SOFTWARE SPECIFICATION REQUIREMENTS for SIEMENS EC HUMAN RESOURCES MANAGEMENT SYSTEM

LOTSOFT

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1. INTRODUCTION

This document includes software requirements for SENTral which is Siemens EC Human Resources Management System. There are also overall descriptions, specific requirements, data models, behavioral model and planning about the project in this document.

1.1. Problem Definition

In today's business life, companies use a lot of software programs. Enterprise Resource Planning software programs are one of the most used software systems in companies' different departments. Siemens EC uses also an ERP software which is human resources management system based on an in-house developed framework. However, this system contains some disadvantages and does not provide needs of company and user requirements. The main disadvantage of used system in Siemens is that the system is not an open source platform. Thus, there is a need for migration of the old system to a new open source platform. Another deficiency of currently used system is being old and not to serve completely needs of the departments and employees of the company. Hence, it should be replaced with a new system which supports the new requirements. According to all these lacks and disadvantages, there occurs that Siemens should have a new and an open source ERP system. So, we will work on a new human resources management system which will solve these problems. In addition, another senior design project group InnovaSoft will work on this project. There are three specific modules to be developed. The modules are master data, annual leaves and training modules. Our group Lotsoft concentrates on annual leaves and training modules and notification mechanism of the entire project. Other parts of the project such as master data, authentication and authorization, will be developed by InnovaSoft.

1.2. Purpose

The aim of this document is describing the software requirement specifications for Siemens EC Human Resources Management System (SENTral). The document also introduces functionalities of the SENTral.

1.3. Scope

The SENTral will be developed for employees, managers and departments of Siemens EC. It will be used as an intranet system. So, it cannot be used by anyone who is not an employee of Siemens EC. In our group responsibility, the annual leaves and training modules will provide many facilities for all users. By using annual leaves module in this system, employees will be able to use their annual leaves and find out how many days they used and they did not used. In addition, managers will decide that their employees will be able to use their annual leaves on this system. By using training module, employees will be able to take trainings and figure out which trainings they took. Human resources department will be able to plan trainings and to send training informations to employees. Also, there will be an auto-notification mechanism by e-mail. Another facility of this system is reporting. The modules will be able create reports to managers and human resources department according to their needs for planning.

1.4. User and Literature Survey

As mentioned in the previous sections, enterprise resources planning systems are used by companies. ERP is used for planning resources of companies. However, the most attractive feature of ERP systems is to combine all departments of corporations in one computer system and to provide data sharing between different departments. [2]



There are a lot of ERP software programs used by a lot of companies. Thus, there are also a lot of companies producing these programs. The biggest and leader company producing ERP software programs is SAP. Another company is Oracle. Also, Microsoft produces such these programs [3]. Although these companies produce ERP programs, there are a lot of small companies all over the world. However, some companies such as Siemens EC want to use ERP software programs developed for their specific requirements instead of using generic programs produced by companies mentioned above.

The SENTral will also be an intranet system. Thus, we can say that it is a hybrid of an intranet and ERP. Intranet is a computer network system that uses internet protocol technology to securely share any part of an organization's information within that organization [4]. In addition, intranet refers to organization's internal website that means only used by in a company and not open to anyone who is not in that company.

The users of the SENTral are employees of Siemens EC. They can be an employee in a department, a manager of a department, an employee of human resources department and an admin.

1.5. Definitions and Abbreviations

The following is a list of terms, acronyms and abbreviations used by the Siemens EC Human Resources Management System software and related documentation.

ABBREVIATIONS	DEFINITIONS	
SENTral	Siemens EC Human Resources	
	Management System	
ERP	Enterprise Resource Planning	
DB	Database	
PBS	Personel Bilgi Sistemi	
PITS	Personel İzin Takip Sistemi	
PEM	Personel Eğitim Modülü	
ALM	Annual Leave Module	
ТМ	Training Module	
MDM	Master Data Module	
HR	Human Resources	
SRS	Software Requirement Specifications	
JSF	Java Server Faces	
GWT	Google Web Toolkit	
Ms SQL	Microsoft SQL Server	

1.6. References

[1] IEEE Std 830-1998: IEEE Recommended Practice for Software Requirements Specifications

- [2] http://www.ias.com.tr/344/erp-nedir.htm
- [3] <u>http://erp.karmabilgi.net/erp-programlari/</u>
- [4] <u>http://en.wikipedia.org/wiki/Intranet</u>
- [5] <u>http://creately.com/</u>, (For all diagrams)

[6] <u>http://www.siemens-enterprise.com/</u>, (Personal Training Module Manual, Personal Annual Leave Module Manual)

1.7. Overview

At the rest of this document, there are overall descriptions of the product, specific requirements, data model, behavioral model and planning for the SENTral. There is also a conclusion at the end of this document.

2. Overall Description

This section of the document describes all general factors of the SENTral and its requirements.

2.1. Product Perspective



Figure 1. Block diagram showing interaction between users and the system

2.1.1. System Interfaces

The SENTral is the new system succeeding of PBS currently used in Siemens EC. It is a standalone web-based project to manage of employees' data, annual leaves and trainings. It is intended to implement all PBS's features for the administration of Siemens EC employees' and managers needs. The SENTral is using J2EE platform. Thus, SENTral is a platform independent intranet system. There is only need to have a web browser. It will also be developed in an open source framework such as JSF, GWT, Vaadin etc. All components follow Model-View-Controller pattern.

The SENTral uses Ms SQL Server database management system to manage and keep data. By connecting DB with a database connector components such as JDBC, it imports to and exports from DB.

2.1.2. User Interfaces

The user interfaces of the SENTral are going to be achieved through a web browser. Thus, it will use web technologies such as HTML, CSS, AJAX, JavaScript etc. There will be forms, buttons, select boxes, text boxes to interact with the user.

There is a main login interface of the system. Each level of user will login to SENTral by this login page. In the login page, there is an authentication system to verify that the user is an employee of Siemens EC. After login to system, there are three modules such as MDM, ALM and TM. There is also an authorization system for each user can access his or her own pages and access rights. Each module has its own user interface. Every user type can only access its own interface.



Figure 2. Employee Interface



Figure 3. Manager Interface



Figure 3. Administrator Interface



Figure 4. Human Resources Interface

2.1.3. Hardware Interfaces

2.1.3.1. Server Side

The web application will be hosted on one of the servers of the company and connecting one of the Microsoft Sql Database servers.

2.1.3.2. Client Side

The system is a web-based application and also it is a intranet system that is only used by the employee of the company. The user must have an internet connection in order to access the system and to use application. Also users are requiring to have a modern web browser such as Mozilla Firefox, Internet Explorer or Google Chrome etc.

2.1.4. Software Interfaces

In this system, an open source Java web application will be used. Although it is certain that the framework will be open source, it is not determined which open source framework will be used in our project.

2.1.5. Communication Interfaces

The HTTP protocol will be used to facilitate communications between the client and server. Also, SMTP protocol will be used to manage mail notification system.

2.2. Product Functions

This section outlines all the main feature of the SENTral. Although, there are three modules of the SENTral which are MDM, ALM and TM, there are product functions of ALM and TM separately in this section. For MDM functions and user roles, they can be seen in SRS prepared by InnovaSoft.

2.2.1. Annual Leave Module Functions

2.2.1.1. Employee Role

2.2.1.1.1. Login & Logout

If an employee of Siemens EC is not defined in the DB of SENTral, he or she can use this system by getting an ID and password from an admin. If employee is defined in the DB of SENTral, he or she can use the system by writing their own IDs and passwords to login page. Employee users will login to and logout from the system.



2.2.1.1.2. View of Used Annual Leaves

By using this function, employees can see their annual leaves which were already used.



2.2.1.1.3. Planning of Annual Leaves

Employees can plan their annual leaves which will be taken by them in the future.



2.2.1.1.4. Printing Leave Paper

In this function, employees will print annual leave paper for approval of their managers and human resources department managers.





2.2.1.2. Manager Role

A manager of a department in Siemens EC has two roles in the system. The first role of a manager is manager role. Second role of a manager is employee role. This section contains only special functions of manager role. Employee role functions are also valid for manager role. They are described in 2.2.1.1. [5]. Employee Role section.

2.2.1.2.1. Login & Logout

If a manager of a department in Siemens EC is not defined in the DB of SENTral, he or she can use this system by getting an ID and password from an admin. If employee is defined in the DB of SENTral, he or she can use the system by writing their own IDs and passwords to login page. Employee users will login to and logout from the system.



2.2.1.2.2. -View of Employees' Information

By using this function, managers can see information, mentioned in Employee Role functions, of employees working under their supervision and their departments.



2.2.1.3. Human Resources Manager Role

Human resources manager has three user roles which are an employee, a manager and a human resources manager. This section only contains special functions of human resources manager role. The role functions of a manager are described in section 2.2.1.2. [6]. Manager Role. Also, the role functions of an employee are described in section 2.2.1.1. [7].

2.2.1.3.1. Login & Logout

If a human resources manager in Siemens EC is not defined in the DB of SENTral, he or she can use this system by getting an ID and password from an admin. If employee is defined in the DB of SENTral, he or she can use the system by writing their own IDs and passwords to login page. Employee users will login to and logout from the system.



2.2.1.3.2. Secondary Approval of Annual Leaves

Human resources manager can approve an annual leave requested by an employee after this employee's manager approves employee's demand.



2.2.1.3.3. Entering Special Days

By using this function, a human resources manager can enter special days such as national holidays, public holidays, to the system.



2.2.1.3.4. Generating General Reports

A human resources manager can create reports about all employees in all departments by using this function according to their data.



2.2.1.4. Admin Role

Admin is the super user of the system. All functions of other roles are valid for admin role. An admin can also activate and deactivate the SENTral ALM and TM for usage.

2.2.1.4.1. Activate System

Admin can activate system for making available to usage of users.



2.2.1.4.2. Deactivate System

Admin can also deactivate system for several reasons such as maintenance, restoration.



2.2.2. Training Module Functions

2.2.2.1. Employee Role

2.2.2.1.1. View of Trainings

An employee can see trainings defined in the system by using this function.



2.2.2.1.2. Training Request

Employee makes request for attending a training defined in the system.



2.2.2.1.3. Listing Trainings

By using this function, an employee can list trainings requested to participate, trainings planned to participate and trainings attended until that day.



2.2.2.1.4. Filling in Evaluation Forms

This function provides employee to fill in an evaluation form about trainings attended by employee.



2.2.2.2. Manager Role

As in the ALM, a manager has two roles such as manager role and employee role in TM. Thus, the functions described for employee role in employee role section are also valid for manager role. Hence, this section contains functions used only by manager role type users.

2.2.2.2.1. Listing Employees' Trainings

This function serves that a manager can list trainings attended by employees, trainings planned to participate by employees and trainings requested to attend by employees.



2.2.2.2.2. Approval and Disapproval of Requested Trainings

By using this function, a manager can approve and disapprove of trainings requested by employees to attend.



2.2.2.3. Admin Role

Admin is also the super user in TM. He or she can use all functions described for other user roles such as employee and manager roles. In addition, this user role has some other functions which are used only by admin. This section contains functions used only by admin role.

2.2.2.3.1. Inserting New Trainings to System

This function provides admin to insert new trainings to system for other users.



By using this function, admin can plan participants of a training.



2.2.2.3.3. View of Training Evaluations

Admin can see evaluations of trainings one by one evaluated by employees. Also, this function also serves that admin can see average evaluations of trainings.



[online diagramming & design] Creately.com

2.3. Constraints, Assumptions and Dependencies

The SENTral will be a web-based Java application. Thus, it will be developed in Java programming language. According to Siemens EC demands, this application must be developed under an open source Java framework. Due to the fact that Siemens EC uses Ms SQL Server as database management system, the SENTral should also use Ms SQL Server.

There is no need to internet connection to access this system. A web browser is the only need of a user. Because, it is an intranet system, the SENTral should locate at Siemens EC's own server and LAN. On the server, Java and its cryptographic packages must be installed.

There is an assumption that Ms SQL Server is installed on the server. Another assumption is authentication and authorization mechanism will be done by InnovaSoft which is another senior design project group working on this project. Also, MDM will be done by InnovaSoft. Thus, we assume that there will be no problem about these parts of the project.

Dependency of ALM and TM is a data dependency. These modules use data inserted in DB by using MDM. Although it is web-base system, another dependency is that Java should be installed on the server.

3. Specific Requirements

3.1. Interface Requirements

Interface concept can be considered as one of the main and important issues of our system. Users are in a strong relationship with user interface, because they can operate the tasks and control all info by directly using it. We can analyze the main interface's input and outputs by associating them with the user cases such as employee, manager, human resources manager and admin in our system.

User interface is created for users to use and understand the system easily and cleverly. Therefore it has to understand the actions that were made by users and process them in order to answer the requested info. processing user actions is an important requirement for our user interface. Input can be considered as the actions that were made by the users and output is reasonable result by processing these actions.

Our interface contains many objects, panels, menus of actions and other information. Therefore, in order to display all these parts to the user, user interface should have to generate all interface components. When the user enters to the application, information about system and other components will be displayed on the screen.

3.2. Functional Requirements

All login & logout functions will be done by InnovaSoft. That is why authentication and authorization mechanisms are under their responsibilities. Thus, it can seen functional requirements of login & logout functions InnovaSoft SRS document.

3.2.1. Annual Leave Module Functions

View of Used Annual Leaves 3.2.1.1.

Func: ViewOfUsedLeaves		
Primary Actor: User		
Stakeholders: Employee		
Goal: to view used annual leaves by the employee		
Brief Description: This explains how to an employee can view his/her annual leaves		
Precondition: The employee logs in to the system		
Normal Flow Of Events:		
1- User opens web browser and types the address of login page		
2- User logins to the system with her user name and password		
3- After opening the main page user clicks on Annual Leave Module		
A- User views used annual leaves from available nanel		



3.2.1.2. Planning of Annual Leaves

Func: PlanAnualLeave		
Primary Actor: User		
Stakeholders: Employee		
Goal: to plan annual leaves by the employee		
Brief Description: This explains how to an employee can plan his/her annual leaves		
Precondition: The employee enter to the annual leave module		
Normal Flow Of Events:		
1- User opens web browser and types the address of login page		
2- User logins to the system with her user name and password		
3- After opening the main page user clicks on Annual Leave Module		
4- User selects the planning section from the annual leaves module		
5- User fills the start and final dates of his/her annual leaves		
6- User also fills "half day" subsection		
Alternative Flow Of Events: If there is failure in the input an error message will be		
given.		



3.2.1.3. Printing Leave Paper

Func: PrintAnualLeave

Primary Actor: User

Stakeholders: Employee

Goal: to print annual leaves by the employee

Brief Description: This explains how to an employee can print his/her annual leaves **Precondition:** The employee selects the planning section from the annual leaves

module

Normal Flow Of Events:

- 1- User opens web browser and types the address of login page
- 2- User logins to the system with her user name and password
- 3- After opening the main page user clicks on Annual Leave Module
- 4- The employee selects the planning section from the annual leaves module
- 5- User fills the start and final dates of his/her annual leaves
- 6- User also fills "half day" subsection
- 7- User clicks on "print leave paper" button



3.2.1.4. View of Rest Annual Leaves

Func: ViewRestAnnualLeaves

Primary Actor: User

Stakeholders: Employee

Goal: to view rest annual leaves by the employee

Brief Description: This explains how an employee can view his/her rest annual leaves **Precondition:** The employee logs in to the system

Normal Flow Of Events:

- 1- User opens web browser and types the address of login page
- 2- User logins to the system with her user name and password
- 3- After opening the main page user clicks on Annual Leave Module
- 4- User views rest annual leaves from available panel



3.2.1.5. View of Employees' Information

Func: ViewEmployeeInfo		
Primary Actor: User		
Stakeholders: Manager		
Goal: to view employees' information		
Brief Description: This explains how manager can view his/her employees'		
information		
Precondition: The manager logs in to the system		
Normal Flow Of Events:		
 User opens web browser and types the address of login page 		
2- User logins to the system with her user name and password		
3- After opening the main page user clicks on Annual Leave Module		
4- User views his/her employees' information		



3.2.1.6. Approval of Annual Leaves

Func: ApproveofAnnualLeaves		
Primary Actor: User		
Stakeholders: Manager		
Goal: to approve employees' annual leave request		
Brief Description: This explains how manager can approve his/her employees'		
annual leave request		
Precondition: The manager selects the annual leaves module from the system main		
page		
Normal Flow Of Events:		
1- User opens web browser and types the address of login page		
2- User logins to the system with her user name and password		
3- After opening the main page user clicks on Annual Leave Module		
4- User views his/her employees' annual leaves information		
5- User selects appropriate annual leave request		
6- User clikcs on "Approve" button to approve selected request		
Alternative Flow Of Events: If there is failure in the input an error message will be		
given.		



3.2.1.7. Generating Reports

Func: GenerateReport		
Primary Actor: User		
Stakeholders: Manager		
Goal: to generate reports		
Brief Description: This explains how manager can generate his/her employees'		
report		
Precondition: The manager selects the annual leaves module from the system main		
page		
Normal Flow Of Events:		
1- User opens web browser and types the address of login page		
2- User logins to the system with her user name and password		
3- After opening the main page user clicks on Annual Leave Module		
4- User selects information needed from system database		
5- User clikcs on "Generate" button to take selected leave reports		
Alternative Flow Of Events: If there is failure in the input an error message will be		

given.



3.2.1.8. Secondary Approval of Annual Leaves

Func: SecApproveofAnnualLeaves

Primary Actor: User

Stakeholders: Human Resources Manager

Goal: to approve employees' annual leave request

Brief Description: This explains how human resources manager can approve employees' annual leave request

Precondition: The human resources manager selects the annual leaves module from the system main page

Normal Flow Of Events:

- 1- User opens web browser and types the address of login page
- 2- User logins to the system with her user name and password
- 3- After opening the main page user clicks on Annual Leave Module
- 4- User selects appropriate annual leave requests which are already once approved by manager
- 5- User clikcs on "Approve" button to approve selected request



3.2.1.9. Entering Special Days

Func: SpecialDays

Primary Actor: User

Stakeholders: Human Resources Manager

Goal: to add special days

Brief Description: This explains how human resources manager can add special days to the annual calendar

Precondition: The human resources manager selects the annual leaves module from the system main page

Normal Flow Of Events:

- 1- User opens web browser and types the address of login page
- 2- User logins to the system with her user name and password
- 3- After opening the main page user clicks on Annual Leave Module
- 4- User fills special dates to the appropriate panel
- 5- User clikcs on "Add" button



3.2.1.10. Generating General Reports

Func: Generating general reports

Primary Actor: User

Stakeholders: Human Resources Manager

Goal: to approve employees' annual leave request

Brief Description: This explains how human resources manager can generate all employee's reports

Precondition: The human resources manager enters the annual leaves module **Normal Flow Of Events:**

- 1- User opens web browser and types the address of login page
- 2- User logins to the system with her user name and password
- 3- After opening the main page user clicks on Annual Leave Module
- 4- User selects information needed from system database
- 5- User clikcs on "Generate" button to take all selected leave reports.



3.2.1.11. Activate System

Func: ActivateSystem		
Primary Actor: User		
Stakeholders: Adminstrator		
Goal: to activate system		
Brief Description: This explains how administrator can activate the system		
Precondition: The administrator enters the annual leaves module		
Normal Flow Of Events:		
1- User opens web browser and types the address of login page		
2- User logins to the system with her user name and password		
3- After opening the main page user clicks on Annual Leave Module		
4- User clikcs on "Activate" button to activate the system		



3.2.1.12. Deactivate System

Func: DeactivateSystem		
Primary Actor: User		
Stakeholders: Adminstrator		
Goal: to deactivate system		
Brief Description: This explains how administrator can deactivate the system		
Precondition: The administrator enters the annual leaves module		
Normal Flow Of Events:		
 User opens web browser and types the address of login page 		
User logins to the system with her user name and password		
3- After opening the main page user clicks on Annual Leave Module		
4- User clikcs on "Deactivate" button to deactivate the system		



3.2.2. Training Module Functions

3.2.2.1. View of Trainings

Func: ViewTraining		
Primary Actor: User		
Stakeholders: Employee		
Goal: to view trainings' list		
Brief Description: This explains how user can view tranining list		
Precondition: The user logs in to the system		
Normal Flow Of Events:		
 User opens web browser and types the address of login page 		
2- User logins to the system with her user name and password		
3- After opening the main page user clicks on Training Module		



3.2.2.2. Training Request

Func: TrainingRequest

Primary Actor: User

Stakeholders: Employee

Goal: to request training

Brief Description: This explains how employee can request a tranining or list of traings

Precondition: The employee enters Training Module

Normal Flow Of Events:

- 1- User opens web browser and types the address of login page
- 2- User logins to the system with her user name and password
- 3- After opening the main page user clicks on Training Module
- 4- User selects the trainings fom the panel
- 5- User clicks the "Request" button.



3.2.2.3. Listing Trainings

Func: ListingRequest		
Primary Actor: User		
Stakeholders: Employee		
Goal: to list training		
Brief Description: This explains how employee can request a trainining or list of		
traings		
Precondition: The employee enters Training Module		
Normal Flow Of Events:		
1- User opens web browser and types the address of login page		
User logins to the system with her user name and password		
3- After opening the main page user clicks on Training Module		
4- User lists available trainings		



3.2.2.4. Filling in Evaluation Forms

Func: FillEvaluationForm

Primary Actor: User

Stakeholders: Employee

Goal: to fill evaluation forms

Brief Description: This explains how employee can fill the forms about trainings that user have attended.

Precondition: The employee enters Training Module

Normal Flow Of Events:

- 1- User opens web browser and types the address of login page
- 2- User logins to the system with her user name and password
- 3- After opening the main page user clicks on Training Module
- 4- User enters the Evaluation Forms page.
- 5- User fills the form



3.2.2.5. Listing Employee's Trainings

Func: ListTrainings		
Primary Actor: User		
Stakeholders: Menager		
Goal: to view the employee's trainings		
Brief Description: This explains how manager can view the information about		
trainings that the employee have attended or requested.		
Precondition: The menager enters Training Module		
Normal Flow Of Events:		
1- User opens web browser and types the address of login page		
2- User logins to the system with her user name and password		
3- After opening the main page user clicks on Training Module		
4- User lists employees' trainings		



3.2.2.6. Approval and Disapproval of Requested Trainings

Func: ApprovalandDisapprovalofRequestedTrainings

Primary Actor: User

Stakeholders: Employee

Goal: to fill evaluation forms

Brief Description: This explains how employee can fill the forms about trainings that user have attended.

Precondition: The employee enters Training Module

Normal Flow Of Events:

- 1- User opens web browser and types the address of login page
- 2- User logins to the system with her user name and password
- 3- After opening the main page user clicks on Training Module
- 4- User selects appropriate training request
- 5- User clicks on "Approve" or "Disapprove" button



3.2.2.7. Inserting New Trainings to System

Func: InsertingTrainings

Primary Actor: User

Stakeholders: Administrator

Goal: to rainings to system

Brief Description: This explains how administrator can fill the forms about trainings that user have attended.

Precondition: The administrator enters Training Module

Normal Flow Of Events:

- 1- User opens web browser and types the address of login page
- 2- User logins to the system with her user name and password
- 3- After opening the main page user clicks on Training Module
- 4- User fills appropriate panel with the details of new training
- 5- User clicks on "Insert" button



3.2.2.8. Planning of Training Participants

 Func: PlaningTrainingParticipants

 Primary Actor: User

 Stakeholders: Administrator

 Goal: to plan training participants

 Brief Description: This explains how administrator can plan training participants

 Precondition: The employee enters Training Module

 Normal Flow Of Events:

 1- User opens web browser and types the address of login page

 2- User logins to the system with her user name and password

 3- After opening the main page user clicks on Training Module

 4- User selects appropriate panel

 5- User plans training participants

 Alternative Flow Of Events: If there is failure in the input an error message will be given.



3.2.2.9. View of Training Evaluations

Func: ViewofTRainingEvaluations

Primary Actor: User

Stakeholders: Administrator

Goal: to view training evaluations

Brief Description: This explains how administrator can view training evaluations

Precondition: The administrator enters Training Module

Normal Flow Of Events:

- 1- User opens web browser and types the address of login page
- 2- User logins to the system with her user name and password
- 3- After opening the main page user clicks on Training Module
- 4- User selects appropriate panel
- 5- User views training evaluations



3.3. Non-functional Requirements

3.3.1. Performance Requirements

The system is expected to response in a short time. The SENTral will be able to response to users' requests in 2-3 seconds. The system performance may vary for different functions in different modules. The reason of this performance difference is about the DB connection and operations on DB.

There is no limit on login users in the system. However, SENTral can serve at least 200 people. The reason of this situation is that there are approximately 200 employees in Siemens EC. This number may vary in next years. Thus, the system will be able to serve different numbers of users.

3.3.2. Design Constraints

According to Siemens EC project managers' decision, Java programming language will be used in this project. Also, usage of an open source framework is a mandatory for the project.

4. Data Model and Descriptions

This section contains data models which will be used in the ALM and TM of the SENTral. Section includes also descriptions of data and relationships between them.

4.1. Data Descriptions

There will be 6 types of objects in the system. These data objects are "User", "AnnualLeave", "Training", "Report", "EvaluationForm" and "Database".

4.1.1. Data Objects

4.1.1.1. User Object

This object will be used to keep name, surname, user Id, department name, age, gender and array of user types.

User: userId, name, surname, departmentName, age, gender, usertype[].

4.1.1.2. AnnualLeave Object

This object consists of year of the leave, number of leave days to be able to use, start date of a leave, finish date of a leave and duration of a leave.

AnnualLeave: leaveYear, numOfLeaveDays, startDateOfLeave, finishDateOfLeave, durationOfLeave.

4.1.1.3. Training Object

This object holds to name of a training, name of organization providing training, type of training, start date of training and finish date of training.

Training: trainingName, organizationName, typeOfTraining, startDateOfTraining, finishDateOfTraining.

4.1.1.4. Report Object

This object will be used to keep a User object array, Training object array, AnnualLeave object array and type of the report.

Report: User[], Training[], AnnualLeave[], reportType.

4.1.1.5. EvaluationForm Object

This object consists of a Training object array, User object array and evaluation questions array.

EvaluationForm: User[], Training[], evaluationQuestions[].

4.1.1.6. Database Object

This object will be used to hold name of the DB, name of the DB host, name of the DB user, password of the DB, connection string of the DB and query string for the DB operation.

Database: dbName, dbHostName, dbUserName, dbPassword, connectionString, queryString.

4.1.2. Relationships

All objects except for Database object are associated with each others. Implementations and methods of different objects are required other objects' attributes. A user object can create an annual object, training object, report object or an evaluation form object. Also, report object and evaluation form object consist of user object array and training object array. In addition, report object has annual leave object array. Other 5 objects are not directly associated with database object. Database object will be used for accessing the DB and querying on it. This object will be created in methods of other objects.

4.1.3. Complete Date Model



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4.1.4. Data Dictionary

This section contains data dictionary for object mentioned section 4.1.1. Data Objects.

4.1.4.1. User

Header	Description	Field Type	Field Length/Maximum
UserId	This is a unique user idendification number which is special to every defined user.	Numeric	4 / 9999
Name	It is the name of a user.	String (of characters)	25
surname	This is the surname of a user.	String (of characters)	25
departmentName	This is name of department in which a user works.	String (of characters)	60
Age	It is age of user.	Numeric	2 / 99
gender	This is for gender of a user	String (of characters)	6
userType	An array of strings keeps user types.	String array	4

4.1.4.2. AnnualLeave

Header	Description	Field Type	Field Length/Maximum
leaveYear	This is year of annual leave	Numeric	4 / 9999
numOfLeaveDays	This keeps number of leave days which is not taken	Numeric	2/99
startDateOfLeave	This is the start date of a leave	Date	DD.MM.YYYY
finishDateOfLeave	This is the finish date of a leave.	Date	DD.MM.YYYY
durationOfLeave	It is duration of an annual leave which is type of day.	Numeric	2/99

4.1.4.3. Training

Header	Description	Field Type	Field Length/Maximum
trainingName	It keeps name of a training.	String (of characters)	100
organizationName	It is the name of organization which prepares the training.	String (of characters)	100
typeOfTraining	This is type of training.	String (of characters)	25
startDateOfTraining	This is start date of a training.	Date	DD.MM.YYYY
finishDateOfTraining	It is finish date of a training.	Date	DD.MM.YYYY

4.1.4.4. Report

Header	Description	Field Type	Field Length/Maximum					
User[]	An array of users about whom generating reports.	Array of User object	400					
Training[]	An array of trainings about which generating reports.	Array of Training object	100					
AnnualLeave[]	An array of annual leaves about which creating reports.	Array of AnnualLeave object	100					
reportType	This is type of report which is about trainings or annual leaves	String (of characters)	15					

4.1.4.5. EvaluationForm

Header	Description	Field Type	Field Length/Maximum
User[]	An array of users filling in evaluation forms.	Array of User object	400
Training[]	An array of trainings evaluated by users.	Array of Training object	100
evaluationQuestions[]	An array of evalution questions asked to users for evaluation	Array of String (of characters)	100

4.1.4.6. Database

Header	Description	Field Type	Field Length/Maximum
dbName	This is name of database used in system	String (of characters)	100
dbHostName	It is the name of host in which database located.	String (of characters)	50
dbUserName	This is name of database user.	String (of characters)	50
dbPassword	This is password of database.	String (of characters)	20
connectionString	It is the connection string for accessing the database.	String (of characters)	200
queryString	This is query string for operating on database	String (of characters)	200

5. Behavioral Model and Description

5.1. Description of Software Behavior

First of all, we explain major states of the software. Major states of software can be listed as: Login Screen, Main Window, Training Module Screen, Annual Leave Module Screen, Message Screen, and Alert Screen. Everything starts with the Login Screen. After user authentication, we can pass the Main Window state. In Main Window state, we have our main user interface application on the screen. We can pass from this state to screens, Alert Screen state for emergency conditions or Settings Screen state for settings.

5.2. State Transition Diagram



6. PLANNING

6.1. Team Structure

The team consists of four members: Alperen Kavun, Tarlan Kheyrullayev, Nihat Büke and Gökhan Gümüş.

Everyone has equal rights and we have a collaborative, mutual decision mechanism. Since we are always in touch and discuss the project related topics together we do not need a leader. Overall design of the project is the result of our joint decisions.

Although we have no strict divisions and everyone contributes to the whole project, each of us coordinates one of the three parts of the project, responsible for details of that part and its interaction with other two.

6.2. Process Model

After starting to work on our application, we will do analysis and design of the project. Then we will build the software using different approaches at different stages.

	October			November			December					January								
COMPONENT/TASK	10	17	24	31	7	14	21	28	5	12	19	26	2	9	16	23	30			
Project Management																				
Pre-Proposal																				
Proposal Report																				
Market Research																				
Literature Survey																				
SRS																				
Java Framework Research																				
Java Application Study																				
Initial Design Report																				
Team Presentation																				
Detailed Design Report																				
Demo Prototype																				
	F	[:] ebr	uar	у	Mart				,	Apri			May				June			
COMPONENT/TASK	6	13	20	27	5	12	19	26	2	9	16	23	30	7	14	21	28	4	11	18
Implementation																				
Coding																				
Debug																				
Extra Features																				
Finalize																				
Documents																				
Code Review																				
Test																				
Web Page																				
Presentation																				

7. Conclusion

In this SRS document, complete description of Human Resources Management System (SENtral) behaviour, features, data flowing and other requirements were stated. These reqirements will help the progression of the project in other stages. However, all of these may be subject to changes in further development stages.