# SW Engineering CSC648-848 Spring 2025

Team #03

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#### MILESTONES:

M1-V1	March 12th 2025
M1-V2	March 20th 2025
M2	March 25th 2025

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## 1. Executive Summary

San Francisco State University (SFSU) is well known as a commuter school, where many students leave campus immediately after classes, making it difficult to build meaningful connections. This has also affected participation in clubs and other school activities. Additionally, students frequently seek affordable ways to purchase textbooks, electronics, and other essentials for their college journey, but finding a safe and reliable marketplace can be a challenge. Gazaar is our solution to these issues-a centralized online platform designed exclusively for the SFSU community. It will serve as both a social hub and a secure marketplace, allowing students, faculty, and alumni to connect, engage, and support one another.

Through Gazaar, users can buy and sell items within a trusted, university-verified network, protecting them from potential scamming. You will also be able to discover and join events, making it easier to participate in student life, clubs, and activities. Gazaar is tailed to address the unique challenges of a commuter campus. By strengthening the SFSU community we also improve the overall student experience and appear appealing to potential future students.

The Gazaar team is made up of five student developers who want to improve student life at SFSU. We have seen and dealt with the struggles of finding community at a commuter campus firsthand and we are dedicated to building a platform for the SFSU community.

## 2. List of Main Data Items and Entities

#### A) Users:

#### **Description:**

Represents any person who can access the platform. This includes Guest (view only), Registered Students, Faculty/Staff, Alumni, and Admin.

#### **Key Fields (Logical Level):**

- 1. user id (Mandatory) Unique identifier (e.g., integer or UUID).
- 2. fullname (Mandatory) The user's full name (e.g., "Shreya Patel").
- 3. email (Mandatory) Must be an SFSU email for registered users (e.g., user@sfsu.edu).
- 4. password\_hash (Mandatory) Securely stored password (hash only, no plain text).
- 5. user\_type (Mandatory) Enumeration: {student, faculty, alumni, admin}.
- 6. sfsu id (Optional) SFSU ID number for official verification.
- 7. profile\_photo\_url (Optional) URL or path to user's profile picture.
- 8. date\_joined (Mandatory) Timestamp of account creation.

#### **B)** Listings:

#### **Description:**

Items that users want to sell or trade, uniquely identified within the system.

- 1. **listing id** (Mandatory) Unique identifier for the listing.
- 2. **seller\_id** (Mandatory) References the user id of the user who posted the item.
- 3. **title** (Mandatory) Short name of the item (e.g., "Dell 24" Monitor").
- 4. **description** (Optional) Detailed text.
- 5. **price** (Mandatory) Numeric value, or 0 if it's a "free" item.
- 6. category (Mandatory) e.g., Books, Electronics, Dorm Essentials, etc.
- 7. **status** (Mandatory) {available, pending, sold}
- 8. **date listed** (Mandatory) Timestamp when listing was created.
- 9. **last updated** (Optional) Timestamp of last edit.
- 10. **image\_url** or **media** (Optional) Could be a path to an uploaded image or multiple photos.

#### C) Messages:

#### **Description:**

Internal communication between a buyer and seller (or any two registered users).

- 1. message\_id (Mandatory) Unique identifier.
- 2. **sender\_id** (Mandatory) The user id of who sent the message.
- 3. **receiver\_id** (Mandatory) The user\_id of who received the message.
- 4. **listing\_id** (Optional) If the message is about a specific listing, store which one; else null.
- 5. **body\_text** (Mandatory) The text content of the message.
- 6. **timestamp** (Mandatory) When the message was sent.

#### D) Receipts:

#### **Description:**

Represents a record of completed transactions (i.e., final purchase details) for logging purposes.

- 1. receipt\_id (Mandatory) Unique identifier.
- 2. **buyer\_id** (Mandatory) The user\_id of who bought the item.
- 3. **seller\_id** (Mandatory) The user\_id of who sold the item.
- 4. **listing\_id** (Mandatory) Which item was purchased.
- 5. **amount** (Mandatory) Final agreed-upon price.
- 6. transaction\_date (Mandatory) Date/time the sale occurred or was recorded.
- 7. **payment\_status** (Mandatory) {pending, completed, canceled}
- 8. **notes** (Optional) Additional remarks or references (e.g., "met in library lobby").

#### E) Review:

#### **Description:**

Allows a buyer to leave a rating and comment about a seller (or possibly about an event).

- 1. **review\_id** (Mandatory) Unique identifier for the review record.
- 2. reviewer\_id (Mandatory) The user\_id of the buyer/reviewer.
- 3. **subject\_user\_id** (Mandatory) The user\_id of the seller who is being reviewed.
- 4. rating (Mandatory) Integer in [1..5].
- 5. **comment** (Optional) Text with the user's feedback.
- 6. date\_submitted (Mandatory) Timestamp.

#### F) Wishlist:

#### **Description:**

Allows registered users to bookmark or "watch" an item they're interested in.

- 1. wishlist\_id (Mandatory) Unique identifier if needed, or a composite key.
- 2. **user\_id** (Mandatory) Which user created the wishlist entry.
- 3. **listing\_id** (Mandatory) Which item is on the wishlist.
- 4. date\_added (Mandatory) Timestamp of when user added the listing.
- 5. **notification\_pref** (Optional) Indicates if the user wants an alert if the price changes or item status changes.

#### G) Events

#### **Description:**

SFSU clubs can post event listings. Different from sale listings, but shares some structure.

- 1. event\_id (Mandatory) Unique ID.
- 2. organizer\_id (Mandatory) Typically references a user (club leader or staff).
- 3. **title** (Mandatory) Name of the event.
- 4. **description** (Optional) Text describing the event.
- 5. **location** (Mandatory) Possibly references an on-campus building or address.
- 6. event\_date\_time (Mandatory) When the event will happen.
- 7. max\_capacity (Optional) If needed for ticketing or RSVP.
- 8. **category** (Optional) If you group events by type (club, sports, social, etc.).

## H) Categories:

- 1. **category\_id** (Mandatory) Unique ID for each category.
- 2. **category\_name** (Manda tory) e.g. "Electronics," "Books."
- 3. **description** (Optional) Additional detail or rules about that category.

## 3. Functional Requirements

• Priority 1 (Must Have)

#### **Unregistered User**

- 1. (Req #1) Public Access
- Unregistered users shall view a public homepage with minimal site details.
- 2. (Req #2) View Basic Item Info
- Webpages shall display high-level information (title, price, short description).
- 3. (Req #3) Keyword Search
- All users can run a simple keyword search to find items.
- 4. (Req #5) Create Account
- SFSU members can sign up using an "@sfsu.edu" email to access full marketplace functionality.
- 5. (Req #6) Display Disclaimer
- All pages shall display the text:
- "SFSU Software Engineering Project CSC 648-848, Spring 2025. For Demonstration Only."

#### Registered User (Students, Faculty, Alumni)

- 7. (Reg #7) Registered User Access
- Can create a "sell" page, post/edit listings, message sellers, and manage items.
- 8. (Reg #8) Internal Messaging

• Registered users can communicate via in-site messaging (no external email).

#### 9. (Req #10) Review & Rating

• Buyers can leave 1–5 star ratings and optional text reviews for sellers.

#### Administrator

#### 14. (Req #14) Admin Authorization

• All listings require an admin's approval before going live to the public.

#### SFSU-Specific (Unique)

#### 19. (Req #19) Campus Event Listings

• Provide a special "SFSU Clubs & Events" section for on-campus events/tickets.

#### • Priority 2 (Desired)

#### **Unregistered User**

#### 4. (Req #4) Category-Based Filtering

• All users can filter items by category (Books, Electronics, etc.).

#### **Registered User**

#### 9. (Req #9) Wishlist Feature

 Registered users can save interesting items; receive notifications if new postings match criteria.

#### 10. (Req #11) Personal Profile Page

• Registered users can see their active listings and basic profile info on a personal page.

#### 12. (Req #12) Refined Search & Filters

• Registered users can refine searches using multiple filters (location, price range).

#### 13. (Req #13) Second-Hand Item Compliance

• Sellers confirm that all listed items are pre-owned, in line with SFSU's "second-hand only" rule.

#### Administrator

#### 15. (Req #15) Approve or Reject Listings

• Admins can approve or reject new listings, optionally providing feedback to the user.

#### 18. (Req #18) Category Management

• Admins can create, rename, or remove listing categories to keep the site organized.

#### SFSU-Specific (Unique)

#### 20. (Req #20) SFSU Campus Map

• Pages display an interactive SFSU campus map so users can identify on-campus meetup points.

#### **Priority 3 (Opportunistic / "Nice to Have")**

#### **Administrator**

#### 16. (Req #16) Remove Listings or Ban Users

Admins can remove listings or ban users who violate rules.

#### 17. (Req #17) Message & Activity Logs

• Admins can view user messages (read-only) to help with dispute resolution.

## 4. UI Storyboards for Each Main Use Case

#### **User Types:**

#### **Involved Students:**

ITEM NAME

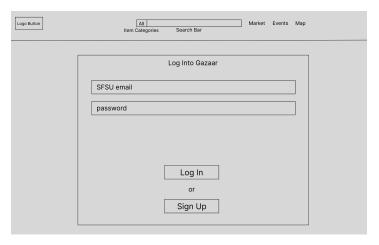
\*\*\*\*

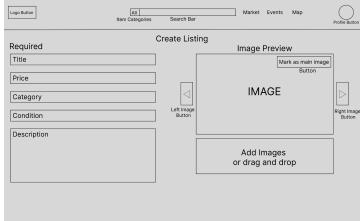
Functions: Registration, Login, Wishlist, Review & Rating

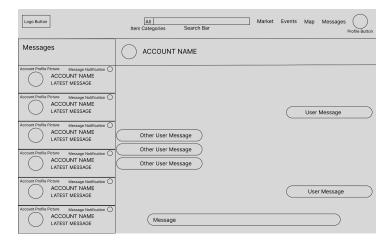


#### **Professors:**

### Functions: Registration, Login, Item Listing, Messaging

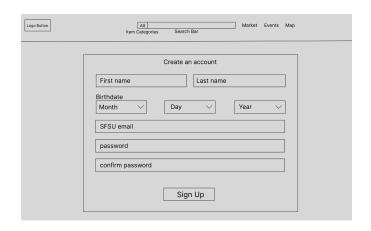




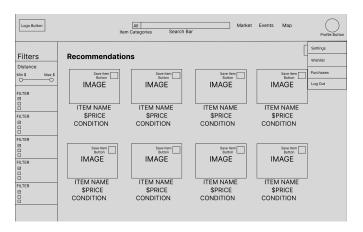


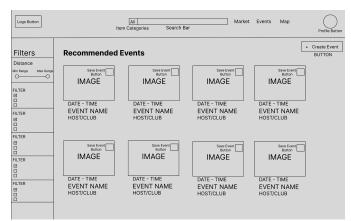
#### **New Student:**

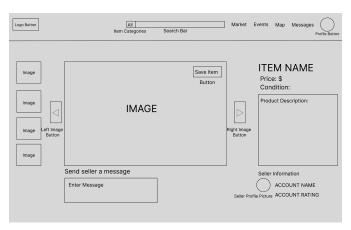
#### Functions: Registration, Login, Filters, Messaging, Events

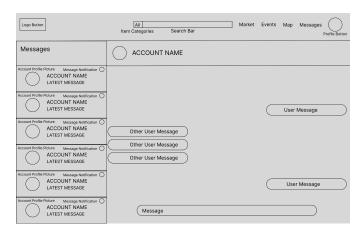










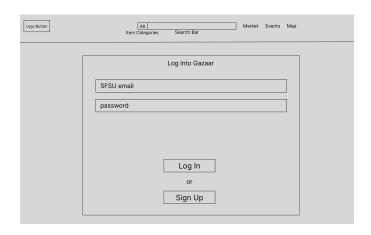


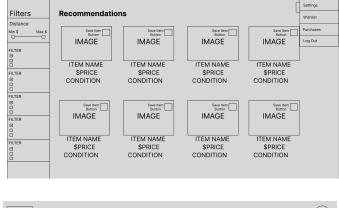
Market Events Map

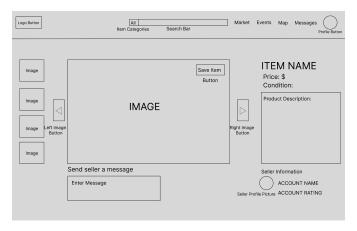
#### Alumni:

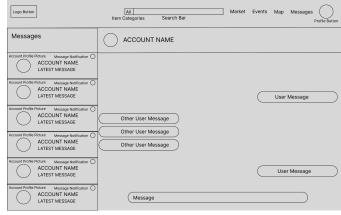
### Function: Login, Messaging

Logo Button



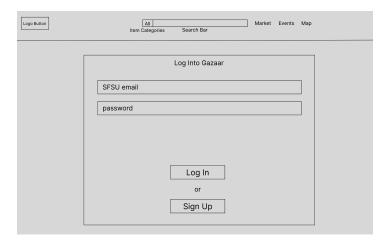


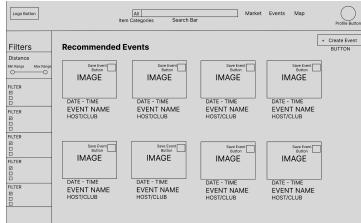


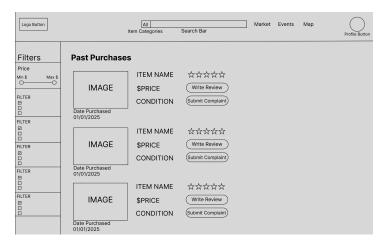


#### **Commuter:**

### Function: Login, Events, Messaging, Rating & Reviews







#### **Data Items:**

Users: Stores the user profile, including name, email, SFSU ID, and user type(Student, faculty, alumni). Maintains the passwords and account settings.

Listings: Items for sale(Listing ID, Title, Description, Price, Category) Status is Required(Available, Pending or Sold) Date Listed and Last Updated.

Messages: Communication between Buyers and sellers about listings. Which includes Timestamps, sender/receiver details and message body. Messages are stored for Transaction tracking.

Receipt: Captures purchase details(buyers, seller, item, date, amount).

Tracks payment status( Pending, Completed, Canceled).

Review: Allows buyers to give the feedback based on the past transactions. Stores ratings(1-5) and review comments.

Wishlist: Allows users to save items they are interested in. They can be accessed later for quick purchase.

## 5. High level Architecture, Database Organization Summary Only

#### **Database Organization:**

#### **Registered Users**

Stores all the details of the registered users in the marketplace.

Attribute	Description	Туре	Mandatory
user_id	Unique identifier for each user	INT	Yes
username	User's display name	VARCHAR(50)	Yes
email	User's email (must be unique)	VARCHAR(100)	Yes
password	Encrypted password	VARCHAR(255)	Yes
user_type	Defines role: Buyer, Seller, Admin	ENUM	Yes
phone_number	User's contact number	VARCHAR(12)	No
registration_date	Date when user registered	TIMESTAMP	Yes
profile_picture	Link to user's profile image	VARCHAR(255)	No
status	Available,Pending or Sold	ENUM	Yes

#### Listings

Stores all items available for sale.

Attribute	Description	Туре	Mandatory
listing_id	Unique identifier for each listing	INT	Yes
seller_id	User ID of the seller	INT (FK → users)	Yes
title	Item name/title	VARCHAR(100)	Yes
description	Detailed item description	TEXT	Yes
category_id	Category classification	INT (FK → categories)	Yes
price	Sale price	DECIMAL(10,2)	Yes
condition	New, Like New, Used, etc.	ENUM	Yes
image_urls	Links to images	JSON	No
post_date	Date when listed	TIMESTAMP	Yes
status	Available, Sold, Removed	ENUM	Yes

## Categories

Defines item categories for structured browsing.

Attribute	Description	Туре	Mandatory
category_id	Unique category identifier	INT	Yes
category_name	Name of the category	VARCHAR(50)	Yes

#### **Transactions**

Records all completed sales between buyers and sellers.

Attribute	Description	Туре	Mandatory
transaction_id	Unique transaction identifier	INT	Yes
buyer_id	ID of the buyer	INT (FK → users)	Yes
seller_id	ID of the seller	INT (FK → users)	Yes
listing_id	Purchased item ID	INT (FK → listings)	Yes
transaction_date	Date of purchase	TIMESTAMP	Yes
payment_method	Cash, PayPal, Venmo, etc.	ENUM	Yes
status	Completed, Pending, Cancelled	ENUM	Yes

## Messages

Stores direct messages between users.

Attribute	Description	Туре	Mandatory
message_id	Unique identifier for each message	INT	Yes
sender_id	User ID of sender	INT (FK → users)	Yes
receiver_id	User ID of receiver	INT (FK → users)	Yes
content	Message text	TEXT	Yes
timestamp	When the message was sent	TIMESTAMP	Yes
status	Read, Unread	ENUM	Yes

#### **WishList**

Users can save their listings for later.

Attribute	Description	Туре	Mandatory
favorite_id	Unique favorite identifier	INT	Yes
user_id	User who saved the listing	INT (FK → users)	Yes
listing_id	Favorited listing ID	INT (FK → listings)	Yes
added_date	When it was added	TIMESTAMP	Yes

#### **Reviews & Ratings**

Buyers can leave feedback for sellers

Attribute	Description	Туре	Mandatory
review_id	Unique review identifier	INT	Yes
buyer_id	User ID of reviewer	INT (FK → users)	Yes
seller_id	User ID being reviewed	INT (FK → users)	Yes
rating	Score (1-5)	INT	Yes
review_text	Review content	TEXT	No
review_date	When it was posted	TIMESTAMP	Yes

#### **Media Storage**

- **Decision:** Images will be stored as URLs in the database, with files hosted in cloud storage (AWS S3 or Firebase Storage).
- Reason: Avoids large DB sizes, improves retrieval speed, and simplifies backups.
- **Special Data Formats:** No BLOBs; videos, images, and files will be referenced via external storage links.

### **Search and Filtering Architecture**

• **Search Algorithm:** SQL query using %LIKE% for keyword searches.

#### • Searchable Fields:

- o title (Items table)
- description (Items table)
- o category (Categories table)

#### • Filtering Options:

- Category-Based: Users can filter by category\_id.
- Price Range: BETWEEN min\_price AND max\_price.
- Availability: Filter by status = 'Available'.

#### • Implementation:

- Backend: SQL Query with %LIKE% and indexed search.
- o Frontend: User selects filters via dropdown or search bar.

## 6. Identify Actual Key Risks for Your Project at this Time

#### 1. Skills Risks

**Risk:** The team has limited expertise in MySQL database optimization, implementing search filters, and integrating cloud-based media storage solutions.

**Resolution:** Address this by studying best practices, leveraging online tutorials, and seeking advice from experienced peers or instructors.

#### 2. Schedule Risks

**Risk:** Meeting Milestone 2 deadlines while managing coursework and tutoring responsibilities may be challenging.

**Resolution:** Focus on essential features, adhere to a structured timeline, and utilize project management tools like Trello to stay organized.

#### 3. Technical Risks

**Risk:** Potential difficulties in integrating AWS S3 or Firebase for media storage, as well as ensuring smooth communication between the frontend and backend.

**Resolution:** Conduct small-scale trials, refer to official documentation, and seek assistance from developer communities if necessary.

#### 4. Teamwork Risks

**Risk:** Possible misalignment between frontend and backend teams, leading to inconsistencies in API endpoints and UI integration.

**Resolution:** Implement regular team meetings, maintain clear API documentation, and use a shared GitHub repository with a well-structured branching strategy.

#### 5. Legal/Content Risks

**Risk:** Ensuring that all third-party libraries and frameworks comply with licensing and copyright regulations.

**Resolution:** Verify the licenses of all external resources before implementation, prioritize widely accepted open-source solutions, and avoid unauthorized proprietary software.

## 7. Project Management

For Milestone 2 and future tasks, we are implementing a structured task management approach to ensure smooth development and timely delivery. Each task is assigned to a specific team member with clear responsibilities and deadlines, with regular follow-ups to track progress. A mid-point checkpoint is scheduled for each task to identify and address potential issues before the final deadline.

To maintain efficiency, the front-end and back-end teams will work independently while collaborating on common API interfaces. Regular sync-up meetings will ensure alignment, preventing integration issues later in development.

For task management, we will use Trello, providing a centralized dashboard where all tasks, assignments, and deadlines are visible to the entire team. Tasks will be categorized into To Do, In Progress, and Completed, enabling real-time tracking. GitHub will be used for version control and collaboration, ensuring organized code contributions and avoiding conflicts. Additionally, Slack or Discord will be used for instant communication to discuss blockers and updates efficiently.

## 8. Use of GenAl tools like ChatGPT and Copilot

GenAl Tool: OpenAl ChatGPT

Version: GPT 4.0

Tasks:

Grammar Checking and Paraphrasing for Executive Summary

Usefulness: HIGH

- Using GPT 4.0 to check for grammatical errors and to fix any phrasing/clarity issues was very helpful. It took the paragraph I had written, fixed any of the grammar issues I had and offered ways to rephrase or rewrite my sentences so that they had more impact. I found it difficult to write about the project in marketing buzz words, so the use of ai helped to make the project seem more appealing.
- **Prompt**: Help me to check this paragraphs grammar and phrasing and make sure it matches these given requirements. Executive Summary: Short description of the final product/application and its key advantages, novelty, value (up to 1 page). Make it as an executive summary to be readable to broad and not just technical audience – think also of answering the question of why we should fund this project. We suggest you assign a name to your project for easier reference and good "marketing". This summary should be readable to a general manger/executive that is not a CS specialist and is used to explain and also to advertise/promote your project. Typical outline is: one paragraph on the motivation and importance of the application you are developing, followed by a paragraph on what functions and services your application will be providing and how it helps the users (high level only, no jargon). You also must say what is unique and custom for SFSU in your design. At the end say in one paragraph something about your team (e.g. about your student startup team...). (BTW ChatGPT may help here BUT be careful not to use meaningless fluff written in perfect English, a common error in blindly using ChatGPT or likes).

#### • Finding websites based on Craigslist and persona

o **Usefulness**: MEDIUM

o **Prompt**:

- 1: Find some websites that we can do a competitive analysis on. Give this pdf
- 2: I am looking for something closer to craigslist

## 9. Team Lead Checklist

$\checkmark$	So far, all team members are fully engaged and attending team sessions when
	required.
$\checkmark$	Team ready and able to use the chosen back and front end frameworks and those who need to learn are working on learning and practicing.
$\checkmark$	Team reviewed suggested resources before drafting Milestone 2
$\checkmark$	Team lead checked Milestone 2 document for quality, completeness, formatting and compliance with instructions before the submission.
$\checkmark$	Team lead ensured that all team members read the final Milestone 2 document and agree/understand it before submission
$\checkmark$	Team shared and discussed experience with GenAl tools among themselves.