Software Requirements Specification

for

SkillSwapHub

Version 1.0

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Software Requirements Specification

1. Introduction

The aim of this document is to gather, analyze, and give an in-depth insight into the complete **SkillSwapHub** by defining the problem statement in detail. SkillSwapHub is a platform designed to facilitate skill-sharing among individuals. It enables users to connect with others based on their skills and learning goals, fostering an interactive community for mutual growth. Through features such as user-friendly registration, dynamic skill-matching algorithms, virtual collaboration tools, and progress tracking, SkillSwapHub provides a seamless and secure environment for users to learn and teach skills. By integrating advanced technologies like AI-powered chatbots and video conferencing, the platform aims to revolutionize the way individuals exchange knowledge and expand their expertise.

1.1 Purpose

SkillSwapHub is a centralized platform designed to empower individuals to exchange skills and knowledge efficiently and effectively. By connecting users eager to learn specific skills with those willing to teach, it fosters lifelong learning and personal growth. The platform simplifies skill discovery and matching through advanced algorithms while providing robust tools for communication, collaboration, and session management. With features to track progress, celebrate achievements, and build a vibrant community, SkillSwapHub encourages peer-to-peer knowledge sharing and engagement. Addressing the increasing demand for affordable and accessible skill acquisition, it serves as a catalyst for personal and professional development, enabling users to unlock their potential and achieve their goals.

1.2 Project Scope

The scope of the **SkillSwapHub** project encompasses the development of a comprehensive platform designed to facilitate skill-sharing and learning among users. Key functionalities include secure user account management, dynamic skill-matching algorithms, and robust session management tools, such as scheduling, video conferencing, and notifications. The platform will also feature progress tracking, enabling users to monitor achievements and milestones through interactive dashboards and detailed reports. Additionally, it will foster community engagement through forums, group collaborations, and messaging tools, while recognizing user accomplishments with badges and certifications. With an emphasis on usability, accessibility, and seamless integration with external tools like calendars, SkillSwapHub aims to

provide a structured, user-friendly, and secure environment for individuals to teach, learn, and grow.

1.3 Document conventions

SkillSwapHub	A Peer-to-Peer Skill Exchange Platform
UI	User Interface
PDF	Portable Document Format
RAID 5	Redundant Array of Inexpensive Disk/Drives

1.4 Intended audience

This project is a prototype for individuals and groups seeking personal and professional growth through skill-sharing. It serves learners acquiring new skills, mentors sharing expertise, professionals upskilling, and students pursuing development. The platform supports a diverse, global audience with varying skill levels and goals, fostering accessible and inclusive learning experiences.

1.5 References

[1] S. E. Bryant, “The Impact of Peer Mentoring on Organizational Knowledge Creation and Sharing,” *Group & Organization Management*, vol. 30, no. 3, pp. 319–338, Jun. 2005, doi: https://doi.org/10.1177/1059601103258439.

[2] E. Stracke, “Undertaking the Journey Together: Peer Learning for a Successful and Enjoyable PhD Experience,” *Journal of University Teaching and Learning Practice*, vol. 7, no. 1, pp. 111–121, Jan. 2010, doi: https://doi.org/10.53761/1.7.1.8.

[3] Wikipedia, “Community education,” *Wikipedia*, Oct. 13, 2019. https://en.wikipedia.org/wiki/Community_education

[4] LinkedIn, “Introducing LinkedIn Learning, personalized eLearning for your organization,” *Linkedin.com*, 2019. https://learning.linkedin.com/

[5] SkillShare, “Online Classes by Skillshare | Start for Free Today,” *Skillshare*, 2014. https://www.skillshare.com/

1.6 Overview

The remaining sections of this document provide a general description, including the characteristics of the users of this project, the product's hardware, and the functional and data requirements of the product. A general description of the project is discussed in **section 2** of this document. **Section 3** gives the functional requirements, non-functional requirements, data requirements, and constraints for the SkillSwapHub. It also gives the user a viewpoint of the product. **Section 3** also gives the specific requirements of the product. **Section 3** also discusses the external interface requirements and gives detailed description of functional and non-functional requirements. **Section 4** is for supporting information.

2. Overall Description

This document outlines the problem statement currently faced by SkillSwapHub, which results in inefficiencies and hinder the system's overall functionality. It includes an overview of the intended users of the proposed solution, a summary of its key features, and a concise description of the envisioned system enhancements.

2.1 Product Perspectives

This is a web-based platform that acts as a hub for skill-sharing and learning, leveraging advanced matchmaking algorithms and collaboration tools to connect users. It builds on existing technologies like video conferencing, calendar integration, and secure authentication to provide a seamless experience. The platform integrates innovative features such as AI-powered chatbots for FAQs, real-time session feedback, and gamified recognition systems to motivate users. Positioned as an accessible, affordable, and inclusive solution, SkillSwapHub bridges the gap between learners and mentors worldwide.

2.2 Assumptions and Dependencies

Assumptions:

- Users will have access to stable internet connections to ensure functionality, particularly for video conferencing and real-time collaboration.
- Third-party services, such as Google and Facebook for authentication and Google Calendar for scheduling integration, will remain operational and available for use.

- Users will possess basic digital literacy to navigate the platform effectively and engage with its features.
- All participants will provide accurate and truthful information regarding their skills, preferences, and availability.

Dependencies:

- The system relies on third-party APIs for authentication, calendar integration, and video conferencing to deliver its core functionalities.
- Access to reliable email services is critical for account verification, password recovery, and notifications.
- Adherence to data protection regulations, such as the General Data Protection Regulation (GDPR), ensures secure handling of user data.
- Availability of scalable and robust server infrastructure to accommodate user growth and manage peak traffic efficiently.

2.3 User Classes and Characteristics

Learners:

- Individuals seeking to acquire new skills or enhance existing ones, encompassing students, professionals, and hobbyists.
- Represent diverse demographics and require a user-friendly interface and accessible guidance.

Mentors:

- Experts or skilled individuals offer their knowledge to teach others, including professionals, educators, and specialists.
- Require efficient tools for organizing, scheduling, and conducting skill-sharing sessions.

Administrators:

- Personnel responsible for overseeing platform operations, managing user registrations, and addressing system issues.
- Require access to comprehensive dashboards, analytics, and control tools to ensure system integrity and efficiency.

Community Participants:

- Users actively contribute to the platform's forums, group discussions, and collaborative initiatives.
- Foster a supportive and engaging community environment by sharing knowledge and participating in group activities.

2.4 Operating Environment

The server-side components of the software system must operate within a Linux operating system environment. The client-side components of the software system must operate within common web browser environments using Secure Sockets Layer (SSL) / Transport Layer Security (TLS) cryptographic protocols at a minimum encryption level of 128 bits. The minimum set of browsers that must be supported is:
• Apple Safari 7+
• Google Chrome 44+
• Microsoft Internet Explorer 10+
• Mozilla Firefox 40+

2.5 Design and Implementation Constraints

2.5.1 Standard Development Tools

The system will be built using a standard web page development tool that conforms to either IBM’s CUA standards or Microsoft’s GUI standards.

2.5.2 Web Based Product

2.5.2.1 There are no memory requirements
2.5.2.2 The computers must be equipped with web browsers such as Internet Explorer.
2.5.2.3 The product must be stored in such a way that allows the user easy access to it.
2.5.2.4 Response time for loading the routine pages should take no longer than five minutes.
2.5.2.5 A general knowledge of basic computer skills is required to use the product.

3. Specific Requirements

The specific requirements are –

3.1 Functionality

Introduction –

This subsection contains the functional working procedure of our proposed SkillSwapHub. It also contains all the features and requirements for building this software. All these functional requirements can be traced using a traceability matrix.

3.1.1 User Registration

3.1.1.1 The system shall enable users to create an account using their email address and a secure password.

3.1.1.2 The system shall support third-party authentication options such as Google or Facebook login.

3.1.1.3 The system shall validate the uniqueness of the email address during registration.

3.1.1.4 The system shall require users to provide mandatory information during registration, including full name, email address, and password.

3.1.1.5 The system shall allow users to optionally add additional details, such as profile picture, location, short bio, and languages spoken.

3.1.1.6 The system shall allow users to specify the skills they can teach and the skills they want to learn, along with their proficiency levels.

3.1.1.7 The system shall enforce password complexity rules, requiring a minimum of 8 characters, with at least one uppercase letter, one number, and one special character.

3.1.1.8 The system shall send a verification email to the user's registered email address to activate the account.

3.1.1.9 The system shall provide a "Forgot Password" feature, allowing users to reset their password using a secure link sent to their registered email.

3.1.1.10 The system shall display appropriate error messages for invalid input, such as incorrect email format, weak passwords, or duplicate email addresses.

3.1.1.11 The system shall enable administrators to review and manage user registrations, including suspicious registration patterns.

3.1.2 Login and Authentication

3.1.2.1 The system shall enable registered users to log in using their email address and password.

3.1.2.2 The system shall support third-party login options such as Google and Facebook authentication.

3.1.2.3 The system shall enforce secure login mechanisms, including encryption of credentials during transmission.

3.1.2.4 The system shall display appropriate error messages for incorrect email or password attempts.

3.1.2.5 The system shall provide users with a "Remember Me" option to stay logged in on trusted devices.

3.1.2.6 The system shall offer users the ability to log out from all sessions via their profile or account settings.

3.1.2.7 The system shall allow users to reset their password by sending a secure link to their registered email address.

3.1.3 User Profile Management

3.1.3.1 The system shall enable users to view their profile information after logging in.

3.1.3.2 The system shall allow users to update their profile details.

3.1.3.3 The system shall allow users to add, edit, or remove the skills they offer to teach and the skills they want to learn.

3.1.3.4 The system shall allow users to set or update their proficiency levels for each skill (e.g., Beginner, Intermediate, Expert).

3.1.3.5 The system shall allow users to specify their availability for skill exchange sessions (e.g., preferred days and times).

3.1.3.6 The system shall display a visual summary of the user's profile, including their skills, proficiency levels, and learning goals.

3.1.3.7 The system shall enable users to make their profile public or private, controlling its visibility to other users.

3.1.3.8 The system shall allow users to view their activity history, such as past sessions, feedback received, and achievements (e.g., badges earned).

3.1.3.9 The system shall validate all profile updates for completeness and correct format before saving.

3.1.3.10 The system shall notify users of successful updates to their profiles via email or in-app notifications.

3.1.4 Skill Matching and Discovery

3.1.4.1 The system shall implement a matchmaking algorithm to connect users based on the following criteria:

- Skills they offer to teach.
- Skills they want to learn.
- Proficiency levels (e.g., Beginner, Intermediate, Expert).
- Availability (preferred days and times).
- Location (if applicable).

3.1.4.2 The system shall allow users to search for other users by:

- Specific skills.

- Location.
- Proficiency levels.

3.1.4.3 The system shall display a list of matching users along with their profile summaries (e.g., name, bio, skills offered and desired, proficiency).

3.1.4.4 The system shall allow users to filter and sort the search results based on criteria such as:

- Proficiency level.
- Location.
- Availability.

3.1.4.5 The system shall enable users to send connection requests to matched users to initiate skill exchange.

3.1.4.6 The system shall notify users of new connection requests and matches via in-app notifications or email.

3.1.4.7 The system shall provide recommendations for potential matches based on the user's profile and activity history.

3.1.4.8 The system shall include a feature to mark users as "Favorites" for easy reference in future searches.

3.1.4.9 The system shall allow users to view their pending and accepted connection requests in a separate section.

3.1.4.10 The system shall enable users to decline or block connection requests from other users.

3.1.5 Session Management

3.1.5.1 The system shall enable users to schedule and organize skill exchange sessions, allowing them to select times based on mutual availability and define session details, such as topics, objectives, and required resources.

3.1.5.2 The system shall provide a calendar view with the following capabilities:

- Monitor and manage scheduled sessions.
- Integrate with external calendar platforms (Google Calendar, Outlook).

- Provide accurate time zone conversion for global users.

3.1.5.3 The system shall incorporate built-in video conferencing tools to support virtual skill-sharing sessions with the following features:

- Screen sharing for collaboration.
- Real-time chat for communication.
- Session recording for future review.

3.1.5.4 The system shall send notifications and reminders about upcoming sessions, including:

- Email and mobile alerts.
- Details such as session topics, dates, times, and access links.
- Customizable notification preferences for users.

3.1.5.5 The system shall allow users to manage session modifications, including:

- Flexible session rescheduling/cancellation.
- Automatic notifications of changes.
- History of session modifications.

3.1.5.6 The system shall synchronize updates to reflect session changes in integrated calendars to ensure consistency across platforms.

3.1.5.7 The system shall prompt users to provide feedback after each session to assess quality and effectiveness, aggregating feedback to generate insights for continuous improvement.

3.1.5.8 The system shall provide mentors with access to anonymized feedback reports for self-assessment, ensuring privacy and fostering growth.

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3.1.6 Progress Tracking

3.1.6.1 The system shall display a personalized dashboard for users to track their learning milestones and achievements.

3.1.6.2 The system shall dynamically update the dashboard based on user activity and progress.

3.1.6.3 The system shall generate detailed reports summarizing completed sessions, acquired skills, and learning outcomes.

3.1.6.4 The system shall allow users to download reports in formats such as PDF and CSV for personal or professional use.

3.1.6.5 The system shall analyze user progress to recommend additional learning paths and sessions.

3.1.6.6 The system shall suggest mentors, resources, or activities to help users address identified skill gaps.

3.1.6.7 The system shall present progress data through interactive charts, graphs, and timelines for intuitive understanding.

3.1.6.8 The system shall use visual tools to highlight strengths, achievements, and areas for improvement.

3.1.7 Community and Networking

3.1.7.1 The system shall provide discussion forums where users can share knowledge, ask questions, and collaborate.

3.1.7.2 The system shall categorize forums by topics to ensure organized and relevant discussions.

3.1.7.3 The system shall enable users to create and manage groups focused on specific skills or interests.

3.1.7.4 The system shall support group activities such as collaborative projects, study sessions, and knowledge-sharing events.

3.1.7.5 The system shall include messaging tools for seamless communication among group members.

3.1.7.6 The system shall notify users of updates, events, and new posts related to their groups.

3.1.7.7 The system shall allow users to customize notification settings for specific groups or activities.

3.1.8 Certification and Recognition

3.1.8.1 The system shall automatically generate certificates for users upon achieving predefined

milestones.

3.1.8.2 The system shall allow users to download and share certificates as proof of their accomplishments.

3.1.8.3 The system shall award badges to mentors for conducting successful sessions and contributing to the community.

3.1.8.4 The system shall provide badge levels (e.g., Bronze, Silver, Gold) based on user performance and activity.

3.1.8.5 The system shall display earned certifications and badges on users' profiles for recognition and motivation.

3.1.8.6 The system shall allow users to showcase their achievements to mentors, peers, and potential collaborators.

3.1.9 AI Chatbot for FAQs and Doubt Resolution

3.1.9.1 The system shall provide an AI-powered chatbot to assist users in resolving frequently asked questions (FAQs) and course-related doubts in real time.

3.1.9.2 User queries submitted via the chatbot interface (text input) shall include optional contextual information such as user course, module, or topic. The system shall retrieve answers from the FAQ database for predefined questions.

3.1.9.3 The system shall provide feedback options for users to rate the response.

3.1.10 User Engagement and Notifications

3.1.10.1 The system shall allow users to customize their notification preferences, including options to receive notifications for new session invitations, group discussions, feedback requests, and platform updates.

3.1.10.2 The system shall send real-time notifications (via email, mobile app, or browser push notifications) for important events such as new skill exchange matches, session reminders, and feedback requests.

3.1.10.3 The platform shall allow users to opt into daily or weekly summary emails that include a digest of platform activity, new opportunities, and relevant discussions.

3.1.10.4 The system shall notify users about community events, webinars, or skill-related challenges based on their interests and previous activity.

3.1.10.5 The system shall allow users to acknowledge, dismiss, or mute notifications, giving them full control over their preferences.

3.1.10.6 The system shall enable platform-wide announcements to be sent to users, such as updates on new features, policy changes, or maintenance schedules.

3.1.11 Search and Filter

3.1.12.1 The system shall allow users to search for other users based on skills they want to learn or teach, location, availability, and experience level.

3.1.11.2 The system shall provide an advanced filtering option to narrow down search results by criteria such as skill categories (e.g., technical, creative, business), language, and rating.

3.1.11.3 The system shall allow users to search for skill exchange sessions based on specific topics, dates, and times that match their availability.

3.1.11.4 The system shall display search results in an easily digestible format, such as a list or grid, with relevant information like user profile, skill set, and session availability.

3.1.11.5 The system shall provide an autocomplete function that suggests search terms as the user types, improving search efficiency.

3.1.11.6 The system shall allow users to sort search results by parameters like relevance, newest, most popular, and highest-rated.

3.1.11.7 The system shall allow users to save custom search filters and create alerts for new skill exchange opportunities that match their saved criteria.

3.1.12 Skill-Driven Personal Projects Gallery

3.1.12.1 The system shall allow users to create a “Personal Projects Gallery” where they can

showcase long-term, self-driven projects that demonstrate their skill development over time.

3.1.12.2 The system shall allow users to break down their projects into different phases or stages, showing the evolution of their skills and the progress made in each phase.

3.1.12.3 The system shall enable users to receive community feedback, tips, and suggestions on their personal projects from others with relevant expertise, fostering growth and improvement.

3.1.12.4 The system shall feature a "project journey" where users can reflect on the challenges faced, solutions developed, and skills learned throughout the project.

3.1.12.5 The system shall allow users to add multimedia elements (e.g., images, videos, presentations, progress reports) to document the milestones of their projects.

3.1.12.6 The system shall allow users to invite others to collaborate on their projects, offering a chance to work with peers and mentors to elevate the project to the next level.

3.1.12.7 The system shall include an option for users to create "Project Milestone Events," where they can announce significant updates or achievements within their projects, gaining recognition and engagement from the community.

3.1.12.8 The system shall reward users with badges, certificates, or public recognition for successfully completing significant milestones within their personal projects.

3.1.13 Session Ratings and Reviews

3.1.13.1 The system shall allow users to rate each skill exchange session on a scale (e.g., 1 to 5 stars) based on their experience.

3.1.13.2 The system shall enable users to leave written feedback on the session, providing insights into their learning experience, mentor performance, or session quality.

3.1.13.3 The system shall aggregate session ratings to generate a summary score visible on the mentor's or learner's profile, helping users make informed decisions.

3.1.13.4 The system shall send a prompt to users after each session asking them to rate and review their experience.

3.1.13.5 The system shall notify mentors when they receive new feedback and ratings, providing

them with opportunities to improve their sessions.

3.1.13.6 The system shall allow mentors and learners to view past session reviews to reflect on their progress and identify areas for improvement.

3.1.14 Skill Exchange Challenges

3.1.14.1 The system shall offer skill-based challenges where users can participate to showcase their skills in specific areas (e.g., coding challenges, creative writing, and design contests).

3.1.14.2 The system shall allow users to create and join challenges with defined goals, deadlines, and evaluation criteria.

3.1.14.3 The system shall include a leaderboard to display top-performing users based on challenge outcomes.

3.1.14.4 The system shall offer rewards or recognition for users who perform exceptionally well in challenges (e.g., badges, certificates, or features on the homepage).

3.1.14.5 The system shall allow mentors to review and provide feedback on user submissions for challenges, helping users improve their skills.

3.1.14.6 The system shall send reminders to users about upcoming challenges, deadlines, and new challenge opportunities.

3.1.14.7 The system shall include a social sharing feature, allowing users to share their challenge participation and achievements on social media.

3.1.15 Personalized Learning Paths

3.1.15.1 The system shall provide users with personalized learning paths based on their skill level, goals, and interests.

3.1.15.2 The system shall allow users to input their current skills, desired skills, and goals to generate a custom learning roadmap.

3.1.15.3 The system shall recommend specific mentors, sessions, and resources aligned with the user's learning path.

3.1.15.4 The system shall track users' progress along their learning paths and suggest adjustments or new learning opportunities as they progress.

3.1.15.5 The system shall allow users to set milestones and deadlines within their learning paths, providing reminders to keep them on track.

3.1.15.6 The system shall enable users to review and modify their learning paths as their interests and goals evolve.

3.1.15.7 The system shall provide users with a summary of their achievements upon completing a learning path, including recommendations for next steps.

3.1.16 In-app Learning Resources

3.1.16.1 The system shall provide a library of learning resources (e.g., articles, tutorials, videos, and e-books) related to various skills and industries.

3.1.16.2 The system shall allow users to access these resources based on their skill interests and learning paths.

3.1.16.3 The system shall enable users to bookmark, save, and share resources with other users for collaborative learning.

3.1.16.4 The system shall allow users to rate and review resources, helping others find high-quality learning materials.

3.1.16.5 The system shall offer curated learning paths, suggesting relevant resources to help users advance in their desired skill areas.

3.1.16.6 The system shall notify users about newly added or updated resources based on their preferences and learning goals.

3.1.16.7 The system shall provide an option for users to submit or upload their own learning materials to share with the community, fostering a collaborative knowledge base.

3.1.17 Dynamic Skill Learning Groups

3.1.17.1 The system shall allow users to create or join dynamic learning groups based on specific

skills or topics of interest.

3.1.17.2 The system shall automatically match users with others who have similar learning goals or complementary skills to foster group-based learning.

3.1.17.3 The system shall enable group members to collaborate on projects, share resources, and engage in discussions relevant to the skill they are learning.

3.1.17.4 The system shall allow group leaders to set learning objectives, deadlines, and checkpoints to ensure continuous progress within the group.

3.1.17.5 The system shall send notifications and reminders to group members about upcoming deadlines, new resources, and group activities.

3.1.17.6 The system shall provide a group chat or forum for communication, enabling members to ask questions, offer feedback, and share insights.

3.1.17.7 The system shall allow users to track their progress as a group, providing visual updates on shared milestones and accomplishments.

3.1.17.8 The system shall allow members to rate the group experience and provide feedback on the learning process after completing group activities.

3.2 Usability

3.2.1 Graphical User Interface

3.2.1.1 The platform will offer a structured 2-D matrix view for scheduling and managing skill exchange sessions.

3.2.1.2 A consistent design and layout will be maintained across all web pages to ensure a cohesive user experience.

3.2.1.3 The interface will utilize intuitive icons and toolbars to enhance navigation and usability.

3.2.2 Accessibility

3.2.2.1 The platform will provide features to support accessibility for users with disabilities like captions and proper sound levels.

3.2.2.2 English will be the primary language of the platform to ensure a standardized user experience.

3.3 Non-Functional Requirements

3.3.1 Reliability and Availability

3.3.1.1 Back-end Internal Computers

3.3.1.1.1 The back-end infrastructure shall consist of scalable internal servers capable of handling a large volume of concurrent requests and processing heavy workloads.

3.3.1.1.2 The system shall employ load balancing techniques to distribute traffic efficiently across multiple back-end servers, ensuring optimal performance.

3.3.1.1.3 The back-end servers shall be equipped with redundant hardware components (e.g., power supplies, storage devices) to prevent single points of failure and ensure continuous operation.

3.3.1.1.4 The back-end system shall support auto-scaling, allowing additional computing resources to be added dynamically based on demand.

3.3.1.2 Internet Service Provider

3.3.1.2.1 The system will have a contractual agreement with an internet service provider that guarantees T3 access with 99.9999% availability.

3.3.1.2.2 The platform will ensure 99.999% availability through its internet service provider’s network infrastructure.

3.3.2 Performance

3.3.2.1 The platform will be a web-based application that runs on a web server.

3.3.2.2 The initial load time of the platform will vary depending on the user's internet connection strength and the medium from which the platform is accessed.

3.3.2.3 Performance may also be influenced by the hardware components of the user's device.

3.3.3 Security

3.3.3.1 Data Transfer

3.3.3.1.1 All transactions involving confidential user data will utilize secure sockets (SSL/TLS) for encrypted communication.

3.3.3.1.2 The system will automatically log out users after a period of inactivity to prevent unauthorized access.

3.3.3.1.3 The platform will not store cookies containing user passwords.

3.3.3.1.4 The system will not store cookies containing any confidential user information.

3.3.3.2 Data Storage

3.3.3.2.1 User passwords will never be visible in the web browser and will be masked using special characters.

3.3.3.2.2 The platform’s back-end servers will never display user passwords; they can only be reset but never revealed.

3.3.3.2.3 The platform’s back-end servers will be accessible only to authorized and authenticated administrators.

3.3.3.2.4 All back-end databases will be encrypted to ensure the security of stored data.

3.3.4 Supportability

3.3.4.1 Configuration Management Tool

The source code of the SkillSwapHub platform will be managed using configuration management tools to ensure version control and systematic updates.

3.3.5 Software Quality Attributes

Testing will be conducted continuously throughout the development process, parallel to the requirements gathering, design, and implementation phases. This includes a pre-testing phase to validate requirements and assess project feasibility. The testing phase will involve comprehensive unit testing, functional testing, white-box testing of the code, and black-box testing of the complete system. All functional requirements will be thoroughly tested and documented to ensure the platform's reliability..

3.4 On-line User Documentation and Help System Requirements

3.4.1 Given that SkillSwapHub is a skill-sharing platform, an online help system will be an integral part of the system, providing support for users.

3.4.2 The help system will offer clear, user-friendly guidelines for navigating and utilizing the platform effectively.

3.4.3 To facilitate easy access to support, the help system will include a search feature and links to relevant documentation directly within the platform.

3.5 Purchased Components

Not Applicable

3.6 External Interface Requirements

There are many types of interfaces as such supported by SkillSwapHub namely; User Interface, Software Interface, and Hardware Interface.

The protocol used will be HTTP. The Port number used will be 80. There will be a logical address of the system in IPv4 format.

3.6.1 User Interfaces

3.6.1.1 The user interface for the software will be compatible with any browser such as Internet Explorer, Mozilla, Google Chrome, or Netscape Navigator by which users can access the system.

3.6.1.2 The user interface will be implemented using any tool or software package like Java Applet, MS Front Page, EJB, etc.

3.6.2 Hardware Interfaces

Since the application must run over the internet, all the hardware required to connect to the internet will be hardware interface for the system. As for e.g. Modem, WAN, LAN, Ethernet Cross-Cable.

3.6.3 Software Interfaces

3.6.3.1 The platform shall provide an API for integration with third-party applications and services, ensuring seamless data exchange and compatibility.

3.6.3.2 The system shall support integration with external calendar platforms (e.g., Google Calendar, Outlook) to facilitate session scheduling and synchronization.

3.6.3.3 The platform will offer integration with payment gateways for potential future monetization or premium feature access.

3.6.3.4 The system shall allow integration with email services (e.g., SMTP, Mailgun) to send notification and reminder emails.

3.6.3.5 The system shall enable user authentication and authorization via OAuth for third-party login services (e.g., Google, Facebook).

3.6.3.6 The platform shall provide a RESTful API that returns data in JSON format for easy

consumption by external applications or client-side interfaces.

3.6.4 Communications Interfaces

The SSH will use the HTTP protocol for communication over the internet and for the intranet communication will be through TCP/IP protocol suite.

3.7 Licensing Requirements

Not Applicable

3.8 Legal, Copyright, and Other Notices

The SkillSwapHub should display the disclaimers, copyright, wordmark, trademark, and product warranties of the SSH.

3.9 Applicable Standards

It will be as per the industry standard.

4. Supporting Information

The following document will be referred to in this section:

1. Vision document for SkillSwapHub.
2. Use case analysis.
3. Structural models.
4. Behavioral models.
5. Nonfunctional requirements model.
6. Traceability Matrix.
7. Project Plan