SW Engineering CSC648-848 Spring 2025

SwiftThrift

Team 09

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Milestone 2 Part I

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Executive Summary

SwiftThrift is a platform that allows SFSU students and faculty to engage in buying and sellings items in a community-driven online marketplace. We believe that this is a necessary addition for the SFSU community, because students often need to purchase essential items for their academic journey, such as textbooks, stationary and other necessary items for getting through their classes. Additionally, there are faculty that wish to offer their textbooks that are needed for their classes, as well as students wanting to try delving into vendorship, either selling hand-made crafts or used hand-me-downs. SwiftThrift aims to solve that problem by providing a place for students and faculty in SFSU alike to sell and buy goods in a controlled marketplace, knowing that who they are selling to and where they are getting their purchases from are all within their college campus. On top of that, SwiftThrift also grants prospective faculty and students the opportunity to sell academic goods or possibly recreational items for the long term, being a place of potential long-term business.

Our application will allow users, verified to be students and faculty of SFSU beforehand, to buy from a listing of various items put up for sale by other users, and to sell any item that fits within the categories of items allowed just like any other platform. However, a key feature towards the selling aspect is allowing users to set up a persistent listing for a product they wish to sell as an entrepreneur or a textbook to rent locally as a teacher. Additionally, buyers will be able to communicate with the sellers before their purchase, providing a means to confirm the listing's authenticity, follow up on questions regarding the item and potentially creating a new friend.

I believe that our team will be the best to push out a trading platform like this for SFSU, because we are experienced in the software engineering scene, always striving to make various technical systems work effectively and honestly for its users. Especially as SFSU students, we are dedicated to catering this application towards helping students like us find a place to trade for what they need and want, all from the safety and familiarity of their own campus.

List of Main Data Items and Entries

General Aspects:

Registration: Guests can create an account to gain the features of registered users by including the following information:

- First name
- Last name
- SFSU email
- Roles (distinction between student and instructor, type of major, year level)

Communication: Registered users buying from another user are not allowed to negotiate and must only go through one round of communication

Students -

- Only SFSU Students should be allowed to register/sign up with a @sfsu.edu email only.
- Allowed to browse listings, put up items to be sold, and be able to report bugs/issues with the site.

Admin - Administrators that maintain the site's cleanliness and complaints

- Any reports or issues that get reported or noticed by users ex: malicious or spam content listed by other students.
- Should be able to delete listings or even delete/suspend users.

Guests - Users not associated with a SFSU account or users not logged into any account can only scroll the website, but will not be able to view a specific item. These users cannot see any registered user's profile or who is selling what on the platform.

Listing - Products or services being sold on the platform should include:

- Title: A clear and concise name for the item with a limit of 75 characters
- Description: An overview of the item or service with a maximum of 800 characters

- ➢ Image: At least one picture is required for each product
- ➢ Category: Products and services must be given an appropriate category
- ➢ Price: An amount that must be set by the seller

Category - Products/services being sold can be divided into categories

- ➢ Services (Tutoring, babysitting, freelancing, etc)
- ➢ Technology (laptops, harddrives, etc)
- ➢ Class material (textbooks, notebooks, etc)
- ➢ Appliances (clothes, furnitures, appliances, etc)

Providers - Providers that are able to list goods, items, and services to consumers.

- ➢ Includes students, and professors that are looking to sell items such as textbooks, electronics, etc.
- ➢ Ex: Providers can list goods that they are looking to get rid of unwanted items that they no longer need like textbooks or wanting to provide services.

Consumers - Consumers that are looking to purchase goods or services from Providers

- ➢ Any student or professor that is looking to purchase any goods like textbooks or electronics.
- ➢ Ex: Students can purchase any course materials, technology, or services like tutoring or moving items.

Features

Filtering - Users should be able to filter out items on types of items listed.

- ➢ Check if its a new or used item
- ➢ Sort the search by pricing range.
- ➢ Whether sold by undergrad, grad student, or alumni

Reporting - Users fill out a form regarding the issue whether it's a bug or reporting a listing that is malicious.

- ➢ Should have a title describing what the issue is ex: a bug or a report
- ➢ Body with text describing the issue in depth (like a email)

Location - User's can set a location to exchange items (Can also be SFSU specific)

- ➢ Can set the location for a meet up to be on campus or off campus.
- ➢ Seller should set the location when listing an item

Course Listed Items - User's should be able to place a course tag next to items like a textbook.

- ➢ I.E. If users wanted to search for CSC 210 textbooks or items, it would display all relevant listings.
- ➢ It would help students sort through course related items and help ease of use by narrowing down items related to a course. Helps people that are experienced and inexperienced with technology.

Search/Filter - Users should be able to search and filter out items that are

- ➢ Users can search items by their listing names that have similar spelling and similar listings shall appear.
- ➢ As for search filtering, uses can filter out categories as well as pricing. Once filtered, it should display listings that fit the criteria of the search/filter.

Personality Quiz - Users will be able to take a personality quiz in a form of multiple choice questions and depending on the result that they get back it will assign a category they might be interested in.

- ➢ I.E. If users get a personality type of creativity. They might get results that are related to art supplies or anything design related that the consumer might be interested in.

Prioritized Functional Requirements

Priority 1

- Unregistered User
    - 1. Guests shall register an account using their first name, last name, and sfsu.edu email.
- Registered User
    - 2. Registered users shall log in using their email and password.
    - 3. Providers shall be able to create product listings with a title (up to 75 words), at least one category, an optional description (up to 800 words), and an image (up to 4 mb).
    - 4. Providers shall be able to make multiple listings.
    - 7. Consumers shall be able to message providers.
    - 8. Consumers shall filter listings by category.
    - 9. Consumers shall search for listings by keywords.
    - 10. Consumers shall view details of a listing, including the provider's name and contact options.
    - 13. Consumers shall be able to complete a personality quiz that will recommend items based on their results.
- Admin
    - 14. The system shall require users to have an sfsu.edu email to register
    - 15. Categories shall be services, technology, class materials, clothes, and tools/appliances.
    - 16. Admins will approve new listings before they are made public.
    - 17. Listings will be hidden by default until approved by an admin.
    - 18. Listings are required to use thumbnails when displayed on the results page.

Priority 2

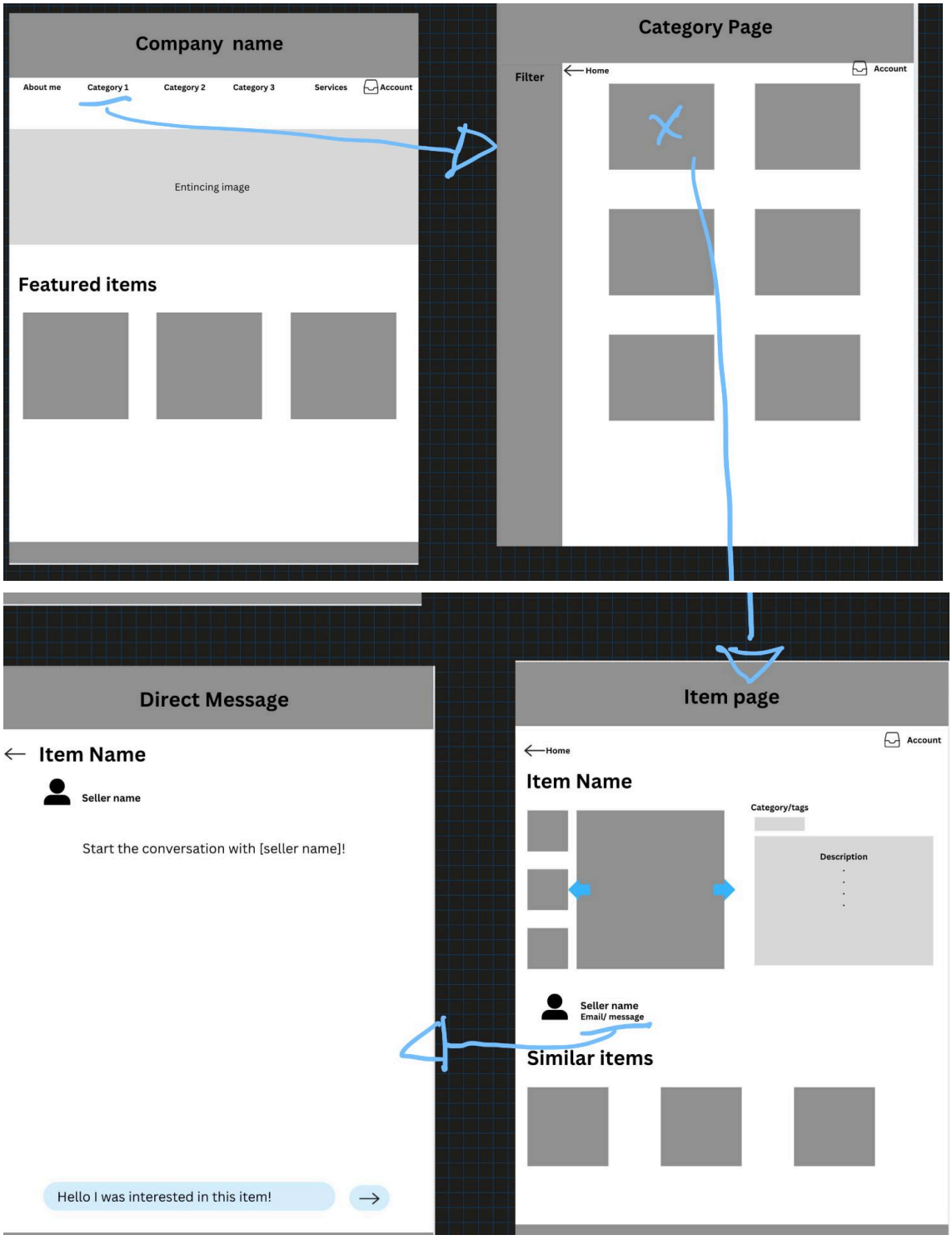
- Unregistered User
- Registered User
    - 11. Consumers shall be able to favorite specific products.
    - 12. Consumers shall be able to access a page of their favorites.
- Admin
    -

Priority 3

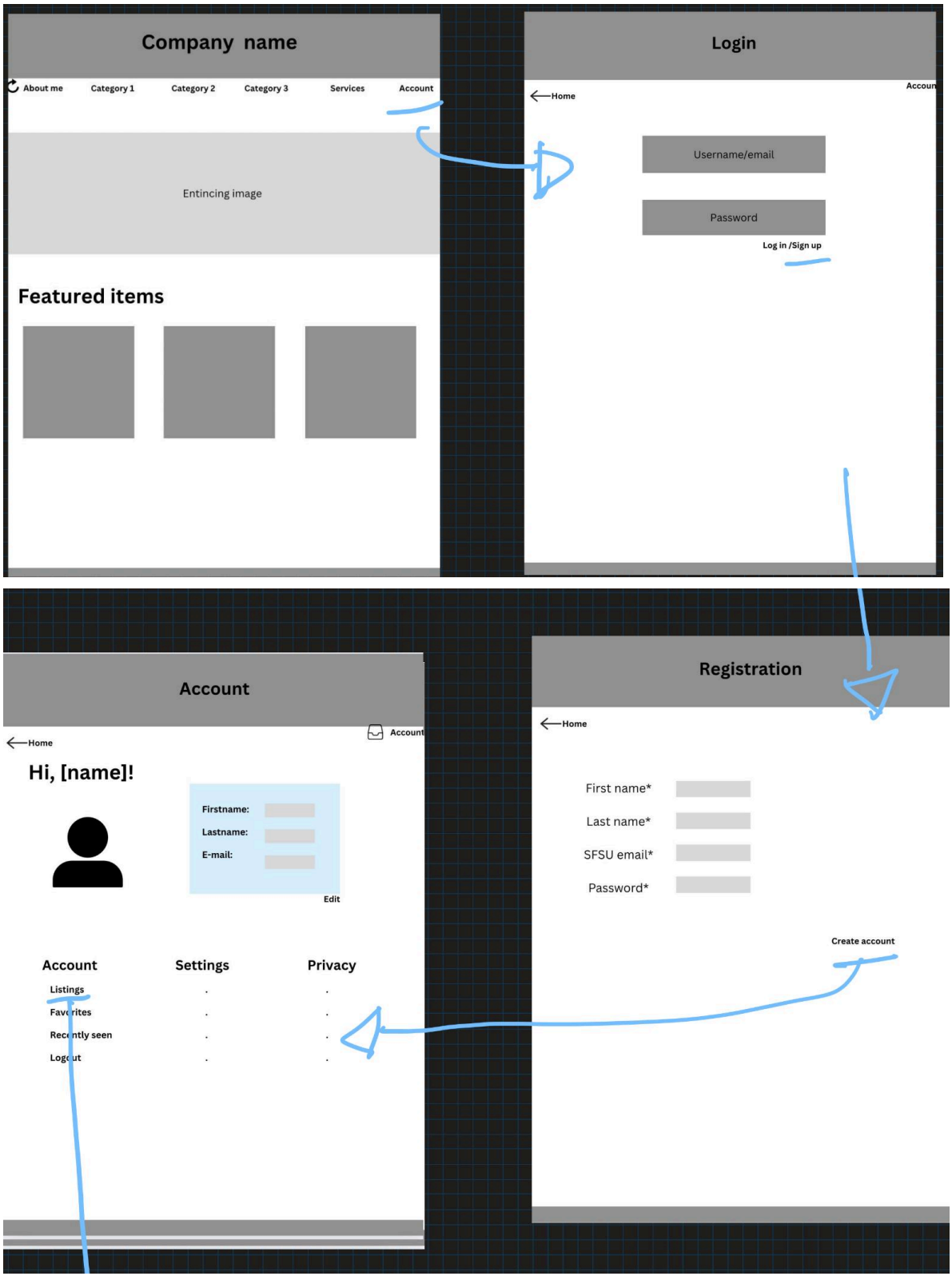
- Unregistered User
- Registered User
    - 5. Providers shall mark a product as sold after completion of transaction
    - 6. Providers shall be able to edit or delete their listings
- Admin

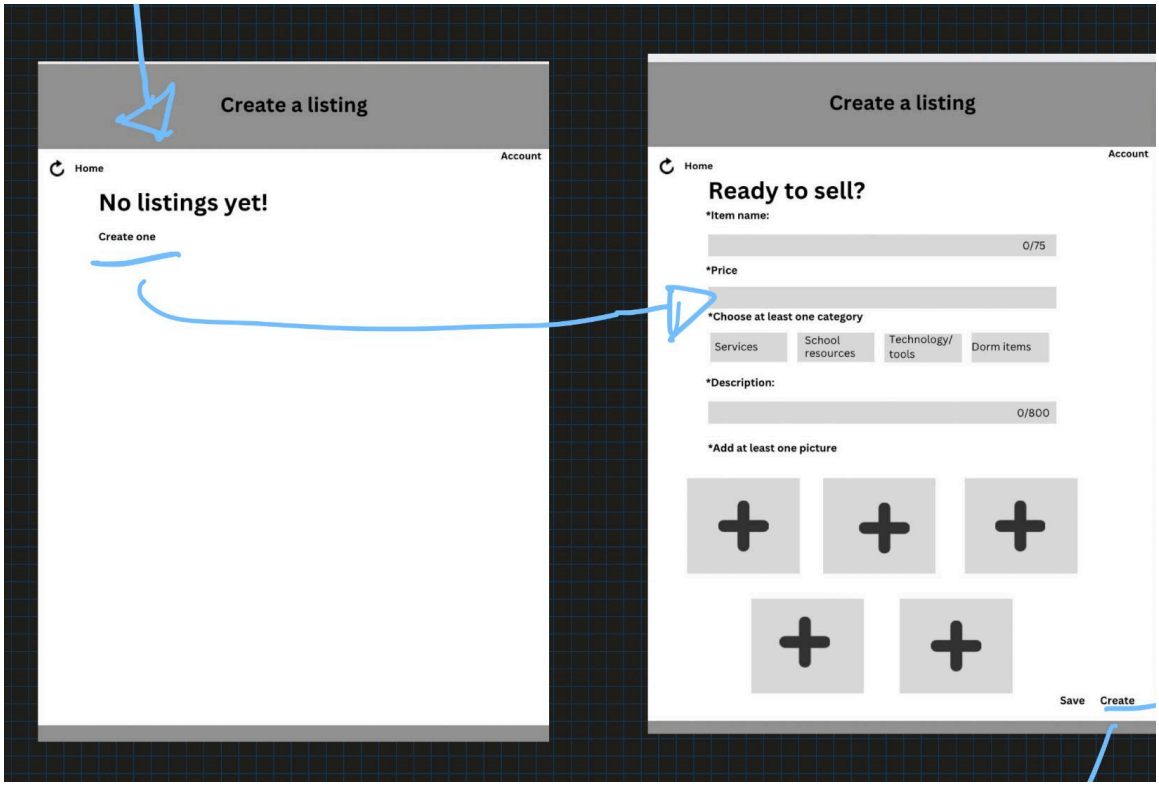
UI Storyboards

Use case 1: User enjoys purchasing used items and is currently looking for second-hand materials from graduating students to save money on class supplies.

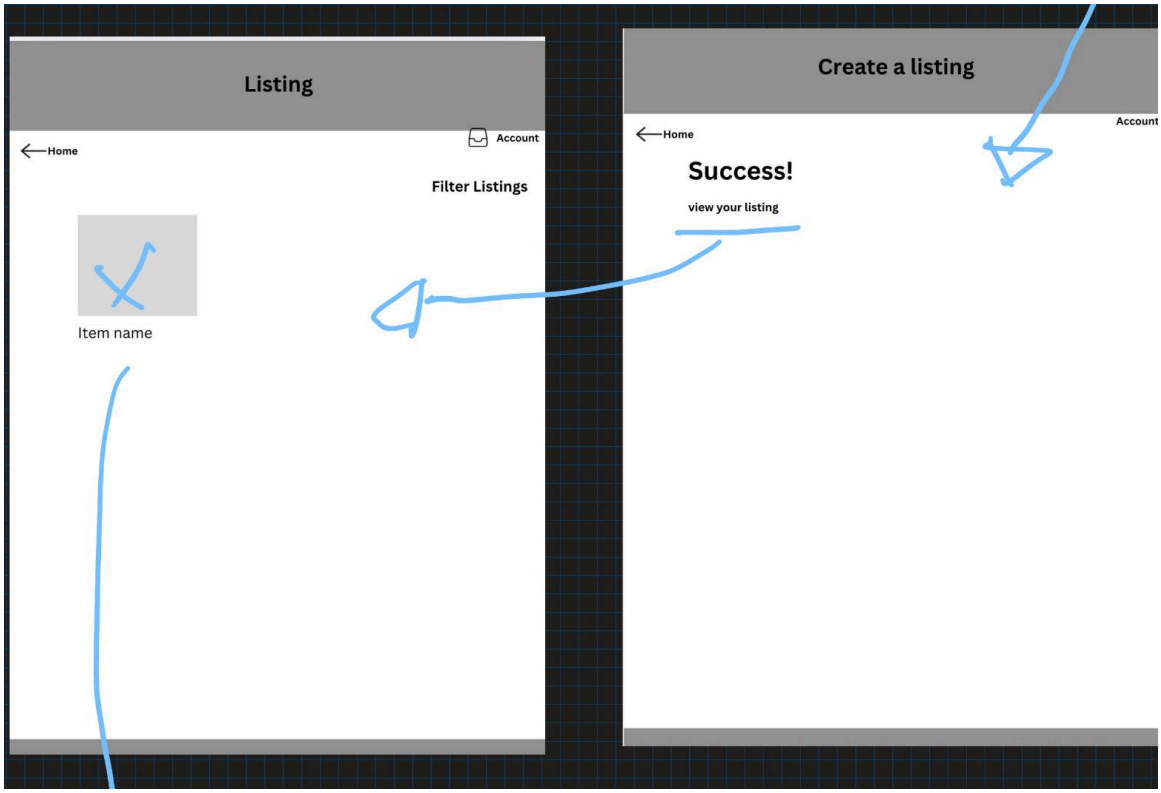


Use case 2: User has extra copies of textbooks and hopes to offer them at a discounted price specifically for SFSU students

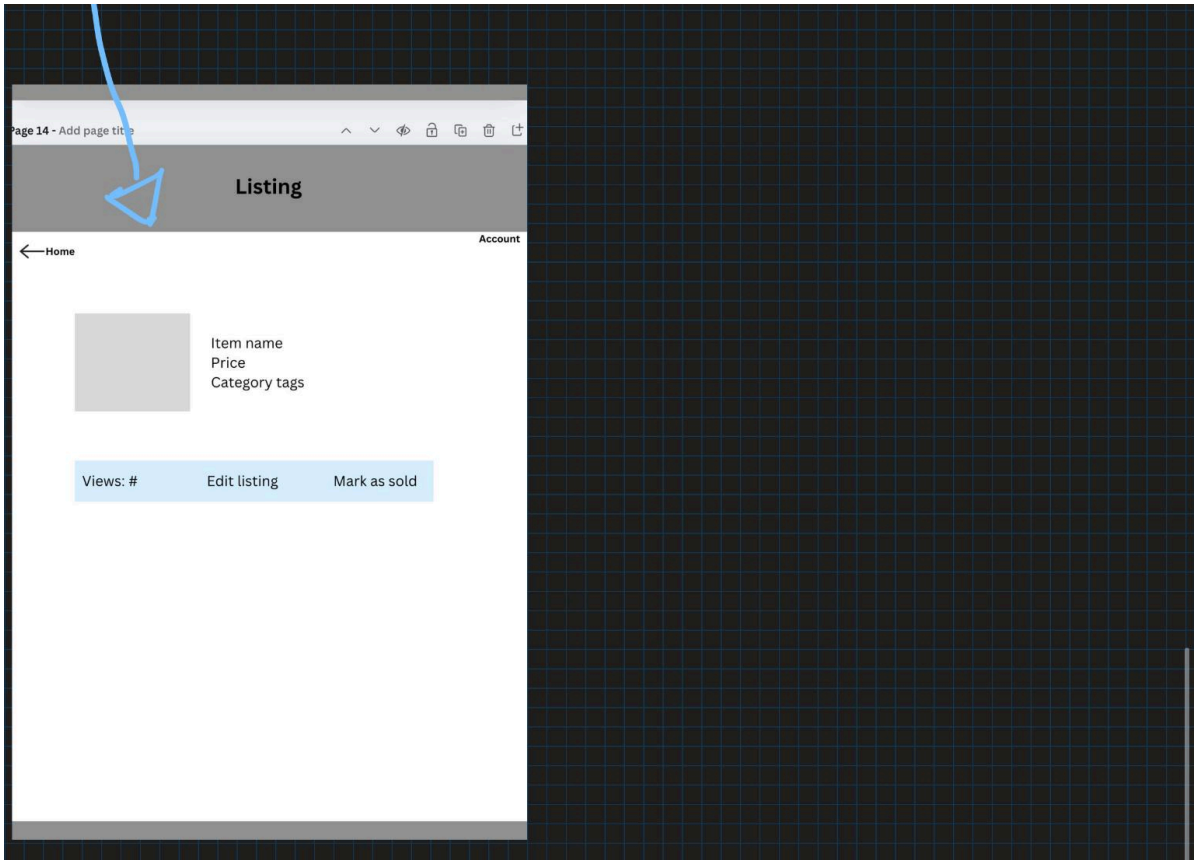



Create a listing
Account
Home
No listings yet!
Create one

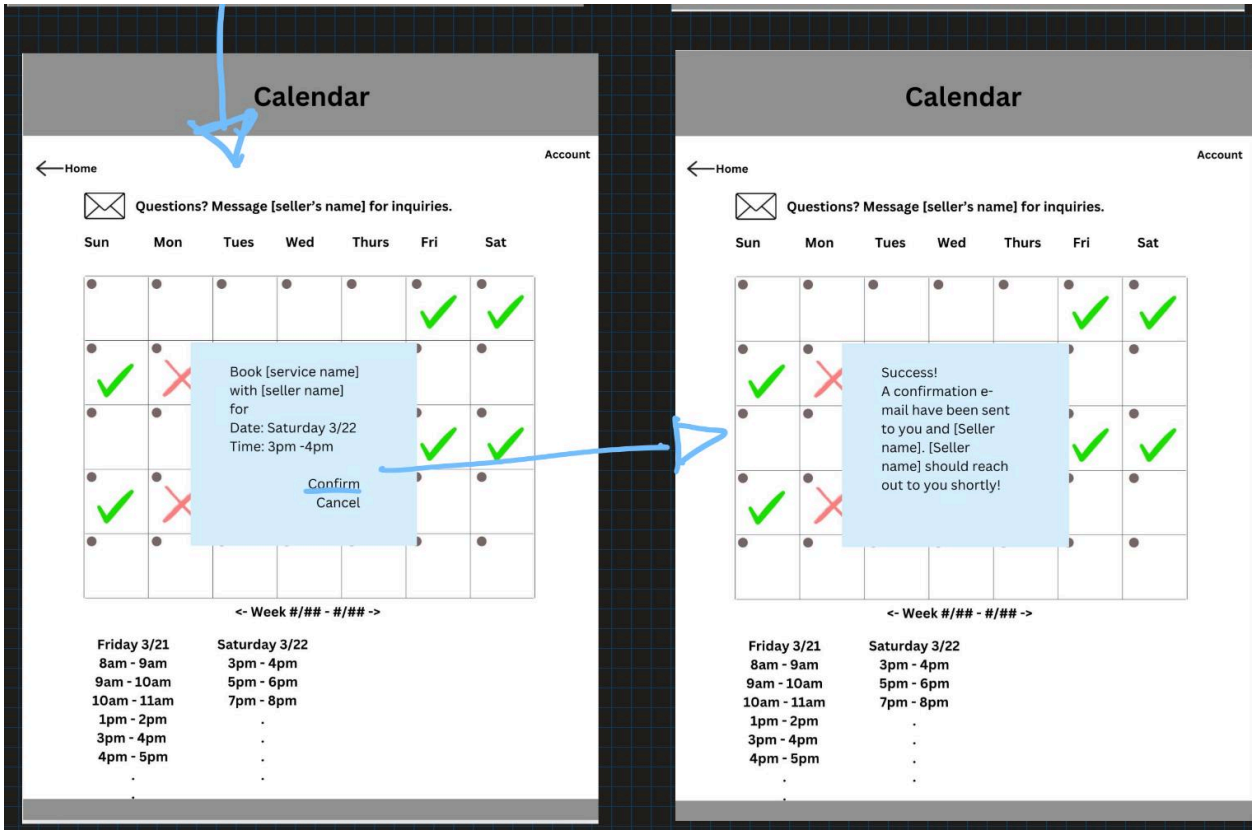
Create a listing
Account
Home
Ready to sell?
*Item name:
0/75
*Price
*Choose at least one category
Services
School resources
Technology/ tools
Dorm items
*Description:
0/800
*Add at least one picture
Save
Create


Listing
Account
Home
Filter Listings
Item name

Create a listing
Account
Home
Success!
view your listing

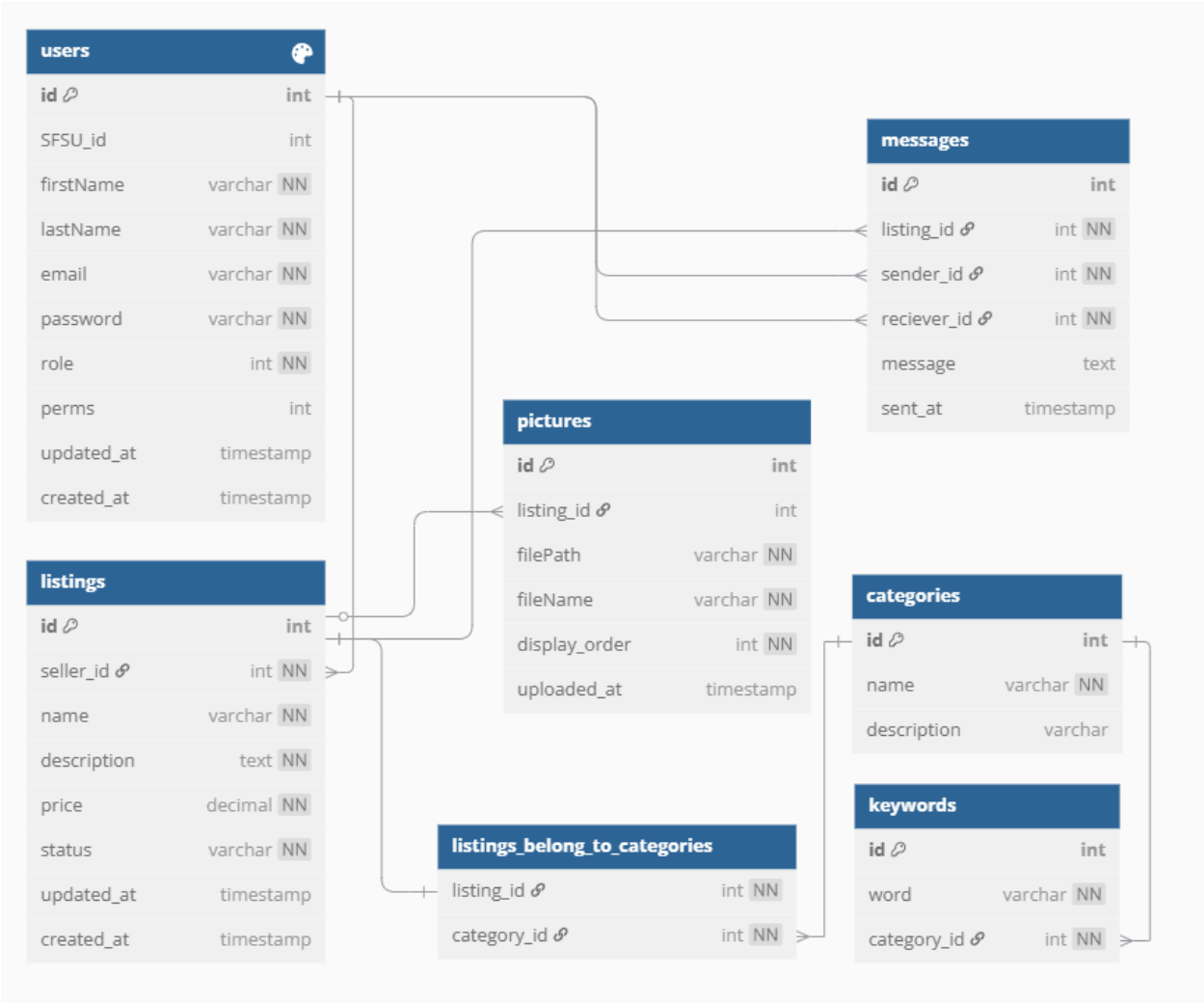

Page 14 - Add page title
Listing
Account
Home
Item name
Price
Category tags
Views: #
Edit listing
Mark as sold

Use case 3: User is looking for freelancing for a specific task and feels more comfortable seeking help from students and faculty in the area that attends the same school


Calendar
Home
Account
Questions? Message [seller's name] for inquiries.
Sun Mon Tues Wed Thurs Fri Sat
Book [service name] with [seller name] for
Date: Saturday 3/22
Time: 3pm -4pm
Confirm
Cancel
<- Week #/## - #/## ->
Friday 3/21
8am - 9am
9am - 10am
10am - 11am
1pm - 2pm
3pm - 4pm
4pm - 5pm
Saturday 3/22
3pm - 4pm
5pm - 6pm
7pm - 8pm
Calendar
Home
Account
Questions? Message [seller's name] for inquiries.
Sun Mon Tues Wed Thurs Fri Sat
Success!
A confirmation e-mail have been sent to you and [Seller name]. [Seller name] should reach out to you shortly!
<- Week #/## - #/## ->
Friday 3/21
8am - 9am
9am - 10am
10am - 11am
1pm - 2pm
3pm - 4pm
4pm - 5pm
Saturday 3/22
3pm - 4pm
5pm - 6pm
7pm - 8pm

High Level Architecture, Database Organization

Database Organization



users

- id: Integer, Primary key
- firstName: Varchar, Not null
- lastName: Varchar, Not null
- mail: Varchar, Not null
- password: Varchar, Not null
- role: Integer, Not null
- perms: Integer
- updated_at: Timestamp
- created_at: Timestamp

listings

- id: Integer, Primary key
- seller_id: Integer, Foreign key to users table, Not null
- name: Varchar, Not null
- description: Text, Not null
- price: Decimal, Not null
- status: Varchar, Not null
- updated_at: Timestamp
- created_at: Timestamp

pictures

- id: Integer, Primary key
- listing_id: Integer, Foreign Key to listings table
- filePath: Varchar, Not null
- fileName: Varchar, Not null
- display_order: Integer, Not null
- uploadedAt: Timestamp

messages

- id: Integer, Primary key
- listing_id: Integer, Foreign key to listings table, Not null
- sender_id: Integer, Foreign key to users table, Not null
- reciever_id: Integer, Foreign key to users table, Not null
- description: Text
- sent_at: Timestamp

keywords

- id: Integer, Primary key
- word: Varchar, Not null
- category_id: Integer, Foreign key to category table, Not null

categories

- id: Integer, Primary key
- name: Varchar, Not null
- description: Varchar

listings_belong_to_categories

- listing_id: Integer, Foreign key to listing table, Not null
- category_id: Integer, Foreign key to category table, Not null

Media storage

- We plan to store our media files in the file systems, utilizing a separate folder to distinguish between pictures, thumbnails, videos, and audio.
- Additionally, in order to prevent any media being accessed from a listing that has already been taken down, we will attempt to create private folders associated with listing posts so that they wouldn't be publicly accessible for when said listings are flagged as defunct.

Search/Filter Architecture and Implementation

- For searching listings, we will utilize SQL and %like to find listings that have the same spelling of words.
- For filtering by categories, we will also use %like with SQL, using a table that contains all of the associated keywords with each category provided to the users that will be used with the %like operation.
- For filtering by price, we will simply use a comparison operator with SQL to find listings within a specified range of prices, defaulting between 0 as the floor and infinity and the ceiling for said range when left unmodified.

Non-trivial algorithm

- We will have a personality quiz as a part of the website. This will be displayed as a form of multiple choice questions, which will return a list of items associated with their choice upon submission.
- There will be an algorithm on the backend that will process the form of multiple choice questions. Using weighted values for each choice towards certain categories of listings, the algorithm will determine which is the majority valued category and showcase a certain number of listings associated with the winning category.

Key Risks

Skill Risks

- Some actual key risks that we've faced so far are skill risks. In our case the skill risk that we have faced so far is that some of our group members are unfamiliar with setting up a database. We had come up with 2 solutions of how to solve this risk and they were to either let someone else that has more experience in that area work on it while the person with less experience can fill in somewhere else that they can. And the second idea is to just learn the skills they are unfamiliar with to the best of their ability.

Schedule Risks

- So far we haven't faced any schedule, technical, teamwork, and any legal/content risks. In terms of schedule, we haven't done anything that wasn't unreasonable and that we weren't able to do considering our resources and what we've committed.

Teamwork Risks

- We haven't had any teamwork risks either. We meet in class and have weekly meetings outside of class as well so we can communicate what we need to do and who's doing what. If we aren't meeting we can communicate over discord.

- No legal/content risks
- No technical risks

Project Management

For Milestone 2, we have primarily used Trello for our task management along with Google Calendar for setting up deadline reminders. During our initial team meeting for this milestone we discussed who will be responsible for each task and assigned those members to the specific card on Trello. Within Trello we have 4 separate lists; those being upcoming, in progress, done, and an archive list for our cards to go after a Milestone is completed. Separating the tasks in this way makes it clear to see which tasks have been finished and what still needs to be worked on. Unfortunately, the free plan for Trello does not allow us to use their Calendar or Timeline feature so we have instead created a synced Google Calendar where we can set up reminders for task deadlines. This of course helps us stay mindful of which tasks are due and makes it easy to check in since we are all already using Google Calendar for our own individual schedules. For Milestone 2 Part 2, we have begun separating tasks for our front-end and back-end team.

Use of GenAI tools

High Level Architecture, Database Organization (Medium)

Generated a database design from a photo

- The GenAI tool that we used is Claude AI. We used Claude AI to convert a white board drawing of our database design into a more tuned up version. We would rate this a medium usefulness because it was able to convert what we had already into a cleaner and easier to read design of the database components we brainstormed. The main benefit that Claude AI provided was that instead of committing to a digital design that's a bit harder to edit we were able to instead use a white board and quickly erase the ideas that weren't as useful as we thought. Once we had a good and "final" design we converted it into a jpeg of the drawn version.

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**
- ➢ Team reviewed suggested resources before drafting Milestone 2
  - **DONE**
- ➢ Team lead checked Milestone 2 document for quality, completeness, formatting and compliance with instructions before the submission
  - **DONE**
- ➢ Team lead ensured that all team members read the final Milestone 2 and agree/understand it before submission
  - **DONE**
- ➢ Team shared and discussed experience with GenAI tools among themselves
  - **DONE**