MixSmart Spec Sheet

The Problem

MixSmart is a new cocktail recipe platform that combines advanced AI-powered generation tools with social sharing features, giving users a creative yet controlled environment to craft, discover, and personalize their favorite drinks. Catering to cocktail enthusiasts (age 21 or above) who value customization and community, MixSmart places each user at the center of their experience. By weaving AI innovation and social discovery into a curated experience, MixSmart empowers cocktail lovers to create, refine, and share recipes in a platform that balances creativity with control—making it the ideal digital companion for everyone from casual sippers to dedicated mixologists.

Key Features

- Comprehensive Cocktail Recipe Management
- AI-Powered Cocktail Recipe Generation
- Seamless BAC Calculation
- Flexible Cocktail Recipe Sharing
- Social Connections & Community
- Local Ingredient Sourcing
- Tailored Recommendations
- Effortless Account Creation & Authentication

Business Requirements

Noun, Verb

- Recipe Management & CRUD
    - Users (noun) can create (verb) new cocktail recipes (noun) with defined attributes (e.g., ingredients, visibility, steps).
    - Users (noun) can read (verb) all their saved recipes (noun) and public recipes (noun) from other users.
    - Users (noun) can update (verb) the ingredients (noun) or other attributes (noun) of their existing recipes (noun).
    - Users (noun) can delete (verb) unwanted or outdated recipes (noun).
- AI-Powered Recipe Generation
    - Users (noun) can submit (verb) preferences (noun) such as base alcohol (noun) and taste profiles (e.g., sweet, sour, bitter) to a Large Language Model (LLM) (noun).
    - The LLM (noun) returns (verb) a recipe (noun) in JSON format, excluding any PKs or FKs.
- Save or Discard Flow
    - After generation, users (noun) choose (verb) to save (verb) the proposed recipe (noun) or discard (verb) it, maintaining (verb) control over their personal recipe list (noun).
- Personal BAC Calculation
    - The system (noun) calculates (verb) a user's estimated Blood Alcohol Concentration (BAC) (noun) per serving of a cocktail recipe (noun) using attributes such as biologicalSex (noun), weightInKg (noun), and the recipe's total alcohol volume (noun) whenever a recipe is viewed (verb).
- Visibility Settings & Access Control

    - Users (noun) can toggle (verb) recipe visibility (noun) between public, private, or friends-only modes.
    - Public recipes (noun) are visible (verb) to everyone, while private recipes (noun) remain hidden (verb) except to their creator.
    - Friends-only recipes (noun) are shared (verb) exclusively with the user's friends (noun).
- Social Features & Community System
    - Users (noun) can add (verb) each other as friends (noun) to form (verb) a more personal network (noun).
    - Friends (noun) can view (verb) each other's friends-only recipes (noun), encouraging (verb) collaborative cocktail discovery.
    - Friends (noun) can direct message (verb) each other.
    - Cocktail recipes (noun) can be liked (verb) and favorited (verb) and receive (verb) comments (noun) from users (noun). Users are notified whenever these interactions take place on their recipes by default.
    - Users (noun) can search (verb) for recipes (noun).
- Local Ingredient Sourcing
    - The system (noun) can retrieve (verb) local purchase options (noun) for each recipe ingredient (noun), using the user's zip code (noun) and an external API (e.g., Perplexity) (noun).
- Recommendations & Similar Recipes
    - MixSmart (noun) can analyze (verb) user preferences (noun), recipe similarity (noun), and friend networks (noun) to suggest (verb) new or relevant recipes (noun).
- Effortless Account Creation & Authentication
    - Users (noun) can register (verb) with a username (noun) and password (noun) without requiring (verb) email or phone input.

    - Users (noun) can opt to add (verb) 2FA (noun) with email and phone number to further protect (verb) their account (noun). Adding 2FA also allows notifications by default.
    - Users (noun) **must** verify (verb) that their age (noun) is 21 or higher with government ID (noun) before their account (noun) can be successfully created (verb).

Extracted Nouns

- Users
- Cocktail recipes
- Attributes
- Ingredients
- Primary key (ID)
- Large Language Model (LLM)
- JSON format
- Preferences (base alcohol, taste profiles)
- Recipe list
- Blood Alcohol Concentration (BAC)
- biologicalSex
- weightInKg
- Total alcohol volume
- Public recipes
- Private recipes
- Friends-only recipes
- Friends
- Personal network
- Local purchase options
- Zip code

- External API (e.g., Perplexity)
- User preferences
- Recipe similarity
- Friend networks
- Username
- Password
- Age
- CRUD
- Government ID
- Add
- Protect
- Account
- 2FA
- Comments
- Friends
- Notifications

Extracted Verbs

- Create
- Read
- Update
- Delete
- Assign
- Prevent
- Belong
- Ensure
- Submit
- Return

- Choose
- Save
- Discard
- Maintain
- Calculate
- Toggle
- Remain (hidden)
- Like
- Favorite
- Add
- Form
- View
- Encourage
- Retrieve
- Analyze
- Suggest
- Register
- Secure
- Require
- Verify
- Receive
- Search

Target Audience

- Adults aged 21+
- Casual cocktail enthusiasts
- Health-conscious mixers
- Professional Mixologists

Rules

- A recipe must have a minimum of 2 ingredients.
- No users below age of 21.
- No notifications without 2FA.
- BAC calculation features only work users that chose to input demographic information.
- AI-generated recipes must be manually saved before they are added to a user's collection.
- Local ingredient sourcing feature will only work for users that chose to input their zip code.

Challenge Questions[1]

- How would you handle version control if users want to track historical changes to their recipes (e.g., reverting to a previous iteration)?
- What safeguards would you implement to ensure AI-generated recipes are safe (e.g., filtering out toxic ingredients) and contextually appropriate?
- How would you help users substitute hard-to-find ingredients identified by the local sourcing API without breaking recipe integrity?
- How would you customize a user's feed based on preferences (doesn't like recipes with combined abv higher than 20%)?
- How would you mitigate legal risks if a user misinterprets BAC estimates and faces health consequences after consuming a recipe?

[1] Generated with the help of Perplexity + DeepSeek-R1-1776

Classes (? = nullable)[2]

Class	Attributes
User	userId, username, password, is2FAEnabled, timeCreated, zipCode?, biologicalSex?, weightInKg?, friends, email?, phoneNumber?, profilePicUrl?
Recipe	creator, title, description?, tasteProfiles?, visibility, timeCreated, timeLastUpdated, steps
RecipeVersion	(... recipe), versionNumber
Ingredient	recipe, name, volumeInMl, abv
Comment	recipe, user, text, timeCreated, timeLastEdited
Like	recipe, user, timeCreated
Favorite	recipe, user, timeCreated
Message	text, attachmentUrls, senderUser, receiverUser, timeCreated, timeLastEdited, isRead
FriendRequest	senderUser, receiverUser, timeCreated, status
Step	
<<enumeration>> BiologicalSex	MALE, FEMALE
<<enumeration>> Visibility	PUBLIC, FRIENDS_ONLY, PRIVATE
<<enumeration>> TasteProfile	BOOZY, SWEET, SALTY, UMAMI, BITTER, HOT, COLD, SOUR, ASTRINGENT
<<enumeration>> FriendRequestStatus	PENDING, ACCEPTED, DECLINED

[2] The contents of this table were generated with the help of o1.

Key Classification Dimensions Ranking

1. Level of Recipe Customization
    - Ranges from Basic (prefers simple AI-generated recipes with minimal tweaking) to Advanced (actively adjusts taste profiles, manually edits ingredients, and closely controls recipe details).
2. Time Commitment & Engagement
    - Spans from Occasional (logs in sporadically to generate or view a new recipe) to Frequent (regularly creating, updating, and sharing recipes, as well as exploring friends' recipes and local sourcing options).
3. Mixology Skill & Confidence
    - Moves from Novice (just starting with cocktails, primarily relies on AI suggestions) to Expert (highly knowledgeable, experiments with complex recipes and advanced techniques).
4. Social Orientation
    - Covers Private (uses MixSmart as a personal recipe archive, rarely interacts) to Communal (actively befriends other users, shares recipes publicly or with friends, and participates in group-driven discovery).
5. Health & Wellness Awareness
    - Goes from Casual (not particularly concerned about BAC or ingredient sourcing) to Health-Conscious (regularly checks BAC estimates, prioritizes mindful alcohol consumption, and may seek low-ABV or zero-proof alternatives).

User Personas

1. Persona 1: Lily – The Casual Sipper
    - Level of Recipe Customization: Basic (relies on AI-generated ideas, rarely tweaks ingredients)
    - Time Commitment & Engagement: Occasional (logs in when hosting a small gathering or trying something new)
    - Mixology Skill & Confidence: Novice (knows only a few classic drinks, wants easy-to-follow instructions)
    - Social Orientation: Private (keeps recipes to herself, rarely shares or friends others)
    - Health & Wellness Awareness: Casual (doesn't pay much attention to BAC estimates or ingredient sourcing)
    - Profile & Backstory:
        - Age: 24, recent graduate living with roommates.
        - Found MixSmart after searching online for quick, simple cocktail ideas.
        - Prefers automated solutions and minimal sign-up steps.
    - Behavior & Motivation:
        - Occasionally generates new cocktail ideas via the LLM, focusing on fun, easy recipes.
        - Saves a couple of favorites for future reference but rarely edits or experiments with them.
        - Likes having an on-demand source of cocktail inspiration without needing deep mixology knowledge.
    - Reason to Use MixSmart:
        - Values the straightforward AI suggestions and the ability to save a recipe "just in case."

    - Enjoys a quick, no-frills approach to discovering new cocktails for casual social nights.

2. Persona 2: Alex – The Social Sampler
    - Level of Recipe Customization: Moderate (sometimes adjusts base alcohol or taste preferences)
    - Time Commitment & Engagement: Moderate (checks MixSmart weekly for new recipes or friend activity)
    - Mixology Skill & Confidence: Beginner-Intermediate (comfortable with standard cocktails, eager to learn)
    - Social Orientation: Communal (adds friends, shares friends-only recipes, enjoys discovering others' creations)
    - Health & Wellness Awareness: Moderate (checks BAC occasionally, but not overly concerned)
    - Profile & Backstory:
        - Age: 30, works in a busy office environment; likes to host casual get-togethers.
        - Found MixSmart through a friend's recommendation for an interactive cocktail app.
        - Uses the app to brainstorm party drink menus and compare notes with friends.
    - Behavior & Motivation:
        - Enjoys browsing public recipes and occasionally tries friends-only cocktails.
        - Leaves comments or "likes" on interesting recipes to share feedback.
        - Exchanges direct messages with friends about new ingredients or trending cocktails.
    - Reason to Use MixSmart:

    - Loves the social aspect: seeing what friends make, swapping tips and recipes.
    - Appreciates moderate personalization without spending too much time on detailed customization.

3. Persona 3: Rowan – The Conscientious Mixer
    - Level of Recipe Customization: Moderate-High (tweaks ABV or selects healthier ingredient swaps)
    - Time Commitment & Engagement: Frequent (logs in multiple times a week to manage recipes and check health stats)
    - Mixology Skill & Confidence: Intermediate (familiar with basic mixology but keen on wellness/low-ABV options)
    - Social Orientation: Balanced (shares with select friends, sometimes sets recipes to public if they align with health-conscious goals)
    - Health & Wellness Awareness: High (relies on BAC estimates, ingredient sourcing, and prefers mindful consumption)
    - Profile & Backstory:
        - Age: 29, fitness enthusiast balancing an active lifestyle with social drinking.
        - Initially discovered MixSmart for healthy cocktail recipes and non-alcoholic mocktails.
        - Values local sourcing for fresh ingredients and enjoys exploring lower ABV or sugar-free variations.
    - Behavior & Motivation:
        - Uses the BAC calculator each time a recipe is viewed to keep track of alcohol intake.
        - Occasionally employs the local sourcing feature to find organic or specialty ingredients.

        - Tends to keep recipes friends-only, sharing them with like-minded acquaintances.
    - Reason to Use MixSmart:
        - Appreciates personalized health metrics and the ability to adapt recipes to personal dietary needs.
        - Finds community support for healthier or low-ABV cocktails.
4. Persona 4: Mia – The Experimental Mixologist
    - Level of Recipe Customization: High (routinely modifies or builds recipes from scratch)
    - Time Commitment & Engagement: High (spends significant time daily exploring, posting, and experimenting)
    - Mixology Skill & Confidence: Expert (comfortable with complex techniques and flavor theory)
    - Social Orientation: Communal (publicly shares recipes, interacts with other enthusiasts, builds a following)
    - Health & Wellness Awareness: Moderate (considers BAC but prioritizes creative expression in cocktail design)
    - Profile & Backstory:
        - Age: 34, professional bartender or beverage consultant aiming to showcase skills.
        - Found MixSmart as a platform to highlight advanced mixology techniques.
        - Leverages the app's social features to attract new clients or fans.
    - Behavior & Motivation:
        - Regularly experiments with AI-generated recipes, then refines them with personal flair.
        - Posts detailed recipe descriptions, encouraging comments and community feedback.

    - Uses direct messaging to network with other expert mixers, occasionally organizes tasting sessions.
- Reason to Use MixSmart:
    - Thrives on creative freedom, advanced ingredient controls, and interactive feedback.
    - Values the app's AI suggestions for inspiration and the social feedback loop to perfect new creations.

User Stories[3]

User Persona	User Story
Lily – The Casual Sipper	• Discovering Quick Recipes: "As Lily (Casual Sipper), I want to generate simple AI-driven cocktail recipes with minimal inputs so that I can easily find a drink for casual get-togethers without spending too much time customizing." • Private Collection: "As Lily, I want to keep my recipes set to private so that I can enjoy my personal collection without sharing them publicly or managing friend lists." • Mindful Awareness: "As Lily, I want to view the approximate BAC when I open a new recipe so that I can maintain a general awareness of how strong each cocktail is."
Alex – The Social Sampler	• Adding Friends & Sharing: "As Alex (Social Sampler), I want to add friends and view their recipes so that I can discover new cocktails and share feedback in a fun social environment." • Engaging with Feedback: "As Alex, I want to like or comment on my friends' recipes so that I can show support and ask questions about interesting flavor combinations." • Moderate Customization: "As Alex, I want to occasionally tweak the base alcohol or taste settings in AI-generated recipes so that I can explore new flavors without diving too deep into advanced mixology." • Recommendations: "As Alex, I want the system to recommend similar recipes or friend-of-friend creations so that I can expand my cocktail horizon and possibly meet new MixSmart users."
Rowan – The Conscientious Mixer	• Local Ingredient Sourcing: "As Rowan, I want to see nearby purchasing options for each ingredient based on my zip code so that I can choose fresh or specialized ingredients for healthier, high-quality cocktails."

[3] User stories were crafted with assistance from o1.

	• Health-Focused Community Interaction: “As Rowan, I want to message like-minded users about ingredient alternatives and mindful consumption so that we can share health-focused cocktail tips and feedback.”
Mia – The Experimental Mixologist	• Advanced Recipe Customization: “As Mia (Experimental Mixologist), I want to deeply refine AI-generated cocktails—adjusting taste profiles, ABV, and specialty ingredients—so that I can develop unique, high-level drinks that showcase my expertise.” • Networking & Collaboration: “As Mia, I want to connect with other advanced users or bartenders, exchanging direct messages with them so that we can collaborate on new creations and share ideas.” • In-Depth Analytics: “As Mia, I want to monitor how many people view, favorite, or comment on my recipes so that I can gauge the popularity of my signature cocktails and adapt my content strategy.” • Ingredient & Flavor Recommendations: “As Mia, I want the system to suggest trending or exotic ingredients based on my existing creations so that I can keep innovating and remain at the cutting edge of cocktail-making.”

UML Diagram[4]

https://lucid.app/lucidchart/004dfd0b-3b14-41e0-9959-1cfc2c77f47a/edit?invitationId=inv_5cd3057b-8dce-4686-86a1-56a751556329

UI Mockups[5]

https://www.figma.com/design/DVjv0IZhI7psUEEVeLe7ZK/MixSmart-UI-Mockups?node-id=0-1&t=rE2CcvRN7MfN6QE7-1

[4] Created with the help of LucidChart AI.
[5] Generated with v0

AI Usage

1.

Perplexity + DeepSeek-R1-1776

Can you generate challenge questions for the MixSmart app described in the attached spec sheet?

- Ignored irrelevant questions.

- Modified/added own questions.

2.

o1-2024-12-17-high

Using the following business requirements for the “MixSmart” app, generate a table of classes and their attributes needed:
…Business Requirements

- Manually deleted unnecessary attributes and added missing ones.

- Manually added Enums.

3.

o1-2024-12-17-high

Using the following user personas for the “MixSmart” app, generate a table of distinct and relevant user stories for each persona:
…User Personas

- Manually deleted duplicate stories.

4.

LucidChart AI

Using the attached Spec Sheet as a guide, generate a UML Class diagram with all the attributes and getters and setters for all the classes described in the table within the document. Make sure all the classes have the appropriate relationships with each other.

- Manually added cardinalities and Enums.

5.

v0.dev

Can you generate a frontend for the "MixSmart" app described in the attached Spec Sheet? Use hardcoded data based on the user personas and stories described in the spec sheet. Ensure to generate a UI component for every single feature described in the spec sheet. You have to make sure that the UI resembles a modern app.

I need you to generate a single page that showcases a single user story. The specific user story you need to build a page for is as follows:

“User Story: …”

Do not add a login/logout/authentication flow. I only want the single page for the specific user story that I have explicitly described in this prompt.

- Manually cleaned up some layout issues and colors.

6.

Cursor Composer + claude-3-5-sonnet-20241022

Can you generate boilerplate including constructors, getters, setters, and documentation for every class inside the classes folder for every interface in the interfaces folder?

- Manually inspected and corrected some method implementations including adding guard clauses for input validation.

7.

Cursor Composer + claude-3-5-sonnet-20241022

Can you generate boilerplate for setting up unit tests and testing suites using Bun for every class inside the classes folder? I need to demonstrate the functionality of all the classes and how they would be used.

- Manually added test implementations.