Software Requirements Specification

Human Resource Management System

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12.07.2023

1. Introduction

This document is a software requirement specification for the HR Management System Project. After giving information about the definition of the project at the beginning of the document, we will give a complete description for overview and list the requirements which meet the needs of the company roughly.

1.1 Problem Definition

Nowadays, companies try to enhance their management and have better control over their employees. In order to fulfill these requirements in a more efficient way they need software called Human Resource Management System.

HR Management System is software which satisfies the needs of the Human Resources Department of a company to manage employees' personal data (citizen identity number, name, surname, birthdate, birthplace, educational information etc.), annual leaves, payroll, training, skills, performance evaluation and so on. Our HR Management System will meet the needs for managing the personal data, system authentication and authorization of an employee.

Our HRMS project is being developed for the HR's who want to control and manage their employee's data in a more appropriate and neat way. With the help of our project they will have better software to manage their personal data, control mechanism to authorize and authenticate for the employees' entry.

1.2 Purpose

This document aims to give a brief description about the HR Management System Project. With the help of this document the needs of the company and the solution that will be provided to that needs will be clearly presented. In other words this document will provide a basis for validation and verification.

1.3 Scope

This document covers the whole definition of the HR Management System (HRMS) project. It basically includes the requirements for managing the personal data, controlling authentication and authorization mechanism, and evaluating employees' performance. After creating the new HRMS we have to accomplish data migration from their existing system to our new one.

More specifically, our HRMS (HR Management System) controls and manages the personal database such that any user with different role types as manager, admin, employee, and human resource will be able to manipulate their personal data.

In addition to manipulating the personal data, our HRMS will provide authentication and authorization mechanisms. Every user with any role type can be able to login to the system with his/her username and password.

2. Overall Description

The overall description of our project can be stated as creating and managing the database, developing a friendly user interface to manipulate the database, and providing an authentication mechanism to safely accomplish tasks mentioned above.

2.1 Product Perspective

HRMS which is an online intranet System will be used by four types of employees' of Siemens. These types who have different roles can be stated as; admin, manager, HR, employee. Every user enters the main authentication page and after that, the system will grant them authorization. After being authorized according to their permissions (role type) users will basically query and edit the database via HRMS.
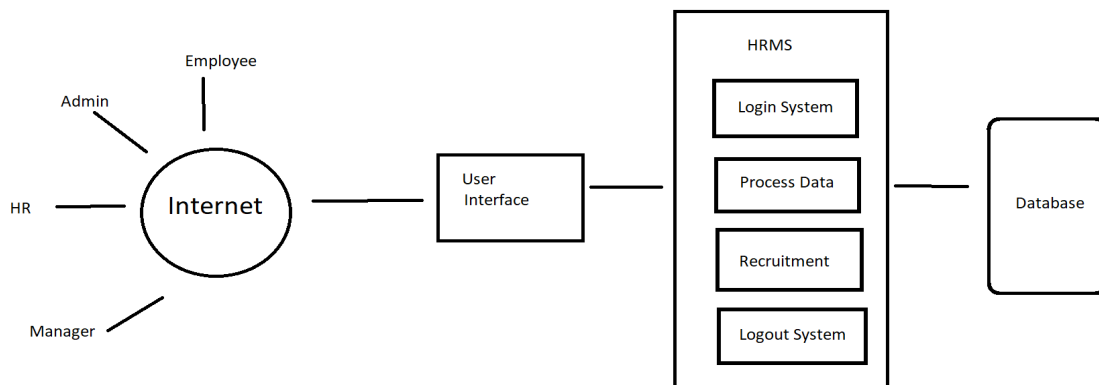
Fig 2.1.1 Generic Use case diagram

2.2 Product Functions

HRMS implements some major functions in order to accomplish required tasks. These functions constitute a basis for the whole system. These functions can be stated as:

2.2.1) Authentication and Authorization

Being connected to the internet, users will be able to get into the system. In order to see the interface related to his/her role type, the user's account should be authorized and also his/her username and password should be authenticated. These tasks are basically held by the functions implemented under the header of the Authentication and Authorization major function.

2.2.2) Process Data

These functions which can be examined in that process data major function basically provides the user to manage the database according to the desired task. These management tasks constitute the

major feature of the HRMS. With the help of these functions a user can update some basic personal data like contact information, marital status etc. In addition to updating data, a user can also search the database in order to obtain the list of the users' which has the properties desired. Also a user may also see the specific information about a user or all users which can be named as a report. In other words searching is the operation with rows of the database while reporting is the operation with columns of the database.

2.2.3) Recruitment

Recruitment of a new person which means introducing a new user to the system can be accomplished in two steps. When it is needed to add a new user to the system, firstly, HR must create an employee account, by the way at this step HRMS automatically gives an id to that user. At the second step, admin creates a user related to that user id.
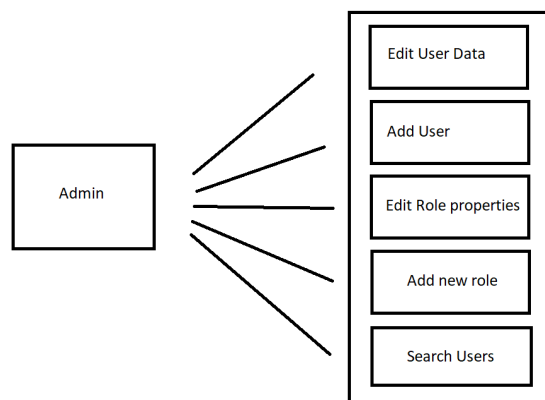
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Fig 2.2.1 Use case diagram of Admin

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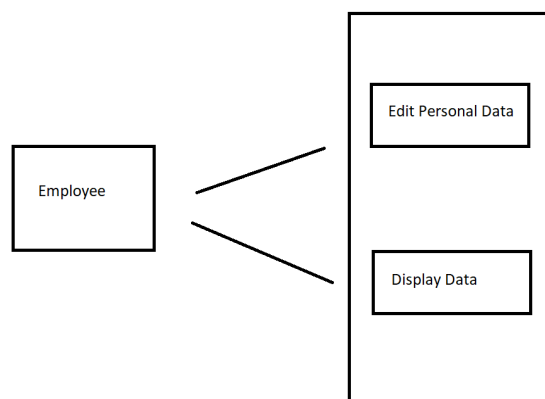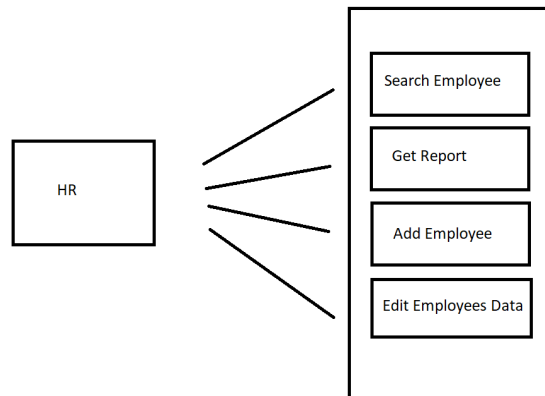
Fig 2.2.2 Use case diagram of Employee
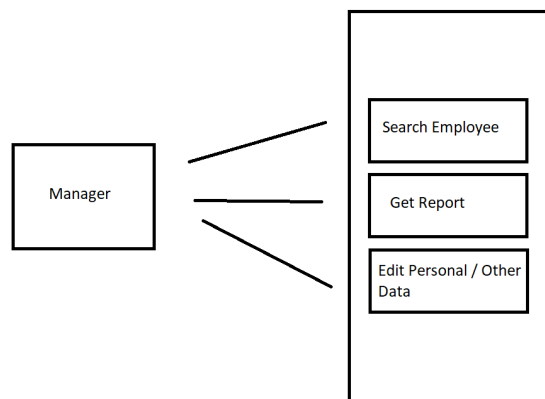
Fig 2.2.3 Use case diagram of Employee HR

Fig 2.2.4 Use case diagram of Manager

3. Specific Requirements

3.1 Functional Requirements

In this section, we will explain the major functions of HRMS along with the data flow. So the major functionality of the project such as authentication mechanism, personal data processing, recruitment, report, and graphical user interface unit will be explained step by step.

3.1.1 Authentication

Login	User can login to the HRMS system with his/her username and password.
Logout	Users can logout from the HRMS system.
Login failure	If the user does not exist in the database or the user did not get authorized by the HRMS admin yet.

3.1.2 Authorization

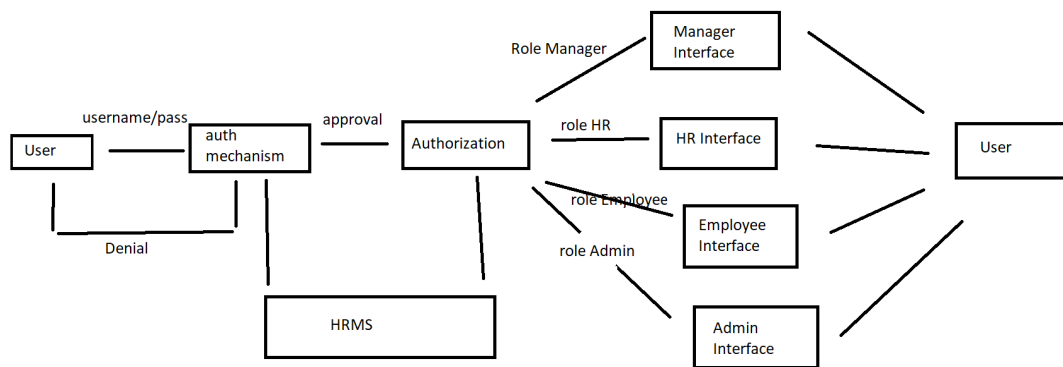| User role check	After logging in, the user role will be checked from the database and the user interface will be created according to that role/roles.

Fig 3.1.1.1 Authorization / Authentication

3.1.3 Process Data

Display	Users with defined roles can display the content of the database. Being more specific, an employee can only view his/her personal information. Manager can see not only his/her personal information but also employees' information who are working under his/her coverage. Admin and HR can display their personal information and all employees' information.
Edit	A user with an employee role can edit his/her specific personal information. Manager can only edit employees' personal information that is under his/her coverage except user role type. HR can edit all employees' information except user role type. Admin can edit all information related to all employees' including their user role type.
Search	Users with manager role type can search the content of the database for the employees who are under his/her coverage. HR and admin roles can search all the employees' information in the database. Search feature works on specific keywords showing employees' characteristics, peculiarities, skills, features, and etc. For example, HR wants to find employees who are well trained in "Java Programming Language". He/she will write the specific keyword in the search bar and press the available search button. Afterwards, he/she will find a list of all the employees' who know the "Java Programming Language".
Report	This feature is basically used to filter the contents of the search mechanism. For instance, as we mentioned in the above search

	feature. The HR wants to get a report of some specific employees who know "java programming Language". The list of employees obtained from the result of the search feature he/she can get the specific report by selecting the corresponding checkbox available for each employee. Or a manager role type can get a report of some or all employees' who are working under his/her coverage by selecting the checkbox. Except employee role type, all other role types such as admin, HR, and manager can use this feature.
Update authentication	This feature can be used only by admin role type. Admin can update the role type of a specific user. For example, an employee got a promotion and his role type will be changed from employee role to manager role. Admin will be able to update this authentication mechanism.

3.1.3 Recruitment

Add new Employee	HR role type is able to add a new employee to the database. The new employee will have all the required personal information related to his/her. The new created employee will have an id.
Add a new user	After being created a new employee by the HR role, the admin role is responsible for creating a new user by the specified id assigned in the "Add a new employee" feature. The unique id will be given by the system. Admin will assign a new role such as employee, manager, HR, and admin to the new created user.

3.2 Non-Functional Requirements

3.2.1 Software Requirements

- Since an HRMS application is a web-based application, internet connection must be established.
- The HRMS software will be used on PCs and will function via the internet or intranet in any web browser.
- The HRMS application interface will be developed by Java frameworks.
- The HRMS software will support the JDK environment.
- The HRMS software personal database model will support the MYSQL environment as DBMS.

3.2.2 Development Environment Requirements

- Intellij IDE will be used for developing the HRMS web-based interface and its relation to the person database module.
- Intellij IDE
  Intellij 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 on Rails framework), Scala, Clojure, Groovy, and Scheme. It can be used to develop packages for the software Mathematica.
- MySql Administrator or Microsoft SQL Server will be used to create, manage, and optimize the person database module.
- MySql Administrator
MySQL is a relational database management system(RDBMS) that runs as a server providing multi-user access to a number of databases. The SQL phrase stands for Structured Query Language. The MySQL development platform has made its source code available under the terms of use of the GNU General Public License.

4. Data Model And Description

This section describes attributes of database objects and relationships between them with a data table dictionary and tables to overcome confusions. These data objects are made under the consideration of getting rid of unnecessary attributes and normalization factors. The HRMS application consists of two main database groups. First one is storing information for the Personal Master Data module and the second one is for the Authorization and Authentication Module.

4.1 Data Description of Personal Master Data Module

In this section we mainly describe each table of the Personal Master Data Module in detail. We determine each table and its responsibility in the module. Each table keeps many fields related to the specific data object. Then in the following sections we will explain the relationships of each database module table with each other.

- ➢ TBL_Employee
- ➢ TBL_APPL_User
- ➢ TBL_Employee_Projects
- ➢ TBL_Employee_TechnicalSkills
- ➢ TBL_Employee_Education
- ➢ TBL_Employee_Certificates

4.1.1 Data Objects

4.1.1.1 TBL_Employee Table

Name :	TBL_Employee Table
Description :	Data table for employees consists of many fields which are responsible for storing the specific employee personal information. Some important fields in the table can be said as employee id, name, surname, email, phone, date of birth, and many more which can be seen in the above database table. Fields in this table will be filled with the specific data of the Employee. At the time a new Employee is added to the HRMS system, these fields keep the data manually provided by the HR. After the first creation of the Employee account, employees, manager, HR, and admin have authorization to modify this information.

4.1.1.2 TBL_APPL_User

Name :	TBL_APPL_User
Description :	The TBL_APPL_User table consists of basic information about a user. The detailed information about this table will be given in part (4.2), in the Authorization and Authentication module part.

4.1.1.3 TBL_Employee_Projects

Name :	TBL_Employee_Projects
Description :	This table stores basic relations between projects and employees. it stores information about projects that this specified employee takes part. In other words, it keeps specific employee id, project id, name, start, finish, and completed dates, and notes.

4.1.1.4 TBL_Employee_TechnicalSkills

Name :	TBL_Employee_TechnicalSkills
Description :	This table stores information about an employee's technical skills. Information such as employee Id, name, level, confirmation, notes, and levelId will be kept.

4.1.1.5 TBL_Employee_Educatioin

Name :	TBL_Employee_Educatioin
Description :	This table keeps information about employee education. Basically, information such as employee id, department, degree, institution, thesis, notes, still studying, entrance date, graduation, and etc.

4.1.1.6 TBL_Employee_Certificates

Name :	TBL_Employee_Certificates
Description :	An employee may have certificates throughout his/her education timeline or he/she will get any other certificates during his working duration in the company. Employee certificate table stores

	data fields such as employee id, name of the certificate, its provider, date, notes and confirmation.

4.1.2 Relationships

Relationships between tables are made through a unique field which is employee id. Employee table creates the basic information table about an employee such as his/her id, name, surname, email, and etc. This provided employee id is a primary key for the employee table, but it will be a foreign key for all other tables using the specific employee id. All tables mentioned above will manipulate employee personal data through that id. Therefore, employee id, the primary key, is like a bridge between a unique employee and his/her relation to other data fields and tables.

4.2 Data Description of Authentication and Authorization Module

In this section all authentication and authorization module database tables will be described in detail. We describe each table and its responsibility in the module. Each authentication and authorization database tables keep many fields related to the specific data object. Relationship between each table will be explained as well.

- ➢ TBL_APPL_User
- ➢ TBL_APPL_User_Resp
- ➢ TBL_APPL_Resp
- ➢ TBL_APPL_Resp_Form
- ➢ TBL_APPL_Form

4.2.1 Data Objects

4.2.1.1 TBL_APPL_User

Name :	TBL_APPL_User
Description :	User application table is used for determining user information. When a user logs into the HRMS, the user's username and password is checked from this table and directed to the system. Also it contains other data fields such as user id, name, surname, when this user is created and modified by whom, title of the user, password history, phone, email, fax, and many more.

4.2.1.2 TBL_APPL_User_Resp

Name :	TBL_APPL_User_Resp
Description :	This table is basically used to determine the assigned role types for a user. It also keeps creation and modification dates, and id of the users who created and modified these role assignments.

4.2.1.3 TBL_APPL_Resp

Name :	TBL_APPL_Resp
Description :	This table is responsible for storing role type lists. The data fields are basically role id, role name, people who created and modified and when.

4.2.1.4 TBL_APPL _Form

Name :	TBL_APPL _Form
Description :	This table stores a list of functions that are used in the application. The basic data fields are function id, function name, creator, and modifier.

4.2.1.5 TBL_APPL_Resp _Form

Name :	TBL_APPL_Resp _Form
Description :	This table is used as a bridge between TBL_APPL_Resp and TBL_APPL_Form. By means of this table we can determine which role types are authorized to which sets of functions. That is why when a user is logged in into the HRMS, according to the user role type the interface will be displayed. .

4.2.1 Data Objects

The relationship between these tables is not prone to a single id. Nevertheless, there exists a process of checking a user at each step and determining his responsibility and authority. By the help of user id, user responsibility will be checked and the interface will be displayed according to the list of roles or responsibilities. After being checked the role types, related authorized functions will be called in the system.
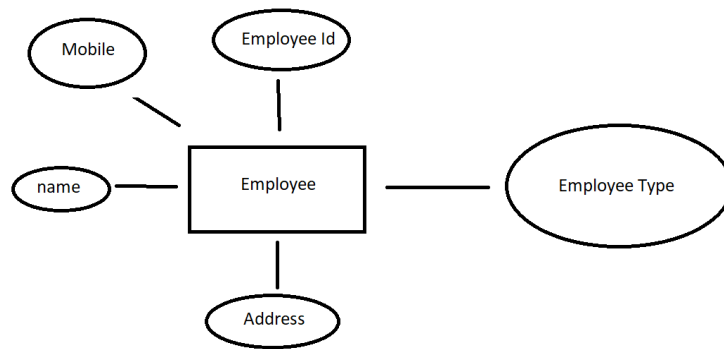
4.3 ER Diagrams
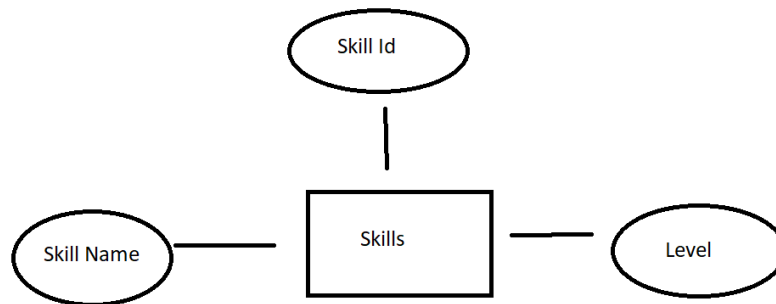
4.3.1 Data Models
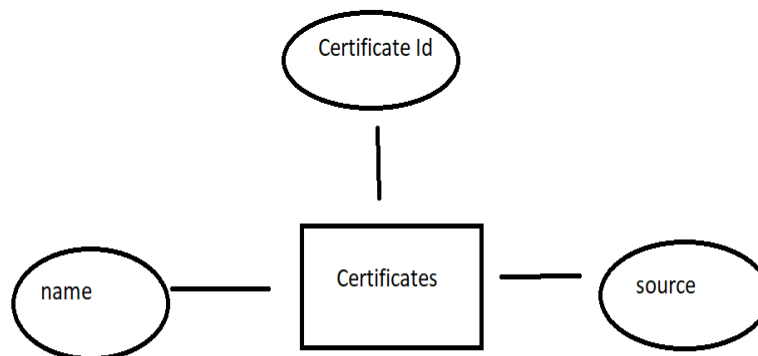
Fig 4.3.1.1 Employee Model

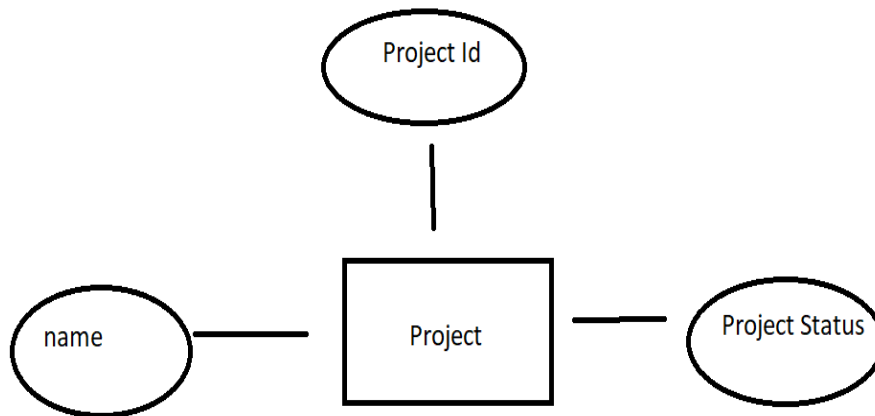Fig 4.3.1.2 Skill Model

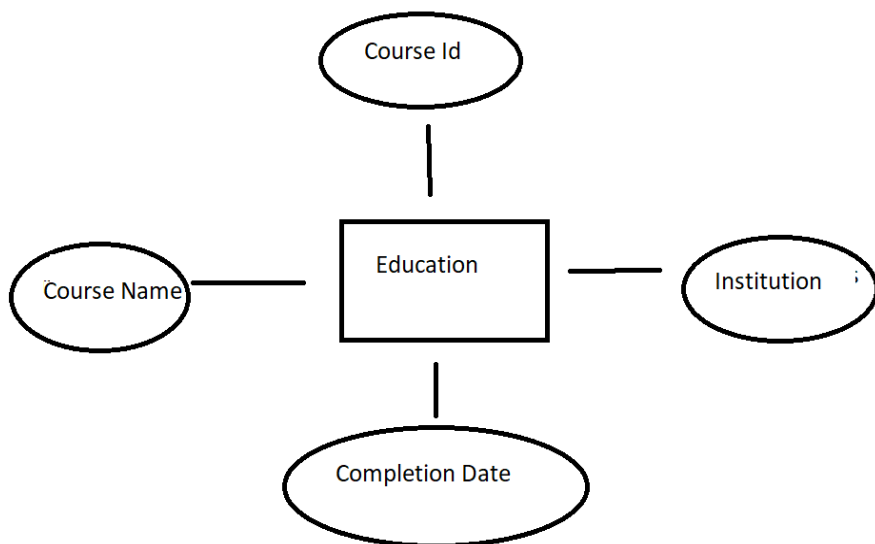Fig 4.3.1.3 Certificate Model

Fig 4.3.1.4 Project Model

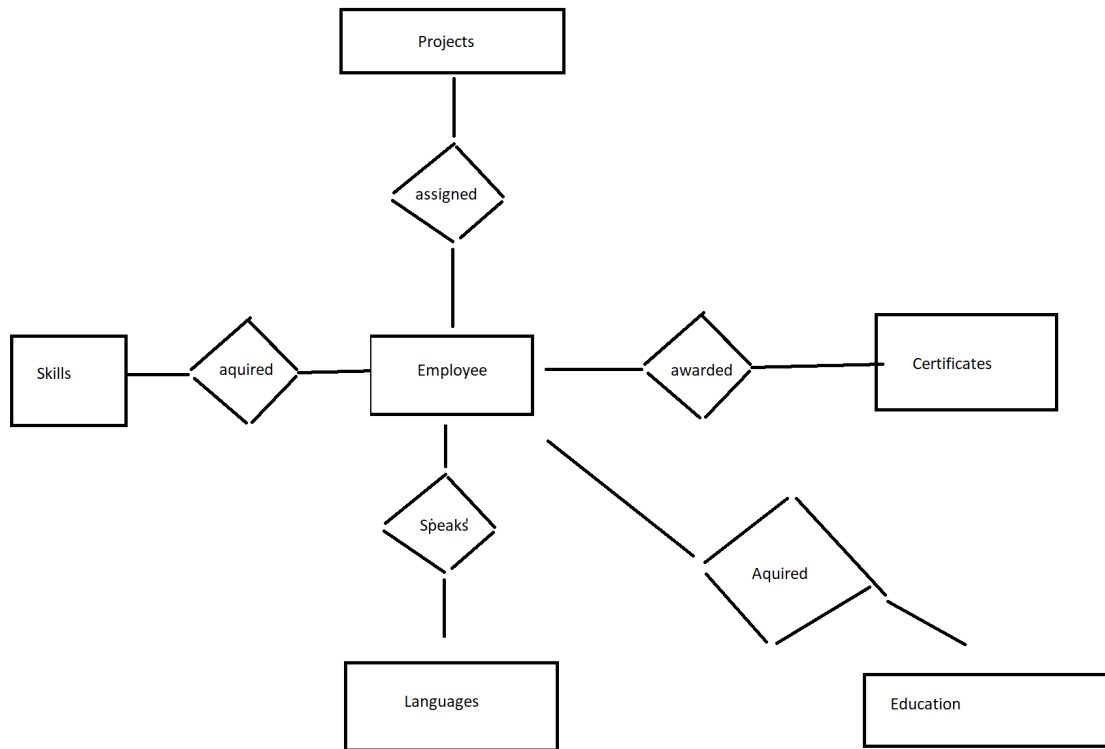Fig 4.3.1.5 Education Model

4.3.2 Relationships Models

Fig 4.3.2.1. Relationships

5. Conclusion

This document states the design level approach for the project HRMS. After giving a basic information about what the HRMS is, the document briefly describes the problem and the solution we proposed to the problem with the figures to visualize better and steps taken to solve the problem. In other words this document introduces the technical details of the HRMS.

In the first part of the technical design, the major functions needed to develop an HRMS are introduced. Later on, these major functions and their sub-functions are visualized with the use case diagrams. In the second part, user interfaces are described in a detailed manner with figures. Lastly, data modules and their relationships are discussed. To conclude, this document constitutes a base for the development of an HRMS.