

Software Requirements Specification

for

Joint Training Certification Program

Version 1.0

**Prepared by Parin Ajmera
Rishi Jash**

**College of Engineering, CSULB
November 27, 2016**

**Client:
College of Engineering
California Department of Transportation**

Table of Contents

1	Introduction	6
1.1	Purpose	6
1.2	Intended Audience	6
1.3	Product Scope	6
2	Overall Description	6
2.1	Product Perspective	6
2.2	Product Features	7
2.3	User Classes and Characteristics	7
2.3.1	<i>User(Employee)</i>	7
2.3.2	<i>User(General)</i>	7
2.3.3	<i>Program coordinator</i>	7
2.3.4	<i>Instructor</i>	7
2.4	Operating Environment	8
2.5	Design and Implementation Convention	8
2.6	User Documentation	8
2.7	Assumptions and Dependencies	8
3	External Interface Requirements	8
3.1	User Interfaces	8
3.2	Software Interfaces	9
3.3	Communications Interfaces	9
4	System Features	9
4.1	Sign Up	9
4.1.1	<i>Objective</i>	9
4.1.2	<i>Actors</i>	9
4.1.3	<i>Preconditions</i>	9
4.1.4	<i>Basic Flow</i>	9
4.1.5	<i>Alternate Flow</i>	9
4.1.6	<i>Exception Flow</i>	9
4.1.7	<i>Functional Requirements</i>	10
4.1.8	<i>Non Functional Requirements</i>	10
4.1.9	<i>Post Condition</i>	10
4.2	Login	10
4.2.1	<i>Objective</i>	10
4.2.2	<i>Actors</i>	10
4.2.3	<i>Preconditions</i>	10
4.2.4	<i>Basic Flow</i>	10
4.2.5	<i>Alternate Flow</i>	10
4.2.6	<i>Exception Flow</i>	10
4.2.7	<i>Functional Requirements</i>	10
4.2.8	<i>Non Functional Requirements</i>	10
4.2.9	<i>Post Condition</i>	11
4.3	Issue Certificate	11
4.3.1	<i>Objective</i>	11
4.3.2	<i>Actors</i>	11

4.3.3	Preconditions	11
4.3.4	Basic Flow	11
4.3.5	Alternate Flow	11
4.3.6	Exception Flow	11
4.3.7	Functional Requirements	11
4.3.8	Non Functional Requirements	12
4.3.9	Post Condition	12
4.4	Revoke Certificate	12
4.4.1	Objective	12
4.4.2	Actors	12
4.4.3	Preconditions	12
4.4.4	Basic Flow	12
4.4.5	Alternate Flow	12
4.4.6	Exception Flow	12
4.4.7	Functional Requirements	12
4.4.8	Non Functional Requirements	12
4.4.9	Post Condition	12
4.5	Complete Pre-requisites	13
4.5.1	Objective	13
4.5.2	Actors	13
4.5.3	Preconditions	13
4.5.4	Basic Flow	13
4.5.5	Alternate Flow	13
4.5.6	Exception Flow	13
4.5.7	Functional Requirements	13
4.5.8	Non Functional Requirements	13
4.5.9	Post Condition	13
4.6	Enroll in Course	14
4.6.1	Objective	14
4.6.2	Actors	14
4.6.3	Preconditions	14
4.6.4	Basic Flow	14
4.6.5	Alternate Flow	14
4.6.6	Exception Flow	14
4.6.7	Functional Requirements	14
4.6.8	Non Functional Requirements	15
4.6.9	Post Condition	15
4.7	Update User Information	15
4.7.1	Objective	15
4.7.2	Actors	15
4.7.3	Preconditions	15
4.7.4	Basic Flow	15
4.7.5	Alternate Flow	15
4.7.6	Exception Flow	15
4.7.7	Functional Requirements	16
4.7.8	Non Functional Requirements	16
4.7.9	Post Condition	16
4.8	Assign Instructor	16

4.8.1	Objective	16
4.8.2	Actors	16
4.8.3	Preconditions	16
4.8.4	Basic Flow	16
4.8.5	Alternate Flow.....	16
4.8.6	Exception Flow	16
4.8.7	Functional Requirements	16
4.8.8	Non Functional Requirements.....	16
4.8.9	Post Condition	16
4.9	View User Enrolled	17
4.9.1	Objective	17
4.9.2	Actors	17
4.9.3	Preconditions	17
4.9.4	Basic Flow	17
4.9.5	Alternate Flow.....	17
4.9.6	Exception Flow	17
4.9.7	Functional Requirements	17
4.9.8	Non Functional Requirements.....	17
4.9.9	Post Condition	17
4.10	Remove User Enrolled.....	17
4.10.1	Objective	17
4.10.2	Actors.....	17
4.10.3	Preconditions	17
4.10.4	Basic Flow	17
4.10.5	Alternate Flow	18
4.10.6	Exception Flow	18
4.10.7	Functional Requirements	18
4.10.8	Non Functional Requirements	18
4.10.9	Post Condition.....	18
4.11	Grade User	18
4.11.1	Objective.....	18
4.11.2	Actors.....	18
4.11.3	Preconditions	18
4.11.4	Basic Flow	18
4.11.5	Alternate Flow	18
4.11.6	Exception Flow	18
4.11.7	Functional Requirements.....	19
4.11.8	Non Functional Requirements	19
4.11.9	Post Condition.....	19
4.12	Search.....	19
4.12.1	Objective	19
4.12.2	Actors.....	19
4.12.3	Preconditions	19
4.12.4	Basic Flow	19
4.12.5	Alternate Flow	19
4.12.6	Exception Flow	19
4.12.7	Functional Requirements.....	19
4.12.8	Non Functional Requirements	19

4.12.9	Post Condition.....	19
4.13	Quiz	19
4.13.1	Objective	19
4.13.2	Actors.....	20
4.13.3	Preconditions	20
4.13.4	Basic Flow	20
4.13.5	Alternate Flow	20
4.13.6	Exception Flow	20
4.13.7	Functional Requirements	20
4.13.8	Non Functional Requirements	20
4.13.9	Post Condition.....	20
5	Non functional Requirements	21
5.1	Performance Requirements	21
5.2	Security Requirements	21
5.3	Software Quality Attributes	22
5.4	Business Rules	22
6	Analysis Models	23
6.1	Use Case Diagram.....	23
6.2	Sequence Diagram	23

1 Introduction

1.1 Purpose

The purpose of this document is to present a detailed description of the Joint Training and Certification Program (JTCP) system. It will explain the purpose, features and technical details of the system, the interfaces of the system, what the system will do, the constraints under which it must operate and how the system will react to external stimuli.

1.2 Intended Audience

This document is intended for both the stakeholders and the developers of the system. The technical specifications and non-functional requirements of the system are explained which should make this document a useful resource for the testing and maintenance teams.

1.3 Product Scope

The scope of this project is creating an online learning and certification system which allows the users to sign up and learn from the content. All the courses on the website are pre-requisites which can be completed online by passing quizzes. The user may then proceed to enroll for courses at CSULB and get certified. The system contains a dashboard to track progress and maintain certificates completed. A search feature will allow anyone with basic information to track and validate the status of the user. The system also provides an interface for a program coordinator to access and update the information as per the requests made by an employer or the user. The instructors of CSULB will use the system to grade the performance which will be the basis of generating certificates for the user. This learning management system conforms to Sharable Content Object Reference Model (SCORM) standards.

2 Overall Description

2.1 Product Perspective

The e-learning platform is designed to provide courses and certification on successful completion of a course. The expected primary user base is from the industry and hence the system includes a search feature with multiple filters which the employer can use to search and track the status of the employee who is using the system. The user has a dashboard to visualize progress and understand the flow of the system to successfully complete a certification. The web application works on all the major web browsers.

2.2 Product Features

The JTCP online learning and certification system provides the following major functionalities:

1. Securely registering users and allows basic account management options.
2. PDF reader for content reading and option to download it.
3. Quiz section to test knowledge.
4. Unique certificate generation on successful completion of a quiz or a course.
5. Intuitive dashboard for user to keep track of progress and status.
6. Search functionality to verify and validate certificates issued by the system.
7. Portal for the program coordinator to edit and update all information stored in the database about users.
8. Ability for program coordinator to assign an instructor to a course.
9. Provides instructor portal to retrieve information of users enrolled in his/her class and grade their performance.
10. Web application functions smoothly on all the major browsers (Internet Explorer, Google Chrome, Mozilla Firefox)

2.3 User Classes and Characteristics

2.3.1 User(Employee)

The user can be motivated by an employer to sign up on the system and get certified for courses of choice. The payment for this type of user is made by the employer and the program coordinator enrolls the user into a course as per request and pre requisites completed.

2.3.2 User(General)

The user can be self motivated to enroll on the system and get certified for the courses provided. This type of user is not affiliated by any employer and thus self enrolls into a class and makes payment.

2.3.3 Program coordinator

The program coordinator will have access to a user's database through the interface provided. He/she is allowed to access, retrieve and update the user's information as per requirements. Furthermore, a program coordinator can enroll a user in a class and assign a course an instructor.

2.3.4 Instructor

The instructor is given access to view all the information of the users enrolled for the class assigned to him/her. They can grade the performance of a user once they have enrolled for the course which is used as a basis to generate certificates.

2.4 Operating Environment

The system will run on an Apache web server and store all the data collected in a MySQL database. It should smoothly function on all major web browsers (Internet Explorer, Google Chrome, Mozilla Firefox).

2.5 Design and Implementation Convention

The web application is designed using HTML and an open source Bootstrap style sheet for front end designing. The quiz section of the system is developed using AngularJS and JQuery is used to validate all the forms in the system. The backend is developed using PHP 5.0 in a model-view-controller format and AJAX for storing data in the MySQL database. The payment gateway pages will use HTTPS protocol and other pages will use HTTP. The website is mobile responsive and should be easy to interact with on any size of screen.

2.6 User Documentation

A user manual will be provided for both the program coordinator and the instructors. This will explain their level of access to the data and the effect it will have on the system. It will include short tutorials to assist them in using the system efficiently.

2.7 Assumptions and Dependencies

It is assumed that the user is connected to the internet to access the web application and uses the latest updated version of the web browser.

3 External Interface Requirements

3.1 User Interfaces

The user should be easily directed to the list of courses from the home page and given a short description of the courses provided. The interface should remain consistent throughout the system.

The sign up page be easy to use and highlight fields which are not filled as per the conditions set.

The user should be provided with a dashboard to keep track of the progress and status of all the courses taken and certification passed. There should be progress bars and comprehensive tables to display the status. There should be a list of certificates on the sidebar.

The search results should be easy to understand. It should have a link which gives access to the information on the searched employee's progress in the courses taken

The program coordinator should have an interface to search and verify the information of any user. He/she should be able to enroll or remove the student into a class easily. The dashboard for the program coordinator should also allow easy addition of an instructor to a course.

The instructor should have a simple interface to view all the candidates enrolled for the course and update their grades easily.

3.2 Software Interfaces

The user, instructor and program coordinator dashboards communicate with the database to view, edit and update information in the MySQL tables. It uses a PHP code in the backend with secured SQL queries and AJAX to perform all the database modifying tasks.

3.3 Communications Interfaces

The communication between the payment gateway page and the user interface should be done over a secured https protocol.

4 System Features

4.1 Sign Up

4.1.1 Objective

The purpose of this feature is to register users into the system with accurate information using a web form.

4.1.2 Actors

- User
- System

4.1.3 Preconditions

- User has active and consistent internet connection and is on the sign up page.

4.1.4 Basic Flow

- User enters all the information correctly into their respective fields
- User agrees with the FERBA terms and conditions
- Enters submit

4.1.5 Alternate Flow

- None

4.1.6 Exception Flow

- User fails to enter data in all the fields marked required
- User enters data in an incorrect format
- User fails to click on the FERBA checkbox before clicking on submit button

4.1.7 Functional Requirements

- The system shall verify all the information that user has entered is accurate using form validation methods
- The system shall notify user on which fields are has incorrect data entered or required fields which are empty.
- The system shall store all the information in the database

4.1.8 Non Functional Requirements

4.1.8.1 Performance

- The web form should respond under a few seconds once the user has clicked submit button.

4.1.8.2 Security

- The data submitted must be verified and in accurate format.

4.1.9 Post Condition

- User can use the credentials entered to login to the system and use other features.

4.2 Login

4.2.1 Objective

To allow users to login to the system using the credentials they setup during registrations.

4.2.2 Actors

- User
- Authentication Module

4.2.3 Preconditions

- User has successfully registered into the system

4.2.4 Basic Flow

- User loads the login page
- User enters id and password into respective fields
- Clicks on submit button

4.2.5 Alternate Flow

- None

4.2.6 Exception Flow

- User enters incorrect id, password or both.

4.2.7 Functional Requirements

- The system shall allow access when correct credentials are entered.
- The system shall prompt user when incorrect information is used to login.

4.2.8 Non Functional Requirements

4.2.8.1 Performance

- The system must respond under a few seconds once the user has clicked submit button

4.2.8.2 Security

- The system must protect from multiple failed attempts to login using one id.
- The system must demand a change in password if more than 10 failed attempts are made.

4.2.9 Post Condition

- The user is now redirected to the user dashboard page.

4.3 Issue Certificate

4.3.1 Objective

The purpose of this feature is to issue a certificate to the user on successful completion of a course.

4.3.2 Actors

- User
- Program Coordinator
- Instructor

4.3.3 Preconditions

- The user has completed the mandatory safety quiz.
- The user has completed the pre-requisite course required.
- The user has enrolled for the course.
- The user or the user's employer has made the payment for the course.
- The user has been given the pass grade by the instructor at CSULB in both practical and theoretical examination.

4.3.4 Basic Flow

- The user has completed the pre requisite and successfully completed the course at CSULB.
- The user can now access the certificate from the dashboard which is valid for three years from the day of completion of course.

4.3.5 Alternate Flow

- None

4.3.6 Exception Flow

- The user failed to complete the course successfully.
- The instructor reserves the right to revoke a certificate under justifiable circumstances.

4.3.7 Functional Requirements

- The system shall generate a unique certificate for the user on completion of the course. A course is successfully completed when the user has been given pass grade in all the required examinations conducted by the instructor.

4.3.8 Non Functional Requirements

4.3.8.1 Performance

- The system must generate a unique certificate as soon as the user has been given a pass grade.
- The issued certificate must expire after three years of completion.
- The system must give user access to the certificate at all times.

4.3.8.2 Security

- The certificate issued must have a unique code and should have the name of the user printed on it.

4.3.9 Post Condition

- The user has a pdf copy of the certificate which can be accessed at all times from the dashboard.

4.4 Revoke Certificate

4.4.1 Objective

The purpose of this feature is to revoke a certificate issued to a user.

4.4.2 Actors

- User
- Instructor

4.4.3 Preconditions

- The user has been issued a certificate

4.4.4 Basic Flow

- The instructor changes the grade of the user from pass to fail.
- The certificate issued for that course is revoked.
- The certificate ID will now have the revoked status.

4.4.5 Alternate Flow

- None

4.4.6 Exception Flow

- None

4.4.7 Functional Requirements

- The system shall change the status of the certificate as per the current status of the grade.

4.4.8 Non Functional Requirements

4.4.8.1 Performance

- The system must revoke the certificate as soon as the user has been given a fail grade.

4.4.8.2 Security

- The certificate status in the database needs to be secure.

4.4.9 Post Condition

- The user's certificate status is now revoked

4.5 Complete Pre-requisites

4.5.1 Objective

To allow user to enroll in the pre-requisite course and complete it successfully.

4.5.2 Actors

- Pre-requisite module
- User

4.5.3 Preconditions

- The user has successfully signed into the system and is on the dashboard page.
- The user completed the safety quiz.

4.5.4 Basic Flow

- The user clicks enroll on the pre-requisite course of choice.
- The user gets access to the course learning material and a quiz to test the knowledge.
- The user answers all the questions in the quiz successfully.
- A pdf proving successful completion is generated and stored in the dashboard.

4.5.5 Alternate Flow

- None

4.5.6 Exception Flow

- The user has not completed a pre-requisite course mandatory to sign up for the desired pre-requisite course and thus cannot complete it.
- The user failed the quiz.

4.5.7 Functional Requirements

- The system shall allow users to enroll in a pre-requisite of choice provided all the conditions for that course are met.
- The system shall grant access to course material once enrolled.
- The system shall allow user to give quiz and complete the pre-requisite.
- The system shall generate an enrollment certificate for the user which is valid for one year since the completion of the pre-requisite.

4.5.8 Non Functional Requirements

4.5.8.1 Performance

- The system should maintain accurate records of user's current status.

4.5.8.2 Security

- The system must prevent any forgery of the enrollment certificate.
- The enrollment certificate must expire in one year and disallow users to circumvent the time frame permitted for enrollment to a course.

4.5.9 Post Condition

- The user has completed the pre-requisite and has a pdf copy called enrollment certificate to prove it.

4.6 Enroll in Course

4.6.1 Objective

The purpose is to allow users to enroll in a course at CSULB through the website.

4.6.2 Actors

- User
- Program Coordinator
- Enrollment module

4.6.3 Preconditions

- The user has completed the pre-requisite course and has an enrollment certificate.

4.6.4 Basic Flow

- The user(employee) or user's employer emails the copy of the enrollment certificate to the program coordinator.
- The user's employer sends payment or confirmation of full payment made to CSULB for the course.
- The program coordinator enrolls the candidate to the course using the feature available in the program coordinator dashboard.

4.6.5 Alternate Flow

- The user(general) opens the page where a table with all the course information is displayed.
- The user(general) clicks on the course for which the pre-requisite is completed.
- The user enters the unique enrollment code on the enrollment certificate into the field on the web page.
- The system verifies the validity of the code and checks the age of the code. The code should be used within one year from the date of issue.
- The user is redirected to the secured payment gateway.
- The user makes the payment in full and is enrolled in the system.
- The user receives confirmation of successful enrollment with information about next steps.

4.6.6 Exception Flow

- The enrollment certificate code is expired.
- The course has enrolled maximum number of users and the user is placed in a waitlist.
- The payment fails.
- The user has already enrolled in the course.

4.6.7 Functional Requirements

- The system shall allow user to enroll for the course provided all the requirements are fulfilled.
- The system should check the validity of the unique code entered.
- The system should provide a secured page to make payment

- The system should provide a method to email the enrollment certificate to the program coordinator or download it.

4.6.8 Non Functional Requirements

4.6.8.1 Performance

- The system must perform in the correct and intended flow. All exceptions must be communicated with user in succinct messages or pop ups.

4.6.8.2 Security

- The validity of the unique code should be checked securely.
- The payment gateway must use https protocol.
- The user must be securely enrolled in the course.

4.6.8.3 Software Quality Attributes

- Reliability:
The reliability of the payment gateway is vital to ensure a safe user experience.

4.6.9 Post Condition

- The user has been successfully enrolled in a course and has received an email confirming it.

4.7 Update User Information

4.7.1 Objective

The user is not allowed to change name and last name once registered to maintain authenticity of the certificates. It can be updated by making a request to the program coordinator.

4.7.2 Actors

- Program coordinator
- User

4.7.3 Preconditions

- The user has successfully signed up for the system.
- The program coordinator has access to the his/her dashboard.

4.7.4 Basic Flow

- The user sends an email requesting the program coordinator a change in personal information.
- The program coordinator verifies the request manually.
- The program coordinator edits the information using his/her dashboard.
- The program coordinator then cancels any certificates generated before the requests.
- The program coordinator then requests system maintenance team to generate a new certificate and publish it to the user's dashboard.

4.7.5 Alternate Flow

- None

4.7.6 Exception Flow

- None

4.7.7 Functional Requirements

- The system shall allow program coordinator to change the personal information of the user.
- The system shall disallow user to change the personal information

4.7.8 Non Functional Requirements

4.7.8.1 Security

- The system should prevent user from changing the information.
- All certificates generated before the change of information request must be discarded.

4.7.9 Post Condition

- The user has successfully updated the personal information and has certificates with updated information.

4.8 Assign Instructor

4.8.1 Objective

The program coordinator has to assign an instructor to the courses available on the website.

4.8.2 Actors

- Instructor
- Program Coordinator

4.8.3 Preconditions

- Program Coordinator has signed in.
- Instructor has registered into the system.

4.8.4 Basic Flow

- Instructor clicks on add instructor tab
- Selects the course and assigns an instructor
- The instructor receives an email confirmation.

4.8.5 Alternate Flow

- None

4.8.6 Exception Flow

- The course already has an instructor assigned.

4.8.7 Functional Requirements

- The system shall allow assigning an instructor to a course.

4.8.8 Non Functional Requirements

4.8.8.1 Security

- The system should not overwrite without warning if a course already has an instructor assigned.

4.8.9 Post Condition

- A course has an instructor assigned.

4.9 View User Enrolled

4.9.1 Objective

This functionality is available for instructor and program coordinator user type. The purpose is to view the list of students enrolled in for a course.

4.9.2 Actors

- Program coordinator
- Instructor

4.9.3 Preconditions

- Users have enrolled for the course
- Instructor/ Program coordinator have signed in and are on their dashboard page.

4.9.4 Basic Flow

- The Instructor/ Program coordinator clicks on course details.
- Then click on the list of enrolled users

4.9.5 Alternate Flow

- None

4.9.6 Exception Flow

- Instructor is not assigned to the course.
- No users have enrolled for the course.

4.9.7 Functional Requirements

- The system shall show the list of users enrolled for a course.

4.9.8 Non Functional Requirements

4.9.8.1 Performance

- The list should populate under 3 seconds.

4.9.9 Post Condition

- Instructor/ Program coordinator has a list of all the users enrolled for a course.

4.10 Remove User Enrolled

4.10.1 Objective

This functionality is available for program coordinator user type. The purpose is to remove a user enrolled for a course.

4.10.2 Actors

- Program coordinator

4.10.3 Preconditions

- Users have enrolled for the course
- Program coordinator have signed in and is on the dashboard page.

4.10.4 Basic Flow

- The Instructor/ Program coordinator clicks on course details.
- Then click on the list of enrolled users
- Clicks on remove user from the course list

4.10.5 Alternate Flow

- None

4.10.6 Exception Flow

- No users have enrolled for the course.

4.10.7 Functional Requirements

- The system shall show the list of users enrolled for a course.
- The system shall remove user on the Program coordinator's request.

4.10.8 Non Functional Requirements

4.10.8.1 Performance

- The list should populate under 3 seconds.
- User should be removed from the course immediately.

4.10.8.2 Security

- Program coordinator is asked for a double confirmation before confirming action to delete user.

4.10.9 Post Condition

- Program coordinator has removed a user from a course list.

4.11 Grade User

4.11.1 Objective

The purpose is to allow the instructor to grade a user's performance in a course at CSULB.

4.11.2 Actors

- User
- Instructor

4.11.3 Preconditions

- User has successfully enrolled in a course.

4.11.4 Basic Flow

- User began course at the CSULB campus
- User has given the written and practical exams conducted by the instructor.
- Instructor logs in to the dashboard.
- Instructor pulls the list of users.
- Instructor now adds grade.
- Instructor gives pass or fail grade on both type of exams
- If there is only one type of test than the status will be not applicable.

4.11.5 Alternate Flow

- None

4.11.6 Exception Flow

- User drops out of the course mid way through the course and status is changed to dropped out.

4.11.7 Functional Requirements

- The system shall allow instructor to grade a user's performance

4.11.8 Non Functional Requirements

4.11.8.1 Performance

- The grade needs to be accurately stored in the database as it decides whether a certificate is issued to the user.

4.11.9 Post Condition

- Instructor has successfully graded a user's performance.

4.12 Search

4.12.1 Objective

The purpose is to allow anyone to search for a candidate and verify the validity of user's certificates and check current status.

4.12.2 Actors

- User
- Instructor

4.12.3 Preconditions

- Active internet connection and search page is loaded in the web browser.

4.12.4 Basic Flow

- Uses the one or all of the six search filters and clicks search.
- A list of all the relevant search results have populated in the search results.

4.12.5 Alternate Flow

- User can use one or all of the following search filters: first name, last name, company, certification expiration date, city, zip code

4.12.6 Exception Flow

- User's search results have no matches in the database

4.12.7 Functional Requirements

- The system shall allow anyone to search for user's information

4.12.8 Non Functional Requirements

4.12.8.1 Performance

- The search results should populate quickly.
- The data in the results should be accurate and latest.

4.12.9 Post Condition

- A list of relevant results with user's first name, last name, link to a table of status of current courses, pre-requisites and certificates. It should be a quick and comprehensive view of the data.

4.13 Quiz

4.13.1 Objective

The purpose is to allow user to pass a pre-requisite course by passing a quiz on the website.

4.13.2 Actors

- User
- Quiz module

4.13.3 Preconditions

- The user has passed the safety quiz.
- The user has successfully enrolled in a pre-requisite course.

4.13.4 Basic Flow

- The user has studied the content provided on the website.
- The user takes the quiz on the website.

4.13.5 Alternate Flow

- None

4.13.6 Exception Flow

- The user has not answered all the question correctly. Every quiz requires a 100% accuracy in the answers.
- The

4.13.7 Functional Requirements

- The system shall allow user to take a quiz on the website with unlimited number of attempts.
- The system shall not keep a timer during the quiz
- The system shall mark all the incorrectly answered questions at the end of every quiz.
- The system shall keep all the answers as marked by the user before the clicking submit
- The system shall remove all the marked question if the user clicks on retake quiz button

4.13.8 Non Functional Requirements

4.13.8.1 Performance

- The quiz section needs to responsive for an improved user experience.

4.13.8.2 Business Rules

- The user should have an indefinite time to finish the quiz.
- The user should easily retake the quiz multiple times till passing it.
- Questions need not be jumbled in case of a retake.

4.13.9 Post Condition

The user has successfully completed the pre-requisite course quiz and now has an enrollment certificate in a printable pdf document.

5 Non functional Requirements

5.1 Performance Requirements

The list below explains the performance requirements for the primary features of the web application.

Search:

The search results have to be quick and accurate. This feature has multiple search filters and the results must be accurate when these filters are used concurrently.

Dashboard:

There are three type of dashboards in the system which will drive the majority of user's interaction with the database. It is important that the data remains consistent and updates quickly when the user interacts and attempts to update the information.

Quiz:

The quiz section should promptly retrieve scores and highlight the questions which were not answered correctly when the submit button is clicked. The response time should be within 3 seconds

Sign Up/Login:

The sign up page will take crucial user information which would be used to create unique certificates in future. The correctness of the data stored is vital.

Page load time:

The web application should load pages on all the major browsers (Internet Explorer, Google Chrome, Mozilla Firefox) quickly to improve user experience. It should be responsive to all size of devices.

5.2 Security Requirements

User data:

The system takes user's personal information in the sign up process and tracks user's performance data during the whole course. The security and correctness of data is important.

Log in:

Encrypting user's password during the logging in process to prevent security breach.

Account management:

The user should not be allowed to change their personal information after signing up to maintain the integrity of the certificates issued to an account holder on successful completion of the course.

Certificates:

The certificates issued by the system has to be unique and the instructor should have the ability to revoke the certificate if the situation demands. Maintaining the authenticity of certificates is important.

Dashboards:

The program coordinator and instructor dashboard login should withstand brute force attacks. Failed attempts to login with more than three consecutive attempts should freeze the account and user should be directed to change password to try again. These accounts have access to user's personal information and data tracking their performance and should be secured.

5.3 Software Quality Attributes

Reliability:

The search function of the system is used to track the performance of the user. This could be used by anyone to validate the certificates issued or to check the status of a user which is funded by an employer. The reliability of the search results is thus important.

Portability

The application should be easily ported to any hosting platform such as AWS that the future maintenance team might choose.

Maintainability

The system must be programmed with latest programming standards. Any team which is responsible to maintain the system should easily understand the code. The code should be written such that it is easy to implement new functionalities.

Availability:

The system must be available at all times to the users with an active internet connection.

5.4 Business Rules

- All users must agree with FERBA to finish the sign up process.
- All users must finish the safety quiz before starting any pre-requisite courses
- The pre-requisite course HMA-2 cannot be started unless the user has completed the HMA-1 course.
- After completion of the pre-requisite course the user has one year to enroll for the course to get certified.
- All certificates issued after completion of a course is valid for three years.

6 Analysis Models

6.1 Use Case Diagram

6.2 Sequence Diagram