"SW Engineering CSC648-848 Spring 2025"
Gator Savvy

Team 5

Yu-Ming Chen (Team Lead) - ychen88@sfsu.edu

David Cabanela (GitHub Master) - dcabanel@mail.sfsu.edu

David (Jun) Chang (Backend Lead) - dchang6@mail.sfsu.edu

Alexis Perez (Frontend Lead) - aperez75@sfsu.edu

Athan Cheung (Frontend) - acheung4@mail.sfsu.edu

Milestone 2

History

	Date Submitted	Date Revised
Milestone 2 class time		3/17/2025
Milestone 2 meetup		3/19/2025
Milestone 2 meetup		3/22/2025
Milestone 2 part 1 meetup		3/24/2025
Milestone 2 part 1 meetup	3/25/2025	3/25/2025
DUE!!!	4/2/2025	

Table of Contents

1. <u>Executive summary</u>

Project Name: Gator Savvy

Students often struggle to make ends meet in today's fast-paced world while balancing their academic responsibilities. The rising cost of living, textbooks, and everyday essentials can leave students searching for affordable options. Gator Savvy aims to solve this problem by creating a dedicated online marketplace that connects SFSU students with exclusive discounts and deals from campus services, student organizations, and university-affiliated vendors. By centralizing these offers, Gator Savvy ensures that students can access the discounts they need, all in one place.

Gator Savvy will function as a one-stop shop for students looking for deals on everything from food, clothing, and tech gadgets to textbooks, transportation, and entertainment. Students can access various verified, time-sensitive discounts through an intuitive website. The platform will also include features like personalized recommendations based on location and student preferences and a user-friendly interface that allows businesses to update and offer new promotions easily. Using Gator Savvy, students can save money on the products and services they need most, while businesses gain access to a loyal and targeted customer base.

What makes Gator Savvy unique is its specific focus on the student experience. Unlike other general coupon sites, Gator Savvy is designed exclusively for the student community, ensuring that all deals are relevant and beneficial to students' everyday needs. Additionally, the platform will partner with local San Francisco businesses and offer exclusive, campus-specific discounts that students can't find elsewhere. This personalized approach to discounts and its seamless integration with campus events and student life ensures that Gator Savvy stands out as a vital tool for SFSU students.

Our startup team comprises driven SFSU students who understand the challenges of managing finances during school. We are a group of passionate individuals with tech, marketing, and business development backgrounds. We are committed to creating a marketplace that saves students money and strengthens the relationship between SFSU and the local community. Funding this project will allow us to refine the platform, expand our reach, and ensure that Gator Savvy becomes a must-have resource for students looking to make the most of their time at SFSU.

2. List of main data items and entities

Users & Roles:

Registered User

The verified user shall interact with the entirety of the website and have access to student deals.

For a user to be verified, they must have an SFSU email. Registered users shall also trade or donate items.

- View, search, and purchase items.
- Like and review items.
- Update their profiles.
- Make posts and sell items.
- Give a listed item the option to rent.
- shall access special offers
- Message sellers.

Guest User

Common user with limited access. This provides a preview for our app.

- View and search events and items.
- Read reviews.
- Shall navigate to any section that does not require signing up.

Key entities:

Profile

Stores the registered user's information and preferences.

- Username
- Full name
- SFSU Email
- SFSU ID
- Preferences(categories)
- Liked/Wishlisted items
- Verification Badge (if any)
- Seller's Rating & Reviews/Comments
- Items list (if any)
  - For sale
  - Sold

Item Listing

This listing provides a full description of everything you need to know about an item. Registered users can also message the sellers from this listing.

- Item Name
- Description
- Pictures
- Videos (if any)
- Price
- Category (can be multiple)
- Reviews
- Quality description (new, near mint, etc.)
- Location
- Rental (if provided by Seller)

Verification Badge

A "verified" badge icon, visible on a Registered User's profile, indicates that they are a more reliable/trusted seller. Users with little to no sales will not have a badge.

- Badge Type

Category

Used to categorize items for our website. Example categories: textbooks, furniture, electronics, clothing, etc.

- Category Name

Shopping Cart

Used to store information about the items a user intends to purchase. It holds the user's selected items and their details until the user is ready to proceed with the checkout process.

- Item Name
- Price
- Quantity

3. <u>Functional Requirements - prioritized</u>

- **Priority 1 (Must-have)**
  - Guest user
    - Shall search and view items
  - Registered user
    - Must register with an SFSU email to be registered
    - Shall post items for sale or rent
    - Shall search and filter listings by category, price, etc.
    - Shall opt for a verification badge to build credibility
    - Shall create a profile with a username and profile picture
  - Admin
    - Shall manage and verify users
    - Shall approve or remove item listings

- **Priority 2 (Desired)**
  - Guest user
    - None
  - Registered user
    - Shall search and filter items by location
    - Shall save items, and save history
  - Admin
    - Secure access for deal management and analytics
    - Shall monitor reports on flagged content

- **Priority 3 (Opportunistic)**
  - Guest user
    - Shall read reviews of items and sellers
    - Receive promotional emails if subscribed
  - Registered user
    - In-app messaging
    - Implement Google Maps for geo-location-based searches
    - Profiles shall have preferences and reviews
  - Admin
    - Advanced analytics on user engagement or items

4. UI Storyboards for each main use case (low-fidelity B&W wire diagrams only).

StoryBoard - Use case 1

Sophia (Persona 1) is looking for cheaper ways to get some tools for class. She logs into Gator Savvy using her school email and searches for exclusive deals on school supplies and groceries.
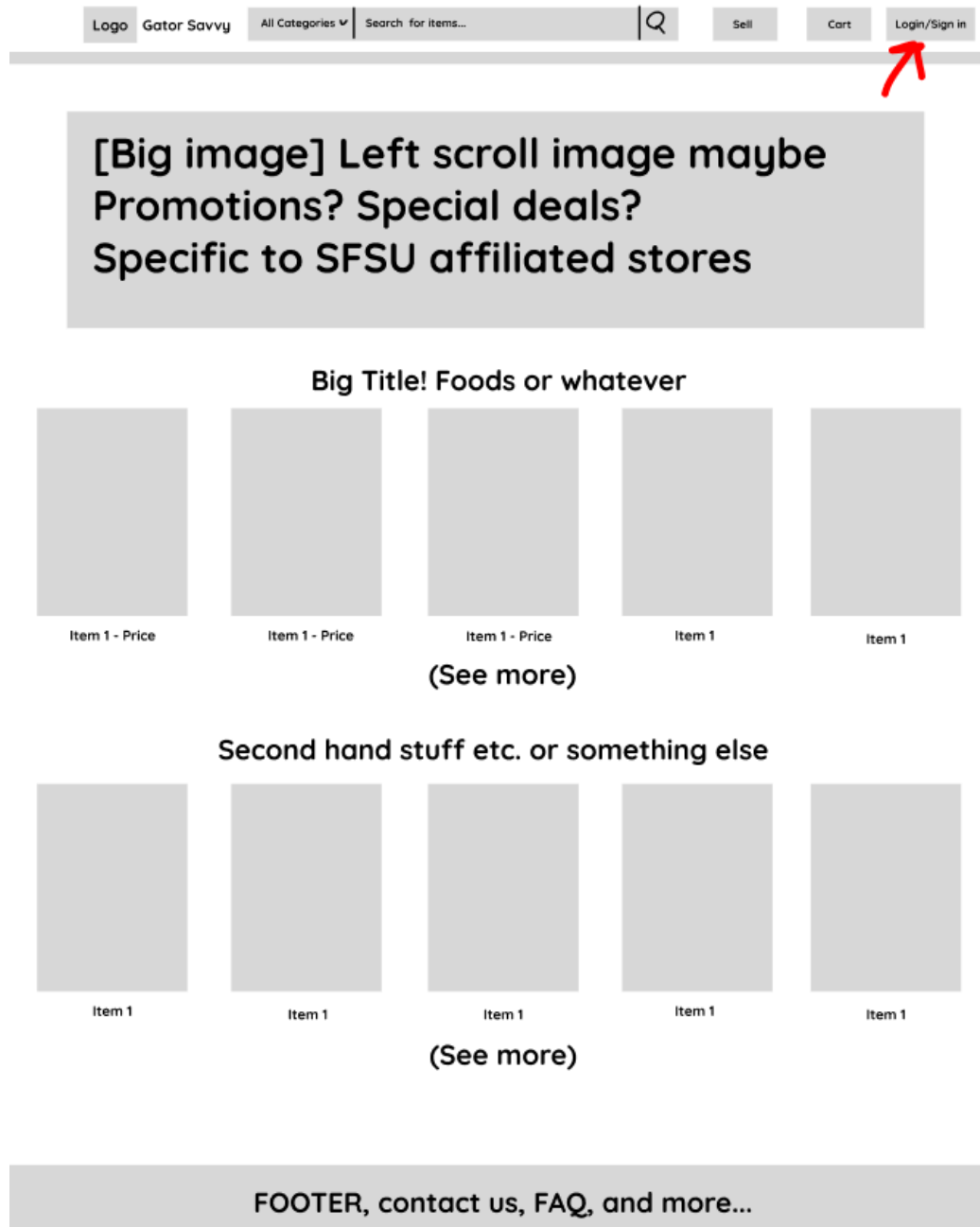
Sophia is on the homepage and clicks the login/signup button and is redirected to login.

Logo   Gator Savvy

Sign in

SFSU email

Password

Login

Forgot password

Don't have an account

FOOTER, contact us, FAQ, and more...

Sophia fills in her account information and hits login which then redirects back home.
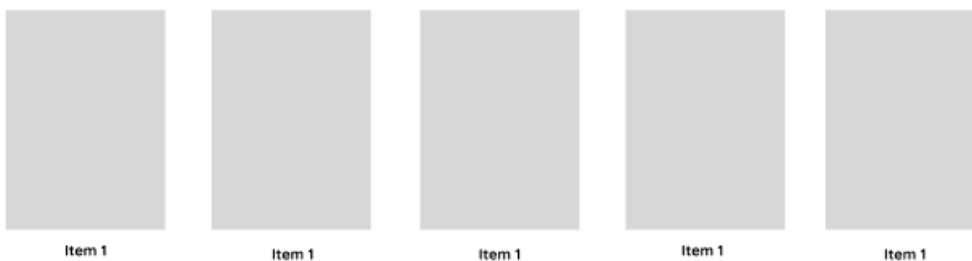
Logo Gator Savvy   All Categories ⌄ | Search for items...   🔍   Sell   Cart   Username

[Big image] Left scroll image maybe
Promotions? Special deals?
Specific to SFSU affiliated stores

Big Title! Foods or whatever

Item 1 - Price   Item 1 - Price   Item 1 - Price   Item 1   Item 1

(See more)

Second hand stuff etc. or something else

Item 1   Item 1   Item 1   Item 1   Item 1

(See more)

FOOTER, contact us, FAQ, and more...

Sophia hits the drop-down menu where the search bar is to access any relevant filters.
Specifically the exclusive deals (made for students)

Logo Gator Savvy   All Categories ⌄ | Search for items...   🔍   Sell   Cart   Username

X Exclusive deals
☐ Furniture
X School Supplies
☐ Textbooks
☐ Electronics
X Groceries

[Big ima ... eft scroll image maybe
Promoti ... Special deals?
Specific to SFSU affiliated stores

Big Title! Foods or whatever

Item 1 - Price   Item 1 - Price   Item 1 - Price   Item 1   Item 1

(See more)

Second hand stuff etc. or something else

Item 1   Item 1   Item 1   Item 1   Item 1

(See more)

FOOTER, contact us, FAQ, and more...

Once ready the clicks search button to bring up a list of items.

All Categories ▾ | Search for items... | 🔍   Sell   Cart   Username

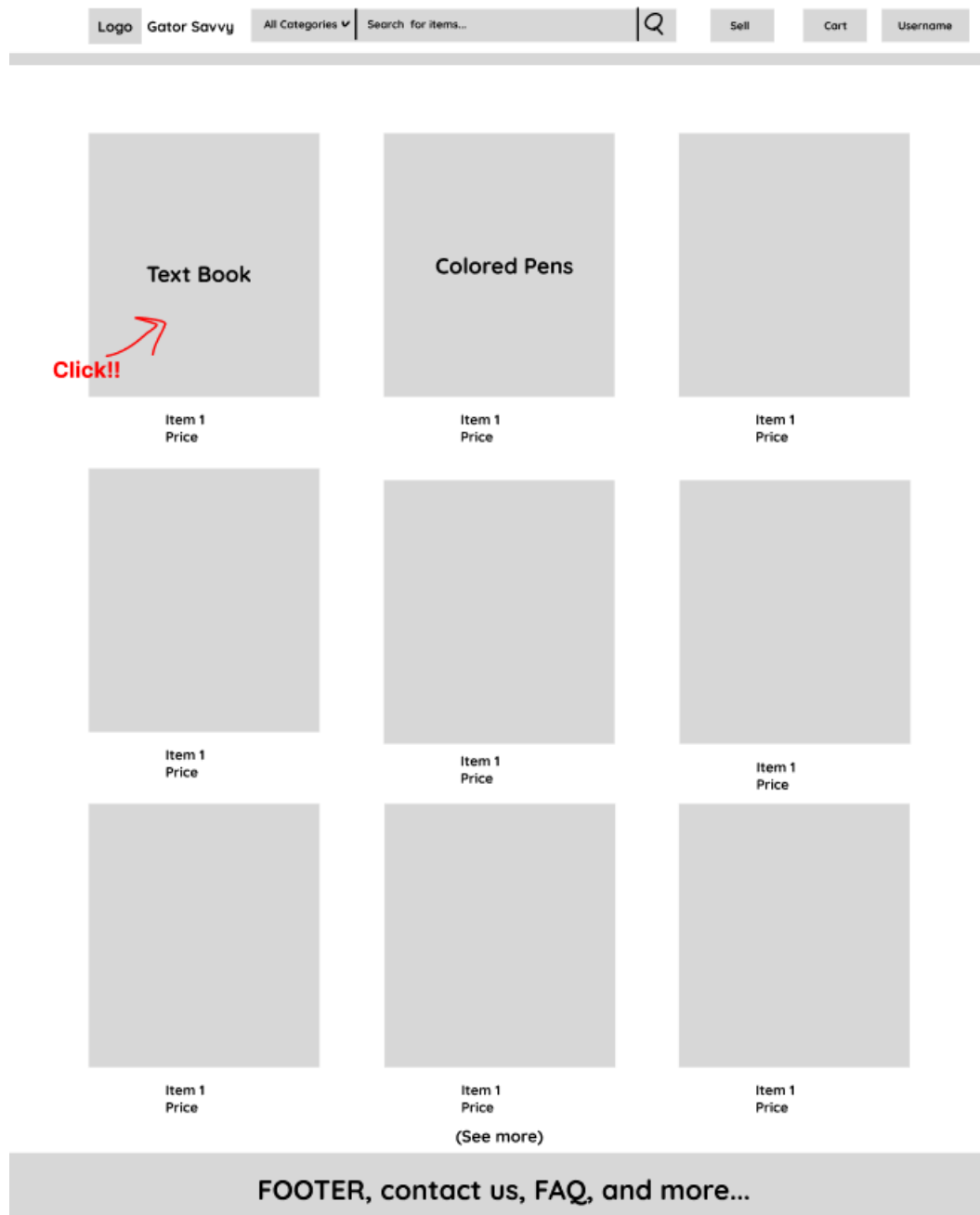| Groceries	Groceries	School Supplies
Item 1 Price	Item 1 Price	Item 1 Price
Groceries	School Supplies	School Supplies
Item 1 Price	Item 1 Price	Item 1 Price
Groceries	School Supplies	Groceries
Item 1 Price	Item 1 Price	Item 1 Price

(See More)

FOOTER, contact us, FAQ, and more...

StoryBoard 2 - Use case 2

Sophia clicks on SFSU Exclusive deals, but she doesn't need that item for too long. From the item page, she shall be able to look for other options, including renting, borrowing, exchanging, or purchasing second-hand items.
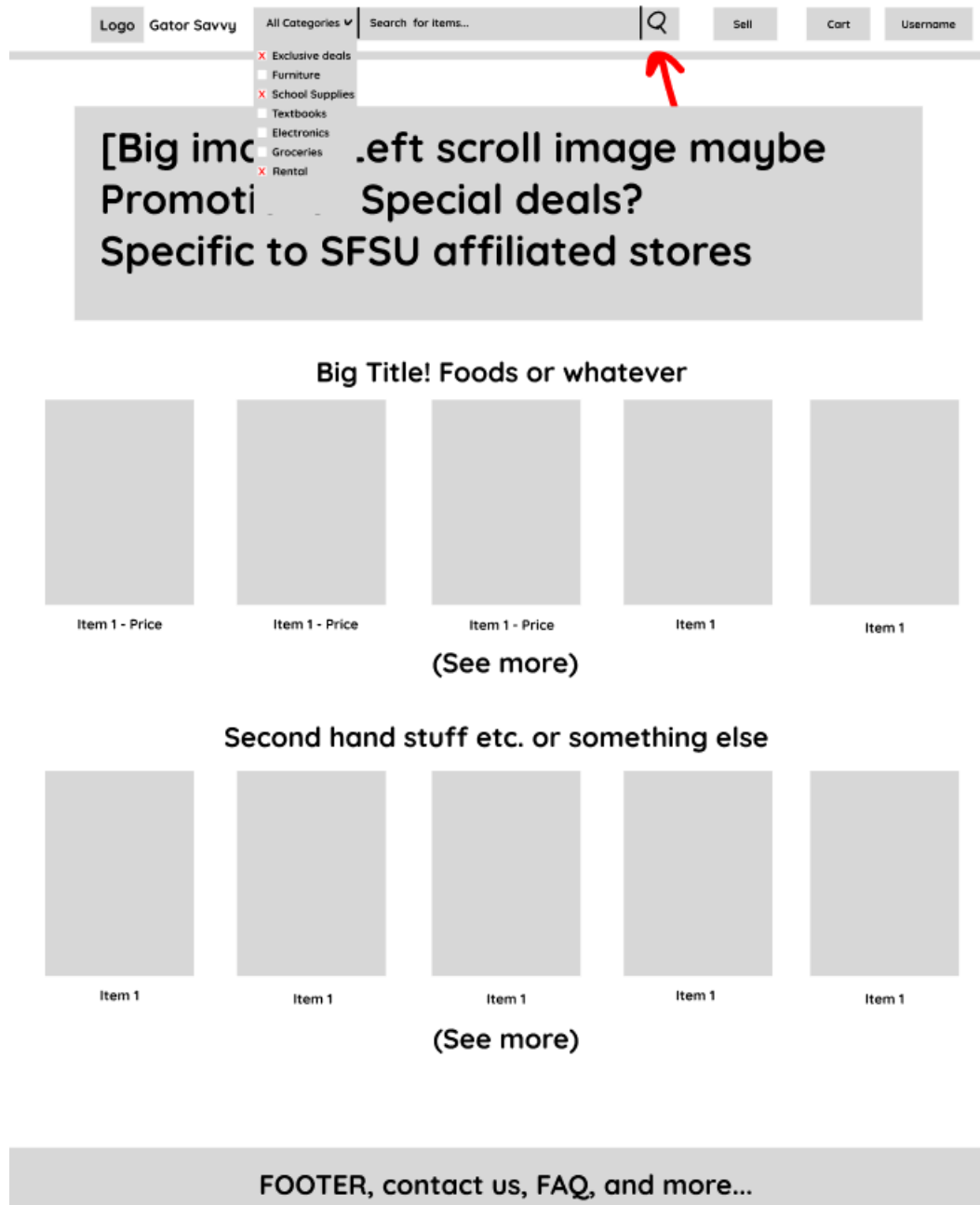
Sophia now uses the dropdown menu to specify school supplies, exclusive deals(These are the deals available due to having the SFSU email), and items available to rent.

| Logo | Gator Savvy | All Categories ⌄ | Search for items... | 🔍 | Sell | Cart | Username |

Text Book

Colored Pens

Click!!

Item 1
Price

Item 1
Price

Item 1
Price

Item 1
Price

Item 1
Price

Item 1
Price

Item 1
Price

Item 1
Price

Item 1
Price

(See more)

FOOTER, contact us, FAQ, and more...

This gives her a large list of items that fit her needs. She shall then click on any item and view further details.

Item Name

Price

Location

Condition
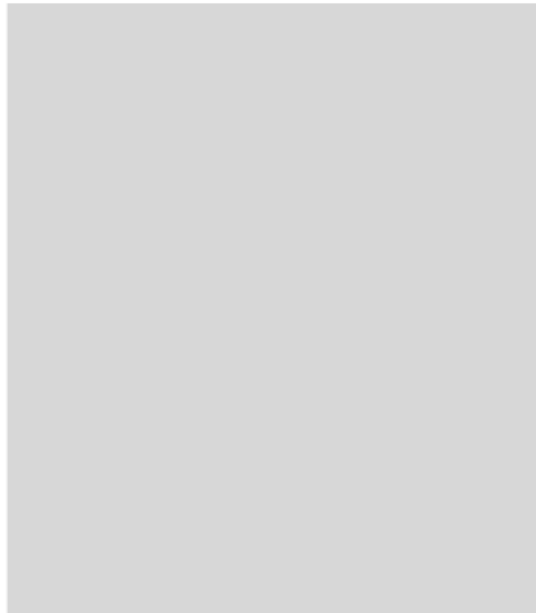
Categories
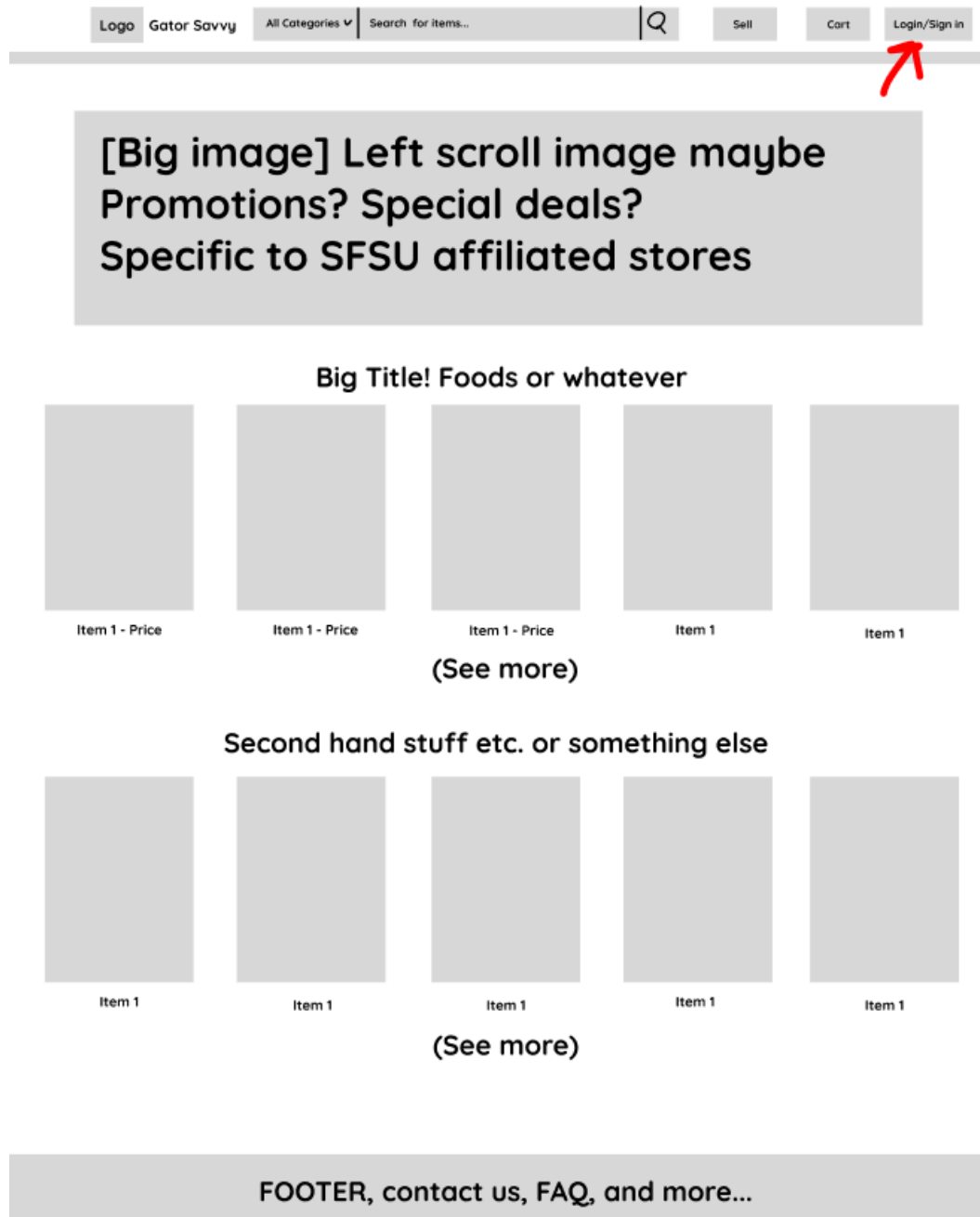
~~~~~~~~~~
~~~~~~~~~~
~~~~~~~~~~

Add To Cart   Rent

Chat with Seller

↑

If looking for
exhanges then you
can chat with
seller

Short Description

~~~~~~~~~~~~~~~~~~~~
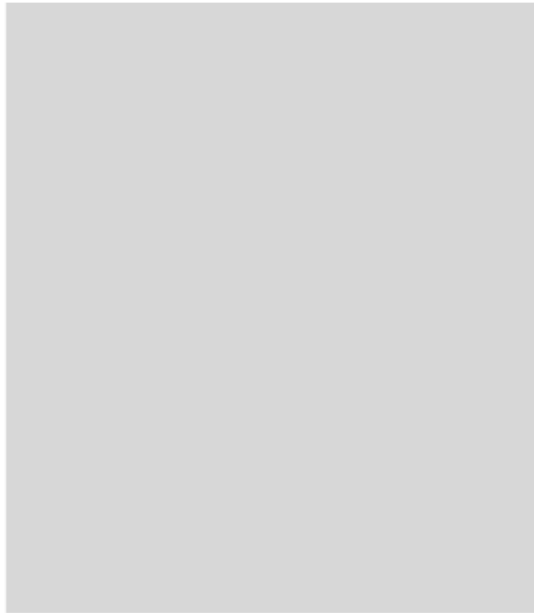~~~~~~~~~~~~~~~~~~~~

Seller Badge Ratings/Reviews

^Can Click to go seller page^

FOOTER, contact us, FAQ, and more...

Here she shall see all relevant details of said item, and is also provided with some seller information. If she wishes to make possible exchanges/trades, then she can contact the seller directly

Logo Gator Savvy | All Categories ⌄ | Search for items... | 🔍   Sell   Cart   Username

Item Name

Price

Location

Condition

Categories

~~~~~~~~~
~~~~~~~~~
~~~~~~~~~

| Add To Cart | Rent |

Chat with Seller

Seller

Short Description

~~~~~~~~~~~~~~~~~~~~~~
~~~~~~~~~~~~~~~~~~~~~~

Seller Badge Ratings/Reviews

^Can Click to go seller page^

Send

FOOTER, contact us, FAQ, and more...

StoryBoard 3 - Use case 3

Jen (Persona 2) is looking for some textbooks and school supplies for her students in her finance class. She's able to register her account via her SFSU email to shop for supplies and extra lecture materials with ease and reasonable value for her students.

Logo   Gator Savvy

Sign in

SFSU email

Password

Login

Forgot password

Don't have an account?

FOOTER, contact us, FAQ, and more...

Because Jen does not yet have an account she clicks the don't have an account link.

She fills in her appropriate information (SFSU EMAIL IS NEEDED) and creates an account. After clicking Create Account she is redirected to login.

Logo   Gator Savvy
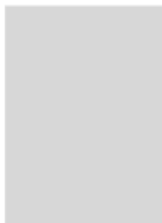
Sign in

SFSU email
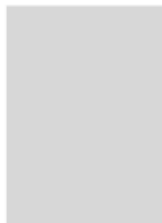
Password

Login

Forgot password

Don't have an account

FOOTER, contact us, FAQ, and more...

Logo   Gator Savvy   All Categories ∨   Search for items...   🔍   Sell   Cart   Username

[Big image] Left scroll image maybe
Promotions? Special deals?
Specific to SFSU affiliated stores

Big Title! Foods or whatever

Item 1 - Price   Item 1 - Price   Item 1 - Price   Item 1   Item 1
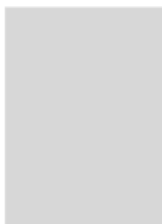
(See more)

Second hand stuff etc. or something else

Item 1   Item 1   Item 1   Item 1   Item 1

(See more)

FOOTER, contact us, FAQ, and more...

After successfully logging in she now searches using the drop down with predefined filters to look for what she needs.

Logo Gator Savvy   All Categories ⌄ | Search for items...   🔍   Sell   Cart   Username

☐ Exclusive deals
☐ Furniture
✗ School Supplies
✗ Textbooks
☐ Electronics
☐ Groceries

[Big image .eft scroll image maybe
Promoti   Special deals?
Specific to SFSU affiliated stores

Big Title! Foods or whatever

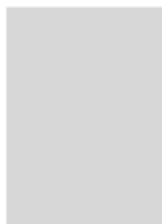Item 1 - Price   Item 1 - Price   Item 1 - Price   Item 1   Item 1

(See more)

Second hand stuff etc. or something else

Item 1   Item 1   Item 1   Item 1   Item 1

(See more)

FOOTER, contact us, FAQ, and more...

Text Book

Item 1
Price

Colored Pens

Item 1
Price

Note Books

Item 1
Price

Note Cards

Item 1
Price

Item 1
Price

Item 1
Price

Item 1
Price

Item 1
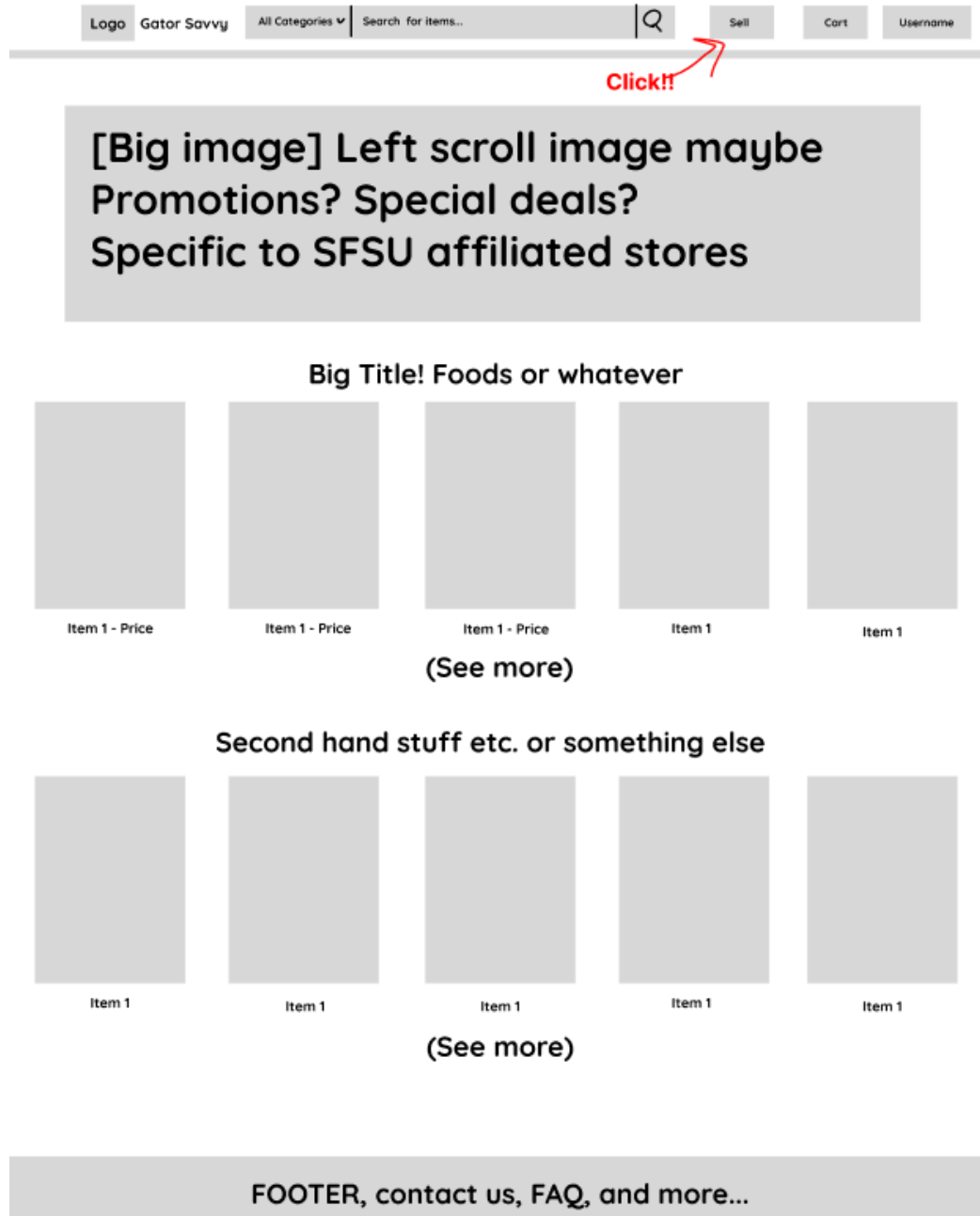Price

Item 1
hPrice

(See More)

FOOTER, contact us, FAQ, and more...

This is the list of items Jen was looking for.

StoryBoard 4 - Use case 4

Jen is not that good with technology. With the simple design of our website, she can put her items, for example, old textbooks and furniture that she wants to sell, with ease.

Jen Clicks the Sell button at the top right of our homepage. (This button is only available if logged in.)

Logo   Gator Savvy

Sell

Item

Category

Price   **Available to rent?**

$

Image   **Condition**

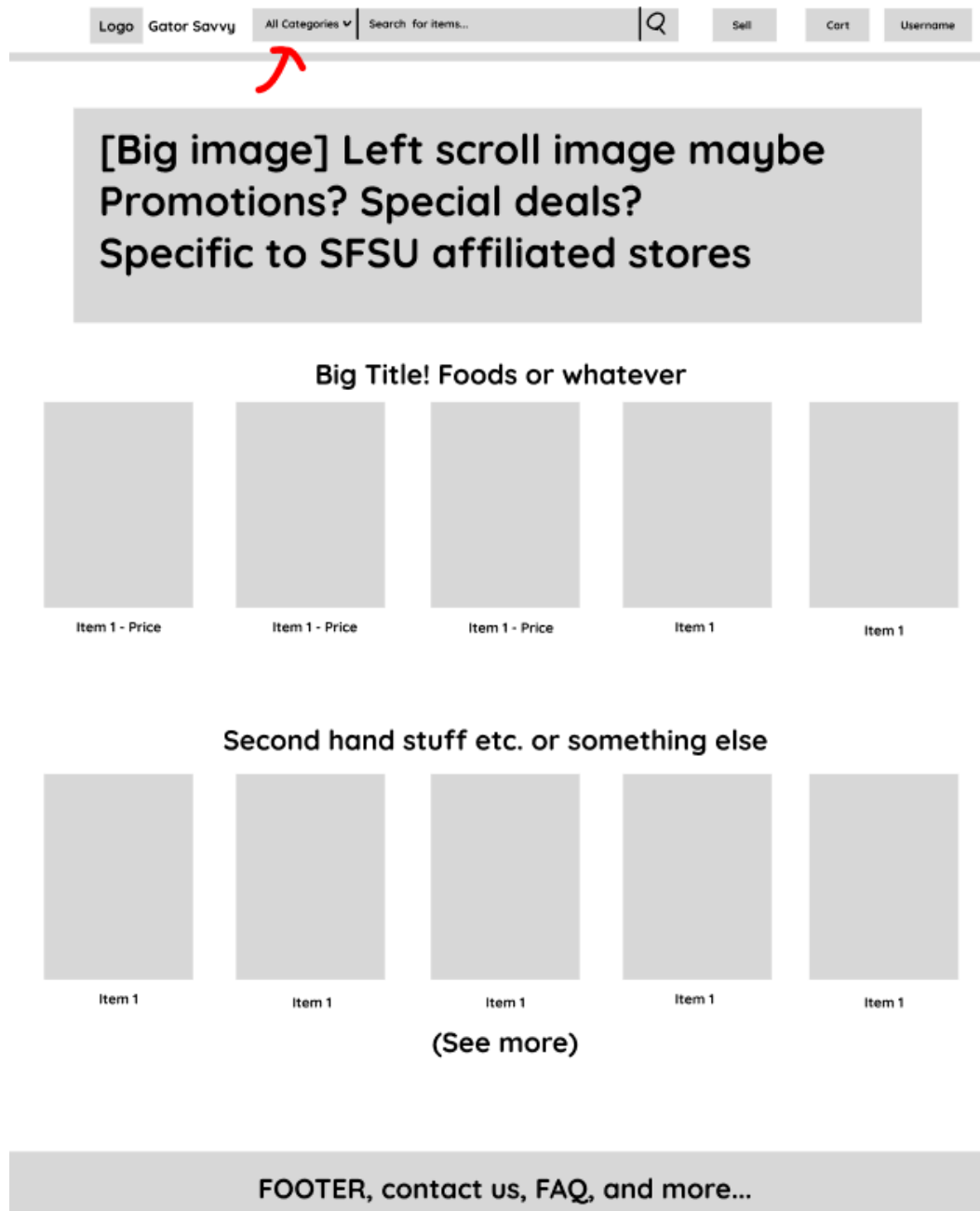Upload

Location

Description

Post

FOOTER, contact us, FAQ, and more...

She fills in all relevant information for said item she wants to sell, along with images and if she wants to allow the item to be rentable.

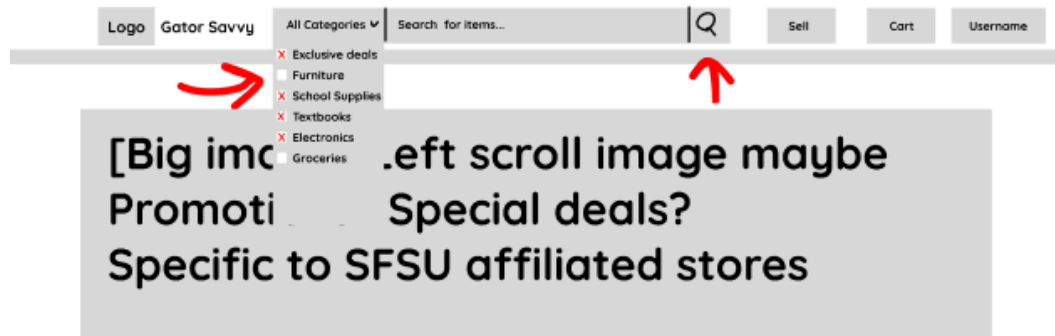*After posting she is redirected to the homepage.*

StoryBoard 5 - Use case 5

James (Persona 3) is trying to look for some related items to purchase for his robot project. He can look up related items or textbooks using our simple categorized search, which refreshes in real-time, along with the search conditions.

Assume James is logged in. He now uses the predefined filters to find what he needs.

Logo Gator Savvy   All Categories ∨   Search for items...   🔍   Sell   Cart   Username

X Exclusive deals
☐ Furniture
X School Supplies
X Textbooks
X Electronics
☐ Groceries

[Big imc .eft scroll image maybe
Promoti   Special deals?
Specific to SFSU affiliated stores

Big Title! Foods or whatever

Item 1 - Price	Item 1 - Price	Item 1 - Price	Item 1	Item 1

(See more)

Second hand stuff etc. or something else

Item 1	Item 1	Item 1	Item 1	Item 1

(See more)

FOOTER, contact us, FAQ, and more...

Because he is logged in with an SFSU Email he can access the exclusive deals.

Logo Gator Savvy | All Categories ⌄ | Search for items... 🔍 | Sell   Cart   Username

Textbook

Item 1
Price

Textbook

Item 1
Price

School
Supplies

Item 1
Price

Textbook

Item 1
Price

School
Supplies

Item 1
Price

School
Supplies

Item 1
Price

Textbook

Item 1
Price

Textbook

Item 1
Price

Electronics

Item 1
Price

(See more)

FOOTER, contact us, FAQ, and more...

Description/Contents of pages

Homepage - Student View

- Header with search bar, search filters, login/signup, and sell button(if logged in)
- Featured deals carousel
- Categories (Food, Clothing, Tech, Textbooks, etc.)
- Recommended items/deals section

Item Browsing Page

- Dropdown with filter options (Category, Expiration Date, Location)
- List of items with thumbnails, locations, and prices
- Load More button

Item Details Page

- Large image of the deal
- Item name and seller info (name/badge/ratings)
- Price, Condition, Location
- Add to cart button, rent(if available)
- Chat with seller

Profile Page

- Profile photo, name, and school email
- Saved Deals section
- Deal History (Previously claimed deals)
- Overview of active and expired deals
- Edit or Delete Existing Deals

Login Page

- SFSU email
- Password
- Login button
- Forgot Password button
- Don't have an account button (Signup page link)

Signup Page

- First name
- Last name
- Username
- SFSU email
- Password
- Repeat password
- Create account button

Sell/Post item Page

- Item name
- Categories
- Price
- Availability to rent
- Image
- Condition/Expiry date
- Location
- Description

Error / No Deals Found Page

- Simple message: "No deals found. Check back later or explore other categories."
- Suggested categories or deals

NOTE: These wireframes will be used as the foundation for the visual design and development stages of Gator Savvy. Each interface will prioritize a clean, intuitive user experience tailored to SFSU students and vendors.

5. High-level Architecture, Database Organization summary only

Database Organization

Below is the list of the main database tables and the columns (attributes) each table contains, consistent with the naming conventions from Section 2.

User
- user_id (Primary Key)
- username
- full_name
- email (Must be a valid SFSU email for verification)
- Password_hash (Encrypted password)
- role (e.g., "Registered User", "Admin")
- is_verified (Boolean to check if the user is verified)
- created_at (Timestamp of user creation)
- updated_at (Timestamp of last update)

Profile
- profile_id (Primary Key)
- user_id (Foreign Key to Users table)
- student_id (Unique identifier for students)
- liked_items (List of item IDs liked or wishlist by the user)
- reviews_count (Number of reviews written by the user)
- rating (Average user rating from seller feedback)
- is_faculty
- preferences (e.g., categories the user is interested in) (optional)

Item_Listing
- item_id (Primary Key)
- user_id (Foreign Key to User table)
- name
- description
- price
- category_id (Foreign Key to Category table)
- location
- quality (e.g., "new", "used", etc.)
- rental_option (Boolean: indicates if the item can be rented)
- created_at
- updated_at
- is_active (Boolean: indicates if the listing is active)

Verification_Badge
- badge_id (Primary Key)
- user_id (Foreign Key to Users table)
- badge_type (Type of badge, e.g., "Verified Seller")
- created_at (Timestamp when the badge was issued)
- updated_at (Timestamp for when the badge status was last updated)

Category
- category_id (Primary Key)
- category_name

Shopping_Cart
- cart_id (Primary Key)
- user_id (Foreign Key to Users table)
- item_id (Foreign Key to Item Listings table)
- quantity

Media Storage

We'll use AWS S3 buckets for storing images, videos, and user profile photos. Plan to connect S3 buckets to an AWS RDS database and to the EC2 instance created.

Search/filter architecture and implementation

We will use the SQLAlchemy library and the Pandas library for searches. The target categories will be searched using Pandas's *query* function, and the category class will be set up using the SQL Alchemy library. The system will search through specific columns to ensure relevant results are returned quickly and accurately.

The following columns from the Item_Listing table will be used for the search:

- Category: Exact match using the category column in the Item_Listings table.
- Item Name: Substring search using *contains()* on the name column.
- Description: Substring search using *contains()* on the description column.

Changes to SW Tools/Frameworks
- Server Host: Amazon AWS EC2
- Operating System: Ubuntu Server 24.04.2 LTS (GNU/Linux 6.8.0-1024-aws x86_64)
- **[[**NEW**]]** Database: Amazon AWS RDS (MySQL Ver 8.0.41-0ubuntu0.24.04.1 for Linux on x86_64)
- **[[**NEW**]]** Storage: Amazon AWS S3 buckets
- Web Server: NGINX 1.26.3
- Server-Side Language: Python 3.12.3
- Web-Side Language: JavaScript

- Backend Framework: Flask 3.0.2
- **[[**NEW**]]** Backend Library: SQLAlchemy, Pandas, bcrypt
- Frontend Framework: Vue.js v3.5.13
- IDE: PyCharm, VS Code
- Web Analytics: Google Analytics
- SSL Cert: Lets Encrypt (Cert Bot)
- Documentation: Doxygen (1.13.2)

- Supported Browsers: Safari 18.3 & Chrome LTS-126

6. Identify actual key risks for your project at this time

Skill risks

Our team has a slight gap in each field, and it would be hard to bring everyone up to the same skill level for this development. The way to corporate this gap is to have the experience to work with other members of the team, and finish it fast and well while practicing using our software stack.

Schedule risks

At this particular time, the spring break has set our team apart from school for a whole week. It will be hard to find everyone's availability for a specific meeting time. Our solution to this is to have a small 13-15-minute quick catch-up session for the progress done each day, and that ensures we keep up with the schedule and submission.

Technical risks

The biggest technical risk is our AWS EC2 instance at this moment. An incident happened where two EC2 instances were running at the same time, causing our available free tier hours to be limited, estimating less than 5 days of total hours available. Our solution to this is to use whatever we have, do development on localhost, and update the server on April 1st. Since we are

Teamwork risks

Our teamwork risks are several issues combined above. One missing component could slow our progress from meeting the deadline on time, and our members could get nervous. Our solution is to cross-check each other's changes and progress at the end of the day, making sure that everyone is on track and comfortable with discussing changes.
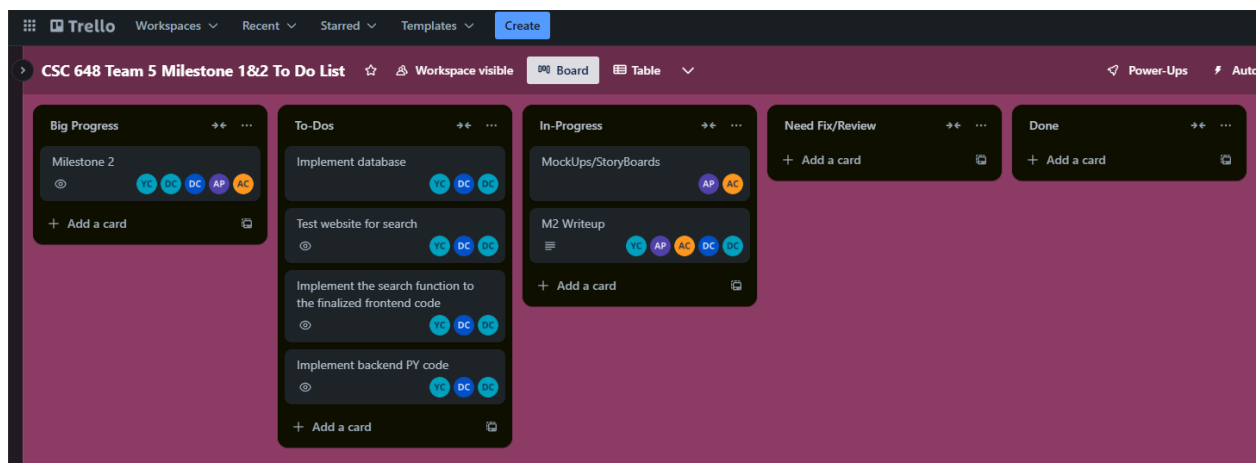
Legal/content risks

One risk is the liability of buyers/sellers who use the marketplace. Since we are not legal experts, one thing we can aim to do is take inspiration from the other marketplace platforms and mimic a version of legal statements ourselves.

7. **Project management**

We are using Trello to manage our project. Here is our plan:

- Frontend
  - Fine-up mockups and storyboards
  - Finalize use cases using
  - Finish write-up (before 3/24)
- Backend
  - Help M2 Pt1 (before 3/24)
  - Finalize DB contents and variable (in Pt1, before 3/24)
  - Test out code on localhost before April 1st (Google Colab for temporal collab coding)
  - After April 1st, EC2 refreshes, pushes updates to the server for submission
- GitHub Master
  - Change credential information after EC2 instance refresh & stable IP

8. Use of GenAI tools like ChatGPT and copilot

AI models used:
ChatGPT (GPT-4o) - HIGH

ChatGPT:
We used ChatGPT for the following tasks

Task 1: Generating some example entities
Helpfulness: Somewhat helpful
Description:

It is nice to have some examples of what entities to include in our database. However, some of the items from GPT's response were too off-topic. We are still able to edit the listed items to meet our team's requirements.

Task 2: Generating a summary for #5's instruction
Helpfulness: Helpful
Description:

We throw in the instructions for #5, let GPT summarize the paragraph for us, and list the items we need to fill out. It was great that GPT is good at summarizing paragraphs, so it saves us more time on reading the actual instructions.

9. Team Lead Checklist

- So far all team members are fully engaged and attending team sessions when required **DONE**
- 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 **DONE**
- The team reviewed suggested resources before drafting Milestone 2 **DONE**
- The team lead checked the Milestone 2 document for quality, completeness, formatting, and compliance with instructions before the submission **DONE**
- The team lead ensured that all team members read the final Milestone 2 document and agreed/understand it before submission **DONE**
- The team shared and discussed the experience with GenAI tools among themselves **DONE**