Kumaraguru College of Technology

Department of Computer Science and Engineering
Coimbatore– 641006.

April 2003

PROJECT MATE

AN ONLINE TEST CASE MAINTENANCE SYSTEM

Project work done at P- 1027

COVANSYS (INDIA) PRIVATE LIMITED

PROJECT REPORT

Submitted in partial fulfillment of the

Requirements for the award of the degree of

Master of Computer Applications

Bharathiar University, Coimbatore

Submitted by

SRIKRISHNA S
Reg.No: 0038M1068

Internal Guide

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External Guide

Mr.B.Shivaprasad
Project Leader,
Covansys India Private Limited
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CERTIFICATE

This is to certify that the project work entitled

PROJECT MATE – AN ONLINE TEST CASE MAINTAINANCE SYSTEM.

Submitted to the

Department of Computer Science and Engineering

Kumaraguru College of Technology

In partial fulfillment of the requirements for the award of the degree of Master of Computer Applications is a record of original work done by Srikrishna.S, Reg.No.0038M1068 during his period of study in the Department of Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore under my supervision and this project work has not formed the basis of award of any Degree/Diploma Associateship/Fellowship or similar title to any candidate of any university.

Professor and Head

Staff-in-charge

Submitted for University Examination held on 16.04.2003.

Internal Examiner

16/4/03

External Examiner

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March 24, 2003

Mr. Muthukumar,
M.C.A Course Co-coordinator,
Kumaraguru College of Technology,
Coimbatore.

Dear Sir,

This is to certify that Mr.S.Srikrishna, who is doing his final M.C.A in Kumaraguru College of Technology, Coimbatore has successfully completed his work entitled "PROJECT MATE" – An Online Test Case Maintenance System, from the month of December-2002 till March-2003. We are satisfied with his work performance and the project will be implemented soon.

His attendance record has also been satisfactory.

Your Sincerely,
For Covansys (India) Private Limited

R Kasturi Rangan
Vice President - Projects

DECLARATION

I here by declare that the project entitled **PROJECT MATE** - An Online Test case Maintenance System, submitted to Bharathiar University as the project work of Master of Computer Application Degree, is a record of original work done by me under the supervision and guidance of **Mr.S.Sundram, Manager – Projects, Covansys (India) Private Limited**, Chennai and **Ms P.Parameshwari, M.C.A, Lecturer**, Department of Computer Science, Kumaraguru College of Technology and this project work as not found the basis for the award of any Degree/Diploma/Associate-ship/Fellow-ship or similar title to any candidate of any University.

Place: COIMBATORE

Date: 08/04/2003

Signature of the Student

ACKNOWLEDGEMENT

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 the Head of the Department **Dr.S.Thangasamy, Ph.D.,** Computer Sciences and Engineering, **Kumaraguru College of Technology,** for encouraging me to take up the project at Covansys (India) Private Limited, Chennai.

I express my sincere thanks to **Mr. A.Muthukumar, M.Sc, MCA, M.Phil**, Senior Lecture, Master of Computer Application, without whose motivation and guidance I would not have been able to embark on a project of this magnitude.

I would like to thank my guide **Ms P.Parameshwari M.C.A**, Lecturer, Dept. of Computer Science and Engineering, Kumaraguru College of Technology, for her active guidance in completing this project and also thank other staff members.

I wish to extend my gratitude to **Mr.R.Kasthurirangan,** Vice President – Covansys (India) Private Limited, Chennai for giving me the opportunity to do this project.

I am greatly privileged to express my deep sense of gratitude to **Mr.S.Sundaram**, Project Manager and **Mr.B.Shivaprasad**, the Project Leader for their valuable advice and encouragement.

My special thanks to all my friends who gave their hands in fulfilling the project.

S.SRIKRISHNA.

SYNOPSIS

The project work entitled "PROJECT MATE"-An online Test Case Maintenance System is an application system developed for Covansys (India) Private Limited, Chennai.

Covansys India has an impressive track record in executing projects in Europe, USA and Asia with quality and client satisfaction as primary objectives. It has provided special expertise for developing many applications based systems. "PROJECT MATE"-An online Test Case Maintenance System was one such application developed by Covansys (India) Private Limited.

" PROJECT MATE " is an online test case maintanence system. This software will be helpful in automating the various services such as writing new test cases, updating the test cases, reviewing the test cases and base lining. All these functionalities will be possible online through this system.

This system was developed using Java Servlets, Java Server Pages, HTML and Oracle 9i as the backend database to store data.

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1. INTRODUCTION

1.1 PROJECT OVERVIEW

"PROJECT MATE " is an online test case maintanence system. The purpose of this system is to provide the services such as writing new test cases, updating the test cases, reviewing the test cases, automatic versioning and baselining online. This system will help developers, testers and reviewers to minimize their work by providing the services online. The system will be used to generate defect matrix and reports automatically. The various modules involved in the system are

- Work Allocation.
- Define Test cases.
- Upload Test cases
- Review Test cases.

SYSTEM SCOPE

This software will be helpful in automating the various services such as writing new test cases, updating the test cases, reviewing the test cases and base lining. All these functionalities will be possible online through this system.

SYSTEM HIGHLIGHTS

- It will help to automate all these services in the organization.
- In the proposed system the configuration item may be considered as a test case, wherein the test plan consists of the test case.
- The system will provide project metrics.
- It gives us any details needed at any time including the status etc.

- The system can add additional features such as test cases, coding etc to this system in future.
- All the debugging activites can be done online and so it takes very little time.
- The system is scalable.

1.2ORGANIZATION PROFILE

Covansys (India) Private Limited was known previously as Complete Business Solutions (India) Limited. CBSI was established in 1991 as Total Business Solutions (TBSI), a joint venture between Indchem Electronics, India and Complete Business Solutions Inc. (CBS Inc.), based at Farmington Hills, Detroit, Michigan, and USA. In 1994, CBS India became a wholly owned subsidiary of CBS Inc. In February 2001, the parent company changed its name to Covansys, as part of a worldwide branding exercise. The offshore facilities in India are therefore now called Covansys, India (P) Ltd.; Covansys (India) Private Limited is a leading software company which has attained the status of PCMM (People Capability Maturity Model) LEVEL 5 certification for quality assurance.

Covansys is a leading provider of software development, maintenance and re-engineering services to Fortune 500 companies worldwide. Covansys India focuses on defining, optimizing, and aligning customer business and IT strategies through expert solutions in Web applications, Data warehousing, Object-oriented development and Legacy applications. Covansys provides high-quality, cost-effective solutions in the quickest possible time. These enable customers to take advantage of new technologies to create new goods and services and to thrive in new business environments. In short, Covansys India's aim is to become the most sought-after service provider to the world's most-demanding customers.

Covansys India's nearly 1700-strong employee base and broad mix of functional and industry experience helps the company achieve targets easily and efficiently. An integrated on-site/off-shore team capable of providing 24x365 services to clients accelerates delivery time. While our onsite members are available with the client around the clock to assist with emergency requests, the offshore team is involved in regular development, modification, maintenance, enhancement and documentation. This is made possible with Covansys India's state-of-the-art satellite communication infrastructure, which translates into round-the-clock production, multiple delivery options, high impact and cost-effective IT solutions.

Expertise

Covansys India's versatile end-to-end service capabilities include: Business Consulting, E-Business Services, Client Server/Legacy Systems Development, Maintenance Outsourcing, Re-engineering, Contract Programming, Data Warehousing, Network Consulting, PeopleSoft Practice and SAP Practice. Industry-Focused Solutions Over 500 companies rely on Covansys India on an ongoing basis and consult the company whenever they need expert IT assistance. Covansys India has worked with market leaders across industries and has built special expertise in the following areas:

- Banking and Financial Services
- Retail/Distribution
- Health Care
- Manufacturing
- Insurance & Public Retirement Services
- Utilities

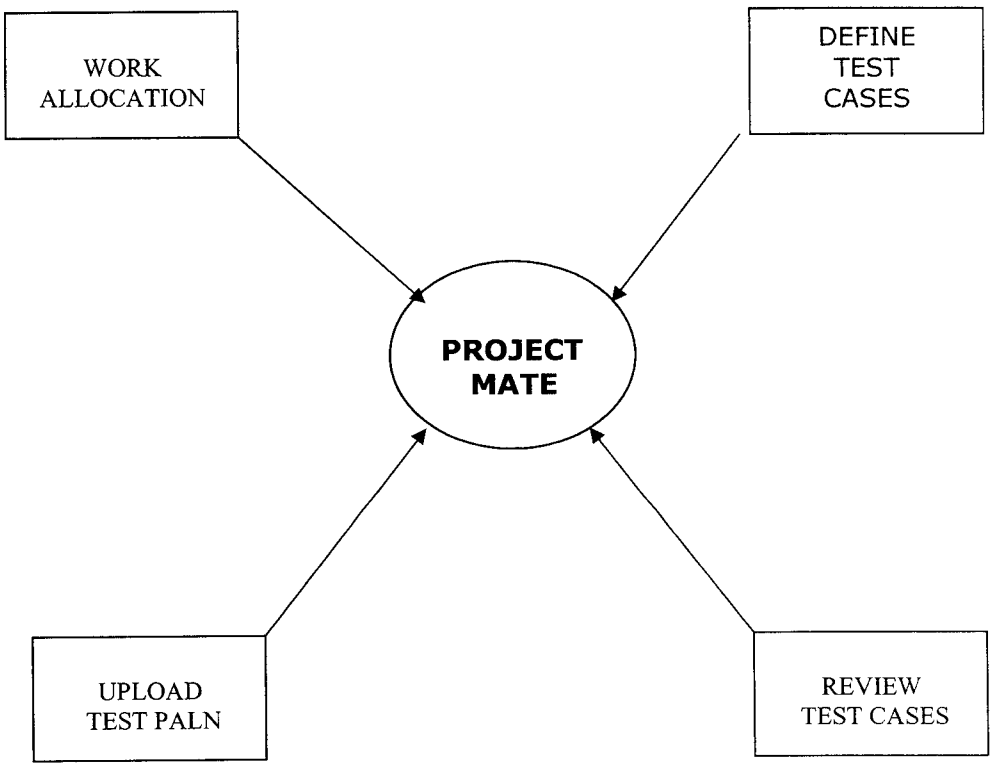
In addition, Covansys has one of the largest U.S.-owned offshore facilities in the world, which enables it to offer its clients a unique operating model with infinitely

flexible onsite/offshore development centers. For its clients, it translates into round-the-clock production, multiple delivery options and high-impact, cost-effective IT solutions.

Clientele

Covansys India has an impressive track record in executing projects in Europe, USA and Asia with quality and client satisfaction as primary objectives. Covansys India is the preferred software services vendor for IBM, UNISYS, Tandem, Ford, Chrysler and MCI to name a few. Others include CITIBANK, Merrill Lynch, UNILEVER, NEC Japan, ACI, ACS, The Gap Inc, CCC, UNUM, SWIFT Belgium, AC Nielsen, WW Grainger, Lands' End, Spartan Stores, Shopko, Kroger, and SEARS most of whom are Fortune 500 clients.

1.3 CONTEXT DIAGRAM



2. SYSTEM STUDY AND ANALYSIS

The system analysis is concerned with analyzing systems with view to making them more effective either by modification or by substantial redesign.

The system analysis involves mainly in developing new information systems; this activity involves investigation of current systems, proposing system and evaluating possible new systems, designing in detail the new system that is agreed, implementing it and maintaining it during its operational life.

Requirement analysis is used to analyze the knowledge about the existing system. After understanding the limitation of the existing system and the identification of the problems, alternate system solutions are studied and recommendations are made about committing the resources required to design the system. Various studies are done in order to get the information like how the data are processed with in the organization, how data are searched for within the organization, how safe the data is used within the organization, what is the procedure for data retrieval and transit.

2.1 EXISTING SYSTEM

In the existing system all the services such as writing new test cases, updating the test cases, reviewing the test cases are not in an organized manner.

- In the existing system the configuration item is a test plan only.
- All the information such as who created the test case? When it was created? What for it was created? Time taken to prepare the test case? And other details are maintained manually.
- There is redundancy of information entry and multiple documents are present.

- The time taken for debugging a bug is too much. In other words it can be said that the tester has to find the bug first, copy it to a separate folder, debug it, again put in the correct place and fix it. So it can be termed as a lengthy process.

- The tracking of status of the test plan is very difficult to be determined.

- Defect matrixes are to be manually determined which is a difficult and a lengthy process.

2.2 PROPOSED SYSTEM

The proposed system should be developed in such a way to solve the above problems faced by the present normal system by using latest technology. For this, the ideal environment is the windows environment, as it is the most popular multitasking tool available today. The tool used to develop the system is Java Servlets for its flexibility and versatility.

The proposed system will help in

- It will help to automate all these services in the organization.

- In the proposed system the configuration item may be considered as a test case, wherein the test plan consists of the test case.

- The system will provide project metrics.

- It gives us any details needed at any time including the status etc.

- The system can add additional features such as test cases, coding etc to this system in future.

- All the debugging activites can be done online and so it takes very little time.

- The system is scalable.

2.3 REQUIREMENTS OF NEW SYSTEM

Because of the manual work done by the organization there are certain limitations as follows.

- For finding a single Test Case we have to search thought out the whole system and hence it will lead to wastage of time and human resources. So the new system can help in solving the problem.

- Once the testing is over, we have to see that the test cases are kept in a safe place because it may be needed any point of time. Hence the new system can help in maintaining the test cases in the database safely.

- A test case may be prepared by one person and when any other person checks up he may not able to know who prepared the test cases and whether the test case was successful or not. So this also can be overcome.

- The system can help us to know whether the test cases were done within the stipulated time or not.

- This system will help us to determine the defect matrix is unable to be correctly and easily.

2.4 USER CHARACTERISTICS

The user of this application should have a basic knowledge about using Internet, which is more than enough. Since it is a user-interface system, the events like clicking and selecting are only to be used. Therefore the user will not be having any difficulty in using the system. Moreover help tips are provided wherever necessary, which facilitates users to work with ease.

3. PROGRAMMING ENVIRONMENT

3.1 HARDWARE CONFIGURATION

The software can be run on any Pentium 100MHZ processor or above. The hardware configuration for the system is as follows

SERVER CONGIGURATION

Processor	:	Pentium®
Memory	:	32 MB
Ports	:	2serial & 1 parallel port.
Floppy Drive	:	1.44 MB
Keyboard	:	105 Keys.
Mouse	:	Logitech Mouse (2 button)
Modem	:	Minimum 36 KBPS speed.

The operating system of server and client is as follows

Server Operating System: Windows NT

Client Operating System: Windows 95

CLIENT CONFIGURATION

Processor	:	Pentium®
Memory	:	32 MB
Hard Disk	:	4 GB
Ports	:	2serial & 1 parallel port.
Floppy Drive	:	1.44 MB
Keyboard	:	105 Keys.
Mouse	:	Logitech Mouse (2 button)
Modem	:	Minimum 36 KBPS speed.

3.2 DESCRIPTION OF SOFTWARE AND PACKAGES USED - REASONS

The software used to develop the proposed system is as follows

- **JAVA Servlets**
  - Internet tool used for web publications.
- **Hypertext Markup Language**
  - Internet tool used for web designing.
- **JavaScript**
  - Scripting Language used to run client side events.
- **Tomcat Server**
  - Web Server to satisfy client side requests.
- **Oracle 9i**
  - Database used to store data.
- **Windows NT**
  - Operating System used for the system.

THE JAVA LANGUAGE

EVOLUTION OF JAVA

Java was conceived by James Gosling, Patrick Naughton, Chris Wrath, Ed Frank and Mike Sheridan at SUN Micro Systems. The primary motivation was the need for platform independent (architecture neutral) language that could be used to create software to be embedded in various consumer electronic devices such as Microwave ovens and remote controls. However with the emergence of World Wide Web, Java was propelled

to the forefront of computer language design, because the web too demanded portable programs.

JAVA derives much of its character from C and C++. This is by intent; Java is cohesive and logically consistent. It gives the programmer full control. Because of the similarities between Java and C++. it is tempting to think of Java as simply the "THE INTERNET VERSION OF C++". However to do so would be a great mistake, because Java is either upwardly or downwardly compatible with C++. That is, Java is not a language that exists in isolation; rather it is the current instance of an ongoing process began years ago. It is a revolutionary force that will change the world.

JAVA 'S PART IN INTERNET

Java has a profound effect on Internet. Because Java expands the universe of objects that can move about freely in the Cyber Space. In a network two very broad categories of objects are transmitted between the server and the personal computer: Passive information and Dynamic, active programs. For example when you read your E-Mail you are viewing passive data. The server might provide a program to display properly the data that server is sending which is an example for dynamic programming.

The dynamic programs present serious problems in the areas of security and portability. This is taken care in Java by a feature called APPLET.

JAVA FEATURES

These are several features in Java, which makes it highly used in Internet based applications. These include security features, the Core API, open standards and memory management.

SECURITY FEATURES

Java security model has three primary components: the class loader, byte code verifier, and security manager. The byte code verifier ensures that Java program has been

compiled correctly, that they will obey the Virtual Machine's (VM) accesses restrictions, and that the byte codes will not access "Private" data when they shouldn't. The class loader provides the next layer of security. When the class loader prevents a class that is loaded off the network from pretending to be one of the standard built-in classes, or from interfering with the operation of class loaded from other servers. The security policy determines which activities the VM is allowed to perform and under what circumstances.

THE CORE API

Java's core API provides a common set of functions on all platforms. The API is divided into packages, which are groups of classes that perform related functions. One of these packages includes some core languages functionality, such as text handling and error processing.

PLATFORM INDEPENDENT

Java Virtual machines are available for more than a dozen different hardware /operating system combinations. The Java class files do not need to be compiled for each platform in advance. The same compiled Java program will work on the PC, Macintosh and every other platform that runs a Java VM. The core API is the same for all the implementation of Java and it is sophisticated enough that the native code is not needed to be written for the desktop applications.

DISTRIBUTED AND DYNAMIC

In the window operating systems, parts of program can be shared and loaded dynamically, i.e. when the program is running. The operating system does the modularity of the soft wares. Java takes Dynamic libraries a step further. The VM class loader fetches class files from the network s as well as from the disk, making Java applications distributed as well as dynamic.

OBJECT ORIENTED

Object- Oriented Programming is a way to write software that is reusable, extensible and maintainable. Java is an Object-Oriented, i.e. it has facilities for OOP incorporated into the language. The core API is an actually a collection of prefabricated OOP components known to Object-Oriented programmers as class library.

MULTITHREADED

A single-threaded application has one thread running at all times and such programs can do only one task at a time. A multi-threaded application can have several threads of execution running independently and simultaneously. These threads may communicate and co-operate. To the user it will appear to be as a single program.

MEMORY MANAGEMENT AND GARBAGE COLLECTION

During the course of a program's execution, memory will be required for temporary operations. If the memory will be required for temporary operations, if the memory allocations do not match memory allocations perfectly, the program will either crash immediately or consume systems until exhausted. Java overcomes this problem by using garbage collection. Temporary memory is automatically reclaims after it is no longer referenced by any Active X part of the programs. This frees the developer from much of the housekeeping that would otherwise be required. The improved performance, Java's garbage collector runs in its low priority good balance of efficiency and real responsiveness.

HOW JAVA WORKS

Java uses a compiler to convert human-readable source code into executable programs... The java compiler generates architecture- independent byte-codes. Only a Java Virtual Machine (JVM) can execute the byte codes, which is an idealized Java

processor chip usually implemented in software rather than hardware. Java byte-code files are called class files because they contain a single java class.

To execute Java byte-codes, the VM uses a class loader eth fetch the byte-codes from a disk or from the network. Each class file is fed to a byte-code verifier that the class is formatted correctly and that the class will not corrupt memory when it is executed. The execution unit is interpreter, which is a program that reads the byte-codes, interpreter, the meanings and associated functions. Interpreter is generally much slower than the native code compilers because the class they continuously need to look up the meaning of each byte code during execution. Fortunately there is another alternative to interpreting code, called Just in Time Compilation.

TYPICAL JAVA ENVIRONMENT

Java programs normally go through five phases to be executed. They are EDITING, COMPILE, LOAD, VERIFY and EXECUTE.

PHASE1- It consists of editing a file. This is accomplished with an editor program. The programmer types Java program using the editor and makes corrections if necessary. The program is then stored on a secondary storage device such as a disk. Java program file named end with Java extension

PHASE2-Here the programmer gives the command *javac* to compile the program. The Java compiler translates the Java program into byte codes- the language understood by the Java interpreter. To compile a program for example call hello. java, we are required to type *javac hello. java.*

If the program compiles correctly, a file called hello. class will be produced. This is the file containing the byte codes that will be interpreted during the execution phase.

PHASE3-This phase is also called loading. Before a program can be executed, the program must first be placed in the memory. This is done by the class loader, which takes the class files containing byte codes, and transfers it to the memory. The class file can be

loaded begins loading class files in the two situations. For example, the command Java hello invokes the Java hello invokes the Java Interpreter for the hello program and causes the class loader to load the information used in the hello program. The hello program is referred to as an application. Applications are programs that are executed by the Java interpreter

.

The class loader is also executed when a Java applet is loaded into World Wide Web browser such as Netscape Navigator browser or Sun's Hot Java browser. Applets are Java programs that are typically loaded from the Internet by a browser. Applets are loaded when the user browses an HTML document containing the applet.

Applets can also be executed from the command line using the appletviewer command provided with Java Developer Kit (JDK) set of tools including the compiler (javac), interpreter (Java), appletviewer and other tools used by the Netscape Navigator Browser and by HotJava. The appletviewer requires an HTML document to invoke the applet. For example, if the hello.html file refers to the hello applet, the appletviewer command is used as follows-

Appletviewer hello.html.

PHASE4-In this phase the byte-code verifier checks whether the byte-codes are executed by the Java interpreter i.e. appletviewer.

PHASE5-In the final phase the computer, under the control of its CPU, interprets the program one byte code at a time.

SERVLETS

Servlet is a generic server extension- - a Java class that can be loaded dynamically to expand the functionally of a server. Servlets are commonly used with Web Servers where can take the place of CGI script. Servlet runs inside Java Virtual Machine (JVM).

So it's safe and portable. Unlike applets they do not require support for Java in the web browser.

Separate threads with in the web server process, which accounts for its efficiency and scalability, handle all Servlets. Since servlets run within the web server they can interact very closely with the server to do things that are not possible with CGI scripts. Another feature of Servlets is that they are portable.

THE POWER OF SERVLETS

Servlets offer number of advantages over other approaches including: Portability, Power and Efficiency, Endurance, Safety, Elegance, Integration, Extensibility and Flexibility.

PORTABILITY

These are highly portable across operating systems and across server implementations. You can develop a servlet on a Windows.NET machine running the Java web server and later deploy it effortlessly on a high-end UNIX server running Apache. With servlets, you can truly "write once, serve every where".

POWER

Servlets can harness the full power of the core Java API's: networking and URL access, Multithreading, image manipulation, Data compression, Database Connectivity, Internationalization, RMI, CORBA connectivity and Object Serialization.

Servlets are also well suited for enabling client/server communication. With a Java based applet and a Java based applet and a Java based servlet, you can use RMI and Object Serialization to handle client/server communication, which means that you can leverage the same custom code on the client as on the server. Using CGI for the same purpose is much more complicated.

EFFICIENCY AND ENDURANCE

Servlet invocation is highly efficient. Once a servlet is loaded, it generally remains in the server's memory as a single object instance. Thereafter the server invokes the servlet to handle a request using a simple, lightweight method invocation. Separate threads handle multiple Concurrent requests and hence servers are highly scalable.

SAFETY

Since they are written in Java servlets inherit the strong type safely of the Java language. The servlet API is implemented to be type-safe. Java's automatic garbage collection and lack of pointers mean that the servlets are generally free from memory management problems like dangling pointers, Invalid pointer references and memory leaks. It handles errors safely due to Java Exception handling mechanism.

A server can further protect itself from servlets through the use of Java Security Manager. A server can execute its servlets under the watch of a strict security manager.

ELEGANCE

The Servlet code is clean, Object Oriented, Modular and amazingly simple. Even advanced operations like Cookie handling and session tracking are abstracted into convenient classes.

INTEGRATION

Servlets are tightly integrated with the server. This integration allows the servlet it co-operates with the server in ways that a CGI program cannot. For example, a servlet can use a server to translate file paths, perform login, check authorization, perform MIME type mapping and in some cases even add users to the server's user database.

EXTENSIBILITY AND FLEXIBILITY

It is designed to be easily extensible. It includes classes that are optimized for HTTP Servlets. Servlets are quite flexible. An HTTP Servlet can be used to generate a complete Web page i.e. can be added to a static page using a <SERVLET> tag in what's known as a Server-side include and it can be used in co-operation with any number of other servlets to filter content in something called a SERVLET CHAIN. Sun introduced Java Server Pages that offer a way to write snippets of servlet code directly within a static HTML page.

Tomcat server

Tomcat is the official reference implementation of the Java Servlet 2.2 and Java Server Pages 1.1 technologies. Developed under the Apache license in an open and participatory environment, it is intended to be a collaboration of the best-of-breed developers from around the world.

Tomcat server Features

Application Server

Solid foundation, via the proven Tomcat Server, for rapidly developing, deploying, and managing e-business applications, including a common application run-time environment.

Development and Deployment

Rich, flexible framework for developing and deploying J2EE applications, including enterprise-class Web services, through Tomcat Server.

Portal

Unified framework for building enterprise portals using Tomcat Portal that includes:

Integration

Integration of enterprise information systems via standards-based integration technology, including enterprise resource planning (ERP), supply chain management (SCM), human resource (HR), and customer relationship management (CRM), as well as custom and legacy applications.

Security

Common security framework for building secure applications.

Java Server Pages (JSP)

JSP is a technology that lets you mix regular, static HTML with dynamically generated HTML. Many Web pages that are built by CGI programs are mostly static, with the dynamic part limited to a few small locations. But most CGI variations, including servlets, make you generate the entire page via your program, even though most of it is always the same. JSP lets you create the two parts separately.

JavaScript

JavaScript is Netscape's cross-platform, object-based scripting language for client and server applications. There are two types of JavaScript:

Navigator JavaScript, also called client-side JavaScript

Livewire JavaScript, also called server-side JavaScript

Netscape Navigator 2.0 (and later versions) can interpret JavaScript statements embedded in an HTML page. When Navigator requests such a page, the server sends the full content of the document, including HTML and JavaScript statements, over the network to the client. The Navigator then displays the HTML and executes the JavaScript, producing the results that the user sees.

Client-side JavaScript statements embedded in an HTML page can respond to user events such as mouse-clicks, form input, and page navigation. For example, you can write a JavaScript function to verify that users enter valid information into a form requesting a telephone number or zip code. Without any network transmission, the HTML page with embedded JavaScript can check the entered data and alert the user with a dialog box if the input is invalid.

ABOUT OPERATING SYSTEM

Windows NT is a 32-bit, preemptive operating system that belongs to the Microsoft Windows family of operating system products.

Networking:

Windows –NT Server is enabled to work as a network operating system.

Reliability and Stability

Windows-NT is more stable than all other previous versions of windows. Windows NT is a complete, true operating system in itself, not relying on DOS for lower level function.

Graphical User Interface

Windows NT is a 32-bit Operating System with a graphical user interface.

Portability and flexibility

Windows NT can be portable on variety of platforms. Windows NT flexibility can be a great advantage when implementing a computer strategy for an organization.

Multi-tasking Operations

Because of multitasking operations users can run more than one operations at a time.

File Systems

Windows NT supports a variety of file systems, including FAT, NTFS and VFAT.

Security

Windows NT's security feature is the advanced security feature available in current operating systems. Its memory protection and auditing and network access can additional qualifications.

Storage Space

Windows NT supports a virtually limitless amount of memory and hard disk space. In the case of RAM, Windows NT supports 4 gigabytes. In the case of hard disk, Windows NT supports 16 hex bytes.

ORACLE ENVIRONMENT

Every business enterprise maintains a large volume of data for its operations. With more and more people accessing this data for their work the need to maintain its integrity and the relevance increases. Normally with the traditional methods of storing

data and information in files the chances that the data loses its integrity and validity are very high.

Oracle 8 is highly "Object Relational Database Management System. It offers capabilities of both relational and object oriented database system. In general, objects can be defined as reusable software codes. These are location independent and perform a specific task on any application with little or no change to the code.

Oracle products are based on the "client – server technology". This concept involves segregating the processing of the application between two systems. One performs all activities related to the database (Server) and the other performs activities that help user to interact with the application (client).

TOOLS OF ORACLE

The tools of oracle are so user friendly that the person with minimum skills in the field of computer can access them with ease. The main tools are

- **SQL* PLUS**
- **PL / SQL**
- **FORMS**
- **REPORTS**

SQL*PLUS:

SQL* Plus is a structured query language supported by oracle. Through SQL* Plus we can store, retrieve, edit and run SQL commands and PL / SQL blocks. Using SQL * Plus we can perform calculation, list columns for any table and also format query results in the form of a paper.

PL / SQL:

PL /SQL combine the data manipulating power of SQL with data processing power of procedural languages.

FORMS

This is a graphical user interface tool for generating and executing form-based applications. A form basically comprises of blocks and fields. Multiple tables can be accessed over a single form, based on the application with the help of transaction commands. We can build, generate and run an Oracle forms application.

REPORTS

Reports are an application development tool for oracle, used for developing, displaying and printing reports. We can create a wide variety of reports, which have various modes.

4. SYSTEM DESIGN AND DEVELOPMENT

4.1 DETAILED DESIGN

The system is developed in various modules. The following are the various modules of the project and their description.

- Work Allocation.
- Define Test cases.
- Upload Test Plan.
- Review Test cases.

The various above modules are explained in detail.

Work allocation

This module will be available only to the project leaders and project managers. The project leader or the project manager will use this module to allocate the work to various developers, testers by allocating various modules to them for purpose of testing.

Define Test cases

This particular module is basically used to define a new test case by the users (i.e. developers, testers). When the developers, testers login into the system, they can view the various modules allocated to them for which they will have to write test cases and in turn use these test cases to test the module assigned to them. The various fields for defining a test case are as Test case number, Test plan name, Version, Test Condition, Expected Result, Effort, Allocated to, Status and Tested by. So once the users (i.e. developers, testers) enter all these fields, he will be finished with defining a new test case. Then he will test the module using the test cases and then will store them in the database for review.

Upload Test Plan

This module is used to upload test plan that are already predefined. In other words it can be told that when we want to include a large number of test cases, it may not be worthy defining each and every test case using the define test case module, which can be termed as a lengthy process. Hence we can define them using excel sheet which will contain various elements and these excel sheets will be converted into a XML format using xerces and xalan functionality using Simple API for XML (SAX). In turn these test plans, which are of XML format, will be stored in the database.

Review Test cases

This module is used to review the test cases that have been completed by the developer to check whether the test case were completed successfully .So here the reviewer can pass his comments and change the status to completed, not completed or Issued back for testing again. So this screen will be accessible only by the reviewers. If the status is completed, then it's done. If the status is not completed, it will be sent back for testing again.

4.2 INPUT DESIGN

The main objective of the input design is to make data entry error free. Input design aims to reduce the errors in data processing that occurs because of inaccurate input data by providing a proper input design.

- Authenticated database access control is given to the administrator-authorized users to operate on the databases.

- Input Validations
    - Valid password entry in the field.

- Valid entry in the fields.
- Overflowing of length for data fields is avoided.
- Avoiding same values entry for a key field.
- Avoiding empty strings are done to avoid errors.

➢ Error Messages Should is displayed properly in the user understandable format.

The various inputs needed are

For Work allocation

This module can be accessed only by the project leader or the project manager and hence when he logs inside he has to decide which module has to be assigned to which employee i.e. team member in turn. He will also decide the starting date and the ending date by which the test case should be prepared and tested and the developer, tester; etc should give the result back.

For defining a new Test case

As the user enters his employee name and password, his role will be recognized accordingly and if he is recognized as a developer, he will be allowed to define a new test case for the module which he has been assigned and the user or developer should enter all the fields except the Comments field, then only a full test case can be said as defined otherwise the test case will not be successful.

For uploading a test plan.

When the user or developer Logs inside the system, he can also upload test plans, wherein one test plan will contain a number of test cases and hence the process becomes very easy. So he should browse for the particular test plan he needs to upload.

For Reviewing Test Cases

Here only the reviewer has access and after reviewing the finished test cases he will have to input his comments and change the status as **completed** or **not completed** or **issued.**

4.3 OUTPUT DESIGN

The output design is a part of the system design and will includes

- The system is designed in such a way that we can view all the test cases that are present in the total system itself.
- We can see the test case whether it has successfully completed testing and if not again will be tested.
- The security feature provides the output of accessing the restricted page by the user.
- We can also have a summary of how many test cases are present and their importance i.e. defined work.

4.4 DATABASE DESIGN

The following tables are used in the database for storing and retrieving the details

1) Database Name : **PM_DB**

   Table Name : **TC_Details**

   Description : **Stores details about the Test Cases.**

Field Name		Data Type	Constraint	Length
TC_ID	(PK)	Number	Not Null	10
Proj_ID	(FK)	Number	Not Null	10
TP_ID	(FK)	Number	Not Null	10
Project Name		Varchar	Not Null	25
Ref_Work		Varchar	Not Null	25
Testcase_Name		Varchar	Not Null	25
Test_Condition		Varchar	Not Null	25
Input_Data		Varchar	Not Null	30
Exp_result		Varchar	Not Null	15
Efforts		Date/Time	Not Null	
Verified_By		Varchar	Null	25
Tested_By		Varchar	Not Null	25
Status		Varchar	Not Null	10

2) Database Name : **PM_DB**

Table Name : **TP_Details**

Description : **Stores details about the Test Plan.**

Field Name		Data Type	Constraint	Length
TP_ID	(PK)	Number	Not Null	20
TP_Name		Varchar	Not Null	20
Module_Name		Varchar	Not Null	5
Module_Ver		Number	Not Null	20
TP_ver		Varchar	Not Null	15
Ref_doc		Varchar	Null	30

3) Database Name : **PM_DB**

Table Name : **Login_Details**

Description : **Stores details about the Emp_Name and Password.**

Field Name		Data Type	Constraint	Length
Emp_Name	(PK)	Varchar	Not Null	20
Password		Number	Not Null	10

4) Database Name : **PM_DB**

Table Name : **Proj_Details**

Description : **Stores details about the Project.**

Field Name		Data Type	Constraint	Length
Proj_ID	(PK)	Number	Not Null	10
Proj_Name		Varchar	Not Null	20
Emp_ID	(FK)	Number	Not Null	5

5) Database Name : **PM_DB**

Table Name : **Emp_Details**

Description : **Stores details about the Employee.**

Field Name		Data Type	Constraint	Length
Emp_ID	(PK)	Number	Not Null	10
Emp_Name	(FK)	Varchar	Not Null	20
Proj_ID	(FK)	Number	Not Null	10
Proj_Name		Varchar	Not Null	20
Role_ID	(FK)	Number	Not Null	10

6) Database Name : **PM_DB**

Table Name : **Role_Details**

Description : **Stores details about the Role.**

Field Name	Data Type	Constraint	Length
Role_ID (FK)	Number	Not Null	10
Role_Name	Varchar	Not Null	15

7) Database Name : **PM_DB**

Table Name : **Module_Details**

Description : **Stores details about the Modules.**

Field Name		Data Type	Constraint	Length
Mod_Ver	(PK)	Number	Not Null	10
Mod_Name		Varchar	Not Null	15
Proj_ID	(FK)	Number	Not Null	10

8) Database Name : **PM_DB**

Table Name : **Work_alloc**

Description : **Stores details about the Work Allocation.**

Field Name		Data Type	Constraint	Length
Task_ID	(PK)	Number	Not Null	10
Emp_ID	(FK)	Number	Not Null	15
Mod_Name		Varchar	Not Null	15
Work_Prod		Varchar	Not Null	30
Version		Number	Not Null	7
CR_No		Number	Not Null	7

9) Database Name : **PM_DB**

Table Name : **Work_effort**

Description : **Stores details about the Work Effort.**

Field Name		Data Type	Constraint	Length
Task_ID	(FK)	Number	Not Null	10
Emp_ID	(FK)	Number	Not Null	10
StartDate		Date/Time	Not Null	
EndDate		Date/Time	Not Null	
Actual_StartDate		Date/Time	Not Null	
Actual_EndDate		Date/Time	Not Null	
Rev_StartDate		Date/Time	Not Null	
Rev_EndDate		Date/Time	Not Null	
ActualEffort		Varchar	Not Null	15
RevEffort		Varchar	Not Null	15
EstEffort		Varchar	Not Null	15

10) Database Name : **PM_DB**

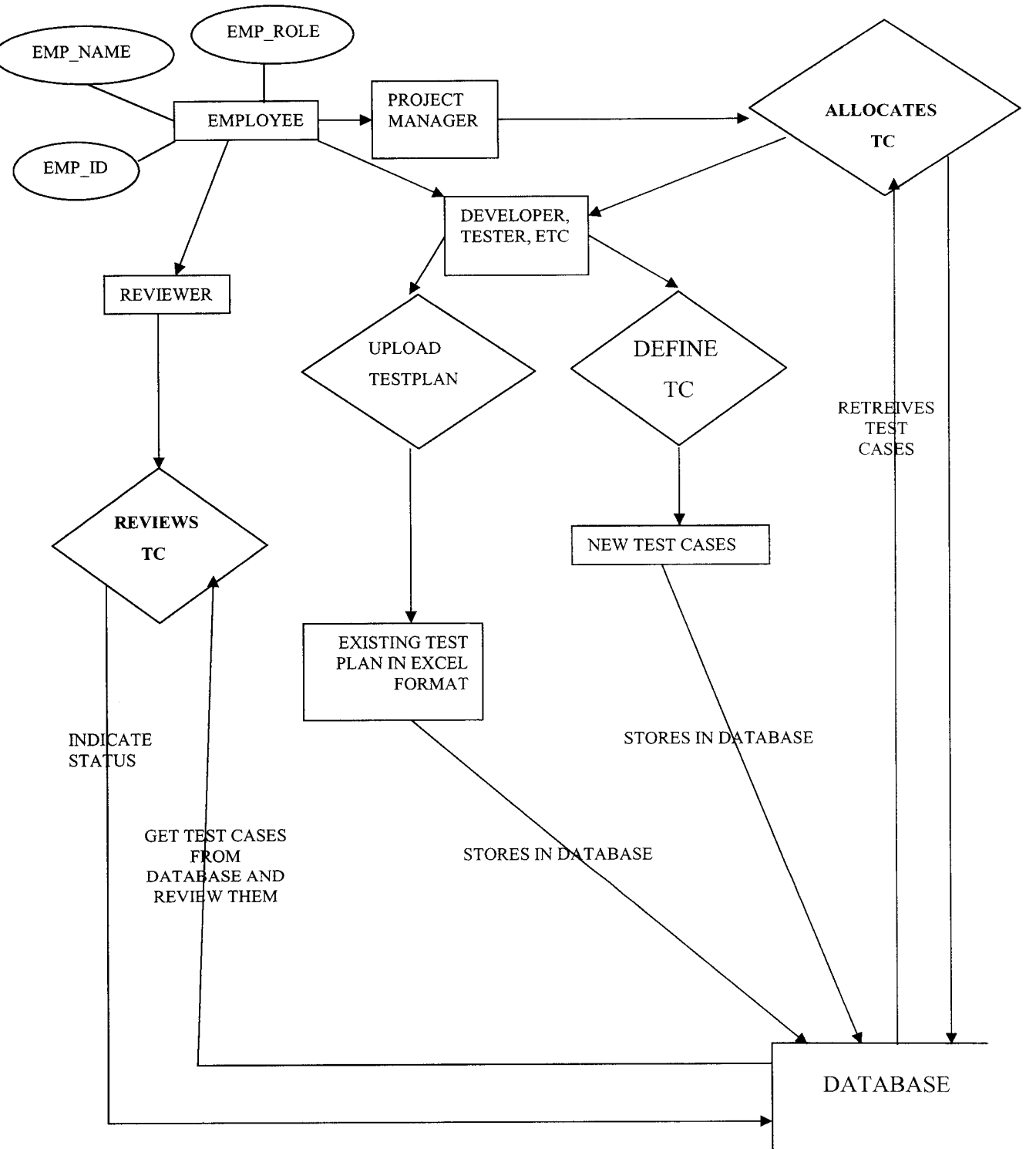
Table Name : **Review_Details**

Description : **Stores details about the Review.**

Field Name		Data Type	Constraint	Length
Task_ID	(FK)	Number	Not Null	10
TC_ID	(FK)	Number	Not Null	10
TP_ID	(FK)	Number	Not Null	10
Severity	(FK)	Varchar	Not Null	15
Rev_comments		Varchar	Not Null	30
Code Effected		Varchar	Not Null	30

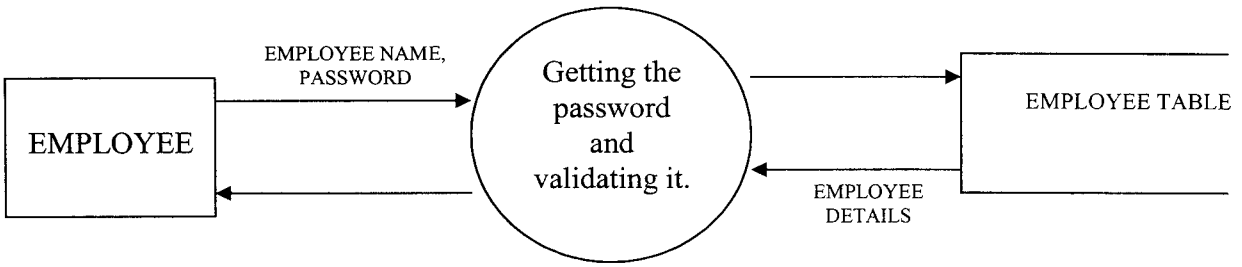
4.5 PROCESS DESIGN

4.5.1 SYSTEM DESIGN

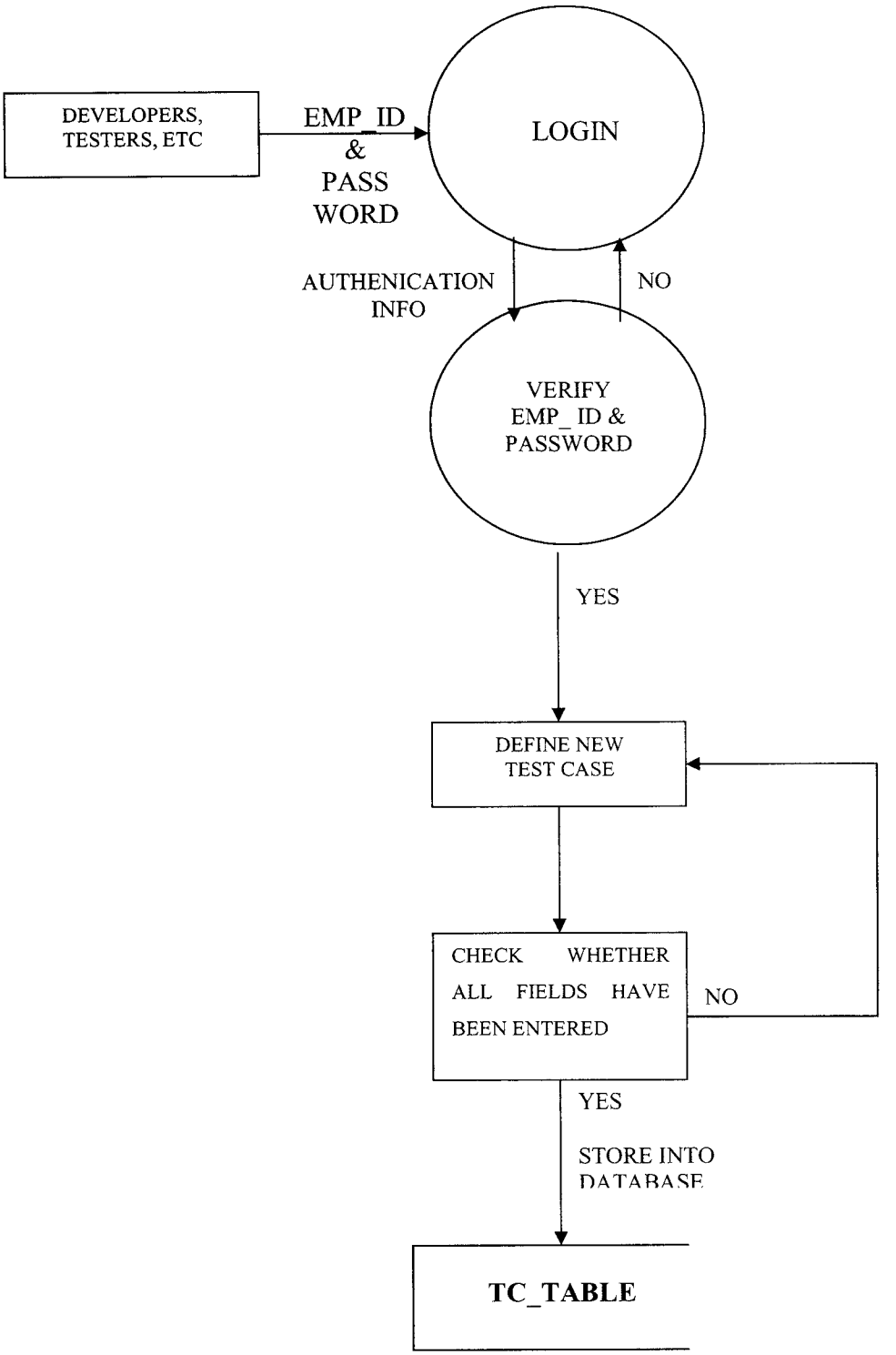


4.5.2 DATA FLOW DIAGRAMS

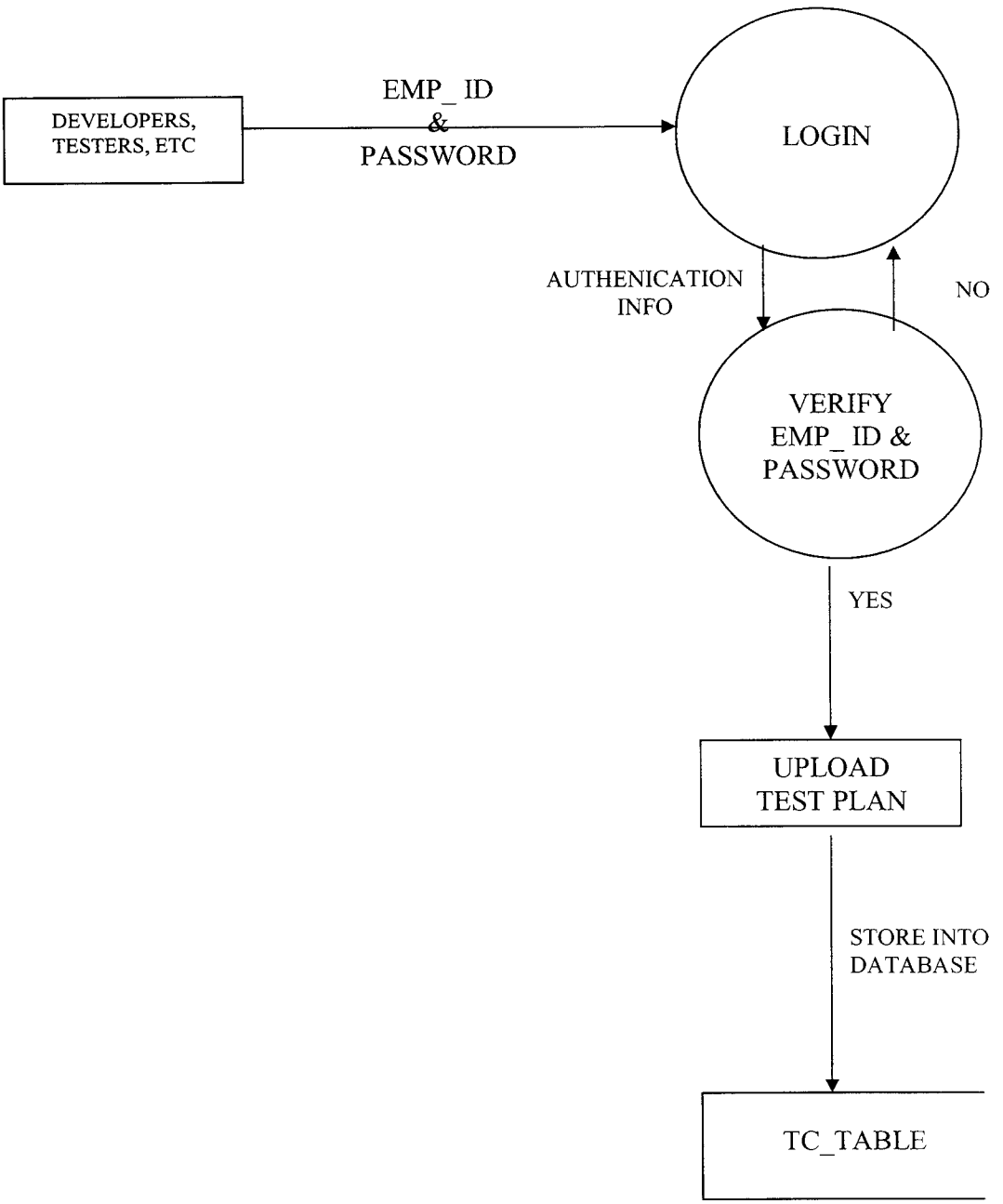
PASSWORD VERIFICATION.



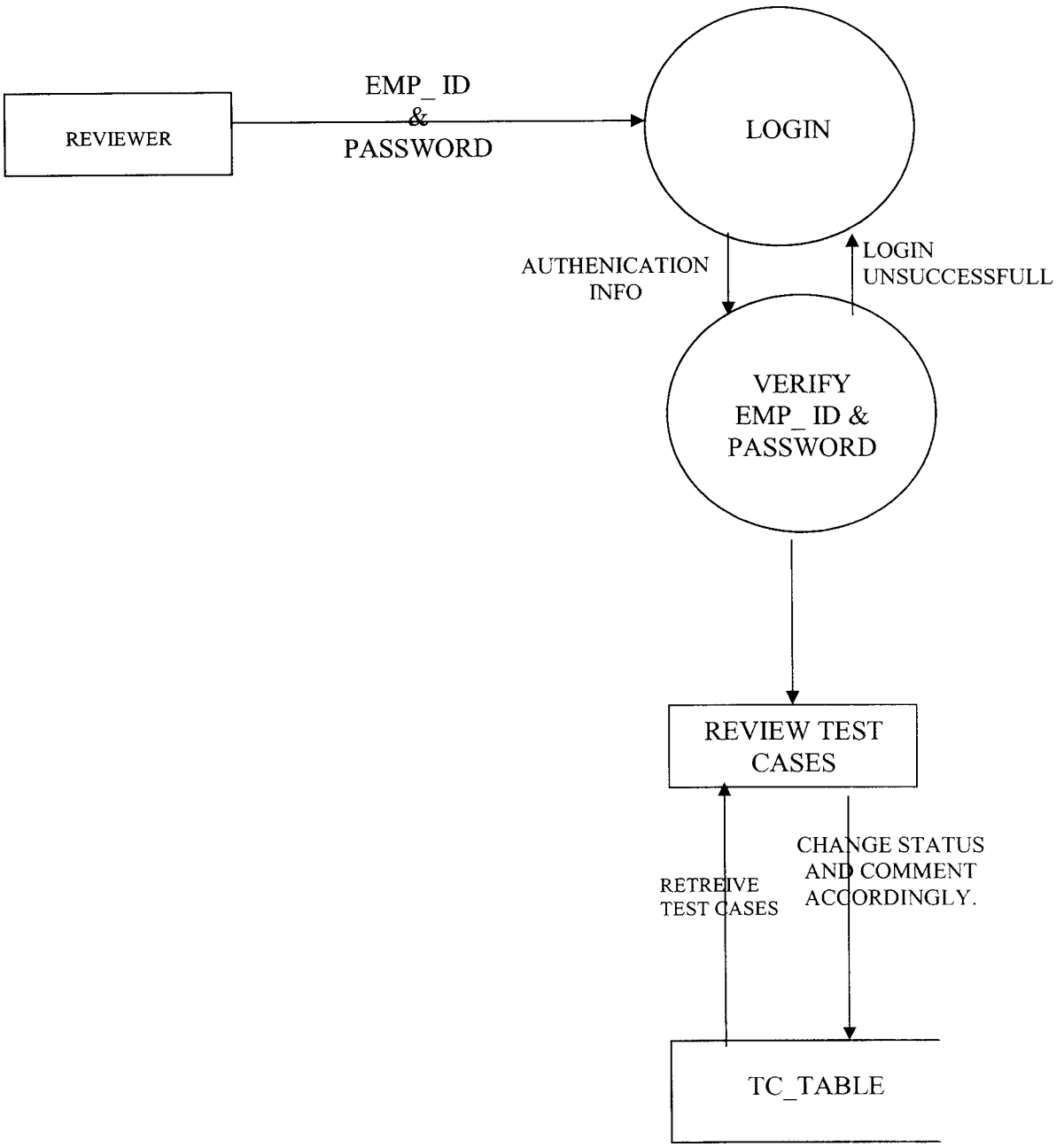
DEFINING A TEST CASE



UPLOADING A TEST PLAN



REVIEWING A TEST CASE



5. SYSTEM IMPLEMENTATION AND TESTING

Implementation is concern with those tasks leading immediately to a fully operational system. It involves programmers, users and operations management, but its planning and timing is a prime function of the system analysis. It includes the final testing of the complete system to user satisfaction, and supervision of the initial operations of the new system.

5.1 SYSTEM IMPLEMENTATION

In implementing the theoretical design is turned into a working system and then to monitor the operation of the system to ensure that it continues effectively and efficiently. It involves careful planning, investigation of the current system and it's constraints on implementation. The system is implementation only after the through test is done on each of its subsystem and checking for, whether it is working according to the specification.

Implementation consists of

- Necessary changes are made to this system as described by the users.
- Developed package is tested using local machine as server and also with real server.
- All the errors are corrected.
- Hardware and software utilities are installed.

The success of the system lies in the methodologies that are adopted during the system design. Since the project consists of several modules. The modules cannot be implemented individually. The other modules are integrated for the successful implementation.

After the success of adopting various methodologies, the manual system for maintaining test cases was replaced by the Online Test Case Maintenance System called "PROJECT MATE". Thus the system was implemented.

5.2 SYSTEM TESTING

Testing is an important process, which leads to the success of the system. System is mainly performed with the intention of finding errors to give the client an error free system. System testing makes a logical assumption that all parts of the system are correct and move towards it to make the system error free.

Inadequate testing of the system will lead to errors, which even can arise after long time of system implementation. The purpose of system testing is to consider all the likely variations, and then push the system to its limits and achieve the results.
The various testing done were,

Unit Testing

- Each and every program needed to be tested, which is known as unit testing.
- The module interface is tested to ensure that information properly flows in and out of the unit under test.
- The local data structure is examined to ensure that data stored temporarily maintains integrity throughout the unit's lifetime.
- Boundary condition is tested.
- All independent paths through the control structure are exercised to ensure that all the statements in the modules have been executed at least once.

- All error-handling paths are tested.

Validation testing

It's said that validation is successful when the software function in a manner that can be reasonably accepted by the customer. This type of testing is very important, because it's the only way to check whether the requirements given by the user have been completely fulfilled. Validation testing is done for all the interface modules. All client side validation codes are tested before they incorporated with the modules or subsystem.

Integration testing

Once the modules are tested individually under the unit testing strategy. It is necessary to put all these modules together. It is here that the data can be lost across the interface. One module can have an inadvertent, adverse effect on another.

Integration testing is a systematic technique for constructing the program structure while at the same time conducting test to uncover errors associated with interfacing. The objective is to take unit-testing modules and build a program structure that has been dictated by design.

5.3 REFINEMENTS BASED ON FEEDBACK

Refinements based on the feedback of the user are done to the system. The various refinements done are:

- Missing errors are corrected when the user sends a feedback on it.
- Interface design is altered based on the feedback of the user.

6. CONCLUSION

The project "**PROJECT MATE**"-An Online Test Case Maintenance System is a new application that helps in providing maintenance for all the test cases done by the developers of Covansys (India) Private Limited, Chennai. This project was done exclusively for Covansys (India) Private Limited to fulfill their requirements.

This application provides the various facilities as given below,

- An interface is provided to all the developers to enter the test cases.
- A database is created to store and maintain the test case details.
- An easy way to search among the WEB to get quick and efficient results is achieved.
- Security is given to the data in the server.
- User-friendly interface for the developers that will make the work of testing easy.

7. SCOPE FOR FUTURE DEVELOPMENT

Any system that has been designed today becomes obsolete the next day itself in the present world of computers. Hence the system is designed in such a way that any future enhancements required by the organization can be easily updated without going for a new system.

The future developments that can be done in the system are

- At present the system is helpful only in maintaining test cases, but can be enhanced to maintain the designs, codes etc also.
- The system can be enhanced in such a way that the system itself can define the test cases for the codes given.
- Any advanced level of encryption can be done to store data.
- Web pages can be redesigned attractively with sounds and animation to make it more user- friendly.

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Reference Web sites

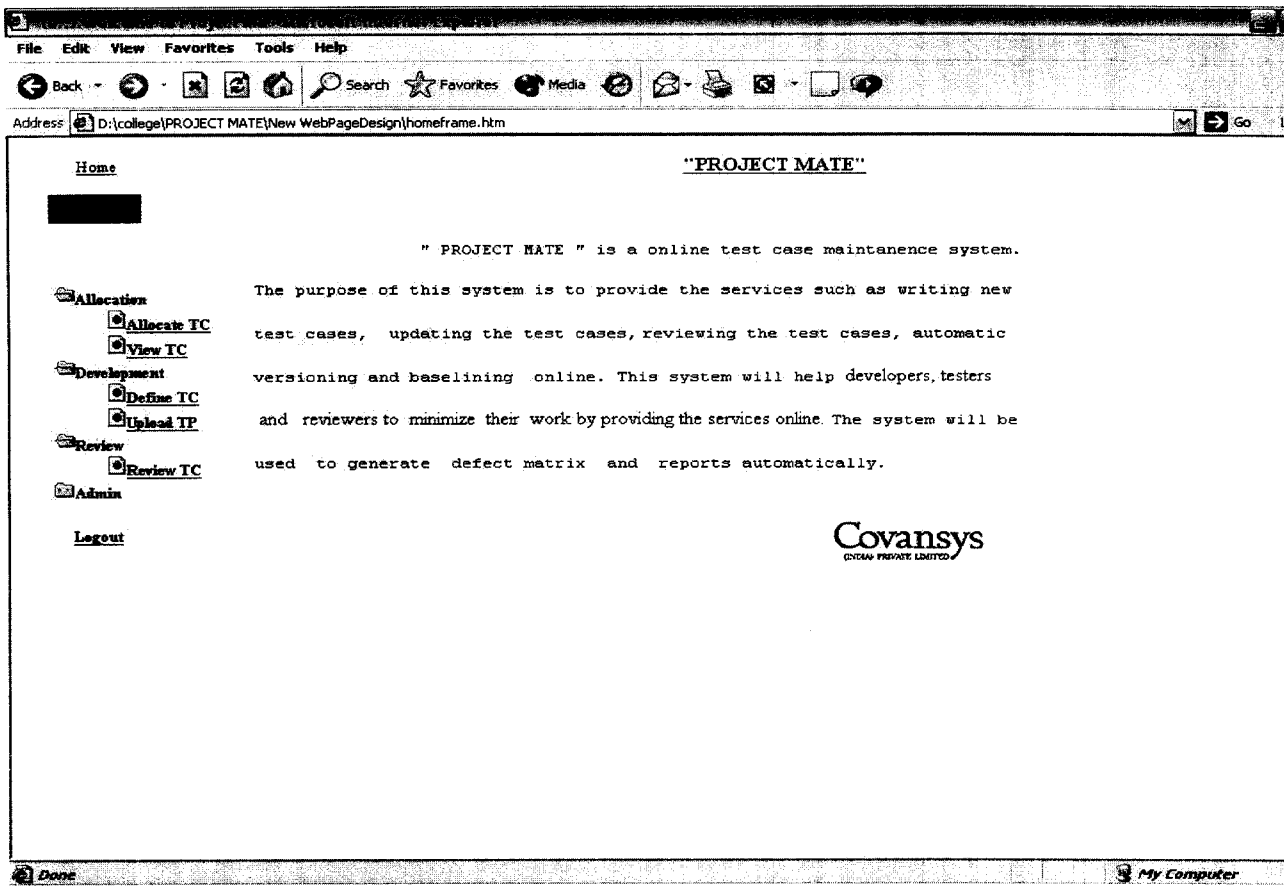
www.javasoft.com

www.sun.java.com

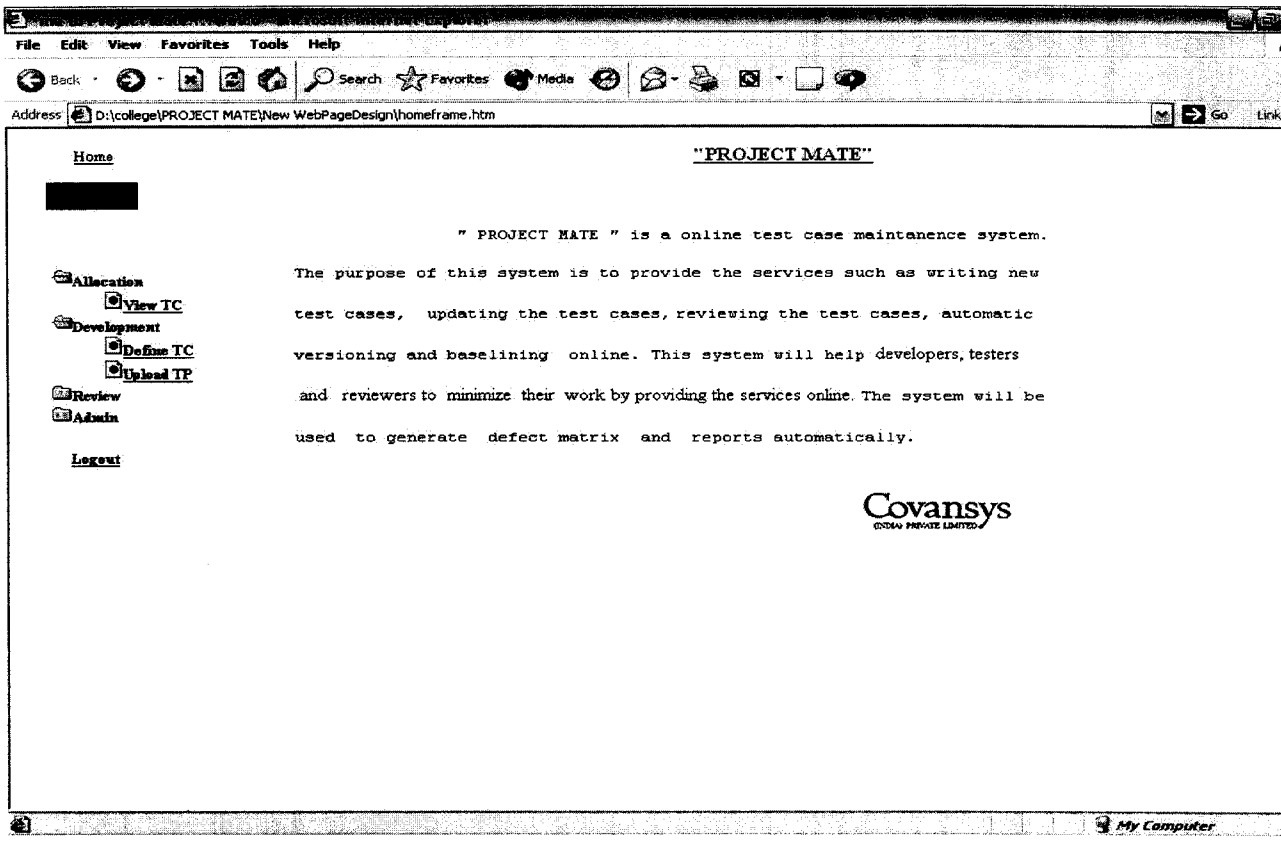
www.javaworld.com

Output Screens

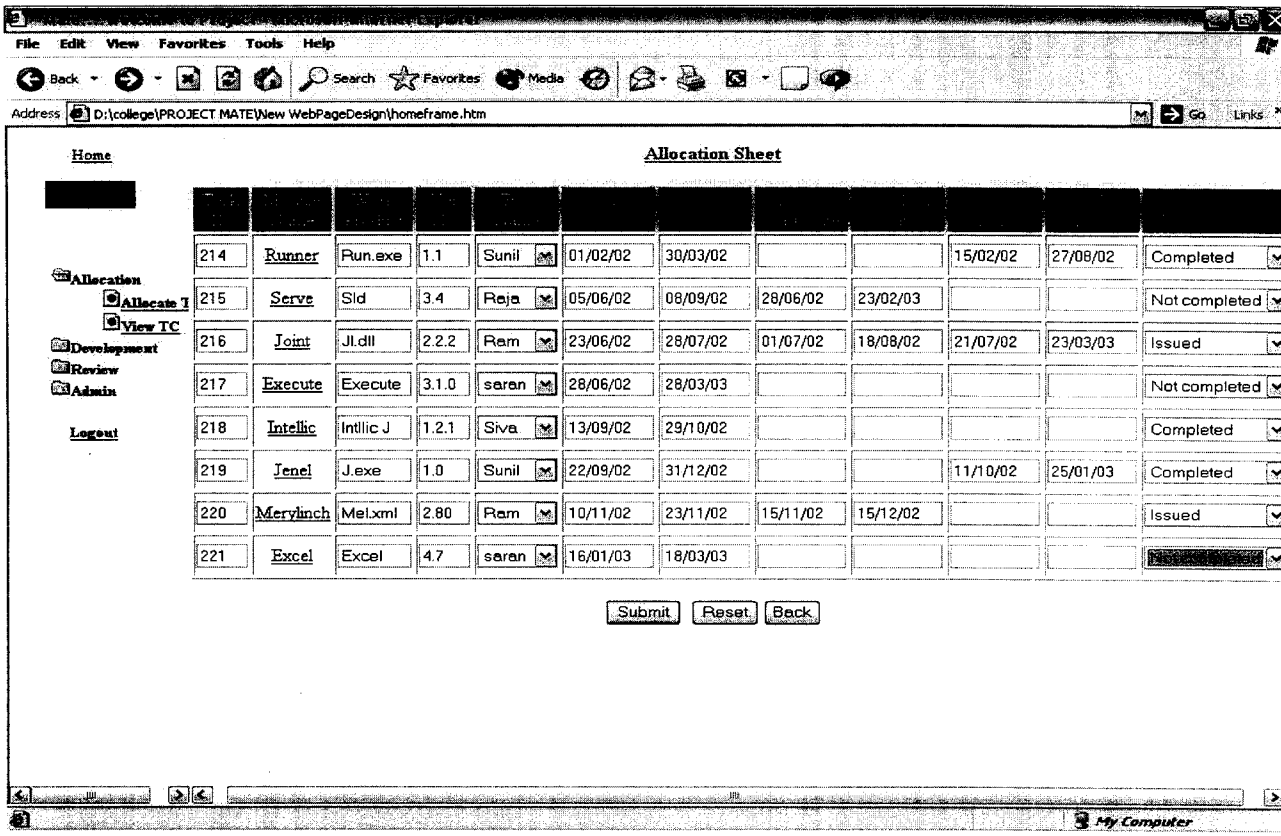
Main Screen



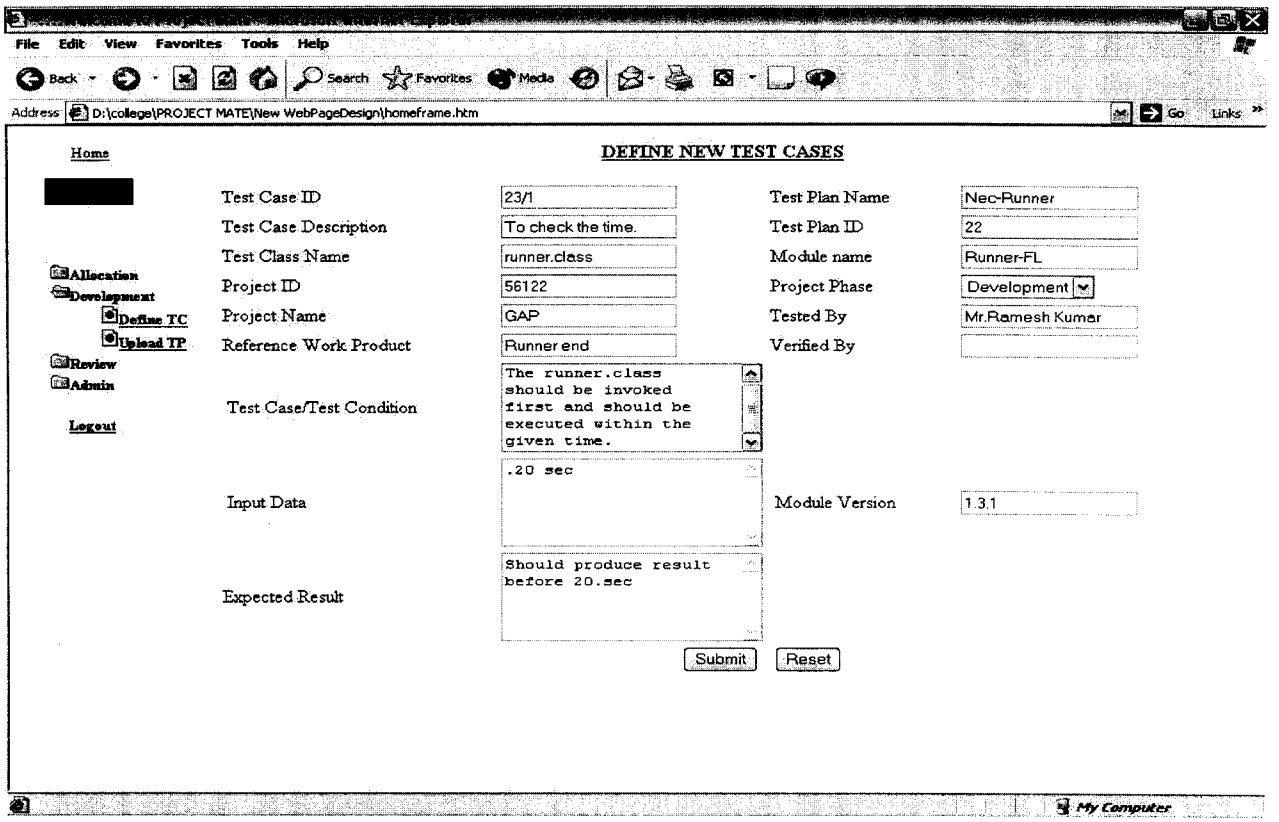
Developer tester login screen:



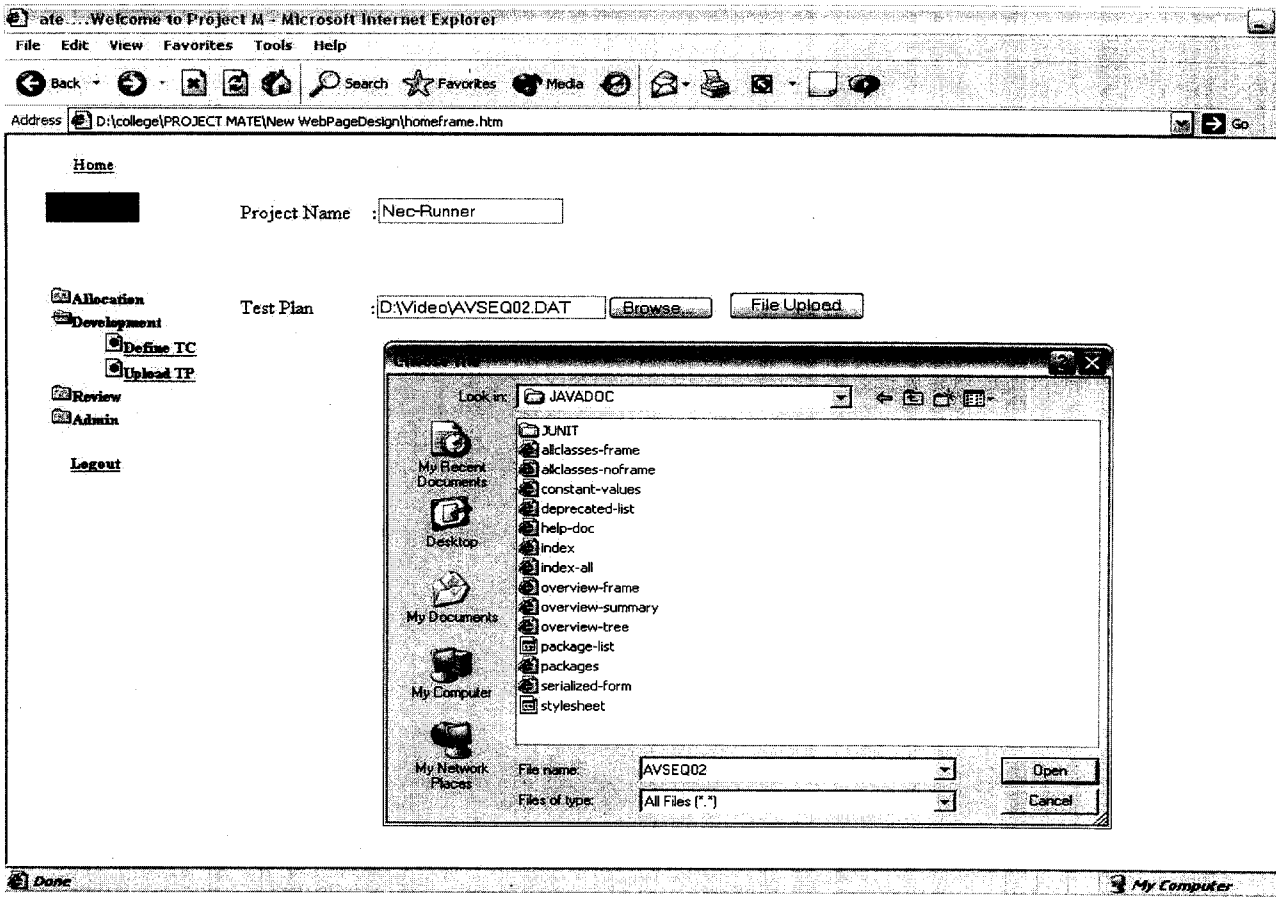
Screen for work allocation



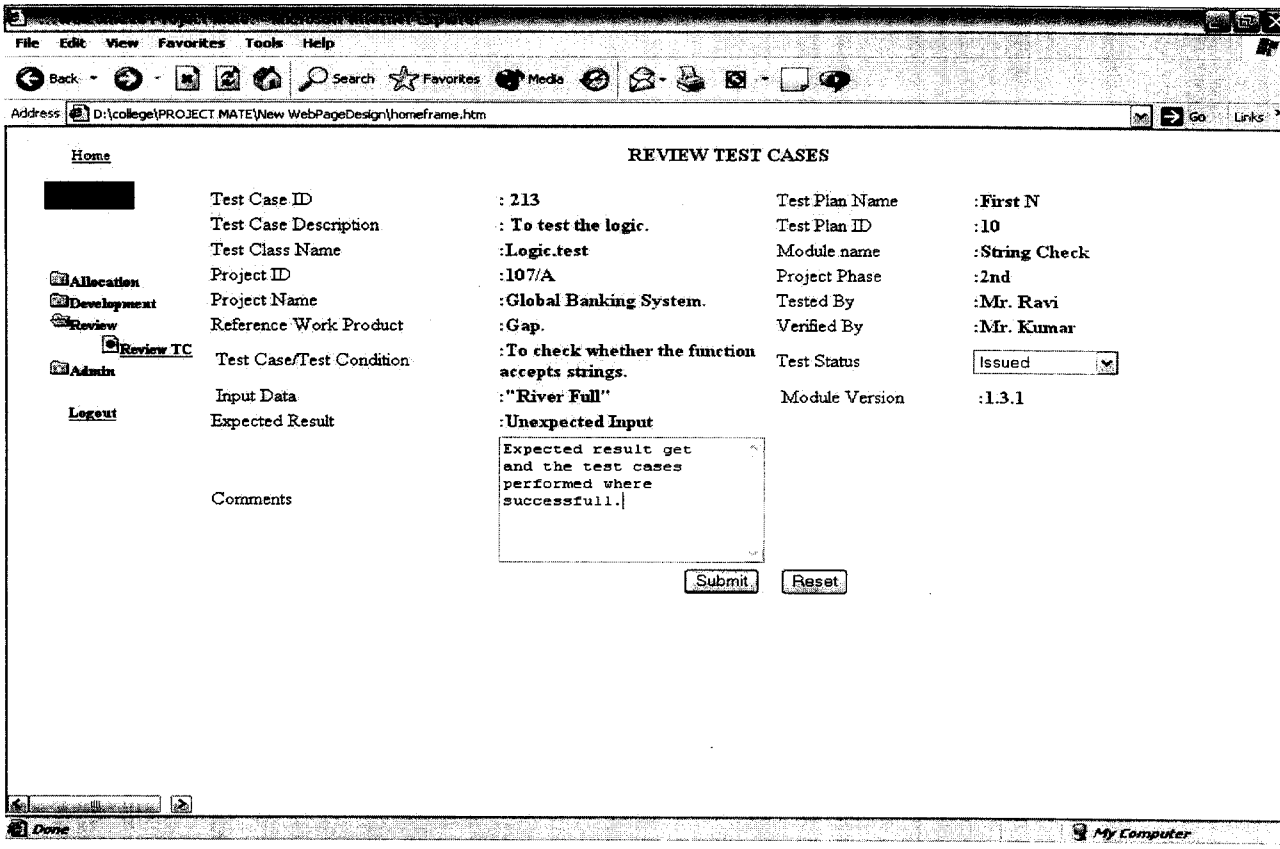
Screen for designing a new test case



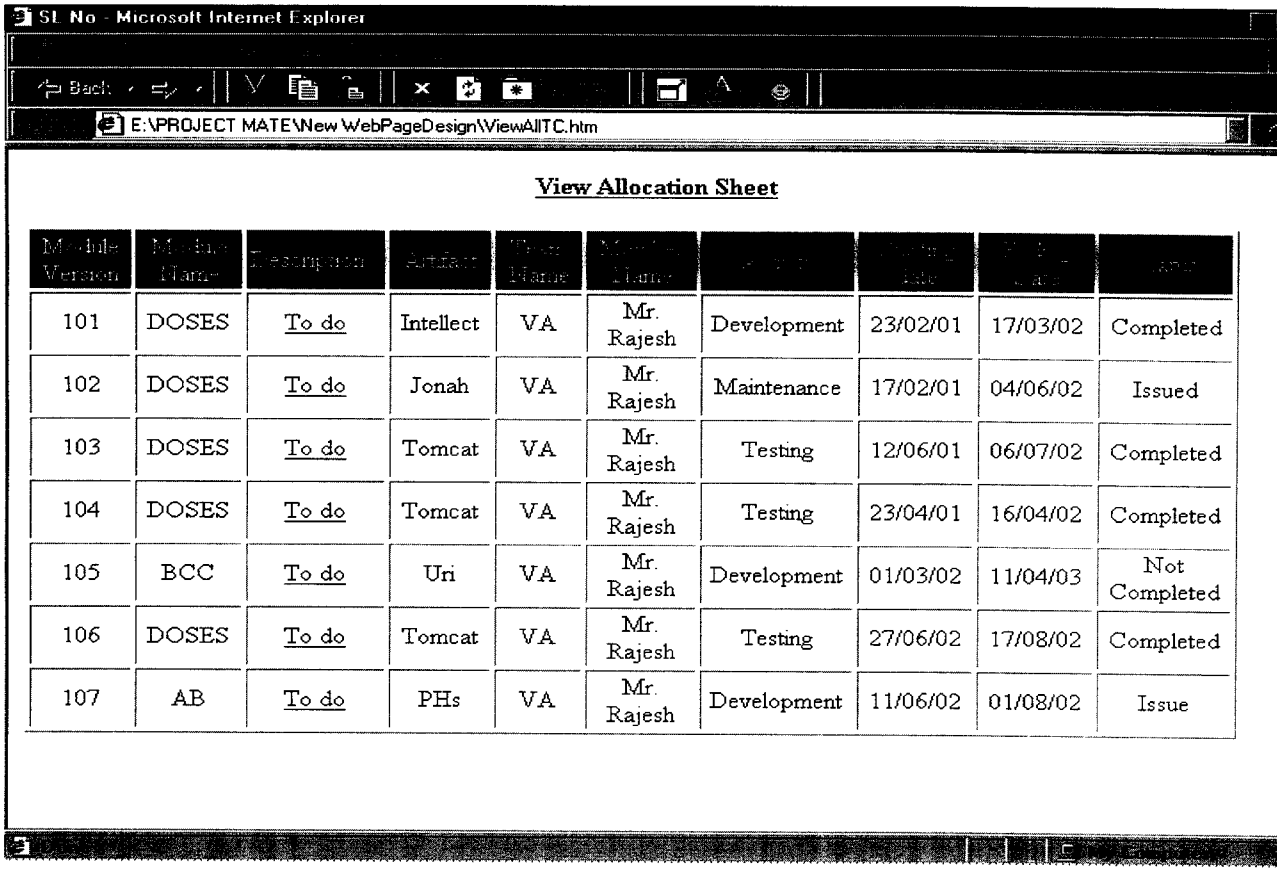
Screen for uploading a test plan



Screen for reviewing test cases



Report for viewing test cases

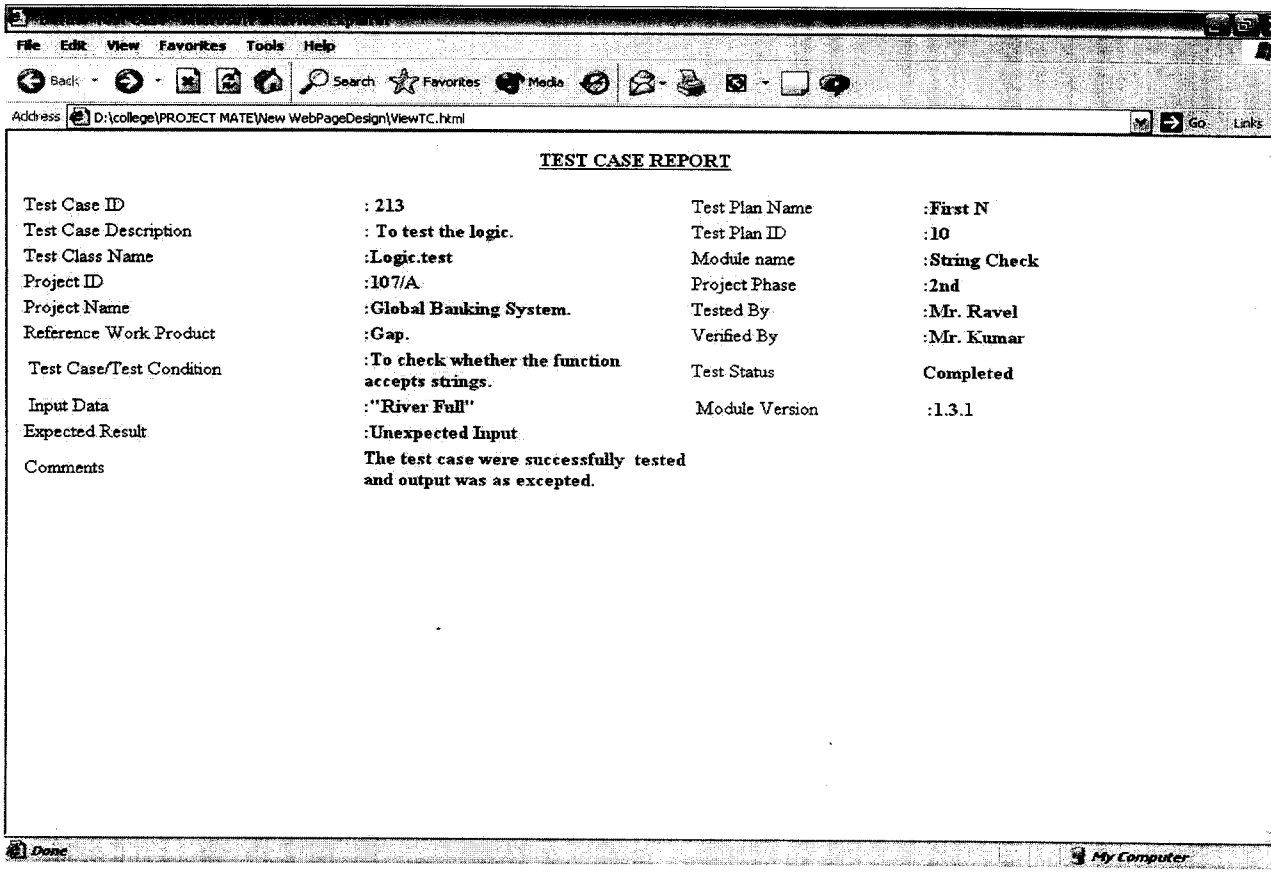

SL No - Microsoft Internet Explorer

E:\PROJECT MATE\New WebPageDesign\ViewAllTC.htm

View Allocation Sheet

Module Version	Module Name	Description	Artifact	Team Name	Manager Name	[illegible]	[illegible] Date	[illegible] Date	[illegible]
101	DOSES	To do	Intellect	VA	Mr. Rajesh	Development	23/02/01	17/03/02	Completed
102	DOSES	To do	Jonah	VA	Mr. Rajesh	Maintenance	17/02/01	04/06/02	Issued
103	DOSES	To do	Tomcat	VA	Mr. Rajesh	Testing	12/06/01	06/07/02	Completed
104	DOSES	To do	Tomcat	VA	Mr. Rajesh	Testing	23/04/01	16/04/02	Completed
105	BCC	To do	Uri	VA	Mr. Rajesh	Development	01/03/02	11/04/03	Not Completed
106	DOSES	To do	Tomcat	VA	Mr. Rajesh	Testing	27/06/02	17/08/02	Completed
107	AB	To do	PHs	VA	Mr. Rajesh	Development	11/06/02	01/08/02	Issue

Test case report after review



TEST CASE REPORT

Test Case ID	: 213	Test Plan Name	:First N
Test Case Description	: To test the logic.	Test Plan ID	:10
Test Class Name	:Logic.test	Module name	:String Check
Project ID	:107/A	Project Phase	:2nd
Project Name	:Global Banking System.	Tested By	:Mr. Ravel
Reference Work Product	:Gap.	Verified By	:Mr. Kumar
Test Case/Test Condition	:To check whether the function accepts strings.	Test Status	Completed
Input Data	:"River Full"	Module Version	:1.3.1
Expected Result	:Unexpected Input		
Comments	The test case were successfully tested and output was as excepted.		