University of Nevada, Reno
Department of Computer Science and Engineering

Master CS
Project Part 3: Acceptance Criteria and Testing Strategy and Plan

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1. Abstract

The team's project is a web application focused on being a platform for users to learn various computer science topics and for teachers to help aid in teaching. The web application will provide each user an opportunity to learn different topics based on an introduction quiz that directs them toward a learning path. The project is important in the recent shift towards online learning. The application will support various features: student and teacher account creation, course selection, course and video viewing, quiz selection and scores, admin account, personalized user profiles with roles, user and course statistics, achievement badge system, introductory personality quiz upon first registering, event selection/creation/registration, and a user discussion forum. This document goes over recent project updates and changes, user stories and acceptance criteria testing workflow, and testing strategy.

2. Project Updates and Changes

Since our beginning of the semester meeting, our group has made progress on both the front-end and back-end portions of our application in addition to the framework. Our semester started with a shift to using Vue.js. Our work then focused on developing features. On the back-end, the database is now successfully connected to the front-end, and multiple elements of the application both post and receive data from the database. The database table structure has also been completed. On the front end, content delivery in the forms of videos and quizzes both functionally work, along with achievements, login and account creation, and event management. However, these components still work independently of one another. Which makes the next development focus take the form of implementing sessions so users can take advantage of the features that are completed.

The most significant change to our project plan has been the shift to the Vue framework. This decision was made for two reasons that are both connected to the way that Vue handles components of the application. Vue easily enables the reuse of components that only have to be created once. This in turn allows for both an easier development process, and a more consistent visual style throughout the application.

3. User Stories and Acceptance Criteria

User Information

US1. As an administrator, I want to see the progress of student users so that I can properly grade them.

- **AC1.** The user is assigned an administrator role and is the administrator of a particular course
- **AC2.** Students are enrolled in a particular course
- **AC3.** Students have completed course content
- **AC4.** Students' progress is saved when completing content

US2. As a student user, I want to see my statistics so that I can evaluate where I am at and how much I have learned.

- **AC1.** The user has made a student account.
- **AC2.** The user is enrolled in a course.
- **AC3.** The user statistics page properly loads their course progress.

Event Registration

US3. As an administrator user, I want to add events so that student users can register to learn in person.

- **AC1.** The user is assigned an administrator role.
- **AC2.** The user fills out all fields in the add events form.
- **AC3.** The system properly adds the event to the database after the submit button.
- **AC4.** The application displays an "Event Added" alert.

US4. As a student user, I want to register for events so that I can learn in person.

- **AC1.** Events have been added to the event page.
- **AC2.** The user is logged into their account.
- **AC3.** There are spots open in the event the user wants to register for.
- **AC4.** The application correctly sends their information to the database to sign up after clicking the register button.

Course Pages

US5. As an administrator user, I want to upload quizzes so that I can evaluate what students know.

- **AC1.** The user is the admin of at least one course.
- **AC2.** The add quiz form is available on the course page.
- **AC3.** The user has filled out all of the required fields.
- **AC4.** The application properly submits the form to the database.

US6. As a student user, I want to look at all of the course content so I can learn a topic.

- **AC1.** The user is enrolled in a course.
- **AC2.** The user has navigated to the course page.
- **AC3.** The application properly displays the course content pulled from the database.

Achievements

US7. As a student user, I want to earn achievements so I can set goals for myself.

- **AC1.** The user has registered for an account.
- **AC2.** The user navigates to achievements and the system properly displays the achievements page.
- **AC3.** The application tracks the user's activity and properly unlocks achievements.

US8. As a student user, I want to view all of the achievements so that I can motivate myself to learn more.

- **AC1.** The user has navigated to the achievements page.
- **AC2.** The application properly pulls achievements from the database and displays them.
- **AC3.** The achievements page displays the locked and unlocked achievements for the user.

Introduction Quiz

US9. As a student user I want to take the introduction quiz so that I can learn what learning style I have and how I can use that to my advantage.

- **AC1.** The user has navigated to the introduction quiz page.
- **AC2.** The user has completed the form and submitted.

- **AC3.** The application computes their learning style based on user input.
- The application outputs the correct learning style and tips for the learning style.

US10. As an administrative user, I want to see what type of learning style students have so I can tailor the course content to them.

- **AC1.** The administrative user navigates to the course page they own.
- **AC2**. The user has students enrolled in the course.
- **AC3.** The students have completed the introductory quiz.
- **AC4.** The application has saved the correct learning style for each student.
- **AC5.** The application properly displays the learning style of each student on a table.

4. Testing Workflow

Happy Path Workflows

Changing user password

1. When logged in, go to the Navigation bar and click My Profile
2. Then mouse over and click Profile
3. Click the User Information
4. Input user email address, current password, and the new password to be changed to.
5. Click Save Changes.

This workflow first checks if the existing email and password matches the stored values in the database by using an API request. If they both match, the new password will be stored in the database.

Taking quiz

1. When logged in, go to Navigation bar and click My Profile
2. Then mouseover and click My Courses
3. Choose a course and click view course
4. On the left sidebar, click on quizzes
5. Choose the desired chapter to take the quiz
6. Take quiz and click submit when finished

When a user selects the course, the frontend sends a request to fetch the corresponding course data and chapter information to pull the quiz questions from the quiz bank. When the user

finishes the quiz and submits, the front end verifies that all questions have been answered. Once verified, the score is pushed to the database with corresponding fields populated with the new data.

Enroll in course

1. When logged in, go to Navigation bar and click Courses
2. Click on View Course on desired course.
3. Click on the Enroll This Course button on the top right.

When the user enrolls, the information is submitted to the Database by using an api call that verifies the user is eligible to enroll in the class. If true, the database is updated to reflect the users current class enrollment.

Log into System

1. Click the login button on the top navigation bar.
2. Enter email address and password.
3. Click Login

The supplied credentials are submitted via api to the database. If a match is found, the front end will enable full access to the website and allow access to the user specific data stored in the My Profile area.

Watch video

1. When logged in, go to Navigation bar and click My Profile
2. Then mouseover and click My Courses
3. Select the desired course by clicking View Course
4. Click on course chapters and click on desired chapter.
5. Click on the play button to begin the video.

When a user selects chapter video to watch, the database is queried to see if the user has watched the video before. If so, the frontend will suggest playback from the previous chapter first. If false, the video will begin playback from the beginning.

Unhappy Path Workflows

Incorrect password

When a user attempts to log into the system with a valid email address but an incorrect password, a popup window will instruct the user that the account is valid but the password is incorrect. The API transferring the credentials to the database will receive the response that the email address is not valid. The frontend needs to be able to notify the user of the error. Testing for this error requires a unit test.

Error loading video

When a user attempts to play a video that does not load. It may no longer be available on the content delivery network, moved file, or lack of available bandwidth. The frontend needs to be capable of notifying the user that the video is not available via a box with the error message content.

Network disconnection while taking quiz

When a participant is disconnected from the internet while taking a quiz, the progress doesn't save after reestablishing network connectivity. Every quiz immediately submits user supplied answers to the database. A popup notification needs to notify that the user's answer was not successfully saved when the api does not hear back from the database server with an positive ack. This can be tested as a unit test

Enroll into event that is full

When a user attempts to enroll into an event that is at full capacity there needs to be a way of blocking the enrollment and notify the user of the error. The text box notification will contain the details of the error and a link to contact the organizer for more information.

Replying to comment deleted by the author in the Discussion area

When a user replying to a comment in the discussion area that has been deleted there needs to be a way of retaining the content of the post. If the frontend detects that the parent comment is deleted, there needs to be a notification that the comment will be orphaned and give the user

options to either delete their comment or create a new thread with said comment. Unit test will be required.

5. Testing Strategy

Types of Tests

- Unit tests: Unit tests will be performed on the server API to ensure proper functionality is documented and verified for each server route from the front-end.
- End-to-end tests: End-to-end tests try to avoid non proper communication and functionality between front-end, back-end and database. Such as front-end validation, sending requests to API, and pulling user's information from the database.

Responsibilities for testing

- Austin Schrage will be testing courses video, introduction quiz and course quizzes related to all functionality from Yan Shore and Zhuqi You. He is going to validate that all the links and videos are valid connections and can be accessed normally.
- Yan Shore and Zhuqi You will be testing the badge, event registration, achievements and adim system related parts assigned to Crystal Atoz and Kayla Garin.
- Crystal Atoz and Kayla Garin will be testing the user information and database related functionality built by Austin Schrage. They are going to validate all functions that are related to end-to-end tests.

TeamWork Report and Defect Discovery

If all members of the team encounter any development problems, they can ask at discord at any time. For the development progress, if the team members complete the assigned tasks, the members will share the development progress and upload the development files to the team's GitHub account. Everyone has different GitHub branches, which ensures that, After each team member completes their task, the expected function can be realized. When the test passes, that is, after the function is realized. The team will merge everyone's work and then upload the latest version to GitHub master. Then the final debugging and code cleaning integration are carried out.

Determine Whether The Project Is Completed and The Test Passes

- The most important part of this part is the acceptance test. At present, each team member has assigned tasks.
- Use Trello platform to mark development progress, such as to do, doing, or done
- Merge the work of all team members. Use GitHub matter to merge. Each team member updates the version of the master, and then uses his own branch for independent development, because all work will be merged into the master in the end.
- Each team member completes according to the task and ensures that the completed part can be run and displayed correctly. Finally, upload to Github branches.
- If any members encounter problems during the development process, we will discuss them in the discord team.

Acceptance Criteria and Workflow Items

Acceptance Criteria

- **Time schedule:** In the next two weeks (before March 38), each team member will do his best to complete the tasks currently assigned. In the last week of March and the first week of April, the final code cleaning will be carried out in these two weeks.
- **Independent testing**: each team member has different GitHub branches. When developing different functions, team members do independent testing, such as whether the code runs normally and whether the output effect of the website meets the expectation.
- **Problem thinking**: if any members encounter development problems and can not solve them all the time, the team will integrate and think about the next help measures.
- **Integration work:** this part will be carried out on March 28 two weeks later, which is the last week of March. The team will use this week and the first week of April to carry out the final project cleaning work. If there are any problems, the team will think and solve them together in this process.

Workflow Items

Use Case Descriptions

Test No.	Test type	Target file	Test Name	Purpose of Test	Test Data or Situation	Expected Result	Actual Result	Outcome and Actions Required
1	User Login/Sign up	Log.vue and SignUp.vue	Users can register accounts and log in to their accounts	Users can have an account and use the website normally	Date set: Done March 10th Newest version will be released before March 18th	1. Users can register through the website 2. After registration, users can log in, and their account and password will be protected.	Users can log in / out of the account or create an account.	After users log in, the website can display their names. When they log out, the website will not display their names. After the test, it will ensure that users log in or log out dynamically.
2	Statistics	Statistics.vue	Profiles overall statistics	Users can see their course completion progress report in their profile	Date Set: March 10th Newest version will be released before March 20th	1.The user profile will successfully save all progress. 2. They will be able to view their profile statistics.	Users can view their overall statistics for an individual course.	At present, the problem of databases needs to be considered. Next, users can see the most complete dynamic statistical report about their progress.
3	Event registration	Events.vue	User can register an event	User can register an event from the event list	Date set: March 10th	Show the event is enrolled by the user	As Expected	From the front-end sends requests to the database, check the remaining spots left.
4	Achievements	Achievements.vue	Users can get badges	Users can view the percent	Date set: Match 8th Newest	View all earned and unearned achieveme	Users can see the badge and	Users will have an achievement added to their profile when completing

				of achievements they have earned. (badges)	version will be released before March 19th	nts.	progress in their profile	specific tasks.
5	Quizzes and Courses's link	Quiz.vue Problem.vue Chapter.vue Courses.vue	Check link validation	Make sure all the links and videos are accessible	Date set: March 8th Newest version will be released before March 20th	All videos and links can be loaded and valid.	Users can browse all courses and register courses. They can also do quizzes	Since videos are embedded, and other related material for quiz are from other websites, so make sure the sources are still accessible.

6. Contributions of team members

Crystal Atoz: 1 hour

Crystal worked on the abstract and overall document revision.

Yan Shore: 1.5 hours

Yan worked on the testing workflow and helped with editing the assignment.

Kayla Garin: 1.5 hours

Kayla worked on the user stories and acceptance criteria section. She also helped with revising the document.

Zhuqi You: 1.5 hour

Zhuqi worked on testing strategy. She also helped with editing the assignment.

Austin Schrage: .5 hours

Austin completed the Project Updates and Changes section.