Software Requirement Specification

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HR Simulation Platform for Risk Management Education

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Content

1.Introduction

1.1 Problem Definition

Learning methods used in risk management today are limited to traditional methods. According to studies, the duration and rate of memorability of many traditional education methods in the audience is quite low. The listener can remember only 10% of the information after 72 hours. When impressive photo, video and story additions are made to educational tools, this rate rises to 35-40% within 72 hours. On the other hand, when methods such as simulation, gamification and animation, which are among the most impressive methods of experiential learning, are included in the learning process, the memorability duration of knowledge can be 80% even after 6 months. This also applies to risk management training.

This project aims to teach risk management to employees and interested parties through a simulation platform using innovative and modern methods.

1.2 Purpose

The main reason for creating this document is to explain the HR Risk Management System simulation with Virtual Reality Simulation. This project aims to develop an experiential learning method for business actors in risk management and increase the effectiveness and efficiency of corporate education. With this document, the purpose ,needs and solutions produced in response to these needs are explained in detail and clearly.

1.3 Scope of Project

This paper aims to clearly explain the project HR Simulation Platform for Risk Management Education Project. It basically includes the requirements for managing the personal data and scores received by users, controlling authentication and authorization mechanisms, and evaluating human resource employees' performance.
In this platform, employee and admin can be able to login to the system with his/her username and password. A score is created based on the points received.
In addition, the simulation has a team mode, with the team mode, it is aimed that the teams come together over the risks. As a result, each team gets a score.

1.4 Definitions,Acronyms, and Abbreviations (Glossary)

SRS: Software Requirements Specification

HR: Human Resource

Admin: Administrator

HR Employees: Human Resource Employees

1.5 References

[1] IEEE Std 830-1998: IEEE Recommended Practice for Software Requirements Specifications. [Online]"http://cengproject.cankaya.edu.tr/wp-content/uploads/sites/10/2017/12/SRS-ieee-830-1998.pdf"

1.6 Overview of the document

This SRS document has been arranged so that every user working in the human resources department can easily understand and use the HR VR Simulation Platform for Risk Management Education.

Fundamentally, this document begins with a brief description of the problems. After that, it proceeds with the specific solutions that we proposed. Furthermore, the diagrams of our solutions to visualize the solutions and the system fairly, non-functional and functional requirements, external interface requirements, limitations that may be encountered while developing software or hardware that may be insufficient, the relationship between admin and HR employees.

2.Overall Description

The general description of our project can be expressed as creating and managing VR simulation, developing a clear user interface to make the simulation understandable, logging in from the website to become a member, and providing an authentication mechanism to perform the above-mentioned tasks securely.

2.1 Product Perspective

The aim of this project is to train employees working in the HR department of companies against possible risks through a VR simulation.
In our simulation project, there are three modes: training ,office mode and office team mode. It is intended to clearly explain to the user how to use the simulation with training mode.

In Office mode, the user encounters questions selected from the question pool. The user tries to find the correct answers to these questions. The application user moves to the stage where they can perform their duties by going step by step on the recruitment process steps. After this part, the user is subjected to two different methods. The user encounters risks and hazards appropriate to the steps he or she has experienced in previous steps. By finding the correct control stage suitable for these risks and dangers, the user tries to get points. In the second method, a risk occurs at the stage in which the user is concerned. The user is asked questions to prevent this risk, and the user tries to eliminate the risk by answering these questions correctly.
In Office team mode, the simulation has the same steps and features with office mode and moreover it is the mode where the employees play together as an extra to the office mode.

2.1.1 Development Methodology

For developing the project, we have planned to use a Waterfall development methodology where stakeholders and our advisor requirements are gathered at the beginning of the project. This methodology is used for long-term and structured projects because requirements have already been determined, the product has been defined, and the resources to be used are specified already.

There are some advantages of a Waterfall that is one of the easiest models to manage, because of its nature, each phase is already defined and has terminated. It relies on teams following a sequence of steps. Before the next steps of development, each step must be done. For our project, another benefit is that when the product is ready, the product can be delivered to the user without any changes.

2.2 User Characteristics

- **2.2.1 HR Employees**

➢ Employees must be an employee in the department of HR.
➢ Since the simulation language is Turkish, employees should understand and read the Turkish language.
➢ Employees should know the basic level of computer usage.

- **2.2.2 Admin**

➢ Admin must be an employee in the department of HR.
➢ Since the simulation language is Turkish, the admin should understand and read the Turkish language.
➢ Admin must have the ability to add, remove and edit employees to the system.
➢ Admin must have the ability to add, remove employees to the teams.

- **2.2.3 Teams**

➢ Teams must consist of HR elements.

2.3 Product Functions

HR VR Simulation Platform for Risk Management Education implements functions required to meet the desired properties. All of these functions are necessary for the system to work regularly.

2.3.1 Authentication and Authorization

➔ Users registered in the database by the administrator can log into the system. To access assignment information, the user account must be authorized, as well as the username and password must be verified. These tasks are essentially performed by functions implemented under the title of Authentication and Authorization main function.

2.3.2 Process Data

➔ Our data is about scores, user information, and assignments that include different recruitment questions and psychological test questions and their answers. Its major functions are essentially providing users to manage the database according to the desired task. These management tasks are the basis feature of the simulation.

2.4 Constraints,Assumptions and Dependencies

- **Regularity Policies:**
  - ➢ Users must be part of the company that owns the product and must be a human resources employee. It means that, every user has an account already created by Admin.

- **Hardware limitation:**
  - ➢ Our simulation will work on each operating system. However, the simulation system and the database will work on a cloud.

3. Requirement Specification

This project has some defined functional/non-functional requirements about the modes and users to be executed.

3.1 External Interface Requirement

This section specifies hardware, software, or database items that a system or component should interface.

3.1.1 User Interfaces

Whole of the users will see the same page when they enter the simulation. On this page, the user enters the password and username.

Later on authentication, users will see the interface. This interface includes different tabs according to their role types. These tabs can be named as; Personal Data Tab, Add New User Tab, Manager Tab, Users List Tab and Arrange Roles Tab. These tabs can be explained in detail as:

Figure 1 : Login screen

3.1.1.1 Personal Data Tab

In this tab, employees will be able to see their personal information that appears in a user-friendly layout, and, thanks to this tab, they will be feasible to edit and update non-assignment, name-surname information in others.

3.1.1.2 Add New User Tab

In this tab, Admins can add new users to the system. Admin can add users with user ID,password and username. This user will be created by synchronizing with an employee with the same identity from the employee database.

3.1.1.3 Manager Tab

In this tab, managers can see registered users. They can remove and add users with the help of this tab. With the search button in this tab, the manager will be able to see the user list(similar with User List Tab but here there are options to edit) and edit the information of the users in this list. If the manager wants to view the user, it will see the user's information in an editable state.
Also managers can add and remove employees to a team.

3.1.1.4 User List Tab

In that tab, the Admin can list whole human resource employees. Moreover, there exists a search button in the Manager tab which lets the admin select employees from the list by searching. Later, choosing the employee a new window is opened with knowledge about that employee.

3.1.1.5 Arrange Roles Tab

In this tab manager can create new roles, assign created roles or existing roles to users, and view them according to the roles that users have.

3.1.2 Hardware Interfaces

This application will run on computers. The simulation will be played using VR glasses.

3.1.3 Software Interface

This application will run on computers regardless of operating system.

3.1.4 Communication Interfaces

The application will use the HTTP protocol for access over the internet. The Web-side of the project will be connected to the internet through Wi-Fi or 3G.

3.2 Functional Requirement

3.2.1 Login Use Case:

➔ Buttons:

- Start
- Login as Admin
- Exit
- Forgot Password

➢ Diagram:

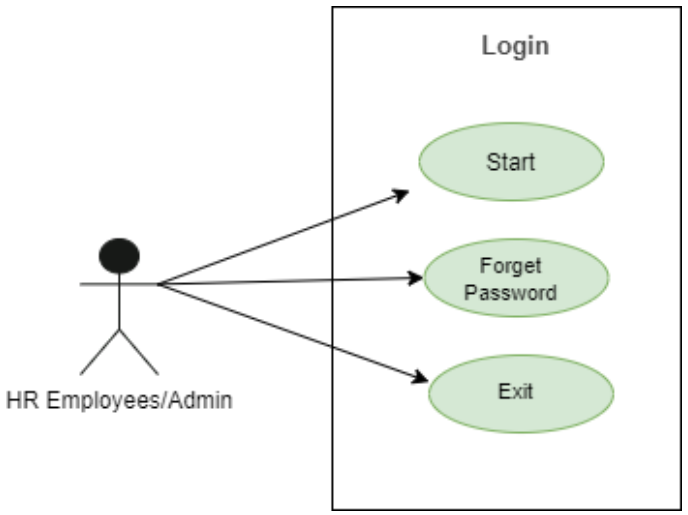

Figure 2: Login Use Case

➢ Brief Description:

As can be seen from the diagram, admin and user can log in to the application using the start button. Admin and user can log out of the application using the exit button.

➢ Step by Step Description:

1.) Admin and user log in to the application with password and user.
2.) If the user entered his password incorrectly, he will receive an "invalid password" warning. He/she must enter the correct password to log in.
3.) If the user forgets his / her password, he / she clicks the Forget Password button and a new random login password is sent to his / her mail.

3.2.2 Options Menu Use Case for Setting:

➔ Buttons:

- Pause
- Continue
- Change Volume Settings
- Start Over
- Display Instructions
- Exit

➢ Diagram:

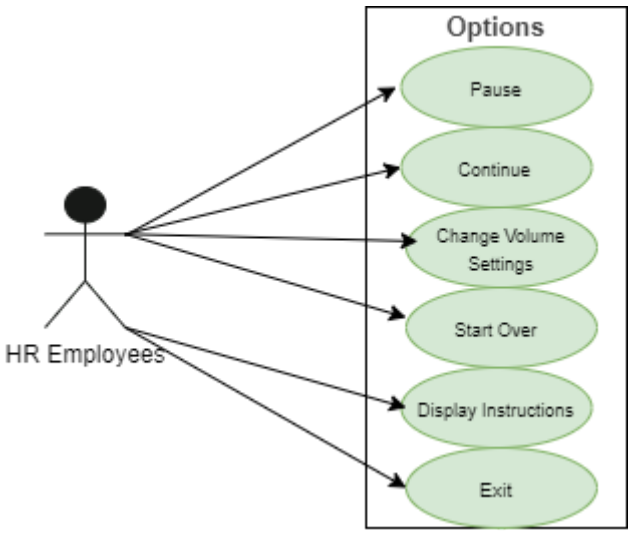

Figure 3: Options Use Case

➢ Brief Description:

As seen in figure 3 user option menu use case diagram. When the user enters training, office mode or office team mode within the system, he/she can display the options menu. Users can click on Pause, Continue, Change Volume Settings,Start over, Display Instructions, and exit the Options menu.

➢ Step by Step Description:

- The user must click the pause button to stop the simulation.
- The user must click the continue button to resume the simulation from where it left off.
- If the user clicks on the Change Volume Settings button, a voice panel is displayed on the screen.
  - The user can increase the volume by selecting the plus sign "+" button.
  - The user can decrease the volume by selecting the minus sign "-" button.
- If the user clicks on the start over button, the simulation will restart.
- If the user clicks on the display instructions button, a panel that shows the instructions of the simulation is displayed.
- If the user clicks on the exit button, simulation will end and the main menu will be seen.
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3.2.3 Profile Setting Use Case for Personal Information:

➔ Buttons:

For Employee Profile: (Figure 4)

- Edit
- See the assignments result
- Start the quiz

- See the team score that were enrolled
- See the teams
- Exit

For Admin profile: (Figure 5)

- Teams (This button is explained in detail in the Figure6/Admin-team profile case.)
- Add Questions
- Delete Questions
- Update Questions
- See all the score of the Participants
- Edit
- Exit

For admin-teams profile: (Figure 6)

- Edit the team
- Create New Team
- Delete the Team
- See the teams' score
- Exit

➢ Diagram:

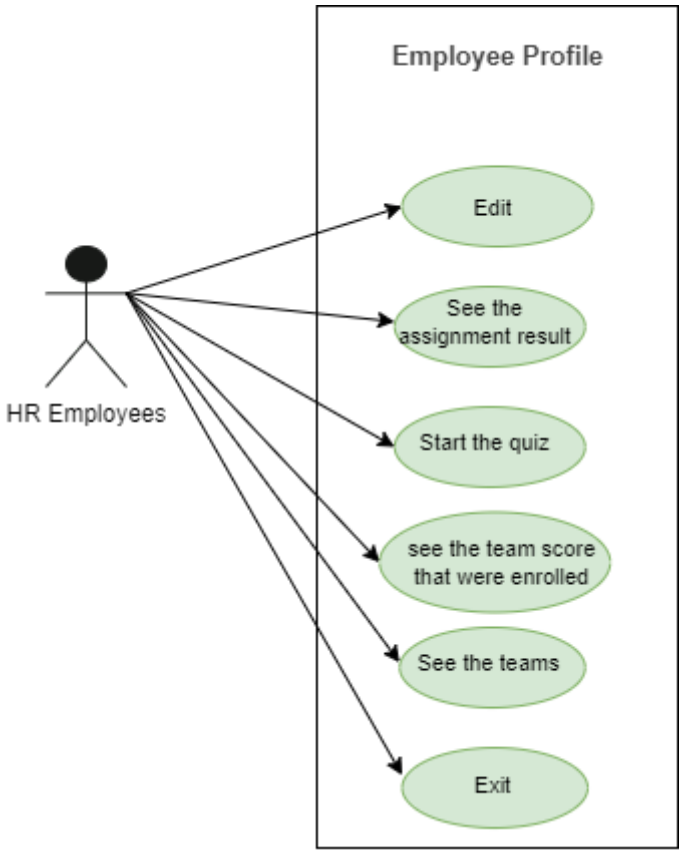


Figure 4 :Employee Profile Use Case Diagram

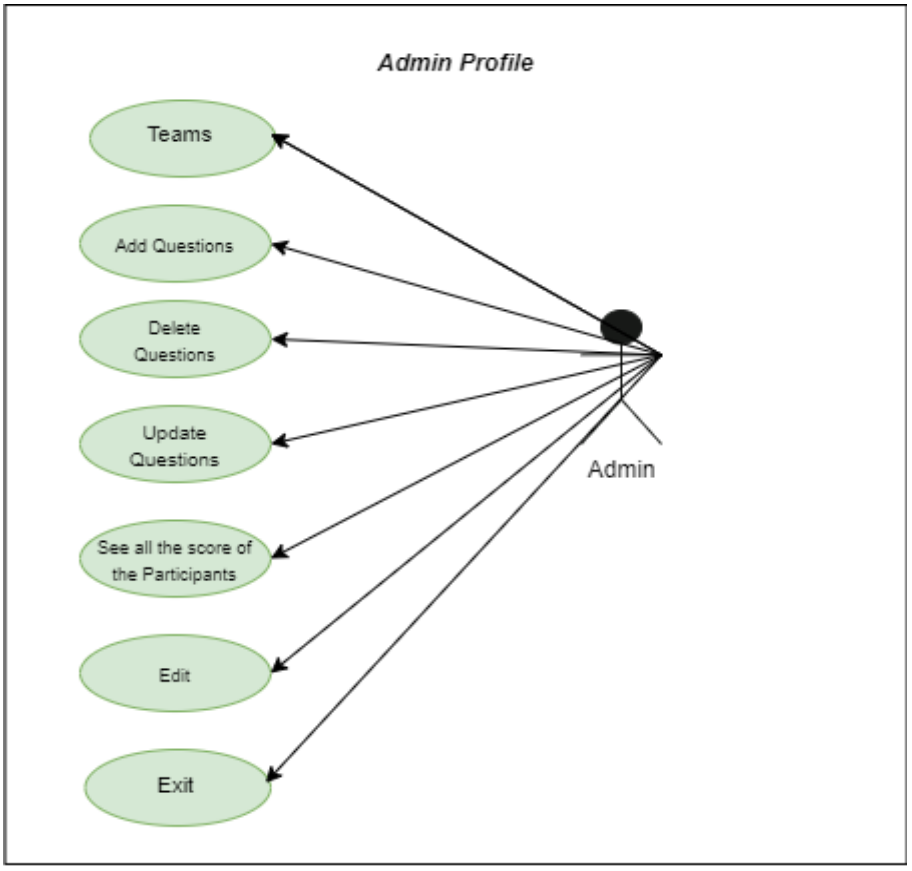


Figure 5: Admin Profile Case Diagram

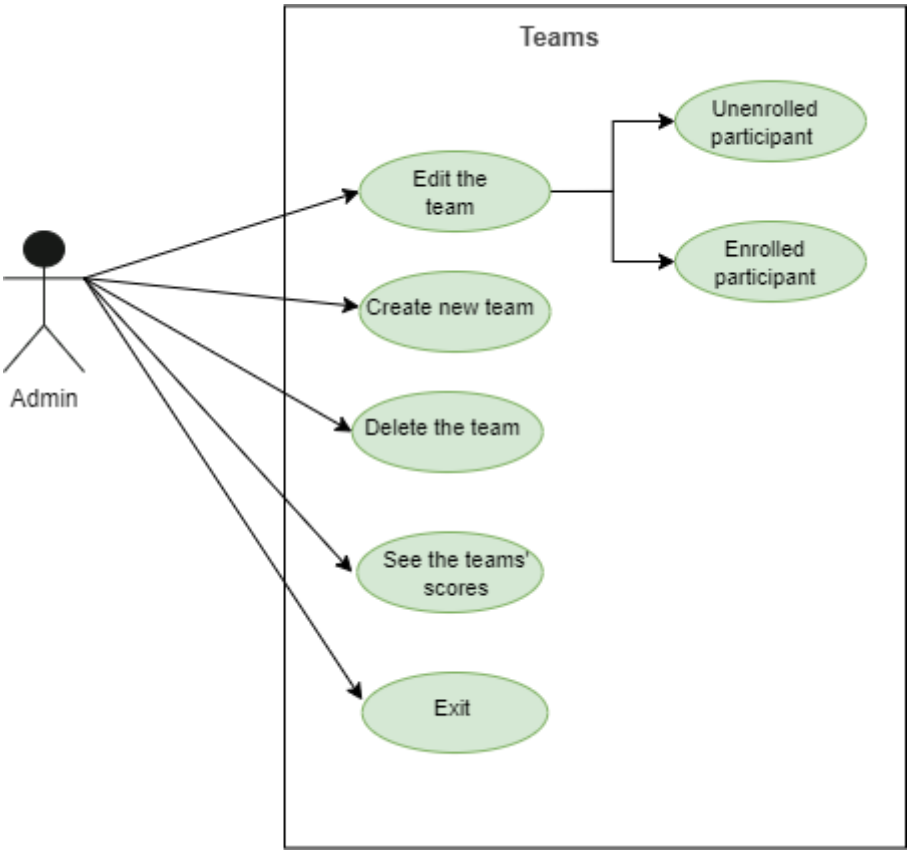


Figure 6: Admin-teams profile setting case diagram

➢ Brief Description:

The employee profile diagram (Figure 4) shows the employee profile management setting part. When the employee logs in the main page has a panel that contains these buttons.

➢ Step by Step Description:

- If the employee clicks on the edit button, see the main information, username, password,email, and can edit except name,surname and assignment scores.
- If the employee clicks on the see the assignment result button, the simulation will display all the assignment scores.
- If the employee clicks on the quiz button, simulation will lead to office mode and quiz will start.
- If the employee clicks on the see the teams button, simulation will open the team list that the employee has been enrolled by admin.
- If the employee clicks on the see the team score that were enrolled button, simulation will open the team list with their assignment scores.
- If the employee clicks on the exit button, the employee will log out and the login page will come to display.

➢ Brief Description:

The admin profile diagram (Figure 5) shows the admin profile management setting part. When the admin logs in the main page has a panel that contains these buttons.

➢ Step by Step Description:

- If the admin clicks on the teams button, the teams page will open and the teams panel will be seen.
- If the admin clicks on the add questions button, the page for adding questions will be opened and admin can add a new question.
- If the admin clicks on the delete questions button, the page for deleting questions will be opened and admin can delete the question that was selected.
- If the admin clicks on the update questions button, the page for updating questions will be opened and admin can update the question that was selected.
- If the admin clicks on the see all the score of participants button, the page for the score page will be opened and the admin can see the scores of the participants.
- If the admin clicks on the edit buttons, the admin first sees all the participants after selecting a participant, admin can edit all the information except assignment scores.
- If the admin clicks on the exit button, the admin will log out and the login page will come to display.

➢ Brief Description:

The teams profile diagram (Figure 6) shows the teams management setting panel. When the admin clicks on the teams button this panel.

➢ Step by Step Description:

- If the admin clicks on the edit the team button, the simulation will open a new panel that includes the teams and after choosing the team, the unenrolled participant and enrolled participant panel will be opened.
  - If admin clicks on the unenrolled participant button, simulation will open the participant list and the selected user will be removed from the list.
  - If admin clicks on the enrolled participant button, simulation will open the participant list and the selected user will be added from the list.
- If the admin clicks on the create new team button, the simulation will open a new panel that includes the participants and after choosing the participants, the team will be created.
- If the admin clicks on the delete the team button, the simulation will open a new panel that includes the teams and after choosing the team, the team will be deleted.
- If the admin clicks on the see the teams' scores button, the simulation will open a new panel that includes the teams and their scores next to them as a list.
- If the admin clicks on the exit button, the admin will be back to the profile management page.

3.2.4 Training Mode Use Case:

➔ Buttons:

- Displaying Score
- Display Options
- Take Quiz
- Answer Questions
- Skip Training
- Exit

➢ Diagram:

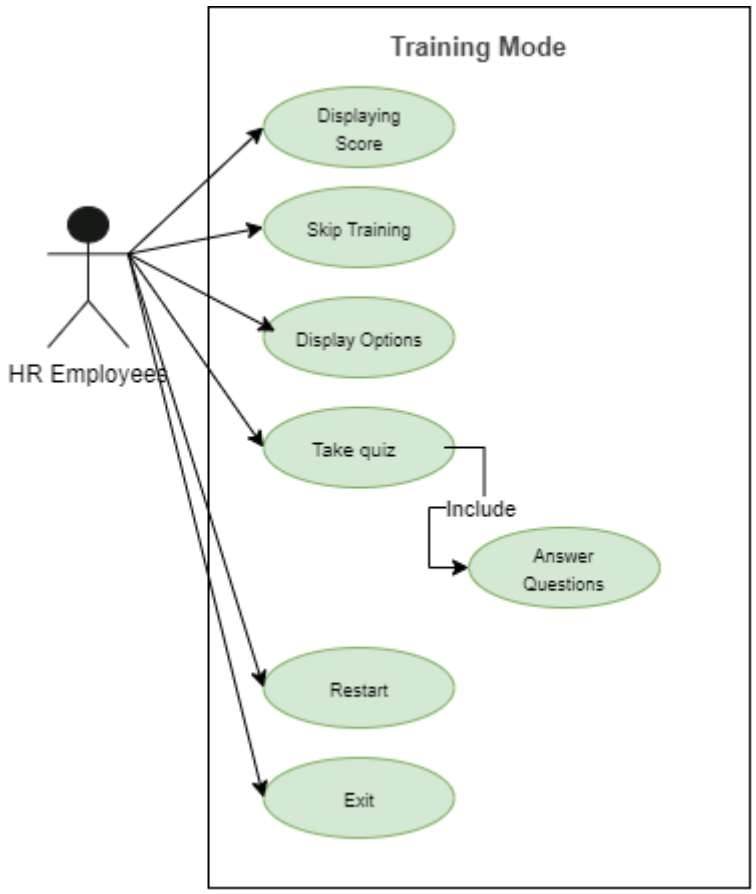


Figure 6: Training Use Case

➢ Brief Description:

This mode is intended to teach office mode for users who have not used the simulation before or want to remember how to use it. There will be a preview of the quiz that the user will be subject to and how to use the application with instructions will be explained. In the preview of the quiz, the user will try to answer the questions asked to her/him with instructions.

➢ Step by Step Description:

- First, if the user receives a quiz for the first time, training mode comes automatically. If the user does not take the first quiz, the user can select the skip training button.
- The user can view the settings by clicking the display options button.
- When training mode starts, the user faces questions that are not in office mode.
- After the user answers the questions by clicking on them in the quiz with the instructions, the training mode ends.

- After completing this mode, the user can switch to office mode using the switch office mode button if he wants, or join training mode again with the restart button.
- Finally, the user can see his/her own score by clicking the displaying score button at the end of the quiz.
- If the employee clicks on the exit button, the employee will log out and the login page will come to display.

3.2.5 Office Mode Use Case:

➔ Buttons:

- Scenario
- Displaying Score
- Display Options
- Chat Box
- Move
- Take Quiz

➢ Diagram:

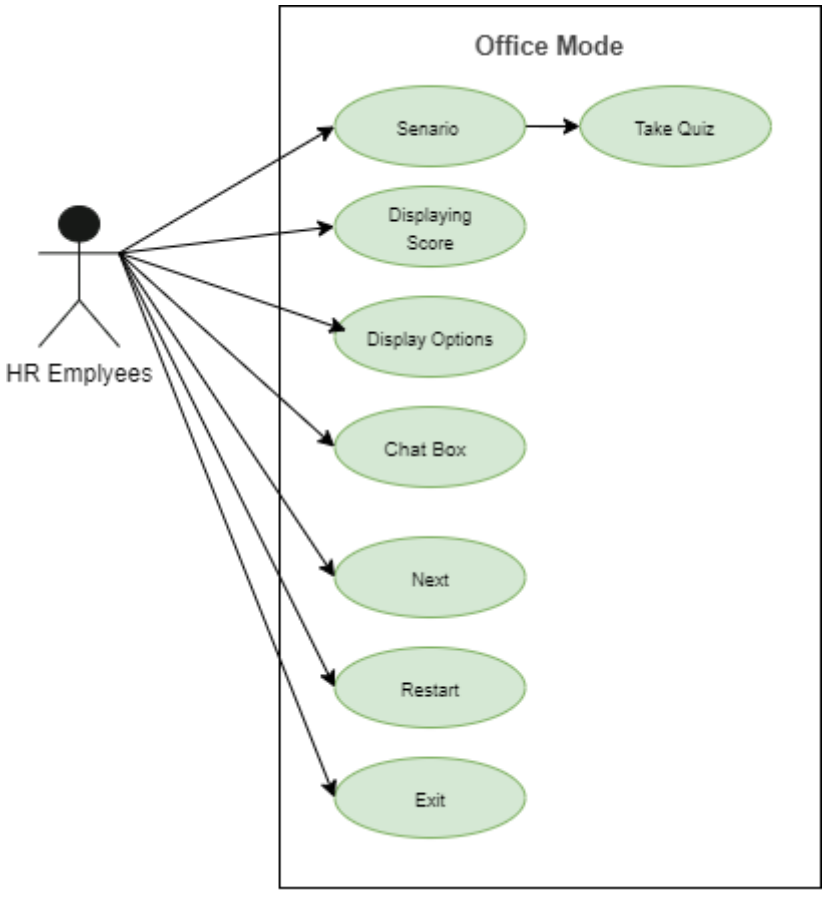


Figure 7: Office Use Case

➢ Brief Description:

In office mode, the user is asked several questions selected from the questions in the question pool on topics such as business instructions, duties and responsibilities. After the user answers these questions, the application user is tested by two different methods. The first method shows several risks/hazards related to the process step experienced by the application user, from the risks/hazards previously included in the risk pool. The user tries to eliminate the risks by finding the correct control. In the second method, a risk occurs in the area where the user is located (selected from the risks in the risk pool) . The user is asked what to do to prevent this. Scoring is done according to the correct and incorrect answers of the user.

➢ Step by Step Description:

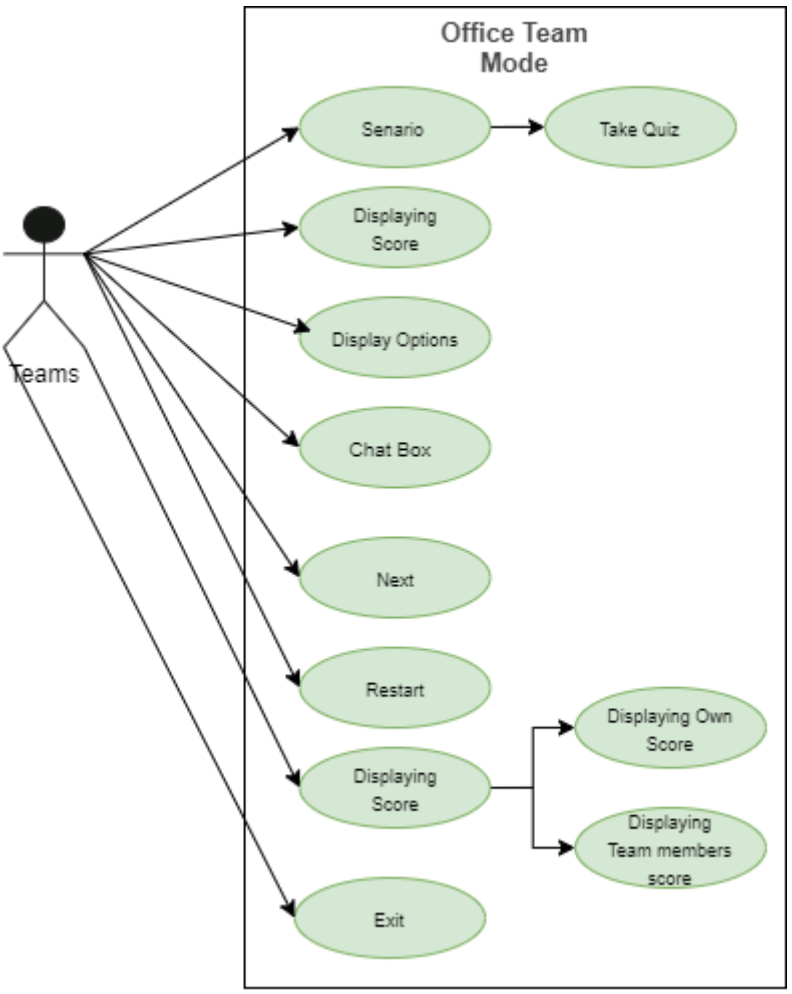
- The user encounters questions.
- The app user answers the questions by clicking on the answer they find correct, and their answers are scored.
- The user can switch to the next step with the next button.
- The application user moves to the stage where they can perform their duties by progressing through the process steps of the recruitment process.
- At this stage, the application user is tested by two different methods.
- The first method shows several risks from the risks in the risk pool.
- To avoid these risks, the user is asked to find the correct control activity option.
- If the user has found the right option, the danger is eliminated. If the user does not find the correct option, the danger becomes a risk. The user is given a point.
- Corrective control activities are shown to the user.
- If the user has found the correct control, the risk is reduced or eliminated. The user is given a point.
- In the second method, a risk occurs in the user's area (selected from the risks in the risk pool), the user is asked what/what to do to prevent it. Scoring is done according to the correct and incorrect answers of the user.
- The user can see the score from the display panel during the application process and at the end of the application.
- The user can view the options from the display options button.
- After the user has finished the quiz or when answering the quiz, he / she can enter the quiz again using the restart button if he / she wishes.
- If the employee clicks on the exit button, the employee will log out and the login page will come to display.

3.2.5 Office-Team Mode Use Case:

➔ Buttons:

- Scenario
- Take Quiz
- Displaying Score
- Display Options
- Chat Box
- Next
- Restart
- Displaying Own Score
- Displaying Team Members Score
- Exit

➢ Diagram:



➢ Brief Description:

In this mode, users answer questions as a team. Users observe the implementation of the activity in the process step. Users get points by trying to answer the questions asked to them correctly.

➢ Step by Step Description:

- The team encounters questions.
- The team must choose a common option to move on to the next question.
- Then, users go through the steps that single users go through as a team.
- After the quiz is finished, the team can display their score using the displaying score button.

3.3 Nonfunctional Requirements

3.3.1 Performance Requirement

Simulation design must run smoothly without any latency to keep the level of immersion high. This requirement depends on the various features of the user's computer. Minimum requirements are listed below.

- CPU:Intel® Core™ i5-4590 equivalent or better
- GPU:NVIDIA GeForce GTX 1050 Ti ,AMD Radeon R9 290 equivalent or better
- RAM:4GB of system memory
- Video Output: HDMI 1.4, DisplayPort 1.2 or newer
- USB port:1x USB 2.0 or better port
- Operating System: Windows 10 (64-bit), Ubuntu 16.10 equivalent operating systems or better versions

3.4 Software System attributes

3.4.2 Portability

- This simulation was designed using Unreal Engine 4.
- This project can run on all types of computer platforms, including Windows, Linux and MAC.
- This project works in harmony with virtual reality glasses such as Samsung Gear VR,Sony Playstation VR and Oculus Rift.

3.4.3 Performance

- Objects, which are not seen by the user, should not be rendered until the user sees the object.
- Animations of objects should not be executed until the user sees the object.

3.4.4 Usability

- Each quiz in training mode has 3 questions and their scores seen after choice has been made.
- Each question in the quizzes has 4 choices.
- When the user has scored under 50 points, an error message, which explains the reason why the user had that point, should be displayed.

3.4.5 Adaptability

- After each new assignment, we need to save the results and make changes in the database because the scores of the people are important for evaluation.

3.4.6 Scalability

- According to the teams assigned by the administrator, the application can be used simultaneously by more than one person.

3.5 Safety Requirement

- VR glasses can lead to various problems in long term use. Therefore, the duration of use should not be ignored. VR glasses can sometimes lead to various side effects. The effects it " gives" are usually the effects that arise from the general effects of using glasses and show temporary properties. These are explained in the form of fatigue, ligament pain and nausea. In order to avoid damage to the glasses, it is necessary to pay close attention to the design and technology of the device. Both the image quality and the transitions of the images should be well adjusted and selected so as not to harm the eye. Because the image is three-dimensional, if there are no quality glasses, the eye has to make an effort to sharpen the image. The point to be noted is that in addition; when using VR glasses, there should be no objects that can be broken around.

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