

IM3080 Design and Innovation Project (AY2023/24 Semester 1)

Individual Report

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Group No: 7

Project Title: Duelingo

Contributions to the Project (1 page)

1. Figma

- Created the UI for the home page and profile page.
- Use the material libraries to standardize the different components.

2. Firebase

- Designed and made the structure of the database is based on the hierarchy – Quiz, Language, Modules & Multiplayers, Topics and Questions.
- Imported the questions from a json file to the Firestore.
- Created the documentation on how to retrieve the data from the Quiz database

3. Home Page

- Created function for the retrieval of data from Firestore which includes question bank, user's lives, number of completed topics for the respective languages.
- Structuring of the question bank from Firestore to fit the requirements of the section list
- Dropdown button which allows users to toggle between the different languages.
- Created the component topicButton which was created from the "really-awesome-button" library and is used in the section list
- Created section list for the respective modules and topics and each section consists of the different topicButton with the respective topic names
- Created different sequence of colours for topicButton depending on the language
- Created a function for disabling topicButton when index exceeds number of completed modules

4. Text-To-Speech

- Used React Native TTS for the Text-To-Speech function
- Created function to set the default language and pitch depending on the respective languages
- Set the TTS function to read out the selected text for the quiz page when the option button in the quiz page with game format 1 or the sound button in the quiz page with game format 0 is being pressed

5. Quiz Page

- Created the quiz page with the game format 0
- Merge and integrated the game format 0 with the existing quiz page with only game format 1 to ensure both game format 0 and 1 can be displayed
- Created the function to update the firestore increase the number of completed topics by one if the index current topic that the user is attempting is the number of completed topics plus one.

6. Lives

- Created the `getLives` function to have a real-time listener to get the amount of lives of the respective user from the Firestore
- Created the `decreaseLives` function to decrease the number of lives of the respective user from the Firestore when the user answers the question incorrectly on the quiz page
- Created the `checkTimestamp` function to check the timestamp such that if the difference in the timestamp and current time is two minutes, one live will be regenerated
- Created the `increaseLives` function to check when the user log in, timestamp will be checked and the lives will be increased according to the user last live refill.
- Created the heart dialog for when the lives hit zero.
- Integrated the `getLives` function and lives dialog into the home screen and quiz screen for cases:
 - Users will not be able to continue doing the questions and the heart dialog will pop up
 - Users will not be able to attempt the quiz by clicking the topic button in the home page and the heart dialog will pop up
- Integrated the `getLives` function and `checkTimestamp` function into the heart container

7. Report

- Did the section on the firestore quiz database
- Did the section on the homepage and text-to-speech function

Reflection on Learning Outcome Attainment

Reflect on your experience during your project and the achievements you have relating to at least two of the points below:

- (a) Engineering knowledge
- (b) Problem Analysis
- (c) Investigation
- (d) Design/development of Solutions
- (e) Modern Tool Usage
- (f) The Engineer and Society
- (g) Environment and Sustainability
- (h) Ethics
- (i) Individual and Team Work
- (j) Communication
- (k) Project Management and Finance
- (l) Lifelong Learning

Point 1: Communication

Through this project, I have learnt the importance of communication. Being in a large team of 10 members, communication is vital in clarifying and understanding the project requirements and conveying the standards that is to be expected from each group member. Our group leader set the expectations for our group and make sure everyone is on the same page. From the initial brainstorming sessions where we openly discussed potential applications, such as a Service Hailing Application and a language learning application, to the ongoing project updates, communication proved essential. It was not only about conveying information but also fostering creativity and collaborative decision-making. One illustrative example of the power of communication occurred when a group member faced challenges with setting screens. Through open dialogue during our meetings, I was able to explain the underlying issues and provide valuable tips for improvement. This exchange of knowledge exemplifies the strength of communication in facilitating mutual support within the team. Project updates and progress reports were critical in ensuring that everyone was well-informed, allowing the team to collectively address areas with slower progress and maintain the project schedule. The effective communication established transparency and accountability, enabling seamless collaboration among team members and ultimately contributing to the success of the project.

Point 2: Lifelong Learning

Lifelong learning has been a cornerstone of my project, where I focused on self-directed learning on React Native and Firebase. Through the consumption of tutorial videos and delving into documentation, I broaden my understanding of these technologies. I gained a nuanced understanding of state management, incorporating elements like use state, use effect, and focus effect into our project. Aspiring to become a developer or software engineer, this project serves as a pivotal experience aligning with my career goals. Staying attuned to emerging technologies, I adapted the project to incorporate the latest developments in React Native and Firebase. Notably, facing challenges like data retrieval issues strengthened my critical thinking and problem-solving skills, providing a practical application of my learning. Through the valuable inputs of my peers, I learnt a lot about the effectiveness of libraries and the different coding practices which has significantly improved my coding and teamwork skills. This project has not only contributed to my

professional development but has also fostered personal growth, offering insights into effective project management and a deeper appreciation for the dynamic nature of software development. The skills and knowledge acquired from this project are beneficial for future development.