** MINISTRY OF EDUCATION AND TRAINING**

**FPT UNIVERSITY**

Capstone Project Document

Outsourcing HRM

|  |  |
| --- | --- |
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| **Capstone Project code** | OHRM |

-Ho Chi Minh City, 05/2015-

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# Definitions, Acronyms, and Abbreviations

|  |  |
| --- | --- |
| **Name** | **Definition** |
| OHRM | Outsourcing Human Resource Management |
| Admin | Administrator |
| HR | Human Resource |
| Evaluation | Period Evaluation |
| Appraisal | Appraise Employee in Project |

Table 1: Definitions

# Report No. 1 Introduction

## Project Information

* Project name: **Outsourcing HRM**
* Project Code: **OHRM**
* Product Type: **Website**
* Start Date: **May 11th, 2015**
* End Date:

## Introduction

Along with the development and growing size of the outsourcing company, human resource management for each project is important.

Human resource management in an outsourcing software firm isn’t simple as manage staff but also ensure to assign work for staff with right skills and interests for the appropriate projects.

Thus the development of specialized management system for human resource involve in specific projects are needed.

OHRM is a system like that. It helps to reduce the pressure management for managers and improve the productivity of works of employee’s project.

## Current Situation

Below are some human resource managements:

* Nowadays, there are a lot human resource management systems in different fields are available on internet and users can easily use it but for outsourcing field it still may not have it yet.
* Some companies develop management system but only internal employees can use it like Fsoft company... The systems provide management specialized functions in outsourcing HRM software such as employee records and assign employees into projects … But there are still some limitations.

## Problem Definition

Below are the disadvantages of current OHRM system:

* The request recruitment for a project or receive the feedback from customer … Still be done through email.
* System can’t suggest engineers with right skills and interests for appropriate project.

## Proposed Solution

System will provide functions that focus on outsourcing resource management‘s efficiency, manage resource for each specific project, sharing experience knowledge system …..

### **Feature functions**

* System suggest people that criteria consistent with specific conditions of the project.
* Manager can establish human resource for project that they are involved.
* Director can approve the request from manager.
* Human resource department can select engineers based on the request of manager.
* Manager, Engineers could hand down experiences of projects as a reference documents to support future projects.
* Admin can manage employees and customer’s account.
* Customer can make feedback

### Advantages and disadvantages

The advantages and disadvantages of the proposed solution:

* Advantages:
* With system suggest
  + - Saving energy and time for manager to easily select engineers for each project base on automatic system suggest.
    - Each engineer will be assigned on projects matching their skills and interests.
    - Productivity of project will be increased.
* With experiences from storage system
* The employee can refer experiences from previous projects.
* Disadvantages:
* System only suggests these criteria: skill and interest. It can’t control in term of specific staff’s time.
* Storage system knowledge experiences can only save each project under text form. It can’t support text of project content to be searched.
* System can’t manage over time works.

## Functional Requirements

Function requirements of the system are listed as below:

### Project Member Management

* Director can create new projects and update projects.
* Manager can choose engineers for project which they have been assigned to.

### System Management

* Admin can manage company account.
* Admin can manage criteria for assessment system.
* Engineer can change their profile.

### Assessment Management

* System can provide assessment form for users.
* Manager can appraise project engineer.
* Manager, Director can perform period evaluation for their employees
* Customers can make feedback project after project ends.

### Recruitment Management

* Director can post new recruitment’s need.
* Human Resource Management can reply director hire post.

### Knowledge Management

* Engineer, Manager, Director can post experience knowledge from existing projects and comment on the post.

### Suggestion System

* System can find and suggest engineer with skills and interests that fit the project.

## Role and Responsibility

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No | Full Name | Role | Position | Contact |
| 1 | Lai Duc Hung | Project Manager | Instructor | hungld@fpt.edu.vn |
| 2 | Nguyen Thi Xuan Mai | Developer | Leader | Maintxse60910@fpt.edu.vn |
| 3 | Le Minh Hoang | Developer | Member | HoangLMSE60937@fpt.edu.vn |
| 4 | Nguyen Huu Phuoc | Developer | Member | PhuocNHSE61138@fpt.edu.vn |
| 5 | Ngo Trac Kien | Developer | Member | KienNTSE61016@fpt.edu.vn |

Table 2: Roles and Responsibilities

# Report No.2 Software Project Management Plan

## Problem Definition

### Name of this Capstone Project

Outsourcing HRM (OHRM)

### Problem Abstract

Managing engineer resource of Software Outsourcing Company is really necessary.

Managing software engineer resource efficiently will help software projects complete on time with high quality.

To manage that resource outsourcing, we can build a system that supports human resource management in the projects. Supporting the assessment of employee based on multiple criteria and store experience knowledge from projects.

In addition, system supports management of employee availability, skills and their assignment to appropriate position which will not only optimize the performance of outsourcing resource but also increase the quality of software projects.

### Project Overview

#### Current Situation

Nowadays, there isn’t a specific software to manage human resource for software engineer, mostly through mail or general human resource management software such as: Microsoft Project, Mantis…..

* Communicating via mail:
  + Director establishes recruitment’s need and send mail to Human Resource Department. Simultaneously receive the result list from Human Resource Department also via email
  + Enterprises receive feedback about project from customer via email.
  + The criteria are sent to manager in order to perform the appraisal.
* Mainly, recruit new employee through interview. Employee information is stored does not include employee’s skills and interests.
* Appraise employee based on criteria and the assessment results are written on paper.
* The experiences, tips from previous projects mainly obtained through training from manager are not stored.

The limitations of current workflows:

* Communicating via email require user to manually formatting text, drawing table … It’s consuming time, easy to make mistakes and has no standard format.
* Employee’s skills and interests aren’t store will make manager harder to choose appropriate employee for suitable project, time-consuming for interview….
* The assessment results aren’t stored in system will make it difficult for director to review the assessment results, and it takes a lot of time to plan and pay salary for employee.
* The current system is limited in supporting PM capture engineer who is available.

#### The Proposed System

This System is a web application that can solve these problem by helping users manage outsourcing human resource with following functions:

* Director can establish recruitment’s need, project management and review employee’s assessment result.
* Manager can manage project member, arrange engineer on project and appraise engineers.....
* Engineer can view and edit their personal information, view project information which they are assigned to, post experience knowledge and log timesheet….
* Human Resource Department can view and respond to recruitment post.
* Admin can manage account, manage assessment criteria and routine evaluation.
* Customer can make feedback for project after project is completed.
* System can suggest engineers in accordance with project, notify users about the changes of human resource, project.....

#### Boundaries of the System

* This system is web application with function for director, manager, engineer, admin, human resource department.
* This system operation requires users to have a computer/laptop with Internet connection. Language that system uses is English.
* The limitations of system:
* System doesn’t support task management.
* Only manage engineer resource for software company.

#### Development Environment

##### Hardware requirements

**For server**

|  |  |  |
| --- | --- | --- |
| Windows | Minimum Requirements | Recommended |
| Internet Connection | Cable, Wifi (4 Mbps) | Cable, Wifi (8 Mbps) |
| Operating System | XP, Vista, 7, 8 | XP, Vista, 7, 8 |
| Computer Processor | Intel® Core 2 Duo | Intel® Core(TM) i5 CPU , M 460 @ 2.53GHz |
| Computer Memory | 1GB RAM | 3GB or more |

Table 3: Hardware Requirement for Server

##### Software requirements

* Microsoft Windows 7 Ultimate: operating system and platform for development.
* SQL Server 2008 Enterprise R2: used to create and manage the database for system.
* Star UML 5.0: used to create models and diagrams.
* Skype: used for communication and meeting.
* Microsoft Visio: used to draw models and diagrams.
* Net Beans IDE 7.4 JDK 7u51: used to implement website.
* GitHub & Tortoise SVN: used for source control.

## Project organization

### Software Process Model

Project is developed under waterfall model.

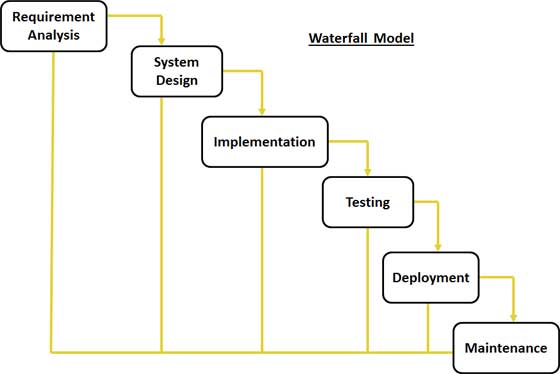


Figure 1: Waterfall Development Model

For more information:

I2EE Book

(Owner tutorialspoint.com. Tutorials Point)

### Roles and responsibilities

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Full name** | **Role in Group** | **Responsibilities** |
| **1** | Lai Duc Hung | Project manager | * Specify user requirement * Control the development process * Give out technique and business analysis support |
| **2** | Nguyen Thi Xuan Mai | Team Leader, BA, DEV, Tester | * Managing process * Designing database * Clarifying requirements * Prepare documents * GUI Design * Create test plan * Coding * Testing |
| **3** | Le Minh Hoang | Team Member, BA, DEV, Tester | * Designing database * Clarifying requirements * Prepare documents * GUI Design * Create test plan * Coding * Testing |
| **4** | Nguyen Huu Phuoc | Team Member, BA, DEV, Tester | * Designing database * Clarifying requirements * Prepare documents * GUI Design * Create test plan * Coding * Testing |
| **5** | Ngo Trac Kien | Team Member, BA, DEV, Tester | * Designing database * Clarifying requirements * Prepare documents * GUI Design * Create test plan * Coding * Testing |

Table 4: Roles and Responsibilities Details

### Tools and Techniques

- Front-end technologies: HTML5, CSS3, JavaScript, jQuery, AJAX.

- Back-end: Website: Website: NetBeans IDE 7.4 JDK 1.7.

- Web Server: Microsoft IIS.

- Database Management System: MS SQL Server 2008 Enterprise R2.

## Project Management Plan

### Software Development Life Cycle

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Phase** | **Description** | **Deliverables** | **Resource needed** | **Dependencies and Constrains** | **Risks** |
| **Preliminary Investigation or Analysis** | - Collect requirements from customer.  - Identify and clarify requirements for the system in general. | - Introduction of proposed system.  - Software requirement specification  - Project Task Plan.  - Prototypes. | 20 man-days | N/A | - Missing requirement- Unclear scope of project.  - Lack of member share of understand. |
| **Design** | - Architecture design for the system.  - Detail design using top-down.  - Choose Architecture style. | - Software Design Document  - Base code structure. | 20 man-days | Depend on “Requirement Analysis”. | - Lack of experience.  - Not fulfil requirement |
| **Implementation** | - Coding system core functions and other feature with GUI.  - Unit test | - Main user’s functions on web. | 40 man-days | Depend on “Design”. | - Lack of experience and knowledge.  - Human’s mistake. |
| **Testing** | - Integration test the system.  - Alpha test.  - Correct bugs.  - Beta test.  - Acceptance test. | - Test document. | 20 man-days | Depend on “Implementation”. | - Lack of experience.  - Missing test case. |
| **Deployment** | N/A | - Installation guide.  - User Manual. | 10 man-days | Depend on “Testing”. | - Lack of experience. |
| **Maintenance** | N/A | N/A | N/A | N/A | N/A |

Table 5: Development Phases

### Phase Detail

#### Phase 1: Requirement Analysis

|  |  |  |
| --- | --- | --- |
| **Task** | **Description** | **Author** |
| **1. Collect requirements** | Find which systems currently provide similar service, their strengths and weakness. | MaiNTX, HoangLM, PhuocNH, KienNT |
| **2. Identify and clarify main functions** | Define which main functions system should provide. | MaiNTX, HoangLM, PhuocNH, KienNT |
| **3.** **Create System Introduction** | Complete Introduction Report. | MaiNTX |
| **4. Software Project Management Plan** | Prepare Project Management Plan. | MaiNTX |
| **5. Prototype** | Build a prototype of proposed system (Website). | MaiNTX, HoangLM, PhuocNH, KienNT |
| **6. SRS** | Create SRS document. | MaiNTX, HoangLM, PhuocNH, KienNT |

Table 6: Phase 1: Requirement Analysis

#### Phase 2: Design

|  |  |  |
| --- | --- | --- |
| **Task** | **Description** | **Author** |
| **1. Detailed Design** | Which feature this function should have and how to implement. | MaiNTX, HoangLM, PhuocNH, KienNT |
| **2. Database Design** | Design a database which contains all entities information. | MaiNTX, HoangLM, PhuocNH, KienNT |
| **3. Design Document** | Create software design document. | MaiNTX, HoangLM, PhuocNH, KienNT |

Table 7: Phase 2: Design

#### Phase 3: Implementation

|  |  |  |
| --- | --- | --- |
| **Task** | **Description** | **Author** |
| **1. Front-end web functions** | Implement front-end functions on web. | MaiNTX, HoangLM, PhuocNH, KienNT |
| **2. Back-end web functions** | Implement back-end functions on web. | MaiNTX, HoangLM, PhuocNH, KienNT |
| **3. Unit testing** | Write test case and testing for web functions. | MaiNTX, HoangLM, PhuocNH, KienNT |

Table 8: Phase 3: Implementation

#### Phase 4: Testing

|  |  |  |
| --- | --- | --- |
| **Task** | **Description** | **Author** |
| **1. Integration testing** | Write test case and testing systems. | MaiNTX, HoangLM, PhuocNH, KienNT |
| **2. Alpha testing** | Do alpha test with customer. | MaiNTX, HoangLM, PhuocNH, KienNT |

Table 9: Phase 4: Testing

#### Phase 5: Deployment

|  |  |  |
| --- | --- | --- |
| **Task** | **Description** | **Author** |
| **1. Installation guide** | Write installation guide. | MaiNTX |
| **2. User Manual** | Write user manual. | HoangLM, PhuocNH, KienNT |

Table 10: Phase 5: Deployment

#### Phase 6: Maintenance

N/A

### All Meeting Minutes

Refer to Meeting Minutes folder.

## Coding Convention

Use Java coding convention to develop website.

Summary:

* Naming Convention.
  + Use camel case for both variable and function name.
  + Use Pascal case for class name.
* Indentation.
  + Avoid lines longer than 80 characters, since they are not handled well by many terminals and tools.
* Declaration.
  + One declaration per line is recommended since it encourages commenting.
  + In absolutely no case should variables and functions be declared on the same line.
  + Do not put different types on the same line.
* Code Examples

Follow “Code Conventions for the Java TM Programming Language, by Sun Microsystems, rev April 20, 1999”.

<http://www.oracle.com/technetwork/java/codeconventions-150003.pdf>

# Report No. 3 Software Requirement Specification

## User Requirement Specification

### Guest Requirement

Guest is a person who does not have access to the system. The function guest can use following functions:

* Login.

### Engineer Requirement

Engineer is a person who have access to the system. Engineer can use these following functions:

* Search projects.
* View projects detail.
* View appraisal.
* View evaluation.
* Search timesheets.
* Write timesheet.
* Edit timesheet.
* Remove timesheet.
* Edit profile.
* Search knowledge.
* View knowledge detail.
* Edit knowledge.
* Comment knowledge.
* Edit comment.
* Remove comment.

### Manager Requirement

Manager is a person who have access to the system. Manager can use these following functions:

* Assign engineers to project
* Remove engineers from project
* Search employees
* View employee profile.
* Review timesheets.
* Appraise project engineers.
* Edit appraisal.
* Evaluate engineers in period time
* Edit evaluation.

### Director Requirement

Director is a person who have access to the system. Director can use these following functions:

* Create project.
* Edit project.
* Review assigned engineers.
* Review evaluation.
* Search recruitment
* View recruitment detail.
* Create recruitment
* Edit recruitment.
* Reply recruitment.

### Customer Requirement

Customer is a person who have access to the system. Customer can use these following functions:

* Make feedback project.

### Admin Requirement

Admin is the person who manages the system. Admin is can use these following function:

* Search account.
* View account.
* Create account.
* Edit account.
* Add criterion.
* Edit criterion.
* Remove criterion.
* Create period evaluation.
* Edit period evaluation.
* Remove period evaluation.

### HR Person Requirement

HR is a person who have access to the system. HR can use these following functions:

* Search recruitment
* View recruitment detail.
* Reply recruitment.

## System Requirement Specification

### External Interface Requirement

#### User Interface

* General requirement for graphics user interface is the GUI should be simple, clear, intuitive, and reminiscent.
* The interface design is an iterate process includes design, sketching, prototyping, user assessment.
* Some design principles will be taken into consideration:
  + UI for business web applications - Janko Jovanovic [Ref: <http://www.smashingmagazine.com/2010/02/25/designing-user-interfaces-for-business-web-applications/>]
  + Ten principles of effective web design – Vitaly Friedman [Ref: <http://www.smashingmagazine.com/2008/01/31/10-principles-of-effective-web-design/>]
  + Principles of mobile interface design – Jonathan Stark [Ref: <http://www.oreilly.com/pub/e/2144>]

#### Hardware Interface

* N/A

#### Software Interface

* Run with Fire Fox (version 37.0.1), Chrome (version 42.0.2311.90 m) browser and must support Java script and HTML5.

#### Communication Protocol

* Using HTTP/HTTPS protocol

### System Overview Use Case



Figure 2: System Overview Use Case



### List of Use Case

#### <Guest> Overview Use Case

****

**Figure 3: <Guest> Overview Use Case**



##### <Guest> Login Use Case

****

**Figure 4: <Guest> Login use case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -1 SPECIFICATION** | | | |
| **Use-case No.** | OHRM001 | **Use-case Version** | 2.0 |
| **Use-case Name** | Login | | |
| **Author** | Nguyen Thi Xuan Mai | | |
| **Date** | 19/05/15 | **Priority** | High |
| **Actor:**  Guest  **Summary:**  This use case allows guest to login to the system.  **Goal:**  Allow guest login to the system.  **Triggers**  Guest press login button on Login screen.  **Preconditions:**   * User hasn’t logged into system.   **Post Conditions:**   * **On Success**: Guest logged in to the system. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Input URL “OutsourcingHRM.com” | System will display Login screen:  - “Username”: textbox, min length 8, max length 50.  - “Password”: textbox, min length: 8, max length 50.  -“Login”: button.  - “Forget password”: Link  - “User log on”: link  [Alternative 1] | | 2 | Guest input username and password | System validates inputted values. | | 3 | Press “Login” button | System will navigate to Home screen. |   **Alternative Scenario:**   * N/A   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Guest press “Forget password” link | System will navigate to Forgot Password screen on web application. | | 2 | Guest lefts “Username” or “Password” textboxes blank. | Show message: “Username or password can’t be blank”. | | 4 | Guest login with wrong username or password. | Show message: “Username or password is incorrect”. | | 5 | Guest login with non-existed account. | Show message: “Invalid Username or Password”. |   **Relationships:**   * N/A   **Business Rules:**   * Guest have to login with Engineer, Manager, Admin, Director, Customer or HR department account to access the web application | | | |

#### <Engineer> Overview Use Cases

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**Figure 5: <Engineer> Overview Use Case**

##### <Engineer> Search Timesheets Use Case

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**Figure 6: < Engineer > Search Timesheets Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -2 SPECIFICATION** | | | |
| **Use Case No.** | OHRM002 | **Use Case Version** | 2.0 |
| **Use Case Name** | Search timesheet | | |
| **Author** | Nguyen Huu Phuoc | | |
| **Date** | 06/06/2015 | **Priority** | Low |
| **Actor:**   * Engineer, Manager, Director.   **Summary:**   * This use case allows engineer to search timesheets.   **Goal:**   * Searching result timesheet is shown.   **Triggers:**   * User click “Search” button.   **Preconditions:**   * Guest logged in as Engineer, Manager or Director.   **Post condition:**   * **Success:** Searching result timesheet is shown. * **Fail:** show message error.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | User clicks on “View all timesheet” tab on timesheet page. | System opens “View all timesheet” tab-content with following fields:   * “Date”: date-picker * “Search”: button | | 2 | User selects date and clicks on “Search” button  [Alternative: 1] | * System searches timesheet of searching date and shows in timesheet table. * [Exception: 1] |   **Alternative:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | User clicks on “Search” button without select a day. | System shows message: “Please select a day!” |   **Exception:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | There is not timesheet in the searching day | Show error message: “There is not timesheet in this day” |   **Relationships:** N/A  **Business Rules:**   * Engineer can only search his/her timesheets on searching day. * Manager can only search engineer’s timesheets of his/her projects on searching day. * Director can search all engineer’s timesheets. | | | |

##### <Engineer> Write Timesheet Use Case

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**Figure 7: <Engineer> Write Timesheet Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -3 SPECIFICATION** | | | |
| **Use Case No.** | OHRM003 | **Use Case Version** | 2.0 |
| **Use Case Name** | Write timesheet | | |
| **Author** | Nguyen Huu Phuoc | | |
| **Date** | 02/06/2015 | **Priority** | Low |
| **Actor:**   * Engineer, Manager   **Summary:**   * This use case allows engineer to write timesheets.   **Goal:**   * A new timesheet is added.   **Triggers:**   * User click “Add timesheet” button.   **Preconditions:**   * Guest logged in as Engineer, Manager.   **Post condition:**   * **Success:** A new timesheet is added. * **Fail:** show message error.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | User clicks on “Timesheet” tab on navigation bar. | System opens “Timesheet” page with following fields:   * “Engineer Name”: label, shows engineer’s name who is logging in system. * “Project Code”: drop-down list, shows list of projects which this engineer is working, required. * “Date”: date-picker, required. * “Time”: text-box, required. * “hours”: label. * “Description”: text-area, min length: 30 characters, max length: 550 characters, required. * “Add Timesheet”: button. * “Reset”: button. * Data table shows list of rejected and pending timesheets. | | 2 | User inputs fields then clicks on “Add Timesheet” button.  [Alternative 1] | * System checks validation. * System adds a new timesheet. * System shows “Add timesheet successfully” message. * System reloads “Timesheet” page, a new timesheet will be add to data table with pending status.   [Exception: 1,2,3,4,5,6] |   **Alternative:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | User clicks on “Reset” button. | All fields will be clear. |   **Exception:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | User doesn’t choose “Project Code”. | Show error message: “You have to choose a project!” | | 2 | User doesn’t choose “Date”. | Show error message: “You have to choose a day” | | 3 | Inputting “Time” text-box is not in range. | Show error message: “Time is from 0.5 to 8 hours a day” | | 4 | User leaves “Time” text-box empty. | Show error message: “Time is from 0.5 to 8 hours a day” | | 5 | Length of “Description” text-area is not in range. | Show error message: “Description has to be from 30 to 550 characters.” | | 6 | User leaves “Description” text-area empty. | Show error message: “You can’t leave this field empty!” |   **Relationships:** N/A  **Business Rules:**   * An engineer can write one or many timesheets. * The status of new timesheet is always “pending”. * One timesheet belongs to one engineer. Engineer can’t write timesheet for others. * One timesheet describes working of one engineer in a particular project. * Total timesheet time for a day can be larger than 8 hours. Time out of working-time day is called OT (overtime). | | | |

##### <Engineer> Edit Timesheet Status Use Case

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**Figure 8: <Engineer> Edit Timesheet Status Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -4 SPECIFICATION** | | | |
| **Use Case No.** | OHRM004 | **Use Case Version** | 2.0 |
| **Use Case Name** | Update timesheet | | |
| **Author** | Nguyen Huu Phuoc | | |
| **Date** | 02/06/2015 | **Priority** | Low |
| **Actor:**   * Engineer, Manager.   **Summary:**   * This use case allows engineer, manager to update timesheet.   **Goal:**   * A selected timesheet is updated.   **Triggers:**   * User clicks on “Update” button.   **Preconditions:**   * User logged in with Engineer or Manager’s role.   **Post condition:**   * **Success:** the selected timesheet is updated. * **Fail:** show message error.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | User clicks on “Update” button on a row on timesheet table ~~of~~ on “Timesheet” page. | System loads data of the selected timesheet to:   * “Project Code”: drop-down list, shows project code of selected timesheet, required. * “Date”: date-picker, shows date of selected timesheet, required. * “Time”: text-box, shows time of selected timesheet, required. * “Hours”: label. * “Description”: text-area, min length: 30 characters, max length: 550 characters, shows project code of selected timesheet, required. * “Add Timesheet”: button, disable. * “Reset”: button, disable. * “Save”: button. * “Cancel”: button. * Data table shows list of rejected and pending timesheets. | | 2 | User inputs fields then clicks on “Save” button.  [Alternative 1] | * The selected timesheet will be update to database. * System shows “Update timesheet successfully” message. * System reloads “Timesheet” page, the selected timesheet is also updated on timesheet table.   [Exception: 1,2,3,4,5,6] |   **Alternative:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | User clicks on “Cancel” button. | All fields will be clear. |   **Exception:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | User doesn’t choose “Project Code”. | Show error message: “You have to choose a project!” | | 2 | User doesn’t choose “Date”. | Show error message: “You have to choose a day” | | 3 | Inputting “Time” text-box is not in range. | Show error message: “Time is from 0.5 to 8 hours a day” | | 4 | User leaves “Time” text-box empty. | Show error message: “Time is from 0.5 to 8 hours a day” | | 5 | Length of “Description” text-area is not in range. | Show error message: “Description has to be from 30 to 550 characters.” | | 6 | User leaves “Description” text-area empty. | Show error message: “You can’t leave this field empty!” |   **Relationships:** N/A  **Business Rules:**   * User can update one or more timesheets. * User just updates one timesheet at a time. * User only can updates timesheet with “pending” or “reject” status. * The status of updated timesheet is always “pending”. * User just updates his/her timesheet on timesheet table. | | | |

##### <Engineer> Remove Timesheet Use Case

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**Figure 9: <Engineer> Remove Timesheet Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -5 SPECIFICATION** | | | |
| **Use Case No.** | OHRM005 | **Use Case Version** | 2.0 |
| **Use Case Name** | Delete timesheet | | |
| **Author** | Nguyen Huu Phuoc | | |
| **Date** | 02/06/2015 | **Priority** | Low |
| **Actor:**   * Engineer, Manager.   **Summary:**   * This use case allows user to delete timesheet.   **Goal:**   * A selected timesheet is deleted from current screen.   **Triggers:**   * User clicks “delete” link on timesheet table.   **Preconditions:**   * User logged in as Engineer role.   **Post condition:**   * **Success:** the selected timesheet is deleted from database. * **Fail:** show message error.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | User clicks on “Delete” link of timesheet that he/she wants to delete on timesheet table of “Timesheet” page. | * System shows confirmation pop-up: “Are you sure you want to delete this timesheet?” * “OK”: button * “Cancel”: button | | 2 | User clicks on “OK” button.  [Alternative 1] | * System closes confirmation pop-up. * The data of selected timesheet will be deleted in database. * System will reload “Timesheet” page.   The deleted timesheet will not be shown on timesheet table any more. |   **Alternative:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | User clicks on “Cancel” button. | * System closes confirmation pop-up. * The selected timesheet will not be deleted. |   **Exception:** N/A  **Relationships:** N/A  **Business Rules:**   * User can delete one or more timesheets. * User just deletes one timesheet at a time. * User only can deletes timesheet with “pending” or “reject” status. * User just deletes his/her timesheets on timesheet table. | | | |

##### <Engineer> Logout Use Case

****

**Figure 10: <Engineer> Logout Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -6 SPECIFICATION** | | | |
| **Use Case No.** | OHRM006 | **Use Case Version** | 2.0 |
| **Use Case Name** | Logout | | |
| **Author** | Nguyen Huu Phuoc | | |
| **Date** | 05/06/2015 | **Priority** | Low |
| **Actor:**   * Engineer, Manager, Director, Admin, Customer and HR.   **Summary:**   * This use case allows all users of system log out of system.   **Goal:**   * Log out of system.   **Triggers:**   * User click “Log out” link.   **Preconditions:**   * Guest logged in as Engineer, Manager, Director, Admin, Customer or HR.   **Post condition:**   * **Success:** log out of system, back to “login” page. * **Fail:** show message error.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | User clicks on “Log out” link on menu bar | System clears session then navigate to “login” page. |   **Alternative:**   * N/A   **Exception:**   * N/A   **Relationships:**   * N/A   **Business Rules:**   * N/A | | | |

##### <Engineer> View Evaluation Use Case

****

**Figure 11: <Engineer> View Evaluation Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -7 SPECIFICATION** | | | |
| **Use Case No.** | OHRM007 | **Use Case Version** | 2.0 |
| **Use Case Name** | View evaluation | | |
| **Author** | Nguyen Huu Phuoc | | |
| **Date** | 06/06/2015 | **Priority** | Low |
| **Actor:**   * Engineer, Manager or Director.   **Summary:**   * This use case allows user to view in period time evaluation.   **Goal:**   * The evaluation result is shown.   **Triggers:**   * User clicks on “View Evaluation Result” button.   **Preconditions:**   * Guest logged in as Engineer, Manager or Director.   **Post condition:**   * **Success:** The evaluation result is shown. * **Fail:** show message error.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | User clicks on “View Evaluation Result” button. | System opens “Evaluation Result” pop up contents following information: “No.”, “Criterion”, “Point”, “Average point” and “OK” button. | | 2 | User clicks on “OK” button | System close “Evaluation Result” pop up. |   **Alternative:** N/A  **Exception:**  **Relationships:** N/A  **Business Rules:**   * User can only view his/her evaluation. * Manager can view engineer’s evaluation of his projects. * Director can view all engineer’s evaluation. * User can only view his/her evaluation after manager evaluated. | | | |

##### <Engineer> View Appraisal Status Use Case

****

**Figure 12: <Engineer> View Appraisal Status Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -8 SPECIFICATION** | | | |
| **Use Case No.** | OHRM008 | **Use Case Version** | 2.0 |
| **Use Case Name** | View appraisal | | |
| **Author** | Nguyen Huu Phuoc | | |
| **Date** | 06/06/2015 | **Priority** | Low |
| **Actor:**   * Engineer, Manager or Director.   **Summary:**   * This use case allows user to view appraisal.   **Goal:**   * The appraisal result is shown.   **Triggers:**   * User clicks on “View Appraisal” button.   **Preconditions:**   * Guest logged in as Engineer, Manager or Director.   **Post condition:**   * **Success:** The appraisal result is shown. * **Fail:** show message error.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | User clicks on “View Appraisal Result” button. | System opens “Appraisal Result” pop up contents following information: “No.”, “Criterion”, “Point”, “Average point” and “OK” button. | | 2 | User clicks on “OK” button | System close “Appraisal Result” pop up. |   **Alternative:** N/A  **Exception:**  **Relationships:** N/A  **Business Rules:**   * User can only view his/her appraisal. * Manager can view engineer’s appraisal of his projects. * Director can view all engineer’s appraisal. * User can only view his/her appraisal after manager appraised. * One appraisal belongs to one project. | | | |

##### <Engineer> Edit Profile Use Case

****

**Figure 13: <Engineer> Edit Profile Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -9 SPECIFICATION** | | | |
| **Use Case No.** | OHRM009 | **Use Case Version** | 2.0 |
| **Use Case Name** | Edit profile | | |
| **Author** | Nguyen Huu Phuoc | | |
| **Date** | 06/06/2015 | **Priority** | Low |
| **Actor:**   * Engineer, Manager, Director, Admin, Customer and HR.   **Summary:**   * This use case allows user to edit profile.   **Goal:**   * User’s profile is changed.   **Triggers:**   * User click “Profile” link.   **Preconditions:**   * Guest logged in as Engineer, Manager, Director, Admin, Customer or HR.   **Post condition:**   * **Success:** User’s profile is changed. * **Fail:** show message error.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | User clicks on “Profile” link on user drop bar. | System opens “Employee profile” page with following fields:   * “Employee name”: text-box, disable. * “Current password”: text-box, min length 6 characters, max length 10 characters. * “New password”: text-box, min length 6 characters, max length 10 characters. * “Confirm password”: text-box, min length 6 characters, max length 10 characters. * “Sex”: text-box, disable. * “Birthday”: date-picker * “Phone”: text-box. * “Email”: text-box * “Company”: text-box. * “Address”: text-box. | | 2 | User inputs fields then clicks on “Save” button.  [Alternative 1] | * System checks validation. * System updates employee’s information. * System reloads “Employee profile” page with new information.   [Exception: 1,2,3] |   **Alternative:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | User clicks on “Save” button without inputting fields. | Current information of employee is not changed |   **Exception:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | “Current password” is not valid. | Show error message: “Current password is not correct!” | | 2 | “New password”: is not in range | Show error message: “Password has to be from 6 to 10 characters” | | 3 | “Confirm password”: does not match to “New password” | Show error message: “Confirm password is not valid” |   **Relationships:** N/A  **Business Rules:**   * Engineer can’t change name and sex. | | | |

##### <Engineer> View Knowledge Detail Use Case

****

**Figure 14: <Engineer> View Knowledge Detail Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -10 SPECIFICATION** | | | |
| **Use-case No.** | OHRM010 | **Use-case Version** | 2.0 |
| **Use-case Name** | View knowledge detail | | |
| **Author** | Nguyen Thi Xuan Mai | | |
| **Date** | 02/06/2015 | **Priority** | High |
| **Actor:**  Engineer, Manager or Director  **Summary:**  This use case allows Engineer, Manager or Director to view a specific topic knowledge detail.  **Goal:**  Knowledge content is shown.  **Triggers**   * Engineer, Manager or Director clicks a specific topic knowledge.   **Preconditions:**   * User log in as Engineer, Manager or Director’s role.   **Post Conditions:**   * **On Success**: The chosen “Topic Knowledge” screen is displayed. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Clicks on a specific topic knowledge on “Knowledge list”. | System navigates to “Topic Knowledge” screen:  - “Recruitment” panel:   * “Topic Name” * “Poster ‘s username” * “Content” * “Edit”: button.   - “Comment” panel:   * List of existed comments * “New comment”: text-area.   - “Back”: button. |   **Alternative Scenario:**   * N/A   **Exceptions:**   * N/A   **Relationships:**   * N/A   **Business Rules:**   * Only Director, Human Resource Department can use this function. * Engineer, Manager or Director can view close topic content but can’t see comment content. | | | |

##### <Engineer> Add Knowledge Use Case

****

**Figure 15: <Engineer> Add Knowledge Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -11 SPECIFICATION** | | | |
| **Use-case No.** | OHRM011 | **Use-case Version** | 2.0 |
| **Use-case Name** | Add knowledge | | |
| **Author** | Ngo Trac Kien | | |
| **Date** | 19/05/2015 | **Priority** | High |
| **Actor:**  Engineer, Manager, Director.  **Summary:**  This use case allows engineer to add new knowledge to the system.  **Goal:**  New knowledge is added into system.  **Triggers**   * User clicks on “Add new knowledge” button on “Knowledge” screen.   **Preconditions:**   * User must log in as Engineer, Manager or Director.   **Post Conditions:**   * **On Success**: New knowledge is posted on Knowledge screen. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Clicks on “Add new knowledge” button on “Knowledge” screen. | System displays “Create Knowledge” screen:  - “Subject”: textbox, min length: 4, max length: 50, required.  - “Project code”: textbox, min length: 4, max length: 10, required.  - “Content”: text-area, min length: 4.  - “Post”: button.  - “Back”: button. | | 2 | Inputs fields, then clicks on “Post” button.  [Alternative 1] | System shows popup:  “Post this knowledge?”  - “OK”: button.  - “Cancel”: button. | | 3 | Clicks on “OK” button.  [Alternative 2] | New knowledge is added to database and system navigates to “Topic Knowledge” screen.  [Exceptions 1, 2, 3, 4] |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Clicks on “Back” button.  [Alternative 3,4] | System shows popup:  “Some fields are being modified, are you sure to leave this page?” - “Continue editing” button. - “Leave” button. | | 2 | Clicks on “Cancel” button. | System navigates to “Knowledge” screen. Nothing is added to database. | | 3 | Clicks on “Continue editing” button. | System closes popup. | | 4 | Clicks on “Leave” button. | System navigates to “Knowledge” screen. Nothing is added to database. |   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | “Subject” textbox contains less than 4 characters or more than 50 characters. | Show message: “Subject must include 4~50 characters”. | | 2 | “Project code” textbox contains less than 4 characters or more than 50 characters. | Show message: “Project code must include 4~10 characters”. | | 3 | “Content” text-area contains less than 4 characters. | Show message: “Content must have at least 4 characters”. | | 4 | Engineer input the wrong project code. | Show message: “This project does not exist”. |   **Relationships:**   * N/A   **Business Rules:**   * Only Engineer, Manager or Director can write or post new knowledge. * Each knowledge is belong to a specific project. * 30 days after project’s end date, user can no longer add new knowledge of that project. * Exceptions must not be violated. | | | |

##### <Engineer> Edit Knowledge Use Case

****

**Figure 16: <Engineer> Edit Knowledge Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -12 SPECIFICATION** | | | |
| **Use-case No.** | OHRM012 | **Use-case Version** | 2.0 |
| **Use-case Name** | Edit Knowledge | | |
| **Author** | Nguyen Thi Xuan Mai | | |
| **Date** | 19/05/15 | **Priority** | High |
| **Actor:**  Engineer, Manager, Director  **Summary:**  This use case allows Engineer, Manager or Director to edit their topic knowledge.  **Goal:**  Edit topic knowledge.  **Triggers**   * Manager chooses topic knowledge to edit.   **Preconditions:**   * User log in as Engineer, Manager, Director.   **Post Conditions:**   * **On Success**: Topic knowledge will be edited with new information. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Click “Knowledge” on navigation bar. | Navigate to “Knowledge” page to view a list of knowledge.  “The list of knowledge”: are shown for Engineer, Manager or Director. | | 2 | Engineer, Manager or Director click on their topic knowledge. | Topic knowledge’s details are shown.  “Back” button Alternative[1] | | 3 | Input new information for fields. | System validates inputted values. | | 4 | Click on “Submit” button. | Topic knowledge will be edit to database and a message will be shown: “You have successfully edit topic knowledge”.  [Exception 1, 2, 3] |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Engineer, Manager and Director click on “back” button. | Navigate to “Knowledge” page |   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Fields are blank | Show error message: "Fields can’t be empty!" | | 2 | Input wrong format. | Show error message: “…..” |   **Relationships:**   * N/A   **Business Rules:**   * Topic knowledge can only be edited by who created it. * Only Engineer, Manager, Director can edit their own topic knowledge. * Exception must not violated | | | |

##### <Engineer> Search Knowledge Use Case

****

**Figure 17: <Engineer> Search Knowledge Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -13 SPECIFICATION** | | | |
| **Use-case No.** | OHRM013 | **Use-case Version** | 2.0 |
| **Use-case Name** | Search knowledge | | |
| **Author** | Ngo Trac Kien | | |
| **Date** | 20/05/2015 | **Priority** | High |
| **Actor:**  Engineer, Manager, Director.  **Summary:**  This use case allows Engineer, Manager or Director to search a specific knowledge.  **Goal:**  Knowledge content is shown.  **Triggers**   * User inputs search content.   **Preconditions:**   * User log in as Engineer, Manager or Director.   **Post Conditions:**   * **On Success**: “Topic Knowledge” screen is displayed. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Clicks on “Knowledge” on navigation bar. | System navigates to “Knowledge” page that contain 2 tabs:  -On “All topics” tab.   * “Search”: textbox. * “Knowledge list”: table, which includes: Topic, Project, Replies, Last comment, “Show more knowledge” button.   -On “By Project” tab.   * “Search”: textbox. * “Project list”: table, which includes: Project code, Project name, Start date, End Date, Customer. * “Show more project” button | | 2 | Inputs into “Search” textbox. | System shows list of knowledge that match their search value.  [Exceptions 1] | | 3 | Clicks on a specific topic knowledge on “Knowledge list”.  [Alternative 1, 2, 3] | System navigates to “Topic Knowledge” screen:  - “Knowledge” panel:   * “Subject” * “Project code” * “Content” * “Edit”: button.   - “Comment” panel:   * List of existed comments * “New comment”: text-area.   - “Back”: button. |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Clicks on “Show more knowledge” button. | 200 next latest active knowledge will be update to “Knowledge list” | | 2 | Clicks on “Show more projects” button. | 200 next latest end date project will be update to “Project list” | | 3 | Clicks on a specific project on “Project list”. | System shows all knowledge that selected project contain:   * “Search”: textbox. * “Knowledge list”: table, which includes: Topic, Project code, Project name, latest comment poster, Latest comment date. |   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Don’t have any knowledge match with the search value. | System shows message: “No topic is found” |   **Relationships:**   * N/A   **Business Rules:**   * “Knowledge list”: contain 200 latest active topics knowledge. * “Knowledge list” is sorted by “Latest comment date” column, descending. * “Project list” is sorted by “End date” column, descending. * Projects that don’t have end date have the highest positions in the “Project list”. | | | |

##### <Engineer> Add comment Use Case

****

**Figure 18: <Engineer> Add Comment Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -14 SPECIFICATION** | | | |
| **Use Case No.** | OHRM014 | **Use Case Version** | 2.0 |
| **Use Case Name** | Add comment | | |
| **Author** | Nguyen Huu Phuoc | | |
| **Date** | 06/06/2015 | **Priority** | Low |
| **Actor:**   * Engineer, Manager or Director.   **Summary:**   * This use case allows user to add comment into particular knowledge.   **Goal:**   * A new comment is added.   **Triggers:**   * User click “Send” button.   **Preconditions:**   * User logged in as Engineer, Manager or Director.   **Post condition:**   * **Success:** A new comment is added. * **Fail:** show message error.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | User clicks on a knowledge on “Knowledge” page. | System opens “Knowledge Details” page:   * “Knowledge content” * “Previous comment” * “Add a new comment”: text-area, min length 30 characters, required. * “Send” button. | | 2 | User inputs fields then clicks on “Send” button. | System adds a new comment into this knowledge.  [Exception: 1] |   **Alternative:** N/A  **Exception:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | The inputted comment is not in range. | Show error message: “Your comment is too short! It should be at least 30 characters.” |   **Relationships:** N/A  **Business Rules:**   * User can add one or many comments. * A comment belongs to particular knowledge. * After adding a comment, user has to wait for 30 second if user wants to add a next comment. * After a comment is added, that knowledge will be on top of knowledge list. | | | |

##### <Engineer> Edit Comment Use Case

****

**Figure 19: <Engineer> Edit Comment Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -15 SPECIFICATION** | | | |
| **Use Case No.** | OHRM015 | **Use Case Version** | 2.0 |
| **Use Case Name** | Edit comment | | |
| **Author** | Nguyen Huu Phuoc | | |
| **Date** | 06/06/2015 | **Priority** | Low |
| **Actor:**   * Engineer, Manager or Director.   **Summary:**   * This use case allows user to edit comment of particular knowledge.   **Goal:**   * The selected comment is edited.   **Triggers:**   * User click “Edit” button.   **Preconditions:**   * Guest logged in as Engineer, Manager or Director.   **Post condition:**   * **Success:** The selected comment is edited. * **Fail:** show message error.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | User clicks on “Edit” button of particular comment on knowledge detail page. | System loads the selected comment to text-area.  “Send”: button  “Cancel”: button | | 2 | User changes the content of comment then click “Send” button.  [Alternative: 1] | System updates the content of comment.  [Exception: 1] |   **Alternative:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | User clicks on “Cancel” button | System clear text-area. Nothing changes. |   **Exception:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | The inputted comment is not in range. | Show error message: “Your comment is too short! It should be at least 30 characters.” |   **Relationships:** N/A  **Business Rules:**   * User can only edit his/her comments. * User can edit comments of closed knowledge. | | | |

##### <Engineer> Remove Comment Use Case

****

**Figure 20: <Engineer> Remove Comment Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -16 SPECIFICATION** | | | |
| **Use Case No.** | OHRM016 | **Use Case Version** | 2.0 |
| **Use Case Name** | Remove comment | | |
| **Author** | Nguyen Huu Phuoc | | |
| **Date** | 06/06/2015 | **Priority** | Low |
| **Actor:**   * Engineer, Manager or Director.   **Summary:**   * This use case allows user to remove comment into particular knowledge.   **Goal:**   * The selected comment is removed.   **Triggers:**   * User click “Remove” button.   **Preconditions:**   * Guest logged in as Engineer, Manager or Director.   **Post condition:**   * **Success:** The selected comment is deleted. * **Fail:** show message error.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | User clicks on “Remove” button of particular comment. | System shows confirm pop up:   * “OK”: button * “Cancel”: button | | 2 | User clicks on “OK” button  [Alternative: 1] | System removes this comment. |   **Alternative:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | User clicks on “Cancel” button. | System closes pop up and nothing changes. |   **Exception:** N/A  **Relationships:** N/A  **Business Rules:**   * Users can only remove their comments. * Users can remove one or many comments. * Who has created the knowledge can remove every comments of his/her knowledge. * User can remove comments of close knowledge. * The removed comment can’t be restored. | | | |

##### <Engineer> Search Projects Use Case

****

**Figure 21: <Engineer> Search Projects Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -17 SPECIFICATION** | | | |
| **Use Case No.** | OHRM017 | **Use Case Version** | 2.0 |
| **Use Case Name** | Search Projects | | |
| **Author** | Nguyen Huu Phuoc | | |
| **Date** | 06/06/2015 | **Priority** | Low |
| **Actor:**   * Engineer, Manager or Director.   **Summary:**   * This use case allows user to search projects.   **Goal:**   * Searching project is shown.   **Triggers:**   * User click “Search” button.   **Preconditions:**   * Guest logged in as Engineer, Manager or Director.   **Post condition:**   * **Success:** Searching projects is shown. * **Fail:** show message error.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | User clicks on “PROJECT” tab on navigation bar. | System opens “List All Projects” page:   * “Project Name”: text-box * “in Year”: drop-down list * “Search”: button. | | 2 | User inputs fields then clicks on “Search” button.  [Alternative 1] | System searches project based on inputted fields then show searching result in project tables.  [Exception 1] |   **Alternative:** N/A  **Exception:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | There is no marching result. | Show error message: “There is not marching projects!” |   **Relationships:** N/A  **Business Rules:**   * User can search project by project’s name and period time that those projects are running. * Engineers can only search projects which they have joined. * Managers or Director can search every projects. | | | |

##### <Engineer> View Projects Detail Use Case

****

**Figure 22: <Engineer> View Projects Detail Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -18 SPECIFICATION** | | | |
| **Use Case No.** | OHRM018 | **Use Case Version** | 2.0 |
| **Use Case Name** | View Project Details | | |
| **Author** | Nguyen Huu Phuoc | | |
| **Date** | 05/06/2015 | **Priority** | Low |
| **Actor:**   * Engineer, Manager or Director.   **Summary:**   * This use case allows user to view employee profile.   **Goal:**   * User can view project details.   **Triggers:**   * User clicks on project’s name on project table.   **Preconditions:**   * User logged in as Engineer, Manager or Director.   **Post condition:**   * **Success:** Project detail is shown. * **Fail:** show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | User clicks on project’s name on project table. | System opens “Project Details” page:   * “Info: tab contents project name, project code, start date, end date, manager, customer, skill, status and “Edit” button. * “Feedback”” tab contents feedback details of this project’s customer. * “Appraisal”: tab contents information about appraising project’s engineers. * “Knowledge”: tab contents knowledge of this project. |   **Alternative:**   * N/A   **Exception:**   * N/A   **Relationships:**   * N/A   **Business Rules:**   * Engineer can’t see “Appraisal” tab and “Edit” button on “Info” tab. * Different statuses have different colors. * If status is new, project detail will be only enable with director. * If status is working, “Appraisal” and “Feedback” tab are disable with engineer, manager and director. * If status is done or close, “Member” tab is disable. | | | |

#### <Manager> Overview Use Case

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**Figure 23: <Manager> Overview Use Case**

##### <Manager> View Employee Profile Use Case

****

**Figure 24: <Manager> View Employee Profile Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -19 SPECIFICATION** | | | |
| **Use Case No.** | OHRM019 | **Use Case Version** | 2.0 |
| **Use Case Name** | View Employee Profile | | |
| **Author** | Nguyen Huu Phuoc | | |
| **Date** | 05/06/2015 | **Priority** | Low |
| **Actor:**   * Manager, Director.   **Summary:**   * This use case allows user to view employee profile.   **Goal:**   * User can view employee profile details.   **Triggers:**   * User clicks on employee’s name on employee table.   **Preconditions:**   * User logged in as Manager or Director.   **Post condition:**   * **Success:** Employee’s profile is shown. * **Fail:** show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | User clicks on employee’s name on employee table. | System opens pop up which contains following information:   * Employee name: label * ID: label * Project: label * Role: label * Sex: male * Phone: label * Email: label * Skill: checkbox |   **Alternative:** N/A  **Exception:** N/A  **Relationships:** N/A  **Business Rules:**   * User can view profile of all employees. * Skills of engineer can be set “interest”. | | | |

##### <Manager> Search Employee Use Case

****

**Figure 25: <Manager> Search Employees Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -20 SPECIFICATION** | | | |
| **Use Case No.** | OHRM020 | **Use Case Version** | 2.0 |
| **Use Case Name** | Search Employees | | |
| **Author** | Nguyen Huu Phuoc | | |
| **Date** | 05/06/2015 | **Priority** | Low |
| **Actor:**   * Manager, Director.   **Summary:**   * This use case allows user to search employees.   **Goal:**   * Searched employee is shown.   **Triggers:**   * User clicks on “Search” button on “Search Employee” page.   **Preconditions:**   * User logged in as Manager or Director.   **Post condition:**   * **Success:** searching result table is shown. * **Fail:** show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | User clicks on “EMPLOYEE” tab on navigation bar. | System opens “Search employee” page:   * “Employee name”: text-box, min length, max length. * “Search employee”: button | | 2 | User types in “Employee name” text-box then click “Search employee” button | System searches all employee with name likes inputted then shows in Employee table.  Employee table includes: “No.”, “Name”, “Role”, “Birthday”, “Mail” and “Phone” columns.  [Alternative 1] |   **Alternative:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | No result is found. | System shows message “No record is matching” |   **Exception:**   * N/A   **Relationships:**   * N/A   **Business Rules:**   * User can only search like employee’s name. * Only employees with status active are shown in searching result. | | | |

##### <Manager> Review Timesheets Use Case

****

**Figure 26: <Manager> Review Timesheets Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -21 SPECIFICATION** | | | |
| **Use Case No.** | OHRM021 | **Use Case Version** | 2.0 |
| **Use Case Name** | Review timesheets | | |
| **Author** | Nguyen Huu Phuoc | | |
| **Date** | 05/06/2015 | **Priority** | Low |
| **Actor:**   * Manager, Director   **Summary:**   * This use case allows user to review engineer’s timesheets.   **Goal:**   * User can approve or reject engineer’s timesheets.   **Triggers:**   * User clicks “Approve” or “Reject” button of timesheet’s row on timesheet table.   **Preconditions:**   * User logged in as Manager, Director.   **Post condition:**   * **Success:** the selected timesheet is approved or rejected. * **Fail:** show message error.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | User clicks on “Timesheet” tab on navigation bar. | System opens “Review timesheets” page:   * Timesheet table includes columns: “No.”, “Engineer Name”, “Date”, “Description”, “Time”, “Project Code”, “Status”, “Action” * “Action” column has “Approve” and “Reject” buttons. | | 2 | User clicks on “Approve” button of a timesheet row on timesheet table.  [Alternative Scenario: 1] | System changes status of the selected timesheet to “Approve”. |   **Alternative:** N/A   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | User clicks on “Reject” button of a timesheet row on timesheet table. | System changes status of the selected timesheet to “Reject”. |   **Exception:** N/A  **Relationships:** N/A  **Business Rules:**   * Manager can only review engineer’s timesheets which belong to his projects. * Manager can review his own timesheets. * Manager can sort timesheet table by all columns. * One timesheet can be reviewed many times. | | | |

##### <Manager> Appraise Engineers Use Case

****

**Figure 27: <Manager> Appraise Engineers Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -22 SPECIFICATION** | | | |
| **Use-case No.** | OHRM022 | **Use-case Version** | 2.0 |
| **Use-case Name** | Appraise engineers | | |
| **Author** | Le Minh Hoang | | |
| **Date** | 06/06/15 | **Priority** | High |
| **Actor:**  Manager  **Summary:**  This use case allows Manager to appraise engineers of his managed project.  **Goal:**  The button is changed from “Appraise” button to “Appraise result” button.  **Triggers**   * Click on “Appraise” button.   **Preconditions:**   * User log in as Manager.   **Post Conditions:**   * **On Success**: Selected engineer’s appraised result is saved. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Clicks on “Appraise” tab on “Project detail” screen. | System show “Appraise” tab content with following fields:   * “#”: Index of each member in project. * “ID”: Username of each member in project. * “Full name”: Full name of each member in project. * “Position”: All position that engineer take in project. * “Start date”: Start date of following position. * “End date”: End date of following position. * “Appraise” button. * “Decline” button. | | 2 | Clicks on “Appraise” button.  [Alternative 1] | System opens popup with following fields:   * “Project name”, “Engineer ID”, “Engineer name” label. * List of criterions with following fields: * “Criterion”: include criterion title, description. * “Point”: textbox, number only, required. * “Average point”: average point of all previous points. * “Manager’s opinion” text-area: required. * “Submit” button. * “Cancel” button. | | 3 | Input all fields, then clicks “Submit” button.  [Alternative 2] | System validates all fields, then close popup, the appraise result will be saved, “Appraise” and “Decline” button disappear, “Appraise result” button appear.  [Exception 1, 2] |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Clicks on “Decline” button. | “Appraise” and “Decline” button disappear, “Appraise result” appear. | | 2 | Clicks on “Cancel” button. | The popup is closed, and nothing changes. |   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | “Point” textbox is left with nothing or characters. | System show message: “This field is required and must be a number”. | | 2 | “Manager’s opinion” text-area is left with nothing. | System show message: “This field is required”. |   **Relationships:**   * N/A   **Business Rules:**   * All engineers that were in this project must be appraised or decline appraised. * Manager will decline appraise a member when manager feels that member’s effort for this project is not enough. * After all members has been appraised or decline appraised, project’s status changes from “done” to “closed”. | | | |

##### <Manager> Edit Appraisal Use Case

****

**Figure 28: <Manager> Edit Appraisal Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -23 SPECIFICATION** | | | |
| **Use-case No.** | OHRM023 | **Use-case Version** | 2.0 |
| **Use-case Name** | Edit appraisal | | |
| **Author** | Le Minh Hoang | | |
| **Date** | 06/06/15 | **Priority** | Low |
| **Actor:**  Manager  **Summary:**  This use case allows Manager to edit appraisal of his managed engineer.  **Goal:**  The appraisal result of selected engineer change.  **Triggers**   * Click on “Edit” button.   **Preconditions:**   * User log in as Manager.   **Post Conditions:**   * **On Success**: Selected engineer’s appraised result is changed. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Clicks on “Edit” button on “Appraisal result” popup. | All input fields of each criterion are enabled.  “Manager’s opinion” text-area is enabled.  “Edit” button disappears, “Submit” and “Cancel” button appear. | | 2 | Input all fields, then clicks “Submit” button.  [Alternative 1] | System validates all fields.  All input fields of each criterion are disabled.  “Manager’s opinion” text-area is disabled.  The appraise result changes.  “Submit” and “Cancel” button disappear.  “Edit” button appear.  [Exception 1, 2] |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Clicks on “Cancel” button. | All input fields of each criterion are disabled.  “Manager’s opinion” text-area is disabled.  The result is not changed.  “Submit” and “Cancel” button disappear.  “Edit” button appear. |   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | “Point” textbox is left with nothing or characters, or greater than max point, or lesser than 0. | System show message: “This field is required to be a positive number and lesser than max point”. | | 2 | “Manager’s opinion” text-area is left with nothing. | System show message: “This field is required”. |   **Relationships:**   * N/A   **Business Rules:**   * Appraisal result can be changed only within 3 days after the appraised date. | | | |

##### <Manager> Evaluate Employees Use Case

****

**Figure 29: <Manager> Evaluate Employee Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -24 SPECIFICATION** | | | |
| **Use-case No.** | OHRM024 | **Use-case Version** | 2.0 |
| **Use-case Name** | Evaluate employees | | |
| **Author** | Le Minh Hoang | | |
| **Date** | 06/06/2015 | **Priority** | High |
| **Actor:**  Manager  **Summary:**  This use case allows Manager to evaluate engineers of his managed project.  **Goal:**  The button is changed from “Evaluate” button to “Evaluate result” button.  **Triggers**   * Click on “Evaluate” button.   **Preconditions:**   * User log in as Manager.   **Post Conditions:**   * **On Success**: Selected engineer’s evaluated result is saved. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Clicks on “EVALUATE” link on navigation bar. | System show “Evaluation” screen, include a list of engineers with following fields:   * “#”: Index of each engineer. * “ID”: Username of each engineer. * “Full name”: Full name of each engineer. * “Project”: All projects that engineer join in. * “Start date”: Start date of following project. * “End date”: End date of following project. * “Status”: status of this evaluation. * “Evaluate” button. | | 2 | Clicks on “Evaluate” button. | System navigate to “Evaluate employee” screen with following fields:   * “Assigned Project”: list of project which this engineer joined. * “#”: Index of each project. * “Project Code”: code of project. * “Project Name”: name of project. * “Position”: All position that engineer take in project. * “Start date”: Start date of following position. * “End date”: End date of following position. * “Point”: average point that engineer get on project. * “View appraisal result” button * “Evaluate form”: list of criterions with following fields. * “Criterion”: include criterion title, description. * “Point”: textbox, number only, required. * “Average point”: average point of all previous points. * “Manager’s opinion” text-area: required. * “Submit” button. * “Cancel” button. | | 3 | Input all fields, then clicks “Submit” button.  [Alternative 1, 2] | System validates all fields, and then evaluation result will be saved.  System navigates to “Evaluation” screen with some changes on selected engineer:   * “Evaluation” button disappear. * “View result” button appear.   [Exception 1, 2] |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Clicks on “View appraisal result” button. | System show a popup that show the result of that engineer’s appraisal in project | | 2 | Clicks on “Cancel” button. | System navigates to “Evaluation” screen and nothing changes. |   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | “Point” textbox is left with nothing or characters. | System show message: “This field is required and must be a number”. | | 2 | “Manager’s opinion” text-area is left with nothing. | System show message: “This field is required”. |   **Relationships:**   * N/A   **Business Rules:**   * Manager has to evaluate all employees that had been worked with him in a specific period time. * “Status” of evaluation has 4 statuses. * “Not yet” status: still not evaluate yet. * “Reviewing” status: has been evaluated, waiting for director review. * “Approved” status: the evaluation has been approved by director. * “Rejected” status: the evaluation has been rejected by director. | | | |

##### <Manager> Edit Evaluation Use Case

****

**Figure 30: <Manager> Edit Evaluation Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -25 SPECIFICATION** | | | |
| **Use-case No.** | OHRM025 | **Use-case Version** | 2.0 |
| **Use-case Name** | Edit period evaluation | | |
| **Author** | Ngo Trac Kien | | |
| **Date** | 05/06/2015 | **Priority** | Medium |
| **Actor:**  Admin.  **Summary:**  This use case allows admin to edit period evaluation.  **Goal:**  Selected evaluation is updated with new information.  **Triggers**   * User clicks on “Edit” button on “Period Evaluation” screen.   **Preconditions:**   * User must log in as Admin.   **Post Conditions:**   * **On Success**: Selected period evaluation information is changed. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Click on “Edit” button on “Period Evaluation” screen. | System displays “Edit Period Evaluation” pop-up:  - “Name”: textbox, min length: 4, max length: 50.  - “Start date”: date-picker.  - “End date”: date-picker.  - “Submit date”: date-picker.  - “Close date”: date-picker.  - “Save”: button.  - “Close”: button.  “Name”, “Start date”, “End date”, “Submit date” and “Close date” contain origin values of selected period evaluation. | | 2 | Edit fields then click on “Save” button.  [Alternative 1] | System shows message dialog:  “Save this period evaluation?”  - “OK”: button.  - “Cancel”: button. | | 3 | Click on “OK” button.  [Alternative 2] | Period evaluation is updated with new values. System closes pop-up and displays period evaluation with new values in “Period Evaluation” screen.  [Exceptions 1,2,3,4] |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Click on “Close” button. | System closes pop-up. Nothing is updated. | | 2 | Click on “Cancel” button. | Message dialog is closed. Nothing is change. |   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | “Name” textbox contains less than 4 characters or more than 50 characters. | Show message: “Name must include 4~50 characters”. | | 2 | “End date” is sooner than “Start date”. | Show message: “End date must be later than start date”. | | 3 | “Submit date” is sooner than “End date”. | Show message: “Submit date must be later than end date”. | | 4 | “Close date” is sooner than “Submit date”. | Show message: “Close date must be later than submit date”. |   **Relationships:**   * N/A   **Business Rules:**   * Period evaluation only can edit before reaching start date. * Exceptions must not be violated. | | | |

##### <Employee> Assign Engineers to Project Use Case

****

**Figure 31: <Manager> Assign Engineers to Project Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -26 SPECIFICATION** | | | |
| **Use-case No.** | OHRM026 | **Use-case Version** | 2.0 |
| **Use-case Name** | Assign engineer to project | | |
| **Author** | Le Minh Hoang | | |
| **Date** | 19/05/15 | **Priority** | High |
| **Actor:**  Manager, Director  **Summary:**  This use case allows Manager, Director to assign engineer to a specific project.  **Goal:**  Assign engineers to project.  **Triggers**   * Click on “Select engineers” function.   **Preconditions:**   * User log in as Manager or Director.   **Post Conditions:**   * **On Success**: Engineer name is added to project. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Clicks on “Assign engineer” button on “Project” screen. | System navigates to “Assign engineer” screen. | | 2 | Clicks on “Select engineers” button | System opens popup:   * Data of engineers: name, skills, interests, current projects, end date. * Check-boxes aside each Data of engineer to select the engineer. * “Assign” button. * “Cancel” button. | | 3 | Clicks on check-boxes then clicks “Assign” button.  [Alternative 1] | Update new information into database, popup disappear, new information update on “Assign engineer” screen. |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Clicks on “Cancel” button. | Popup disappears and nothing change. |   **Exceptions:**   * N/A   **Relationships:**   * N/A   **Business Rules:**   * “Current projects” cell belongs to “Data of engineers” table will list all projects that an engineer is working on. “End date” cell will list all end date that according with those projects. * Only Manager assigned to current project or Director can see “Assign engineer” button. * Assigned engineers rows have gray color, assign accepted engineers row have green color, assign decline engineers row have red color. * The engineers that are more suitable will be at the top of the list. | | | |

##### <Employee> Remove Engineers from Project Use Case

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**Figure 32: <Manager> Remove Engineers from Project Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -27 SPECIFICATION** | | | |
| **Use-case No.** | OHRM027 | **Use-case Version** | 2.0 |
| **Use-case Name** | Remove engineers from project | | |
| **Author** | Le Minh Hoang | | |
| **Date** | 06/06/2015 | **Priority** | High |
| **Actor:**  Manager  **Summary:**  This use case allows Manager to change project member’s position.  **Goal:**  New data is updated on the screen.  **Triggers**   * Click on “Edit” button on “Project member” screen of “Project details” screen.   **Preconditions:**   * User log in as Manager.   **Post Conditions:**   * **On Success**: Data about position of selected member has been updated. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Clicks on “Member” tab on “Project detail” screen. | System show “Member” tab content with following fields:   * “#”: Index of each member in project. * “ID”: Username of each member in project. * “Full name”: Full name of each member in project. * “Position”: All position that engineer take in project. * “Work type”: type of work of member in project. * “Edit” button. * “Add more engineers” button. | | 2 | Clicks on “Edit” button.  [Alternative 1] | System opens popup with following fields:   * “ID”: Username of selected engineer. * “Full name”: Full name of selected engineer. * “Skill”: All skill that engineer has and interest. * “Work type” drop-down list: include only 3 options: “Full-time”, “Part-time”, “Support”. * “Position” group of check-boxes: all positions that system support. * “Save” button. * “Cancel” button. | | 3 | Input all fields, then clicks “Save” button.  [Alternative 2] | System validates all fields, then close popup.  New data is updated on the screen.  [Exception 1] |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Clicks on “Add more engineers” button. | Reference to “Assign engineers to project” use case. | | 2 | Clicks on “Cancel” button. | The popup is closed, and nothing changes. |   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Choose “Full-time” in “Work type” drop-down list. | If this engineer is working with other project then system show message: “This engineer is working with other project, please choose “Part-time” for this engineer”. |   **Relationships:**   * N/A   **Business Rules:**   * If manager uncheck all the check-boxes and clicks on “Save” button, this engineer will be removed from this project. * The check-boxes that have same values as selected engineer’s position will be checked when popup open. | | | |

#### <Director> Overview Use Case

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**Figure 33: <Director> Overview Use Case**

##### <Director> Create Project Use Case

****

**Figure 34: <Director> Create Project Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -28 SPECIFICATION** | | | |
| **Use-case No.** | OHRM028 | **Use-case Version** | 1.0 |
| **Use-case Name** | Create Project | | |
| **Author** | Nguyen Thi Xuan Mai | | |
| **Date** | 06/06/15 | **Priority** | High |
| **Actor:**  Director  **Summary:**  This use case allows director to create a new project.  **Goal:**  A new project is added into “Project” screen  **Triggers**   * Director clicks on “Create new project” button on Project screen.   **Preconditions:**   * User must login as Director.   **Post Conditions:**   * **On Success**: New project is created. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Director clicks on “Create new project” button. | Show pop-up for inputting following information:  - “Project Code”: textbox, min length: 3, max length: 5, required.  - “Project Name”: textbox, min length: 5, max length: 50, required.  - “Manager”: drop-down list.  - “Start date”: drop-down calendar, required.  - “End date”: drop-down calendar.  - “Customer”: textbox, min length: 5, max length: 50, required.  - “OK”: button.  - “Cancel”: button | | 2 | Input fields, then clicks on “OK” button.  [Alternative Scenario: 1] | System validates inputted values  All fields will be added to database and show “Create new project successfully” message.  System will navigate to “Project” screen.  [Exception: 1, 2, 3, 4, 5, 6] |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Director clicks “Cancel” button. | Pop-up disappears and nothing change |   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Length of project code is not in range. | Show error message: “Length of project code must be from 3 to 5 characters!” | | 2 | Director inputs existed project code. | Show error message: “This project code is existed. Try another!” | | 3 | Length of project name is not in range. | Show error message: “Length of project name must be from 5 to 50 characters!” | | 4 | Director inputs existed project name. | Show error message: “This project name is existed. Try another!” | | 5 | Start date is not specified. | Show error message: “You can’t leave this empty!” | | 6 | Length of customer is not in range. | Show error message: “Length of customer must be from 5 to 50 characters!” |   **Relationships:**   * N/A   **Business Rules:**   * New project will be shown in Working Projects table of Project screen. * There is no need to write Start Date * Exception must not be violated. | | | |

##### <Director> Edit Project Use Case

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**Figure 35: <Director> Edit Project Use Case**

**Use Case Specification**

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| --- | --- | --- | --- |
| **USE CASE -29 SPECIFICATION** | | | |
| **Use-case No.** | OHRM029 | **Use-case Version** | 1.0 |
| **Use-case Name** | Edit Project | | |
| **Author** | Nguyen Thi Xuan Mai | | |
| **Date** | 06/06/15 | **Priority** | High |
| **Actor:**  Director, Manager  **Summary:**  This use case allows director to edit a project.  **Goal:**  New project information will be shown in Project screen.  **Triggers**   * Director clicks on “Edit” button on Project screen.   **Preconditions:**   * User must login as Director.   **Post Conditions:**   * **On Success**: Update project information. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Director clicks on “Edit” button. | System displays Project fields:  - “Project Name”: textbox.  - “Start Date”: textbox  - “End Date”: textbox  - “Skill”: textbox  - “Save”: button.  -“Reset”: button  -“Cancel”: button  All fields contains current values of current project. | | 2 | Edits fields then clicks on “Save” button.  [Alternative 1,2] | System validates inputted values.  System shows message:  “Save this project?”  - “OK”: button.  - “Cancel”: button. | | 3 | Clicks on “OK” button.  [Alternative 3] | Selected project is updated with new values, system displays project with new values in project screen. |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Director clicks “Cancel” button. | Reload project page, and nothing is changed. | | 2 | Clicks on “Reset” button. | All edited textboxes return to origin values. | | 3 | Director clicks “Cancel” button. | Pop-up message close, nothing is change |   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Length of project name is not in range. | Show error message: “Length of project code must be from 5 to 50 characters!” | | 2 | End Date is a day before Start Date | Show error message: “End Date must be after Start Date” | | 3 | No “Skill” checkbox is checked. | Show error message: “Must chose at least one skill” |   **Relationships:**   * N/A   **Business Rules:**   * Exception must not be violated. * Manager only can edit their assigned project. * Project with status done and close can’t be edited. | | | |

##### <Director> Review Assigned Engineers Use Case

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**Figure 36: <Director> Review Assigned engineers Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -30 SPECIFICATION** | | | |
| **Use-case No.** | OHRM030 | **Use-case Version** | 1.0 |
| **Use-case Name** | Review Assigned Engineer | | |
| **Author** | Nguyen Thi Xuan Mai | | |
| **Date** | 06/06/15 | **Priority** | High |
| **Actor:**  Director  **Summary:**  This use case allows director to review assigned Engineer of a project.  **Goal:**  Project with assigned engineer will be approved or rejected.  **Triggers**   * Director clicks on “Review Assigned Engineer” on Project page.   **Preconditions:**   * User must login as Director.   **Post Conditions:**   * **On Success**: Review assigned engineer * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Chose a specific project on Project page | Navigate to chosen project page. | | 2 | Click “Review” button | System display Assign Engineer page with following fields information:  - Username  - Full name  - Status  - Skill  - Interest  - Point  - Assign as  - Type | | 3 | Click “approve” button.  [Alternative 1] | System display chosen employee status change to Approved |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Click on “Reject” button. | System display chosen employee status change to Rejected. |   **Exceptions:**   * N/A   **Relationships:**   * N/A   **Business Rules:**   * Director can only review assigned engineer after Manager finishing assign’s task. | | | |

##### <Director> Create Recruitment Engineers Use Case

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**Figure 37: <Director> Create Recruitment Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -31 SPECIFICATION** | | | |
| **Use-case No.** | OHRM031 | **Use-case Version** | 1.0 |
| **Use-case Name** | Create Recruitment | | |
| **Author** | Nguyen Thi Xuan Mai | | |
| **Date** | 05/06/15 | **Priority** | Medium |
| **Actor:**  Director  **Summary:**  This use case allows director to create a new recruitment.  **Goal:**  New recruitment will be shown in search recruitment table of recruitment screen  **Triggers**   * Director clicks on “Create Recruitment” button on Recruitment Screen.   **Preconditions:**   * User must login as Director.   **Post Conditions:**   * **On Success:** Create a new recruitment * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Director clicks on “Create new recruitment” button. | Show create recruitment page for inputting following information:  - “Title”: textbox.  - “Content”: textbox.  - “Post Recruitment”: button.  - “Cancel” : button | | 2 | Input fields, then clicks on “Post Recruitment” button.  [Alternative Scenario: 1] | All fields will be added to database and show “Create new recruitment successfully” message.  System will navigate to “Search Recruitment” screen.  [Exception: 1] |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Director clicks “Cancel” button. | Redirect to Search Recruitment Page |   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | “Title” textbox contains less than 4 characters or more than 100 character. | Show message: “Title must include 4~50 characters”. | | 2 | “Contain” textbox contains less than 50 characters. | Show message: “Contain can’t be less than 50 characters”. |   **Relationships:**   * N/A   **Business Rules:**   * Exception must not be violated. | | | |

##### <Director> Edit Recruitment Use Case

****

**Figure 38: <Director> Edit Recruitment Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -32 SPECIFICATION** | | | |
| **Use-case No.** | OHRM032 | **Use-case Version** | 1.0 |
| **Use-case Name** | Edit Recruitment | | |
| **Author** | Nguyen Thi Xuan Mai | | |
| **Date** | 05/06/2015 | **Priority** | Medium |
| **Actor:**  Director.  **Summary:**  This use case allows admin to edit a topic recruitment.  **Goal:**  Selected topic recruitment is updated with new information.  **Triggers**   * User clicks on “Edit” button on “Topic recruitment” screen.   **Preconditions:**   * User must log in as Director.   **Post Conditions:**   * **On Success**: Selected “Topic recruitment” data is updated in database. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Clicks on “Edit” button on selected “Topic recruitment” screen. | System displays “Topic recruitment” fields:  - “Title”: textbox.  - “Content”: textbox.  - “Save”: button.  - “Reset”: button  -“Cancel” button.  “Title”, “Content” contains current values of selected “Topic recruitment”. | | 2 | Edits fields then clicks on “Save” button.  [Alternative 1,2] | System validates inputted values.  System shows message:  “Save this recruitment?”  - “OK”: button.  - “Cancel”: button. | | 3 | Clicks on “OK” button.  [Alternative 3] | Selected “Topic recruitment” is updated with new values, system displays recruitment with new values in “Topic recruitment” screen.  [Exceptions 1, 2, ] |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Clicks on “Cancel” button. | System closes edit. Nothing is updated. | | 2 | Clicks on “Reset” button. | All edited textboxes return to origin values. | | 3 | Clicks on “Cancel” button. | Message box is closed. Nothing is change. |   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | “Title” textbox contains less than 4 characters or more than 50 characters. | Show message: “Title must include 4~50 characters”. | | 2 | “Content” textbox contains less than 10 characters or more than 100 characters. | Show message: “Content must include 10~100 characters”. |   **Relationships:**   * N/A   **Business Rules:**   * Exceptions must not be violated. * Recruitment with status close can’t be edited | | | |

##### <Director> Search Recruitment Use Case

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**Figure 40: <Director> Search Recruitment Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -33 SPECIFICATION** | | | |
| **Use-case No.** | OHRM033 | **Use-case Version** | 2.0 |
| **Use-case Name** | Search Recruitment | | |
| **Author** | Nguyen Thi Xuan Mai | | |
| **Date** | 02/06/2015 | **Priority** | High |
| **Actor:**  Director, Human Resource Department.  **Summary:**  This use case allows Director, Human Resource Department to search a specific recruitment.  **Goal:**  Recruitment list is shown.  **Triggers**   * Director inputs search content.   **Preconditions:**   * User log in as Human Resource Department or Director’s role.   **Post Conditions:**   * **On Success**: “Topic Recruitments” screen is displayed. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Clicks on “Recruitment” on navigation bar. | System navigates to “Recruitment” page that contain:  -“Search”: textbox.  - “Recruitment list”: table, which includes: Topics, Replies, Project name, Latest comment poster and latest comment date.  - “Create new recruitment” button. | | 2 | Inputs into “Search” textbox. | System shows list of recruitment that match their search value.  [Exceptions 1] | | 3 | Clicks on a specific recruitment on “Recruitment list”. | System navigates to a chosen “Topic Recruitment” screen.  - “Back”: button. |   **Alternative Scenario:**   * N/A   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Don’t have any recruitment match with the search value. | System shows message: “No topic is found” |   **Relationships:**   * N/A   **Business Rules:**   * “Recruitment list”: contain 10 latest active topics recruitment. * “Recruitment list” is sorted by “Latest comment date” column, descending. * Recruitments that are closed have gray background color. | | | |

##### <Director> Reply Recruitment Use Case

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**Figure 39: <Director> Reply Recruitment Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE-34 SPECIFICATION** | | | |
| **Use-case No.** | OHRM034 | **Use-case Version** | 2.0 |
| **Use-case Name** | Reply Recruitment | | |
| **Author** | Nguyen Thi Xuan Mai | | |
| **Date** | 02/06/2015 | **Priority** | High |
| **Actor:**   * Director, Human Resource Person.   **Summary:**   * This use case allows Director, Human Resource Person to make a comment on “topic recruitment” page.   **Goal:**   * A comment is posted on “topic recruitment” page.   **Triggers**   * Director or Human Resource Person types a comment on “New comment” text-area comment box at “topic recruitment” page.   **Preconditions:**   * User must log in as Director or Human Resource Person’s role.   **Post Conditions:**   * **On Success**: New comment appears on that topic recruitment * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Director or Human Resource Person click on a “topic recruitment” link. | Topic recruitment’s detail screen are shown:  “Topic knowledge’s details”: text  “Comment”: text-field (area), min length: 50 characters.  “Send”: button  “Back”: button | | 2 | Input comment | System validates inputted value.  Show new comment on topic recruitment page.  [Exceptions: 1, 2] |   **Alternative Scenario:**   * N/A   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | User inputs bellow 50 characters | Show error message: “Your comment is too short. It must be at least 50 characters.” | | 2 | User input more than 50000 characters | Show error message: “Your comment is too long. Try again, please.” |   **Relationships:**   * N/A   **Business Rules:**   * Director, Human Resource Department are only people that can view or make a comment on a recruitment page. * Director, Human Resource Department can comment many times as they want. * On success scenario, new comment will be added to database. * Only Recruitments that haven’t closed yet can be commented. * Exception must not be violated. | | | |

##### <Director> Edit A Reply Use Case

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**Figure 39: <Director> Edit A Reply Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -35 SPECIFICATION** | | | |
| **Use-case No.** | OHRM035 | **Use-case Version** | 1.0 |
| **Use-case Name** | Edit A Reply | | |
| **Author** | Nguyen Thi Xuan Mai | | |
| **Date** | 06/06/15 | **Priority** | High |
| **Actor:**  Director, Human Resource Person  **Summary:**  This use case allows director, Human Resource Person to edit a reply.  **Goal:**  New reply information will be shown in Topic Recruitment screen.  **Triggers**   * Director, Human Resource Person clicks on “Edit” button.   **Preconditions:**   * User must login as Director or Human Resource Person’s role.   **Post Conditions:**   * **On Success**: Update reply information. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Director, Human Resource Person clicks on “Edit” button. | System displays Comment fields:  - “Content area”: textbox.  - “Save”: button.  -“Reset”: button  -“Cancel”: button  All fields contains current values of current project. | | 2 | Edits fields then clicks on “Save” button.  [Alternative 1,2] | System validates inputted values.  System shows message:  “Save this reply?”  - “OK”: button.  - “Cancel”: button. | | 3 | Clicks on “OK” button.  [Alternative 3] | Selected reply is updated with new values, system displays reply on topic recruitment with new values in that topic recruitment screen. |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Director or Human Resource Person clicks “Cancel” button. | Reload topic recruitment page, and nothing is changed. | | 2 | Clicks on “Reset” button. | All edited textboxes return to origin values. | | 3 | Director clicks “Cancel” button. | Pop-up message close, nothing is change |   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | User inputs bellow 50 characters | Show error message: “Your comment is too short. It must be at least 50 characters.” | | 2 | User input more than 50000 characters | Show error message: “Your comment is too long. Try again, please.” |   **Relationships:**   * N/A   **Business Rules:**   * Exception must not be violated. * Director or Human Resource Person can only edit their own reply, they can’t edit each other reply. * When a topic recruitment status is close, Director or Human Resource Person can’t edit reply. | | | |

##### <Director> View Recruitment Detail Use Case

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**Figure 41: <Director> View Recruitment Detail Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -36 SPECIFICATION** | | | |
| **Use-case No.** | OHRM036 | **Use-case Version** | 2.0 |
| **Use-case Name** | View recruitment detail | | |
| **Author** | Nguyen Thi Xuan Mai | | |
| **Date** | 02/06/2015 | **Priority** | High |
| **Actor:**  Director, Human Resource Department.  **Summary:**  This use case allows Director, Human Resource Department to view a specific recruitment detail.  **Goal:**  Recruitment content is shown.  **Triggers**   * Director, Human Resource Department click on a specific topic recruitment.   **Preconditions:**   * User log in as Human Resource Department or Director role.   **Post Conditions:**   * **On Success**: The chosen “Topic Recruitment” screen is displayed. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Clicks on a specific topic knowledge on “Recruitment list”. | System navigates to “Topic Recruitment” screen:  - “Recruitment” panel:   * “Topic Name” * “Poster ‘s username” * “Content” * “Edit”: button.   - “Comment” panel:   * List of existed comments * “New comment”: text-area.   - “Back”: button. |   **Alternative Scenario:**   * N/A   **Exceptions:**   * N/A   **Relationships:**   * N/A   **Business Rules:**   * When a topic status isn’t closed, user can see all contents. * When a topic status is closed, user only see recruitment content but can’t see comment content. | | | |

##### <Director> Review Evaluation Use Case

****

**Figure 42: <Director> Review Evaluation Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -37 SPECIFICATION** | | | |
| **Use-case No.** | OHRM037 | **Use-case Version** | 1.0 |
| **Use-case Name** | Review Evaluation | | |
| **Author** | Nguyen Thi Xuan Mai | | |
| **Date** | 06/06/15 | **Priority** | High |
| **Actor:**  Director  **Summary:**  This use case allows director to review an evaluation result.  **Goal:**  All evaluation results will be approved or rejected.  **Triggers**   * Director clicks on Evaluation on navigation bar.   **Preconditions:**   * User must login as Director.   **Post Conditions:**   * **On Success**: Review evaluation results. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Click Evaluation on navigation bar | System will display a list of evaluation results which contain these fields information:  - Username  - Full name  - Projects  - Role  - “View Result”: button | | 2 | Click “View Result” button | System display result pop-up include:  - Criterions  - Point  - Opinion  - Average point  -“Approve” button  -“Reject” button | | 3 | Click “Approve” button.  [Alternative 1] | System displays message dialog: “Approve this result?”  -“OK” button  -“Cancel” button | | 4 | Click “OK” button  [[Alternative 2] | Evaluation Result is update with new status. System close pop-up and display result in result list with Approved |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Click on “Reject” button. | System displays message dialog: “Reject this result?”  -“OK” button  -“Cancel” button | | 2 | Click “Cancel” button | Message dialog is closed. Nothing is change. |   **Exceptions:**   * N/A   **Relationships:**   * N/A   **Business Rules:**   * Director can only view evaluation result after Manager finish evaluating. * Director can review after Submit Date. * Director must review all the Evaluation Result before Close Date. | | | |

#### <Customer> Overview Use Case



**Figure 43: <Customer> Overview Use Case**

##### <Customer> Make Feedback Project Use Case



**Figure 44: <Customer> Make Feedback Project Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -38 SPECIFICATION** | | | |
| **Use-case No.** | OHRM038 | **Use-case Version** | 2.0 |
| **Use-case Name** | Make feedback project | | |
| **Author** | Ngo Trac Kien | | |
| **Date** | 06/06/2015 | **Priority** | High |
| **Actor:**  Customer.  **Summary:**  This use case allows customer to feedback a project.  **Goal:**  Feedback result is shown in project.  **Triggers**   * User clicks on “Make feedback” button in “Feedback” tab on “Project” screen.   **Preconditions:**   * User must log in as Customer.   **Post Conditions:**   * **On Success**: Feedback result is added into system. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Click on “Feedback” tab on “Project” screen. | System displays “Feedback” tab which includes:  - “Make feedback”: buttons. | | 2 | Click on “Make feedback” button. | System displays “Feedback” screen:  - “Project name”: label.  - “Date”: label.  - “Feedback” form which includes:  + “No”: label.  + “Criterion”: label.  + “Point”: textbox, required.  + “Average point”: label.  - “Submit”: button.  - “Cancel”: button. | | 3 | Input fields, then click on “Submit” button.  [Alternative 1] | System shows message dialog:  “Submit this feedback?”  - “OK”: button.  - “Cancel”: button. | | 4 | Click on “OK” button.  [Alternative 2] | Feedback result is saved. System navigates to Project screen and “Feedback” tab is displayed with new feedback result.  [Exceptions 1] |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Click on “Cancel” button. | System navigates back to Project screen. | | 2 | Click on “Cancel” button. | Message dialog is closed. Nothing is changed. |   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | “Point” textboxes contains non-number or negative value. | Show message: “Point must be positive number”. |   **Relationships:**   * N/A   **Business Rules:**   * After customer feedback, project status remains “Done” until director close the project. * Customer only can feedback project one time and will not be able to fix feedback result after submitted. * Customer can feedback after project is “done” and before project close. * Exceptions must not be violated. | | | |

#### <Admin> Overview Use Case

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**Figure 45: <Admin> Overview Use Case**

##### <Admin> Add Criterion Project Use Case

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**Figure 46: <Admin> Add Criterion Project Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -39 SPECIFICATION** | | | |
| **Use-case No.** | OHRM038 | **Use-case Version** | 2.0 |
| **Use-case Name** | Add criterion | | |
| **Author** | Ngo Trac Kien | | |
| **Date** | 02/06/2015 | **Priority** | High |
| **Actor:**  Admin.  **Summary:**  This use case allows admin to add new criterion to the system.  **Goal:**  New criterion is added to “Criterion” screen.  **Triggers**   * User clicks on “Add new criterion” button on “Criterion” screen.   **Preconditions:**   * User must log in as Admin.   **Post Conditions:**   * **On Success**: New criterion is added into system. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Click on “Criterion” on navigation bar. | System displays “Criterion” screen which includes:  - “Appraisal”, “Feedback”, “Period Evaluation”: tab.  - List of criterion: table.  - “Add new criterion”: button.  - “Edit”: buttons.  - “Remove”: buttons.  Content of criterion list depends on the tab which is chosen by admin. | | 2 | Click on “Add new criterion” button on “Criterion” screen. | System displays “Create Criterion” pop-up:  - “Title”: textbox, min length: 4, max length: 50, required.  - “Max point”: textbox, integer, required.  - “Description”: text-area.  - “Save”: button.  - “Reset”: button.  - “Close”: button. | | 3 | Input fields, then click on “Save” button.  [Alternative 1,2] | System validates inputted values then shows message dialog:  “Save this criterion?”  - “OK”: button.  - “Cancel”: button.  [Exceptions 1,2] | | 4 | Click on “OK” button.  [Alternative 3] | New criterion is added to database and system closes pop-up and displays new criterion in “Criterion” screen. |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Click on “Close” button. | System closes pop-up. Nothing is added to database. | | 2 | Click on “Reset” button. | All inputted textboxes are erased. | | 3 | Click on “Cancel” button. | Message dialog is closed. Nothing is change. |   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | “Title” textbox contains less than 4 characters or more than 50 characters. | Show message: “Title must include 4~50 characters”. | | 2 | “Max point” textboxes contains non-integer value or negative integer or 0. | Show message: “Max point must be positive integer and greater than 0”. |   **Relationships:**   * N/A   **Business Rules:**   * Only Admin can create new criterion. * Exceptions must not be violated. | | | |

##### <Admin> Edit Criterion Use Case

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**Figure 47: <Admin> Edit Criterion Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -40 SPECIFICATION** | | | |
| **Use-case No.** | OHRM040 | **Use-case Version** | 2.0 |
| **Use-case Name** | Edit criterion | | |
| **Author** | Ngo Trac Kien | | |
| **Date** | 02/06/2015 | **Priority** | Medium |
| **Actor:**  Admin.  **Summary:**  This use case allows admin to edit criterions in the system.  **Goal:**  Selected criterion is updated with new information.  **Triggers**   * User clicks on “Edit” button on “Criterion” screen.   **Preconditions:**   * User must log in as Admin.   **Post Conditions:**   * **On Success**: Selected criterion’s information is changed. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Click on “Edit” button on “Criterion” screen. | System displays “Edit Criterion” pop-up:  - “Title”: textbox, min length: 4, max length: 50, required.  - “Max point”: textbox, integer, required.  - “Description”: text-area.  - “Save”: button.  - “Reset”: button.  - “Close”: button.  “Title”, “Max point”, “Description” contains current values of selected criterion. | | 2 | Edit fields then click on “Save” button.  [Alternative 1,2] | System validates inputted values then shows message dialog:  “Save this criterion?”  - “OK”: button.  - “Cancel”: button.  [Exceptions 1,2,3,4] | | 3 | Click on “OK” button.  [Alternative 3] | Criterion is updated with new values, system closes pop-up and displays criterion with new values in “Criterion” screen. |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Click on “Close” button. | System closes pop-up. Nothing is updated. | | 2 | Click on “Reset” button. | All edited textboxes return to origin values. | | 3 | Clicks on “Cancel” button. | Message dialog is closed. Nothing is change. |   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | “Title” textbox contains less than 4 characters or more than 50 characters. | Show message: “Title must include 4~50 characters”. | | 2 | “Max point” textbox contains non-integer value or negative integer or 0. | Show message: “Max point must be positive integer and greater than 0”. | | 3 | “Description” text-area contains less than 4 characters. | Show message: “Description must have at least 4 characters”. | | 4 | “Point” value is larger than “Max point” value. | Show message: “Point must be less than or equal max point”. |   **Relationships:**   * N/A   **Business Rules:**   * Only Admin can edit criterion. * Only criterions that are created within 3 days can be edited. * Exceptions must not be violated. | | | |

##### <Admin> Remove Criterion Use Case

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**Figure 48: <Admin> Remove Criterion Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -41 SPECIFICATION** | | | |
| **Use-case No.** | OHRM041 | **Use-case Version** | 2.0 |
| **Use-case Name** | Remove criterion | | |
| **Author** | Ngo Trac Kien | | |
| **Date** | 02/06/2015 | **Priority** | Medium |
| **Actor:**  Admin.  **Summary:**  This use case allows admin to remove criterion from the system.  **Goal:**  Selected criterion is removed from current screen.  **Triggers**   * User clicks on “Remove” button on “Criterion” screen.   **Preconditions:**   * User must log in as Admin.   **Post Conditions:**   * **On Success**: Selected criterion is deactivated. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Click on “Remove” button on “Criterion” screen. | System shows message dialog:  “Remove this criterion?”  - “OK”: button.  - “Cancel”: button. | | 2 | Click on “OK” button.  [Alternative 1] | Criterion is deactivated and is removed from “Criterion” screen. |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Click on “Cancel” button. | Message dialog is closed. Nothing is change. |   **Exceptions:**   * N/A   **Relationships:**   * N/A   **Business Rules:**   * Only Admin can remove criterion. | | | |

##### <Admin> Create Period Evaluation Use Case

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**Figure 49: <Admin> Create Period Evaluation Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -42 SPECIFICATION** | | | |
| **Use-case No.** | OHRM042 | **Use-case Version** | 2.0 |
| **Use-case Name** | Create period evaluation | | |
| **Author** | Ngo Trac Kien | | |
| **Date** | 05/06/2015 | **Priority** | High |
| **Actor:**  Admin.  **Summary:**  This use case allows admin to create new period evaluation.  **Goal:**  New period evaluation is added to “Period Evaluation” screen.  **Triggers**   * User clicks on “Create period evaluation” button on “Evaluation” screen.   **Preconditions:**   * User must log in as Admin.   **Post Conditions:**   * **On Success**: New period evaluation is added into system. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Click on “Evaluation” on navigation bar. | System displays “Period Evaluation” screen which includes:  - “Create period evaluation”: button.  - List of period evaluation: table which includes “Name”, “Start date”, “End date”, “Submit date”, “Close date”.  - “Edit”: buttons.  - “Remove”: buttons. | | 2 | Click on “Create period evaluation” button on “Period Evaluation” screen. | System displays “Create Period Evaluation” pop-up:  - “Name”: textbox, min length: 4, max length: 50, required.  - “Start date”: date-picker, required.  - “End date”: date-picker, required.  - “Submit date”: date-picker, required.  - “Close date”: date-picker, required.  - “Create”: button.  - “Close”: button. | | 3 | Input fields, then click on “Create” button.  [Alternative 1] | System shows message dialog:  “Create this evaluation?”  - “OK”: button.  - “Cancel”: button. | | 4 | Click on “OK” button.  [Alternative 2] | System validates the input data.  New period evaluation is created. System closes pop-up and displays new evaluation in “Period Evaluation” screen.  [Exceptions 1,2,3,4] |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Click on “Close” button. | System closes pop-up. Nothing is created. | | 2 | Click on “Cancel” button. | Message dialog is closed. Nothing is change. |   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | “Name” textbox contains less than 4 characters or more than 50 characters. | Show message: “Name must include 4~50 characters”. | | 2 | “End date” is sooner than “Start date”. | Show message: “End date must be later than start date”. | | 3 | “Submit date” is sooner than “End date”. | Show message: “Submit date must be later than end date”. | | 4 | “Close date” is sooner than “Submit date”. | Show message: “Close date must be later than submit date”. |   **Relationships:**   * N/A   **Business Rules:**   * Start date must be create date or later. * Manager can makes period evaluation on employees in the period time between start date and end date. * Employees can view and discuss with manager about their evaluation result and manager can fix the result or not in the period time between end date and submit date. * Director can review period evaluation result and manager can fix result for reviewing again in the period time between submit date and close date. * Exceptions must not be violated. | | | |

##### <Admin> Edit Period Evaluation Use Case

****

**Figure 50: <Admin> Edit Period Evaluation Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -43 SPECIFICATION** | | | |
| **Use-case No.** | OHRM043 | **Use-case Version** | 2.0 |
| **Use-case Name** | Edit period evaluation | | |
| **Author** | Ngo Trac Kien | | |
| **Date** | 05/06/2015 | **Priority** | Medium |
| **Actor:**  Admin.  **Summary:**  This use case allows admin to edit period evaluation.  **Goal:**  Selected evaluation is updated with new information.  **Triggers**   * User clicks on “Edit” button on “Period Evaluation” screen.   **Preconditions:**   * User must log in as Admin.   **Post Conditions:**   * **On Success**: Selected period evaluation information is changed. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Click on “Edit” button on “Period Evaluation” screen. | System displays “Edit Period Evaluation” pop-up:  - “Name”: textbox, min length: 4, max length: 50.  - “Start date”: date-picker.  - “End date”: date-picker.  - “Submit date”: date-picker.  - “Close date”: date-picker.  - “Save”: button.  - “Close”: button.  “Name”, “Start date”, “End date”, “Submit date” and “Close date” contain origin values of selected period evaluation. | | 2 | Edit fields then click on “Save” button.  [Alternative 1] | System shows message dialog:  “Save this period evaluation?”  - “OK”: button.  - “Cancel”: button. | | 3 | Click on “OK” button.  [Alternative 2] | Period evaluation is updated with new values. System closes pop-up and displays period evaluation with new values in “Period Evaluation” screen.  [Exceptions 1,2,3,4] |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Click on “Close” button. | System closes pop-up. Nothing is updated. | | 2 | Click on “Cancel” button. | Message dialog is closed. Nothing is change. |   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | “Name” textbox contains less than 4 characters or more than 50 characters. | Show message: “Name must include 4~50 characters”. | | 2 | “End date” is sooner than “Start date”. | Show message: “End date must be later than start date”. | | 3 | “Submit date” is sooner than “End date”. | Show message: “Submit date must be later than end date”. | | 4 | “Close date” is sooner than “Submit date”. | Show message: “Close date must be later than submit date”. |   **Relationships:**   * N/A   **Business Rules:**   * Period evaluation only can edit before reaching start date. * Exceptions must not be violated. | | | |

##### <Admin> Remove Period Evaluation Use Case

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**Figure 51: <Admin> Remove Evaluation Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -44 SPECIFICATION** | | | |
| **Use-case No.** | OHRM044 | **Use-case Version** | 2.0 |
| **Use-case Name** | Remove period evaluation | | |
| **Author** | Ngo Trac Kien | | |
| **Date** | 05/06/2015 | **Priority** | Medium |
| **Actor:**  Admin.  **Summary:**  This use case allows admin to remove period evaluation from the system.  **Goal:**  Selected period evaluation is removed from “Period Evaluation” screen.  **Triggers**   * User clicks on “Remove” button on “Period Evaluation” screen.   **Preconditions:**   * User must log in as Admin.   **Post Conditions:**   * **On Success**: Selected period evaluation is deactivated. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Click on “Remove” button on “Period Evaluation” screen. | System shows message dialog:  “Remove this period evaluation?”  - “OK”: button.  - “Cancel”: button. | | 2 | Click on “OK” button.  [Alternative 1] | Period evaluation is deactivated and is removed from “Period Evaluation” screen. |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Click on “Cancel” button. | Message dialog is closed. Nothing is change. |   **Exceptions:**   * N/A   **Relationships:**   * N/A   **Business Rules:**   * Period evaluation only can remove before reaching start date. * Exceptions must not be violated. | | | |

##### <Admin> View Account Use Case

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**Figure 52: <Admin> View Account Project Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -45 SPECIFICATION** | | | |
| **Use-case No.** | OHRM045 | **Use-case Version** | 2.0 |
| **Use-case Name** | View account | | |
| **Author** | Ngo Trac Kien | | |
| **Date** | 04/06/2015 | **Priority** | Medium |
| **Actor:**  Admin.  **Summary:**  This use case allows admin to view account detail.  **Goal:**  Account detail is shown.  **Triggers**   * User clicks on account name in accounts list on “Account” screen.   **Preconditions:**   * User must log in as Admin.   **Post Conditions:**   * **On Success**: Selected account detail is shown. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Click on “Account name” in accounts list. | System shows “Account detail” pop-up which includes:  - “Name”: label.  - “Username”: label.  - “Role”: label.  - “Status”: label.  - “OK”: button.  [Alternative 1] |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Click “OK” button. | System closes pop-up. |   **Exceptions:**   * N/A   **Relationships:**   * N/A   **Business Rules:**   * N/A | | | |

##### <Admin> Search Accounts Use Case

****

**Figure 53: <Admin> Search Accounts Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -46 SPECIFICATION** | | | |
| **Use-case No.** | OHRM046 | **Use-case Version** | 2.0 |
| **Use-case Name** | Search accounts | | |
| **Author** | Ngo Trac Kien | | |
| **Date** | 04/06/2015 | **Priority** | High |
| **Actor:**  Admin.  **Summary:**  This use case allows admin to search accounts.  **Goal:**  Searched accounts are shown.  **Triggers**   * User clicks on “Search” button on “Account” screen.   **Preconditions:**   * User must log in as Admin.   **Post Conditions:**   * **On Success**: Accounts which have name matches searched value are shown. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Click on “Account” on navigation bar. | System displays “Account” screen which includes:  - “Name”: textbox.  - “Search”: button.  - List of accounts: table which includes:  + “No”  + “Name”  + “Username”  + “Password”  + “Role”  + “Status”  + “Edit”: button.  - “Create new account”: button. | | 2 | Input into “Name” textbox and click “Search” button. | System searches all accounts which have name matches searched value then shows result in “List of accounts”.  [Alternative 1] |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | No result is found. | System shows message: “No matching record”. |   **Exceptions:**   * N/A   **Relationships:**   * N/A   **Business Rules:**   * Accounts can only be searched by name. | | | |

##### <Admin> Create Account Use Case

****

**Figure 54: <Admin> Create Account Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -47 SPECIFICATION** | | | |
| **Use-case No.** | OHRM047 | **Use-case Version** | 2.0 |
| **Use-case Name** | Create account | | |
| **Author** | Ngo Trac Kien | | |
| **Date** | 04/06/2015 | **Priority** | High |
| **Actor:**  Admin.  **Summary:**  This use case allows admin to create new account.  **Goal:**  New account is shown.  **Triggers**   * User clicks on “Create new account” button on “Account” screen.   **Preconditions:**   * User must log in as Admin.   **Post Conditions:**   * **On Success**: New account is created. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Click on “Create new account” button. | System navigates to “Create account” page which includes:  - “Name”: textbox, required.  - “Username”: textbox, required.  - “Password”: textbox, required.  - “Email”: textbox, required.  - “Role”: drop-down-list, required.  - “Status”: checkbox.  - “Create”: button.  - “Cancel”: button | | 2 | Edit fields then click on “Create” button.  [Alternative 1] | System validates inputted values.  New account is created. System navigates to “Account” screen with new account in accounts list.  [Exception 1,2,3,4] |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Click on “Cancel” button. | System navigates back to “Account” screen, nothing is created. |   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | “Name” textbox contains less than 6 characters or more than 50 characters. | Show message: “Name must include 6~50 characters”. | | 2 | “Username” textbox contains less than 6 characters or more than 15 characters. | Show message: “Username must include 6~15 characters”. | | 3 | “Email” is not in right format: “username@company-domain”. | Show message: “Email must be in format: username@company-domain”. | | 4 | “Role” is not chosen. | Show message: “Role must not be left empty”. | | 5 | “Username” is exist. | Show message: “This username is taken”. |   **Relationships:**   * N/A   **Business Rules:**   * System suggests username based on inputted name and admin can change. For example: The name “Ngô Trắc Kiện” will have the username: “kiennt”, and add number if username is exist: “kiennt01”. * Account’s email uses format: “username@company-domain”. * Password is set with value “123456”. * System does not support sending account information to employee. * Exceptions must not be violated. | | | |

##### <Admin> Edit Account Use Case

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**Figure 55: <Admin> Edit Account Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -48 SPECIFICATION** | | | |
| **Use-case No.** | OHRM048 | **Use-case Version** | 2.0 |
| **Use-case Name** | Edit account | | |
| **Author** | Ngo Trac Kien | | |
| **Date** | 04/06/2015 | **Priority** | High |
| **Actor:**  Admin.  **Summary:**  This use case allows admin to edit account detail.  **Goal:**  New account detail is shown.  **Triggers**   * User clicks on “Edit” button on “Account” screen.   **Preconditions:**   * User must log in as Admin.   **Post Conditions:**   * **On Success**: Selected account detail is changed. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Click on “Edit” button. | System changes selected account row into edit mode which includes:  - “Name”: textbox.  - “Username”: textbox, read-only.  - “Password”: “Reset” button.  - “Role”: drop-down-list.  - “Status”: checkbox.  - “Save”: button.  - “Cancel”: button | | 2 | Edit fields then clicks on “Save” button.  [Alternative 1,2] | System validates inputted values.  Account is updated with new values. System displays selected account with new data.  [Exception 1] |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Click on “Cancel” button. | System changes selected account back to view mode. | | 2 | Click on “Reset” button. | Editing account’s password is set to “123456”. |   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | “Name” textbox contains less than 4 characters or more than 50 characters. | Show message: “Name must include 4~50 characters”. |   **Relationships:**   * N/A   **Business Rules:**   * If account’s status is changed to “Deactivated”, that account can no longer log in. * Exceptions must not be violated. | | | |

#### <HR> Overview Use Case

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**Figure 56: <HR> Overview Use Case**

##### <HR> View Recruitment Detail Use Case

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**Figure 41: <HR> View Recruitment Detail Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -49 SPECIFICATION** | | | |
| **Use-case No.** | OHRM048 | **Use-case Version** | 2.0 |
| **Use-case Name** | View recruitment detail | | |
| **Author** | Nguyen Thi Xuan Mai | | |
| **Date** | 02/06/2015 | **Priority** | High |
| **Actor:**  Director, Human Resource Department.  **Summary:**  This use case allows Director, Human Resource Department to view a specific recruitment detail.  **Goal:**  Recruitment content is shown.  **Triggers**   * Director, Human Resource Department click on a specific topic recruitment.   **Preconditions:**   * User log in as Human Resource Department or Director role.   **Post Conditions:**   * **On Success**: The chosen “Topic Recruitment” screen is displayed. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Clicks on a specific topic knowledge on “Recruitment list”. | System navigates to “Topic Recruitment” screen:  - “Recruitment” panel:   * “Topic Name” * “Poster ‘s username” * “Content” * “Edit”: button.   - “Comment” panel:   * List of existed comments * “New comment”: text-area.   - “Back”: button. |   **Alternative Scenario:**   * N/A   **Exceptions:**   * N/A   **Relationships:**   * N/A   **Business Rules:**   * When a topic status isn’t closed, user can see all contents. * When a topic status is closed, user only see recruitment content but can’t see comment content. | | | |

##### < HR> Reply Recruitment Use Case

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**Figure 39: <HR> Reply Recruitment Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE-50 SPECIFICATION** | | | |
| **Use-case No.** | OHRM050 | **Use-case Version** | 2.0 |
| **Use-case Name** | Reply Recruitment | | |
| **Author** | Nguyen Thi Xuan Mai | | |
| **Date** | 02/06/2015 | **Priority** | High |
| **Actor:**   * Director, Human Resource Person.   **Summary:**   * This use case allows Director, Human Resource Person to make a comment on “topic recruitment” page.   **Goal:**   * A comment is posted on “topic recruitment” page.   **Triggers**   * Director or Human Resource Person types a comment on “New comment” text-area comment box at “topic recruitment” page.   **Preconditions:**   * User must log in as Director or Human Resource Person’s role.   **Post Conditions:**   * **On Success**: New comment appears on that topic recruitment * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Director or Human Resource Person click on a “topic recruitment” link. | Topic recruitment’s detail screen are shown:  “Topic knowledge’s details”: text  “Comment”: text-field (area), min length: 50 characters.  “Send”: button  “Back”: button | | 2 | Input comment | System validates inputted value.  Show new comment on topic recruitment page.  [Exceptions: 1, 2] |   **Alternative Scenario:**   * N/A   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | User inputs bellow 50 characters | Show error message: “Your comment is too short. It must be at least 50 characters.” | | 2 | User input more than 50000 characters | Show error message: “Your comment is too long. Try again, please.” |   **Relationships:**   * N/A   **Business Rules:**   * Director, Human Resource Department are only people that can view or make a comment on a recruitment page. * Director, Human Resource Department can comment many times as they want. * On success scenario, new comment will be added to database. * Only Recruitments that haven’t closed yet can be commented. * Exception must not be violated. | | | |

##### < HR> Edit A Reply Use Case

****

**Figure 39: <HR> Edit A Reply Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -51 SPECIFICATION** | | | |
| **Use-case No.** | OHRM051 | **Use-case Version** | 1.0 |
| **Use-case Name** | Edit A Reply | | |
| **Author** | Nguyen Thi Xuan Mai | | |
| **Date** | 06/06/15 | **Priority** | High |
| **Actor:**  Director, Human Resource Person  **Summary:**  This use case allows director, Human Resource Person to edit a reply.  **Goal:**  New reply information will be shown in Topic Recruitment screen.  **Triggers**   * Director, Human Resource Person clicks on “Edit” button.   **Preconditions:**   * User must login as Director or Human Resource Person’s role.   **Post Conditions:**   * **On Success**: Update reply information. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Director, Human Resource Person clicks on “Edit” button. | System displays Comment fields:  - “Content area”: textbox.  - “Save”: button.  -“Reset”: button  -“Cancel”: button  All fields contains current values of current project. | | 2 | Edits fields then clicks on “Save” button.  [Alternative 1,2] | System validates inputted values.  System shows message:  “Save this reply?”  - “OK”: button.  - “Cancel”: button. | | 3 | Clicks on “OK” button.  [Alternative 3] | Selected reply is updated with new values, system displays reply on topic recruitment with new values in that topic recruitment screen. |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | Director or Human Resource Person clicks “Cancel” button. | Reload topic recruitment page, and nothing is changed. | | 2 | Clicks on “Reset” button. | All edited textboxes return to origin values. | | 3 | Director clicks “Cancel” button. | Pop-up message close, nothing is change |   **Exceptions:**   |  |  |  | | --- | --- | --- | | No | Actor Action | System Response | | 1 | User inputs bellow 50 characters | Show error message: “Your comment is too short. It must be at least 50 characters.” | | 2 | User input more than 50000 characters | Show error message: “Your comment is too long. Try again, please.” |   **Relationships:**   * N/A   **Business Rules:**   * Exception must not be violated. * Director or Human Resource Person can only edit their own reply, they can’t edit each other reply. * When a topic recruitment status is close, Director or Human Resource Person can’t edit reply. | | | |

##### < HR> View Recruitment Detail Use Case

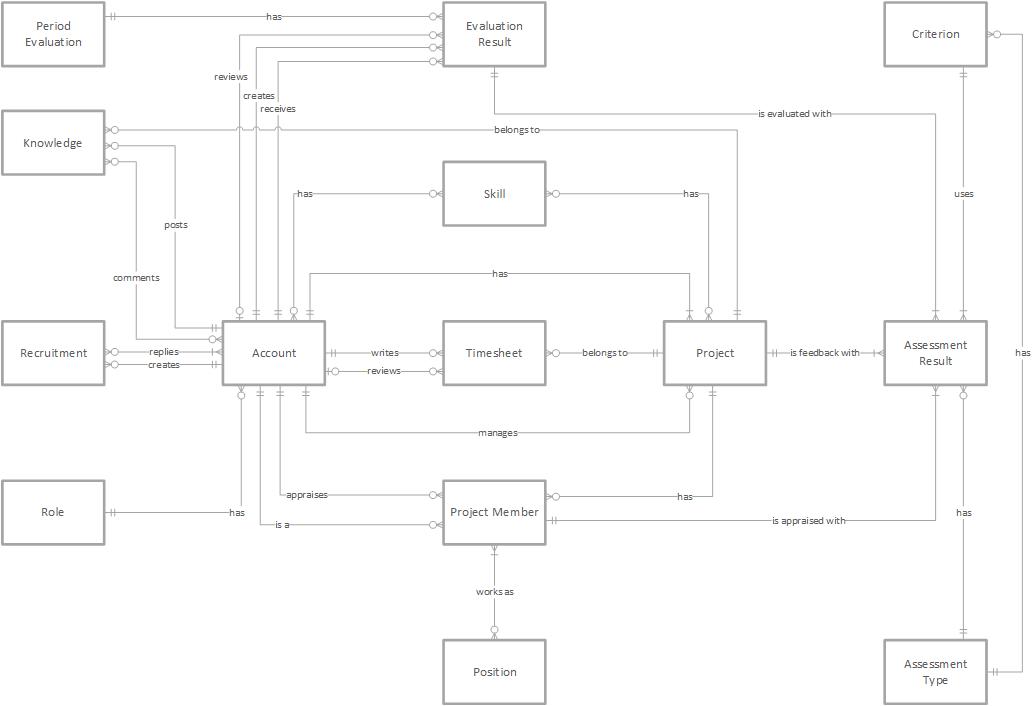
****

**Figure 41: <HR> View Recruitment Detail Use Case**

**Use Case Specification**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE -52 SPECIFICATION** | | | |
| **Use-case No.** | OHRM052 | **Use-case Version** | 2.0 |
| **Use-case Name** | View recruitment detail | | |
| **Author** | Nguyen Thi Xuan Mai | | |
| **Date** | 02/06/2015 | **Priority** | High |
| **Actor:**  Director, Human Resource Department.  **Summary:**  This use case allows Director, Human Resource Department to view a specific recruitment detail.  **Goal:**  Recruitment content is shown.  **Triggers**   * Director, Human Resource Department click on a specific topic recruitment.   **Preconditions:**   * User log in as Human Resource Department or Director role.   **Post Conditions:**   * **On Success**: The chosen “Topic Recruitment” screen is displayed. * **On Failure**: Show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | Step | Actor Action | System Response | | 1 | Clicks on a specific topic knowledge on “Recruitment list”. | System navigates to “Topic Recruitment” screen:  - “Recruitment” panel:   * “Topic Name” * “Poster ‘s username” * “Content” * “Edit”: button.   - “Comment” panel:   * List of existed comments * “New comment”: text-area.   - “Back”: button. |   **Alternative Scenario:**   * N/A   **Exceptions:**   * N/A   **Relationships:**   * N/A   **Business Rules:**   * When a topic status isn’t closed, user can see all contents. * When a topic status is closed, user only see recruitment content but can’t see comment content. | | | |

## Conceptual Diagram



**Figure 60: Conceptual Diagram**

**Data Dictionary**

|  |  |
| --- | --- |
| **Entity Data dictionary: describe content of all entities** | |
| Entity Name | Description |
| Period Evaluation | Describe all Period Evaluations in the system. |
| Evaluation Result | Describe all Evaluation Results in the system. |
| Criterion | Describe all Criterions available in the system. |
| Knowledge | Describe all Knowledge in the system. |
| Skills | Describe all Skills in the system. |
| Account | Describe all Accounts in the system. |
| Timesheet | Describe all Timesheets in the system. |
| Project | Describe all Projects in the system. |
| Assessment Result | Describe all Assessment Results in the system. |
| Role | Describe all Roles in the system. |
| Project Member | Describe all Project Members in the system. |
| Position | Describe all Positions in the system. |
| Assessment Type | Describe all Assessment Types in the system. |
| Recruitment | Describe all Recruitment in the system. |

## Software System Attribute

### Usability

#### Graphic User Interface

* + All the texts, labels and should be written in English.

#### Usability

* + Admin only need two days of training to use this system.

#### Installation

* + The system must be easy to deploy. Employees can deploy successfully and learn to configure, maintain the system within one day of training.
  + The attached manual guide must be clear. User can read and do themselves without developer’s help.

### Reliability

* + Personal information about order of Employees can be backup and restore easily using import/export function.

### Availability

* + User need to have an internet connection to use every function of the system in the best way.

### Security

* + Information about employee only can be view by their own or be view with limitation by others. Even Admin cannot do everything to account’s information.

### Maintainability

* + The system is divided into separated modules.

### Portability

* + The system can be deployed into many type of servers those have Tomcat server.

### Performance

* The speed of suggestion should be less than 5 seconds

# Report No. 4 Software Design Description

## Design Overview

* This document describes the technical and user interface design of OHRM System. It includes the architectural design, the detailed design of common functions and business functions and the design of database model.
* The architectural design describes the overall architecture of the system and the architecture of each main component and subsystem.
* The detailed design describes static and dynamic structure for each component and functions. It includes class diagrams, class explanations and sequence diagrams for each use cases.
* The database design describes the relationships between entities and details of each entity.
* Document overview:
* Section 2: gives an overall description of the system architecture design.
* Section 3: gives component diagrams that describe the connection and integration of the system.
* Section 4: gives the detail design description, which includes class diagram, class explanation, and sequence diagram to details the application functions.
* Section 5: describe a fully attributed ERD.

## System Architectural Design

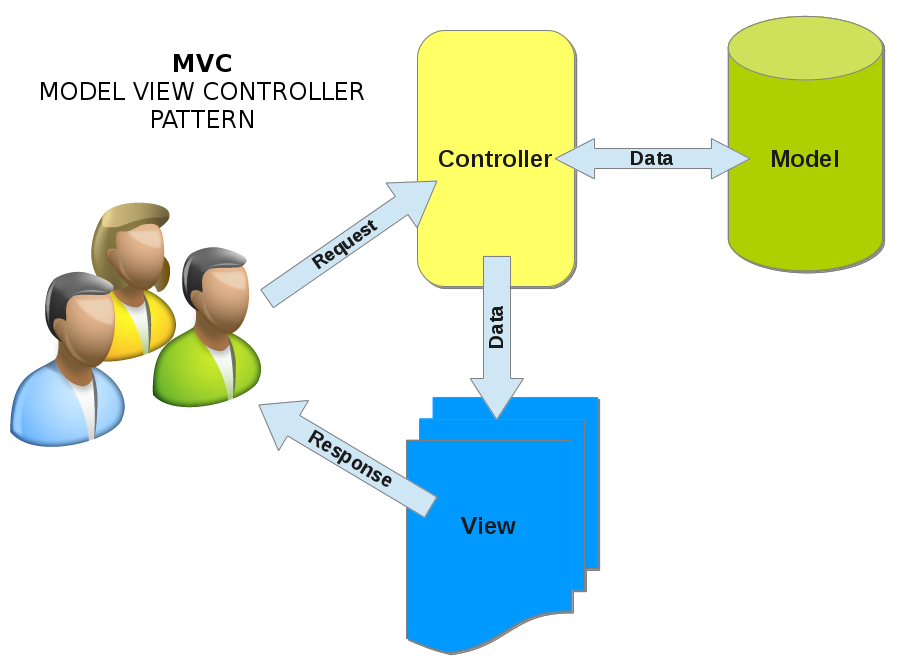
****

Figure 4: OHRM System Architectural



#### Web application architecture description

* The system is developed from MVC architecture style and customized with passive model to adapt to JAVA MVC, RESTful web service technologies.
* **Model** is a part of application which uses to storage and retrieval data.
* **View** is the part of the application that visualizes the data to help user easily to view, update or customize them.
* **Controller** is the parts of the application that acts like event handler to handles user interaction. Typically controller read data from a request and returns respective view for user.
* **Web Service** is the parts of the application which use to provide interface for mobile application to do some background operation such as download template, convert excel file...

## Component Diagram

Figure 4: Component Diagram

|  |  |
| --- | --- |
| **Component dictionary: describe component** | |
| Component Name | Description |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

## Detailed Description

### Class Diagram

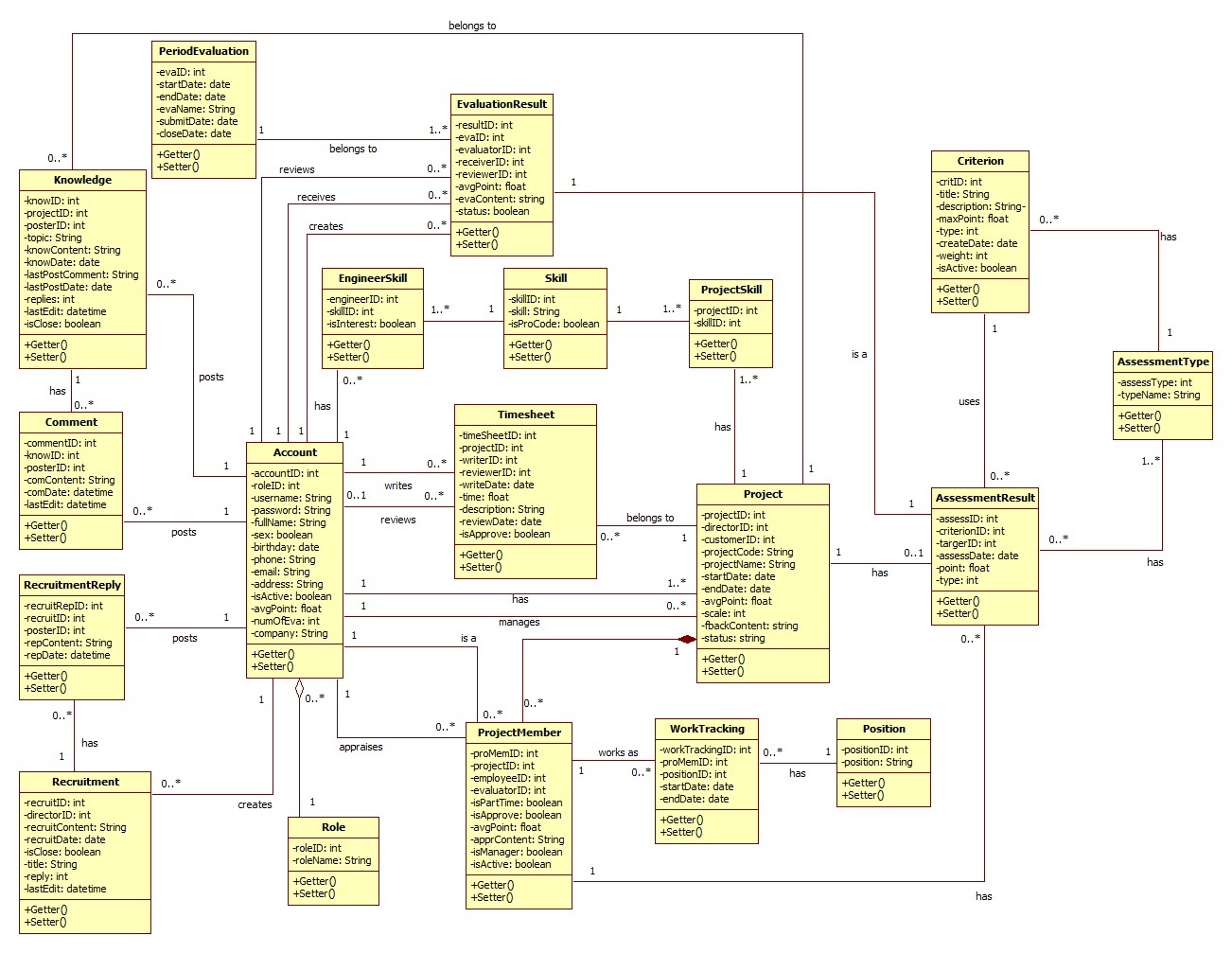


Figure 2: Class Diagram

### Class Diagram Explanation

#### Account

Attribute

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| acountID | int | Private | Unique identifier of account |
| roleID | int | Private | ID of Role |
| username | String | Private | Account’s username |
| password | String | Private | Account’s password |
| isActive | String | Private | Account’s status |
| fullName | String | Private | Account’s name |
| sex | bit | Private | Account’s gender |
| birthday | date | Private | Account’s birthday |
| phone | String | Private | Account’s phone number |
| email | String | Private | Account’s email |
| avgPoint | float | Private | Account’s average period evaluation point |
| numOfEva | int | Private | Account’s number of evaluation |
| company | String | Private | Account’s company (for customer) |
| address | String | Private | Account’s address |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### Role

Attribute

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| roleID | int | Private | Unique identifier of role |
| roleName | String | Private | Role’s name |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### Project

Attribute

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| projectID | int | Private | Unique identifier of project |
| directorID | int | Private | ID of Director |
| customerID | int | Private | ID of Customer |
| projectCode | String | Private | Project’s code |
| projectName | String | Private | Project’s name |
| startDate | date | Private | Project’s start date |
| endDate | date | Private | Project’s end date |
| avgPoint | float | Private | Project’s average feedback point |
| scale | int | Private | Project’s scale |
| fbackContent | String | Private | Project’s feedback content |
| status | String | Private | Project’s status |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### Project Member

Attribute

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| proMemID | int | Private | Unique identifier of project member |
| projectID | int | Private | ID of Project |
| employeeID | int | Private | ID of Employee |
| evaluatorID | int | Private | ID of Evaluator |
| isPartTime | boolean | Private | Project member’s working type |
| isApprove | boolean | Private | Project member’s approval status |
| avgPoint | float | Private | Project member’s average appraisal point |
| isManager | boolean | Private | Project member is manager or not |
| isActive | boolean | Private | Project member’s status |
| apprContent | String | Private | Project member’s appraisal content |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### Working Tracking

Attribute

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| workTrackingID | int | Private | Unique identifier of work tracking |
| proMemID | int | Private | ID of Project member |
| positionID | int | Private | ID of Position |
| startDate | Date | Private | Work tracking’s start date |
| endDate | Date | Private | Work tracking’s end date |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### Position

Attribute

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| positionID | int | Private | Unique identifier of position |
| position | String | Private | Position’s name |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### Skill

Attribute

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| skillID | int | Private | Unique identifier of skill |
| skill | String | Private | Skill’s name |
| isProCode | boolean | Private | Skill is programing code or not |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### Project Skill

Attribute

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| projectID | int | Private | ID of Project |
| skillID | int | Private | ID of Skill |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### Engineer Skill

Attribute

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| engineerID | int | Private | ID of Engineer |
| skillID | int | Private | ID of Skill |
| isInterest | boolean | Private | Skill is engineer’s interest or not |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### Criterion

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| critID | int | Private | Unique identifier of criterion |
| title | String | Private | Criterion’s title |
| description | String | Private | Criterion’s description |
| maxPoint | float | Private | Criterion’s max point |
| type | String | Private | Criterion’s status |
| createDate | date | Private | Criterion’s create date |
| type | int | Private | Assessment type |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### Assessment Type

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| assessType | int | Private | Unique identifier of assessment type |
| typeName | String | Private | Assessment type’s name |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### Assessment Result

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| assessID | int | Private | Unique identifier of assessment result |
| criterionID | int | Private | ID of Criterion |
| targetID | int | Private | ID of Target |
| assessDate | date | Private | Assessment result’s date |
| point | float | Private | Assessment result’s point |
| type |  |  | Assessment type |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### Period Evaluation

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| evaID | int | Private | Unique identifier of period evaluation |
| startDate | date | Private | Period evaluation’s name |
| endDate | date | Private | Period evaluation’s start date |
| evaNam | String | Private | Period evaluation’s end date |
| submitDate | date | Private | Period evaluation’s submit date |
| closeDate | date | Private | Period evaluation’s close date |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### Evaluation Result

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| resultID | int | Private | Unique identifier of evaluation result |
| evaID | int | Private | ID of Period evaluation |
| evaluatorID | int | Private | ID of Evaluator |
| receiverID | int | Private | ID of Receiver |
| avgPoint | float | Private | Evaluation result’s average point |
| EvaContent | String | Private | Evaluation result’s content |
| reviewerID | int | Private | ID of Reviewer |
| status | boolean | Private | Evaluation result’s status |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### Timesheet

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| timeSheetID | int | Private | Unique identifier of timesheet |
| projectID | int | Private | ID of Project |
| writerID | int | Private | ID of Writer |
| reviewerID | int | Private | ID of Reviewer |
| writeDate | date | Private | Timesheet’s write date |
| time | float | Private | Timesheet’s time |
| description | String | Private | Timesheet’s description |
| reviewDate | datetime | Private | Timesheet’s review date |
| isApprove | boolean | Private | Time sheet is approved or not |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### Knowledge

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| knowID | int | Private | Unique identifier of knowledge |
| topic | String | Private | Knowledge’s topic |
| projectID | int | Private | ID of Project |
| posterID | int | Private | ID of Poster |
| knowContent | String | Private | Knowledge’s content |
| knowDate | date | Private | Knowledge’s post date |
| lastPostComment | String | Private | Knowledge’s last comment content |
| lastPostDate | date | Private | Knowledge’s last comment time |
| replies | int | Private | Knowledge’s reply number |
| lastEdit | datetime | Private | Knowledge’s last edit time |
| isClose | boolean | Private | Knowledge’s status |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### Comment

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| commentID | int | Private | Unique identifier of comment |
| knowID | int | Private | ID of Knowledge |
| posterID | int | Private | ID of Poster |
| comContent | String | Private | Comment’s content |
| comDate | datetime | Private | Comment’s post date |
| lastEdit | datetime | Private | Comment’s last edit time |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### Recruitment

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| recruitID | int | Private | Unique identifier of recruitment |
| directorID | int | Private | ID of Director |
| recruitContent | String | Private | Recruitment’s content |
| recruitDate | date | Private | Recruitment’s post date |
| isClose | boolean | Private | Recruitment’s status |
| title | String | Private | Recruitment’s title |
| reply | int | Private | Recruitment’s reply number |
| lastEdit | date | Private | Recruitment’s last edit date |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

#### Recruitment Reply

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| recruitRepID | int | Private | Unique identifier of recruitment reply |
| recruitID | int | Private | ID of Recruitment |
| posterID | Int | Private | ID of Poster |
| repContent | String | Private | Reply’s content |
| repDate | datetime | Private | Reply’s post time |

Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Return type** | **Visibility** | **Description** |
| Getter | Attribute type | Public | Get attribute value |
| Setter | Void | Public | Set value of attribute |

### Sequence Diagram

##### <Guest> Login

**Summary:** This diagram shows how to guest login as Engineer, Manager, Director, Customer, Admin, HR.

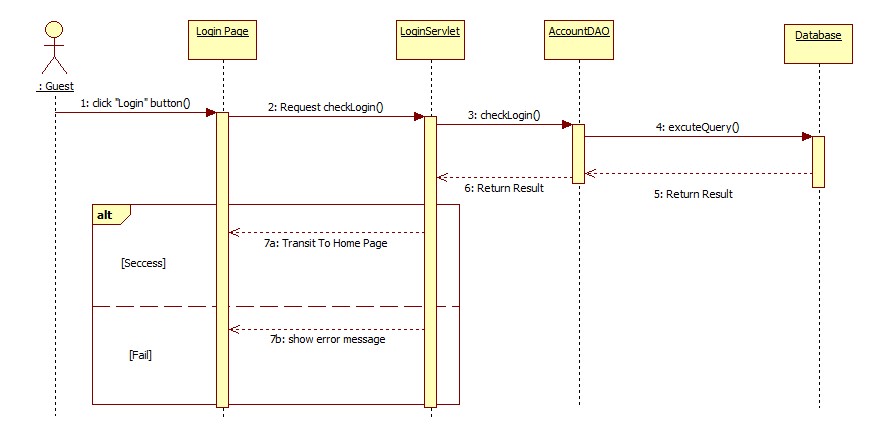
****

Figure 61: <Guest> Login

##### <Engineer> Logout

**Summary:** This diagram shows how to…...

Figure 62: <Engineer> Logout

##### <Engineer> Search Timesheets

**Summary:** This diagram shows how to…...

Figure 63: <Engineer> Search Timesheets

##### <Engineer> Write Timesheets

**Summary:** This diagram shows how to…...

Figure 64: <Engineer> Write Timesheets

##### <Engineer> Search Timesheets

**Summary:** This diagram shows how to…...

Figure 65: <Engineer> Search Timesheets

##### <Engineer> Edit Timesheets

**Summary:** This diagram shows how to…...

Figure 66: <Engineer> Edit Timesheets

##### <Engineer> Remove Timesheets

**Summary:** This diagram shows how to…...

Figure 67: <Engineer> Remove Timesheets

##### <Engineer> View Evaluation

**Summary:** This diagram shows how to…...

Figure 68: <Engineer> View Evaluation

##### <Engineer> View Appraisal

**Summary:** This diagram shows how to…...

Figure 69: <Engineer> View Appraisal

##### <Engineer> Edit Profile

**Summary:** This diagram shows how to…...

Figure 70: <Engineer> Edit Profile

##### <Engineer> View Knowledge Detail

**Summary:** This diagram shows how to…...

Figure 71: <Engineer> View Knowledge Detail

##### <Engineer> Add Knowledge

**Summary:** This diagram shows how to…...

Figure 72: <Engineer>Add Knowledge

##### <Engineer> Search Knowledge

**Summary:** This diagram shows how to…...

Figure 73: <Engineer> Search Knowledge

##### <Engineer> Add Comment

**Summary:** This diagram shows how to…...

Figure 74: <Engineer> Add Comment

##### <Engineer> Edit Comment

**Summary:** This diagram shows how to…...

Figure 75: <Engineer> Edit Comment

##### <Engineer> Remove Comment

**Summary:** This diagram shows how to…...

Figure 76: <Engineer> Remove Comment

##### <Engineer> Search Projects

**Summary:** This diagram shows how to…...

Figure 77: <Engineer> Search Projects

##### <Engineer> View Project Detail

**Summary:** This diagram shows how to…...

Figure 78: <Engineer> View Project Detail

##### <Manager> View Employee Profile

**Summary:** This diagram shows how to…...

Figure 79: <Manager> View Employee Profile

##### <Manager> Search Employees

**Summary:** This diagram shows how to…...

Figure 80: <Manager> Search Employees

##### <Manager> Review Timesheet

**Summary:** This diagram shows how to…...

Figure 81: <Manager> Review Timesheet

##### <Manager> Appraise Engineers

**Summary:** This diagram shows how to…...

Figure 82: <Manager> Appraise Engineers

##### <Manager> Edit Appraisal

**Summary:** This diagram shows how to…...

Figure 83: <Manager> Edit Appraisal

##### <Manager> Evaluate Employees

**Summary:** This diagram shows how to…...

Figure 84: <Manager> Evaluate Employees

##### <Manager> Edit Evaluation

**Summary:** This diagram shows how to…...

Figure 85: <Manager> Edit Evaluation

##### <Manager> Assign Engineers to Project

**Summary:** This diagram shows how to…...

Figure 86: <Manager> Assign Engineers to Project

##### <Manager> Remove Engineers from Project

**Summary:** This diagram shows how to…...

Figure 87: <Manager> Remove Engineers from Project

##### <Director> Create Recruitment

**Summary:** This diagram shows how to…...

Figure 88: <Director> Create Recruitment

##### <Director> Edit Recruitment

**Summary:** This diagram shows how to…...

Figure 89: <Director> Edit Recruitment

##### <Director> Reply Recruitment

**Summary:** This diagram shows how to…...

Figure 90: <Director> Reply Recruitment

##### <Director> Search Recruitment

**Summary:** This diagram shows how to…...

Figure 91: <Director> Search Recruitment

##### <Director> View Recruitment

**Summary:** This diagram shows how to…...

Figure 92: <Director> View Recruitment

##### <Director> Review Evaluation

**Summary:** This diagram shows how to…...

Figure 93: <Director> Review Evaluation

##### <Director> Create Project

**Summary:** This diagram shows how to…...

Figure 94: <Director> Create Project

##### <Director> Edit Project

**Summary:** This diagram shows how to…...

Figure 95: <Director> Edit Project

##### <Director> Review Assigned Engineer

**Summary:** This diagram shows how to…...

Figure 96: <Director> Review Assigned Engineer

##### <Customer> Make Feedback Project

**Summary:** This diagram shows how to…...

Figure 97: <Customer> Make Feedback Project

##### <Admin> Add Criterion

**Summary:** This diagram shows how to…...

Figure 98: <Admin> Add Criterion

##### <Admin> Edit Criterion

**Summary:** This diagram shows how to…...

Figure 99: <Admin> Edit Criterion

##### <Admin> Remove Criterion

**Summary:** This diagram shows how to…...

Figure 100: <Admin> Remove Criterion

##### <Admin> Create Period Evaluation

**Summary:** This diagram shows how to…...

Figure 101: <Admin> Create Period Evaluation

##### <Admin> Edit Period Evaluation

**Summary:** This diagram shows how to…...

Figure 102: <Admin> Edit Period Evaluation

##### <Admin> Remove Period Evaluation

**Summary:** This diagram shows how to…...

Figure 103: <Admin> Remove Period Evaluation

##### <Admin> Search Account

**Summary:** This diagram shows how to…...

Figure 104: <Admin> Search Account

##### <Admin> View Account

**Summary:** This diagram shows how to…...

Figure 105: <Admin> View Account

##### <Admin> Edit Account

**Summary:** This diagram shows how to…...

Figure 106: <Admin> Edit Account

##### <Admin> Create Account

**Summary:** This diagram shows how to…...

Figure 107: <Admin> Create Account

##### <HR> Reply Recruitment

**Summary:** This diagram shows how to…...

Figure 108: <HR> Reply Recruitment

##### <HR> Search Recruitment

**Summary:** This diagram shows how to…...

Figure 109: <HR> Search Recruitment

##### <HR> View Recruitment Detail

**Summary:** This diagram shows how to…...

Figure 110: <HR> View Recruitment Detail

### Activity Diagram

#### <Guest> Login

**Summary:** This diagram shows how Guest login into system, which assigned for them.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

Figure 111: <Guest> Login

#### <Engineer> Write Timesheet

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 112: <Engineer> Write Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 113: < Engineer > Search Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 114: < Engineer > Search Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 115: < Engineer > Search Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 116: < Engineer > Search Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 117: < Engineer > Search Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 118: < Engineer > Search Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 119: < Engineer > Search Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 120: < Engineer > Search Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 121: < Engineer > Search Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 122: < Engineer > Search Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 123: < Engineer > Search Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 124: < Engineer > Search Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 125: < Engineer > Search Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 126: < Engineer > Search Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 127: < Engineer > Search Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 128: < Engineer > Search Timesheet

#### < Manager> View Employee Profile

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 129: < Manager > View Employee Profile

#### < Manager> Search Employees

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 130: < Manager > Search Employees

#### < Manager> Review Timesheet

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 131: < Manager > Review Timesheet

#### < Manager> Appraise Engineers

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 132: < Manager > Appraise Engineers

#### < Manager> Edit Appraisal

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 133: < Manager > Edit Appraisal

#### < Manager> Evaluate Engineers

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 134: < Manager > Evaluate Engineers

#### < Manager> Edit Evaluation

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 135: < Manager > Edit Evaluation

#### < Manager> Assign Engineers to Project

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 136: < Manager > Assign Engineers to Project

#### < Manager> Remove Engineers from Project

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 137: < Manager > Remove Engineers from Project

#### < Director> Create Recruitment

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 138: < Director > Create Recruitment

#### < Director> Edit Recruitment

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 139: < Director > Edit Recruitment

#### < Director> Reply Recruitment

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 140: < Director > Reply Recruitment

#### < Director> Search Recruitment

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 141: < Director > Search Recruitment

#### < Director> View Recruitment Detail

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 142: < Director > View Recruitment Detail

#### < Director> Review Evaluation

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 143: < Director > Review Evaluation

#### < Director> Create Project

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 144: < Director > Create Project

#### < Director> Edit Project

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 145: < Director > Edit Project

#### < Director> Review Assigned Engineers

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 146: < Director > Review Assigned Engineers

#### < Customer> Make Feedback Project

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 147: < Customer> Make Feedback Project

#### < Admin> Add Criterion

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 148: < Admin> Add Criterion

#### < Admin> Edit Criterion

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 149: < Admin> Edit Criterion

#### < Admin> Remove Criterion

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 150: < Admin> Remove Criterion

#### < Admin> Create Period Evaluation

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 151: < Admin> Create Period Evaluation

#### < Admin> Edit Period Evaluation

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 152: < Admin> Edit Period Evaluation

#### < Admin> Remove Period Evaluation

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 153: < Admin> Remove Period Evaluation

#### < Admin> Search Account

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 154: < Admin> Search Account

#### < Admin> View Account

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 155: < Admin> View Account

#### < Admin> Edit Account

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 156: < Admin> Edit Account

#### < Admin> Create Account

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 157: < Admin> Create Account

#### < HR> Reply Recruitment

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 158: < HR> Reply Recruitment

#### < HR> Search Recruitment

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 159: < HR> Search Recruitment

#### < HR> View Recruitment Detail

**Summary:** This diagram shows how….

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

Figure 160: < HR> View Recruitment Detail

## User Interface Design

### Guest Interface Design

#### Login

****

Figure 1: Guest Login

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
| 1 | Username | Fill user name | No | Yes | Textbox | String | N/A |
| 2 | Password | Fill password | No | Yes | Password | String | N/A |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
| 3 | Log in | Log-in into the system | N/A | Transfer to employee, manager, director, customer, admin or HR home page |

### Engineer Interface Design

#### Search Timesheets

**Figure 5: Search Timesheet**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Write Timesheet

**Figure 5: Write Timesheet**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Edit Timesheet

**Figure 5: Edit Timesheet**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Remove Timesheet

**Figure 5: Remove Timesheet**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### View appraisal

**Figure 5: View Appraisal**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### View Evaluation

**Figure 5: View Evaluation**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Edit Profile

**Figure 5: Edit Profile**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### View Knowledge Detail

**Figure 5: View Knowledge Detail**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Add Knowledge

**Figure 5: Add Knowledge**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Edit Knowledge

**Figure 5: Edit Knowledge**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Search Knowledge

**Figure 5: Search Knowledge**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Add Comment

**Figure 5: Add Comment**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Edit Comment

**Figure 5: Edit Comment**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Remove Comment

**Figure 5: Remove Comment**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Search Project

**Figure 5: Search Project**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### View Project Detail

**Figure 5: View Project Detail**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

### Manager Interface Design

#### View Employee Profile

**Figure 27: View Employee Profile**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Search Employee

**Figure 27: Search Employee**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Review Timesheet

**Figure 27: Review Timesheet**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Appraise Engineer

**Figure 27: Appraise Engineer**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Edit Appraisal

**Figure 27: Edit Appraisal**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Evaluate Engineer

**Figure 27: Evaluate Engineer**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Edit Evaluation

**Figure 27: Edit Evaluation**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Assign Engineer to Project

**Figure 27: Assign Engineer to Project**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Remove Engineer from Project

**Figure 27: Remove Engineer from Project**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

### Director Interface Design

#### Create Recruitment

**Figure 27: Create Recruitment**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Edit Recruitment

**Figure 27: Edit Recruitment**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Reply Recruitment

**Figure 27: Reply Recruitment**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Search Recruitment

**Figure 27: Search Recruitment**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### View Recruitment Detail

**Figure 27: View Recruitment Detail**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Review Evaluation

**Figure 27: Review Evaluation**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Create Project

**Figure 27: Create Project**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Edit Project

**Figure 27: Edit Project**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Review Assigned Engineers

**Figure 27: Review Assigned Engineers**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

### Customer Interface Design

#### Make Feedback Project

**Figure 27: Make Feedback Project**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

### Admin Interface Design

#### Add Criterion

**Figure 27: Add Criterion**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Edit Criterion

**Figure 27: Edit Criterion**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Remove Criterion

**Figure 27: Remove Criterion**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Create Period Evaluation

**Figure 27: Create Period Evaluation**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Edit Period Evaluation

**Figure 27: Edit Period Evaluation**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Remove Period Evaluation

**Figure 27: Remove Period Evaluation**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Search Account

**Figure 27: Search Account**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### View Account

**Figure 27: View Account**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Create Account

**Figure 27: Create Account**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Edit Account

**Figure 27: Edit Account**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

### HR Interface Design

#### Reply Recruitment

**Figure 27: Reply Recruitment**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### Search Recruitment

**Figure 27: Search Recruitment**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

#### View Recruitment Detail

**Figure 27: View Recruitment Detail**

**Fields**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Field Name** | **Description** | **Read only** | **Mandatory** | **Control Type** | **Data Type** | **Length** |
|  |  |  |  |  |  |  |  |

**Buttons/Hyperlinks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Function** | **Description** | **Validation** | **Outcome** |
|  |  |  |  |  |

## Database Design

### Logical Diagram

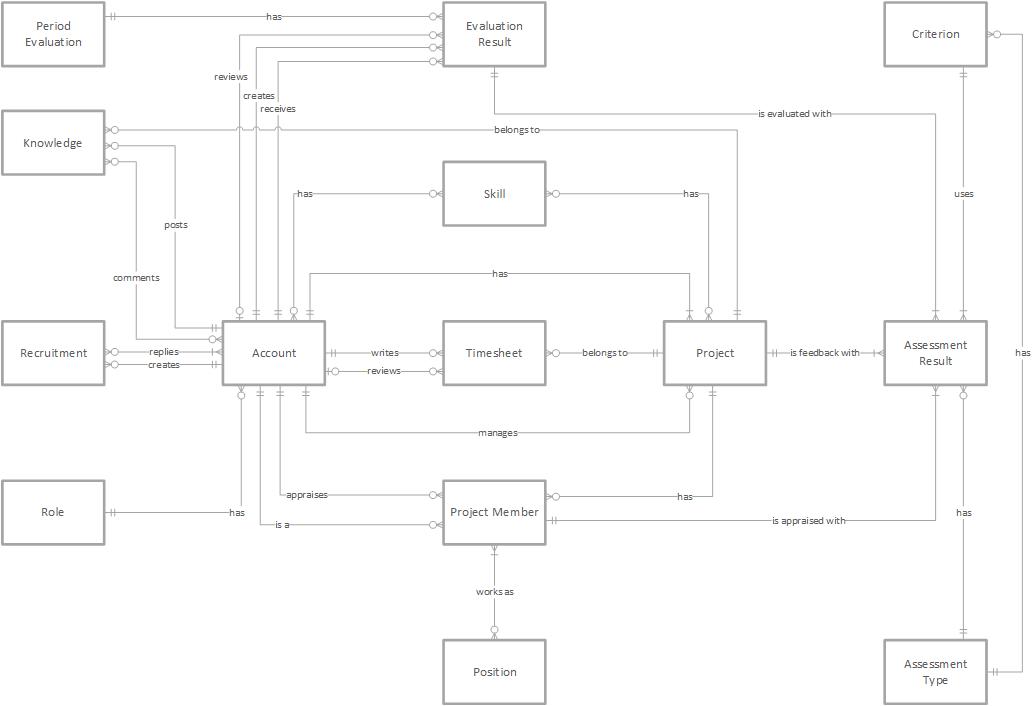


Figure 51: Logical Diagram

### Data Dictionary

|  |  |
| --- | --- |
| **Entity Data dictionary: describe content of all entities** | |
| Entity Name | Description |
| Period Evaluation | Describe all Period Evaluations in the system. |
| Evaluation Result | Describe all Evaluation Results in the system. |
| Criterion | Describe all Criterions available in the system. |
| Knowledge | Describe all Knowledge in the system. |
| Skills | Describe all Skills in the system. |
| Account | Describe all Accounts in the system. |
| Timesheet | Describe all Timesheets in the system. |
| Project | Describe all Projects in the system. |
| Assessment Result | Describe all Assessment Results in the system. |
| Role | Describe all Roles in the system. |
| Project Member | Describe all Project Members in the system. |
| Position | Describe all Positions in the system. |
| Assessment Type | Describe all Assessment Types in the system. |
| Recruitment | Describe all Recruitment in the system. |

Table 7: Entity Data Dictionary

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Entity name** | **Attributes** | **Description** | **Domain** | **Null** |
| Account | aacountID | Unique identifier of account, auto increment | int | No |
| roleID | Role, foreign key | int | No |
| username | Account’s username | nvarchar(16) | No |
| password | Account’s password | nvarchar(16) | No |
| isActive | Account’s status | bit | No |
| fullName | Account’s name | nvarchar(100) | Yes |
| sex | Account’s gender | bit | Yes |
| birthday | Account’s birthday | date | Yes |
| phone | Account’s phone number | nvarchar(15) | Yes |
| email | Account’s email | nvarchar(50) | Yes |
| avgPoint | Account’s average period evaluation point | float | Yes |
| numOfEva | Account’s number of evaluation | int | Yes |
| company | Account’s company (for customer) | nvarchar(50) | Yes |
| address | Account’s address | nvarchar(250) | Yes |
| Role | roleID | Unique identifier of role, auto increment | int | No |
| roleName | Role’s name | nvarchar(20) | No |
| Project | projectID | Unique identifier of project, auto increment | int | No |
| directorID | Director, foreign key | int | No |
| customerID | Customer, foreign key | int | No |
| projectCode | Project’s code | nchar(10) | No |
| projectName | Project’s name | nvarchar(50) | No |
| startDate | Project’s start date | date | No |
| endDate | Project’s end date | date | Yes |
| avgPoint | Project’s average feedback point | float | Yes |
| scale | Project’s scale | int | Yes |
| fbackContent | Project’s feedback content | nvarchar(MAX) | Yes |
| status | Project’s status | nvarchar(50) | Yes |
| Project Member | proMemID | Unique identifier of project member, auto increment | int | No |
| projectID | Project, foreign key | int | No |
| employeeID | Employee, foreign key | int | No |
| evaluatorID | Evaluator, foreign key | int | Yes |
| isPartTime | Project member’s working type | bit | Yes |
| isApprove | Project member’s approval status | bit | Yes |
| avgPoint | Project member’s average appraisal point | float | Yes |
| isManager | Project member is manager or not | bit | Yes |
| isActive | Project member’s status | bit | Yes |
| apprContent | Project member’s appraisal content | nvarchar(MAX) | Yes |
| Work Tracking | workTrackingID | Unique identifier of work tracking, auto increment | int | No |
| proMemID | Project member, foreign key | int | Yes |
| positionID | Position, foreign key | int | No |
| startDate | Work tracking’s start date | datetime | Yes |
| endDate | Work tracking’s end date | datetime | Yes |
| Skill | skillID | Unique identifier of skill, auto increment | int | No |
| skillName | Skill’s name | nvarchar(50) | Yes |
| isProCode | Skill is programing code or not | bit | Yes |
| Engineer Skill | engineerID | Engineer, foreign key | int | No |
| skillID | Skill, foreign key | int | No |
| isInterest | Skill is engineer’s interest or not | bit | Yes |
| Project Skill | projectID | Project, foreign key | int | No |
| skillID | Skill, foreign key | int | No |
| Period Evaluation | evaID | Unique identifier of period evaluation, auto increment | int | Yes |
| evaName | Period evaluation’s name | nvarchar(50) | Yes |
| startDate | Period evaluation’s start date | date | Yes |
| endDate | Period evaluation’s end date | date | Yes |
| submitDate | Period evaluation’s submit date | date | Yes |
| closeDate | Period evaluation’s close date | date | Yes |
| Evaluation Result | resultID | Unique identifier of evaluation result, auto increment | int | No |
| evaID | Period evaluation, foreign key | int | No |
| evaluatorID | Evaluator, foreign key | int | No |
| receiverID | Receiver, foreign key | int | No |
| avgPoint | Evaluation result’s average point | float | Yes |
| EvaContent | Evaluation result’s content | nvarchar(MAX) | Yes |
| reviewerID | Reviewer, foreign key | int | Yes |
| status | Evaluation result’s status | bit | No |
| Criterion | critID | Unique identifier of criterion, auto increment | int | No |
| title | Criterion’s title | nvarchar(150) | Yes |
| description | Criterion’s description | nvarchar(1000) | Yes |
| maxPoint | Criterion’s max point | float | Yes |
| isActive | Criterion’s status | bit | Yes |
| createDate | Criterion’s create date | date | Yes |
| type | Assessment type, foreign key | int | Yes |
| Assessment Type | assessTypeID | Unique identifier of assessment type, auto increment | int | No |
| typeName | Assessment type’s name | nvarchar(50) | Yes |
| Assessment Result | assessID | Unique identifier of assessment result, auto increment | int | No |
| criterionID | Criterion, foreign key | int | Yes |
| targetID | Target, foreign key | int | Yes |
| assessDate | Assessment result’s date | int | Yes |
| point | Assessment result’s point | float | Yes |
| type | Assessment type, foreign key | nvarchar(MAX) | Yes |
| Timesheet | timeSheetID | Unique identifier of timesheet, auto increment | int | No |
| projectID | Project, foreign key | int | No |
| writerID | Writer, foreign key | int | No |
| reviewerID | Reviewer, foreign key | int | Yes |
| writeDate | Timesheet’s write date | date | Yes |
| time | Timesheet’s time | float | Yes |
| description | Timesheet’s description | nvarchar(500) | Yes |
| reviewDate | Timesheet’s review date | datetime | Yes |
| isApprove | Time sheet is approved or not | bit | Yes |
| Recruitment | recruitID | Unique identifier of recruitment, auto increment | int | No |
| directorID | Director, foreign key | int | No |
| recruitContent | Recruitment’s content | nvarchar(500) | No |
| recruitDate | Recruitment’s post date | date | No |
| isClose | Recruitment’s status | bit | Yes |
| title | Recruitment’s title | nvarchar(100) | Yes |
| reply | Recruitment’s reply number | int | Yes |
| lastEdit | Recruitment’s last edit date | date | Yes |
| Recruitment Reply | recruitRepID | Unique identifier of recruitment reply, auto increment | int | No |
| recruitID | Recruitment, foreign key | int | No |
| posterID | Poster, foreign key | int | No |
| repContent | Reply’s content | nvarchar(500) | No |
| repDate | Reply’s post time | datetime | No |
| Knowledge | knowID | Unique identifier of knowledge, auto increment | int | No |
| topic | Knowledge’s topic | nvarchar(50) | Yes |
| projectID | Project, foreign key | int | Yes |
| posterID | Poster, foreign key | int | Yes |
| knowContent | Knowledge’s content | nvarchar(1000) | Yes |
| knowDate | Knowledge’s post date | date | Yes |
| lastPostComment | Knowledge’s last comment content | nvarchar(105) | Yes |
| lastPostDate | Knowledge’s last comment time | datetime | Yes |
| replies | Knowledge’s reply number | int | Yes |
| lastEdit | Knowledge’s last edit time | datetime | Yes |
| isClose | Knowledge’s status | bit | Yes |
| Comment | commentID | Unique identifier of comment, auto increment | int | No |
| knowID | Knowledge, foreign key | int | Yes |
| posterID | Poster, foreign key | int | Yes |
| comContent | Comment’s content | nvarchar(1000) | Yes |
| comDate | Comment’s post date | datetime | No |
| lastEdit | Comment’s last edit time | datetime | Yes |

Table 8: Detail Data Dictionary

\* Business integrity constraint:

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## Algorithms

### Definition

### Definition Problem

### Solution

### Complexity

### Flow chat