



TED UNIVERSITY

CMPE 491 Senior Project I

A Gamified Training Platform Supported By AI

Project Specifications Report

The URL of the project web page:

<https://isthisecho.github.io/TermProject/>

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1. Introduction

1.1. Description

In the project, we want to make an education platform supported by artificial intelligence. Our project will consist of two parts, a web program running on the web side and a mobile application. We also want to add gamified materials to increase the impact of the content.

Mentally, there will be two divided programs which are .Net based server with MsSql database at the backend side and React Native application at the frontend side. Also, artificial intelligence will be used for suggestions.

Instructors will be able to upload education materials such as videos, documents or slides according to related courses and subjects to the web app. Also, students will be able to reach these materials by using mobile app.

In addition, There will be online and offline quizzes to determine understanding levels of students. According to these outcomes, ML .Net based artificial intelligence facility will suggest specified education materials which contain missing parts about lectures. At the end of the day, Instructors will get the ability profile of their students.

Moreover, we are planning to add gamified materials such as leaderboards for competitions or badges to drain the attention of students.

1.2. Constraints

If we want to have a good process and to make it in time with plans we must declare our constraints.

As we all know constraints are generally split into 3 parts which are Scope, Time Schedule and Cost of the Project. We are going to explain them one by one.

Scope

As we already mentioned in the description, Our goal is to make an education platform supported by artificial intelligence. We will have 2 parts of Project. First one is a desktop program running in the background and other one is mobile application. We are going to use .net based server with Mssql database at the backend side and React native application at the frontend side. After implementing the functional process , we are going to start the second phase of artificial intelligence. We are going to use algorithms for computing users overall score and add them to the leaderboard. Every week we have SCRUM meetings and we are synchronously working with our team and SimSoft.

Time Schedule

As i mentioned above in the scope, we have SCRUM meetings every week. We are trying to be precise about our goal. Our aim is finishing organizing and having proper structure in the week 7. And after that we are trying to finish the development process at least at the beginning of the second semester.

Cost

We can not say anything certain about the costs because for now we are just designing and implementing and there is no need for a cost till now. We might get some server-side payment for domain and server fee in the future.

1.3. Professional and Ethical Issues

As we said in the description of the Project, Our aim is developing a gamified training platform supported by ai technology software with the partnership of Simsoft. Our Project users mainly will be workers in the companies who is going to use this software. And we can clearly assume that an average company has a lot of workers. And they will store their data. Because of that we have to be careful about data because if someone outside the company reaches them it might cause real problems. Due to that we are going to avoid harm as much as possible. And also we are going to be honest and trustworthy about the idea of the Project. In our Project we will have some quizzes and result of that we will have some leaderboard. Every month top tier

users will get some prizes. And we are going to compute these leaderboards by using some AI and Machine learning algorithms. So our actions need to be trustworthy and our algorithms need to be fair about that ,and should not discriminate any of the workers by their scores and their personal information.

Basically we are going to prevent All harmful things and try to be honest, trustworthy,fair , respect their privacy and not to discriminate any of the users. This is our final goal as final year computer engineering students. We are going to produce ethical and professional software as much as we can.

2. Requirements

System Features for Mobile Application

1. Account Login

1.1. Description

The system shall let users sign into their accounts along with a username and password if they already possess a valid account on the system. System verifies username and password which were given by the user. If a user enters the correct username and password, the homepage will be displayed by system. When a user enters faulty input, an error message will be displayed by the system.

1.2. Functional Requirements

REQ1 The system shall require email address and password. When a user does not enter required information, the system shall display an error message.

REQ2 System shall not let users enter more than 3 times the wrong username or password. After the third inaccurate try, the user will be asked to enter the verification code which has been sent to the user's email address by system.

REQ3 System shall not allow users which are not signed in to manage their information.

REQ4 If the user is not able to login within 30 seconds, the system displays an error message and the process ends.

2. Reset Password

2.1. Description

The reset password function allows users who forgot their passwords to reset their passwords.

2.2. Functional Requirements

REQ5 The user who wants to reset his/her password must enter the registered email address.

REQ6 The user must enter the confirmation code sent to his/her email address in the box.

3. Account Registration

3.1. Sign Up as a Student

3.1.1. Description

The Account Registration function shall let users create accounts that include their name, surname, email address, ID number and password.

3.1.2. Functional Requirements

REQ7 The system shall require name, surname, email address, ID number and password. When a user does not enter required information, the system shall display an error message.

REQ8 The system shall not accept passwords shorter than 8 characters. When a user attempts to choose a password which is less than 8 characters, the system shall display an error message.

REQ9 The system shall not accept emails and ID numbers which are used in previous registrations. When a user attempts to choose a used email or ID number, the system shall display an error message.

REQ10 The system requires confirmation of the agreement form to successfully complete the account registration. When a user does not confirm agreement form, the system shall display an error message.

4. Manage Account

4.1. Manage Information

4.1.1. Description

Manage Information function shall let users who are logged into the account modify their information such as name, surname and email address.

4.1.2. Functional Requirements

REQ11 The system shall require a password from the user to make changes in Account Information.

4.2. Change Password

4.2.1. Description

Change Password function shall let users change their passwords.

4.2.2. Functional Requirements

REQ12 The system shall require the user to enter their old password to change the password.

REQ13 The system shall not accept passwords shorter than 8 characters. When a user attempts to choose a password which is less than 8 characters, the system shall display an error message.

REQ14 If the password change process is successfully completed, the system shall send an informative message to the user's email address.

4.3. Logout

4.3.1. Description

Logout function shall let users log out of the system.

5. View Main Menu

5.1. View Student Main Menu

5.1.1. Description

View Student Main Menu function shall let users whose role is a student to view the information about their grades. Users will be able to see their own scores and their place on the leaderboard.

5.1.2. Functional Requirements

REQ15 The system shall show students their total scores and rankings.

REQ16 When the user clicks on the name of any user, the system shall show earned badges of this user.

6. View Courses

6.1. Description

View Courses function shall let users whose role is a student to view and download all course related documents such as videos, notes and study materials.

6.2. Functional Requirements

REQ17 When the user clicks on the course, the system shall open the course page and display the chapters.

REQ18 The system shall display the courses in which the student is enrolled in a different color from other courses.

REQ19 The system shall allow the student to filter the courses as all courses and my courses.

REQ20 The system shall display the completion percentage of the courses.

REQ21 The system shall display the course description and the instructor's name when the user clicks on the 'i' icon.

REQ22 When the user clicks on the course name, the system shall display the videos, pdf's and documents of the course separately on a new page.

REQ23 When the user clicks on the videos, the system shall display the videos according to the chapters they belong to.

7. View Events

7.1. Description

View Courses function shall let users whose role is a student to view course events.

7.2. Functional Requirements

REQ24 The system shall display online quizzes in green and offline quizzes in red to the user.

REQ25 The system shall display the start and end date of online quizzes.

REQ26 The system shall allow users to filter quizzes online or offline.

REQ27 When the user clicks on the open quiz, they will be able to start the quiz.

8. Attend Quiz

8.1. Description

Attend Quiz function shall let users whose role is a student to take part in online or offline quizzes organized by the instructor and view scores.

8.2. Functional Requirements

REQ28 The system shall display the question text and answer options to the user.

REQ29 The system shall let the user be able to skip to the previous and next questions.

REQ30 If the quiz is online, the system shall show the remaining time to the user.

REQ31 If the user completes and submits the quiz, the system shall close the quiz for the user.

9. View Overall Stats

9.1. Description

View Stats function shall let users whose role is a student to view their overall course stats.

9.2. Functional Requirements

REQ32 The system shall display the success percentage of total courses of the student.

10. View Quiz Stats

10.1. Description

View Stats function shall let users whose role is a student to view their quiz results and stats.

10.2. Functional Requirements

REQ33 The system shall display the student's percentage of success in the quiz.

REQ34 The system shall display the number of correct and wrong answers of the student.

REQ35 The system shall show the missing chapters to the student according to the subjects of the questions answered incorrectly by the student.

11. Examine Quiz Results

11.1. Description

The Examine Quiz Results function shall let users examine the answers of the quiz after the quiz is closed.

11.2. Functional Requirements

REQ36 The system shall display the correct answer option in green.

REQ37 The system shall display the student's wrong answer in red.

12. View Notifications

12.1. Description

View Notification function shall let users to view notifications.

12.2. Functional Requirements

REQ38 The system shall allow the user to delete the notification by clicking the delete sign next to the notification.

REQ39 The system shall display the new incoming notification in a different color from the old notifications.

System Features for Web Application

1. Account Login

1.1. Description

The system shall let users sign into their accounts along with a username and password if they already possess a valid account on the system. System verifies username and password which were given by the user. If a user enters the correct username and password, the homepage will be displayed by system. When a user enters faulty input, an error message will be displayed by the system.

1.2. Functional Requirements

REQ1 The system shall require email address and password. When a user does not enter required information, the system shall display an error message.

REQ2 System shall not let users enter more than 3 times the wrong username or password. After the third inaccurate try, the user will be asked to enter the verification code which has been sent to the user's email address by system.

REQ3 System shall not allow users which are not signed in to manage their information.

REQ4 If the user is not able to login within 30 seconds, the system displays an error message and the process ends.

2. Reset Password

2.1. Description

The reset password function allows users who forgot their passwords to reset their passwords.

2.2. Functional Requirements

REQ5 The user who wants to reset his/her password must enter the registered email address.

REQ6 The user must enter the confirmation code sent to his/her email address in the box.

3. Account Registration

3.1. Sign Up as a Instructor

3.1.1. Description

The Account Registration function shall let users create accounts that include their name, surname, email address, ID number and password.

3.1.2. Functional Requirements

REQ7 The system shall require name, surname, email address, ID number and password. When a user does not enter required information, the system shall display an error message.

REQ8 The system shall not accept passwords shorter than 8 characters. When a user attempts to choose a password which is less than 8 characters, the system shall display an error message.

REQ9 The system shall not accept emails and ID numbers which are used in previous registrations. When a user attempts to choose a used email or ID number, the system shall display an error message.

REQ10 The system requires confirmation of the agreement form to successfully complete the account registration. When a user does not confirm agreement form, the system shall display an error message.

REQ40 The system shall require an instructor certificate of the user to create an account. When a user does not upload the required document, the system shall display an error message.

4. Manage Account

4.1. Manage Information

4.1.1. Description

Manage Information function shall let users who are logged into the account modify their information such as name, surname and email address.

4.1.2. Functional Requirements

REQ11 The system shall require a password from the user to make changes in Account Information.

4.2. Change Password

4.2.1. Description

Change Password function shall let users change their passwords.

4.2.2. Functional Requirements

REQ12 The system shall require the user to enter their old password to change the password.

REQ13 The system shall not accept passwords shorter than 8 characters. When a user attempts to choose a password which is less than 8 characters, the system shall display an error message.

REQ14 If the password change process is successfully completed, the system shall send an informative message to the user's email address.

4.3. Logout

4.3.1. Description

Logout function shall let users log out of the system.

5. View Main Menu

5.1. View Instructor Main Menu

5.1.1. Description

View Instructor Main Menu function shall let users whose role is an instructor to view all courses, notifications and calendar.

5.1.2. Functional Requirements

REQ41 When the user clicks on the calendar, the system shall open the calendar in a popup window.

REQ42 When the user clicks on the notification icon, the system will open the notifications in a popup window. When the user clicks on the notification icon, the system will open the notifications in a popup window.

REQ43 When the user clicks on the profile icon, the system will open the account information in a popup window.

REQ44 The system shall let the user sort and search.

REQ45 The system shall allow users to create courses by clicking the 'Add Course' button.

REQ46 The system shall allow users to create a quiz by clicking the 'Add Quiz' button.

6. Manage Courses

6.1. Add Course

6.1.1. Description

Add Courses function shall let users whose role is an instructor to create a new course.

6.1.2. Functional Requirements

REQ47 The system shall require course name and description. When a user does not enter required information, the system shall display an error message.

REQ48 If the course creation process is completed successfully, the system shall display an informative message.

6.2. Add Chapter

6.2.1. Description

Add Chapter function shall let users whose role is an instructor to create a new chapter.

6.2.2. Functional Requirements

REQ49 The system shall require chapter name, chapter code and chapter description. When a user does not enter required information, the system shall display an error message.

REQ50 If the chapter creation process is completed successfully, the system shall display an informative message.

6.3. Add Subtopic

6.3.1. Description

Add Subtopic function shall let users whose role is an instructor to create a new subtopic of a chapter.

6.3.2. Functional Requirements

REQ51 The system shall require subtopic name and subtopic description. When a user does not enter required information, the system shall display an error message.

REQ52 If the subtopic creation process is completed successfully, the system shall display an informative message.

7. View Stats

7.1. Description

View Stats function shall let users whose role is an instructor to view the information about students. Users can see the students' earned points.

7.2. Functional Requirements

REQ53 When the user clicks on the student's name, the system shall open the student's profile.

REQ54 The system shall display students whose total earned score is lower than the average in red.

8. Add Material

8.1. Description

Add material function shall let users whose role is an instructor to upload, activate or deactivate all course related documents.

8.2. Functional Requirements

REQ55 The system shall require the user to select the material type to be loaded. When a user does not choose the type of the material, the system shall display an error message.

REQ56 The system shall require the user to drag and drop the file they want to upload into the box.

REQ57 If the material upload process is completed successfully, the system shall display an informative message.

9. Set Event

9.1. Description

Set Event function shall let users whose role is an instructor to create new events.

9.2. Functional Requirements

REQ58 The system shall require the course name, chapter name, date, time and type of the quiz to be created. When a user does not enter required information, the system shall display an error message.

REQ59 If the event creation process is completed successfully, the system will display an informative message and send notification to students.

10. Create Quiz

10.1. Description

Create Quiz function shall let users whose role is an instructor to prepare questions and answers to create online or offline quizzes.

10.2. Functional Requirements

REQ60 The system shall require the text of the question. When the user does not enter required information, the system shall display an error message.

REQ61 The system shall require answer options of the question to be created.

REQ62 The system shall require selecting the answer of the question to be created.

REQ63 The system shall allow users to upload images for the questions.

REQ64 The system shall allow the user to save the question by pressing the 'Save Question' button.

REQ65 The system shall allow the user to delete the question by pressing the 'Delete Question' button.

REQ66 The system shall allow the user to complete the quiz by pressing the 'Complete' button.

REQ67 If the quiz creation process is completed successfully, the system shall display an informative message.

11. Manage Admin Panel

11.1. Description

The Manage Admin Panel function shall let admin to approve newly created instructor accounts.

11.2. Functional Requirements

REQ68 The system shall display the newly created instructor accounts to the admin.

REQ69 The system shall display the creation dates of the accounts.

REQ70 The system shall allow the admin to view the certificates by clicking the 'Examine Certificate' button.

REQ71 The system shall allow the admin to approve or reject the reviewed certificate.

Requirements List

REQ1 The system shall require email address and password. When a user does not enter required information, the system shall display an error message. **(Mobile, Web)**

REQ2 System shall not let users enter more than 3 times the wrong username or password. After the third inaccurate try, the user will be asked to enter the verification code which has been sent to the user's email address by system. **(Mobile, Web)**

REQ3 System shall not allow users which are not signed in to manage their information. **(Mobile, Web)**

REQ4 If the user is not able to login within 30 seconds, the system displays an error message and the process ends. **(Mobile, Web)**

REQ5 The user who wants to reset his/her password must enter the registered email address. **(Mobile, Web)**

REQ6 The user must enter the confirmation code sent to his/her email address in the box. **(Mobile, Web)**

REQ7 The system shall require name, surname, email address, ID number and password. When a user does not enter required information, the system shall display an error message. **(Mobile, Web)**

REQ8 The system shall not accept passwords shorter than 8 characters. When a user attempts to choose a password which is less than 8 characters, the system shall display an error message. **(Mobile, Web)**

REQ9 The system shall not accept emails and ID numbers which are used in previous registrations. When a user attempts to choose a used email or ID number, the system shall display an error message. **(Mobile, Web)**

REQ10 The system requires confirmation of the agreement form to successfully complete the account registration. When a user does not confirm agreement form, the system shall display an error message. **(Mobile, Web)**

REQ11 The system shall require a password from the user to make changes in Account Information. **(Mobile, Web)**

REQ12 The system shall require the user to enter their old password to change the password. **(Mobile, Web)**

REQ13 The system shall not accept passwords shorter than 8 characters. When a user attempts to choose a password which is less than 8 characters, the system shall display an error message. **(Mobile, Web)**

REQ14 If the password change process is successfully completed, the system shall send an informative message to the user's email address. **(Mobile, Web)**

REQ15 The system shall show students their total scores and rankings. **(Mobile)**

REQ16 When the user clicks on the name of any user, the system shall show earned badges of this user. **(Mobile)**

REQ17 When the user clicks on the course, the system shall open the course page and display the chapters. **(Mobile)**

REQ18 The system shall display the courses in which the student is enrolled in a different color from other courses. **(Mobile)**

REQ19 The system shall allow the student to filter the courses as all courses and my courses. **(Mobile)**

REQ20 The system shall display the completion percentage of the courses. **(Mobile)**

REQ21 The system shall display the course description and the instructor name when the user clicks on the 'i' icon. **(Mobile)**

REQ22 When the user clicks on the course name, the system shall display the videos, pdf's and documents of the course separately on a new page. **(Mobile)**

REQ23 When the user clicks on the videos, the system shall display the videos according to the chapters they belong to. **(Mobile)**

REQ24 The system shall display online quizzes in green and offline quizzes in red to the user. **(Mobile)**

REQ25 The system shall display the start and end date of online quizzes. **(Mobile)**

REQ26 The system shall allow users to filter quizzes online or offline. **(Mobile)**

REQ27 When the user clicks on the open quiz, they will be able to start the quiz. **(Mobile)**

REQ28 The system shall display the question text and answer options to the user. **(Mobile)**

REQ29 The system shall let the user be able to skip to the previous and next questions. **(Mobile)**

REQ30 If the quiz is online, the system shall show the remaining time to the user. **(Mobile)**

REQ31 If the user completes and submits the quiz, the system shall close the quiz for the user. **(Mobile)**

REQ32 The system shall display the success percentage of total courses of the student. **(Mobile)**

REQ33 The system shall display the student's percentage of success in the quiz. **(Mobile)**

REQ34 The system shall display the number of correct and wrong answers of the student. **(Mobile)**

REQ35 The system shall show the missing chapters to the student according to the subjects of the questions answered incorrectly by the student. **(Mobile)**

REQ36 The system shall display the correct answer option in green. **(Mobile)**

REQ37 The system shall display the student's wrong answer in red. **(Mobile)**

REQ38 The system shall allow the user to delete the notification by clicking the delete sign next to the notification. **(Mobile)**

REQ39 The system shall display the new incoming notification in a different color from the old notifications. **(Mobile)**

REQ40 The system shall require an instructor certificate of the user to create an account. When a user does not upload the required document, the system shall display an error message. **(Web)**

REQ41 When the user clicks on the calendar, the system shall open the calendar in a popup window. **(Web)**

REQ42 When the user clicks on the notification icon, the system will open the notifications in a popup window. When the user clicks on the notification icon, the system will open the notifications in a popup window. **(Web)**

REQ43 When the user clicks on the profile icon, the system will open the account information in a popup window. **(Web)**

REQ44 The system shall let the user sort and search. **(Web)**

REQ45 The system shall allow users to create courses by clicking the 'Add Course' button. **(Web)**

REQ46 The system shall allow users to create a quiz by clicking the 'Add Quiz' button. **(Web)**

REQ47 The system shall require course name and description. When a user does not enter required information, the system shall display an error message. **(Web)**

REQ48 If the course creation process is completed successfully, the system shall display an informative message. **(Web)**

REQ49 The system shall require chapter name, chapter code and chapter description. When a user does not enter required information, the system shall display an error message. **(Web)**

REQ50 If the chapter creation process is completed successfully, the system shall display an informative message. **(Web)**

REQ51 The system shall require subtopic name and subtopic description. When a user does not enter required information, the system shall display an error message. **(Web)**

REQ52 If the subtopic creation process is completed successfully, the system shall display an informative message. **(Web)**

REQ53 When the user clicks on the student's name, the system shall open the student's profile. **(Web)**

REQ54 The system shall display students whose total earned score is lower than the average in red. **(Web)**

REQ55 The system shall require the user to select the material type to be loaded. When a user does not choose the type of the material, the system shall display an error message. **(Web)**

REQ56 The system shall require the user to drag and drop the file they want to upload into the box. **(Web)**

REQ57 If the material upload process is completed successfully, the system shall display an informative message. **(Web)**

REQ58 The system shall require the course name, chapter name, date, time and type of the quiz to be created. When a user does not enter required information, the system shall display an error message. **(Web)**

REQ59 If the event creation process is completed successfully, the system will display an informative message and send notification to students. **(Web)**

REQ60 The system shall require the text of the question. When the user does not enter required information, the system shall display an error message. **(Web)**

REQ61 The system shall require answer options of the question to be created. **(Web)**

REQ62 The system shall require selecting the answer of the question to be created. **(Web)**

REQ63 The system shall allow users to upload images for the questions. **(Web)**

REQ64 The system shall allow the user to save the question by pressing the 'Save Question' button. **(Web)**

REQ65 The system shall allow the user to delete the question by pressing the 'Delete Question' button. **(Web)**

REQ66 The system shall allow the user to complete the quiz by pressing the 'Complete' button. **(Web)**

REQ67 If the quiz creation process is completed successfully, the system shall display an informative message. **(Web)**

REQ68 The system shall display the newly created instructor accounts to the admin. **(Web)**

REQ69 The system shall display the creation dates of the accounts. **(Web)**

REQ70 The system shall allow the admin to view the certificates by clicking the ‘Examine Certificate’ button. **(Web)**

REQ71 The system shall allow the admin to approve or reject the reviewed certificate. **(Web)**

3. References

The code affirms an obligation of computing professionals to use their skills for the benefit of society. Code of Ethics. (n.d.). Retrieved November 5, 2021, from <https://www.acm.org/code-of-ethics>.