WEB BASED INTEGRATED TESTING TOOL (WEB@ITT)

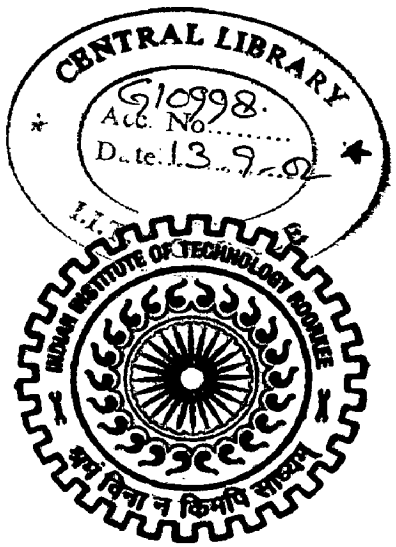
A DISSERTATION

Submitted in partial fulfilment of the requirements for the award of the degree of

MASTER OF COMPUTER APPLICATIONS

By

ROHIT GOSAIN



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MAY, 2002

CANDIDATE'S DECLARATION

I hereby certify that the work which is being presented in the dissertation report entitled "**WEB BASED INTEGRATED TESTING TOOL**" in partial fulfillment of the requirement for the award of the degree of "**MASTER OF COMPUTER APPLICATIONS**" submitted in the Department of Mathematics of the Institute is an authentic record of my work under the supervision of Mr. Vinay G. Indurkar, Head - Testing, Nucleus Software Exports Ltd. and Prof. Dr. R.C. Mittal, Department of Mathematics, Indian Institute Of Technology Roorkee, Roorkee.

The matter embodied in this report has not been submitted by me for the award of any other degree.

Dated : 27th May, 2002

Rohit
(Candidate's Signature)

This is to certify that the above statement made by the candidate is correct to the best of my knowledge.

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TO WHOM SO EVER IT MAY CONCERN

This is to certify that Mr. Rohit Gosain, student of MCA Final Year, IIT-Roorkee is doing a dissertation on "**WEB BASED INTEGRATED TESTING TOOL**" which started from 14th JAN, 2002.

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(Rohit Gosain)

ORAGNIZATION'S PROFILE

Nucleus Software, established in 1986, has been providing innovative and pioneering products and Customized Software Solutions for the last fourteen years with focus on the Banking & Financial Services Sector. The Solutions developed so far by Nucleus Software include Retail Banking Systems, Credit Card Systems Relationship Banking, Telephone Banking, Customer Activated Service terminals, Personalized Sales & Marketing Systems, and ATM Network. With offices in India, USA, Japan and Singapore, the Company has expanded its marketing operations into Canada, Africa, Gulf and SAARC. Nucleus has set up offshore development centers at Chennai, Bangalore and Singapore.

So far, over 350 projects have been developed, implemented and supported successfully in leading financial institutions in India, Singapore, Indonesia, Thailand, Korea, Taiwan, New Zealand, Australia, UAE, Saudi Arabia, Mauritius, Mongolia, UK and the United States of America.

The past year saw the company add Centurion Bank, First leasing Company of India, ICICI, IDBI Bank, ABN AMRO Bank, Banque Nationale de Paris, GMAC-TCFC Finance, Standard Chartered Bank, The Shinsei bank, GE SBI, Apnaloan.com, Cholamandalam Investment and Finance Company to its growing list of valued clients like American Express Bank, HDFC Bank, Vysya Bank, Scotia Finance, GE Capital, The Associates and Citibank.

Over the years Nucleus has gained tremendous experience working closely with IT leaders in the Banking and Financial Services industry, leading to, not only a thorough but an unmatched insight into the unique needs of the sector.

From consultancy and services, to the creation of innovative solutions, the transformation of Nucleus Software into a products company, has been a deliberate, much thought-out process. It is hardly surprising, therefore, that Nucleus Software is today a much respected provider of Customized Software Solutions and Products for Financial Services, including Retail banking, Credit Cards and Leasing. Nucleus is managed by a set of professionals from the top to the bottom.

Our Quality Policy

We will strive to meet customer expectations consistently.

We will continuously strive to improve our abilities to uncover and meet unstated / undiscovered requirements

ABSTRACT

WEB@ITT ie. WEB BASED INTEGRATED TESTING TOOL is project which keeps record of the project details, test cases, their results, bugs, bugs responses etc. for the various projects developed by the different IBU of the NSEL (Nucleus Software Exports Ltd.) It helps the testers, which performs the testing on the project and keeps the record of their work on the project. It also helps the developers of various IBUS of the organization to put their responses corresponding to the bugs. It also helps the top level management of the organization which keeps track of the performance of the software engineers.

WEB@ITT uses ORACLE 8i(ver. 8.1.7.0.0) as its back end for storing the data and ASP (ver. 3.0) for the interfaces. My contribution to the project is at the Database Level and in making the DLL's of the functions written in VB6. My work includes creating the ORACLE OBJECTS like tables, package specification, package body, making the DLL's of the functions which in turn called the functions in the packages, testing the entire functionality of the DLL's.

Apart from the above written tools i.e. ORACLE 8i(ver. 8.1.7.0.0) as its back end for storing the data and ASP (ver. 3.0) for the interfaces and VB6 for making DLL's, it uses Crystal Reports 8.0 for MIS i.e. Management Information System.

CHAPTER 1

INTRODUCTION

INTRODUCTION

WEB@ITT is a product that is being targeted as a Solution for Integrated Testing. WEB@ITT has been developed with the aim of increasing the overall efficiency of the Testing Process, which would thus enhance the quality of the product being tested. WEB@ITT aims to provide a much faster and error-free process of testing a product.

The solution is divided into two categories

Functionality modules, namely

- User Module
- Project Details Module
- Testing Module
- Bug Module
- Report Module

Support Modules, namely

- Security Administration

The main objective of WEB@ITT is to improve the efficiency of the Testing Department of Nucleus Software Exports Ltd., and thus contribute to the overall efforts towards achieving the CMM Level 5.

OBJECTIVES

The Software Engineering approach adopted by Nucleus Software Exports Ltd. works towards a single goal: to produce high-quality software. Yet a very common question arises here: "What is software quality?"

Philip Crosby, in his landmark book on quality provides a wry answer to this question:

The problem of quality management is not what people don't know about it. The problem is what they think the do know...

In this regard, quality has much in common with sex. Everybody is for it. (Under certain conditions, of course.) Everybody feels they understand it. (Even though they wouldn't want to explain it.) Everyone thinks execution is only a matter of following natural inclinations. (After all, we do get along somehow.) And, of course, most people feel that problems in these areas are caused by other people. (If only they would take the time to do things right.)

The product shall have the following modules to encompass the following Testing Services

- User Module
- Project Details Module
- Testing Module
- Bug Module
- Report Module

The product would be used by the Testing Department Administrator as well as other users for carrying out the process of testing a project and would consist of both administrative and operational aspects

The Administrative aspects would consist of functions regarding:

- Administration of the Users
- Maintenance of the various Project Details
- Generation of Reports

The Operational aspect would consist of functions regarding:

- Maintenance of the various Test Cases
- Maintenance of the Bug Details

NEED

There is a growing desire to develop products that meet the highest possible standards of quality. This increasing desire has led to a rise in the importance of incorporating a Testing process in the day-to-day development process.

A number of universally accepted standards have been determined each different from each other in a few ways but all with the same purpose – that of achieving the highest possible quality products. Some of the most commonly accepted standards are ISO (International Standards) and CMM (Capability Maturity Model).

Nucleus Software Exports Ltd. aims to develop quality products according to the CMM standards. Nucleus is at present in CMM Level 3.

WEB@ITT aims to contribute towards the overall process of attaining CMM Level – 5 (Optimizing).

FEATURES

The various features that would be offered are

- Maintenance of the various projects required to be tested
- Maintenance of the various test cases implemented to test each project
- Recording of the various types of bugs obtained in each project detected in each project during each cycle of testing
- Pre-Defined roles for the system to which the various users can belong
- Generation of useful reports to extract useful managerial and other such information for the testing process

ADVANTAGES

WEB@ITT provides manifold advantages to the Testing process as a whole. WEB@ITT will contribute greatly to the overall quality standards of the product

Some of the advantages provided by WEB@ITT are shown as under:

- Reduction in Documentation efforts of a Tester
- Self explanatory Reports and Graphs for Analysis
- Auto-Mailing of Bugs and Error Lists to the Developer/PL/PM
- Auto-Generation of SRS
- Only Authorized Users from the Senior Management will have access to all the Testing Projects
- Web Based Interaction between the Developers and Testers
- Auto-Linking of Test Cases and Bugs
- Project-Wise Collection of Test Cases and Bugs
- Testing Resource Management

- Testing Strategy
- Auto-Generation of QCTP
- Test-Cycle Bug Tracking

PREVIOUS SYSTEM(s)

BUGGIT is a system currently being used by the Testing Department, Nucleus Software Exports Ltd. as a tool for testing a project and finding out the bugs that exist in it (if any).

BUGGIT manages bugs and features throughout the software development process. Testers, developers, and managers can all benefit greatly from BUGGIT. Use it to enter and edit bugs/features, perform quick lookups of existing issues, print from a wide variety of powerful reports and graphs, administer new bug project databases, and much more. BUGGIT provides an unlimited number of central, multi-user databases, each supporting multiple members of your development team.

BUGGIT is intended for use by small to large software development companies or organizations. BUGGIT was designed to be easy to learn and use. Most features are implemented as intuitive wizards for users to step through.

REQUIREMENTS OF BUGGIT

BUGGIT is an Access application that requires the following items:

- Access 97 (Access 2000 has its own version) must be installed on the same machine on which you will install and run BUGGIT
- Windows 95/98 (Windows NT4/2000 should also work)
- Should have at least 32MB of RAM for Access to run fast, but can get by with less

- Should have a Pentium or better, but a 486 will work
- Other optional requirements for network use include:
- Should have no more than 4-5 concurrent users doing data entry on a single BUG_Project database.
- Can have 10+ non-concurrent users tied in to the bug database for reporting or bug viewing (no editing).
- Should have ample drive space on the network location where BUG_Project databases are stored.
- Must have directories properly shared out for network users to all access the BUG_Project databases.

DISADVANTAGES OF BUGGIT

Upon study of the prevailing system in the Testing Department we came to understand the various disadvantages of BUGGIT as a Testing Tool.

- The most glaring disadvantage about it was the limitations imposed on the functioning of the Testing Department by the Access Features. As a result of it being an Access Application we found that it could not be used for large amounts of data and that too in a consistent manner.
- It was not flexible enough to deal with large amounts of data and required a lot of extra features and add-ons to be available before it could be installed and used.
- It did not allow for a very productive way of keeping track of the performance of the testers as well as that of the Testing process as a whole.

SOLUTION PROVIDED TO IMPROVE UPON THE PREVIOUS SYSTEM

Upon study of the prevailing system in the Testing Department we came to understand that there existed a great need for the presence of a web-based testing tool, which could take advantage of the latest technologies as well as improve the productivity of the Tester as a whole

- For handling large amounts of data it was decided that Oracle was the best option.
- For a user-friendly interface and keeping in mind the need for a web-based application it was decided that ASP was the best option.
- For handling the database connectivity features required between the front-end and the back-end it was decided that Visual Basic DLLs (Dynamic Linked Libraries) was the best option.

By using the above features we understood that we would be lending a great amount of flexibility to the Department.

The Dissertation Report is divided into 5 chapters which are as follows:

Chapter 1: The present chapter is the Introductory in nature.

Chapter 2 : Design Of The System : This chapter describes the requirements for both the software and the hardware. It also describes the architecture and ER diagrams for the project.

Chapter 3 : System Layout : This chapter describes the collected requirements in the tabular format.

Chapter 4: Database Design : This chapter describes the detail description of the fields required for the Oracle Object i.e. Tables

Chapter 5: Results & Conclusions : This chapter describes the overall advantages the organization will be having over the previous system.

CHAPTER 2

DESIGN OF THE SYSTEM

HARDWARE REQUIREMENTS

Server: 40 GB HDD, 2 GB RAM, SCSI Drivers

Client: Any PC with 10 GB HDD, 256 MB RAM

SOFTWARE REQUIREMENTS

Server: Win NT Server 4.0, Oracle 8i (ver. 8.1.7.0.0)

Client: Any Browser Most preferred browser is IE (Internet Explorer 4.0+)

SYSTEM SPECIFICATIONS

The Application shall be a Web Based Application using Three-Tier Architecture

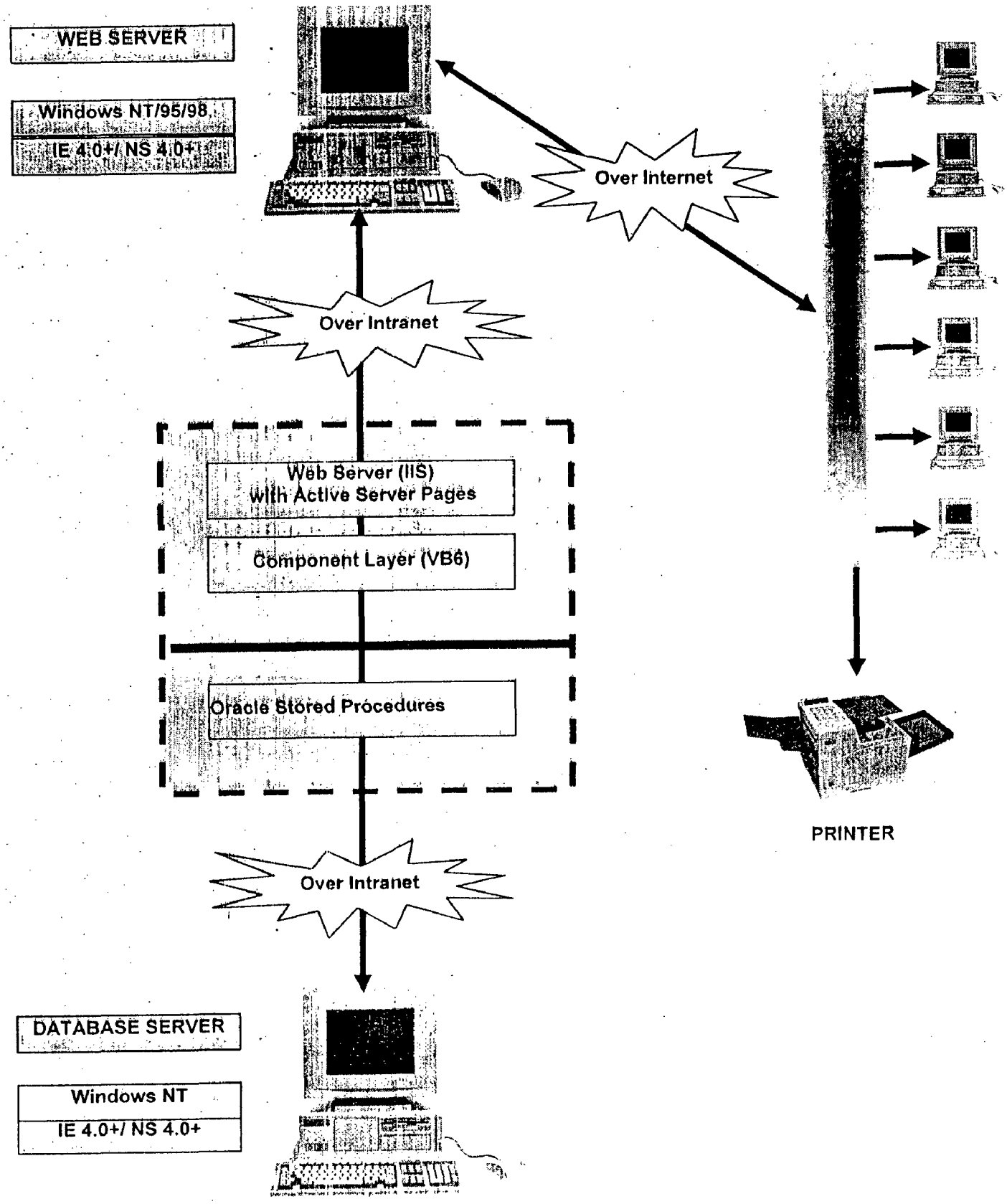
This Three-tier architecture would consist of (ASP-MTS-ORACLE)

The Client Interface shall be web-based through ASP and Crystal Reports (for reports. Details about the Crystal Reports ver. 8.0 may be seen in the Appendix given at the end.)

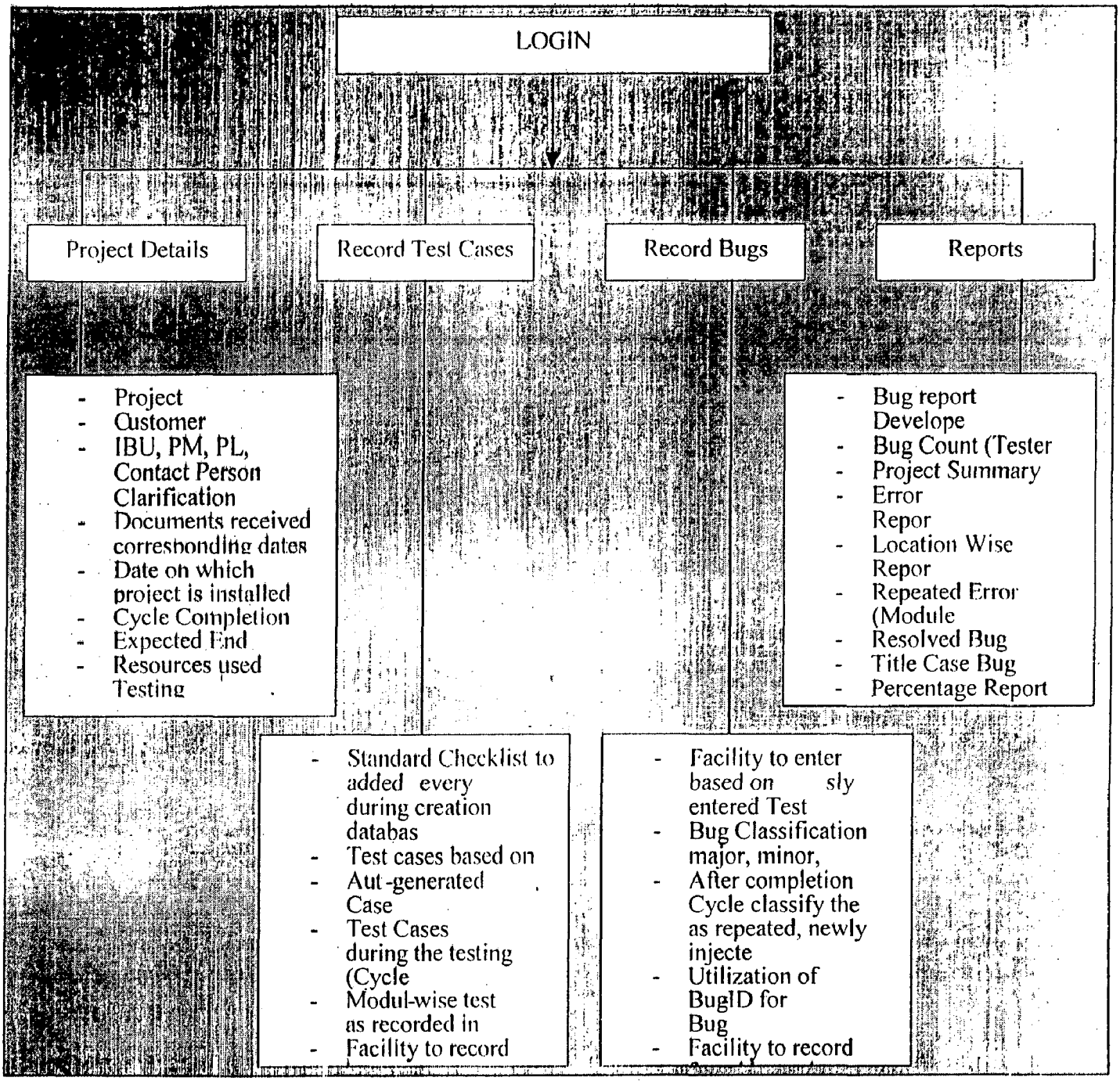
The Application Server shall consist of VB (IIS, MTS & DLLs)

The Database would be Oracle 8i and shall reside on Windows NT Server 4.0

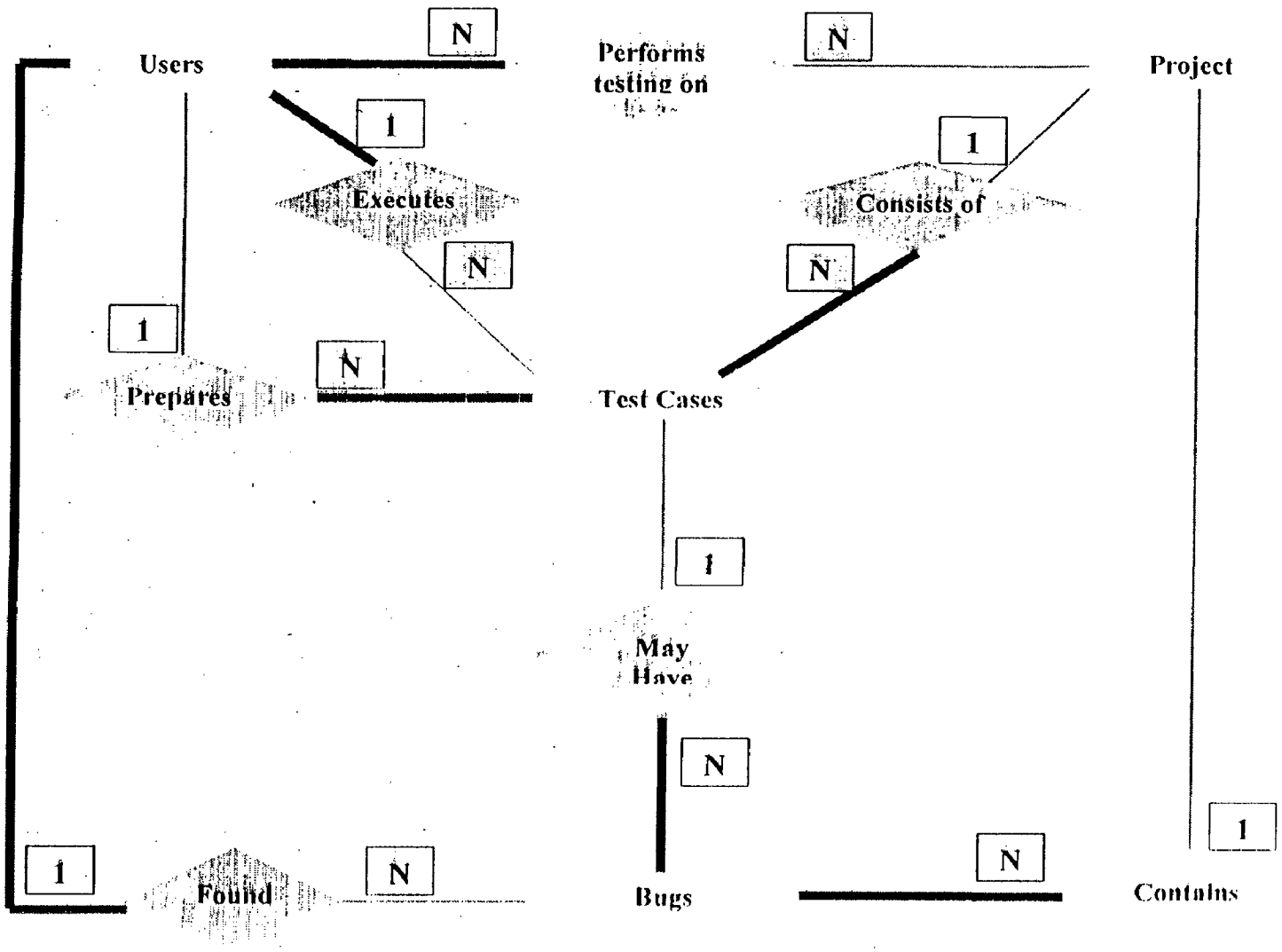
ARCHITECTURE



PROCESS FLOW

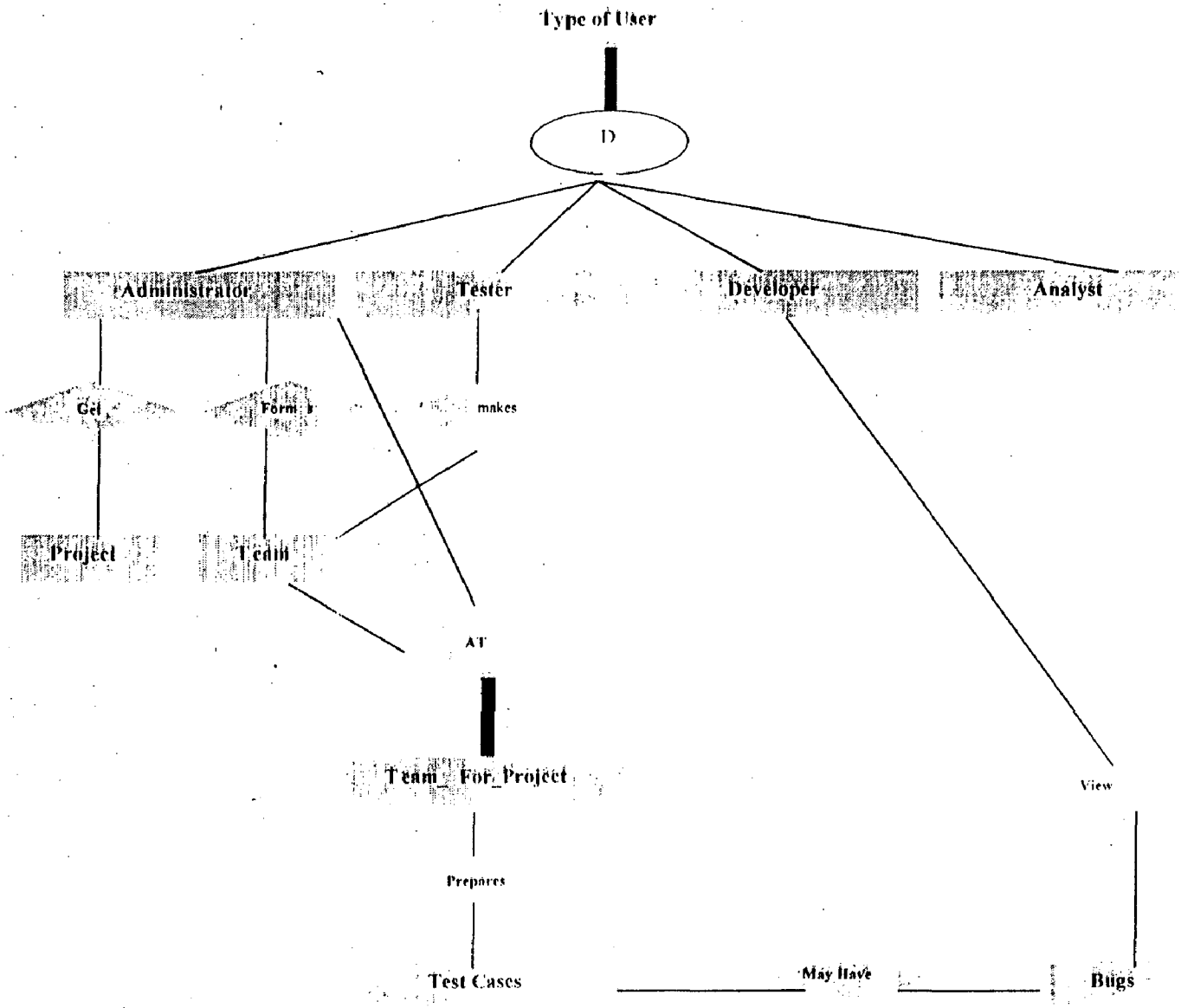


E R DIAGRAM 1



Relation Ship Name	Entities Name	Cardinality
Perform Testing On	Users : Project	N : N
Prepares	Users : Test Cases	1 : N
Found	Users : Bugs	1 : N
Executes	Users : Test Cases	1 : N
Consists Of	Project : Test Cases	1 : N
May Have	Test Cases : Bugs	1 : N
Contains	Project : Bugs	1 : N

E R DIAGRAM 2


Type of User
D
Administrator
Tester
Developer
Analyst
Get
Form
makes
Project
Team
AT
Team_For_Project
Prepares
Test Cases
May Have
View
Bugs

CHAPTER 3

SYSTEM LAYOUT

USERS

This consists of the following

a. Modifications to User Type

b. Modifications to Login Information

c. Modifications to User Information

d. Modifications to User Rights

Modifications to User Type

Description Of User Type

This is used to store the different type of groups (having one or more users) that can access the project. The groups are uniquely identified by their code which is auto generated by the system.

Field Name	Field Description
Serial Number	Used as a counter.
User Type Code	It is auto generated and is associated with the group.
User Type	Used to store the different type of groups of users available for the project
User Type Description	Used to store the description related to the group.
Remove	Used to delete the record logically.

Modifications to Login Information

Description Of Login Information

This is used to store the login information of the various users of the project. In case the user doesn't remember the password then he/she is required to enter the Question along with the Answer, he/she will be given a temporary password after comparing the inputs given by the user with the one that user had entered at the time of filling the information form. If user is allowed to login then the system will force him/her to change the temporary password. Only those users having the Status field set as "Operative" will be allowed to access the application.

Field Name	Field Description
Serial Number	Used as a counter.
User EmpID	Used to store the employee ID of the user.
Login Password	Used to store the password of the user.
Login Password	Used to store the date when the user will be forced to change the

Change Date	password of his/her login. This date will be automatically be calculated by the application.
Login First Time	Used to store the status about the password that whether the user was forced to change the password on first login or not. This field also forces the user to change the password when he/she was given a temporary password in case of not remembering the password.
Login Lock	Used to store the status of the login. It is Lock when the user fails to login in three attempts.
Login Status	Used to store the current working status of the user i.e. whether he/she is working or has left the organization (Active/Inactive)
Login Question	Used to store a question from the user. This will help the user to change the password.
Login Answer	Used to store an answer from the user. This answer corresponds to the question which is stored in the above said field.
Login Counter	Used to store the number of time the user had failed to login. After three attempts in a day the login of the user will be locked which can only be unlocked by the Administrator.
Remove	Used to delete the record logically.
Group Status	Used to whether the group to which user belong is marked as deleted or not.

Modifications to User Information

Description Of User Information

This is used to store the information about the different users, which comes under the group Administrator. All the users are required to enter their Employee ID. The unique Employee ID helps in identifying the users. Only those users having the Status field set as "Active" will be allowed to access the application.

Field Name	Field Description
Serial Number	Used as a counter.
User Type	Used as foreign key, reference from the User Type
User EmpID	Used to store the employee ID of the user.
User Name	Used to store the name of the user.
User Sex	Used to know about the sex of the user.
User Status	Used to store the current working status of the user i.e. whether he/she is working or has left the organization.
User EmailID	Used to store the email ID of the user.
User Contact Number	Used to store the contact number of the user.
User Mobile Number	Used to store the mobile number of the user.
User Department	Used to store the department to which the user belongs.
User Station	Used to store the place where the user works.
Remove	Used to delete the record logically.
Group Status	Used to know whether the group to which user belong is marked as deleted or not.

Modifications to User Rights

Description Of User Rights

This is used to store the rights of the user, which comes under the Administrator category.

Field Name	Field Description
Serial Number	Used as a counter.
User EmpID	Used to store the employee ID of the user.
User New Right	Used to specify his "New" rights
User Modify Right	Used to specify his "Edit" rights
User View Right	Used to specify his "View" rights
User Delete Right	Used to specify his "Delete" rights

PROJECT DETAILS

This consists of modifications made to the following tables

a. Maintenance of Project Details

1. Maintenance of template of IBU Template
2. Maintenance of template of Document Template
3. Maintenance of template of Resource Template
4. Modification of IBU Details (Project-wise)
5. Modification of Project Documents (Received Project-wise)
6. Modification of Project Resources (Received Project-wise)
7. Modification of Cycle Details Project-wise

b. Maintenance of Team Formation

1. Modification of Team Members
2. Maintenance of Team Rights

Maintenance of Project Details

Description Of Project Details

This is used to store the details of the project, which the testing department receives. Every project is identified by its Project ID.

Field Name	Field Description
Serial Number	Used as a counter
Project ID	Used to store the project ID. This will be unique for every project.
Project Name	Used to store the name of the project.
Table Name	Used to know in which tables the test cases are stored.
Project EmpID	Used to know which user had taken the project.
Project Customer	Used to store the name of the project's customer.
Project Resource Status	Used to know whether any kind of resources for the testing of the project is used or not.
Project Document Status	Used to know whether any kind of document related to the project has been received or not.
Project Received Date	Used to store the date on which the testing department receives the project.
Project Expected End Date	Used to store the expected end date for the cycle. This date is given by the IBU.
Project Installment Date	Used to store the installation date of the project on the servers of the testing department.
Project Mode	Used to store the mode in which the project exists. It can be ReadOnly or Editable. As long as the cycle of the project is not closed, the project will be in the Editable Mode. Once the cycle is closed, project can be opened in the Read Only Mode.
Project Priority	Used to store the priority of the project. If this filed is set to High then the error reports will be send to the developer automatically at the end of the day.
Project Contact Person	Used to store the email Id of the person to whom the bugs may be reported
Remove	Used to delete the record logically.

Maintenance of IBU Template

Description Of IBU Template

This is used to store the description of the all the different kinds of personnel that are involved in the Project Details

Field Name	Field Description
Serial Number	Used as a counter.
IBU Name	Used to show type of IBU Personnel
Code	Used to identify the type of IBU Personnel
IBU Description	Used to store the description of the IBU.
Remove	Used to delete the record logically.

Modifications to Document Template

Description Of Document Template

This is used to store the description of the all the different kinds of documents that the testing department can receive. These documents will act as a template i.e. for a given project, testing department may receive the documents listed in this table but not any other, which is not listed. If any document, which is not listed then the facility for adding the document in the is provided. This is the master table where all the different kind of documents is stored.

Field Name	Field Description
Serial Number	Used as a counter.
Code	It is auto generated and is associated with the document.
Document Name	Used to store the name of the document.
Document Description	Used to store the description about the document.
Remove	Used to delete the record logically.

Modifications to Resource Template

Description Of Resource Template

This is used to store the description of the all the different kinds of resources that the testing department uses for testing the project. These resources will act as a template i.e. for a given project, testing department may/may not use the resources listed in this table but not any other, which is not listed. If any resource, which is not listed then the facility for adding the resource in the is provided. This is the master table where all the different kind of resources is stored.

Field Name	Field Description
Serial Number	Used as a counter.
Code	It is auto generated and is associated with the resource.
Resource Name	Used to store the name of the resource.
Resource Description	Used to store the description about the resource.
Remove	Used to delete the record logically.

Modifications to IBU Details

Description Of IBU Details

This is used to store the details of the IBU and its head. This table also store the information about the PM (Project Manager) and the PL (Project Leader).

Field Name	Field Description
Serial Number	Used as a counter.
Project ID	Used as foreign key, reference from the Project Details
Code	Used as foreign key, reference from the IBU Template
User EmpID	Used to store Employee ID of IBU Personnel It is manually entered and is not auto-generated
IBU Type	Used to know the designation of the IBU personnel.
IBU Name	Used to store the name of the IBU Personnel
IBU EmailID	Used to store the email ID of the IBU Personnel
IBU Status	Used to store the current working status of the head of the IBU i.e. whether he/she is working or has left the organization He is shown as Active or Inactive
IBU From Date	Used to show the starting date of the duration of a User
IBU To Date	Used to show the ending date of the duration of a User
Remove	Used to delete the record logically.

Modifications to Project Documents

Description Of Project Documents

This is used to store the details of the documents that the testing department receives with the project.

Field Name	Field Description
Serial Number	used as a counter
Project ID	used as foreign key, reference from the Project Details
Code	used as foreign key, reference from the Document Template
Project Document Received Date	used to store the date on which the documents are received.
Remove	Used to delete the record logically.

Modifications to Project Resources

Description Of Project Resources

This is used to store the details of the resources that the testing department uses for the testing of the project.

Field Name	Field Description
Serial Number	Used as a counter
Project ID	Used as foreign key, reference from the Project Details
Code	Used as foreign key, reference from the Resource Template
Project Resource Time	Used to store the duration of the resource used during testing.
pro_cost	Used to store the cost of the resource used during testing. It depends on the time factor.
Remove	Used to delete the record logically.

Modifications to Cycle Details

Description Of Cycle Details

This is used to store the details of the testing cycle for the project.

Field Name	Field Description
Serial Number	Used as a counter
Project ID	Used as foreign key, reference from the Project Details
Cycle Number	Used to store the testing cycle number.
Cycle Start Date	Used to store the starting date of the testing cycle.
Cycle Expected End Date	Used to store the expected end date of the testing cycle. This date is given by the head of the testing department to the testing team.
Cycle Actual End Date	Used to store the actual end date of the testing cycle.
Cycle Status	Used to store the status of the testing cycle i.e. whether it is Open Or Close.
Remove	Used to delete the record logically.

Modifications to Team Formation

Description Of Team Formation

This is used to store the details of the team that work on the project.

Field Name	Field Description
Serial Number	Used as a counter
Team Formation Code	It is auto generated and is associated with the every team.
Project ID	Used as foreign key, reference from the Project Details
Team Leader	Used to store the User EmpID of the team leader
Remove	Used to delete the record logically.

Modifications to Team Members

Description Of Team Members

This is used to store the details of the team that work on the project.

Field Name	Field Description
Serial Number	Used as a counter
Team Formation Code	Used as foreign key, reference from the Team Formation
User EmpID	Used as foreign key, reference from the tester_tab
Project ID	Used as foreign key, reference from the Project Details
Team Member From Date	Used to store date when the employee starts working in the team.
Team Member To Date	Used to store the last working day of the employee in the team
Team Member New Right	Used to specify his "New" rights
Team Member View Right	Used to specify his "View" rights
Team Member Modify Right	Used to specify his "Modify" rights
Team Member Delete Right	Used to specify his "Delete" rights
Remove	Used to delete the record logically.

Modifications to Team Rights

Description Of Team Rights

This is used to store the details of the rights given to the team that work on the project.

Field Name	Field Description
Serial Number	Used as a counter
Team Formation Code	Used as foreign key, reference from the Team Formation
Team Rights New	Used to know whether the team has been given the right to create new project or not.
Team Rights Modify	Used to know whether the team has been given the right to edit the details of the project.
Team Rights View	Used to know whether the team has been given the right to view the project's detail or not.
Team Rights Delete	Used to know whether the team has been given the right to delete the project's details or not.
Remove	Used to delete the record logically.

TEST CASE RECORDS

This consists of modifications made to the following tables

a. Modifications to Test Case Details

b. Modifications to Test Case Categories Template

c. Modifications to Test Case Sub Categories Template

Modifications to Test Case Details

Description Of Test Case Details

This is used to store the details of the test cases, which the testing team makes for the project.

Field Name	Field Description
Serial Number	Used as a counter
Project ID	Used as foreign key, reference from the Project Details
Test Cases ID	It is auto generated. It identifies the test case for a project given the project ID.
Test Cases Title	Used to store the title of the test case.
Test Cases Prepared By	Used to store the name of the tester who prepares the test case.
Test Cases Prepared On	Used to store on which date the test case was prepared.
Test Cases Location	Used to store the location from where the test case belongs to.
Test Cases Categories Code	Used as foreign key, reference from the Test Case Categories Template
Test Cases Type	Used to store that whether the test case is executed or not. Presently it can have any of the following values (Executed/Not Executed/Not Applicable) N.A. is used when it is not possible to prepare the test cases.
Test Cases Action Performed	Used to store the actions to be taken to the corresponding test case.
Test Cases Expected Result	User to store the expected result of the test case before its execution.
Test Cases Result	Used to store that whether the test case Pass or Fail.
Test Cases Comments	Used to store the comments related to the test case.
Remove	Used to delete the record logically.

Modifications to Test Case Categories Template

Details Of Test Case Categories Template

This is used to store the category for the test cases under which the test case may lie.

Field Name	Field Description
Serial Number	Used as a counter
Test Cases Categories Code	Used as Primary key
Test Cases Categories Name	Used to store the name of the test case category.
Test Cases Categories Status	Used to store the status which will help to know whether the category has any sub category or not.
Remove	Used to delete the record logically.

Modifications to Test Case Sub Categories

Details Of Test Case Sub Categories

This is used to store the name of the sub category and the contents of the category

Field Name	Field Description
Serial Number	Used as a counter
Test Cases Categories Code	Used as foreign key, reference from the Test Case Categories Template
Test Case Sub Categories Name	Used to store the name of the test case category.
Test Case Sub Categories Location	Used to store the hierarchy within the test cases.
Test Case Sub Categories Description	Used to store the content of the subcategory.
Remove	Used to delete the record logically.

BUG RECORDS

This consists of modifications made to the following tables

a. Modifications to Bug Records

b. Modifications to Bug Response

c. Modifications to Bug Records for no Test Cases

Modifications to Bug Records

Details Of Bug Records

This is used to store the details of the bugs found in case if the test case result is fail.

Field Name	Field Description
Serial Number	Used as a counter.
Code	It is auto generated and is associated with the every bug.
Project ID	Used as foreign key, reference from the Project Details
Test Cases ID	Used as foreign key, reference from the Test Case Details
Bug Severity	Used to store that whether the bug is Major/Minor/Critical.
Bug Age	Used to store that whether the bug is Injected/Repeated/New.
Bug Stage	Used to store that whether the bug is from Coding/Analysis/Requirements.
Bug Class	Used to store that whether the bug is from Functionality/GUI/Installation.
Bug Reference ID	Used to store the bug id from the previous cycle if the bug is repeated.
Bug Status	Used to store that whether the bug's status i.e. Closed/Resolved/Open
Bug Found By	Used to store the name of the tester who found the bug.
Bug Found On	Used to store the date on which the bug was detected.
Bug Assigned To	Used to store the name of the person to whom the bug should be reported.
Bug Priority	Used to store the priority of the bug.
Bug Change Bugs	Used to know that whether the bug resolved is giving the incorrect results, which are different from the previous ones if same steps for executing are followed.
Bug Steps Followed	Used to store the steps taken to execute the test case.
Remove	Used to delete the record logically.

Modifications to Bug Response

Details Of Bugs Response

This is used to store the response of the bug from the developer and the tester. There are two responses from the tester, first response will tell about whether the bug is there or not, second response will help the system to find out which bugs are repeated in nature but only after getting a response from the developer and after the testing for its checking has been over.

Field Name	Field Description
Serial Number	Used as a counter
Project ID	Used as foreign key, reference from the Project Details
Test Cases ID	Used as foreign key, reference from the Test Case Details
Code	Used as foreign key, reference from the Bugs Record
Bug Response Cycle Number.	Used to store the testing cycle number in which the bug appears.
Bug Response First Tester Response	Used to store the response of the tester.
Bug Response Developer Response	Used to store the response of the developer.
Bug Response Second Tester Response	Used to store the second response of the tester.
Bug Response Resolve Date	Used to store the resolve date of the bug.
Remove	Used to delete the record logically.

Modifications to Bug Records for no Test Cases

Details Of Bug Records for no Test Cases

This is used to store the details of the bugs for which it not possible to make the test cases.

Field Name	Field Description
Serial Number	Used as a counter.
BugF Code	It is auto generated and is associated with the every bug.
Project ID	Used as foreign key, reference from the Project Details
BugF Severity	Used to store that whether the bug is Major/Minor/Critical.
BugF Age	Used to store that whether the bug is Injected/Repeated/New.
BugF Stage	Used to store that whether the bug is from Coding/Analysis/Requirements.
BugF Class	Used to store that whether the bug is from Functionality/GUI/Installation.
BugF Reference ID	Used to store the bug id from the previous cycle if the bug is repeated.
BugF Status	Used to store that whether the bug's status i.e. Closed/Resolved/Open
BugF Found By	Used to store the name of the tester who found the bug.
BugF Found On	Used to store the date on which the bug was detected.
BugF Assigned To	Used to store the name of the person to whom the bug should be reported.
BugF Priority	Used to store the priority of the bug.
BugF Description	Used to store the description how that bug appears.
BugF Steps Followed	Used to store the steps taken to execute the test case.
Remove	Used to delete the record logically.

REPORTS

The System will generate comprehensive reports

The System will use pie charts, line graphs, bar graphs (horizontal/vertical) for the same

The following reports will be generated:

- **Bug Report for Developers**
  - This will be the Error List that will be generated consisting of the following fields
    - Sr. No.
    - Unique Bug ID
    - Reference Bug ID (Cycle II onwards)
    - Test Case Performance (Including Expected Result and Actual Result)
    - Severity

- **Bug Count**
  - Tester Wise

- **Project Summary Report**
  - Bugs Found Per Week
  - Breakdown status by Priority
  - Project Progress Report (Number and Category of bugs found everyday)

- **Error Categorization Report**
  - Number if bugs in each set of category
    - Critical/Major/Minor
    - Injected/New/Repeated
    - Functionality/GUI/Installation
    - Coding/Analysis/Requirement

- **Location-Wise Bug Report**

- **Repeated Bugs Report**
    - Between each pair of Versions and common between all versions

- **Resolved Bug Report**
    - The Bugs which are Open/Fixed/Resolved

- **Title Based Bug Reports**

- **3 modules with maximum errors and of which category**
    - Top 3 modules for the Tester

- **3 dates/days on which maximum errors and of which category reported**
    - Top 3 days for the Tester

- **3 categories in which maximum number of errors are obtained**
    - Top 3 categories

- **Cost and Time of each Resource**
    - Calculates the time and cost put in by each resource for each cycle of the project

SECURITY – USER SETUP

Individual User Setup

a. Individual User entry in User Information

b. Individual User entry in Login Information

c. Individual User Rights Setup

Individual Team Setup

a. Team Formation Setup

b. Team Members Setup

c. Team Rights Setup

INDIVIDUAL USER SETUP

a. Individual User entry in User Information

i. Specification of User Type

The User Type can be assigned in two ways

- By selecting a pre-defined User Type from the User Type Table. This option is available only to the Administrator

- In case the User is of a User Type not already mentioned in the User Type Table there is an option for the addition of the New User Type and then selecting that New User Type. This option is available only to the Administrator

ii. Specification of User EmpID

This will be automatically generated on addition of a new user

iii. Specification of User Status

This is used to store the current working status of the User i..e, whether he/she is working or has left the organization

This specifies the status of the User as

a. Active

b. Inactive

This ensures for greater security against invalid login

iv. Specification of User Department

This is used to store the name of the Department to which the User belongs

This ensures greater security by ensuring that the User is from the correct Department

b. Individual User entry in Login Information

i. Specification of User EmpID

This is to indicate the Employee ID of the person for whom the Login Info details are being set

ii. Specification of Login Password

This is user-defined

When a person logs in for the first time he/she is given a temporary password and is forced to change the password to one of his own preference the next time he logs in

iii. Specification of Login Password Change Date

This is used to store the date when the user will be forced to change the password of his/her login

This date will automatically be calculated by the application

iv. Specification of Login First Time

This is used to indicate whether a person has logged in for the first time or not

There are two cases when a person would be logging in for the first time

- Upon first-time initialization of the user
- When a current user forgets his/her password and is allocated a temporary password which he/she has to change to one of his own preference the next time he logs in

v. Specification of Login Lock

This is used to store the status of the user

It is set to "lock" if the user fails to login correctly three times in succession

It is set to "unlock" in case of a valid login

vi. Specification of Login Status

This is used to store the current working status of the User i..e, whether he/she is working or has left the organization

This specifies the status of the User as

a. Active

b. Inactive

This ensures for greater security against invalid login

vii. Specification of Login Question

This is defined by the user

It is used as a parameter for comparison when a person forgets his/her password

viii. Specification of Login Answer

This is defined by the user and corresponds to the Question specified above

It is used as a parameter for comparison when a person forgets his/her password

ix. Specification of Login Counter

This is used to store the number of times a user has failed to log in

After three attempts in the span of a day, the login of the user will be locked which can be unlocked only by the Administrator

c. Individual User Rights Setup in User Table

i.Specification of User EmpID

This is used to specify the User to whom we are assigning the rights

ii.Specification of User New Right

This specifies the "New" rights of the User

iii.Specification of User New Modify

This specifies the "Edit" rights of the User

iv.Specification of User New View

This specifies the "View" rights of the User

v.Specification of User New Delete

This specifies the "Delete" rights of the User

INDIVIDUAL TEAM SETUP

a. Team Formation Setup

A Team is selected just before a new Cycle of Testing starts

The Team would consist of personnel all of whom are of User Type Tester

No personnel of any other User Type would be allowed to become members of the Team

i. Assignment of Unique Team Formation Code

Each Team is assigned an Auto-Generated Unique Team Formation Code, which allows for greater security in the association of a project with a group of Users

ii. Specification of Project ID

For each Team, their Team Formation Code is associated with the corresponding Project ID

It is compulsory that this association is made before exiting the Table

This ensures that no Team can be formed without being associated with a Project

iii. Assignment of Team Leader

This is used to specify the Leader of the Team

The contains the Employee ID of the person

The Leader cannot be anything else other than a Tester

The Tester has to be one of the Team Members to be selected as a Leader

b. Team Members Setup

Modifications to this Team Members are made only in the following cases

a. When a new entry is made in the Team Formation

b. When modifications have to be made to an existing Team Formation during the span of a single Cycle

i. **Display of Team Formation Code**

This is automatically displayed when we choose the option for the Team Members Setup from the Team Formation form

ii. **Specification of User EmpID**

This will be selected from the list generated from the User Main Table where User Type is "Tester"

No duplicates will be allowed

iii. **Specification of Team Member From Date**

This determines the starting date of the Team Member i.e., from when can he start working

By default this could be the current date

iv. **Specification of Team Member To Date**

This determines the date till which a Team Member can be part of a Team

By default this could be the ending date of the Cycle i.e., Cycle Expected End Date

It can also be user-defined

v. **Specification of Team Member Leader**

This determines whether the Team Member is the Leader of the Team or not

There are conditions regarding the Team Leader

There cannot be more than one Leader for a single Team

The Team Leader has to be of type Tester only

vi. **Specification of Team Member New Right**

This indicates the "New" Rights of the Team

vii. **Specification of Team Member Modify Right**

This indicates the "Edit" Rights of the Team

viii. **Specification of Team Member View Right**

This indicates the "View" Rights of the Team

ix. **Specification of Team Member Delete Right**

This indicates the "Delete" Rights of the Team

c. **Team Rights Setup**

i. **Specification of Team Formation Code**

This indicates which Team the rights are being set for

It is important to remember that all the members of the Team are Testers only

ii. **Specification of Team Rights New**

This indicates the "New" Rights of the Team

iii. **Specification of Team Rights Modify**

This indicates the "Edit" Rights of the Team

iv. **Specification of Team Rights View**

This indicates the "View" Rights of the Team

v. **Specification of Team Rights Delete**

This indicates the "Delete" Rights of the Team

CHAPTER 4

DATABASE DESIGN

DESCRIPTION OF USER GROUP

This table is used to store the different type of groups (having one or more users) that can access the information. The groups are uniquely identified by their code which is auto generated by the system.

Primary Key: Vc_Ugrp_Code
Candidate Key: Vc_Ugrp_Name
Foreign Key:

Field Name	Field Data Type	Field Length	Mandatory Or Not	Field Description
Nu_Ugrp_Sno	Number	5	System Generated	Used as a counter.
Vc_Ugrp_Code	Varchar2	10	System Generated	It is auto generated and is associated with the group.
Vc_Ugrp_Name	Varchar2	35	Yes	Used to store the different type of groups of to which a user may belong.
Vc_Ugrp_Descp	Varchar2	150	Not	Used to store the description related to the group.
Nu_Ugrp_Remove	Number	1	Not	Used to delete the record logically.

DESCRIPTION OF USERS

This table is used to store the information about the different users. All the users are required to enter their Employee ID. The unique Employee ID helps in identifying the users.

Primary Key: Nu_Usr_Empld
Candidate Key: Vc_Usr_Emailid
Foreign Key: Vc_Usr_Code

Field Name	Field Data Type	Field Length	Mandatory Or Not	Field Description
Nu_Usr_Sno	Number	ND	System Generated	Used as a counter.
Vc_Usr_Code	Varchar2	10	Yes	Used as foreign key, reference from the User Group
Nu_Usr_Empld	Number	ND	Yes	Used to store the employee ID of the user.
Vc_Usr_Name	Varchar2	50	Yes	Used to store the name of the user.
Nu_Usr_Sex	Number	1	Yes	Used to know about the sex of the user.
Vc_Usr_Status	Varchar2	15	Yes	Used to store the current working status of the user i.e. whether he/she is working or has left the organization.
Vc_Usr_Emailid	Varchar2	35	Yes	Used to store the email ID of the user.
Vc_Usr_Contact_No	Varchar2	50	Not	Used to store the contact number of the user.
Vc_Usr_Mobile	Varchar2	50	Not	Used to store the mobile number of the user.
Vc_Usr_Dept	Varchar2	50	Yes	Used to store the department to which the user belongs.
Vc_Usr_Station	Varchar2	50	Yes	Used to store the place where the user works.
Nu_Usr_Remove	Number	1	Not	Used to delete the record logically.
Nu_Usr_Group_Status	Number	1	Not	Used to know whether the group to which user belong is marked as deleted or not.

DESCRIPTION OF LOGIN INFORMATION

This table is used to store the login information of the various users of the project. In case the user doesn't remember the password then he/she is required to enter the Question along with the Answer, he/she will be given a temporary password after comparing the inputs given by the user with the one that user had entered at the time of filling the information form. If user is allowed to login then the system will force him/her to change the temporary password. Only those users having the Status field set as "Active", marked as Undeleted and whose Login is not Locked will be allowed to access the application.

Primary Key : Nu_Log_Sno
Candidate Key :
Foreign Key : Nu_Log_EmpId

Field Name	Field Data Type	Field Length	Mandatory Or Not	Field Description
Nu_Log_Sno	Number	ND	System Generated	Used as a counter.
Nu_Log_EmpId	Number	ND	Yes	Used to store the employee ID of the user
Vc_Log_Password	Varchar2	10	Yes	Used to store the password of the user.
Dt_Log_PCD	Date		System Generated	Used to store the date when the user will be forced to change the password of his/her login. This date will be automatically be calculated by the application
Nu_Log_Ft	Number	1	System Generated	Used to store the status about the password that whether the user was forced to change the password on first login or not. This field also forces the user to change the password when he/she was given a temporary password in case of not remembering the password.

Nu_Log_Lock	Number	1	System Generated	Used to store the status of the login. It is Lock when the user fails to login in three attempts.
Vc_Log_Status	Varchar2	15	Yes	Used to store the current working status of the user i.e. whether he/she is working or has left the organization (Active/Inactive)
Vc_Log_Question	Varchar2	150	Yes	Used to store a question from the user. This will help the user to change the password.
Vc_Log_Answer	Varchar2	100	Yes	Used to store a answer from the user. This answer corresponds to the question which is stored in the above said field.
Nu_Log_Counter	Number	2	System Generated	Used to store the number of time the user had failed to login. After three attempts in a day the login of the user will be locked which can only be unlocked by the Administrator.
Nu_Log_Remove	Number	1	Not	Used to delete the record logically.
Nu_Log_Group_Status	Number	1	Not	Used to know whether the group to which user belong is marked as deleted or not.
Nu_Log_Online	Number	1	Not	Used to know whether the user is currently logged in to the application or not.

DESCRIPTION OF USER RIGHTS

This table is used to store the rights of the user.

Primary Key: Nu_Rgt_Sno
Candidate Key:
Foreign Key: Nu_Rgt_Empid

Field Name	Field Data Type	Field Length	Mandatory Or Not	Field Description
Nu_Rgt_Sno	Number	ND	System Generated	Used as a counter.
Nu_Rgt_Empid	Number	ND	Yes	Used to store the employee ID of the user.
Nu_Rgt_New	Number	1	Not	Used to specify his "New" rights
Nu_Rgt_Modify	Number	1	Not	Used to specify his "Edit" rights
Nu_Rgt_View	Number	1	Not	Used to specify his "View" rights
Nu_Rgt_Delete	Number	1	Not	Used to specify his "Delete" rights
Nu_Rgt_Remove	Number	1	Not	Used to delete the record logically.

DESCRIPTION OF IBU TEMPLATE

This table is used to store the description of the all the different kinds of IBU that are in the organization.

Primary Key: Vc_Ibu_Code
Candidate Key: Vc_Ibu_Name
Foreign Key:

Field Name	Field Data Type	Field Length	Mandatory Or Not	Field Description
Nu_Ibu_Sno	Number	ND	System Generated	Used as a counter.
Vc_Ibu_Code	Varchar2	8	System Generated	Used to show type of IBU Personnel
Vc_Ibu_Name	Varchar2	100	Yes	Used to identify the type of IBU Personnel
Vc_Ibu_Descp	Varchar2	200	Not	/Used to store the description of the IBU.
Nu_Ibu_Remove	Number	1	Not	Used to delete the record logically.

DESCRIPTION OF DOCUMENT TEMPLATE

This table is used to store the description of the all the different kinds of documents that the testing department can receive. These documents will act as a template i.e. for a given project, testing department may receive the documents listed in this table but not any other, which is not listed. If any document, which is not listed then the facility for adding the document in the table is provided. This is the master table where all the different kind of documents is stored.

Primary Key: Vc_Doc_Code
Candidate Key: Vc_Doc_Name
Foreign Key:

Field Name	Field Data Type	Field Length	Mandatory Or Not	Field Description
Nu_Doc_Sno	Number	ND	System Generated	Used as a counter.
Vc_Doc_Code	Varchar2	8	System Generated	It is auto generated and is associated with the document.
Vc_Doc_Name	Varchar2	100	Yes	Used to store the name of the document.
Vc_Doc_Descp	Varchar2	100	Not	Used to store the description about the document.
Nu_Doc_Remove	Number	1	Not	Used to delete the record logically.

DESCRIPTION OF RESOURCES TEMPLATE

This table is used to store the description of the all the different kinds of resources that the testing department uses for testing the project. These resources will act as a template i.e. for a given project, testing department may/may not use the resources listed in this table but not any other, which is not listed. If any resource, which is not listed then the facility for adding the resource in the table is provided. This is the master table where all the different kind of resources is stored.

Primary Key: Vc_Res_Code
Candidate Key: Vc_Res_Name
Foreign Key:

Field Name	Field Data Type	Field Length	Mandatory Or Not	Field Description
Nu_Res_Sno	Number	ND	System Generated	Used as a counter.
Vc_Res_Code	Varchar2	8	System Generated	It is auto generated and is associated with the resource.
Vc_Res_Name	Varchar2	100	Yes	Used to store the name of the resource.
Vc_Res_Descp	Varchar2	100	Not	Used to store the description about the resource.
Nu_Res_Remove	Number	1	Not	Used to delete the record logically.

DESCRIPTION OF PROJECT DETAILS

This table is used to store the details of the project, which the testing department receives. Every project is identified by its Project ID.

Primary Key: Vc_Prdt_PID
Candidate Key: Vc_Prdt_Name
Foreign Key: Nu_Prdt_Empid

Field Name	Field Data Type	Field Length	Mandatory Or Not	Field Description
Nu_Prdt_Sno	Number	ND	System Generated	Used as a counter
Vc_Prdt_PID	Varchar2	15	System Generated	Used to store the project ID. This will be unique for every project.
Vc_Prdt_Name	Varchar2	200	Yes	Used to store the name of the project.
Vc_Prdt_Tblname	Varchar2	50	Not	Used to know in which tables the test cases are stored.
Nu_Prdt_Empid	Number	ND	Yes	Used to know which user had taken the project.
Vc_Prdt_Customer	Varchar2	200	Yes	Used to store the name of the project's customer.
Nu_Prdt_Ver	Number	ND	Yes	Used to store the version of the project.
Nu_Prdt_Cycle	Number	ND	Yes	Used to store the testing cycle number of the project.
Nu_Prdt_Res_Status	Number	1	Not	Used to know whether any kind of resources for the testing of the project is used or not.
Nu_Prdt_Doc_Status	Number	1	Not	Used to know whether any kind of document related to the project has been received or not.
Dt_Prdt_Recd	Date		Yes	Used to store the date on which the testing department receives the project.

Dt_Prdt_Exp_End	Date		Yes	Used to store the expected end date for the cycle. This date is given by the IBU.
Dt_Prdt_Inst	Date		Yes	Used to store the installation date of the project on the servers of the testing department.
Nu_Prdt_Prj_Mode	Number	1	Yes	Used to store the mode in which the project exists. It can be ReadOnly or Editable. As long as the cycle of the project is not closed, the project will be in the Editable Mode. Once the cycle is closed, project can be opened in the Read Only Mode.
Nu_Prdt_Priority	Number	1	Yes	Used to store the priority of the project. If this filed is set to High then the error reports will be send to the developer automatically at the end of the day.
Vc_Prdt_Contact_Person	Varchar2	50	Yes	Used to store the email Id of the person to whom the bugs may be reported
Nu_Prdt_Remove	Number	1	Not	Used to delete the record logically.

DESCRIPTION OF PROJECT IBU

This table is used to store the details of the project's IBU and its head. This table also store the information about the PM (Project Manager) and the PL (Project Leader).

Primary Key: Nu_Prjibu_Sno
Candidate Key:
Foreign Key: Vc_PrjIbu_PID, Vc_PrjIbu_Ibu_Code & Nu_PrjIbu_Empid

Field Name	Field Data Type	Field Length	Mandatory Or Not	Field Description
Nu_Prjibu_Sno	Number	ND	System Generated	Used as a counter.
Vc_PrjIbu_PID	Varchar2	15	Yes	Used as foreign key, reference from the Project Details
Vc_PrjIbu_Ibu_Code	Varchar2	10	Yes	Used as foreign key, reference from the Ibu Template
Nu_PrjIbu_Empid	Number	ND	Yes	Used to store Employee ID of IBU Personnel.
Nu_PrjIbu_Type	Number	1	Yes	Used to know the designation of the IBU personnel.
Dt_PrjIbu_From	Date		Not	Used to show the starting date of the duration of a User
Dt_PrjIbu_To	Date		Not	Used to show the ending date of the duration of a User
Nu_PrjIbu_Remove	Number	1	Not	Used to delete the record logically.

DESCRIPTION OF PROJECT DOCS

This table is used to store the details of the documents that the testing department receives with the project.

Primary Key: Nu_Prdoc_Sno
Candidate Key:
Foreign Key: Vc_Prdoc_PID, Vc_Prdoc_Code

Field Name	Field Data Type	Field Length	Mandatory Or Not	Field Description
Nu_Prdoc_Sno	Number	ND	System Generated	Used as a counter
Vc_Prdoc_PID	Varchar2	15	Yes	Used as foreign key, reference from the Project Details.
Vc_Prdoc_Code	Varchar2	8	Yes	Used as foreign key, reference from the Documents template
Dt_Prdoc_Recd	Date		Yes	Used to store the date on which the documents are received.
Nu_Prdoc_Remove	Number	1	Not	Used to delete the record logically.

DESCRIPTION OF PROJECT RESOURCES

This table is used to store the details of the resources that the testing department uses for the testing of the project.

Primary Key: Nu_Prres_Sno
Candidate Key:
Foreign Key: Vc_Prrès_PID& Vc_Prres_Code

Field Name	Field Data Type	Field Length	Mandatory Or Not	Field Description
Nu_Prres_Sno	Number	ND	System Generated	Used as a counter
Vc_Prres_PID	Varchar2	15	Yes	Used as foreign key, reference from the Project Details
Vc_Prres_Code	Varchar2	8	Yes	Used as foreign key, reference from the Resources Template
Nu_Prres_Time	Number	ND	Not	Used to store the duration of the resource used during testing.
Nu_Prres_Cost	Number	(10,2)	Not	Used to store the cost of the resource used during testing. It depends on the time factor.
Nu_Prres_Remove	Number	1	Not	Used to delete the record logically.

DESCRIPTION OF TESTING CYCLE DETAILS

This table is used to store the details of the testing cycle for the project.
Primary Key: Nu_Cycdt_Sno
Candidate Key:
Foreign Key Vc_Cycdt_PID

Field Name	Field Data Type	Field Length	Mandatory Or Not	Field Description
Nu_Cycdt_Sno	Number	ND	System Generated	Used as a counter
Vc_Cycdt_PID	Varchar2	15	Yes	Used as foreign key, reference from the Project Details
Nu_Cycdt_No	Number	ND	Yes	Used to store the testing cycle number.
Dt_Cycdt_Start	Date		Yes	Used to store the starting date of the testing cycle.
Dt_Cycdt_Exp_End	Date		Not	Used to store the expected end date of the testing cycle. This date is given by the head of the testing department to the testing team.
Dt_Cycdt_Act_End	Date		Not	Used to store the actual end date of the testing cycle.
Nu_Cycdt_Status	Number	1	Not	Used to store the status of the testing cycle i.e. whether it is Open Or Close.
Nu_Cycdt_Remove	Number	1	Not	Used to delete the record logically.

DESCRIPTION OF TEAM FORMATION

This table is used to store the details of the team that work on the project.

Primary Key: Vc_Tmfrm_Code
Candidate Key:
Foreign Key: Vc_Tmfrm_PID

Field Name	Field Data Type	Field Length	Mandatory Or Not	Field Description
Nu_Tmfrm_Sno	Number	ND	System Generated	Used as a counter
Vc_Tmfrm_Code	Varchar2	15	Yes	It is auto generated and is associated with the every team.
Vc_Tmfrm_PID	Varchar2	15	Yes	Used as foreign key, reference from the Project Details
Nu_Tmfrm_Remove	Number	1	Not	Used to of the team leader

DESCRIPTION OF TEAM RIGHTS

This table is used to store the details of the rights given to the team that work on the project.

Primary Key: Nu_Tmrgt_Sno
Candidate Key:
Foreign Key: Vc_Tmrgt_Code

Field Name	Field Data Type	Field Length	Mandatory Or Not	Field Description
Nu_Tmrgt_Sno	Number	ND	System Generated	Used as a counter
Vc_Tmrgt_Code	Varchar2	15	Yes	Used as foreign key, reference from the Team Formation.
Nu_Tmrgt_New	Number	1	Not	Used to know whether the team has been given the right to create new project or not.
Nu_Tmrgt_Modify	Number	1	Not	Used to know whether the team has been given the right to edit the details of the project.
Nu_Tmrgt_View	Number	1	Not	Used to know whether the team has been given the right to view the project's detail or not.
Nu_Tmrgt_Delete	Number	1	Not	Used to know whether the team has been given the right to delete the project's details or not.
Nu_Tmrgt_Remove	Number	1	Not	Used to delete the record logically.

DESCRIPTION OF TEAM MEMBERS

This table is used to store the details of the team that work on the project.

Primary Key: Nu_Tmmem_Sno
Candidate Key:
Foreign Key: Vc_Tmmem_Code, Nu_Tmmem_Empid

Field Name	Field Data Type	Field Length	Mandatory Or Not	Field Description
Nu_Tmmem_Sno	Number	ND	System Generated	Used as a counter
Vc_Tmmem_Code	Varchar2	10	Yes	Used as foreign key, reference from the Team formation.
Nu_Tmmem_Empid	Number	ND	Yes	Used as foreign key, reference from the User Table
Dt_Tmmem_From	Date		Yes	Used to store date when the employee starts working in the team.
Dt_Tmmem_To	Date		Yes	Used to store the last working day of the employee in the team
Nu_Tmmem_Leader	Number	1	Yes	Used as foreign key, reference from the Project Details.
Nu_Tmmem_New	Number	1	Not	Used to specify his "New" rights
Nu_Tmmem_View	Number	1	Not	Used to specify his "View" rights
Nu_Tmmem_Modify	Number	1	Not	Used to specify his "Modify" rights
Nu_Tmmem_Delete	Number	1	Not	Used to specify his "Delete" rights
Nu_Tmmem_Remove	Number	1	Not	Used to delete the record logically.

DETAILS OF TEST CASE CATEGORIES

This table is used to store the category for the test cases under which the test case may lie.

Primary Key: Vc_Tccat_Catid
Candidate Key: Vc_Tccat_Name
Foreign Key:

Field Name	Field Data Type	Field Length	Mandatory Or Not	Field Description
Nu_Tccat_Sno	Number	ND	System Generated	Used as a counter
Vc_Tccat_Catid	Varchar2	10	System Generated	Used as Primary key
Vc_Tccat_Name	Varchar2	100	Yes	Used to store the name of the test case category.
Vc_Tccat_Descp	Varchar2	300	Not	Used to store the status which will help to know whether the category has any sub category or not.
Nu_Tccat_Remove	Number	1	Not	Used to delete the record logically.

DETAILS OF TEST CASE SUB CATEGORIES

This table is used to store the name of the sub category and the contents of the category

Primary Key: Vc_Scat_Subcatid
Candidate Key:
Foreign Key: Vc_Scat_Catid

Field Name	Field Data Type	Field Length	Mandatory Or Not	Field Description
Nu_Scat_Sno	Number	ND	System Generated	Used as a counter
Vc_Scat_Subcatid	Varchar2	20	System Generated	Used as primary key.
Vc_Scat_Catid	Varchar2	10	Yes	Used as foreign key, reference from the Test Case Categories.
Vc_Scat_Location	Varchar2	100	Yes	Used to store the hierarchy within the test cases.
Vc_Scat_Content	Varchar2	500	Yes	Used to store the content of the subcategory.
Nu_Scat_Remove	Number	1	Not	Used to delete the record logically.

DETAILS OF TEST CASE LOCATION

This table is used to store the location of the screen for which a test case is to be written.

Primary Key: Vc_Tcloc_Locid
Candidate Key:
Foreign Key: Vc_Tcloc_Pid

Field Name	Field Data Type	Field Length	Mandatory Or Not	Field Description
Nu_Tcloc_Sno	Number	ND	System Generated	Used as a counter
Vc_Tcloc_Locid	Varchar2	20	System Generated	Used as primary key.
Vc_Tcloc_Pid	Varchar2	10	Yes	Used as foreign key, reference from the Project Details.
Vc_Tcloc_Location	Varchar2	400	Yes	Used to store the location of the screen corresponding to the test cases.
Nu_Tcloc_Remove	Number	1	Not	Used to delete the record logically.

DESCRIPTION OF TEST CASES DETAILS

This table is used to store the details of the test cases, which the testing team makes for the project.

Primary Key: Vc_Tcdt_CaseID
Candidate Key:
Foreign Key: Vc_Tcdt_PID, Nu_Tcdt_Empid, Vc_Tcdt_Location & Vc_Tcdt_Code

Field Name	Field Data Type	Field Length	Mandatory Or Not	Field Description
Nu_Tcdt_Sno	Number	ND	System Generated	Used as a counter
Vc_Tcdt_PID	Varchar 2	10	Yes	Used as foreign key, reference from the Project Details.
Vc_Tcdt_Prjpart	Varchar 2	8	System Generate	Used to store the first 8 characters from the project ID.
Nu_Tcdt_Cycno	Number	2	System Generate	Used to store the cycle number of the testing cycle for the give project.
Vc_Tcdt_CaseID	Varchar 2	20	System Generated	Used as a primary key.
Vc_Tcdt_Title	Varchar 2	100	Yes	Used to store the title of the test case.
Nu_Tcdt_Empid	Number	ND	Yes	Used to store the employee ID of the tester who prepares the test case.
Vc_Tcdt_Prepared_By	Varchar 2	50	Yes	Used to store the name of the tester who prepares the test case.
Dt_Tcdt_Prepared_On	Date		Yes	Used to store on which date the test case was prepared.
Vc_Tcdt_Location	Varchar 2	10	Yes	User as foreign key from Test Case Location Table to know corresponding to which screen the test case has been written.

Vc_Tcdt_Code	Varchar2	10	Yes	User as foreign key from Test Case Category Table to know under which category the test case belongs..
Vc_Tcdt_Action_Performed	Varchar2	1000	Yes	Used to store the sequence of action taken to perform the test case.
Vc_Tcdt_Exp_Result	Varchar2	500	Yes	Used to store the expected result of the test case.
Nu_Tcdt_Remove	Number	1	Not	Used to delete the record logically.

DESCRIPTION OF TEST CASES RESULT

This table is used to store the details of the test cases, which the testing team makes for the project.

Primary Key: Nu_Tcrt_Sno
Candidate Key:
Foreign Key: :Vc_Tcrt_PID, Nu_Tcrt_Empid & Vc_Tcrt_CaseID

Field Name	Field Data Type	Field Length	Mandatory Or Not	Field Description
Nu_Tcrt_Sno	Number	ND	System Generated	Used as a counter
Vc_Tcrt_PID	Varchar2	10	Yes	Used as foreign key, reference from the Project Details.
Vc_Tcrt_Prjpart	Varchar2	8	System Generated	Used to store the first 8 characters from the project ID.
Vc_Tcrt_CaseID	Varchar2	20	Yes	Used as foreign key, reference from the Test Case Details
Nu_Tcrt_Empid	Number	ND	Yes	Used to store the empid of the tester who executes the test case.
Vc_Tcrt_Exec_By	Varchar2	50	Yes	Used to store the name of the tester who executes the test case.
Dt_Tcrt_Exec_On	Date		Not	Used to store on which date the test case was executed.
Nu_Tcrt_Type	Number	1	Yes	Used to store that whether the test case is executed or not. Presently it can have any of the following values (Executed/Not Executed/N.A) N.A. is used when it is not possible to prepare the test cases.
Vc_Tcrt_Act_Result	Varchar2	500	Yes	Used to store the actual result of the test case when it is executed.

Nu_Tcrt_Result	Number	1	Not	Used to store that whether the test case Pass or Fail.
Vc_Tcrt_Comments	Varchar2	500	Not	Used to store the comments related to the test case.
Nu_Tcrt_Remove	Number	1	Not	Used to delete the record logically.

DETAILS OF BUGS RECORDING

This table is used to store the details of the bugs found in case if the test case result is fail.

Primary Key: Vc_Brdt_BID
Candidate Key:
Foreign Key: Vc_Brdt_PID & Vc_Brdt_Caseid

Field Name	Field Data Type	Field Length	Mandatory Or Not	Field Description
Nu_Brdt_Sno	Number	ND	System Generated	Used as a counter.
Vc_Brdt_BID	Varchar2	20	System Generated	It is auto generated and is associated with the every bug.
Vc_Brdt_PID	Varchar2	10	Yes	Used as foreign key, reference from the Project Details.
Vc_Brdt_Prjpart	Varchar2	8	System Generated	Used to store the first 8 characters of the project ID.
Vc_Brdt_Caseid	Varchar2	20	Yes	Used as foreign key, reference from the Test Case Details
Nu_Brdt_Severity	Number	1	Yes	Used to store that whether the bug is Major/Minor/Critical.
Nu_Brdt_Age	Number	1	Yes	Used to store that whether the bug is Injected/Repeated/New.
Nu_Brdt_Stage	Number	1	Yes	Used to store that whether the bug is from Coding/Analysis/Requirements.
Nu_Brdt_Classify	Number	1	Yes	Used to store that whether the bug is from Functionality/GUI/Installation.
Vc_Brdt_Bugrefid	Varchar2	20	Not	Used to store the bug id from the previous cycle if the bug is repeated.

Nu_Brdt_Status	Number	1	Yes	Used to store that whether the bug's status i.e. Closed/Resolved/Open
Nu_Brdt_Empid	Number	ND	Yes	
Vc_Brdt_Found_By	Varchar2	50	Yes	Used to store the name of the tester who found the bug.
Dt_Brdt_Found_On	Date		Yes	Used to store the date on which the bug was detected.
Vc_Brdt_Assigned_To	Varchar2	50	Yes	Used to store the name of the person to whom the bug should be reported.
Nu_Brdt_Priority	Number	1	Yes	Used to store the priority of the bug.
Nu_Brdt_Change_Bugs	Number	1	Not	Used to know that whether the bug resolved is giving the incorrect results, which are different from the previous ones if same steps for executing are followed.
Nu_Brdt_Remove	Number	1	Not	Used to delete the record logically.

DETAILS OF BUGS RESPONSE

This table is used to store the response of the bug from the developer and the tester. There are two responses from the tester, first response will tell about whether the bug is there or not, second response will help the system to find out which bugs are repeated in nature but only after getting a response from the developer and after the testing for its checking has been over.

Primary Key: Nu_Bresp_Sno
Candidate Key:
Foreign Key: Vc_Bresp_PID, Vc_Bresp_Caseid & Vc_Bresp_BID

Field Name	Field Data Type	Field Length	Mandatory Or Not	Field Description
Nu_Bresp_Sno	Number	ND	System Generated	Used as a counter
Vc_Bresp_PID	Varchar2	10	Yes	Used as foreign key, reference from the Project Details.
Vc_Bresp_Prjpart	Varchar2	8	System Generated	Used to store the first 8 characters of the project code.
Vc_Bresp_Caseid	Varchar2	20	Yes	Used as foreign key, reference from the Test Case Details
Vc_Bresp_BID	Varchar2	20	Yes	Used as foreign key, reference from the Bugs Recording
Nu_Bresp_Cycle_No	Number	ND	Yes	Used to store the testing cycle number in which the bug appears.
Nu_Bresp_Fst_Resp_Tstr	Number	ND	Yes	Used to store the response of the tester.
Nu_Bresp_Dev_Resp	Number	ND	Yes	Used to store the response of the developer.
Dt_Bresp_Response	Date		Yes	Used to store the resolve date of the bug.

Vc_Bresp_Reason	Varchar2	500	Not	Used to store the reason of the developer.
*Nu_Bresp_Sec_Resp_Tstr	Number	ND	Yes	Used to store the second response of the tester.
Nu_Bresp_Remove	Number	1	Not	Used to delete the record logically.

Process Of Development

- Setup Of Database Server With Oracle 8i (ver. 8.1.7.0.0)
- Setup Of Web Server
- Design Of Tables Structure
- Design Of Packages Specifications & Definitions
- Making Functions In VB 6 Which In Turn Call Functions In Packages And Making The Entire Functionality In VB 6
- Compiling The Functions In VB6, Test Them And Making DLL Of Them.
- Installation Of The DLL Files On The Web Server.

Chapter 5

Results & Conclusions

ADVANTAGES OF WEB@ITT OVER BUGGIT

WEB@ITT provides manifold advantages over BUGITT

WEB@ITT provides the following advantages:

Great Degree of Flexibility

With the use of Active Server Pages, Visual Basic DLLs (Dynamic Linked Libraries) and Oracle Stored procedures there is a great deal of flexibility being offered to the Testing Department

First of all, the only requirements from the clients are the availability of Internet Explorer Browsers and an Internet or Intranet connection

Secondly, the requirements to be met from the server side are common specifications and can be satisfied easily.

Global Access

Buggit being a Access Application could be accessed only within the Intranet and thus didn't give a great deal of flexibility to the end-user

WEB@ITT gave that much-needed flexibility since it is a web-based application and allows for global access

Less Requirements from Clients

The client computers need only Internet Explorer and an Internet or Intranet connection both of which are easily available. Thus the client only needs to have a proper understanding of the system's functions.

Centralized Database

All the data entered by the end-users especially the Administrator, Tester, Developer and Analyst are centrally located which allows for instant updations and modifications and thus immediate reflection of those updations globally

Greater Control over Access

WEB@ITT gives scope for greater control over the user's actions by the Administrator. The Administrator has the super-rights and the remaining groups of users each have different levels of rights which allow for a greater control over the user from the Administrator's point of view.

Better Reporting and Better MIS

One of the most important features of WEB@ITT is the Reports. This feature also is provided in a very user-friendly manner and there exists a great range of styles to choose from. The Reports are very informative and can be used as a great source of information which in turn would be used for making better conclusions about the performance of the Testing Department. This in turn increases the efficiency of the MIS (Management Information Systems)

Secure Multiple Access

By the use of Active Server Pages, we ensured that multiple users could access the same page independent of each other's actions. Since the Active Server Pages were all centrally located at the Web Server and in the Web Root Directory, virtual copies of the page being called were generated and displayed on the client's computer. This eradicated the need for any page to be installed onto the client's computer. Also it ensured that there would be a great degree of consistency throughout. Plus any changes made to the original Active Server Page's layout would be immediately reflected.

No need for physical mapping

There is no need for any physical mapping. This increases the flexibility of the application.

Buggit requires for explicit mapping from the client's computer to the server.

Internet Based

In these modern times there is a growing realization of the benefits of having a web-based application or internet-based application. WEB@ITT is internet-based and gives us all the benefits that comes with having a web-based application like global access, multiple access and so on.

Buggit is a Access Application and can be used efficiently only within the Intranet.

User Friendly Interface

The WEB@ITT is very user-friendly and appeals to the end-user. It is made to order and gives a great sense of compactness and simplicity to the ens-user.

Buggit doesn't provide a very user-friendly interface.

Customised according to the needs of the Testing Department's Function

WEB@ITT has been developed to satisfy the needs of the Testing Department and as such is a customized application. So WEB@ITT has been developed keeping in mind the exact requirements of the Testing Departmet whereas in the caseof BUGGIT the Testing Department ha to adjust according to it.

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Appendix

DETAILS ABOUT SPECIALIZED PACKAGES

CRYSTAL REPORTS 8.0

Powerful Information Delivery for the Web

Deliver rich, interactive content from virtually any data source, publish it to the Web, and integrate it within applications with Crystal Reports.

Crystal Reports is available in three editions: **Developer, Professional and Standard**

Features

With Crystal Reports®, you can easily deliver rich, interactive content from virtually any data source, publish it to the Web in a variety of formats and integrate it with applications. Crystal Reports is part of a suite of integrated technologies that ensure data can be accessed, analyzed, reported on and delivered to any stakeholder anytime, anywhere, by any device.

Powerful content creation

- **Wide variety of report types**. Create virtually any report you can imagine including subreports, conditional, summary, cross-tab, form, drill down, OLAP, Top N, multiple details, mailing labels.
- **Fast and easy report creation**. Powerful wizards, experts and built-in functionality help novice and expert users quickly assemble highly interactive reports. Customize your reports with logos, pictures, shapes and colors. An extensive formula language gives developers full control over report formatting, complex business logic and data selection.
- **Interactive**. Add charts, drill-down, alerting, parameter prompts, hyperlinks, geographic mapping, field highlighting, running totals, Top N, Bottom N, sorting to turn reports into compelling, interactive content.
- **Complex reports made easy**. Address complex reporting requirements with expert-driven features including grouping, sorting, subreports and cross-tabs, or use the powerful formula editor.
- **Flexible information distribution**. Publish reports to a variety of formats including XML, PDF, DHTML, RTF, Word, Excel, text, email and version 7 .rpt format.

- **Access to all**. Crystal Reports provides report access to all users, regardless of platform or location, and supports popular infrastructures including Microsoft, Netscape® and Lotus® web servers.
- **Rapid application development**. With the RDC, you can open, design and, modify reports inside the Visual Basic IDE using familiar Visual Basic code. Microsoft Visual InterDev® 6.0 developers can write ASP applications with integrated Crystal Reports using the same object model used in Win 32 applications. And developers using Microsoft Visual InterDev 6.0 can use the Report Integration Controls to write web applications and generate Crystal Reports hosted either on a Web Report Server or an ASP Server.
- **Royalty-free runtime**. Access hundreds of royalty-free runtime properties, methods and events for unprecedented control over the reporting engine.
- **Report creation at runtime**. Let users create reports - on the fly - from within the application, using report creation at runtime APIs or the drag-and-drop interface of the Embeddable Crystal Report Designer Control.
- **Easy data access**. Connect to over 30 different types of OLAP, SQL and PC databases using supported native, ODBC and OLE DB connectivity. Or report off in-memory application data.

Our integrated solution

Who knows reporting better than Crystal? We use Crystal report files for delivering interactive, actionable content to every user in the organization. Crystal is the clear choice for robust, easy-to-use reporting, analysis and information delivery software