



## AJAX Database Application

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# Agenda

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## Ajax Database Application

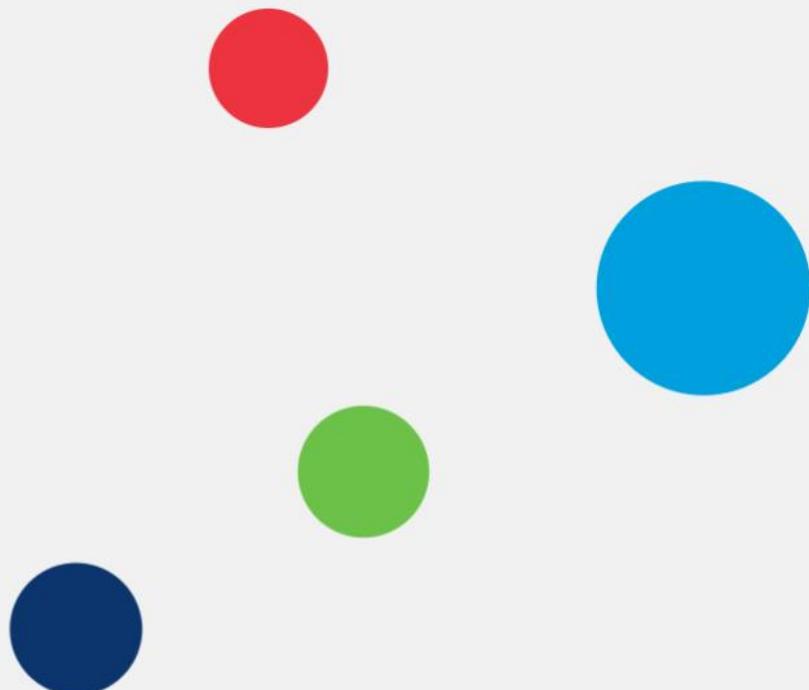
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## Objectives

At the end of this module, you will be able to:

- Learn how to communicate with database using AJAX and DAO
- Learn how to return a JSP page as AJAX response

# Ajax Database Application



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## AJAX Database Application

**Case Study :**Create a web application that takes new entry for department and check if the department is already entered in the database

- The entry form should be designed in a **JSP page**
- Department no should be **autogenerated**
- While taking the input in department name check using ajax if the name is already present in the database using **DAO**
- Notify the message in a span placed adjascent to the department name textbox

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## Step 1- DeptEntry.jsp

```
<%@page import="com.wipro.dao.DeptDAO"%>
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Department Entry</title>
    </head>
    <body>
        <script src="DeptApps.js"></script>
        <h1>Enter Department Details</h1>
        <%
            DeptDAO dao=new DeptDAO();
        %>
```

---

## **Step 1- DeptEntry.jsp (Contd.).**

```
<form method="post" action="AddDepartmentServlet">
    <table>
        <tr>
            <td>Deptno</td>
            <td><input type="text" name="dno"
value="<%>=dao.generateDeptno()%>" readonly/></td>
        </tr>
        <tr>
            <td>Enter Deptname</td>
            <td><input type="text" name="dname"
onblur="sendRequest(this.value)"/></td>
            <td><span id="dname_status"></span></td>
        </tr>
        <tr><td>Enter Location</td>
            <td><input type="text" name="loc"/></td>
        </tr>
```

---

## **Step 1- DeptEntry.jsp (Contd.).**

```
<tr>
<td><input type="submit" name="b1" value="Add"/></td>
<td><input type="reset" name="b2" value="Clear"/></td>
</tr>
</table>
</form>
</body>
</html>
```

---

## **Step 2- DeptApps.js (javascript)**

```
var req;//global variable  
//function to get the department name as parameter  
//and passing it to server for checking its existence  
function sendRequest(dnm)  
{  
    //for firefox/safari/opera/google chrome  
    if (window.XMLHttpRequest) {  
        req = new XMLHttpRequest( );  
    }  
    else if (window.ActiveXObject) //for IE  
    {  
        req = new ActiveXObject("Microsoft.XMLHTTP");  
    }  
    //concatenate the dname as parameter value to url  
    var url = "DnameChecker?dname="+dnm;
```

---

## **Step 2- DeptApps.js (javascript) (Contd.).**

```
req.onreadystatechange = getResponse;//check server request state
req.open("POST", url, true);//send request to server
req.send(null);
}

//function to get the response and display in the specific area
function getResponse()
{
if (req.readyState==4) //request is complete
{
if (req.status == 200) //target page is found
{
//write the response text in the span area
document.getElementById("dname_status").innerHTML = req.responseText;;
}}}
```

---

## **Step 3- DeptDAO.java (DAO)**

```
package com.wipro.dao;

import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.PreparedStatement;
import java.sql.ResultSet;
import java.sql.SQLException;

/**
 *  Dept DAO class
 */
public class DeptDAO
{
    //Database connection url
    String url="jdbc:oracle:thin:@localhost:1521:orcl";
```

---

## **Step 3- DeptDAO.java (DAO) (Contd.).**

```
//Database connection username  
String username="scott";  
//Database connection password  
String password="tiger";  
  
//method to establish database connection  
public Connection connect() throws SQLException, ClassNotFoundException  
{  
    //Using type 4 driver  
    Class.forName("oracle.jdbc.OracleDriver");  
    //return connection url  
    return DriverManager.getConnection(url,username,password);  
}
```

---

## **Step 3- DeptDAO.java (DAO) (Contd.).**

```
//method to autogenerate deptno by finding the maximum deptno  
//currently present and generating the new deptno by 10  
public int generateDeptno()  
{  
    int deptno=0;  
    try  
    {  
        //establish connection  
        Connection conn=connect();  
        //query to fetch the max deptno value  
        String query="select max(deptno) from dept";  
        //Using PreparedStatement the query plan is created  
        PreparedStatement ps=conn.prepareStatement(query);  
        //fetch value into resultset  
        ResultSet rs=ps.executeQuery();
```

---

## **Step 3- DeptDAO.java (DAO) (Contd.).**

```
if(rs.next())
{
    //fetch max(deptno) value into deptno
    deptno=rs.getInt(1);

}
//increment deptno by 10
//if no value is returned from the query ie
//when table is empty then deptno will start with 10
deptno=deptno+10;
}
catch(Exception ex)
{
    ex.printStackTrace();
}
return deptno;
}
```

---

## **Step 3- DeptDAO.java (DAO) (Contd.).**

```
//method to check if dname passed as parameter is already present  
public boolean getDname(String dname)  
{  
    try  
    {  
        //establish connection  
        Connection conn=connect();  
        //query to fetch the max deptno value  
        String query="select * from dept where dname=?";  
        //Using PreparedStatement the query plan is created  
        PreparedStatement ps=conn.prepareStatement(query);  
        //send dname as parameter to preparedstatement  
        ps.setString(1, dname);
```

---

## **Step 3- DeptDAO.java (DAO) (Contd.).**

```
//fetch value into resultset  
        ResultSet rs=ps.executeQuery();  
        //check if resultset contains at least one row  
        if(rs.next())  
        { //dname is present  
            return true;  
        }  
        else  
        { //dname is not present  
            return false;  
        }  
    }  
    catch(Exception ex)  
    { //for exception also return false  
        return false;  
    }  
}
```

---

## **Step 4- DeptChecker.java (Servlet)**

```
package com.wipro.servlet;

import com.wipro.dao.DeptDAO;
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

/**
 * Servlet class which receives the
 * application request
 */
```

---

## **Step 4- DeptChecker.java (Servlet) (Contd.).**

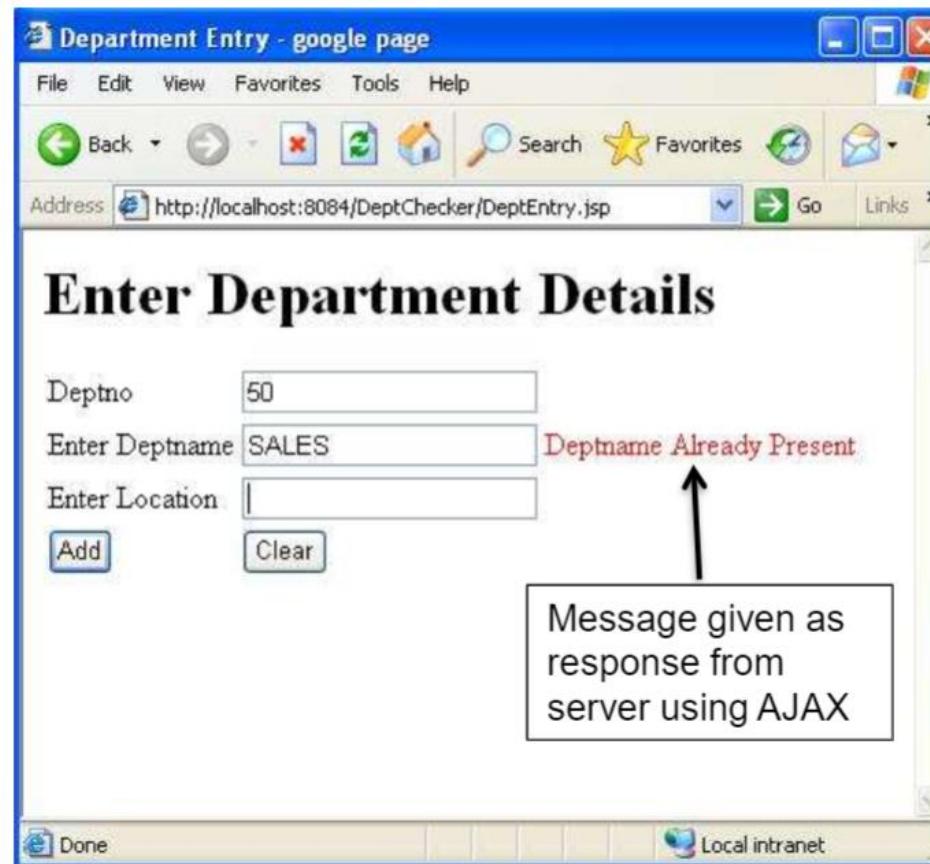
```
public class DnameChecker extends HttpServlet {
    protected void doPost(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {
        response.setContentType("text/html;charset=UTF-8");
        PrintWriter out = response.getWriter();
        try {
            //extract department name from the parameter
            String deptname=request.getParameter("dname");
            if(deptname.length()>0)//if not blank
            {
                DeptDAO dao=new DeptDAO();
                //check from DAO if department exists
                if(dao.getDname(deptname)==true)//when found
                {out.println("<font color=red>Deptname Already Present</font>");}
            }
        }
    }
}
```

---

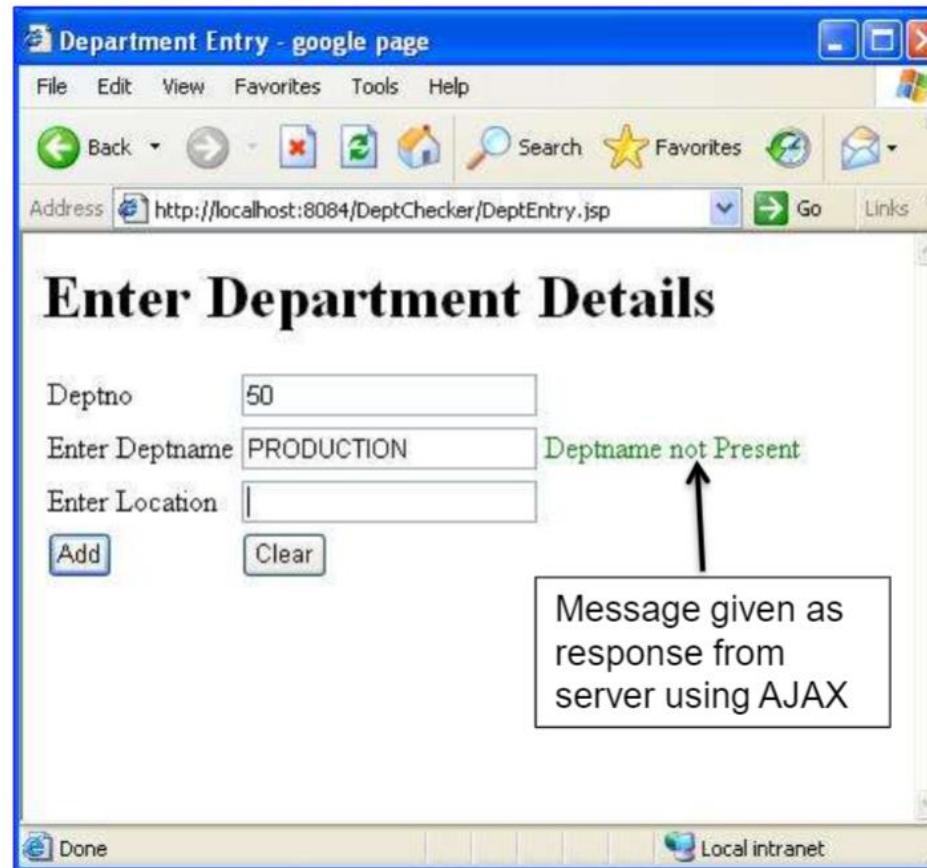
## **Step 4- DeptChecker.java (Servlet) (Contd.).**

```
        else
            { //when not found
                out.println("<font color=green>Deptname not
Present</font>");
            }
        }
    else
        { //for blank
            out.println("<font color=red>Deptname cannot be blank</font>");
        }
    } finally {
    out.close();
}
}
```

## Expected Output (One) – preexisting deptname



## Expected Output (Two) – new deptname



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## AJAX Database Application returning JSP

**Case Study :**Create a web application that provides the user a list of jobs, selecting which the employees having that job profile is displayed

- When a particular job is chosen, use ajax to fetch the list of employees having that job profile and display them in a div area
- Fetch the employees from the database using **DAO** and store them as a Vector of **EmployeeBean** objects
- Store the Vector in a **session**
- The final response is generated from a **JSP** which retrieves the employee records from the session and display them in a tabular manner

## Step 1- EmployeesJob.html (HTML)

```
<html>
  <head>
    <title>View Employees</title>
  </head>
  <script src="EmpApps.js">
  </script>
  <body>
    Choose Employee job type
    <select name="job_list" onchange="sendRequest(this.value)">
      <option value="nojob">---Choose Job---</option>
      <option value="ANALYST">Analyst</option>
      <option value="CLERK">Clerk</option>
      <option value="SALESMAN">Salesman</option>
      <option value="MANAGER">Manager</option>
    </select>
    <hr/><div id="emp_details"></div>
  </body></html>
```

---

## **Step 2- EmpApps.js (Javascript)**

```
var req;//global variable  
//function to get the job as parameter and  
//passing to server to find related employee records  
function sendRequest(j)  
{  
    //for firefox/safari/opera/google chrome  
    if (window.XMLHttpRequest) {  
        req = new XMLHttpRequest( );  
    }  
    else if (window.ActiveXObject) //for IE  
    {  
        req = new ActiveXObject("Microsoft.XMLHTTP");  
    }  
    //concatenate the job as parameter value to url  
    var url = "FindEmp?job_list="+j;
```

---

## **Step 2- EmpApps.js (Javascript) (Contd.).**

```
req.onreadystatechange = getResponse;//check server request state
req.open("POST", url, true);//send request to server
req.send(null);
}

//function to get the response from jsp
//and display in the specific area
function getResponse()
{
if (req.readyState==4) //request is complete
{
if (req.status == 200) //target page is found
{
//write the response text in the div area
document.getElementById("emp_details").innerHTML = req.responseText;;
}}}
```

---

## **Step 3- EmployeeBean.java (Bean)**

```
package com.wipro.bean;

import java.io.Serializable;
/**
 * Employee Bean class
 * containing accessor and mutator
 * methods of Employee attributes in the table
 */
public class EmployeeBean implements Serializable
{
    private int empno;
    private String ename;
    private String job;
    private double salary;
    public EmployeeBean()
    {
    }
}
```

---

## **Step 3- EmployeeBean.java (Bean) (Contd.).**

```
public int getEmpno() {  
    return empno;        }  
public void setEmpno(int empno) {  
    this.empno = empno;    }  
public String getEname() {  
    return ename;        }  
public void setEname(String ename) {  
    this.ename = ename;    }  
public String getJob() {  
    return job;        }  
public void setJob(String job) {  
    this.job = job;    }  
public double getSalary() {  
    return salary;        }  
public void setSalary(double salary) {  
    this.salary = salary; }  
}
```

---

## **Step 4- EmployeeDAO.java (DAO)**

```
package com.wipro.dao;

import com.wipro.bean.EmployeeBean;
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.PreparedStatement;
import java.sql.ResultSet;
import java.util.Vector;

/**
 * DAO class to fetch Employee records
 * on the basis of selected job profile
 */

public class EmployeeDAO
```

---

## **Step 4- EmployeeDAO.java (DAO) (Contd.).**

```
//Method to fetch employee records who are having the job  
//matching the job supplied from the view as parameter  
  
public Vector<EmployeeBean> fetchEmployees(EmployeeBean empbean)  
{  
    //Database connection url  
    String url="jdbc:oracle:thin:@localhost:1521:orcl";  
    //Database connection username  
    String username="scott";  
    //Database connection password  
    String password="tiger";  
    //Vector to store a collection of employee objects  
    //fetched from database  
    Vector<EmployeeBean> V=new Vector<EmployeeBean>();
```

---

## **Step 4- EmployeeDAO.java (DAO) (Contd.).**

```
try
{
    //Using type 4 driver
    Class.forName("oracle.jdbc.OracleDriver");
    //Establish the connection
    Connection conn=DriverManager.getConnection(url,username,password);
    //Query to fetch empno,ename and sal based on job and //sort result on the
    basis of empno in ascending order
    String query="select empno,ename,sal from emp where job=? order by empno";
    //Using PreparedStatement the query plan is created
    PreparedStatement ps=conn.prepareStatement(query);
    //set the job as parameter to PreparedStatement
    ps.setString(1, empbean.getJob());
```

---

## **Step 4- EmployeeDAO.java (DAO) (Contd.).**

```
//Execute the query and store result in ResultSet  
ResultSet rs=ps.executeQuery(); //executeQuery() for select  
//fetch each row from resultset until no rows are available  
while(rs.next())  
{  
    //An employee record object created to map and store  
    //each attribute of employee record from the resultset  
    EmployeeBean emprecord=new EmployeeBean();  
    emprecord.setEmpno(rs.getInt(1)); //fetch empno  
    emprecord.setEname(rs.getString(2)); //fetch ename  
    emprecord.setSalary(rs.getDouble(3)); //fetch sal  
    V.addElement(emprecord); //store entire employee object in vector  
}
```

---

## **Step 4- EmployeeDAO.java (DAO) (Contd.).**

```
        }  
        catch(Exception ex)  
        {  
            ex.printStackTrace();  
        }  
        return v;  
    }  
}
```

---

## **Step 5- FindEmp.java (servlet)**

```
package com.wipro.servlet;

import com.wipro.bean.EmployeeBean;
import com.wipro.dao.EmployeeDAO;
import java.io.IOException;
import java.io.PrintWriter;
import java.util.Vector;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import javax.servlet.http.HttpSession;
/**
 * Servlet class to process application request
 */
public class FindEmp extends HttpServlet {
```

---

## **Step 5- FindEmp.java (servlet) (Contd.).**

```
protected void doPost(HttpServletRequest request, HttpServletResponse response)
    throws ServletException, IOException {
    response.setContentType("text/html;charset=UTF-8");
    PrintWriter out = response.getWriter();
    try {//extract job from the parameter
        String job_selected=request.getParameter("job_list");
        //check if 'nojob' is selected
        if(!job_selected.equalsIgnoreCase("nojob"))
        {
            EmployeeBean empbean=new EmployeeBean();
            empbean.setJob(job_selected);//set the job
            EmployeeDAO empdao=new EmployeeDAO();
            //call the fetchEmployees() of EmployeeDAO
            Vector<EmployeeBean> employeeV=empdao.fetchEmployees(empbean);
```

---

## **Step 5- FindEmp.java (servlet) (Contd.).**

```
HttpSession hs=request.getSession();
//set the entire vector object containing employee records in the session
hs.setAttribute("emp", employeeV);
//redirect to ShowEmployees.jsp
response.sendRedirect("ShowEmployees.jsp");
}
}
catch(Exception e)
{
    out.println(e);
}
finally {
    out.close();
}
}
}
```

---

## **Step 6- ShowEmployees.jsp (jsp)**

```
<%@page import="com.wipro.bean.EmployeeBean"%>
<%@page import="java.util.Vector"%>
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Employees</title>
    </head>
    <body>
        <%
            //Get the Vector object containing employee records from session
            Vector<EmployeeBean>
            empV= (Vector<EmployeeBean>) session.getAttribute("emp");
        %>
```

---

## **Step 6- ShowEmployees.jsp (jsp) (Contd.).**

```
<table>
<th>Emp No</th><th>Emp Name</th><th>Salary</th>
<%
//Fetch each employee bean object from vector
for(int i=0;i<empV.size();i++) {
EmployeeBean beanobject=empV.elementAt(i);
//create rows and feed data from employee bean object
%>
<tr>
<td><%=beanobject.getEmpno()%></td>
<td><%=beanobject.getEname()%></td>
<td><%=beanobject.getSalary()%></td>
</tr>
<%
}
%>
</table></body></html>
```

## Expected Output

View Employees - google page

File Edit View Favorites Tools Help

Back    Search Favorites    Address http://localhost:8084/EmpDBProject/EmployeesJob.html Go Links

Choose Employee job type Analyst

Choose Job Combobox

Emp No	Emp Name	Salary
7788	SCOTT	3000.0
7902	FORD	3000.0

Data fetched from database using AJAX and returned as JSP response in the div area

Done Local intranet

---

## Summary

In this module, you were able to:

- Develop application to communicate with database using AJAX and DAO
- Develop application through which a JSP page could be returned as AJAX response

---

## References

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Thank You