# JAWAHARALAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

A

[Mini] Project Report on

**Automatic Database Schema Generation** 

.....

Submitted in partial fulfillment of the requirement for the award of the Degree of

Bachelor of Technology in Information Technology

By

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2010 - 2011

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This is to certify that the [Mini] Project Report entitled "AUTOMATIC DATABASE SCHEMA GENERATION" is submitted by

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In the partial fulfillment of the degree of Bachelor of Technology in Information Technology

from Jawaharlal Nehru Technological University, Hyderabad during the year 2011-2012.

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# **ACKNOWLEDGEMENTS**

This report will certainly not be completed without due acknowledgements paid to all those who have helped me in doing my seminar work.

I express my sincere thanks to my supervisor **Mr. NIRANJAN KUMAR**, Assistant Professor for giving me moral support, kind attention and valuable guidance to me throughout this seminar work.

It is my privilege to thank **Mr. Y.V.R. NAGA PAWAN**, Associate Professor & Head of the Department, I.T.E. for his encouragement during the progress of this seminar work.

It is my privilege to thank **Dr. AKASH N. PATWARI**, Principal for his support during the progress of this seminar work.

I would like to express my gratitude to our college **ANURAG ENGINEERING COLLEGE, KODAD** for providing required facilities during this seminar work.

I am thankful to both teaching and non-teaching staff members of CSE Department for their kind cooperation and all sorts of help to bring out this seminar work successfully.

I would like to thank my parents and my friends for being supportive all the time, and I am very much obliged to them.

# ABSTRACT

The Automatic Database Schema Generation is a system, which allows the developers to focus on creating the database using the GUI interface. The user needs to fulfill the requirements in the interface and he can perform the database operations which he wants and can create the database.

This project aims at creation of an automatic database schema generation. This project will be accessible to all developers and its facility allows developers to focus on creating the database schema on the basis of JSP while letting the application server define table based on the fields in JSP and relationships between them. This system provides the following facilities.

- This facilitates the user to focus much on application aspects leaving behind the database aspects.
- This project allows users to generate database schema generation without having much knowledge of database Aspects.

#### **Existing system**

There are many Database Management systems available today. The Database designer is familiar with any one of the database Management Systems. Let us consider a condition when a database designer required to design the schema for an application on different DBMS. He required to learn all the DBMS User Interfaces. Where some of them are GUI (Graphic User Interface) based and others are CUI(Character User Interface).

#### DRAWBACKS OF EXISTING SYSTEM

Through this approach to alter or to edit a large database schema, It consumes more time for a Database Designer. The operations like altering the table structure, Editing the table, Dropping columns, searching for a column name, searching for a data in the table.. etc.,

To Design and alter the Database schema there exists different user interfaces for different DBMS.

## **Proposed System:**

#### Functionality of the proposed systems

The Automatic Database Schema Generation System provides the following features.

- 1. The Automatic Database Schema Generation System provides a Common User Interface to interact with all the databases.
- 2. Here the user interface is Graphical User Interface.
- 3. This application is a Web based Application.
- 4. Being a web based application it doesn't require any client side installation.
- 5. Any number of users can interact with the system simultaneously.
- 6. Centralized database connectivity.
- 7. Using Session management the interaction more flexible and secure.

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# List of Acronyms

- AWT Abstract window toolkit.
- CUI -Character User Interface.
- HTTP Hyper Text Transfer Protocol.
- UML Unified Modeling language.
- JFC Java Foundation Class.
- GUI Graphical Interface.
- AWT Abstract Window Toolkit.
- RFT Rich Text Format.
- HTML Hyper Text Markup Language.
- API Application Programming Interface.
- CGI Common Gateway interface.
- SAPI -Servlet Application Programming Interface
- JSP Java Server Pages
- URL Uniform Resource Locator
- JDBC Java Database Connectivits
- SQL Structure Query Language
- ODBC Open Database Connectivity
- DBMS Database Management System
- ACID Atomicity Consistency Isolation Durability
- RAID Redundant array of inexpensive Disk
- DDl Data definition Language
- DML Data Manipulation Language
- IDE Integrated Development Environment

- JDT Java Development Tool
- ECJ Eclipse Compiler for java
- RCP Rich Client Platform
- SWT Standard widget toolkit
- $CDT \quad \text{-}C/C\text{++} \text{ Development tools}$
- GET -Graphical Editing Framework
- JST -J2ee Standard tools
- PDT -php development tools
- WST -web standard tools
- XML -extended markup language
- GMF -graphical modeling frame work
- TPTP -text performance tools platform
- BIRT -business intelligence and report tools project
- SQL -software quality assurance
- IEEE -Institute of electrical and electronics engineering
- SDLC -software development life cycle
- DTD -Document type definition

List of keywords

# organization

# **1**.Analysis

## **1.1. Problem Statement**

- Through this approach to alter or to edit a large database schema, It consumes more time for a Database Designer. The operations like altering the table structure, Editing the table, Dropping columns, searching for a column name, searching for a data in the table.. etc., using queries.
- 2. To Design and alter the Database schema there exists different user interfaces for different DBMS.
- 3. when a database designer required to design the schema for an application on different DBMS. He required to learn all the DBMS User Interfaces. Where like CUI(Character User Interface).

## **1.2. Solution strategy**

- The Automatic Database Schema Generation System provides a Common User Interface to interact with all the databases, and it provides Graphical user interface to easily done the operations like altering the table structure, Editing the table, Dropping columns, searching for a column name, searching for a data in the table.. etc.,
- Being a web based application it doesn't require any client side installation, Any number of users can interact with the system simultaneously.
- Using Session management the interaction more flexible and secure

## **1.3. Technical Challenges**

The Automatic Database Schema Generation System is a web based application and it requires Centralized database connectivity, so this project use the web technologies and middleware technologies .

#### 1.3.1. Web Technologies:

This project consists following web technologies

I. HTML and SGML.

- II. Java Scripts.
- III. Servlets.
- IV. Java server pages.

#### I.HTML and SGML

Hypertext Markup Language (HTML), the languages of the World Wide Web (WWW), allows users to produces Web pages that include text, graphics and pointer to other Web pages (Hyperlinks).

HTML is not a programming language but it is an application of ISO Standard 8879, SGML (Standard Generalized Markup Language), but specialized to hypertext and adapted to the Web. We can navigate through the information based on our interest and preference.

HTML can be used to display any type of document on the host computer, which can be geographically at a different location. It is a versatile language and can be used on any platform or desktop.

HTML provides tags (special codes) to make the document look attractive. HTML tags are not case-sensitive. Using graphics, fonts, different sizes, color, etc., can enhance the presentation of the document.

Basic HTML Tags :

	Specifies comments
<a></a>	Creates hypertext links
<b></b>	Formats text as bold
<big></big>	Formats text in large font.
<body></body>	Contains all tags and text in the HTML document
<center></center>	Creates text
<dd></dd>	Definition of a term

<dl></dl>	Creates definition list	
<font></font>	Formats text with a particular font	
<form></form>	Encloses a fill-out form	
<frame/>	Defines a particular frame in a set of frames	
<h#></h#>	Creates headings of different levels	
<head></head>	Contains tags that specify information about a document	
<hr/>	Creates a horizontal rule	
<html></html>	Contains all other HTML tags	
<meta/>	Provides meta-information about a document	
<script></script>	Contains client-side or server-side script	
<table></table>	Creates a table	
<td></td>		Indicates table data in a table
<tr></tr>	Designates a table row	
<th></th>		Creates a heading in a table
Fig 1.	1: basic HTML tags	

#### **II.Java Scripts**

JavaScript is a script-based programming language that was developed by Netscape Communication Corporation. JavaScript was originally called Live Script and renamed as JavaScript to indicate its relationship with Java. JavaScript supports the development of both client and server components of Web-based applications. On the client side, it can be used to write programs that are executed by a Web browser within the context of a Web page. On the server side, it can be used to write Web server programs that can process information submitted by a Web browser and then updates the browser's display accordingly. JavaScript statements can be included in HTML documents by enclosing the statements between a pair of scripting tags

<SCRIPTS>.. </SCRIPT>.

<SCRIPT LANGUAGE = "JavaScript">

JavaScript statements

</SCRIPT>

Fig 1.2: sample javascript program.

Here are a few things we can do with JavaScript:

- > Validate the contents of a form and make calculations.
- > Add scrolling or changing messages to the Browser's status line.
- > Animate images or rotate images that change when we move the mouse over them.

#### **III.Servlets**

Servlets provide a Java-based solution used to address the problems currently associated with doing server-side programming, including inextensible scripting solutions, platform-specific APIs, and incomplete interfaces.

an HTTP Servlets can be used to generate dynamic HTML content. When you use Servlets to do dynamic content you get the following advantages:

- > They're faster and cleaner than CGI scripts
- > They use a standard API (the Servlets API)
- They provide all the advantages of Java (run on a variety of servers without needing to be rewritten).
- > Easily configured using the GUI-based Admin tool
- > Can be loaded and invoked from a local disk or remotely across the network.

A client can invoke Servlets in the following ways:

- The client can ask for a document that is served by the Servlet.
- The client (browser) can invoke the Servlet directly using a URL, once it has been mapped using the Servlet Aliases section of the admin GUI.
- The Servlet can be invoked through server side include tags.
- The Servlet can be invoked by placing it in the Servlets/ directory.
- The Servlet can be invoked by using it in a filter chain.

#### **IV.Java server pages**

Java server Pages is a simple, yet powerful technology for creating and maintaining dynamiccontent web pages. Based on the Java programming language, Java Server Pages offers proven portability, open standards, and a mature re-usable component model .The Java Server Pages architecture enables the separation of content generation from content presentation.

Java Server Pages files can be run on any web server or web-enabled application server that provides support for them. Dubbed the JSP engine, this support involves recognition, translation, and management of the Java Server Page lifecycle and its interaction components.

#### 1.3.2. Middleware Technologies:

The automatic database schema generation requires following middleware technologies,

#### I.Java Database Connectivity.

JDBC is a Java API for executing SQL statements. (As a point of interest, JDBC is a trademarked name and is not an acronym; nevertheless, JDBC is often thought of as standing for Java Database Connectivity. It consists of a set of classes and interfaces written in the Java programming language. JDBC provides a standard API for tool/database developers and makes it possible to write database applications using a pure Java API.

Using JDBC, it is easy to send SQL statements to virtually any relational database. One can write a single program using the JDBC API, and the program will be able to send SQL statements to

the appropriate database. The combinations of Java and JDBC lets a programmer write it once and run it anywhere.

#### What Does JDBC Do?

Simply put, JDBC makes it possible to do three things:

- > Establish a connection with a database
- Send SQL statements
- Process the results.

The JDBC provides database-independent connectivity between the J2EE platform and a wide range of tabular data sources. JDBC technology allows an Application Component Provider to:

- Perform connection and authentication to a database server
- Manager transactions
- > Move SQL statements to a database engine for preprocessing and execution
- Execute stored procedures
- Inspect and modify the results from Select statements

#### **II.JDBC versus ODBC and other APIs**

At this point, Microsoft's ODBC (Open Database Connectivity) API is that probably the most widely used programming interface for accessing relational databases. It offers the ability to connect to almost all databases on almost all platforms.

In the two-tier model, a Java applet or application talks directly to the database. This requires a JDBC driver that can communicate with the particular database management system being accessed. A user's SQL statements are delivered to the database, and the results of those statements are sent back to the user.



Fig 1.4: tree-tier architecture.

In the three-tier model, commands are sent to a "middle tier" of services, which then send SQL statements to the database. The database processes the SQL statements and sends the results back to the middle tier, which then sends them to the user.

#### JDBC versus ODBC and other APIs

At this point, Microsoft's ODBC (Open Database Connectivity) API is that probably the most widely used programming interface for accessing relational databases. It offers the ability to connect to almost all databases on almost all platforms.

So why not just use ODBC from Java? The answer is that you can use ODBC from Java, but this is best done with the help of JDBC in the form of the JDBC-ODBC Bridge, which we

will cover shortly. The question now becomes "Why do you need JDBC?" There are several answers to this question:

- 1. ODBC is not appropriate for direct use from Java because it uses a C interface. Calls from Java to native C code have a number of drawbacks in the security, implementation, robustness, and automatic portability of applications.
- 2. A literal translation of the ODBC C API into a Java API would not be desirable. For example, Java has no pointers, and ODBC makes copious use of them, including the notoriously error-prone generic pointer "void \*". You can think of JDBC as ODBC translated into an object-oriented interface that is natural for Java programmers.
- 3. ODBC is hard to learn. It mixes simple and advanced features together, and it has complex options even for simple queries. JDBC, on the other hand, was designed to keep simple things simple while allowing more advanced capabilities where required.
- 4. A Java API like JDBC is needed in order to enable a "pure Java" solution. When ODBC is used, the ODBC driver manager and drivers must be manually installed on every client machine. When the JDBC driver is written completely in Java, however, JDBC code is automatically installable, portable, and secure on all Java platforms from network computers to mainframes.

## **1.4. Feasibility Report**

#### **1.4.1. TECHINICAL FEASIBILITY:**

Evaluating the technical feasibility is the trickiest part of a feasibility study. This is because, at this point in time, not too many detailed design of the system, making it difficult to access issues like performance, costs on (on account of the kind of technology to be deployed) etc. A number of issues have to be considered while doing a technical

#### analysis.

- i) Understand the different technologies involved in the proposed system:
  Before commencing the project, we have to be very clear about what are the technologies that are to be required for the development of the new system.
- ii) Find out whether the organization currently possesses the required technologies:
  - Is the required technology available with the organization?

• If so is the capacity sufficient? For instance –

"Will the current printer be able to handle the new reports and forms required for the new system?"

## **1.4.2. OPERATIONAL FEASIBILITY:**

Proposed projects are beneficial only if they can be turned into information systems that will meet the organizations operating requirements. Simply stated, this test of feasibility asks if the system will work when it is developed and installed. Are there major barriers to Implementation? Here are questions that will help test the operational feasibility of a project:

- Is there sufficient support for the project from management from users? If the current system is well liked and used to the extent that persons will not be able to see reasons for change, there may be resistance.
- Are the current business methods acceptable to the user? If they are not, Users may welcome a change that will bring about a more operational and useful systems.
- Have the user been involved in the planning and development of the project?
- Early involvement reduces the chances of resistance to the system and in
- General and increases the likelihood of successful project.

Since the proposed system was to help reduce the hardships encountered. In the existing manual system, the new system was considered to be operational feasible.

#### **1.4.3. ECONOMIC FEASIBILITY:**

Economic feasibility attempts 2 weigh the costs of developing and implementing a new system, against the benefits that would accrue from having the new system in place. This feasibility study gives the top management the economic justification for the new system.

A simple economic analysis which gives the actual comparison of costs and benefits are much more meaningful in this case. In addition, this proves to be a useful point of reference to compare actual costs as the project progresses. There could be various types of intangible benefits on account of automation. These could include increased customer satisfaction, improvement in product quality better decision making timeliness of information, expediting activities, improved accuracy of operations, better documentation and record keeping, faster retrieval of information, better employee morale.

#### **1.5. REQUIREMENT SPECIFICATION:**

The application Automatic Database Schema Generation, which is design to connect different DBMS using common Interface. All the major activities that are carried are used to Design the database schema transparent to the DBMS by using a GUI.

#### **Required Hardware**

- Pentium IV Processor.
- 256 MB RAM.
- 40GB Hard Disk space.
- Ethernet card with an Internet and Internet zone.

#### **Required Software**

Server Side:

- Platform Independent (Based on Operating System).
- Internet explorer 5.0 or above or Netscape navigator.
- Any Centralized Database.
- JDK 1.4 or higher.
- Apache Tomcat Web Server 4.0 or above.
- TCP/IP Protocol suite.

#### **Client Side:**

Any Web Browser on any operating system.

# 2. DESIGN

#### 2.1. UNIFIED MODELING LANGUAGE DIAGRAMS:

- The unified modeling language allows the software engineer to express an analysis model using the modeling notation that is governed by a set of syntactic semantic and pragmatic rules.
- A UML system is represented using five different views that describe the system from distinctly different perspective. Each view is defined by a set of diagram, which is as follows.
- User Model View
  - i. This view represents the system from the users perspective.
  - ii. The analysis representation describes a usage scenario from the end-users perspective.

#### Structural model view

- In this model the data and functionality are arrived from inside the system.
- This model view models the static structures.

#### **Behavioral Model View**

It represents the dynamic of behavioral as parts of the system, depicting the interactions of collection between various structural elements described in the user model and structural model view.

#### **Implementation Model View**

• In this the structural and behavioral as parts of the system are represented as they are to be built.

#### **Environmental Model View**

In this the structural and behavioral aspects of the environment in which the system is to be implemented are represented.

UML is specifically constructed through two different domains they are

- UML Analysis modeling, which focuses on the user model and structural model views of the system.
- UML design modeling, which focuses on the behavioral modeling, implementation modeling and environmental model views.

Use case Diagrams represent the functionality of the system from a user's point of view. Use cases are used during requirements elicitation and analysis to represent the functionality of the system. Use cases focus on the behavior of the system from external point of view.

Actors are external entities that interact with the system. Examples of actors include users like administrator, bank customer etc., or another system like central database.

# Use case Model.



Fig 2.1: usecase model diagram

# 2.1.1. Use Cases diagram:



Fig 2.2: Usecase diagram of Automatic DB Schema Generation.

## 2.1.2. Class Diagram:

Class diagrams describe the structure of the system in terms of classes and objects. The servlet api class diagram will be as follows.



Fig 2.3: Class Diagram of Automatic DB Schema Generation.

## 2.1.3. Sequence Diagrams

Sequence Diagrams Represent the objects participating the interaction horizontally and time vertically.



#### Sequence Diagram 1





Fig 2.5: Sequence diagram for Designer DB operation.



Fig 2.6: Sequence diagram for Designer press Structure Button.

#### Sequence Diagram 4







Fig 2.8: Sequence diagram for Designer press SQL Button.





Fig 2.10: Sequence diagram for Designer press Export Button.



Fig 2.11: Sequence diagram for Designer press Operation Button.



Fig 2.12: Sequence diagram for Designer press Search Button.

# **2.3. DATA DICTIONARY**

#### **2.3.1. USECASE description:**

Use case name	Database Login
Participating actors	Schema Designer
Flow of events	DB Schema Designer gives the database driver name, selects the url, enters user name and password. On success connection is established to the database.
Entry Condition	The DB Designer Logged into the system automatic database schema generation.
Exit condition	The DB Designer Disconnects from the system automatic database

## schema generation

QualityMust provide respective error messages during connection.Requirements

Use case name	Schema Creation
Participating	Schema Designer
actors	
Flow of events	The DB Designer uses the user interface, to create tables, generate the
	schema, the database responds on successful schema creation
Entry	The user must enter the table names, column names and their datatypes.
Condition	
Exit condition	Successful creation
Quality	User Interface must be user friendly,
Requirements	

Use case name	Schema Modification
Participating	Database Designer
actors	
Flow of events	The DB Designer uses the user interface to modify the tables, column names, column content, data types.
Entry	The user must select the respective table, column and data for the
Condition	modification
Exit condition	Successful modification
Quality	Best Error Handling techniques.
Requirements	

Use case name	Search
Participating actors	Database Designer
Flow of events	The DB Designer enters the search key and must select the criteria to search like column names, data or both. Optional is the search condition too.
Entry Condition	User must have knowledge of what he required
Exit condition	Result set displayed on the User interface.
Quality Requirements	Easy viability in displaying the records.

Use case name	Export schema
Participating actors	Database Schema Designer
Flow of events	The user must select the schema or tables or columns to be exported in the required formats like into sql,html,excel and also what to be exported like structure, data, both.
Entry Condition	User must be ready with what tables to be exported.
Exit condition	Save the file in the specified location.
Quality Requirements	File insertion must be error free.
Use case name	Import schma
-------------------------	---
Participating actors	Database Schema Designer
Flow of events	The user select the file to be imported here it will support only SQL format.
Entry Condition	The user must search for where the sql file exists
Exit condition	Successful import of the schema from sql file.
Quality Requirements	The file must be read the delimiters carefully for successful import

# **3. CODING**

### Sample code:

### Login.java:-

import java.lang.String; import java.io.IOException; import java.io.PrintWriter; import javax.servlet.ServletException; import javax.servlet.http.HttpServlet; import javax.servlet.http.HttpSession; import javax.servlet.http.HttpServletRequest; import javax.servlet.http.HttpServletResponse; public class Login extends HttpServlet

```
{
```

public void doGet(HttpServletRequest req, HttpServletResponse res)

throws ServletException, IOException {

String message = req.getParameter("message");

```
res.setContentType("text/html");
```

PrintWriter writer = res.getWriter();

writer.println("<HTML>");

writer.println("<HEAD>");

writer.println("<TITLE> Myadmin </TITLE>");

## writer.println("<META NAME=Author CONTENT=vamsi>");

writer.println( "<STYLE>" +

```
"#t1 { " +
```

- " position:absolute; " +
- " margin-left:210px; " +
- " margin-top:50px; " +
- " width:340px; " +
- " height:33px; " +
- " background:#336699; " +
- " font-family:Serif; " +
- " font-weight:bold; " +
- " font-size:20px; " +
  - " color:#ffffff; " +
- " text-align:center; " +
- " border-style:double; " +
- " border-color:black; " +
- " border-width:2px; " +
- "} "+

"

- "#t2 { " +
- " position:absolute; " +
  - margin-left:210px; " +

"	margin-top:84px; " +
"	width:340px; " +
"	height:180px; " +
"	background:#f5f5f5; " +
"	font-family:Tahoma; " +
"	font-weight:bold; " +
"	font-size:14px; " +
"	color:black; " +
"	border-style:groove; " +
"	border-color:black; " +
"	border-width:1px; " +
"} "+	
	"#msg {" +
"	background:#abcdef; " +
"	font-family:Tahoma; " +
"	font-family:Tahoma; " + font-size:14; " +
"	font-family:Tahoma; " + font-size:14; " + font-weight:bold; " +
	font-family:Tahoma; " + font-size:14; " + font-weight:bold; " + color:black; " +
" " "	font-family:Tahoma; " + font-size:14; " + font-weight:bold; " + color:black; " + text-align:center; "

" text-transform:Capitalize; " +

"} "+

"input { " +
" height:26px; " +
" width:240px; " +
" font-size:14px; " +
"} " +
"select { font-size:16px; } " +

"</STYLE>");

writer.println( "<SCRIPT LANGUAGE=javascript>" +

	<pre>var onImages = new Array(); " +</pre>
"	<pre>var offImages = new Array(); " +</pre>
"functi	on verify() { " +
	var ur = document.loginform.url.value; " +
	if(ur == null    ur == \"\"    ur == \" \") { " +
	alert('URL must be entered.'); " +
	<pre>document.loginform.url.focus(); " +</pre>
	} " +
	else document.loginform.submit(); " +
"} "+	
"functi	ion isEmpty(id) { " +
	if(id.value==null    id.value==\"\"    id.value==\" \") { " +
	alert(id.name + \" must be entered.\"); " +

	"	id.focus(); " +
	"	} " +
	"} "+	
	"functi	on empty() { " +
	"	<pre>document.loginform.reset(); " +</pre>
	"	document.loginform.url.value = \"jdbc:odbc:mydsn\"; " +
	"	document.loginform.userid.focus(); " +
	"} "+	
	"functi	ion down(id) { " +
	"	if(id == 1) document.loginform.pic1.src = onImages[id-
1].src; " +		
13	"	if(id == 2) document.loginform.pic2.src = onImages[id-
1].src; +		
	"} "+	
	"functi	ion up(id) { " +
	"	if(id == 1) document.loginform.pic1.src = offImages[id-
1].src; " +		
	"	if(id == 2) document.loginform.pic2.src = offImages[id-
1].src; " +		
	"} "+	
	"functi	ion load() { " +
	"	onImages[0] = new Image(); " +

" onImages[1] = new Image(); " + " onImages[0].src = \"/httpadmin/pics/login2.jpg\"; " + onImages[1].src = "/httpadmin/pics/reset2.jpg"; "+" " offImages[0] = new Image(); " + offImages[1] = new Image(); " + " " offImages[0].src = '/httpadmin/pics/login1.jpg '; " +offImages[1].src = \"/httpadmin/pics/reset1.jpg\"; " + " document.loginform.url.value = \"jdbc:odbc:mydsn\"; " + " " document.loginform.userid.focus(); " + "} "+ "function setURL() { " + " var i = document.loginform.driver.selectedIndex; " + " if(i == 0)document.loginform.url.value =\"jdbc:odbc:mydsn\"; " + " else if(i 1) document.loginform.url.value == =\"jdbc:mysql:/localhost/mysql\"; " + " else if(i document.loginform.url.value 2) ===\"jdbc:oracle:thin:@localhost:1521:oracle8i\"; " + "} "+ "</SCRIPT>"); writer.println("</HEAD>"); writer.println("<BODY BGCOLOR=#f5f5f5 onLoad=load()>");

```
writer.println("<HR WIDTH=80%>");
      writer.println("<TABLE
                                 ALIGN=center
                                                   CELLPADDING=4
                                                                          BORDER=0
WIDTH=80%");
      writer.println("<TR>");
      writer.println("<TH id=msg>" + message + "</TH>");
      writer.println("</TR>");
      writer.println("</TABLE>");
      writer.println("<HR WIDTH=80%>");
      writer.println("<FORM
                                         NAME=loginform
                                                                        METHOD=post
ACTION='/httpadmin/LoadAll'>");
      writer.println("<TABLE
                                     align=center
                                                         id=t1><TR><TD>DATABASE
LOGIN</TD></TR></TABLE>");
      writer.println("<TABLE align=center id=t2>");
      writer.println("<TR><TD align=center>Driver</TD>");
      writer.println("<TD align=center>");
      writer.println("<SELECT name=driver onChange=setURL()>");
      writer.println("<OPTION selected>sun.jdbc.odbc.JdbcOdbcDriver</OPTION>");
      writer.println("<OPTION>org.gjt.mm.mysql.Driver</OPTION>");
      writer.println("<OPTION>oracle.jdbc.driver.OracleDriver</OPTION>");
      writer.println("</SELECT>");
      writer.println("</TD>");
      writer.println("</TR>");
```

```
writer.println("<TR><TD align=center>URL</TD>");
```

```
writer.println("<TD align=center><INPUT type=text name=url size=32></TD></TR>");
writer.println("<TR><TD align=center>Username</TD>");
writer.println( "<TD align=center><input type=text name=userid size=32 " +</pre>
```

"onFocus='isEmpty(document.loginform.url)'></TD></TR>");

writer.println("<TR><TD align=center>Password</TD>");

```
writer.println( "<TD align=center><input type=password name=pass size=32 " +
```

```
"onFocus='isEmpty(document.loginform.url)'></TD></TR>");
```

```
writer.println("<TR><TD align=center colspan=2>");
```

writer.println( "<IMG name=pic1 src='/httpadmin/pics/login1.jpg' border=0 " +

```
"onMouseOut='up(1)' STYLE='cursor:hand'
```

```
onMouseDown='down(1)' " +
```

```
"onMouseUp='up(1)'
```

onClick='verify()'>&nbsp&nbsp&nbsp");

writer.println( "<img name=pic2 src='/httpadmin/pics/reset1.jpg' border=0 " +

"onMouseOut='up(2)' STYLE='cursor:hand'

onMouseDown='down(2)' " +

```
"onMouseUp='up(2)' onClick='empty()'>");
```

writer.println("</TD></TR>");

writer.println("</TABLE>");

writer.println("</FORM>");

writer.println("</BODY>");

writer.println("</HTML>");

writer.close();

}

}

Fig 3.1:sample login java program.

# 4. RESULTS

# **SCREEN SHOT:**

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Fig 4.1: DataBase login screen.

## Structure of DataBase:

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Fig 4.2: Structure of Scott DataBase screen.

## **Structure of Bonus DataBase:**

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salgra	o de	Display	ed Schema	SCOT	т								
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			Column Name		Туре		Size	Nullable		Act	ion		
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Fig 4.3: Structure of Bonus DataBase screen.

#### **Browse a Database:**



Fig 4.4: Browse a DataBase screen.

# **Properties of SCOTT schema:**

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bonus	Database Product Name	oracle						
dept emp salgrade	Database Product Version	oracle database 10g enterprise edition release 10.2.0.1.0 - production with the partitioning, olap and data mining options						
	Driver Name	oracle jdbc driver						
	Driver Version	8.1.6.0.0						
	SchemaTerm	schema						
	Max SchemaName Length	30						
	Supports Schemas In Data Manipulation	true						
	Supports Schemas In Index Definitions	true						
	Supports Schemas In Privilege Definitions	true						
	Supports Schemas In Procedure Calls	true						
	Supports Schemas In Table Definitions	true						
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	Max UserName Length	30						
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Fig 4.5: Properties of SCOTT schema.

# SQL Query Pane:

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Fig 4.6: SQL Query Pane.

# **Result of SQL Query:**

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	7698	blake	manage	er 7	839 19	981-05-01 00:00:00.0	2850	null	30	
	7782	clark	manage	er 7	839 19	981-06-09 00:00:00.0	2450	null	10	
	7788	scott	analyst	7	566 19	987-04-19 00:00:00.0	3000	null	20	
	7839	king	preside	nt n	ull 19	981-11-17 00:00:00.0	5000	null	10	
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Fig 4.7: Result of SQL Query.

## **Import from SQL file:**



### Fig 4.8:Import from SQL file.

#### Import scott\_emp\_ data schema:



Fig 4.9: Import scott\_emp\_ data schema.

## Import succeeded message:

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Fig 4.10: Import succeeded message.

# **Export the Table:**

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Fig 4.11: Export the Table.

# Export the SQL file:

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Fig 4.11: Export the SQL file.

# To save the Export file:

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Fig 4.12: To save the Export file.

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Fig 4.13: Save on Desktop.

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Fig 4.14: Create the table.

## Search the DataBase:

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Fig 4.15: Search the DataBase.

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Fig 4.16: Search Results.

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Fig 4.17: Logout from the DataBase.

# **5. TESTING**

Testing is the process of detecting errors. Testing performs a very critical role for quality assurance and for ensuring the reliability of software. The results of testing are used later on during maintenance also.

### **Psychology of Testing**

The aim of testing is often to demonstrate that a program works by showing that it has no errors. The basic purpose of testing phase is to detect the errors that may be present in the program. Hence one should not start testing with the intent of showing that a program works, but the intent should be to show that a program doesn't work. Testing is the process of executing a program with the intent of finding errors.

### **Testing Objectives**

The main objective of testing is to uncover a host of errors, systematically and with minimum effort and time. Stating formally, we can say,

- > Testing is a process of executing a program with the intent of finding an error.
- > A successful test is one that uncovers an as yet undiscovered error.
- > A good test case is one that has a high probability of finding error, if it exists.
- > The tests are inadequate to detect possibly present errors.
- > The software more or less confirms to the quality and reliable standards.

## **5.1.** Levels of Testing

In order to uncover the errors present in different phases we have the concept of levels of testing. The basic levels of testing are as shown below...



Fig 5.1:Levels of Testing.

## System Testing

The philosophy behind testing is to find errors. Test cases are devised with this in mind. A strategy employed for system testing is code testing.

## **Code Testing:**

This strategy examines the logic of the program. To follow this method we developed some test data that resulted in executing every instruction in the program and module i.e. every path is tested. Systems are not designed as entire nor are they tested as single systems. To ensure that the coding is perfect two types of testing is performed or for that matter is performed or that matter is performed or for that matter is performed on all systems.

# **5.2.** Types of Testing:

Unit Testing

➤ Link Testing

## **Unit Testing**

Unit testing focuses verification effort on the smallest unit of software i.e. the module. Using the detailed design and the process specifications testing is done to uncover errors within the boundary of the module. All modules must be successful in the unit test before the start of the integration testing begins.

In this project each service can be thought of a module. There are so many modules like Login, HWAdmin, MasterAdmin, Normal User, and PManager. Giving different sets of inputs has tested each module. When developing the module as well as finishing the development so that each module works without any error. The inputs are validated when accepting from the user.

In this application developer tests the programs up as system. Software units in a system are the modules and routines that are assembled and integrated to form a specific function. Unit testing is first done on modules, independent of one another to locate errors. This enables to detect errors. Through this errors resulting from interaction between modules initially avoided.

## Link Testing

Link testing does not test software but rather the integration of each module in system. The primary concern is the compatibility of each module. The Programmer tests where modules are designed with different parameters, length, type etc.

## **Integration Testing**

After the unit testing we have to perform integration testing. The goal here is to see if modules can be integrated properly, the emphasis being on testing interfaces between modules. This testing activity can be considered as testing the design and hence the emphasis on testing module interactions.

In this project integrating all the modules forms the main system. When integrating all the modules I have checked whether the integration effects working of any of the services by giving different combinations of inputs with which the two services run perfectly before Integration.

### System Testing

Here the entire software system is tested. The reference document for this process is the requirements document, and the goal os to see if software meets its requirements. Here entire 'ATM' has been tested against requirements of project and it is checked whether all requirements of project have been satisfied or not.

### **Acceptance Testing**

Acceptance Test is performed with realistic data of the client to demonstrate that the software is working satisfactorily. Testing here is focused on external behavior of the system; the internal logic of program is not emphasized.

In this project 'Network Management Of Database System' I have collected some data and tested whether project is working correctly or not.

Test cases should be selected so that the largest number of attributes of an equivalence class is exercised at once. The testing phase is an important part of software development. It is the process of finding errors and missing operations and also a complete verification to determine whether the objectives are met and the user requirements are satisfied.

## **5.2.1.White Box Testing**

This is a unit testing method where a unit will be taken at a time and tested thoroughly at a statement level to find the maximum possible errors. I tested step wise every piece of code, taking care that every statement in the code is executed at least once. The white box testing is also called Glass Box Testing.

I have generated a list of test cases, sample data, which is used to check all possible combinations of execution paths through the code at every module level.

## **5.2.2. Black Box Testing**

This testing method considers a module as a single unit and checks the unit at interface and communication with other modules rather getting into details at statement level. Here the module will be treated as a block box that will take some input and generate output. Output for a given set of input combinations are forwarded to other modules.

### **Criteria Satisfied by Test Cases**

Test cases that reduced by a count that is greater than one, the number of additional test cases that much be designed to achieve reasonable testing.

Test cases that tell us something about the presence or absence of classes of errors, rather than an error associated only with the specific test at hand.

# **6. MAINTENANCE**

## Introduction to Modules

#### 1) SQL Query Pane Module

Here we can type SQL queries and get the data from Database

#### 2) Import Option Module

We can import .sql files only into the Database

### 3) Export Option Module

We can export sql Structure, sql Data or both based on some conditions into 3 types of files

- i. .sql files
- ii. .html files
- iii. .csv files(Excel Files)

#### 4) Operation Module

- i. Here we can create table with constraints
- ii. Alter the existing table like
- iii. Alter column
- iv. Rename column
- v. Drop column
- vi. Empty column

#### 5) Search Database Module

- i. Search based on keywords
- ii. Search looks for column names only

iii. Search looks for data only

## **Number of Modules:**

### 6.1. SQL Query Pane Module

This module is used to retrieve data from the database by using SQL Queries. The User interface is designed with a query pane to type the query, where a user can type the sql query. The sql query is taken by the module as input and generates the output of that query. The output is displayed in a tabular manner.

### **6.2. Import Option Module**

This module is developed to retrieve schema from the external files. The supported files are .sql files. .sql files contains the set of queries that can be executed. This module uses the FTP protocol which will enable the web server to load the files.

### **6.3. Export Option Module**

The user can export sql Structure, sql Data or both based on some conditions into 3 types of files.

- .sql files
- .html files
- .csv files(Excel Files)

## **6.4. Operations Module**

The user can create table with constraints, Alter the table, Rename the Table, Drop table.

The user can Alter the existing table like by using following keys.

- Alter column
- $\circ$  Rename column
- o Drop column
- o Empty column

The user can rename the table by giving the old name and new name. The user can drop the table by selecting the table name from the select box.

### 6. 5. Search Database Module

The user must search based on keywords

- Search looks for column names only
- Search looks for data only
### 7. CONCLISION

The entire project has been developed and deployed as per the requirements stated by the user, it is found to be bug free as per the testing standards that are implemented. Any specification untraced errors will be concentrated in the coming versions, which are planned to be developed in near future. The system at present does not take care off the money payment methods, as the consolidated constructs need SSL standards and are critically to be initiated in the first face; the application of the credit card transactions is applied as a developmental phase in the coming days. The system needs more elaborative technicality for its inception and evolution.

# **8. FUTURE WORK**

### **Scope of the Development Project:**

**Database Tier:** The concentration is applied by adopting wide range of DBMS.

**User Tier:** The user interface is developed in a browser specific environment to have web based architecture. The components are designed using HTML standards and Java server pages power the dynamic of the page design. Java Script for Loading graphics and Validations.

**Data Base Connectivity Tier:** The communication architecture is designed by concentrated on the standards of servlets and JSP's. The database connectivity is established using the JDBC.

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