** 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 simply 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 evaluation from customer … Still be done through email.
* System can’t suggest employees 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 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 employees and assign them base on the request of manager.
* Manager, Leader, Engineers could hand down experiences of projects as a reference documents to support future projects.
* Admin can manage employee and customer’s account.
* Customer can 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 employees for each project base on automatic system suggest.
    - Each employee 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.
* With application form management system
* Manager, Director can review the stored application form for hiring.
* System matching the data in order to create new employee profile.
* Disadvantages:
* System only suggests these criteria: skill and interest. It can’t control in term of specific staff’s time.
* Storage system 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 feedback 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.

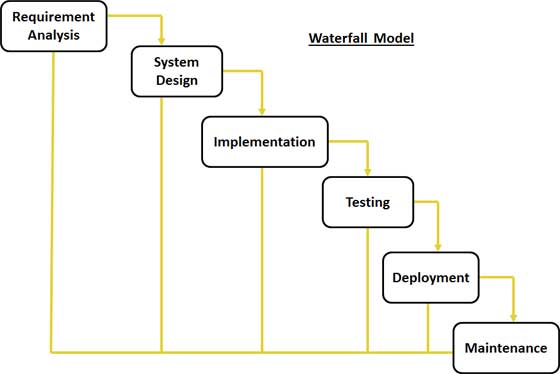


Figure 1: Waterfall Development Model

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

### 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.

### 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 Diagram

****

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

**Use Case Specification**

#### <Engineer> Overview Use Case

****

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

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

##### <Engineer> Logout Use Case Diagram

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

#### <Manager> Overview Use Case

****

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

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

#### <Director> Overview Use Case

****

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

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

#### <Customer> Overview Use Case



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

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



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

**Use Case Specification**

#### <Admin> Overview Use Case

****

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

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

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

****

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

**Use Case Specification**

#### <HR> Overview Use Case

****

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

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

****

**Figure 57: <HR> Reply Recruitment Use Case Diagram**

**Use Case Specification**

##### <HR> Search Recruitment Use Case Diagram

****

**Figure 58: <HR> Search Recruitment**

**Use Case Specification**

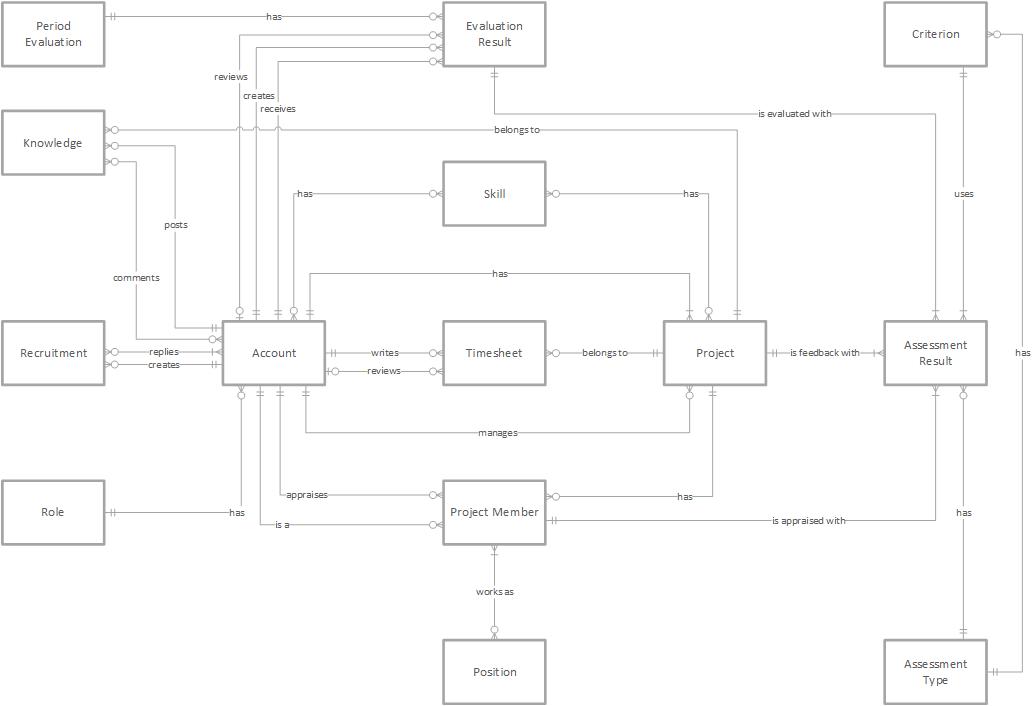
##### <HR> View Recruitment Detail Use Case Diagram

****

**Figure 59: <HR> View Recruitment Detail Use Case Diagram**

**Use Case Specification**

## 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 one day 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

# 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

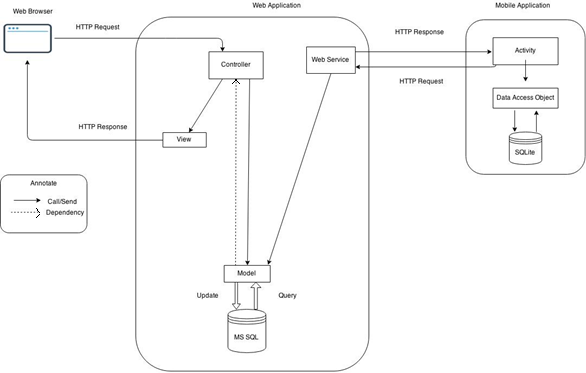


Figure 4: EPS System Architectural



#### 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

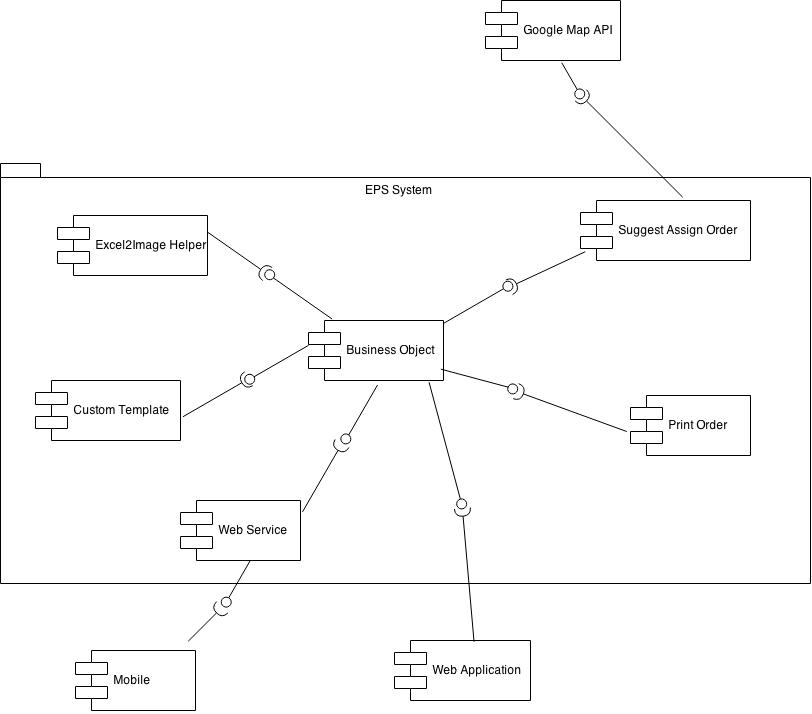
****

Figure 4: Conceptual Diagram

|  |  |
| --- | --- |
| **Component dictionary: describe component** | |
| Component Name | Description |
| Business Object | Handle business process. |
| Excel2Html Helper | Handle process of create a printable order, using XSSF Helper library from Apache POI and Html2Image library.  *Html2Image*  *( https://code.google.com/p/java-html2image/ )*  *XSSFHtmlHelper (http://svn.apache.org/repos/asf/poi/trunk/src/examples/*  *src/org/apache/poi/ss/examples/html/)* |
| Web Service | Content all web service of the system. |
| Custom Template | Handle the process of create and customize template. |
| Suggest Assign Order | Use to make suggest for StoreOwner to assign order for their Employee. |
| Print Order | Handle the process of printing order. |
| Google Map API | Use to work with Google Map API to get input data for Suggest Assign Order. |
| Mobile | Android Application. |
| Web Application | Web Application |

## Detailed Description

### Class Diagram



Figure 2: Class Diagram

### Class Diagram Explanation

#### Account

Attribute

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| AccountID | int | Private |  |
| roleID | int | Private |  |
| username | String | Private |  |
| password | String | Private |  |
| fullname | String | Private |  |
| sex | boolean | Private |  |
| birthday | String | Private |  |
| phone | String | Private |  |
| email | String | Private |  |
| address | String | Private |  |
| isActive | boolean | Private |  |
| avgPoint | float | Private |  |
| numofEva | int | Private |  |
| company | String | Private |  |

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 |  |
| roleName | String | Private |  |

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 |  |
| directorID | int | Private |  |
| customerID | int | Private |  |
| projectCode | String | Private |  |
| projectName | String | Private |  |
| startDate | date | Private |  |
| endDate | date | Private |  |
| avgPoint | float | Private |  |

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 |  |
| projectID | int | Private |  |
| employeeID | int | Private |  |
| evaluatorID | int | Private |  |
| isPartTime | boolean | Private |  |
| avgPoint | float | Private |  |
| isManager | boolean | Private |  |
| isActive | boolean | Private |  |

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 |  |
| proMemID | int | Private |  |
| positionID | int | Private |  |
| startDate | Date | Private |  |
| endDate | Date | Private |  |

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** |
| postionID | int | Private |  |
| position | String | Private |  |

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 |  |
| skill | String | Private |  |
| isProCode | boolean | Private |  |

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 |  |
| skillID | int | Private |  |

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 |  |
| skillID | int | Private |  |
| isInterest | boolean | Private |  |

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 |  |
| title | String | Private |  |
| description | String | Private |  |
| maxPoint | float | Private |  |
| type | String | Private |  |
| createDate | date | Private |  |
| isActive | boolean | Private |  |

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 |  |
| typeName | String | Private |  |

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 |  |
| criterionID | int | Private |  |
| targetID | int | Private |  |
| assessDate | date | Private |  |
| point | float | Private |  |

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 |  |
| startDate | date | Private |  |
| endDate | date | Private |  |
| evaNam | String | Private |  |
| submitDate | date | Private |  |
| closeDate | date | Private |  |

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 |  |
| evaID | int | Private |  |
| evaluatorID | int | Private |  |
| receiverID | int | Private |  |
| reviewerID | int | Private |  |
| avgPoint | float | Private |  |
| status | boolean | Private |  |

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 |  |
| projectID | int | Private |  |
| writerID | int | Private |  |
| reviewerID | int | Private |  |
| time | float | Private |  |
| description | String | Private |  |
| reviewDate | date | Private |  |
| isApprove | boolean | Private |  |

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** |
| knowledgeID | int | Private |  |
| projectID | int | Private |  |
| posterID | int | Private |  |
| topic | String | Private |  |
| knowConten | String | Private |  |
| knowDate | date | Private |  |
| lastPostComment | String | Private |  |
| lastPostDate | String | Private |  |
| replies | int | Private |  |
| lasrEdit | datetime | Private |  |
| isClose | boolean | Private |  |

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 |  |
| knowID | int | Private |  |
| posterID | int | Private |  |
| comContent | String | Private |  |
| comDate | datetime | Private |  |
| lastEdit | datetime | Private |  |

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 |  |
| projectID | int | Private |  |
| recruitContent | String | Private |  |
| recruitDate | date | Private |  |
| isClose | boolean | Private |  |

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 |  |
| posterID | int | Private |  |
| repContent | String | Private |  |
| repDate | datetime | Private |  |
| recruitID | int | Private |  |

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 29: <Guest> Login

##### <Engineer> Logout

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

Figure 30: <Engineer> Logout

##### <Engineer> Search Timesheets

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

Figure 30: <Engineer> Search Timesheets

##### <Engineer> Write Timesheets

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

Figure 30: <Engineer> Write Timesheets

##### <Engineer> Search Timesheets

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

Figure 30: <Engineer> Search Timesheets

##### <Engineer> Edit Timesheets

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

Figure 30: <Engineer> Edit Timesheets

##### <Engineer> Remove Timesheets

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

Figure 30: <Engineer> Remove Timesheets

##### <Engineer> View Evaluation

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

Figure 30: <Engineer> View Evaluation

##### <Engineer> View Appraisal

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

Figure 30: <Engineer> View Appraisal

##### <Engineer> Edit Profile

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

Figure 30: <Engineer> Edit Profile

##### <Engineer> View Knowledge Detail

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

Figure 30: <Engineer> View Knowledge Detail

##### <Engineer> Add Knowledge

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

Figure 30: <Engineer>Add Knowledge

##### <Engineer> Search Knowledge

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

Figure 30: <Engineer> Search Knowledge

##### <Engineer> Add Comment

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

Figure 30: <Engineer> Add Comment

##### <Engineer> Edit Comment

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

Figure 30: <Engineer> Edit Comment

##### <Engineer> Remove Comment

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

Figure 30: <Engineer> Remove Comment

##### <Engineer> Search Projects

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

Figure 30: <Engineer> Search Projects

##### <Engineer> View Project Detail

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

Figure 30: <Engineer> View Project Detail

##### <Manager> View Employee Profile

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

Figure 30: <Manager> View Employee Profile

##### <Manager> Search Employees

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

Figure 30: <Manager> Search Employees

##### <Manager> Review Timesheet

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

Figure 30: <Manager> Review Timesheet

##### <Manager> Appraise Engineers

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

Figure 30: <Manager> Appraise Engineers

##### <Manager> Edit Appraisal

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

Figure 30: <Manager> Edit Appraisal

##### <Manager> Evaluate Employees

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

Figure 30: <Manager> Evaluate Employees

##### <Manager> Edit Evaluation

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

Figure 30: <Manager> Edit Evaluation

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

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

Figure 30: <Manager> Assign Engineers to Project

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

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

Figure 30: <Manager> Remove Engineers from Project

##### <Director> Create Recruitment

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

Figure 30: <Director> Create Recruitment

##### <Director> Edit Recruitment

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

Figure 30: <Director> Edit Recruitment

##### <Director> Reply Recruitment

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

Figure 30: <Director> Reply Recruitment

##### <Director> Search Recruitment

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

Figure 30: <Director> Search Recruitment

##### <Director> View Recruitment

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

Figure 30: <Director> View Recruitment

##### <Director> Review Evaluation

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

Figure 30: <Director> Review Evaluation

##### <Director> Create Project

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

Figure 30: <Director> Create Project

##### <Director> Edit Project

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

Figure 30: <Director> Edit Project

##### <Director> Review Assigned Engineer

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

Figure 30: <Director> Review Assigned Engineer

##### <Customer> Make Feedback Project

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

Figure 30: <Customer> Make Feedback Project

##### <Admin> Add Criterion

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

Figure 30: <Admin> Add Criterion

##### <Admin> Edit Criterion

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

Figure 30: <Admin> Edit Criterion

##### <Admin> Remove Criterion

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

Figure 30: <Admin> Remove Criterion

##### <Admin> Create Period Evaluation

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

Figure 30: <Admin> Create Period Evaluation

##### <Admin> Edit Period Evaluation

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

Figure 30: <Admin> Edit Period Evaluation

##### <Admin> Remove Period Evaluation

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

Figure 30: <Admin> Remove Period Evaluation

##### <Admin> Search Account

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

Figure 30: <Admin> Search Account

##### <Admin> View Account

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

Figure 30: <Admin> View Account

##### <Admin> Edit Account

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

Figure 30: <Admin> Edit Account

##### <Admin> Create Account

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

Figure 30: <Admin> Create Account

##### <HR> Reply Recruitment

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

Figure 30: <HR> Reply Recruitment

##### <HR> Search Recruitment

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

Figure 30: <HR> Search Recruitment

##### <HR> View Recruitment Detail

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

Figure 30: <HR> View Recruitment Detail

### Activity Diagram

#### <Guest> Login

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

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

Figure 48: <Guest> Login

#### <Engineer> Write Timesheet

**Summary:** This diagram shows how….

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

Figure 49: <Engineer> Write Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

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

Figure 50: < Engineer > Search Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

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

Figure 50: < Engineer > Search Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

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

Figure 50: < Engineer > Search Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

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

Figure 50: < Engineer > Search Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

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

Figure 50: < Engineer > Search Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

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

Figure 50: < Engineer > Search Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

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

Figure 50: < Engineer > Search Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

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

Figure 50: < Engineer > Search Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

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

Figure 50: < Engineer > Search Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

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

Figure 50: < Engineer > Search Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

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

Figure 50: < Engineer > Search Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

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

Figure 50: < Engineer > Search Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

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

Figure 50: < Engineer > Search Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

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

Figure 50: < Engineer > Search Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

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

Figure 50: < Engineer > Search Timesheet

#### < Engineer> Search Timesheet

**Summary:** This diagram shows how….

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

Figure 50: < Engineer > Search Timesheet

#### < Manager> View Employee Profile

**Summary:** This diagram shows how….

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

Figure 50: < Manager > View Employee Profile

#### < Manager> Search Employees

**Summary:** This diagram shows how….

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

Figure 50: < Manager > Search Employees

#### < Manager> Review Timesheet

**Summary:** This diagram shows how….

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

Figure 50: < Manager > Review Timesheet

#### < Manager> Appraise Engineers

**Summary:** This diagram shows how….

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

Figure 50: < Manager > Appraise Engineers

#### < Manager> Edit Appraisal

**Summary:** This diagram shows how….

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

Figure 50: < Manager > Edit Appraisal

#### < Manager> Evaluate Engineers

**Summary:** This diagram shows how….

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

Figure 50: < Manager > Evaluate Engineers

#### < Manager> Edit Evaluation

**Summary:** This diagram shows how….

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

Figure 50: < Manager > Edit Evaluation

#### < Manager> Assign Engineers to Project

**Summary:** This diagram shows how….

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

Figure 50: < Manager > Assign Engineers to Project

#### < Manager> Remove Engineers from Project

**Summary:** This diagram shows how….

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

Figure 50: < Manager > Remove Engineers from Project

#### < Director> Create Recruitment

**Summary:** This diagram shows how….

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

Figure 50: < Director > Create Recruitment

#### < Director> Edit Recruitment

**Summary:** This diagram shows how….

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

Figure 50: < Director > Edit Recruitment

#### < Director> Reply Recruitment

**Summary:** This diagram shows how….

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

Figure 50: < Director > Reply Recruitment

#### < Director> Search Recruitment

**Summary:** This diagram shows how….

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

Figure 50: < Director > Search Recruitment

#### < Director> View Recruitment Detail

**Summary:** This diagram shows how….

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

Figure 50: < Director > View Recruitment Detail

#### < Director> Review Evaluation

**Summary:** This diagram shows how….

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

Figure 50: < Director > Review Evaluation

#### < Director> Create Project

**Summary:** This diagram shows how….

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

Figure 50: < Director > Create Project

#### < Director> Edit Project

**Summary:** This diagram shows how….

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

Figure 50: < Director > Edit Project

#### < Director> Review Assigned Engineers

**Summary:** This diagram shows how….

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

Figure 50: < Director > Review Assigned Engineers

#### < Customer> Make Feedback Project

**Summary:** This diagram shows how….

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

Figure 50: < Customer> Make Feedback Project

#### < Admin> Add Criterion

**Summary:** This diagram shows how….

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

Figure 50: < Admin> Add Criterion

#### < Admin> Edit Criterion

**Summary:** This diagram shows how….

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

Figure 50: < Admin> Edit Criterion

#### < Admin> Remove Criterion

**Summary:** This diagram shows how….

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

Figure 50: < Admin> Remove Criterion

#### < Admin> Create Period Evaluation

**Summary:** This diagram shows how….

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

Figure 50: < Admin> Create Period Evaluation

#### < Admin> Edit Period Evaluation

**Summary:** This diagram shows how….

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

Figure 50: < Admin> Edit Period Evaluation

#### < Admin> Remove Period Evaluation

**Summary:** This diagram shows how….

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

Figure 50: < Admin> Remove Period Evaluation

#### < Admin> Search Account

**Summary:** This diagram shows how….

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

Figure 50: < Admin> Search Account

#### < Admin> View Account

**Summary:** This diagram shows how….

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

Figure 50: < Admin> View Account

#### < Admin> Edit Account

**Summary:** This diagram shows how….

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

Figure 50: < Admin> Edit Account

#### < Admin> Create Account

**Summary:** This diagram shows how….

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

Figure 50: < Admin> Create Account

#### < HR> Reply Recruitment

**Summary:** This diagram shows how….

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

Figure 50: < HR> Reply Recruitment

#### < HR> Search Recruitment

**Summary:** This diagram shows how….

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

Figure 50: < HR> Search Recruitment

#### < HR> View Recruitment Detail

**Summary:** This diagram shows how….

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

Figure 50: < HR> View Recruitment Detail

## User Interface Design

### Guest Interface Design

#### Guest 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

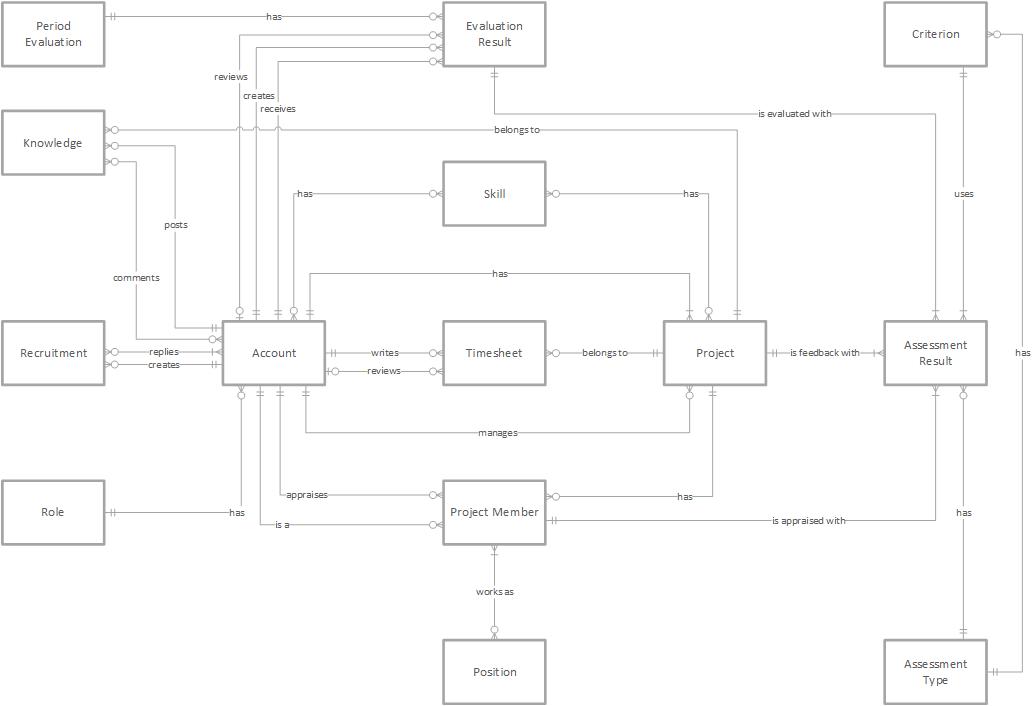


Figure 51: Logical Diagram

### 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 | accountID | 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 | No |
| targetID | Target, foreign key | int | No |
| assessDate | Assessment result’s date | date | No |
| point | Assessment result’s point | float | Yes |
| type | Assessment type, foreign key | int | 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 | datetime | 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

### Algorithm

#### Definition

#### Definition Problem

#### Solution

#### Complexity

#### Flowchart