JEE

Mini Project

Internal Recruitment System

Document Control

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| Author(s): | **Name** | | **Title** |
| Vaishali Kulkarni | | Deputy Manager – T & D |
|  | |  |
| Reviewer(s): | **Name** | | **Title** |
| Training Team | |  |
| Issuer(s): | **Name** | | **Title** |
|  | |  |
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# Introduction

This document outlines a mini project for the J2EE LOT. The project is to develop an

Internal Recruitment System for an organization that uses it for its internal recruitment process. This document contains the work flow of the system and gives guidelines on how to build the functionality gradually in each of the course modules of the J2EE LOT.

## Setup Checklist for Mini Project

Minimum System Requirements

* Intel Pentium 90 or higher (P166 recommended)
* Microsoft Windows 95, 98, or NT 4.0, 2k, XP, Windows 7
* Memory: 32MB of RAM (64MB or more recommended)
* Internet Explorer 6.0 or higher
* Oracle 9i client and access to oracle 9i server
* JDK 8
* Eclipse Luna
* JUnit 4.0, Maven
* WildFly

## Instructions

* The code modules in the mini project should follow all the coding standards.
* Create a directory by your name in drive **<drive>**. In this directory, create a subdirectory **MiniProject**. Store your Project here.
* You can refer to your course material.
* You may also look up the help provided in the java docs and documentation provided with WildFly.
* The total time required to complete this mini project is 50 hrs.
* Since this project work will span over couple of months, you will need to take care of maintaining the code

# Problem Statement

## Objective

Development of Online Internal Recruitment System used for internal recruitment in an organization.

## Abstract of the project

This project is aimed at developing Online Internal Recruitment System. This is a web based application that can be accessed over the web. This system can be used for internal recruitment across projects within an organization. This system also includes searching and managing the existing employee resources for a project and raising requisition for internal recruitment for a project by its Resource Manager (RM). RMG Executive (RMGE) assigns the employee resources against the requisition raised by RM. This is an integrated system that contains three user components, Resource Management Group Executive (RMGE), Resource Manager (RM) and Admin component.

## Functional components of the project

Following is a list of functionalities of the system. Wherever, the description of functionality is not adequate, you can make appropriate assumptions and proceed.

The three type of users who would access the system viz. Resource Manager (RM), RMG Executive & Admin.

Each user would have some exclusive privileges (for e.g. resource manager can raise a requisition for internal recruitment to their project, the RMG executive selects from employee that match domain, skill and experience having current project id as ‘RMG’ for the requisition.

A requisition does not mention experience level required, since it is indicated with skill level.

So mentioning skill implies the experience for a candidate.

A requisition cannot be processed partly. Refer to the following sample requisition.

Sample Requisition:

(requisition\_id, RM\_id, project\_id, date\_created, date\_closed, current\_status, vacancy\_name, skill, domain, number\_required)

RQ01 RM01 P01 -- -- OPEN Project Leads Level3 JEE 2

To fulfill this requisition the RMGE will have to suggest minimum 2 employee resources with matching skill and domain. RMGE must provide exact skill, domain and minimum number of resources. The software must not allow any deviation to this process. This means that a requisition cannot be partly processed.

Sample Employee records: (employee\_is, name, project\_id, skill, domain, experience)

E01 Ram Suryavanshi RMG Level3 JEE 15

E02 Sugreev Mantri P01 Level2 JEE 7

E03 Lakshman Suryavanshi RMG Level3 JEE 12

Assume that RMGE assigns E01 and E02 to the RQ01.

On acceptance by the RM, the requisition is closed and status of employee assigned to it is automatically changed to the project id in the requisition.

Following changes will happen to the records…….

Employee records:

E01 Ram Suryavanshi P01 Level3 JEE 15

E02 Sugreev Mantri P01 Level2 JEE 7

E03 Lakshman Suryavanshi P01 Level3 JEE 12

Requisition record.

RQ01 RM01 P01 -- -- CLOSED Project Leads Level3 JEE 2

Once a project finishes, RM of the project can update project id of its employee to ‘RMG’; tracking of project completion of an employee is beyond scope of this project however the software provides for RM to manually change the project id of an employee to RMG.

Admin can to add new users to the system with one of the following roles, Resource Manager, RMG Executive or Admin. Admin can delete an existing user).

1. Resource Manager should be able to do following through ‘RM Page’, except for Login
   * Login to the system from Home Page
   * Raise a for internal recruitment for his/her concerned project/s
   * Accept/Reject the suggested resources against the requisition (if accepted following status updates are done automatically : Requisition status changed to ‘closed’ and Project id of the employee is changed to the concerned project)
   * Manually change the ‘Project Name/Code’ of employee on the RM’s concerned project/s to ‘RMG’ once the project is completed.
   * Generate various reports for pending as well as closed requisitions for his/her concerned Project, requisitions for a specific period of time, requisitions that are pending or closed.
2. The Admin should be able to following through ‘Admin Page’, except for Login
   * Login to the system using his/her credentials from Home Page
   * Add new users & assign roles, Delete existing users

1. RMG Executive able to following through ‘RMGE Page’, except for Login
   * Login to the system using his/her credentials from Home Page
   * Search employee on domain, skill, experience as per the requisitions
   * Assign RMG project employee matching the profile in the requisitions
   * View all requisitions irrespective of the RM or for specific RM
   * Generate various reports for pending as well as closed requisitions/ RMs including List all raised requisitions for his/her concerned Project, a specific period of time, pending or closed.

## Technology used:

* + - *Front End & Web Components:–* 
      1. HTML/JavaScript
      2. Servlets
      3. JSP
    - *Business Logic Components and Services :-* 
      1. Java Beans
    - *Application Servers :-* 
      1. WildFly
    - *Databases:-*
      1. Oracle 9i

# Implementation in J2EE LOT

## Summary of the functionality to be built:

The participants need to develop the Online Resume Management System for Internal Recruitment by building the functionality incrementally in each of the course modules of J2EE LOT.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sr. No** | **Course** | **Duration**  **(in PDs)** | **No. of Saturdays** | **Functionality to be built** |
| 1 | Programming Foundation with Pseudo code | 3 | 1 | Analyze the given case study |
| 2 | Introduction to Software Engineering | 0.5 |  | Analyze the Case study using SDLC phases. |
| 3 | Web Basics (HTML 5,CSS 3, JavaScript, XML) | 4.5 | 1 | Developing prototype i.e. developing screens/web pages in HTML and client side validation in JavaScript. |
| 4 | Oracle Basics | 4 | 1 | Creating relevant database tables |
| 5 | OOP & UML | 1.5 | 1 | Creating relevant Use case and class diagrams |
|  | Programming Foundation with Pseudo code + Web Basics +Oracle Basics +OOP & UML Test | 1 |
|  | Core Java 8 & Development Tools (Junit, Log4j) | 10 | 2 | Developing Business components (java classes). Coding for test classes & testing the functionality using JUnit |
|  |  |  |  |
|  | Core Java 8 + Dev Tools + OOP/UML Test | 1 |  |
| 8 | Servlets | 3.5 | 2 | Developing the web application using the prototypes. Converting the HTML web pages to jsp pages and java classes (business components) to java beans. Integrating jsp web pages with business components to complete the entire functionality. Building the web applications component using MAVEN build script. |
| 9 | JSP | 2 |
| 10 | Developer Workbench (PMD, MAVEN) | 1 |
| 11 | Servlets + JSP + Dev Workbench Test | 1 |
| 12 | Basic Spring 4.0 | 5 | 1 | Prepare document for presentation. |
| 13 | Basic Spring Test | 1 |
| 14 | Mini Project presentation | 1 |  |  |

## Guidelines on the functionality to be built:

The functionality and components to be built in each of the course modules of JEE LOT is as follows:

1. Course: HTML, JavaScript **(Duration: 10 hours)**
2. Develop the following screens:
   * 1. Home page screen with login: Home page of the Online Resume Management System is common to all users as it appears before login, which provides for login and minimal functional information about working of the internal recruitment process. Login on the Home page allows the valid user to logon to the system as per the role of the user.

There are 3 inputs required b the user for login; username, password and role of the user. (Users are assigned roles by the Admin)

* + 1. RM Page: For the RM, this screen shows links for all the functionality for RM. Also develop screens related to RM the functionality with java script based validation wherever applicable.
    2. RMGE Page: For the RMGE, this screen shows links for all the functionality for RMGE. Also develop screens related to RMGE the functionality with java script based validation wherever applicable
    3. Admin Page: For the Admin, this screen shows links for all the functionality for Admin. Also develop screens related to Admin the functionality with java script based validation wherever applicable.

1. In this course you need to develop the user interface using HTML and document the flow of your application including the images of html page in a word document. The screens/web pages should include the fields as per the functionality mentioned above. Also, include client-side validations using JavaScript wherever applicable.
2. Course: Oracle **(Duration: 5 hours)**
3. Create the following database tables:
   * 1. User: This table will contain the details of valid users
     2. Employee: This table will contain the details of Employee including project currently assigned to the employee, skill, domain, experience, designation etc.
     3. Project : This table will contain the details of all the Projects in the Organization. Adding new project etc. is not in scope of this application.
     4. Requisition: This table will contain the details like RM id, project id date of creation, requisition id, vacancy name, number of people, skill, domain, experience, status (initially ‘open’), list of employee chosen (initially blank)
4. The structure of the above listed tables is as follows:
   * 1. **User**: user\_id VARCHAR2(3), password VARCHAR2(20), role VARCHAR2(10)

* For Admin, RM & RMGE, assume that the users are already added to the system
  + 1. **Employee**: employee\_id VARCHAR2(3), employee\_name VARCHAR2(50), project\_id VARCHAR2(3), skill VARCHAR2(15), domain VARCHAR2(15), experience\_yrs NUMBER
* For skill and domain assume single word entry and not multi words values
* Sample records :

E01 Ram Suryavanshi RMG Level3 JEE 15

E02 Sugreev Mantri P01 Level2 JEE 7

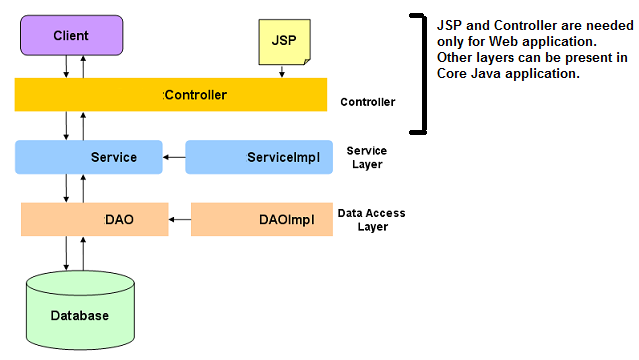
E03 Lakshman Suryavanshi RMG Level3 JEE 12

* + 1. **Project**: project\_id VARCHAR2(3) project\_name VARCHAR2(10), description VARCHAR2(20), start\_date DATETIME, end\_date DATETIME, RM\_id VARCHAR2(3)
* For Project, the RM\_id will be the user\_id of corresponding RM
  + 1. **Requisition**: requisition\_id VARCHAR2(3), RM\_id VARCHAR2(3), project\_id VARCHAR2(3), date\_created DATETIME, date\_closed DATETIME, current\_status VARCHAR2(10), vacancy\_name VARCHAR2(10), skill VARCHAR2(5), domain VARCHAR2(5), number\_required NUMBER

Note: You may add/normalize/denormalize the tables if your application demands it.

1. Course: OOP & UML **(Duration: 5 hours)**
   1. Develop relevant Use case and Class diagrams for the application.
2. Course: Core Java 8 + Developer Tools **(Duration: 14 hours)**
3. Develop business components (java classes) for the following functionality:
   * 1. Authentication Service (on Login): This component will verify if the user who is trying to access the system is a valid user. This verification is as against the valid users listed in the user table.
     2. Admin Service : This component will allow the admin to add new users, update roles for and delete existing user.
     3. RMGE Service: This component will allow the RMGE to search employee and assign them to the requisition
     4. RM Service: This component will allow the RM to raise a requisition for a project. Accept or reject the suggested solution by RMGE
     5. Reporting Service: This component allows RM and RMGE to get the required reports from the system
     6. XMLAuthentication Service (xml data store): Develop a component to replace the class Authentication Service that does user verification to perform authentication against an XML data store (i.e. the user details are in xml file instead of database). The component should be easily pluggable.
   1. Develop test classes for testing the following functionality
      1. Login
      2. Raising a Requisition
      3. Modify user details
   2. Test the application using JUnit.
   3. Configure Logger to log the status of an application
4. Course: Servlets + JSP + Developer Workbench **(Duration: 14 hours)**
5. Convert all the screens developed in HTML to JSP.
6. Convert all the java classes (business components) created in Java module to Java beans
7. Integrate all screens (JSP pages) with business components (java beans) to complete the entire functionality
8. Configure the DataSource and modify the data access classes to use DataSource object configured.
9. Use https for security throughout the pages so that the valid users can only access the application**.**
10. Develop Logger ServletFilter to log status of an application
11. Build the web component using Maven
12. Documentation **(Duration: 2 hours)**
    1. Project Documentation: Document your project details (Duration: 1 hour 30 mins).
    2. Project submission: Submit your project with all the artifacts including the test cases & documentation (Duration: 30 mins).

Application Architecture: Discuss this with your mentor on regular basis.



## Evaluation and assessment parameters:

This miniproject will be done in groups of five. Each group will identify a Team Lead who will decide which team member will code for which functionality. This project shall be evaluated at the end of spring module.

**Evaluation Criteria (out of 100):**

|  |  |
| --- | --- |
| Look and Feel of Web pages | **05** |
| Client-side and server-side validation | **10** |
| Code Documentation and using coding standards | **10** |
| Overall Business logic. This includes:   * Usage of Logging API (log4j) | **25** |
| Usage of Maven to build project | **5** |
| Good amount of appropriate dataset to showcase project completely | **5** |
| Appropriate test cases using JUnit 4.0 | **5** |
| Using MVC architecture and clean encapsulation of business logic in appropriate components. Judicious use of java beans, cleaner looks to JSP | **35** |