Software Requirements Specification (SRS)

for
Skill Swap

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Document History

Version	Date	Changes	Author(s)
1.0	September 16, 2025	Initial draft based on SRS document.	[Mohsin, Mridula, Santo, Nishat, Shehab, Jaowad]

Chapter 1

Introduction

Education has changed in today's digital world. Learning is no longer restricted to classrooms, formal courses, or expensive programs. People now crave flexible, accessible, and cost-free ways to learn and share their knowledge. This is where SkillSwap comes in.

1.1 Purpose

SkillSwap is a new approach to learning by challenging the monetary systems. The platform uses a familiar and user-friendly environment, inspired by the simplicity of freelance platforms like Fiverr and the learning focus of Coursera or Ostad. However, instead of financial exchange, SkillSwap focuses on mutual growth, inclusivity, and accessibility. SkillSwap introduces a "knowledge exchange" model where users can trade skills with one another: you teach what you know, and in return, you learn what you don't. In this system, individuals have the option to both request the learning of categorized skills and offer to teach their own expertise. Hence, It's free, mutual, and community driven.

1.2 Intended Audience

This SRS is created to serve as a guideline for all the stakeholders of the Skillswap project. The primary audiences of this SRS are:

- **Investors:** To provide a clear and detailed insight into the project's scope, potential, and operational framework for easier decision-making.
- **Project Managers:** To have a clear understanding of the budget and resources and track the project efficiently.
- **Business Analysts:** To find if business goals are properly aligned with requirements.
- **UI/UX Designers:** To gain the user's POV while designing features and UI flow for multiple user types.
- **Developers:** To get detailed project features and logics and coding standards.
- **QA/QC Team:** To create test plans, cases and acceptance measures of the application.
- **Testers:** To check that each and every feature works seamlessly.

- **Administrators:** To manage the system.
- **Moderators:** To understand how the verification process will work and how they can do their job efficiently.
- **End-users:** To gain a clear understanding of features and best use.
- **Marketing & Promotion Staffs:** To create effective plans for promoting the app among targeted audiences.

1.3 Intended Use

This SRS is intended to serve as a guideline for all stakeholders involved in the Skillswap project. This subsection describes how they should use the SRS for a better appreciation of the purposes and features of the project.

- **Investors:** They can use this SRS to get an understandable and accurate knowledge of the scope, possibility, work structure, and risk of the project, thus making sound investment decisions.
- **Project Managers:** This document gives a clear understanding of the scope of the project, resources, and budget, thus allowing them to track progress and manage the project effectively.
- **Business Analysts:** The SRS will be used to ensure that the business goals are properly mapped against the documented requirements and that those requirements are best communicated to the development team.
- **UI/UX Designers:** They would look at the SRS for understanding the different categories of users, their needs, and the system features. This understanding is crucial for developing an intuitive user interface (UI) as well as a smooth user experience (UX) flow.
- **Developers:** The document is a technical manual that offers a vivid specification of project features, logic, and coding conventions to be followed.
- **QA/QC Team and Testers:** They will refer to the SRS in creating comprehensive test plans, cases, and acceptance criteria to guarantee that every feature runs flawlessly and adheres to the requirements laid out.
- **Administrators:** The SRS helps them comprehend the system management functionality, their role, and how to oversee the platform operations in an efficient way.
- **Moderators:** They will use this document to understand the procedure of skill verification, platform rules, and their role in the quality and integrity of the platform.
- **End-users:** The SRS gives end-users a clear vision of the features of the platform and how they can most effectively use the system to teach or learn skills.
- **Marketing & Promotion Team:** The document assists them in comprehending the target market and notable features, which is pivotal in developing good marketing strategies and promotional content.

1.4 Product Scope

SkillSwap is like a global classroom where people can share their skills with others. It lets you learn specific parts of a skill from someone who already knows it, and also helps you teach your own skills in return. The platform provides roadmaps, matchmaking, and secure collaboration tools to make learning simple, trustworthy, and interactive.

Purpose

The purpose of SkillSwap is to provide a secure and interactive platform where people can exchange skills directly, focusing on flexible micro-learning, roadmap-based progress, and trustworthy collaboration through verification, reviews, and smart matchmaking.

Benefits and Objectives

- **Affordable learning** - exchange skills instead of paying for costly courses.
- **Micro-learning flexibility** - focus only on the parts of a skill you need.
- **Roadmap-based progression** - learn complex skills step by step through structured sub-skills.
- **Personalized experience** - build profiles, showcase verified skills, and find the right partners.
- **Trust and credibility** - ensure reliability with verification, reviews, and ratings. Seamless collaboration use messaging, scheduling, and file/resource sharing.
- **Smart matchmaking** - connect learners and teachers by skill, availability, and goals.
- **Secure and scalable system** - protect accounts and support global users.
- **Admin support** - manage community, analytics, and skill catalog moderation.

1.5 Risk Definitions

While SkillSwap aims to create a smooth, secure, and engaging platform for mutual learning, several risks must be considered.

1. **Technical Risks**
    - **Server Downtime:** If the server goes down during peak hours, learners and trainers may lose access to ongoing sessions, chats, or uploaded resources. This could break trust and discourage consistent use.
    - **Data Loss or Corruption:** If database backups fail or data becomes corrupted, users might lose resumes, certificates, or uploaded resources, which are vital for credibility and smooth skill swaps.
2. **Security Risks**

- **Malicious File Uploads:** Since users can upload files (resumes, study resources, assignments), there is a risk of harmful files (e.g., malware, corrupted PDFs) being uploaded, which could compromise user systems.
- **Data Privacy Breach:** Unauthorized access to personal details (emails, resumes, certificates) could damage user trust and cause legal implications.

3. **User Risks**

   - **Fake Credentials or Misrepresentation:** Users might upload false certificates or exaggerate their expertise, which could lead to poor learning experiences or disputes.
   - **Inappropriate Behavior:** Misuse of chat, resource sharing, or reporting tools may create a hostile environment, requiring strong moderation policies.

4. **Operational Risks**

   - **Scalability Issues:** If the platform grows faster than expected (e.g., hundreds of users joining within weeks), the system may face performance lags, slow file uploads, or delayed notifications.
   - **Adoption Gap:** Some users may sign up but remain inactive, leading to fewer real swaps and making the platform appear less engaging to newcomers.

5. **External Risks**

   - **Email Delivery Failures:** Notifications might land in spam folders or fail to deliver, leaving users unaware of deadlines or swap requests.
   - **Legal/Policy Changes:** New data protection or digital learning laws (e.g., GDPR compliance) could force major changes in how user data and resources are handled.

Each of these risks will be paired with mitigation plans such as regular server monitoring, verification badges for trusted users, and periodic backups to ensure reliability.

Chapter 2

Overall Description

SkillSwap is built using Node.js for the backend, React, HTML, CSS for the frontend, and PostgreSQL for the database. It will run smoothly on modern browsers, both desktop and mobile, and will be hosted on cloud services to ensure stability. We assume that users have basic digital literacy and internet access. For now, the platform will support only English, though expansion is possible in the future.

2.1 User Classes and Characteristics

In the SkillSwap platform, user classes are defined to address the specific roles and requirements of learners, skill providers, moderators, and administrators, ensuring a tailored experience for each group.

2.1.1 User Class: Learners

Characteristics:

1. Learners actively explore the platform to identify and select skills they wish to acquire.
2. They engage in the matching process, evaluating potential skill providers based on profiles and ratings.
3. Learners initiate interactions by sending swap requests to skill providers, commencing the skill exchange process.
4. They communicate to discuss session details, clarify skill requirements, and coordinate learning schedules.
5. They maintain their accounts, ensuring profiles are updated with accurate personal and skill-related information.

2.1.2 User Class: Skill Providers

Characteristics:

1. Skill providers actively list their expertise on the platform, providing detailed descriptions, proficiency levels, and supporting evidence.

2. They manage the availability and status of their offered skills, indicating readiness for swap sessions.
3. Skill providers engage in communication with potential learners, responding to inquiries, negotiating terms, and scheduling sessions.
4. Upon agreement, they confirm swap requests, initiating the learning period.
5. They ensure their skills are adequately demonstrated and supported (e.g., through verified credentials or resources) during exchanges.
6. They adhere to platform processes for completing sessions, including providing feedback and managing account updates.
7. Skill providers maintain their user accounts, keeping profiles current with evolving expertise.

2.1.3 User Class: Moderators

Characteristics:

1. Moderators possess comprehensive access to verification tools, enabling them to assess and validate skill submissions.
2. They manage the skill verification process, ensuring compliance with quality standards and accuracy of claims.
3. They address and resolve issues reported during verification, maintaining a consistent user experience.
4. Moderators enforce platform guidelines, ensuring submissions meet ethical and proficiency criteria.
5. They implement security protocols to protect the integrity of the verification process and user data.
6. Moderators serve as a key point of contact for escalation, facilitating communication between users and administrators.

2.1.4 User Class: Administrators

Characteristics:

1. Administrators have full control over system management, enabling oversight of all platform operations.
2. They manage user accounts, ensuring adherence to policies, security standards, and data accuracy.
3. They handle and resolve escalated issues reported by users or moderators, ensuring operational continuity.
4. Administrators enforce platform regulations, maintaining a secure and ethical environment.

5. They implement and oversee security measures to protect user information, transaction processes, and system stability.

6. Administrators act as the central communication nexus, coordinating updates and support across the platform.

2.2 User Needs

This section of the Software Requirements Specification (SRS) delineates the specific requirements and expectations of the end-users within the SkillSwap platform, tailored to the distinct roles of learners, skill providers, moderators, and administrators.

2.2.1 Learners

1. **Profile Management:** Learners require an intuitive interface to create and maintain profiles with essential data (e.g., personal details, skills sought, location), facilitating effective matching with skill providers.

2. **Matching and Communication:** Learners need a robust matching algorithm and communication tools (e.g., messaging, notifications) to identify and engage with suitable skill providers for session coordination.

3. **Feedback Submission:** Learners necessitate the ability to submit evaluations and feedback on learning experiences, enhancing the accuracy of future matches and fostering community trust.

4. **Device Compatibility:** The system interface must be responsive across various devices, ensuring accessibility for learners on mobile or desktop platforms.

2.2.2 Skill Providers

1. **Skill Listing and Verification:** Skill providers require a streamlined process to list their expertise with detailed descriptions and submit evidence for verification, ensuring professional credibility.

2. **Session Management:** Providers need tools to manage session availability, accept or decline swap requests, and track ongoing exchanges effectively.

3. **Interaction Capabilities:** A dedicated communication channel is essential, enabling providers to respond to inquiries, negotiate terms, and coordinate sessions with learners.

4. **Device Compatibility:** The system interface must be responsive to skill providers' devices, supporting both mobile and desktop usage for profile and session management.

2.2.3 Moderators

1. **Verification Management:** Moderators require a centralized dashboard to review skill evidence, provide detailed feedback, and manage verification workflows to maintain platform quality.

2. **Issue Resolution:** Moderators need tools to address reported issues during verification and escalate complex cases, ensuring a consistent user experience.
3. **Performance Monitoring:** Moderators necessitate periodic reports on verification accuracy to support continuous improvement and operational efficiency.
4. **Device Compatibility:** The system interface must be optimized for desktop use, accommodating the detailed tasks performed by moderators.

2.2.4 Administrators

1. **System Oversight:** Administrators require comprehensive controls to monitor user activities, manage escalations, and maintain platform operations.
2. **Security Implementation:** Administrators need robust security features to protect user data, ensure transaction integrity, and manage authentication processes.
3. **Analytics and Updates:** Administrators necessitate access to usage analytics and the capability to disseminate critical system updates to all users.
4. **Device Compatibility:** The system interface must support secure desktop access, tailored to the administrative functions performed.

2.2.5 General User Needs

1. **User Authentication and Authorization:** A secure and efficient authentication system is imperative, enabling users to access and manage their accounts with confidence.
2. **Accessibility and Usability:** The platform must be accessible to users with varying technical proficiencies, providing an intuitive interface to enhance the overall user experience.
3. **Notifications:** Users require timely notifications via email or in-app alerts for swap requests, session updates, verification statuses, and other pertinent information to remain engaged.

2.3 Operating Environment

The SkillSwap platform will be deployed on a web-based architecture supported by scalable cloud infrastructure. The hardware requirements are as follows:

2.3.1 Server Side (Cloud/Hosting Environment)

- **Processor:** Multi-core CPU ($\geq$ 4 cores, 2.5 GHz or higher)
- **Memory:** 16 GB RAM (scalable as user base grows)
- **Storage:** 500 GB SSD (expandable for user data and resources)
- **Network:** High-speed internet with $\geq$ 1 Gbps bandwidth
- **Deployment:** Cloud servers (e.g., AWS, Azure, GCP) with load balancing and auto-scaling support

2.3.2 Client Side (End Users)

- **Device:** Desktop, Laptop, Tablet, or Smartphone
- **Processor:** Minimum dual-core CPU, 1.8 GHz or higher
- **Memory:** 4 GB RAM (recommended 8 GB for better performance)
- **Storage:** At least 2 GB free space (for cache and temporary files)
- **Browser:** Latest versions of Chrome, Firefox, Edge, or Safari
- **Internet:** Stable broadband/mobile connection ($\geq$ 2 Mbps)

2.3.3 Software Components and Applications

- Google Chrome (latest stable version)
- Mozilla Firefox (latest stable version)
- Microsoft Edge (latest stable version)
- Safari (latest stable version)

2.4 Constraints

2.4.1 Technical Constraints

- The system must be web-based and mobile-friendly to support multiple device types.
- PostgreSQL will be used as the primary database due to its scalability and advanced querying capabilities.
- The application must ensure real-time data synchronization for matching, availability, and notifications.
- Authentication must integrate with third-party providers (e.g., Google, Facebook) for ease of access.
- The platform must comply with common web security practices (e.g., HTTPS, encrypted passwords, secure APIs).

2.4.2 Data Constraints

- User personal data (profile details, ratings, reviews) must be stored securely and comply with data protection regulations.
- Search and filter queries must be optimized to handle large datasets without performance degradation.
- Only supported languages will be available for communication (to be expanded gradually).
- Transaction records of point trading must be immutable to prevent disputes.

2.4.3 Integration Constraints

- The system must integrate with external APIs for authentication, payment/point top-up, and notifications (email/push).
- Compatibility with multiple browsers (Chrome, Firefox, Edge, Safari) must be ensured.
- Limited dependency on third-party services to reduce vendor lock-in.

2.4.4 Time Constraints

- Initial MVP must be delivered within the semester timeframe for evaluation.
- Features may need to be prioritized, with non-essential modules deferred to later iterations.

2.4.5 Budget Constraints

- Development will rely on free or community versions of tools, frameworks, and hosting (where possible).
- Paid services such as cloud hosting, SMS/email notifications, or premium APIs may only be adopted if sponsors or grants are available.

2.4.6 Regulatory and Compliance Constraints

- The system must comply with relevant data privacy laws (e.g., GDPR principles for international users).
- User consent must be explicitly collected before storing personal or sensitive data.
- Copyright and licensing terms must be respected for any third-party integrations.

2.4.7 Resource Constraints

- Development is limited to a team of 6 members with predefined roles.
- Team members are students; hence, working hours are limited by academic workload.
- Limited access to high-performance servers during initial deployment; may rely on shared hosting solutions initially.

2.5 Assumptions

- **User Participation:** It is assumed that users will actively participate by teaching, learning, reviewing, and engaging in the point trading system.
- **User Proficiency:** It is assumed that users have at least basic digital literacy and can operate the application without extensive guidance.

- **Genuine Intent:** It is assumed that all users join the platform with the intent to teach, learn, or both. not to spam or scam others.
- **Stable Infrastructure:** It is assumed that hosting providers and third-party APIs used by the system will remain available and reliable.

Chapter 3

Requirements

This section outlines the functional and non-functional requirements of the SkillSwap system.

3.1 Functional Requirements

The system must provide the following functionalities:

Authentication and User Management

- **FR1:** The system shall allow users to register using email or third-party authentication (e.g., Google, Facebook).
- **FR2:** The system shall allow users to log in and log out securely.
- **FR3:** The system shall allow users to manage their profile information, including skills, interests, availability, and language preferences.
- **FR4:** The system shall allow administrators to access an admin profile with elevated privileges for moderation.

Skill Discovery and Matching

- **FR5:** The system shall provide categorized skill listings.
- **FR6:** The system shall provide a search and filter mechanism (by rating, language, availability, category, trading points, etc.).
- **FR7:** The system shall implement cross-matching logic so that learners can be paired with users who can teach their expected skills and vice versa.
- **FR8:** The system shall provide recommendations if no direct matches are found.

Communication and Session Management

- **FR9:** The system shall provide a messaging feature for learners and teachers to communicate.
- **FR10:** The system shall allow scheduling and conducting sessions (one-on-one or group).

- **FR11:** The system shall allow users to share files relevant to learning during sessions.
- **FR12:** The system shall send notifications (e.g., email or in-app) regarding session confirmations, updates, or reminders.

Engagement and Quality Assurance

- **FR13:** The system shall allow users to provide reviews and feedback after each session.
- **FR14:** The system shall verify skills of users through human moderation before publishing them.
- **FR15:** The system shall track and display user reputation through points, ratings, or achievements.
- **FR16:** The system shall provide administrators with tools to monitor reports, feedback, and resolve disputes.

3.2 Non-Functional Requirements

The system shall adhere to the following non-functional requirements:

Performance

- **NFR1:** The system shall handle concurrent usage by multiple users without performance degradation.
- **NFR2:** Search and filter results shall be returned within 2 seconds under normal load.
- **NFR3:** Messaging and notification services shall operate in near real-time.

Security

- **NFR6:** User credentials shall be stored securely using encryption and hashing mechanisms.
- **NFR7:** All communication between client and server shall be encrypted via HTTPS.
- **NFR8:** Access to administrative functions shall be restricted to authorized personnel.

Usability

- **NFR9:** The user interface shall be intuitive and responsive across devices (desktop, tablet, mobile).
- **NFR10:** The system shall support at least English in the initial version, with provisions for adding more languages.
- **NFR11:** The system shall ensure accessibility by following WCAG 2.1 guidelines where feasible.

Reliability & Availability

- **NFR12:** The system shall maintain at least 99% uptime during normal operation.
- **NFR13:** The system shall provide proper error handling and fallback mechanisms if services are temporarily unavailable.

References

Appendix A

First

Appendix B

Second