National University Of Computer and Emerging Sciences

Orange HRM (Payroll Module)

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Abstract

Orange HRM is a human resource management tool for middle level enterprise. By using this tool one can manage the data of all the employees of the particular enterprise. Orange HRM holds the information like profile of the employees and their daily activities i.e., their attendance, leave, working hours, salary etc. However, an important feature missing in Orange HRM was the payroll sub-system.

The project is about adding a payroll management module into Orange HRM to provide an integrated solution for all the HRM functions. The payroll module is designed as an extensible and customizable module to be able to customize according to the local needs.

The module has been developed using Symfony framework and integrated into Orange HRM code-base.

1. Introduction

This section provides a brief introduction to the document, highlighting its purpose and scope.

1.1 Purpose

The purpose of this document is to report the implementation of Payroll Management module in Orange HRM [1]. This document describes all the salient aspects of the system including requirements, design and implementation.

1.2 Scope

This document covers all the functional and non-functional requirements of the Payroll Management solution.

It also presents the design and implementation of the system using Architecture Diagram, Class Diagram and sequence diagrams

2.   Development Lifecycle and Project Summary
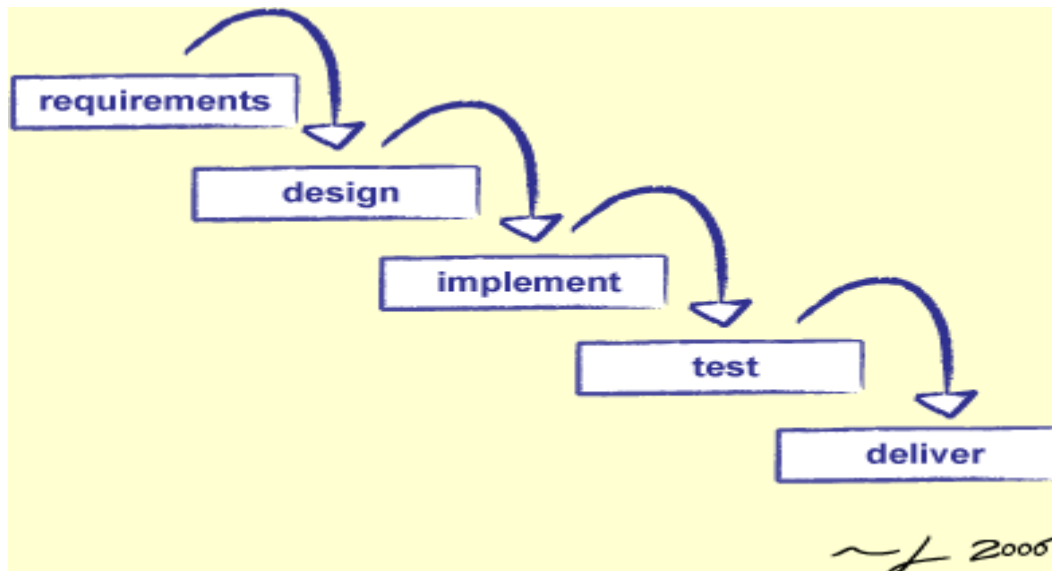
The development lifecycle we used resembles most to the water fall model.

1. We gather all the required information needed to generate a payroll.
2. Then we gather all available information already in orangehrm. Then we design how to use this information in our project.
3. Then we started the implementaion by using symfony.
4. Then we tested our code under different values and circumstances.
5. Then we delivered the iron out product after removal of bugs found in testing.

3. Functional Requirements

3.1 Payroll Calculation

System shall be able to calculate payroll for all the employees on the payroll list.

3.1.1 Inputs

Inputs to the Payroll Calculation shall comprise of:

1. **Start Date:** A date specifying the start of payroll calculation period
2. **End Date:** A date specifying the end of payroll calculation period
3. **Employee(s):** A list of employees for which to generate the payroll. The list can include:
   a. A specific employee
   b. A set of employees based upon the designation
   c. All employees in the company
4. **Payroll Configuration:** The configuration used to calculate the payroll (see section 3.2)

3.1.2 Output(s)

The output shall be a list comprising:

1. **Payroll Period:** The Starting and Ending dates for which the payroll has been calculated
2. **Payroll Summary:** A list of all the employees and their corresponding pays calculated for the given period and selected employees

3.1.3 Constraints

The following constraints shall apply for the payroll calculation for any employee:

1. Employee shall be on the company payroll. The payroll status shall be determined based upon the Employee's Employment Contract (see section Error: Reference source not found) and Employment Status (see section Error: Reference source not found) according to the following rules:
   a. If the Employment Status is Terminated then Employee shall NOT be considered on the payroll
   b. If the Payroll Start Date is greater than the Employment Contract End Date, the Employee shall NOT be considered on the payroll
   c. If the Payroll End Date is less than the Employment Contract Start Date, the employee shall NOT be considered on the payroll
   d. In all cases other than (a), (b) or (c) above, the Employee shall be considered on the payroll
2. Payroll shall NOT be computed for any period that overlaps with another period for which payroll has already been generated. Either of the following two rules define an

overlap:

    a. Payroll Start Date is greater than or equal to the start date and less than or equal to end date of a previously generated payroll

    b. Payroll Period End Date is greater than or equal to the start date and less than or equal to the end date of a previously generated payroll

3. Payroll shall be calculated according to the rules defined in the selected Payroll Configuration.

3.2   Payroll Configuration

System shall be able to create Payroll Configurations. A Payroll Configuration comprises of a set of Rules and defines the order in which the Rules are fired to calculate the Payroll.

3.3   Rule

A User shall be able to add/remove a Rule from the Configuration. A Rule shall comprise of:

1. **Sequence Number:** A Natural Number specifying the sequence in which the Rule is applied

2. **Name:** A character string to specify a descriptive name for the rule

3. **Rule Type:** Rule Type defines the calculations to be done. Rule Type shall be selected from the list of Rule Types available in the system.

4. **Parameter(s):** A list of parameters required by the Rule Type for necessary calculations.

3.3.1 Rule Type

Rule Type defines the calculations to be done. The following Rule Types shall be available in the system:

3.3.1.1   Basic Salary Rule

Basic Salary Rule shall be used to compute the Basic Salary Payable (see section Error: Reference source not found) of the Employee. It shall ALWAYS be the first Rule in the Configuration and shall NOT be repeated in the Configuration

The Rule shall use Employee Basic Salary (see section Error: Reference source not found) and Pay Frequency (see section Error: Reference source not found) to calculate the total amount payable to employee as the basic salary. The following rules shall apply:

    a. If the pay frequency is hourly, then Employee Attendance Records shall be accounted. Total Basic Salary shall be the Total Number of Hours worked in the given period multiplied by the Basic Salary.

    b. If the pay frequency is weekly, then Total Basic Salary shall be Number of Weeks in the Payroll Period multiplied by the Basic Salary

    c. If the pay frequency is bi-weekly, then Total Basic Salary shall be the Basic

Salary multiplied by Number of Weeks in the payroll period Divided by 2.

d. If the pay frequency is semi-monthly, then Total Basic Salary shall be number of fortnights in the payroll period multiplied by the Basic Salary.

e. If the pay frequency is monthly or monthly on first pay of month, then Total Basic Salary shall be number of months in the payroll period multiplied by the Basic Salary.

3.3.1.2 Leave Rule

Leave Rule shall result in a deduction if the Employee's Paid Leaves exceed the allocated Quota or if the Employee takes Unpaid Leave (see section Error: Reference source not found and for further details regarding support in Orange HRM see section 3.3.1.8). The amount of deduction shall be computed according to the following procedure:

a. Hourly rate shall be computed for the employee according to the formulae mentioned in the following table:

Pay Frequency	Formula
Hourly	Basic Salary
Weekly	Basic Salary / (5*Total Work Hours in a day)
Bi-weekly	Basic Salary / (2*5*Total Work Hours in a day)
Semi-monthly	Basic Salary / (15* Total Work Hours in a day)
Monthly	Basic Salary / (30* Total Work Hours in a day)

b. Calculate the total number of hours wasted because of the leaves exceeding the paid leaves quota or unpaid leaves (for leave quota or unpaid leaves, see section 3.3.1.8).

c. Calculate the amount of deduction by multiplying the hourly rate (calculated in step "a" above) with total number of wasted hours (calculated in step "b" above)

3.3.1.3 Health Savings Plan Rule

Health Savings Plan Rule (HSP) shall result in a deduction to be done according to the per-day contribution amount for the health savings plan defined for the employee in the currently active HSP in the company.

3.3.1.4 Tax Rule

Tax Rule shall result in a deduction to be done based upon the selected Tax Configuration (see section 3.4). Deduction amount shall be computed according to the following procedure:

a. Determine the appropriate slab for the taxable salary (passed as a parameter). The appropriate slab shall be determined according to the following rules:

   i. The absolute value of the difference of the taxable salary and the slab starting value is minimal

ii.   The absolute value of the difference of the taxable salary and the slab ending value is minimal

     b. Calculate tax by multiplying the tax-rate for the slab (identified in step "b" above) with the taxable salary

3.3.1.5   Sum Rule

Sum Rule shall compute and return sum total for a list of numeric values passed to it as a parameter. For instance, if the list of values comprises 1, 2, 3 and -10; the rule shall return -4.

3.3.1.6   Percent Accumulation Rule

Percent Accumulation Rule shall take two parameters:

1. a percentage value (in percentage); and
2. a base value (which can be any number)

Rule shall compute a positive number that makes the percentage value of the base value.

For example, if the percentage value is 5 and base value is 50, the result shall be 2.5

3.3.1.7   Percent Deduction Rule

Percent Deduction Rule shall take two parameters:

1. a percentage value (in percentage); and
2. a base value (which can be any number)

Rule shall compute a negative number that makes the percentage value of the base value

For example, if the percentage value is 5 and base value is 50, the result shall be -2.5

3.3.1.8   Leave Configuration

System shall add functionality for configuring leaves related information for the payroll. The following additions shall be made:

1. User shall be able to define leave type for all the leave categories available in the system. Leave Types shall be the following two:
   a. Paid Leave
   b. Unpaid Leave
2. User shall be able to define leave quota for each leave category. A quota defines the maximum limit on the leaves available under the given category.
   a. Quota shall be an integer value representing total number of days
   b. Quota shall be same for all the employees in the organization across the board.
   c. Quota shall be applicable on annual basis

For example, a quota of 15 for the Medical Leaves category means that an employee can avail a maximum of 15 days of medical leaves annually.

3.4   Tax Configuration

System shall be able to create a Tax Configuration. Tax Configuration shall comprise of:

1. **Name:** A unique string representing the name of configuration
2. **Slabs:** A set of slabs where each slab comprises of:
   a. **Start Value:** A number up to 2 decimal places representing the starting value for the slab
   b. **End Value:** A number up to 2 decimal places representing the ending value for the slab
   c. **Tax-rate:** A numeric value in percentages up to 2 decimal places specifying the tax-rate for slab

4.   Non-Functional Requirements

System shall support following non-functional requirements:

1. System shall be based upon the Symfony framework 14 14.
2. The design of the system shall support multiple languages.
3. UI shall conform to Orange HRM look and feel.
4. All PHP, HTML and JavaScript coding conventions mentioned in Orange HRM Developers' guide 14 shall be followed.
5. Design of the system shall be easily extendable and customizable
6. Appropriate error messages shall be shown in the case if user has made an error.

5.   Actors

System shall have the following actor(s):

- **System Administrator**

6. Use-Cases

This section lists all the use-cases for Orange HRM Payroll Management module.

6.1 Generate Payroll

Use-case Name	Generate Payroll
Actors	Admin
Preconditions	System should have employees in database.
Basic Flow	1. Admin inputs start date and end date for payroll generation 2. Admin selects All Employees option 3. Admin selects the payroll configuration from the list of available payroll configurations in the system 4. Admin presses the Calculate Payroll button. 5. System generates payroll for all the employees in the organization. (For details please refer to section 3.1 of the document) 6. Admin presses "Verified and Save" button.
Alternative path	2A.1. Admin selects Specific Employee option 2A.2. Admin selects the employee from the list 2A.3. Admin selects the payroll configuration from the list of available payroll configurations in the system 2A.4. Admin presses the Calculate Payroll button. 2A.5. System generates payroll for the selected employee in the organization. (For details please refer to section 3.1 of the document) 2A.6. Admin presses "Verified and Save" button. 2B.1. Admin selects Designation option 2B.2. Admin selects the designation from the list 2B.3. Admin selects the payroll configuration from the list of available payroll configurations in the system 2B.4. Admin presses the Calculate Payroll button. 2B.5. System generates payroll for all the employees with the selected designation. (For details please refer to section 3.1 of the document) 2B.6. Admin presses "Verified and Save" button.
Post Condition	None.

6.2   Add/Edit Payroll Configuration

Use Case Name	Add/Edit Payroll Configuration
Actors	Admin
Preconditions	System should have employees in database.
Basic Flow	1. User creates a new Payroll configuration (also see section 3.2) 2. System adds the Basic Salary Rule (see section 3.3.1.1) as the first Rule in the configuration grid 3. User adds a new rule to the grid 4. System adds the rule sequence number 5. User specifies the rule name 6. User selects rule type (see section 3.3.1 and all sub-sections for details) 7. User specifies the required parameters 8. User adds as many rules as required by repeating step 3 9. User specifies a name for the configuration and saves the configuration
Alternative path	1A.1. User opens an already created Payroll Configuration for editing 1A.2. System shows the configuration grid 1A.3. Use-case resumes from step 4 of the main flow 4A.1. User removes a rule from the configuration by clicking the Remove option shown against each rule entry
Post Condition	None.

6.3   Add/Edit Leave Configuration

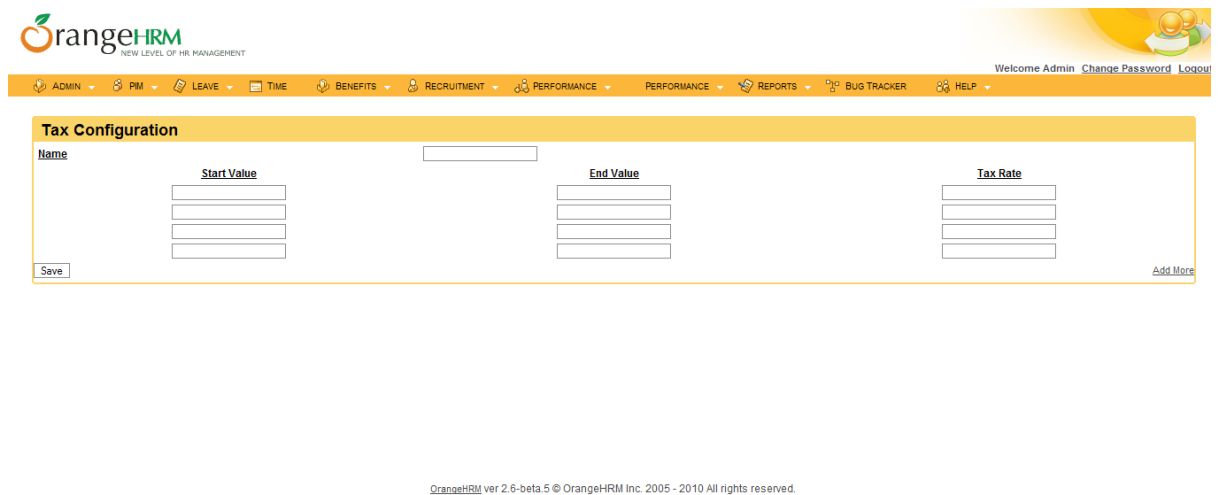| Use Case Name	Add/Edit Leave Configuration
Actors	Admin
Preconditions	None
Basic Flow	1. Admin opens the Leave Configuration GUI (see section 3.3.1.8) 2. System shows the list of all leave categories defined in the system 3. User selects leave type (paid / unpaid) from the drop-down shown against each category 4. User specifies the leave quota for each of the leave category 5. User saves the configuration
Alternative path	
Post Condition	None.

6.4   Add/Edit Tax configuration

Use Case Name	Add/Edit Tax configuration
Actors	Admin
Preconditions	None

Basic Flow	1. Admin opens the Tax Configuration GUI (see section 3.4 for details)
	2. Admin adds a slab entry
	    a. Admin specifies the Start value
	    b. Admin specifies the End value
	    c. Admin enters Tax-rate
	3. Admin adds further slab entries by repeating step 2
	4. Admin specifies the configuration name and presses save button to save the configuration

Alternative path	1A.1. Admin opens a particular Tax Configuration by selecting from the available configurations for editing purpose 1A.2. Use case resumes from step 3 in the main flow 3A.1. Admin removes a slab entry by pressing the remove option shown against each slab entry and then repeat this step or step 2 of the main-flow as required
Post Condition	None.

6.5   Payroll History

Use Case Name	Payroll History
Actors	Admin
Preconditions	None
Basic Flow	1. Admin can see the history of all the payrolls which have been generated earlier by clicking on payroll history. 2. All the list of payrolls will appear in descending order by date (latest will be shown at the top) 3. Admin can click on any of the listed payroll to see its details.
Alternative path	None.
Post Condition	None.

7.   Graphical User Interfaces

7.1   Add Tax Configuration

7.2   Add Payroll Configuration

7.3   Add Leave Configuration

7.4   Payroll generation

8.   Requirements Traceability Matrix

| Use Case	Actor	Functional Requirements	Non-Functional Requirements	GUI
6.1	Administrator	3.1, 3.2	1 – 6	8.4
6.2	Administrator	3.2	1 – 6	8.2
6.3	Administrator	3.3	1 – 6	8.3
6.4	Administrator	3.4	1 – 6	8.1
6.5	Administrator		1 – 6	8.5

9.   Assumptions

This system shall be designed considering the following assumptions:

1. Employees fill their time-sheets on regular basis
2. Leave records are up-to-date prior to generating the payroll
3. The design of the system shall support multiple languages but ONLY English language support will be the responsibility of the development team
4. Advanced taxation rules like exemptions, marginal relief, etc. need not be supported in this module. However, the design of the system shall allow to modify the existing rules in order to support more advanced rules as the need be.

10.   Class Design
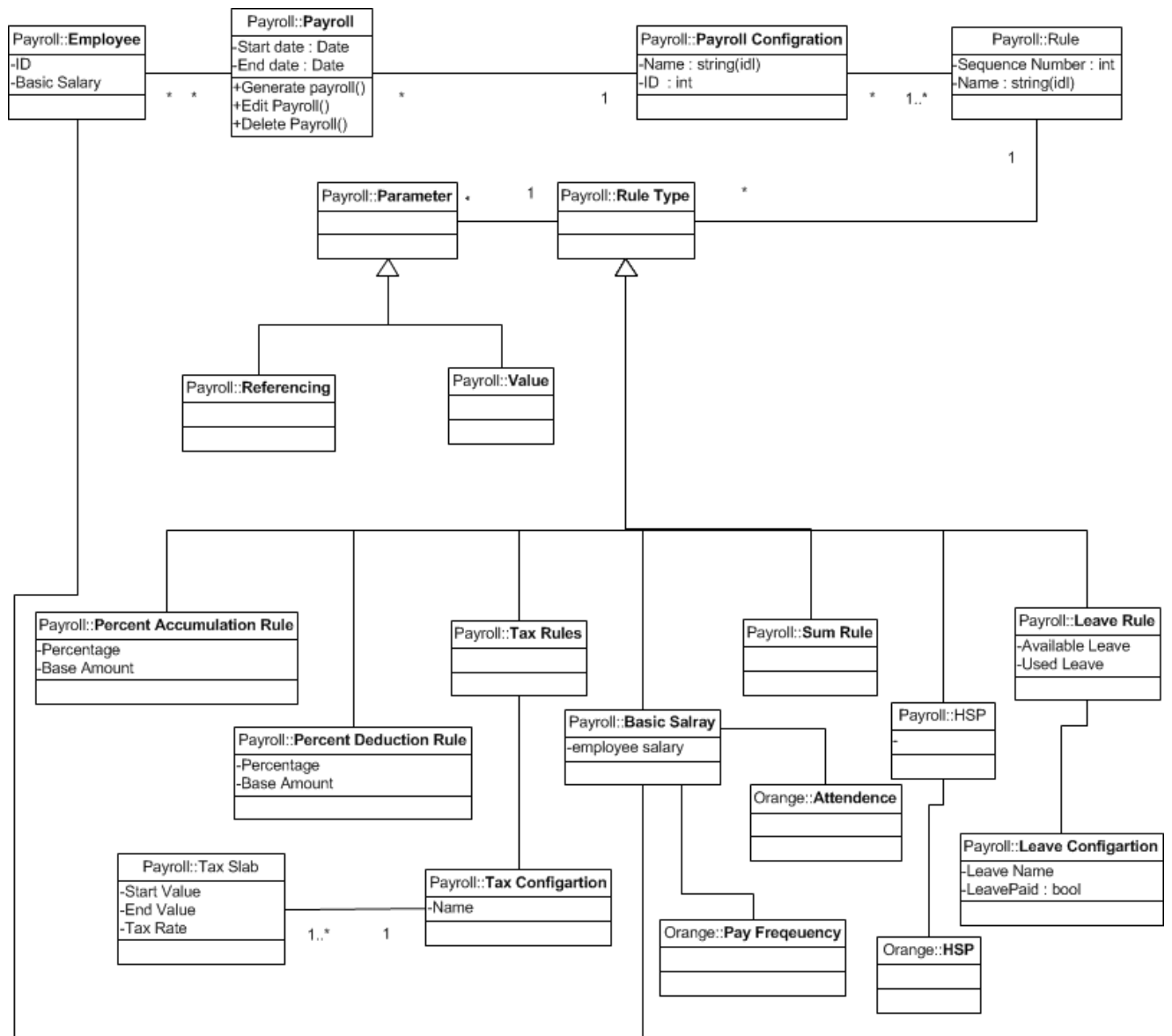
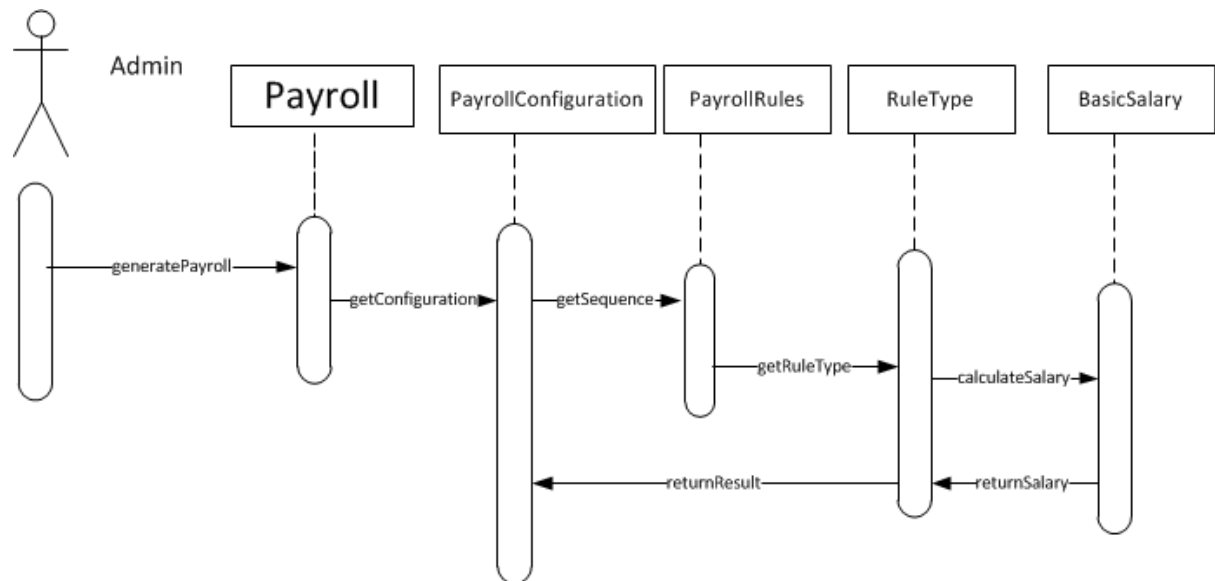# 11. Data Design
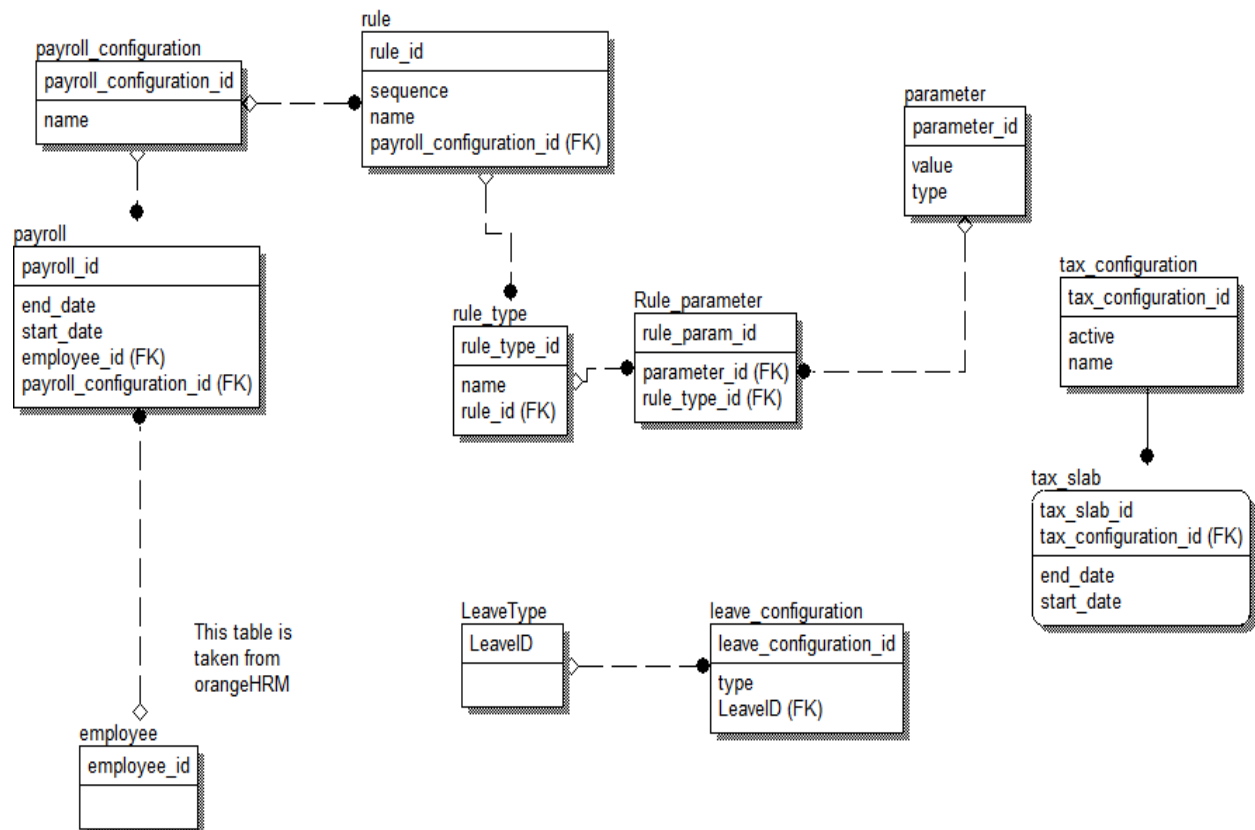
12. Sequence diagram

13. Conclusion

The project introduces a payroll management module for Orange HRM system to provide an integrated solution for all the HRM functions. The payroll module is designed as an extensible and customizable module to be able to customize according to the local needs. The document presents a complete set of requirements and its technical design.

14. References

[1] Orange HRM (http://www.orangehrm.com)

[2] Wikipedia Article on Human Resource Management Systems (http://en.wikipedia.org/wiki/Human_resource_management_system)

[3] Orange HRM Developers' Wiki (http://www.orangehrm.com/wiki/index.php/Orange_Developer_Wiki)

[4] Symfony (http://www.symfony-project.org/)

[5] Orange HRM – Developing with Symfony (http://www.orangehrm.com/wiki/index.php/Developing_With_Symfony)

[6] FBR Revenue Division's Brochure on Taxation of Income on Salary (http://www.fbr.gov.pk/tpef/brochures/2009/Salary.pdf)

15. Glossary

This section lists meanings of all the important terms used in the document

1. **Basic Salary:** An amount or a rate of compensation for a specified position of employment or activity excluding any other payments or allowances. It is an amount received for a given work period, as an hour or week, but not including additional pay, as for overtime work or other allowances. It also doesn't include any deductions as fines, taxes, etc. (http://www.wisegeek.com/what-is-unpaid-leave.htm). Basic Salary is definable for any particular employee by the Administrator in Orange HRM.

2. **Basic Salary Payable:** Basic Salary Payable is the amount payable to an employee for a given period under the Basic Salary head. It is a product of Basic Salary and Pay Frequency (see below)

3. **Employment Contract:** Employment Contract defines the period for which a person is an employee of the company. It defines the start and end dates of the period and is definable in the Orange HRM

4. **Employment Status:** Employment status determines the current status of an employee in the organization. This is configurable in Orange HRM.

5. **Paid Leave:** Paid leave is a situation in which the employee is away from the workplace with permission of the employer, but continues to receive salary or wages during that period of time (http://www.wisegeek.com/what-is-paid-leave.htm)

6. **Pay Frequency:** Pay frequency determines the period after which the salary is paid to the employee. It can range from hourly to monthly basis. A number of Pay Frequency periods are defined in Orange HRM from which Administrator can select one for a particular employee.

7. **Unpaid Leave:** Unpaid leave is time off from work which is provided without pay. When an employee takes or is given unpaid leave, he or she retains a position in a company, and many retain benefits as well, but the employee receives no salary. (http://www.wisegeek.com/what-is-unpaid-leave.htm)

16. Appendix

This appendix lists tax-rates according to the tax laws in Pakistan under the prevalent Tax Ordinance 2001 and Income Tax Rules 2002 as illustrated in FBR Revenue Division's Brochure on Taxation of Income on Salary 14. These rates are listed just as a reference to illustrate the possible tax configurations.

S/No	Taxable Income (PKR)		Rate
	Minimum	Maximum	(%)
1	0	180,000	0
2	180,001	250,000	0.50
3	250,001	350,000	0.75
4	350,001	400,000	1.50
5	400,001	450,000	2.50
6	450,001	550,000	3.50
7	550,001	650,000	4.50
8	650,001	750,000	6.00
9	750,001	900,000	7.50
10	900,001	1,050,000	9.00
11	1,050,001	1,200,000	10.00
12	1,200,001	1,450,000	11.00
13	1,450,001	1,700,000	12.50
14	1,700,001	1,950,000	14.00
15	1,950,001	2,250,000	15.00
16	2,250,001	2,850,000	16.00
17	2,850,001	3,550,000	17.50
18	3,550,001	4,550,000	18.50
19	4,550,001	8,650,000	19.00

20	8,650,001	-	20.00

Note: **In case of a woman tax-payer, no tax shall be charged if the income does not exceed Rs. 240,000**