# REVISED DETAILED DESIGN REPORT FOR SIEMENS EC HUMAN RESOURCES MANAGEMENT SYSTEM

## LOTSOFT

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# 1. INTRODUCTION

This document includes the initial design strategies, overall system architecture and data architecture for SENTral which is Siemens EC Human Resources Management System. There are system overview, design considerations, data designs, system architecture, user interface designs, libraries and tools which will be used in project and time planning of the project.

## 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.

The old software system used in Siemens EC does not have a dynamic structure. In addition, it is very difficult to upgrade the system and to add new modules or functions. Thus, our project will have a dynamic structure to overcome these problems.

There are about 200 employees in the company, so it is very hard to manage annual leaves and trainings of employees by manually for HR department. Also, it is not a very useful method for planning of resources and getting reports about employees.

Also, they are very important issues for managers to know information of employees in their department and to get reports about employees. Hence, the new system can be a solution for that problem.

For employees, there are a lot of procedures for getting an annual leave and attending training. All these procedures take so many times. In addition, to see of their information about annual leaves and training is very important for planning their future requests and rights.

Thus, in order to overcome all these problems there is a need of a contemporary software system for Siemens EC. By using this system, all processes and procedures can be done on a network, such as an intranet, in the company. Also, the SENTral will contribute to company for managing employees and for planning of future of company.

## 1.2. Purpose

The aim of this document is providing a description of the software product in order to give the developers a guidance of the architecture of the software. It also serves the purpose of making the functionality clear to system designers.

## 1.3. Scope

This document includes descriptions about the design of the SENTral. All components and functions of the system are introduced in this document. However, there are design descriptions for only ALM and TM of the SENTral. Also, the document describes the database tables, entity relations between objects and architectural structure of the system as noted in SRS document. Thus, this document is a guideline for software developers of the SENTral project.

## 1.4. Overview

At rest of this document, there are introduced system overview which provides a general description of the SENTral including its functionality and matters related to the overall system and its design in chapter 2. In chapter 3, there are design considerations such as assumptions, dependencies, constraints, goals and guidelines. There are data descriptions and data dictionary at chapter 4 which is Data Design. In chapter 5, there is system architecture of the SENTral. The user interface design is at the chapter 6. The libraries and tools will be used in the project are at the chapter 7.

There are time plannings for this and next term as gantt charts. And the last chapter is a brief conclusion of this document.

## 1.5. Definitions and Abbreviations

The table in the Figure 1 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 |
| TM | 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 |
| ER | Entity Relationship |
| MVC | Model-View-Controller |

**Figure 1: Definitions and Abbreviations**

## 1.6. References

[1] IEEE Std 1016-1998 - IEEE Recommended Practice for Software Design Descriptions.

[2] http://en.wikipedia.org/wiki/Software_Design_Description

[3] Software Requirements Specification Report for Siemens EC. Human Resources Management System prepared by LotSoft

[4] Software Requirements Specification Report for Siemens EC. Human Resources Management System prepared by InnovaSoft

[5] Initial Design Report prepared by InnovaSoft

[6] http://en.wikipedia.org/wiki/Eclipse_%28software%29

[7] http://en.wikipedia.org/wiki/SQL_Server_Management_Studio

[8] http://en.wikipedia.org/wiki/Java_Platform,_Standard_Edition

[9] http://en.wikipedia.org/wiki/Ajax_%28programming%29

[10] http://en.wikipedia.org/wiki/Hibernate_%28Java%29

[11] http://en.wikipedia.org/wiki/HTML

[12] http://en.wikipedia.org/wiki/Cascading_Style_Sheets

# 2. System Overview

Our project consists of two main parts, namely ALM (Annual Leave Module) and TM (Training Module). In these modules we have three roles. These roles are employee, manager, HR manager. In Figure 2, there is a diagram for explanation of general system overview of the SENTral.

In ALM of this project, employees should be able to see their annual leaves, to plan their annual leaves, to query about their annual leaves. Managers should be able to do all processes defined for employee role and be able to see information about the annual leaves of employees in their departments. Also, a manager should approve or disapprove an annual leave request done by an employee. A manager should be able to query about employees' annual leaves and to get reports about them. A HR manager should be able to do all functions and processes defined for employee role and manager role. In addition, a HR manager should be able to get reports about all employees in the company.

In TM of this project, employees should be able to see the trainings that are open for them and the dates of these trainings. They are able to request to attend training, and also be able to see the trainings which they have been attended so far. In common with ALM, manager should be able to do all functions of the employee role. Also he/she should be able to see the employees' trainings that are attended before. Manager can approve or disapprove the training requests of employees. In the system an HR manager is able to do all processes defined for employee and manager and additional to this he/she has an allowance to get reports about the trainings of the employees.

Actually, this project is divided into two parts. Our responsibilities in this project are ALM and TM. Other part will be projected by another group but our modules will be related with their master data module (Personal Information System). These relations will be clarified in case of necessity.

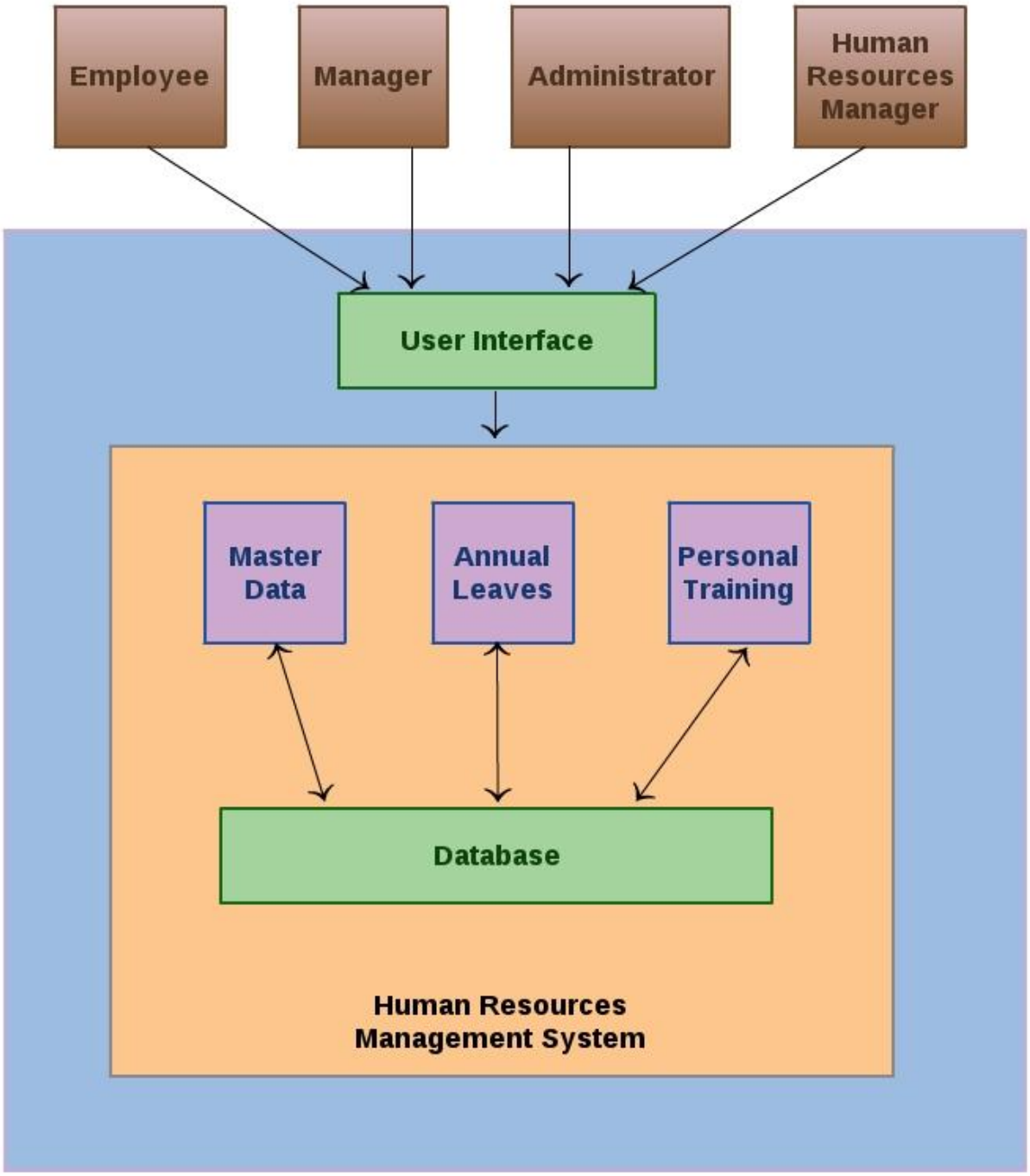



**Figure 2: SENTral in a larger context**

# 3. Design Considerations

## 3.1. Design Assumptions, Dependencies and Constraints

### 3.1.1. Time Constraints

Our human resources management system (SENTral) manages to run requests of at most 200 hundreds users of Siemens Company at the same time. For this purpose, system should able to access database and get information requested with 2-3 seconds latency. Users connect to our system through intranet. Performance of our system depends on the speed of their local server.

### 3.1.2. Resources Constraints

Siemens Company has a database for human resources management system. They have been using this database for their old system. Any big changes to database are not necessary for this project. However, some minor details can be added or removed according to company's request.

### 3.1.3. Performance Constraints

Poor performance of SENTral is not expected since number of users is not over two hundreds. Moreover, performance of the system is directly related to local server that company using. Technical quality of our implementation also affects the performance of SENTral.

### 3.1.4. Software Constraints

The system will be implemented by using Java programming language. Usage of an open source Java framework is mandatory for this project.

It should be a web based system. In this project ZK framework will be used as an open source java framework.

DBMS of this project is Microsoft SQL Server. Hibernate will be used as Object Relation Mapping tool. Database for this project is available in the company and have been used in the previous human resources management system.

The project will be developed in Eclipse IDE.

### 3.1.5. Hardware Constraints

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

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 required to have a modern web browser such as Mozilla Firefox, Internet Explorer or Google Chrome etc.

## 3.2. Design Goals and Guidelines

Since the system will work on web services, it must prevent all attacks from the outside and only authorized people must access the database.

Also another major principle that the system must provide is reliability. People must rely on the system and they must use the system in confidence.

Functionality is another important issue that should be considered. We should keep module interfaces simple so that users can easily make use of them. Functions of system should be understandable and sufficient for our clients.

# 4. Data Design

## 4.1. Data Description

We will keep the information about the data objects in a database management system whose name is Ms SQL. There is a database already designed and used in the company and we will use this database by making some changes such as adding or deleting some columns in the database tables. We have mainly 6 tables in the database. These tables are employee table, used annual leaves table, leaves information table, excuse table, training table and participation table. We will use these tables for holding necessary information about employees, annual leaves and trainings. Employee annual leaves table, annual leave table and excuse table are only reachable by ALM. Training table and participation table are only reachable by TM. Employee table is reachable by both of the modules. E-R diagram in the Figure 3 shows relationship between these six tables.

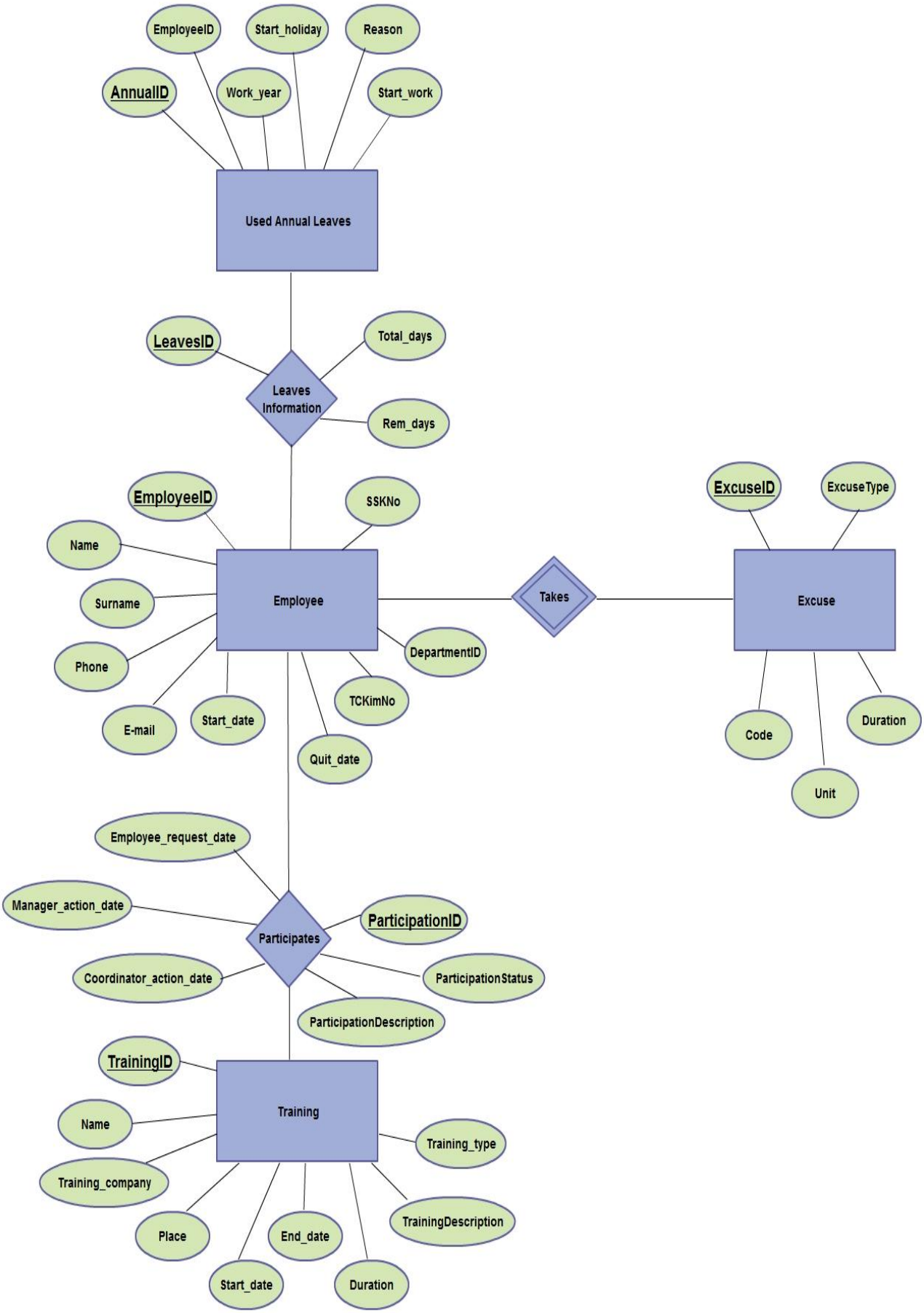



**Figure 3: E-R Diagram**

### 4.1.1. Employee Table

Employee table holds shown in Figure 4 information about the employee user of the SENTral. It holds the basic attributes of employee entity which are EmployeeID, Name, Surname, Phone, E-mail, Start_date, Quit_date, TCKimNo, SSKNo, DepartmentID. EmployeeID is the primary key of employee table.

| Field Name | Type | Null | Foreign Key | References |
|---|---|---|---|---|
| **EmployeeID** | varchar(50) | No | No | - |
| **Name** | varchar(32) | No | No | - |
| **Surname** | varchar(32) | No | No | - |
| **Phone** | varchar(16) | Yes | No | - |
| **E-mail** | varchar(50) | No | No | - |
| **Start_date** | datetime | Yes | No | - |
| **Quit_date** | datetime | Yes | No | - |
| **TCKimNo** | varchar(11) | No | No | - |
| **SSKNo** | varchar(13) | No | No | - |
| **DepartmentID** | varchar(50) | No | No | - |

**Figure 4: Employee Table**

### 4.1.2. Leaves Information Table

Leaves Information Table (Figure 5) holds the information about the annual leaves of employee of our system. It contains basic attributes employee annual leaves entity such as AnnualID, EmployeeID, Work_year, Total_days and Rem_days. Primary key of this entity is LeavesID. EmployeeID and Work_year are foreign keys of this entity.

| Field Name | Type | Null | Foreign Key | References |
|---|---|---|---|---|
| **LeavesID** | Varchar(32) | No | No | - |
| **EmployeeID** | varchar(50) | No | Yes | Employee |
| **Work_year** | numeric(4,0) | Yes | Yes | Used Annual Leaves |
| **Total_days** | numeric(4,0) | Yes | No | - |
| **Rem_days** | numeric(4,1) | Yes | No | - |

**Figure 5: Employee Annual Leaves Table**

### 4.1.3. Used Annual Leaves Table

Used Annual Leaves Table (Figure 6) holds the information about the annual leaves of employees of the company. There are basic attributes in annual leaves entity such as AnnualID, EmployeeID, Work_year, Start_holiday, Start_Work and Reason. There is a primary key available for this entity which is AnnualID. EmployeeID is the foreign key references employee entity.

| Field Name | Type | Null | Foreign Key | References |
|---|---|---|---|---|
| **AnnualID** | Varchar(32) | No | No | - |
| **EmployeeID** | varchar(50) | No | Yes | Employee |
| **Work_year** | numeric(4,0) | Yes | No | - |
| **Start_holiday** | datetime | Yes | No | - |
| **Start_Work** | datetime | Yes | No | - |
| **Reason** | varchar(50) | Yes | No | - |

**Figure 6: Annual Leaves Table**

### 4.1.4. Excuse Table

Excuse table shown in Figure 7 holds the information about the excuses of employees in Siemens EC. company. Attributes of this entity are ExcuseID, ExcuseType, Code, Duration and Unit. The primary key is ExcuseID. There is one foreign key available which is EmployeeID. That key are references from Employee table.

| Field Name | Type | Null | Foreign Key | References |
|---|---|---|---|---|
| **ExcuseID** | varchar(32) | No | No | - |
| **EmployeeID** | Varchar(50) | No | Yes | Employee |
| **ExcuseType** | varchar(20) | Yes | No | - |
| **Code** | varchar(20) | Yes | No | - |
| **Duration** | numeric(4,0) | Yes | No | - |
| **Unit** | varchar(10) | Yes | No | - |

**Figure 7: Excuse Table**

### 4.1.5. Training Table

Training table (Figure 8) holds the information about the training requests available in the company. It holds attributes of training entity which are TrainingID, Name, Training_company, Place, Start_date, End_date, Duration, TrainingDescription and Training_type. Primary key is TrainingID column in this table. There is no foreign key.

| Field Name | Type | Null | Foreign Key | References |
|---|---|---|---|---|
| **TrainingID** | Varchar(32) | No | No | - |
| **Name** | nvarchar(350) | Yes | No | - |
| **Training_company** | nvarchar(350) | Yes | No | - |
| **Place** | nvarchar(350) | Yes | No | - |
| **Start_date** | datetime | Yes | No | - |
| **End_date** | datetime | Yes | No | - |
| **Duration** | numeric(18,0) | Yes | No | - |
| **TrainingDescription** | nvarchar(500) | Yes | No | - |
| **Training_type** | nvarchar(50) | Yes | No | - |

**Figure 8: Training Table**

### 4.1.6. Participation Table

Participation table (Figure 9) holds the information of employees' participation in training provided by company. It has attributes such as ParticipationID, TrainingID, EmployeeID, ParticipationStatus, Employee_request_date, Manager_action_date, Coordinator_action_date and ParticipationDescription. Primary key is ParticipationID. There are two foreign keys available which are TrainingID and EmployeeID. Those keys are references from Training table and Employee table accordingly.

| Field Name | Type | Null | Foreign Key | References |
|---|---|---|---|---|
| **ParticipationID** | Varchar(32) | No | No | - |
| **TrainingID** | Varchar(32) | No | Yes | Training |
| **EmployeeID** | varchar(50) | No | Yes | Employee |
| **ParticipationStatus** | varchar(50) | Yes | No | - |
| **Employee_request_date** | datetime | Yes | No | - |
| **Manager_action_date** | datetime | Yes | No | - |
| **Coordinator_action_date** | datetime | Yes | No | - |
| **ParticipationDescription** | varchar(500) | Yes | No | - |

**Figure 9: Participation Table**

## 4.2. Data Schemas

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.

There will be 6 types of objects in the system. These data objects are “User”, “AnnualLeave”, “Training”, “Report”, “EvaluationForm” and “Database”. If there occur a need for creating new classes for user types such as employees, managers and HR managers, it can be inherited from the user object.

### 4.2.1 Data Objects

#### 4.2.1.1. 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[].

#### 4.2.1.2. 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.

#### 4.2.1.3. Training Object

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

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

#### 4.2.1.4. 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.

#### 4.2.1.5. EvaluationForm Object

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

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

#### 4.2.1.6. 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.

### 4.2.2. 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.

### 4.2.3. Object Methods

In this section, there are methods of the objects mentioned the previous section.

#### 4.2.3.1. Methods of User Object

- getUserInfo() : This method gets information ,about the user such as user ID, name, surname, department name, legal annual leave right and the rest of annual leaves which are not used yet, from DB.
- viewAnnLeavesByYear() : This method provides to see annual leaves of user according to years. It gets annual leave year, annual leave right in terms of day and the rest of annual leaves which are not used at that year in terms of day from the DB.
- viewUsedAnnLeavesByYear() : This method is responsible for getting information about the annual leaves used in that year. The fields got from DB are start and finish dates of an annual leave and duration of the leave.
- planAnnLeave() : This method serves for planning an annual leave and request it from the manager.
- printAnnLeavePaper() : This method is responsible for getting necessary information from DB and user then, create an annual leave paper and finally printing it from a printer.
- approveAnnLeave() : This method is working for approve of a request for annual leave done by a employee. It is reachable for just manager and HR manager user types.
- disapproveAnnLeave() : This method is responsible for disapproving of a request for annual leave done by employee. It is reachable for just manager and HR manager user types.
- viewAttendedTrainings() : This method provides user to get information about the trainings which were attended by user.
- requestAttendTraining() : This method serves for requesting to attend a training from manager.
- approveTrainingRequest() : This method is working for approve of a request ,for attending to training, done by an employee. It is reachable for just manager and HR manager user types.
- disapproveTrainingRequest() : This method is responsible for disapproving of a request ,for attending to training, done by an employee. It is reachable for just manager and HR manager user types.

#### 4.2.3.2. Methods of Annual Leave Object

- addAnnLeave() : This method is responsible for adding a new annual leave to DB. The fields added to DB are the year of that annual leave, number of leave

days which is not taken, start date of the leave, finish date of the leave and duration of the leave.

- deleteAnnLeave() : This method serves for deleting an annual leave from DB.
- editAnnLeave() : This method is responsible for editing an annual leave to be planned for using and added to DB.

#### 4.2.3.3. Methods of Training Object

- addTraining() : This method provides user to add a new training to DB. The added fields to DB are training name, organization name which prepares the training, type of the training, start date of the training and finish date of the training.
- deleteTraining() : This method is responsible for deleting a training from the DB.
- editTraining() : This method serves for editing a training which was added to DB

#### 4.2.3.4. Methods of Report Object

- setUsers() : This method is responsible for setting the users about whom generating reports.
- setTrainings() : This method serves for setting trainings about which generating reports.
- setAnnLeave() : This method provides to set annual leaves about which generating reports.

#### 4.2.3.5. Methods of EvaluationForm Object

- setUsers() : This method is responsible for setting users fills in evaluation forms.
- setTrainings() : This method provides to set trainings evaluated by users.
- setEvalQuestions() : This method serves for setting evaluation questions asked to users for evaluation.

#### 4.2.3.6. Methods of Database Object

- setDBInfo() : This method is responsible for setting the DB information such as DB name, host name, user name , DB password.
- setConnStr() : This method is responsible for setting connection string for DB.
- setQueryStr() : This method is responsible for setting query string which will be executed on the DB.
- exeQuery() : This method is responsible for executing the query which is hold in queryString.

- dbConnect() : This method is responsible for connecting to DB by using connectionString.
- dbCutConnect() : This method is responsible for cutting the connection between DB and application.

## 4.3. Data Dictionary

This section contains data dictionary for object mentioned section 4.2. Data Objects.

### 4.3.1. 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 |

Figure 10: User object data dictionary

### 4.3.2. 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 |

Figure 11: AnnualLeave object data dictionary

### 4.3.3. 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 |

Figure 12: Training Object Data Dictionary

### 4.3.4. 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 |

**Figure 13: Report object data dictionary**

### 4.3.5. 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 |

**Figure 14: EvaluationForm object data dictionary**

### 4.3.6. 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 |

Figure 15: Database object data dictionary

## 4.4. Class Diagrams

### 4.4.1. Model Package

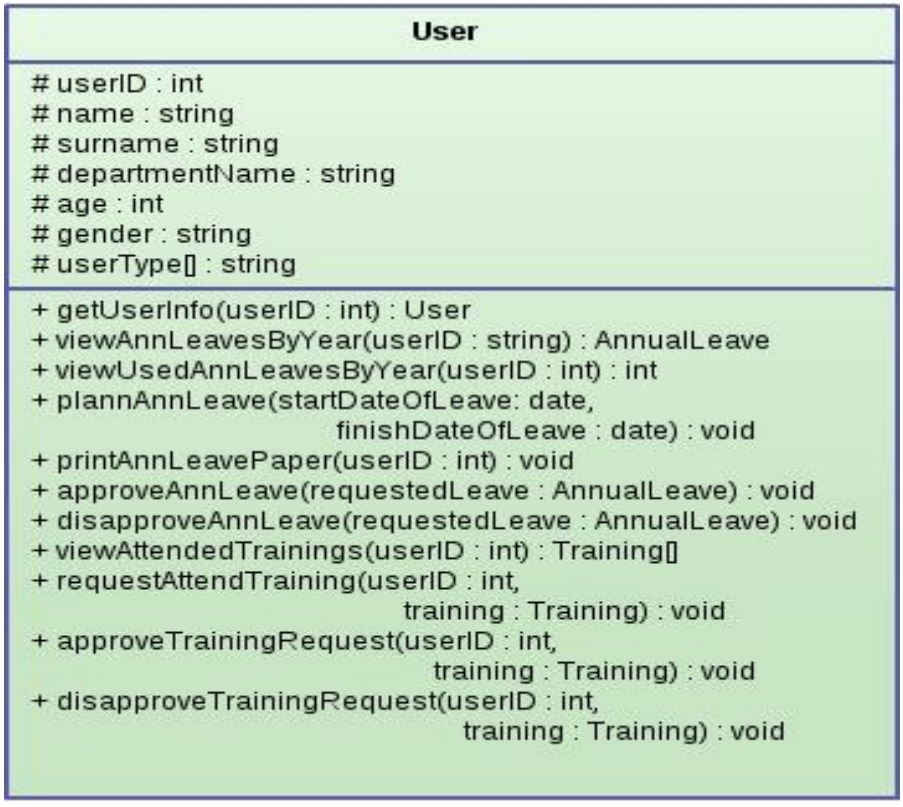
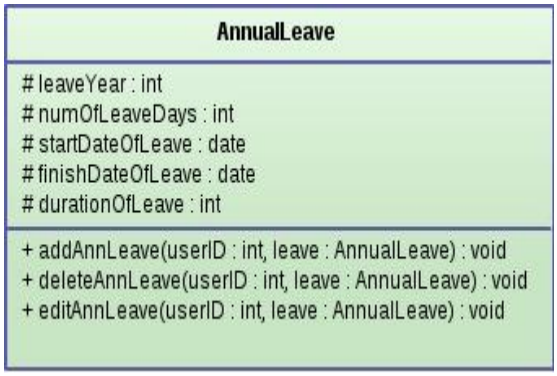



Figure 16: User class diagram



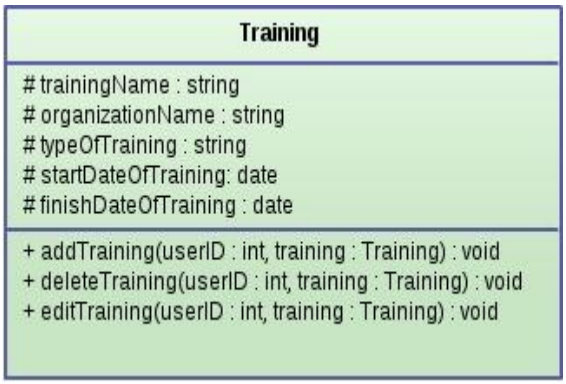
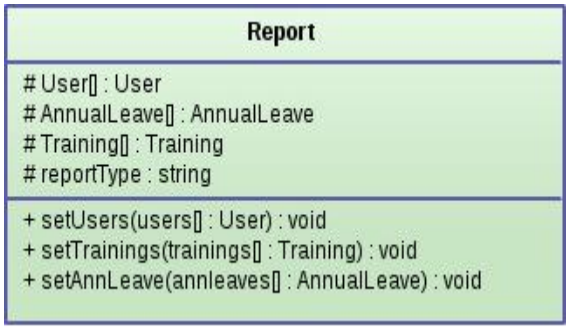




**Figure 17 : AnnualLeave class diagram Figure 18 : Training class diagram**



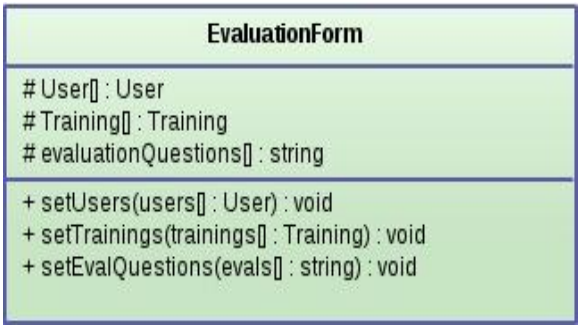




**Figure 19 : Report class diagram**

**Figure 20 : EvaluationForm class diagram**

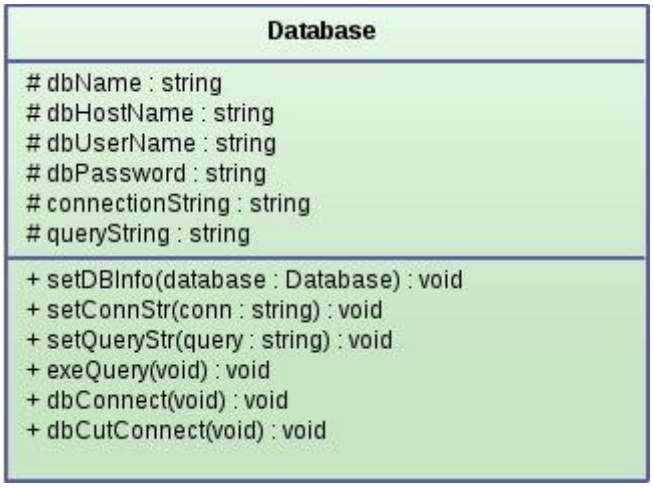



**Figure 21 : Database class diagram**

# 5. System Architecture

## 5.1. Architectural Design

The architectural design of our project consists of five main components. The components are the system database, system server and three system modules called Master Data module, Annual Leave module and Training module. In Figure 22, there is a diagram for architectural design of our project. Although there are three modules in the project, we will develop only Annual Leave and Training modules. Our project has MVC design pattern architecture. Thus, in view structure, user interfaces of modules are included and interact with user. Controller structure are responsible for business logic of project such as getting requests from view structure and sending responses to view, also getting and setting data in model structure. Model structure is responsible for data in the database of project. Each component has assigned to subcomponents. Sub – components of system are lately explained in Chapter 7 in detailed.

System server component consists of three sub-components which are Controller, Reporting Component and Auto-Mailing component. The role of system server is managing business logic of the SENtral. The system server is responsible to carrying out requests of many clients simultaneously. It also plays role in accessing to database system. The database component has role to store data in the system. Any change or access to database is able with the help of two modules.

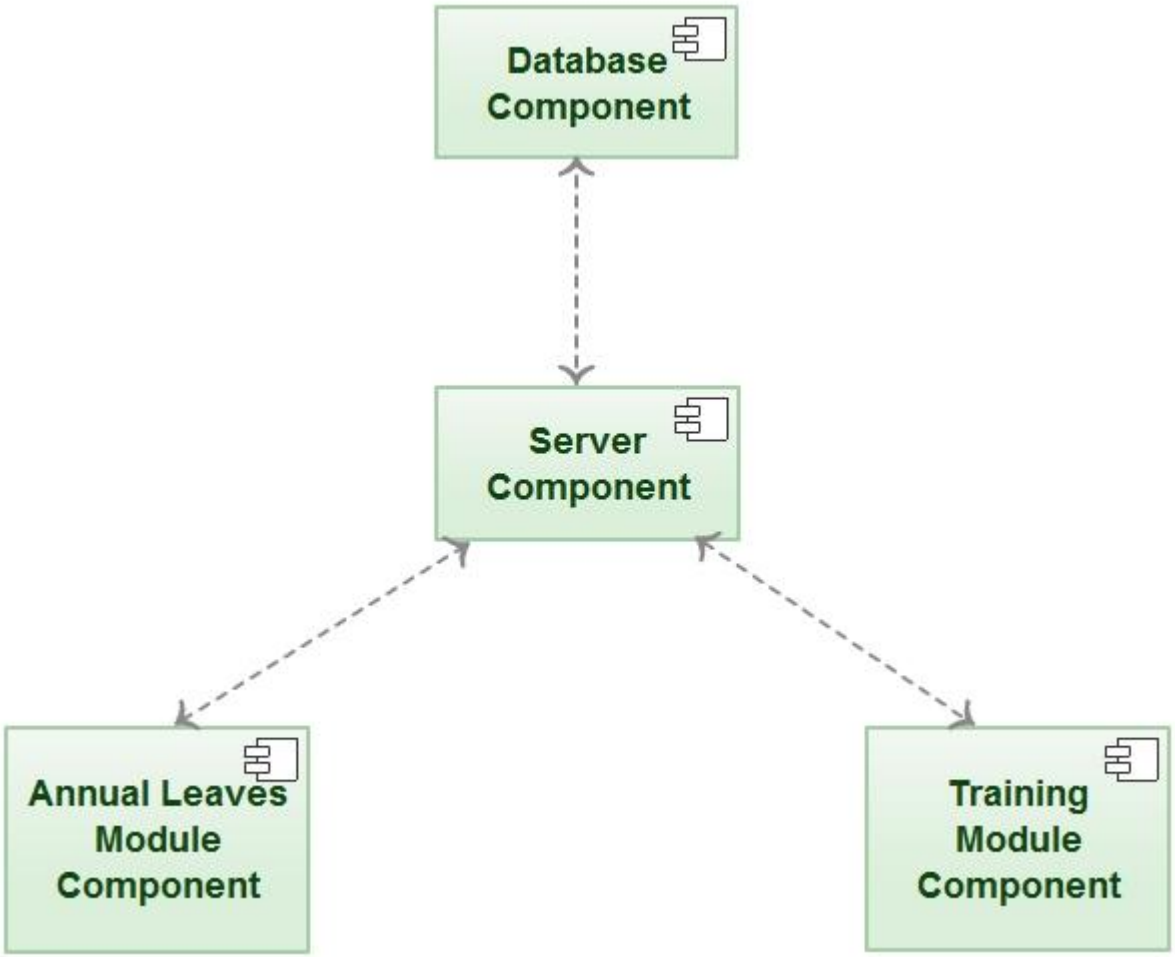



Figure 22: Component Diagram

## 5.2. Description of Components

### 5.2.1. Database Component

Database component is essential component of our system. All other components depend on this core section. Data flow occurs through database and system runs regularly via system database. Our system modules are continuously related to database during user operations. Any changes in the system operated through system modules are saved in the system database.

#### 5.2.1.1. Processing Narrative for Database

Responsibility of database component is to store data of the system. The system modules get data that is needed from system database component. It also accepts any changes and access by modules within the system rule.

#### 5.2.1.2. Interface Description for Database

The interface of the component has the particular property. This property is called Data Interface which provides an interface to the system to carry data between the modules. All the data through the system will flow over this interface. It receives data requests through system modules as an input. Then it translates into SQL data types and processes them using Hibernate.

#### 5.2.1.3. Database Processing Detail

This component sees all the other modules as blackboxes. All other data communications is done over this module. In other words the modules cannot communicate with each other. The information that needs to be transmitted somewhere is hold in this core component.

1) The system database receives a request of data from system modules
2) It translates this request into SQL commands using Hibernate
3) After generating the SQL calls it creates a corresponding object
4) Created object is presented to the related system module

#### 5.2.1.4. Dynamic Behaviour of Database

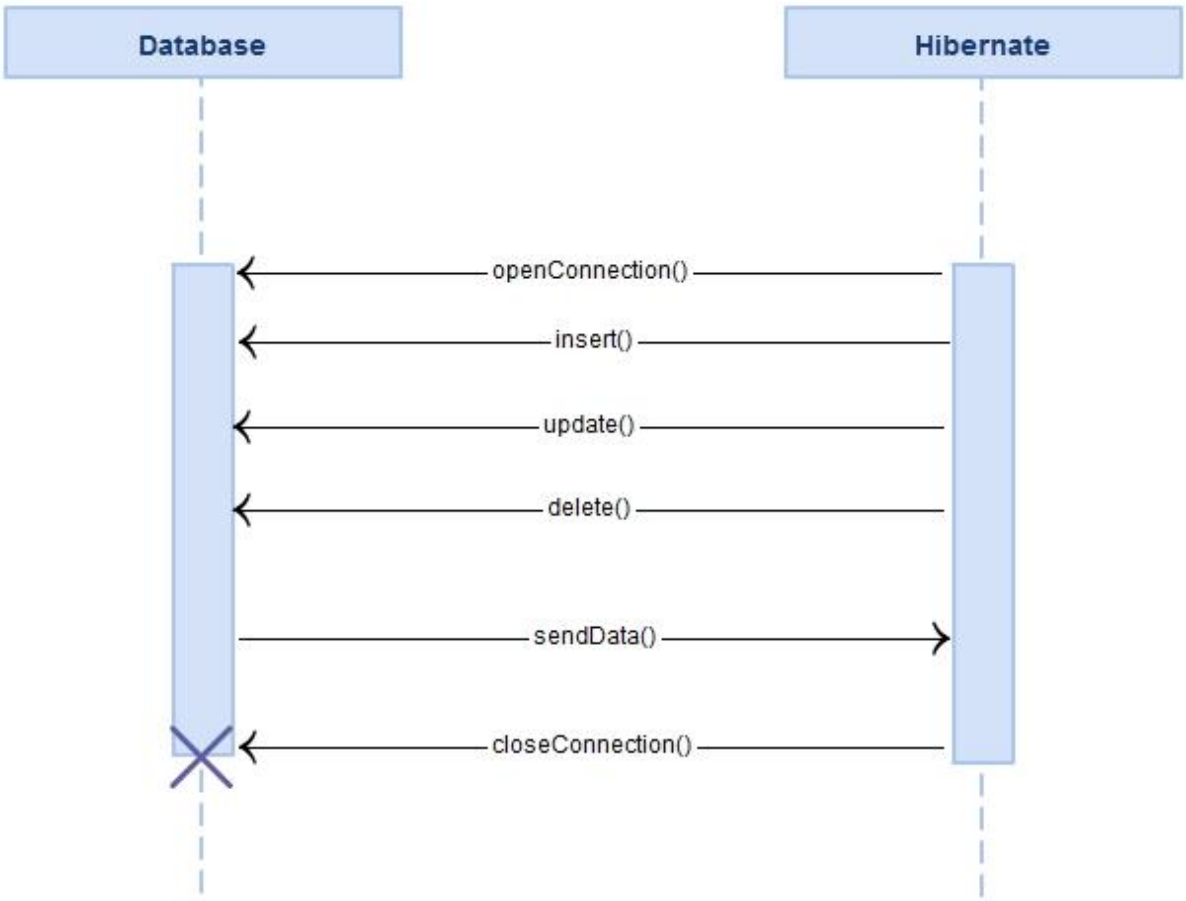



**Figure 23: Sequence Diagram for Database component**

### 5.2.2. Server Component

System Server is the component which provides technical environment for modules to run. With the help of system server modules reach database and system server is the reason for modules to occur.

#### 5.2.2.1. Processing Narrative for Server

The system server is responsible to carrying out requests of many clients simultaneously. In other words, it plays great role in the way of accessing to database system. It is a nexus between requests and responses. It receives HTTP requests from the user side and delegate the requests to respect servlets to process the requests.

#### 5.2.2.2. Interface Description for Server

In general server task can be considered as an input to the database. It receives data in form of HTTP protocols as an input. The required information is extracted and the necessary steps are taken into actions. It outputs HTTP responses and sends them to the clients via the intranet.

#### 5.2.2.3. Server Processing Detail

It works as follows:

1) It receives a request from clients through HTTP
2) It checks the validity of the request
3) It assigns the request according to the type of it
4) The result is sent to the user when it is processed

#### 5.2.2.4. Dynamic Behaviour of Server

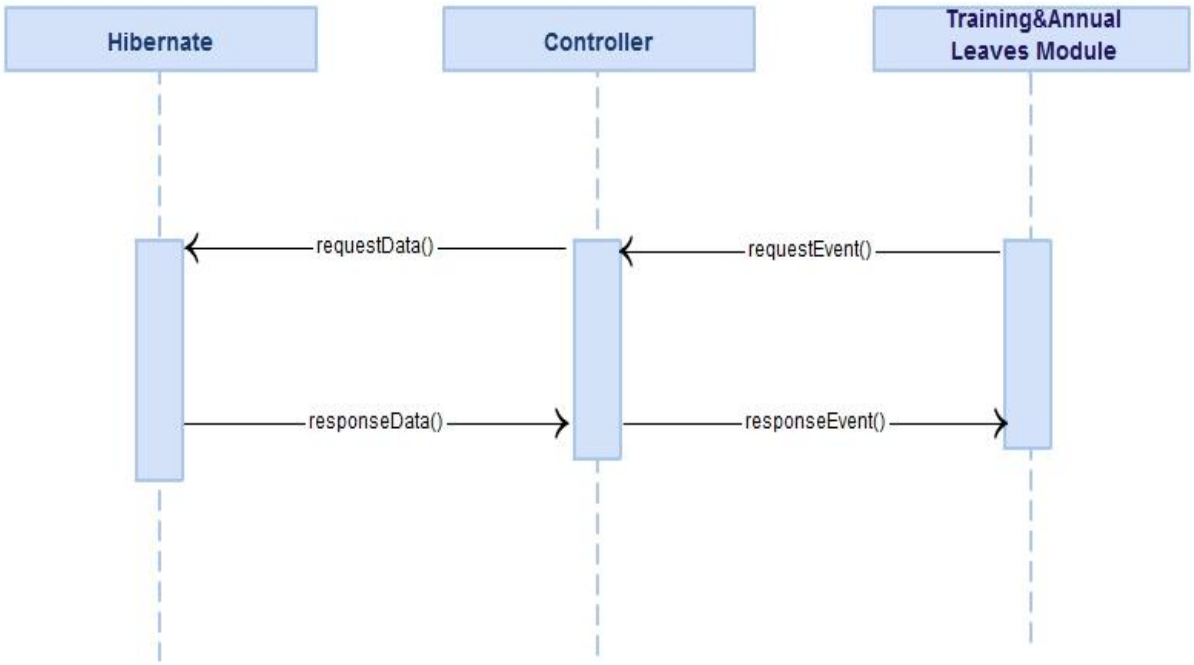



**Figure 24: Sequence Diagram for System Server component**

### 5.2.3. Annual Leave Module Component

Annual Leave Module component is the central system made to meet expectations for planning annual leaves and reporting them. The main role of Annual Leave module is to answer expectations of users in the way of leave requests.

#### 5.2.3.1. Processing Narrative for Annual Leave Module

The responsibility of this component is to keep track of annual leaves, allow a planning, coordination and approval mechanisms for annual leaves throughout the fiscal year. This module gives possibility to user to make leave requests or to approve and disapprove the requests.

#### 5.2.3.2. Interface Description for Annual Leave Module

The interface of component has a property to provide users with leave requests and also with actions like printing leave paper.

#### 5.2.3.3. Annual Leave Module Processing Detail

This component appears after loginning to the system. Every request made by employee is noticed by the system and immediately noted in database of the system.

1) The request made by user is accepted
2) It checks the validity of the request
3) The result is sent to the module when it is processed
4) The result is shown in the user interface to the user

#### 5.2.3.4. Dynamic Behaviour of Annual Leave Module

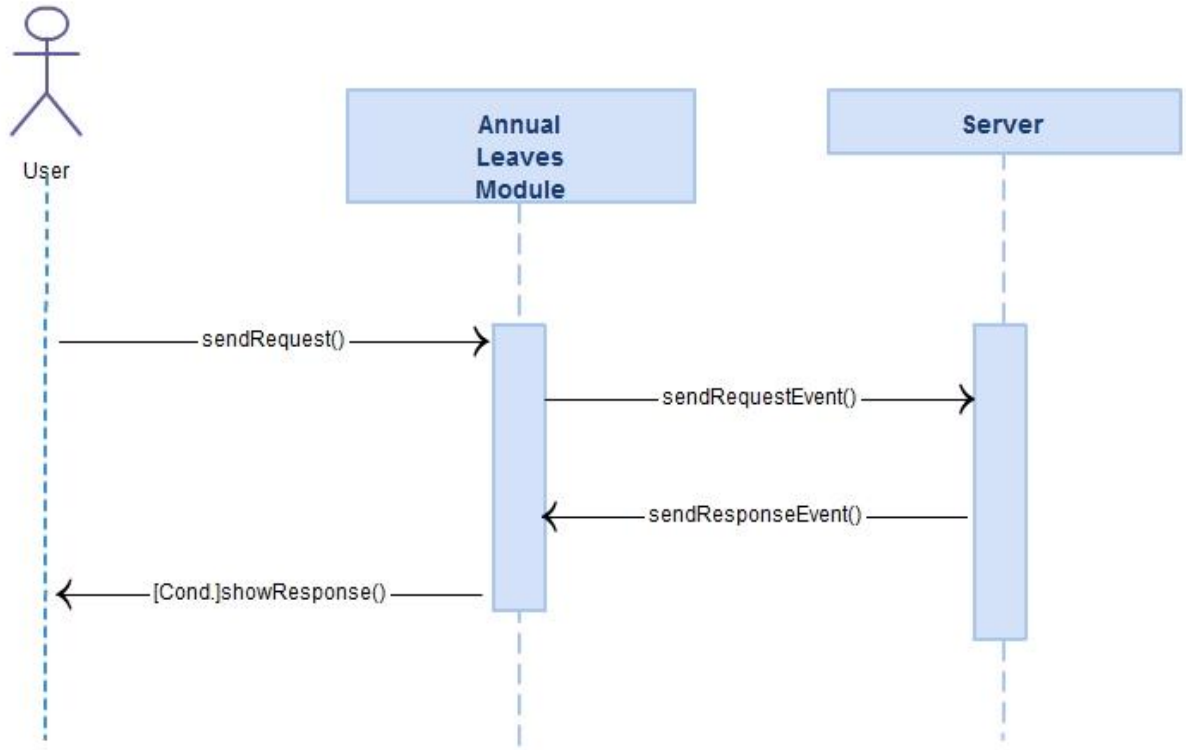



**Figure 25: Sequence Diagram for Annual Leave component**

### 5.2.4. Training Module Component

Training Module is needed to generate a central application for the purpose of providing work and time savings for employees and training coordinators.

This module mainly serves for the employees of the company. Every action taken in this module is notified by the database of the system.

#### 5.2.4.1. Processing Narrative for Training Module

This component is responsible for solving issues related with training requests of employee. It provides appropriate options to the user.

#### 5.2.4.2. Interface Description for Training Module.

The interface of component has a property to provide users with training requests. It receives training requests from the user as an input.

#### 5.2.4.3. Training Module Processing Detail

This component appears after logging in to the system. Every request by employee is noticed by the database of the system. Each step of the processing detail is as follows:

1) The request made by user is accepted
2) It checks the validity of the request
3) The result is sent to the module when it is processed
4) The result is shown in the user interface to the user

#### 5.2.4.4. Dynamic Behaviour of Training Module

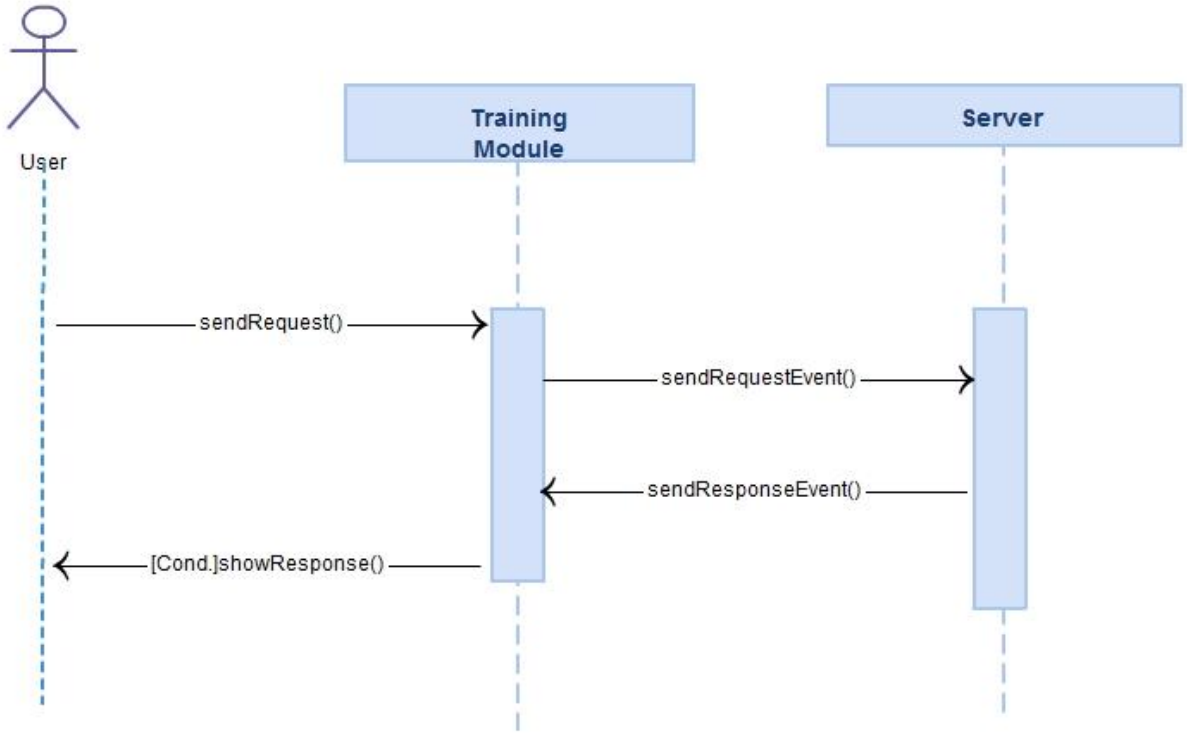



**Figure 26: Dynamic Behaviour for Training component**

## 5.3. Design Rationale

We separated the system into two major modules in order to keep the system simple, minimize cost and increase security level. The presence of one application server minimizes cost in terms of money and the cost of system distribution. All the necessary computations are carried out at the database of the system.
Data storage is separate and already available because we wanted to separate it completely from direct communication with the clients.
Before concluding this system there is a term that should be noticed. The human resources management system was or is available for company. However, there are

some critical issues concerning about this system. In order to move the system to open source, best practice frameworks together with enhanced user requirements that company needs upgrade in the system. In other words, it is a different system that answers expectations of Siemens Company.

# 6. USER INTERFACES

## 6.1. Overview of User Interface

Since the system consists of two modules, user interfaces will be different in those two modes. In both modules there will be common home page interface for all system users and they will use these pages for login operation.

After the login operation, users see annual leave page or training requests page on the screen.The login screen and the other screens for each module for each role (employee, manager, HR manager) is described in the next part.

## 6.2. Screen Images, Objects and Actions

In this part some of the screen images and their functionalities are described.

### 6.2.1. Annual Leave Module

#### 6.2.1.1 Login Page


**Figure 27: Annual Leave Module Login Page**

This interface in Figure 27 will be used by all of the system users and by entering the user ID and password they will be able to login to the system. For an incorrect password or user ID the system will promote an error message to the users. For all user roles, this login page should be used.

### 6.2.1.2 Personal Leaves Screen

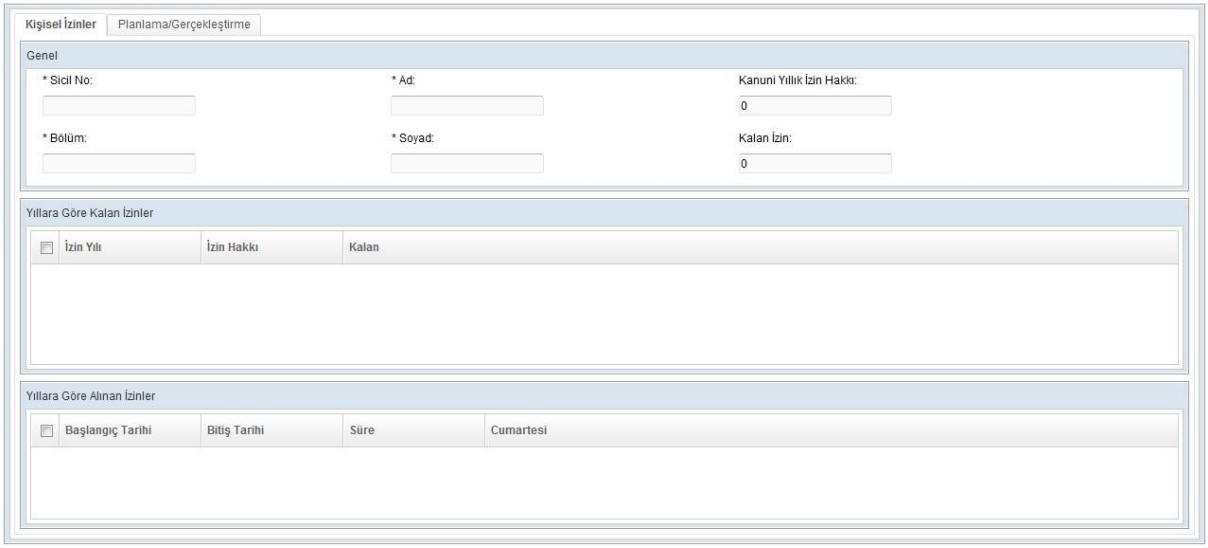



**Figure 28: Personal Leaves Screen**

In the entrance of the system, the personal leaves screen (Figure 28) is opened. All fields in this screen are read-only and they are listed to give information. In the "Genel" panel, Legal Annual Leave Right and Rest Leaves can be viewed besides the personal information. Other two panels are connected. With respect to the date that is chosen in the second panel, leaves used by the user in that year are listed in the last panel.

### 6.2.1.3 Personal Leave Details Screen

This screen shown in Figure 30 consists of three panels. In the first panel, used leaves in that year are listed. In the second panel, user is able to enter the dates of the leave which he/she plan to use. The records in this panel can be changed and deleted by the user. In order to make an annual leave request, in addition to start and finish date fields, the "half day" field must be filled.

A user must be print his/her leave request, to make this request approved by the manager.

For that purpose, users click the "İzin Kağıdı Bas" button (Figure 29) after pointing the corresponding leave in the second panel and he/she fills the required fields on the paper that is shown below. If the user wants to use excuse leave he/she goes on same processes on the third panel.


Figure 29: Print annual leaves paper

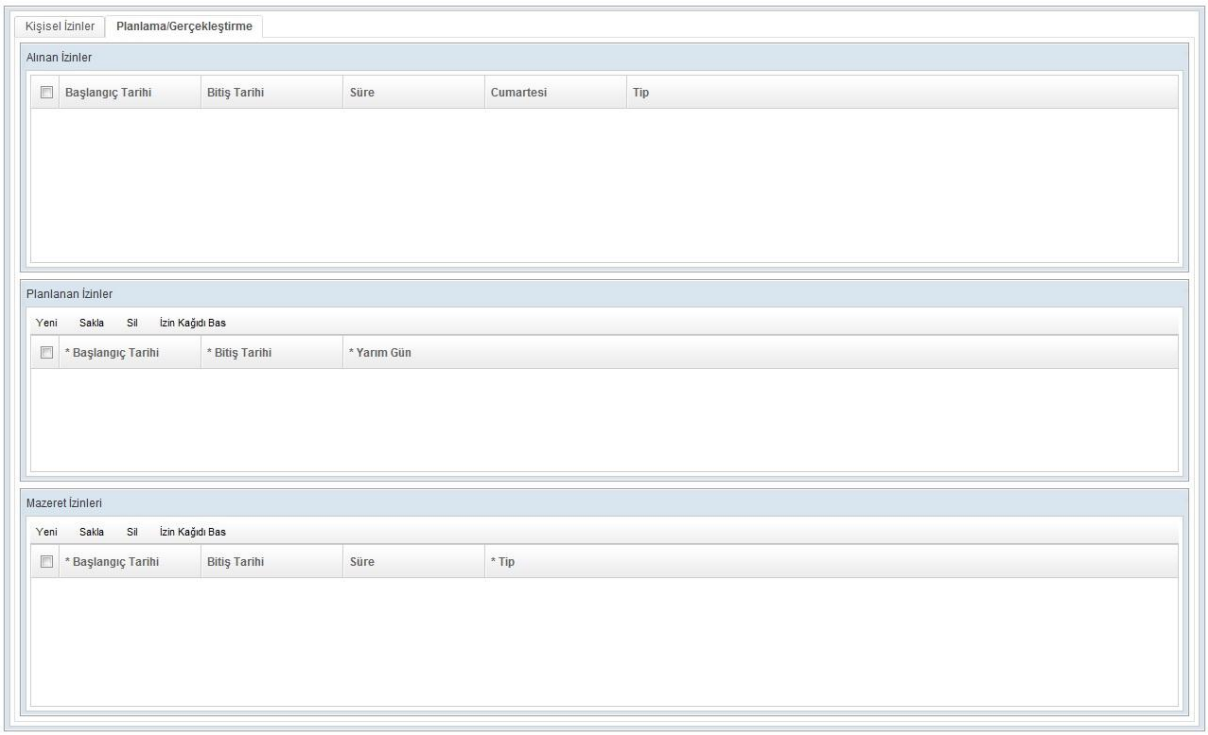



Figure 30: Personal Leave Details Screen

### 6.2.1.4 Annual Paid Leave Paper

Bastır

SIEMENS
Siemens EC Kurumsal İletişim Hizmetleri A.Ş.

-

YILLIK ÜCRETLİ İZİN KULLANMA BELGESİ 10.11.2009

İZİN KULLANACAK PERSONELİN

| | |
|---|---|
| Adı Soyadı | Tunca Gerdaneri |
| Sicil Numarası | 2037 |
| Bölümü | iSEC12 |
| İşe Giriş Tarihi | 01.04.2007 |
| İzin Sebebi | Özel |
| İzne Çıkacağı Tarih | 30.10.2009 |
| Göreve Başlayacağı Tarih | 02.11.2009 |
| Kanuni İzin Hakkı | 22 gün |
| Kullanılan Gün Sayısı (Cumartesi günleri dâhil) | 1.5 gün |
| İzinde Ulaşılabilecek Telefon No. | 0 5XX XXX XX XX |
| İmzası | |

YÖNETİCİSİNİN

| | |
|---|---|
| Adı Soyadı | Selma Şahin |
| İmzası | |

**Figure 31: Annual Paid Leave Paper Screen**

As it mentioned above the annual leave paper viewed on the annual paid leave paper screen (Figure 31), should be filled in order to make the leave request approved by the manager.

## 6.2.2. Training Module

### 6.2.2.1. Login Page


**Figure 32: Login Screen for Training Module**

As it is noticed before, for each module there is a login page. The screen in Figure 32 is the login page of the Training Module. The user fills the fields of user ID and password and clicks the “Login” button. Unless the user enters a correct password or user ID the system will promote an error message to the users. All user roles must login through this login page.

### 6.2.2.2. Training Requests Screen

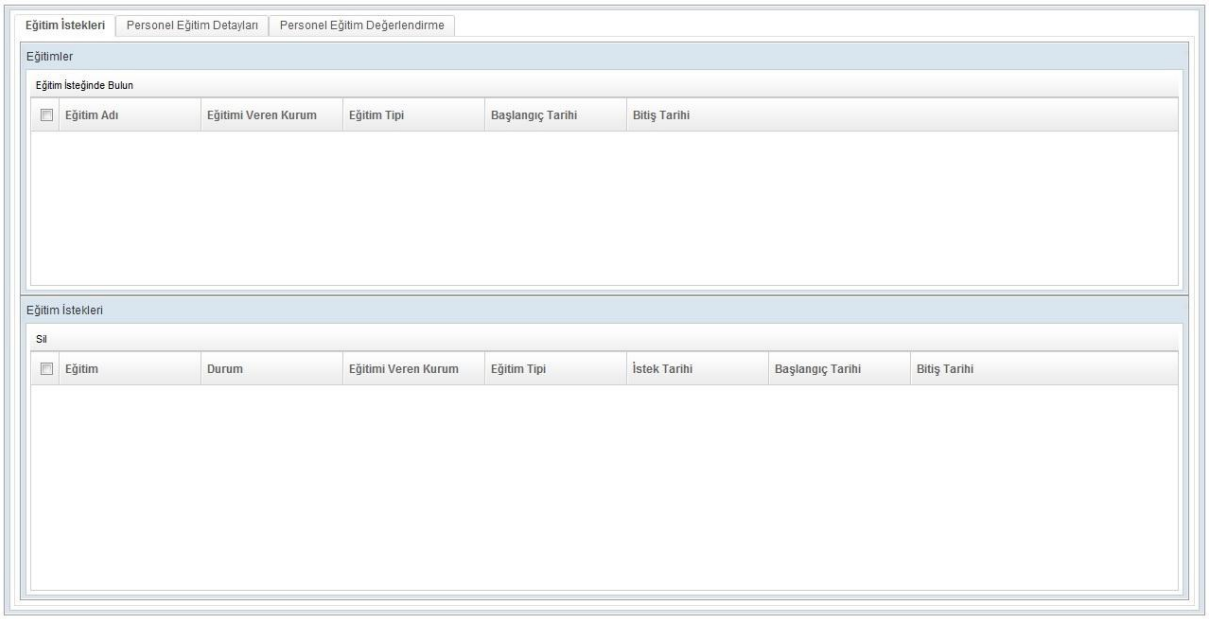


**Figure 33: Training Requests Screen**

In the entrance of the module, Training Request screen in Figure 33 is opened. In this part users are able to see the trainings described in the system and the trainings requested by the user to attend. The user should select the trainings which he/she wants to attend and clicks the “Eğitim İsteğinde Bulun” button. The trainings requested by the user are listed in second panel (Eğitim İstekleri). The user can delete any training request that is not approved yet by the manager by clicking the button “Sil” in the same screen after selecting to training.

### 6.2.2.3. Training Details

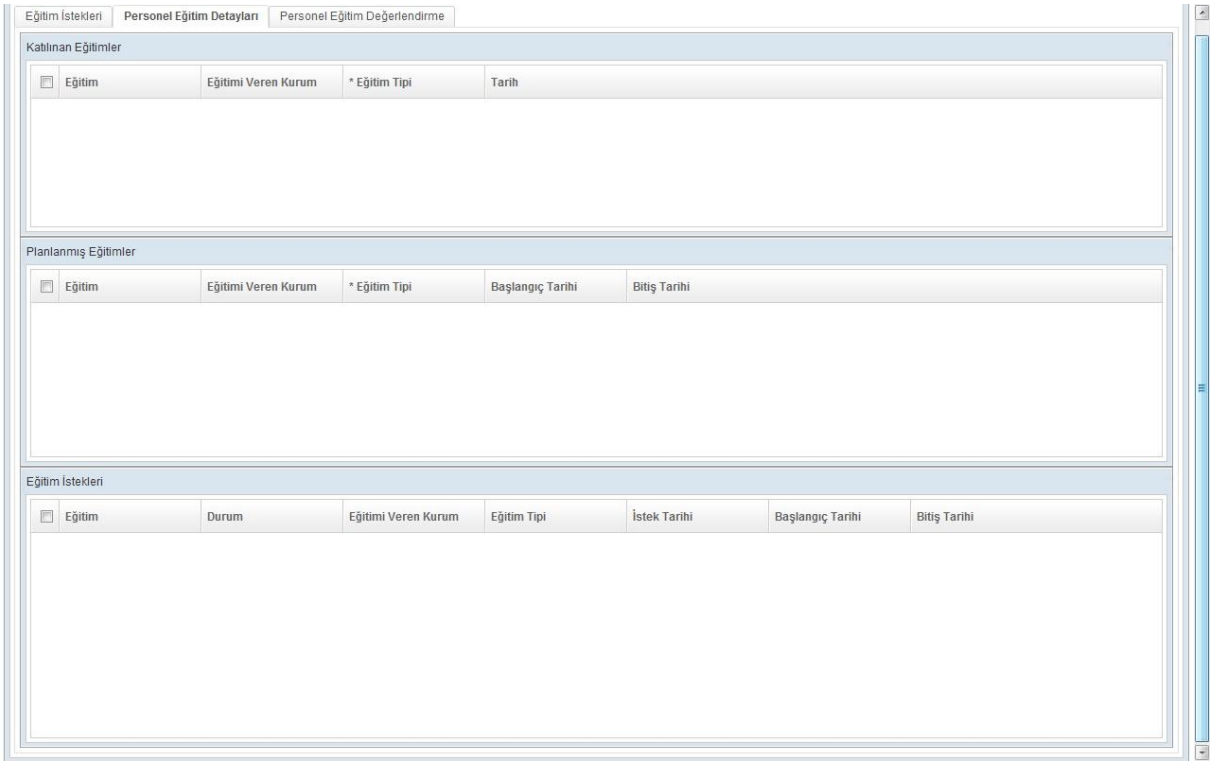



**Figure 34: Training Details Screen**

In the screen in Figure 34, user is able to see, the trainings in three panels orderly that the user attended before, planned by the training coordinator and is waiting for manager approval.

#### 6.2.2.4. Training Evaluation

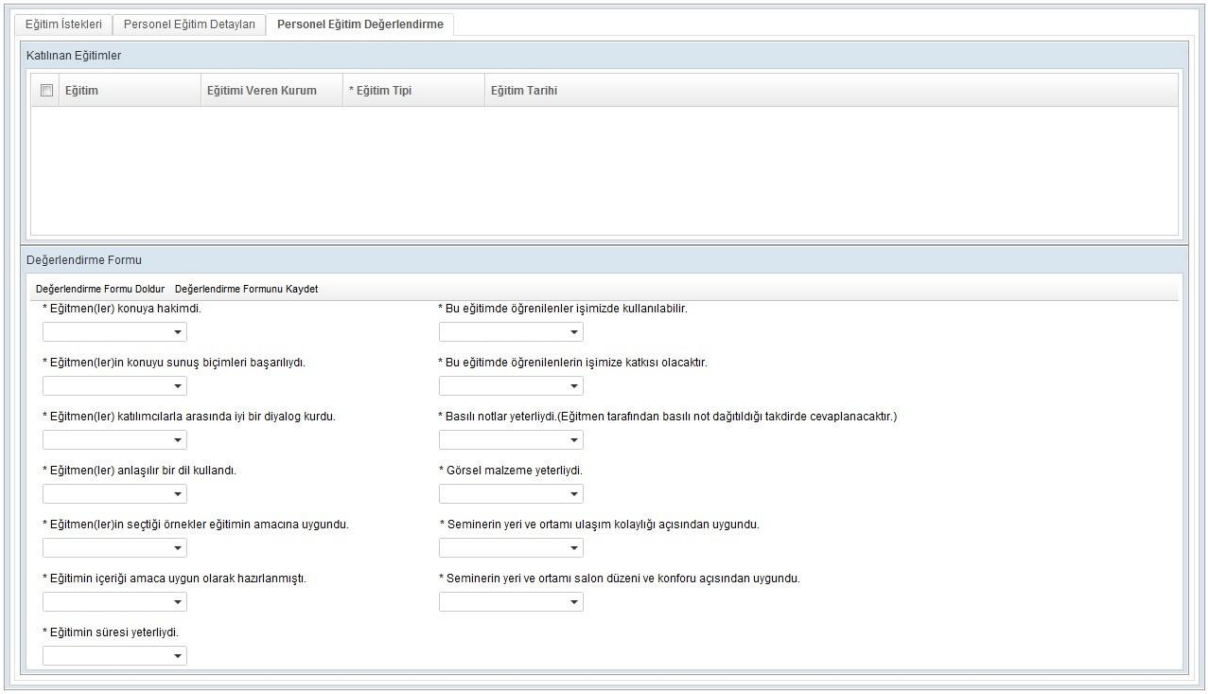



**Figure 35: Training evaluation screen**

After every training user attended, he/she must fill a form on the Training Evaluation screen that is shown in Figure 35. In order to do this, user should select the training that he/she wants to evaluate, then clicks to button “Değerlendirme Formu Doldur”. After filling the fields, user clicks the button “Değerlendirme Formunu Kaydet”.

# 7. Detailed Design

## 7.1. Database Component

### 7.1.1. Classification

The kind of Database Component is package type

### 7.1.2. Definition

This package contains database tables that correspond to data source of whole system. For every database table there is a corresponding controller class.

### 7.1.3. Responsibilities

Responsibility of this component is to store data and provide a data source for the other components.

### 7.1.4. Constraints

There is no particular constraint for this component

### 7.1.5. Composition

There is not any sub-package of this component

### 7.1.6. Uses/Interactions

This component interacts with all other components. It provides data source for the Training Module and Annual Leave Module through the System Server Component.

### 7.1.7. Resources

The only resource for this component is the memory that keeps data.

### 7.1.8. Processing

There is no processing about how this component performs the duties necessary to fulfil its responsibilities.

### 7.1.9. Interface/Exports

There is no any specific service that is provided by this component.

## 7.2. Server Component

### 7.2.1. Classification

Server component is middleware subsystem in our whole system.

### 7.2.2. Definition

As mentioned above section, server component is middleware system of the SENtral. Business logic and main operations of the whole system is done at this component. It has a role controller structure in MVC design pattern. Server component has 3 sub-components namely controller, reporting and auto-mailing. These sub-components are packages.

### 7.2.3. Responsibilities

Main responsibility of this component is managing business logic of the whole system. By getting requests from Annual Leave Module and Training Module, server component do operations in controller and other sub-components. According to requests, this component creates responses and sends these responses to modules. Another responsibility of server component is connecting to database and doing some operations on database component according to requests. It can be thought as a transporter system between modules and database.

### 7.2.4. Constraints

There is only one constraint for this component. This constraint is getting requests from module by HTTP connection. If server component does not get any requests from our ALM and TM, it will not do any operations on database and also business logic of the system.

### 7.2.5. Composition

Server component has 3 different sub-components which are namely controller, reporting and auto-mailing. These sub-components are packages in the server component. At the below sections, we will mention about these packages.

#### 7.2.5.1. Controller Package

Controller package is responsible for business logic of the whole system. According to requests got from modules, it can do operations on database and send responses to module which show these responses to users. The operations done by controller package on database are inserting, updating selecting and deleting data from database.

#### 7.2.5.2. Reporting Package

Reporting package is responsible for creating reports for manager and HR manager user types. These reports are about employees in department of managers and whole employees in company for HR manager. This package can be a ready-system which is created by other peoples or companies. Also, it can be an open-source reporting tool such as Crystal Reports.

#### 7.2.5.3. Auto-mailing Package

This package is responsible for sending mails to managers and HR managers when an employee requests for taking annual leave and attending to a training. This package creates mails which have some specific templates. These mails are sent for information to managers and HR managers. SMTP protocols will be used in this package.

### 7.2.6. Uses/Interactions

Server component are in the middle part of the SENtral. Thus, it interacts with both of modules, which are ALM and TM, and database component. It does have any connection with users directly.

### 7.2.7. Resources

Resources of this component are ALM, TM and database. It gets request from modules. Also, it gets data from database according to requests.

### 7.2.8. Processing

Server component is getting requests from users indirectly by ALM and TM. According to these requests, it does some operations in its sub-systems which are mentioned above sections detailed. After doing operations, server creates responses and sends these responses to ALM and TM. The operations done in server are database operations such as insert, update, select and delete. Also, report creating and sending auto-mails operations are done in server component.

### 7.2.9. Interface/Exports

This component has a role as being interface to ALM and TM. Both of the modules can connect database by this component. Also, necessary operations on business logic of modules are done in server. Another role of this component is exporting reports to modules and sending mails to users.

## 7.3. Annual Leave Module

### 7.3.1. Classification

Annual Leave Module is a module as a part of our system.

### 7.3.2. Definition

This module is used by different user types for managing annual leaves of employees in the Siemens EC. Also, this module contains some classes that correspond to panels of user interfaces. The whole system is interacting with users by this module.

### 7.3.3. Responsibilities

This module is responsible for keeping tracking of annual leaves of employees. There are many responsibilities for different user types. An employee type user uses this module for see information about previous and current years' annual leaves. Also, employees can plan annual leaves and send requests to their manager for approval of annual leaves by an auto-mailing component. A manager type user can do operations mentioned above for employee as an employee user type. In addition, managers can approve or disapprove employees' requests for annual leaves and see information of employees in their departments. An HR manager type user can do all operations mentioned above for employee and manager user types. Also, HR manager can see information of whole employees' for annual leaves.

### 7.3.4. Constraints

The main constraint for this module is to log into the system and to have a right for accessing to this module. Every user type has right to access different sub-components which are pages. Additionally, there is a limit in the user interface of this component in case of data viewing which is called paging.

### 7.3.5. Composition

Annual Leave Module has different sub-components which are screens and every screen consist of many panels have some functions. The name of screens and their panels are described below sections. Also, details are explained in the "Note" and "Condition" part. Every user type has own specific user interface.

#### 7.3.5.1. Personal Leaves Screen General Panel-Employee

This section contains first screen in the Annual Leaves Module after an employee logins to the SENtral. There are some panels in this screen. These panels are described in the below sections.

Figure 36 contains general information of employees and their annual leaves.

| Field Name | Type | Employee | HR | Manager | DB Table Name | DB Table Column | Note |
|---|---|---|---|---|---|---|---|
| Sicil No | Text Field | Readonly | Readonly | Readonly | TBL_EMPLOYEE | EMPLOYEE_ID | |
| Bölüm | Text Field | Readonly | Readonly | Readonly | TBL_EMPLOYEE | DEPARTMENT | --- |
| Ad | Text Field | Readonly | Readonly | Readonly | TBL_EMPLOYEE | NAME | --- |
| Soyad | Text Field | Readonly | Readonly | Readonly | TBL_ EMPLOYEE | SURNAME | --- |
| Kanuni Yıllık İzin Hakkı | Text Field | Readonly | Readonly | Readonly | TBL_ITS_EMP_YEAR | TOTAL_DAYS | Cond [1], [2], [3] |
| Kalan İzin | Text Field | Readonly | Readonly | Readonly | TBL_ITS_EMP_YEAR | REM_DAYS | Note[1] |

**Figure 36: Personal Leaves Screen**

#### 7.3.5.2. Unused Annual Leaves According to Years Panel - Employee

The panel in Figure 37 contains fields for information of employees' unused annual leaves.

| Field Name | Type | Employee | HR | Manager | DB Table Name | DB Table Column | Note |
|---|---|---|---|---|---|---|---|
| İzin Yılı | Text Field | Selectable & Readonly | Selectable & Readonly | Selectable & Readonly | TBL_ITS_EMP_YEAR | WORK_YEAR | Cond [4] |
| İzin Hakkı | Text Field | Readonly | Readonly | Readonly | TBL_EMPLOYEE | TOTAL_DAYS | Cond [1], [2], [3] |
| Kalan | Text Field | Readonly | Readonly | Readonly | TBL_EMPLOYEE | REM_DAYS | Note[1] |

**Figure 37: Unused Annual Leaves According to Years Panel**

#### 7.3.5.3. Used Annual Leaves According to Years Panel - Employee

The panel in Figure 38 is used for seeing annual leaves which were used by employees.

| Field Name | Type | Employee | HR | Manager | DB Table Name | DB Table Column | Note |
|---|---|---|---|---|---|---|---|
| Başlangıç Tarihi | Date | Readonly | Readonly | Readonly | TBL_ITS_DATES | START_HOLIDAY | |
| Bitiş Tarihi | Date | Readonly | Readonly | Readonly | TBL_ITS_DATES | START_WORK | |
| Süre | Text Field | Readonly | Readonly | Readonly | TBL_ITS_DATES | DURATION_WITH_SAT | Cond [1] |
| Cumartesi | Text Field | Readonly | Readonly | Readonly | TBL_ITS_DATES | SAT_USED | |

**Figure 38: Used Annual Leaves According to Years Panel**

#### 7.3.5.4. Used Annual Leaves Panel - Employee

The panel in Figure 39 shows in detail that used annual leaves by employee.

| Field Name | Type | Employee | HR | Manager | DB Table Name | DB Table Column | Note |
|---|---|---|---|---|---|---|---|
| Başlangıç Tarihi | Date | Readonly | Readonly | Readonly | TBL_ITS_DATES | START_HOLIDAY | |
| Bitiş Tarihi | Date | Readonly | Readonly | Readonly | TBL_ITS_DATES | START_WORK | |
| Süre | Text Field | Readonly | Readonly | Readonly | TBL_ITS_DATES | DURATION_WITH_SAT | Cond [1] |
| Cumartesi | Text Field | Readonly | Readonly | Readonly | TBL_ITS_DATES | SAT_USED | |
| Tip | Text Field | Readonly | Readonly | Readonly | TBL_ITS_DATES | REASON | |

Figure 39: Used Annual Leaves Panel

#### 7.3.5.5. Plan Annual Leaves Panel - Employee

The panel shown in Figure 40 is used to plan an annual leave and send a request to manager to approve of this annual leave by an auto-mailing system.

| Field Name | Type | Employee | HR | Manager | DB Table Name | DB Table Column | Note |
|---|---|---|---|---|---|---|---|
| Başlangıç Tarihi | Date | Editable | Readonly | Readonly | TBL_ITS_DATES | START_HOLIDAY | |
| Bitiş Tarihi | Date | Editable | Readonly | Readonly | TBL_ITS_DATES | START_WORK | |
| Yarım Gün | Selectbox | Editable | Readonly | Readonly | TBL_ITS_DATES | HALF_DAY | Cond [1] |
| Manager Onay | Checkbox | Invisible | Readonly | Editable | --- | --- | Cond [2], [3] |
| HR Onay | Checkbox | Invisible | Editable | Invisible | --- | --- | Cond [4] |

Figure 40: Plan Annual Leaves Panel

#### 7.3.5.6. Excuse Leaves Panel - Employee

The panel in Figure 41 is used to plan an excuse leaves apart from annual leaves. Also, user can send a request to manager to approve of this annual leave by an auto-mailing system by this panel.

| Field Name | Type | Employee | HR | Manager | DB Table Name | DB Table Column | Note |
|---|---|---|---|---|---|---|---|
| Başlangıç Tarihi | Date | Editable | Readonly | Readonly | TBL_ITS_DATES | START_HOLIDAY | |
| Bitiş Tarihi | Date | Editable | Readonly | Readonly | TBL_ITS_DATES | START_WORK | |
| Süre | Text Field | Editable | Readonly | Readonly | TBL_ITS_EXCUSE | DURATION | |
| Tip | Selectbox | Editable | Readonly | Readonly | TBL_ITS_EXCUSE | TYPE | |
| Manager Onay | Checkbox | Invisible | Readonly | Editable | --- | --- | Cond [1] |
| HR Onay | Checkbox | Invisible | Editable | Invisible | --- | --- | Cond [2] |

**Figure 41: Excuses Leaves Panel**

#### 7.3.5.7. Employees' List Panel – Manager & HR

In this panel, there are list of all employees in the department of manager. Also, there are whole employees in the company for HR manager user type. Figure 42 shows the fields and details of the panels.

| Field Name | Type | Manager | DB Table Name | DB Table Column | Note |
|---|---|---|---|---|---|
| Çalışanı Seç | Checkbox | Editable | --- | --- | Note[8] |
| Sicil No | Text Field | Readonly | TBL_EMPLOYEE | EMPLOYEEID | --- |
| Adı | Text Field | Readonly | TBL_EMPLOYEE | NAME | --- |
| Soyadı | Text Field | Readonly | TBL_EMPLOYEE | SURNAME | --- |

Figure 42: Employees' List Panel

#### 7.3.5.8. Used Annual Leaves of Employees Panel – Manager & HR

The panel in Figure 43 contains information of annual leaves of employee which is selected at the above panel which is Employees' List Panel.

| Field Name | Type | HR | Manager | DB Table Name | DB Table Column |
|---|---|---|---|---|---|
| Başlangıç Tarihi | Date | Readonly | Readonly | TBL_ITS_DATES | START_HOLIDAY |
| Bitiş Tarihi | Date | Readonly | Readonly | TBL_ITS_DATES | START_WORK |
| Süre | Text Field | Readonly | Readonly | TBL_ITS_DATES | DURATION_WITH_SAT |
| Cumartesi | Text Field | Readonly | Readonly | TBL_ITS_DATES | SAT_USED |
| Tip | Text Field | Readonly | Readonly | TBL_ITS_DATES | REASON |

Figure 43: Used Annual Leaves of Employees Panel

#### 7.3.5.9. Annual Leaves Requests Panel – Manager & HR

In the panel shown in Figure 44, managers and HR managers can see annual leaves requests of employees in their departments for managers and requests of whole employees in Siemens EC. for HR managers user type.

| Field Name | Type | HR | Manager | DB Table Name | DB Table Column |
|---|---|---|---|---|---|
| Adı | Textfield | Readonly | Readonly | TBL_EMPLOYEE | NAME |
| Soyadı | Textfield | Readonly | Readonly | TBL_EMPLOYEE | SURNAME |
| Başlangıç Tarihi | Date | Readonly | Readonly | TBL_ITS_DATES | START_HOLIDAY |
| Bitiş | Date | Readonly | Readonly | TBL_ITS_DATES | START_WORK |

| | | | | | |
|---|---|---|---|---|---|
| Tarihi | | | | | |
| Süre | Text Field | Readonly | Readonly | TBL_ITS_DATES | DURATION_WITH_SAT |
| Tip | Text Field | Readonly | Readonly | TBL_ITS_DATES | REASON |
| Onay | Checkbox | Editable | Editable | ---- | ---- |

**Figure 44: Annual Leaves Requests**

### 7.3.6. Uses/Interactions

This component is designed separately from Training Module. It interacts only with database component and server component.

### 7.3.7. Resources

The main resource that is affected by this component is database. It uses database component as a data source.

### 7.3.8. Processing

Now, we analyze the processing of this component:

- First of all, the user comes to the screen that he/she wants to do operations

-Then user takes appropriate action in the appropriate subcomponent/panel

-The component needs to understand the request that comes from user.

-Operation (update data or get data) on database is done by this component according to the request

-The result(s) is shown in the user interface

## 7.4. Training Module

### 7.4.1. Classification

Training Module is the *module* of the whole system. In other words, it has a module type.

### 7.4.2. Definition

This module contains particular number of classes that correspond to panels of user interfaces. The users are able to do operations with these classes through the interface panels.

### 7.4.3. Responsibilities

Training Module is used to keep track of personnel training, also it allows users to plan their training program. Coordination, approval and evaluation of personnel trainings are also parts of this component.

### 7.4.4. Constraints

The main constraint includes a precondition for interacting with this component. The user should log in to the system and should have a role in order to use this component. Additionally, there is a limit in the user interface of this component in case of data viewing which is called paging. For example, the number of trainings available for the employee or number of trainings that an employee attended is out of limit then it is displayed within the limit in every page.

### 7.4.5. Composition

The user interface of Training Module consists of screens and panels (classes). These are subcomponents of Training Module. Names of the fields of these screens, which users can edit or cannot edit, are shown in the Figure xxx. Also details are explained in the “Note” and “Condition” part (Section 7.4.5.23). The most important property of this part is that each role has its different user interface.

#### 7.4.5.1. Training Screen - Employee

The first screen of Training Module that appears after logging in is Training screen. Figure 45 presents details of this screen.

| Field Name | Type | Employee | HR | Manager | DB Table Name | DB Table Column | Note |
|---|---|---|---|---|---|---|---|
| Eğitim Alma | Check box | Editable | Readonly | Readonly | --- | --- | Note[3] |
| Eğitim Adı | Text Field | Readonly | Editable | Readonly | TBL_PEM_TRAINING | Name | --- |
| Eğitimi Veren Kurum | Text Field | Readonly | Editable | Readonly | TBL_PEM_TRAINING | Training_company | --- |
| Eğitim | Text | Readonly | Editable | Readonl | TBL_PEM_TRAINI | Training | --- |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Tipi | Field | | | y | NG | _type | |
| Başlangıç Tarihi | Date | Readonly | Editable | Readonly | TBL_PEM_TRAINING | Start_date | --- |
| Bitiş Tarihi | Date | Readonly | Editable | Readonly | TBL_PEM_TRAINING | End_date | --- |

**Figure 45: Training Screen**

#### 7.4.5.2. Training Request Screen - Employee

The users are able to see trainings they have done, and approval or disapproval of their training requests. Figure 46 presents details of this screen.

| Field Name | Type | Employee | HR | Manager | DB Table Name | DB Table Column | Note |
|---|---|---|---|---|---|---|---|
| Eğitim Silme | Check box | Editable | Readonly | Readonly | --- | --- | Note[4] |
| Eğitim | Text Field | Readonly | Readonly | Readonly | TBL_PEM_TRAINING | Name | --- |
| Durum | Text Field | Readonly | Readonly | Readonly | TBL_PEM_PARTICIPATION | Status | --- |
| Eğitimi Veren Kurum | Text Field | Readonly | Readonly | Readonly | TBL_PEM_TRAINING | Training_company | --- |
| Eğitim Tipi | Text Field | Readonly | Readonly | Readonly | TBL_PEM_TRAINING | Training_type | --- |
| Manager Onay | Check box | Invisible | Readonly | Editable | --- | --- | Note[5] |
| HR Onay | Check box | Invisible | Editable Cond[9] | Readonly | --- | --- | Note[6] |
| İstek Tarihi | Date | Readonly | Readonly | Readonly | TBL_PEM_PARTICIPATION | Employee_request_date | --- |
| Başlangıç Tarihi | Date | Readonly | Readonly | Readonly | TBL_PEM_TRAINING | Start_date | --- |
| Bitiş Tarihi | Date | Readonly | Readonly | Readonly | TBL_PEM_TRAINING | End_date | --- |

**Figure 46: Training Request Screen**

#### 7.4.5.3. Attended Training Screen - Employee

The users see their attended training in this panel. Details of this screen are shown in the Figure 47.

| Field Name | Type | Employee | HR | Manager | DB Table Name | DB Table Column | Note |
|---|---|---|---|---|---|---|---|
| Eğitim | Text Field | Readonly | Readonly | Readonly | TBL_PEM_TRAINING | Name | --- |
| Eğitimi Veren Kurum | Text Field | Readonly | Readonly | Readonly | TBL_PEM_TRAINING | Training_company | --- |
| Eğitim Tipi | Text Field | Readonly | Readonly | Readonly | TBL_PEM_TRAINING | Training_type | --- |
| Tarih | Date | Readonly | Readonly | Readonly | TBL_PEM_TRAINING | Start_date | --- |

**Figure 47: Attended Training Screen**

#### 7.4.5.4. Planned Training Screen - Employee

The users see their planned trainings. Details of this screen are shown in the Figure 48.

| Field Name | Type | Employee | HR | Manager | DB Table Name | DB Table Column | Note |
|---|---|---|---|---|---|---|---|
| Eğitim | Text Field | Readonly | Editable | Readonly | TBL_PEM_TRAINING | Name | --- |
| Eğitimi Veren Kurum | Text Field | Readonly | Editable | Readonly | TBL_PEM_TRAINING | Training_company | --- |
| Eğitim Tipi | Text Field | Readonly | Editable | Readonly | TBL_PEM_TRAINING | Training_type | --- |
| Başlangıç Tarihi | Date | Readonly | Editable | Readonly | TBL_PEM_TRAINING | Start_date | --- |
| Bitiş Tarihi | Date | Readonly | Editable | Readonly | TBL_PEM_TRAINING | End_date | --- |

**Figure 48: Planned Training Screen**

#### 7.4.5.5. Training Request Screen - Employee

The user requests available trainings. Details of this screen are shown in the Figure 49.

| Field Name | Type | Employee | HR | Manager | DB Table Name | DB Table Column | Note |
|---|---|---|---|---|---|---|---|
| Eğitim | Text Field | Readonly | Readonly | Readonly | TBL_PEM_TRAINING | Name | --- |
| Durum | Text Field | Readonly | Readonly | Readonly | TBL_PEM_PARTICIPATION | Status | --- |
| Eğitimi Veren Kurum | Text Field | Readonly | Readonly | Readonly | TBL_PEM_TRAINING | Training_company | --- |
| Eğitim Tipi | Text Field | Readonly | Readonly | Readonly | TBL_PEM_TRAINING | Training_type | --- |
| İstek Tarihi | Date | Readonly | Readonly | Readonly | TBL_PEM_PARTICIPATION | Employee_request_date | --- |
| Başlangıç Tarihi | Date | Readonly | Readonly | Readonly | TBL_PEM_TRAINING | Start_date | --- |
| Bitiş Tarihi | Date | Readonly | Readonly | Readonly | TBL_PEM_TRAINING | End_date | --- |

**Figure 49: Training Request Screen**

#### 7.4.5.6. Training Evaluation Screen - Employee

Users evaluate their attended trainings according to the evaluation form. Details are shown in the Figure 50.

| Field Name | Type | Employee | HR | Manager | DB Table Name | DB Table Column | Note |
|---|---|---|---|---|---|---|---|
| Eğitimi Seç | Check box | Editable | Readonly | Readonly | --- | --- | Note[7] |
| Eğitim | Text Field | Readonly | Readonly | Readonly | TBL_PEM_TRAINING | Name | --- |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Eğitimi Veren Kurum | Text Field | Readonly | Readonly | Readonly | TBL_PEM_TRAINING | Training_company | --- |
| Eğitim Tipi | Text Field | Readonly | Readonly | Readonly | TBL_PEM_TRAINING | Training_type | --- |
| Eğitim Tarihi | Date | Readonly | Readonly | Readonly | TBL_PEM_TRAINING | Start_date | --- |

**Figure 50: Training Evaluation Screen**

#### 7.4.5.7. Employee (selected employee) Panel - Manager

Manager sees list of his/her employees. Information of the particular employee which selected by manager appears in this panel. Details are shown in the Figure 51.

| Field Name | Type | Manager | DB Table Name | DB Table Column | Note |
|---|---|---|---|---|---|
| Çalışanı Seç | Checkbox | Editable | --- | --- | Note[8] |
| Sicil No | Text Field | Readonly | TBL_EMPLOYEE | EMPLOYEEID | --- |
| Adı | Text Field | Readonly | TBL_EMPLOYEE | NAME | --- |
| Soyadı | Text Field | Readonly | TBL_EMPLOYEE | SURNAME | --- |

**Figure 51: Employee (selected employee) Panel**

#### 7.4.5.8. Attended Training (selected employee) Panel - Manager

Manager sees his/her employees' participated training. Attended trainings of the particular employee which is selected by manager appears in this panel. Details are shown in the Figure 52

| Field Name | Type | Manager | DB Table Name | DB Table Column | Note |
|---|---|---|---|---|---|
| Eğitim | Text Field | Readonly | TBL_PEM_TRAINING | name | --- |
| Eğitimi Veren | Text | Readonl | TBL_PEM_TRAININ | Training_compa | --- |

| | | | | | |
|---|---|---|---|---|---|
| Kurum | Field | y | G | ny | |
| Eğitim Tipi | Text Field | Readonly | TBL_PEM_TRAINING | Training_type | --- |
| Tarih | Date | Readonly | TBL_PEM_TRAINING | Start_date | --- |

**Figure 52: Attended Training (selected employee) Panel**

#### 7.4.5.9. Planned Training (selected employee) Panel - Manager

Manager sees his/her employees' approved and planned requests. Planned trainings of the particular employee which is selected by manager appears in this panel. Details are shown in the Figure 53.

| Field Name | Type | Manager | DB Table Name | DB Table Column | Note |
|---|---|---|---|---|---|
| Eğitim | Text Field | Readonly | TBL_PEM_TRAINING | name | --- |
| Eğitimi Veren Kurum | Text Field | Readonly | TBL_PEM_TRAINING | Training_company | --- |
| Eğitim Tipi | Text Field | Readonly | TBL_PEM_TRAINING | Training_type | --- |
| Başlangıç Tarihi | Date | Readonly | TBL_PEM_TRAINING | Start_date | --- |
| Bitiş Tarihi | Date | Readonly | TBL_PEM_TRAINING | End_date | --- |

**Figure 53: Planned Training (selected employee) Panel**

#### 7.4.5.10. Training Request (selected employee) Panel - Manager

Manager sees his/her employees' training requests. Training requests of the particular employee which is selected by manager appears in this panel. Details are shown in the Figure 54.

| Field Name | Type | Manager | DB Table Name | DB Table Column | Note |
|---|---|---|---|---|---|
| Eğitimi Seç | Checkbox | Editable | --- | --- | Note[9] |
| Eğitim Adı | Text Field | Readonly | TBL_PEM_TRAINING | name | --- |

| | | | | | |
|---|---|---|---|---|---|
| Eğitimi Veren Kurum | Text Field | Readonly | TBL_PEM_TRAINING | Training_company | --- |
| Eğitim Tipi | Text Field | Readonly | TBL_PEM_TRAINING | Training_type | --- |
| Katılım İstek Tarihi | Date | Readonly | TBL_PEM_PARTICIPATION | Employee_request_date | --- |
| Eğitim Başlangıç Tarihi | Date | Readonly | TBL_PEM_TRAINING | Start_date | --- |
| Açıklama | Text Field | Readonly | TBL_PEM_PARTICIPATION | Description | --- |

**Figure 54: Training Request (selected employee) Panel**

#### 7.4.5.11. Training Request Panel – Manager

Manager sees all his/her employees' training requests without selecting them. Details are shown in the Figure 55.

| Field Name | Type | Manager | DB Table Name | DB Table Column | Note |
|---|---|---|---|---|---|
| Eğitimi Seç | Checkbox | Editable | --- | --- | Note[9] |
| Sicil No | Text Field | Readonly | TBL_EMPLOYEE | EMPLOYEEID | --- |
| Adı | Text Field | Readonly | TBL_EMPLOYEE | NAME | --- |
| Soyadı | Text Field | Readonly | TBL_EMPLOYEE | SURNAME | --- |
| Eğitim Adı | Text Field | Readonly | TBL_PEM_TRAINING | name | --- |
| Eğitimi Veren Kurum | Text Field | Readonly | TBL_PEM_TRAINING | Training_company | --- |
| Eğitim Tipi | Text Field | Readonly | TBL_PEM_TRAINING | Training_type | --- |
| İstek Tarihi | Date | Readonly | TBL_PEM_PARTICIPATION | Employee_request_date | --- |
| Başlangıç Tarihi | Date | Readonly | TBL_PEM_TRAINING | Start_date | --- |
| Bitiş Tarihi | Date | Readonly | TBL_PEM_PARTICIPATION | Description | --- |
| Yer | Text Field | Readonly | TBL_PEM_TRAINING | Place | --- |

**Figure 55: Training Request Panel**

#### 7.4.5.12. Attended Training Panel - Manager

Manager sees all his/her employees' participated trainings without selecting them. Details are shown in the Figure 56

| Field Name | Type | Manager | DB Table Name | DB Table Column | Note |
|---|---|---|---|---|---|
| Sicil No | Text Field | Readonly | TBL_EMPLOYEE | EMPLOYEEID | --- |
| Adı | Text Field | Readonly | TBL_EMPLOYEE | NAME | --- |
| Soyadı | Text Field | Readonly | TBL_EMPLOYEE | SURNAME | --- |
| Eğitim Adı | Text Field | Readonly | TBL_PEM_TRAINING | name | --- |
| Eğitimi Veren Kurum | Text Field | Readonly | TBL_PEM_TRAINING | Training_company | --- |
| Eğitim Tipi | Text Field | Readonly | TBL_PEM_TRAINING | Training_type | --- |
| Başlangıç Tarihi | Date | Readonly | TBL_PEM_TRAINING | Start_date | --- |
| Bitiş Tarihi | Date | Readonly | TBL_PEM_PARTICIPATION | Description | --- |

**Figure 56: Attended Training Panel**

#### 7.4.5.13. Planned Training Panel

Manager sees all his/her approved and planned training requests. Details are shown in the Figure 57.

| Field Name | Type | Manager | DB Table Name | DB Table Column | Note |
|---|---|---|---|---|---|
| Sicil No | Text Field | Readonly | TBL_EMPLOYEE | EMPLOYEEID | --- |
| Adı | Text Field | Readonly | TBL_EMPLOYEE | NAME | --- |
| Soyadı | Text Field | Readonly | TBL_EMPLOYEE | SURNAME | --- |
| Eğitim Adı | Text Field | Readonly | TBL_PEM_TRAINING | name | --- |
| Eğitimi Veren Kurum | Text Field | Readonly | TBL_PEM_TRAINING | Training_company | --- |
| Eğitim Tipi | Text Field | Readonly | TBL_PEM_TRAINING | Training_type | --- |
| Başlangıç Tarihi | Date | Readonly | TBL_PEM_TRAINING | Start_date | --- |
| Bitiş Tarihi | Date | Readonly | TBL_PEM_PARTICIPATION | Description | --- |
| Yer | Text Field | Readonly | TBL_PEM_TRAINING | Place | --- |

**Figure 57: Planned Training Panel**

#### 7.4.5.14. Rejected Training Request Panel

Manager sees all his/her employees' rejected training requests. Details are shown in the Figure 58

| Field Name | Type | Manager | DB Table Name | DB Table Column | Note |
|---|---|---|---|---|---|
| Eğitimi Seç | Checkbox | Editable | --- | --- | Note[1 |

| | | | | | 0] |
|---|---|---|---|---|---|
| Sicil No | Text Field | Readonly | TBL_EMPLOYEE | EMPLOYEEID | --- |
| Adı | Text Field | Readonly | TBL_EMPLOYEE | NAME | --- |
| Soyadı | Text Field | Readonly | TBL_EMPLOYEE | SURNAME | --- |
| Eğitim Adı | Text Field | Readonly | TBL_PEM_TRAINING | name | --- |
| Eğitimi Veren Kurum | Text Field | Readonly | TBL_PEM_TRAINING | Training_company | --- |
| Eğitim Tipi | Text Field | Readonly | TBL_PEM_TRAINING | Training_type | --- |
| İstek Tarihi | Date | Readonly | TBL_PEM_PARTICIPATION | Employee_request_date | --- |
| Açıklama | Date | Readonly | TBL_PEM_PARTICIPATION | Description | --- |

**Figure 58: Rejected Training Request Panel**

#### 7.4.5.15. Employee (selected employee) Panel - HR

HR sees all information of the employee that is selected from the list. Details are shown in the Figure 59

| Field Name | Type | HR | DB Table Name | DB Table Column | Note |
|---|---|---|---|---|---|
| Çalışanı Seç | Checkbox | Editable | --- | --- | Note[8] |
| Sicil No | Text Field | Readonly | TBL_EMPLOYEE | EMPLOYEEID | --- |
| Adı | Text Field | Readonly | TBL_EMPLOYEE | NAME | --- |
| Soyadı | Text Field | Readonly | TBL_EMPLOYEE | SURNAME | --- |

**Figure 59: Employee (selected employee) Panel**

#### 7.4.5.16. Attended Training (selected) Panel - HR

HR sees participated trainings of the selected employee. Details are shown in the Figure 60

| Field Name | Type | HR | DB Table Name | DB Table Column | Note |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| Eğitim | Text Field | Readonly | TBL_PEM_TRAINING | name | --- |
| Eğitimi Veren Kurum | Text Field | Readonly | TBL_PEM_TRAINING | Training_company | --- |
| Eğitim Tipi | Text Field | Readonly | TBL_PEM_TRAINING | Training_type | --- |
| Tarih | Date | Readonly | TBL_PEM_TRAINING | Start_date | --- |

**Figure 60: Attended Training (selected) Panel**

#### 7.4.5.17. Planned Training (selected employee) Panel - HR

HR sees planned and approved trainings of the selected employee. Details are shown in the Figure 61.

| Field Name | Type | HR | DB Table Name | DB Table Column | Note |
|---|---|---|---|---|---|
| Eğitim | Text Field | Readonly | TBL_PEM_TRAINING | Name | --- |
| Eğitimi Veren Kurum | Text Field | Readonly | TBL_PEM_TRAINING | Training_company | --- |
| Eğitim Tipi | Text Field | Readonly | TBL_PEM_TRAINING | Training_type | --- |
| Başlangıç Tarihi | Date | Readonly | TBL_PEM_TRAINING | Start_date | --- |
| Bitiş Tarihi | Date | Readonly | TBL_PEM_TRAINING | End_date | --- |

**Figure 61: Planned Training (selected employee) Panel**

#### 7.4.5.18. Training Request (selected employee) Panel - HR

HR sees training requests of the selected employee that are already approved by manager. Details are shown in the Figure 62

| Field Name | Type | HR | DB Table Name | DB Table Column | Note |
|---|---|---|---|---|---|
| Eğitimi Seç | Checkbox | Editable | --- | --- | Note[11] |

| | | | | | |
|---|---|---|---|---|---|
| Eğitim Adı | Text Field | Readonly | TBL_PEM_TRAINING | name | --- |
| Eğitimi Veren Kurum | Text Field | Readonly | TBL_PEM_TRAINING | Training_company | --- |
| Eğitim Tipi | Text Field | Readonly | TBL_PEM_TRAINING | Training_type | --- |
| Katılım İstek Tarihi | Date | Readonly | TBL_PEM_PARTICIPATION | Employee_request_date | --- |
| Eğitim Başlangıç Tarihi | Date | Readonly | TBL_PEM_TRAINING | Start_date | --- |
| Açıklama | Text Field | Readonly | TBL_PEM_PARTICIPATION | Description | --- |

**Figure 62: Training Request (selected employee) Panel**

#### 7.4.5.19. Training Request Panel - HR

HR sees all employees' training requests. Details are shown in the Figure 63.

| Field Name | Type | HR | DB Table Name | DB Table Column | Note |
|---|---|---|---|---|---|
| Eğitimi Seç | Checkbox | Editable | --- | --- | Note[11] |
| Sicil No | Text Field | Readonly | TBL_EMPLOYEE | EMPLOYEEID | --- |
| Adı | Text Field | Readonly | TBL_EMPLOYEE | NAME | --- |
| Soyadı | Text Field | Readonly | TBL_EMPLOYEE | SURNAME | --- |
| Eğitim Adı | Text Field | Readonly | TBL_PEM_TRAINING | name | --- |
| Eğitimi Veren Kurum | Text Field | Readonly | TBL_PEM_TRAINING | Training_company | --- |
| Eğitim Tipi | Text Field | Readonly | TBL_PEM_TRAINING | Training_type | --- |
| İstek Tarihi | Date | Readonly | TBL_PEM_PARTICIPATION | Employee_request_date | --- |
| Başlangıç Tarihi | Date | Readonly | TBL_PEM_TRAINING | Start_date | --- |
| Bitiş Tarihi | Date | Readonly | TBL_PEM_PARTICIPATION | Description | --- |
| Yer | Text Field | Readonly | TBL_PEM_TRAINING | Place | --- |

**Figure 63: Training Request Panel**

#### 7.4.5.20. Attended Training Panel - HR

HR sees all employees' participated trainings. Details are shown in the Figure 64

| Field Name | Type | HR | DB Table Name | DB Table Column | Note |
|---|---|---|---|---|---|
| Sicil No | Text Field | Readonly | TBL_EMPLOYEE | EMPLOYEEID | --- |
| Adı | Text Field | Readonly | TBL_EMPLOYEE | NAME | --- |

| | | | | | |
|---|---|---|---|---|---|
| Soyadı | Text Field | Readonly | TBL_EMPLOYEE | SURNAME | --- |
| Eğitim Adı | Text Field | Readonly | TBL_PEM_TRAINING | name | --- |
| Eğitimi Veren Kurum | Text Field | Readonly | TBL_PEM_TRAINING | Training_company | --- |
| Eğitim Tipi | Text Field | Readonly | TBL_PEM_TRAINING | Training_type | --- |
| Başlangıç Tarihi | Date | Readonly | TBL_PEM_TRAINING | Start_date | --- |
| Bitiş Tarihi | Date | Readonly | TBL_PEM_PARTICIPATION | Description | --- |

**Figure 64: Attended Training Panel**

#### 7.4.5.21. Planned Training Panel - HR

HR sees all employees' approved training requests. Details are shown in the Figure 65.

| Field Name | Type | HR | DB Table Name | DB Table Column | Note |
|---|---|---|---|---|---|
| Sicil No | Text Field | Readonly | TBL_EMPLOYEE | EMPLOYEEID | --- |
| Adı | Text Field | Readonly | TBL_EMPLOYEE | NAME | --- |
| Soyadı | Text Field | Readonly | TBL_EMPLOYEE | SURNAME | --- |
| Eğitim Adı | Text Field | Readonly | TBL_PEM_TRAINING | name | --- |
| Eğitimi Veren Kurum | Text Field | Readonly | TBL_PEM_TRAINING | Training_company | --- |
| Eğitim Tipi | Text Field | Readonly | TBL_PEM_TRAINING | Training_type | --- |
| Başlangıç Tarihi | Date | Readonly | TBL_PEM_TRAINING | Start_date | --- |
| Bitiş Tarihi | Date | Readonly | TBL_PEM_PARTICIPATION | Description | --- |
| Yer | Text Field | Readonly | TBL_PEM_TRAINING | Place | --- |

**Figure 65: Planned Training Panel**

#### 7.4.5.22. Rejected Training Request Panel - HR

HR sees all employees' training requests that are rejected by him. Details are shown in the Figure 66.

| Field Name | Type | HR | DB Table Name | DB Table Column | Note |
|---|---|---|---|---|---|
| Eğitimi Seç | Checkbox | Editable | --- | --- | Note[12] |
| Sicil No | Text Field | Readonly | TBL_EMPLOYEE | EMPLOYEEID | --- |
| Adı | Text Field | Readonly | TBL_EMPLOYEE | NAME | --- |
| Soyadı | Text Field | Readonly | TBL_EMPLOYEE | SURNAME | --- |

| | | | | | |
|---|---|---|---|---|---|
| Eğitim Adı | Text Field | Readonly | TBL_PEM_TRAINING | Name | --- |
| Eğitimi Veren Kurum | Text Field | Readonly | TBL_PEM_TRAINING | Training_company | --- |
| Eğitim Tipi | Text Field | Readonly | TBL_PEM_TRAINING | Training_type | --- |
| İstek Tarihi | Date | Readonly | TBL_PEM_PARTICIPATION | Employee_request_date | --- |
| Açıklama | Date | Readonly | TBL_PEM_PARTICIPATION | Description | --- |

**Figure 66: Rejected Training Request Panel**

#### 7.4.5.23. Notes and Conditions

**COND 1 :** If an employee works from 1 to 5 years, the legal annual leave right is 18 days including 3 Saturdays.

**COND 2 :** If an employee works from 5 to 15 years, the legal annual leave right is 22 days including 3 Saturdays.

**COND 3 :** If an employee works 15+ years, the legal annual leave right is 26 days including 4 Saturdays.

**COND 4 :** The next panel is dependent to this field. "Yıllara Göre Alınan İzinler" shows detailed that the annual leaves were used by employee at that year.

**COND 5 :** In order to plan an annual leave, user should enter start date and finish date of leave. After entering these fields, user should also enter "Yarım Gün" field like below:

a. Hiçbiri : If employee will use the whole day at the start date and return back to work in the morning of finish date.
b. Bitiş günü yarım gün izinliyim : If employee will use the whole day at the start date and return back to work in afternoon of finish date.
c. Başlangıç günü yarım gün izinliyim : If employee will use leave at afternoon of the start date and return back to work in the morning of finish date.
d. Her iki gün yarımşar gün izinliyim : If employee will use leave at afternoon of the start date and return back to work in the afternoon of finish date.

**COND 6 :** This field is dependent to whether an employee request an leave.

**COND 7 :** In order to submit an annual leave to manager, user should print annual leave request paper by selecting the annual leave from "Planlanan İzinler Paneli". Then press the "İzin kağıdı bas" button.

**COND 8 :** This field is dependent to whether a manager approve of an employee's leave request.

**COND 9 :** HR can not edit "HR onay" check box unless manager approves same request.

**NOTE 1 :** The value in this field can be a negative number. This shows that employee used annual leaves which are not deserved yet.

**NOTE 2 :** If duration of an annual leave is greater than rest of annual leaves that are not used in its year, it can be separated into next year or next years.

**NOTE 3 :** If employee wants to request a training, he/she clicks the box next to the training and clicks the button labeled as "Eğitim İsteğinde Bulun".

**NOTE 4 :** If employee wants to delete a training request, he/she clicks the box next to the training and clicks the button labeled as "Sil".

**NOTE 5 :** When manager approves a training request, manager_action_date column in TBL_PEM_PARTICIPATION table is updated.

**NOTE 6 :** When HR approves a training request, coordinator_action_date column in TBL_PEM_PATRICIPATION table is updated.

**NOTE 7 :** If employee wants to fill an evaluation form related to his/her trainings, he/she clicks the box next to the training and clicks the button labeled as "Değerlendirme Formu Doldur". After clicking this button the evaluation form is activated below. Employee fills evaluation form and clicks the button labeled as "Değerlendirme Formunu Kaydet". Finally, after clicking this button his/her answers are saved in TBL_PEM_EVALUATION table, anonymously.

**NOTE 8 :** Training details of employee selected can be seen by manager in the following panel

**NOTE 9 :** Manager presses "Onayla" or "Presses" button after selecting the training request. The required space in the database is updated.

**NOTE 10 :** Manager can approve the training request that disapproved before by selecting the training and pressing "Onayla" button.

**NOTE 11 :** HR presses "Onayla" or "Reddet" button after selecting the training request approved by manager. The required space in the database is updated.

**NOTE 12 :** HR can approve the training request that disapproved before by selecting the training and clicking the “Onayla” button.

**NOTE 13 :** Manager sees employee’s annual leave details in the following panel.

### 7.4.6. Uses/Interactions

This component is designed separately from Annual Leave Module. It interacts only with database component and server component.

### 7.4.7. Resources

The main resource that is affected by this component is database. It uses database component as a data source.

### 7.4.8. Processing

Now, we analyze the processing of this component:

- First of all, the user comes to the screen that he/she wants to do operations

-Then user takes appropriate action in the appropriate subcomponent/panel

-The component needs to understand the request that comes from user.

-Operation (update data or get data) on database is done by this component according to the request

-The result(s) is shown in the user interface

# 8. Libraries and Tools

We will use some technologies, libraries and tools mentioned at the below.

## 8.1. Eclipse

Eclipse[6] is a multi-language software development environment comprising an integrated development environment (IDE) and an extensible plug-in system. It is written mostly in Java and can be used to develop applications in Java and, by means of various plug-ins, other programming languages including Ada, C, C++, COBOL, Perl, PHP, Python, R, Ruby (including Ruby on Rails framework), Scala, Clojure, Groovy and Scheme. It can also be used to develop packages for the software Mathematica. The

IDE is often called Eclipse ADT (Ada Development Toolkit) for Ada, Eclipse CDT for C/C++, Eclipse JDT for Java, and Eclipse PDT for PHP.

## 8.2. SQL Server Management Studio

SQL Server Management Studio[7] is a tool included with Microsoft SQL Server 2005 and later versions for configuring, managing, and administering all components within Microsoft SQL Server. The tool includes both script editors and graphical tools which work with objects and features of the server.

## 8.3. Java Platform, Standard Edition

Java Platform, Standard Edition or Java SE[8] is a widely used platform for programming in the Java language. It is the Java Platform used to deploy portable applications for general use. In practical terms, Java SE consists of a virtual machine, which must be used to run Java programs, together with a set of libraries (or "packages") needed to allow the use of file systems, networks, graphical interfaces, and so on, from within those programs.

## 8.4. AJAX

Ajax[9] is a group of interrelated web development methods used on the client-side to create asynchronous web applications. With Ajax, web applications can send data to, and retrieve data from, a server asynchronously (in the background) without interfering with the display and behavior of the existing page. Data is usually retrieved using the `XMLHttpRequest` object. Despite the name, the use of XML is not needed (JSON is often used instead), and the requests do not need to be asynchronous.

## 8.5. Hibernate

Hibernate[10] is an object-relational mapping (ORM) library for the Java language, providing a framework for mapping an object-oriented domain model to a traditional relational database. Hibernate solves object-relational impedance mismatch problems by replacing direct persistence-related database accesses with high-level object handling functions.

## 8.6. Hyper Text Markup Language(HTML)

HyperText Markup Language (HTML)[11] is the predominant markup language for web pages. HTML elements are the basic building-blocks of webpages. HTML elements form the building blocks of all websites. HTML allows images and objects to be embedded and can be used to create interactive forms. It provides a means to create structured documents by denoting structural semantics for text such as

headings, paragraphs, lists, links, quotes and other items. It can embed scripts in languages such as JavaScript which affect the behavior of HTML webpages.

### 8.7. Cascading Style Sheets(CSS)

Cascading Style Sheets (CSS)[12] is a style sheet language used to describe the presentation semantics (the look and formatting) of a document written in a markup language. Its most common application is to style web pages written in HTML and XHTML, but the language can also be applied to any kind of XML document, including plain XML, SVG and XUL.

## 9. Time Planning

### 9.1. Term 1 Gannt Chart

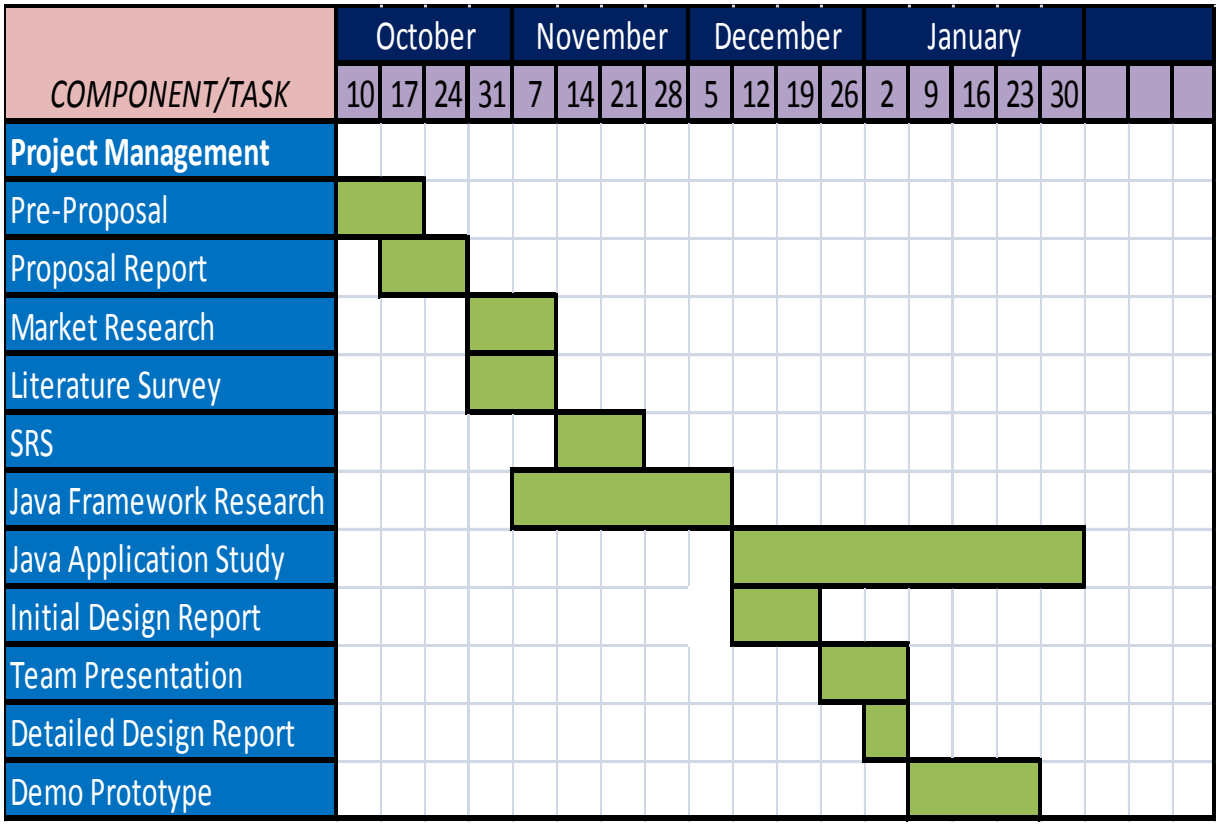



Figure 67: Gantt Chart for term 1

## 8.2. Term 2 Gannt Chart

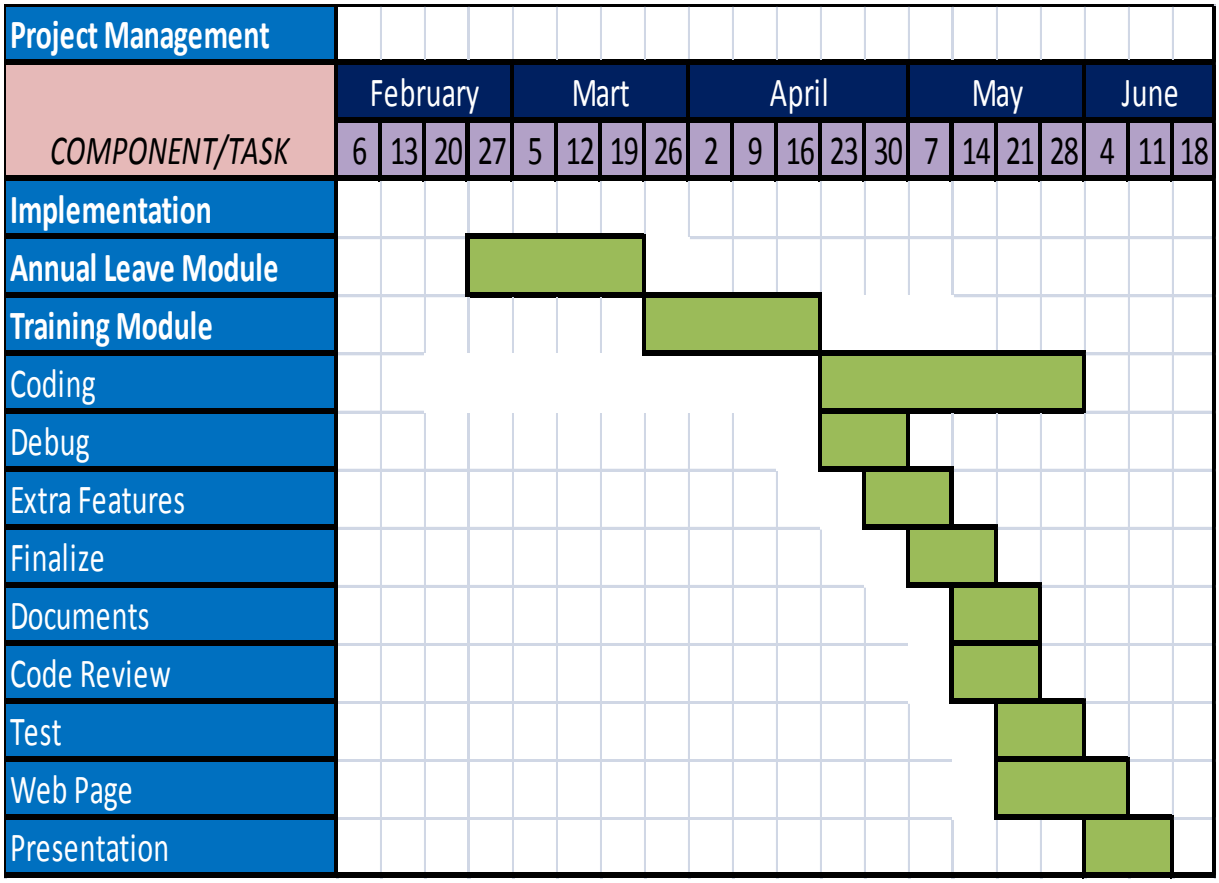



Figure 68: Gantt Chart for term 2

# 10. Conclusion

This document describes the design levels of the project SENtral conducted by Lotsoft group. The possible design and other constraints that can be faced are explained. The system structure of SENtral and data representations are stated through this doucment. Furthermore, data flow models, class diagrams, interface features and entity relationships diagrams are showed in the document in details. Finally time planning of our team and the gantt charts for both terms, fall and spring, are provided. In conclusion, this document is prepared to conduct better design approaches to SENtral project at implementation.