

Skill Swap

Software Requirements Specification

PRJ566 – Fall 2024

PRJ566 – Team No: 4

Name of Project: Skill Swap Application

Project Leader:

Diba Makki

Last updated:

April 17, 2025

Team Members:

1. Anton Zhuravlev
2. Diba Makki
3. Dylan Dioneda
4. Gia Huy Nguyen
5. Lawrence Wan

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1- Introduction/Overview- Document Information

1.1 Document Authors

Gia Huy Nguyen

Diba Makki

1.2 Revision History

Week 03	1. Introduction/Overview 1.1 Document Authors 1.2 Revision History 1.3 Document Conventions 1.4 Document Purpose 1.5 Intended Audience 1.6 Group Agreement 2.1 Project Proposal
Week 04	2.1 Problem Statement: Identified the need for a centralized skill-sharing platform and its impact. Added updates to: 1.5 Document Conventions 2.1 Product Vision: Defined the purpose, target audience, and unique value of SkillsSwap. 2.2 Stakeholders & Users: Listed key stakeholders and their roles. 2.5 Project Scope: Outlined included features (e.g., skill matching, scheduling) and exclusions (e.g., payments). 2.6 System Risks: Highlighted potential risks and mitigation plans. 2.7 Operating Environment: Described the technical setup, tools, platforms, and security measures.
Week 05	Completed: 1.5 Intended Audience
Week 06	Completed: 1.6 Group Agreement
Week 07	Updated: 1.4 Document Purpose, 1.5 Intended Audience
Week 08	Reviewed: 2.1 Problem Statement, 2.2 Stakeholders & Users, 2.5 Project Scope, 2.6 System Risks, and 2.7 Operating Environment
Week 09	Reviewed: 2.1 Problem Statement, 2.2 Stakeholders & Users, 2.5 Project Scope, 2.6 System Risks, and 2.7 Operating Environment
Week 10	Completed: 2.1 Problem Statement, 2.2 Stakeholders & Users, 2.5 Project Scope, 2.6 System Risks, and 2.7 Operating Environment
Week 11	Finalized: 2.1 Problem Statement, 2.2 Stakeholders & Users, 2.5 Project Scope, 2.6 System Risks, and 2.7 Operating Environment
Final Document	Final Document: 2.1 Problem Statement, 2.2 Stakeholders & Users, 2.5 Project Scope, 2.6 System Risks, and 2.7 Operating Environment

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1.3 Document Conventions

For example:

Any text **in red** indicates an exception or error.

Any text **in blue** is in-progress.

Any text highlighted **in yellow** is an important point.

Any text **in green** was recently added.

Any text *italicized* represents definitions.

Any text with ~~strike-through~~ is deleted.

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1.4 Document Purpose

This Business Case Study document outlines the rationale, objectives and strategic plan for the Skill Swap Application, a platform designed to enable skill sharing without monetary exchange. It aims to provide a clear vision of the project, guide decision-making by analyzing market opportunities and risks, define Key requirements, and secure stakeholder buy-in. Additionally, it establishes a roadmap with detailed timeline and budget to ensure the successful development, launch, and post-launch improvement of the app. This document is intended for stakeholders, including investors, development teams, and senior management, to align efforts and ensure the project's success.

1.5 Intended Audience

This document is intended for:

1. **Investors:** Individuals or organizations providing funding for the SkillSwap project. They need to understand the business case, financial projections, and potential return on investment.
2. **Senior Management:** Executives and decision-makers within the organization who will approve the project, allocate resources, and oversee its progress.
3. **Development Team:** Engineers, designers, and developers responsible for building the SkillSwap app. They require detailed technical requirements, timelines, and deliverables.
4. **Marketing Team:** Professionals tasked with promoting the app and driving user adoption. They need insights into the target market, unique selling points, and launch strategy.
5. **Legal and Compliance Teams:** Experts ensuring the app adheres to data privacy, security standards, and other regulatory requirements.
6. **Project Managers:** Individuals overseeing the project's execution, ensuring it stays on track, within budget, and meets deadlines.
7. **End Users (Indirect Audience):** While not directly reading the document, the needs and expectations of potential SkillSwap users are central to the app's design and functionality.
8. **Partners and Collaborators:** External organizations or individuals who may collaborate on the project, such as vendors, consultants, or community groups.
9. **Stakeholders:** Any other internal or external parties with an interest in the project's success, such as advisors, board members, or industry experts.

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1.6 Group Agreement

TEAM AGREEMENT

Team #: Group 4

Project Title: SkillSwap Application

Project Time Frame: 9 months

Team Members:

Diba Makki (Project Leader) : Oversees the project and ensures smooth execution.

Dylan Dioneda (UI/UX Designer) : Designs the app's interface and user experience.

Gia Huy Nguyen (Backend Developer) : Builds the server-side infrastructure and APIs.

Lawrence Wan (Frontend Developer) : Implements the client-side interface and ensures responsiveness.

Anton Zhuravlev (Quality Assurance(QA)) : Tests the app for bugs, performance, and security

Team Leadership:

Diba Makki

Team Functions:

- We will share information through MS Teams, OneDrive, GitHub ,email, and meetings.
- Conduct weekly meetings to track progress and resolve issues.
- Ensure timely communication and task delegation to meet deadlines.

Team Meetings:

- Frequency: Weekly
- Medium: Virtual (MS Teams or Zoom)

Team Problems:

- All issues will be discussed during weekly meetings.
- Escalation of unresolved issues to the project lead.

Team Commitment

The undersigned members agree to work together on the project until the end of the PRJ666 next Semester. They recognize that as a team and individually they are responsible for the quality of all deliverables.

Name

Date

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Gia Huy Nguyen	2025 01-26
Anton Zhuravlev	2025 01-26
Diba Makki	2025 01-26
Dylan Dioneda	2025 01-26
Lawrence Wan	2025 01-26

2- Project Overview

2.1 Project Proposal

Project Background

In today's fast-paced and interconnected world, the demand for skill-sharing and collaborative learning has grown significantly, yet there is no centralized, efficient, and trustworthy platform to facilitate skill exchanges without monetary transactions. Currently, skill-sharing happens informally through word-of-mouth, social media, or local community boards, leading to disorganization, trust issues, and scheduling challenges. SkillSwap aims to address this gap by creating a user-friendly app that connects individuals to exchange skills in a structured, reliable, and community-driven manner. The platform will leverage advancements in technology to offer features like skill verification, secure authentication, and scheduling tools, ensuring a seamless and trustworthy experience. With the rise of collaborative economies and the increased adoption of digital platforms for learning and connection—accelerated by the COVID-19 pandemic—SkillSwap is well-positioned to tap into this untapped market and become a leading solution in the skill-sharing space.

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Problem Statement

The Problem of:	Lack of a centralized, efficient, and trustworthy platform for skill-sharing without monetary exchange.
Affects:	Individuals seeking to learn or share skills, communities, and organizations that could benefit from collaborative learning.
The impact of which is:	Disorganized skill exchanges, lack of trust and verification, scheduling conflicts, and unmet expectations, leading to inefficiency and frustration.
A successful solution would:	Provide a user-friendly, secure, and community-driven platform that enables seamless skill-sharing, ensures skill verification, and facilitates reliable matchmaking and scheduling

Product Vision

For	Individuals and communities seeking to share and learn skills without monetary exchange.
Who	Wants a reliable, efficient, and trustworthy platform for skill-sharing.
The Product Name	SkillSwap
That	Connects users to exchange skills seamlessly, offering features like skill verification, secure authentication, and scheduling tools.
Unlike	Informal skill-sharing methods (e.g., social media, word-of-mouth) that lack structure, trust, and reliability.
Our product	Provides a centralized, user-friendly platform that fosters collaboration, ensures trust, and makes skill-sharing accessible to everyone.

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2.2 Stakeholders and Users

Stakeholder Name/Identifier	Category
CEO (Chief Executive Officer)	Administration, Sponsor
Primary Users	SkillSwap App Users (End Users)
Investors	Angel Investors, Venture Capitalists
Development Team	Developers, Designers, QA Testers
Marketing Team	Marketing Specialist, Social Media Managers
Management	Project Sponsors
Legal and Compliance Team	Legal Advisor, Compliance Officers

2.3 Functional Requirements

Functional Requirements for the project would be to have User Management so that users can log in with accounts that they make using their email and usernames and passwords they think up and any other relevant data like, real name, date of birth, this would also require secure login and authentication. There is also talents that would need to be included as well, a panel that users can go to and edit to show their best foot forward, like some sort of resume that people can scroll through and see when they search for a specific job.

There would also be requirements for better security so users can use the app with total safety, when they are logging in, to ensure no one steals their account, when they talk to other users so that their chats cant be seen by the public eye, but we would also need moderation, so that nothing illegal or morally wrong is happening in the app

2.4 Nonfunctional Requirements

Nonfunctional Requirements for the project would include things along the lines of, performance and scalability, end user experience, cross platform compatibility as well as reliability of the program with things like maintenance and program upkeep as we are still in the planning stages of the program those tasks which would provide quality of life to the users are not yet needed

2.5 Project Scope

The SkillSwap project aims to develop and launch a user-friendly, secure platform that enables individuals to exchange skills without monetary transactions. The app will include key features such as mobile and web compatibility, secure user authentication, skill verification, skill matching, scheduling tools, and community-building features like forums and chat functionality. Additionally, an admin dashboard will be developed for platform management, and comprehensive testing will ensure a bug-free and secure application. The project will culminate in a coordinated app launch supported by a marketing campaign to drive user adoption. The timeline for development is 9 months, with an

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additional 3 months allocated for post-launch improvements, and the total budget is set at \$500,000, covering development, marketing, and contingency expenses.

Certain features and functionalities are explicitly out of scope for this project. These include monetary transactions, advanced AI-driven features, offline functionality, and global expansion. The initial launch will focus on a specific region or market, with scalability in mind for future growth. The project assumes user willingness to adopt the platform, the development team's ability to deliver within budget and timeline, and user trust in the platform's verification and matching systems. Key risks include low user adoption, security vulnerabilities, and potential delays, while constraints include the limited budget, strict timeline, and compliance with data privacy regulations. By defining these boundaries, the project ensures a clear focus on delivering a secure, efficient, and community-driven skill-sharing platform.

2.6 System Risks

Risk	Response
Data privacy and security vulnerabilities could expose user information.	Implement robust encryption, comply with data privacy regulations, and conduct regular security audits.
Delays in backend development could impact the overall project timeline.	Allocate additional resources to backend development and set up frequent progress check-ins to ensure milestones are met.
Low user adoption due to a lack of awareness or trust in the platform.	Launch a targeted marketing campaign, offer incentives for early adopters, and implement a user feedback loop to build trust and improve the platform.
Integration issues between the mobile and web versions of the app.	Use a unified development framework and conduct cross-platform testing to ensure seamless integration.
Skill verification system may be exploited or abused by users.	Implement a multi-step verification process, including user reviews and manual checks for high-risk skills.
Scalability challenges as the user base grows.	Design the app with scalability in mind, using cloud-based infrastructure and load testing to handle increased traffic.

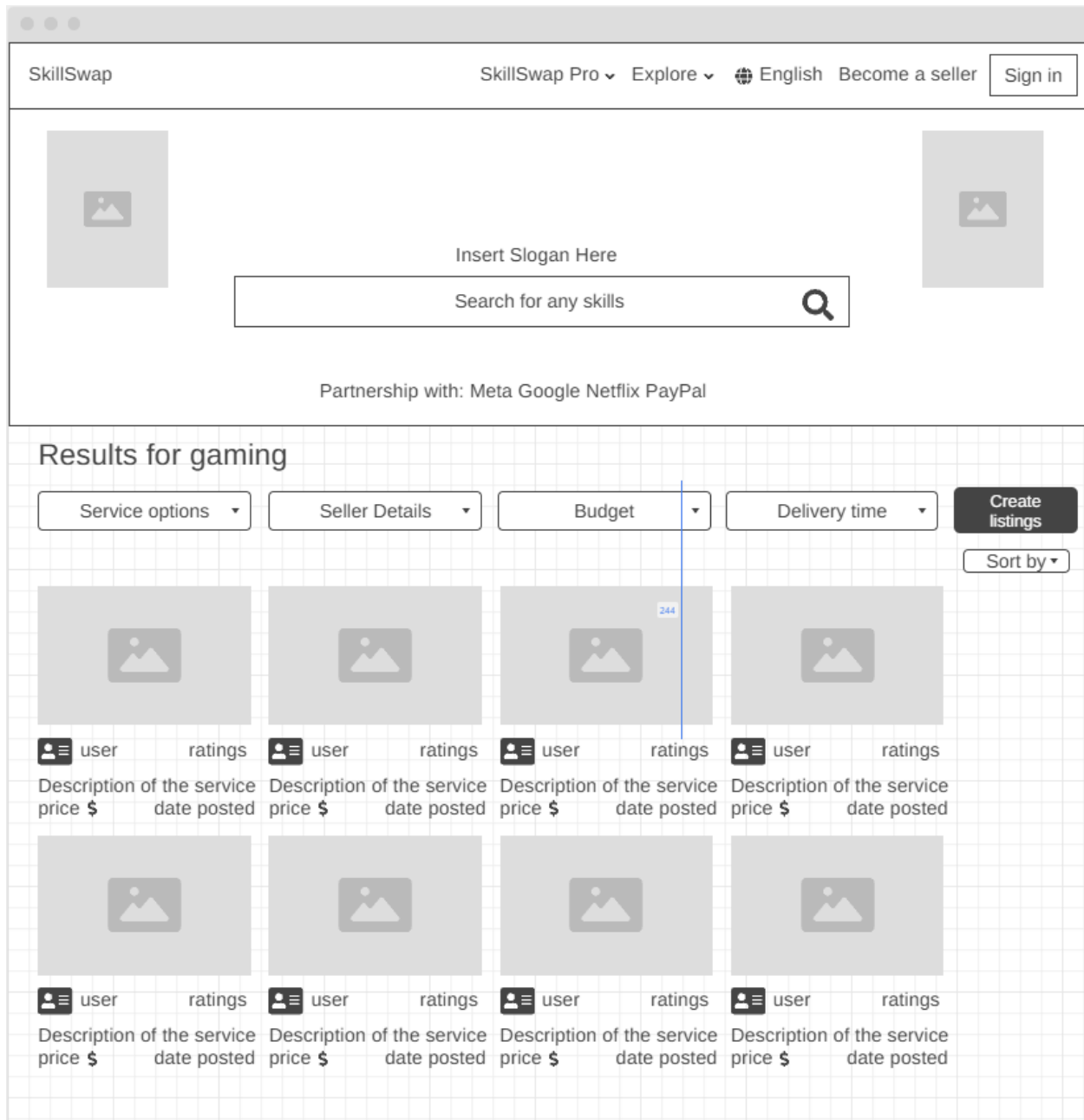
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2.7 Operating Environment

SkillSwap will be built using **React Native** for mobile apps (iOS and Android) and **HTML/CSS** for the web. The backend will use **Node.js** with a **MongoDB** database, hosted on **AWS** or **Google Cloud**. The app will work on **iOS 14+**, **Android 10+**, and modern browsers like Chrome and Safari. It will include **secure login** (OAuth 2.0 and JWT), **data encryption**, and follow **GDPR/CCPA** rules. Testing will ensure the app works well and is secure. After launch, we'll use tools like **New Relic** to monitor performance and fix issues quickly.

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2.8 UI/UXD Interface Mock-ups



URL: <https://wireframe.cc/FWoQuI>

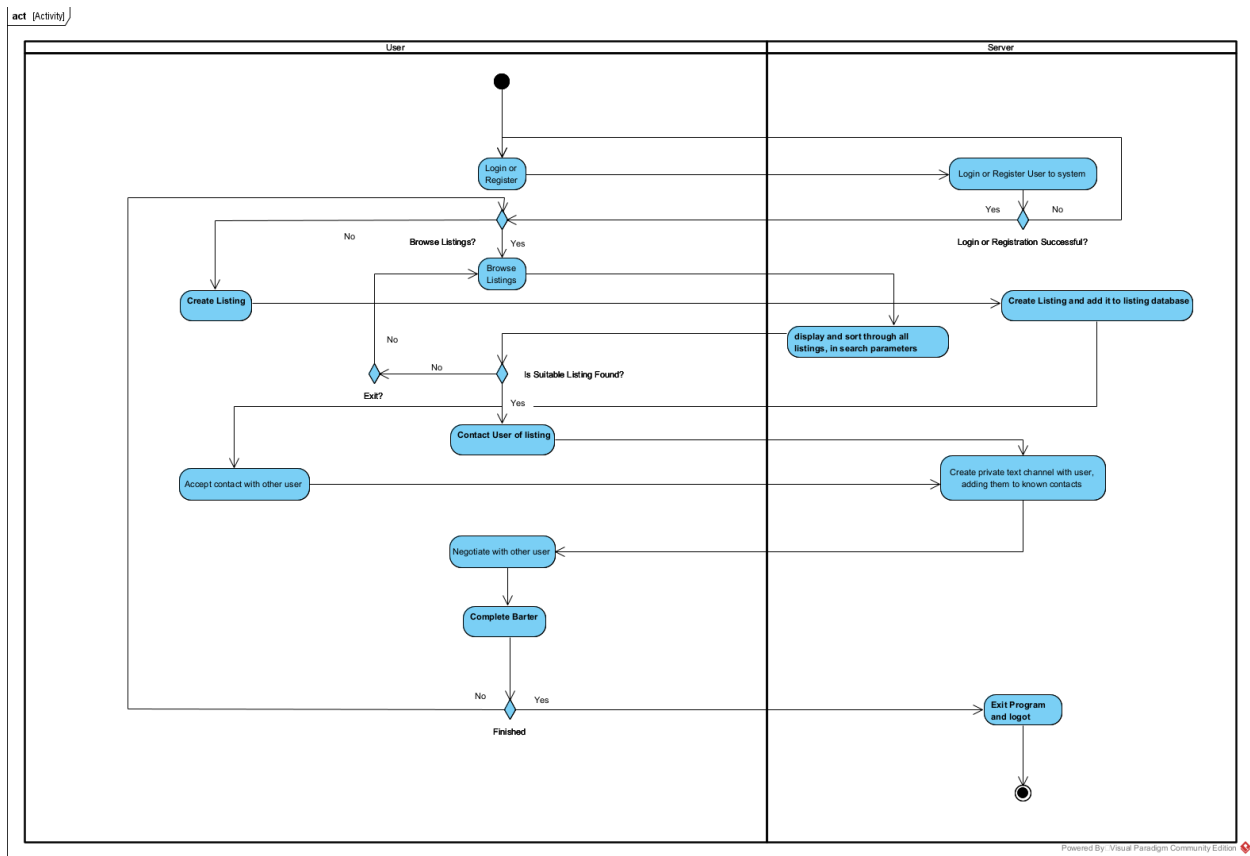
URL: <https://www.figma.com/design/A3oZ3xHZ6Rskrt4lY48Kmb/SkillSwap?node-id=11-6&t=GYbtco1Em1gml8M-1>

3. Process and Data Modeling

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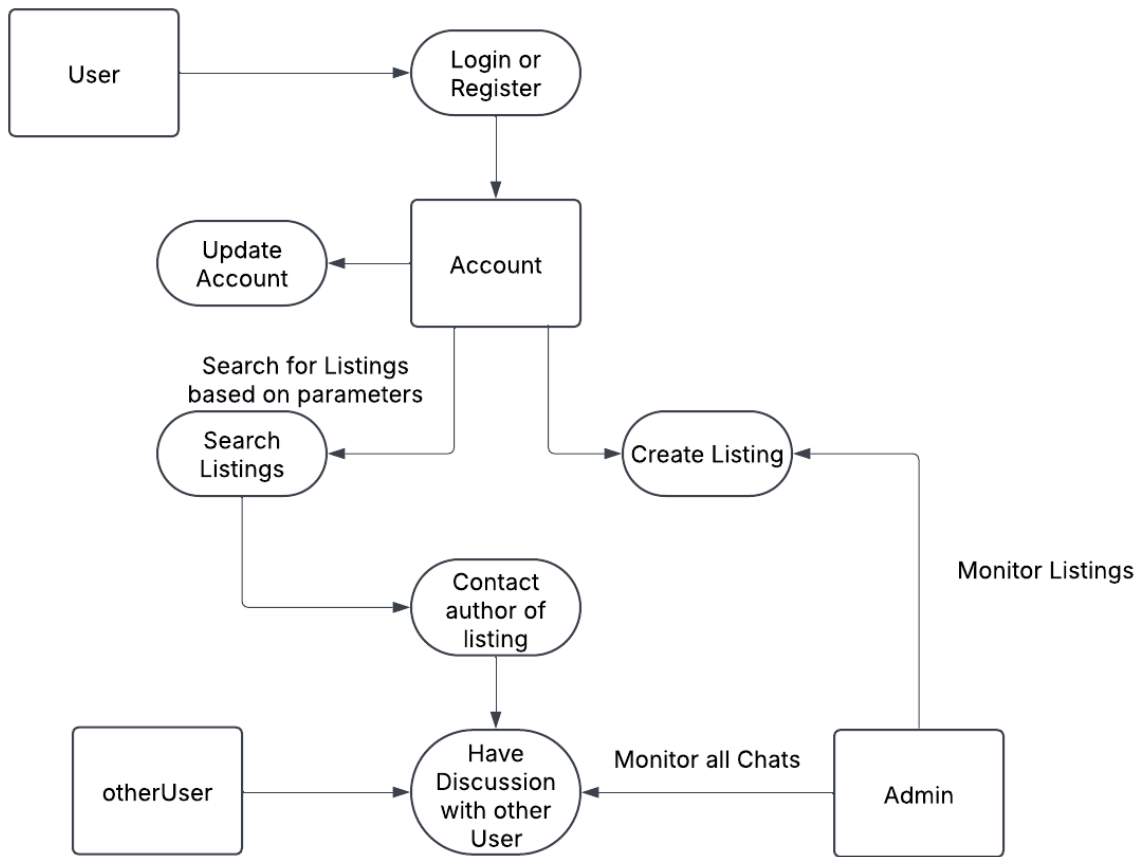
3.1 UML/DFD Modeling and Data Modeling

Activity Diagram



Data Flow Diagram

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3.2 Business Rules

Business Rule Number	Business Rule Description	Related UC
BR01	User must provide a username, email and password to register for the app.	UC01
BR02	Post length can be no longer than 300 characters	UC02
BR03	Password must be at least 8 characters long and include one uppercase letter, one lowercase letter, one number, and one special character.	UC01
BR04	Users must verify their email via a verification link before they can log in.	UC01/UC02
BR05	Users can only edit their own profiles.	UC03
BR06	Each skill post must be categorized under at least one skill type.	UC04
BR07	A user may not post more than 5 skill offers per day.	UC04
BR08	A user can send a maximum of 10 skill match requests per day.	UC05
BR09	Users must confirm a skill exchange within 48 hours of receiving a match, or the request will expire.	UC06
BR10	Both parties must agree on a date and time before a session is scheduled.	UC07
BR11	Users may report inappropriate behavior or content, which will notify moderators.	UC08
BR12	Users with 3 or more verified reports will be temporarily suspended until reviewed.	UC08/UC09
BR13	All private chats are encrypted end-to-end.	UC10

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3.3 Use Case Specifications with corresponding interface mockups: Each use case needs to have the following:

UC01 – User Registration

Business Rules:

BR01, BR03, BR04

Actors:

New User

Preconditions:

User has not registered yet.

Main Flow:

1. User accesses registration form.
2. Enters name, email, password.
3. Clicks “Register”.
4. System validates data.
5. Sends verification email.
6. User clicks verification link.
7. Account is activated.

Postconditions:

User can log in to their new account.

Exceptions:

- Email already in use → error message.
 - Weak password → prompt to fix.
-

UC02 – User Login

Business Rules:

BR03, BR04

Actors:

Registered User

Preconditions:

User must be registered and have a verified account.

Main Flow:

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1. User opens the login screen.
2. Enters email and password.
3. Clicks "Login".
4. System authenticates user.
5. Redirects to dashboard/homepage.

Postconditions:

User is logged into their account.

Exceptions:

- Incorrect credentials → error message.
 - Unverified email → prompt to verify.
-

UC03 – Post Skill

Business Rules:

BR02, BR06, BR07

Actors:

Registered User

Preconditions:

User must be logged in.

Main Flow:

1. User navigates to "Post a Skill" screen.
2. Enters title, description (max 300 characters), selects category.
3. Clicks "Post".
4. System validates content and stores skill in database.
5. Skill becomes publicly viewable in listings.

Postconditions:

Skill is available for matching.

Exceptions:

- Missing required fields → form error.
 - Daily post limit reached → notify user.
-

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UC04 – Request Skill Match

Business Rules:

BR08, BR09

Actors:

Registered User

Preconditions:

User must be logged in and have a completed profile.

Main Flow:

1. User searches for a skill.
2. Selects a skill post and clicks “Request Match”.
3. Confirms request and adds optional message.
4. System logs the request and notifies the other user.
5. Await response.

Postconditions:

Request is pending or accepted/rejected.

Exceptions:

- Request limit reached → block further requests.
- Duplicate request to same skill → prevent repeat.

UC05 – Schedule Session

Business Rules:

BR10

Actors:

Two Matched Users

Preconditions:

Users have accepted a match request.

Main Flow:

1. One user opens the scheduling tool.
2. Proposes a date/time.
3. Other user receives the proposal and confirms or reschedules.
4. Upon mutual agreement, session is finalized and saved.

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Postconditions:

Scheduled session saved and synced to both calendars.

Exceptions:

- Conflict in availability → system prompts alternate options.
-

UC08 – Report User

Business Rules:

BR11, BR12

Actors:

Any Logged-In User

Preconditions:

User is logged in and has interacted with another user.

Main Flow:

1. User navigates to other user's profile or chat.
2. Clicks "Report User" button.
3. Selects a reason and provides a description.
4. Clicks "Submit Report".
5. System logs report, notifies moderator for review.

Postconditions:

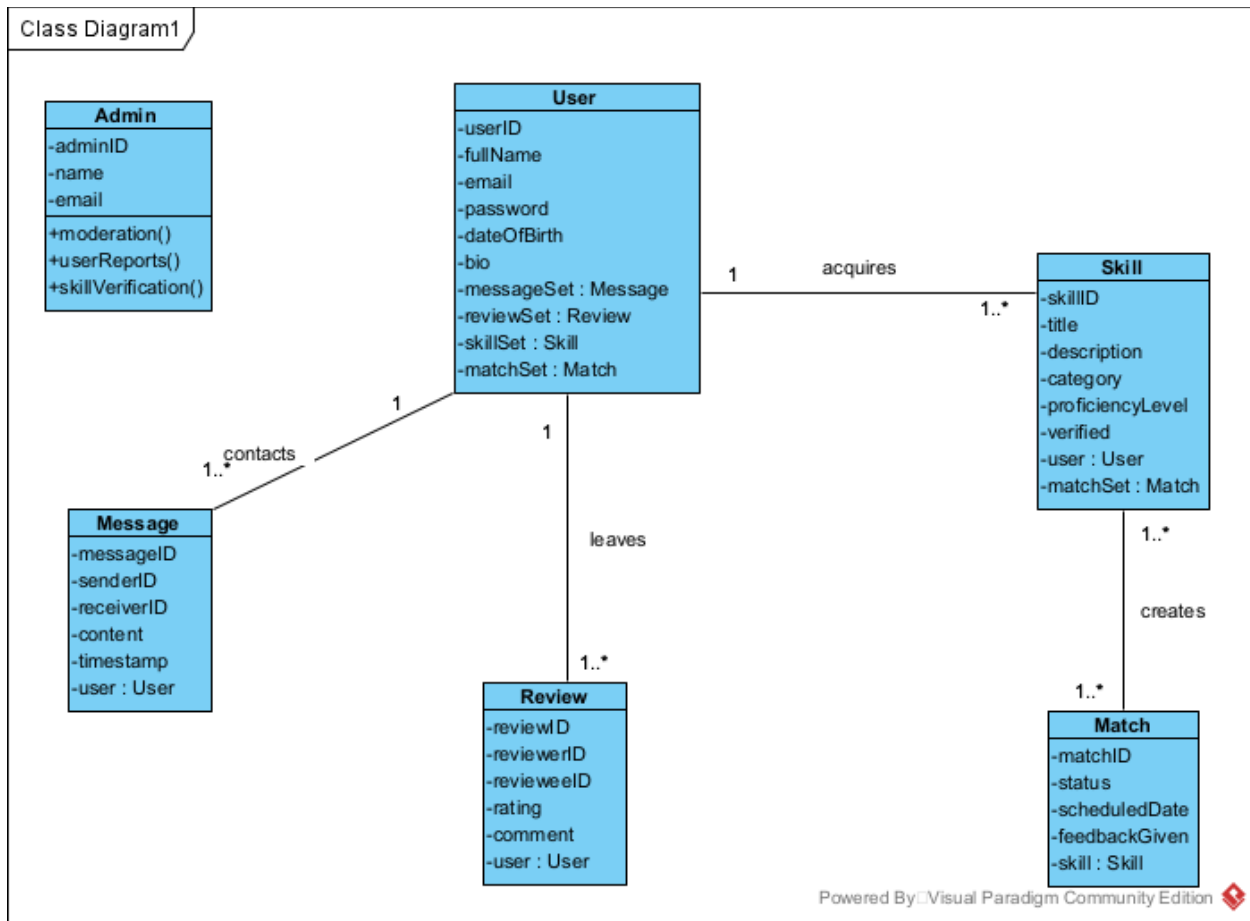
Report is queued for admin action.

Exceptions:

- Duplicate report on same issue → notify user.

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4. Domain Class Diagram



5. Database

MongoDB

Collections:

- users

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- skills
- matches
- messages
- sessions

Sample Document (users)

Json:

```
{
  "_id": ObjectId("..."),
  "name": "John Smith",
  "email": "JohnSmith@example.com",
  "password": "hashed_password_here",
  "verified": true,
  "skills": ["Guitar", "Public Speaking"]
}
```

Data Dictionary

Collection	Field	Type	Description
Users	Name	String	Full name
	email	String	Unique email
	Password	String	Hashed password
	skills	[String]	List of skills
skills	title	String	Name of skill
	description	String	Details about the skill
	owner_id	ObjectId	Linked user

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6. Work Breakdown Structure (WBS)

Task Name ▼	Duration ▼	Start ▼	Finish ▼
▣ Project – SkillSwap Application	300 days	Mon 4/7/25	Fri 5/29/26
▣ Initiation & Planning	20 days	Mon 4/7/25	Fri 5/2/25
Define scope	5 days		
Team setup	7 days		
Stakeholder analysis	8 days		
▣ Requirements & Design	40 days	Fri 5/2/25	Thu 6/26/25
Functional/Non-functional reqs	15 days		
Use case diagrams	10 days		
UI mockups	15 days		
▣ Development	130 days	Thu 6/26/25	Wed 12/24/25
Backend (APIs, DB, authentication)	40 days		
Frontend (web/mobile UI)	40 days		
Chat, Matching, Scheduling	50 days		
▣ Testing	45 days	Wed 12/24/25	Tue 2/24/26
Unit Testing	10 days		
Integration Testing	10 days		
Security Testing	10 days		
User Acceptance Testing	15 days		
▣ Deployment	20 days	Tue 2/24/26	Mon 3/23/26
Hosting	5 days		
App Store Publishing	7 days		
Performance Monitoring	8 days		
▣ Post-Launch	45 days	Mon 3/23/26	Fri 5/22/26
Feedback Integration	15 days		
Maintenance	15 days		
Feature Enhancements	15 days		

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7. Milestones and Acceptance Criteria

Milestone	Definition	Acceptance Criteria
Requirements Finalized	All SRS and mockups approved	Signed-off requirements document
MVP Development Complete	Core features built and functional	Users can register, login, match, message, and schedule
Beta Testing Begins	App released to selected users for feedback	Bugs logged, feedback collected
Final Release	App deployed to stores	No critical bugs, performance meets standards, compliance checks passed
Project Closure	Documentation & sign-off complete	All deliverables submitted, approval received from faculty

8. Implementation Schedule- Product Backlog (Agile-Scrum)

1. User Authentication & Account Management

Epic: Secure Sign-up, Login, and Account Recovery

ID	User Story	Priority	Acceptance Criteria	Dependencies	Effort (SP)

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PB-001	As a user, I want to register with my email and username so I can use the app.	High	Validations for unique email/username, password rules, email verification.	-	5
PB-002	As a user, I want to log in securely to access my account.	High	JWT token-based session; incorrect credentials blocked after 5 tries.	PB-001	3
PB-003	As a user, I want to reset my password via email.	High	Secure password reset token, expiry link, email notification.	PB-001	5

2. Skill Discovery & Browsing

Epic: Browse, Search, and Filter Skills

ID	User Story	Priority	Acceptance Criteria	Dependencies	Effort (SP)
PB-004	As a user, I want to browse a list of skills other users offer.	High	Skill cards with basic info (title, rating, category) shown.	PB-002	5
PB-005	As a user, I want to search skills by name or keyword.	High	Live search with suggestions; relevant results displayed.	PB-004	3
PB-006	As a user, I want to filter skills by category and level.	Medium	Dropdown filters with real-time updates to listings.	PB-004	3

3. Matching and Session Scheduling

Epic: Skill Matching & Availability Booking

ID	User Story	Priority	Acceptance Criteria	Dependencies	Effort (SP)
PB-007	As a user, I want to send match requests to other users based on skill interest.	High	Match request sent; visible in both users' dashboards.	PB-004	5

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PB-008	As a user, I want to accept or reject match requests.	High	Response saved; notification sent to requester.	PB-008	3
PB-009	As a matched user, I want to schedule a session at a mutually convenient time.	High	Integrated calendar; time conflict validation; confirmation prompt.	PB-008	5

4. Messaging System

Epic: Real-Time User Communication

ID	User Story	Priority	Acceptance Criteria	Dependencies	Effort (SP)
PB-010	As a matched user, I want to message my match to coordinate details.	High	Secure chat with timestamps, only available to matched users.	PB-008	5
PB-011	As a user, I want to report inappropriate messages.	High	Report button with automated flagging to admin.	PB-010	3

5. Reviews & Ratings

Epic: Post-Session Feedback

ID	User Story	Priority	Acceptance Criteria	Dependencies	Effort (SP)
PB-012	As a user, I want to leave a review after a completed session.	Medium	Star rating, comment field, once per session.	PB-009	5
PB-013	As a user, I want to view reviews before matching with someone.	Medium	List of past reviews shown on user profile.	PB-012	3

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6. Admin Management

Epic: Moderation and Skill Verification

ID	User Story	Priority	Acceptance Criteria	Dependencies	Effort (SP)
PB-014	As an admin, I want to review flagged messages and take actions.	High	Admin panel with report list and action buttons.	PB-011	5
PB-015	As an admin, I want to verify skill profiles before publishing.	Medium	Verification badge shown only after admin approval.	PB-004	4

7. Notifications & Alerts

Epic: Event-Based Alerts

ID	User Story	Priority	Acceptance Criteria	Dependencies	Effort (SP)
PB-016	As a user, I want to receive notifications for match, schedule, and chat updates.	Medium	In-app and optional email notifications.	PB-007	3
PB-017	As an admin, I want alerts when users are flagged or reported.	Medium	Notification dashboard updates in real-time.	PB-014	3

8. Cross-Platform Experience

Epic: Responsive & Accessible UI

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ID	User Story	Priority	Acceptance Criteria	Dependencies	Effort (SP)
PB-018	As a user, I want a responsive interface that works on mobile and desktop.	High	Consistent layout across screen sizes.	PB-001 PB-017	8

9. Client / Faculty Sign-off

Date: _____

X

Name of Client/Rep/Professor