Group # 4

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SWE 6783 User Interactions

Final Document (Group)

Project Title: QuizEms

Project Tagline: The easy solution to practice quizzes and tests!

GitHub URL: https://github.com/clincol2/QuizEmsDocs

Source Code: https://github.com/clincol2/UISummerProject

Link to application: https://quizemsnew.firebaseapp.com/#/

Note: We recommend clearing your cache before using incase any updates were made to the code between your last visit and now.

Project Summary:

Domain:

A. Introduction

This document will underline and describe the design of our entire project. It will contain this domain analysis, problems, goals, research, design, prototype, evaluation and more.

B. Glossary

Quiz: a test of knowledge, especially brief, informal test given to students.

Test: a procedure intended to establish the quality, performance, or reliability of something, especially before it is taken to widespread use.

C. Clients and users

Potential users are targeted to those attending Universities or those who are employed through a University. These users are listed below.

Professors: Primary use will be creating the quiz and sharing the link to the quiz with the next user, Students.

Students: Primary use will be taking the quiz link, pulling it up in their browser and taking the quiz to test their knowledge on the information from their class.

Admin: Primary use is purely administrative. Providing updates, adding features and correcting bugs as they may appear.

User Characteristics	QuizEms customer characteristics, by group		
	College Students	Professors	Admin
Age	18+	25+	20+
Sex	Both Male and Female	Both Male and Female	Both Male and Female
Educational Background	Completed High School or Equivalent. Currently Pursuing a degree (Undergraduate or higher).	Completed college education and any other certifications.	Currently pursuing a college degree or has completed their higher education.
Physical Limitations	Most likely fully able-bodies but may have some physical limitations. Will be of varying heights.	Most likely fully able-bodies but may have some physical limitations. Will be of varying heights.	Most likely fully able-bodies but may have some physical limitations. Will be of varying heights.
Computer/ IT use	Will most likely have prior experience of computer work. Possibly IT use as well.	Will most likely have prior experience of computer work and IT use.	Will most likely have prior experience of computer work and IT use.
Motivation	Probably motivated to use QuizEms in relation to future exams and quizzes in their classes.	Could be very motivated to use QuizEms for their classes, especially if they can repeatedly use the same practice quiz for future semesters.	Could be very motivated to develop and maintain QuizEms, especially if it means they understand User Interactions because of it.
Attitude	Attitudes to use will vary, depending on the ease of the practice test/quiz as well as the reliability of the application.	Attitudes to use will vary, depending on the simplicity to create a practice test/quiz, the ability to share the test/quiz and the reliability of the application.	Attitudes may vary, depending on the difficulty of creating and maintaining QuizEms.

D. The environment

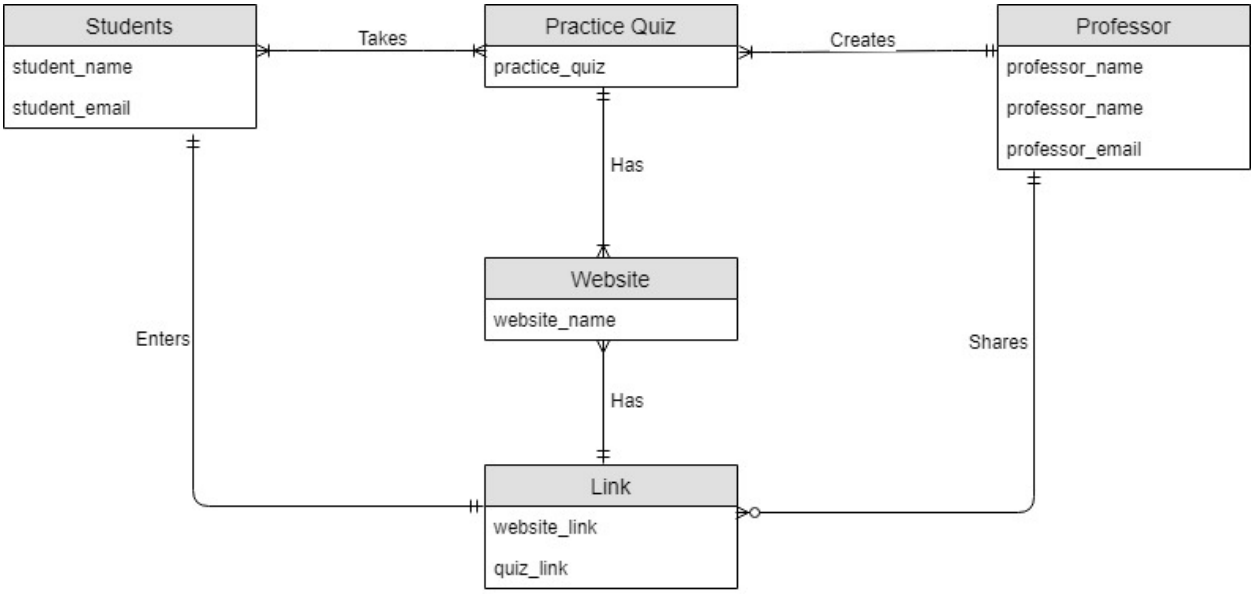
The user will need a computer. Any platform will suffice.

The only configuration needed is a browser installed on their computer.

E. Current process

Currently the professors are using University provided application to create practice quizzes. These provided applications are not user friendly, typically cannot be transferred from semester to semester and provide anxiety to the students.

Domain Analysis UML:



Problems:

Some problems we identified with the current process are listed below:

1. Professors have difficulty creating practice quizzes with the University provided application.
2. Professors have to re-create the same practice quiz each semester.
3. A large percent of students were not utilizing the practice quiz on their University site due to fear that the professor will see their results.

Goals:

We had three main goals for QuizEms:

1. A user friendly and simple application for creating practice quizzes for educational purposes.
2. Provide anonymity to the students to reduce anxiety when taking a practice quiz.
3. A way to re-use already created quizzes for future semester.

Our technical goals are blow:

1. Create a practice quiz.
2. Take a practice quiz.
3. Share a practice quiz.

Preconditions:

The application has the capacity for all desired questions. The application provides an accurate grade once the practice quiz or test is completed. The link to the test or quiz is correct and links the user to the correct practice quiz or test.

Subtasks:

1. Add questions and answers.
2. Edit questions and answers.
3. Submit the questions and the answers.
4. Select an answer to the quiz.
5. Submit all answers to the quiz.
6. Review grade on accuracy of answered questions. .
7. Ability to retake quiz.

Process Description:

Research:

Our research consisted of interviewing students, professors, and the admin with a short questionnaire. We also conducted user evaluations when we created our prototype to gage our design and to see if we were blatantly missing anything major in the design. While the user identified many things that they would like to see approved upon in our design, they were items we were aware of and would change if we had the time.

Design:

We had an idea and design in mind when we started this project, but it wasn't until Deliverable 3 where we began jotting down and sketching our ideas. We each produced 4 sketches with small or major changes between them. We went through each sketch, provided a rating, discussed its strengths, weakness, feasibility and originality. Once each sketch had been discussed, we ordered them based on their rating. We then took the 3 highest ranked sketches and composed a statement about each one. It highlighted why we felt these designs were better and went into more detail than our previous feedback.

While it wasn't required, we identified the features we felt we must haves and features we would like but were optional if time allowed. We then created a final design based on functionality. Similar to a paper protype, but without the interaction function.

As we began coding and working more on the quiz, design decisions had to be made that went against our must have features. This was mainly due to time constraint and the limitation of the language we chose to code in. These changes did affect our user evaluation, and many of the features or confusion they proposed were things we had already wanted but did not have the time to implement. We

addressed these concerns that future releases may have these features which will significantly improve the design of the application.

Prototype:

Our first prototype was the Paper Prototype on Deliverable 4. We chose to utilize Adobe's free application Adobe XD to create our Paper Prototype. The majority of its function was the same as our computer prototype, but due to limitations, we included an extra button so that the user could experience creating a practice quiz and taking the practice quiz.

A link to our paper prototype: https://xd.adobe.com/view/964b5b67-0bb5-410a-741c-2efe04e47beb-e07a/

Our next prototype was the computer prototype. We poured everything we could from our design into this prototype. Many features we wanted (i.e. email function, multiple types of questions, answer options suppressed when not used, etc.) we not implemented in the computer prototype. We created a short three-minute video of the computer prototype to show our users doe the user evaluation.

A link to our computer prototype video:
https://drive.google.com/drive/folders/1CFqyPfbJixZ1AMTux_UaCFvkU70eUgJ0?usp=sharing

We also provided the implementation, which is the application link at the beginning of this document. This is the computer prototype that the user can physically use on their computer. This allows the user to create a quiz, take the link provided and take the quiz.

Evaluation:

Our user evaluation, while we previously discussed, was comprised of three users. We had 2 former professors and one student who reviewed each of our prototypes.

This was completed in Deliverable 4, but here are the response again for reference. Continue to the next page to view this content.

Evaluation of the Paper Prototype:

Step	Expectation
Click 'Create Quiz' button	Quiz Creation Page displays
Click 'Save' button	Checkmark confirming progress saved displays
Click 'Add Question' button	Question and Answer fields display
Click 'Save' button	Checkmark confirming progress saved displays
Click 'Delete' button	Question and Answer fields should no longer display
Click 'Add Question' button	Question and Answer fields display
Click 'Create Link' button	Modal Pop-Up with message and link to quiz display
Click 'Close' button	Quiz Creation Page displays
Click 'Create Link' button	Modal Pop-Up with message and link to quiz display
Click 'Take Quiz' button**	Quiz Page displays
Click 'Submit' button	Modal Pop-Up with message and results
Click 'Close' button	Quiz Page displays
Click 'Retake' button	Quiz Page displays (no questions answered)

****This is not a feature we intend for the computer prototype, but because of the paper protype having limitations, we wanted a way for the user to get to the quiz page.

User 1 (Former Professor):

1. There isn't much going on the home page.
2. Very simple functionality.
3. Do I select the option (a) b) c) d)) or do I need to rewrite the correct answer?
4. The pop-up is simple and to the point.

User 2 (Student):

1. Like every other quiz we take.
2. Will the professor be able to see that I take a quiz?
3. What happens if the time runs out?
4. Straight-forward quiz.

User 3 (Former Professor):

1. Am I only able to create quizzes with this application?

2. No logo or mascot, no branding can be seen. How do you expect people to remember to use this?

3. What if I forget to copy the link? Is there any records of the work I just did?

5. What is the purpose of the save? Would I be able to continue this later?

6. Can I not do different types of answers like True or False, Matching, Multiple Correct Answers?

7. I think this needs more functionality.

8. Why would I take the quiz after making it. (We did advise this is not a current feature but placed for the paper prototype only).

Evaluation of the Computer Prototype:

Step	Expectation
Click 'Create Quiz' button	Quiz Creation Page displays
Click 'Save' button	Checkmark confirming progress saved displays
Click 'Add Question' button	Question and Answer fields display
Click 'Save' button	Checkmark confirming progress saved displays
Click 'Delete' button	Question and Answer fields should no longer display
Click 'Add Question' button	Question and Answer fields display
Click 'Create Link' button	Modal Pop-Up with message and link to quiz display
Click 'Close' button	Quiz Creation Page displays
Click 'Create Link' button	Modal Pop-Up with message and link to quiz display
Copy and paste the quiz link into your browser	Quiz Page displays
Click 'Submit' button	Modal Pop-Up with message and results
Click 'Close' button	Quiz Page displays
Click 'Retake' button	Quiz Page displays (no questions answered)

User 1 (Former Professor):

1. Homepage looks the same. Did you make any changes?

2. Very simple functionality.

3. I still do not know which input to put for correct answer. Either new functionality or clearer instructions.

User 2 (Student):

1. Quiz looks the same.

2. I like that the timer moves with the screen, so I do not need to take time to scroll back up to see it.

3. Quick results are nice to have.

User 3 (Former Professor):

1. I see zero changes on the home page.

2. Same questions and concerns as before when reviewing the paper prototype.

3. I would still love more options of the type of questions I can create.

Context:

The purpose of QuizEms is to provide an easy solution to creating practice quizzes that are shareable with the professor's students. Even though most Universities have a quiz maker application built into their educational sites (i.e. D2L), there were many pain points associated with it. Students didn't like the idea that the professor could see their results and the professors feel that quiz maker was too complex and non-transferable between semesters. Both users also dislike the clutter that the practice quizzes brought to their course's page and would be easily confused by what was a real quiz and which one is the practice quiz. QuizEms allows the professor to create a practice quiz, share that practice quiz via a link, keep record of that link in their email and allows the students the anonymity they want. Lastly, the professors can re-use the same practice quiz for future semesters.

Background:

We wanted to start this project in efforts to help professors and students. We wanted an easy to use, simple application that brought big relief in the many pain points we discussed earlier. From the questionnaires we developed to the user evaluation, it was clear that this was a need for students and professors. Our foundation, as students, was to help our professors be able to provide extra resources that could help improve grades amongst the student mass. This was a driving force for QuizEms.

Rationale for our Design:

Our original design question:

What quiz creation application is the most user-friendly and how can we improve it as a basis for our application?

With feedback from our professor, our improved design question is:

What features are lacking in current quiz making applications?

Our design, not the prototype, answers this question. Current quiz making applications are not made for educational purposes. The ones that are for educational purposes are not Third-Party applications and are usually provided by the University. Professors are able to create one quiz and re-use for future semester with our design. Students have anonymity and comfort knowing the professor cannot see their

results. The students can retake the quiz multiple times, which has been proven to help with information retention. And lastly, the professors will have an email record of the quiz they created.

We made the decisions for our design based on pain points we have seen as a student ourselves. We wanted a tool that would benefit both professors and students who use it. We jotted down what design features we felt were important to implement into our design. Our thought process was to try an create something simple but sophisticated.

Analysis of results:

What went well:

Many things went well for our project that we our proud to share. As a team of two, we communicated daily, and we were able to understand one another well. We both took recommendations from each other professionally and were always able to come together as a team to strive for one goal.

What challenges we faced:

The number one challenge we faced was time. This was an 8-week course and we would normally have a longer time to try an develop our computer prototype. Because of this, we were not able to implement all the features we would have liked. We also faced problems with bootstrap having specified colors for their buttons and customization was greatly limited.

What would we do differently:

One thing we would do differently that is within our control, is choose a different programming language. We would choose a language that has more flexibility in the design and functionality. Another would be to define the major functions we want earlier on, before Deliverable 3.

Details of our Design:

When brainstorming ideas for this project, we went through all the topics provided. We jotted down ideas for the different topics, but we noticed that we gravitated towards the topic: A tool that benefits students and teachers.

We came up with a few ideas, and then did an informal feasibility evaluation. Things we considered in that evaluation was time to code the application, the difficultness, was there anything legally we would need to fulfill and if it was possible in general.

Once we finished this review, we pinpointed our idea: QuizEms.

We began writing requirements for the application, QuizEms, and discussed what could and could not be in the scope of work. We also took this time to make sure we both were on the same page about functionality. While we understood somethings could be hardcoded, and we jotted which features those were, we overall decided to have a true working application.

The next step for our design was to question our users to see if our assumptions around practice quizzes were correct. We were surprised and happy to see that our assumptions were on target and that our idea can continue to the sketches portion of our design.

We both had a general idea of how we wanted the application to look, more or less, but we decided to go with the recommended 4 sketches each to demonstrate and display the features we wanted to see. Color schemes, fonts, logos were not part of this process. We then evaluated all of our sketches, chose our top 3, and created a list of must have features as well as an optional list. We created a final sketch (via draw.io) to demonstrate a rough illustration of what our must have features would look like.

Unfortunately, we were not able to implement all the must have features in our paper prototype and computer protype, but we still tried to make decisions based on how the user would use the application. What wasn't documented was the many changes we made based on each other's recommendation to best try an improve the design. This includes moving buttons to the most convenient location. We also implement auto-scroll when the user adds a new question as this will help avoid confusion. We also implement auto-scroll with the timer so that the user would not need to scroll up to the top of the screen to see how much time they have left.

All of our design choices had the users in mind and while we know that the computer prototype did not encapsulate all the design decisions and ideas we wanted, we did think of them as good design choices.

Further direction:

Our next steps, should we continue with development, is to implement the features we wanted but did not have time to add. We would continue to hold user evaluations and try to implement new and user-friendly features for our targeted audience. A major hurdle we must take is finding a way to better customize the look or convert to a new code base. We believe this is an application that is not out there for professors and students and that it could be a great solution. Lastly, we would remove any hard-coded functions to work with a real user who would be using the application.