer sends horns for service and these problems are being analyzed and are reported in this screen according to the remarks mentioned in the despatch details.

REPORTS:

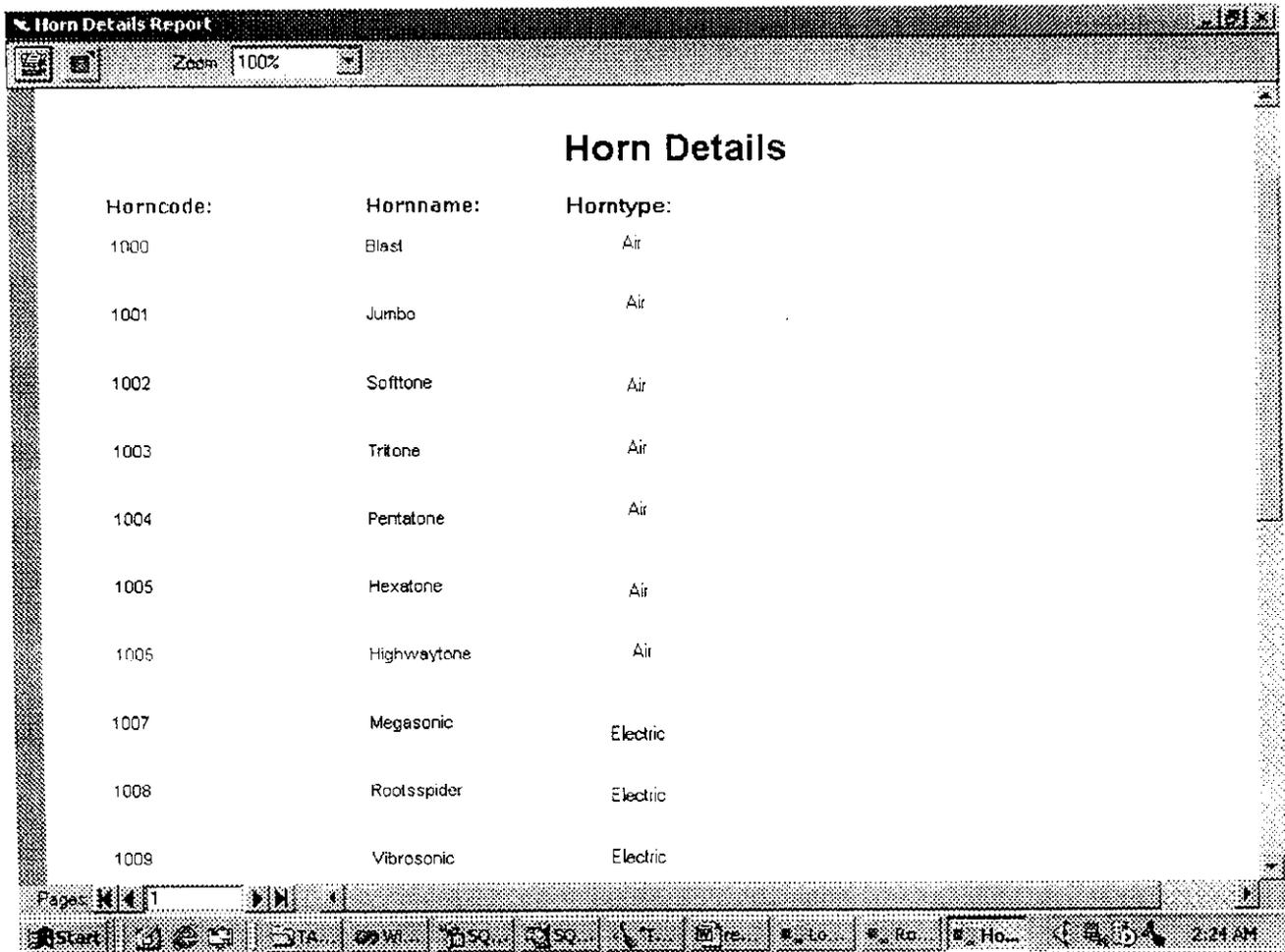
CUSTOMER REPORT



Customer Details

Custcode:	Custname:	Address:	City:	State:	Region:	Phone:
1002	AJAY@CO	16,R.S.PURAM	Coimbatore	Tamilnadu	South	243550
1003	ram@co	665/68_B,K.Pudur	coimbatore	Tamilnadu	South	455464
1004	junction	3,Jatabad	Coimbatore	Tamilnadu	South	344533

HORN DETAIL REPORT:



The screenshot shows a window titled "Horn Details Report" with a zoom level of 100%. The main content is a table titled "Horn Details" with three columns: "Horncode:", "Hornname:", and "Horntype:". The table lists ten different horn types, each with a unique code and name. The types are categorized as "Air" or "Electric".

Horncode:	Hornname:	Horntype:
1000	Blast	Air
1001	Jumbo	Air
1002	Softtone	Air
1003	Tritone	Air
1004	Pentalone	Air
1005	Hexatone	Air
1005	Highwaytone	Air
1007	Megasonic	Electric
1008	Rootspider	Electric
1009	Vibrosonic	Electric

The above screen shot is the report of the horn details available and their corresponding type. The output report details all the horns with their respective unique horn code.

HORN SPARE DETAIL REPORT

Horn Spare		Details
Hornname:	Sparecode:	Sparename:
Blast	b01	Leverswitch
Blast	b02	Electron pneumatic
Junbo	j01	Melodymaker
Tritone	t01	Horncontroller

The above screen shot is the report of the horn spare details available and their corresponding horn name. The output report details all the horns with their respective spare part name and their unique code.

DESPATCH DETAILS:

The screenshot shows a web browser window with the title 'Desptach'. The browser's address bar is empty, and the zoom level is set to 100%. The main content area displays a table titled 'Desptach Details'. The table has seven columns: DNO, DDATE, DELNO, CDATE, CNAME, WEI, and REM. There are two rows of data in the table. The first row shows DNO: sk4554, DDATE: 12/3/03, DELNO: 2433, CDATE: 4/5/03, CNAME: ejay, WEI: recieved, and REM: delivered. The second row shows DNO: sb3443, DDATE: 13/4/03, DELNO: 5544, CDATE: 5/6/03, CNAME: ran, WEI: recieved, and REM: delivered. The browser's status bar at the bottom shows the time as 1:42 AM.

DNO:	DDATE:	DELNO:	CDATE:	CNAME:	WEI:	REM:
sk4554	12/3/03	2433	4/5/03	ejay	recieved	delivered
sb3443	13/4/03	5544	5/6/03	ran	recieved	delivered

The above screen shot is the output of the despatched horns which have been received for service. It includes the despatch number, despatched date, delivery chellan number and the received date along with the customer name and the status of the customer whether he has received the horns that have been send and the remark so forth.

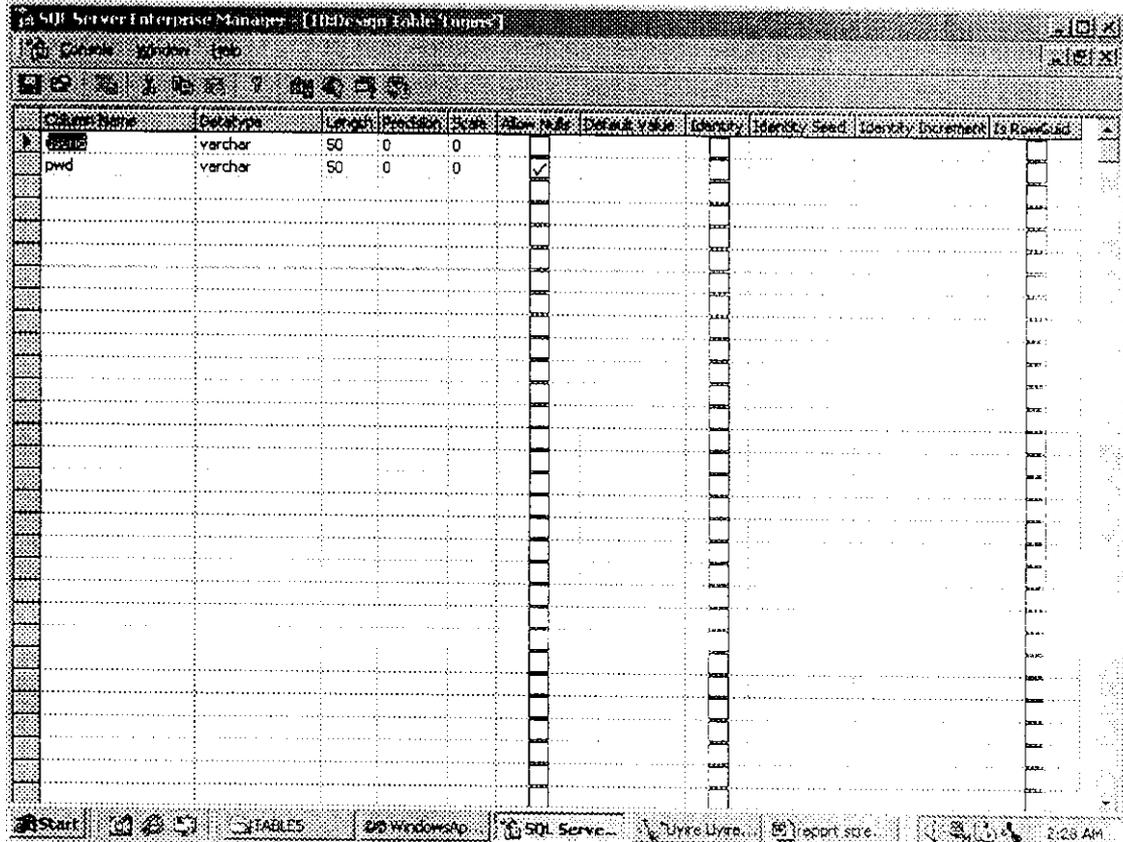
SUPPLIER DETAIL REPORT:

Suppcode:	Suppname:	Address:	City:	District:	State:
s001	alagendra	123,crosscutroad	Coimbatore	Coimbatore	Tamilnadu
s002	after autos	239,salabacolony	Coimbatore	Coimbatore	Tamilnadu
s003	junction spares	776,hr road	Coimbatore	Coimbatore	Tamilnadu

The above screen shot depicts the supplier details who send us the spare parts and the details of their personal verification with the address and the means of communication.

9.2. TABLE DESIGN

Table Name – Logins



The screenshot shows the 'Table Design' view for a table named 'Logins'. The table has two columns: 'userid' and 'pwd'. The 'userid' column is the primary key, indicated by a key icon in the 'PK' column. Both columns are of type 'varchar' with a length of 50 and a precision of 0. The 'Allow Nulls' column for 'userid' is empty, while for 'pwd' it contains a checkmark. The 'Default Value' column is empty for both. The 'Identity' column is empty for both. The 'Identity Seed' and 'Identity Increment' columns are empty for both. The 'RowGuid' column is empty for both.

ColumnName	Data Type	Length	Precision	Scale	Allow Nulls	Default Value	Identity	Identity Seed	Identity Increment	RowGuid
userid	varchar	50	0	0						
pwd	varchar	50	0	0	<input checked="" type="checkbox"/>					

In the above table userid is the primary key.

Table Name – DC

Column Name	Data Type	Length	Precision	Scale	Allow Nulls	Default Value	Identity	Identity Seed	Identity Increment	Show Coll
DCNO	varchar	20	0	0	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			
DELCNO	varchar	20	0	0	<input checked="" type="checkbox"/>					
DCDATE	varchar	20	0	0	<input checked="" type="checkbox"/>					
CNAME	varchar	20	0	0	<input checked="" type="checkbox"/>					
WDATE	varchar	20	0	0	<input checked="" type="checkbox"/>					
HNAME	varchar	20	0	0	<input checked="" type="checkbox"/>					
QTY	varchar	20	0	0	<input checked="" type="checkbox"/>					
ACTION	varchar	20	0	0	<input checked="" type="checkbox"/>					

In the above table DCNO is the primary key.

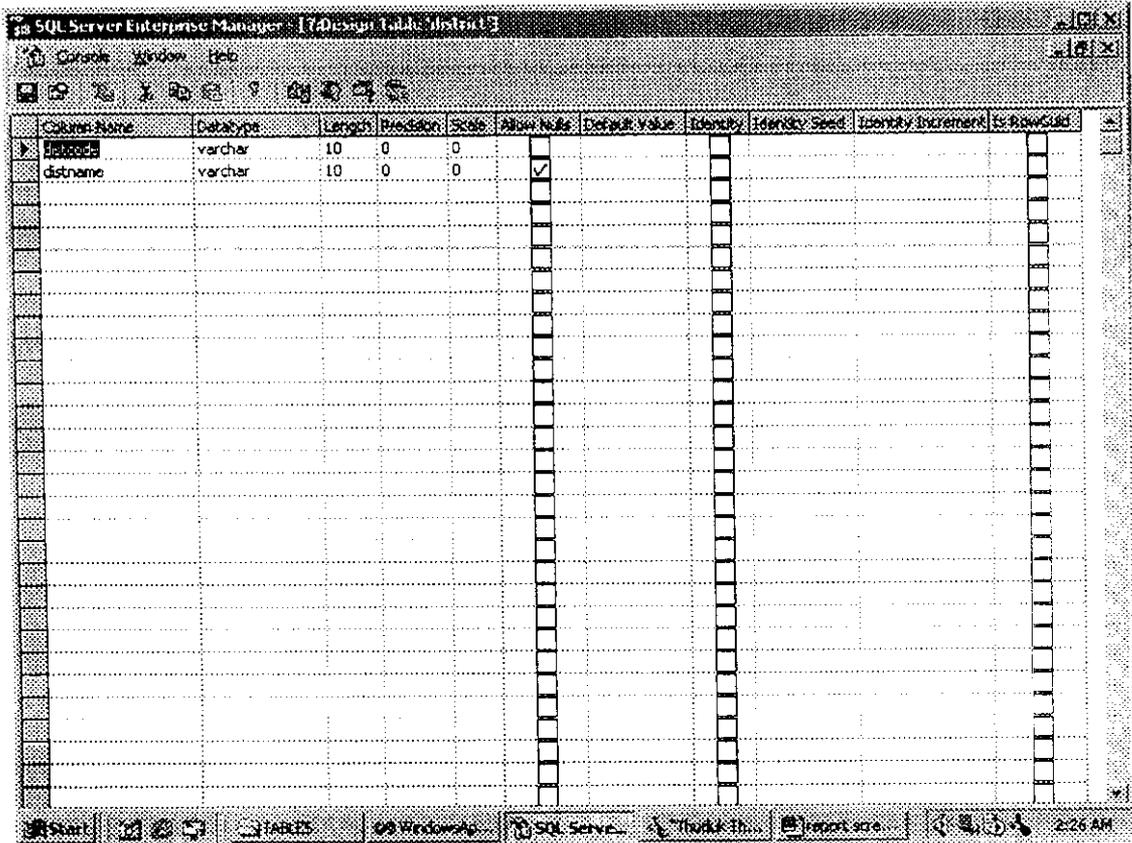
Table Name – DESPATCH

The screenshot shows the SQL Server Enterprise Designer interface for a table named 'DESPATCH'. The table structure is as follows:

Column Name	Data Type	Length	Precision	Scale	Allow Nulls	Default Value	Identity	Identity Seed	Identity Increment	Rowguid
DNO	varchar	10	0	0	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			
DDATE	varchar	15	0	0	<input checked="" type="checkbox"/>					
DELNO	varchar	10	0	0	<input checked="" type="checkbox"/>					
COATE	varchar	12	0	0	<input checked="" type="checkbox"/>					
CNAME	varchar	20	0	0	<input checked="" type="checkbox"/>					
WEI	varchar	20	0	0	<input checked="" type="checkbox"/>					
REM	varchar	50	0	0	<input checked="" type="checkbox"/>					

In the above table DNO is the primary key.

Table Name – District

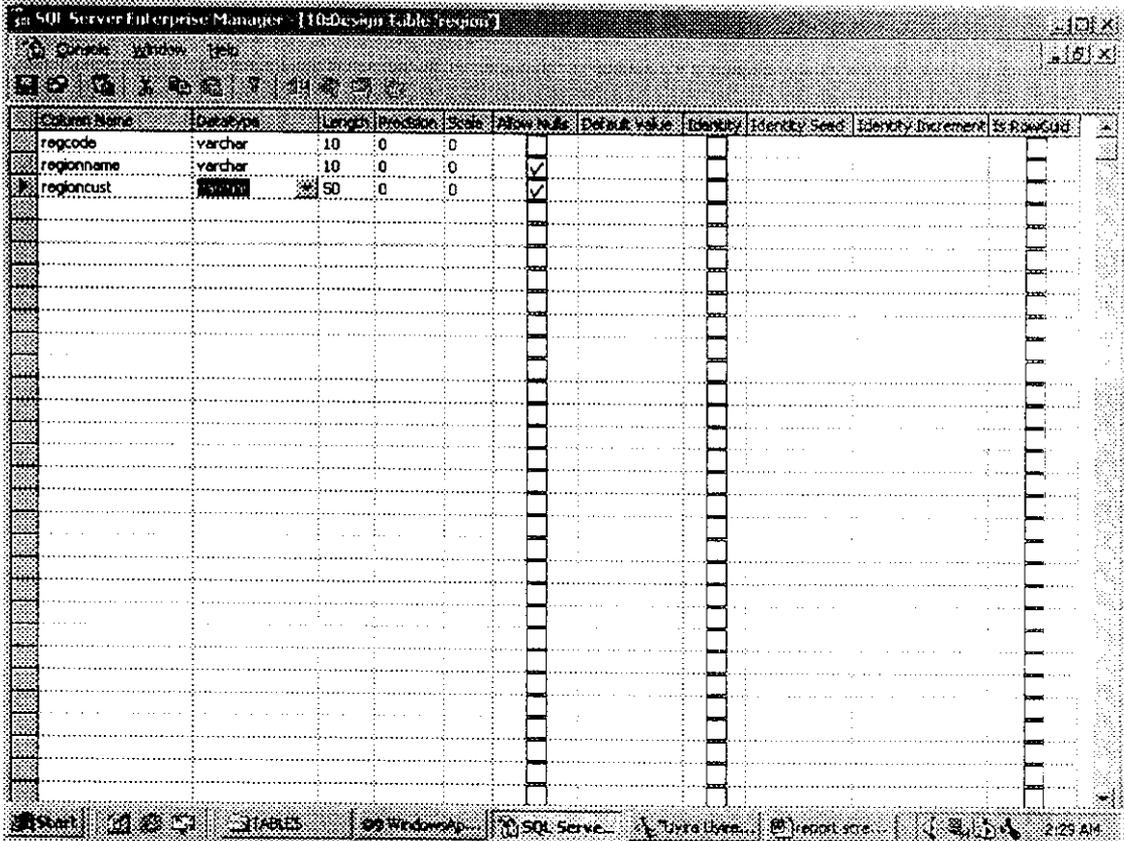


The screenshot shows the 'Table Design' view for a table named 'District'. The table has two columns: 'distcode' and 'distname'. Both columns are of type 'varchar' with a length of 10 and a precision of 0. The 'distcode' column is marked as the primary key with a checkmark in the 'Allow Nulls' column. The 'distname' column is also marked as the primary key with a checkmark in the 'Allow Nulls' column. The 'Identity' column is checked for both columns, with a seed of 0 and an increment of 1. The 'RowGUID' column is also checked for both columns.

Column Name	Data type	Length	Precision	Scale	Allow Nulls	Default Value	Identity	Identity Seed	Identity Increment	RowGUID
distcode	varchar	10	0	0	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	0	1	<input checked="" type="checkbox"/>
distname	varchar	10	0	0	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	0	1	<input checked="" type="checkbox"/>

In the above table distcode is the primary key.

Table Name – Region

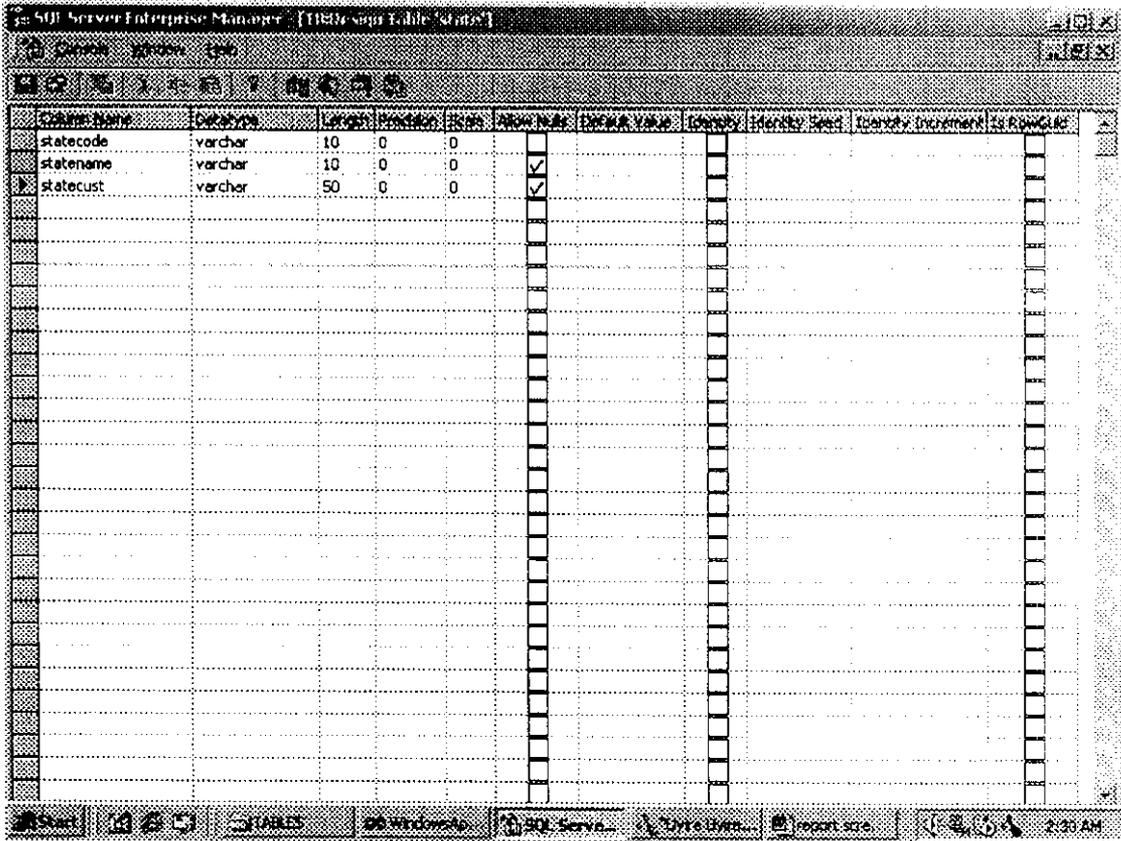


The screenshot shows the 'Design Table: Region' window in SQL Server Enterprise Manager. The table has three columns: 'regcode', 'regionname', and 'regioncust'. The 'regcode' column is the primary key, indicated by a key icon in the 'Is RowGUID' column. The 'regioncust' column has a checkmark in the 'Allow Nulls' column. The 'regionname' column is a standard varchar column. The 'regcode' column is a varchar column with a length of 10. The 'regioncust' column is a varchar column with a length of 50. The 'Allow Nulls' column has a checkmark for 'regioncust' and is empty for 'regcode' and 'regionname'. The 'Default Value' column is empty for all columns. The 'Identity' column is empty for all columns. The 'Identity Seed' and 'Identity Increment' columns are empty for all columns. The 'Is RowGUID' column has a key icon for 'regcode' and is empty for 'regionname' and 'regioncust'.

Column Name	Data type	Length	Precision	Scale	Allow Nulls	Default Value	Identity	Identity Seed	Identity Increment	Is RowGUID
regcode	varchar	10	0	0						
regionname	varchar	10	0	0						
regioncust	varchar	50	0	0	<input checked="" type="checkbox"/>					

In the above table regcode is the primary key.

Table Name – State



The screenshot displays the 'Table Properties' window for a table named 'State'. The 'Columns' tab is active, showing the following columns:

Column Name	Data Type	Length	Precision	Scale	Allow Nulls	Default Value	Identity	Identity Seed	Identity Increment	Is RowGUID
statecode	varchar	10	0	0	<input type="checkbox"/>		<input type="checkbox"/>			<input type="checkbox"/>
statename	varchar	10	0	0	<input checked="" type="checkbox"/>		<input type="checkbox"/>			<input type="checkbox"/>
statecust	varchar	50	0	0	<input checked="" type="checkbox"/>		<input type="checkbox"/>			<input type="checkbox"/>

The 'statename' column is marked as the primary key with a checkmark in the 'Allow Nulls' column. The 'statecode' column is also marked as the primary key with a checkmark in the 'Allow Nulls' column.

In the above table statecode is the primary key.

Table Name – Horn

The screenshot shows the 'Design Table: Horn' window in SQL Server Enterprise Manager. The table structure is as follows:

Column Name	DataType	Length	Precision	Scale	Allow Nulls	Default Value	Identity	Identity Seed	Identity Increment	Is Rowguid
Horncode	varchar	50	0	0	<input checked="" type="checkbox"/>					
Hornname	varchar	50	0	0	<input type="checkbox"/>					
Horntype	varchar	50	0	0	<input type="checkbox"/>					

In the above table Horncode is the primary key.

Table Name - Hornspares

The screenshot shows the 'Design Table' view for a table named 'Hornspares'. The table structure is as follows:

Column Name	Data Type	Length	Precision	Scale	Allow Nulls	Default Value	Identity	Identity Seed	Identity Increment	Rowguid
sparename	varchar	50	0	0	<input checked="" type="checkbox"/>		<input type="checkbox"/>			
sparecode	varchar	50	0	0	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			
sparename	varchar	50	0	0	<input checked="" type="checkbox"/>		<input type="checkbox"/>			

In the above table sparecode is the primary key.

Table Name – HPIS

The screenshot shows the 'Table Structure' view for a table named 'HPIS' in SQL Server Enterprise Manager. The table has the following columns:

Column Name	DataType	Length	Precision	Scale	Allow Nulls	Default Value	Identity	Identity Seed	Identity Increment	Is Rowguid
DCNO	varchar	10	0	0	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			<input type="checkbox"/>
CDATE	varchar	20	0	0	<input checked="" type="checkbox"/>		<input type="checkbox"/>			<input type="checkbox"/>
CNAME	varchar	50	0	0	<input checked="" type="checkbox"/>		<input type="checkbox"/>			<input type="checkbox"/>
Warperiod	varchar	10	0	0	<input checked="" type="checkbox"/>		<input type="checkbox"/>			<input type="checkbox"/>
WarriDate	varchar	12	0	0	<input checked="" type="checkbox"/>		<input type="checkbox"/>			<input type="checkbox"/>
Hname	varchar	50	0	0	<input checked="" type="checkbox"/>		<input type="checkbox"/>			<input type="checkbox"/>

In the above table DCNO is the primary key

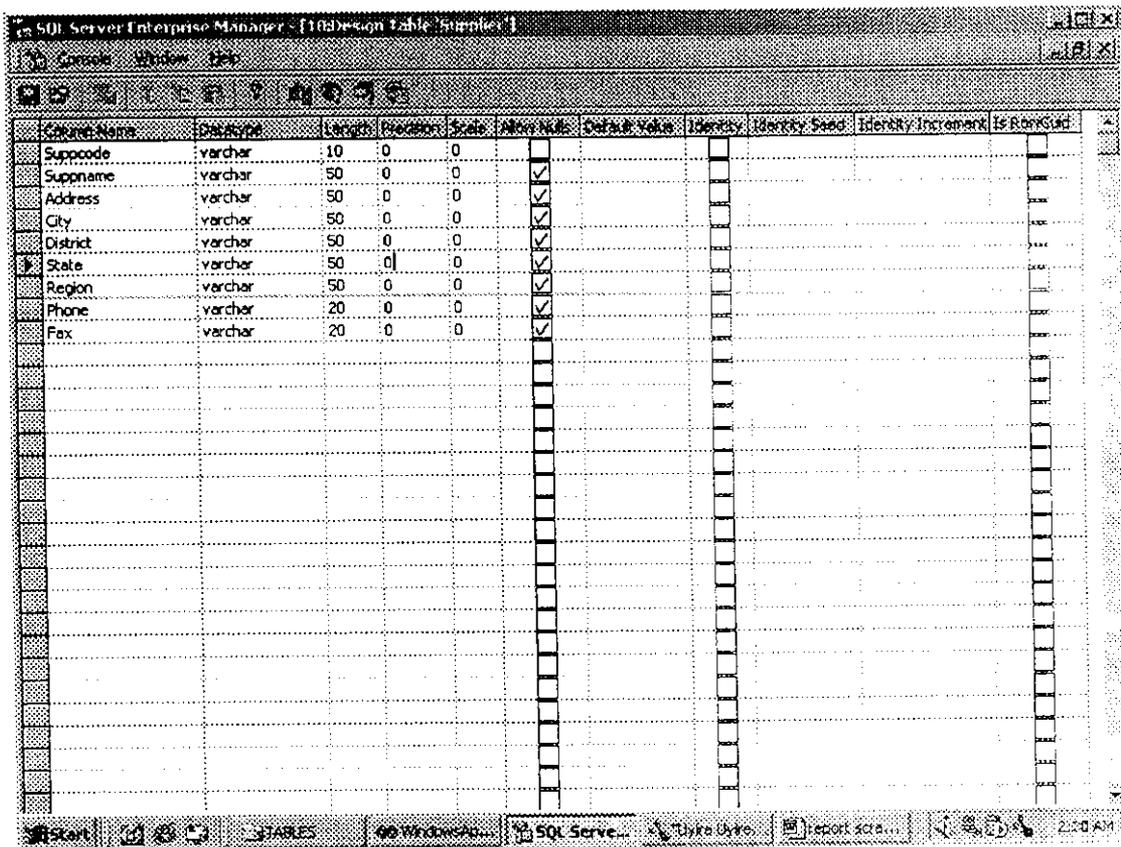
Table Name – HRPA

The screenshot shows the 'Table Properties' window for 'HRPA' in SQL Server Enterprise Manager. The 'Columns' tab is active, displaying the following table structure:

Column Name	Data Type	Length	Precision	Scale	Allow Nulls	Default Value	Identity	Identity Seed	Identity Increment	Rowguid
DCNO	varchar	10	0	0	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			<input type="checkbox"/>
CDATE	varchar	20	0	0	<input checked="" type="checkbox"/>		<input type="checkbox"/>			<input type="checkbox"/>
CNAME	varchar	50	0	0	<input checked="" type="checkbox"/>		<input type="checkbox"/>			<input type="checkbox"/>
WED	varchar	50	0	0	<input checked="" type="checkbox"/>		<input type="checkbox"/>			<input type="checkbox"/>

In the above table DCNO is the primary key

Table Name – Supplier



The screenshot shows the 'Table Structure' view for a table named 'Supplier' in SQL Server Enterprise Manager. The table has the following columns and properties:

Column Name	Data Type	Length	Precision	Scale	Allow Nulls	Default Value	Identity	Identity Seed	Identity Increment	Is RowGuid
Suppcode	varchar	10	0	0	<input type="checkbox"/>		<input checked="" type="checkbox"/>			<input type="checkbox"/>
Suppname	varchar	50	0	0	<input checked="" type="checkbox"/>		<input type="checkbox"/>			<input type="checkbox"/>
Address	varchar	50	0	0	<input checked="" type="checkbox"/>		<input type="checkbox"/>			<input type="checkbox"/>
City	varchar	50	0	0	<input checked="" type="checkbox"/>		<input type="checkbox"/>			<input type="checkbox"/>
District	varchar	50	0	0	<input checked="" type="checkbox"/>		<input type="checkbox"/>			<input type="checkbox"/>
State	varchar	50	0	0	<input checked="" type="checkbox"/>		<input type="checkbox"/>			<input type="checkbox"/>
Region	varchar	50	0	0	<input checked="" type="checkbox"/>		<input type="checkbox"/>			<input type="checkbox"/>
Phone	varchar	20	0	0	<input checked="" type="checkbox"/>		<input type="checkbox"/>			<input type="checkbox"/>
Fax	varchar	20	0	0	<input checked="" type="checkbox"/>		<input type="checkbox"/>			<input type="checkbox"/>

In the above table Suppcode is the primary key.