

PLANNING REPORT

TOOKHAK

Introduction

The initiative, Toohak, is a new quiz game platform inspired by the popular quiz game Kahoot which aims to enhance student engagement through interactive quiz sessions.

This report outlines the iterative software development process adopted by the team in developing Toohak. The upcoming sections will detail the process for eliciting and analyzing user needs, specifying requirements, validating functionality through use cases, and designing the user interface, all of which are critical to the successful deployment of Toohak.

Elicitation

Objective

To obtain user feedback and insights for the development and improvement of Toohak.

Methodology

Three target users were selected based on their current use of, or experience with, online quiz tools that are similar to Toohak. The details of the interviewees are as follows:

Name	Occupation	Email
Jeff Lim	Tutor	rlim2210@gmail.com
Jessica Zhang	Student	jesszhang2000@gmail.com

Each interviewee was asked a series of questions aimed at identifying the specific needs, shortcomings, challenges and potential improvements with online quiz platforms:

- **Admin Setup:** As an admin, are there any specific tools or features you would like to see to make the administration process smoother?
- **Admin Features:** What administrative tools or functionalities do you find lacking or inefficient in your current quiz platform? Are there any additional features that would improve your ability to manage quizzes and users?
- **Quiz Setup:** Are there any challenges you face when creating quizzes and setting up quiz sessions?
- **Quiz Session Management:** Are there any improvements or features that would help you monitor and manage live quiz session sessions more effectively?
- **Post-Session Analytics and Feedback:** After a quiz session ends, what type of data and analytics do you find most useful? What additional information would you like to see?
- **Player Features:** From a player's perspective, are there any features or aspects that you find lacking or would like to see added?
- **Missing Features:** Aside from the features already discussed, is there anything else missing from current quiz tools that you would like to see implemented in Toohak?

Based on the feedback, a preliminary solution is proposed to target these findings.

Interview 1: Jeff Lim | Tutor

Q1. What administrative tools or functionalities do you find lacking or inefficient in your current quiz platform? What features would improve your ability to manage quizzes and users?

It would be great if I can categorize quizzes under topics and so it's easier to set up quiz sessions for a specific topic or category.

Q2. Are there any challenges you face when creating quizzes and setting up quiz sessions?

I wish there were more text formatting options available when creating questions. Being able to highlight, bold, italicize, or underline text would make it easier to emphasize key points and improve the readability of questions. Also, being able to categorize a question's difficulty would be great.

Q3. Are there any improvements or features that would help you monitor and manage live quiz session sessions more effectively?

A real-time monitoring dashboard that displays ongoing participation statistics, such as number of active users, question response times, and instant feedback for a question would be amazing.

Q4. After a quiz session ends, what type of data and analytics do you find most useful? What additional information would you like to see?

Currently, I find overall score distributions and individual question performance metrics most useful. However, I would appreciate deeper insights, such as trend analysis over which topics/areas were most difficult etc.

Q5. From a player's perspective, are there any features or aspects that you find lacking or would like to see added?

As a player, it would be beneficial to have the ability to flag questions for review or as important.

Q6. Aside from the features already discussed, is there anything else missing from current quiz tools that you would like to see implemented in Toohak?

A missing feature that I would like to see is adaptive learning paths. It would be great if the quiz could be taken later and dynamically adjust its difficulty based on the student's performance.

Interview 2: Jessica Zhang | Student

Q1. What administrative tools or functionalities do you find lacking or inefficient in your current quiz platform? What features would improve your ability to manage quizzes and users?

I find the lack of bulk operations frustrating. Being able to bulk import questions, delete multiple quizzes, or assign quizzes to multiple groups at once would save a lot of time.

Q2. Are there any challenges you face when creating quizzes and setting up quiz sessions?

Being able to turn off the timed-mode would be nice for personal use. Also being able to create more quiz types such as short-answer questions, flash-cards etc.

Q3. Are there any improvements or features that would help you monitor and manage live quiz session sessions more effectively?

A feature to pause and modify a quiz in real-time would be extremely useful, especially when noticing errors during a session or when wanting to adjust the difficulty based on participant responses.

Q4. After a quiz session ends, what type of data and analytics do you find most useful? What additional information would you like to see?

I would like to see more granular data on the time taken per question by each participant, which can help identify questions that are too difficult or too easy. Additionally, heat maps of answer selections could visually show where participants are making the most mistakes, providing insights into common misconceptions or areas needing further explanation.

Q5. From a player's perspective, are there any features or aspects that you find lacking or would like to see added?

Features like offline capabilities, app notifications for upcoming quizzes would help make joining the quiz more accessible and easier.

Q6. Aside from the features already discussed, is there anything else missing from current quiz tools that you would like to see implemented in Toohak?

It would be beneficial to have an integrated scheduler for planning quizzes ahead of time with automated reminders for participants. A calendar view of scheduled and past quizzes could also help with organization and planning.

Proposed Solution

Based on the responses collected, the identified key areas that can be implemented in Toohak are as follows:

- Enhanced Quiz Management
 - a. Implement a feature to categorize quizzes under specific topics
 - b. Allow quizzes and users to be saved and grouped.
- Bulk Operations
 - a. Introduce capabilities for bulk operations such as importing questions, deleting multiple quizzes, or assigning quizzes to groups simultaneously.
- Text Formatting
 - a. Provide advanced text editing tools to allow admins to highlight, bold, italicize, and underline text.
- Question Creation
 - a. Expand the range of question types available, including short-answer questions, flashcards, and adjustable difficulty levels for questions.
 - b. Be able to turn-off the timed-mode for questions.
- Advanced Analytics
 - a. Offer detailed post-session analytics, including trend analysis on difficult topics, time taken per question, and heat maps of answer selections.
- Player Features
 - a. Allow players to flag questions for review or highlight them as important

Analysis & Specification - Use Cases

Objective

To synthesize the collected information from the elicitation phase into actionable insights used to shape the development of Toohak.

User Stories, Acceptance Criteria and Use Cases

User Story 1

As an Admin User, I want to be able to categorize quizzes under specific topics, so that I can more efficiently manage quizzes.

Acceptance Criteria:

- Admins can create and name new categories for quizzes.
- Admins can assign quizzes to these categories.
- Admins can filter quizzes by categories.

Use Case ID	UC001
Use Case Name	Assigning Quiz Categories to a Quiz
Primary Actor	Quiz Creator
Secondary Actor	Quiz Player
Preconditions	The quiz creator is logged in and created a quiz.
Postcondition	The quiz creator can filter the list of quizzes by category.
Main Flow	<ol style="list-style-type: none">1. The quiz creator creates a quiz and enters the quiz details which now include an optional category field.2. The system verifies the details and creates the quiz with the category.3. The admin uses the category filter on the quiz list to view all quizzes under a specific category.4. The system displays all quizzes that fall under the selected category.
Alternative Flow	<p>A1a. If the creator enters a format other than text for the category field, the system will display an error message</p> <p>A2a. The system checks if the category entered is already in the system. If it is, it will assign the quiz under the existing category. Otherwise, it will create a new category and assign the quiz to this category.</p>

User Story 2

As a Quiz Creator, I want a range of question formats available, so that I can tailor the quiz content to be more suitable and engaging for the players.

Acceptance Criteria:

- Question type options are added during the creation of a quiz question, including multiple choice, true/false, short answer, and fill-in-the-blank.
- Each question format allows for appropriate response options (e.g. text input for short answers, True/False options).
- Players see the questions displayed in the format chosen by the creator and can interact with them accordingly during the quiz.
- The system correctly records and assesses responses based on the format-specific interaction required.

Use Case ID	UC002
Use Case Name	Adding Question Format Options
Primary Actor	Quiz Creator
Secondary Actor	Quiz Player
Preconditions	The quiz creator is logged in and has created a quiz.
Postcondition	The quiz is successfully created with multiple question formats displayed correctly to the player.
Main Flow	<ol style="list-style-type: none">1. The quiz creator creates a quiz.2. The creator starts the quiz question creation process.3. For each new question, the creator is presented with an option of question formats to choose from (multiple choice, true/false, short answer, etc.).4. The creator selects the desired question format for the current question.5. The system processes and displays the specific fields appropriate to the selected question format.6. The creator inputs the question text and answer(s).7. When a quiz session is running, the correct answer formats are displayed to the players.
Alternative Flow	<p>A6a. If the creator inputs the incorrect answer format for the question type, the system will display an error message.</p> <p>A9a. If the creator identifies an error in a question or wishes to change the format, they can edit the question by selecting it and modifying any of its components.</p>

User Story 3

As a Quiz Creator, I want to be able to categorize quizzes under specific topics and group users into different categories,

Acceptance Criteria:

- Text formatting options are available when creating a quiz question.
- Formatted text is correctly displayed to participants during quiz sessions.

User Story 4

As an Admin User, I want a real-time feedback mechanism that displays ongoing participation statistics and question response metrics, so that I can monitor and manage live quiz sessions more effectively.

Acceptance Criteria:

- Admin is displayed the number of active players, average response time, and live feedback on each question during a live quiz session.
- The system supports real-time data updates without significant delays or performance issues.

Validation

Objective

To validate the developed use cases by soliciting feedback from the initial interviewees, ensuring the proposed solutions accurately address the user-defined problems.

Methodology

We asked the interviewees to review the use case and provide feedback on whether it addresses the problems they faced.

Specifically, we inquired for their feedback on:

- Whether the use case completely addresses their problem.
- Overall satisfaction with the proposed solution.
- Any gaps or additional features they think should be included.

Feedback

Use Case UC001: Assigning Quiz Categories to a Quiz

Interviewee 1 | Jeff Lim

"The use case is clearly outlined and easy to understand. The main flow describes a straightforward process of entering quiz details, including assigning a category, which reflects how I would typically handle quiz categorization. However, one thing I would like added is the ability to also create quiz categories separately and assign quizzes to categories after creation"

Use Case UC002: Adding Question Format Options to a Quiz Question

Interviewee 2 | Jessica Zhang

"Overall, I'm completely satisfied with how this use case comprehensively addresses the creation process of quizzes with multiple question formats. One suggestion I would make is the option of choosing a format for the quiz itself so that all questions for the quiz are created in the same format."

Interface Design

Objective

To design and specify the necessary HTTP endpoints for the backend interface aligning with established requirements.

Methodology

Utilize RESTful API design principles to define clear, scalable, and well-documented HTTP endpoints in the Swagger documentation. This process will involve iterative development and testing to refine endpoint definitions based on functionality needs and user feedback.

Endpoint	Body Parameters	Responses
POST /admin/quiz/{quizid}/topic Create a quiz topic for a quiz	{ topic: string }	200: { } 400: If the topic contains invalid characters (only alphanumeric and spaces allowed) 400: If the quiz is already assigned to a topic
PUT /admin/quiz/{quizid}/topic Update the quiz topic	{ topic: string }	200: { } 400: If the topic contains invalid characters (only alphanumeric and spaces allowed)
DELETE /admin/quiz/{quizid}/topic Delete topic for a quiz		200: { } 400: No topic is assigned to the quiz
GET /admin/quiz/{quizid}/topic		200: { topic: string } The topic assigned to the quiz
GET /admin/quiz/topic	{ topic: string }	200: { topic: quiz[] } A list of all quizzes assigned to the topic 400: Topic is invalid for the user

Conceptual Modelling - State Diagrams

This diagram demonstrates the user's options in creating a quiz with a topic.

