FIT5046 MOBILE AND DISTRIBUTED COMPUTING SYSTEM

Assignment 2 : Android Project Proposal

Team Members,

Akash Balakrishnan – 32192886
Ananya Alagh – 33046417
Ashiklal Memanaparambil Asokalal – 32935064
Jason Dsouza - 32346492

Table of Contents

PROJECT PROPOSAL

1. Introduction

a. An Overview

SkillSwap is an Android app in the education and personal development domain, which connects people that want to learn new skills with individuals that can teach them. The SkillSwap platform lowers barriers for access to learning by enabling instantaneous connection between users across a broad range of skill categories, seeking peer instructors and pupils. The app aims to strengthen communities enabling grassroots level skill development and promoting meaningful connections between community members.

b. User Group

Skillswap's intended audience includes individuals from diverse backgrounds. Based on the idea of lowering barriers to access learning, SkillSwap is intended for people from various age, gender, cultural background etcetera.

This application may be especially useful for:

- Individuals with limited access to traditional education systems.
- Individuals that have resigned or retired from the workforce looking to impart their knowledge.
- Individuals that want to undertake new skills or tasks in a low-pressure environment

c. Key Functionalities

- Profile creation : the users can create a profile and set its preferred location for the search.
- Instructor search : The users can search for the skills and browse a list of instructors who provide their service.
- Skill exchange request : The users can connect to the instructor and request to have a meeting for the skill exchange.
- Schedule session : The user and instructor can schedule a meeting for the skill exchange.

- Peer messaging : The user and instructor can have a conversation in-app to discuss the details of the skill exchange.

d. Scope and Limitations

SkillSwap connects users worldwide for skill exchange across diverse categories, promoting continuous learning and personal growth. The app fosters a supportive community, integrates with external services, and offers monetization opportunities. With potential for expansion, it aims to create a global network of skill sharers, enhancing knowledge and collaboration.

Limitations:

- Dependency on Internet Connectivity: The app relies on a stable internet connection to function properly. Users may face difficulties in using the app if they have poor or no internet connectivity, which can affect searching for skill partners, scheduling sessions, and sending chat messages.
- Limited Skill Categories: The app's effectiveness depends on the variety of skill categories available. If the app has limited skill categories, users might not find partners with the desired skills, making the app less useful.
- Geographical Limitations: If the app has a limited user base, users in certain geographical areas may struggle to find nearby skill partners, reducing the app's usefulness for those users.
- Privacy Concerns: Users might be hesitant to share their personal information, such as their location, skills, and contact details, due to privacy concerns. This could affect the app's adoption rate and make it difficult for users to find suitable skill partners.
- User Authentication and Security: The app relies on Firebase Authentication for user registration and authentication. Any security vulnerabilities in Firebase could potentially compromise users' personal information and affect the app's reputation.
- Scalability: As the number of users increases, the app's performance might be affected if the Firebase Realtime Database or Firestore is not configured to handle the increased load. This can lead to slower response times and a poor user experience.
- User Ratings and Feedback: The app's user rating system might be subject to manipulation or fake reviews, which could affect the trustworthiness of the ratings and make it difficult for users to find reliable skill partners.

- Accessibility: The app's UI might not be optimized for users with disabilities, such as those with visual or hearing impairments. This could limit the app's usability and accessibility for a portion of the user base.
- Platform Compatibility: The app is designed for Android devices, which means that users with iOS or other platforms will not be able to use the app. This can limit the app's user base and its potential for growth.

2. The Market and Competitor Analysis

a. SkillShare

A subscription-based online learning community with over 28,000 online classes in design, business, technology, and more. Skillshare is offered on both Android and iOS platforms. Skillshare's mobile app has received generally positive reviews on both the Google Play Store and the Apple App Store. Some users have reported technical issues with the app, such as slow loading times or crashes.

Key functionalities:

- Users can browse and search for courses across different categories.
- Users can access video-based lessons, class projects, and discussions.
- Users can bookmark, download, and watch courses offline.
- Users can create and share projects with other learners.

Strengths:

- Skillshare's mobile app has an intuitive, user-friendly interface that allows users to navigate and discover courses easily.
- Skillshare offers high-quality video content optimized for mobile devices, ensuring that users can view the content clearly and without any buffering issues.
- The app allows for offline viewing, which is beneficial for users who may not have access to the internet at all times.

Weaknesses:

- The Users are required to Login/Sign up to browse courses and view course details.

- Some users have reported technical issues with the app, such as slow loading times or crashes.
- The app may not be optimized for all devices, leading to compatibility issues on certain devices.

Screenshots:

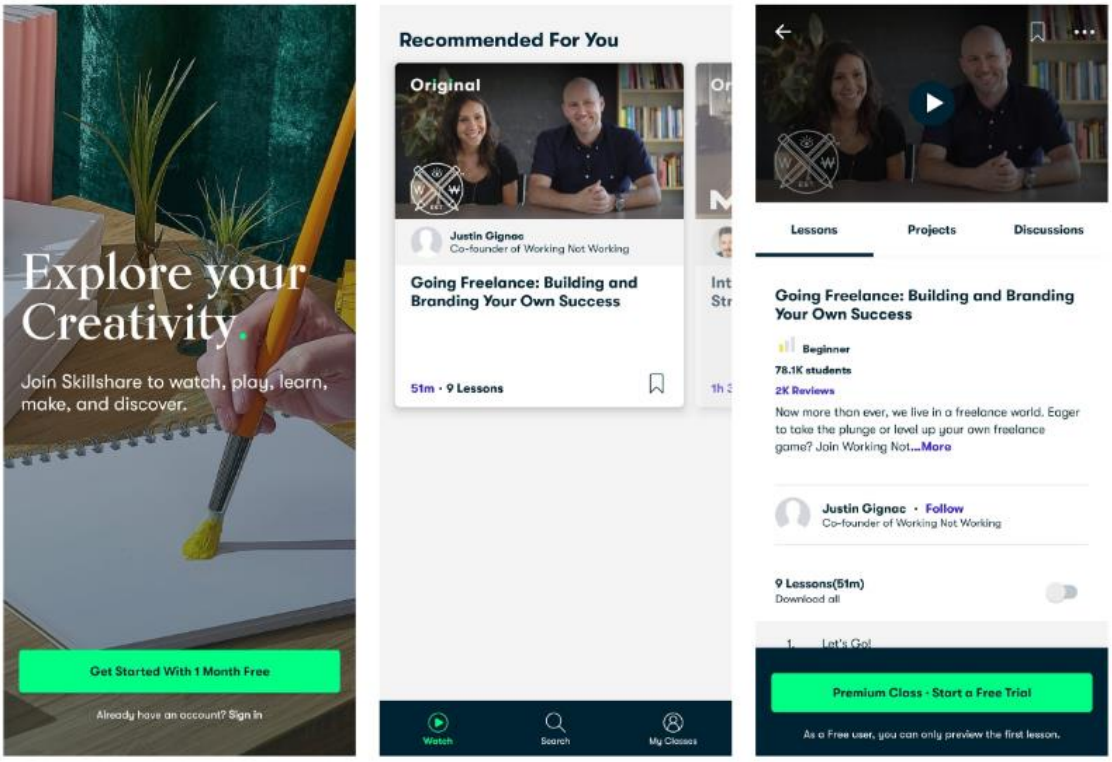

Figure 1 : SkillShare screenshots 1

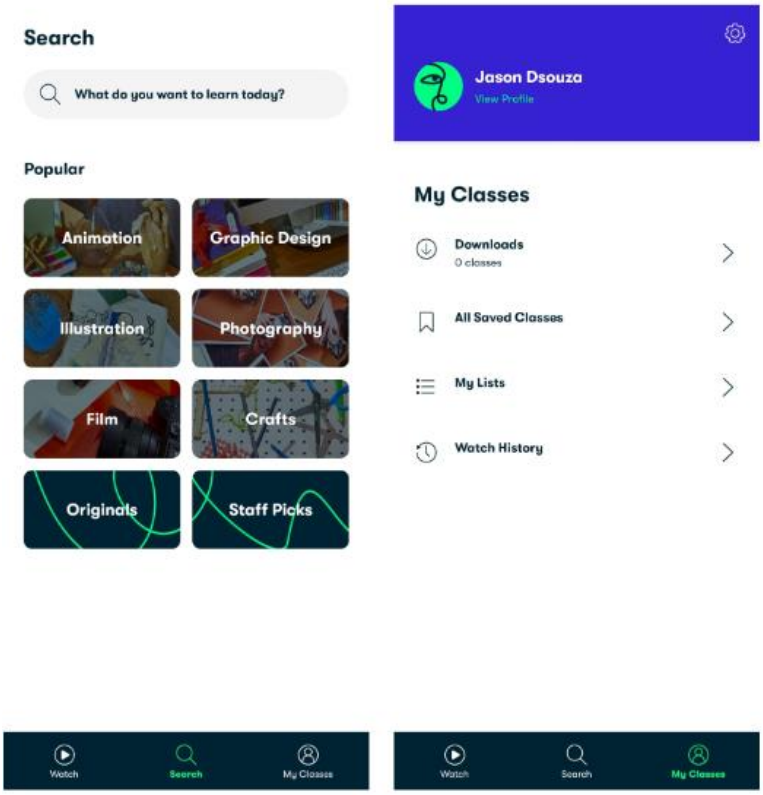

Figure 2 : SkillShare screenshots 2

b. Preply

Preply is a global online language learning platform that facilitates personalized, one-on-one instruction between students and tutors. Offering an extensive range of languages, the platform aims to foster language acquisition through tailored lessons with proficient or native-speaking tutors. In addition to individualized tutoring sessions, Preply provides supplementary learning resources, such as articles and multimedia content, to enhance students' language learning experience in a supportive and engaging environment (ChatGPT, personal communication, April 19, 2023).

Key Functionalities:

- Students can find tutors based on language, expertise, availability, and price for a tailored learning experience.
- Preply provides a convenient calendar system for managing bookings and coordinating with tutors.
- One-on-One Lessons: Personalized instruction enhances retention and accelerates progress through direct student-tutor interaction.

- The platform connects students with native or highly proficient tutors across various subjects and languages.
- Supplementary Resources: Additional materials such as articles and videos enrich the learning process beyond scheduled sessions.

Strengths:

- Well established platform with a wide selection of languages and tutors available.
- Easy-to-navigate platform streamlines searching, selecting, and communicating with tutors.
- Customized Plans: Lessons designed to address student-specific needs, goals, and learning preferences.
- A committed team supports users with queries and resolves platform-related concerns.
- Trial Sessions: Allows students to assess tutor compatibility before engaging in regular lessons.

Weaknesses:

- Inconsistent Pricing: Varied tutor rates lead to price disparities, impacting affordability for some learners.
- Tutor Quality Variation: Differing qualifications among tutors may result in uneven instructional quality.
- Limited Free Resources: Preply provides some extra materials, but a wide range of free resources would enrich learning experiences.
- No Group Classes: The platform exclusively offers one-on-one lessons, lacking group learning opportunities.
- Login Requirement: Users must log in to access the list of tutors offering their desired skill.

Screenshots:

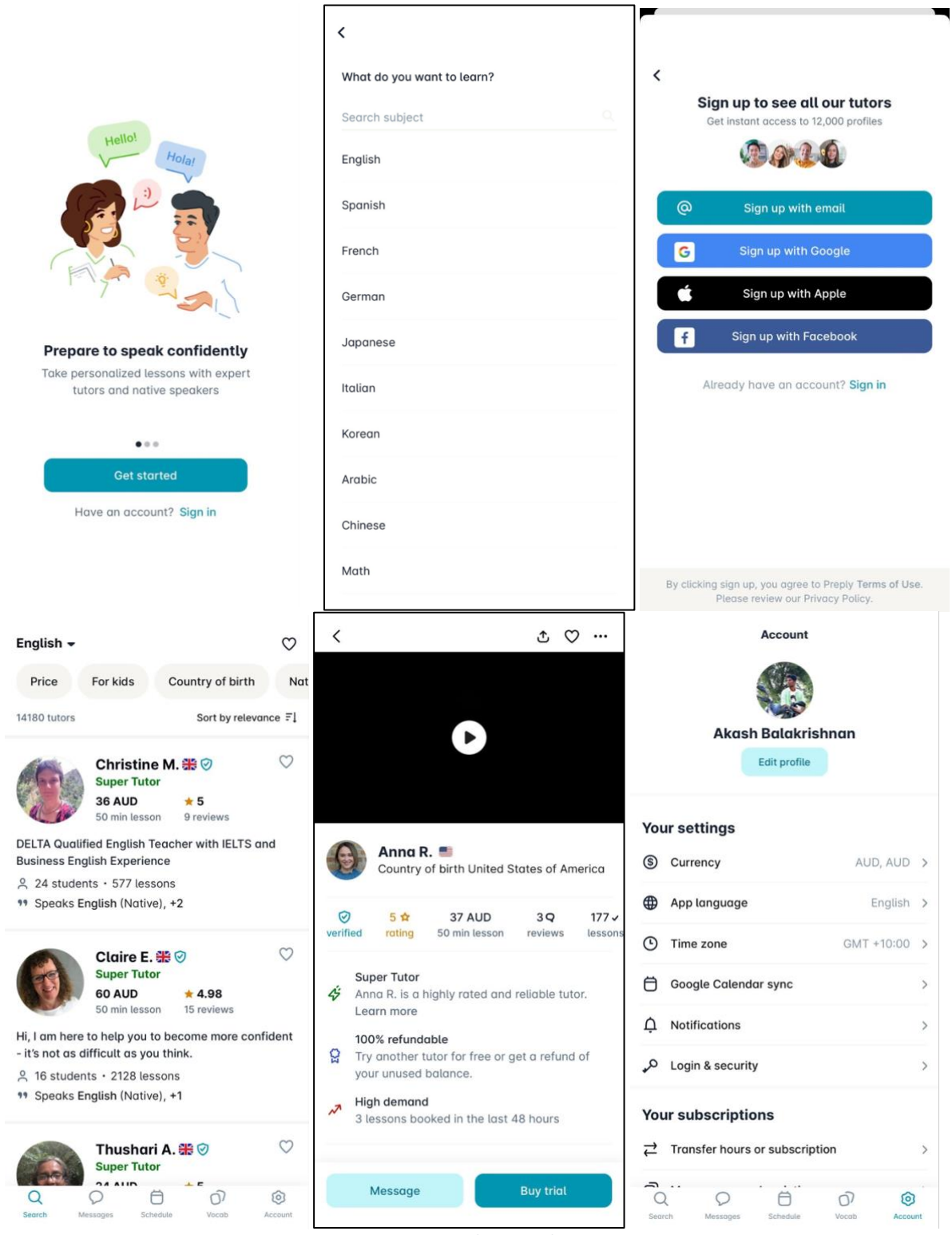

Figure 3 : Preply screenshots

3. The System Architecture

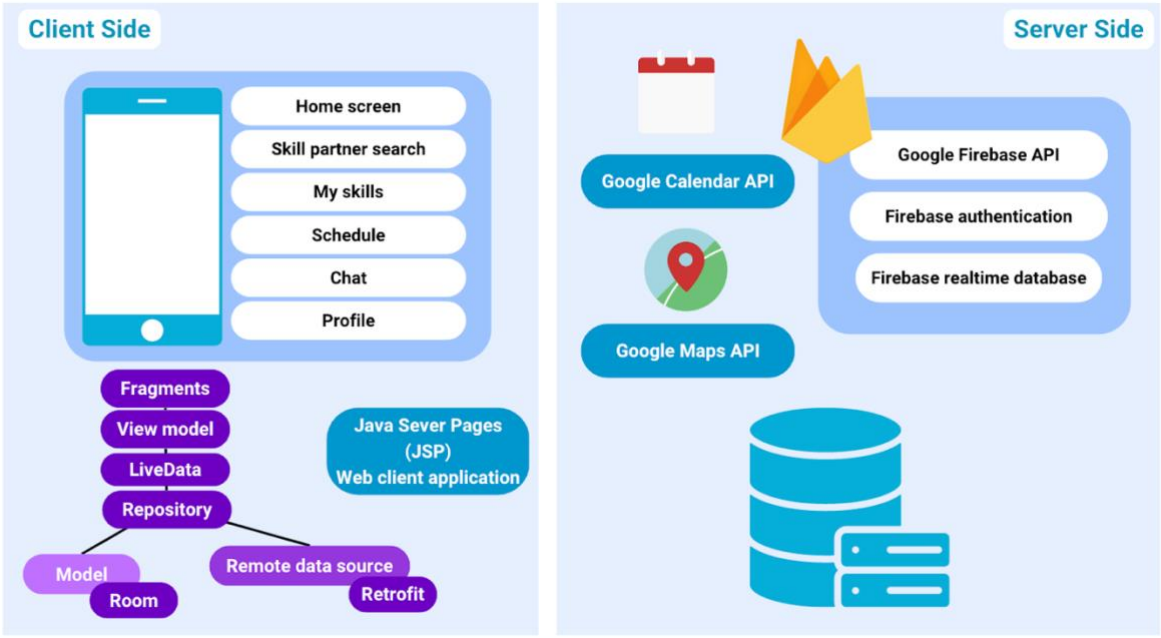

Image 1 : Client - Server Components (dglozano, 2018)

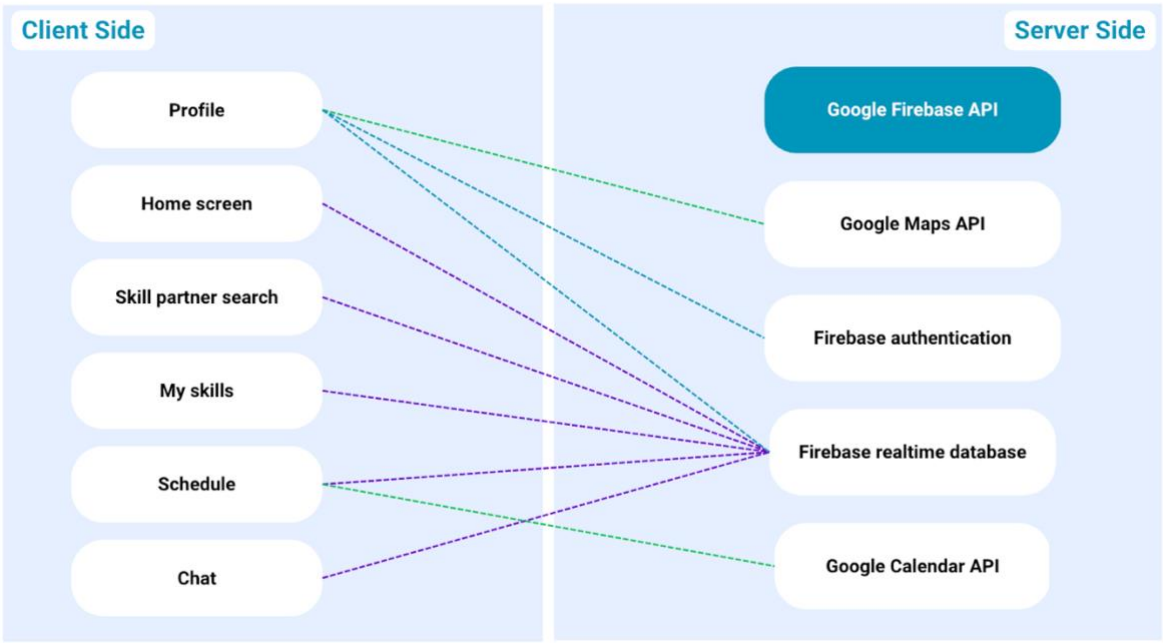

Image 2 : Client - Server Interaction (Enciso, Guarnizo, Torres,& Quezada-Sarmiento, 2018)

The diagrams above depict the client-server architecture of the proposed app (Enciso, Guarnizo, Torres,& Quezada-Sarmiento, 2018).

This section will list each of the components, and then describe each one in further detail, elucidating on the way in which key components of the client-side and server-side interact with one another (ChatGPT, personal communication, April 19, 2023).

Image 1: Client-serve components

Image 1 lists each of the main client-side and server-side components:

Android mobile client: will display the identified key screens to the user as part of the in-app experience.

- Home screen*
- Skill search*
- My skills
- Schedule
- Chat
- Profile

*User does need to log in to view these screens.

Web Client Application (Java Server Pages – JSP): will create the user interface for the application and form the basis for interaction with the server-side components. JSP will be used to retrieve and update information from Google Firebase and the Google Calendars APIs (ChatGPT, personal communication, April 19, 2023).

Image 2: Client-server interaction

Image 2 describes the way in which each of the key components of the user interface will interact with the main components of the backend. Here a brief overview of the client-side functionality for each key screen is summarised to contextualise the way in which each component will interact with it's server-side counterpart.

Google Firebase and Google Calendar APIs comprise the majority of the crucial server-side components (Enciso, Guarnizo, Torres,& Quezada-Sarmiento, 2018).

User story	About	Client-server
Home	This is the first screen users interact with when they open the app. It will display skill recommendations that relate to the users' previous interests, or randomised skill suggestions for new users.	User information stored on the Firebase Realtime Database will inform the skills and customisation aspect of the home screen.
Skill search	The search screen allows users to input key words related to skills or talents they want to learn or teach.	Instructor and learner information stored on the Firebase Realtime Database will form the basis for skill partner search, based on the attributes or skills a given user is looking for.
My skills	This screen will include saved skills and interests that users are interested an learning and/or showcase skills in which users could offer teaching sessions. This page also represents data on user's skill progress, categorising number of lessons taken/taught by broader skill category (I.e.: sport, language, etc.)	This component is also connected with the Firebase Realtime Database, which is used to store and retrieve user skill data and saved skills.
Schedule	This screen is a list view of any peer-to-peer skill sessions that the user has on their calendar.	Skill-session for app users are stored and managed via the Firebase Realtime Database. This feature also connects with the Google Calendar API to manage skill sessions via the users personal calendar.
Chat	This screen involves in-app, bilateral messaging between two users that are logged in to the app.	The Firebase Realtime Databases serves as the basis for storage of message history.

Profile	This screen displays the user's name, profile image, a short description, and generalised location data.	Users are authenticated via, and able to manage their profile data via Firebase Authentication. This will also involve interaction with Google Maps API to display location data via the app.

4. The UI Design and Screen Mock-ups

5. Advanced Features

Feature: Google Calendar Integration for SkillSwap

Decription: Integrate skill exchange sessions with Google Calendar to streamline scheduling and administration. The Google Calendar API integration enables skill sessions to be synchronised with users' personal calendars, facilitating the creation, editing, and deletion of events within the app. Google Calendar sends reminders and notifications to users to ensure they do not neglect scheduled sessions. This efficient scheduling and organisation feature enhances the SkillSwap app's overall user experience and functionality.

Online Resources:

Google Calendar API Developer Documentation

6. References

1. ChatGPT, personal communication, April 19, 2023.

2. dglozano [Screen name]. (2018). BoundService + LiveData + ViewModel best practice in new Android recommended architecture. [Stack Overflow Post]. https://stackoverflow.com/questions/53382320/boundservice-livedata-viewmodel-best-practice-in-new-android-recommended-arc

3. Enciso, L., Guarnizo, J., Torres, E., & Quezada-Sarmiento, P. A. (2018). Smart Office: Development of a Mobile Application for Android with Firebase Services Oriented to GroupMe Messaging. In WEBIST (pp. 454-461).

4. https://developers.google.com/calendar/api/v3/reference

Appendix

Task Name and Description	**Team Members**
Home Screen: Task: Implement the welcome message, search bar, personalized skill recommendations, and bottom navigation bar. Description: Design and develop the main screen with a personalized user experience and easy navigation to other app screens.	Akash Balakrishnan
Skill Partner Search: Task: Implement the search bar and skill partner list. Description: Create a screen that allows users to search for skill partners based on specific criteria and view the search results.	Ashiklal Memanaparambil Asokalal
My Skills: Task: Implement the "Skills to Teach" and "Skills to Learn" sections, along with add, edit, and remove options. Description: Develop a screen where users can manage their skills, both the ones they can teach and the ones they want to learn.	Ananya Alagh
Schedule: Task: Implement the calendar view, add session button, and scheduled sessions list. Description: Create a screen that displays the user's scheduled skill learning sessions and allows them to manage these sessions.	Ananya Alagh, Jason Dsouza
Chat: Task: Implement the chat list, new chat button, and chat interface. Description: Develop a messaging system for users to communicate with their skill partners and coordinate their learning sessions.	Akash Balakrishnan, Ashiklal Memanaparambil Asokalal
Profile: Task: Implement the user's profile information display and editing options, user rating display, and logout functionality. Description: Create a screen that allows users to view and manage their profile information, including personal details, skills, and user ratings.	Jason Dsouza