# CUSTOMER SERVICE MANAGEMENT



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Coimbatore-641006

Department Of Computer Science and Engineering

**Bonafide Certificate**

Certified that this project report titled **CUSTOMER SERVICE MANAGEMENT** is the bonafide work of **Mr. MAJO GEORGE CHERUVATHUR (Reg No. 71202621020)** who carried out the research under my supervision. Certified further, that to the best of my knowledge the work reported here in 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.

**GUIDE**

**HEAD OF DEPARTMENT**

Submitted for the University Examination held on 23/6/05

**Internal Examiner**

**External Examiner**

# ABSTRACT

The Service department is responsible for up keeping the products after the sale to customers. They attend to the nature of complaint made by the customers on the products they use. The goods sold to customers are moved to warranty and maintenance to service department. The products that are under warranty are attended and repaired at free of cost. Service department also attends to the customer's job after warranty either as annual maintenance contract or as per call basis on complaints.

The Annual Maintenance Contract (AMC) is an agreement made between the service department of the company and customers for the maintenance of products for the whole year to which the contract is made. The contracts may either be for a full product contract or may be only for service labour involved, in the later case the spares are charged additionally. A bill is raised to the customer for the AMC annually at the start of the contract period.

The service department for the customer's complaint calls maintains a call center and a service co-ordinator allocates the jobs to the service engineers/staffs for various tasks involved in the calls. The call center also provides an online help to customers by maintaining a remedial database based on the past history of complaints against respective products. This feature helps to resolve product problems and its complaints to the service staff and customers in time.

The spares required for the service departments are maintained based on the consumption pattern on the defective parts involved during the service complaints. The consumption pattern is calculated based on the usage of the Spares for respective products on time-to-time basis. A spares indent is raised to the stores whenever the spare stock falls below the minimum requirement level. The product complaints occurring during the warranty period are reviewed seriously as it may have occurred due to faulty design or manufacture. The service department analysis these defects and raises a product warranty complaint review request to the engineering department on the areas of the complaints.

The service complaint fulfillment time is confirmed to the customer based on the service personal availability and the nature of complaint filed. The service department maintains and reports to management, various reports such as most occurring complaints, utilization of the service staff, service business turnover, Spares selling turnover and customer satisfaction index.

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# TABLE OF CONTENTS

# LIST OF TABLES

# LIST OF FIGURES

## LIST OF SYMBOLS, ABBREVIATIONS AND NOMANCLATURE

| | |
|---|---|
| AMC | : ANNUAL MAINTENANCE CONTRACT |
| DFD | : DATA FLOW DIAGRAM |
| JSP | : JAVA SERVER PAGES |
| SQL | : STRUCTURED QUERY LANGUAGE |

# CHAPTER 1

# INTRODUCTION

## 1.1 COMPANY PROFILE

**Zellweger Uster India Private Limited** located at RS Puram in Coimbatore is a leading manufacturer and sellers of Textile Electronic Equipments. They have their group companies all over the world. The primary job in Indian operations is sales and servicing of the equipments.

They have all types of leading Textile Mills in India and abroad as their clients. They have about 60 employees in 3 locations. They have equipped their IT services with MS Windows 2000 Servers and operate with MS SQL Server 2000 Database. They develop their existing software running in VB and currently migrating the application using MS DOT Net v1.1 on MS Visual Studio 2003 development platform. They have 15 Clients equipped with MS Windows 2000 professional hooked to the network with a switch. Easy Design Systems are software consultants and software development service providers for them. They have 2 EDS Staffs to maintain these resources. They run their reports Using ASP.net and MS Access 2000 languages.

**Easy Design Systems** established by Mr. S.Padmanabhan, is one of the leading software development centre in Coimbatore. The company develops software for some of the leading companies in coimbatore and is growing in rapid pace. Some of the prominent clients are Zellweger Uster India Private Limited, IndoShell Cast Private Limited and Habasit Iakoka India private limited. More than 20 employees are working in Easy Design Systems.

## PROJECT OVERVIEW

The customer service department is responsible for keeping the products after the sale to customers. They attend to the nature of complaint made by the customers on the products they use. The goods sold to customers are moved to warranty and maintenance to service department. The products that are under warranty are attended and repaired at free of cost. Service department also attends to the customer's job after warranty either as an annual maintenance contract or as a per call basis on complaints.

Call center provides an online help to customers based on past complaints against respective products. This feature helps to resolve product problems easily and pass its complaints to service staff and customers in time. Spares are maintained when complaint comes. Spares indent is raised to the stores whenever the spare stock falls below the minimum requirement level. Product complaint on warranty period considered seriously as it may occur due to fault design or manufacture. The service department analysis defect and raises a product warranty complaint review request to engineering department on the areas of complaints.

## Highlights of the project

- ► Simple & Pleasing Look and Feel
- ► Easy to handle
- ► On-line help to the customers
- ► Complaints can easily be determined

## Components

The customer service management is developed using Java Server Pages (JSP) and SQL Server 2000.

# CHAPTER 2

# SYSTEM STUDY AND ANALYSIS

## 2.1 PROBLEM STATEMENT

The main objective of the project is to allow the customers to collect the past complaints done by the organization. The project should be able to accurately handle the complaints and also should give access to customers who have password. The call center module determines the staff when complaint comes.

## 2.2 FEASIBILITY ANALYSIS

Feasibility is the measure of how beneficial or practical the development of information system will be to an organization. Once the problem is explained the feasibility study is to be done to test whether the product is achievable. The feasibility study describes the degree of the usefulness of the product to the organization. The feasibility study can be divided into four phases. They are as follows:

### 2.2.1 EXISTING SYSTEM

The existing system for storing complaints is done in terms of files and secondary storage and which is shared throughout to the users. The complaints are neither sorted according to the category nor technology. The access to the share as not authenticated and there was no restriction in terms of user roles. Moreover the complaints were scattered around many shared file locations in the secondary storage.

#### 2.2.1.1 LIMITATIONS OF EXISTING SYSTEM

As in the existing system, all the complaints are maintained in terms of files in secondary storage, the past complaints were not easily accessible by the users. The complaints were not sorted according to the category, so the entire search process was very complex.

### 2.2.2 PROPOSED SYSTEM

The proposed system provides easy access to the users. The proposed system categorize the complaints and easy access to the users about the past complaints. All these storage retrieval are done in an efficient way.

#### 2.2.2.1 ADVANTAGES OF THE PROPOSED SYSTEM

The proposed system implements the online help to the customers. It should be easy to handle. The data storage capacity is increased.

### 2.2.3 TECHNICAL FEASIBILITY

Technical Feasibility is a measure of practicality of a specific technical solution and the availability of technical resource and expertise. This deals with the study of building within the pre-established cost and schedule bounds, the technology that exist to develop all elements of the system, systems reliability on proven technologies, the possibility of defining the interfaces, performance and functional aspects, analysis of technical resources, risk associated with the technologies. Feasibility study on quality of the elements of the system, system's external environment, and system communications is performed.

The tool can be developed with the existing technology. The individual modules are to be developed as JSP pages. SQL SERVER 2000 was chosen as the backend engine, because of the huge data volume to be handled. The Tool works effectively even for huge amount of data.

### 2.2.4 ECONOMIC FEASIBILITY

Economic Feasibility is a measure of the cost-effectiveness of a project or solution. The System has been designed to work for any type of flat file(fixed width or delimited) and it manages voluminous data. Since the effort to develop the product was found to be feasible, the development presents a good investment for the organization. Hence the above system is economically feasible.

## 2.3 PURPOSE OF THE PROJECT

- ► Fast retrieval of any stored data.
- ► It is user friendly, interactive and it is very useful for the organization.
- ► Workload for the employees is reduced.
- ► Records can easily be converted into hard copies.
- ► Required reports can easily be generated.
- ► Updating any records can be handled quickly.

## 2.4 SCOPE OF THE PROJECT

The scope of the project is to convert requirements specified by the user into functional requirements and implement the same in the system. It involves the following stages Requirement Analysis, Functional Specification, Design, Coding, and Testing.

# CHAPTER 3

# PROGRAMMING ENVIRONMENT

## 3.1 HARDWARE SPECIFICATION

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

| | |
|---|---|
| CPU | : PENTIUM III |
| RAM | : 128MB |
| POWER SUPPLY | : 300V |
| ADAPTER TYPE | : VGA |
| HARD DISK DRIVE | : 40GB |
| KEYBOARD | : 108 KEYS |
| OPERATING SYSTEM | : WINDOWS 2000 |
| DRIVER ADAPTER | : IDE TYPE 47 |

## 3.2 SOFTWARE SPECIFICATION

| | |
|---|---|
| TOOL | : NETBEANS IDE 3.6 |
| LANGUAGE | : JSP, JAVA , SERVLETS |
| DATABASE | : SQL SERVER 2000 |

## 3.3 ABOUT THE SOFTWARE

### JAVA

Java is a powerful but lean object oriented programming language . Java builds on the strength of C++. It has taken the best features of C++ and discarded the more problematic and error prone areas. To this lean core, it has added garbage collection(Automatic memory management), multithreading and security capabilities. The result is that java is simple, elegant, powerful and easy to use.

### SERVLETS

Servlets are programs that executes on the server side of a web connection. The Java Servlet Development Kit(JSDK) contains the class libraries that needed to create servlets.

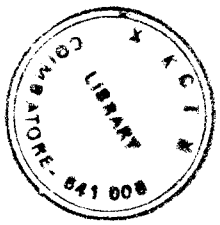
A servlet is a dynamically loaded module that services the request from a web server. It runs entirely inside the Java Virtual Machine. Because the servlet is running on the server side, it does not depend upon the browser compatibility.

#### REASONS TO USE JAVA SERVLET

There are several advantages in using servlets.They are

- EFFICIENT

A servlet's initialization code is executed only the first time the web server loads it. After the servlet is loaded, handling new requests is only a matter of calling a service method. This proves it to be more efficient.




♦ PERSISTENT

Servlets can maintain state between requests. When a servlet loade,it stays resident in memory while serving incoming request. Taking advantage of the persistent characteristics of servlets can improve your applications performance drastically.

♦ PORTABLE

Servlets are developed using java, therefore they are portable. This enables servlets to be moved to a new OS without changing the source. You can take code that code as compiled on a Windows platform and move to a Solaris without making any changes.

♦ ROBUST

Java provides a very well-defined exception hierarchy for error handling. It has garbage collector to prevent problems with memory leaks. It also include very large class library that includes network support, file support, database access, distributed object components, security and many other classes.

♦ EXTENSIBLE

Another advantage of servlets gain by being developed in an object oriented language like java is that they can be extended into new objects that better suit for your needs.

♦ SECURE

Servlets run on the server side, inheriting the security provided by the webserver. Servlets can also take advantage of the Java Security Manager.

## JAVASCRIPT

JavaScript is an easy-to-use programming language that can be embedded in the header of your web pages. It can enhance the dynamics and interactive features of your page by allowing you to perform calculations, check forms, write interactive games, add special effects and more.

JavaScript is integrated with HTML and Internet Explorer. It include built-in objects related to the current windows and documents as well as object such as Math, String and Date that contain Mathematical functions, String functions respectively. Since javaScript is an object-based language, its supports instances, methods and properties.

## JSP

Java Server Pages (JSP) Technology allows you to easily create web component that has both static and dynamic components. JSP Technology makes available all the dynamic capabilities of Java Servlet technology but provides a more natural approach to creating static content.

A JSP page is a text document that contains two types of text. The static data, which can be expressed in any text-based format and JSP elements, which construct dynamic content. The JSP code contains the following types of JSP constructs.

- A page directive sets the content type returned by the page.
- Tag library directives import custom tag libraries.
- jsp:useBean creates an object containing a collection of locales and

initializes an identifier that points to that object .

- Custom tags set a variable (c:set) , iterate over a collection of locale names.
- Jsp:setProperty sets the value of an object property .

**LIFE CYCLE OF A JSP PAGE**

The jsp page services request a servlet whenever a page created newly or modified. When a request is map to a JSP page, the web container first checks whether the JSP page is older than the current servlet. If it finds older the page compiled to a new servlet class. The following thing happen during the session:

- The directives are translated into servlet commands.
- Scriplets are translated into servlet codes.
- Expressions are evaluated.
- Custom tags are converted into calls.

**JDBC**

You can run a java program on any java enabled platform without even recompiling that program. The java language is completely specified and by definition a java enabled platform must support a known core of libraries. One such library is JDBC.

Database vendors are already busy creating bridges from the JDBC API to their particular systems. Java has also provided a bridge drive that translates JDBC to ODBC allowing you to communicate with the legacy database that have no idea that java exists. Using Java in conjunction with JDBC provides a truly portable solution to writing database applications.

## SQLSERVER

Structured Query Language is a set of commands that allows you to modify or retrieve information from a database.

### RELATIONAL FEATURES:

#### 1. INFORMATION REPRESENTATION

In SQL Server data is represented in terms of rows and columns of a table. Data stored as a table can be easily visualized.

#### 2. UNIQUE DEFINITION OF ROWS

The unique row requirement ensures that each row in the table can be accessed and changed independently from other rows of the table. In SQL Server we can make each row of a table unique by using a feature called as constraint.

#### 3. SYSTEMATIC TREATMENT OF NULL VALUES

SQL Server like most RDBMS treats Null values, zeros and blanks differently. While creating a table one can specify whether a field allows Null values or not.

#### 4. GUARANTEED ACCESS

In SQL Server, data that is stored across tables in one or more databases can be combined using query.

## 5. HIGH LEVEL UPDATE, INSERT AND DELETE

In SQL Server, if a record is updated or deleted in master table, the corresponding record in the referencing table is also updated or dropped. This process of ensuring that corresponding records of related tables are maintained to keep relationship intact is called referential integrity.

# CHAPTER 4

# SYSTEM DESIGN AND DEVELOPMENT

## 4.1 ELEMENTS OF DESIGN

System Design is the most creative and challenging phase in the life cycle of a software development. Design implies to a description of the final system and the process by which it is developed. The first step to determine what input data is needed from the system and the database that has to be designed to meet the requirements of the proposed system.The next step is to determine how the required output is produced and in what format.

During the design of the proposed system some thoughts that come to mind are:

- ► what are the inputs required and the outputs produced?
- ► How should the data be organized?
- ► What should be the screen format?
- ► What are the processes involved in the system?

During the design phase, the following steps are carried out :

- ► Input Design
- ► Output Design
- ► Modular Design
- ► Database Design

### 4.1.1 INPUT DESIGN

The input design is one of the important tasks in the software development, since it helps to reduce the user work and select the correct data entry. Any system needs data for its working. How the data is fed into the system has to be determined so that the data is error free and is system specific. The ways in which the data is to be fed into the system is decided during the input design stage.

The error raising method is also included in the software which helps to raise error message while wrong entry of input is done.

### 4.1.2 OUTPUT DESIGN

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, intelligible output design should improve the system's relationship with the user and help in decision making. Since the management for taking decisions directly refers the reports and to draw conclusions they must be designed with almost care and the details in the reports must be simple, descriptive and clear to the user.

### 4.1.3 MODULAR DESIGN

It is always difficult for any developer to grasp a system without breaking it up into several smaller systems. These smaller segments will all be part of the

original system yet they will be independent in the sense that they will incorporate within them a major function in the system.

A software system is always divided into several sub systems that makes it easier for the development. A software system that is structured into several subsystems makes it easy for the development and testing. The different subsystems are known as the modules and the process of dividing an entire system into subsystems is known as Decomposition.

A system cannot be decomposed into several subsystems in any way. There must some logical barrier, which facilitates the separation of each module. The separation must be simple but yet must be effective so that the development is not effected.

The two modules in the system are:

- ► User module
- ► Administrator module

### 4.1.4 DATABASE DESIGN

A database is a collection of interrelated data stored with minimum redundancy. Database design is one of the most important parts of the system design phase. In a database environment common data are available and are used by several users. Instead of each program managing its own data, authorized users share data across application with the database software managing the data as an entity. The primary objective of a database design are fast response time to enquiries, more information at low cost, control of redundancy, clarity and ease of use, date and program independence, accuracy and integrity of the system, fast recovery and availability of powerful end-user languages.

An important aspect of database design is normalization.

### 4.1.4.1 NORMALIZATION

The term normalization of data refers to the way data items are grouped together into record structures. Normalization is used to overcome the drawbacks like repetition of data, loss of information and inconsistency. Various normal forms that are followed commonly are:

**FIRST NORMAL FORM (1NF)**

A relation is said to be in first normal form (1NF) if and only if all underlying domains contains atomic values only i.e. only one value is associated with each attribute and the value is not a set or a list of values. Here all tables are in 1NF.

**SECOND NORMAL FORM (2NF)**

A relation scheme is in second normal form (2NF) if and only if it is in 1NF and all non- key attributes are fully functionally dependant on the primary key. All tables are in 2NF.

**THIRD NORMAL FORM (3NF)**

A relation scheme is in third normal form (3NF) if and only if it is in 2NF and all non-key attributes are non-transitively dependant on the primary key. Here all tables are kept in 3NF to avoid redundancy to a maximal level.

## 4.2 TABLE STRUCTURE

| FIELD NAME | DATA TYPE | DESCRIPTION |
|---|---|---|
| CustomerID | Number | Unique id of the customer, primary key |
| CustomerName | Varchar(30) | Name of the customer |
| Address | Varchar(30) | Customer address |
| City | Varchar(30) | City |
| State | Varchar(30) | State |
| Pin | Varchar(30) | Pin |
| TelephoneNumber | Varchar(30) | Personal phone |
| MobileNumber | Varchar(30) | Mobile |
| OtherDetails | Varchar(30) | Additional information |

**Table 4.1 CustomerMasterDB**

| FIELDNAME | DATA TYPE | DESCRIPTION |
|---|---|---|
| ProductCode | Number | Id of the Product, primary key |
| Description | Varchar(30) | Description about the product |
| ShortName | Varchar(30) | Short name of the product |
| Make | Varchar(30) | Who make the product |
| ServiceCharges | Number | Service charge details about particular product |

**Table 4.2 ProductMaster**

| FIELDNAME | DATA TYPE | DESCRIPTION |
|---|---|---|
| ComplaintID | Number | The complaint number, primarykey |
| ComplaintDate | Datetime | Product submit date |
| CustomerID | Number | Id of the customer |
| Complaint Type | Varchar(30) | Type of complaint |
| Complaint | Varchar(30) | Complaint of the product |
| ProductID | Number | Id of the product |
| Warranty | Varchar(30) | Warranty should be mentioned |
| NoComplaints | Number | No of complaints occurred for the product |

**Table 4.3 ComplaintMaster**

| FIELDNAME | DATA TYPE | DESCRIPTION |
|---|---|---|
| ComplaintID | Number | Complaint number, primary key |
| ComplaintType | Varchar(30) | Type of complaint for the product |
| Complaint | Varchar(30) | Complaints mentioned by customer |
| SuggestedRemedy | Varchar(30) | Remedy for complaints |
| Remarks | Varchar(30) | About the complaint |

**Table 4.4 ComplaintDetails**

| FIELDNAME | TYPE | DESCRIPTION |
|---|---|---|
| CustomerID | Number | Id of the customer, primarykey |
| CustomerName | Varchar(30) | Name of the customer |

**Table 4.5 CustomerEntryDB**

| FIELDNAME | DATATYPE | DESCRIPTION |
|---|---|---|
| CustomerID | Number | Id of the customer, primarykey |
| CustomerIndex | Varchar(30) | Customer satisfaction index |

**Table 4.6 CustomerIndexDB**

| FIELDNAME | DATATYPE | DESCRIPTION |
|---|---|---|
| CustomerID | Number | Id of the customer, primarykey |
| Password | Varchar(30) | Password for the customer |

**Table 4.7 Security**

| FIELDNAME | DATATYPE | DESCRIPTION |
|---|---|---|
| SpareCode | Number | Spare number, primarykey |
| SpareName | Varchar(30) | Spare name |
| PricePerSpare | Varchar(30) | Price per spare |
| SpareStock | Varchar(30) | Spare stock in org. |
| MinStock | Number | Minimum no. of stock |

**Table 4.8 SpareMaster**

| FIELDNAME | DATATYPE | DESCRIPTION |
|---|---|---|
| EngineerID | Number | Engineer number, primarykey |
| EngineerName | Varchar(30) | Engineer name |
| Designation | Varchar(30) | Designation of the engineer |
| Remarks | Varchar(30) | Additional information about staff |
| Class | Varchar(30) | A,B or C |
| ProblemRange | Varchar(30) | Problem range expressed as 1,2,3,4,5 |

**Table 4.9 EngineerMaster**

| FIELDNAME | DATATYPE | DESCRIPTION |
|---|---|---|
| ContractID | Number | Contract number, primarykey |
| CustomerID | Number | ID of Customer |
| ProductID | Number | ID of product |
| ContractRenewed | Varchar(30) | Checking contract renewal |
| RenewalDate | Datetime | Renewal date of contract period |
| ContractType | Varchar(30) | As per Call basis (or) Annual maintenance contract |
| ContractAmount | Number | Amount of the contract |

**Table 4.10 ContractMaster**

| FIELDNAME | DATATYPE | DESCRIPTION |
|---|---|---|
| CallID | Number | Call number, primary key |
| CallDate | Datetime | Call date |
| CustomerID | Number | Customer number |
| ProductID | Number | Problem number |
| CallType | Varchar(30) | letter/telephone/fax/mail/oral/others |
| Level | Varchar(30) | urgent/casual/tech.clarification |
| EngineerID | Number | Engineer number |

**Table 4.11 CallCenter**

| FIELDNAME | DATATYPE | DESCRIPTION |
|---|---|---|
| BillNO | Number | Bill number, primary key |
| BillDate | Datetime | Bill date |
| CustomerID | Number | Customer number |
| SpareID | Number | Product number |
| BillAmount | Number | Bill amount charged for the spare |
| Discount | Number | Discount for particular spare |
| SpareCharge | Number | Final amount paid to the company for spare |

**Table 4.12 SparesBill**

| FIELDNAME | DATATYPE | DESCRIPTION |
|---|---|---|
| BillNO | Number | Bill no for particular service, primarykey |
| BillDate | Datetime | Bill date for particular service |
| EngineerID | Number | Engineer number |
| TravelFare | Number | Travel fare for engineer |
| Lodging | Number | Lodging for engineer |
| ProductID | Number | Product number |
| ServiceCharge | Number | Service charges for the product |
| Payment | Varchar(30) | In cheque,cash,chalan,etc.. |
| CustomerID | Number | Customer number |
| Delivery | Varchar(30) | By courieror, taxi ,etc..or nothing |

**Table 4.13 ServiceBillMaster**

| FIELDNAME | DATATYPE | DESCRIPTION |
|---|---|---|
| BillNo | Number | Bill number, primarykey |
| BillDate | Number | Bill Date |
| CustomerID | Number | Id of customer |
| ProductID | Number | Id of the product |
| TotalSpareCharges | Number | Total spare amount |
| TotalServiceCharges | Number | Total service amount |
| NetAmount | Number | Total amount |

**Table 4.14 ProductDeliveryBill**

| FIELDNAME | DATATYPE | DESCRIPTION |
|---|---|---|
| AdministratorID | Number | Id of the administrator, primarykey |
| Password | Varchar(30) | Password for the administrator |

**Table 4.15 AdminSecurity**

# CHAPTER 5

# SYSTEM FLOW DIAGRAMS

## 5.1 DATAFLOW DIAGRAM

### CONTEXT LEVEL DIAGRAM

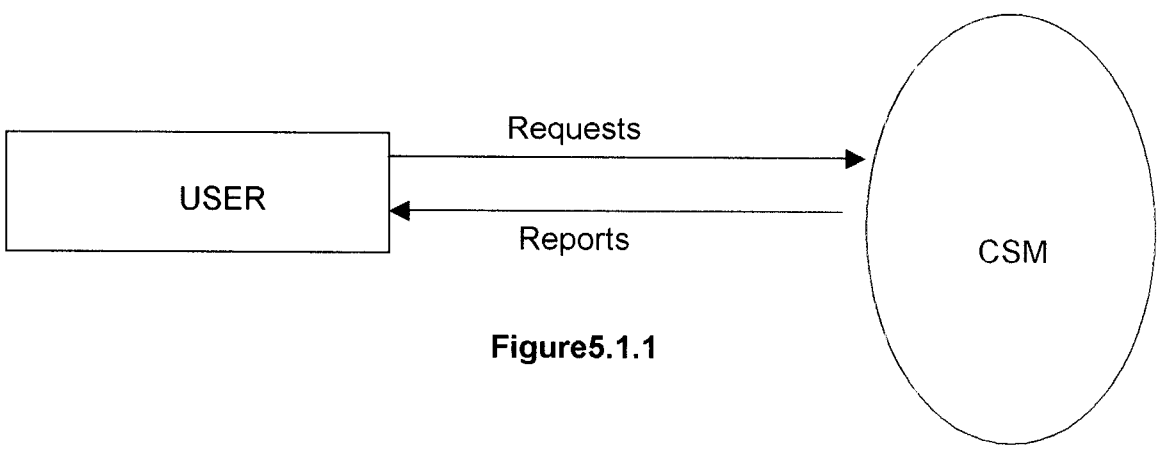



**Figure5.1.1**

## DATA FLOW DIAGRAMS

### CustomerModule

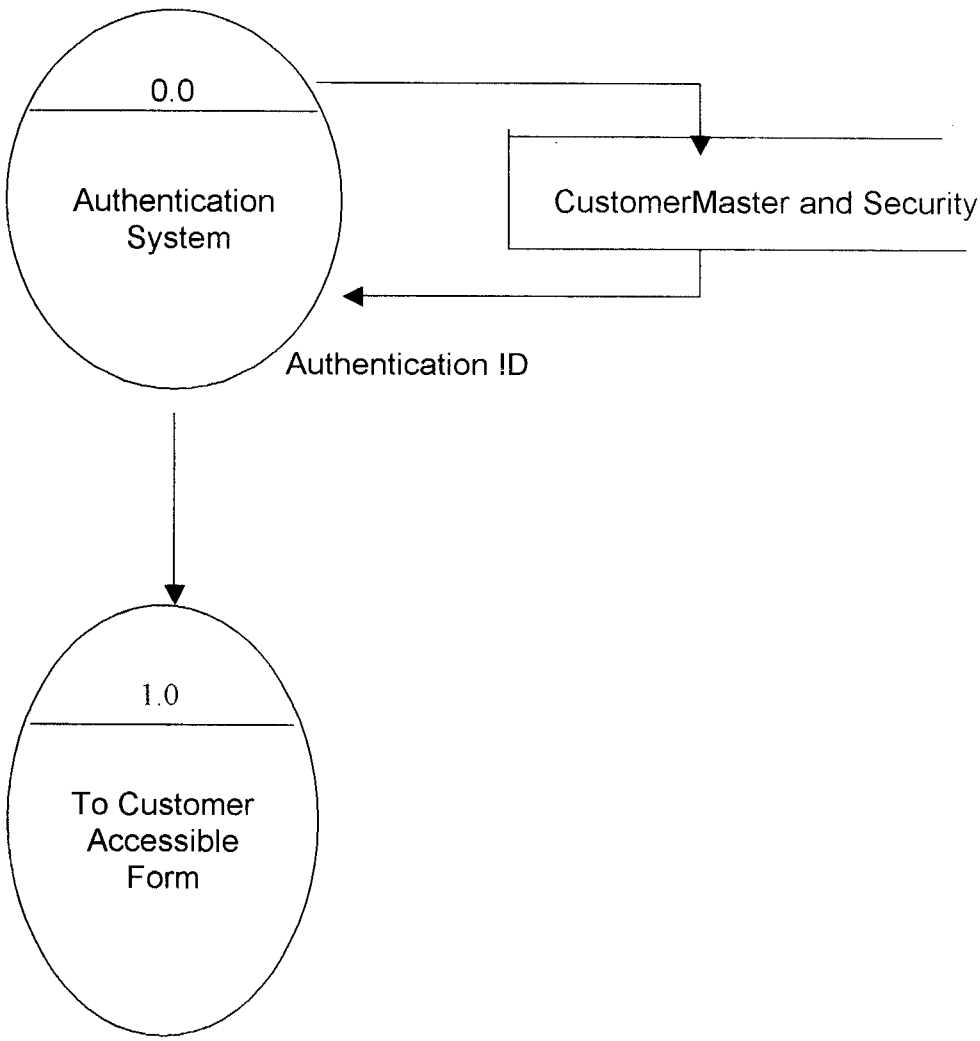



**Figure 5.1.2**

**Data Flow Diagram Level 1**

**Administrator Module**

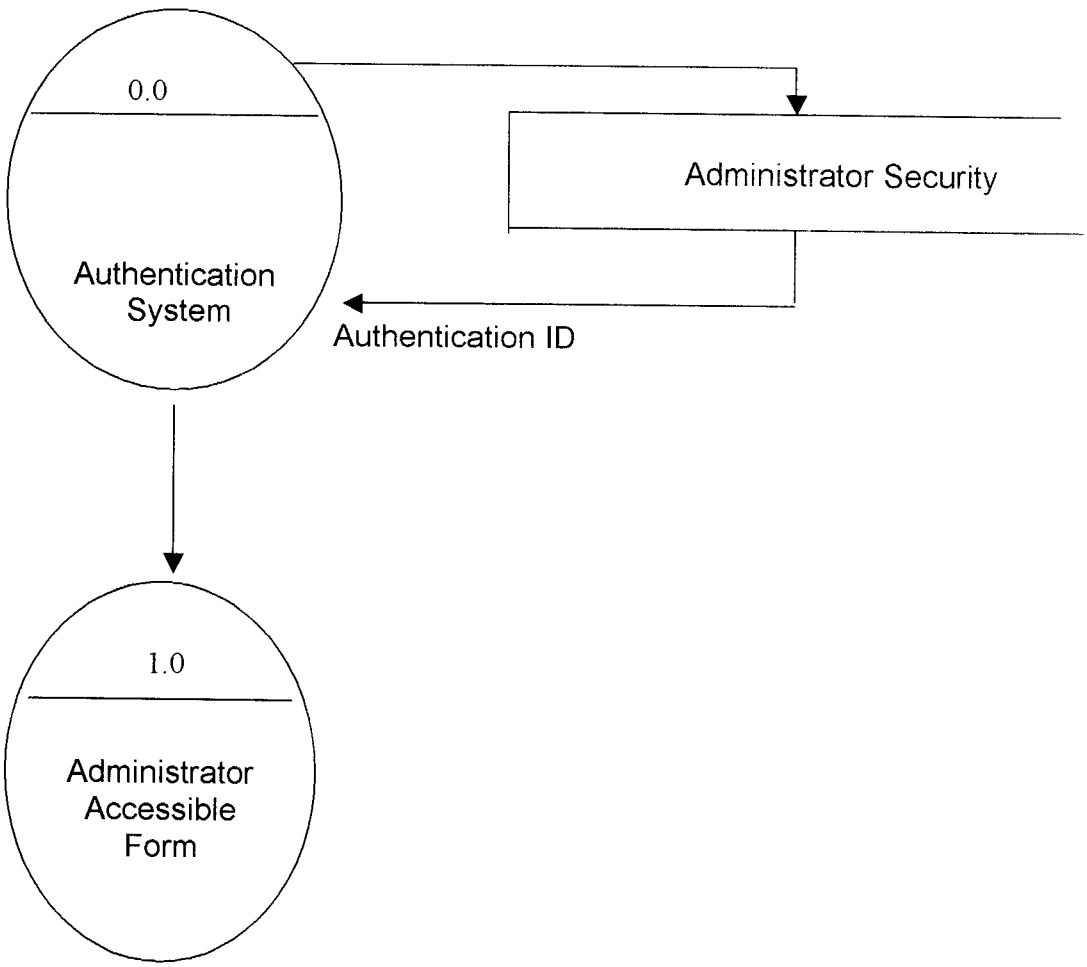



**Figure 5.1.3**

**Data Flow Diagram Level 1(Administrator Module)**

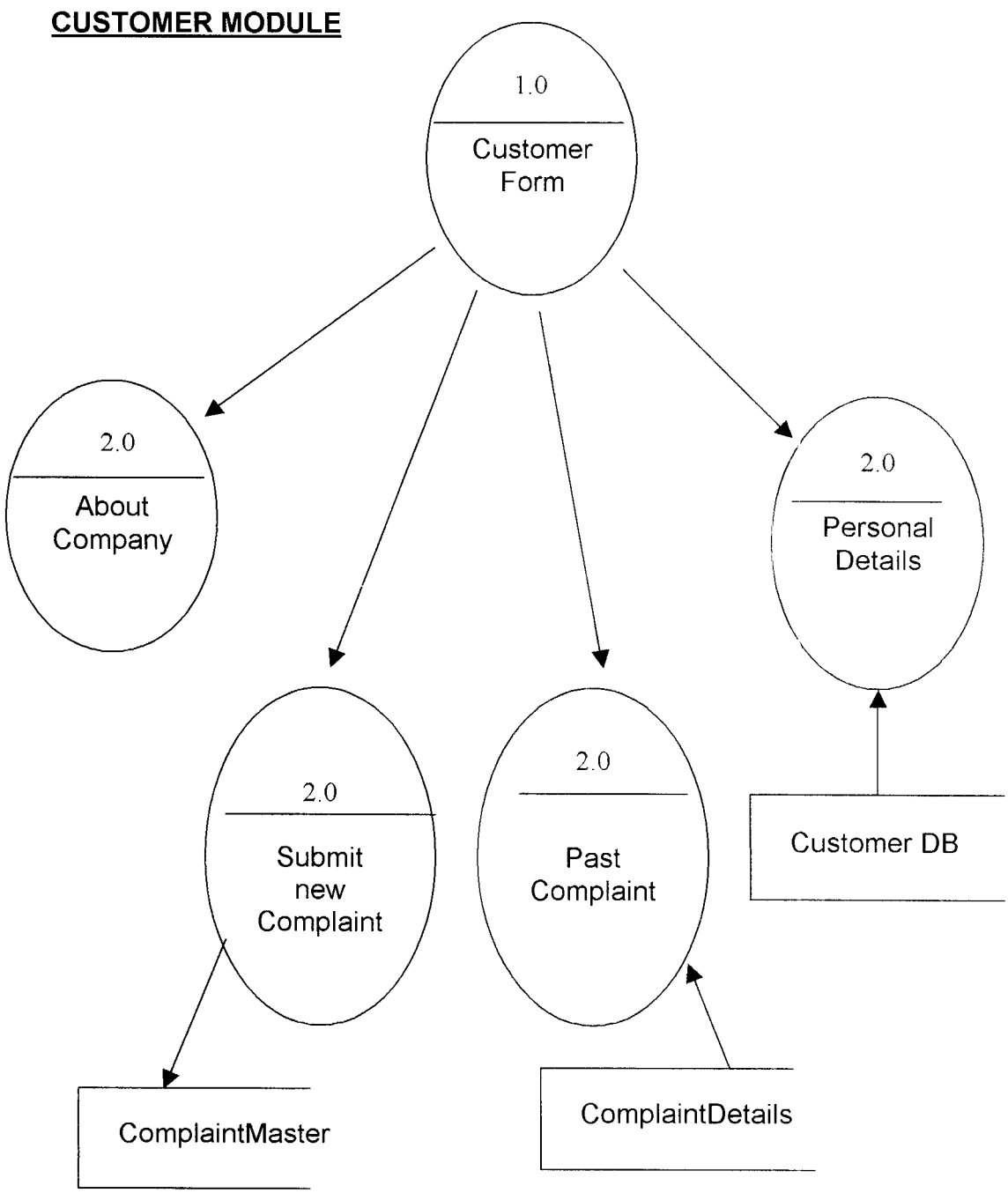



**Figure 5.1.4**

**Data Flow Diagram Level 2 ( Customer Module )**

**ADMINISTRATOR MODULE**

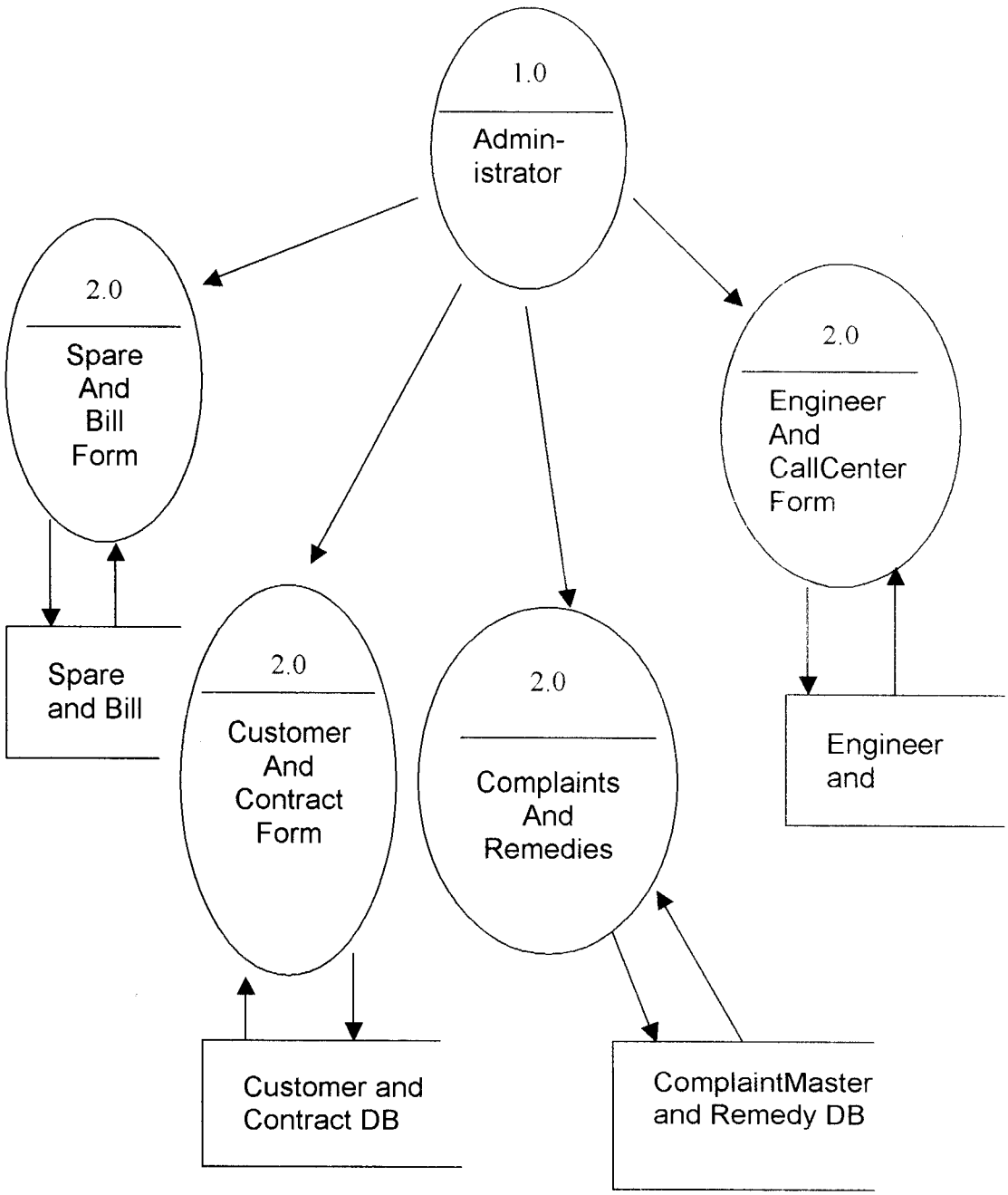



**Figure 5.1.5**

**Data Flow Diagram Level 2 (Administrator Module)**

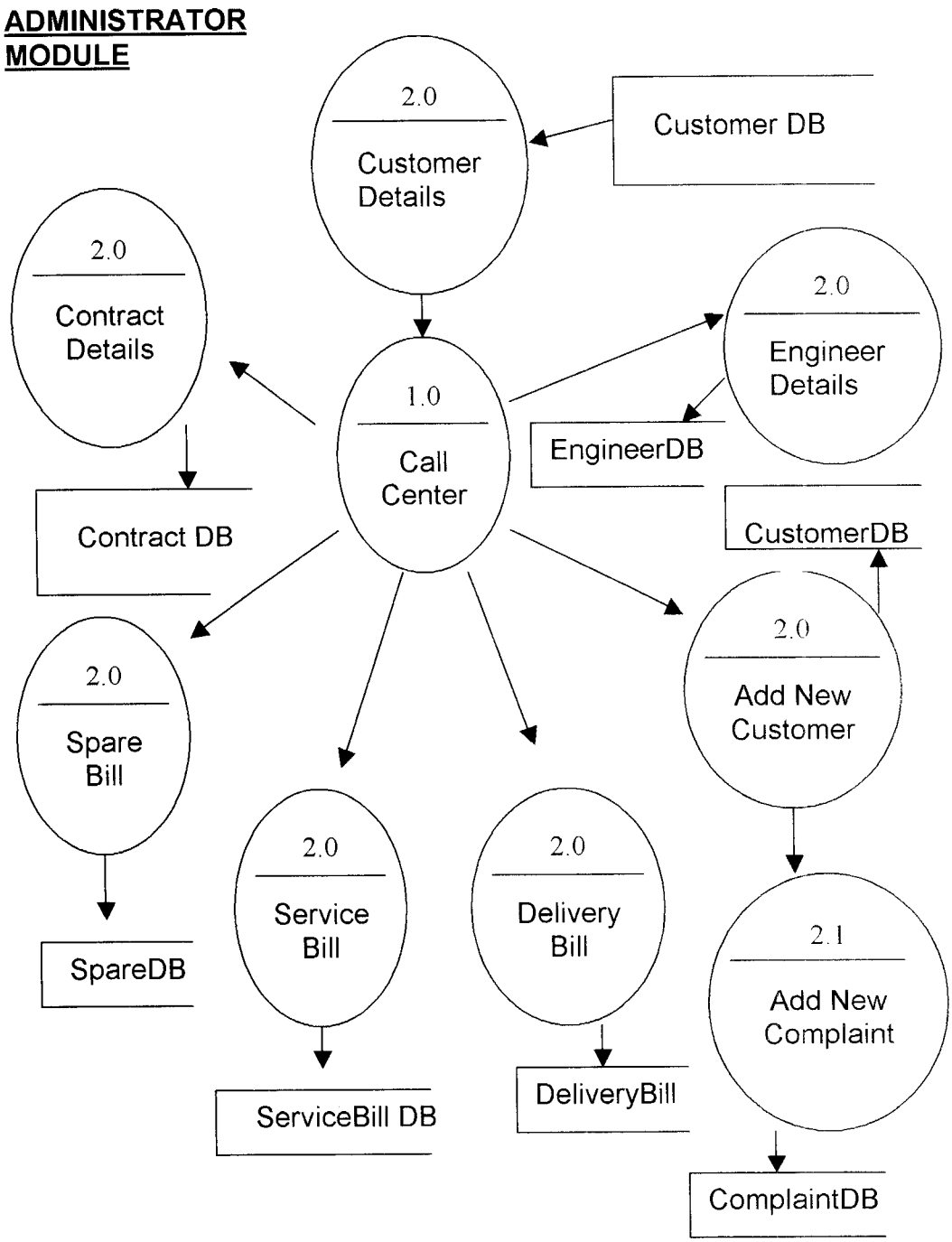



**Figure 5.1.6**

**Data Flow Diagram (Call Center Module )**

# CHAPTER 6

# SYSTEM TESTING AND IMPLEMENTATION

## 6.1 SYSTEM TESTING

System testing is most vital activity that has to be enforced in any system development. This could be done parallel during the development phase and after implementation. The feedback received from this testing was carefully examined for further enhancements. It is the part of testing where the entire website is tested. This testing is performed with the requirements document as the reference and the goal is to see whether the application meets the requirements.

### 6.1.1 WHITE BOX TESTING

White box testing also referred to as glass-box software testing. It is a test case design that would use the 'program control flow' structures to derive software test cases. The software engineer can derive white box software testing using following guidelines.

- All independent paths within a module have been exercised
- All logical decisions are exercised on their true or false sides.
- All loops are executed at their boundaries and within their operational bounds.
- All internal data structures are exercised to assure their validity.

### 6.1.2 BLACK BOX TESTING

Black box testing enables the software engineer to derive set of conditions that will fully exercise all requirements for a web design code. Black box testing "is not an alternative" to white box testing. Rather it is a compulsory approach that it is likely to uncover a different CLASS OF ERRORS than what white box testing methods reveal.

Black box testing reveal attempts to reveal errors in the following software work areas:

- Interface of inputs
- Database access
- Initialization and termination

### 6.1.3 ACCEPTANCE TESTING

Acceptance testing involves planning and execution of the functional tests, performance tests and stress tests in order to demonstrate that the implemented system satisfies its requirements. It is not unusual for two sets of acceptance tests to be run those developed by the Quality Assurance group and those developed by the customer.

### 6.1.4 ALPHA TESTING

A third person who just has the knowledge and the working capacity of the system conducts the alpha test at the developer's site. The developer 'looks over the shoulder' of the user and records the errors and usage problems. The user in turn gives general discomforts, which may be mended to make the system little better in a way of efficiency and user-friendly.

### 6.1.5 BETA TESTING

After alpha testing is done the developed website is given to other solution partners to check for errors. After this testing has been done then the website will be published.

## 6.2 IMPLEMENTATION

The implementation is one phase of software development. It is concerned with translating design specifications with source code. The primary goal of implementation is to write source code, so that its specification can be easily verified and debugging, testing and modifications can be eased. The goal can be achieved by making the source code as clear and straight forward as possible. The implementation is the process of converting a new or revised system into operational one. It is the key stage in achieving a successful new system because; usually it involves a lot of upheaval in the user department.

System testing is an expensive but critical process that can take as much as 50% of the budget for program development. Testing is the stage of implementation, which is aimed at ensuring that the system works accurately and efficiently before live operation commences. It is the process of executing a program with the explicit intention of finding errors. The logical design and physical design are thoroughly examined to ensure that it will work when implemented.

Tests data are designed to show that the system will operate successfully in all aspects and produce expected result as specified. Thus the presentation of test date and the checking of results are carried out in conjunction with the

appropriate user. Implementation includes all those activities that take place to convert from the old system to the new.

The new system may be totally new, replacing an existing manual or automated system or it may be a major modification to an existing system. Proper implementation is essential to provide a reliable system to meet the organization requirements if the organization using the system, but improper installation will prevent it.

# CHAPTER 7

# CONCLUSION

By taking up this project for Easy Design Systems titled as Customer Service Management, I attained an extensive knowledge of how to use the existing system.

This project done for Zellweger Uster India Private Limited is aimed to provide assistance for the customers. It provides an online help to the customers about the past complaints. The module developed would be user friendly and does demand a little computer knowledge to work.

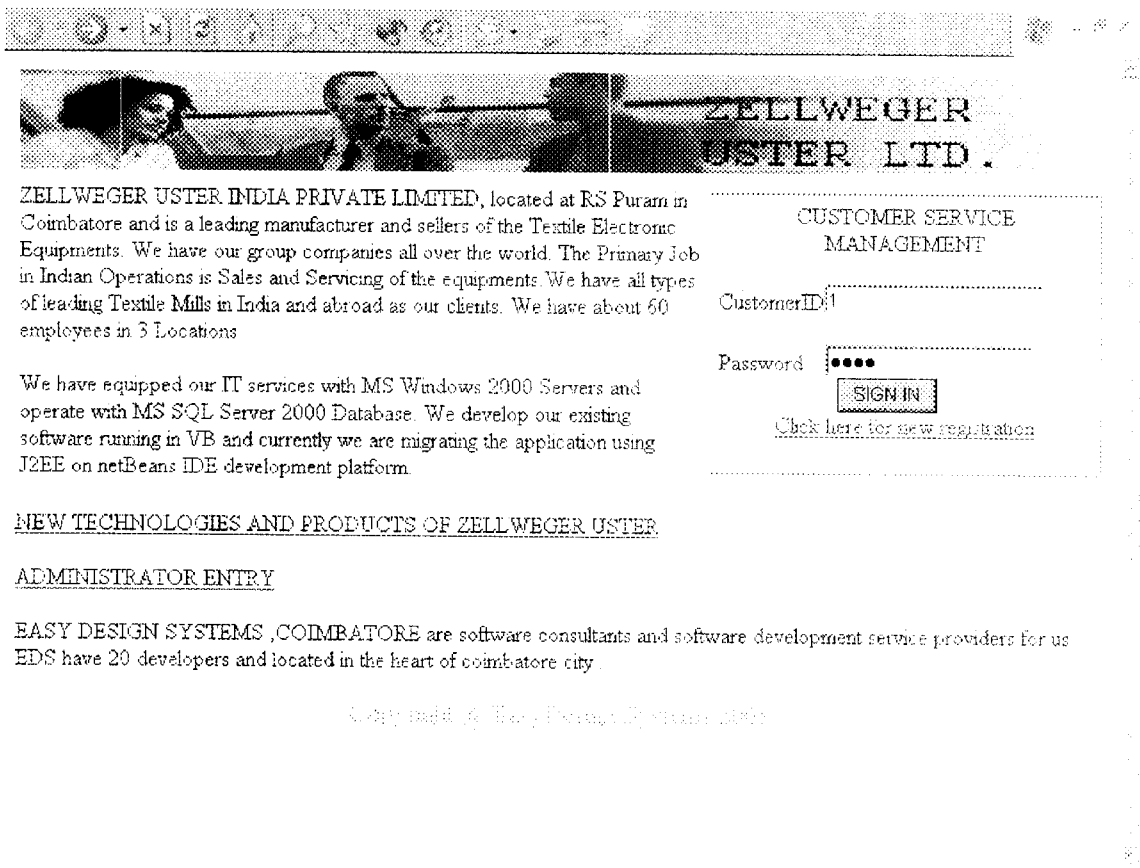
Objectives:

- ►Online help to the customers
- ►large data storage
- ►Easy to handle

So I am proud to undertake and finish this project. The system has been developed keeping in mind all the given possible conditions and found to work efficiently and effectively. The developed system is so flexible that any necessary changes can be made easily.

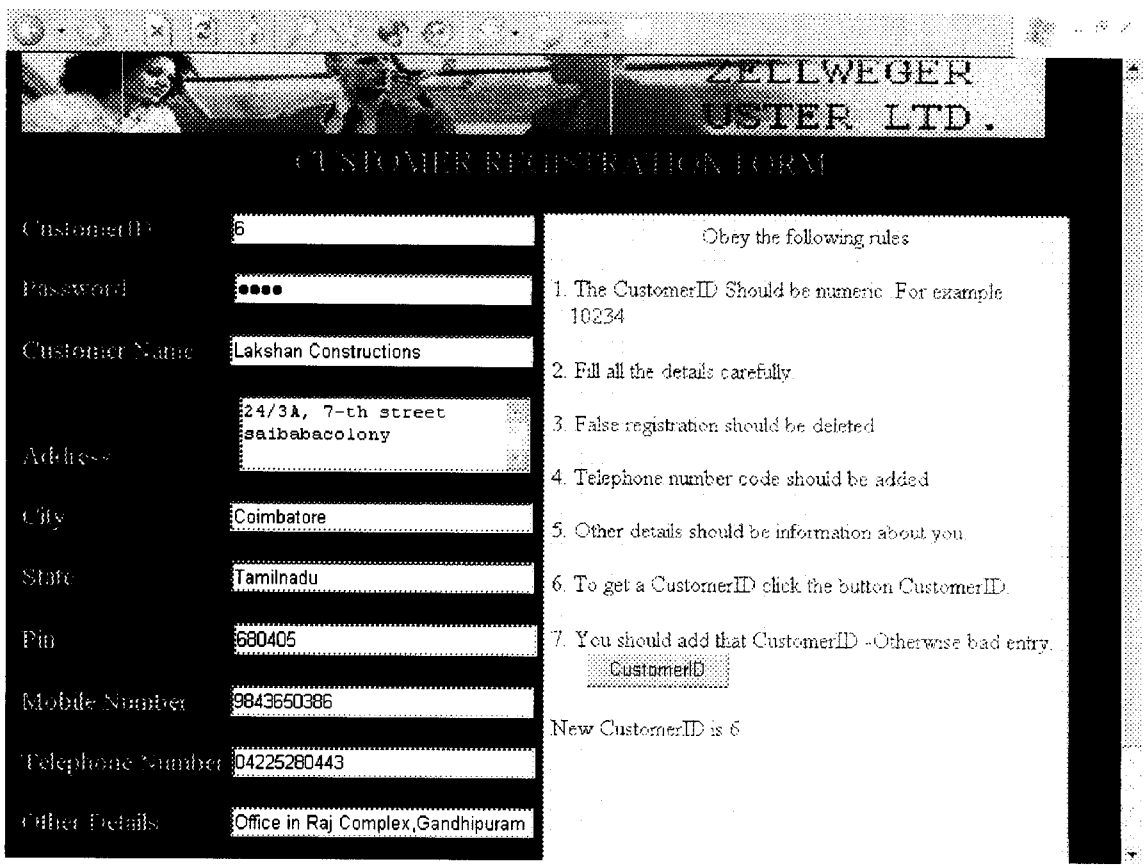
# APPENDICES

## CUSTOMER ENTRY



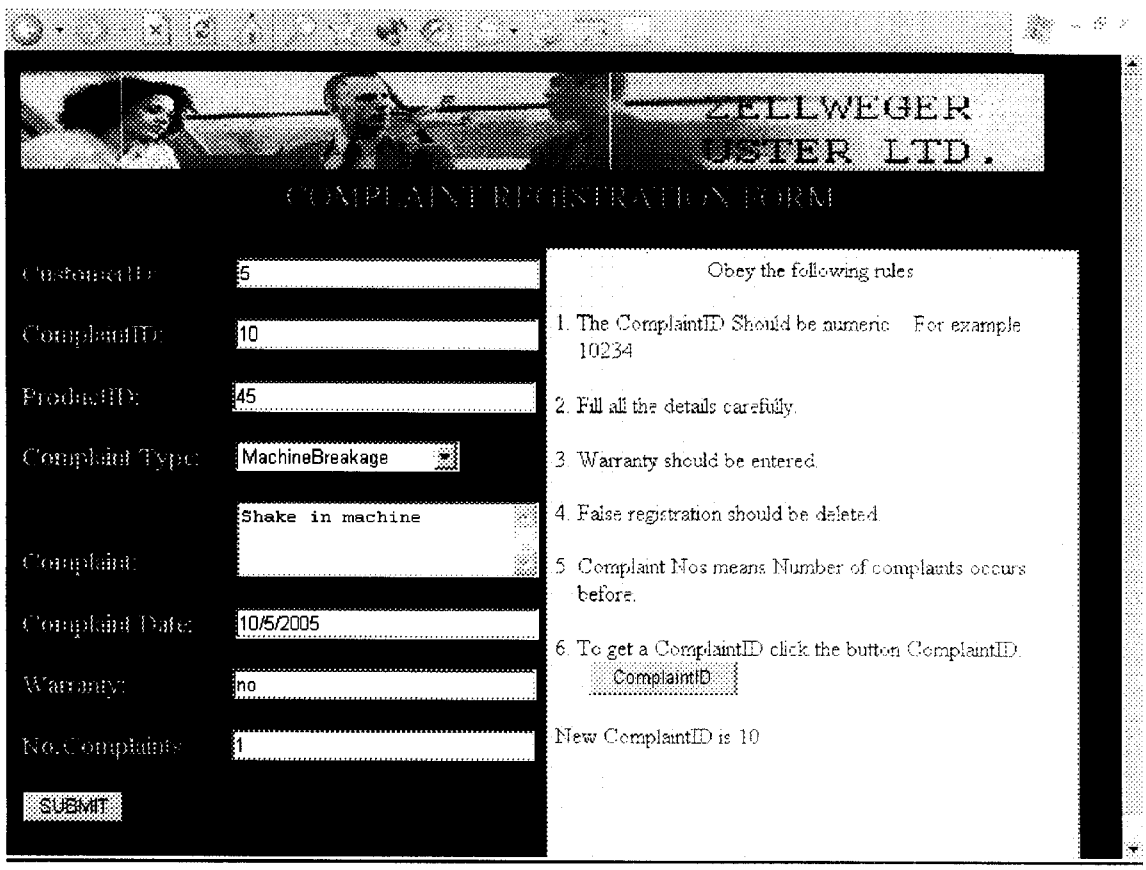
## CUSTOMER FORM

## CUSTOMER REGISTRATION

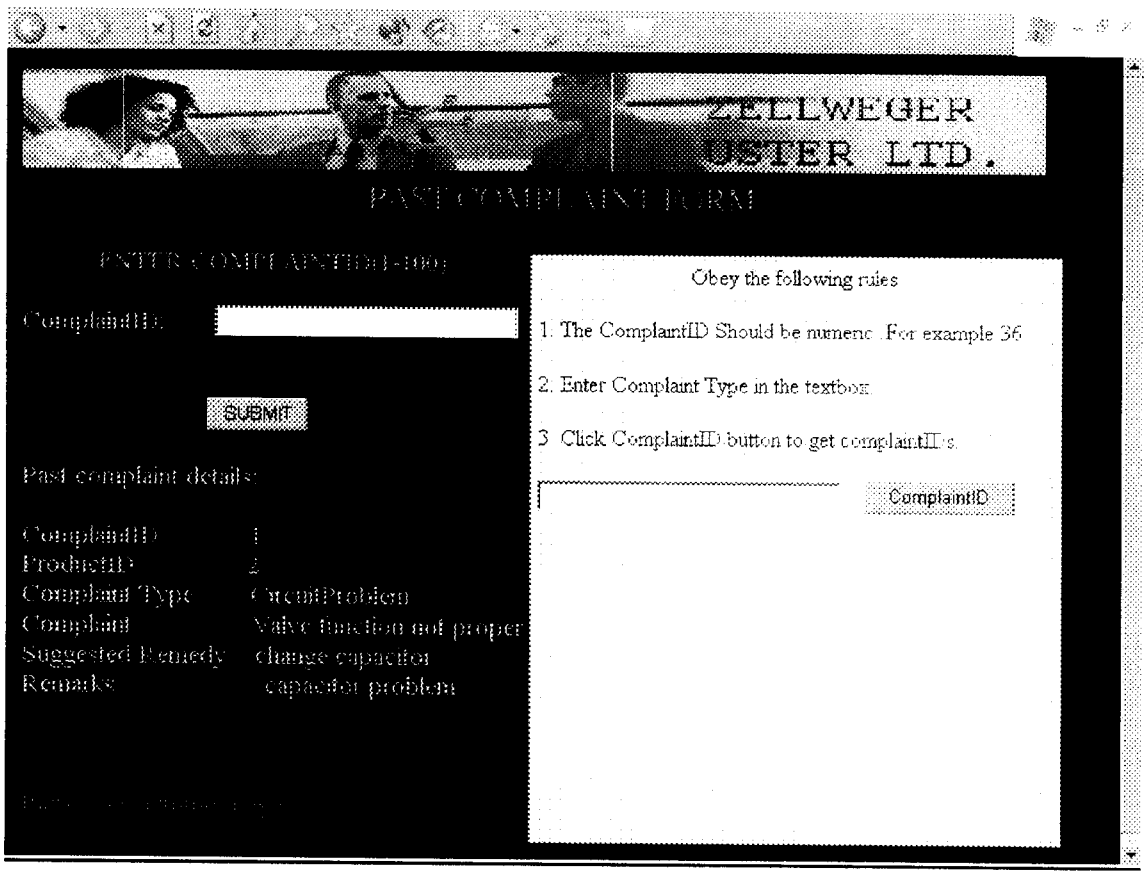


## PERSONAL DETAILS

## ADD COMPLAINT



## PAST COMPLAINTS



## ADMINISTRATOR ENTRY


ZELLWEGER USTER INDIA PRIVATE LIMITED, located at RS Puram in Coimbatore and is a leading manufacturer and sellers of the Textile Electronic Equipments. We have our group companies all over the world. The Primary Job in Indian Operations is Sales and Servicing of the equipments.We have all types of leading Textile Mills in India and abroad as our clients. We have about 60 employees in 3 Locations.

We have equipped our IT services with MS Windows 2000 Servers and operate with MS SQL Server 2000 Database. We develop our existing software running in VB and currently we are migrating the application using J2EE on netBeans IDE development platform.

CUSTOMER SERVICE MANAGEMENT

AdmnID 1

Password ••••

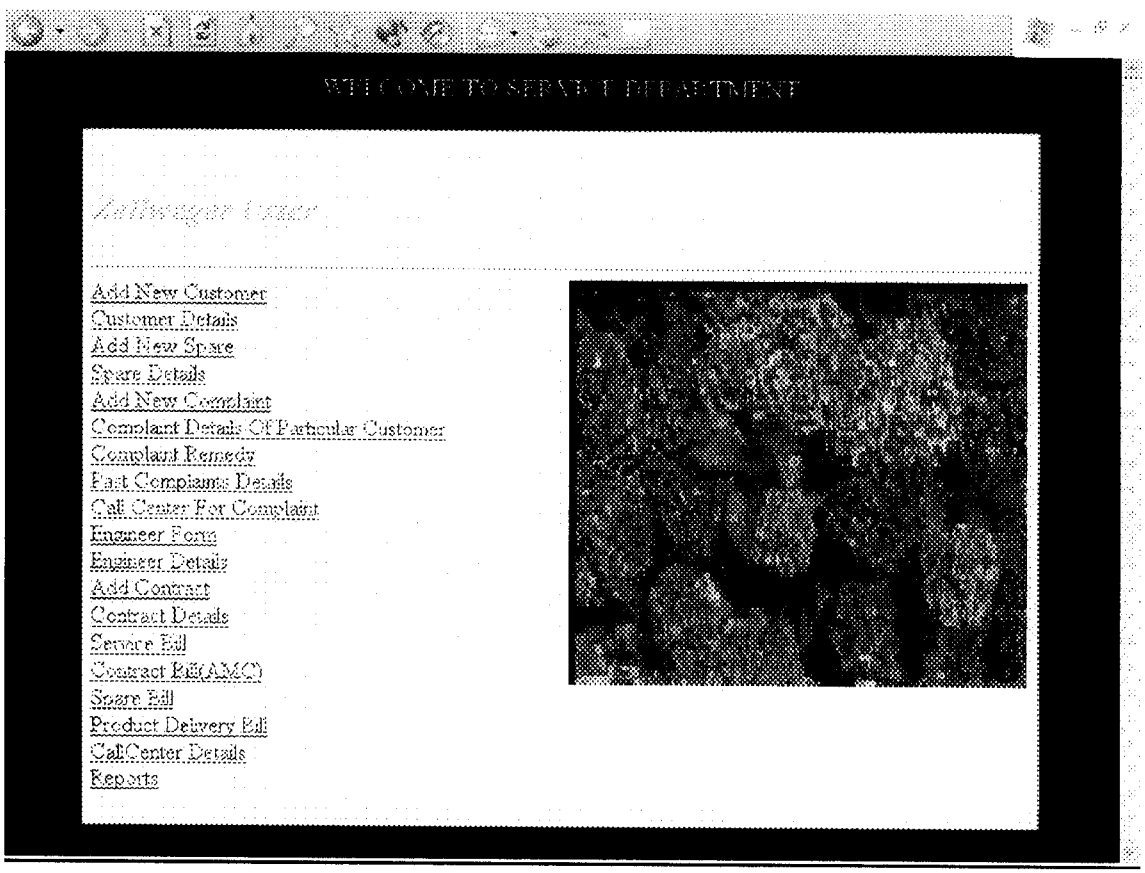
SIGN IN

NEW TECHNOLOGIES AND PRODUCTS OF ZELLWEGER USTER

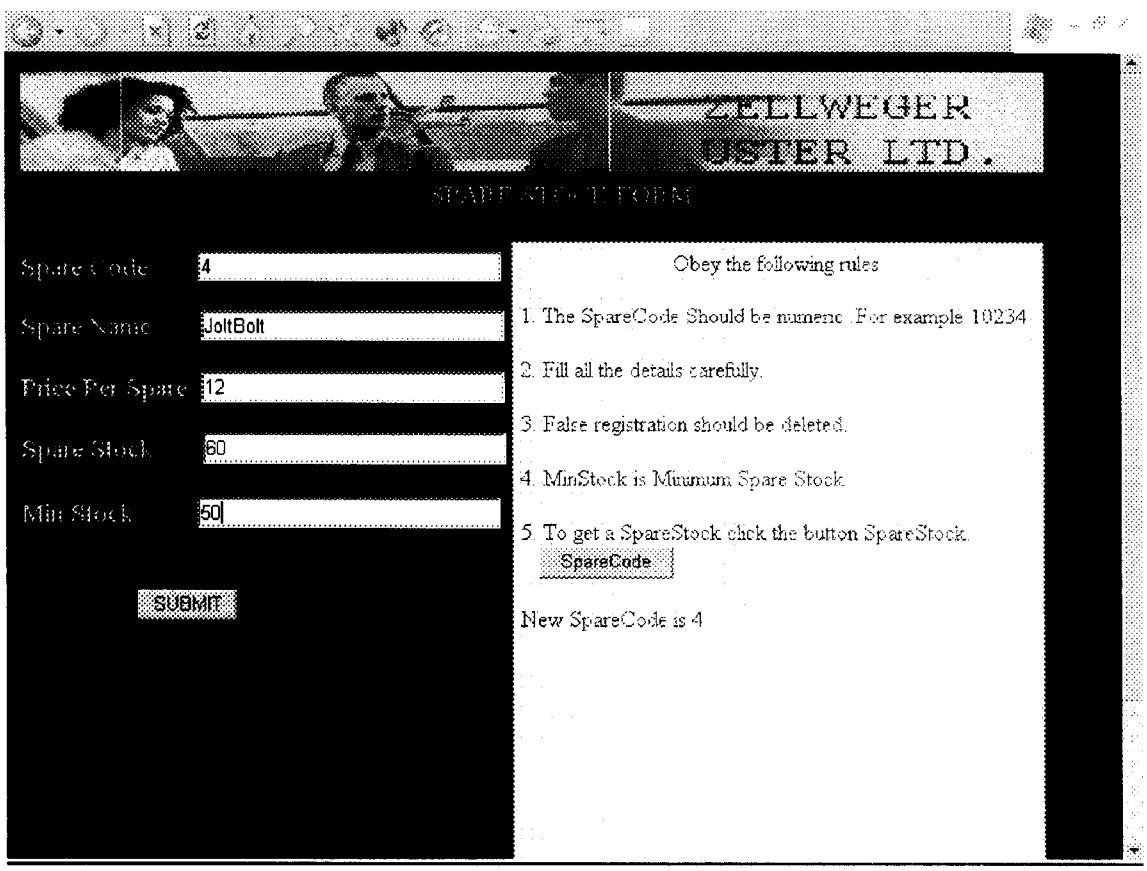
BACK TO HOME PAGE

EASY DESIGN SYSTEMS ,COIMBATORE are software consultants and software development service providers for us EDS have 20 developers and located in the heart of coimbatore city

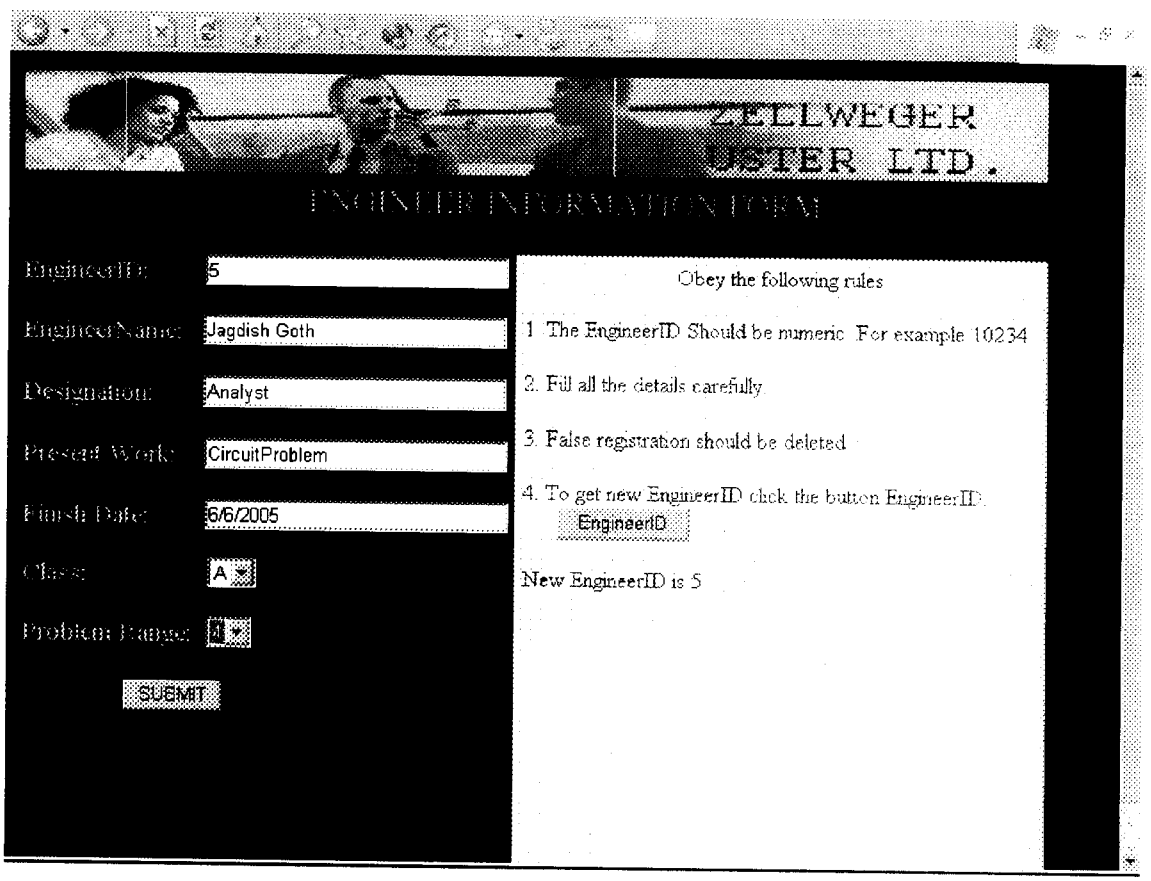
## SERVICE DEPARTMENT FORM



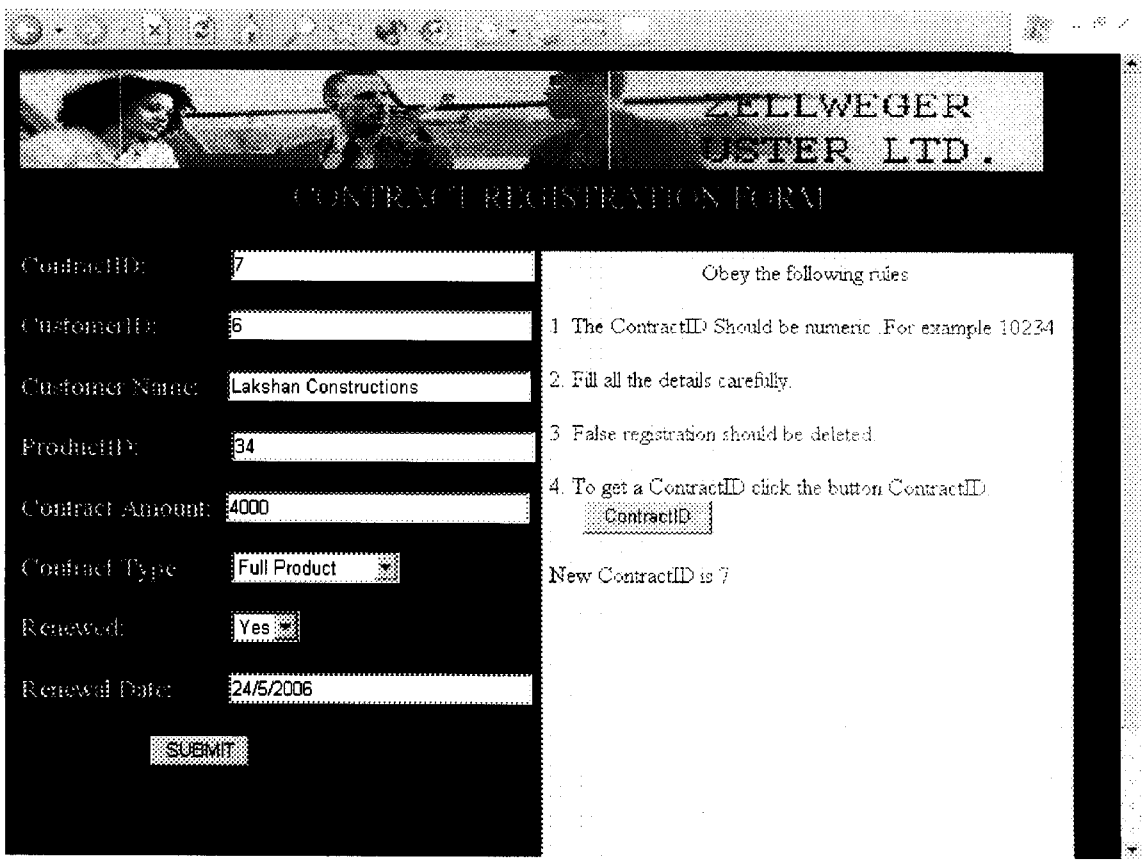
## ADD SPARE


ZELLWEGER
USTER LTD.
Spare Code
4
Spare Name
JoltBolt
Price Per Spare
12
Spare Stock
60
Min Stock
50
SUBMIT
Obey the following rules
1. The SpareCode Should be numeric .For example 10234
2. Fill all the details carefully.
3. False registration should be deleted.
4. MinStock is Mnimum Spare Stock
5. To get a SpareStock click the button SpareStock.
SpareCode
New SpareCode is 4

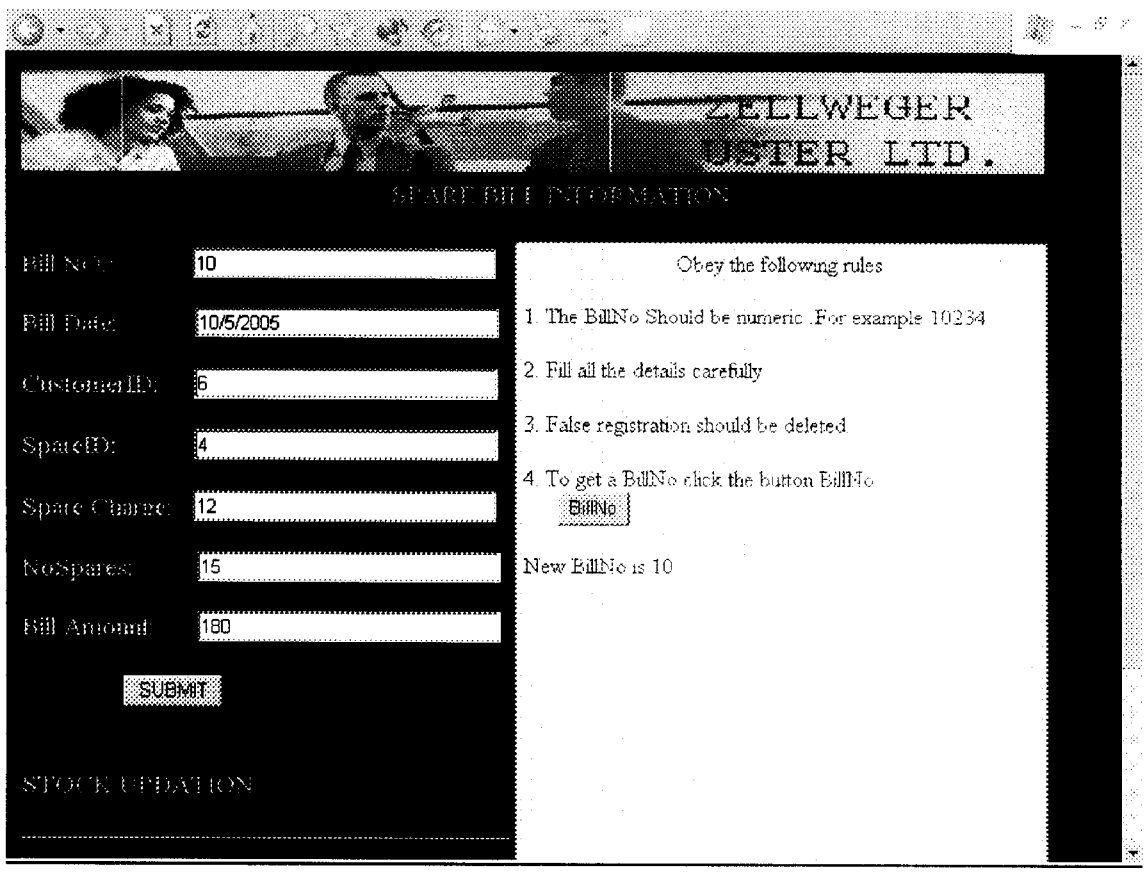
## ADD ENGINEER



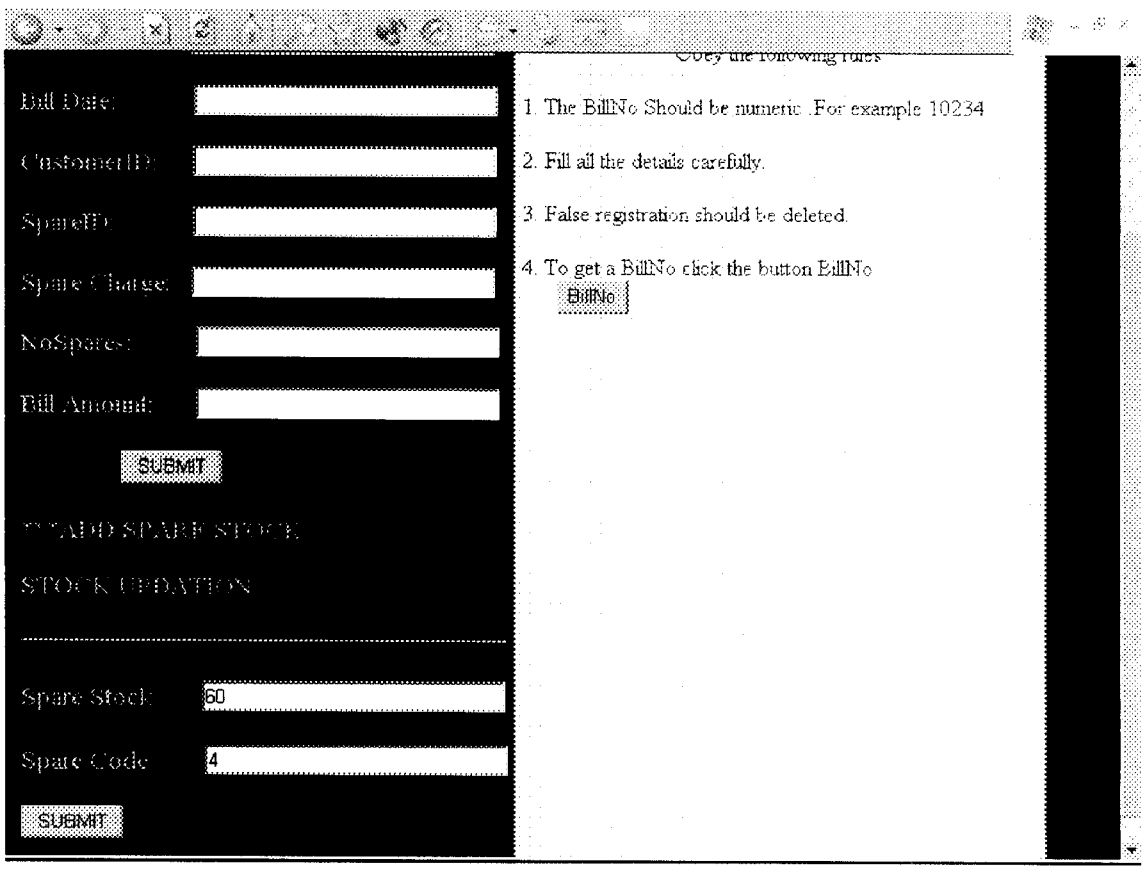
## ADD CONTRACT



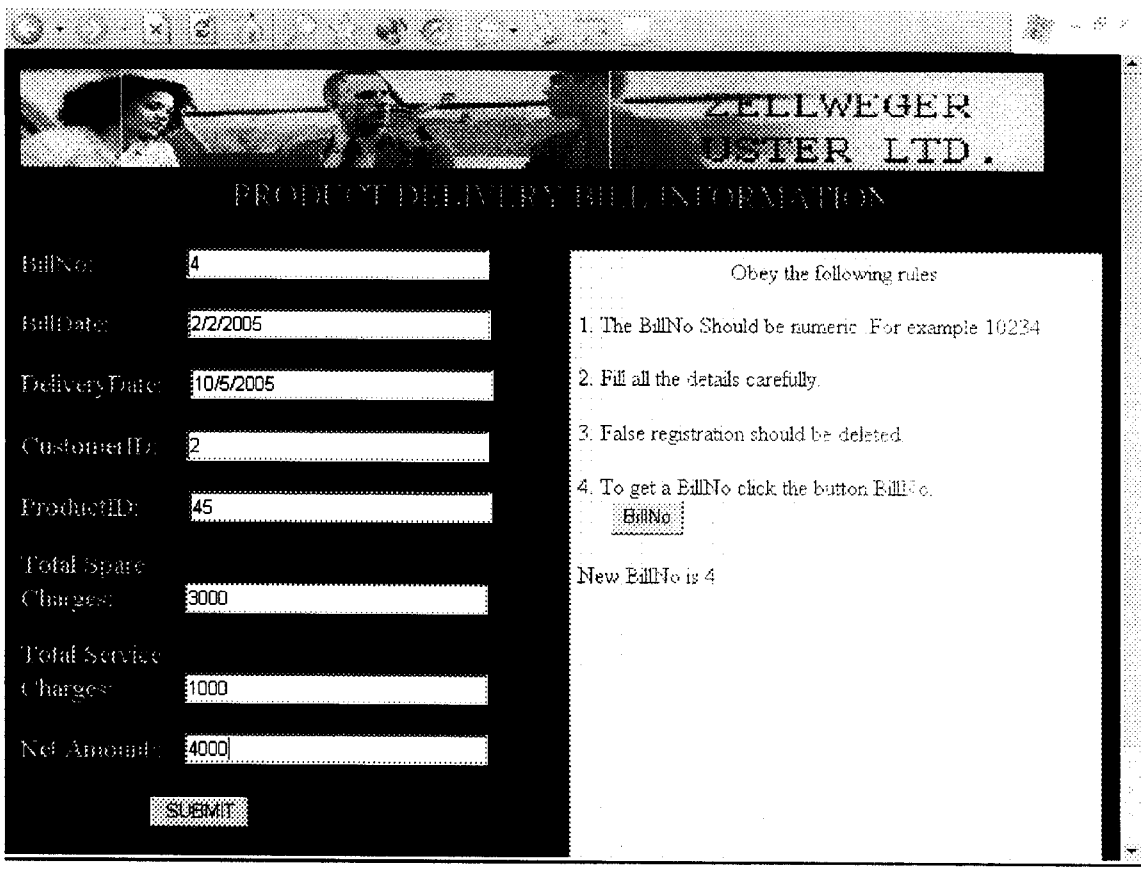
## Spare Bill


ZELLWEGER
USTER LTD.
SPARE BILL INFORMATION
Bill No:
10
Bill Date:
10/5/2005
CustomerID:
6
SpareID:
4
Spare Charge:
12
NoSpares:
15
Bill Amount
180
SUBMIT
STOCK UPDATION
Obey the following rules
1. The BillNo Should be numeric .For example 10234
2. Fill all the details carefully
3. False registration should be deleted
4. To get a BillNo click the button BillNo
BillNo
New BillNo is 10

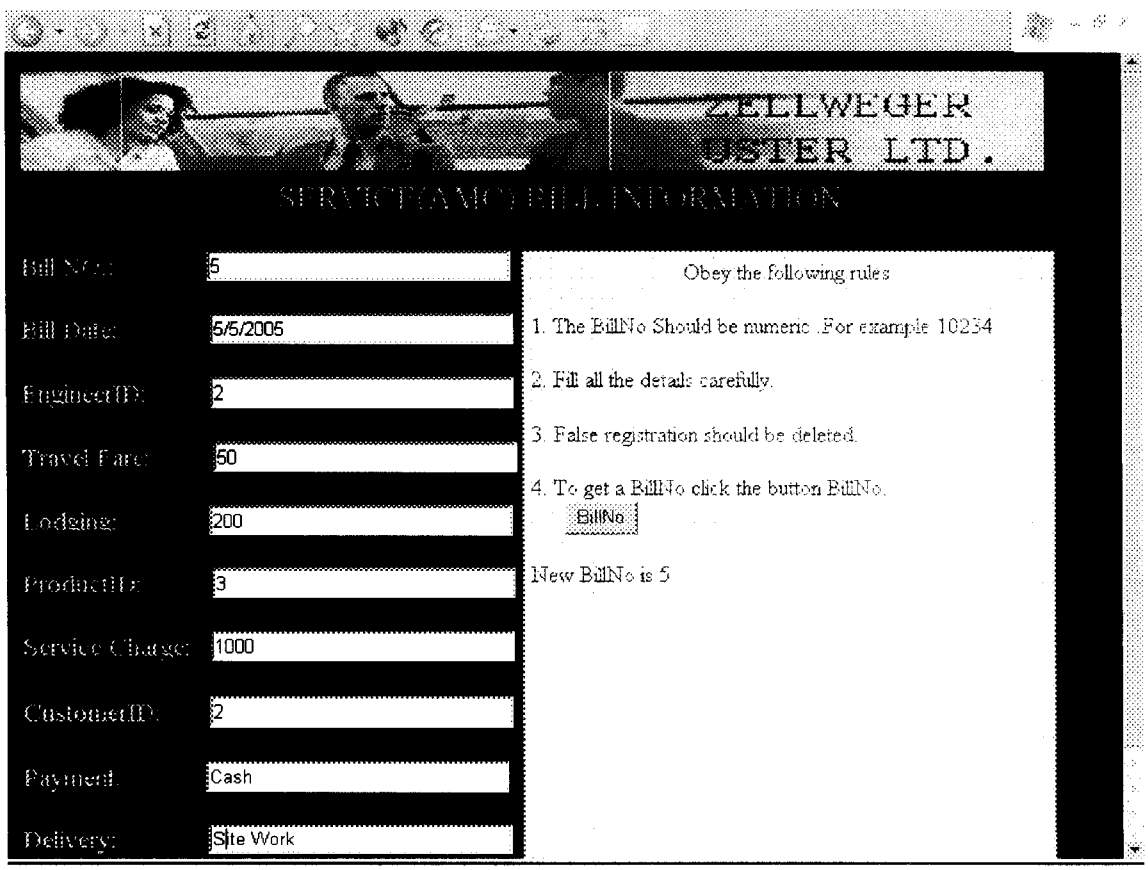
## ADD STOCK


Bill Date:
CustomerID:
SpareID:
Spare Charge:
NoSpares:
Bill Amount:
SUBMIT
ADD SPARE STOCK
STOCK UPDATION
Spare Stock:
60
Spare Code:
4
SUBMIT
1. The BillNo Should be numeric .For example 10234
2. Fill all the details carefully.
3. False registration should be deleted.
4. To get a BillNo click the button BillNo
BillNo

## DELIVERY BILL



## SERVICE BILL



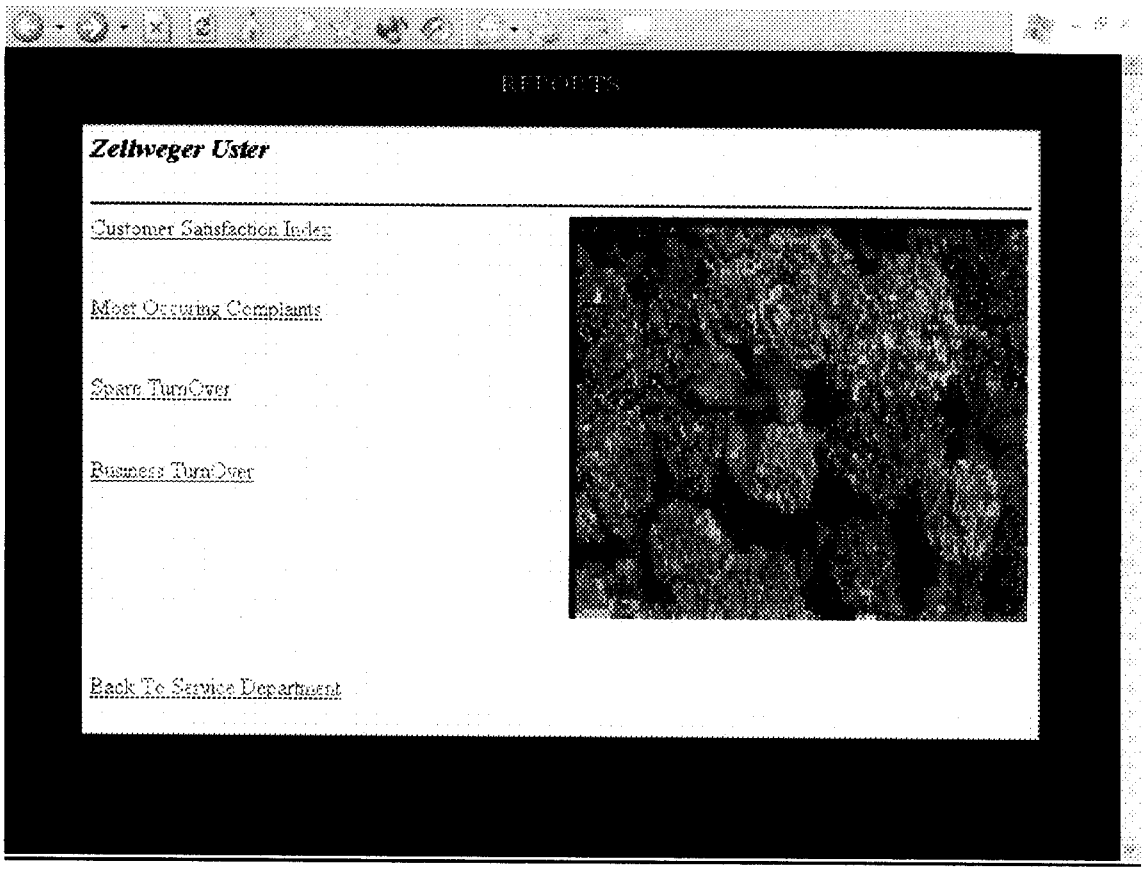
**CONTRACT BILL**

# CONTRACT BILL

SUBMIT

| CONTRACT | CONTRACT DETAILS |
|---|---|
| CONTRACTID | 2 |
| CUSTOMERID | 1 |
| CUSTOMER NAME | Jhon Trading |
| PRODUCTID | 23 |
| CONTRACT AMOUNT | 3000 |
| CONTRACT TYPE | FullProduct |
| RENEWAL DATE | 2004-12-02 00:00:00 |

## REPORTS FORM



**CUSTOMER SATISFACTION INDEX**

# CUSTOMER SATISFACTION INDEX

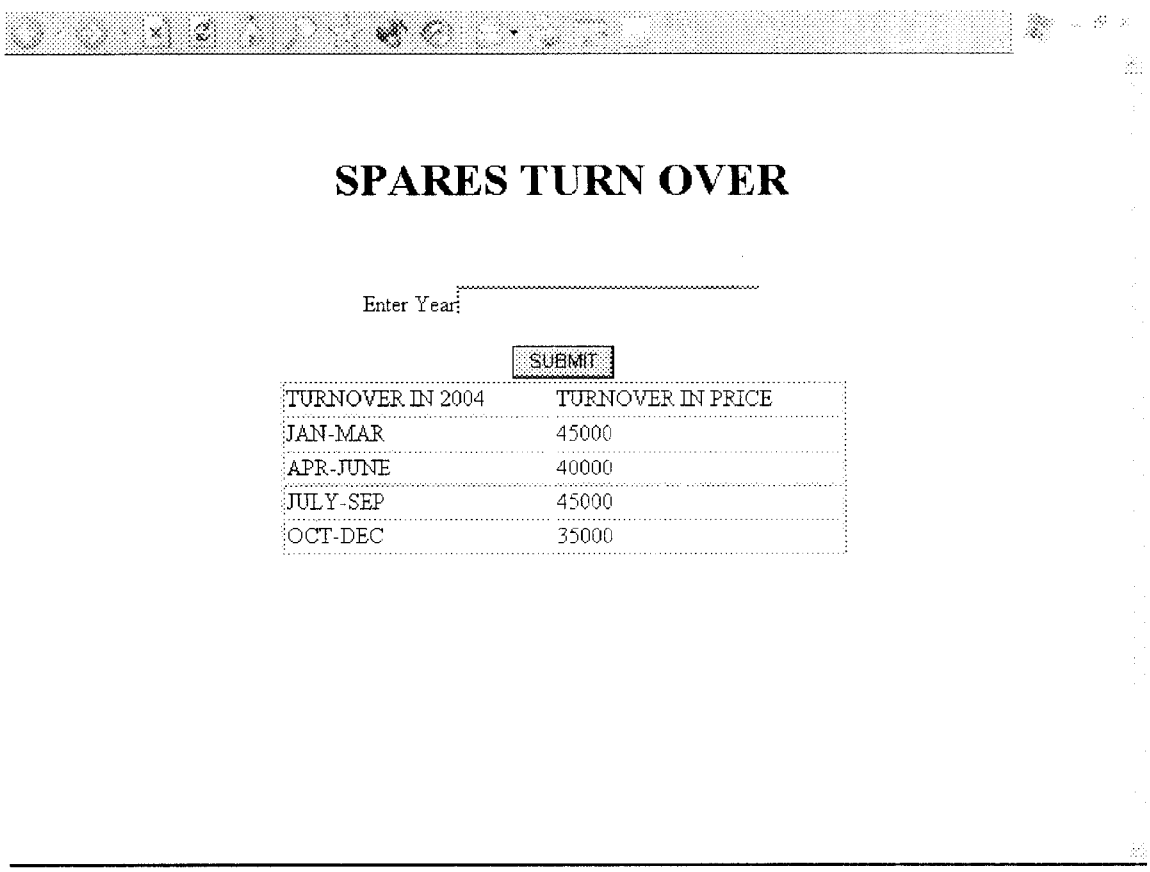
| CustomerID | CustomerIndex |
|---|---|
| 55 | 2 |
| 45 | 3 |
| 56 | 4 |
| 43 | 4 |
| 23 | 2 |
| 57 | 3 |
| 58 | 4 |
| 59 | 5 |
| 60 | 5 |
| 70 | 5 |

**MOST OCCURING COMPLAINTS**

# MOST OCCURING COMPLAINTS

| COMPLAINT TYPE | COMPLAINT NOS |
|---|---|
| Machine Breakage | 3 |
| Power Down | 4 |
| Machine Power Problem | 5 |
| Circuit Problem | 12 |

**SPARE TURNOVER**



# SPARES TURN OVER

Enter Year:

SUBMIT

| TURNOVER IN 2004 | TURNOVER IN PRICE |
|---|---|
| JAN-MAR | 45000 |
| APR-JUNE | 40000 |
| JULY-SEP | 45000 |
| OCT-DEC | 35000 |

**BUSINESS TURNOVER**

# BUSINESS TURN OVER

Enter Year:

SUBMIT

| TURNOVER IN 2004 | TURNOVER IN PRICE |
|---|---|
| JAN-MAR | 150000 |
| APR-JUNE | 160000 |
| JULY-SEP | 120000 |
| OCT-DEC | 175000 |

## REFERENCES


1. Aneesha Bakharia(2001) 'JavaServer Pages . Prentice-Hall of India Private Limited .,New Delhi .

2. Brian Jepson(1997) 'Java Database Programming . John Wiley & Sons,Inc .,United States Of America .

3. Herbert Schildt(1980) 'Java Server Page(jsp)'.

4. Dustin R. Callaway(2000)'Inside Servlets .Addison-Wesley., NewDelhi .