Project Proposal for Project and Seminary 2021/22

Quick Quiz

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1 Introduction

Quick Quiz is a project to promote interaction between professors and his students through quizzes answered anonymously. The main idea of this project is to implement a service that allow teachers to quickly create questions and receive feedback from students.

Given the generality of the idea, it can also partake in the following scenarios: conferences, quick feedback, suggestions for a business or gathering data for statistical analysis, were the organizer is the entity who creates quizzes and the guests the ones that answer.

This service will allow different types of questions like multiple-choice, short and long written answers. All the answers are always anonymous.

There will also exist limits, to prevent the abusive usage of the platform, and mechanisms to increase security.

2 Similar Existing Apps

There already exist similar options to what will be developed, an example is Kahoot[1].

Similarities:	Can enter session with pin code or *QR Code*.
	Guest can answer on different devices.
	Registration required to create a quiz.
Differences:	Question is only showed on organizer screen.
	Only supports multiple-choice questions for free tier.
	Up to 50 guests per session on free tier.

3 Proposed Architecture

The proposal is to set up a service that will provide the project functionality and an application that will expose it to the users.

On the service side a Server will handle the organizers and guests as well as the quizzes. There will also exist a Database to store the relevant information. This service will be exposed through an HTTP API.

On the application side there will also exist a Server that processes user information and interacts with the APIs. There will also be available a Web App that runs on browsers and interacts with the App Server to fulfill users requests.

Spring[2] is the proposed framework for the service server, since it's a well-established piece of software. As for the database, the technology proposed is the No-SQL Elasticsearch[3]. A No-SQL database allows for a more malleable data structure that fits great with the project.

For the application side, the framework proposed is Blazor WebAssembly[4]. The reason for this choice is to build the app with C#. Other technology that might be considered during development phase is React[5].

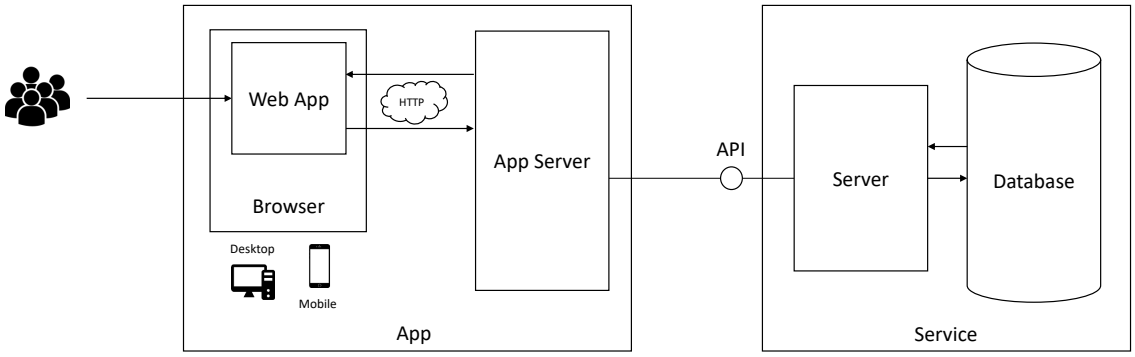

Figure 1: Proposed Architecture Diagram

4 Acceptance and Success Criteria

The success criteria for this project are:

- Ability for an organizer to create a quiz session and have guests join.
- Ability to create different type of questions as multiple-choice, short and long answer.
- Ability to create an account and log in for more functionalities.
- Ability for an organizer to create templates with multiple questions.
- Have a Web App that allows for any user to use the service.

5 Additional Objectives

For this project there are some additional objectives:

- Ability for organizer to download quizzes and all participants answers.
- Ability for guests to download their answers and questions answered.
- Ability for the organizer to release the questions 1 by 1 or in bulk.
- Have different kinds of formatting for the long answer (code, math, etc...).
- Ability to annex a file to the answer or the question (image, video, etc...).
- Ability to generate a *QR Code* with the link and pin code.

6 Approach and Deliverables

The first goal of the project is to create the service that will support all the functionalities that were proposed. This involves implementing the API, to process the requests, and the database which will store all the information.

The main feature of the service is the session. A session is created by an organizer and is what the guests can join to answer the quizzes.

Initial focus will be on the session, and the next step will be to develop user registration and login.

When the API main functions are ready, the focus will shift to the development of the App. With the Web App being developed, is the perfect time to start implementing integration tests which will validate the expected behavior and performance of the project.

In the run-up to the deadline, additional features and quality of life improvements will be developed.

At the deadline, it is planned to have a comprehensive report and documentation as well as the multiple parts of the project deployed on hosting services.

7 Deployment

The deployment can be divided into two parts: the service and the application. The deployment phase of this project remains under analysis. For now it is considered that both are deployed on the same hosting service. The proposed service for the deployment is Heroku[6]:

- Has a free tier.
- Has support for Kotlin language.
- Able to easily integrate Spring applications.
- Can connect to different types of databases.

8 Constraints, Assumptions and Risks

Due to the nature of the project, budget constraints exists, and therefore the use of paid technologies is limited. Because of this, will be used free tools. These tools have a learning curve which can cause delays in the overall delivery of the project.

Some other risks:

- The free platform limitations or changes in terms of service.
- Disruption of hosting services.
- Learning curve of the different platforms.
- Issues with work tools (laptops breaking, internet connectivity, etc...).
- Human resources limitation (sickness, inexperience, etc...).

9 Major Milestones

Based on the course deadlines and the proposed success criteria, project progress should be tracked in the following milestones:

- 3^{rd} week: Project proposal.
- 9^{th} week: API session developed.

  - May 9th: Progress Report.
- 13th week: Registration and Login developed.
- 14th week: API and Front-end integration.
  - June 6th: Demo.
- 17th week: API Documentation and Integration Tests.
- 19th week: Additional features implemented.
- 20th week: Report finished.
  - July 31st: Final Version Deadline.

10 Project Plan

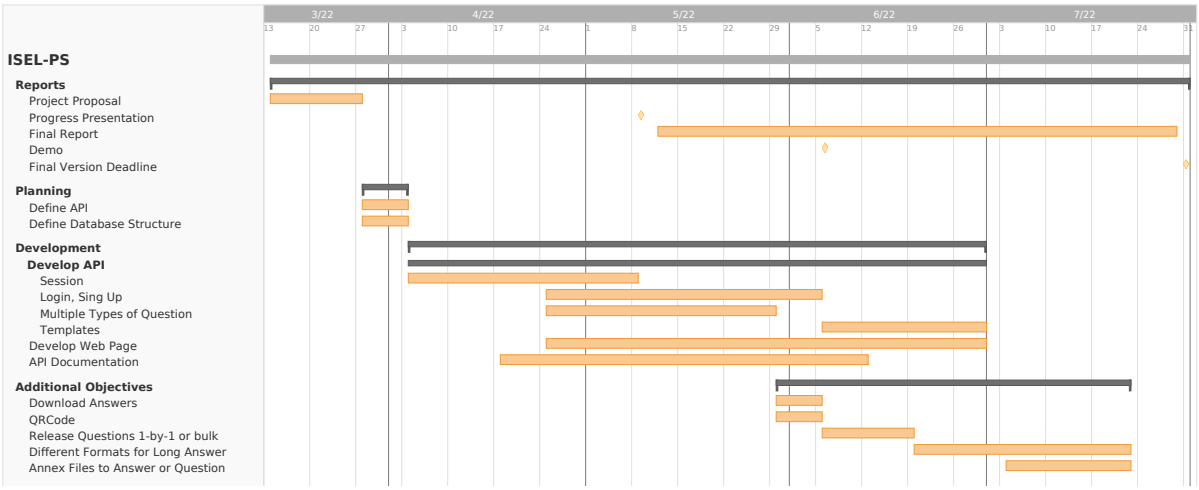

Figure 2: Project Plan *Gantt* Diagram

References

[1] `https://kahoot.com/` - Kahoot!, 2022 [Online; accessed 28-March-2022]

[2] `https://spring.io/` - VMware, Inc. 2022 [Online; accessed 28-March-2022]

[3] `https://www.elastic.co/pt/` - Elasticsearch B.V. [Online; accessed 28-March-2022]

[4] `https://dotnet.microsoft.com/en-us/apps/aspnet/web-apps/blazor` - Microsoft, 2022 [Online; accessed 28-March-2022]

[5] `https://reactjs.org/` - Meta Platforms, Inc. 2022 [Online; accessed 28-March-2022]

[6] `https://www.heroku.com/` - Salesforce, 2022 [Online; accessed 28-March-2022]