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)

- Background research of project
- Figma
    o Design Splash screen
    o Design Login/Signup screens
    o Design Settings screen
    o Create a visual representation of our user's database structure using flowcharts on Figma
- Backend Development of project (Firebase)
    o Implement structure of user's database into Firestore database
    o Write different API functions to read and update user data on Firestore database, the different user data fields I touched on are as follows:
        ▪ Hearts (Live)
        ▪ EXP
            • Single Player Mode
                o Designed mathematical formula to calculate exp using module, topic and score as its parameters
            • Multiplayer Mode
                o Designed mathematical formula to calculate exp using difficulty of questions and score as its parameters

        ▪ Chinese modules
        ▪ Malay modules
        ▪ Display name
        ▪ Username
            • Function implemented to also check if username already exist in database as username is unique
        ▪ Avatar

- Report Writing for our project
- Help in the filming of project video
- Slides for group presentation

Reflection on Learning Outcome Attainment

Reflect on your experience during your project and the achievements you have relating to <u>at least two</u> 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: Design/development of Solutions

Being tasked to help with the backend development of the project and more specifically to deal with the database used to store our user data, I initially struggled with the development of the basic structure of our database. I had to really understand the requirements of our application. What kind of data will we be storing? What are the relationships between different types of data? I had to consider the functional and non-functional requirements, query requirements and scalability. The database structure must be flexible to changes and easy to maintain. As this task was also something relatively new to me, there were many trials and errors and I had to make changes to our database structure along the way as our project progressed each week. Through this experience, I learned how to be adaptive and develop solutions to the different problems we may have with our database as we progress with our application.

Point 2: Lifelong Learning

Creating our project's mobile app was a significant learning experience for me, especially since I hadn't used Figma, React Native, TypeScript and Firebase before. Mastering these new coding languages and exploring design tools highlighted the importance of continual growth. Learning Figma showed me the crucial role of design and effective communication within the team. Despite being new to coding with React Native and TypeScript, I embraced the challenges, reinforcing the idea that growth often comes from stepping out of one's comfort zone. Integrating Firebase into our app enhanced my understanding of backend infrastructure and the imperative need to stay updated on emerging technologies. This project not only equipped me with technical skills but also instilled a mindset of adaptability and continual self-improvement, transcending both personal and professional aspects of life. Moving forward, I carry a valuable blend of technical knowledge and a mindset that embraces the ever-evolving nature of the tech industry. This project has set the stage for a lifelong commitment to learning, emphasizing that the journey is as significant as the destination in our ever-changing world.