SkillXChange Project Report

Introduction:

In the ever-evolving digital age, learning and skill development have become increasingly collaborative and community-driven. While several platforms provide access to courses and tutorials, they often lack a personal, peer-to-peer exchange mechanism that fosters interactive and real-time learning. To bridge this gap, SkillXchange emerges as an innovative platform that enables users to share and learn skills directly from each other in a structured yet flexible environment.

SkillXchange is a mobile application built using Flutter and backed by Firebase, designed to encourage peer learning through live skill-sharing sessions. Users can register on the platform with the skills they possess and are capable of teaching. These skills can be posted publicly, allowing other users to browse and book live sessions. The platform utilizes a Skill Coin economy, where coins are earned by conducting skill sessions and spent when booking sessions offered by others. This incentivized model promotes active participation and ensures a balanced give-and-take within the community.

The application also includes features such as a centralized homepage displaying all available skill posts, a calendar to manage scheduled sessions, and integrated meet links for seamless virtual interactions. This model not only fosters skill enhancement but also cultivates a strong learning community.

Problem Statement:

Despite the availability of numerous online learning platforms, many users find it difficult to access real-time and interactive opportunities for skill development. Most existing platforms are static, instructor-centric, and lack the flexibility and personal engagement required for effective peer-to-peer learning. Learners often miss out on the benefits of live interaction and customizable learning experiences, which are crucial for certain skills that thrive in a more hands-on, communicative environment.

At the same time, individuals who possess valuable skills often do not have a dedicated platform where they can share their knowledge, gain recognition, and receive benefits in

a way that promotes collaboration over competition. The absence of a non-monetary, reward-driven model further discourages casual and community-based teaching efforts.

SkillXchange seeks to address these challenges by providing a decentralized, community-driven platform for skill exchange. It incorporates a unique reward system through "Skill Coins," which motivates users to both teach and learn by offering a fair and balanced give-and-take model. The platform also supports real-time booking and scheduling of live sessions, complete with integrated meet links and a calendar view. With a focus on simplicity and user-friendliness, SkillXchange offers an accessible space for anyone to manage their skill profiles, schedule sessions, and engage meaningfully in peer learning. This ecosystem empowers users to grow together by making knowledge sharing interactive, rewarding, and community-centric.

Literature Survey

The literature survey for this project was conducted to explore existing research and solutions related to digital milk delivery systems. Focus was placed on subscription-based models, mobile app development, and customer order management in the dairy sector. Using academic sources like Google Scholar and IEEE Xplore, relevant studies were identified through targeted keywords. Recent papers discussing technological advancements in dairy distribution, user interaction, and supply chain efficiency were prioritized. The findings provided valuable insights into current practices and helped identify areas for improvement, guiding the project's overall design and direction.

Papers Referred:

2.3.1 Paper 1: Skill Swap

Objective: To create a platform that facilitates skill exchange among students, societies, and course centers within academic environments.

Problem Statement: Traditional academic and skill-sharing platforms are limited to specific fields (primarily computer-related), and they lack integrated payment systems and interactive event participation features, reducing engagement.

Proposed System: The platform allows students to showcase their academic profiles, connect with peers, join societies, and manage courses. Societies can maintain event calendars and make announcements, while course centers manage and notify students about courses and enrollments.

Conclusion: The system is limited by its focus on a narrow field

(academic/computer-related) and lacks important interactive features like user participation in events. Without a payment/earning system, the platform's long-term viability may be challenged due to lower user engagement and resources for enhancement.

2.3.2 Paper 2: Simbi

Objective: To develop a barter-based platform for skill-sharing where users can exchange services without traditional currency.

Problem Statement: Many skill-sharing platforms fail due to a lack of user engagement, geographical limitations, and the absence of a flexible virtual economy.

Proposed System: Simbi operates on a virtual currency called "Simbi credits," allowing users to list services, create profiles with ratings and reviews, and search for skill exchanges. It focuses on creating a community-driven environment.

Conclusion: Simbi's reliance on active user participation and location-based service availability poses challenges to its effectiveness. Without an engaged user base, the diversity and availability of services are limited, which can affect overall platform growth.

Proposed Design:

The proposed design of SkillXchange integrates a user-centric frontend interface with a scalable and secure backend architecture, ensuring smooth functionality, real-time updates, and an engaging user experience. Built using Flutter for the frontend and Firebase for the backend, the system is optimized for mobile usability and seamless data handling.

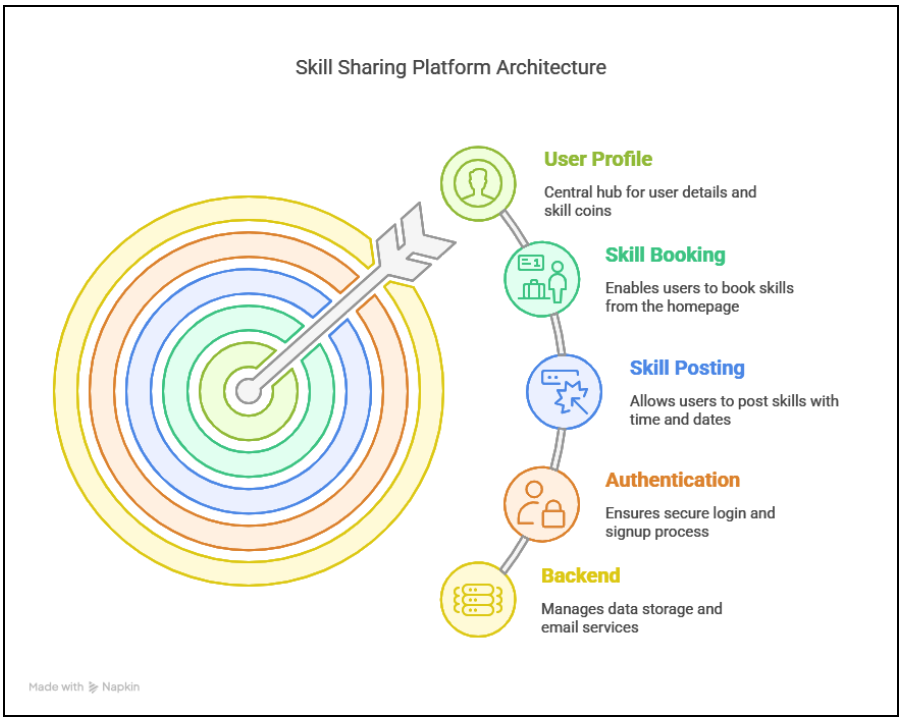
On the frontend, the user journey begins with an intuitive splash screen that leads into login and signup options, enabling authentication through email and password. Once authenticated, users are directed to the home screen, where a curated list of available skills is displayed. This screen allows users to filter the skills based on categories or specific interests, making it easier to find relevant sessions. The next key feature is the Post Skill screen, where users can share the skills they are willing to teach by entering relevant details such as the skill name, description, available dates, and times. Once submitted, the skill session is made visible on the homepage for others to discover and book.

Users can book sessions directly from the homepage, and upon successful booking, the session is added to their calendar screen, which displays all scheduled events along with the corresponding meeting links. The profile screen serves as a personalized dashboard, showing the user's name, email, total available Skill Coins, and the option to edit profile details or manage sessions.

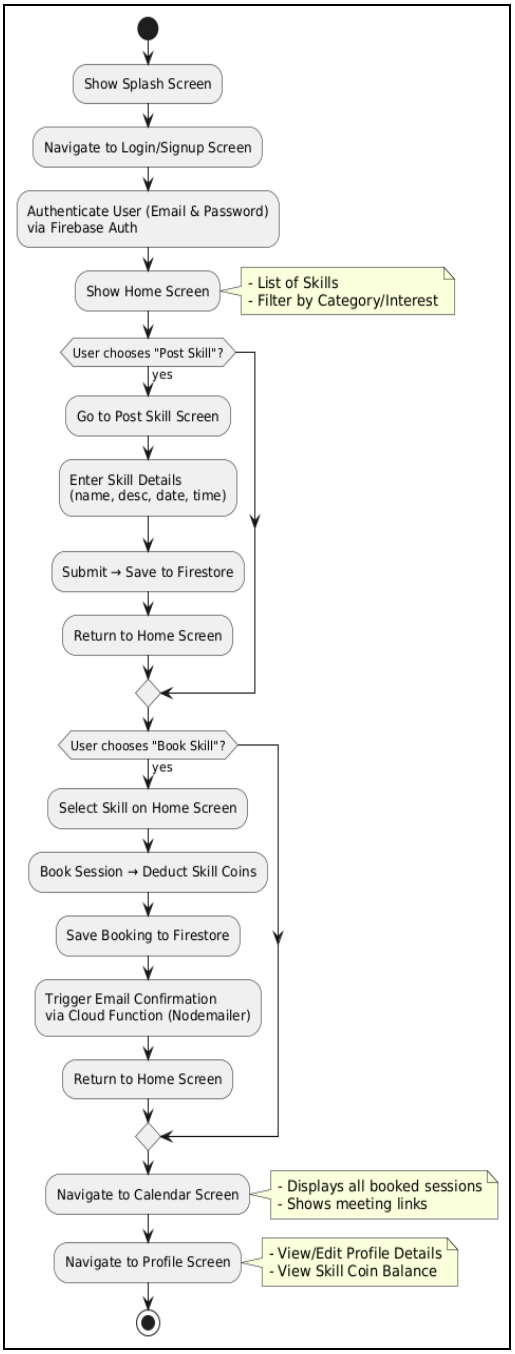
On the backend, Firebase handles the core operations. Firebase Authentication is used for secure user login and signup via email and password. Cloud Firestore, Firebase's NoSQL database, is utilized to store and manage all user data, skill posts, booking details, and calendar entries. Real-time synchronization ensures that updates made by one user reflect instantly across the platform. Additionally, the system employs a Node.js server function hosted on Firebase Cloud Functions to handle email notifications. Using Nodemailer, automated emails are sent to users upon successful booking of sessions, providing them with confirmation and the necessary session details.

Together, this design ensures a smooth and responsive experience, offering robust functionality while maintaining simplicity and clarity in both user interface and data management.

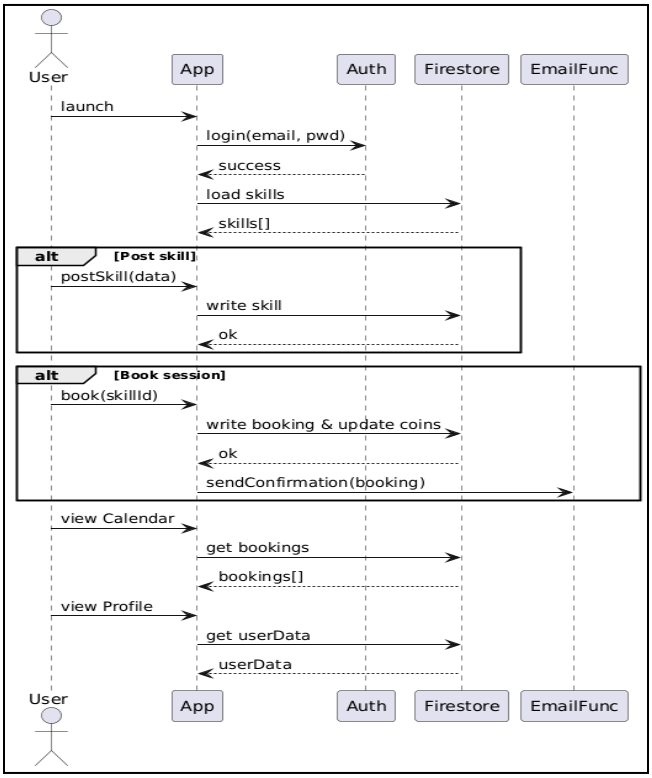
Diagram to explain the app:



Platform Architecture



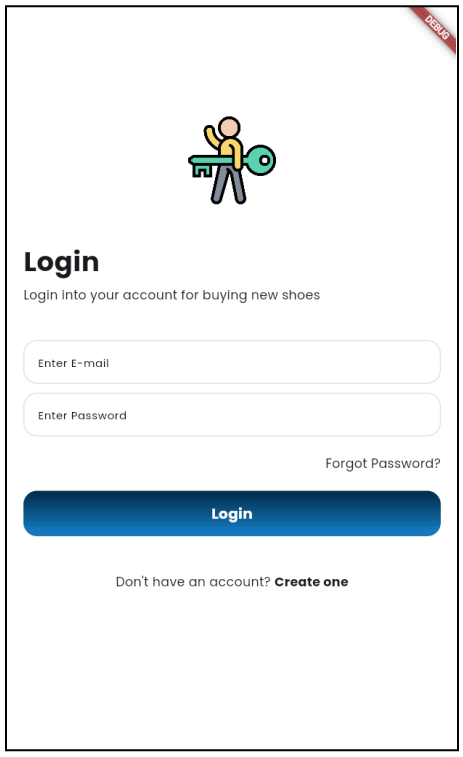
Flowchart of the process

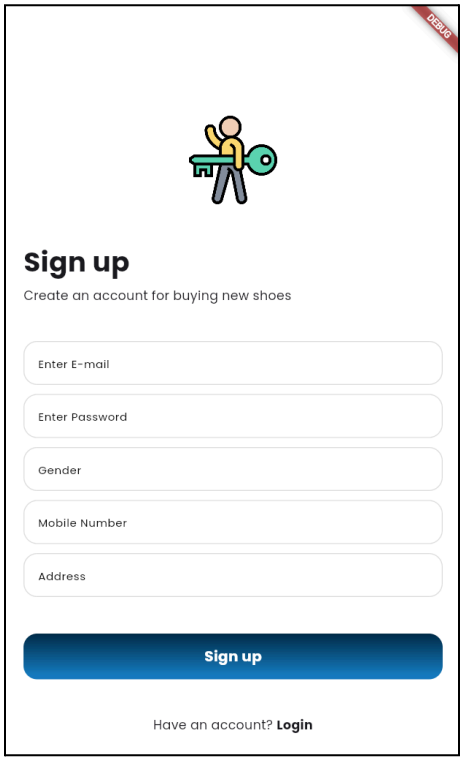


SequenceUML for the process

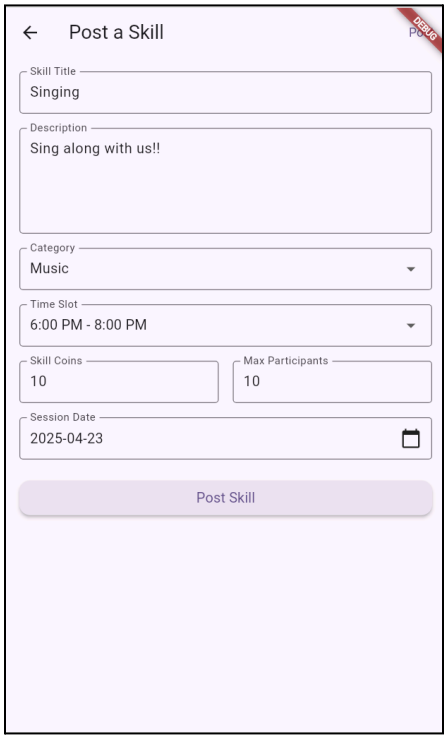
Implementation:

1) Login screen/Signup screen

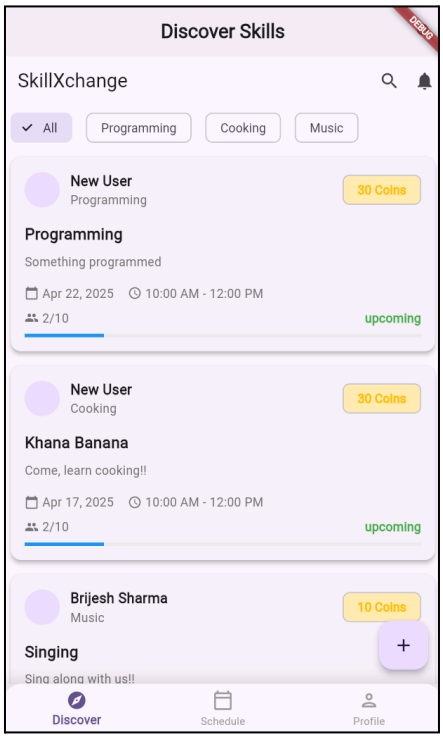




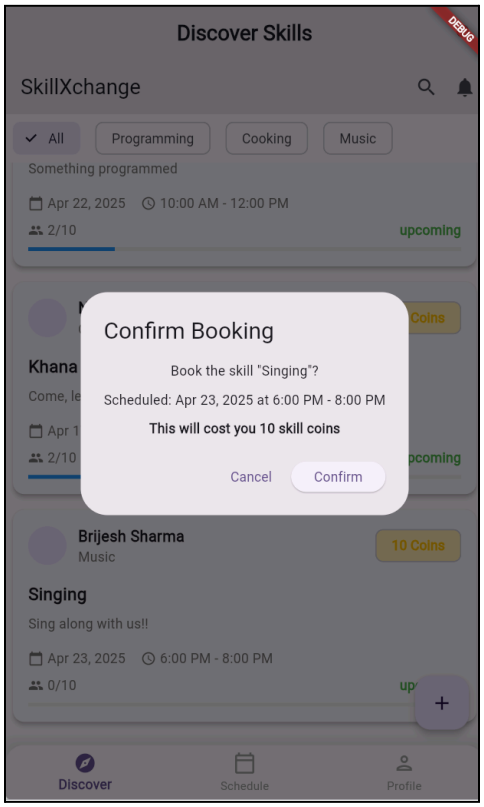
2) Post Skill Screen



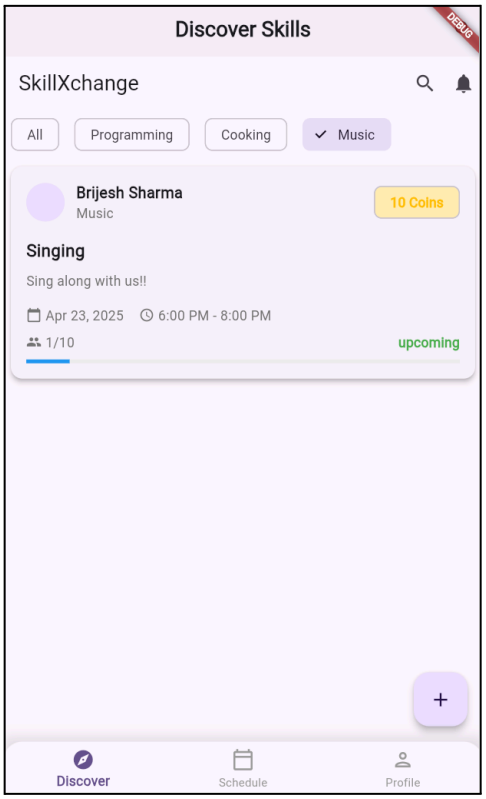
3) Home Page



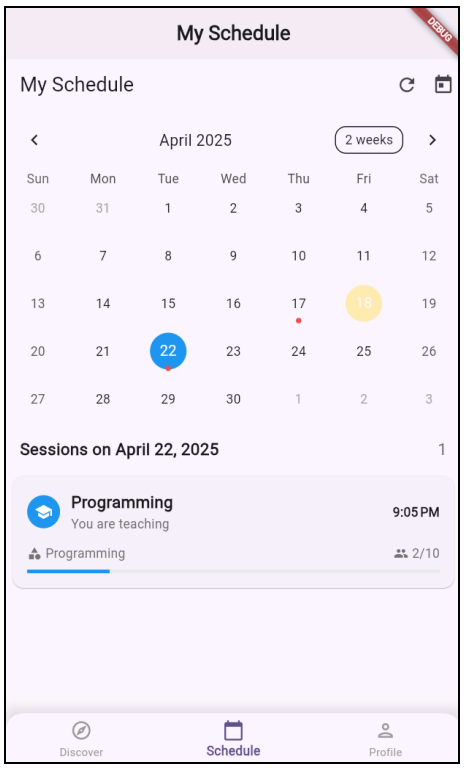
4) Confirm Booking Page



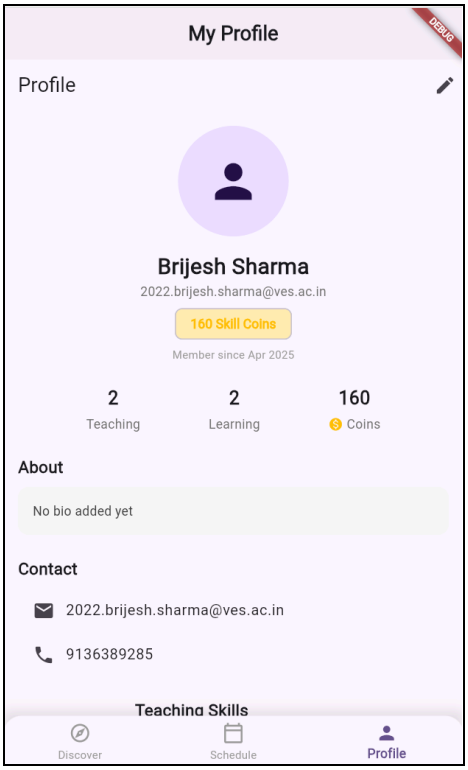
5) Filter Skills



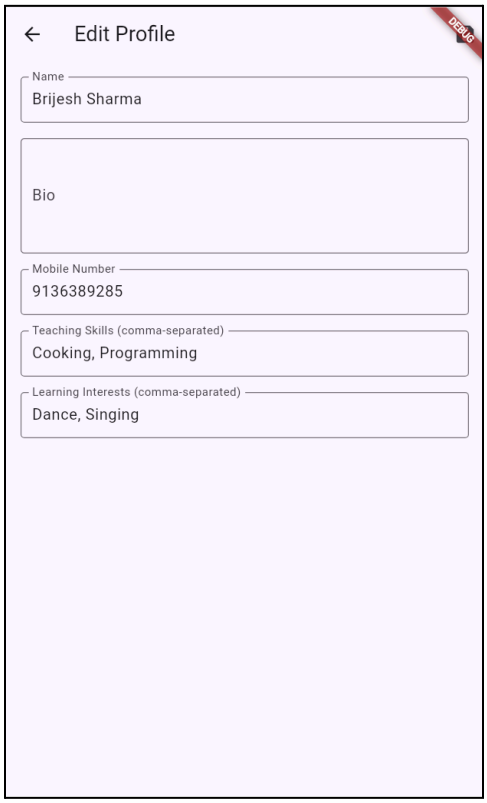
6) Calendar Screen



7) Profile Page



8) Edit Profile Page



Conclusion:

In conclusion, SkillXchange demonstrates how a thoughtfully designed mobile platform can harness community-driven learning to democratize skill development. By leveraging Flutter for a seamless, cross-platform user experience and Firebase for real-time data synchronization, secure authentication, and scalable backend services, the app delivers an end-to-end, robust and intuitive solution. The Skill Coin economy successfully incentivizes users to contribute and engage, while core features, such as live session bookings, calendar integration, and automated email notifications, ensure a smooth, end-to-end workflow. As a foundation for future enhancements like user ratings, group workshops, and personalized recommendations, SkillXchange sets the stage for an ever-growing ecosystem where learners and teachers can connect, collaborate, and excel together.

Bibliography:

1) https://repository.najah.edu/server/api/core/bitstreams/540c8773-0a94-4570-9198-510a88a63ad5/content - Skill Swap - Author - Aya Nassar & Ruoa Awaysa

2) Simbi - https://simbi.com - A symbiotic platform for skill-sharing and barter, where individuals can exchange services and skills without using traditional currency.